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

October 18, 2021

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T)
315 Spencer Plains Road, Westbrook, CT 06498 – AT&T Site # CT2047
N 41.29238889
W -72.43036389

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 148-foot level of the existing 180-foot Self Support Tower at 315 Spencer Plains Road, Westbrook. The tower is owned by the Connecticut Department of Emergency Services and Public Protection (DESPP) and the property is owned by the State of Connecticut. AT&T now intends to remove nine (9) existing antennas and install three (3) Kathrein 840-370964K and three (3) CCI DMP65R-BU4DA antennas. AT&T will also remove six (6) Remote Radio Units (RRU) and install three (3) Ericsson 8843 B2/B66A and three (3) 4449 B5/B12 RRUs. The new antennas and RRUs will also be installed at the 148-foot level. This modification/proposal includes B2, B5, and B12 hardware that is both 4G (LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

This facility was approved by the Connecticut Siting Council, Petition #061 on September 16, 1980. There were no conditions that could feasibly be violated by this modification, including total facility height or mounting restrictions. This modification therefore 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 Mr. Noel Bishop, First Selectman of the Town of Westbrook, the Westbrook Town Planner and 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.

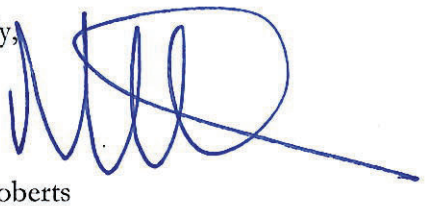
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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: Mr. Noel Bishop – First Selectman, Town of Westbrook
Eric Knapp – Westbrook Planning & Zoning
Brian Benito – CT DESPP, as Tower/Property Owner

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							13.47%
AT&T GSM	2	279	148	0.0100	880	0.5867	0.17%
AT&T GSM	1	398	148	0.0071	1900	1.0000	0.07%
AT&T UMTS	6	340	148	0.0364	880	0.5867	0.62%
AT&T UMTS	6	587	148	0.0628	1900	1.0000	0.63%
AT&T LTE	1	793	148	0.0141	740	0.4933	0.29%
AT&T LTE	1	1734	148	0.0309	1900	1.0000	0.31%
Site Total							15.56%

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

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

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							13.47%
AT&T UMTS	1	279	148	0.0050	850	0.5867	0.09%
AT&T LTE	1	1476	148	0.0263	700	1.0000	0.56%
AT&T LTE	1	1000	148	0.0178	850	0.5867	0.31%
AT&T 5G	1	1000	148	0.0178	850	1.0000	0.31%
AT&T LTE	2	3664	148	0.1307	1900	0.4933	1.31%
AT&T LTE	1	3837	148	0.0684	2100	1.0000	0.68%
Site Total							16.74%

*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 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T ANTENNAS: 840-370964K (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T RRUS: B5/B12 4449 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T RRUS: B2/B66A 8843 (AWS/PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • ADD (6) Y-CABLE. • NEW AT&T 18-PAIR FIBER TRUNK. ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION: • SWAP BB WITH (2) 6630. • ADD (1) IDLe. • ADD (1) XMU. • INSTALL NEW NETSURE 7100 WITH 3 STR BATT, (TO REPLACE EXISTING). • ADD 12 VERTIV UPCONVERTERS. ITEMS TO BE REMOVED: • EXISTING AT&T ANTENNAS: 7770 (TYP. OF 2 PER SECTOR, TOTAL OF 6). • EXISTING AT&T ANTENNAS: AM-X-CD-14-65-00T-RET (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T RRUS: RRUS-11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T RRUS: RRUS-12 B2 (PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T TT19-08BP111-001 (TYP. OF 2 PER SECTOR, TOTAL OF 6). • EXISTING AT&T (6) COAX CABLES. • EXISTING AT&T (1) FIBER. ITEMS TO REMAIN: • (1) SURGE ARRESTOR, (6) COAX CABLES & (2) DC POWER.
SITE ADDRESS:	315 SPENCER PLAIN ROAD WESTBROOK, CT 06498
LATITUDE:	41.292436 N, 41° 17' 32.76" N
LONGITUDE:	72.430388 W, 72° 25' 49.39" W
TYPE OF SITE:	SELF SUPPORT TOWER / INDOOR
STRUCTURE HEIGHT:	180'-0"±
RAD CENTER:	148'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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G-1	GROUNDING DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1

SITE NUMBER: CT2047

SITE NAME: WESTBROOK-SPENCER RD

FA CODE: 10035035

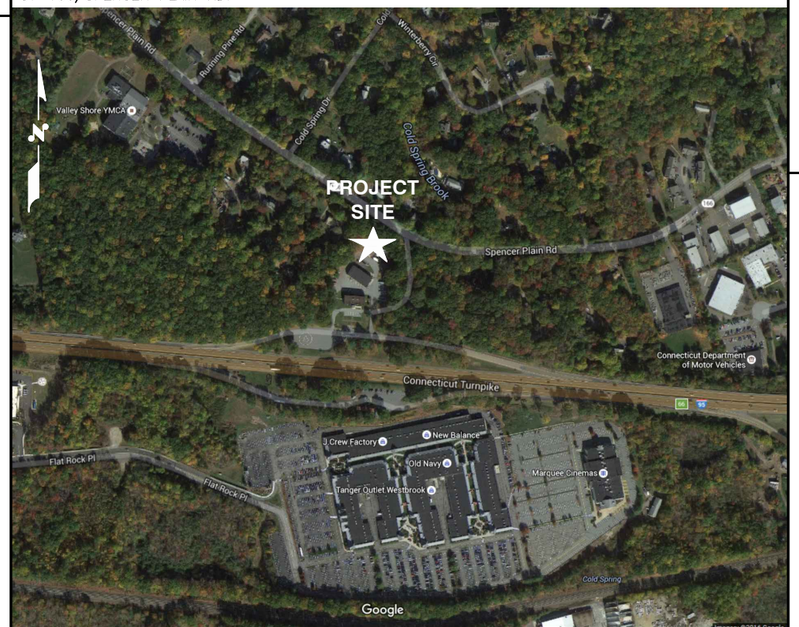
PACE ID: MRCTB040425, MRCTB040379, MRCTB040829

PROJECT: LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

FROM ROCKY HILL, CT: TAKE CT-99/MAIN ST CONTINUE TO FOLLOW MAIN ST 5.8 MI, TAKE THE RAMP ONTO CT-9 S 24.9 MI, TAKE THE EXIT ONTO GOVERNOR JOHN DAVIS LODGE TURNPIKE/I-95 S/US-1 S TOWARD NEW HAVEN/N.Y. CITY, CONTINUE TO FOLLOW GOVERNOR JOHN DAVIS LODGE TURNPIKE/I-95 S 3.4 MI, TAKE EXIT 66 FOR SPENCER PLAIN RD/CT-166 0.3 MI, TURN LEFT AT CT-166/SPENCER PLAIN RD.



GENERAL NOTES

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

72 HOURS

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

UNDERGROUND SERVICE ALERT

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

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2047
SITE NAME: WESTBROOK-SPENCER RD

315 SPENCER PLAIN ROAD
WESTBROOK, CT 06498
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	09/15/21	ISSUED FOR REVIEW	GA	HC	DPH
A	09/03/19	ISSUED FOR REVIEW	ET	HC	DPH

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

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

AT&T

TITLE SHEET
LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81 STANDARDS) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND #2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

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

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

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. **APPLICABLE BUILDING CODES:**
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

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

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

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

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

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

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

ABBREVIATIONS

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

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2047
SITE NAME: WESTBROOK-SPENCER RD

315 SPENCER PLAIN ROAD
WESTBROOK, CT 06498
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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

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

AT&T

GENERAL NOTES
LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

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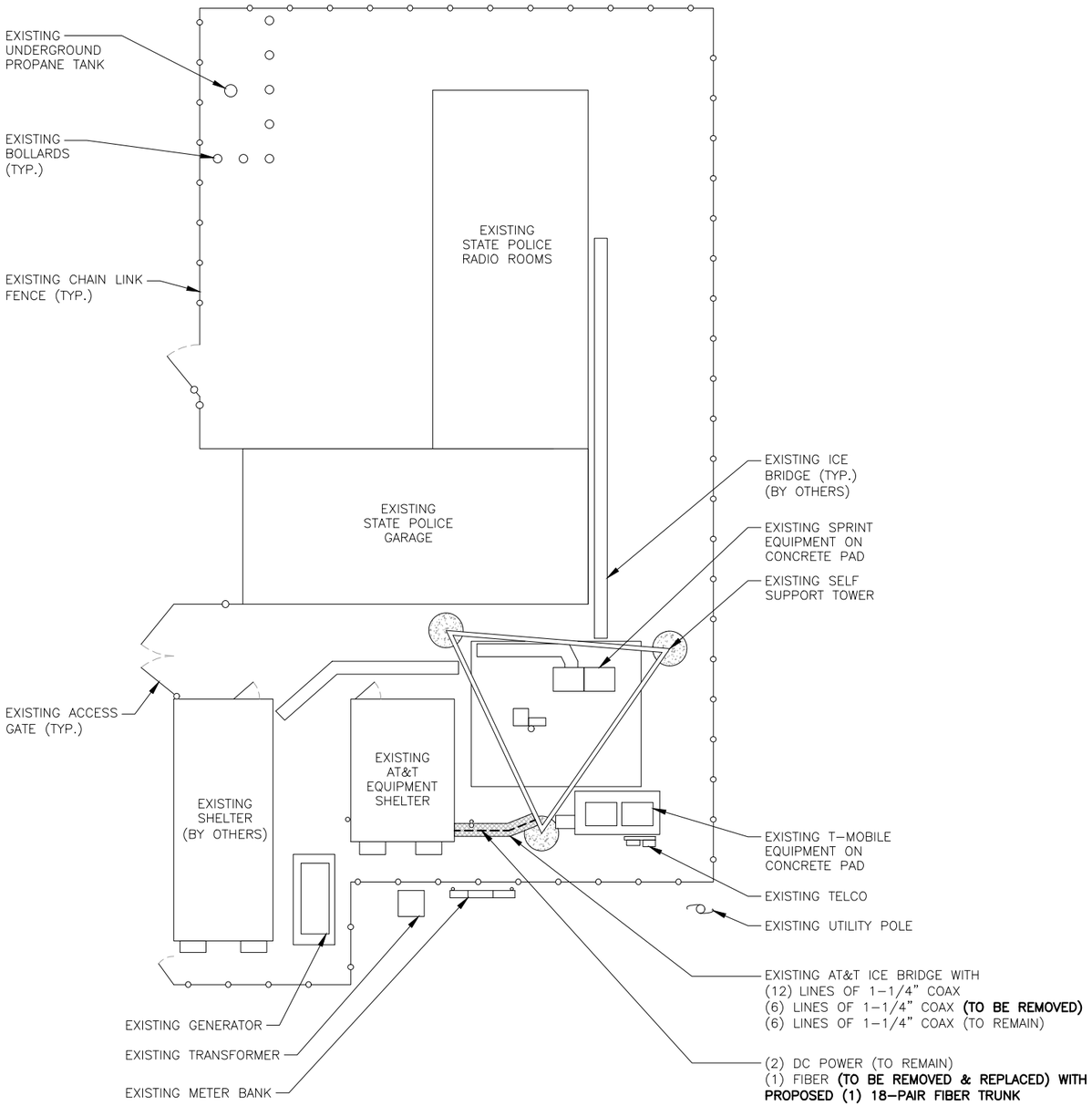
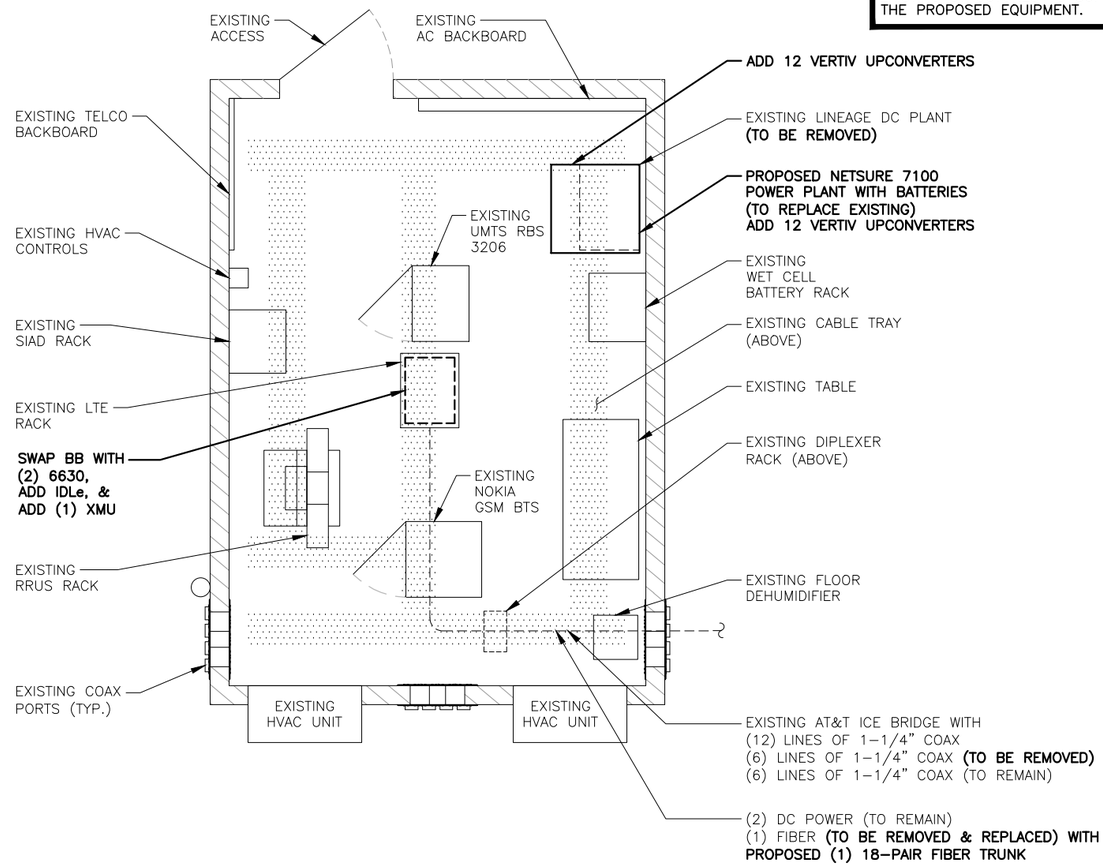
CT2047	GN-1	1





