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

November 8, 2019

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) – CT1134
38 Lower Road, North Canaan, CT 06018
N 41.01472222
W 73.32638889

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 140-foot level of the existing 195-foot Self Support Tower at 38 Lower Road, North Canaan, CT. The tower and property are owned by Litchfield County Dispatch. AT&T now intends to remove (1) Andrew, (2) CCI and (3) Powerwave antennas and replace them with (2) CCI DMP65R-BU4DA antennas and (4) CCI DMP65R-BU6DA antennas. AT&T will also remove (3) existing Ericsson Remote Radio Units (RRU) and install (3) Ericsson 4449 B5/B12 and (3) 4478 B14 RRUs. The new antennas and RRUs will also be installed at the 140-foot level of the tower.

This facility was approved by the Town of North Canaan, which issued a Building Permit for the construction of a 195-foot tower on April 24, 1998. Since no modifications to the overall facility or tower height are proposed, 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 Charles P. Perotti, First Selectman of the Town of North Canaan, and the North Canaan Planning & Zoning

Office, 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: Charles P. Perotti - Elected Official
Litchfield County Dispatch – Tower and Property Owner
Richelle Hozda – Zoning Enforcement Officer

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*							9.96%
AT&T GSM	2	414	140	0.0166	850	0.5667	0.29%
AT&T UMTS	2	414	140	0.0166	850	0.5667	0.29%
AT&T UMTS	2	656	140	0.0263	1900	1.0000	0.26%
AT&T LTE	2	940	140	0.0377	700	0.4667	0.81%
AT&T LTE	2	1919	140	0.0769	2100	1.0000	0.77%
Site Total							12.39%

*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*							9.96%
AT&T UMTS	1	500	140	0.0063	850	0.5667	0.11%
AT&T LTE	1	1476	140	0.0296	700	0.4667	0.63%
AT&T LTE	1	2951	140	0.0591	700	0.4667	1.27%
AT&T LTE	1	1000	140	0.0200	850	0.5667	0.35%
AT&T 5G	1	1000	140	0.0200	850	0.5667	0.35%
AT&T LTE	2	4842	140	0.1939	1900	1.0000	1.94%
Site Total							14.62%

*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 SELF SUPPORT TOWER:
- NEW AT&T ANTENNAS: DMP65R-BU4DA (TOTAL OF 2 FOR ALPHA SECTOR).
- NEW AT&T ANTENNAS: DMP65R-BU6DA (TYP. OF 2 PER BETA & GAMMA SECTORS, TOTAL OF 4).
- NEW AT&T RRUS: 4449 B5/B12 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4478 B14 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T DC & FIBER SURGE ARRESTORS DC6-48-60-18-8C-EV (TOTAL OF 2) WITH (4) DC POWER & (2) FIBER RUN.
- PROPOSED MOUNT MODS (SEE S-1 SHEET).
- ROTATE EXISTING ANTENNA FRAMES TO MATCH LTE ANTENNA AZIMUTHS. EXISTING UMTS ANTENNAS AZIMUTHS TO REMAIN THE SAME.
- EXISTING UMTS ANTENNA AND EQUIPMENT TO BE RELOCATED FROM POSITION 1 TO POSITION 4.

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- SWAP DUS WITH 6630.
- ADD IDLe.
- ADD 6630 FOR 5G.
- HOME RUN UMTS RETS.
- NEW NETSURE 7100 POWER PLANT WITH BATTERIES TO REPLACE EXISTING.
- INSTALL (1) DC 12.

ITEMS TO BE REMOVED:
- EXISTING AT&T 7770 GSM ANTENNAS (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T SBNHH-1D65A LTE ANTENNAS (TOTAL OF 1 FOR ALPHA SECTOR).
- EXISTING AT&T HPA-65R-BUU-H6 LTE ANTENNAS (TYP. OF 1 PER BETA & GAMMA SECTORS, TOTAL OF 2).
- EXISTING AT&T RRUS-11 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T TMA'S (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING (6) LGP21901 DIPLEXERS. (GROUND LEVEL)

SITE ADDRESS:	38 LOWER ROAD NORTH CANAAN , CT 06018
LATITUDE:	42.014661° N, 42° 00' 52.77" N
LONGITUDE:	73.326305° W, 73° 19' 34.69" W
TYPE OF SITE:	SELF SUPPORT TOWER / INDOOR
STRUCTURE HEIGHT:	195'-0"±
RAD CENTER:	140'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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

SITE NUMBER: CT1134

SITE NAME: NORTH CANAAN-LOWER COUNTY RD

FA CODE: 10035410

PACE ID: MRCTB040404, MRCTB040581

PROJECT: LTE 3C_4C 2019 UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

TRAVELING WEST FROM WINSTED ON ROUTE 44 FOR APPROXIMATELY 16 MILES AND AT TRAFFIC LIGHT INTERSECTION OF ROUTE 44 AND ROUTE 7,TAKE A LEFT ONTO ROUTE 7 SOUTH (CITGO GAS STATION ON RIGHT) AND GO FOR ONE TENTH OF A MILE JUST CROSSING SMALL BRIDGE, TAKE A LEFT ON TO LOWER VALLEY ROAD. NOW PROCEED FOR 3 TENTHS OF A MILE, THERE WILL BE A GATE ON YOUR RIGHT WHICH YOU WILL GO THRU TO A SECOND GATE AND PROCEED THROUGH.

GENERAL NOTES

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

72 HOURS

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

UNDERGROUND SERVICE ALERT

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

12 INDUSTRIAL WAY
SALEM, NH 03079

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SITE NAME: NORTH CANAAN-LOWER COUNTY RD

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

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

AT&T

TITLE SHEET
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	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-G, 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

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SALEM, NH 03079

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

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

AT&T

GENERAL NOTES
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
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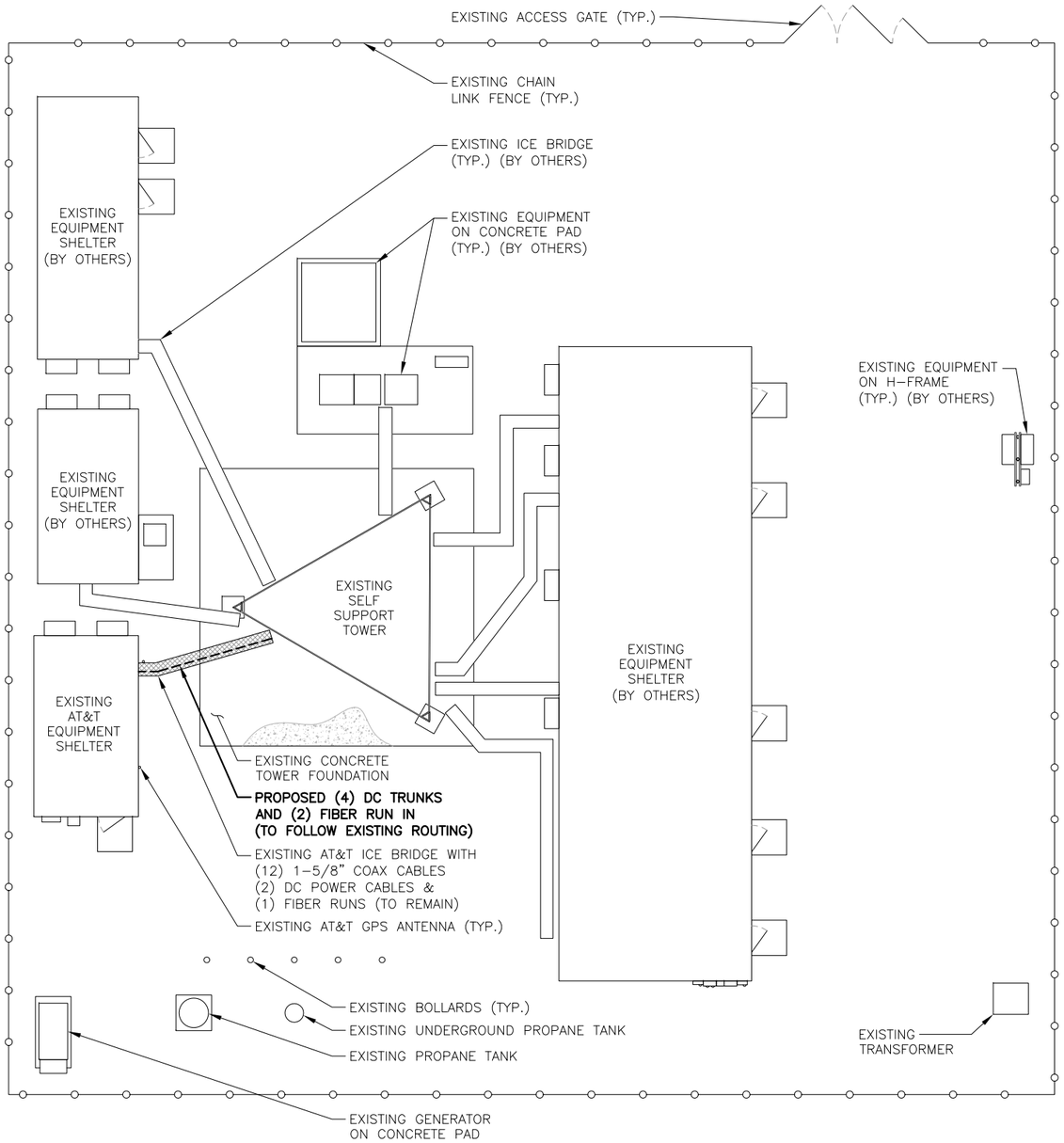
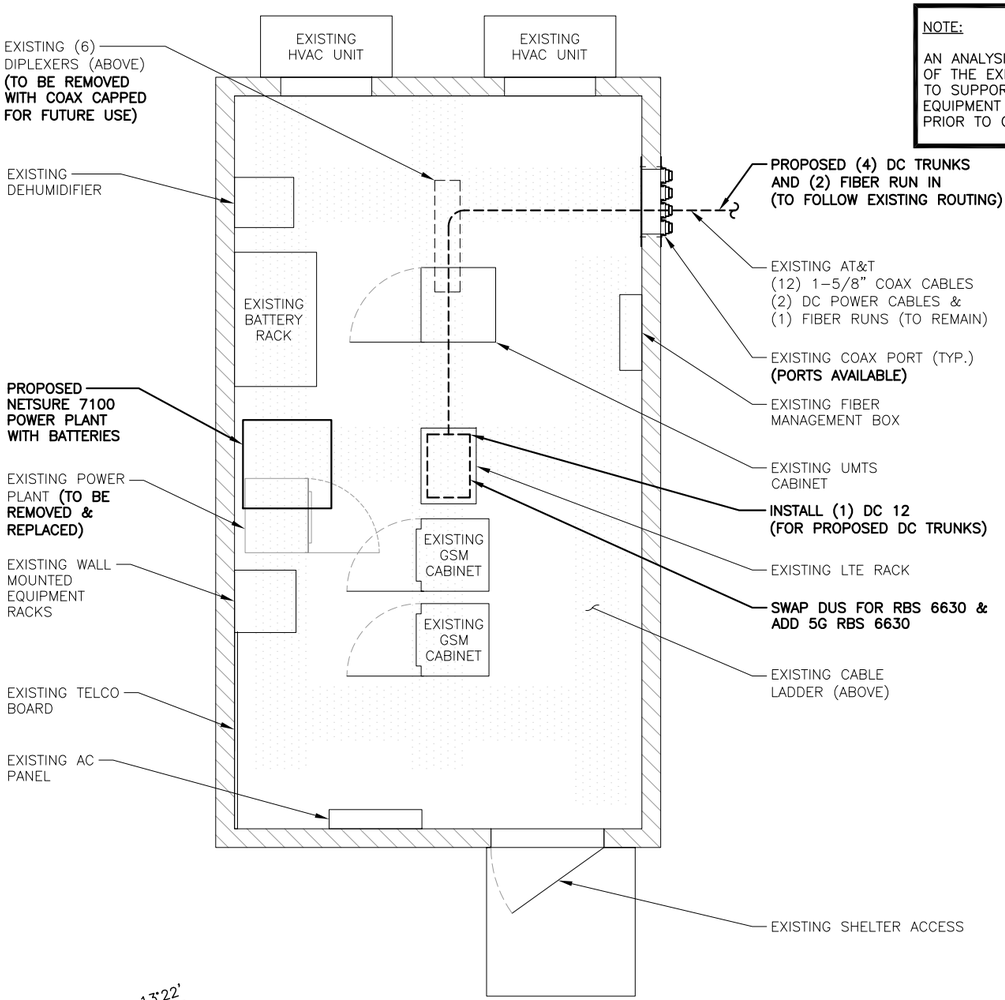




NOTE:

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

NOTE:

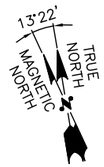
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: SEPTEMBER 13, 2019 (REV. 1)

NOTE:

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

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

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



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

0 1'-0" 2'-0" 4'-0" 6'-0"

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AT&T

COMPOUND & EQUIPMENT PLANS
LTE 3C_4C 2019 UPGRADE

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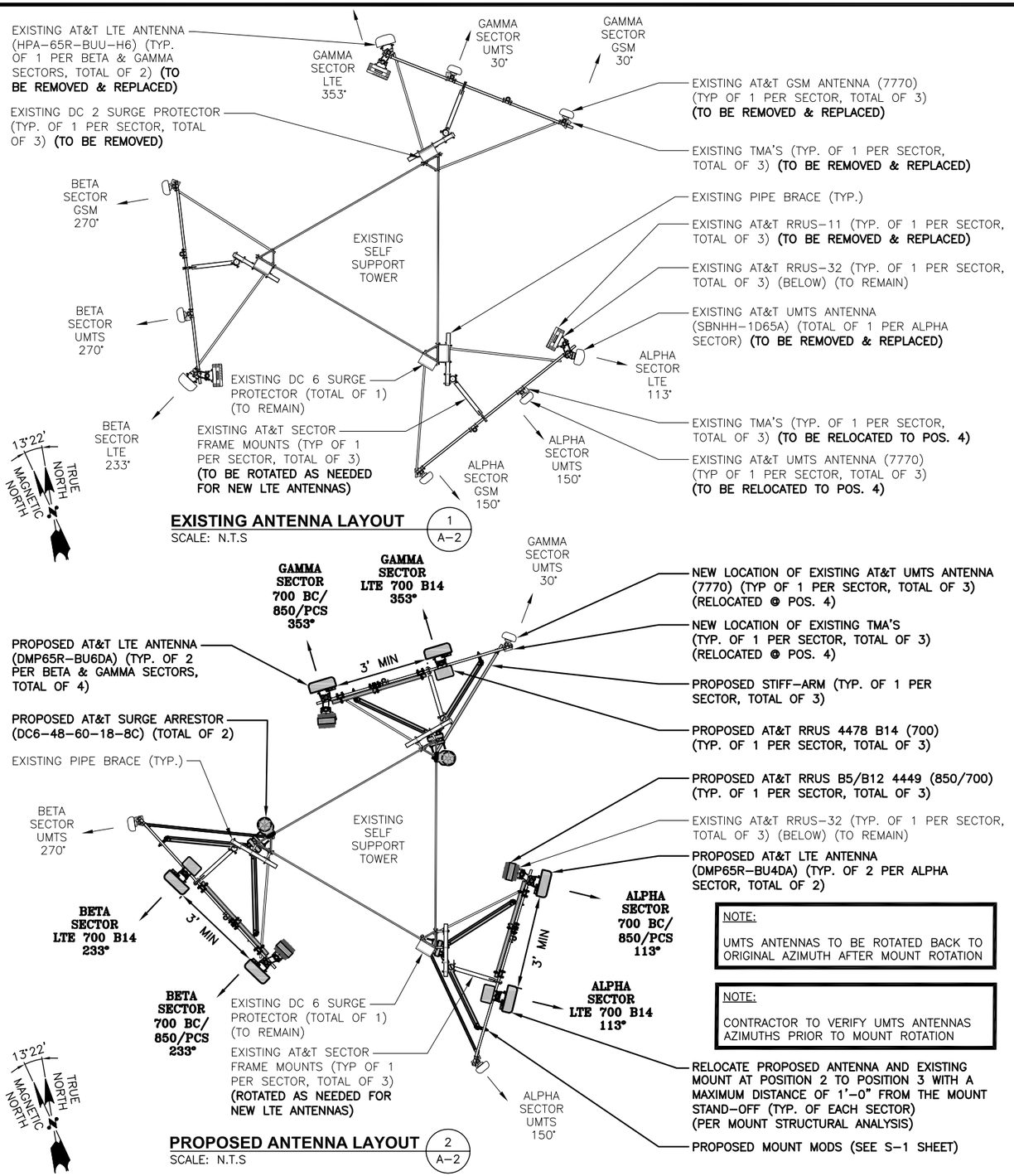

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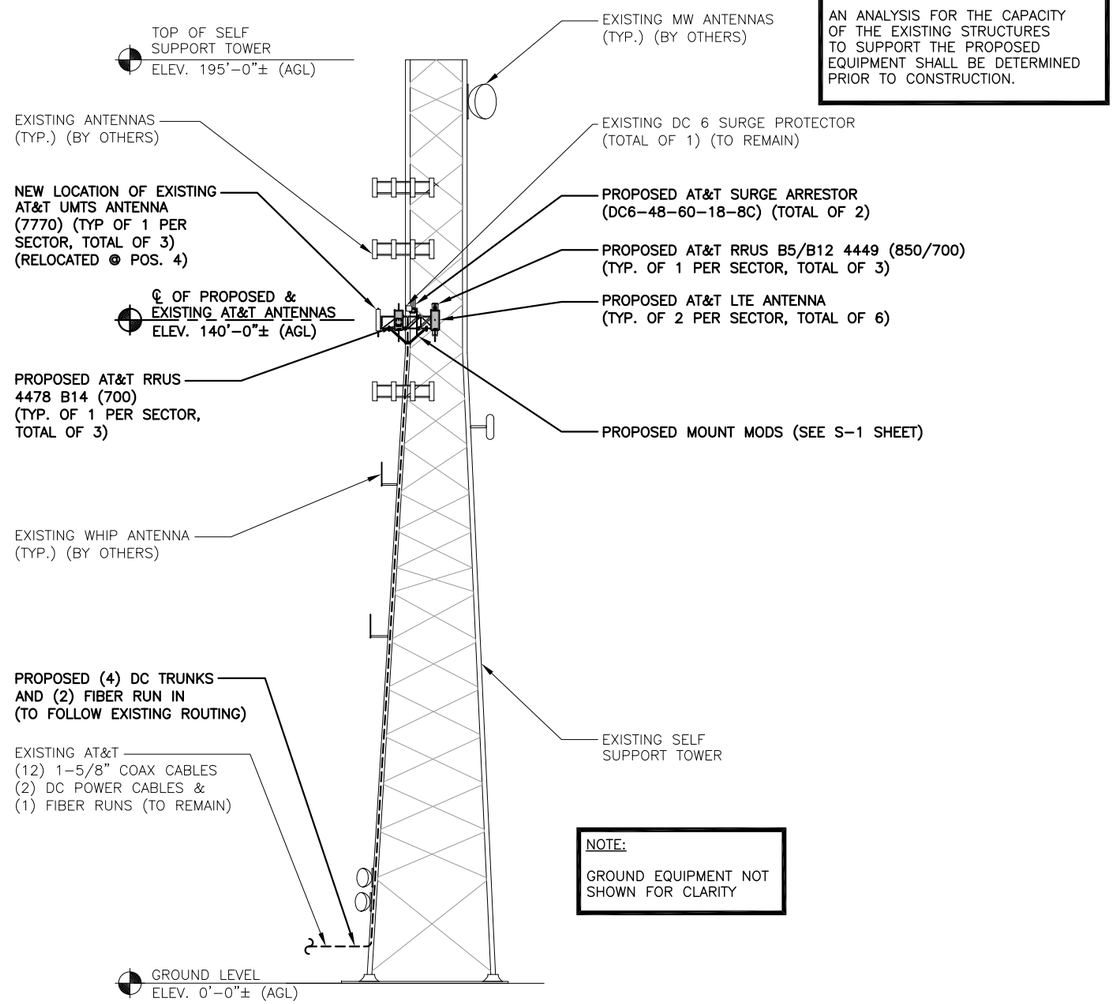

NOTE:

GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION
22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"
3
A-2

0 8'-0" 16'-0" 32'-0" 48'-0"

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

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

SITE NUMBER: CT1134
SITE NAME: NORTH CANAAN-LOWER COUNTY RD

38 LOWER ROAD
NORTH CANAAN , CT 06018
LITCHFIELD COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/17/19	ISSUED FOR CONSTRUCTION	TR	AT	DPH
0	10/11/19	ISSUED FOR REVIEW	TR	AT	DPH
A	09/13/19	ISSUED FOR REVIEW	ET	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

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

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ANTENNA LAYOUTS & ELEVATION
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	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	700 BC/ 850/PCS	DMP65R-BU4DA	48.0X20.7X7.7	140'-0"±	113°	–	(P)(1) 4449 B5/12 (850/700) (E)(1) RRUS-32 B2 (PCS)	14.9"x13.2"x10.4" –	–	(E) (1) SURGE PROTECTOR
A2	–	–	–	–	–	–	–	–	–	–	
A3	PROPOSED	LTE 700 B14	DMP65R-BU4DA	48.0X20.7X7.7	140'-0"±	113°	–	(P)(1) 4478 B14 (700)	18.1"x13.4"x8.3"	(2)1-5/8 COAX FOR FUTURE USE	
A4	EXISTING	UMTS	7770	55X11X5	140'-0"±	150°	(E)(1) TT19-08BP111-001	–	–	(2)1-5/8 COAX	
B1	PROPOSED	700 BC/ 850/PCS	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	233°	–	(P)(1) 4449 B5/12 (850/700) (E)(1) RRUS-32 B2 (PCS)	14.9"x13.2"x10.4" –	–	(P) (1) RAYCAP DC6-48-60-18-8C
B2	–	–	–	–	–	–	–	–	–	–	
B3	PROPOSED	LTE 700 B14	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	233°	–	(P)(1) 4478 B14 (700)	18.1"x13.4"x8.3"	(2)1-5/8 COAX FOR FUTURE USE	
B4	EXISTING	UMTS	7770	55X11X5	140'-0"±	270°	(E)(1) TT19-08BP111-001	–	–	(2)1-5/8 COAX	
C1	PROPOSED	700 BC/ 850/PCS	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	353°	–	(P)(1) 4449 B5/12 (850/700) (E)(1) RRUS-32 B2 (PCS)	14.9"x13.2"x10.4" –	–	(P) (1) RAYCAP DC6-48-60-18-8C
C2	–	–	–	–	–	–	–	–	–	–	
C3	PROPOSED	LTE 700 B14	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	353°	–	(P)(1) 4478 B14 (700)	18.1"x13.4"x8.3"	(2)1-5/8 COAX FOR FUTURE USE	
C4	EXISTING	UMTS	7770	55X11X5	140'-0"±	30°	(E)(1) TT19-08BP111-001	–	–	(2)1-5/8 COAX	

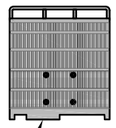
FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
P(3)	4449 (850/700)	14.9"x13.2"x10.4"
P(3)	4478 B14 (700)	18.1"x13.4"x8.3"
E(3)	RRUS-32 (PCS)	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:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: SEPTEMBER 13, 2019 (REV. 1)

NOTE:
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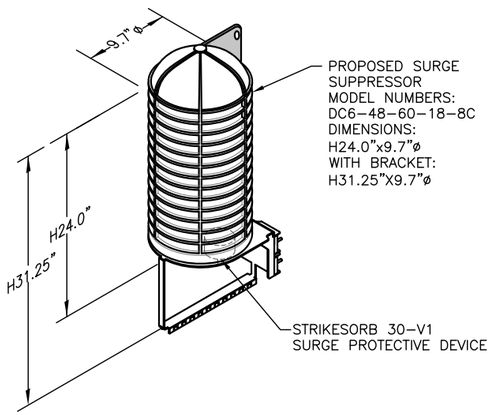
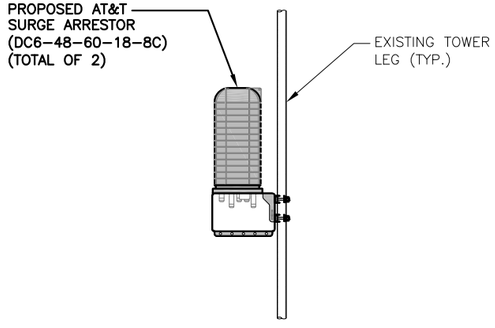


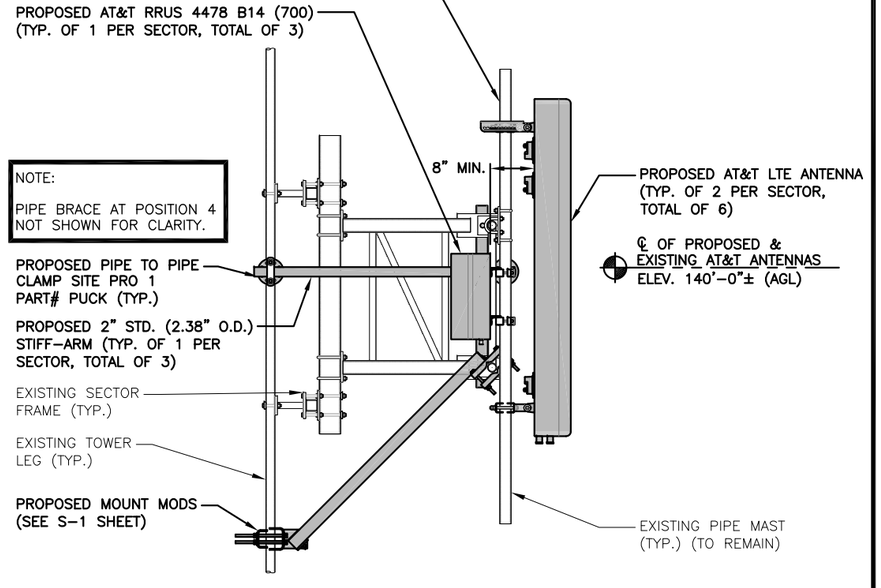
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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



PROPOSED SURGE ARRESTOR MOUNTING DETAIL (4 / A-3)
SCALE: N.T.S

PROPOSED NETSURE 7100 PHOTO DETAIL (5 / A-3)
SCALE: N.T.S



PROPOSED LTE ANTENNA MOUNTING DETAIL (6 / A-3)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"

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

AT&T

DETAILS
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	A-3	1

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G 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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STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

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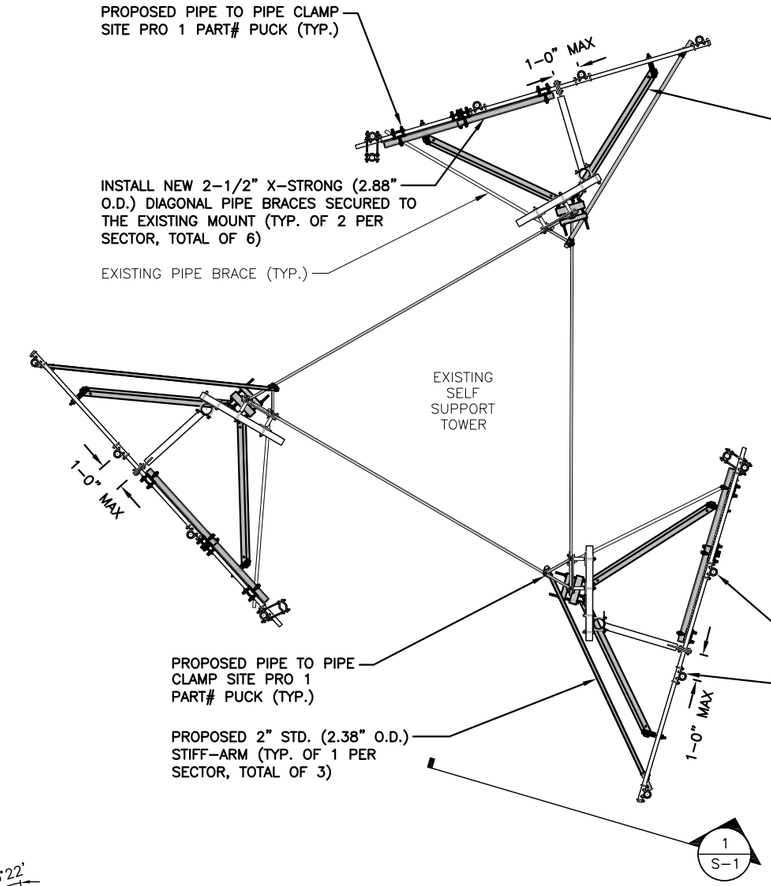
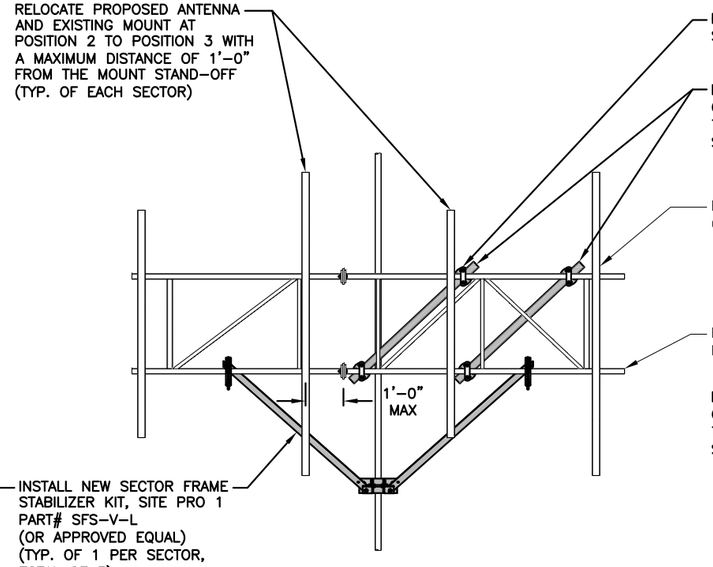
STRUCTURAL NOTES
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	SN-1	1



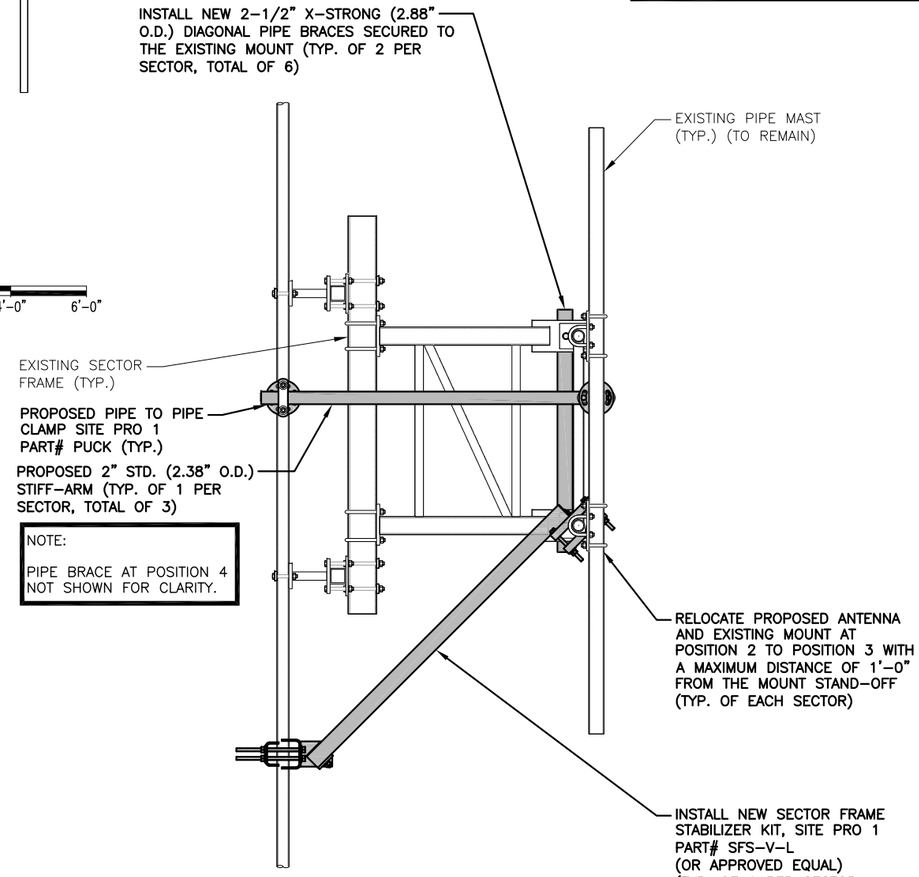
PROPOSED MOUNT MODIFICATIONS PLAN (1 / S-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"



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

0 1'-0" 2'-0" 4'-0" 6'-0"



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

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

NOTE:

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

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: SEPTEMBER 13, 2019 (REV. 1)

NOTE:

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MOUNT MODIFICATION DESIGN
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
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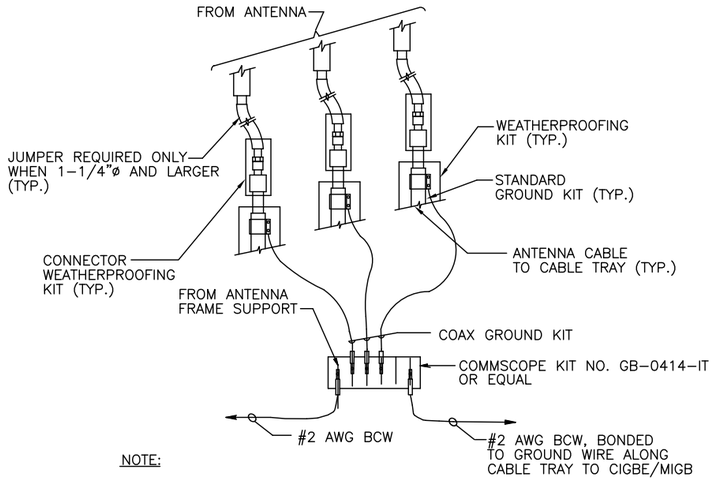


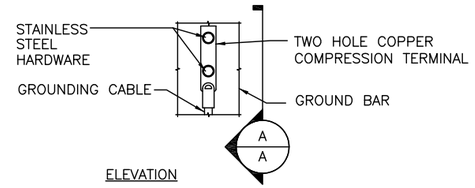
NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

1 / G-1



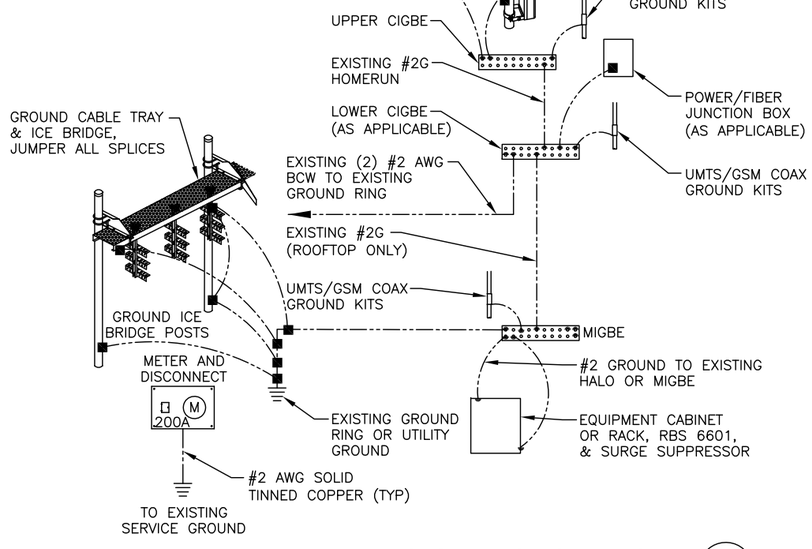
NOTES:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

3 / G-1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G-1

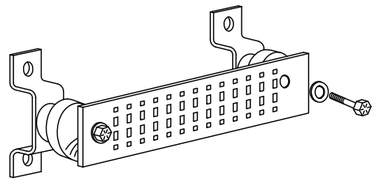
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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



GROUND BAR - DETAIL

SCALE: N.T.S

4 / G-1

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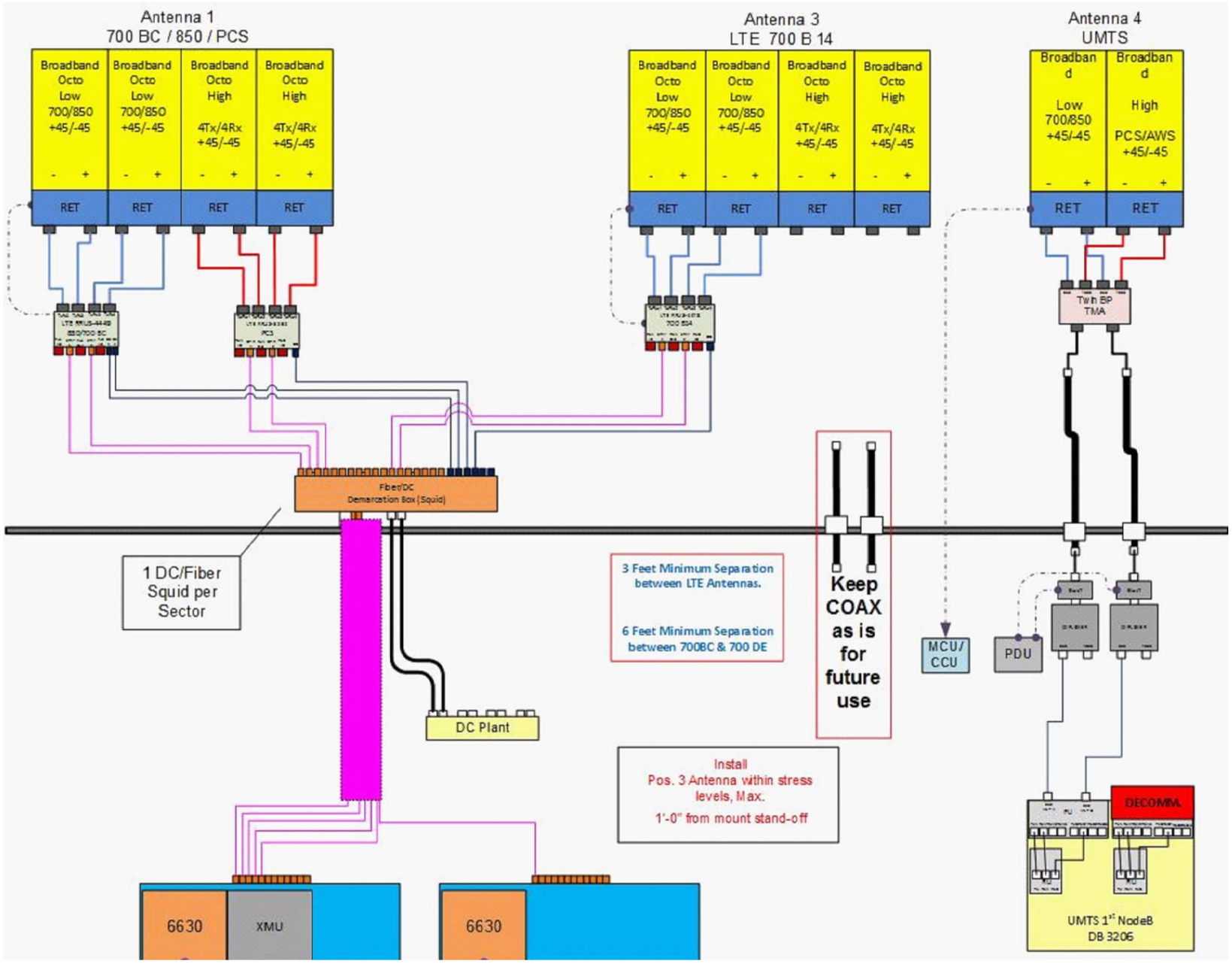
AT&T

GROUNDING DETAILS
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	G-1	1



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: CT1134
SITE NAME: NORTH CANAAN-LOWER COUNTY RD

38 LOWER ROAD
NORTH CANAAN , CT 06018
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/17/19	ISSUED FOR CONSTRUCTION	TR	AT	DPH
0	10/11/19	ISSUED FOR REVIEW	TR	AT	DPH
A	09/13/19	ISSUED FOR REVIEW	ET	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

AT&T

RF PLUMBING DIAGRAM
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	RF-1	1

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

195-ft Existing Pirod Lattice Tower

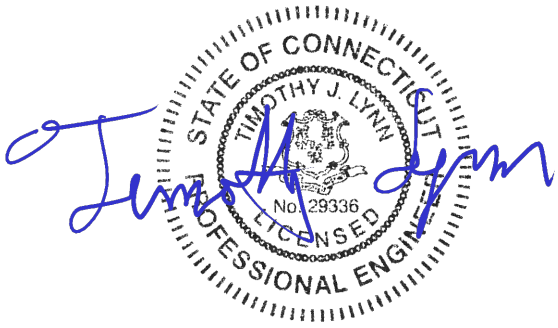
AT&T Site #: CT1134
AT&T Site North Canaan-Lower County Rd
Project: LTE 3C_4C 2019 Upgrade
PACE #: MRCTB040404, MRCTB040581
FA #: 10035410

38 Lower Road
North Canaan, CT 06018

Centek Project No. 19156.00

Date: October 30, 2019

Max Stress Ratio = 73.2%



Prepared for:

AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna installation proposed by AT&T on the existing lattice tower located in North Canaan, Connecticut.

The host tower is a 195-ft, three legged, steel lattice tower originally designed and manufactured by PiROD Inc., Job No. A-117388 dated 2/13/2001. The tower geometry, structure member sizes and foundation information were taken from the original design documents.

Antenna and appurtenance information were obtained from AT&T Construction documents as prepared by Hudson Design Group, LLC dated September 13, 2019, a previous structural analysis prepared by Hudson Design Group, LLC dated January 9, 2019 and visual verification from grade conducted by Centek personnel on March 11, 2019.

The tower consists of eleven (11) vertical sections consisting of truss legs conforming to ASTM A572 Gr. 50. Horizontal and diagonal lateral support bracing consists of steel angles conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates while the legs and bracing are connected by bolted and welded gusset connections. The tower face width is 12.00-ft at the top and 26.00-ft at the bottom.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- Unknown (Existing):
  Antennas: One (1) 6-ft Microwave dish leg mounted with a RAD center elevation of ±188-ft above grade level.
  Coax Cable: One (1) WE-65 elliptical coax cable running on the leg of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- Unknown (Existing):
  Antennas: Four (4) Kathrein OGT9-840 Omni-directional whip antennas and one (1) Telewave ANT150D3 dipole mounted on three (3) 6-ft PiROD Rigid Side arms with an elevation of 184-ft above grade level.
  Coax Cables: One (1) 1-5/8" ∅ and four (4) 7/8" ∅ coax cables running on the leg of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- Unknown (Existing):
  Antennas: One (1) Telewave ANT150F2 Omni-directional whip antenna mounted on a 3-ft side arm with an elevation of 183-ft above grade level.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- Verizon (Existing):
  Antennas: Four (4) Commscope LPA80090-4CF, two (2) Antel LPA80080-4CF, four (4) Commscope NHH-65B-R2B panel antennas, two (2) Commscope NHH-85B-R2B panel antennas, three (3) B5/B13 RRH-BR04C remote radio heads, three (3) B2/B66A TTH RRH-BR049 remote radio heads and one (1) Raycap RCMDC-6627-PF-48 surge arrestor mounted on three (3) existing 12-ft T-Frames with a RAD center elevation of ±168-ft above grade level.

Coax Cable: Twelve (12) 1-5/8" ∅ and one (1) 1-7/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report. (coax on exterior tower)

- Sprint (Existing):
  Antenna: Three (3) RFS APXV9ERR18-C-A20 panel antennas, three (3) Commscope DT465B-2XR panel antennas, six (6) 800mhz remote radio head, three (3) 1900mhz remote radio heads and three (3) Alcatel-Lucent TD-RRH8x20-25 remote radio heads mounted on three (3) existing 12-ft T-Frames with a RAD center elevation of ±154-ft above grade level.
  Coax Cable: Four (4) fiber cables running on a leg/face of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- T-MOBILE (Existing):
  Antennas: Four (4) Ericsson AIR32 panel antennas, four (4) RFS APXV18-206517 panel antennas, four (4) RFS APXVAA24-43 panel antennas, twelve (12) Ericsson RRUS-11 remote radio heads and one (1) Commscope SC2-W100AB microwave dish mounted on one (1) custom 4-sided sector frame with a RAD center elevation of 125-ft AGL.
  Coax Cables: Four (4) 1-5/8" ∅ fiber cables and one (1) 1/2" ∅ coax cable running on a leg/face of the existing tower. (coax on exterior tower)
- Unknown (Existing):
  Equipment: One (1) vacant 6-ft PiROD Rigid Side arm face mounted to the existing tower with an elevation of 118-ft above grade level.
- Unknown (Existing):
  Antennas: One (1) Telewave ANT150D3 dipole mounted on one (1) 6-ft PiROD Rigid Side arms with an elevation of 105-ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- Unknown (Existing):
  Equipment: One (1) vacant 6-ft PiROD Rigid Side arm face mounted to the existing tower with an elevation of ±98-ft above grade level.
- Unknown (Existing):
  Antennas: One (1) Celwave PD458-2 Omni-directional whip antenna mounted on one (1) 6-ft PiROD Rigid Side arm with an elevation of ±98-ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- Unknown (Existing):
  Antennas: One (1) 6-ft Microwave dish with ice shield leg mounted with a RAD center elevation of ±97-ft above grade level.
  Coax Cable: One (1) WE-65 elliptical coax cable running on the leg of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- Unknown (Existing):
  Antennas: One (1) Antel BCD-80609 Omni-directional whip antenna, one (1) yagi, one (1) DB222-A 2-Bay Dipole antenna, one (1) Celwave PD220 Omni-directional whip antenna and one (1) Celwave PD1142 Omni-directional whip mounted on three (3) 6-ft PiROD Rigid Side arms with an elevation of 78-ft above grade level.

Coax Cables: One (1) 1-5/8" ∅, one (1) 7/8" ∅ and three (3) 1/2" ∅ coax cables running on the leg of the existing tower as specified in Section 3 of this report. (coax on inner tower)

- Unknown (Existing):
  Antennas: One (1) GPS mounted on one (1) 2-ft side arm with an elevation of 32-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the leg of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- AT&T(EXISTING TO REMAIN)
  Antennas: Three (3) Powerwave 7770 panel antennas, three (3) Powerwave TT19-08BP111-001 TMAs, three (3) Ericsson RRUS-32 remote radio heads and three (3) Raycap DC6-48-60-18 8F surge arrestors mounted on three (3) existing 12-ft T-Frames with a RAD center elevation of ±140-ft above grade level
- Coax Cables: Twelve (12) 1-5/8" ∅ coax cables, one (1) fiber cable and two (2) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report. (coax on inner tower)
- AT&T(EXISTING TO REMOVE)
  Antennas: Three (3) Powerwave 7770 panel antennas, two (2) CCI HPA-65R-BUU-H6 panel antennas, one (1) Andrew SBNHH-1D65A panel antenna, three (3) Ericsson RRUS-11 remote radio heads and three (3) Powerwave TT19-08BP111-001 TMAs mounted on three (3) existing 12-ft T-Frames with a RAD center elevation of ±140-ft above grade level
- **AT&T (PROPOSED):**
  Antenna: Four (4) CCI DMP65R-BU6D panel antennas, two (2) CCI DMP65R-BU4D panel antennas, three (3) Ericsson 4478 B14 remote radio heads, three (3) Ericsson 4449 B5/B12 remote radio heads and two (2) Raycap DC6-48-60-18 8F surge arrestors mounted on three (3) existing 12-ft T-Frames with a RAD center elevation of ±140-ft above grade level

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 1.00" radial ice on the tower structure and its components.

Basic Wind Speed:	Litchfield; v= 90-100 (3 second gust) North Canaan; v = 89 mph (3 second gust)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 89 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; = 40 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **73.2%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T12)	20'-0"- 40'-0"	69.2%	**PASS**
Diagonal (T6)	120'-0"- 140'-0"	73.2%	**PASS**

Foundation and Anchors

The existing foundation consists of one (1) 31.5' square x 4' thick reinforced concrete mat with (12) rock anchors. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned manufacturers original design documents. The tower legs are connected to the foundation by means of six (6) 2"∅, ASTM 687 Grade 105 anchor bolts per leg, embedded into the concrete foundation structure.

- The tower reactions developed from the governing Load Case 1 of the proposed reinforced tower condition were used in the verification of the foundation and anchor bolts:

Leg Reactions	Vector	Proposed Tower Reactions
Leg	Shear	**52 kips**
	Compression	**384 kips**
	Uplift	**325 kips**
Base	Shear	**75 kips**
	Compression	**78 kips**
	Moment	**8052 kip-ft**

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	20.5%	**PASS**

- The foundation was found to be within allowable limits.

Foundation Type	Design Limit	Allowable Limit/FS	Proposed Loading	Result
Rock Anchored Mat	Ultimate Bearing Pressure	20.00 ksf	1.46 ksf	**PASS**
	Uplift Resistance	1.00 (1)	1.64	**PASS**

Note 1: Minimum required Factor of Safety (FS) of 1.0 required per TIA-222-G section 9.4

Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Fernando J. Palacios
Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

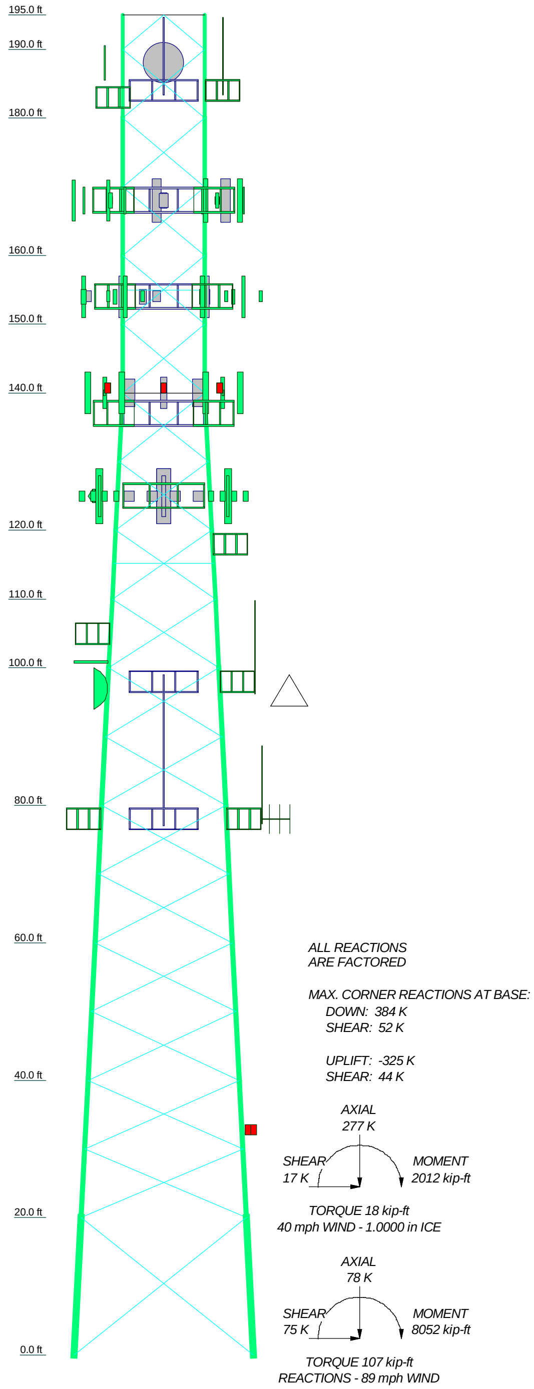
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Sec. Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	Pirod 105244	A572-50	A	A36	A	N.A.	12	1 @ 5	0.9
T2			B		N.A.			17 @ 10	1.1
T3	Pirod 105216		L3x3x3/16						2.0
T4	Pirod 105217		L3x3x5/16			L3x3x5/16			1.6
T5						N.A.			1.4
T6	Pirod 105218				L3x3x5/16				3.5
T7			L3 1/2x3 1/2x5/16		N.A.	C	14		2.1
T8						N.A.	15		1.8
T9	Pirod 105219		L4x4x1/4				16		4.7
T10			L4x4x3/8				18		5.6
T11	Pirod 105220		L5x5x3/8				20		7.0
T12							22		7.3
T13	Pirod 112738		2L3 1/2x3 1/2x5/16				24	1 @ 20	7.8
							26		46.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6' Dish	188	TT19-08BP111-001 TMA (ATT - Existent)	140
OGT9-840	184	TT19-08BP111-001 TMA (ATT - Existent)	140
OGT9-840	184	RRUS-32 (ATT - Existent)	140
Pirod 6-8' Box Arm (1)	184	DC6-48-60-18-8F Surge Arrestor (ATT - Proposed)	140
OGT9-840	184	DC6-48-60-18-8F Surge Arrestor (ATT - Proposed)	140
OGT9-840	184	DC6-48-60-18-8F Surge Arrestor (ATT - Existent)	140
Pirod 6-8' Box Arm (1)	184	DC6-48-60-18-8F Surge Arrestor (ATT - Existent)	140
ANT150D3	184	4478 B14 (ATT - Proposed)	140
Pirod 6-8' Box Arm (1)	184	4478 B14 (ATT - Proposed)	140
ANT150F2	183	4478 B14 (ATT - Proposed)	140
3' Side Mount Standoff	183	4449 B5/B12 (ATT - Proposed)	140
LPA-80090-4CF (Verizon)	168	4449 B5/B12 (ATT - Proposed)	140
B5/B15 RRH -BRO4C (Verizon)	168	4449 B5/B12 (ATT - Proposed)	140
B5/B15 RRH -BRO4C (Verizon)	168	RRUS-32 (ATT - Existent)	140
B5/B15 RRH -BRO4C (Verizon)	168	RRUS-32 (ATT - Existent)	140
Pirod 12' T-Frame Sector Mount (1) (Verizon)	168	SitePro SFS-V-L	137
Pirod 12' T-Frame Sector Mount (1) (Verizon)	168	SitePro SFS-V-L	137
Pirod 12' T-Frame Sector Mount (1) (Verizon)	168	SitePro SFS-V-L	137
(2) NHH-65B-R2B (Verizon)	168	Pirod 12' T-Frame Sector Mount (1) (ATT - Existent)	137
(2) NHH-65B-R2B (Verizon)	168	Pirod 12' T-Frame Sector Mount (1) (ATT - Existent)	137
LPA-80080-4CF (Verizon)	168	Pirod 12' T-Frame Sector Mount (1) (ATT - Existent)	137
LPA-80090-4CF (Verizon)	168	AIR32 (T-Mobile)	125
(2) NHH-85B-R2B (Verizon)	168	AIR32 (T-Mobile)	125
B2/B66A RRH (Verizon)	168	APXVAA24_43 (T-Mobile)	125
LPA-80090-4CF (Verizon)	168	APXV18-206517S (T-Mobile)	125
LPA-80090-4CF (Verizon)	168	APXVAA24_43 (T-Mobile)	125
B2/B66A RRH (Verizon)	168	APXV18-206517S (T-Mobile)	125
B2/B66A RRH (Verizon)	168	AIR32 (T-Mobile)	125
RVZDC-6627-PF-48 (Verizon)	168	APXVAA24_43 (T-Mobile)	125
LPA-80080-4CF (Verizon)	168	APXV18-206517S (T-Mobile)	125
TD-RRH8x20-25 (Sprint)	154	(4) RRUS-11 (T-Mobile)	125
TD-RRH8x20-25 (Sprint)	154	(4) RRUS-11 (T-Mobile)	125
TD-RRH8x20-25 (Sprint)	154	(4) RRUS-11 (T-Mobile)	125
Pirod 12' T-Frame Sector Mount (1) (Sprint)	154	Custom 4-Sided Sector Mount (T-Mobile)	125
Pirod 12' T-Frame Sector Mount (1) (Sprint)	154	AIR32 (T-Mobile)	125
Pirod 12' T-Frame Sector Mount (1) (Sprint)	154	APXVAA24_43 (T-Mobile)	125
APXV9ERR18-C-A20 (Sprint)	154	SC2-W100AB (T-Mobile Proposed)	125
APXV9ERR18-C-A20 (Sprint)	154	APXV18-206517S (T-Mobile)	125
APXV9ERR18-C-A20 (Sprint)	154	Pirod 6-8' Box Arm (1) (Vacant)	118
DT465B-2XR (Sprint)	154	ANT150D3	105
DT465B-2XR (Sprint)	154	Pirod 6-8' Box Arm (1)	105
DT465B-2XR (Sprint)	154	6' Dish Ice Shield	101
(2) FD-RRH 2x50 800 (Sprint)	154	Pirod 6-8' Box Arm (1) (Vacant)	98
(2) FD-RRH 2x50 800 (Sprint)	154	PD458-2	98
(2) FD-RRH 2x50 800 (Sprint)	154	Pirod 6-8' Box Arm (1)	98
FD-RRH 4x45 1900 (Sprint)	154	6' Dish	97
FD-RRH 4x45 1900 (Sprint)	154	PD220	78
FD-RRH 4x45 1900 (Sprint)	154	PD1142-1	78
DC6-48-60-18-8F Surge Arrestor (ATT - Existent)	140	Pirod 6-8' Box Arm (1)	78
7770.00 (ATT - Existent)	140	BCD-80609-NE	78
(2) DMP65R-BU4D (ATT - Proposed)	140	6' Yagi	78
7770.00 (ATT - Existent)	140	Pirod 6-8' Box Arm (1)	78
(2) DMP65R-BU6D (ATT - Proposed)	140	DB222	78
7770.00 (ATT - Existent)	140	Pirod 6-8' Box Arm (1)	78
(2) DMP65R-BU6D (ATT - Proposed)	140	2-ft Stand Off	32
TT19-08BP111-001 TMA (ATT - Existent)	140	GPS	32

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2L2 1/2x2 1/2x3/16	C	L3 1/2x3 1/2x5/16
B	L2 1/2x2 1/2x3/16		

MATERIAL STRENGTH

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

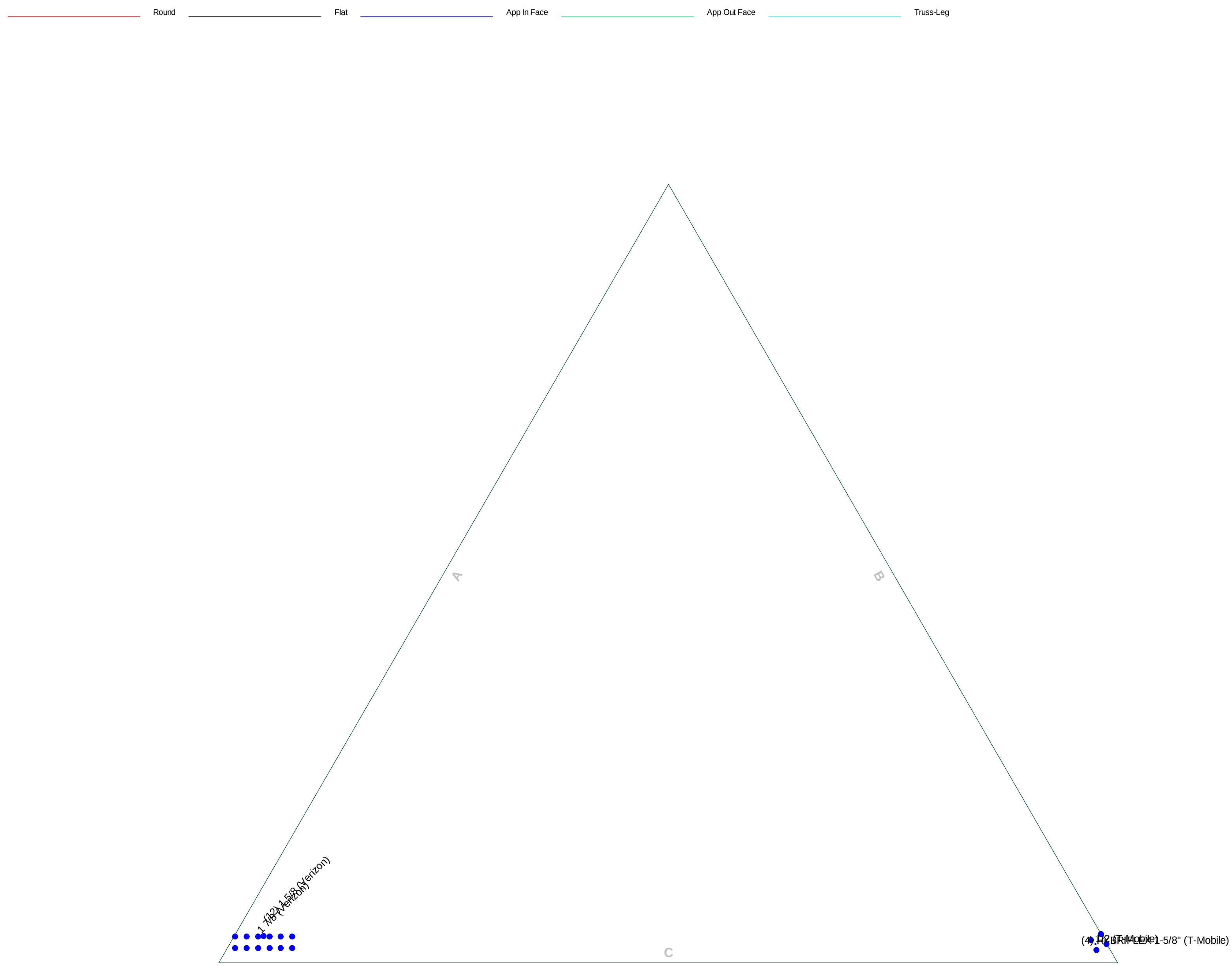
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 89 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 40 mph basic wind with 1.00 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 1 with Crest Height of 0.00 ft
7. TOWER RATING: 73.2%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **19156.00- CT1134**		
Project: **38 Lower Road, North Canaan, CT**		
Client: AT&T	Drawn by: FJP	App'd:
Code: TIA-222-G	Date: 10/30/19	Scale: NTS
Path:		Dwg No. E-1

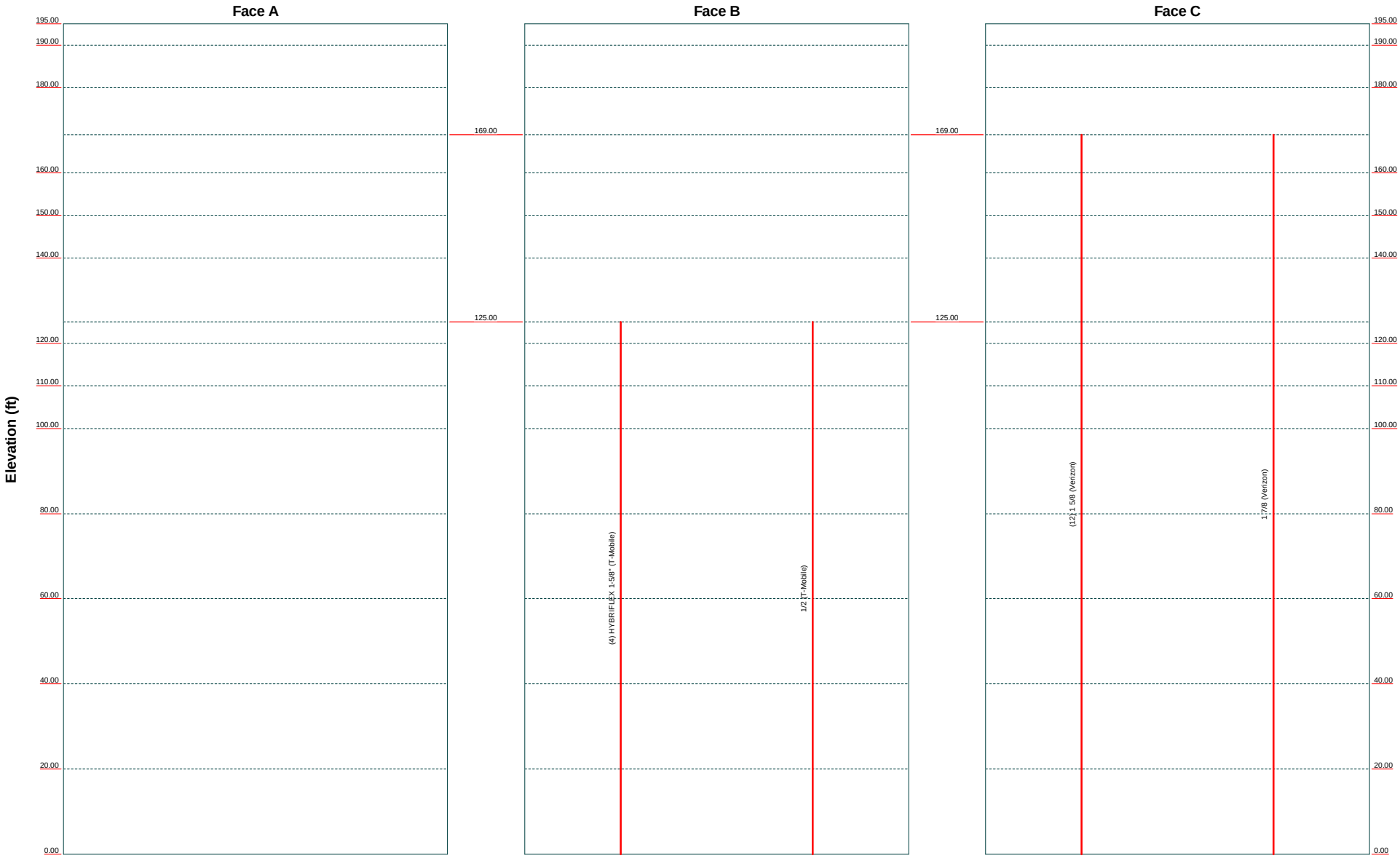
Feed Line Plan



Centek Engineering Inc.	Job: ***19156.00- CT1134***		
63-2 North Branford Rd.	Project: ***38 Lower Road, North Canaan, CT***		
Branford, CT 06405	Client: AT&T	Drawn by: FJP	App'd:
Phone: (203) 488-0580	Code: TIA-222-G	Date: 10/30/19	Scale: NTS
FAX: (203) 488-8587	Path: J:\Jobs\1915600.WI\04_Structural\Backup Documentation\ERI Files\Outter Tower\195' Pirod Lattice Tower.eri		Dwg No. E-7

Feed Line Distribution Chart
0' - 195'

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



Centek Engineering Inc.
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FAX: (203) 488-8587

Job:	***19156.00- CT1134***		
Project:	***38 Lower Road, North Canaan, CT***		
Client: AT&T	Drawn by: FJP	App'd:	
Code: TIA-222-G	Date: 10/30/19	Scale: NTS	
Path: J:\Jobs\19150\00.WIP\04_Structural\Backup Documentation\EDR Files\Oatter Tower\195' Prod Lattice Tower.eri		Dwg No. E-7	

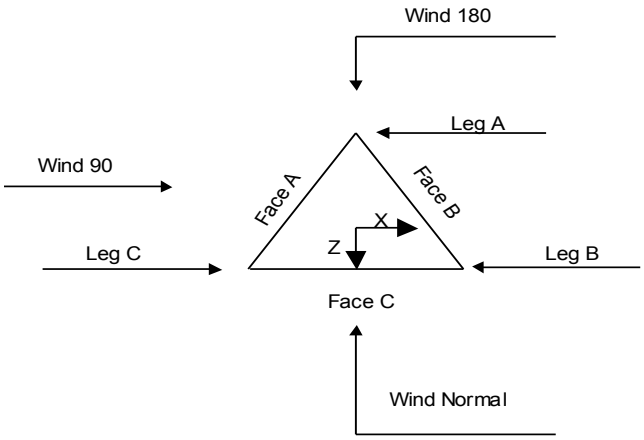
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 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 12.00 ft at the top and 26.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 89 mph.
Structure Class III.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in 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 ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	195.00-190.00			12.00	1	5.00
T2	190.00-180.00			12.00	1	10.00
T3	180.00-160.00			12.00	1	20.00
T4	160.00-150.00			12.00	1	10.00
T5	150.00-140.00			12.00	1	10.00
T6	140.00-120.00			12.00	1	20.00
T7	120.00-110.00			14.00	1	10.00
T8	110.00-100.00			15.00	1	10.00
T9	100.00-80.00			16.00	1	20.00
T10	80.00-60.00			18.00	1	20.00
T11	60.00-40.00			20.00	1	20.00
T12	40.00-20.00			22.00	1	20.00
T13	20.00-0.00			24.00	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	195.00-190.00	5.00	K Brace Down	No	Yes	0.0000	0.0000
T2	190.00-180.00	10.00	X Brace	No	No	0.0000	0.0000

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
T3	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T4	160.00-150.00	10.00	X Brace	No	Yes	0.0000	0.0000
T5	150.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T6	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T7	120.00-110.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	110.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T9	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T10	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T11	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T12	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T13	20.00-0.00	20.00	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 195.00-190.00	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 190.00-180.00	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 180.00-160.00	Truss Leg	Pirod 105216	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T4 160.00-150.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T5 150.00-140.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T6 140.00-120.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T7 120.00-110.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T8 110.00-100.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T9 100.00-80.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T10 80.00-60.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Single Angle	L4x4x3/8	A36 (36 ksi)
T11 60.00-40.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Single Angle	L5x5x3/8	A36 (36 ksi)
T12 40.00-20.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Single Angle	L5x5x3/8	A36 (36 ksi)
T13 20.00-0.00	Truss Leg	Pirod 112738	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16	A36 (36 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
T6 140.00-120.00	Single Angle	L3x3x5/16	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
T1 195.00-190.00	None	Solid Round		A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 160.00-150.00	Single Angle	L3x3x5/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 120.00-110.00	Single Angle	L3 1/2x3 1/2x5/16	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 195.00-190.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	Mid-Pt	36.0000
T2 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 160.00-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 120.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 110.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

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
T12 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T13 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	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 195.00-190.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 190.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 160.00-150.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 150.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 120.00-110.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 110.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 100.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T12 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T13 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 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
T1 195.00-190.00	1	0.5	0.85	1	0.5	0.85

	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T2 190.00-180.00	1	0.5	0.85	1	0.5	0.85
T3 180.00-160.00	1	0.5	0.85	1	0.5	0.85
T4 160.00-150.00	1	0.5	0.85	1	0.5	0.85
T5 150.00-140.00	1	0.5	0.85	1	0.5	0.85
T6 140.00-120.00	1	0.5	0.85	1	0.5	0.85
T7 120.00-110.00	1	0.5	0.85	1	0.5	0.85
T8 110.00-100.00	1	0.5	0.85	1	0.5	0.85
T9 100.00-80.00	1	0.5	0.85	1	0.5	0.85
T10 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T11 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T12 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T13 20.00-0.00	1	0.5	0.85	1	0.5	0.85

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 195.00-190.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 190.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 160.00-150.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 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
T6 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
T7 120.00-110.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 110.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 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

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
T11 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
T12 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
T13 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 195.00-190.00	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 A615M	0
T2 190.00-180.00	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
T3 180.00-160.00	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 160.00-150.00	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	1.0000 A325N	1
T5 150.00-140.00	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
T6 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	1.0000 A325N	1	0.6250 A325N	0
T7 120.00-110.00	Flange	0.0000 A325N	0	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	1.0000 A325N	1
T8 110.00-100.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T9 100.00-80.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T10 80.00-60.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T11 60.00-40.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T12 40.00-20.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T13 20.00-0.00	Flange	2.0000 A687	6	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	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
HYBRIFLEX 1-5/8"	B	No	No	Ar (CaAa)	125.00 - 0.00	-3.0000	0.47	4	2	1.9800	1.9800		1.90

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
(T-Mobile)													
1 5/8	C	No	No	Ar (CaAa)	169.00 - 0.00	-8.0000	0.45	12	6	1.9800	1.9800		1.04
(Verizon)													
1 7/8	C	No	No	Ar (CaAa)	169.00 - 0.00	-8.0000	0.45	1	1	2.2250	2.2250		1.04
(Verizon)													
1/2	B	No	No	Ar (CaAa)	125.00 - 0.00	-3.0000	0.47	1	1	0.5800	0.5800		0.25
(T-Mobile)													

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 K
T1	195.00-190.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	190.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	180.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	23.387	0.000	0.12
T4	160.00-150.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	25.985	0.000	0.14
T5	150.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	25.985	0.000	0.14
T6	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.250	0.000	0.04
		C	0.000	0.000	51.970	0.000	0.27
T7	120.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	8.500	0.000	0.08
		C	0.000	0.000	25.985	0.000	0.14
T8	110.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	8.500	0.000	0.08
		C	0.000	0.000	25.985	0.000	0.14
T9	100.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	17.000	0.000	0.16
		C	0.000	0.000	51.970	0.000	0.27
T10	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	17.000	0.000	0.16
		C	0.000	0.000	51.970	0.000	0.27
T11	60.00-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	17.000	0.000	0.16
		C	0.000	0.000	51.970	0.000	0.27
T12	40.00-20.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	17.000	0.000	0.16
		C	0.000	0.000	51.970	0.000	0.27
T13	20.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	17.000	0.000	0.16
		C	0.000	0.000	51.970	0.000	0.27

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 K
T1	195.00-190.00	A	2.982	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	190.00-180.00	A	2.970	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	180.00-160.00	A	2.945	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	41.159	0.000	1.26
T4	160.00-150.00	A	2.918	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	45.590	0.000	1.39
T5	150.00-140.00	A	2.899	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	45.487	0.000	1.38
T6	140.00-120.00	A	2.867	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	13.476	0.000	0.32
		C		0.000	0.000	90.642	0.000	2.74
T7	120.00-110.00	A	2.832	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	26.760	0.000	0.62
		C		0.000	0.000	45.137	0.000	1.36
T8	110.00-100.00	A	2.807	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	26.618	0.000	0.62
		C		0.000	0.000	45.001	0.000	1.35
T9	100.00-80.00	A	2.764	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	52.760	0.000	1.22
		C		0.000	0.000	89.550	0.000	2.66
T10	80.00-60.00	A	2.695	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	52.000	0.000	1.18
		C		0.000	0.000	88.827	0.000	2.61
T11	60.00-40.00	A	2.606	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	51.013	0.000	1.15
		C		0.000	0.000	87.887	0.000	2.55
T12	40.00-20.00	A	2.476	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	49.576	0.000	1.09
		C		0.000	0.000	86.522	0.000	2.45
T13	20.00-0.00	A	2.219	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	46.724	0.000	0.98
		C		0.000	0.000	83.816	0.000	2.27

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	195.00-190.00	0.0000	0.0000	0.0000	0.0000
T2	190.00-180.00	0.0000	0.0000	0.0000	0.0000
T3	180.00-160.00	-14.7823	8.3258	-12.6208	6.7941
T4	160.00-150.00	-23.1323	12.9819	-20.7120	11.1459
T5	150.00-140.00	-25.3436	14.0714	-22.5724	12.1050
T6	140.00-120.00	-22.3151	15.2562	-18.2805	14.0649
T7	120.00-110.00	-14.4678	17.4843	-7.3986	18.1385
T8	110.00-100.00	-16.7840	20.2546	-8.4641	20.7680
T9	100.00-80.00	-16.8812	20.7169	-8.9154	22.0266

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T10	80.00-60.00	-18.0678	22.5099	-9.6977	23.9913
T11	60.00-40.00	-17.4615	22.1925	-10.0780	24.9304
T12	40.00-20.00	-18.3011	23.5146	-10.8417	26.4373
T13	20.00-0.00	-24.5563	30.7398	-13.1901	30.2529

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	2	1 5/8	160.00 - 169.00	1.0000	1.0000
T3	3	1 7/8	160.00 - 169.00	1.0000	1.0000
T4	2	1 5/8	150.00 - 160.00	1.0000	1.0000
T4	3	1 7/8	150.00 - 160.00	1.0000	1.0000
T5	2	1 5/8	140.00 - 150.00	1.0000	1.0000
T5	3	1 7/8	140.00 - 150.00	1.0000	1.0000
T6	1	HYBRIFLEX 1-5/8"	120.00 - 125.00	1.0000	1.0000
T6	2	1 5/8	120.00 - 140.00	1.0000	1.0000
T6	3	1 7/8	120.00 - 140.00	1.0000	1.0000
T6	4	1/2	120.00 - 125.00	1.0000	1.0000
T7	1	HYBRIFLEX 1-5/8"	110.00 - 120.00	1.0000	1.0000
T7	2	1 5/8	110.00 - 120.00	1.0000	1.0000
T7	3	1 7/8	110.00 - 120.00	1.0000	1.0000
T7	4	1/2	110.00 - 120.00	1.0000	1.0000
T8	1	HYBRIFLEX 1-5/8"	100.00 - 110.00	1.0000	1.0000
T8	2	1 5/8	100.00 - 110.00	1.0000	1.0000
T8	3	1 7/8	100.00 - 110.00	1.0000	1.0000
T8	4	1/2	100.00 - 110.00	1.0000	1.0000
T9	1	HYBRIFLEX 1-5/8"	80.00 - 100.00	1.0000	1.0000
T9	2	1 5/8	80.00 - 100.00	1.0000	1.0000
T9	3	1 7/8	80.00 - 100.00	1.0000	1.0000
T9	4	1/2	80.00 - 100.00	1.0000	1.0000
T10	1	HYBRIFLEX 1-5/8"	60.00 - 80.00	1.0000	1.0000
T10	2	1 5/8	60.00 - 80.00	1.0000	1.0000
T10	3	1 7/8	60.00 - 80.00	1.0000	1.0000
T10	4	1/2	60.00 - 80.00	1.0000	1.0000
T11	1	HYBRIFLEX 1-5/8"	40.00 - 60.00	1.0000	1.0000
T11	2	1 5/8	40.00 - 60.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	3	1 7/8	40.00 - 60.00	1.0000	1.0000
T11	4	1/2	40.00 - 60.00	1.0000	1.0000
T12	1	HYBRIFLEX 1-5/8"	20.00 - 40.00	1.0000	1.0000
T12	2	1 5/8	20.00 - 40.00	1.0000	1.0000
T12	3	1 7/8	20.00 - 40.00	1.0000	1.0000
T12	4	1/2	20.00 - 40.00	1.0000	1.0000
T13	1	HYBRIFLEX 1-5/8"	0.00 - 20.00	1.0000	1.0000
T13	2	1 5/8	0.00 - 20.00	1.0000	1.0000
T13	3	1 7/8	0.00 - 20.00	1.0000	1.0000
T13	4	1/2	0.00 - 20.00	1.0000	1.0000

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 K
LPA-80080-4CF	A	From Leg	3.00	0.0000	168.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
(2) NHH-65B-R2B	A	From Leg	3.00	0.0000	168.00	No Ice	11.19	8.69	0.07
(Verizon)			4.00			1/2" Ice	11.69	9.17	0.15
			0.00			1" Ice	12.20	9.66	0.24
(2) NHH-65B-R2B	B	From Leg	3.00	0.0000	168.00	No Ice	11.19	8.69	0.07
(Verizon)			0.00			1/2" Ice	11.69	9.17	0.15
			0.00			1" Ice	12.20	9.66	0.24
LPA-80080-4CF	A	From Leg	3.00	0.0000	168.00	No Ice	2.62	5.40	0.01
(Verizon)			-6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
LPA-80090-4CF	B	From Leg	3.00	0.0000	168.00	No Ice	2.71	4.06	0.01
(Verizon)			6.00			1/2" Ice	3.01	4.37	0.04
			0.00			1" Ice	3.32	4.69	0.07
(2) NHH-85B-R2B	C	From Leg	3.00	0.0000	168.00	No Ice	8.20	5.42	0.04
(Verizon)			4.00			1/2" Ice	8.66	5.88	0.09
			0.00			1" Ice	9.13	6.35	0.15
B2/B66A RRH	A	From Leg	2.00	0.0000	168.00	No Ice	2.54	1.61	0.06
(Verizon)			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
LPA-80090-4CF	B	From Leg	3.00	0.0000	168.00	No Ice	2.71	4.06	0.01
(Verizon)			-6.00			1/2" Ice	3.01	4.37	0.04
			0.00			1" Ice	3.32	4.69	0.07
LPA-80090-4CF	C	From Leg	3.00	0.0000	168.00	No Ice	2.71	4.06	0.01
(Verizon)			6.00			1/2" Ice	3.01	4.37	0.04
			0.00			1" Ice	3.32	4.69	0.07
B2/B66A RRH	B	From Leg	2.00	0.0000	168.00	No Ice	2.54	1.61	0.06
(Verizon)			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
B2/B66A RRH	C	From Leg	2.00	0.0000	168.00	No Ice	2.54	1.61	0.06
(Verizon)			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
LPA-80090-4CF	C	From Leg	3.00	0.0000	168.00	No Ice	2.71	4.06	0.01
(Verizon)			-6.00			1/2" Ice	3.01	4.37	0.04

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 K
			0.00			1" Ice	3.32	4.69	0.07
B5/B15 RRH -BRO4C	A	From Leg	2.00	0.0000	168.00	No Ice	1.87	1.02	0.07
(Verizon)			0.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
B5/B15 RRH -BRO4C	B	From Leg	2.00	0.0000	168.00	No Ice	1.87	1.02	0.07
(Verizon)			0.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
B5/B15 RRH -BRO4C	C	From Leg	2.00	0.0000	168.00	No Ice	1.87	1.02	0.07
(Verizon)			0.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
Pirod 12' T-Frame Sector	A	From Leg	1.50	0.0000	168.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	B	From Leg	1.50	0.0000	168.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	C	From Leg	1.50	0.0000	168.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon)			0.00			1" Ice	23.20	23.20	0.73
APXV9ERR18-C-A20	A	From Leg	3.00	0.0000	154.00	No Ice	8.02	5.81	0.06
(Sprint)			-6.00			1/2" Ice	8.48	6.27	0.11
			0.00			1" Ice	8.94	6.73	0.17
APXV9ERR18-C-A20	B	From Leg	3.00	0.0000	154.00	No Ice	8.02	5.81	0.06
(Sprint)			-6.00			1/2" Ice	8.48	6.27	0.11
			0.00			1" Ice	8.94	6.73	0.17
APXV9ERR18-C-A20	C	From Leg	3.00	0.0000	154.00	No Ice	8.02	5.81	0.06
(Sprint)			-6.00			1/2" Ice	8.48	6.27	0.11
			0.00			1" Ice	8.94	6.73	0.17
DT465B-2XR	A	From Leg	3.00	0.0000	154.00	No Ice	9.10	5.97	0.06
(Sprint)			6.00			1/2" Ice	9.56	6.43	0.12
			0.00			1" Ice	10.04	6.90	0.18
DT465B-2XR	B	From Leg	3.00	0.0000	154.00	No Ice	9.10	5.97	0.06
(Sprint)			6.00			1/2" Ice	9.56	6.43	0.12
			0.00			1" Ice	10.04	6.90	0.18
DT465B-2XR	C	From Leg	3.00	0.0000	154.00	No Ice	9.10	5.97	0.06
(Sprint)			6.00			1/2" Ice	9.56	6.43	0.12
			0.00			1" Ice	10.04	6.90	0.18
(2) FD-RRH 2x50 800	A	From Leg	3.00	0.0000	154.00	No Ice	2.06	1.93	0.06
(Sprint)			-6.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
(2) FD-RRH 2x50 800	B	From Leg	3.00	0.0000	154.00	No Ice	2.06	1.93	0.06
(Sprint)			-6.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
(2) FD-RRH 2x50 800	C	From Leg	3.00	0.0000	154.00	No Ice	2.06	1.93	0.06
(Sprint)			-6.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
FD-RRH 4x45 1900	A	From Leg	3.00	0.0000	154.00	No Ice	2.32	2.38	0.06
(Sprint)			-3.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 4x45 1900	B	From Leg	3.00	0.0000	154.00	No Ice	2.32	2.38	0.06
(Sprint)			-3.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 4x45 1900	C	From Leg	3.00	0.0000	154.00	No Ice	2.32	2.38	0.06
(Sprint)			-3.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
TD-RRH8x20-25	A	From Leg	3.00	0.0000	154.00	No Ice	4.05	1.53	0.07
(Sprint)			6.00			1/2" Ice	4.30	1.71	0.10

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 K
			0.00					1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	3.00			0.0000	154.00	No Ice	4.05	1.53	0.07
(Sprint)			6.00					1/2" Ice	4.30	1.71	0.10
			0.00					1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	3.00			0.0000	154.00	No Ice	4.05	1.53	0.07
(Sprint)			6.00					1/2" Ice	4.30	1.71	0.10
			0.00					1" Ice	4.56	1.90	0.13
Pirod 12' T-Frame Sector	A	From Leg	1.25			0.0000	154.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00					1/2" Ice	18.40	18.40	0.60
(Sprint)			0.00					1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	B	From Leg	1.25			0.0000	154.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00					1/2" Ice	18.40	18.40	0.60
(Sprint)			0.00					1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	C	From Leg	1.25			0.0000	154.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00					1/2" Ice	18.40	18.40	0.60
(Sprint)			0.00					1" Ice	23.20	23.20	0.73
7770.00	A	From Leg	3.00			0.0000	140.00	No Ice	5.51	2.93	0.04
(AT&T - Existent)			0.00					1/2" Ice	5.87	3.27	0.07
			0.00					1" Ice	6.23	3.63	0.11
(2) DMP65R-BU4D	A	From Leg	3.00			0.0000	140.00	No Ice	8.00	3.51	0.07
(AT&T - Proposed)			0.00					1/2" Ice	8.38	3.81	0.12
			0.00					1" Ice	8.77	4.12	0.17
7770.00	B	From Leg	3.00			0.0000	140.00	No Ice	5.51	2.93	0.04
(AT&T - Existent)			0.00					1/2" Ice	5.87	3.27	0.07
			0.00					1" Ice	6.23	3.63	0.11
(2) DMP65R-BU6D	B	From Leg	3.00			0.0000	140.00	No Ice	12.71	5.62	0.08
(AT&T - Proposed)			0.00					1/2" Ice	13.21	6.07	0.15
			0.00					1" Ice	13.71	6.53	0.23
7770.00	C	From Leg	3.00			0.0000	140.00	No Ice	5.51	2.93	0.04
(AT&T - Existent)			0.00					1/2" Ice	5.87	3.27	0.07
			0.00					1" Ice	6.23	3.63	0.11
(2) DMP65R-BU6D	C	From Leg	3.00			0.0000	140.00	No Ice	12.71	5.62	0.08
(AT&T - Proposed)			0.00					1/2" Ice	13.21	6.07	0.15
			0.00					1" Ice	13.71	6.53	0.23
TT19-08BP111-001 TMA	A	From Leg	3.00			0.0000	140.00	No Ice	0.55	0.45	0.02
(AT&T - Existent)			0.00					1/2" Ice	0.65	0.53	0.02
			0.00					1" Ice	0.75	0.63	0.03
TT19-08BP111-001 TMA	B	From Leg	3.00			0.0000	140.00	No Ice	0.55	0.45	0.02
(AT&T - Existent)			0.00					1/2" Ice	0.65	0.53	0.02
			0.00					1" Ice	0.75	0.63	0.03
TT19-08BP111-001 TMA	C	From Leg	3.00			0.0000	140.00	No Ice	0.55	0.45	0.02
(AT&T - Existent)			0.00					1/2" Ice	0.65	0.53	0.02
			0.00					1" Ice	0.75	0.63	0.03
RRUS-32	A	From Leg	2.50			0.0000	140.00	No Ice	3.31	2.42	0.08
(AT&T - Existent)			0.00					1/2" Ice	3.56	2.64	0.10
			0.00					1" Ice	3.81	2.86	0.14
RRUS-32	B	From Leg	2.50			0.0000	140.00	No Ice	3.31	2.42	0.08
(AT&T - Existent)			0.00					1/2" Ice	3.56	2.64	0.10
			0.00					1" Ice	3.81	2.86	0.14
RRUS-32	C	From Leg	2.50			0.0000	140.00	No Ice	3.31	2.42	0.08
(AT&T - Existent)			0.00					1/2" Ice	3.56	2.64	0.10
			0.00					1" Ice	3.81	2.86	0.14
DC6-48-60-18-8F Surge	B	From Leg	2.50			0.0000	140.00	No Ice	1.91	1.91	0.02
Arrestor			0.00					1/2" Ice	2.10	2.10	0.04
(AT&T - Existent)			0.00					1" Ice	2.29	2.29	0.06
Pirod 12' T-Frame Sector	A	From Leg	1.25			0.0000	137.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00					1/2" Ice	18.40	18.40	0.60