NOTE:

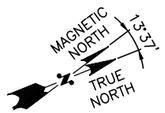
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: SEPTEMBER 3, 2021 (Rev.3)

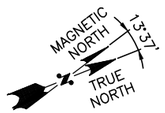
NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK ENGINEERING DATED: JULY 27, 2021 (Rev.1) FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



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"

HUDSON Design Group LLC
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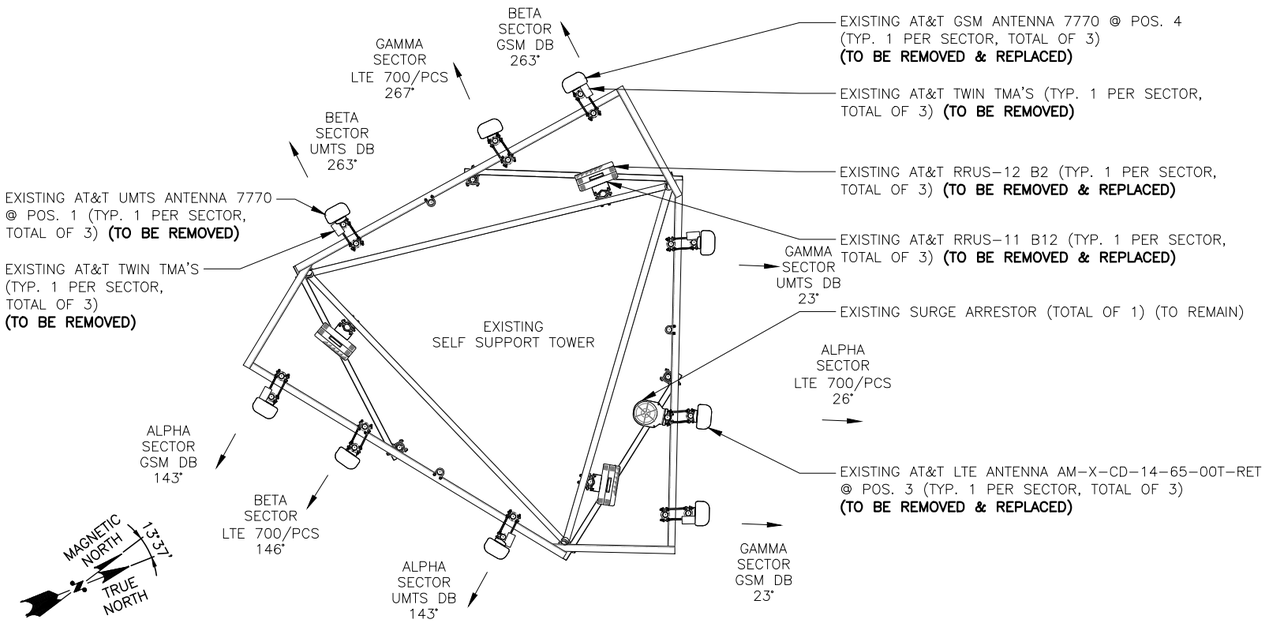
STATE OF CONNECTICUT DANIEL P. HAMM No.24178 LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLANS
LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

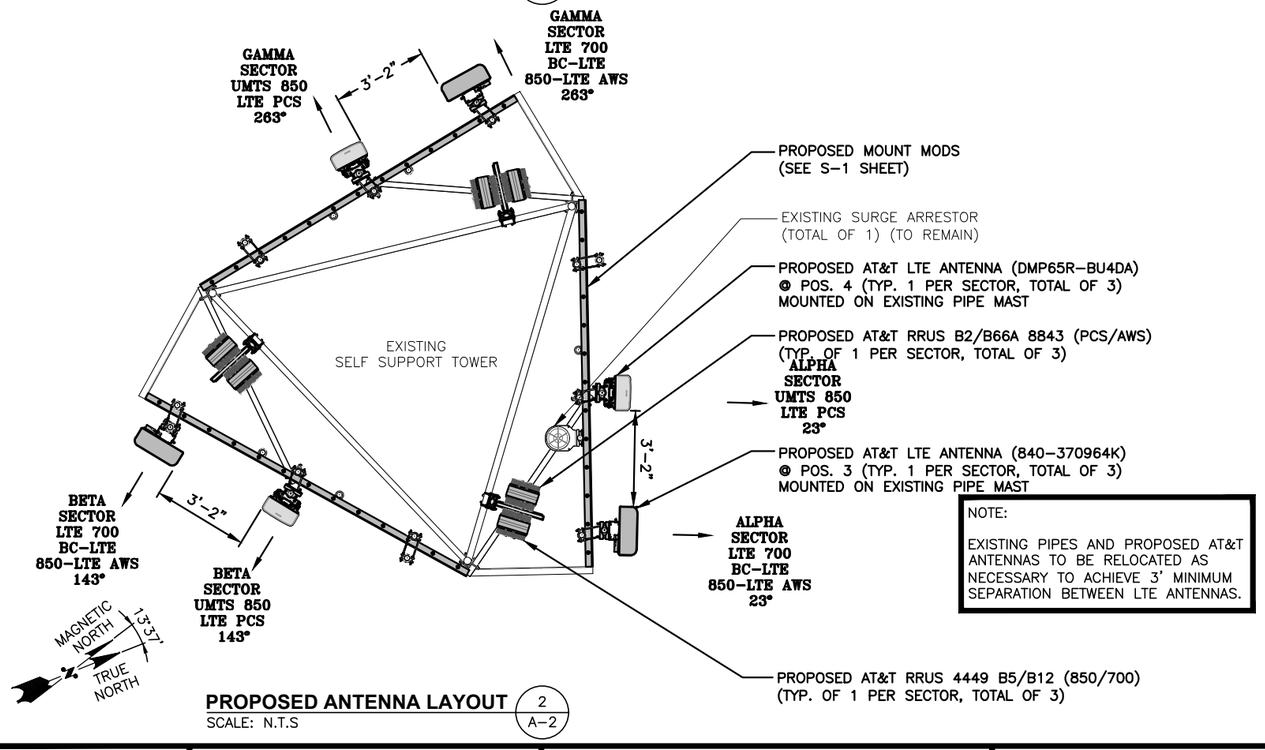
SITE NUMBER	DRAWING NUMBER	REV
CT2047	A–1	1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S

1 / A-2



NOTE:

EXISTING PIPES AND PROPOSED AT&T ANTENNAS TO BE RELOCATED AS NECESSARY TO ACHIEVE 3' MINIMUM SEPARATION BETWEEN LTE ANTENNAS.

PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

2 / A-2

NOTE:

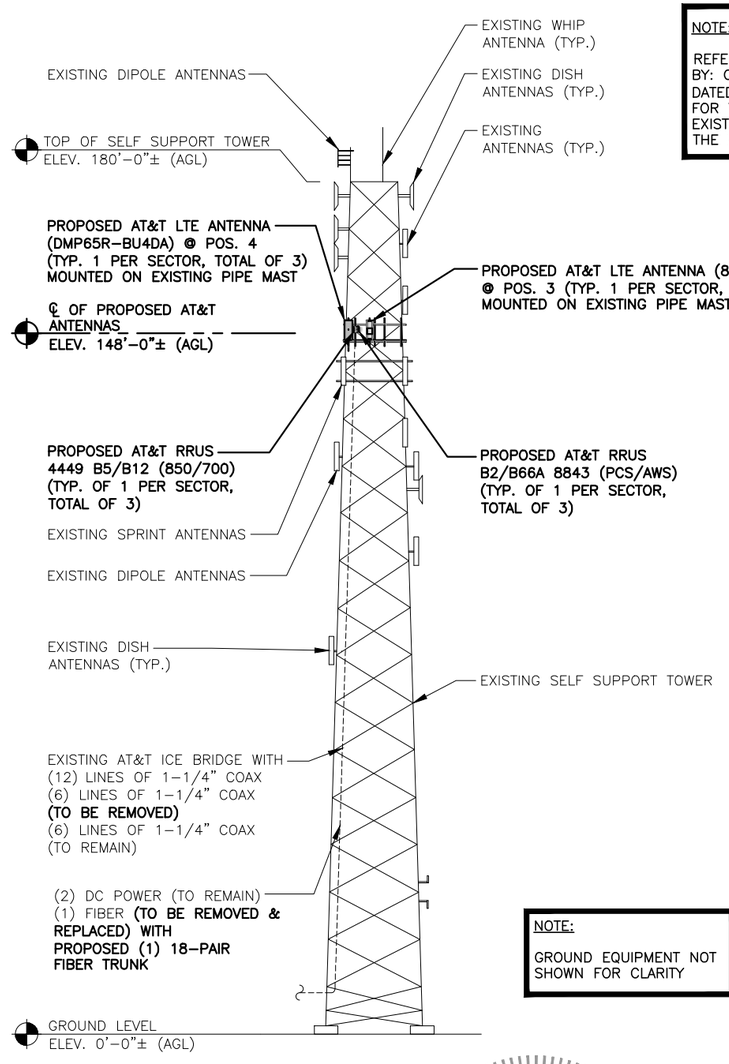
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: SEPTEMBER 3, 2021 (Rev.3)

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK ENGINEERING
DATED: JULY 27, 2021 (Rev.1)
FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



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

550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

SITE NUMBER: CT2047
SITE NAME: WESTBROOK-SPENCER RD

315 SPENCER PLAIN ROAD
WESTBROOK, CT 06498
MIDDLESEX COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/04/21	ISSUED FOR CONSTRUCTION	JJ	HC	DPH
0	09/15/21	ISSUED FOR REVIEW	GA	HC	DPH
A	09/03/19	ISSUED FOR REVIEW	ET	HC	DPH

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

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

AT&T

ANTENNA LAYOUTS & ELEVATION
LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	A-2	1

NOTE:

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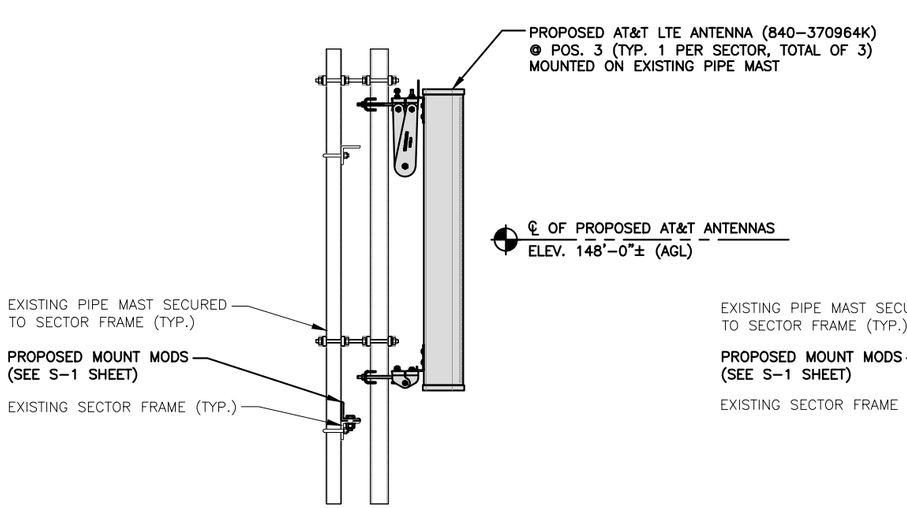
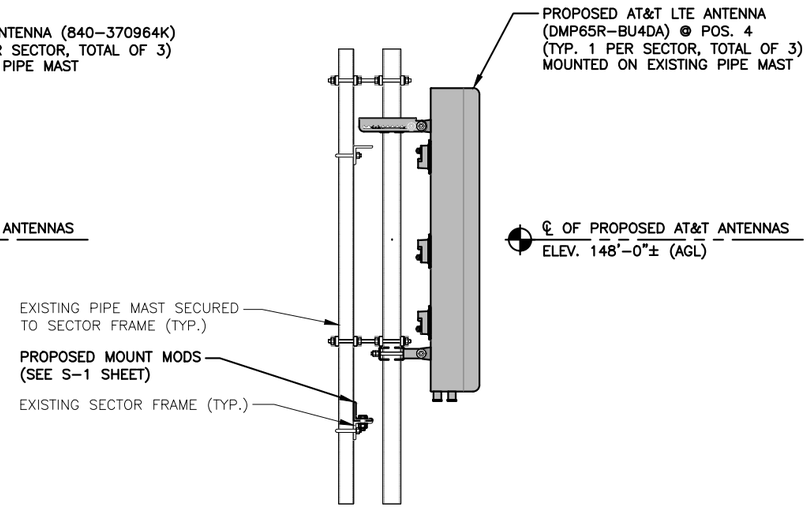