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 K
(AT&T - Existent)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	1.25 0.00	0.0000	137.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(AT&T - Existent)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	1.25 0.00	0.0000	137.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(AT&T - Existent)			0.00			1" Ice	23.20	23.20	0.73
AIR32 (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	6.51 6.89 7.27	4.71 5.07 5.43	0.13 0.18 0.23
APXVAA24_43 (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	20.24 20.89 21.54	8.73 9.33 9.93	0.13 0.24 0.36
APXV18-206517S (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
AIR32 (T-Mobile)	B	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	6.51 6.89 7.27	4.71 5.07 5.43	0.13 0.18 0.23
APXVAA24_43 (T-Mobile)	B	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	20.24 20.89 21.54	8.73 9.33 9.93	0.13 0.24 0.36
APXV18-206517S (T-Mobile)	B	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
AIR32 (T-Mobile)	C	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	6.51 6.89 7.27	4.71 5.07 5.43	0.13 0.18 0.23
APXVAA24_43 (T-Mobile)	C	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	20.24 20.89 21.54	8.73 9.33 9.93	0.13 0.24 0.36
APXV18-206517S (T-Mobile)	C	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
AIR32 (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	6.51 6.89 7.27	4.71 5.07 5.43	0.13 0.18 0.23
APXVAA24_43 (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	20.24 20.89 21.54	8.73 9.33 9.93	0.13 0.24 0.36
APXV18-206517S (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
(4) RRUS-11 (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	2.57 2.76 2.97	1.07 1.21 1.36	0.05 0.07 0.09
(4) RRUS-11 (T-Mobile)	B	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	2.57 2.76 2.97	1.07 1.21 1.36	0.05 0.07 0.09
(4) RRUS-11 (T-Mobile)	C	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	2.57 2.76 2.97	1.07 1.21 1.36	0.05 0.07 0.09
Custom 4-Sided Sector Mount (T-Mobile)	A	None		0.0000	125.00	No Ice 1/2" Ice 1" Ice	36.00 42.00 48.00	36.00 42.00 48.00	3.00 3.30 3.60
OGT9-840	A	From Leg	3.00 0.00	0.0000	184.00	No Ice 1/2" Ice	2.27 3.44	2.27 3.44	0.02 0.04

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 K
			5.00			1" Ice	4.61	4.61	0.06
OGT9-840	A	From Leg	3.00	0.0000	184.00	No Ice	2.27	2.27	0.02
			0.00			1/2" Ice	3.44	3.44	0.04
			5.00			1" Ice	4.61	4.61	0.06
Pirod 6-8' Box Arm (1)	A	From Leg	3.00	0.0000	184.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
OGT9-840	B	From Leg	3.00	0.0000	184.00	No Ice	2.27	2.27	0.02
			0.00			1/2" Ice	3.44	3.44	0.04
			5.00			1" Ice	4.61	4.61	0.06
OGT9-840	B	From Leg	3.00	0.0000	184.00	No Ice	2.27	2.27	0.02
			0.00			1/2" Ice	3.44	3.44	0.04
			5.00			1" Ice	4.61	4.61	0.06
Pirod 6-8' Box Arm (1)	B	From Leg	3.00	0.0000	184.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
ANT150D3	C	From Leg	3.00	0.0000	184.00	No Ice	4.50	4.50	0.02
			0.00			1/2" Ice	6.00	6.00	0.04
			5.00			1" Ice	7.50	7.50	0.07
Pirod 6-8' Box Arm (1)	B	From Leg	3.00	0.0000	184.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
ANT150F2	C	From Leg	3.00	0.0000	183.00	No Ice	1.29	1.29	0.02
			0.00			1/2" Ice	1.60	1.60	0.03
			5.00			1" Ice	1.91	1.91	0.04
3' Side Mount Standoff	C	From Leg	1.50	0.0000	183.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
Pirod 6-8' Box Arm (1) (Vacant)	B	From Leg	3.00	0.0000	118.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
ANT150D3	C	From Leg	6.00	0.0000	105.00	No Ice	4.50	4.50	0.02
			0.00			1/2" Ice	6.00	6.00	0.04
			5.00			1" Ice	7.50	7.50	0.07
Pirod 6-8' Box Arm (1)	C	From Leg	3.00	0.0000	105.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
6' Dish Ice Shield	C	From Leg	3.00	0.0000	101.00	No Ice	5.00	5.00	0.03
			0.00			1/2" Ice	7.00	7.00	0.05
			0.00			1" Ice	9.00	9.00	0.07
Pirod 6-8' Box Arm (1) (Vacant)	A	From Leg	3.00	0.0000	98.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
PD458-2	B	From Leg	6.00	0.0000	98.00	No Ice	3.40	3.40	0.02
			0.00			1/2" Ice	4.79	4.79	0.05
			5.00			1" Ice	6.20	6.20	0.08
Pirod 6-8' Box Arm (1)	B	From Leg	3.00	0.0000	98.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
PD220	A	From Leg	6.00	0.0000	78.00	No Ice	3.08	3.08	0.02
			0.00			1/2" Ice	5.30	5.30	0.05
			10.00			1" Ice	7.54	7.54	0.09
PD1142-1	A	From Leg	6.00	0.0000	78.00	No Ice	1.32	1.32	0.01
			0.00			1/2" Ice	3.21	3.21	0.02
			-5.00			1" Ice	5.12	5.12	0.05
Pirod 6-8' Box Arm (1)	A	From Leg	3.00	0.0000	78.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28

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 K
			0.00			1" Ice	15.24	15.24	0.34
BCD-80609-NE	B	From Leg	6.00	0.0000	78.00	No Ice	2.95	2.95	0.03
			0.00			1/2" Ice	4.11	4.11	0.05
			5.00			1" Ice	5.29	5.29	0.08
6' Yagi	B	From Leg	6.00	0.0000	78.00	No Ice	5.00	5.00	0.04
			0.00			1/2" Ice	6.50	6.50	0.06
			0.00			1" Ice	8.00	8.00	0.08
Pirod 6-8' Box Arm (1)	B	From Leg	3.00	0.0000	78.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
DB222	C	From Leg	6.00	0.0000	78.00	No Ice	1.60	1.60	0.02
			0.00			1/2" Ice	2.88	2.88	0.02
			7.00			1" Ice	4.16	4.16	0.03
Pirod 6-8' Box Arm (1)	C	From Leg	3.00	0.0000	78.00	No Ice	4.50	4.50	0.21
			0.00			1/2" Ice	9.87	9.87	0.28
			0.00			1" Ice	15.24	15.24	0.34
GPS	B	From Leg	2.00	0.0000	32.00	No Ice	1.00	1.00	0.01
			0.00			1/2" Ice	1.50	1.50	0.01
			0.00			1" Ice	2.00	2.00	0.02
2-ft Stand Off	B	From Leg	1.00	0.0000	32.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
SitePro SFS-V-L	A	From Leg	1.00	0.0000	137.00	No Ice	5.09	4.75	0.08
			0.00			1/2" Ice	5.74	5.35	0.10
			0.00			1" Ice	6.53	6.07	0.14
SitePro SFS-V-L	B	From Leg	1.00	0.0000	137.00	No Ice	5.09	4.75	0.08
			0.00			1/2" Ice	5.74	5.35	0.10
			0.00			1" Ice	6.53	6.07	0.14
SitePro SFS-V-L	C	From Leg	1.00	0.0000	137.00	No Ice	5.09	4.75	0.08
			0.00			1/2" Ice	5.74	5.35	0.10
			0.00			1" Ice	6.53	6.07	0.14
DC6-48-60-18-8F Surge	C	From Leg	2.50	0.0000	140.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Proposed)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	B	From Leg	2.50	0.0000	140.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Proposed)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	A	From Leg	2.50	0.0000	140.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Existent)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	C	From Leg	2.50	0.0000	140.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Existent)			0.00			1" Ice	2.29	2.29	0.06
4478 B14	A	From Leg	2.50	0.0000	140.00	No Ice	1.84	1.06	0.06
(AT&T - Proposed)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
4478 B14	B	From Leg	2.50	0.0000	140.00	No Ice	1.84	1.06	0.06
(AT&T - Proposed)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
4478 B14	C	From Leg	2.50	0.0000	140.00	No Ice	1.84	1.06	0.06
(AT&T - Proposed)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
4449 B5/B12	A	From Leg	2.50	0.0000	140.00	No Ice	1.97	1.41	0.07
(AT&T - Proposed)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
4449 B5/B12	B	From Leg	2.50	0.0000	140.00	No Ice	1.97	1.41	0.07
(AT&T - Proposed)			0.00			1/2" Ice	2.14	1.56	0.09

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 K
			0.00			1" Ice	2.33	1.73	0.11
4449 B5/B12	C	From Leg	2.50	0.0000	140.00	No Ice	1.97	1.41	0.07
(AT&T - Proposed)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
RVZDC-6627-PF-48	A	From Leg	2.00	0.0000	168.00	No Ice	3.25	2.15	0.03
(Verizon)			0.00			1/2" Ice	3.48	2.35	0.06
			0.00			1" Ice	3.71	2.55	0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
SC2-W100AB	C	Paraboloid	From	3.00	0.0000		125.00	2.00	No Ice	3.14	0.02
(T-Mobile Proposed)		w/Radome	Leg	0.00					1/2" Ice	3.41	0.04
				0.00					1" Ice	3.68	0.06
6' Dish	C	Paraboloid w/o	From	0.00	0.0000		97.00	6.00	No Ice	28.27	0.08
		Radome	Leg	0.00					1/2" Ice	29.07	0.10
				0.00					1" Ice	29.87	0.12
6' Dish	A	Paraboloid w/o	From	0.00	0.0000		188.00	6.00	No Ice	28.27	0.08
		Radome	Leg	0.00					1/2" Ice	29.07	0.10
				0.00					1" Ice	29.87	0.12

Truss-Leg Interaction Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Section Modulus S_x in^3	Section Modulus S_y in^3	Leg Area in^2
Pirod 105244	1026.8606	3703.4895	0.54	1.38	7.1310	25.7187	12.8052	14.7861	3.6816
Pirod 105244	1026.8606	3698.2947	0.54	1.38	7.1310	25.6826	12.8052	14.7861	3.6816
Pirod 105216	2169.0308	7004.3543	0.45	2.57	7.5314	24.3207	12.8052	14.7861	3.6816
Pirod 105217	2296.2363	7057.0902	0.56	2.56	7.9730	24.5038	18.4723	21.3300	5.3014
Pirod 105217	2296.2363	7043.2921	0.56	2.54	7.9730	24.4559	18.4723	21.3300	5.3014
Pirod 105218	2425.3141	7092.8972	0.69	2.52	8.4212	24.6281	25.1958	29.0936	7.2158
Pirod 105218	2425.3141	7068.0433	0.69	2.47	8.4212	24.5418	25.1958	29.0936	7.2158
Pirod 105218	2425.3141	7049.7974	0.69	2.43	8.4212	24.4785	25.1958	29.0936	7.2158
Pirod 105219	2597.9095	7091.2564	1.03	2.48	9.0205	24.6224	32.9885	38.0918	9.4248
Pirod 105219	2597.9095	7042.4634	1.03	2.38	9.0205	24.4530	32.9885	38.0918	9.4248
Pirod 105220	2735.0688	7051.0275	1.20	2.28	9.4968	24.4827	41.8654	48.3420	11.9282
Pirod 105220	2735.0688	6958.7096	1.20	2.10	9.4968	24.1622	41.8654	48.3420	11.9282
Pirod 112738	3389.3479	8842.7666	1.68	2.55	11.7686	30.7041	77.0732	88.9965	14.7262

Tower Pressures - No Ice

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	192.50	1.453	29	65.521	A	5.275	5.942	5.942	52.98	0.000	0.000
195.00-190.00					B	5.275	5.942		52.98	0.000	0.000
					C	5.275	5.942		52.98	0.000	0.000
T2	185.00	1.441	29	131.042	A	5.966	11.885	11.885	66.58	0.000	0.000
190.00-180.00					B	5.966	11.885		66.58	0.000	0.000
					C	5.966	11.885		66.58	0.000	0.000
T3	170.00	1.415	28	262.083	A	14.319	25.105	25.105	63.68	0.000	0.000
180.00-160.00					B	14.319	25.105		63.68	0.000	0.000
					C	14.319	25.105		63.68	23.387	0.000
T4	155.00	1.388	28	131.250	A	9.909	13.288	13.288	57.28	0.000	0.000
160.00-150.00					B	9.909	13.288		57.28	0.000	0.000
					C	9.909	13.288		57.28	25.985	0.000
T5	145.00	1.369	27	131.250	A	7.159	13.288	13.288	64.99	0.000	0.000
150.00-140.00					B	7.159	13.288		64.99	0.000	0.000
					C	7.159	13.288		64.99	25.985	0.000
T6	130.00	1.337	27	282.945	A	17.894	28.118	28.118	61.11	0.000	0.000
140.00-120.00					B	17.894	28.118		61.11	4.250	0.000
					C	17.894	28.118		61.11	51.970	0.000
T7	115.00	1.303	26	156.473	A	13.500	14.059	14.059	51.01	0.000	0.000
120.00-110.00					B	13.500	14.059		51.01	8.500	0.000
					C	13.500	14.059		51.01	25.985	0.000
T8	105.00	1.279	25	166.473	A	10.067	14.059	14.059	58.27	0.000	0.000
110.00-100.00					B	10.067	14.059		58.27	8.500	0.000
					C	10.067	14.059		58.27	25.985	0.000
T9	90.00	1.238	25	363.362	A	24.755	30.118	30.118	54.89	0.000	0.000
100.00-80.00					B	24.755	30.118		54.89	17.000	0.000
					C	24.755	30.118		54.89	51.970	0.000
T10	70.00	1.174	23	403.362	A	27.125	30.118	30.118	52.61	0.000	0.000
80.00-60.00					B	27.125	30.118		52.61	17.000	0.000
					C	27.125	30.118		52.61	51.970	0.000
T11	50.00	1.094	22	443.780	A	36.924	31.709	31.709	46.20	0.000	0.000
60.00-40.00					B	36.924	31.709		46.20	17.000	0.000
					C	36.924	31.709		46.20	51.970	0.000
T12	30.00	0.982	19	483.780	A	39.986	31.709	31.709	44.23	0.000	0.000
40.00-20.00					B	39.986	31.709		44.23	17.000	0.000
					C	39.986	31.709		44.23	51.970	0.000
T13 20.00-0.00	10.00	0.85	17	534.209	A	17.745	39.294	39.294	68.89	0.000	0.000
					B	17.745	39.294		68.89	17.000	0.000
					C	17.745	39.294		68.89	51.970	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	192.50	1.453	5	2.9822	68.006	A	5.275	34.016	21.432	54.55	0.000	0.000
195.00-190.00						B	5.275	34.016		54.55	0.000	0.000
						C	5.275	34.016		54.55	0.000	0.000

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
T2	185.00	1.441	5	2.9703	135.992	A	5.966	56.982	42.804	68.00	0.000	0.000
190.00-180.00						B	5.966	56.982		68.00	0.000	0.000
						C	5.966	56.982		68.00	0.000	0.000
T3	170.00	1.415	5	2.9453	271.901	A	14.319	109.185	81.069	65.64	0.000	0.000
180.00-160.00						B	14.319	109.185		65.64	0.000	0.000
						C	14.319	109.185		65.64	41.159	0.000
T4	155.00	1.388	5	2.9182	136.114	A	9.909	60.118	40.840	58.32	0.000	0.000
160.00-150.00						B	9.909	60.118		58.32	0.000	0.000
						C	9.909	60.118		58.32	45.590	0.000
T5	145.00	1.369	5	2.8988	136.081	A	7.159	54.596	40.760	66.00	0.000	0.000
150.00-140.00						B	7.159	54.596		66.00	0.000	0.000
						C	7.159	54.596		66.00	45.487	0.000
T6	130.00	1.337	5	2.8674	292.515	A	17.894	116.436	82.230	61.21	0.000	0.000
140.00-120.00						B	17.894	116.436		61.21	13.476	0.000
						C	17.894	116.436		61.21	90.642	0.000
T7	115.00	1.303	5	2.8324	161.199	A	13.500	62.821	40.971	53.68	0.000	0.000
120.00-110.00						B	13.500	62.821		53.68	26.760	0.000
						C	13.500	62.821		53.68	45.137	0.000
T8	105.00	1.279	4	2.8068	171.156	A	10.067	57.012	40.865	60.92	0.000	0.000
110.00-100.00						B	10.067	57.012		60.92	26.618	0.000
						C	10.067	57.012		60.92	45.001	0.000
T9 100.00-80.00	90.00	1.238	4	2.7638	372.587	A	24.755	116.421	82.211	58.23	0.000	0.000
						B	24.755	116.421		58.23	52.760	0.000
						C	24.755	116.421		58.23	89.550	0.000
T10 80.00-60.00	70.00	1.174	4	2.6952	412.358	A	27.125	118.200	81.646	56.18	0.000	0.000
						B	27.125	118.200		56.18	52.000	0.000
						C	27.125	118.200		56.18	88.827	0.000
T11 60.00-40.00	50.00	1.094	4	2.6061	452.477	A	36.924	120.236	81.745	52.01	0.000	0.000
						B	36.924	120.236		52.01	51.013	0.000
						C	36.924	120.236		52.01	87.887	0.000
T12 40.00-20.00	30.00	0.982	3	2.4763	492.044	A	39.986	120.282	80.675	50.34	0.000	0.000
						B	39.986	120.282		50.34	49.576	0.000
						C	39.986	120.282		50.34	86.522	0.000
T13 20.00-0.00	10.00	0.85	3	2.2186	541.614	A	17.745	125.015	102.517	71.81	0.000	0.000
						B	17.745	125.015		71.81	46.724	0.000
						C	17.745	125.015		71.81	83.816	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	192.50	1.453	11	65.521	A	5.275	5.942	5.942	52.98	0.000	0.000
195.00-190.00					B	5.275	5.942		52.98	0.000	0.000
					C	5.275	5.942		52.98	0.000	0.000
T2	185.00	1.441	11	131.042	A	5.966	11.885	11.885	66.58	0.000	0.000
190.00-180.00					B	5.966	11.885		66.58	0.000	0.000
					C	5.966	11.885		66.58	0.000	0.000
T3	170.00	1.415	11	262.083	A	14.319	25.105	25.105	63.68	0.000	0.000
180.00-160.00					B	14.319	25.105		63.68	0.000	0.000
					C	14.319	25.105		63.68	23.387	0.000
T4	155.00	1.388	11	131.250	A	9.909	13.288	13.288	57.28	0.000	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
160.00-150.00					B	9.909	13.288		57.28	0.000	0.000
					C	9.909	13.288		57.28	25.985	0.000
T5	145.00	1.369	11	131.250	A	7.159	13.288	13.288	64.99	0.000	0.000
150.00-140.00					B	7.159	13.288		64.99	0.000	0.000
					C	7.159	13.288		64.99	25.985	0.000
T6	130.00	1.337	10	282.945	A	17.894	28.118	28.118	61.11	0.000	0.000
140.00-120.00					B	17.894	28.118		61.11	4.250	0.000
					C	17.894	28.118		61.11	51.970	0.000
T7	115.00	1.303	10	156.473	A	13.500	14.059	14.059	51.01	0.000	0.000
120.00-110.00					B	13.500	14.059		51.01	8.500	0.000
					C	13.500	14.059		51.01	25.985	0.000
T8	105.00	1.279	10	166.473	A	10.067	14.059	14.059	58.27	0.000	0.000
110.00-100.00					B	10.067	14.059		58.27	8.500	0.000
					C	10.067	14.059		58.27	25.985	0.000
T9	90.00	1.238	10	363.362	A	24.755	30.118	30.118	54.89	0.000	0.000
100.00-80.00					B	24.755	30.118		54.89	17.000	0.000
					C	24.755	30.118		54.89	51.970	0.000
T10	70.00	1.174	9	403.362	A	27.125	30.118	30.118	52.61	0.000	0.000
80.00-60.00					B	27.125	30.118		52.61	17.000	0.000
					C	27.125	30.118		52.61	51.970	0.000
T11	50.00	1.094	9	443.780	A	36.924	31.709	31.709	46.20	0.000	0.000
60.00-40.00					B	36.924	31.709		46.20	17.000	0.000
					C	36.924	31.709		46.20	51.970	0.000
T12	30.00	0.982	8	483.780	A	39.986	31.709	31.709	44.23	0.000	0.000
40.00-20.00					B	39.986	31.709		44.23	17.000	0.000
					C	39.986	31.709		44.23	51.970	0.000
T13 20.00-0.00	10.00	0.85	7	534.209	A	17.745	39.294	39.294	68.89	0.000	0.000
					B	17.745	39.294		68.89	17.000	0.000
					C	17.745	39.294		68.89	51.970	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	29	1	1	8.662	0.57	114.28	C
195.00-190.00			B	0.171	2.695		1	1	8.662			
			C	0.171	2.695		1	1	8.662			
T2	0.00	1.09	A	0.136	2.823	29	1	1	12.696	0.87	86.99	C
190.00-180.00			B	0.136	2.823		1	1	12.696			
			C	0.136	2.823		1	1	12.696			
T3	0.12	2.05	A	0.15	2.77	28	1	1	28.568	2.44	122.22	C
180.00-160.00			B	0.15	2.77		1	1	28.568			
			C	0.15	2.77		1	1	28.568			
T4	0.14	1.62	A	0.177	2.676	28	1	1	17.494	1.70	170.22	C
160.00-150.00			B	0.177	2.676		1	1	17.494			
			C	0.177	2.676		1	1	17.494			
T5	0.14	1.41	A	0.156	2.75	27	1	1	14.709	1.53	153.20	C
150.00-140.00			B	0.156	2.75		1	1	14.709			
			C	0.156	2.75		1	1	14.709			
T6	0.31	3.48	A	0.163	2.726	27	1	1	33.891	3.35	167.43	C
140.00-120.00			B	0.163	2.726		1	1	33.891			
			C	0.163	2.726		1	1	33.891			
T7	0.21	2.09	A	0.176	2.678	26	1	1	21.524	2.02	202.29	C
120.00-110.00			B	0.176	2.678		1	1	21.524			
			C	0.176	2.678		1	1	21.524			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T8	0.21	1.82	A	0.145	2.79	25	1	1	18.039	1.83	182.73	C
110.00-100.00			B	0.145	2.79		1	1	18.039			
			C	0.145	2.79		1	1	18.039			
T9	0.43	4.67	A	0.151	2.768	25	1	1	41.852	3.85	192.71	C
100.00-80.00			B	0.151	2.768		1	1	41.852			
			C	0.151	2.768		1	1	41.852			
T10	0.43	5.61	A	0.142	2.801	23	1	1	44.195	3.81	190.67	C
80.00-60.00			B	0.142	2.801		1	1	44.195			
			C	0.142	2.801		1	1	44.195			
T11	0.43	7.04	A	0.155	2.754	22	1	1	54.936	4.06	202.97	C
60.00-40.00			B	0.155	2.754		1	1	54.936			
			C	0.155	2.754		1	1	54.936			
T12	0.43	7.31	A	0.148	2.778	19	1	1	57.976	3.81	190.35	C
40.00-20.00			B	0.148	2.778		1	1	57.976			
			C	0.148	2.778		1	1	57.976			
T13	0.43	7.78	A	0.107	2.937	17	1	1	39.929	2.67	133.36	C
20.00-0.00			B	0.107	2.937		1	1	39.929			
			C	0.107	2.937		1	1	39.929			
Sum Weight:	3.27	46.88						OTM	2989.94 kip-ft	32.52		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	29	0.825	1	7.739	0.51	102.10	C
195.00-190.00			B	0.171	2.695		0.825	1	7.739			
			C	0.171	2.695		0.825	1	7.739			
T2	0.00	1.09	A	0.136	2.823	29	0.825	1	11.652	0.80	79.84	C
190.00-180.00			B	0.136	2.823		0.825	1	11.652			
			C	0.136	2.823		0.825	1	11.652			
T3	0.12	2.05	A	0.15	2.77	28	0.825	1	26.062	2.28	113.95	C
180.00-160.00			B	0.15	2.77		0.825	1	26.062			
			C	0.15	2.77		0.825	1	26.062			
T4	0.14	1.62	A	0.177	2.676	28	0.825	1	15.760	1.59	159.37	C
160.00-150.00			B	0.177	2.676		0.825	1	15.760			
			C	0.177	2.676		0.825	1	15.760			
T5	0.14	1.41	A	0.156	2.75	27	0.825	1	13.456	1.45	145.25	C
150.00-140.00			B	0.156	2.75		0.825	1	13.456			
			C	0.156	2.75		0.825	1	13.456			
T6	0.31	3.48	A	0.163	2.726	27	0.825	1	30.760	3.16	157.81	C
140.00-120.00			B	0.163	2.726		0.825	1	30.760			
			C	0.163	2.726		0.825	1	30.760			
T7	0.21	2.09	A	0.176	2.678	26	0.825	1	19.161	1.88	188.40	C
120.00-110.00			B	0.176	2.678		0.825	1	19.161			
			C	0.176	2.678		0.825	1	19.161			
T8	0.21	1.82	A	0.145	2.79	25	0.825	1	16.277	1.72	172.14	C
110.00-100.00			B	0.145	2.79		0.825	1	16.277			
			C	0.145	2.79		0.825	1	16.277			
T9	0.43	4.67	A	0.151	2.768	25	0.825	1	37.520	3.60	180.21	C
100.00-80.00			B	0.151	2.768		0.825	1	37.520			
			C	0.151	2.768		0.825	1	37.520			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T10	0.43	5.61	A	0.142	2.801	23	0.825	1	39.448	3.55	177.52	C
80.00-60.00			B	0.142	2.801		0.825	1	39.448			
			C	0.142	2.801		0.825	1	39.448			
T11	0.43	7.04	A	0.155	2.754	22	0.825	1	48.474	3.73	186.58	C
60.00-40.00			B	0.155	2.754		0.825	1	48.474			
			C	0.155	2.754		0.825	1	48.474			
T12	0.43	7.31	A	0.148	2.778	19	0.825	1	50.979	3.49	174.26	C
40.00-20.00			B	0.148	2.778		0.825	1	50.979			
			C	0.148	2.778		0.825	1	50.979			
T13	0.43	7.78	A	0.107	2.937	17	0.825	1	36.824	2.54	126.83	C
20.00-0.00			B	0.107	2.937		0.825	1	36.824			
			C	0.107	2.937		0.825	1	36.824			
Sum Weight:	3.27	46.88						OTM	2788.13 kip-ft	30.30		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	29	0.8	1	7.607	0.50	100.36	C
195.00-190.00			B	0.171	2.695		0.8	1	7.607			
			C	0.171	2.695		0.8	1	7.607			
T2	0.00	1.09	A	0.136	2.823	29	0.8	1	11.503	0.79	78.81	C
190.00-180.00			B	0.136	2.823		0.8	1	11.503			
			C	0.136	2.823		0.8	1	11.503			
T3	0.12	2.05	A	0.15	2.77	28	0.8	1	25.704	2.26	112.76	C
180.00-160.00			B	0.15	2.77		0.8	1	25.704			
			C	0.15	2.77		0.8	1	25.704			
T4	0.14	1.62	A	0.177	2.676	28	0.8	1	15.512	1.58	157.82	C
160.00-150.00			B	0.177	2.676		0.8	1	15.512			
			C	0.177	2.676		0.8	1	15.512			
T5	0.14	1.41	A	0.156	2.75	27	0.8	1	13.277	1.44	144.12	C
150.00-140.00			B	0.156	2.75		0.8	1	13.277			
			C	0.156	2.75		0.8	1	13.277			
T6	0.31	3.48	A	0.163	2.726	27	0.8	1	30.313	3.13	156.43	C
140.00-120.00			B	0.163	2.726		0.8	1	30.313			
			C	0.163	2.726		0.8	1	30.313			
T7	0.21	2.09	A	0.176	2.678	26	0.8	1	18.824	1.86	186.42	C
120.00-110.00			B	0.176	2.678		0.8	1	18.824			
			C	0.176	2.678		0.8	1	18.824			
T8	0.21	1.82	A	0.145	2.79	25	0.8	1	16.026	1.71	170.63	C
110.00-100.00			B	0.145	2.79		0.8	1	16.026			
			C	0.145	2.79		0.8	1	16.026			
T9	0.43	4.67	A	0.151	2.768	25	0.8	1	36.901	3.57	178.42	C
100.00-80.00			B	0.151	2.768		0.8	1	36.901			
			C	0.151	2.768		0.8	1	36.901			
T10	0.43	5.61	A	0.142	2.801	23	0.8	1	38.770	3.51	175.64	C
80.00-60.00			B	0.142	2.801		0.8	1	38.770			
			C	0.142	2.801		0.8	1	38.770			
T11	0.43	7.04	A	0.155	2.754	22	0.8	1	47.551	3.68	184.23	C
60.00-40.00			B	0.155	2.754		0.8	1	47.551			
			C	0.155	2.754		0.8	1	47.551			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T12	0.43	7.31	A	0.148	2.778	19	0.8	1	49.979	3.44	171.96	C
40.00-20.00			B	0.148	2.778		0.8	1	49.979			
			C	0.148	2.778		0.8	1	49.979			
T13	0.43	7.78	A	0.107	2.937	17	0.8	1	36.380	2.52	125.89	C
20.00-0.00			B	0.107	2.937		0.8	1	36.380			
			C	0.107	2.937		0.8	1	36.380			
Sum Weight:	3.27	46.88						OTM	2759.30 kip-ft	29.99		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	29	0.85	1	7.871	0.52	103.84	C
195.00-190.00			B	0.171	2.695		0.85	1	7.871			
			C	0.171	2.695		0.85	1	7.871			
T2	0.00	1.09	A	0.136	2.823	29	0.85	1	11.801	0.81	80.86	C
190.00-180.00			B	0.136	2.823		0.85	1	11.801			
			C	0.136	2.823		0.85	1	11.801			
T3	0.12	2.05	A	0.15	2.77	28	0.85	1	26.420	2.30	115.13	C
180.00-160.00			B	0.15	2.77		0.85	1	26.420			
			C	0.15	2.77		0.85	1	26.420			
T4	0.14	1.62	A	0.177	2.676	28	0.85	1	16.008	1.61	160.92	C
160.00-150.00			B	0.177	2.676		0.85	1	16.008			
			C	0.177	2.676		0.85	1	16.008			
T5	0.14	1.41	A	0.156	2.75	27	0.85	1	13.635	1.46	146.39	C
150.00-140.00			B	0.156	2.75		0.85	1	13.635			
			C	0.156	2.75		0.85	1	13.635			
T6	0.31	3.48	A	0.163	2.726	27	0.85	1	31.207	3.18	159.18	C
140.00-120.00			B	0.163	2.726		0.85	1	31.207			
			C	0.163	2.726		0.85	1	31.207			
T7	0.21	2.09	A	0.176	2.678	26	0.85	1	19.499	1.90	190.39	C
120.00-110.00			B	0.176	2.678		0.85	1	19.499			
			C	0.176	2.678		0.85	1	19.499			
T8	0.21	1.82	A	0.145	2.79	25	0.85	1	16.529	1.74	173.65	C
110.00-100.00			B	0.145	2.79		0.85	1	16.529			
			C	0.145	2.79		0.85	1	16.529			
T9	0.43	4.67	A	0.151	2.768	25	0.85	1	38.138	3.64	182.00	C
100.00-80.00			B	0.151	2.768		0.85	1	38.138			
			C	0.151	2.768		0.85	1	38.138			
T10	0.43	5.61	A	0.142	2.801	23	0.85	1	40.127	3.59	179.40	C
80.00-60.00			B	0.142	2.801		0.85	1	40.127			
			C	0.142	2.801		0.85	1	40.127			
T11	0.43	7.04	A	0.155	2.754	22	0.85	1	49.397	3.78	188.92	C
60.00-40.00			B	0.155	2.754		0.85	1	49.397			
			C	0.155	2.754		0.85	1	49.397			
T12	0.43	7.31	A	0.148	2.778	19	0.85	1	51.979	3.53	176.56	C
40.00-20.00			B	0.148	2.778		0.85	1	51.979			
			C	0.148	2.778		0.85	1	51.979			
T13	0.43	7.78	A	0.107	2.937	17	0.85	1	37.267	2.56	127.76	C
20.00-0.00			B	0.107	2.937		0.85	1	37.267			
			C	0.107	2.937		0.85	1	37.267			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	3.27	46.88						OTM	2816.96 kip-ft	30.62		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.00	4.36	A	0.578	1.819	5	1	1	30.103	0.24	47.09	C
195.00-190.00			B	0.578	1.819		1	1	30.103			
			C	0.578	1.819		1	1	30.103			
T2	0.00	5.37	A	0.463	1.953	5	1	1	43.896	0.37	36.55	C
190.00-180.00			B	0.463	1.953		1	1	43.896			
			C	0.463	1.953		1	1	43.896			
T3	1.26	14.61	A	0.454	1.967	5	1	1	86.528	0.89	44.25	C
180.00-160.00			B	0.454	1.967		1	1	86.528			
			C	0.454	1.967		1	1	86.528			
T4	1.39	8.78	A	0.514	1.882	5	1	1	51.567	0.59	58.59	C
160.00-150.00			B	0.514	1.882		1	1	51.567			
			C	0.514	1.882		1	1	51.567			
T5	1.38	7.58	A	0.454	1.967	5	1	1	43.255	0.53	52.89	C
150.00-140.00			B	0.454	1.967		1	1	43.255			
			C	0.454	1.967		1	1	43.255			
T6	3.05	16.86	A	0.459	1.959	5	1	1	95.188	1.15	57.50	C
140.00-120.00			B	0.459	1.959		1	1	95.188			
			C	0.459	1.959		1	1	95.188			
T7	1.98	9.82	A	0.473	1.937	5	1	1	55.655	0.69	69.31	C
120.00-110.00			B	0.473	1.937		1	1	55.655			
			C	0.473	1.937		1	1	55.655			
T8	1.96	8.42	A	0.392	2.08	4	1	1	46.143	0.63	63.42	C
110.00-100.00			B	0.392	2.08		1	1	46.143			
			C	0.392	2.08		1	1	46.143			
T9	3.88	18.85	A	0.379	2.107	4	1	1	97.794	1.28	63.81	C
100.00-80.00			B	0.379	2.107		1	1	97.794			
			C	0.379	2.107		1	1	97.794			
T10	3.80	19.85	A	0.352	2.166	4	1	1	100.051	1.24	62.11	C
80.00-60.00			B	0.352	2.166		1	1	100.051			
			C	0.352	2.166		1	1	100.051			
T11	3.69	22.51	A	0.347	2.178	4	1	1	110.877	1.23	61.56	C
60.00-40.00			B	0.347	2.178		1	1	110.877			
			C	0.347	2.178		1	1	110.877			
T12	3.54	22.33	A	0.326	2.23	3	1	1	113.039	1.13	56.42	C
40.00-20.00			B	0.326	2.23		1	1	113.039			
			C	0.326	2.23		1	1	113.039			
T13	3.25	20.25	A	0.264	2.397	3	1	1	91.310	0.88	43.95	C
20.00-0.00			B	0.264	2.397		1	1	91.310			
			C	0.264	2.397		1	1	91.310			
Sum Weight:	29.19	179.59						OTM	1032.73 kip-ft	10.84		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	4.36	A	0.578	1.819	5	0.825	1	29.180	0.23	45.65	C
195.00-190.00			B	0.578	1.819		0.825	1	29.180			
			C	0.578	1.819		0.825	1	29.180			
T2	0.00	5.37	A	0.463	1.953	5	0.825	1	42.852	0.36	35.68	C
190.00-180.00			B	0.463	1.953		0.825	1	42.852			
			C	0.463	1.953		0.825	1	42.852			
T3	1.26	14.61	A	0.454	1.967	5	0.825	1	84.022	0.86	43.22	C
180.00-160.00			B	0.454	1.967		0.825	1	84.022			
			C	0.454	1.967		0.825	1	84.022			
T4	1.39	8.78	A	0.514	1.882	5	0.825	1	49.833	0.57	57.24	C
160.00-150.00			B	0.514	1.882		0.825	1	49.833			
			C	0.514	1.882		0.825	1	49.833			
T5	1.38	7.58	A	0.454	1.967	5	0.825	1	42.002	0.52	51.89	C
150.00-140.00			B	0.454	1.967		0.825	1	42.002			
			C	0.454	1.967		0.825	1	42.002			
T6	3.05	16.86	A	0.459	1.959	5	0.825	1	92.057	1.13	56.29	C
140.00-120.00			B	0.459	1.959		0.825	1	92.057			
			C	0.459	1.959		0.825	1	92.057			
T7	1.98	9.82	A	0.473	1.937	5	0.825	1	53.292	0.68	67.55	C
120.00-110.00			B	0.473	1.937		0.825	1	53.292			
			C	0.473	1.937		0.825	1	53.292			
T8	1.96	8.42	A	0.392	2.08	4	0.825	1	44.381	0.62	62.04	C
110.00-100.00			B	0.392	2.08		0.825	1	44.381			
			C	0.392	2.08		0.825	1	44.381			
T9	3.88	18.85	A	0.379	2.107	4	0.825	1	93.462	1.24	62.14	C
100.00-80.00			B	0.379	2.107		0.825	1	93.462			
			C	0.379	2.107		0.825	1	93.462			
T10	3.80	19.85	A	0.352	2.166	4	0.825	1	95.304	1.21	60.32	C
80.00-60.00			B	0.352	2.166		0.825	1	95.304			
			C	0.352	2.166		0.825	1	95.304			
T11	3.69	22.51	A	0.347	2.178	4	0.825	1	104.415	1.19	59.28	C
60.00-40.00			B	0.347	2.178		0.825	1	104.415			
			C	0.347	2.178		0.825	1	104.415			
T12	3.54	22.33	A	0.326	2.23	3	0.825	1	106.041	1.08	54.15	C
40.00-20.00			B	0.326	2.23		0.825	1	106.041			
			C	0.326	2.23		0.825	1	106.041			
T13	3.25	20.25	A	0.264	2.397	3	0.825	1	88.205	0.86	43.01	C
20.00-0.00			B	0.264	2.397		0.825	1	88.205			
			C	0.264	2.397		0.825	1	88.205			
Sum Weight:	29.19	179.59						OTM	1006.72 kip-ft	10.54		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	4.36	A	0.578	1.819	5	0.8	1	29.048	0.23	45.44	C
195.00-190.00			B	0.578	1.819		0.8	1	29.048			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.578	1.819		0.8	1	29.048			
T2	0.00	5.37	A	0.463	1.953	5	0.8	1	42.703	0.36	35.55	C
190.00-180.00			B	0.463	1.953		0.8	1	42.703			
			C	0.463	1.953		0.8	1	42.703			
T3	1.26	14.61	A	0.454	1.967	5	0.8	1	83.664	0.86	43.07	C
180.00-160.00			B	0.454	1.967		0.8	1	83.664			
			C	0.454	1.967		0.8	1	83.664			
T4	1.39	8.78	A	0.514	1.882	5	0.8	1	49.585	0.57	57.05	C
160.00-150.00			B	0.514	1.882		0.8	1	49.585			
			C	0.514	1.882		0.8	1	49.585			
T5	1.38	7.58	A	0.454	1.967	5	0.8	1	41.823	0.52	51.75	C
150.00-140.00			B	0.454	1.967		0.8	1	41.823			
			C	0.454	1.967		0.8	1	41.823			
T6	3.05	16.86	A	0.459	1.959	5	0.8	1	91.609	1.12	56.12	C
140.00-120.00			B	0.459	1.959		0.8	1	91.609			
			C	0.459	1.959		0.8	1	91.609			
T7	1.98	9.82	A	0.473	1.937	5	0.8	1	52.955	0.67	67.30	C
120.00-110.00			B	0.473	1.937		0.8	1	52.955			
			C	0.473	1.937		0.8	1	52.955			
T8	1.96	8.42	A	0.392	2.08	4	0.8	1	44.130	0.62	61.84	C
110.00-100.00			B	0.392	2.08		0.8	1	44.130			
			C	0.392	2.08		0.8	1	44.130			
T9	3.88	18.85	A	0.379	2.107	4	0.8	1	92.843	1.24	61.90	C
100.00-80.00			B	0.379	2.107		0.8	1	92.843			
			C	0.379	2.107		0.8	1	92.843			
T10	3.80	19.85	A	0.352	2.166	4	0.8	1	94.626	1.20	60.07	C
80.00-60.00			B	0.352	2.166		0.8	1	94.626			
			C	0.352	2.166		0.8	1	94.626			
T11	3.69	22.51	A	0.347	2.178	4	0.8	1	103.492	1.18	58.96	C
60.00-40.00			B	0.347	2.178		0.8	1	103.492			
			C	0.347	2.178		0.8	1	103.492			
T12	3.54	22.33	A	0.326	2.23	3	0.8	1	105.042	1.08	53.82	C
40.00-20.00			B	0.326	2.23		0.8	1	105.042			
			C	0.326	2.23		0.8	1	105.042			
T13	3.25	20.25	A	0.264	2.397	3	0.8	1	87.761	0.86	42.88	C
20.00-0.00			B	0.264	2.397		0.8	1	87.761			
			C	0.264	2.397		0.8	1	87.761			
Sum Weight:	29.19	179.59						OTM	1003.00 kip-ft	10.50		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	4.36	A	0.578	1.819	5	0.85	1	29.312	0.23	45.86	C
195.00-190.00			B	0.578	1.819		0.85	1	29.312			
			C	0.578	1.819		0.85	1	29.312			
T2	0.00	5.37	A	0.463	1.953	5	0.85	1	43.001	0.36	35.80	C
190.00-180.00			B	0.463	1.953		0.85	1	43.001			
			C	0.463	1.953		0.85	1	43.001			
T3	1.26	14.61	A	0.454	1.967	5	0.85	1	84.380	0.87	43.37	C
180.00-160.00			B	0.454	1.967		0.85	1	84.380			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.454	1.967		0.85	1	84.380			
T4	1.39	8.78	A	0.514	1.882	5	0.85	1	50.080	0.57	57.44	C
160.00-150.00			B	0.514	1.882		0.85	1	50.080			
			C	0.514	1.882		0.85	1	50.080			
T5	1.38	7.58	A	0.454	1.967	5	0.85	1	42.181	0.52	52.03	C
150.00-140.00			B	0.454	1.967		0.85	1	42.181			
			C	0.454	1.967		0.85	1	42.181			
T6	3.05	16.86	A	0.459	1.959	5	0.85	1	92.504	1.13	56.46	C
140.00-120.00			B	0.459	1.959		0.85	1	92.504			
			C	0.459	1.959		0.85	1	92.504			
T7	1.98	9.82	A	0.473	1.937	5	0.85	1	53.630	0.68	67.80	C
120.00-110.00			B	0.473	1.937		0.85	1	53.630			
			C	0.473	1.937		0.85	1	53.630			
T8	1.96	8.42	A	0.392	2.08	4	0.85	1	44.633	0.62	62.24	C
110.00-100.00			B	0.392	2.08		0.85	1	44.633			
			C	0.392	2.08		0.85	1	44.633			
T9	3.88	18.85	A	0.379	2.107	4	0.85	1	94.081	1.25	62.38	C
100.00-80.00			B	0.379	2.107		0.85	1	94.081			
			C	0.379	2.107		0.85	1	94.081			
T10	3.80	19.85	A	0.352	2.166	4	0.85	1	95.982	1.21	60.58	C
80.00-60.00			B	0.352	2.166		0.85	1	95.982			
			C	0.352	2.166		0.85	1	95.982			
T11	3.69	22.51	A	0.347	2.178	4	0.85	1	105.338	1.19	59.61	C
60.00-40.00			B	0.347	2.178		0.85	1	105.338			
			C	0.347	2.178		0.85	1	105.338			
T12	3.54	22.33	A	0.326	2.23	3	0.85	1	107.041	1.09	54.47	C
40.00-20.00			B	0.326	2.23		0.85	1	107.041			
			C	0.326	2.23		0.85	1	107.041			
T13	3.25	20.25	A	0.264	2.397	3	0.85	1	88.648	0.86	43.15	C
20.00-0.00			B	0.264	2.397		0.85	1	88.648			
			C	0.264	2.397		0.85	1	88.648			
Sum Weight:	29.19	179.59						OTM	1010.43 kip-ft	10.58		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	11	1	1	8.662	0.23	45.16	C
195.00-190.00			B	0.171	2.695		1	1	8.662			
			C	0.171	2.695		1	1	8.662			
T2	0.00	1.09	A	0.136	2.823	11	1	1	12.696	0.34	34.38	C
190.00-180.00			B	0.136	2.823		1	1	12.696			
			C	0.136	2.823		1	1	12.696			
T3	0.12	2.05	A	0.15	2.77	11	1	1	28.568	0.97	48.30	C
180.00-160.00			B	0.15	2.77		1	1	28.568			
			C	0.15	2.77		1	1	28.568			
T4	0.14	1.62	A	0.177	2.676	11	1	1	17.494	0.67	67.27	C
160.00-150.00			B	0.177	2.676		1	1	17.494			
			C	0.177	2.676		1	1	17.494			
T5	0.14	1.41	A	0.156	2.75	11	1	1	14.709	0.61	60.55	C
150.00-140.00			B	0.156	2.75		1	1	14.709			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.156	2.75		1	1	14.709			
T6	0.31	3.48	A	0.163	2.726	10	1	1	33.891	1.32	66.17	C
140.00-120.00			B	0.163	2.726		1	1	33.891			
			C	0.163	2.726		1	1	33.891			
T7	0.21	2.09	A	0.176	2.678	10	1	1	21.524	0.80	79.95	C
120.00-110.00			B	0.176	2.678		1	1	21.524			
			C	0.176	2.678		1	1	21.524			
T8	0.21	1.82	A	0.145	2.79	10	1	1	18.039	0.72	72.22	C
110.00-100.00			B	0.145	2.79		1	1	18.039			
			C	0.145	2.79		1	1	18.039			
T9	0.43	4.67	A	0.151	2.768	10	1	1	41.852	1.52	76.16	C
100.00-80.00			B	0.151	2.768		1	1	41.852			
			C	0.151	2.768		1	1	41.852			
T10	0.43	5.61	A	0.142	2.801	9	1	1	44.195	1.51	75.35	C
80.00-60.00			B	0.142	2.801		1	1	44.195			
			C	0.142	2.801		1	1	44.195			
T11	0.43	7.04	A	0.155	2.754	9	1	1	54.936	1.60	80.22	C
60.00-40.00			B	0.155	2.754		1	1	54.936			
			C	0.155	2.754		1	1	54.936			
T12	0.43	7.31	A	0.148	2.778	8	1	1	57.976	1.50	75.23	C
40.00-20.00			B	0.148	2.778		1	1	57.976			
			C	0.148	2.778		1	1	57.976			
T13	0.43	7.78	A	0.107	2.937	7	1	1	39.929	1.05	52.70	C
20.00-0.00			B	0.107	2.937		1	1	39.929			
			C	0.107	2.937		1	1	39.929			
Sum Weight:	3.27	46.88						OTM	1181.64 kip-ft	12.85		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	11	0.825	1	7.739	0.20	40.35	C
195.00-190.00			B	0.171	2.695		0.825	1	7.739			
			C	0.171	2.695		0.825	1	7.739			
T2	0.00	1.09	A	0.136	2.823	11	0.825	1	11.652	0.32	31.55	C
190.00-180.00			B	0.136	2.823		0.825	1	11.652			
			C	0.136	2.823		0.825	1	11.652			
T3	0.12	2.05	A	0.15	2.77	11	0.825	1	26.062	0.90	45.03	C
180.00-160.00			B	0.15	2.77		0.825	1	26.062			
			C	0.15	2.77		0.825	1	26.062			
T4	0.14	1.62	A	0.177	2.676	11	0.825	1	15.760	0.63	62.98	C
160.00-150.00			B	0.177	2.676		0.825	1	15.760			
			C	0.177	2.676		0.825	1	15.760			
T5	0.14	1.41	A	0.156	2.75	11	0.825	1	13.456	0.57	57.41	C
150.00-140.00			B	0.156	2.75		0.825	1	13.456			
			C	0.156	2.75		0.825	1	13.456			
T6	0.31	3.48	A	0.163	2.726	10	0.825	1	30.760	1.25	62.37	C
140.00-120.00			B	0.163	2.726		0.825	1	30.760			
			C	0.163	2.726		0.825	1	30.760			
T7	0.21	2.09	A	0.176	2.678	10	0.825	1	19.161	0.74	74.46	C
120.00-110.00			B	0.176	2.678		0.825	1	19.161			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.176	2.678		0.825	1	19.161			
T8	0.21	1.82	A	0.145	2.79	10	0.825	1	16.277	0.68	68.03	C
110.00-100.00			B	0.145	2.79		0.825	1	16.277			
			C	0.145	2.79		0.825	1	16.277			
T9	0.43	4.67	A	0.151	2.768	10	0.825	1	37.520	1.42	71.22	C
100.00-80.00			B	0.151	2.768		0.825	1	37.520			
			C	0.151	2.768		0.825	1	37.520			
T10	0.43	5.61	A	0.142	2.801	9	0.825	1	39.448	1.40	70.16	C
80.00-60.00			B	0.142	2.801		0.825	1	39.448			
			C	0.142	2.801		0.825	1	39.448			
T11	0.43	7.04	A	0.155	2.754	9	0.825	1	48.474	1.47	73.74	C
60.00-40.00			B	0.155	2.754		0.825	1	48.474			
			C	0.155	2.754		0.825	1	48.474			
T12	0.43	7.31	A	0.148	2.778	8	0.825	1	50.979	1.38	68.87	C
40.00-20.00			B	0.148	2.778		0.825	1	50.979			
			C	0.148	2.778		0.825	1	50.979			
T13	0.43	7.78	A	0.107	2.937	7	0.825	1	36.824	1.00	50.12	C
20.00-0.00			B	0.107	2.937		0.825	1	36.824			
			C	0.107	2.937		0.825	1	36.824			
Sum Weight:	3.27	46.88						OTM	1101.89 kip-ft	11.98		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	11	0.8	1	7.607	0.20	39.66	C
195.00-190.00			B	0.171	2.695		0.8	1	7.607			
			C	0.171	2.695		0.8	1	7.607			
T2	0.00	1.09	A	0.136	2.823	11	0.8	1	11.503	0.31	31.15	C
190.00-180.00			B	0.136	2.823		0.8	1	11.503			
			C	0.136	2.823		0.8	1	11.503			
T3	0.12	2.05	A	0.15	2.77	11	0.8	1	25.704	0.89	44.56	C
180.00-160.00			B	0.15	2.77		0.8	1	25.704			
			C	0.15	2.77		0.8	1	25.704			
T4	0.14	1.62	A	0.177	2.676	11	0.8	1	15.512	0.62	62.37	C
160.00-150.00			B	0.177	2.676		0.8	1	15.512			
			C	0.177	2.676		0.8	1	15.512			
T5	0.14	1.41	A	0.156	2.75	11	0.8	1	13.277	0.57	56.96	C
150.00-140.00			B	0.156	2.75		0.8	1	13.277			
			C	0.156	2.75		0.8	1	13.277			
T6	0.31	3.48	A	0.163	2.726	10	0.8	1	30.313	1.24	61.82	C
140.00-120.00			B	0.163	2.726		0.8	1	30.313			
			C	0.163	2.726		0.8	1	30.313			
T7	0.21	2.09	A	0.176	2.678	10	0.8	1	18.824	0.74	73.67	C
120.00-110.00			B	0.176	2.678		0.8	1	18.824			
			C	0.176	2.678		0.8	1	18.824			
T8	0.21	1.82	A	0.145	2.79	10	0.8	1	16.026	0.67	67.43	C
110.00-100.00			B	0.145	2.79		0.8	1	16.026			
			C	0.145	2.79		0.8	1	16.026			
T9	0.43	4.67	A	0.151	2.768	10	0.8	1	36.901	1.41	70.51	C
100.00-80.00			B	0.151	2.768		0.8	1	36.901			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.151	2.768		0.8	1	36.901			
T10	0.43	5.61	A	0.142	2.801	9	0.8	1	38.770	1.39	69.41	C
80.00-60.00			B	0.142	2.801		0.8	1	38.770			
			C	0.142	2.801		0.8	1	38.770			
T11	0.43	7.04	A	0.155	2.754	9	0.8	1	47.551	1.46	72.81	C
60.00-40.00			B	0.155	2.754		0.8	1	47.551			
			C	0.155	2.754		0.8	1	47.551			
T12	0.43	7.31	A	0.148	2.778	8	0.8	1	49.979	1.36	67.96	C
40.00-20.00			B	0.148	2.778		0.8	1	49.979			
			C	0.148	2.778		0.8	1	49.979			
T13	0.43	7.78	A	0.107	2.937	7	0.8	1	36.380	1.00	49.75	C
20.00-0.00			B	0.107	2.937		0.8	1	36.380			
			C	0.107	2.937		0.8	1	36.380			
Sum Weight:	3.27	46.88						OTM	1090.50 kip-ft	11.85		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.00	0.91	A	0.171	2.695	11	0.85	1	7.871	0.21	41.04	C
195.00-190.00			B	0.171	2.695		0.85	1	7.871			
			C	0.171	2.695		0.85	1	7.871			
T2	0.00	1.09	A	0.136	2.823	11	0.85	1	11.801	0.32	31.96	C
190.00-180.00			B	0.136	2.823		0.85	1	11.801			
			C	0.136	2.823		0.85	1	11.801			
T3	0.12	2.05	A	0.15	2.77	11	0.85	1	26.420	0.91	45.50	C
180.00-160.00			B	0.15	2.77		0.85	1	26.420			
			C	0.15	2.77		0.85	1	26.420			
T4	0.14	1.62	A	0.177	2.676	11	0.85	1	16.008	0.64	63.60	C
160.00-150.00			B	0.177	2.676		0.85	1	16.008			
			C	0.177	2.676		0.85	1	16.008			
T5	0.14	1.41	A	0.156	2.75	11	0.85	1	13.635	0.58	57.85	C
150.00-140.00			B	0.156	2.75		0.85	1	13.635			
			C	0.156	2.75		0.85	1	13.635			
T6	0.31	3.48	A	0.163	2.726	10	0.85	1	31.207	1.26	62.91	C
140.00-120.00			B	0.163	2.726		0.85	1	31.207			
			C	0.163	2.726		0.85	1	31.207			
T7	0.21	2.09	A	0.176	2.678	10	0.85	1	19.499	0.75	75.24	C
120.00-110.00			B	0.176	2.678		0.85	1	19.499			
			C	0.176	2.678		0.85	1	19.499			
T8	0.21	1.82	A	0.145	2.79	10	0.85	1	16.529	0.69	68.63	C
110.00-100.00			B	0.145	2.79		0.85	1	16.529			
			C	0.145	2.79		0.85	1	16.529			
T9	0.43	4.67	A	0.151	2.768	10	0.85	1	38.138	1.44	71.93	C
100.00-80.00			B	0.151	2.768		0.85	1	38.138			
			C	0.151	2.768		0.85	1	38.138			
T10	0.43	5.61	A	0.142	2.801	9	0.85	1	40.127	1.42	70.90	C
80.00-60.00			B	0.142	2.801		0.85	1	40.127			
			C	0.142	2.801		0.85	1	40.127			
T11	0.43	7.04	A	0.155	2.754	9	0.85	1	49.397	1.49	74.66	C
60.00-40.00			B	0.155	2.754		0.85	1	49.397			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.155	2.754		0.85	1	49.397			
T12	0.43	7.31	A	0.148	2.778	8	0.85	1	51.979	1.40	69.78	C
40.00-20.00			B	0.148	2.778		0.85	1	51.979			
			C	0.148	2.778		0.85	1	51.979			
T13	0.43	7.78	A	0.107	2.937	7	0.85	1	37.267	1.01	50.49	C
20.00-0.00			B	0.107	2.937		0.85	1	37.267			
			C	0.107	2.937		0.85	1	37.267			
Sum Weight:	3.27	46.88						OTM	1113.28 kip-ft	12.10		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	26.85					
Bracing Weight	20.03					
Total Member Self-Weight	46.88			14.13	2.59	
Total Weight	65.34			14.13	2.59	
Wind 0 deg - No Ice		0.79	-46.74	-5003.04	-75.06	-45.27
Wind 30 deg - No Ice		22.77	-38.66	-4156.48	-2445.40	-16.83
Wind 45 deg - No Ice		31.57	-31.34	-3363.64	-3393.17	-0.40
Wind 60 deg - No Ice		38.13	-22.22	-2386.68	-4098.96	15.87
Wind 90 deg - No Ice		44.40	-0.50	-35.11	-4754.10	44.62
Wind 120 deg - No Ice		40.28	23.45	2600.59	-4280.88	63.12
Wind 135 deg - No Ice		32.03	32.43	3560.31	-3406.06	67.01
Wind 150 deg - No Ice		21.75	38.90	4255.20	-2318.54	64.45
Wind 180 deg - No Ice		-0.10	44.28	4838.82	12.80	47.21
Wind 210 deg - No Ice		-21.94	39.17	4282.31	2343.18	17.03
Wind 225 deg - No Ice		-30.87	32.04	3529.02	3304.26	-0.52
Wind 240 deg - No Ice		-39.91	24.15	2669.32	4249.80	-17.85
Wind 270 deg - No Ice		-44.10	0.03	16.40	4729.80	-47.46
Wind 300 deg - No Ice		-37.66	-21.83	-2348.16	4057.84	-63.09
Wind 315 deg - No Ice		-31.07	-30.95	-3325.14	3347.92	-64.40
Wind 330 deg - No Ice		-22.03	-38.36	-4126.29	2377.49	-61.81
Member Ice	132.70					
Total Weight Ice	264.11			115.66	79.18	
Wind 0 deg - Ice		0.16	-16.73	-1740.46	63.84	-6.53
Wind 30 deg - Ice		8.31	-14.24	-1467.63	-842.80	2.64
Wind 45 deg - Ice		11.64	-11.60	-1173.02	-1213.01	7.11
Wind 60 deg - Ice		14.17	-8.22	-799.01	-1493.79	11.06
Wind 90 deg - Ice		16.39	-0.10	105.97	-1737.24	16.57
Wind 120 deg - Ice		14.45	8.38	1059.35	-1515.98	17.98
Wind 135 deg - Ice		11.67	11.75	1432.18	-1209.88	17.01
Wind 150 deg - Ice		8.11	14.29	1712.91	-817.68	14.52
Wind 180 deg - Ice		-0.02	16.41	1949.58	81.12	6.91
Wind 210 deg - Ice		-8.15	14.34	1718.29	979.78	-2.60
Wind 225 deg - Ice		-11.50	11.74	1431.61	1352.61	-7.29
Wind 240 deg - Ice		-14.38	8.52	1072.88	1667.09	-11.45
Wind 270 deg - Ice		-16.33	0.01	116.05	1889.65	-17.13
Wind 300 deg - Ice		-14.08	-8.15	-791.41	1642.88	-17.97
Wind 315 deg - Ice		-11.54	-11.52	-1165.37	1361.31	-16.49
Wind 330 deg - Ice		-8.16	-14.18	-1461.59	986.66	-13.99