PROPOSED LTE ANTENNA MOUNTING DETAIL (POS.3) (1 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

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



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

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SITE NUMBER: CT2047
SITE NAME: WESTBROOK-SPENCER RD

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WESTBROOK, CT 06498
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
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AT&T

DETAILS

LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	A-3	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	–	–	–	–	–	–	–	–	–	–	(E) (1) RAYCAP DC6-48-60-18-8F
A2	–	–	–	–	–	–	–	–	–	–	
A3	**PROPOSED**	**UMTS 850 LTE PCS**	**840-370964K**	**47.7X14.9X6.5**	**148'-0"±**	**23°**	(2)(E)(G) CM1007-DBPXBC-003	**(P)(1) 8843 B2/B66A (PCS/AWS)**	**14.9X13.2X10.9**	(2)1-1/4 COAX	
A4	**PROPOSED**	**LTE 700 BC-LTE 850-LTE AWS**	**DMP65R-BU4DA**	**48.0X20.7X7.7**	**148'-0"±**	**23°**	–	**(P)(1) 4449 B5/B12 (850/700)**	**14.9x13.2x10.4**	(2)(E) DC POWER **& (1)(P) FIBER**	
B1	–	–	–	–	–	–	–	–	–	–	I
B2	–	–	–	–	–	–	–	–	–	–	
B3	**PROPOSED**	**UMTS 850 LTE PCS**	**840-370964K**	**47.7X14.9X6.5**	**148'-0"±**	**143°**	(2)(E)(G) CM1007-DBPXBC-003	**(P)(1) 8843 B2/B66A (PCS/AWS)**	**14.9X13.2X10.9**	(2)1-1/4 COAX	
B4	**PROPOSED**	**LTE 700 BC-LTE 850-LTE AWS**	**DMP65R-BU4DA**	**48.0X20.7X7.7**	**148'-0"±**	**143°**	–	**(P)(1) 4449 B5/B12 (850/700)**	**14.9X13.2X10.4**	–	
C1	–	–	–	–	–	–	–	–	–	–	I
C2	–	–	–	–	–	–	–	–	–	–	
C3	**PROPOSED**	**UMTS 850 LTE PCS**	**840-370964K**	**47.7X14.9X6.5**	**148'-0"±**	**263°**	(2)(E)(G) CM1007-DBPXBC-003	**(P)(1) 8843 B2/B66A (PCS/AWS)**	**14.9X13.2X10.9**	(2)1-1/4 COAX	
C4	**PROPOSED**	**LTE 700 BC-LTE 850-LTE AWS**	**DMP65R-BU4DA**	**48.0X20.7X7.7**	**148'-0"±**	**263°**	–	**(P)(1) 4449 B5/B12 (850/700)**	**14.9X13.2X10.4**	–	

FINAL ANTENNA SCHEDULE (1 / A-4)
SCALE: N.T.S

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

NOTE:
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NOTE:
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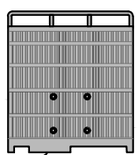
RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
P(3)	4449 (850/700)	14.9"x13.2"x10.4"
P(3)	8843 (AWS/PCS)	14.9"x13.2"x10.9"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

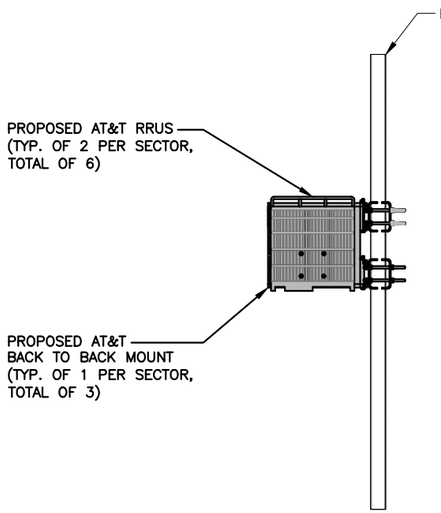
NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



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-4)
SCALE: N.T.S



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

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

PROPOSED NETSURE 7100 POWER PLANT DETAIL (4 / A-4)
SCALE: N.T.S

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

SITE NUMBER: CT2047
SITE NAME: WESTBROOK-SPENCER RD

315 SPENCER PLAIN ROAD
WESTBROOK, CT 06498
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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A	09/03/19	ISSUED FOR REVIEW	ET	HC	DPH

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

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

AT&T

DETAILS

LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	A-4	1

STRUCTURAL NOTES:

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

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

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

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

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

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

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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

AT&T

STRUCTURAL NOTES

LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	SN-1	1

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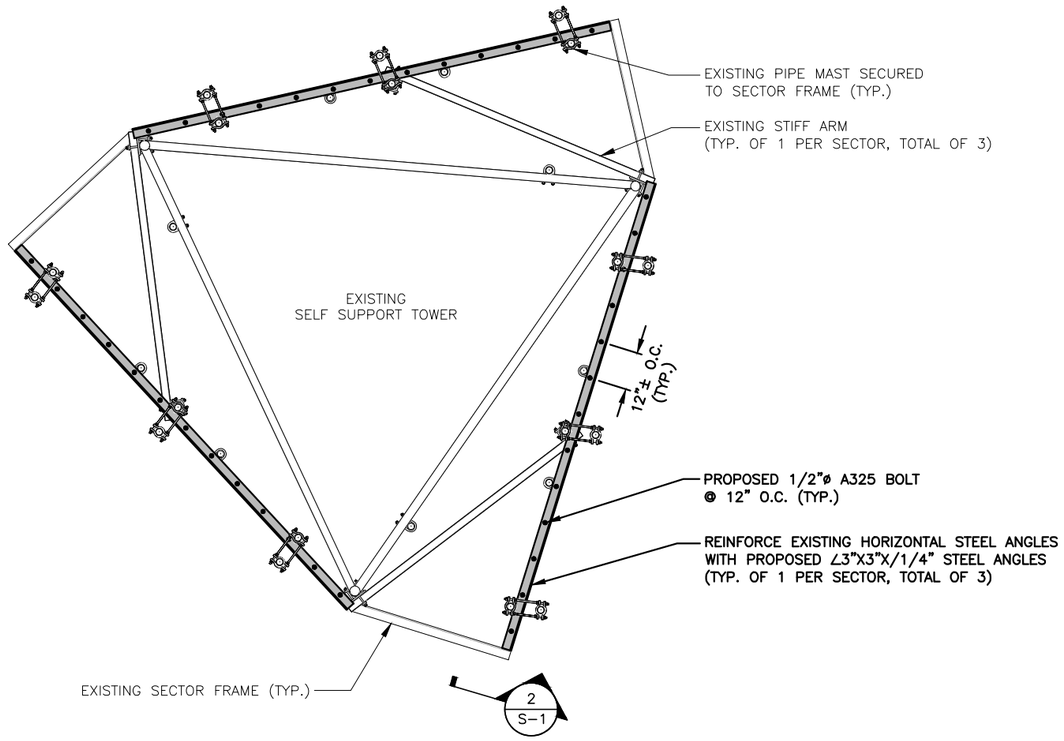
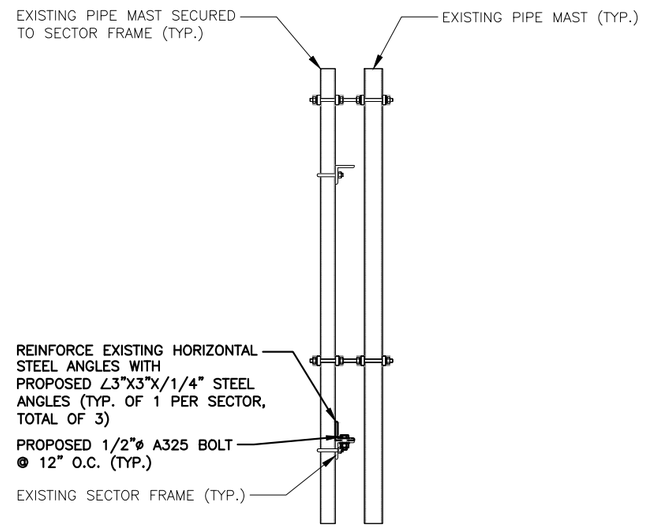


PROPOSED MOUNT MODIFICATION PLAN (1 / S-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"
0 1'-0" 2'-0" 4'-0" 6'-0"



PROPOSED MOUNT MODIFICATION ELEVATION DETAIL (2 / 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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A	09/03/19	ISSUED FOR REVIEW	ET	HC	DPH

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

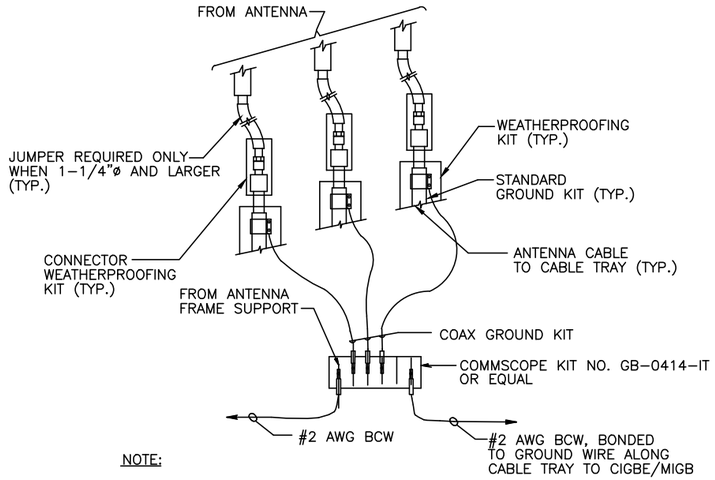
STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

AT&T

MOUNT MODIFICATION DESIGN
LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	S-1	1

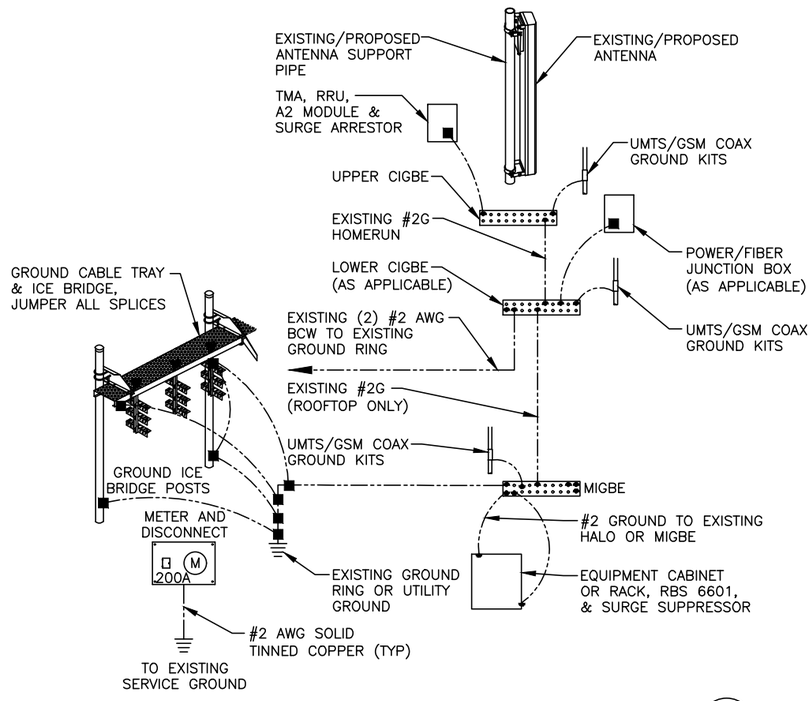


NOTE:

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

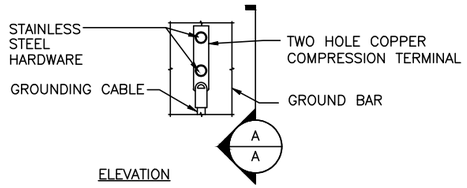
GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

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

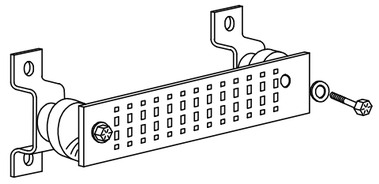
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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 (AS REQUIRED) (4 / G-1)

SCALE: N.T.S

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

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2047
SITE NAME: WESTBROOK-SPENCER RD