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Total Weight	65.34			14.13	2.59	
Wind 0 deg - Service		0.31	-18.47	-1984.24	-37.14	-17.89
Wind 30 deg - Service		9.00	-15.28	-1649.67	-973.92	-6.65
Wind 45 deg - Service		12.48	-12.39	-1336.33	-1348.48	-0.16
Wind 60 deg - Service		15.07	-8.78	-950.23	-1627.42	6.27
Wind 90 deg - Service		17.55	-0.20	-20.88	-1886.33	17.64
Wind 120 deg - Service		15.92	9.27	1020.77	-1699.31	24.94
Wind 135 deg - Service		12.66	12.82	1400.06	-1353.58	26.48
Wind 150 deg - Service		8.59	15.37	1674.69	-923.78	25.47
Wind 180 deg - Service		-0.04	17.50	1905.34	-2.42	18.66
Wind 210 deg - Service		-8.67	15.48	1685.40	918.56	6.73
Wind 225 deg - Service		-12.20	12.66	1387.69	1298.39	-0.21
Wind 240 deg - Service		-15.77	9.55	1047.93	1672.07	-7.05
Wind 270 deg - Service		-17.43	0.01	-0.52	1861.77	-18.76
Wind 300 deg - Service		-14.88	-8.63	-935.01	1596.21	-24.93
Wind 315 deg - Service		-12.28	-12.23	-1321.12	1315.64	-25.45
Wind 330 deg - Service		-8.71	-15.16	-1637.74	932.12	-24.43

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
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

Comb. No.	Description
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 K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	195 - 190	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	43	-0.67	-0.90	0.08
			Max. Mx	18	-0.19	-1.10	0.07
			Max. My	32	-0.19	-0.17	-0.21
			Max. Vy	18	0.29	-1.10	0.07
			Max. Vx	32	0.11	0.00	0.00
		Diagonal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	43	-0.55	0.00	0.00
			Max. Mx	44	-0.34	0.21	0.00
			Max. My	46	-0.36	0.00	0.00
			Max. Vy	44	-0.11	0.00	0.00
			Max. Vx	46	-0.00	0.00	0.00
		Top Girt	Max Tension	24	0.17	0.00	0.00
			Max. Compression	17	-0.12	-0.03	0.00
			Max. Mx	43	0.06	-0.16	0.00
			Max. My	46	0.08	-0.15	-0.00
			Max. Vy	43	0.14	-0.16	0.00
			Max. Vx	46	0.00	0.00	0.00
T2	190 - 180	Leg	Max Tension	19	0.85	-1.07	0.07
			Max. Compression	40	-5.41	0.84	0.06
			Max. Mx	18	0.75	-1.10	0.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	20	-1.64	0.25	-1.38
			Max. Vy	18	-0.83	-1.10	0.07
			Max. Vx	20	-0.65	0.25	1.02
		Diagonal	Max Tension	18	1.57	0.00	0.00
			Max. Compression	12	-1.51	0.00	0.00
			Max. Mx	35	0.39	0.16	0.00
			Max. My	43	0.07	0.16	0.00
			Max. Vy	42	-0.10	0.16	0.00
			Max. Vx	43	0.00	0.00	0.00
T3	180 - 160	Leg	Max Tension	19	12.47	-0.98	-0.03
			Max. Compression	40	-17.15	0.57	-0.01
			Max. Mx	24	-15.44	-1.63	-0.16
			Max. My	26	-2.84	0.06	1.95
			Max. Vy	8	-1.26	-1.02	0.01
			Max. Vx	10	1.31	-0.14	0.66
		Diagonal	Max Tension	30	4.73	0.00	0.00
			Max. Compression	14	-5.04	0.00	0.00
			Max. Mx	40	0.76	0.19	-0.00
			Max. My	30	-1.62	0.03	-0.00
			Max. Vy	41	-0.12	0.19	0.00
			Max. Vx	43	0.00	0.00	0.00
T4	160 - 150	Leg	Max Tension	19	23.68	-1.38	0.03
			Max. Compression	12	-30.17	-0.69	0.29
			Max. Mx	35	-22.86	2.36	-0.01
			Max. My	16	-6.85	-0.53	-2.62
			Max. Vy	12	1.64	2.21	0.05
			Max. Vx	16	1.02	-0.53	-2.62
		Diagonal	Max Tension	5	7.41	0.04	0.01
			Max. Compression	4	-7.58	0.00	0.00
			Max. Mx	42	1.90	0.20	-0.00
			Max. My	4	-7.55	0.03	0.01
			Max. Vy	42	-0.12	0.20	-0.00
			Max. Vx	4	0.00	0.03	0.01
		Secondary Horizontal	Max Tension	12	1.27	0.00	0.00
			Max. Compression	19	-0.94	0.04	0.01
			Max. Mx	43	-0.22	0.14	-0.00
			Max. My	49	0.82	0.13	-0.01
			Max. Vy	43	-0.12	0.14	-0.00
			Max. Vx	43	0.00	0.00	0.00
T5	150 - 140	Leg	Max Tension	19	39.81	-0.13	-0.03
			Max. Compression	12	-47.98	2.89	-0.40
			Max. Mx	12	-47.98	2.89	-0.40
			Max. My	16	-7.80	-0.53	-2.62
			Max. Vy	12	-0.52	2.89	-0.40
			Max. Vx	16	-0.48	-0.53	-2.62
		Diagonal	Max Tension	21	8.97	0.00	0.00
			Max. Compression	4	-9.24	0.00	0.00
			Max. Mx	40	1.08	0.22	-0.00
			Max. My	14	-8.64	0.03	-0.01
			Max. Vy	46	-0.13	0.22	0.00
			Max. Vx	16	0.00	0.02	-0.01
T6	140 - 120	Leg	Max Tension	19	77.78	-3.14	-0.06
			Max. Compression	2	-93.57	2.12	0.14
			Max. Mx	18	76.09	-3.24	-0.05
			Max. My	16	-11.02	-0.28	-4.21
			Max. Vy	18	-1.14	-3.24	-0.05
			Max. Vx	16	-1.15	-0.28	-4.21
		Diagonal	Max Tension	4	11.16	0.00	0.00
			Max. Compression	4	-11.30	0.00	0.00
			Max. Mx	43	2.00	0.24	0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	40	0.11	0.23	-0.04
			Max. Vy	43	0.14	0.24	0.03
			Max. Vx	40	-0.01	0.00	0.00
		Top Girt	Max Tension	18	0.63	0.00	0.00
			Max. Compression	3	-0.46	0.00	0.00
			Max. Mx	34	0.46	-0.58	0.00
			Max. My	41	0.48	0.00	0.02
			Max. Vy	34	0.19	0.00	0.00
			Max. Vx	41	0.01	0.00	0.00
T7	120 - 110	Leg	Max Tension	19	97.42	-2.40	-0.17
			Max. Compression	12	-116.46	-0.13	-0.04
			Max. Mx	12	-116.24	6.91	0.13
			Max. My	16	-15.30	-0.46	-3.69
			Max. Vy	24	1.44	6.89	-0.07
			Max. Vx	16	0.78	-0.46	-3.69
		Diagonal	Max Tension	5	12.41	0.09	0.00
			Max. Compression	4	-13.03	0.00	0.00
			Max. Mx	46	1.66	0.29	0.03
			Max. My	47	-3.94	0.26	0.03
			Max. Vy	43	0.16	0.29	0.03
			Max. Vx	48	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	12	2.02	0.04	-0.00
			Max. Compression	12	-2.02	0.00	0.00
			Max. Mx	38	0.50	0.23	0.05
			Max. My	45	-0.38	0.23	0.05
			Max. Vy	38	0.16	0.23	0.05
			Max. Vx	45	-0.01	0.00	0.00
T8	110 - 100	Leg	Max Tension	19	119.69	-0.66	-0.16
			Max. Compression	24	-141.33	3.40	-0.14
			Max. Mx	2	-141.00	3.42	0.20
			Max. My	16	-16.42	-0.46	-3.69
			Max. Vy	2	-0.62	3.42	0.20
			Max. Vx	16	-0.51	-0.46	-3.69
		Diagonal	Max Tension	4	12.50	0.00	0.00
			Max. Compression	4	-12.54	0.00	0.00
			Max. Mx	46	2.27	0.33	0.04
			Max. My	40	0.15	0.31	-0.05
			Max. Vy	43	0.18	0.33	-0.04
			Max. Vx	40	-0.01	0.00	0.00
T9	100 - 80	Leg	Max Tension	19	162.13	-2.63	-0.07
			Max. Compression	24	-188.90	4.74	-0.10
			Max. Mx	2	-188.77	4.76	0.35
			Max. My	16	-20.11	0.14	-4.37
			Max. Vy	8	-0.69	-3.16	-0.03
			Max. Vx	6	-0.63	1.01	-2.42
		Diagonal	Max Tension	4	13.45	0.00	0.00
			Max. Compression	26	-13.66	0.00	0.00
			Max. Mx	43	1.86	0.42	-0.06
			Max. My	41	-0.70	0.38	-0.06
			Max. Vy	43	0.20	0.42	0.05
			Max. Vx	40	-0.01	0.00	0.00
T10	80 - 60	Leg	Max Tension	19	203.21	-2.70	0.04
			Max. Compression	24	-236.70	4.23	-0.09
			Max. Mx	2	-212.05	4.76	0.35
			Max. My	16	-20.94	0.14	-4.37
			Max. Vy	28	-0.60	-4.43	0.36
			Max. Vx	14	-0.51	-1.04	-4.33
		Diagonal	Max Tension	10	14.64	0.00	0.00
			Max. Compression	26	-14.84	0.00	0.00
			Max. Mx	46	3.10	0.55	-0.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	40	0.14	0.51	-0.07
			Max. Vy	43	0.24	0.55	0.07
			Max. Vx	40	-0.01	0.00	0.00
T11	60 - 40	Leg	Max Tension	19	242.56	-3.36	-0.03
			Max. Compression	24	-283.57	1.99	-0.25
			Max. Mx	18	219.46	-4.28	-0.23
			Max. My	16	-27.01	-0.81	-6.80
			Max. Vy	2	0.36	4.04	0.05
			Max. Vx	16	0.66	-0.81	-6.80
		Diagonal	Max Tension	26	15.61	0.00	0.00
			Max. Compression	10	-15.58	0.00	0.00
			Max. Mx	46	2.81	0.77	0.09
			Max. My	41	-0.73	0.70	-0.10
			Max. Vy	43	0.31	0.75	-0.10
			Max. Vx	41	-0.02	0.00	0.00
T12	40 - 20	Leg	Max Tension	19	281.57	-4.36	0.04
			Max. Compression	24	-331.06	4.60	-0.50
			Max. Mx	18	275.85	-7.28	-0.46
			Max. My	16	-30.97	-1.45	-18.45
			Max. Vy	38	-0.66	-3.43	0.03
			Max. Vx	16	2.55	-1.45	-18.45
		Diagonal	Max Tension	12	17.77	0.00	0.00
			Max. Compression	12	-17.59	0.00	0.00
			Max. Mx	44	-1.45	0.89	-0.11
			Max. My	48	-3.79	0.82	0.12
			Max. Vy	44	0.33	0.89	-0.11
			Max. Vx	48	0.02	0.00	0.00
T13	20 - 0	Leg	Max Tension	19	302.67	-6.90	-0.46
			Max. Compression	24	-355.20	0.00	0.00
			Max. Mx	18	297.56	-7.28	-0.46
			Max. My	16	-30.35	-1.45	-18.45
			Max. Vy	8	-0.70	-7.22	-0.10
			Max. Vx	16	-1.36	-1.45	-18.45
		Diagonal	Max Tension	29	22.28	0.00	0.00
			Max. Compression	12	-26.04	0.00	0.00
			Max. Mx	44	5.37	-1.09	-0.15
			Max. My	47	0.99	-1.08	-0.16
			Max. Vy	44	-0.34	-1.09	-0.15
			Max. Vx	47	-0.02	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	383.51	45.37	-25.26
	Max. H_x	24	383.51	45.37	-25.26
	Max. H_z	7	-309.81	-37.02	21.64
	Min. Vert	9	-318.56	-38.44	21.53
	Min. H_x	9	-318.56	-38.44	21.53
	Min. H_z	24	383.51	45.37	-25.26
Leg B	Max. Vert	12	383.06	-46.15	-23.83
	Max. H_x	29	-314.51	38.76	19.76
	Max. H_z	29	-314.51	38.76	19.76
	Min. Vert	29	-314.51	38.76	19.76
	Min. H_x	12	383.06	-46.15	-23.83
	Min. H_z	12	383.06	-46.15	-23.83

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Max. Vert	2	383.07	-1.63	51.99
	Max. H_x	16	-277.00	1.84	-37.93
	Max. H_z	2	383.07	-1.63	51.99
	Min. Vert	19	-324.65	1.69	-44.39
	Min. H_x	32	320.57	-1.84	43.29
	Min. H_z	19	-324.65	1.69	-44.39

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	65.34	0.00	0.00	14.13	2.59	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	78.41	1.27	-74.78	-8037.00	-121.28	-72.45
0.9 Dead+1.6 Wind 0 deg - No Ice	58.81	1.27	-74.78	-8034.29	-121.98	-72.45
1.2 Dead+1.6 Wind 30 deg - No Ice	78.41	36.44	-61.86	-6678.19	-3926.56	-26.89
0.9 Dead+1.6 Wind 30 deg - No Ice	58.81	36.44	-61.86	-6676.65	-3923.97	-26.90
1.2 Dead+1.6 Wind 45 deg - No Ice	78.41	50.52	-50.14	-5405.40	-5448.09	-0.60
0.9 Dead+1.6 Wind 45 deg - No Ice	58.81	50.52	-50.14	-5404.96	-5444.17	-0.61
1.2 Dead+1.6 Wind 60 deg - No Ice	78.41	61.01	-35.55	-3837.06	-6581.14	25.44
0.9 Dead+1.6 Wind 60 deg - No Ice	58.81	61.01	-35.55	-3837.98	-6576.24	25.43
1.2 Dead+1.6 Wind 90 deg - No Ice	78.41	71.04	-0.79	-61.87	-7632.75	71.44
0.9 Dead+1.6 Wind 90 deg - No Ice	58.81	71.04	-0.79	-66.08	-7626.95	71.43
1.2 Dead+1.6 Wind 120 deg - No Ice	78.41	64.45	37.52	4169.55	-6872.77	101.05
0.9 Dead+1.6 Wind 120 deg - No Ice	58.81	64.45	37.52	4161.61	-6867.65	101.03
1.2 Dead+1.6 Wind 135 deg - No Ice	78.41	51.25	51.88	5710.12	-5468.45	107.26
0.9 Dead+1.6 Wind 135 deg - No Ice	58.81	51.25	51.88	5700.86	-5464.52	107.24
1.2 Dead+1.6 Wind 150 deg - No Ice	78.41	34.79	62.23	6825.59	-3722.75	103.15
0.9 Dead+1.6 Wind 150 deg - No Ice	58.81	34.79	62.23	6815.37	-3720.32	103.11
1.2 Dead+1.6 Wind 180 deg - No Ice	78.41	-0.16	70.85	7762.38	19.63	75.54
0.9 Dead+1.6 Wind 180 deg - No Ice	58.81	-0.16	70.85	7751.37	18.86	75.54
1.2 Dead+1.6 Wind 210 deg - No Ice	78.41	-35.11	62.67	6868.93	3760.43	27.22
0.9 Dead+1.6 Wind 210 deg - No Ice	58.81	-35.11	62.67	6858.70	3756.42	27.22
1.2 Dead+1.6 Wind 225 deg - No Ice	78.41	-49.39	51.27	5659.77	5303.21	-0.88
0.9 Dead+1.6 Wind 225 deg - No Ice	58.81	-49.39	51.27	5650.53	5297.86	-0.84

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 240 deg - No Ice	78.41	-63.85	38.64	4279.66	6820.91	-28.60
0.9 Dead+1.6 Wind 240 deg - No Ice	58.81	-63.85	38.64	4271.65	6814.27	-28.59
1.2 Dead+1.6 Wind 270 deg - No Ice	78.41	-70.56	0.04	20.77	7591.65	-75.98
0.9 Dead+1.6 Wind 270 deg - No Ice	58.81	-70.56	0.04	16.50	7584.33	-75.97
1.2 Dead+1.6 Wind 300 deg - No Ice	78.41	-60.26	-34.93	-3775.12	6513.14	-100.98
0.9 Dead+1.6 Wind 300 deg - No Ice	58.81	-60.26	-34.93	-3776.08	6506.75	-100.97
1.2 Dead+1.6 Wind 315 deg - No Ice	78.41	-49.71	-49.53	-5343.47	5373.55	-103.08
0.9 Dead+1.6 Wind 315 deg - No Ice	58.81	-49.71	-49.53	-5343.09	5368.13	-103.04
1.2 Dead+1.6 Wind 330 deg - No Ice	78.41	-35.25	-61.38	-6629.62	3815.77	-98.94
0.9 Dead+1.6 Wind 330 deg - No Ice	58.81	-35.25	-61.38	-6628.11	3811.67	-98.90
1.2 Dead+1.0 Ice+1.0 Temp	277.18	0.00	-0.00	119.14	80.26	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	277.18	0.16	-16.73	-1762.32	65.28	-6.61
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	277.18	8.31	-14.24	-1485.51	-854.04	2.62
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	277.18	11.64	-11.60	-1186.78	-1229.41	7.12
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	277.18	14.17	-8.22	-807.56	-1514.10	11.10
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	277.18	16.39	-0.10	110.05	-1760.90	16.66
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	277.18	14.45	8.38	1076.99	-1536.65	18.10
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	277.18	11.67	11.75	1454.90	-1226.39	17.13
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	277.18	8.11	14.29	1739.46	-828.56	14.63
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	277.18	-0.02	16.41	1979.41	82.72	6.98
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	277.18	-8.15	14.34	1744.89	993.84	-2.59
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	277.18	-11.50	11.74	1454.27	1372.10	-7.30
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	277.18	-14.38	8.52	1090.64	1690.84	-11.49
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	277.18	-16.33	0.01	120.23	1916.40	-17.22
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	277.18	-14.08	-8.15	-799.89	1666.24	-18.08
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	277.18	-11.54	-11.52	-1179.05	1380.76	-16.61
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	277.18	-8.16	-14.18	-1479.41	1000.91	-14.10
Dead+Wind 0 deg - Service	65.34	0.31	-18.47	-1974.09	-28.16	-17.89
Dead+Wind 30 deg - Service	65.34	9.00	-15.28	-1638.63	-967.52	-6.64
Dead+Wind 45 deg - Service	65.34	12.48	-12.39	-1324.43	-1343.12	-0.15
Dead+Wind 60 deg - Service	65.34	15.07	-8.78	-937.27	-1622.82	6.28
Dead+Wind 90 deg - Service	65.34	17.55	-0.20	-5.33	-1882.44	17.65
Dead+Wind 120 deg - Service	65.34	15.92	9.27	1039.23	-1694.86	24.95
Dead+Wind 135 deg - Service	65.34	12.66	12.82	1419.56	-1348.18	26.49
Dead+Wind 150 deg - Service	65.34	8.59	15.37	1694.93	-917.23	25.47

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 180 deg - Service	65.34	-0.04	17.50	1926.22	6.64	18.66
Dead+Wind 210 deg - Service	65.34	-8.67	15.48	1705.66	930.13	6.72
Dead+Wind 225 deg - Service	65.34	-12.20	12.66	1407.16	1311.00	-0.21
Dead+Wind 240 deg - Service	65.34	-15.77	9.55	1066.45	1685.68	-7.06
Dead+Wind 270 deg - Service	65.34	-17.43	0.01	15.07	1875.94	-18.77
Dead+Wind 300 deg - Service	65.34	-14.88	-8.63	-922.00	1609.67	-24.94
Dead+Wind 315 deg - Service	65.34	-12.28	-12.23	-1309.17	1328.33	-25.46
Dead+Wind 330 deg - Service	65.34	-8.71	-15.16	-1626.67	943.77	-24.43

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-65.34	0.00	0.00	65.34	0.00	0.000%
2	1.27	-78.41	-74.78	-1.27	78.41	74.78	0.000%
3	1.27	-58.81	-74.78	-1.27	58.81	74.78	0.000%
4	36.44	-78.41	-61.86	-36.44	78.41	61.86	0.000%
5	36.44	-58.81	-61.86	-36.44	58.81	61.86	0.000%
6	50.52	-78.41	-50.14	-50.52	78.41	50.14	0.000%
7	50.52	-58.81	-50.14	-50.52	58.81	50.14	0.000%
8	61.01	-78.41	-35.55	-61.01	78.41	35.55	0.001%
9	61.01	-58.81	-35.55	-61.01	58.81	35.55	0.000%
10	71.04	-78.41	-0.79	-71.04	78.41	0.79	0.000%
11	71.04	-58.81	-0.79	-71.04	58.81	0.79	0.000%
12	64.45	-78.41	37.52	-64.45	78.41	-37.52	0.000%
13	64.45	-58.81	37.52	-64.45	58.81	-37.52	0.000%
14	51.25	-78.41	51.88	-51.25	78.41	-51.88	0.000%
15	51.25	-58.81	51.88	-51.25	58.81	-51.88	0.000%
16	34.79	-78.41	62.23	-34.79	78.41	-62.23	0.000%
17	34.79	-58.81	62.23	-34.79	58.81	-62.23	0.000%
18	-0.16	-78.41	70.85	0.16	78.41	-70.85	0.000%
19	-0.16	-58.81	70.85	0.16	58.81	-70.85	0.000%
20	-35.11	-78.41	62.67	35.11	78.41	-62.67	0.000%
21	-35.11	-58.81	62.67	35.11	58.81	-62.67	0.000%
22	-49.39	-78.41	51.27	49.39	78.41	-51.27	0.000%
23	-49.39	-58.81	51.27	49.39	58.81	-51.27	0.000%
24	-63.85	-78.41	38.64	63.85	78.41	-38.64	0.000%
25	-63.85	-58.81	38.64	63.85	58.81	-38.64	0.000%
26	-70.56	-78.41	0.04	70.56	78.41	-0.04	0.000%
27	-70.56	-58.81	0.04	70.56	58.81	-0.04	0.000%
28	-60.26	-78.41	-34.93	60.26	78.41	34.93	0.000%
29	-60.26	-58.81	-34.93	60.26	58.81	34.93	0.000%
30	-49.71	-78.41	-49.53	49.71	78.41	49.53	0.000%
31	-49.71	-58.81	-49.53	49.71	58.81	49.53	0.002%
32	-35.25	-78.41	-61.38	35.25	78.41	61.38	0.000%
33	-35.25	-58.81	-61.38	35.25	58.81	61.38	0.000%
34	0.00	-277.18	0.00	-0.00	277.18	0.00	0.000%
35	0.16	-277.18	-16.73	-0.16	277.18	16.73	0.000%
36	8.31	-277.18	-14.24	-8.31	277.18	14.24	0.000%
37	11.64	-277.18	-11.60	-11.64	277.18	11.60	0.000%
38	14.17	-277.18	-8.22	-14.17	277.18	8.22	0.000%
39	16.39	-277.18	-0.10	-16.39	277.18	0.10	0.000%
40	14.45	-277.18	8.38	-14.45	277.18	-8.38	0.000%
41	11.67	-277.18	11.75	-11.67	277.18	-11.75	0.000%
42	8.11	-277.18	14.29	-8.11	277.18	-14.29	0.000%
43	-0.02	-277.18	16.41	0.02	277.18	-16.41	0.000%
44	-8.15	-277.18	14.34	8.15	277.18	-14.34	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
45	-11.50	-277.18	11.74	11.50	277.18	-11.74	0.000%
46	-14.38	-277.18	8.52	14.38	277.18	-8.52	0.000%
47	-16.33	-277.18	0.01	16.33	277.18	-0.01	0.000%
48	-14.08	-277.18	-8.15	14.08	277.18	8.15	0.000%
49	-11.54	-277.18	-11.52	11.54	277.18	11.52	0.000%
50	-8.16	-277.18	-14.18	8.16	277.18	14.18	0.000%
51	0.31	-65.34	-18.47	-0.31	65.34	18.47	0.000%
52	9.00	-65.34	-15.28	-9.00	65.34	15.28	0.000%
53	12.48	-65.34	-12.39	-12.48	65.34	12.39	0.000%
54	15.07	-65.34	-8.78	-15.07	65.34	8.78	0.000%
55	17.55	-65.34	-0.20	-17.55	65.34	0.20	0.000%
56	15.92	-65.34	9.27	-15.92	65.34	-9.27	0.000%
57	12.66	-65.34	12.82	-12.66	65.34	-12.82	0.000%
58	8.59	-65.34	15.37	-8.59	65.34	-15.37	0.000%
59	-0.04	-65.34	17.50	0.04	65.34	-17.50	0.000%
60	-8.67	-65.34	15.48	8.67	65.34	-15.48	0.000%
61	-12.20	-65.34	12.66	12.20	65.34	-12.66	0.000%
62	-15.77	-65.34	9.55	15.77	65.34	-9.55	0.000%
63	-17.43	-65.34	0.01	17.43	65.34	-0.01	0.000%
64	-14.88	-65.34	-8.63	14.88	65.34	8.63	0.000%
65	-12.28	-65.34	-12.23	12.28	65.34	12.23	0.000%
66	-8.71	-65.34	-15.16	8.71	65.34	15.16	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000078
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000209
5	Yes	4	0.00000001	0.00000139
6	Yes	4	0.00000001	0.00000204
7	Yes	4	0.00000001	0.00000138
8	Yes	4	0.00000001	0.00000198
9	Yes	4	0.00000001	0.00000119
10	Yes	4	0.00000001	0.00000179
11	Yes	4	0.00000001	0.00000119
12	Yes	4	0.00000001	0.00000080
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000206
15	Yes	4	0.00000001	0.00000232
16	Yes	4	0.00000001	0.00000281
17	Yes	4	0.00000001	0.00000322
18	Yes	4	0.00000001	0.00000261
19	Yes	4	0.00000001	0.00000129
20	Yes	4	0.00000001	0.00000210
21	Yes	4	0.00000001	0.00000139
22	Yes	4	0.00000001	0.00000155
23	Yes	4	0.00000001	0.00000219
24	Yes	4	0.00000001	0.00000078
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000171
27	Yes	4	0.00000001	0.00000114
28	Yes	4	0.00000001	0.00000253
29	Yes	4	0.00000001	0.00000129

30	Yes	4	0.00000001	0.00000235
31	Yes	4	0.00000001	0.00000168
32	Yes	4	0.00000001	0.00000272
33	Yes	4	0.00000001	0.00000312
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000421
36	Yes	4	0.00000001	0.00000413
37	Yes	4	0.00000001	0.00000413
38	Yes	4	0.00000001	0.00000413
39	Yes	4	0.00000001	0.00000418
40	Yes	4	0.00000001	0.00000436
41	Yes	4	0.00000001	0.00000441
42	Yes	4	0.00000001	0.00000447
43	Yes	4	0.00000001	0.00000457
44	Yes	4	0.00000001	0.00000460
45	Yes	4	0.00000001	0.00000458
46	Yes	4	0.00000001	0.00000455
47	Yes	4	0.00000001	0.00000446
48	Yes	4	0.00000001	0.00000438
49	Yes	4	0.00000001	0.00000432
50	Yes	4	0.00000001	0.00000427
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	195 - 190	3.372	56	0.1292	0.0209
T2	190 - 180	3.237	56	0.1292	0.0209
T3	180 - 160	2.963	56	0.1289	0.0209
T4	160 - 150	2.417	62	0.1249	0.0210
T5	150 - 140	2.151	62	0.1213	0.0208
T6	140 - 120	1.894	62	0.1155	0.0200
T7	120 - 110	1.412	62	0.1030	0.0172
T8	110 - 100	1.192	62	0.0948	0.0159
T9	100 - 80	0.991	62	0.0853	0.0143
T10	80 - 60	0.637	62	0.0688	0.0101
T11	60 - 40	0.365	62	0.0496	0.0071
T12	40 - 20	0.171	62	0.0328	0.0046
T13	20 - 0	0.044	62	0.0149	0.0020