315 SPENCER PLAIN ROAD
WESTBROOK, CT 06498
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/04/21	ISSUED FOR CONSTRUCTION	JJ	HC	DPH
0	09/15/21	ISSUED FOR REVIEW	GA	HC	DPH
A	09/03/19	ISSUED FOR REVIEW	ET	HC	DPH

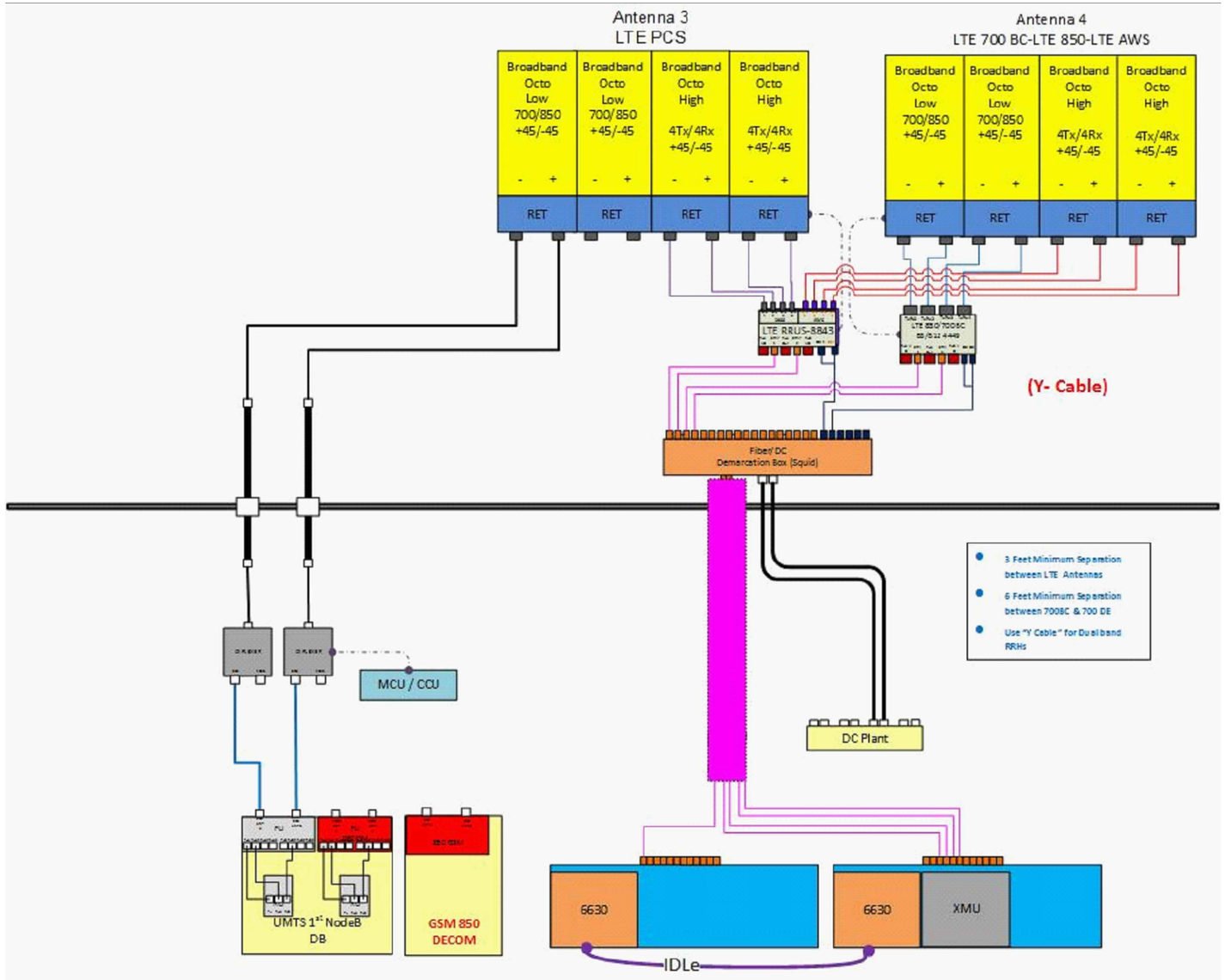
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: ET

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

AT&T

GROUNDING DETAILS
LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	G-1	1



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

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

NOTE:

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

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2047
SITE NAME: WESTBROOK-SPENCER RD

315 SPENCER PLAIN ROAD
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MIDDLESEX COUNTY

at&t
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A	09/03/19	ISSUED FOR REVIEW	ET	HC	DPH

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

AT&T

RF PLUMBING DIAGRAM
LTE 3C_4C_4TX4RX RETROFIT 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2047	RF–1	1

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

180' Existing Lattice Tower

Proposed AT&T
Antenna Upgrade

AT&T Site Ref: CT2047

CSP Tower Ref: #36

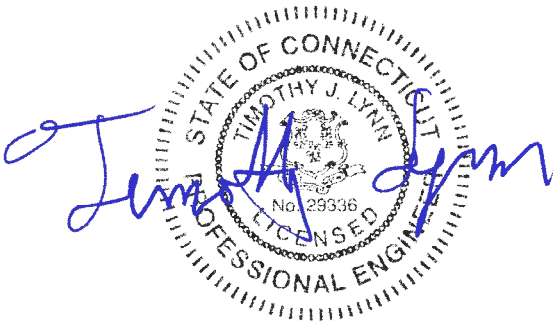
315 Spencer Plains Road
Westbrook, CT

CENTEK Project No. 21082.01

~~Date: July 21, 2021~~

Rev 1: July 27, 2021

Max Stress Ratio = 94%



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 upgrade proposed by AT&T on the existing lattice tower located in Westbrook, Connecticut.

The host tower is a 180-ft, three legged, lattice tower originally designed and manufactured by Stainless, Inc. project no. 358811 dated 6/14/94. The tower geometry, structure member sizes and foundation information were taken from a previous structural analysis report prepared by AECOM job no. EVS-018 60627191 dated July 31, 2020. The tower has been previously reinforced multiple times. All previous reinforcements are assumed to be installed. See Primary Assumptions Section below for detailed reinforcement reference reports.

Antenna and appurtenance inventory was taken from the aforementioned structural analysis and information provided by AT&T.

The tower consists of eight (8) vertical sections consisting of pipe legs conforming to ASTM A572 Gr. 50 and steel angle lateral bracing conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 10-ft 7-in at the top and 25-ft 0-in at the bottom.

Antenna and Appurtenance Summary

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

- Tower:
  Antenna: One (1) lightning rod pipe mounted to the top of the tower.
- D&K-42, D&K53 – D&K55 (ST# 1-4):
  Antenna: One (1) 11’ Omni-directional antenna, one (1) 10’ 4-bay dipole antenna, one (1) 18’ 4-bay dipole antenna and one (1) 11’ Omni-directional antenna (inverted) mounted on (2) 6-ft side-arms with an elevation of 178.5-ft AGL.
  Cables: Two (2) 1-5/8”∅ and two (2) 7/8”∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- (ST# 16):
  Antenna: One (1) junction box face mounted with an elevation of 178-ft AGL.
  Cables: One (1) 7/8”∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-40, D&K-41, D&K-47, D&K-48, D&K-51, D&K-52, D&K-57, D&K-58 (ST# 5-12):
  Antenna: One (1) 14’ Omni-directional antenna, two (2) 16’ Omni-directional antennas, one (1) 10’ Omni-directional antenna, one (1) single dipole, two (2) 10’ 8-bay dipole antennas (inverted) and one (1) TTA pipe mounted on (4) 6-ft side-arms with an elevation of 177.5-ft AGL.
  Cables: Two (2) 1-1/4”∅, five (5) 7/8”∅ and one (1) 1/2”∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-38, D&K39, D&K59 (ST# 13-15):
  Antenna: One (1) 16’ Omni-directional antennas and two (2) 16’ Omni-directional antennas (inverted) mounted on (1) 6-ft T-arm with an elevation of 177.5-ft AGL.
  Cables: Three (3) 1-5/8”∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- D&K-45 (ST# 17):
  Antenna: One (1) 6-ft microwave dish pipe mounted with an elevation of 178-ft AGL.
  Cables: One (1) 2" elliptical cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-44 (ST# 18):
  Antenna: One (1) 6-ft microwave dish pipe mounted with an elevation of 176-ft AGL.
  Cables: One (1) 2" elliptical cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- (ST# 20):
  Antenna: One (1) Telewave ANT150F2 antenna mounted on one (1) 3-ft sidearm with an elevation of 164-ft AGL.
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Eversource (Existing):
  Antenna: One (1) Telewave ANT220F2 antenna mounted on one (1) USF-4U mount with an elevation of 159-ft AGL.
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-35 (ST# 31):
  Antenna: One (1) Telewave ANT450F6 antenna mounted on one (1) 2-ft sidearm with an elevation of 157-ft AGL.
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-32, D&K-33 (ST# 24-25):
  Antenna: One (1) 9' Omni-directional antenna and one (1) 14' Omni-directional antenna (inverted) mounted on (1) 3-ft side-arm with an elevation of 156-ft AGL.
  Cables: One (1) 1-5/8"∅ and one (1) 7/8"∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-37 (ST# 23):
  Antenna: One (1) Kathrein PRF-950 grid dish mounted on (1) 1-ft side-arm with an elevation of 156-ft AGL
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-34 (ST# 22):
  Antenna: One (1) Telewave ANT400D dipole antenna mounted on one (1) 2-ft sidearm with an elevation of 151-ft AGL.
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Sprint (Existing):
  Antenna: Three (3) RFS APXVTM14 panel antennas, three (3) Commscope NNVV-65B-R4 panel antennas, three (3) 1900MHz 4X45W RRHs, six (6) 800MHz 2X50W RRHs and three (3) three (3) TD-RRH-8x20-25 RRHs mounted on three (3) 13-ft T-frames with a RAD center elevation of ±137-ft above grade level.
  Cables: Four (4) 1-1/4"∅ Hybriflex cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- T-MOBILE (Existing):
  Antennas: Three (3) Commscope DBXNH-6565B panel antennas, six (6) TMAs, six (6) diplexers and three (3) Bias Tees mounted on three (3) side-arms with a RAD center elevation of ±130-ft above grade level.
  Cables: Twelve (12) 7/8" ∅ coax cables running on a face of the existing tower as specified in Section 3 of this report.
- D&K-9 (ST# 45):
  Antenna: One (1) Decibel DB210-c dipole antenna mounted on one (1) side-arm with an elevation of 125-ft AGL.
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Eversource (Existing):
  Antenna: One (1) Comprod 871F-70 dipole antenna mounted on one (1) USF-4U mount with an elevation of 121-ft AGL.
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-10 (ST# 46):
  Antenna: One (1) 19.5"x19.5" panel antenna mounted on one (1) side-arm with an elevation of 123-ft AGL.
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-8 (ST# 47):
  Antenna: One (1) Kathrein PRF-950 grid dish mounted on (1) 2-ft side-arm with an elevation of 111-ft AGL
  Cables: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-6, D&K-7 (ST# 48-49):
  Antenna: One (1) 20' 4-bay dipole antenna and one (1) 3-ft yagi antenna mounted on (1) 1-ft side-arm with an elevation of 82.5-ft AGL
  Cables: Two (2) 7/8"∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Sprint (Existing):
  Antenna: One (1) GPS mounted on (1) 1-ft side-arm with an elevation of 81-ft AGL
  Cables: One (1) 1-1/4"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-3, D&K-4 (ST# 51-52):
  Antenna: Two (2) DB803M-XC Omni-directional antennas (one upright and one inverted) mounted on (1) 4-ft side-arm with an elevation of 32-ft AGL
  Cables: Two (2) 1/2"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- D&K-1, D&K-2 (ST# 53-54):
  Antenna: One (1) 3' Omni-directional antenna and one (1) 3' yagi mounted on (1) 4-ft side-arm with an elevation of 18-ft AGL
  Cables: Two (2) 1/2"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- AT&T (Existing to Remain):
  Antenna: One (1) Raycap surge arrestor mounted on three (3) 13-ft Sector Frames with a RAD center elevation of ±148-ft above grade level.
  Coax Cable: Six (6) 1-1/4" ∅ cables, one (1) fiber cable and two (2) DC cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **AT&T (Existing to Remove):**
  Antenna: Six (6) Powerwave 7770 panel antennas, three (3) KMW AM-X-CD-14-65 panel antennas, six (6) Powerwave TT19-08BP111-001 TMAs, three (3) Ericsson RRUS-11 remote radio heads and three (3) Ericsson RRUS-12 remote radio mounted on three (3) 13-ft Sector Frames with a RAD center elevation of ±148-ft above grade level.
  Coax Cable: Six (6) 1-1/4" ∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **AT&T (Proposed):**
  Antenna: Three (3) CCI DMP65R-BU4D panel antennas, three (3) Kathrein 840-370964 panel antennas, three (3) Ericsson 4449 B5/B12 remote radio heads and three (3) Ericsson 8843 B2/B66A remote radio heads mounted on three (3) 13-ft Sector Frames with a RAD center elevation of ±148-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.
- All coax cables should be routed as specified in section 3 of this report.
- **All previous reinforcements per the below listed structural analysis and modification reports are assumed to be installed.**
  - **Structural report prepared by URS Corp for T-Mobile, NU and AT&T project no. SAI-063 / 36924430 dated 6/16/11.**
  - **Structural report prepared by AECOM for T-Mobile project no. NSS-015 / 36931360 dated 5/22/15.**
  - **Structural report prepared by AECOM for AT&T project no. SAI-100 / 60553539 dated 9/29/17.**
  - **Structural report prepared by AECOM for Sprint project no. ASM-009 / 60577720 dated 9/17/18.**

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 with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-H entitled "Structural Standard for Antenna Support Structures, Antennas and Small Wind Turbine Support Structures", 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-H Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-H, gravity loads of the tower structure and its components, and the application of 1.0" radial ice on the tower structure and its components.