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	6' Dish	56	3.182	0.1292	0.0209	166684
184.00	OGT9-840	56	3.073	0.1291	0.0209	320539
183.00	ANT150F2	56	3.046	0.1291	0.0209	407339
168.00	LPA-80080-4CF	56	2.634	0.1269	0.0210	405593
154.00	APXV9ERR18-C-A20	62	2.257	0.1230	0.0209	149903
140.00	7770.00	62	1.894	0.1155	0.0200	120741
137.00	Pirod 12' T-Frame Sector Mount (1)	62	1.819	0.1137	0.0197	114855
125.00	SC2-W100AB	62	1.528	0.1064	0.0179	89544
118.00	Pirod 6-8' Box Arm (1)	62	1.367	0.1015	0.0169	74774
105.00	ANT150D3	62	1.089	0.0900	0.0152	69479
101.00	6' Dish Ice Shield	62	1.010	0.0862	0.0145	81303
98.00	Pirod 6-8' Box Arm (1)	62	0.952	0.0836	0.0139	82391
97.00	6' Dish	62	0.933	0.0827	0.0137	80909
78.00	PD220	62	0.606	0.0670	0.0098	54431
32.00	GPS	62	0.111	0.0256	0.0035	63284

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 190	13.614	12	0.5201	0.0846
T2	190 - 180	13.072	24	0.5201	0.0845
T3	180 - 160	11.973	24	0.5191	0.0849
T4	160 - 150	9.773	24	0.5039	0.0851
T5	150 - 140	8.697	24	0.4899	0.0842
T6	140 - 120	7.657	24	0.4667	0.0812
T7	120 - 110	5.706	24	0.4164	0.0695
T8	110 - 100	4.816	24	0.3831	0.0644
T9	100 - 80	4.003	24	0.3448	0.0580
T10	80 - 60	2.572	24	0.2780	0.0411
T11	60 - 40	1.473	24	0.2001	0.0289
T12	40 - 20	0.690	24	0.1326	0.0187
T13	20 - 0	0.180	2	0.0600	0.0081

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	6' Dish	24	12.854	0.5201	0.0845	41367
184.00	OGT9-840	24	12.415	0.5199	0.0847	81342
183.00	ANT150F2	24	12.304	0.5197	0.0847	108435
168.00	LPA-80080-4CF	24	10.649	0.5118	0.0852	103240
154.00	APXV9ERR18-C-A20	24	9.124	0.4966	0.0848	37724
140.00	7770.00	24	7.657	0.4667	0.0812	29920
137.00	Pirod 12' T-Frame Sector Mount (1)	24	7.352	0.4594	0.0797	28532
125.00	SC2-W100AB	24	6.174	0.4302	0.0725	22171
118.00	Pirod 6-8' Box Arm (1)	24	5.522	0.4103	0.0685	18493

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
105.00	ANT150D3	24	4.401	0.3639	0.0615	17217
101.00	6' Dish Ice Shield	24	4.082	0.3485	0.0588	20149
98.00	Pirod 6-8' Box Arm (1)	24	3.848	0.3376	0.0565	20420
97.00	6' Dish	24	3.771	0.3341	0.0557	20052
78.00	PD220	24	2.447	0.2706	0.0396	13455
32.00	GPS	2	0.448	0.1035	0.0143	15675

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	195	Leg	A325N	1.0000	6	0.04	53.01	0.001 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	0.55	41.76	0.013 ✓	1	Member Bearing
		Top Girt	A325N	1.0000	1	0.17	25.45	0.007 ✓	1	Member Bearing
T2	190	Leg	A325N	1.0000	6	0.30	53.01	0.006 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	1.57	12.72	0.123 ✓	1	Member Bearing
T3	180	Leg	A325N	1.0000	6	2.08	53.01	0.039 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	4.73	12.72	0.372 ✓	1	Member Bearing
T4	160	Diagonal	A325N	1.0000	1	7.41	21.21	0.349 ✓	1	Member Bearing
		Secondary Horizontal	A325N	1.0000	1	1.27	21.21	0.060 ✓	1	Member Bearing
T5	150	Leg	A325N	1.0000	6	6.64	53.01	0.125 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8.97	21.21	0.423 ✓	1	Member Bearing
T6	140	Leg	A325N	1.0000	6	12.96	53.01	0.245 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	11.16	21.21	0.526 ✓	1	Member Bearing
T7	120	Diagonal	A325N	1.0000	1	12.41	21.21	0.585 ✓	1	Member Bearing
		Secondary Horizontal	A325N	1.0000	1	2.02	21.21	0.095 ✓	1	Member Bearing
T8	110	Leg	A325N	1.0000	6	19.95	53.01	0.376 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	12.50	21.21	0.590 ✓	1	Member Bearing
T9	100	Leg	A325N	1.2500	6	27.02	82.83	0.326 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	13.45	21.32	0.631 ✓	1	Member Bearing
T10	80	Leg	A325N	1.2500	6	33.87	82.83	0.409 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	14.64	31.97	0.458 ✓	1	Member Bearing
T11	60	Leg	A325N	1.2500	6	40.43	82.83	0.488 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	15.61	31.97	0.488 ✓	1	Member Bearing
T12	40	Leg	A325N	1.2500	6	46.93	82.83	0.567 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	17.77	31.97	0.556 ✓	1	Member Bearing
T13	20	Leg	A687	2.0000	6	50.45	247.40	0.204 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	2	13.02	63.62	0.205 ✓	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	195 - 190	Pirod 105244	5.00	5.00	45.4 K=1.00	3.6816	-0.19	142.49	0.001
T2	190 - 180	Pirod 105244	10.00	10.00	45.4 K=1.00	3.6816	-5.35	142.49	0.038
T3	180 - 160	Pirod 105216	20.00	10.00	45.4 K=1.00	3.6816	-16.15	142.49	0.113
T4	160 - 150	Pirod 105217	10.00	5.00	37.8 K=1.00	5.3014	-29.61	214.86	0.138
T5	150 - 140	Pirod 105217	10.00	10.00	37.8 K=1.00	5.3014	-47.98	214.86	0.223
T6	140 - 120	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-93.43	300.68	0.311
T7	120 - 110	Pirod 105218	10.02	5.18	32.4 K=1.00	7.2158	-116.35	300.68	0.387
T8	110 - 100	Pirod 105218	10.02	10.02	32.4 K=1.00	7.2158	-141.33	300.68	0.470
T9	100 - 80	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-188.77	399.87	0.472
T10	80 - 60	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-236.52	399.87	0.591
T11	60 - 40	Pirod 105220	20.03	10.02	25.2 K=1.00	11.9282	-283.17	512.38	0.553
T12	40 - 20	Pirod 105220	20.03	10.02	25.2 K=1.00	11.9282	-330.66	512.38	0.645
T13	20 - 0	Pirod 112738	20.03	20.03	32.6 K=1.00	14.7262	-352.78	613.14	0.575

Leg Bending Design Data (Compression)

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
T1	195 - 190	Pirod 105244	-1.10	41.30	0.027	0.07	47.69	0.000
T2	190 - 180	Pirod 105244	0.81	41.30	0.020	0.21	47.69	0.004
T3	180 - 160	Pirod 105216	1.51	41.30	0.036	0.18	47.69	0.004
T4	160 - 150	Pirod 105217	2.21	62.39	0.035	0.05	72.04	0.001
T5	150 - 140	Pirod 105217	2.89	62.39	0.046	-0.40	72.04	0.006
T6	140 - 120	Pirod 105218	2.04	87.49	0.023	-0.31	101.03	0.003
T7	120 - 110	Pirod 105218	6.91	87.49	0.079	0.13	101.03	0.001
T8	110 - 100	Pirod 105218	3.40	87.49	0.039	-0.14	101.03	0.001
T9	100 - 80	Pirod 105219	4.76	116.63	0.041	0.35	134.68	0.003
T10	80 - 60	Pirod 105219	4.24	116.63	0.036	0.29	134.68	0.002
T11	60 - 40	Pirod 105220	4.04	149.86	0.027	-0.10	173.04	0.001
T12	40 - 20	Pirod 105220	6.86	149.86	0.046	0.20	173.04	0.001
T13	20 - 0	Pirod 112738	4.62	267.42	0.017	0.70	308.79	0.002

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	195 - 190	Pirod 105244	0.001	0.027	0.000	0.028 ✔	1.000	4.8.1 ✔
T2	190 - 180	Pirod 105244	0.038	0.020	0.004	0.062 ✔	1.000	4.8.1 ✔
T3	180 - 160	Pirod 105216	0.113	0.036	0.004	0.153 ✔	1.000	4.8.1 ✔
T4	160 - 150	Pirod 105217	0.138	0.035	0.001	0.174 ✔	1.000	4.8.1 ✔
T5	150 - 140	Pirod 105217	0.223	0.046	0.006	0.275 ✔	1.000	4.8.1 ✔
T6	140 - 120	Pirod 105218	0.311	0.023	0.003	0.337 ✔	1.000	4.8.1 ✔
T7	120 - 110	Pirod 105218	0.387	0.079	0.001	0.467 ✔	1.000	4.8.1 ✔
T8	110 - 100	Pirod 105218	0.470	0.039	0.001	0.510 ✔	1.000	4.8.1 ✔
T9	100 - 80	Pirod 105219	0.472	0.041	0.003	0.515 ✔	1.000	4.8.1 ✔
T10	80 - 60	Pirod 105219	0.591	0.036	0.002	0.630 ✔	1.000	4.8.1 ✔
T11	60 - 40	Pirod 105220	0.553	0.027	0.001	0.580 ✔	1.000	4.8.1 ✔
T12	40 - 20	Pirod 105220	0.645	0.046	0.001	0.692 ✔	1.000	4.8.1 ✔
T13	20 - 0	Pirod 112738	0.575	0.017	0.002	0.595 ✔	1.000	4.8.1 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T1	195 - 190	0.5	1.48	121.0	165.67	0.1963	0.29	3.39	0.086 ✔
T2	190 - 180	0.5	1.48	121.0	165.67	0.1963	0.84	3.39	0.249 ✔
T3	180 - 160	0.5	1.48	121.0	165.67	0.1963	1.34	3.29	0.408 ✔
T4	160 - 150	0.5	1.47	120.0	238.57	0.1963	1.65	3.34	0.494 ✔
T5	150 - 140	0.5	1.47	120.0	238.57	0.1963	0.55	3.34	0.166 ✔
T6	140 - 120	0.5	1.46	119.0	324.71	0.1963	1.23	3.38	0.366 ✔
T7	120 - 110	0.5	1.46	119.0	324.71	0.1963	1.44	3.38	0.428 ✔

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T8	110 - 100	0.5	1.46	119.0	324.71	0.1963	0.66	3.38	0.196 ✔
T9	100 - 80	0.625	1.45	94.4	424.12	0.3068	0.70	6.96	0.101 ✔
T10	80 - 60	0.625	1.45	94.4	424.12	0.3068	0.62	6.96	0.089 ✔
T11	60 - 40	0.625	1.43	93.6	536.77	0.3068	0.68	7.01	0.097 ✔
T12	40 - 20	0.625	1.43	93.6	536.77	0.3068	2.57	7.01	0.367 ✔
T13	20 - 0	0.75	1.73	93.9	662.68	0.4418	1.38	14.36	0.097 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2L2 1/2x2 1/2x3/16	7.81	6.83	105.3 K=1.00	1.8000	-0.55	32.54	0.017 [1] ✔
T2	190 - 180	L2 1/2x2 1/2x3/16	15.62	6.99	169.5 K=1.00	0.9020	-1.51	7.09	0.213 [1] ✔
T3	180 - 160	L3x3x3/16	15.62	6.99	140.8 K=1.00	1.0900	-5.04	12.42	0.406 [1] ✔
T4	160 - 150	L3x3x5/16	15.62	6.99	142.5 K=1.00	1.7800	-7.58	19.81	0.383 [1] ✔
T5	150 - 140	L3x3x5/16	15.62	6.99	142.5 K=1.00	1.7800	-9.24	19.81	0.466 [1] ✔
T6	140 - 120	L3x3x5/16	16.80	7.92	161.4 K=1.00	1.7800	-11.30	15.43	0.732 [1] ✔
T7	120 - 110	L3 1/2x3 1/2x5/16	17.62	8.34	145.0 K=1.00	2.0900	-13.03	22.45	0.580 [1] ✔
T8	110 - 100	L3 1/2x3 1/2x5/16	18.45	8.76	152.3 K=1.00	2.0900	-12.54	20.34	0.616 [1] ✔
T9	100 - 80	L4x4x1/4	20.16	9.59	144.8 K=1.00	1.9400	-13.66	20.90	0.654 [1] ✔
T10	80 - 60	L4x4x3/8	21.92	10.48	159.6 K=1.00	2.8600	-14.84	25.37	0.585 [1] ✔
T11	60 - 40	L5x5x3/8	23.71	11.38	138.0 K=1.00	3.6100	-15.51	42.84	0.362 [1] ✔
T12	40 - 20	L5x5x3/8	24.62	11.84	143.6 K=1.00	3.6100	-17.59	39.57	0.445 [1] ✔
T13	20 - 0	2L3 1/2x3 1/2x5/16	32.02	15.40	159.0 K=0.93	4.1800	-26.04	37.36	0.697 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	160 - 150	L3x3x5/16	12.00	10.67	138.8 K=1.00	1.7800	-0.94	20.86	0.045 [1] ✔
T7	120 - 110	L3 1/2x3 1/2x5/16	14.48	13.15	146.1 K=1.00	2.0900	-2.02	22.12	0.091 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2L2 1/2x2 1/2x3/16	12.00	8.08	93.3 K=1.00	1.8000	-0.12	36.89	0.003 [1] ✔
T6	140 - 120	L3x3x5/16	12.00	11.00	184.0 K=0.82	1.7800	-0.46	11.87	0.039 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	190 - 180	Pirod 105244	10.00	10.00	45.4	3.6816	0.06	165.67	0.000
T3	180 - 160	Pirod 105216	20.00	10.00	45.4	3.6816	10.39	165.67	0.063
T4	160 - 150	Pirod 105217	10.00	5.00	37.8	5.3014	23.58	238.57	0.099
T5	150 - 140	Pirod 105217	10.00	10.00	37.8	5.3014	39.70	238.57	0.166
T6	140 - 120	Pirod 105218	20.03	10.02	32.4	7.2158	77.78	324.71	0.240
T7	120 - 110	Pirod 105218	10.02	5.18	32.4	7.2158	97.37	324.71	0.300
T8	110 - 100	Pirod 105218	10.02	10.02	32.4	7.2158	119.62	324.71	0.368
T9	100 - 80	Pirod 105219	20.03	10.02	28.4	9.4248	161.94	424.12	0.382
T10	80 - 60	Pirod 105219	20.03	10.02	28.4	9.4248	202.82	424.12	0.478
T11	60 - 40	Pirod 105220	20.03	10.02	25.2	11.9282	242.56	536.77	0.452
T12	40 - 20	Pirod 105220	20.03	10.02	25.2	11.9282	281.34	536.77	0.524
T13	20 - 0	Pirod 112738	20.03	20.03	32.6	14.7262	302.67	662.68	0.457

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T2	190 - 180	Pirod 105244	0.89	48.02	0.018	0.79	55.45	0.014
T3	180 - 160	Pirod 105216	-1.22	48.02	0.025	0.84	55.45	0.015
T4	160 - 150	Pirod 105217	-1.56	69.27	0.022	0.07	79.99	0.001
T5	150 - 140	Pirod 105217	-2.22	69.27	0.032	-0.40	79.99	0.005
T6	140 - 120	Pirod 105218	-3.14	94.48	0.033	-0.06	109.10	0.001
T7	120 - 110	Pirod 105218	-5.61	94.48	0.059	0.06	109.10	0.001
T8	110 - 100	Pirod 105218	-3.11	94.48	0.033	-0.17	109.10	0.002
T9	100 - 80	Pirod 105219	-4.57	123.71	0.037	-0.31	142.84	0.002
T10	80 - 60	Pirod 105219	-4.25	123.71	0.034	-0.23	142.84	0.002
T11	60 - 40	Pirod 105220	-3.36	157.00	0.021	-0.03	181.28	0.000
T12	40 - 20	Pirod 105220	-6.90	157.00	0.044	-0.46	181.28	0.003
T13	20 - 0	Pirod 112738	-6.90	289.02	0.024	-0.46	333.74	0.001

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	190 - 180	Pirod 105244	0.000	0.018	0.014	0.032 ✔	1.000	4.8.1 ✔
T3	180 - 160	Pirod 105216	0.063	0.025	0.015	0.103 ✔	1.000	4.8.1 ✔
T4	160 - 150	Pirod 105217	0.099	0.022	0.001	0.122 ✔	1.000	4.8.1 ✔
T5	150 - 140	Pirod 105217	0.166	0.032	0.005	0.204 ✔	1.000	4.8.1 ✔
T6	140 - 120	Pirod 105218	0.240	0.033	0.001	0.273 ✔	1.000	4.8.1 ✔
T7	120 - 110	Pirod 105218	0.300	0.059	0.001	0.360 ✔	1.000	4.8.1 ✔
T8	110 - 100	Pirod 105218	0.368	0.033	0.002	0.403 ✔	1.000	4.8.1 ✔
T9	100 - 80	Pirod 105219	0.382	0.037	0.002	0.421 ✔	1.000	4.8.1 ✔
T10	80 - 60	Pirod 105219	0.478	0.034	0.002	0.514 ✔	1.000	4.8.1 ✔
T11	60 - 40	Pirod 105220	0.452	0.021	0.000	0.473 ✔	1.000	4.8.1 ✔
T12	40 - 20	Pirod 105220	0.524	0.044	0.003	0.571 ✔	1.000	4.8.1 ✔
T13	20 - 0	Pirod 112738	0.457	0.024	0.001	0.482 ✔	1.000	4.8.1 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T1	195 - 190	0.5	1.48	121.0	165.67	0.1963	0.29	3.39	0.086

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T2	190 - 180	0.5	1.48	121.0	165.67	0.1963	0.84	3.39	0.249 ✔
T3	180 - 160	0.5	1.48	121.0	165.67	0.1963	1.34	3.29	0.408 ✔
T4	160 - 150	0.5	1.47	120.0	238.57	0.1963	1.65	3.34	0.494 ✔
T5	150 - 140	0.5	1.47	120.0	238.57	0.1963	0.55	3.34	0.166 ✔
T6	140 - 120	0.5	1.46	119.0	324.71	0.1963	1.23	3.38	0.366 ✔
T7	120 - 110	0.5	1.46	119.0	324.71	0.1963	1.44	3.38	0.428 ✔
T8	110 - 100	0.5	1.46	119.0	324.71	0.1963	0.66	3.38	0.196 ✔
T9	100 - 80	0.625	1.45	94.4	424.12	0.3068	0.70	6.96	0.101 ✔
T10	80 - 60	0.625	1.45	94.4	424.12	0.3068	0.62	6.96	0.089 ✔
T11	60 - 40	0.625	1.43	93.6	536.77	0.3068	0.68	7.01	0.097 ✔
T12	40 - 20	0.625	1.43	93.6	536.77	0.3068	2.57	7.01	0.367 ✔
T13	20 - 0	0.75	1.73	93.9	662.68	0.4418	1.38	14.36	0.097 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	190 - 180	L2 1/2x2 1/2x3/16	15.62	6.99	110.4	0.9020	1.57	29.22	0.054 [1] ✔
T3	180 - 160	L3x3x3/16	15.62	6.99	91.5	1.0900	4.73	35.32	0.134 [1] ✔
T4	160 - 150	L3x3x5/16	15.62	6.99	93.2	1.7800	7.41	57.67	0.129 [1] ✔
T5	150 - 140	L3x3x5/16	15.62	6.99	93.2	1.7800	8.97	57.67	0.156 [1] ✔
T6	140 - 120	L3x3x5/16	16.80	7.92	105.3	1.7800	11.16	57.67	0.194 [1] ✔
T7	120 - 110	L3 1/2x3 1/2x5/16	17.62	8.34	94.5	2.0900	12.41	67.72	0.183 [1] ✔
T8	110 - 100	L3 1/2x3 1/2x5/16	18.45	8.76	99.2	2.0900	12.50	67.72	0.185 [1] ✔
T9	100 - 80	L4x4x1/4	19.30	9.17	89.9	1.9400	13.45	62.86	0.214 [1] ✔
T10	80 - 60	L4x4x3/8	21.92	10.48	104.2	2.8600	14.64	92.66	0.158 [1] ✔
T11	60 - 40	L5x5x3/8	23.71	11.38	89.1	3.6100	15.61	116.96	0.133 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T12	40 - 20	L5x5x3/8	25.54	12.30	96.1	3.6100	17.77	116.96	0.152 [1]
T13	20 - 0	2L3 1/2x3 1/2x5/16	32.02	15.40	174.3	4.1800	22.28	135.43	0.164 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	160 - 150	L3x3x5/16	12.00	10.67	143.2	1.7800	1.27	57.67	0.022 [1]
T7	120 - 110	L3 1/2x3 1/2x5/16	14.48	13.15	149.8	2.0900	2.02	67.72	0.030 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2L2 1/2x2 1/2x3/16	12.00	8.08	95.2	1.8000	0.17	58.32	0.003 [1]
T6	140 - 120	L3x3x5/16	12.00	11.00	143.2	1.7800	0.63	57.67	0.011 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	195 - 190	Leg	Pirod 105244	3	-0.19	142.49	8.6	Pass
T2	190 - 180	Leg	Pirod 105244	15	-4.65	142.49	24.9	Pass
T3	180 - 160	Leg	Pirod 105216	24	-15.99	142.49	40.8	Pass
T4	160 - 150	Leg	Pirod 105217	38	-29.61	214.86	49.4	Pass
T5	150 - 140	Leg	Pirod 105217	50	-47.98	214.86	27.5	Pass
T6	140 - 120	Leg	Pirod 105218	58	-93.43	300.68	36.6	Pass
T7	120 - 110	Leg	Pirod 105218	77	-116.35	300.68	46.7	Pass
T8	110 - 100	Leg	Pirod 105218	88	-141.33	300.68	51.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	100 - 80	Leg	Pirod 105219	99	-188.77	399.87	51.5	Pass
T10	80 - 60	Leg	Pirod 105219	114	-236.52	399.87	63.0	Pass
T11	60 - 40	Leg	Pirod 105220	127	-283.17	512.38	58.0	Pass
T12	40 - 20	Leg	Pirod 105220	142	-330.66	512.38	69.2	Pass
T13	20 - 0	Leg	Pirod 112738	159	-352.78	613.14	59.5	Pass
T1	195 - 190	Diagonal	2L2 1/2x2 1/2x3/16	10	-0.55	32.54	1.7	Pass
T2	190 - 180	Diagonal	L2 1/2x2 1/2x3/16	18	-1.51	7.09	21.3	Pass
T3	180 - 160	Diagonal	L3x3x3/16	27	-5.04	12.42	40.6	Pass
T4	160 - 150	Diagonal	L3x3x5/16	44	-7.58	19.81	38.3	Pass
T5	150 - 140	Diagonal	L3x3x5/16	56	-9.24	19.81	46.6	Pass
T6	140 - 120	Diagonal	L3x3x5/16	68	-11.30	15.43	73.2	Pass
T7	120 - 110	Diagonal	L3 1/2x3 1/2x5/16	83	-13.03	22.45	58.0 58.5 (b)	Pass
T8	110 - 100	Diagonal	L3 1/2x3 1/2x5/16	95	-12.54	20.34	61.6	Pass
T9	100 - 80	Diagonal	L4x4x1/4	100	-13.66	20.90	65.4	Pass
T10	80 - 60	Diagonal	L4x4x3/8	115	-14.84	25.37	58.5	Pass
T11	60 - 40	Diagonal	L5x5x3/8	131	-15.51	42.84	36.2 48.8 (b)	Pass
T12	40 - 20	Diagonal	L5x5x3/8	152	-17.59	39.57	44.5 55.6 (b)	Pass
T13	20 - 0	Diagonal	2L3 1/2x3 1/2x5/16	161	-26.04	37.36	69.7	Pass
T4	160 - 150	Secondary Horizontal	L3x3x5/16	48	-0.94	20.86	4.5 6.0 (b)	Pass
T7	120 - 110	Secondary Horizontal	L3 1/2x3 1/2x5/16	86	-2.02	22.12	9.1 9.5 (b)	Pass
T1	195 - 190	Top Girt	2L2 1/2x2 1/2x3/16	6	0.15	58.32	0.7	Pass
T6	140 - 120	Top Girt	L3x3x5/16	61	-0.46	11.87	3.9	Pass
							Summary	
						Leg (T12)	69.2	Pass
						Diagonal (T6)	73.2	Pass
						Secondary Horizontal (T7)	9.5	Pass
						Top Girt (T6)	3.9	Pass
						Bolt Checks	63.1	Pass
						RATING =	**73.2**	**Pass**

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	
Legs	SR 1 3/4	SR 1 3/4	Pirod 105216		Pirod 105217		Pirod 105218		Pirod 105219		Pirod 105220	
Leg Grade	A572-50											
Diagonals	SR 3/4		L2 1/2x2 1/2x3/16		L3x3x3/16		L3x3x5/16		L3 1/2x3 1/2x5/16		L4x4x1/4	
Diagonal Grade	A572-50						A36					
Top Girts	SR 1 3/4	SR 3/4					N.A.					
Bottom Girts	SR 1 3/4	SR 3/4					N.A.					
Sec. Horizontals	N.A.				L3x3x3/16				N.A.			
Face Width (ft)	4	8 @ 2.48958	6		8	9	10	12	14	16	18	20
# Panels @ (ft)	6 @ 2.48611						16 @ 10					
Weight (K)	0.8	0.9	1.8	1.8	1.2	1.1	3.1	4.3	4.6	5.3	5.3	30.3

195.0 ft
180.0 ft
160.0 ft
140.0 ft
120.0 ft
110.0 ft
100.0 ft
80.0 ft
60.0 ft
40.0 ft
20.0 ft
0.0 ft

MATERIAL STRENGTH

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

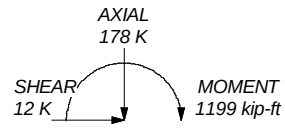
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 89 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 40 mph basic wind with 1.00 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 1 with Crest Height of 0.00 ft
7. TOWER RATING: 59.3%

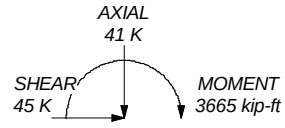
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 225 K
SHEAR: 28 K

UPLIFT: -193 K
SHEAR: 25 K



TORQUE 15 kip-ft
40 mph WIND - 1.0000 in ICE



TORQUE 36 kip-ft
REACTIONS - 89 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **19156.00- CT1134**			
Project: **38 Lower Road, North Canaan, CT**			
Client: AT&T	Drawn by: FJP	App'd:	
Code: TIA-222-G	Date: 10/30/19	Scale: NTS	
Path: J:\Jobs\19156\00.WI\04_Structural\Backup Documentation\ERI Files\Inner Tower\195' Pirod Lattice Tower.eri		Dwg No. E-1	

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: FOUNDATION WITH ANCHORS

Location: North Canaan, CT

Rev. 0: 10/30/19

Prepared by: F.J.P Checked by: T.J.L.
Job No. 19156.00

Foundation Analysis:

Input Data:

Max Pier Reactions: Inner Tower

Overturning = $Overturning_{In} := 3665 \cdot ft \cdot kip$ *user input*

BaseShear = $Shear_{In} := 45 \cdot kip$ *user input*

Base Compression = $Axial_{In} := 41 \cdot kip$ *user input*

Max Pier Reactions: Outter Tower

Overturning = $Overturning_{Out} := 8052 \cdot ft \cdot kip$ *user input*

Shear = $Shear_{Out} := 75 \cdot kip$ *user input*

Compression = $Axial_{Out} := 78 \cdot kip$ *user input*

Leg Compression = $Uplift_{leg} := 325 \cdot kip$ *user input*

Leg Uplift = $Comp_{leg} := 384 \cdot kip$ *user input*

Concrete Mat:

Footing Width = $B_{ftg} := 31.5 \cdot ft$ *user input*

Footing Length = $L_{ftg} := 31.5 \cdot ft$ *user input*

Footing Thickness = $T_{ftg} := 4.00 \cdot ft$ *user input*

Internal Friction Angle = $\phi := 35 \cdot deg$ *user input*

Unit Weight of Earth = $\gamma_{earth} := 120 \cdot pcf$ *user input*

Unit Weight of Rock = $\gamma_{rock} := 165 \cdot pcf$ *user input*

Unit Weight of Conc = $\gamma_{conc} := 150 \cdot pcf$ *user input*

Ultimate Bearing = $q_u := 20000 \cdot psf$ *user input*

Rock Anchor Properties:

Number of Anchors = $N_{anchor} := 4$ *user input* Per Leg

Rock Anchor Ultimate Strength = $Fu_{anchor} := 150.0 \cdot ksi$ *user input* Williams R71-11 1-3/8" dia. 150ksi

Rock Anchor Diameter = $d_{ra} := 1.375 \cdot in$ *user input*

Required Factor of Safety = $F_S := 1.0$ *user input*

Rock Anchor Lock off Load = $Anchor_{LL} := 133 \cdot kip$

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Stability of Footing:

Concrete Mat:

Total Volume of Concrete = $V_{conc} := B_{ftg} \cdot L_{ftg} \cdot T_{ftg} = 3969\ ft^3$

Total Weight of Concrete = $W_{conc} := V_{conc} \cdot \gamma_{conc} = 595.4\ kip$

Resisting Moment = $M_r := \left(0.9 \cdot W_{conc} + 0.75 \cdot Axial_{ln}\right) \cdot \frac{L_{ftg}}{2} = 8923\ kip \cdot ft$

Overturning Moment = $M_{ot} := Overturning_{ln} + Shear_{ln} \cdot T_{ftg} = 3845\ kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.32$

Factor of Safety Required = $FS_{req} := 1$

$OverTurning\_Moment\_Check := \text{if}\left(FS \geq FS_{req}, \text{“Okay”}, \text{“No Good”}\right)$

OverTurning_Moment_Check = “Okay”

Rock Anchor:

Factor of Safety Actual = $FS := \frac{N_{anchor} \cdot Anchor_{LL}}{Uplift_{leg}} = 1.64$

Factor of Safety Required = $FS_{req} := 1$

$OverTurning\_Moment\_Check := \text{if}\left(FS \geq FS_{req}, \text{“Okay”}, \text{“No Good”}\right)$

OverTurning_Moment_Check = “Okay”

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := W_{conc} + Axial_{In} + Axial_{Out} = 714$ kip

Area of the Mat = $A_{mat} := B_{ftg}^{2} = 992.25$ ft²

Section Modulus of Mat = $S := \frac{B_{ftg}^{3}}{6} = 5209.31$ ft³

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.458$ ksf

$Max\_Pressure\_Check := \text{if}\left(P_{max} < 0.75 \cdot q_u, \text{“Okay”}, \text{“No Good”}\right)$

Max_Pressure_Check = “Okay”

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.018$ ksf

$Min\_Pressure\_Check := \text{if}\left(\left(P_{min} \geq 0\right) \cdot \left(P_{min} < 0.75 \cdot q_u\right), \text{“Okay”}, \text{“No Good”}\right)$

Min_Pressure_Check = “No Good”

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{B_{ftg}}} \cdot \frac{1}{3} = 10.371$ ft

Distance to Kern = $X_k := \frac{B_{ftg}}{6} = 5.25$ ft

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 5.383$ ft

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot B_{ftg} \cdot \left(\frac{L_{ftg}}{2} - e\right)} = 1.458$ ksf

$q_{adj} := \text{if}\left(P_{min} < 0, P_a, P_{max}\right) = 1.458$ ksf

$Pressure\_Check := \text{if}\left(q_{adj} < 0.75 \cdot q_u, \text{“Okay”}, \text{“No Good”}\right)$

Pressure_Check = “Okay”

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING SELF SUPPORT TOWER:
- NEW AT&T ANTENNAS: DMP65R-BU4DA
(TOTAL OF 2 FOR ALPHA SECTOR).
- NEW AT&T ANTENNAS: DMP65R-BU6DA
(TYP. OF 2 PER BETA & GAMMA SECTORS, TOTAL OF 4).
- NEW AT&T RRUS: 4449 B5/B12 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4478 B14 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T DC & FIBER SURGE ARRESTORS DC6-48-60-18-8C-EV
(TOTAL OF 2) WITH (4) DC POWER & (2) FIBER RUN.
- PROPOSED MOUNT MODS (SEE S-1 SHEET).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- SWAP DUS WITH 6630.
- ADD IDLe.
- ADD 6630 FOR 5G.
- HOME RUN UMTS RETS.
- NEW NETSURE 7100 POWER PLANT WITH BATTERIES TO REPLACE EXISTING.

ITEMS TO BE REMOVED:
- EXISTING AT&T 7770 GSM ANTENNAS (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T SBNHH-1D65A LTE ANTENNAS (TOTAL OF 1 FOR ALPHA SECTOR).
- EXISTING AT&T HPA-65R-BUU-H6 LTE ANTENNAS
(TYP. OF 1 PER BETA & GAMMA SECTORS, TOTAL OF 2).
- EXISTING AT&T RRUS-11 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T TMA'S (TYP. OF 1 PER SECTOR, TOTAL OF 3)

SITE ADDRESS:	38 LOWER ROAD NORTH CANAAN , CT 06018
LATITUDE:	42.014661° N, 42° 00' 52.77" N
LONGITUDE:	73.326305° W, 73° 19' 34.69" W
TYPE OF SITE:	SELF SUPPORT TOWER / INDOOR
STRUCTURE HEIGHT:	195'-0"±
RAD CENTER:	140'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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

SITE NUMBER: CT1134

SITE NAME: NORTH CANAAN-LOWER COUNTY RD

FA CODE: 10035410

PACE ID: MRCTB040404, MRCTB040581

PROJECT: LTE 3C_4C 2019 UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

TRAVELING WEST FROM WINSTED ON ROUTE 44 FOR APPROXIMATELY 16 MILES AND AT TRAFFIC LIGHT INTERSECTION OF ROUTE 44 AND ROUTE 7,TAKE A LEFT ONTO ROUTE 7 SOUTH (CITGO GAS STATION ON RIGHT) AND GO FOR ONE TENTH OF A MILE JUST CROSSING SMALL BRIDGE, TAKE A LEFT ON TO LOWER VALLEY ROAD. NOW PROCEED FOR 3 TENTHS OF A MILE, THERE WILL BE A GATE ON YOUR RIGHT WHICH YOU WILL GO THRU TO A SECOND GATE AND PROCEED THROUGH.

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

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BEFORE YOU DIG
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OR CALL 811

UNDERGROUND SERVICE ALERT

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

AT&T

TITLE SHEET
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	T-1	A

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-G, STRUCTURAL STANDARDS FOR STEEL

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

ABBREVIATIONS

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

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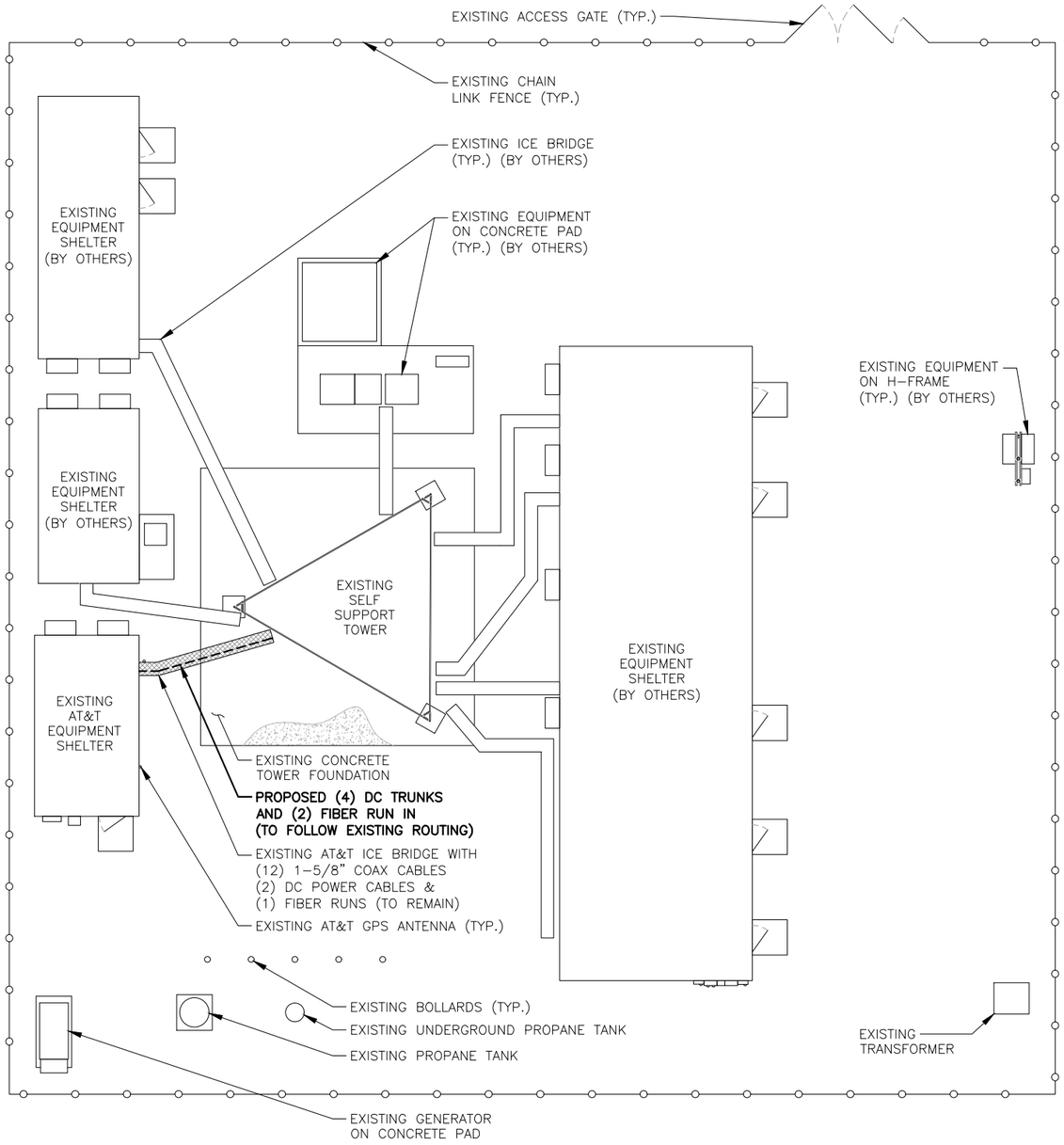
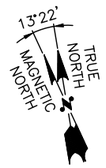
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

AT&T

GENERAL NOTES
LTE 3C_4C 2019 UPGRADE

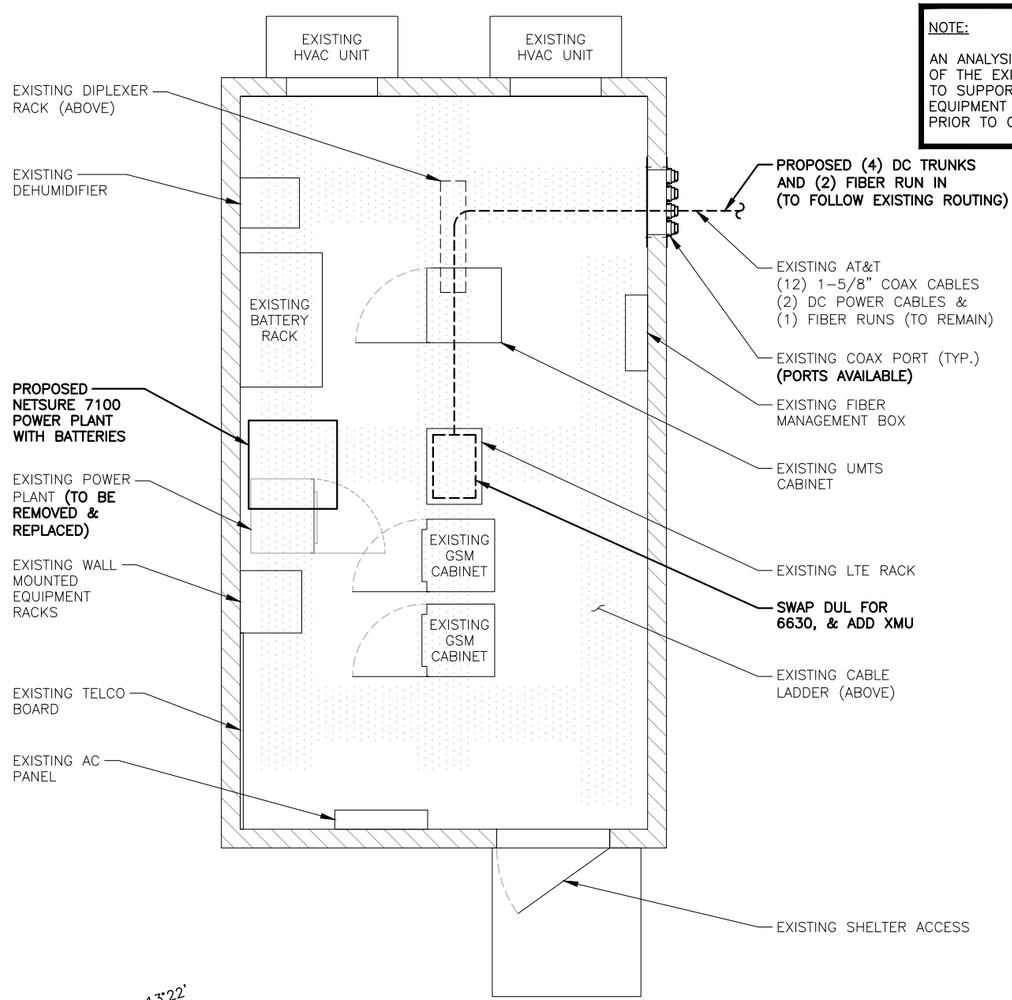
SITE NUMBER	DRAWING NUMBER	REV
CT1134	GN-1	A

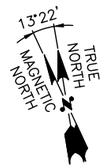




COMPOUND PLAN (1 / A-1)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

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





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

0 1'-0" 2'-0" 4'-0" 6'-0"

NOTE:

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

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: SEPTEMBER 5, 2019

NOTE:

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

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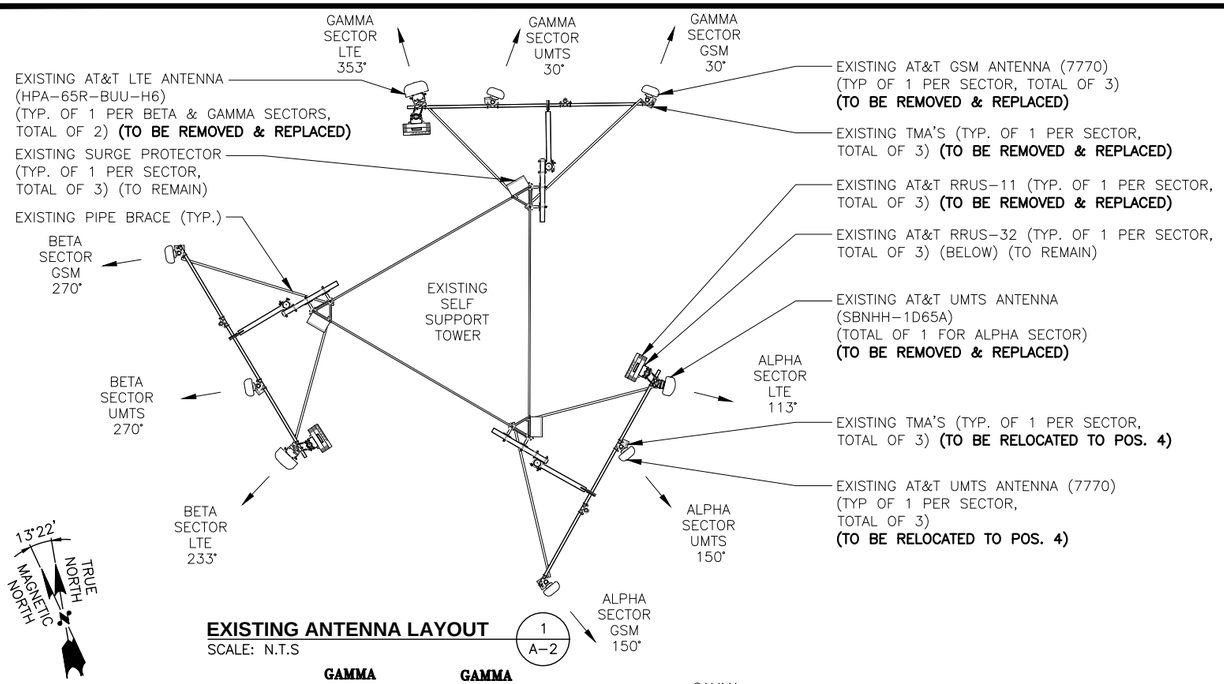
COMPOUND & EQUIPMENT PLANS
LTE 3C_4C 2019 UPGRADE