Load Cases:	Load Case 1; 145 mph (Risk Cat III) 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; 50 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-H]*
	Load Case 3; 90 mph wind speed w/ 0.5" radial ice plus gravity load – used in calculation of tower twist and sway.	*[TIA-222-F used for calculation of tower twist and sway per the requirements of the CSP]*

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

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower.

- Calculated stresses **were found to be within allowable limits**.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T14)	0.0' - 12.5'	91.0%	**PASS**
Diagonal (T10)	50.0' – 75.0'	93.7%	**PASS**
Horizonta (T11)	37.5' - 50.0'	82.9%	**PASS**

- The tower combined deflection **was found to be within allowable limits**.

Deflection Criteria	Proposed (degrees)	Allowable (degrees)	Result
Sway (Tilt)	0.5960	n/a	**n/a**
Twist	0.1250	n/a	**n/a**
Combined	0.7210	0.75	**PASS**

TIA-222-F standard used for calculation of tower twist and sway per the requirements of the CSP.

Foundation and Anchors

The existing foundation consists of a three (3) 4-ft ∅ x 11-ft long reinforced concrete piers concentrically bearing on three (3) 16.25-ft square x 2-ft thick reinforced concrete pads. The sub grade conditions used in the foundation analysis were derived from aforementioned structural analysis. The base of the tower is connected to the foundation by means of (9) 1"∅ anchor bolts per leg embedded into the concrete foundation structure.

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

Load Effect	Proposed Tower Reactions
Leg Shear	57 kips
Leg Compression	489 kips
Leg Tension	424 kips
Base Moment	10,113 ft-kips
Base Shear	100 kips

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

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Compression and Shear	73%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	(percentage of capacity)	Result
Reinforced Concrete Pad and Piers	Uplift	75%	**PASS**
	Bearing	79%	**PASS**
	Concrete Strength	94%	**PASS**

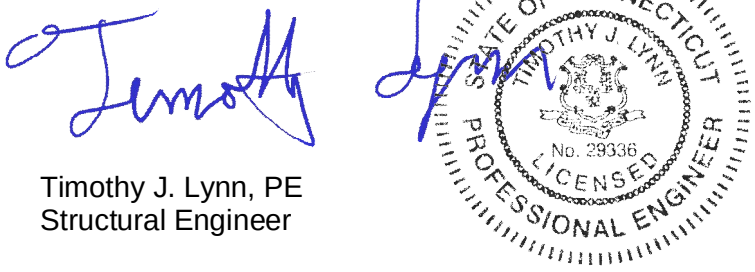
C o n c l u s i o n

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

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

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.

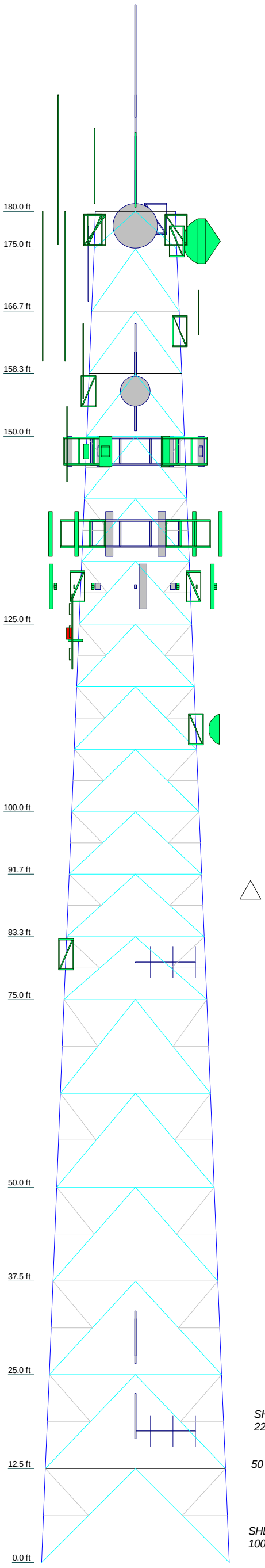
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly RISA Tower, 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	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	
Legs	Stainless P5x0.250				Stainless P5x0.300	Stainless P5x0.400	A	1/3 Pipe w/ 5"x0.5 Stainless		Stainless P6.875x0.400					
Leg Grade					A513-50			A500-42			A572-60				
Diagonals	2L2 1/2x2x3/16x3/8				2L2 1/2x2x5/16x3/8		2L3x2 1/2x1/4x3/8			2L3 1/2x3 1/2x5/16x3/8		2L3 1/2x3 1/2x5/16x3/8			
Diagonal Grade						A36						A529-50			
Top Girts	L2 1/2x2 1/2x3/16	N.A.										N.A.	2L4x4x1/4	2L4x4x5/16	
Horizontals	N.A.	B			L3x2 1/2x1/4		2L3x3x1/4			L4x4x1/4		N.A.	L4x4x3/8	N.A.	
Red. Horizontals	N.A.		N.A.				L3x3x5/16				L2x2x3/16	L2 1/2x2 1/2x3/16			
Red. Diagonals	N.A.						L2x2x3/16				L2x2x3/16	L2 1/2x2 1/2x3/16			
Inner Bracing	N.A.						L2 1/2x2 1/2x3/16			L2 1/2x2 1/2x3/16		L3x3x1/4			
Face Width (ft)	10.599	11	11.6667	12.3333	13	15	17	17.6667	18.3333	19	21	22	23	24	25
# Panels @ (ft)	1 @ 5				12 @ 8.33333							6 @ 12.5			
Weight (K)	0.6	0.8	0.8	0.8	4.0	4.8	2.0	2.2	2.2	6.3	3.4	4.0	3.9	4.4	39.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x15' (DNK-56 (L.R.))	200	8843 B2/B66A (ATI - Proposed)	148
2" Dia 10' Omni (DNK-52 (St# 10))	186	8843 B2/B66A (ATI - Proposed)	148
3" Dia 20' Omni (DNK-59 (St# 13))	185.5	RVZDC-6627-PF-48 (ATI - Proposed)	148
3" Dia 12' Omni (DNK-48 (St# 8))	185.5	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
3" Dia 20' Omni (DNK-57 (St# 6))	185.5	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
2" Dia 10' Omni (DNK-53 (St# 3))	185	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
10' - 2 Bay Dipole (DNK-54 (St# 2))	185	APXVTM14-C-120 Panel Antenna (Sprint)	137
1" Dia 8' Omni (DNK-58 (St# 5))	182.5	APXVTM14-C-120 Panel Antenna (Sprint)	137
1 Bay Dipole ANT400D (DNK-51 (St# 11))	181	APXVTM14-C-120 Panel Antenna (Sprint)	137
20' 4-Bay Dipole (DNK-55 (St# 1))	181	NNVV-65B-R4 Panel Antenna (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	NNVV-65B-R4 Panel Antenna (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	NNVV-65B-R4 Panel Antenna (Sprint)	137
11"x8"x12" Junction Box ((St# 16))	178	ALU TD-RRH-8x20-25 (Sprint)	137
6' w/Radome (DNK-45 (St# 17))	178	ALU TD-RRH-8x20-25 (Sprint)	137
Pirod 6' Side Mount Standoff (1) (DNK-38,39 (St# 13,14,15,16))	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
		(2) ALU 800MHz 2x50W (Sprint)	137
432E-83I-01T TTA Unit (DNK-47 (St# 9))	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
1' Side Arm (DNK-44 (St# 18))	176	(2) TMA 10"x8"x5" (T-Mobile)	130
1' Side Arm (DNK-45 (St# 17))	176	(2) TMA 10"x8"x5" (T-Mobile)	130
6' w/Radome (DNK-44 (St# 18))	176	(2) TMA 10"x8"x5" (T-Mobile)	130
(inverted) 2" Dia 10' Omni (DNK-42 (St# 4))	173	(2) CBC1923Q-43 Diplexer (T-Mobile)	130
(Inverted) 3" Dia 20' Omni (DNK-38 (St# 15))	170	(2) CBC1923Q-43 Diplexer (T-Mobile)	130
(Inverted) 3" Dia 20' Omni (DNK-39 (St# 14))	170	(2) CBC1923Q-43 Diplexer (T-Mobile)	130
(inverted) 10' 8 Bay Di-Pole (DNK-41 (St# 12))	170	ATSBT-TOP-FM-4G (T-Mobile)	130
(inverted) 10' 8 Bay Di-Pole (DNK-40 (St# 7))	170	ATSBT-TOP-FM-4G (T-Mobile)	130
Telewave 150F2 Omni ((St # 20))	166.5	ATSBT-TOP-FM-4G (T-Mobile)	130
Pirod 4' Side Mount Standoff (1) ((St # 20))	164	DBXNH-6565B (T-Mobile)	130
Telewave ANT220F2 - Omni Antenna (Eversource)	162	DBXNH-6565B (T-Mobile)	130
ANT450F6 (DNK-35 (St# 21))	161	DBXNH-6565B (T-Mobile)	130
3" Dia 9' Omni (DNK-33 (St# 24))	160	2' Sidearm (T-Mobile)	130
Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource)	159	2' Sidearm (T-Mobile)	130
		2' Sidearm (T-Mobile)	130
2' Sidearm (DNK-35 (St# 21))	157	1' Side Arm (DNK-9 (St# 45))	125
1' Side Arm (DNK-37 (St# 23))	156	Decibel DB210-C Dipole (Single) (DNK-9 (St# 45))	125
Pirod 4' Side Mount Standoff (1) (DNK-32, 33 (St# 24,25))	156	Comprod 871F-70 Dipole (Eversource)	124
		19.5"x19.5" Panel Antenna (DNK-10 (St# 46))	123
10'6"x4" Pipe Mount (DNK-34 (St# 22))	156	1' Side Arm (DNK-10 (St# 46))	123
4' Paraflector [PRF-950] (DNK-37 (St# 23))	156	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource)	121
1 Bay Dipole ANT400D (DNK-34 (St# 22))	151		
2" Dia 14' Omni (inverted) (DNK-32 (St# 25))	149	2' Sidearm (DNK-8 (St# 47))	111
13-ft Sector Frame (ATI - Existing)	148	4' Paraflector [PRF-950] (DNK-8 (St# 47))	111
13-ft Sector Frame (ATI - Existing)	148	1' Side Arm (Un-used Mount)	102
13-ft Sector Frame (ATI - Existing)	148	20' 4-Bay Dipole (DNK-7 (St# 48))	89.5
DMP65R-BU4D (ATI - Proposed)	148	1' Side Arm (DNK-6,7 (St# 48,49))	82.5
840-370964 (ATI - Proposed)	148	3' Yagi (DNK-6 (St# 49))	81
DMP65R-BU4D (ATI - Proposed)	148	1' Side Arm (DNK-5 (St# 50))	81
840-370964 (ATI - Proposed)	148	GPS (DNK-5 (St# 50))	81
DMP65R-BU4D (ATI - Proposed)	148	1.5" Dia 3' Omni (DNK-4 (St# 51))	34 - 27
840-370964 (ATI - Proposed)	148	1.5" Dia 3' Omni (inverted) (DNK-3 (St# 52))	29.5
4449 B5/B12 (ATI - Proposed)	148	4' Side Mount Standoff (1) (DNK-3,4 (St# 51,52))	26
4449 B5/B12 (ATI - Proposed)	148	1.5" Dia 3' Omni (DNK-2 (St# 53))	19.5
4449 B5/B12 (ATI - Proposed)	148	4' Side Mount Standoff (1) (DNK 1,2 (St# 53,54))	18
8843 B2/B66A (ATI - Proposed)	148	3' Yagi (DNK-1 (St# 54))	17.5

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Stainless P5x0.500	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A513-50	50 ksi	66 ksi	A572-60	60 ksi	75 ksi
A36	36 ksi	58 ksi	A529-50	50 ksi	65 ksi
A500-42	42 ksi	58 ksi			

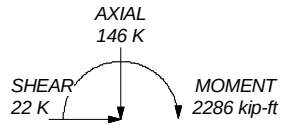
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 145 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 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 Risk Category III.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. TOWER RATING: 93.7%

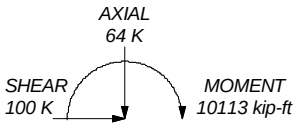
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 489 K
SHEAR: 57 K