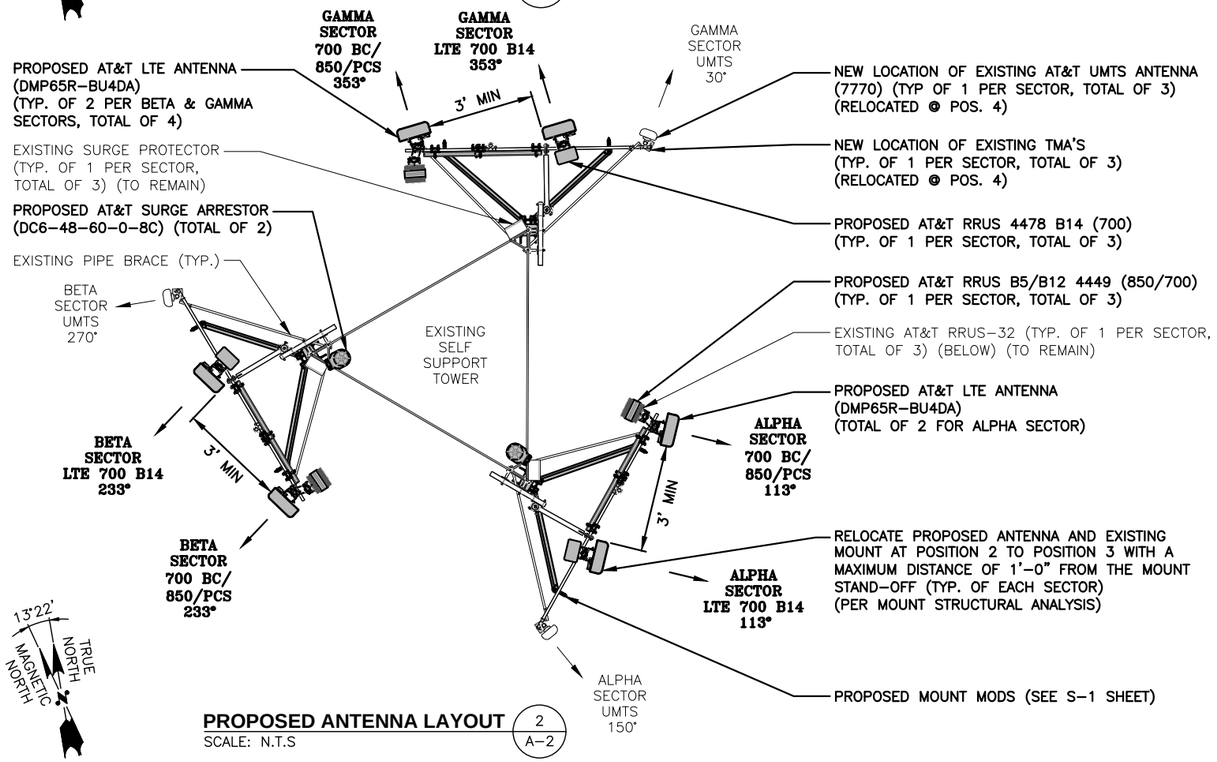
SITE NUMBER	DRAWING NUMBER	REV
CT1134	A-1	A



EXISTING ANTENNA LAYOUT

SCALE: N.T.S

1 / A-2



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

2 / A-2

NOTE:

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DATED: SEPTEMBER 5, 2019

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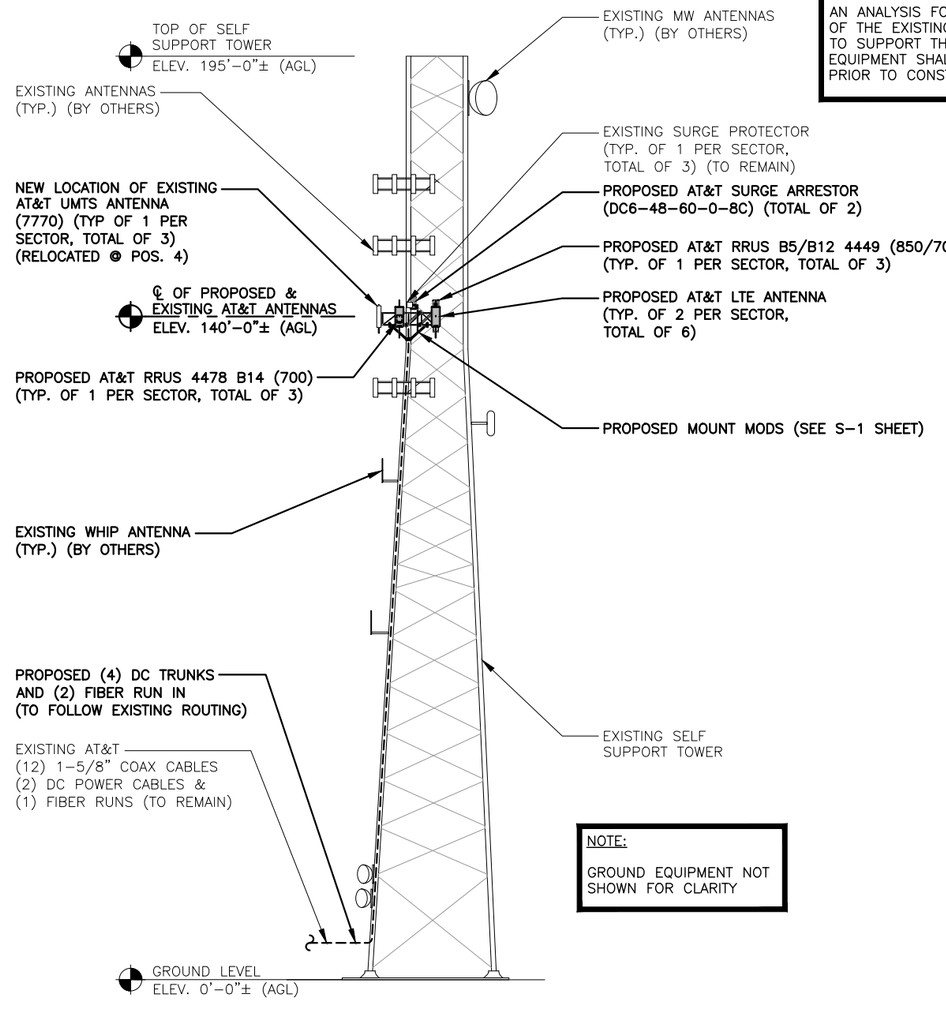

NOTE:

GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION

22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"

3 / A-2

0 8'-0" 16'-0" 32'-0" 48'-0"

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AT&T

ANTENNA LAYOUTS & ELEVATION
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	A-2	A

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	700 BC/ 850/PCS	DMP65R-BU4DA	48.0X20.7X7.7	140'-0"±	113°	–	(P)(1) 4449 B5/12 (850/700) (E)(1) RRUS-32 B2 (PCS)	14.9"x13.2"x10.4" –	–	(E) (1) SURGE PROTECTOR
A2	–	–	–	–	–	–	–	–	–	–	
A3	PROPOSED	LTE 700 B14	DMP65R-BU4DA	48.0X20.7X7.7	140'-0"±	113°	–	(P)(1) 4478 B14 (700)	18.1"x13.4"x8.3"	(2)1-5/8 COAX FOR FUTURE USE	
A4	EXISTING	UMTS	7770	55X11X5	140'-0"±	150°	(E)(1) TT19-08BP111-001	–	–	(2)1-5/8 COAX	
B1	PROPOSED	700 BC/ 850/PCS	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	233°	–	(P)(1) 4449 B5/12 (850/700) (E)(1) RRUS-32 B2 (PCS)	14.9"x13.2"x10.4" –	–	(E) (1) SURGE PROTECTOR (P) (1) RAYCAP DC6-48-60-18-8C
B2	–	–	–	–	–	–	–	–	–	–	
B3	PROPOSED	LTE 700 B14	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	233°	–	(P)(1) 4478 B14 (700)	18.1"x13.4"x8.3"	(2)1-5/8 COAX FOR FUTURE USE	
B4	EXISTING	UMTS	7770	55X11X5	140'-0"±	270°	(E)(1) TT19-08BP111-001	–	–	(2)1-5/8 COAX	
C1	PROPOSED	700 BC/ 850/PCS	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	353°	–	(P)(1) 4449 B5/12 (850/700) (E)(1) RRUS-32 B2 (PCS)	14.9"x13.2"x10.4" –	–	(E) (1) SURGE PROTECTOR (P) (1) RAYCAP DC6-48-60-18-8C
C2	–	–	–	–	–	–	–	–	–	–	
C3	PROPOSED	LTE 700 B14	DMP65R-BU6DA	71.2X20.7X7.7	140'-0"±	353°	–	(P)(1) 4478 B14 (700)	18.1"x13.4"x8.3"	(2)1-5/8 COAX FOR FUTURE USE	
C4	EXISTING	UMTS	7770	55X11X5	140'-0"±	30°	(E)(1) TT19-08BP111-001	–	–	(2)1-5/8 COAX	

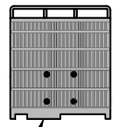
FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
P(3)	4449 (850/700)	14.9"x13.2"x10.4"
P(3)	4478 B14 (700)	18.1"x13.4"x8.3"
E(3)	RRUS-32 (PCS)	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

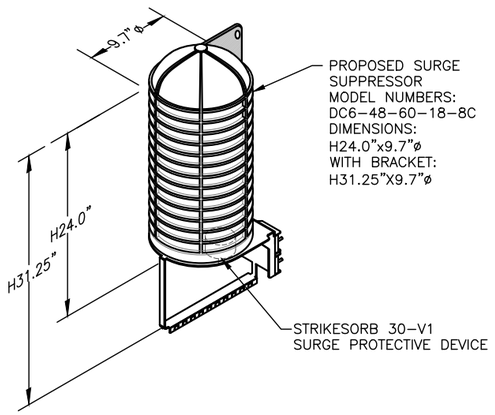
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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

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

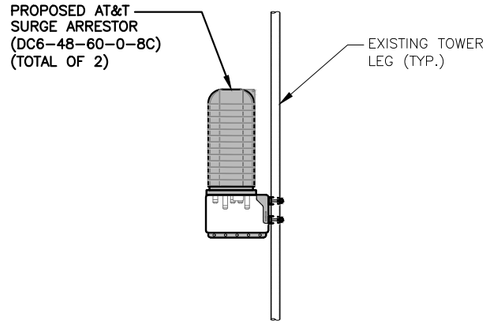
NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: SEPTEMBER 5, 2019

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



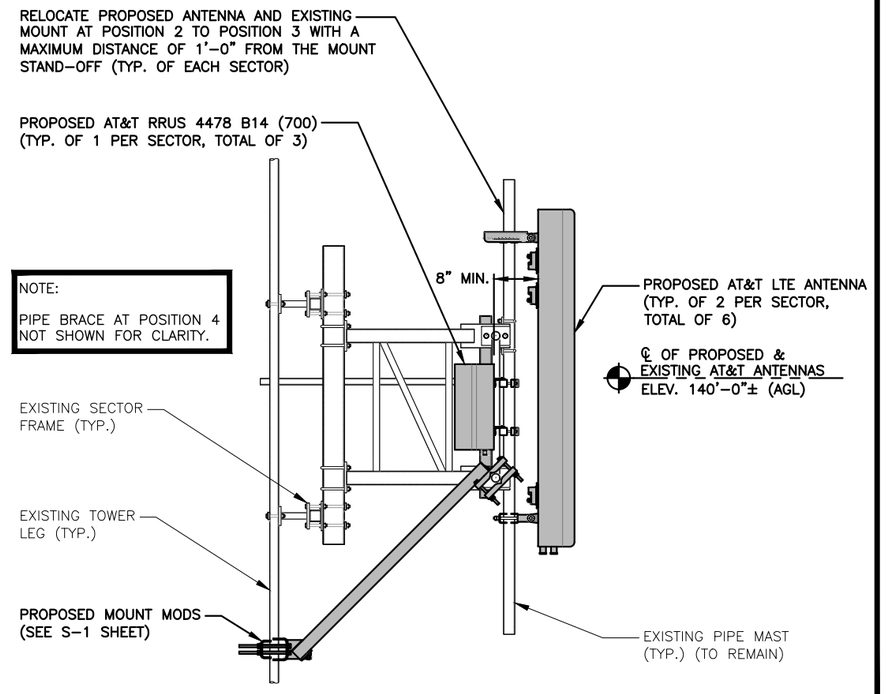
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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



PROPOSED SURGE ARRESTOR MOUNTING DETAIL (4 / A-3)
SCALE: N.T.S

PROPOSED NETSURE 7100 PHOTO DETAIL (5 / A-3)
SCALE: N.T.S



PROPOSED LTE ANTENNA MOUNTING DETAIL (6 / A-3)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

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

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500 ENTERPRISE DRIVE, SUITE 3A
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SITE NUMBER: CT1134
SITE NAME: NORTH CANAAN-LOWER COUNTY RD

38 LOWER ROAD
NORTH CANAAN , CT 06018
LITCHFIELD COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	09/13/19	ISSUED FOR REVIEW	ET	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

AT&T

DETAILS
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	A-3	A

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G 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:	

HUDSON Design Group LLC
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12 INDUSTRIAL WAY
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LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: ET

AT&T

STRUCTURAL NOTES
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	SN-1	A

NOTE:

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NOTE:

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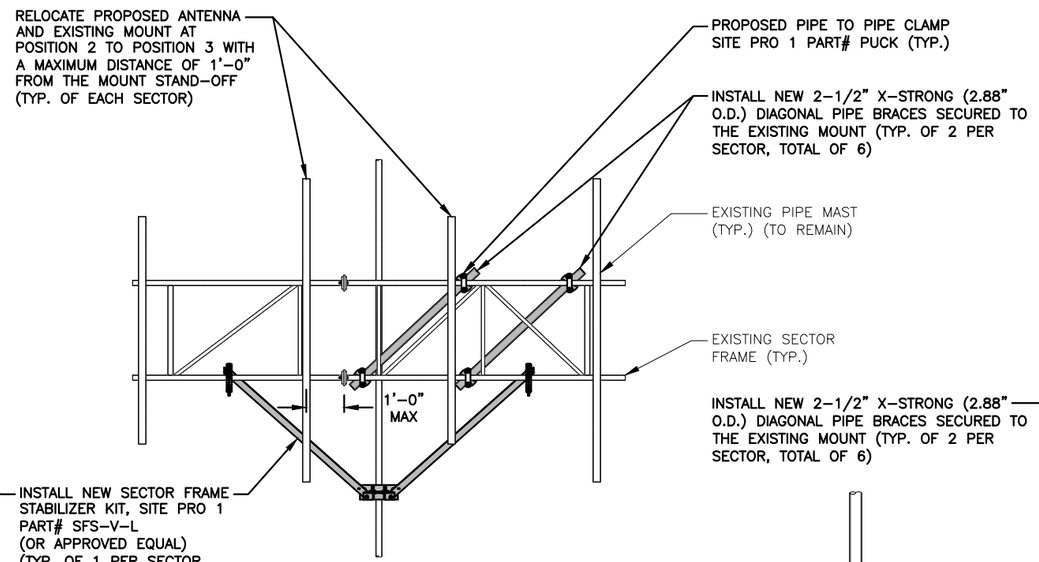
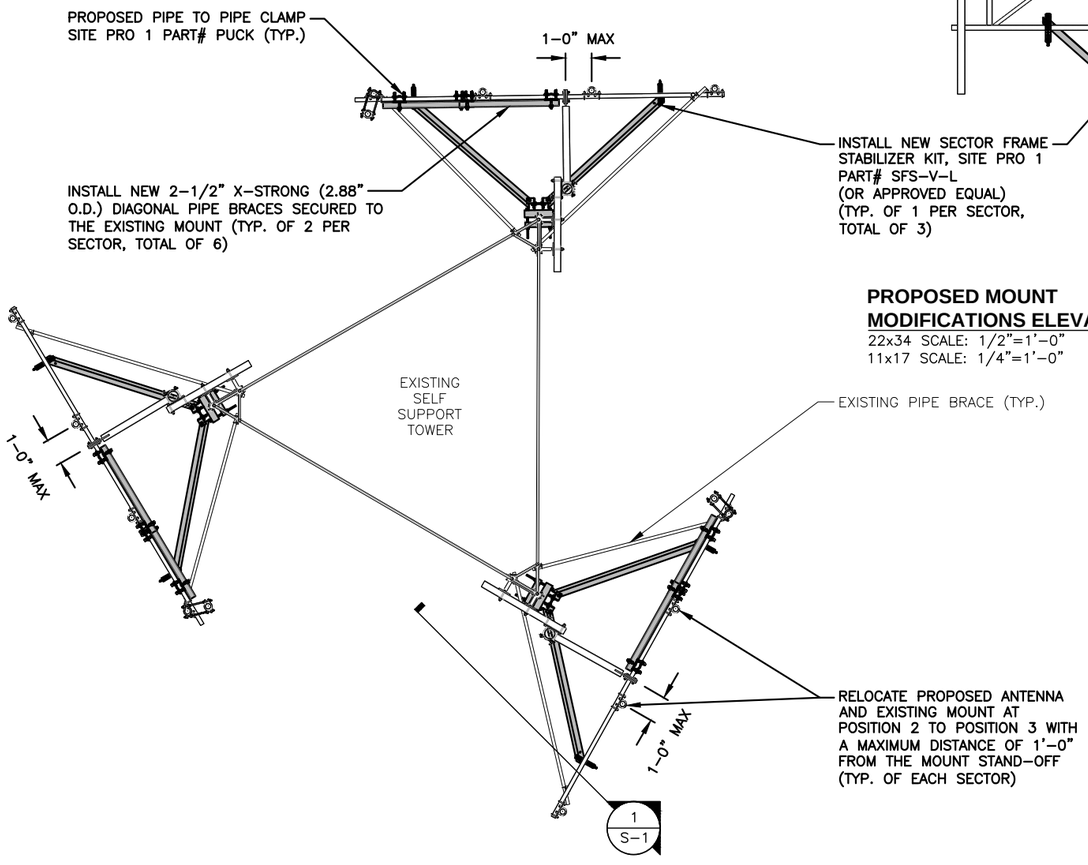


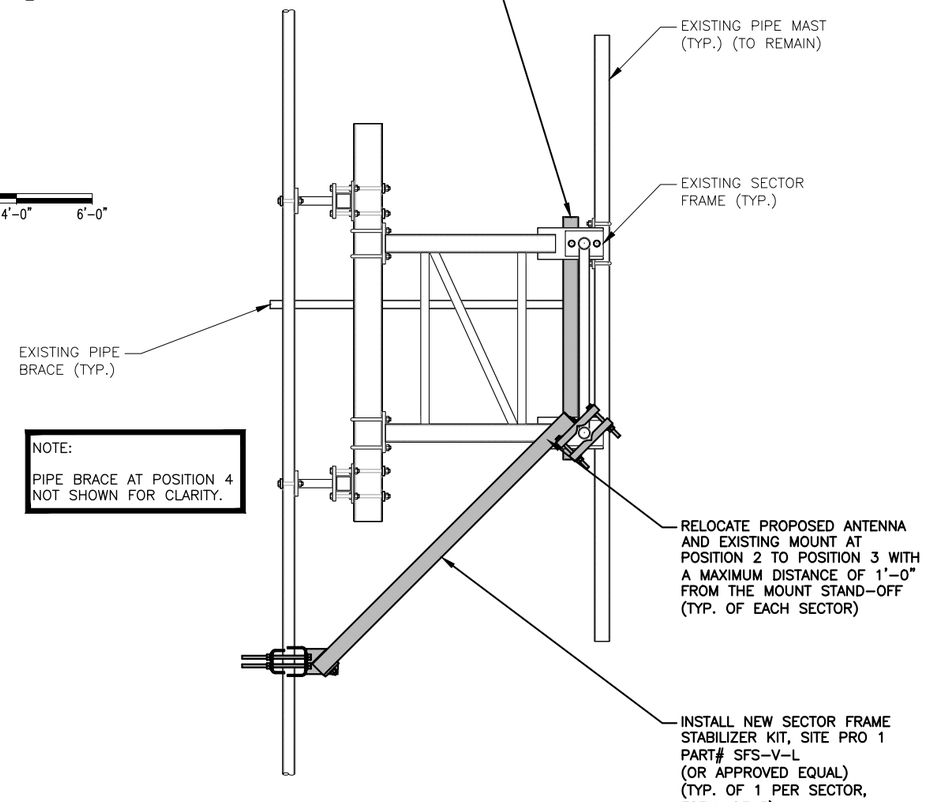
PROPOSED MOUNT MODIFICATIONS ELEVATION (2 / S-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"



PROPOSED MOUNT MODIFICATIONS PLAN (1 / S-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"



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

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

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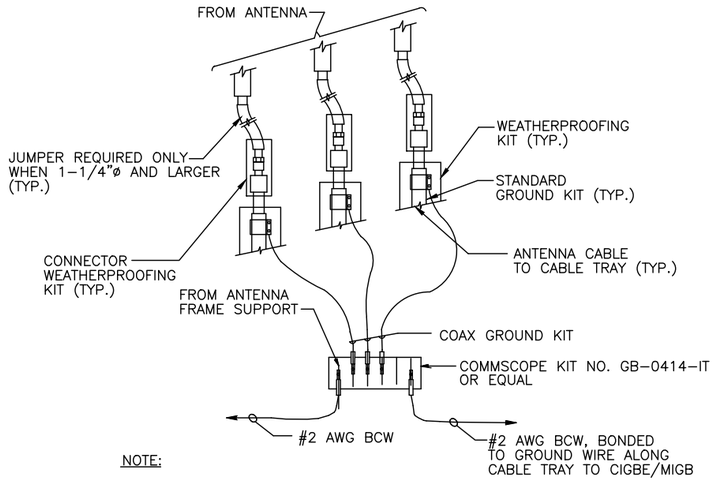
MOUNT MODIFICATION DESIGN
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	S-1	A

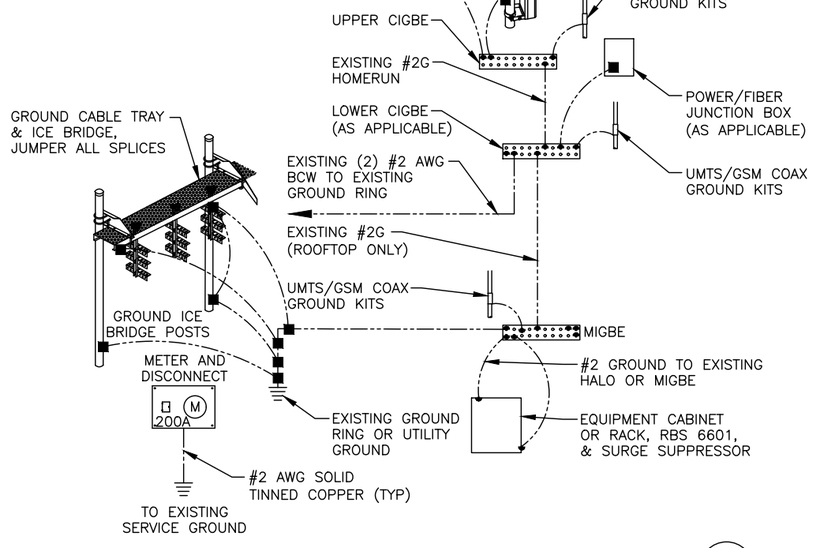


NOTE:

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

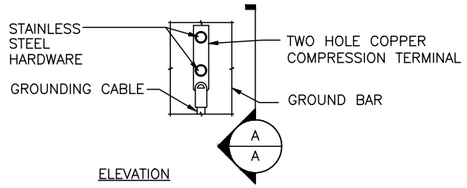
GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

SCALE: N.T.S



GROUNDING RISER DIAGRAM (2 / G-1)

SCALE: N.T.S



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

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G-1)

SCALE: N.T.S

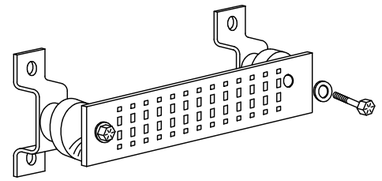
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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



GROUND BAR - DETAIL (4 / G-1)

SCALE: N.T.S

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GROUNDING DETAILS
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	G-1	A

RFDS TO BE INSERTED ONCE FINAL RFDS IS AVAILABLE

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RF PLUMBING DIAGRAM
LTE 3C_4C 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1134	RF-1	A

Antennas

MultiPort Series

DATA SHEET

Diplexed Multi-Band Antenna

DMP65R-BU4D

- Four foot (1.2 m) internally multiplexed MultiBand antenna, including eight external RF ports (12 RF ports internal), with a 65° azimuth beamwidth covering 698-896 MHz and 1695-2400 MHz frequencies
- Four wide high band ports covering 1695-2400 MHz and four wide low band ports covering 698-896 MHz in a single antenna enclosure
- Innovative Multiplexed/RET Control configuration, supporting Dual Band Radio Configurations (B12/B5 and B29/B5). The antenna provides Dual 4T4R (4x4 MIMO) capability, while providing independent RET control, an Industry First
- Innovative Low and High Band Array configuration allows for 4T4R (4x4 MIMO) on Low Band and 4T4R (4x4 MIMO) High Band Arrays, using full length arrays (non stacked), all in a 20.7" (525 mm) width enclosure, an Industry First
- Industry leading antenna topology and RET shielding techniques drastically mitigate PIM propagation from B12/B14/B29 operations, allowing for superior Network performance
- Full Spectrum Compliance for PCS, AWS-3 and WCS frequencies and 700/850 MHz Dual Band Radio Configurations
- LTE Optimized FBR and SPR performance, providing for an efficient use of valuable radio capacity
- LTE Optimized Boresight and Sector XPD and USL performance, essential for LTE Performance
- Exceeds minimum PIM performance requirements
- Equipped with new 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Ordering options for External RET Controllers (Type 1) or Internally Integrated RET Controllers (Type 17)

Overview

The CCI internally multiplexed MultiBand array is an eight port (12 RF ports internal) antenna, with four wide band ports covering 1695-2400 MHz and four low band ports covering 698-896 MHz. The antenna provides the capability to deploy 4T4R (4x4 MIMO) in the high band, with separate RET control. The antenna also provides the capability to provide independent RET control for 700/850 MHz Dual Band Radio Configurations, while maintaining 4T4R (4x4 MIMO) across the low band ports.

CCI antennas are designed and produced to ISO 9001 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

Applications

- 4x4 MIMO for the High Band and 4X4 MIMO Low Band ports
- Ready for Network Standardization on 4.3-10 DIN connectors
- With CCI's multiband antennas, wireless providers can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation costs

SPECIFICATIONS

Diplexed Multi-Band Antenna

DMP65R-BU4D

Electrical

Ports	4 x Low Band Ports for 698-896 MHz	
Frequency Range	698-798 MHz	824-896 MHz
Gain[1]	12.7 dBi	13.0 dBi
Gain (Average)[2]	11.5 dBi	12.3 dBi
Azimuth Beamwidth (-3dB)	75°	67°
Elevation Beamwidth (-3dB)	19.9°	17.9°
Electrical Downtilt	2° to 16°	2° to 16°
Elevation Sidelobes (1st Upper)	<-16 dB	<-16 dB
Front-to-Back Ratio @180°	> 32 dB	> 35 dB
Front-to-Back Ratio ±20°	> 28 dB	> 32 dB
Cross-Polar Discrimination at Peak	> 25 dB	> 25 dB
Cross-Polar Discrimination at Sector[2]	10.7 dB	11.1 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -153 dBc	≤ -153 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts
Polarization	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground

[1]Peak gain across sub-bands.
[2]Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6.

Ports	4 x High Band Ports for 1695-2400 MHz			
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz
Gain[1]	16.4 dBi	16.4 dBi	16.9 dBi	17.2 dBi
Gain (Average)[2]	15.3 dBi	15.9 dBi	16.1 dBi	16.6 dBi
Azimuth Beamwidth (-3dB)	71°	69°	69°	57°
Elevation Beamwidth (-3dB)	8.2°	7.3°	6.8°	5.9°
Electrical Downtilt	2° to 10°	2° to 10°	2° to 10°	2° to 10°
Elevation Sidelobes (1st Upper)	<-15 dB	<-16 dB	<-16 dB	<-15 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Front-to-Back Ratio ±20°	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Discrimination at Peak	> 18 dB	> 17 dB	> 18 dB	> 19 dB
Cross-Polar Discrimination at Sector[2]	9.6 dB	7.4 dB	7.7 dB	9.3 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc
Input Power Continuous Wave (CW)	300 watts	300 watts	300 watts	300 watts
Polarization	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground

[1]Peak gain across sub-bands.
[2]Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6.

SPECIFICATIONS

Diplexed Multi-Band Antenna

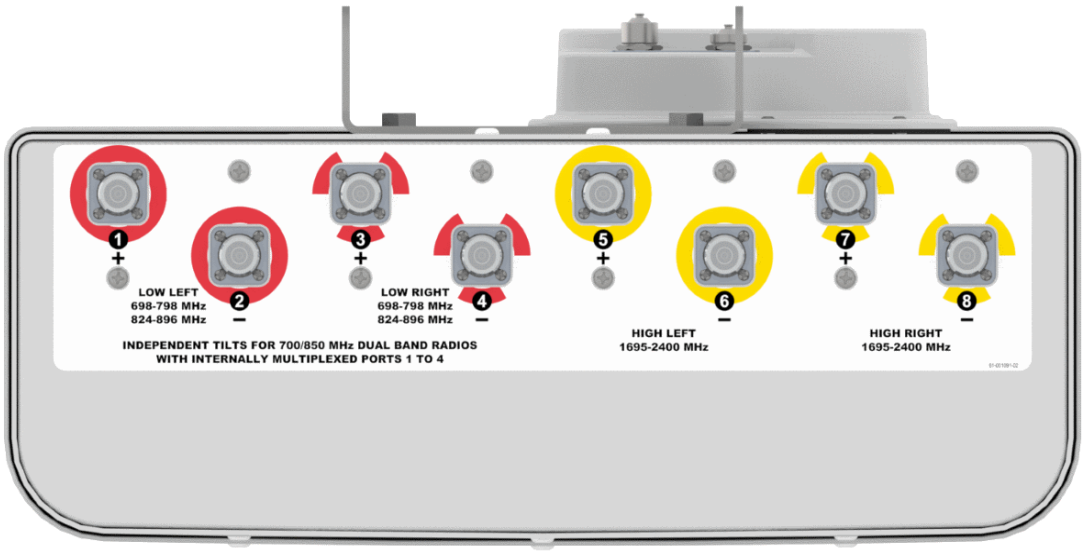
DMP65R-BU4D

Mechanical

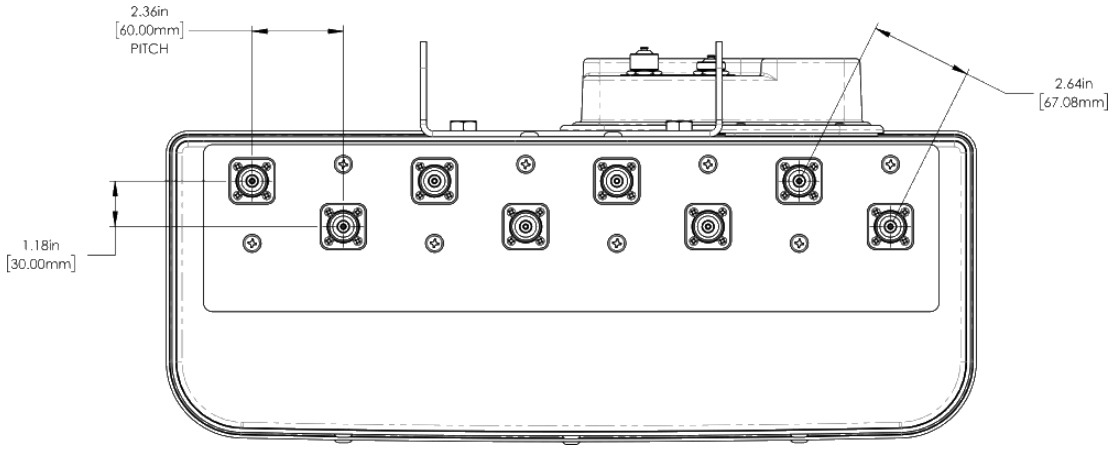
Dimensions (LxWxD)	48.0x20.7x7.7 in (1220x525x197 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	212 lbs (943 N) @ 100 mph (161 kph)
Side Wind Load	90 lbs (402 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	8.3 ft^2 (0.8 m^2)
Weight *	67.9 lbs (30.8 kg)
Connector	8 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

** Weight excludes mounting*

Bottom View



Connector Spacing



Antennas

MultiPort Series

DATA SHEET

Diplexed Multi-Band Antenna

DMP65R-BU6D

- Six foot (1.8 m) internally multiplexed MultiBand antenna, including eight external RF ports (12 RF ports internal), with a 65° azimuth beamwidth covering 698-896 MHz and 1695-2400 MHz frequencies
- Four wide high band ports covering 1695-2400 MHz and four wide low band ports covering 698-896 MHz in a single antenna enclosure
- Innovative Multiplexed/RET Control configuration, supporting Dual Band Radio Configurations (B12/B5 and B29/B5). The antenna provides Dual 4T4R (4x4 MIMO) capability, while providing independent RET control, an Industry First
- Innovative Low and High Band Array configuration allows for 4T4R (4x4 MIMO) on Low Band and 4T4R (4x4 MIMO) High Band Arrays, using full length arrays (non stacked), all in a 20.7" (525 mm) width enclosure, an Industry First
- Industry leading antenna topology and RET shielding techniques drastically mitigate PIM propagation from B12/B14/B29 operations, allowing for superior Network performance
- Full Spectrum Compliance for PCS, AWS-3 and WCS frequencies and 700/850 MHz Dual Band Radio Configurations
- LTE Optimized FBR and SPR performance, providing for an efficient use of valuable radio capacity
- LTE Optimized Boresight and Sector XPD and USL performance, essential for LTE Performance
- Exceeds minimum PIM performance requirements
- Equipped with new 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Ordering options for External RET Controllers (Type 1) or Internally Integrated RET Controllers (Type 17)

Overview

The CCI internally multiplexed MultiBand array is an eight port (12 RF ports internal) antenna, with four wide band ports covering 1695-2400 MHz and four low band ports covering 698-896 MHz. The antenna provides the capability to deploy 4T4R (4x4 MIMO) in the high band, with separate RET control. The antenna also provides the capability to provide independent RET control for 700/850 MHz Dual Band Radio Configurations, while maintaining 4T4R (4x4 MIMO) across the low band ports.

CCI antennas are designed and produced to ISO 9001 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

Applications

- 4x4 MIMO for the High Band and 4X4 MIMO Low Band ports
- Ready for Network Standardization on 4.3-10 DIN connectors
- With CCI's multiband antennas, wireless providers can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation costs

SPECIFICATIONS

Diplexed Multi-Band Antenna

DMP65R-BU6D

Electrical

Ports	4 x Low Band Ports for 698-896 MHz	
Frequency Range	698-798 MHz	824-896 MHz
Gain[1]	14.0 dBi	14.6 dBi
Gain (Average)[2]	13.2 dBi	13.7 dBi
Azimuth Beamwidth (-3dB)	74°	63°
Elevation Beamwidth (-3dB)	13.0°	11.1°
Electrical Downtilt	2° to 12°	2° to 12°
Elevation Sidelobes (1st Upper)	<-19 dB	<-19 dB
Front-to-Back Ratio @180°	> 34 dB	> 34 dB
Front-to-Back Ratio ±20°	> 30 dB	> 30 dB
Cross-Polar Discrimination at Peak	> 25 dB	> 25 dB
Cross-Polar Discrimination at Sector[2]	13.0 dB	10.5 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -153 dBc	≤ -153 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts
Polarization	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground

[1]Peak gain across sub-bands.
[2]Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6.

Ports	4 x High Band Ports for 1695-2400 MHz			
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz
Gain[1]	17.4 dBi	17.7 dBi	18.1 dBi	18.4 dBi
Gain (Average)[2]	16.7 dBi	16.9 dBi	17.1 dBi	17.3 dBi
Azimuth Beamwidth (-3dB)	70°	69°	68°	54°
Elevation Beamwidth (-3dB)	5.7°	5.2°	4.8°	4.1°
Electrical Downtilt	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	<-16 dB	<-17 dB	<-16 dB	<-17 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Front-to-Back Ratio ±20°	> 32 dB	> 32 dB	> 32 dB	> 32 dB
Cross-Polar Discrimination at Peak	> 20 dB	> 19 dB	> 20 dB	> 20 dB
Cross-Polar Discrimination at Sector[2]	11.2 dB	9.5 dB	9.5 dB	8.6 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc
Input Power Continuous Wave (CW)	300 watts	300 watts	300 watts	300 watts
Polarization	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground

[1]Peak gain across sub-bands.
[2]Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6.

SPECIFICATIONS

Diplexed Multi-Band Antenna

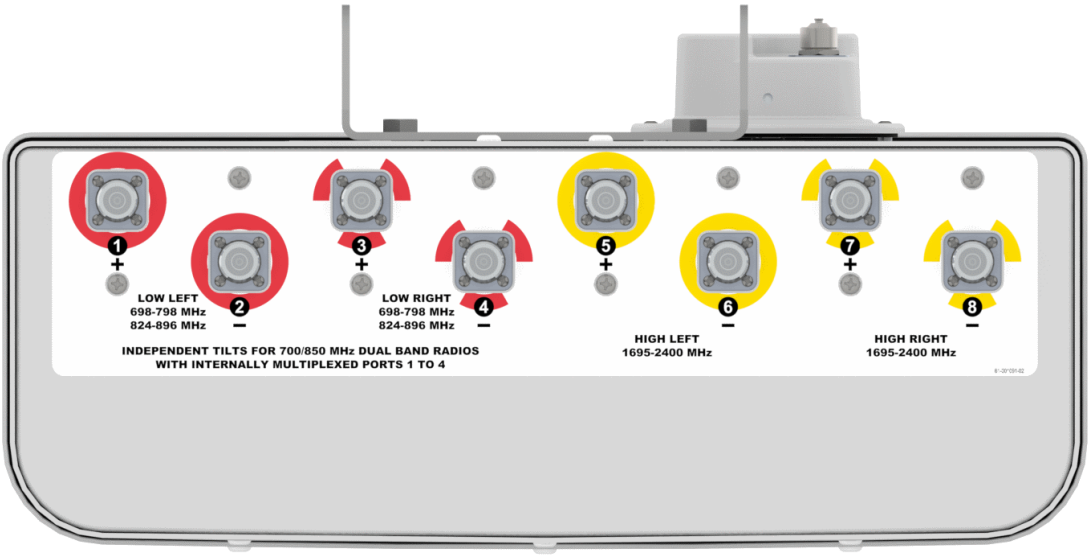
DMP65R-BU6D

Mechanical

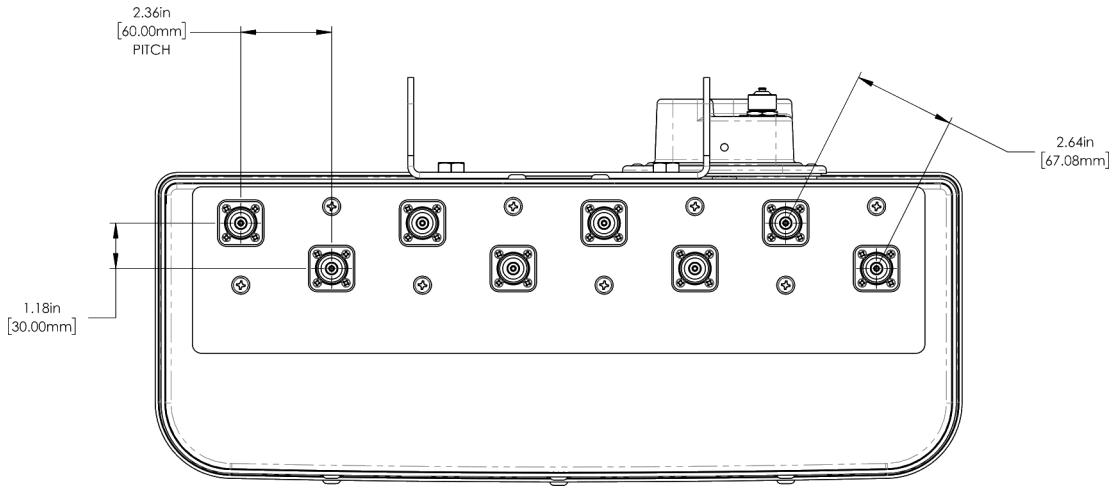
Dimensions (LxWxD)	71.2x20.7x7.7 in (1808x525x197 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	325 lbs (1446 N) @ 100 mph (161 kph)
Side Wind Load	144 lbs (642 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	12.7 ft^2 (1.2 m^2)
Weight *	79.4 lbs (36.0 kg)
Connector	8 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

** Weight excludes mounting*

Bottom View



Connector Spacing



Equipment Specifications

Specification	Ericsson Radio 4449
Band(s)	**LTE B13 (700 MHz) + LTE B5 (850 MHz)**
Output power	**(2) 2 x 40W**
Power consumption	**1439W**
Power supply	**-48 V_{DC} or external (100-250)V_{AC} power supply unit**
Physical dimensions	**18.0” (height) x 13.2” (width) x 9.4” (depth)**
Weight	**70.0 lbs**
Connectors	**4 x 4.3-10 female**

[redacted]

RADIO 4478

The macro Radio 4478 is a 4T/4R radio supporting low bands with 4x40W output power. As part of the Ericsson Radio System portfolio Radio 4478 has best in class design when it comes to radio performance and power efficiency for wide area 3GPP radio products.

Radio 4478 has by use of its small and smart dimensions support for a wide range of mounting scenarios and provides a pioneering flexibility within its product segment with the One-bolt Installation. With Radio 4478 Ericsson evolves the macro radio part of the portfolio to become even more flexible and making it easier than ever to make small and efficient single and multi-band macro radio installations.

The Radio 4478 should preferably be located near the antenna and can be located up to 40 km from the baseband unit. A fiber optic cable can be used to connect the Radio 4478 to the baseband unit and several radio units can be connected in a cascade or star configuration.

Radio 4478 provides support for AISG TMA and RET towards the antenna system. LTE is supported with up to 6 carriers in MIMO. Four duplex (TX/RX) branches provide in-built support for MIMO, antenna calibration and TX/RX diversity.

Optional installation equipment for wall and pole mount is available. To support AC installations there will be optional Power Supply Units (PSU).