UPLIFT: -424 K
SHEAR: 50 K



TORQUE 15 kip-ft
50 mph WIND - 1.000 in ICE



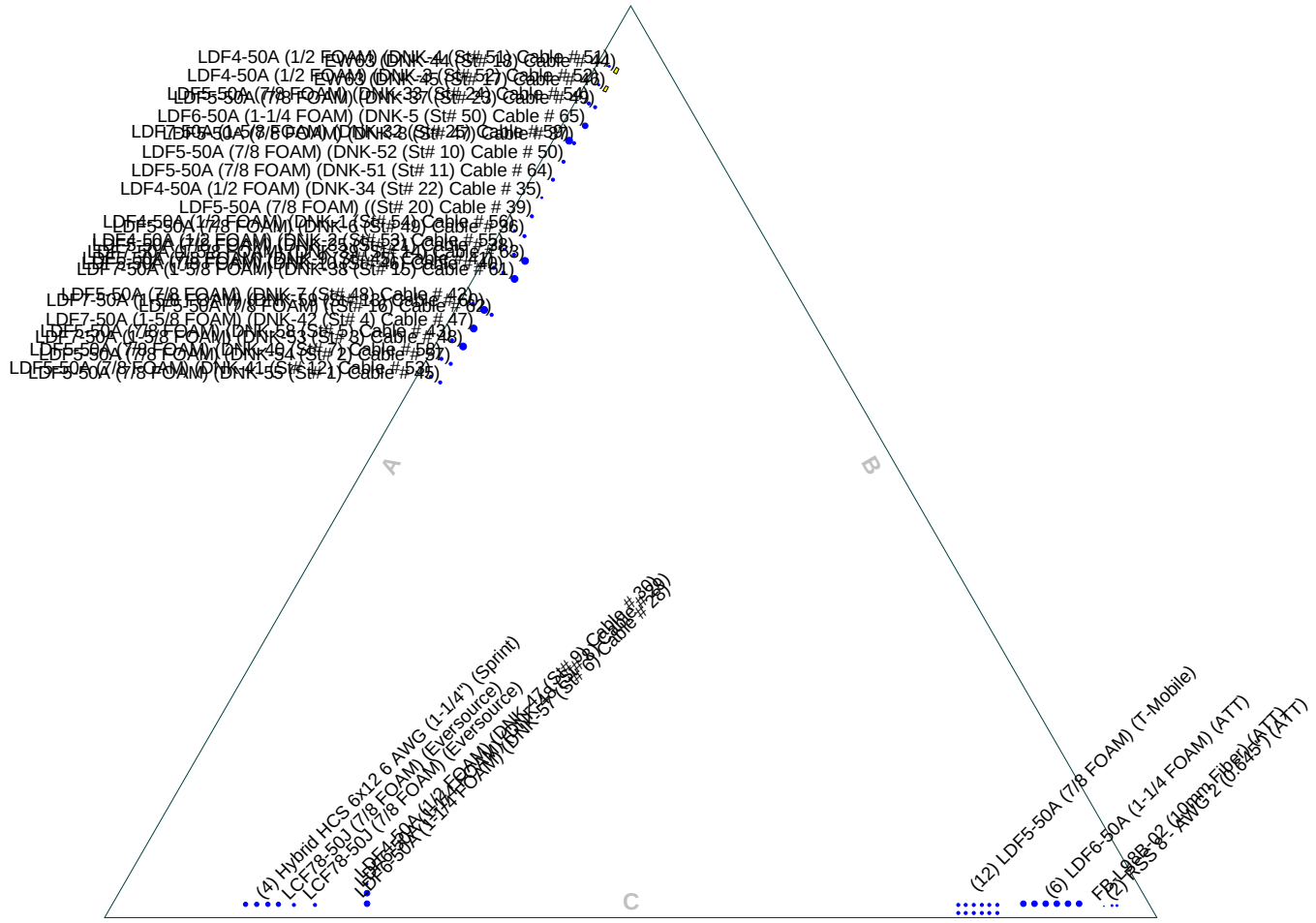
TORQUE 44 kip-ft
REACTIONS - 145 mph WIND

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

Job: 21082.01 - CT2047		
Project: 180-ft Lattice Tower (CSP #36)		
Client: AT&T	Drawn by: TJL	App'd:
Code: TIA-222-H	Date: 07/21/21	Scale: NTS
Path: J:\Jobs\21082\00 WI\01_CT2047 CSP #36 Westbrook\05_Structural\Calcs\mytower\180-ft Lattice Tower CSP #36.eri		Dwg No. E-1

Feed Line Plan

Round | Flat | App In Face | App Out Face



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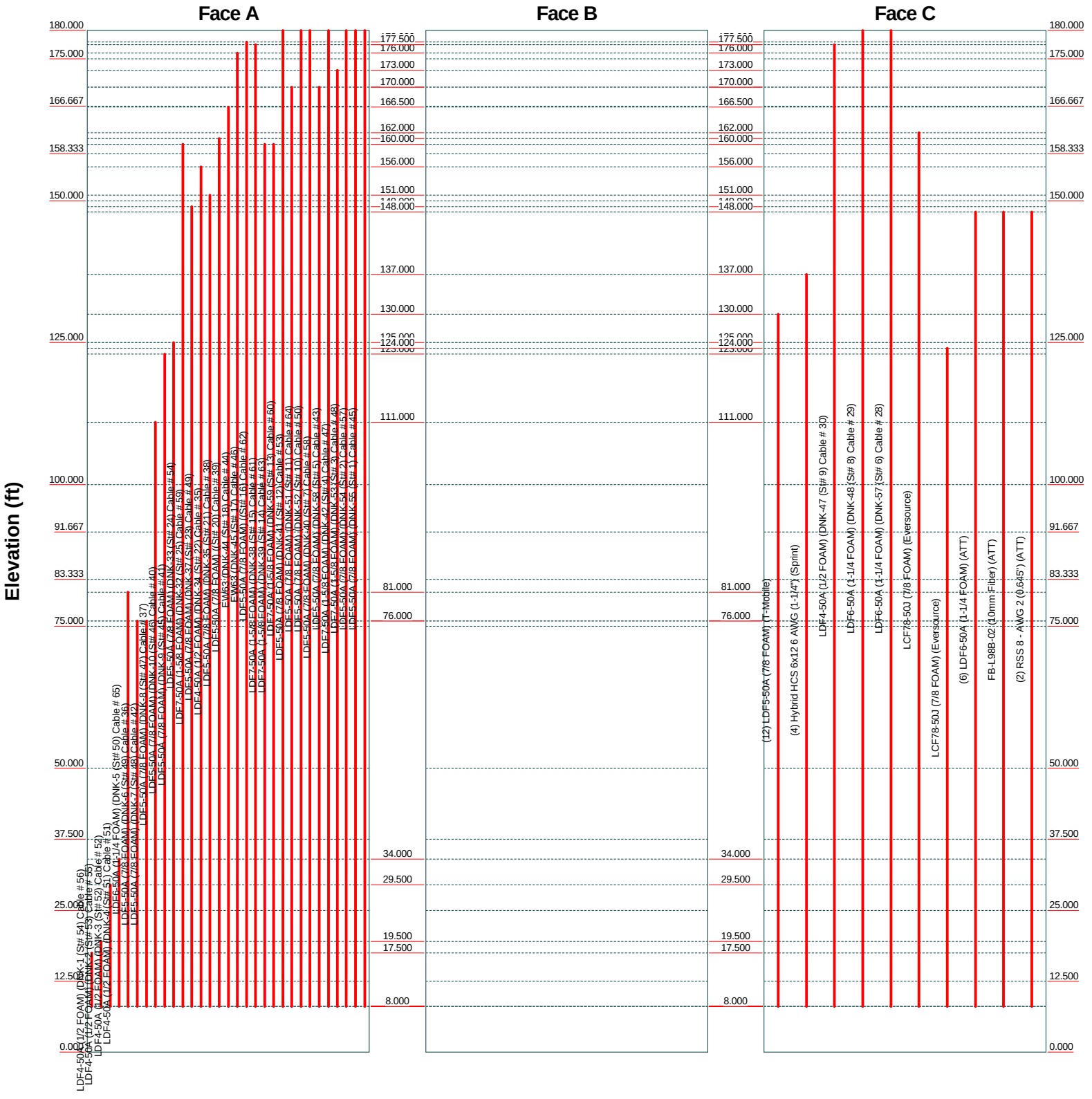
Project: ***180-ft Lattice Tower (CSP #36)***		
Client: AT&T	Drawn by: TJL	App'd:
Code: TIA-222-H	Date: 07/21/21	Scale: NTS
Path: J:\Jobs\2108200.WI\01_CT2047 CSP #36 Westbrook\05_Structural\Calcs\tnxtower\180-ft Lattice Tower CSP #36.eri		Dwg No. E-7

Feed Line Distribution Chart
0' - 180'

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



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Job: **21082.01 - CT2047**			
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Client: AT&T	Drawn by: TJL	App'd:	
Code: TIA-222-H	Date: 07/21/21	Scale: NTS	
Path: J:\Jobs\21082000 WI\01_CT2047 CSP #36 Westbrook\05_Structural\Calculations\tower\180-ft Lattice Tower CSP #36.eri		Dwg No. E-7	

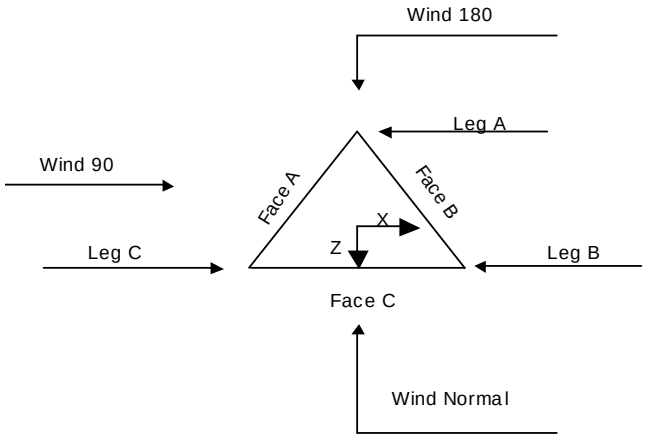
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 10.599 ft at the top and 25.000 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 0.000 ft.
Basic wind speed of 145 mph.
Risk Category III.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Deflections calculated using a wind speed of 60 mph.
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-H Bracing Resist. Exemption
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
√ Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.000-175.000			10.599	1	5.000
T2	175.000-166.667			11.000	1	8.333
T3	166.667-158.333			11.667	1	8.333
T4	158.333-150.000			12.333	1	8.333
T5	150.000-125.000			13.000	1	25.000
T6	125.000-100.000			15.000	1	25.000
T7	100.000-91.667			17.000	1	8.333
T8	91.667-83.333			17.667	1	8.333
T9	83.333-75.000			18.333	1	8.333
T10	75.000-50.000			19.000	1	25.000
T11	50.000-37.500			21.000	1	12.500
T12	37.500-25.000			22.000	1	12.500
T13	25.000-12.500			23.000	1	12.500
T14	12.500-0.000			24.000	1	12.500

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	180.000-175.000	5.000	K Brace Down	No	Yes	0.000	0.000

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
T2	175.000-166.667	8.333	K Brace Down	No	Yes	0.000	0.000
T3	166.667-158.333	8.333	K Brace Down	No	Yes	0.000	0.000
T4	158.333-150.000	8.333	K Brace Down	No	Yes	0.000	0.000
T5	150.000-125.000	8.333	K1 Down	No	Yes	0.000	0.000
T6	125.000-100.000	8.333	K1 Down	No	Yes	0.000	0.000
T7	100.000-91.667	8.333	K1 Down	No	Yes	0.000	0.000
T8	91.667-83.333	8.333	K1 Down	No	Yes	0.000	0.000
T9	83.333-75.000	8.333	K1 Down	No	Yes	0.000	0.000
T10	75.000-50.000	12.500	K1 Down	No	Yes	0.000	0.000
T11	50.000-37.500	12.500	K1 Down	No	Yes	0.000	0.000
T12	37.500-25.000	12.500	K1 Down	No	Yes	0.000	0.000
T13	25.000-12.500	12.500	K1 Down	No	Yes	0.000	0.000
T14	12.500-0.000	12.500	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.000-175.000	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T2 175.000-166.667	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T3 166.667-158.333	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T4 158.333-150.000	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T5 150.000-125.000	Pipe	Stainless P5x0.300	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x5/16x3/8	A36 (36 ksi)
T6 125.000-100.000	Pipe	Stainless P5x0.400	A513-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T7 100.000-91.667	Pipe	Stainless P5x0.500	A513-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T8 91.667-83.333	Arbitrary Shape	1/3 Pipe w/ 5"x0.5 Stainless	A500-42 (42 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T9 83.333-75.000	Arbitrary Shape	1/3 Pipe w/ 5"x0.5 Stainless	A500-42 (42 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T10 75.000-50.000	Pipe	Stainless P6.875x0.400	A572-60 (60 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T11 50.000-37.500	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3x5/16x3/8	A36 (36 ksi)
T12 37.500-25.000	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (50 ksi)
T13 25.000-12.500	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (50 ksi)
T14 12.500-0.000	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.000-175.000	Single Angle	L3x3x1/4	A36 (36 ksi)	Pipe		A36 (36 ksi)
T3 166.667-158.333	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Pipe		A36 (36 ksi)
T4 158.333-150.000	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Pipe		A36 (36 ksi)
T12 37.500-25.000	Double Equal Angle	2L4x4x1/4	A36 (36 ksi)	Pipe		A36 (36 ksi)
T14 12.500-0.000	Double Equal Angle	2L4x4x5/16	A36 (36 ksi)	Pipe		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 180.000-175.000	None	Pipe		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T2 175.000-166.667	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 166.667-158.333	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 158.333-150.000	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 150.000-125.000	None	Pipe		A36 (36 ksi)	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)
T6 125.000-100.000	None	Pipe		A36 (36 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T7 100.000-91.667	None	Pipe		A36 (36 ksi)	Double Equal Angle	2L3x3x1/4	A36 (36 ksi)
T8 91.667-83.333	None	Pipe		A36 (36 ksi)	Double Angle	2L3x3x1/4	A36 (36 ksi)
T9 83.333-75.000	None	Pipe		A36 (36 ksi)	Double Angle	2L3x3x1/4	A36 (36 ksi)
T10 75.000-50.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T11 50.000-37.500	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T12 37.500-25.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T13 25.000-12.500	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x3/8	A529-50 (50 ksi)
T14 12.500-0.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x5/16	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
T5 150.000-125.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 125.000-100.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 100.000-91.667	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 91.667-83.333	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 83.333-75.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T10 75.000-50.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T11 50.000-37.500	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T12 37.500-25.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 25.000-12.500	Solid Round		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T14 12.500-0.000	Solid Round		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T5 150.000-125.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T6 125.000-100.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T7 100.000-91.667	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T8 91.667-83.333	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T9 83.333-75.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T10 75.000-50.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T11 50.000-37.500	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T12 37.500-25.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T13 25.000-12.500	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T14 12.500-0.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1

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 180.000-175.000	0.000	0.000	A36 (36 ksi)	1	1	1	29.736	Third-Pt	Third-Pt
T2 175.000-166.667	0.000	0.000	A36 (36 ksi)	1	1	1	40.696	Third-Pt	Third-Pt
T3 166.667-158.333	0.000	0.000	A36 (36 ksi)	1	1	1	41.476	Third-Pt	Third-Pt
T4 158.333-150.000	0.000	0.000	A36 (36 ksi)	1	1	1	42.280	Third-Pt	Third-Pt
T5 150.000-125.000	0.000	0.000	A36 (36 ksi)	1	1	1	33.639	Third-Pt	Third-Pt
T6 125.000-100.000	0.000	0.000	A36 (36 ksi)	1	1	1	47.620	Third-Pt	Third-Pt
T7 100.000-91.667	0.000	0.000	A36 (36 ksi)	1	1	1	48.580	Third-Pt	Third-Pt
T8 91.667-83.333	0.000	0.000	A36 (36 ksi)	1	1	1	37.170	Third-Pt	Third-Pt
T9 83.333-75.000	0.000	0.000	A36 (36 ksi)	1	1	1	37.917	Third-Pt	Third-Pt
T10 75.000-50.000	0.000	0.000	A36 (36 ksi)	1	1	1	65.308	Third-Pt	Third-Pt
T11 50.000-37.500	0.000	0.000	A36 (36 ksi)	1	1	1	24.980	Third-Pt	Third-Pt
T12 37.500-25.000	0.000	0.000	A36 (36 ksi)	1	1	1	67.952	Third-Pt	Third-Pt
T13 25.000-12.500	0.000	0.000	A36 (36 ksi)	1	1	1	51.990	Third-Pt	Third-Pt
T14 12.500-0.000	0.000	0.000	A36 (36 ksi)	1	1	1	53.040	Mid-Pt	Third-Pt

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 180.000-175.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 175.000-166.667	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 166.667-158.333	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 158.333-150.0	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
00										
T5	Yes	No	1	1	1	1	1	1	1	1
150.000-125.000				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
125.000-100.000				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
100.000-91.667				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
91.667-83.333				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
83.333-75.000				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
75.000-50.000				1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1
50.000-37.500				1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1
37.500-25.000				1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1
25.000-12.500				1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1
12.500-0.000				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	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
180.000-175.000														
T2	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
175.000-166.667														
T3	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
166.667-158.333														
T4	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
158.333-150.000														
T5	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
150.000-125.000														
T6	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
125.000-100.000														

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
T7 100.000-91.667	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 91.667-83.333	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 83.333-75.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 75.000-50.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 50.000-37.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T12 37.500-25.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T13 25.000-12.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T14 12.500-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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 180.000-175.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 175.000-166.667	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 166.667-158.333	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 158.333-150.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 150.000-125.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 125.000-100.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 100.000-91.667	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 91.667-83.333	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 83.333-75.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 75.000-50.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 50.000-37.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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
T12 37.500-25.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T13 25.000-12.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T14 12.500-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

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 180.000-175.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T2 175.000-166.667	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T3 166.667-158.333	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T4 158.333-150.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T5 150.000-125.000	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T6 125.000-100.000	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T7 100.000-91.667	Flange	1.000 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T8 91.667-83.333	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T9 83.333-75.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T10 75.000-50.000	Flange	1.000 A325X	8	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T11 50.000-37.500	Flange	1.000 A325X	8	1.000 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T12 37.500-25.000	Flange	1.000 A325X	0	1.000 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T13 25.000-12.500	Flange	1.000 A325X	8	1.000 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T14 12.500-0.000	Flange	1.000 A325X	0	1.000 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 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*
* Stainless Inc. Tower Mapping (12/11/2019)													
LDF4-50A (1/2 FOAM) (DNK-1 (St# 54) Cable # 56)	A	No	No	Ar (CaAa)	17.500 - 8.000	-3.000	0.26	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-2 (St# 53) Cable # 55)	A	No	No	Ar (CaAa)	19.500 - 8.000	-3.000	0.24	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-3 (St# 52) Cable # 52)	A	No	No	Ar (CaAa)	29.500 - 8.000	-3.000	0.42	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-4 (St# 51) Cable # 51)	A	No	No	Ar (CaAa)	34.000 - 8.000	-3.000	0.44	1	1	0.630	0.630		0.150
LDF6-50A (1-1/4 FOAM) (DNK-5 (St# 50) Cable # 65)	A	No	No	Ar (CaAa)	81.000 - 8.000	-5.000	0.38	1	1	1.550	1.550		0.660
LDF5-50A (7/8 FOAM) (DNK-6 (St# 49) Cable # 36)	A	No	No	Ar (CaAa)	76.000 - 8.000	-6.000	0.26	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-7 (St# 48) Cable # 42)	A	No	No	Ar (CaAa)	76.000 - 8.000	-3.000	0.18	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-8 (St# 47) Cable # 37)	A	No	No	Ar (CaAa)	111.000 - 8.000	-5.000	0.36	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-10 (St# 46) Cable # 40)	A	No	No	Ar (CaAa)	123.000 - 8.000	-6.000	0.22	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-9 (St# 45) Cable # 41)	A	No	No	Ar (CaAa)	125.000 - 8.000	-3.000	0.22	1	1	1.090	1.090		0.330
* TMW													

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*
Proposed 5-1-2019 LDF5-50A (7/8 FOAM) (T-Mobile) * TMW	C	No	No	Ar (CaAa)	130.000 - 8.000	-3.000	-0.33	12	6	1.090	1.090		0.330
Proposed 5-1-2019 * Sprint Hybrid HCS 6x12 6 AWG (1-1/4") (Sprint) * Sprint *AT&T *AT&T * Stainless Inc. Tower Mapping (12/11/2019)	C	No	No	Ar (CaAa)	137.000 - 8.000	-3.000	0.35	4	4	1.540	1.540		1.700
LDF5-50A (7/8 FOAM) (DNK-33 (St# 24) Cable # 54)	A	No	No	Ar (CaAa)	160.000 - 8.000	-3.000	0.4	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-32 (St# 25) Cable # 59)	A	No	No	Ar (CaAa)	149.000 - 8.000	-3.000	0.36	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-37 (St# 23) Cable # 49)	A	No	No	Ar (CaAa)	156.000 - 8.000	-5.000	0.4	1	1	1.090	1.090		0.330
LDF4-50A (1/2 FOAM) (DNK-34 (St# 22) Cable # 35)	A	No	No	Ar (CaAa)	151.000 - 8.000	-5.000	0.3	1	1	0.630	0.630		0.150
LDF5-50A (7/8 FOAM) (DNK-35 (St# 21) Cable # 38)	A	No	No	Ar (CaAa)	161.000 - 8.000	-6.000	0.24	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) ((St# 20) Cable # 39)	A	No	No	Ar (CaAa)	166.500 - 8.000	-5.000	0.28	1	1	1.090	1.090		0.330
EW63 (DNK-44 (St# 18) Cable # 44)	A	No	No	Af (CaAa)	176.000 - 8.000	-5.000	0.44	1	1	1.574	1.574		0.510
EW63 (DNK-45 (St# 17) Cable # 46)	A	No	No	Af (CaAa)	178.000 - 8.000	-5.000	0.42	1	1	1.574	1.574		0.510
LDF5-50A (7/8 FOAM) ((St# 16)	A	No	No	Ar (CaAa)	177.500 - 8.000	-9.000	0.18	1	1	1.090	1.090		0.330

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
Cable # 62)													
LDF7-50A (1-5/8 FOAM) (DNK-38 (St# 15) Cable # 61)	A	No	No	Ar (CaAa)	160.000 - 8.000	-9.000	0.22	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-39 (St# 14) Cable # 63)	A	No	No	Ar (CaAa)	160.000 - 8.000	-9.000	0.24	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-59 (St# 13) Cable # 60)	A	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.18	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-41 (St# 12) Cable # 53)	A	No	No	Ar (CaAa)	170.000 - 8.000	-3.000	0.1	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-51 (St# 11) Cable # 64)	A	No	No	Ar (CaAa)	180.000 - 8.000	-5.000	0.32	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-52 (St# 10) Cable # 50)	A	No	No	Ar (CaAa)	180.000 - 8.000	-5.000	0.34	1	1	1.090	1.090		0.330
LDF4-50A (1/2 FOAM) (DNK-47 (St# 9) Cable # 30)	C	No	No	Ar (CaAa)	177.500 - 8.000	-9.000	0.25	1	1	0.630	0.630		0.150
LDF6-50A (1-1/4 FOAM) (DNK-48 (St# 8) Cable # 29)	C	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.25	1	1	1.550	1.550		0.660
LDF5-50A (7/8 FOAM) (DNK-40 (St# 7) Cable # 58)	A	No	No	Ar (CaAa)	170.000 - 8.000	-3.000	0.12	1	1	1.090	1.090		0.330
LDF6-50A (1-1/4 FOAM) (DNK-57 (St# 6) Cable # 28)	C	No	No	Ar (CaAa)	180.000 - 8.000	-3.000	0.25	1	1	1.550	1.550		0.660
LDF5-50A (7/8 FOAM) (DNK-58 (St# 5) Cable # 43)	A	No	No	Ar (CaAa)	180.000 - 8.000	-3.000	0.14	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-42 (St# 4) Cable # 47)	A	No	No	Ar (CaAa)	173.000 - 8.000	-6.000	0.16	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-53 (St# 3) Cable # 48)	A	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.14	1	1	1.980	1.980		0.820
LDF5-50A	A	No	No	Ar (CaAa)	180.000 -	-6.000	0.12	1	1	1.090	1.090		0.330

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
(7/8 FOAM) (DNK-54 (St# 2) Cable # 57)					8.000								
LDF5-50A (7/8 FOAM) (DNK-55 (St# 1) Cable # 45) * Stainless Inc. Tower Mapping (12/11/2019) * Eversource Proposed (4/20/2020)	A	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.1	1	1	1.090	1.090		0.330
LCF78-50J (7/8 FOAM) (Eversource)	C	No	No	Ar (CaAa)	162.000 - 8.000	-3.000	0.32	1	1	1.100	1.100		0.530
LCF78-50J (7/8 FOAM) (Eversource) *AT&T	C	No	No	Ar (CaAa)	124.000 - 8.000	-3.000	0.3	1	1	1.100	1.100		0.530
LDF6-50A (1-1/4 FOAM) (ATT)	C	No	No	Ar (CaAa)	148.000 - 8.000	-3.000	-0.4	6	6	1.550	1.550		0.660
FB-L98B-02 (10mm Fiber) (ATT)	C	No	No	Ar (CaAa)	148.000 - 8.000	-3.000	-0.45	1	1	0.394	0.394		0.300
RSS 8 - AWG 2 (0.645") (ATT) *AT&T	C	No	No	Ar (CaAa)	148.000 - 8.000	-3.000	-0.46	2	2	0.645	0.645		0.300

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
* TMW Proposed 5-1-2019 * Sprint *AT&T * Stainless Inc. Tower Mapping (12/11/2019) *AT&T								