Technical specification for Radio 4478

FREQUENCY BANDS	
Bands:	3GPP FDD low bands (600-900 MHz)
HW CAPACITY	
Carrier capacity LTE:	Up to 6 carriers in MIMO
IBW:	Full band IBW
MIMO:	Yes, 4T4R
Output power:	Up to 4 x 40 W
INTERFACE SPECIFICATIONS	
Antenna ports:	4 x 4.3-10 (f)
External Antenna Line Device:	RET 2.0, using DIN 8 or over the antenna port. AISG TMA & RET support
CPRI:	2 x 2.5/4.9/9.8/10.1 Gbps (exchangeable SFP modules)
Optical indicators:	5
Maintenance button:	1
External alarms:	2 (using DIN 14) or optional fan unit
Field ground:	Dual lug
MECHANICAL SPECIFICATIONS	
Weight:	27 kg
Volume:	24 liter
Mounting:	Rail, wall and pole mount Fans needed when mounted in non-vertical direction
ELECTRICAL SPECIFICATIONS	
Power Supply:	-48 VDC (3-wire)
ENVIRONMENTAL SPECIFICATIONS	
Normal operating temp.:	-40 °C to +55 °C (cold start at -40 °C)
Environment:	Outdoor class with IP65

Telefonaktiebolaget LM Ericsson
SE-164 80 Stockholm, Sweden
www.ericsson.com

28701-FGC 101 3398 Rev A

DATA SHEET

DC Surge Protection Solutions for Rooftop or Towertop

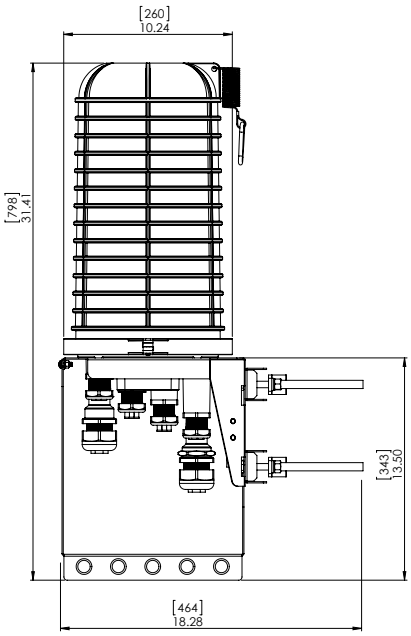
DC6-48-60-18-8F

Overvoltage Protection and Fiber Distribution/Cable Management Solution

Rooftop / Towertop

The DC6-48-60-18-8F is designed to be the most robust lightning and power surge protector available for distributed node B or e-node B applications. The flexible design provides electrical protection and fiber distribution/cable management at rooftop or towertop sectors. The solution employs the patented Strikesorb® 30-V1-HV surge protective device (SPD), capable of providing 5kA (10/350 µs) of surge capacity for up to 6 -48V DC circuits.

powered by **Strikesorb®**



Features

- Provides protection for six individual -48V DC circuits
- Surge protection of 60kA 8/20 µs
- Maximum impulse current 5kA 10/350 µs
- Fiber connections for up to 18 fiber pair
- Simplifies inter-connectivity and cable management for DC conductors
- UL 1449 4th Edition Type 2 protective device
- IEC 61643-11 Class I protection for DC applications
- Form C relay contacts included, allowing remote monitoring of suppressor status
- Raycap recommends that DC protection system be installed within 5 meters of the radio
- Patent pending

Benefits

- Strikesorb modules are fully recognized to UL 1449 4th Edition, and IEC 61643-11 Safety Standards, meeting all intermediate and high current fault requirements to facilitate use in original equipment manufacturers (OEM) applications
- Strikesorb offers unique maintenance-free protection against direct lightning currents
- Design provides maximum flexibility for installation on top of towers or roofs
- NEMA 4X enclosure allows for indoor or outdoor installation

G02-00-068 150115

Raycap

www.raycap.com

SPECIFICATIONS

powered by **Strikesorb®**

DC Surge Protection Solutions for Rooftop / Towertop

DC6-48-60-18-8F

Overvoltage Protection and Fiber Distribution/Cable Management Solution

Electrical		
Model Number		DC6-48-60-18-8F
CEQ / ANT Number		CEQ. 13884
Number of Circuits Protected		6
Surge Protective Device (SPD) Type per UL 1449 4th Edition		Type 2
Surge Protection Class as per IEC 61643-11		Class I
Nominal Operating DC Voltage [U_n]		48 V
Nominal Discharge Current [I_n] per UL 1449 3rd Edition		20 kA 8/20 µs
Maximum Surge Current [I_{max}] per IEC 61643-11		60 kA 8/20 µs
Maximum Impulse (Lightning) Current [I_{imp}] per IEC 61643-11		5 kA 10/350 µs
Maximum Continuous Operating DC Voltage [U_c] (MCOV)		75 VDC
Voltage Protection Level [U_p] per IEC 61643-11		300 V
Voltage Protection Rating (VPR)		600 V
Suppression Technology		MOV
Strikesorb Module Type 2CA (UL 1449 4th edition)		30-V1-HV
Protection Modes:	Normal Mode	-48V to Return
	Common Mode	Return to Ground
Mechanical		
Connection Terminal (Alarm) Method		Form C Hardwired, #22 to #12 AWG [0.34 to 4 mm²]
Connection Terminal (Suppression) Method		Compression lug 2 hole, #10, 5/8 pitch, 12-6 AWG [3.3-13.3 mm²]
Connection Terminal (Terminal Block) Method	Copper	#12 to #6 AWG [3.3 to 13.3 mm²]
Fiber Connection Method		LC-LC Single Mode
Environmental Ingress Protection (IP) Rating		IP 68
Operating Temperature (°C)		-40° C to +100° C
Storage Temperature (°C)		-70° C to +80° C
Cold Temperature Cycling IEC 61300-2-22		-30° C to +60° C 200 hrs @5 PSI
Resistance to Aggressive Materials CEI IEC 61073-2		Including Acids and Bases
UV Protection ISO 4892-2 Method A		Xenon-Arc 2160 hrs
Enclosure Type		Outdoor NEMA 4X
Enclosure Dimensions (L x W x H)		18.17" x 20.06" x 6.37" [461.39 x 509.52 x 161.71 mm]
Weight*		System: 16.0 lbs [7.25 kg] Mount: 10.2 lbs [4.62 kg] Total: 26.2 lbs [11.87 kg]
Combined Wind Loading	Sustained	150 mph Sustained: 105.7 lbs [470 N]
	Gust	195 mph Gust: 213.6 lbs [950 N]

Optional Configuration		
Power/Fiber connection system with no OVP	FC18-PC6-8F	CEQ.11167

Standards Compliance & Certifications

NEBS certified to: GR-63-CORE Issue 4, GR-1089-CORE Issue 6, GR-3108-CORE Issue 3, GR-487-CORE Issue 4, ATT-TP-76200 Issue 18

Strikesorb modules are compliant to the following Surge Protection Device Standards:

Standards: UL 1449 4th Edition: 2011, IEC 61643-11: 2011, EN 61643-11: 2012, IEEE C62.11: 2005, IEEE C62.41: 2002, IEEE C62.45: 2002, NEMA-LS-1

Certifications: UL, VDE, CE

AWG=American Wire Gauge

September 5, 2019
September 13, 2019 (Rev.1)

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:		
	Site Number:	CT1134 (LTE 3C/4C)
	FA Number:	10035410
	PACE Number:	MRCTB040404
	PT Number:	2051A0PQWP
	Site Name:	NORTH CANAAN-LOWER COUNTY RD
	Site Address:	38 Lower Road North Canaan, CT 06018

To Whom It May Concern:

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

- (3) 7770 Antennas (55.0"x11.0"x5.0" – Wt. = 35 lbs. /each)
- (3) RRUS-32 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) TT19-08BP111-001 TMA's (9.9"x6.7"x5.4" – Wt. = 16 lbs. /each)
- (1) 9E Surge Arrestor (10.8"x10.4"x6.3" – Wt. = 16 lbs.) (Tower Mounted)
- **(2) DMP65R-BU4DA Antennas (48.0"x20.7"x7.7" – Wt. = 68 lbs. /each)**
- **(4) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)**
- **(3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (14.9"x13.2"x10.4" – Wt. = 73 lbs. /each)**
- **(2) Squid Surge Arrestors (24.0"x9.7" Ø – Wt. = 33 lbs. /each) (Tower Mounted)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mounts on May 29, 2019.

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 115 mph with a max basic wind speed with ice of 40 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.28 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 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.
- The existing mounts are secured to the existing tower with bent plates. The connections are considered OK by visual inspection.

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

- **Swap antenna position 2 with antenna position 3. Antenna position 2 to have a maximum distance of 1'-0" from the mount stand-off (typ. of 2 per sector, total of 6). Reference the attached sketch.**
- **Install new 2-1/2" x-strong (2.88" O.D.) diagonal pipe braces secured to the existing mount (typ. of 2 per sector, total of 6).**
- **Install new Sector Frame Stabilizer Kit, SitePro1 P/N SFS-V-L (or approved equal) (typ. of 1 per sector, total of 3).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (LTE 3C/4C) Mount Rating	15	LC26	229%	**FAIL**
Modified (LTE 3C/4C) Mount Rating	20	LC39	89%	**PASS**

Reference Documents:

- Mount mapping data prepared by ProVertic LLC.

This determination was based on the following limitations and assumptions:

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

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

Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

STATE OF CONNECTICUT
DANIEL HAMM
24178
LICENSED
PROFESSIONAL ENGINEER

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:






p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, N. Andover, MA 01845
p: 203.208.3919 f: 203.234.6398 a: 110 Washington Avenue, 4th Floor, North Haven CT 06473

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 9/13/2019
Project Name: NORTH CANAAN-LOWER COUNTY RD
Project No.: CT1134
Designed By: BD **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	140 (ft)
z_g=	1200 (ft)
α=	7.0

K_z= 1.088

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}= 1.335493321

K_h=	3.0648542	
K_c=	0.9	(from Table 2-4)
K_t=	0.53	(from Table 2-5)
f=	2	(from Table 2-5)
z=	140	
z_s=	925	(Mean elevation of base of structure above sea level)
H=	250	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.34	(from 2.6.6.2.1)
K_e=	0.97	(from 2.6.8)

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

Category= **3**

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = **1.00** in
Importance Factor = I= **1.0** (from Table 2-3)
K_{iz} = **1.16** (from Sec. 2.6.10)

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

t_{iz} = **1.28** in

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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=	195	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=	1.088	(from 2.6.5.2)	
K_{zt}=	1.3	(from 2.6.6.2.1)	
K_s=	1.0	(from 2.6.7)	
K_e=	0.97	(from 2.6.8)	
K_d=	0.85	(from Table 2-2)	
V_{max}=	115	mph (Ultimate Wind Speed)	
$V_{max\ (ice)}$=	40	mph	
V_{30}=	30	mph	

q_z=	40.44
$q_{z\ (ice)}$=	4.89
$q_{z\ (30)}$=	2.75

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

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Determine Ca:

Table 2-9

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

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

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

Ice Thickness = 1.28 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)
7770 Antenna	55.0	11.0	5.0	4.20	5.00	1.31	223	35	15
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	514	72	35
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.32	1.20	335	48	23
RRUS-32 RRH	27.2	12.1	7.0	2.29	2.25	1.20	111	18	8
RRUS-32 RRH (Shielded)	27.2	0.0	7.0	0.00	0.00	1.20	0	0	0
B14 4478 RRH	18.1	13.4	8.3	1.68	1.35	1.20	82	13	6
B14 4478 RRH (Shielded)	18.1	0.0	8.3	0.00	0.00	1.20	0	0	0
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.13	1.20	66	11	5
4449 B5/B12 RRH (Shielded)	14.9	0.0	10.4	0.00	0.00	1.20	0	0	0
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	1.83	1.20	18	4	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	46	8	3
5/8" Round Bar	0.6	12.0		0.05	0.05	1.20	3	2	0
1" Round Bar	1.0	12.0		0.08	0.08	1.20	4	2	0
1-1/4" Round Bar	1.3	12.0		0.10	0.10	1.20	5	2	0
1-1/4" Pipe	1.7	12.0		0.14	0.14	1.20	7	3	0
2" Pipe	2.4	12.0		0.20	0.20	1.20	10	3	1
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	12	3	1
4" Pipe	4.5	12.0		0.38	0.38	1.20	18	4	1
HSS 2-1/2x2-1/2	2.5	12.0		0.21	0.21	1.25	11	3	1

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WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.28	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)
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	223	118	197
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	514	227	442
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	335	142	287
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	100
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	60	67	62
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	82	51	74
B14 4478 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	41	51	44
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	66	52	63
4449 B5/B12 RRH (Shielded)	14.9	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	33	52	38
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	18	22	19

WIND LOADS WITH ICE:

7770 Antenna	57.6	13.6	7.6	5.42	3.02	4.25	7.62	1.28	1.42	34	21	31
DMP65R-BU6DA Antenna	73.8	23.3	10.3	11.91	5.25	3.17	7.19	1.23	1.41	72	36	63
DMP65R-BU4DA Antenna	50.6	23.3	10.3	8.17	3.60	2.17	4.93	1.20	1.31	48	23	42
RRUS-32 RRH	29.8	14.7	9.6	3.03	1.97	2.03	3.11	1.20	1.23	18	12	16
RRUS-32 RRH (Shielded)	29.8	7.3	9.6	1.51	1.97	4.06	3.11	1.27	1.23	9	12	10
B14 4478 RRH	20.7	16.0	10.9	2.29	1.56	1.29	1.90	1.20	1.20	13	9	12
B14 4478 RRH (Shielded)	20.7	8.0	10.9	1.14	1.56	2.59	1.90	1.20	1.20	7	9	7
4449 B5/B12 RRH	17.5	15.8	13.0	1.91	1.57	1.11	1.35	1.20	1.20	11	9	11
4449 B5/B12 RRH (Shielded)	17.5	7.9	13.0	0.96	1.57	2.22	1.35	1.20	1.20	6	9	7
TT19-08BP111-001 TMA	12.5	8.0	9.3	0.69	0.80	1.57	1.35	1.20	1.20	4	5	4

WIND LOADS AT 30 MPH:

7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	15	8	13
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	30
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	20
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	7
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	4	5	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	6	3	5
B14 4478 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	3	3	3
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	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	2	4	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	2	1

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HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.28	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)
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	223	118	144
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	514	227	299
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	335	142	190
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	78
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	85	67	72
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	82	51	58
B14 4478 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	61	51	53
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	66	52	56
4449 B5/B12 RRH (Shielded)	14.9	9.9	10.4	1.02	1.08	1.51	1.43	1.20	1.20	50	52	52
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	18	22	21

WIND LOADS WITH ICE:

7770 Antenna	57.6	13.6	7.6	5.42	3.02	4.25	7.62	1.28	1.42	34	21	24
DMP65R-BU6DA Antenna	73.8	23.3	10.3	11.91	5.25	3.17	7.19	1.23	1.41	72	36	45
DMP65R-BU4DA Antenna	50.6	23.3	10.3	8.17	3.60	2.17	4.93	1.20	1.31	48	23	29
RRUS-32 RRH	29.8	14.7	9.6	3.03	1.97	2.03	3.11	1.20	1.23	18	12	13
RRUS-32 RRH (Shielded)	29.8	11.0	9.6	2.27	1.97	2.71	3.11	1.21	1.23	13	12	12
B14 4478 RRH	20.7	16.0	10.9	2.29	1.56	1.29	1.90	1.20	1.20	13	9	10
B14 4478 RRH (Shielded)	20.7	12.0	10.9	1.72	1.56	1.73	1.90	1.20	1.20	10	9	9
4449 B5/B12 RRH	17.5	15.8	13.0	1.91	1.57	1.11	1.35	1.20	1.20	11	9	10
4449 B5/B12 RRH (Shielded)	17.5	11.8	13.0	1.43	1.57	1.48	1.35	1.20	1.20	8	9	9
TT19-08BP111-001 TMA	12.5	8.0	9.3	0.69	0.80	1.57	1.35	1.20	1.20	4	5	5

WIND LOADS AT 30 MPH:

7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	15	8	10
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	20
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	13
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	5
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	6	5	5
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	6	3	4
B14 4478 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	4	3	4
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	3	4	4
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	2	1

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HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.28	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)
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	223	118	118
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	514	227	227
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	335	142	142
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	67
RRUS-32 RRH (Shielded)	27.2	0.0	7.0	0.00	1.32	0.00	3.89	1.20	1.26	0	67	67
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	82	51	51
B14 4478 RRH (Shielded)	18.1	0.0	8.3	0.00	1.04	0.00	2.18	1.20	1.20	0	51	51
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	66	52	52
4449 B5/B12 RRH (Shielded)	14.9	0.0	10.4	0.00	1.08	0.00	1.43	1.20	1.20	0	52	52
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	18	22	22

WIND LOADS WITH ICE:

7770 Antenna	57.6	13.6	7.6	5.42	3.02	4.25	7.62	1.28	1.42	34	21	21
DMP65R-BU6DA Antenna	73.8	23.3	10.3	11.91	5.25	3.17	7.19	1.23	1.41	72	36	36
DMP65R-BU4DA Antenna	50.6	23.3	10.3	8.17	3.60	2.17	4.93	1.20	1.31	48	23	23
RRUS-32 RRH	29.8	14.7	9.6	3.03	1.97	2.03	3.11	1.20	1.23	18	12	12
RRUS-32 RRH (Shielded)	29.8	2.6	9.6	0.53	1.97	11.64	3.11	1.55	1.23	4	12	12
B14 4478 RRH	20.7	16.0	10.9	2.29	1.56	1.29	1.90	1.20	1.20	13	9	9
B14 4478 RRH (Shielded)	20.7	2.6	10.9	0.37	1.56	8.08	1.90	1.44	1.20	3	9	9
4449 B5/B12 RRH	17.5	15.8	13.0	1.91	1.57	1.11	1.35	1.20	1.20	11	9	9
4449 B5/B12 RRH (Shielded)	17.5	2.6	13.0	0.31	1.57	6.83	1.35	1.39	1.20	2	9	9
TT19-08BP111-001 TMA	12.5	8.0	9.3	0.69	0.80	1.57	1.35	1.20	1.20	4	5	5

WIND LOADS AT 30 MPH:

7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	15	8	8
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	15
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	10
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	5
RRUS-32 RRH (Shielded)	27.2	0.0	7.0	0.00	1.32	0.00	3.89	1.20	1.26	0	5	5
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	6	3	3
B14 4478 RRH (Shielded)	18.1	0.0	8.3	0.00	1.04	0.00	2.18	1.20	1.20	0	3	3
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	0.0	10.4	0.00	1.08	0.00	1.43	1.20	1.20	0	4	4
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	2	2

Date: 9/13/2019
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Designed By: BD Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.28	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)
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	223	118	144
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	514	227	299
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	335	142	190
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	78
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	85	67	72
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	82	51	58
B14 4478 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	61	51	53
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	66	52	56
4449 B5/B12 RRH (Shielded)	14.9	9.9	10.4	1.02	1.08	1.51	1.43	1.20	1.20	50	52	52
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	18	22	21

WIND LOADS WITH ICE:

7770 Antenna	57.6	13.6	7.6	5.42	3.02	4.25	7.62	1.28	1.42	34	21	24
DMP65R-BU6DA Antenna	73.8	23.3	10.3	11.91	5.25	3.17	7.19	1.23	1.41	72	36	45
DMP65R-BU4DA Antenna	50.6	23.3	10.3	8.17	3.60	2.17	4.93	1.20	1.31	48	23	29
RRUS-32 RRH	29.8	14.7	9.6	3.03	1.97	2.03	3.11	1.20	1.23	18	12	13
RRUS-32 RRH (Shielded)	29.8	11.0	9.6	2.27	1.97	2.71	3.11	1.21	1.23	13	12	12
B14 4478 RRH	20.7	16.0	10.9	2.29	1.56	1.29	1.90	1.20	1.20	13	9	10
B14 4478 RRH (Shielded)	20.7	12.0	10.9	1.72	1.56	1.73	1.90	1.20	1.20	10	9	9
4449 B5/B12 RRH	17.5	15.8	13.0	1.91	1.57	1.11	1.35	1.20	1.20	11	9	10
4449 B5/B12 RRH (Shielded)	17.5	11.8	13.0	1.43	1.57	1.48	1.35	1.20	1.20	8	9	9
TT19-08BP111-001 TMA	12.5	8.0	9.3	0.69	0.80	1.57	1.35	1.20	1.20	4	5	5

WIND LOADS AT 30 MPH:

7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	15	8	10
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	20
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	13
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	5
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	6	5	5
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	6	3	4
B14 4478 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	4	3	4
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	3	4	4
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	2	1

Date: 9/13/2019
Project Name: NORTH CANAAN-LOWER COUNTY RD
Project No.: CT1134
Designed By: BD Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.28	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)
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	223	118	197
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	514	227	442
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	335	142	287
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	100
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	60	67	62
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	82	51	74
B14 4478 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	41	51	44
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	66	52	63
4449 B5/B12 RRH (Shielded)	14.9	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	33	52	38
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	18	22	19

WIND LOADS WITH ICE:

7770 Antenna	57.6	13.6	7.6	5.42	3.02	4.25	7.62	1.28	1.42	34	21	31
DMP65R-BU6DA Antenna	73.8	23.3	10.3	11.91	5.25	3.17	7.19	1.23	1.41	72	36	63
DMP65R-BU4DA Antenna	50.6	23.3	10.3	8.17	3.60	2.17	4.93	1.20	1.31	48	23	42
RRUS-32 RRH	29.8	14.7	9.6	3.03	1.97	2.03	3.11	1.20	1.23	18	12	16
RRUS-32 RRH (Shielded)	29.8	7.3	9.6	1.51	1.97	4.06	3.11	1.27	1.23	9	12	10
B14 4478 RRH	20.7	16.0	10.9	2.29	1.56	1.29	1.90	1.20	1.20	13	9	12
B14 4478 RRH (Shielded)	20.7	8.0	10.9	1.14	1.56	2.59	1.90	1.20	1.20	7	9	7
4449 B5/B12 RRH	17.5	15.8	13.0	1.91	1.57	1.11	1.35	1.20	1.20	11	9	11
4449 B5/B12 RRH (Shielded)	17.5	7.9	13.0	0.96	1.57	2.22	1.35	1.20	1.20	6	9	7
TT19-08BP111-001 TMA	12.5	8.0	9.3	0.69	0.80	1.57	1.35	1.20	1.20	4	5	4

WIND LOADS AT 30 MPH:

7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	15	8	13
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	30
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	20
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	7
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	4	5	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	6	3	5
B14 4478 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	3	3	3
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	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	2	4	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	2	1

Date: 9/13/2019
Project Name: NORTH CANAAN-LOWER COUNTY RD
Project No.: CT1134
Designed By: BD **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.28 in.
Density of ice: 56 pcf

7770 Antenna
Weight of ice based on total radial SF area:

Height (in):	55.0	
Width (in):	11.0	
Depth (in):	5.0	
Total weight of ice on object:		96 lbs
Weight of object:	35.0 lbs	
Combined weight of ice and object:		131 lbs

DMP65R-BU4DA Antenna
Weight of ice based on total radial SF area:

Height (in):	48.0	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		146 lbs
Weight of object:	68.0 lbs	
Combined weight of ice and object:		214 lbs

DMP65R-BU6DA Antenna
Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		217 lbs
Weight of object:	80.0 lbs	
Combined weight of ice and object:		297 lbs

RRUS-32 RRH
Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		54 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		114 lbs

B14 4478 RRH
Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:		40 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		100 lbs

4449 B5/B12 RRH
Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.4	
Total weight of ice on object:		35 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		108 lbs

TT19-08BP111-001 TMA
Weight of ice based on total radial SF area:

Height (in):	9.9	
Width (in):	5.4	
Depth (in):	6.7	
Total weight of ice on object:		13 lbs
Weight of object:	16.0 lbs	
Combined weight of ice and object:		29 lbs

9E Surge Arrestor
Weight of ice based on total radial SF area:

Height (in):	10.8	
Width (in):	10.4	
Depth (in):	6.3	
Total weight of ice on object:		19 lbs
Weight of object:	16.0 lbs	
Combined weight of ice and object:		35 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:		34 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		67 lbs

1-1/4" Round Bar
Per foot weight of ice:

diameter (in):	1.25	
Per foot weight of ice on object:		4 plf

5/8" Round Bar
Per foot weight of ice:

diameter (in):	0.63	
Per foot weight of ice on object:		3 plf

HSS 2-1/2x2-1/2
Weight of ice based on total radial SF area:

Height (in):	2.5	
Width (in):	2.5	
Per foot weight of ice on object:		8 plf

1" Round Bar
Per foot weight of ice:

diameter (in):	1	
Per foot weight of ice on object:		4 plf

1-1/4" Pipe
Per foot weight of ice:

diameter (in):	1.66	
Per foot weight of ice on object:		5 plf

2-1/2" Pipe
Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		7 plf

2" Pipe
Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		6 plf

4" Pipe
Per foot weight of ice:

diameter (in):	4.5	
Per foot weight of ice on object:		9 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

Bentley

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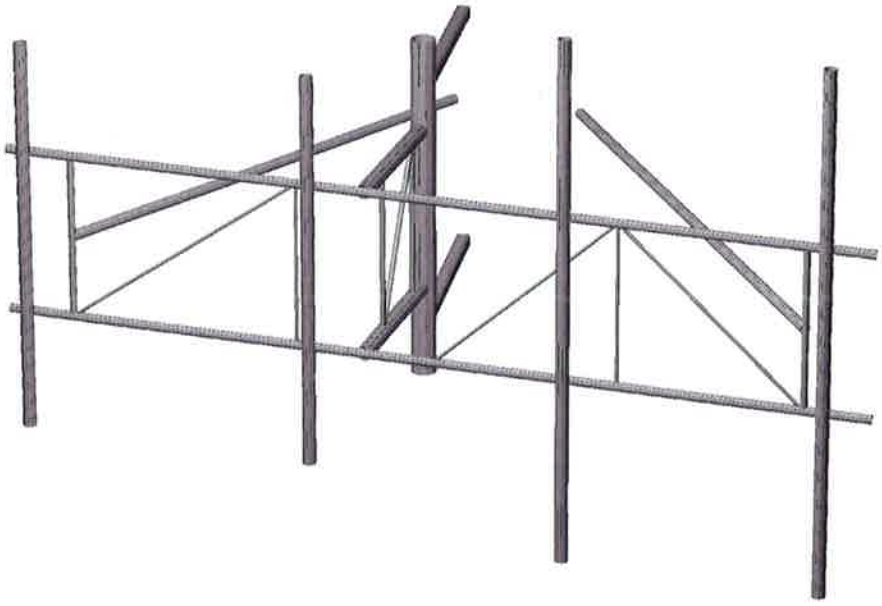

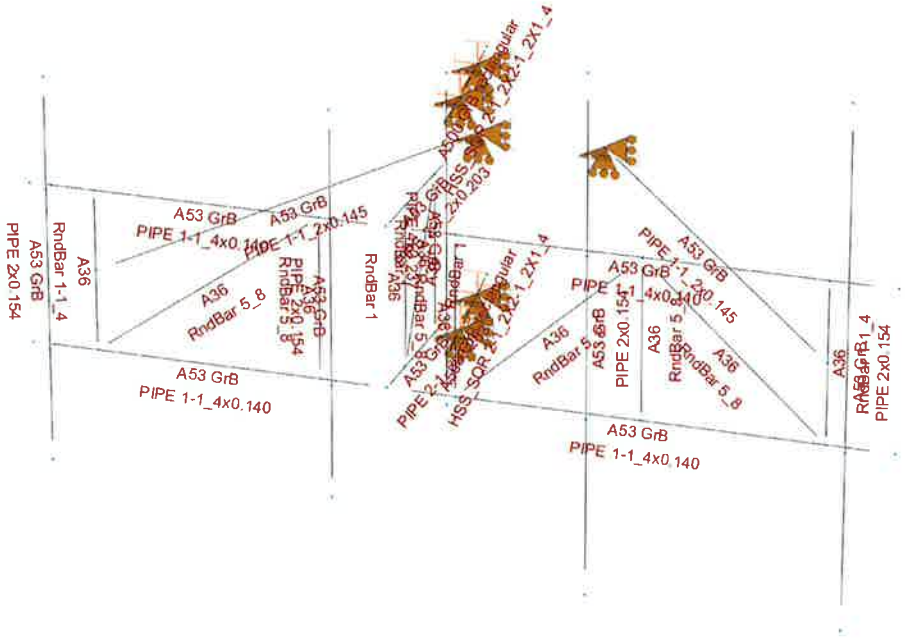
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A36
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RndBar 1-1_4
PIPE 2x0.154
RndBar 1
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HSS_SQR 2-1_2X1_4
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Y
X
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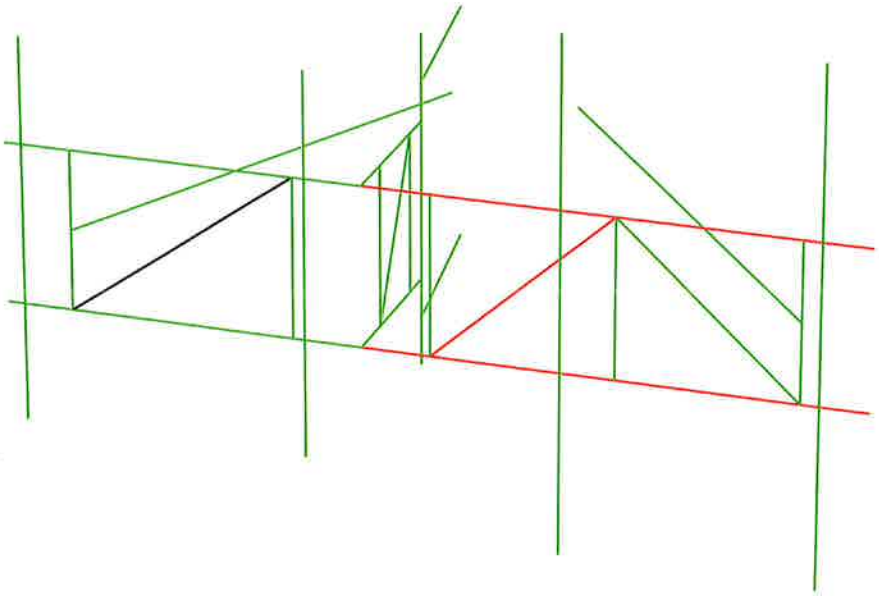
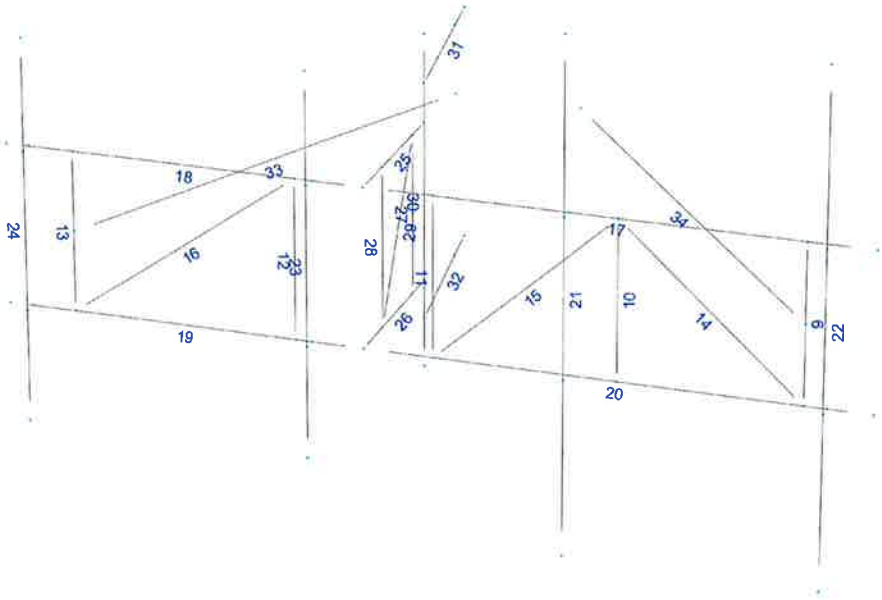
Design O.K.
With warnings

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Load data

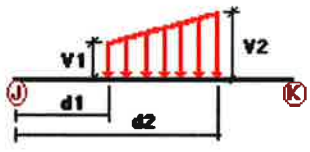
GLOSSARY

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

Distributed force on members

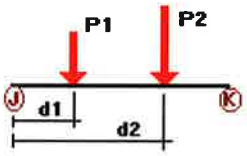


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	9	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	10	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	11	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	12	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	13	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	14	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	15	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	16	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	17	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	18	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	19	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	20	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	23	Z	-0.01	-0.01	0.00	Yes	100.00	Yes
	30	Z	-0.018	-0.018	0.00	Yes	100.00	Yes
	33	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	34	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
W30	9	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	10	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	11	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	12	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	13	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	14	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	15	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	16	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	17	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	18	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	19	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	20	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	23	Z	-0.01	-0.01	0.00	Yes	100.00	Yes
	30	Z	-0.018	-0.018	0.00	Yes	100.00	Yes
	33	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	34	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
W60	9	X	-0.005	-0.005	0.00	Yes	100.00	Yes
	10	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	11	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	12	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	13	X	-0.005	-0.005	0.00	Yes	100.00	Yes
	14	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	15	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	16	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	21	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	22	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	23	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	24	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	25	X	-0.012	-0.012	0.00	Yes	100.00	Yes
	26	X	-0.012	-0.012	0.00	Yes	100.00	Yes
	27	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	28	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	29	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	30	X	-0.018	-0.018	0.00	Yes	100.00	Yes
	31	X	-0.011	-0.011	0.00	Yes	100.00	Yes
	32	X	-0.011	-0.011	0.00	Yes	100.00	Yes
	33	X	-0.007	-0.007	0.00	Yes	100.00	Yes
	34	X	-0.007	-0.007	0.00	Yes	100.00	Yes
W90	9	X	-0.005	-0.005	0.00	Yes	100.00	Yes
	10	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	11	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	12	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	13	X	-0.005	-0.005	0.00	Yes	100.00	Yes
	14	X	-0.003	-0.003	0.00	Yes	100.00	Yes

	15	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	16	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	21	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	22	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	23	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	24	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	25	X	-0.012	-0.012	0.00	Yes	100.00	Yes
	26	X	-0.012	-0.012	0.00	Yes	100.00	Yes
	27	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	28	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	29	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	30	X	-0.018	-0.018	0.00	Yes	100.00	Yes
	31	X	-0.011	-0.011	0.00	Yes	100.00	Yes
	32	X	-0.011	-0.011	0.00	Yes	100.00	Yes
	33	X	-0.007	-0.007	0.00	Yes	100.00	Yes
	34	X	-0.007	-0.007	0.00	Yes	100.00	Yes
W120	9	X	-0.005	-0.005	0.00	Yes	100.00	Yes
	10	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	11	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	12	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	13	X	-0.005	-0.005	0.00	Yes	100.00	Yes
	14	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	15	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	16	X	-0.003	-0.003	0.00	Yes	100.00	Yes
	21	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	22	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	23	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	24	X	-0.01	-0.01	0.00	Yes	100.00	Yes
	25	X	-0.012	-0.012	0.00	Yes	100.00	Yes
	26	X	-0.012	-0.012	0.00	Yes	100.00	Yes
	27	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	28	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	29	X	-0.004	-0.004	0.00	Yes	100.00	Yes
	30	X	-0.018	-0.018	0.00	Yes	100.00	Yes
	31	X	-0.011	-0.011	0.00	Yes	100.00	Yes
	32	X	-0.011	-0.011	0.00	Yes	100.00	Yes
	33	X	-0.007	-0.007	0.00	Yes	100.00	Yes
	34	X	-0.007	-0.007	0.00	Yes	100.00	Yes
W150	9	Z	0.005	0.005	0.00	Yes	100.00	Yes
	10	Z	0.003	0.003	0.00	Yes	100.00	Yes
	11	Z	0.003	0.003	0.00	Yes	100.00	Yes
	12	Z	0.003	0.003	0.00	Yes	100.00	Yes
	13	Z	0.005	0.005	0.00	Yes	100.00	Yes
	14	Z	0.003	0.003	0.00	Yes	100.00	Yes
	15	Z	0.003	0.003	0.00	Yes	100.00	Yes
	16	Z	0.003	0.003	0.00	Yes	100.00	Yes
	17	Z	0.007	0.007	0.00	Yes	100.00	Yes
	18	Z	0.007	0.007	0.00	Yes	100.00	Yes
	19	Z	0.007	0.007	0.00	Yes	100.00	Yes
	20	Z	0.007	0.007	0.00	Yes	100.00	Yes
	21	Z	0.01	0.01	0.00	Yes	100.00	Yes
	22	Z	0.01	0.01	0.00	Yes	100.00	Yes
	23	Z	0.01	0.01	0.00	Yes	100.00	Yes
	24	Z	0.01	0.01	0.00	Yes	100.00	Yes
	30	Z	0.018	0.018	0.00	Yes	100.00	Yes
	33	Z	0.007	0.007	0.00	Yes	100.00	Yes
	34	Z	0.007	0.007	0.00	Yes	100.00	Yes
Di	9	Y	-0.004	-0.004	0.00	Yes	100.00	Yes
	10	Y	-0.003	-0.003	0.00	Yes	100.00	Yes
	11	Y	-0.003	-0.003	0.00	Yes	100.00	Yes

12	Y	-0.003	-0.003	0.00	Yes	100.00	Yes
13	Y	-0.004	-0.004	0.00	Yes	100.00	Yes
14	Y	-0.003	-0.003	0.00	Yes	100.00	Yes
15	Y	-0.003	-0.003	0.00	Yes	100.00	Yes
16	Y	-0.003	-0.003	0.00	Yes	100.00	Yes
17	Y	-0.005	-0.005	0.00	Yes	100.00	Yes
18	Y	-0.005	-0.005	0.00	Yes	100.00	Yes
19	Y	-0.005	-0.005	0.00	Yes	100.00	Yes
20	Y	-0.005	-0.005	0.00	Yes	100.00	Yes
21	Y	-0.006	-0.006	0.00	Yes	100.00	Yes
22	Y	-0.006	-0.006	0.00	Yes	100.00	Yes
23	Y	-0.006	-0.006	0.00	Yes	100.00	Yes
24	Y	-0.006	-0.006	0.00	Yes	100.00	Yes
25	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
26	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
27	Y	-0.004	-0.004	0.00	Yes	100.00	Yes
28	Y	-0.004	-0.004	0.00	Yes	100.00	Yes
29	Y	-0.004	-0.004	0.00	Yes	100.00	Yes
30	Y	-0.009	-0.009	0.00	Yes	100.00	Yes
31	Y	-0.008	-0.008	0.00	Yes	100.00	Yes
32	Y	-0.008	-0.008	0.00	Yes	100.00	Yes
33	Y	-0.005	-0.005	0.00	Yes	100.00	Yes
34	Y	-0.005	-0.005	0.00	Yes	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	21	y	-0.04	1.50	No
		y	-0.04	6.50	No
		y	-0.06	2.00	No
	22	y	-0.04	1.50	No
		y	-0.04	6.50	No
		y	-0.073	2.00	No
		y	-0.06	6.00	No
	24	y	-0.018	0.708	No
		y	-0.018	5.29	No
		y	-0.016	3.00	No
Wo	21	z	-0.257	1.50	No
		z	-0.257	6.50	No
	22	z	-0.257	1.50	No
		z	-0.257	6.50	No
	24	z	-0.112	0.708	No
		z	-0.112	5.29	No
W30	21	3	-0.221	1.50	No
		3	-0.221	6.50	No
		3	-0.044	2.00	No
	22	3	-0.221	1.50	No
		3	-0.221	6.50	No
		3	-0.038	2.00	No

		3	-0.062	6.00	No
	24	3	-0.018	0.708	No
		3	-0.018	5.29	No
		3	-0.019	3.00	No
W60	21	3	-0.15	1.50	No
		3	-0.15	6.50	No
		3	-0.053	2.00	No
	22	3	-0.15	1.50	No
		3	-0.15	6.50	No
		3	-0.052	2.00	No
		3	-0.072	6.00	No
	24	3	-0.072	0.708	No
		3	-0.072	5.29	No
		3	-0.021	3.00	No
W90	21	x	-0.114	1.50	No
		x	-0.114	6.50	No
		x	-0.051	2.00	No
	22	x	-0.114	1.50	No
		x	-0.114	6.50	No
		x	-0.052	2.00	No
		x	-0.067	6.00	No
	24	x	-0.059	0.708	No
		x	-0.059	5.29	No
		x	-0.022	3.00	No
W120	21	2	-0.15	1.50	No
		2	-0.15	6.50	No
		2	-0.053	2.00	No
	22	2	-0.15	1.50	No
		2	-0.15	6.50	No
		2	-0.052	2.00	No
		2	-0.072	6.00	No
	24	2	-0.072	0.708	No
		2	-0.072	5.29	No
		2	-0.021	3.00	No
W150	21	2	-0.221	1.50	No
		2	-0.221	6.50	No
		2	-0.044	2.00	No
	22	2	-0.221	1.50	No
		2	-0.221	6.50	No
		2	-0.038	2.00	No
		2	-0.062	6.00	No
	24	2	-0.018	0.708	No
		2	-0.018	5.29	No
		2	-0.019	3.00	No
Di	21	y	-0.109	1.50	No
		y	-0.109	6.50	No
		y	-0.04	2.00	No
	22	y	-0.109	1.50	No
		y	-0.109	6.50	No
		y	-0.035	2.00	No
		y	-0.054	6.00	No
	24	y	-0.048	0.708	No
		y	-0.048	5.29	No
		y	-0.013	3.00	No
WI0	21	z	-0.036	1.50	No
		z	-0.036	6.50	No
	22	z	-0.036	1.50	No
		z	-0.036	6.50	No
	24	z	-0.018	0.708	No
		z	-0.018	5.29	No

WI30	21	3	-0.032	1.50	No
		3	-0.032	6.50	No
		3	-0.007	2.00	No
	22	3	-0.032	1.50	No
		3	-0.032	6.50	No
		3	-0.007	2.00	No
		3	-0.01	6.00	No
	24	3	-0.018	0.708	No
		3	-0.018	5.29	No
		3	-0.004	3.00	No
WI60	21	3	-0.023	1.50	No
		3	-0.023	6.50	No
		3	-0.009	2.00	No
	22	3	-0.023	1.50	No
		3	-0.023	6.50	No
		3	-0.009	2.00	No
		3	-0.012	6.00	No
	24	3	-0.012	0.708	No
		3	-0.012	5.29	No
		3	-0.005	3.00	No
WI90	21	x	-0.018	1.50	No
		x	-0.018	6.50	No
		x	-0.009	2.00	No
	22	x	-0.018	1.50	No
		x	-0.018	6.50	No
		x	-0.009	2.00	No
		x	-0.012	6.00	No
	24	x	-0.011	0.708	No
		x	-0.011	5.29	No
		x	-0.005	3.00	No
WI120	21	2	-0.023	1.50	No
		2	-0.023	6.50	No
		2	-0.009	2.00	No
	22	2	-0.023	1.50	No
		2	-0.023	6.50	No
		2	-0.009	2.00	No
		2	-0.012	6.00	No
	24	2	-0.012	0.708	No
		2	-0.012	5.29	No
		2	-0.005	3.00	No
WI150	21	2	-0.032	1.50	No
		2	-0.032	6.50	No
		2	-0.007	2.00	No
	22	2	-0.032	1.50	No
		2	-0.032	6.50	No
		2	-0.007	2.00	No
		2	-0.01	6.00	No
	24	2	-0.018	0.708	No
		2	-0.018	5.29	No
		2	-0.004	3.00	No
WL0	21	z	-0.018	1.50	No
		z	-0.018	6.50	No
	22	z	-0.018	1.50	No
		z	-0.018	6.50	No
	24	z	-0.008	0.708	No
		z	-0.008	5.29	No
WL30	21	3	-0.015	1.50	No
		3	-0.015	6.50	No
		3	-0.003	2.00	No
	22	3	-0.015	1.50	No

		3	-0.015	6.50	No
		3	-0.003	2.00	No
		3	-0.004	6.00	No
	24	3	-0.007	0.708	No
		3	-0.007	5.29	No
		3	-0.001	3.00	No
WL60	21	3	-0.01	1.50	No
		3	-0.01	6.50	No
		3	-0.004	2.00	No
	22	3	-0.01	1.50	No
		3	-0.01	6.50	No
		3	-0.004	2.00	No
		3	-0.005	6.00	No
	24	3	-0.005	0.708	No
		3	-0.005	5.29	No
		3	-0.001	3.00	No
WL90	21	x	-0.008	1.50	No
		x	-0.008	6.50	No
		x	-0.003	2.00	No
	22	x	-0.008	1.50	No
		x	-0.008	6.50	No
		x	-0.004	2.00	No
		x	-0.005	6.00	No
	24	x	-0.004	0.708	No
		x	-0.004	5.29	No
		x	-0.002	3.00	No
WL120	21	2	-0.01	1.50	No
		2	-0.01	6.50	No
		2	-0.004	2.00	No
	22	2	-0.01	1.50	No
		2	-0.01	6.50	No
		2	-0.004	2.00	No
		2	-0.005	6.00	No
	24	2	-0.005	0.708	No
		2	-0.005	5.29	No
		2	-0.001	3.00	No
WL150	21	2	-0.015	1.50	No
		2	-0.015	6.50	No
		2	-0.003	2.00	No
	22	2	-0.015	1.50	No
		2	-0.015	6.50	No
		2	-0.003	2.00	No
		2	-0.004	6.00	No
	24	2	-0.007	0.708	No
		2	-0.007	5.29	No
		2	-0.001	3.00	No
LL1	17	y	-0.25	86.00	Yes
LL2	17	y	-0.25	0.00	No
LL3	18	y	-0.25	100.00	Yes
LLa1	22	y	-0.25	50.00	Yes
LLa2	21	y	-0.25	50.00	Yes
LLa3	24	y	-0.25	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load Right End of Mount	No	0.00	0.00	0.00
LL3	250 lb Live Load Left End of Mount	No	0.00	0.00	0.00
LLa1	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

Earthquake (Dynamic analysis only)

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

LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+Wl0
LC26=1.2D+Di+Wl30
LC27=1.2D+Di+Wl60
LC28=1.2D+Di+Wl90
LC29=1.2D+Di+Wl120
LC30=1.2D+Di+Wl150
LC31=1.2D+Di-Wl0
LC32=1.2D+Di-Wl30
LC33=1.2D+Di-Wl60
LC34=1.2D+Di-Wl90
LC35=1.2D+Di-Wl120
LC36=1.2D+Di-Wl150
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

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 2-1_2X2-1_2X1_4	**31**	LC11 at 66.67%	**0.63**	**OK**	
		32	LC5 at 31.25%	0.61	OK	
	PIPE 1-1_2x0.145	**33**	LC36 at 100.00%	0.15	OK	
		34	LC1 at 0.00%	**0.19**	**OK**	
	PIPE 1-1_4x0.140	**17**	LC32 at 100.00%	1.45	N.G.	
		18	LC36 at 13.75%	0.94	OK	
		19	LC30 at 86.25%	0.97	OK	
		20	LC26 at 0.00%	**1.70**	**N.G.**	
	PIPE 2-1_2x0.203	**25**	LC36 at 100.00%	**0.91**	**OK**	
		26	LC30 at 100.00%	0.86	OK	
	PIPE 2x0.154	**21**	LC7 at 35.42%	**0.25**	**OK**	
		22	LC7 at 35.42%	0.25	OK	
		23	LC35 at 29.17%	0.21	OK	
		24	LC40 at 29.17%	0.12	OK	
	PIPE 4x0.237	**30**	LC36 at 75.00%	**0.12**	**OK**	
	RndBar 1	**27**	LC25 at 0.00%	0.11	OK	
		28	LC34 at 0.00%	**0.39**	**OK**	
		29	LC30 at 100.00%	0.24	OK	
	RndBar 1-1_4	**9**	LC13 at 50.00%	**0.67**	**OK**	
		13	LC7 at 50.00%	0.25	OK	
	RndBar 5_8	**10**	LC24 at 0.00%	0.09	OK	
		11	LC31 at 100.00%	0.28	OK	
		12	LC26 at 100.00%	0.15	OK	
		14	LC6 at 0.00%	0.15	OK	
		15	LC26 at 100.00%	**2.29**	**N.G.**	
		16	LC32 at 100.00%	0.13	With warnings	

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Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
4	5.83	0.00	0.00	0
5	2.00	0.00	0.00	0
6	-1.83	0.00	0.00	0
7	-6.16	0.00	0.00	0
8	-6.16	0.00	0.20	0
9	-1.83	0.00	0.20	0
10	2.00	0.00	0.20	0
11	5.83	0.00	0.20	0
12	5.50	0.00	0.00	0
13	2.75	0.00	0.00	0
14	-2.08	0.00	0.00	0
15	-5.50	0.00	0.00	0
16	0.00	2.50	0.00	0
17	6.50	2.50	0.00	0
18	-6.50	2.50	0.00	0
19	5.83	2.50	0.00	0
20	2.00	2.50	0.00	0
21	-1.83	2.50	0.00	0
22	-6.16	2.50	0.00	0

23	-6.16	2.50	0.20	0
24	-1.83	2.50	0.20	0
25	2.00	2.50	0.20	0
26	5.83	2.50	0.20	0
27	5.50	2.50	0.00	0
28	2.75	2.50	0.00	0
29	-2.08	2.50	0.00	0
30	-5.50	2.50	0.00	0
31	-1.04	2.50	0.00	0
32	-1.04	0.00	0.00	0
37	-6.16	4.25	0.20	0
38	-1.83	4.25	0.20	0
39	-1.83	-1.75	0.20	0
40	-6.16	-1.75	0.20	0
41	2.00	5.25	0.20	0
42	5.83	5.25	0.20	0
43	2.00	-2.75	0.20	0
44	5.83	-2.75	0.20	0
45	-1.04	2.50	-2.67	0
46	-1.04	0.00	-2.67	0
47	-1.04	2.50	-2.15	0
48	-1.04	0.00	-2.15	0
49	-1.04	2.50	-0.82	0
50	-1.04	0.00	-0.82	0
52	-1.04	3.11	-2.67	0
53	-1.04	-0.61	-2.67	0
54	-1.04	3.88	-2.67	0
55	-1.04	-1.38	-2.67	0
58	-1.50	3.11	-5.90	0
59	-1.50	-0.61	-5.90	0
64	-1.3905	3.11	-5.131	0
73	-1.1933	3.11	-3.7467	0
74	-1.3905	-0.61	-5.131	0
75	-1.1933	-0.61	-3.7467	0
76	-5.50	1.25	0.00	0
77	5.50	1.25	0.00	0
78	-2.00	1.25	-7.00	0
79	0.00	1.25	-7.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
64	1	1	1	1	1	1
73	1	1	1	1	1	1
74	1	1	1	1	1	1
75	1	1	1	1	1	1
78	1	1	1	0	0	0
79	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
9	12	27		RndBar 1-1_4	A36	0.00	0.00	0.00
10	13	28		RndBar 5_8	A36	0.00	0.00	0.00
11	1	16		RndBar 5_8	A36	0.00	0.00	0.00
12	14	29		RndBar 5_8	A36	0.00	0.00	0.00
13	15	30		RndBar 1-1_4	A36	0.00	0.00	0.00
14	12	28		RndBar 5_8	A36	0.00	0.00	0.00
15	28	1		RndBar 5_8	A36	0.00	0.00	0.00
16	29	15		RndBar 5_8	A36	0.00	0.00	0.00
17	17	31		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
18	31	18		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
19	3	32		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
20	32	2		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
21	41	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	42	44		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
23	38	39		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	37	40		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
25	31	45		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
26	32	46		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
27	48	47		RndBar 1	A36	0.00	0.00	0.00
28	50	49		RndBar 1	A36	0.00	0.00	0.00
29	50	47		RndBar 1	A36	0.00	0.00	0.00
30	55	54		PIPE 4x0.237	A53 GrB	0.00	0.00	0.00
31	58	52		HSS_SQR 2-1_2X2-1_2...	A500 GrB rectangular	0.00	0.00	0.00
32	53	59		HSS_SQR 2-1_2X2-1_2...	A500 GrB rectangular	0.00	0.00	0.00
33	78	76		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
34	79	77		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
21	315.00	0	0.00	0.00	0.00
22	315.00	0	0.00	0.00	0.00
24	315.00	0	0.00	0.00	0.00

HUDSON
Design Group LLC

Mount Calculations
(Modified Conditions)

Bentley

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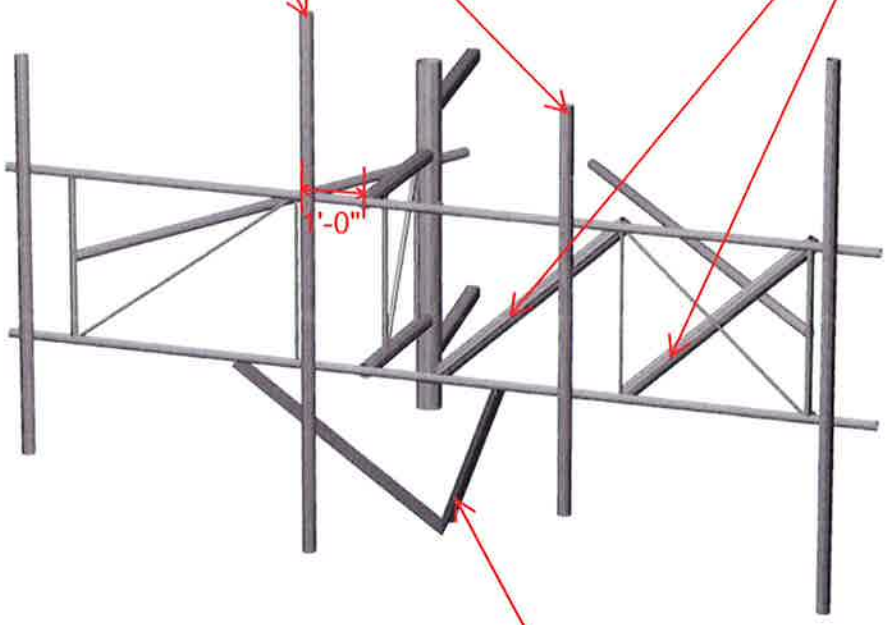
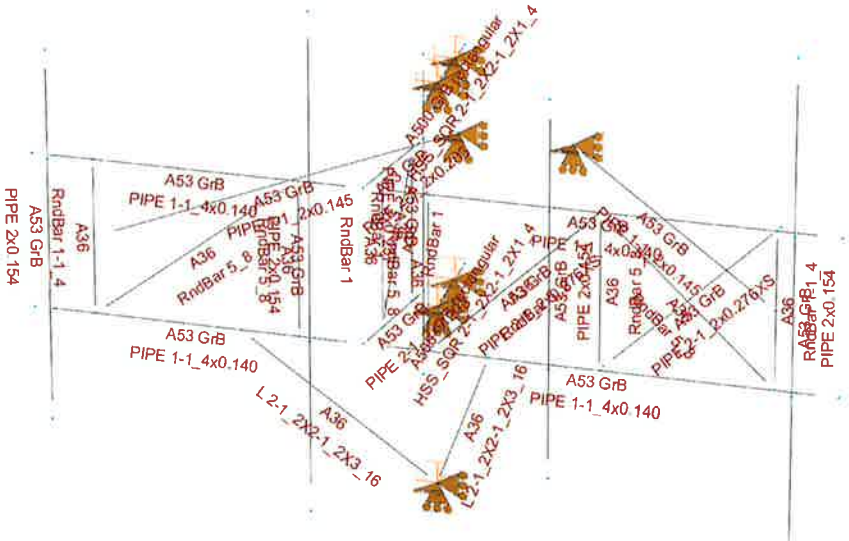
Swap antenna position 2 with antenna position 3. Antenna position 2 to have a maximum distance of 1'-0" from the mount stand-off (typ. of 2 per sector, total of 6).

Install new 2-1/2" x-strong (2.88" O.D.) diagonal pipe braces secured to the existing mount (typ. of 2 per sector, total of 6).



Install new Sector Frame Stabilizer Kit, SitePro1 P/N SFS-V-L (or approved equal) (typ. of 1 per sector, total of 3).


A53 GrB
PIPE 1-1_4x0.140
A53 GrB
PIPE 2x0.154
A36
RndBar 1-1_4
A53 GrB
PIPE 1-1_4x0.140
L 2-1_2X2-1_2X3_16
A36
A53 GrB
PIPE 1-1_4x0.140
A53 GrB
PIPE 2x0.154
A36
RndBar 5_8
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 1-1_2x0.145
A36
RndBar 1
A500 GrB Rectangular
HSS_SQR 2-1_2X2-1_2X1_4
A53 GrB
PIPE 2x0.203
A53 GrB
PIPE 2x0.154
A36
RndBar 5_8
A53 GrB
PIPE 1-1_2x0.276XS
A53 GrB
PIPE 1-1_4x0.140
A36
L 2-1_2X2-1_2X3_16
A53 GrB
PIPE 1-1_4x0.140
A53 GrB
PIPE 2x0.154
A36
RndBar 1-1_4
A53 GrB
PIPE 2x0.154
Y
Z
X

Bentley

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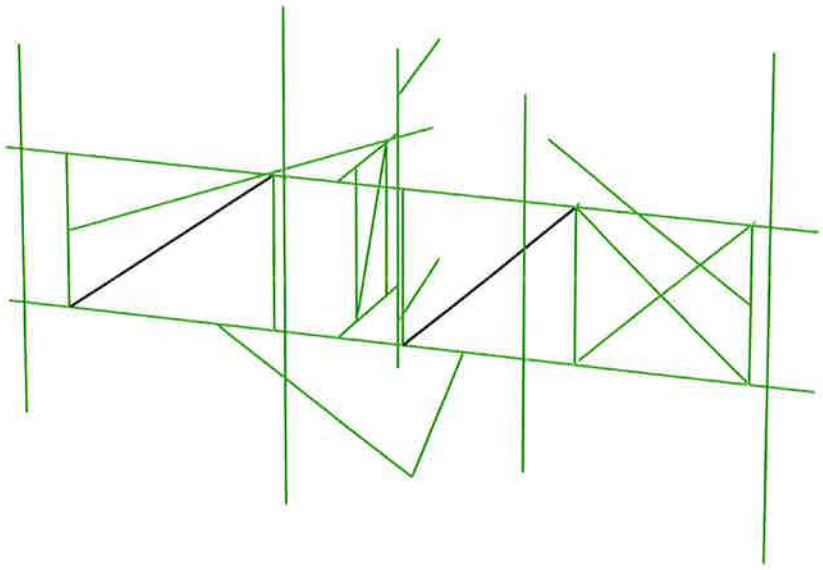
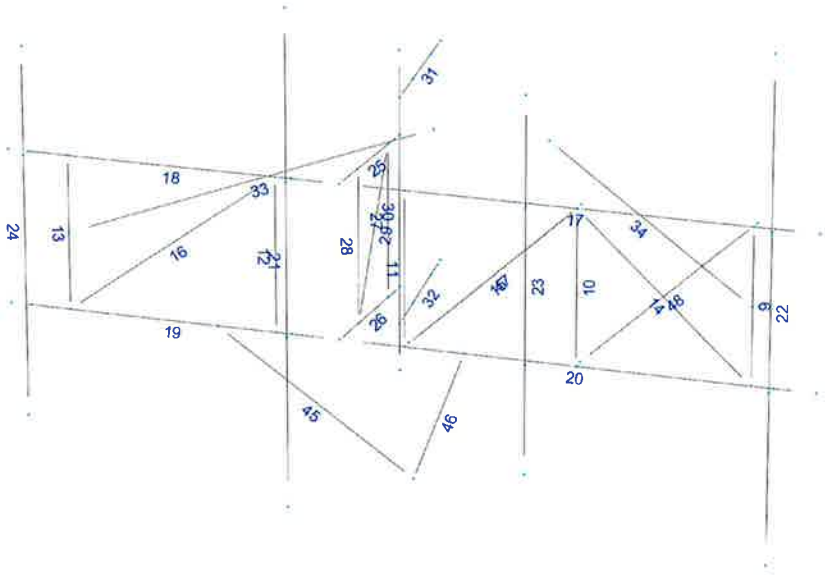
Not designed
Error on design
Design O.K.
With warnings

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

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

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 2-1_2X2-1_2X1_4	**31**	LC11 at 66.67%	**0.51**	**OK**	
		32	LC11 at 31.25%	0.40	OK	
	L 2-1_2X2-1_2X3_16	**45**	LC4 at 100.00%	0.44	OK	
		46	LC5 at 100.00%	**0.46**	**OK**	
	PIPE 1-1_2x0.145	**33**	LC39 at 100.00%	0.13	OK	
		34	LC24 at 0.00%	**0.14**	**OK**	
	PIPE 1-1_4x0.140	**17**	LC36 at 100.00%	0.61	OK	
		18	LC36 at 13.75%	0.65	OK	
		19	LC39 at 62.50%	0.61	OK	
		20	LC39 at 26.79%	**0.89**	**OK**	
	PIPE 2-1_2x0.203	**25**	LC11 at 100.00%	**0.60**	**OK**	
		26	LC4 at 100.00%	0.37	OK	
	PIPE 2-1_2x0.276XS	**47**	LC39 at 0.00%	**0.11**	**OK**	
		48	LC39 at 100.00%	0.05	OK	
	PIPE 2x0.154	**21**	LC32 at 64.58%	**0.28**	**OK**	
		22	LC1 at 33.33%	0.23	OK	
		23	LC39 at 68.75%	0.16	OK	
		24	LC40 at 29.17%	0.13	OK	
	PIPE 4x0.237	**30**	LC32 at 75.00%	**0.06**	**OK**	
	RndBar 1	**27**	LC35 at 0.00%	0.07	OK	
		28	LC36 at 100.00%	**0.26**	**OK**	
		29	LC34 at 100.00%	0.13	OK	
	RndBar 1-1_4	**9**	LC6 at 50.00%	**0.58**	**OK**	
		13	LC7 at 50.00%	0.26	OK	
	RndBar 5_8	**10**	LC12 at 0.00%	0.07	OK	
		11	LC39 at 100.00%	0.13	OK	
		12	LC2 at 100.00%	**0.32**	**OK**	
		14	LC6 at 0.00%	0.15	OK	
		15	LC40 at 0.00%	0.28	With warnings	
		16	LC32 at 100.00%	0.13	With warnings	

Bentley

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Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
4	5.83	0.00	0.00	0
5	-1.83	0.00	0.00	0
6	2.00	0.00	0.00	0
7	-6.16	0.00	0.00	0
8	-6.16	0.00	0.20	0
9	2.00	0.00	0.20	0
10	-1.83	0.00	0.20	0
11	5.83	0.00	0.20	0
12	5.50	0.00	0.00	0
13	2.75	0.00	0.00	0
14	-2.08	0.00	0.00	0
15	-5.50	0.00	0.00	0
16	0.00	2.50	0.00	0
17	6.50	2.50	0.00	0
18	-6.50	2.50	0.00	0
19	5.83	2.50	0.00	0
20	-1.83	2.50	0.00	0
21	2.00	2.50	0.00	0
22	-6.16	2.50	0.00	0

23	-6.16	2.50	0.20	0
24	2.00	2.50	0.20	0
25	-1.83	2.50	0.20	0
26	5.83	2.50	0.20	0
27	5.50	2.50	0.00	0
28	2.75	2.50	0.00	0
29	-2.08	2.50	0.00	0
30	-5.50	2.50	0.00	0
31	-1.04	2.50	0.00	0
32	-1.04	0.00	0.00	0
37	-6.16	4.25	0.20	0
38	2.00	4.25	0.20	0
39	2.00	-1.75	0.20	0
40	-6.16	-1.75	0.20	0
41	-1.83	5.25	0.20	0
42	5.83	5.25	0.20	0
43	-1.83	-2.75	0.20	0
44	5.83	-2.75	0.20	0
45	-1.04	2.50	-2.67	0
46	-1.04	0.00	-2.67	0
47	-1.04	2.50	-2.15	0
48	-1.04	0.00	-2.15	0
49	-1.04	2.50	-0.82	0
50	-1.04	0.00	-0.82	0
52	-1.04	3.11	-2.67	0
53	-1.04	-0.61	-2.67	0
54	-1.04	3.88	-2.67	0
55	-1.04	-1.38	-2.67	0
58	-1.50	3.11	-5.90	0
59	-1.50	-0.61	-5.90	0
64	-1.3905	3.11	-5.131	0
73	-1.1933	3.11	-3.7467	0
74	-1.3905	-0.61	-5.131	0
75	-1.1933	-0.61	-3.7467	0
76	-5.50	1.25	0.00	0
77	5.50	1.25	0.00	0
78	-2.00	1.25	-7.00	0
79	0.00	1.25	-7.00	0
80	0.00	0.00	-0.20	0
81	2.75	2.50	-0.20	0
82	2.75	0.00	-0.20	0
83	5.50	2.50	-0.20	0
86	0.96	0.00	0.00	0
87	-3.04	0.00	0.00	0
88	-1.1933	-3.61	-3.7467	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
64	1	1	1	1	1	1
73	1	1	1	1	1	1
74	1	1	1	1	1	1
75	1	1	1	1	1	1
78	1	1	1	0	0	0
79	1	1	1	0	0	0

88	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
9	12	27		RndBar 1-1_4	A36	0.00	0.00	0.00
10	13	28		RndBar 5_8	A36	0.00	0.00	0.00
11	1	16		RndBar 5_8	A36	0.00	0.00	0.00
12	14	29		RndBar 5_8	A36	0.00	0.00	0.00
13	15	30		RndBar 1-1_4	A36	0.00	0.00	0.00
14	12	28		RndBar 5_8	A36	0.00	0.00	0.00
15	28	1		RndBar 5_8	A36	0.00	0.00	0.00
16	29	15		RndBar 5_8	A36	0.00	0.00	0.00
17	17	31		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
18	31	18		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
19	3	32		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
20	32	2		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
21	41	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	42	44		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
23	38	39		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	37	40		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
25	31	45		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
26	32	46		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
27	48	47		RndBar 1	A36	0.00	0.00	0.00
28	50	49		RndBar 1	A36	0.00	0.00	0.00
29	50	47		RndBar 1	A36	0.00	0.00	0.00
30	55	54		PIPE 4x0.237	A53 GrB	0.00	0.00	0.00
31	58	52		HSS_SQR 2-1_2X2-1_2...	A500 GrB rectangular	0.00	0.00	0.00
32	53	59		HSS_SQR 2-1_2X2-1_2...	A500 GrB rectangular	0.00	0.00	0.00
33	78	76		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
34	79	77		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
45	87	88		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
46	86	88		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
47	80	81		PIPE 2-1_2x0.276XS	A53 GrB	0.00	0.00	0.00
48	82	83		PIPE 2-1_2x0.276XS	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
21	315.00	0	0.00	0.00	0.00
22	315.00	0	0.00	0.00	0.00
24	315.00	0	0.00	0.00	0.00
45	180.00	0	0.00	0.00	0.00
46	90.00	0	0.00	0.00	0.00

Permit # 5830 Building Inspector W Bonap

Date 4-24-98

BUILDING PERMIT

ISSUED TO Litchfield County Dispatch

TO

AT LOCATION 38 Lower Rd

TOWN OF NORTH CANAAN, CONN.

THIS PERMIT EXPIRES ONE YEAR FROM DATE OF ISSUE

POST THIS CARD AT BUILDING SIGHT IN A DRY AREA AVAILABLE TO THE BUILDING OFFICIAL

Where applicable, separate permits are required for electrical, plumbing and mechanical installations.

Work shall not proceed until the Inspector has approved the various stages of construction.

	Date Inspected		Date Inspected
Preliminary & or Excavation		Plumbing Rough-In	
Footings & Foundations		HVAC Rough-In	
Waterproofing/Foundation Coating		Electric Rough-In	
Footing Drains		Fireplace & Masonry Chimneys	
Electrical Service		Insulation Inspection	
Framing Inspection		Sheetrock or Plaster	
Roofing Inspection		Fuel Tanks and Lines	

This Structure is Not to be Used in Whole or Part Until a Certificate of Occupancy is Issued

APPLICATION FOR BUILDING PERMIT

(APPLICATION MUST BE TYPED OR PRINTED)

TOWN OF North Canaan PERMIT NO. 5830

LOCATION OF JOB

38 Lower Road
NO. STREET

N. Canaan Ct 06018
TOWN STATE ZIP

FEE SCHEDULE

FEE	ESTIMATED VALUE
$12	FOR 1ST $1000 (MINIMUM FEE).
$ 5	FOR EACH ADDITIONAL $1000 OR PART THEREOF.

BUILDING OFFICIAL MAY DEMAND AFFIDAVIT OF ACTUAL VALUE.

TYPE OF JOB

- ☒ ORIGINAL CONST. ☐ REPAIR
- ☐ ALTERATION ☐ DEMOLITION
- ☐ ADDITION ☐ CHANGE OF USE

OWNER

Litchfield County Dispatch Inc
NAME

452 Bantam Rd
NO. STREET

Litchfield Ct 06759
TOWN STATE ZIP

VALUE-FEES

	VALUE	FEE
ESTIMATED	$ 750,000.00	$ 3750.00
ACTUAL		
DIFFERENCE		
ADDITIONAL FEE		

REQUIREMENTS

- ☒ BLUEPRINTS ☐ TOWN ZONING
- ☐ SANITATION APPLIC. ☐ PLOT PLAN
- ☐ OTHER

APPLICANT

Litchfield County Dispatch Inc
NAME

452 Bantam Rd
NO. STREET

Litchfield Ct 06759
TOWN STATE ZIP

DEPARTMENT DECISION

APPLICATION IS HEREBY
☒ APPROVED ☐ DISAPPROVED

4-25-78 W Lowe & D
DATE INSPECTOR

TYPE OF BUILDING

- ☐ RESIDENTIAL ☐ COMMERCIAL
- ☒ Emergency 911 Radio Tower and Transmitter Building
OTHER

BUILDING

BUILDER-CONTRACTOR INFORMATION

NAME

CONTRACTOR LICENSE - REGISTRATION NUMBER

NO. STREET

EXPIRATION DATE CONTRACTOR TELEPHONE

TOWN STATE ZIP

CONTRACTOR SIGNATURE

MECHANICAL CONTRACTORS ARE REQUIRED TO OBTAIN PERMITS BEFORE STARTING ANY WORK.
PERMITS EXPIRE ONE (1) YEAR FROM DATE OF ISSUE.

DISTANCE FROM EACH SIDE LOT LINE

NORTH _____ EAST _____

SOUTH _____ WEST _____

1. DESCRIPTION OF STRUCTURE Communication Tower and 1 story Bldg TYPE 3A NO. OF STORIES 195-T
2. PROPOSED USE 911 Communication USE GROUP M
3. TWO (2) COPIES OF PLANS AND SPECIFICATIONS ATTACHED ☐ YES ☐ NO
4. PLOT PLAN ATTACHED ☐ YES ☐ NO

REMARKS:

1. Seismic Requirement (see Spec Page 135) design will follow.

2. Plat Plan will follow.

This is to certify that I am the owner or authorized agent for the owner. All work covered by this application has been authorized by the owner of this property and will be done according to the Connecticut Basic Building Code. As the applicant I understand that a Certificate of Use and Occupancy document is required before occupancy.

4-24-78 Alan J Gould "Manager"
DATE APPLICANT SIGNATURE

BO-01 (10-88)

CONTRACTOR

qPublic.net™ Town of North Canaan, CT

Summary

Parcel ID	15/086-2
Account Number	98102063
Section Plat	
Neighborhood	7 - Commercial
Property Address	Lower Rd 036 North Canaan, CT 06018
Acreage	6.37
Class	901 - BAAX Municipal
Tax District/Area	100 - NORTH CANAAN, CT

Owner

Primary Owner
Litchfield County Dispatch Inc
452 Bantam Rd
Litchfield, CT 06759-0000

Land

Lot Dimensions	Regular Lot: x
Lot Area	6.3700 Acres; 277477 SF

Site Description

Topography	
Public Utilities	
Street or Road	
Zoning	Residential- Agricultural
Legal Acres	6.3700
Legal Sq Ft	277,477

Buildings

Commercial Building	
Primary Use	Storage - Maintenance Bldg
Year Built	1999
Building Type	Storage - Maintenance Bldg:001
Condition	AV - Normal for age
Exterior Material	
Roof Type	4
Roof Material	
Interior Walls	
Predominate Floor Covs	
Stories/Floors	1
Above-Grade Living Area	1804 SF
Attic Type	None
Number of Rooms	1
Basement Type	
Basement Area	SF
Basement Finished Area	SF
Number of Bathrooms	
Central Air	N
Heat Type	0 sf
Porches	
Decks	SF
Garages	
Other Features	Cell Tower-Self Supported General Purpose Bldg Steel Frame General Purpose Bldg Steel Frame General Purpose Bldg Steel Frame

Sales

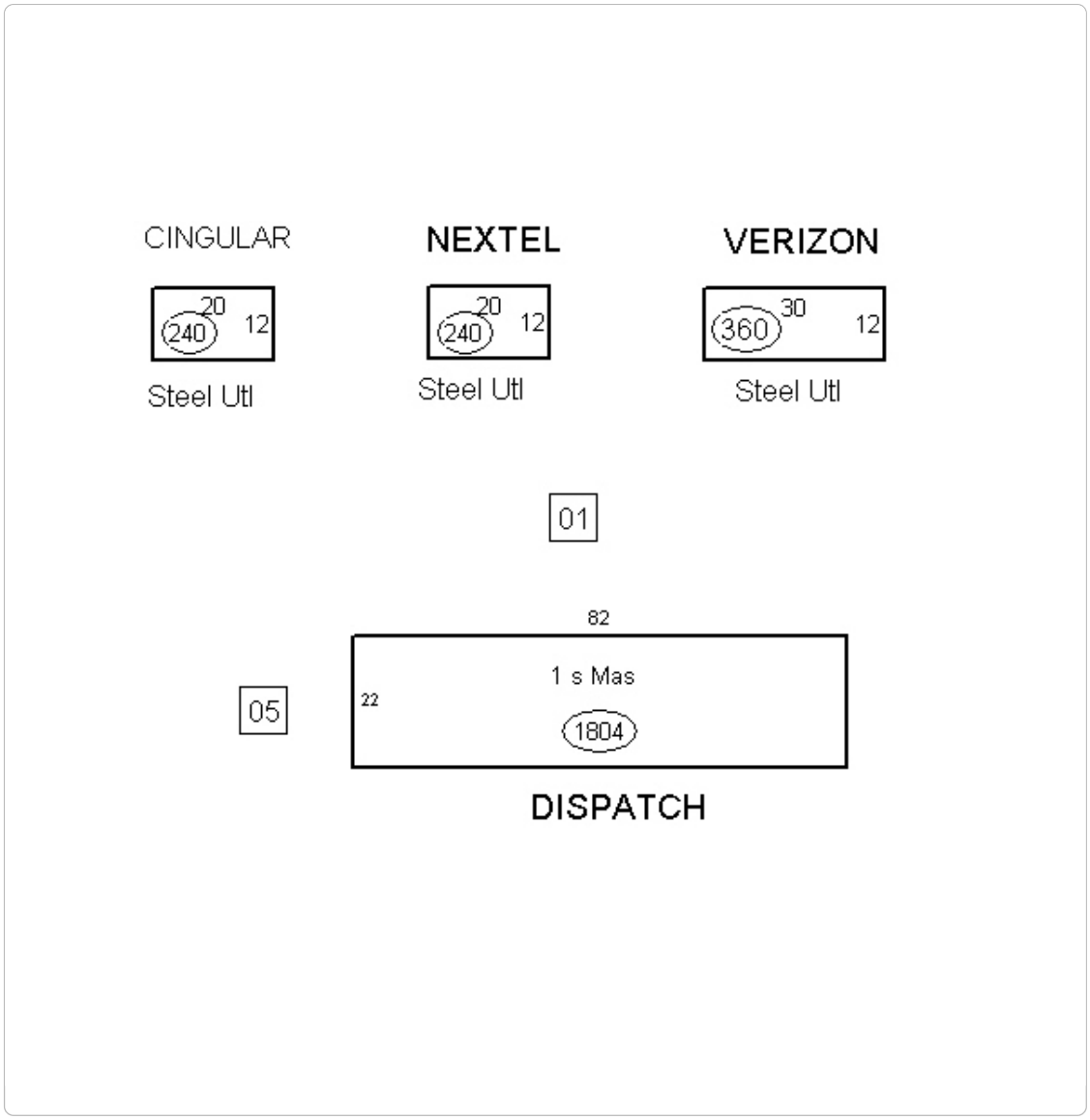
Date	Grantor	Recording	Type	Amount
12/29/1997	FOLEY THOMAS J JR & DOROTHY	Bk:0084 Pg:984		$75,000.00

Valuation

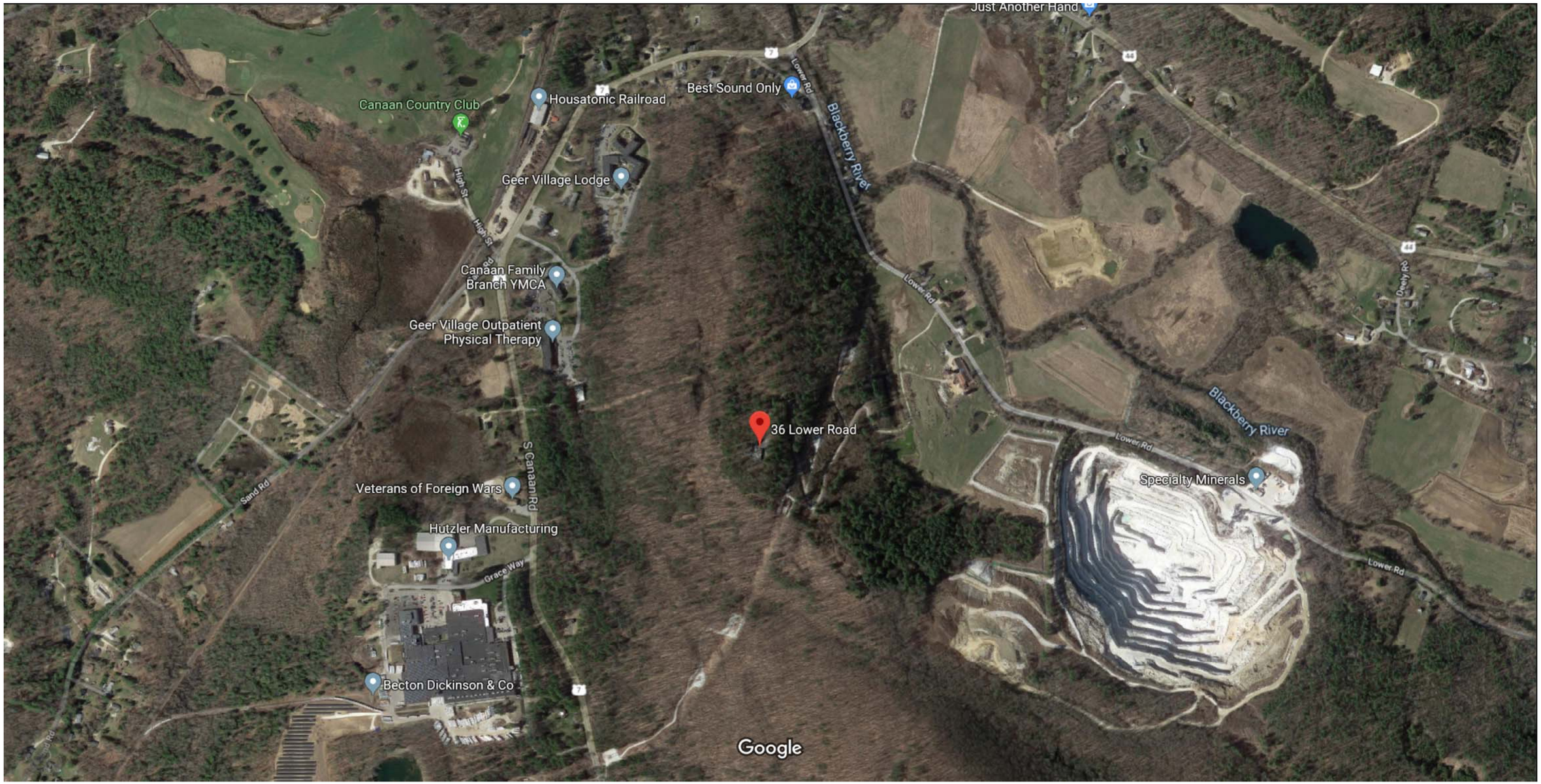
Assessment Year		10/01/2017	10/01/2012	10/01/2007
Reason for Change		2017 Reval	2012 REVAL	2007 Reval
VALUATION (Market Value)	Land	$105,560	$107,920	$126,220
	Improvements	$970,330	$977,310	$956,910
	Total	**$1,075,890**	**$1,085,230**	**$1,083,130**
VALUATION (Assessed/Use Value)	Land	$73,900	$75,540	$88,350
	Improvements	$679,240	$684,130	$669,850
	Total	**$753,140**	**$759,670**	**$758,200**

Photos

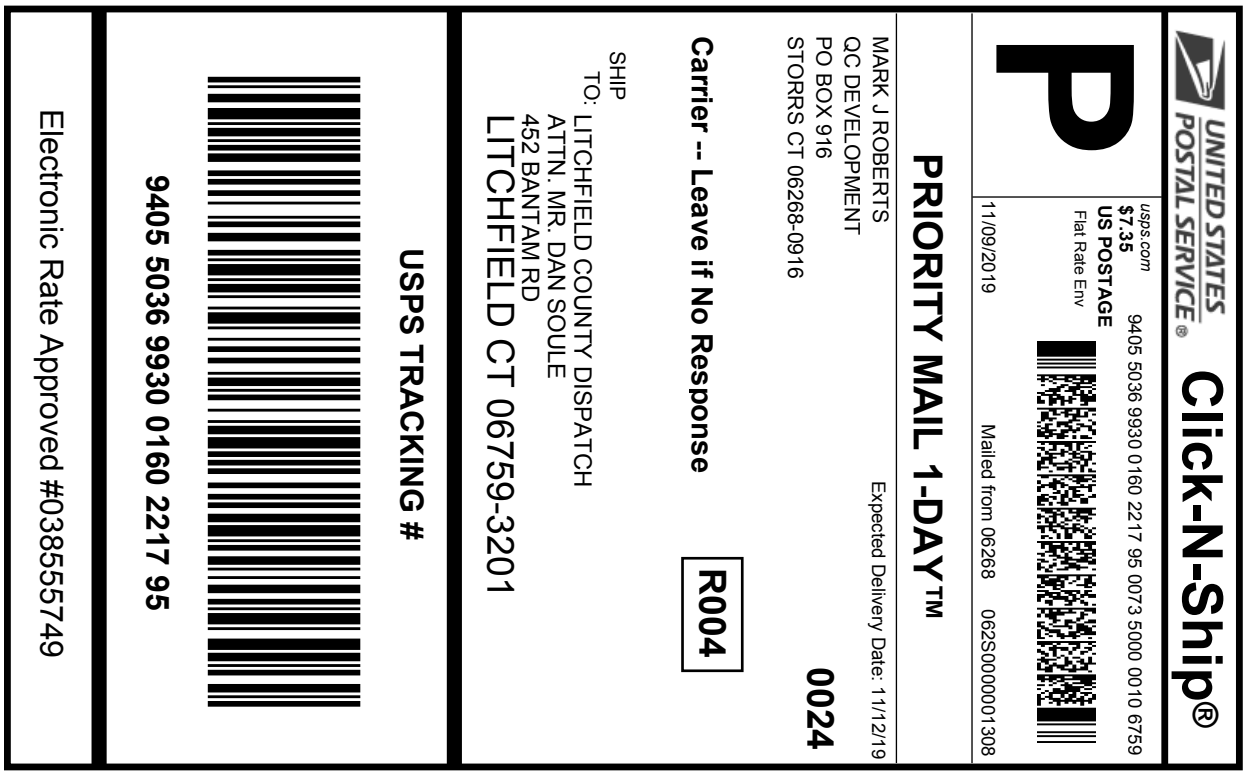
Sketches



Google Maps 36 Lower Rd



Imagery ©2019 Google, Imagery ©2019 CNES / Airbus, MassGIS, Commonwealth of Massachusetts EOEA, Maxar Technologies, USDA Farm Service Agency, Map data ©2019 500 ft



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0160 2217 95

Trans. #:	476585784
Print Date:	11/08/2019
Ship Date:	11/09/2019
Expected Delivery Date:	11/12/2019

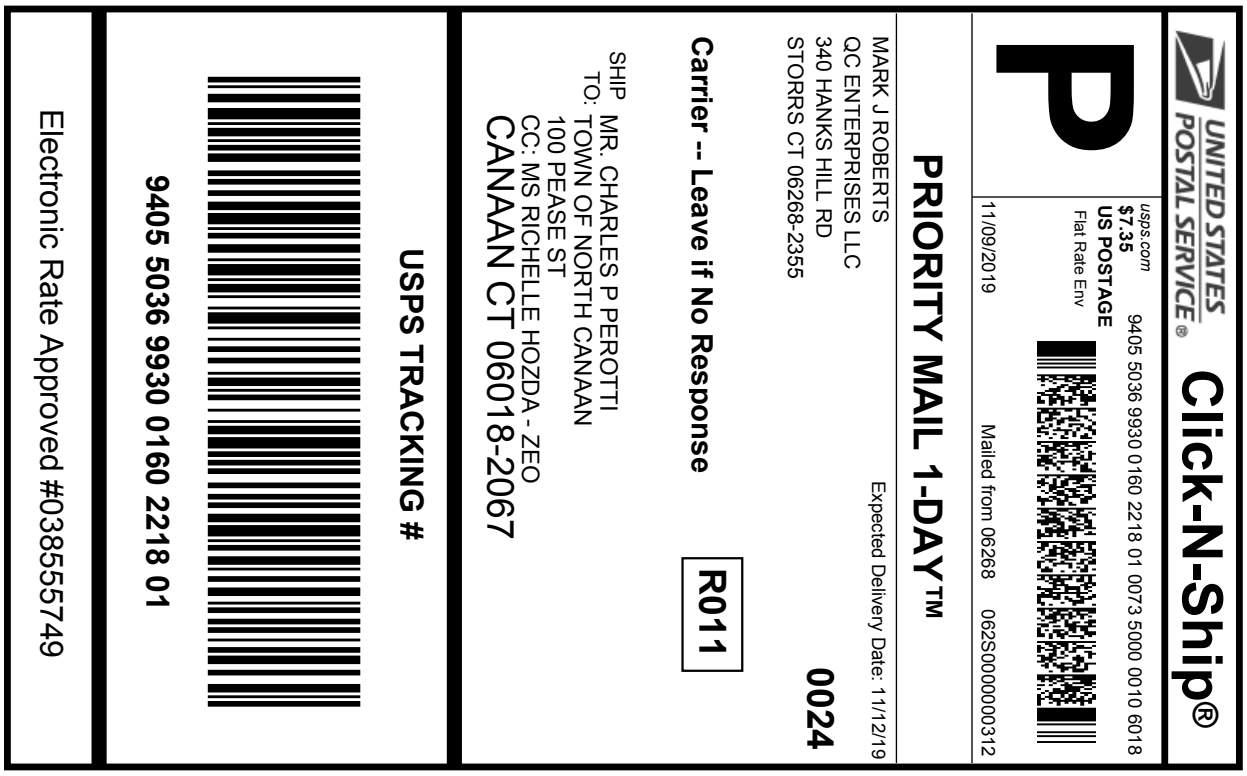
Priority Mail® Postage:	**$7.35**
Total:	**$7.35**

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

To: LITCHFIELD COUNTY DISPATCH
ATTN. MR. DAN SOULE
452 BANTAM RD
LITCHFIELD CT 06759-3201

* 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 0160 2218 01

Trans. #:	476585784
Print Date:	11/08/2019
Ship Date:	11/09/2019
Expected Delivery Date:	11/12/2019

Priority Mail® Postage:	**$7.35**
Total:	**$7.35**

From: MARK J ROBERTS
QC ENTERPRISES LLC
340 HANKS HILL RD
STORRS CT 06268-2355

To: MR. CHARLES P PEROTTI
TOWN OF NORTH CANAAN
100 PEASE ST
CC: MS RICHELLE HOZDA - ZEO
CANAAN CT 06018-2067

* 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