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	180.000-175.000	A	0.000	0.000	6.027	0.000	0.019
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.708	0.000	0.007
T2	175.000-166.667	A	0.000	0.000	15.103	0.000	0.046
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	3.108	0.000	0.012
T3	166.667-158.333	A	0.000	0.000	18.612	0.000	0.058
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	3.512	0.000	0.014
T4	158.333-150.000	A	0.000	0.000	23.331	0.000	0.075
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	4.025	0.000	0.017
T5	150.000-125.000	A	0.000	0.000	76.895	0.000	0.250
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	51.270	0.000	0.263
T6	125.000-100.000	A	0.000	0.000	83.524	0.000	0.271
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	90.274	0.000	0.453
T7	100.000-91.667	A	0.000	0.000	28.423	0.000	0.092
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	30.128	0.000	0.151
T8	91.667-83.333	A	0.000	0.000	28.423	0.000	0.092
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	30.128	0.000	0.151
T9	83.333-75.000	A	0.000	0.000	29.571	0.000	0.097
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	30.128	0.000	0.151
T10	75.000-50.000	A	0.000	0.000	94.593	0.000	0.309
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	90.384	0.000	0.454
T11	50.000-37.500	A	0.000	0.000	47.297	0.000	0.155
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	45.192	0.000	0.227
T12	37.500-25.000	A	0.000	0.000	48.147	0.000	0.157
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	45.192	0.000	0.227
T13	25.000-12.500	A	0.000	0.000	49.628	0.000	0.160
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	45.192	0.000	0.227
T14	12.500-0.000	A	0.000	0.000	18.161	0.000	0.058
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	16.269	0.000	0.082

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	180.000-175.000	A	1.361	0.000	0.000	17.321	0.000	0.209
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	5.109	0.000	0.064
T2	175.000-166.667	A	1.356	0.000	0.000	41.220	0.000	0.492
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	9.886	0.000	0.120
T3	166.667-158.333	A	1.349	0.000	0.000	52.106	0.000	0.620
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	11.245	0.000	0.136
T4	158.333-150.000	A	1.342	0.000	0.000	65.460	0.000	0.783

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
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	12.969	0.000	0.156
T5	150.000-125.000	A	1.326	0.000	0.000	215.903	0.000	2.563
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	150.754	0.000	1.803
T6	125.000-100.000	A	1.300	0.000	0.000	235.371	0.000	2.744
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	227.544	0.000	2.898
T7	100.000-91.667	A	1.279	0.000	0.000	79.598	0.000	0.917
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	75.543	0.000	0.954
T8	91.667-83.333	A	1.268	0.000	0.000	79.134	0.000	0.906
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	75.304	0.000	0.947
T9	83.333-75.000	A	1.255	0.000	0.000	81.786	0.000	0.931
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	75.043	0.000	0.939
T10	75.000-50.000	A	1.226	0.000	0.000	260.082	0.000	2.908
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	223.310	0.000	2.763
T11	50.000-37.500	A	1.183	0.000	0.000	127.142	0.000	1.387
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	110.324	0.000	1.342
T12	37.500-25.000	A	1.144	0.000	0.000	128.439	0.000	1.363
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	109.112	0.000	1.307
T13	25.000-12.500	A	1.087	0.000	0.000	131.028	0.000	1.333
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	107.351	0.000	1.256
T14	12.500-0.000	A	0.974	0.000	0.000	45.328	0.000	0.427
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	37.390	0.000	0.417

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.000-175.000	-3.171	-5.213	-5.512	-7.909
T2	175.000-166.667	-4.554	-10.277	-7.279	-12.977
T3	166.667-158.333	-5.625	-12.229	-8.781	-15.570
T4	158.333-150.000	-6.433	-15.200	-9.682	-19.295
T5	150.000-125.000	-0.001	-7.458	-0.142	-9.090
T6	125.000-100.000	2.373	-2.631	0.412	-5.191
T7	100.000-91.667	2.326	-3.123	0.252	-5.979
T8	91.667-83.333	2.040	-2.862	0.217	-5.856
T9	83.333-75.000	1.951	-3.674	0.060	-6.993
T10	75.000-50.000	1.910	-5.471	-0.534	-9.307
T11	50.000-37.500	1.917	-5.738	-0.535	-9.539
T12	37.500-25.000	1.890	-6.449	-0.536	-10.851
T13	25.000-12.500	1.750	-7.413	-0.711	-12.518
T14	12.500-0.000	0.785	-3.914	-0.304	-7.076

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	36	EW63	175.00 - 176.00	0.6000	0.6000
T1	37	EW63	175.00 - 178.00	0.6000	0.6000
T1	38	LDF5-50A (7/8 FOAM)	175.00 - 177.50	0.6000	0.6000
T1	41	LDF7-50A (1-5/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	43	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	44	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	45	LDF4-50A (1/2 FOAM)	175.00 - 177.50	0.6000	0.6000
T1	46	LDF6-50A (1-1/4 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	48	LDF6-50A (1-1/4 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	49	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	51	LDF7-50A (1-5/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	52	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	53	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T2	36	EW63	166.67 - 175.00	0.6000	0.6000
T2	37	EW63	166.67 - 175.00	0.6000	0.6000
T2	38	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	41	LDF7-50A (1-5/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	42	LDF5-50A (7/8 FOAM)	166.67 - 170.00	0.6000	0.6000
T2	43	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	44	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	45	LDF4-50A (1/2 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	46	LDF6-50A (1-1/4 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	47	LDF5-50A (7/8 FOAM)	166.67 - 170.00	0.6000	0.6000
T2	48	LDF6-50A (1-1/4 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	49	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	50	LDF7-50A (1-5/8 FOAM)	166.67 - 173.00	0.6000	0.6000
T2	51	LDF7-50A (1-5/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	52	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	53	LDF5-50A (7/8 FOAM)	166.67 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			175.00		
T3	29	LDF5-50A (7/8 FOAM)	158.33 - 160.00	0.6000	0.6000
T3	33	LDF5-50A (7/8 FOAM)	158.33 - 161.00	0.6000	0.6000
T3	34	LDF5-50A (7/8 FOAM)	158.33 - 166.50	0.6000	0.6000
T3	36	EW63	158.33 - 166.67	0.6000	0.6000
T3	37	EW63	158.33 - 166.67	0.6000	0.6000
T3	38	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	39	LDF7-50A (1-5/8 FOAM)	158.33 - 160.00	0.6000	0.6000
T3	40	LDF7-50A (1-5/8 FOAM)	158.33 - 160.00	0.6000	0.6000
T3	41	LDF7-50A (1-5/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	42	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	43	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	44	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	45	LDF4-50A (1/2 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	46	LDF6-50A (1-1/4 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	47	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	48	LDF6-50A (1-1/4 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	49	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	50	LDF7-50A (1-5/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	51	LDF7-50A (1-5/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	52	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	53	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	56	LCF78-50J (7/8 FOAM)	158.33 - 162.00	0.6000	0.6000
T4	29	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	31	LDF5-50A (7/8 FOAM)	150.00 - 156.00	0.6000	0.6000
T4	32	LDF4-50A (1/2 FOAM)	150.00 - 151.00	0.6000	0.6000
T4	33	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	34	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	36	EW63	150.00 - 158.33	0.6000	0.6000
T4	37	EW63	150.00 - 158.33	0.6000	0.6000
T4	38	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	39	LDF7-50A (1-5/8 FOAM)	150.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	40	LDF7-50A (1-5/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	41	LDF7-50A (1-5/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	42	LDF5-50A (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	43	LDF5-50A (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	44	LDF5-50A (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	45	LDF4-50A (1/2 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	46	LDF6-50A (1-1/4 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	47	LDF5-50A (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	48	LDF6-50A (1-1/4 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	49	LDF5-50A (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	50	LDF7-50A (1-5/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	51	LDF7-50A (1-5/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	52	LDF5-50A (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	53	LDF5-50A (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T4	56	LCF78-50J (7/8 FOAM)	158.33 150.00 -	0.6000	0.6000
T5	13	LDF5-50A (7/8 FOAM)	158.33 125.00 -	0.6000	0.6000
T5	18	Hybrid HCS 6x12 6 AWG (1-1/4")	130.00 125.00 -	0.6000	0.6000
T5	29	LDF5-50A (7/8 FOAM)	137.00 125.00 -	0.6000	0.6000
T5	30	LDF7-50A (1-5/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	31	LDF5-50A (7/8 FOAM)	149.00 125.00 -	0.6000	0.6000
T5	32	LDF4-50A (1/2 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	33	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	34	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	36	EW63	150.00 125.00 -	0.6000	0.6000
T5	37	EW63	150.00 125.00 -	0.6000	0.6000
T5	38	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	39	LDF7-50A (1-5/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	40	LDF7-50A (1-5/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	41	LDF7-50A (1-5/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	42	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	43	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	44	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	45	LDF4-50A (1/2 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	46	LDF6-50A (1-1/4 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	47	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	48	LDF6-50A (1-1/4 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	49	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	50	LDF7-50A (1-5/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	51	LDF7-50A (1-5/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	52	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	53	LDF5-50A (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	56	LCF78-50J (7/8 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	60	LDF6-50A (1-1/4 FOAM)	150.00 125.00 -	0.6000	0.6000
T5	61	FB-L98B-02 (10mm Fiber)	148.00 125.00 -	0.6000	0.6000
T5	62	RSS 8 - AWG 2 (0.645")	148.00 125.00 -	0.6000	0.6000
T6	9	LDF5-50A (7/8 FOAM)	148.00 100.00 -	0.6000	0.6000
T6	10	LDF5-50A (7/8 FOAM)	111.00 100.00 -	0.6000	0.6000
T6	11	LDF5-50A (7/8 FOAM)	123.00 100.00 -	0.6000	0.6000
T6	13	LDF5-50A (7/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	18	Hybrid HCS 6x12 6 AWG (1-1/4")	125.00 100.00 -	0.6000	0.6000
T6	29	LDF5-50A (7/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	30	LDF7-50A (1-5/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	31	LDF5-50A (7/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	32	LDF4-50A (1/2 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	33	LDF5-50A (7/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	34	LDF5-50A (7/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	36	EW63	125.00 100.00 -	0.6000	0.6000
T6	37	EW63	125.00 100.00 -	0.6000	0.6000
T6	38	LDF5-50A (7/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	39	LDF7-50A (1-5/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	40	LDF7-50A (1-5/8 FOAM)	125.00 100.00 -	0.6000	0.6000
T6	41	LDF7-50A (1-5/8 FOAM)	125.00 100.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			125.00		
T6	42	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	43	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	44	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	45	LDF4-50A (1/2 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	46	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	47	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	48	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	49	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	50	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	51	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	52	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	53	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	56	LCF78-50J (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	57	LCF78-50J (7/8 FOAM)	100.00 - 124.00	0.6000	0.6000
T6	60	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	61	FB-L98B-02 (10mm Fiber)	100.00 - 125.00	0.6000	0.6000
T6	62	RSS 8 - AWG 2 (0.645")	100.00 - 125.00	0.6000	0.6000
T7	9	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	10	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	11	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	13	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	18	Hybrid HCS 6x12 6 AWG (1-1/4")	91.67 - 100.00	0.6000	0.6000
T7	29	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	30	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	31	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	32	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	33	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	34	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	36	EW63	91.67 - 100.00	0.6000	0.6000
T7	37	EW63	91.67 - 100.00	0.6000	0.6000
T7	38	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	39	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	40	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	41	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	42	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	43	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	44	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	45	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	46	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	47	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	48	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	49	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	50	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	51	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	52	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	53	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	56	LCF78-50J (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	57	LCF78-50J (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	60	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	61	FB-L98B-02 (10mm Fiber)	91.67 - 100.00	0.6000	0.6000
T7	62	RSS 8 - AWG 2 (0.645")	91.67 - 100.00	0.6000	0.6000
T8	9	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	10	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	11	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	13	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	18	Hybrid HCS 6x12 6 AWG (1-1/4")	83.33 - 91.67	0.6000	0.6000
T8	29	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	30	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	31	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	32	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	33	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	34	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	36	EW63	83.33 - 91.67	0.6000	0.6000
T8	37	EW63	83.33 - 91.67	0.6000	0.6000
T8	38	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	39	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	40	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	41	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	42	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	43	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	44	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	45	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	46	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	47	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	48	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	49	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	50	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	51	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	52	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	53	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	56	LCF78-50J (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	57	LCF78-50J (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	60	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	61	FB-L98B-02 (10mm Fiber)	83.33 - 91.67	0.6000	0.6000
T8	62	RSS 8 - AWG 2 (0.645")	83.33 - 91.67	0.6000	0.6000
T9	6	LDF6-50A (1-1/4 FOAM)	75.00 - 81.00	0.6000	0.6000
T9	7	LDF5-50A (7/8 FOAM)	75.00 - 76.00	0.6000	0.6000
T9	8	LDF5-50A (7/8 FOAM)	75.00 - 76.00	0.6000	0.6000
T9	9	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	10	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	11	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	13	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	18	Hybrid HCS 6x12 6 AWG (1-1/4")	75.00 - 83.33	0.6000	0.6000
T9	29	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	30	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	31	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	32	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	33	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	34	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	36	EW63	75.00 - 83.33	0.6000	0.6000
T9	37	EW63	75.00 - 83.33	0.6000	0.6000
T9	38	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	39	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	40	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	41	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	42	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	43	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	44	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	45	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	46	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	47	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	48	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	49	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	50	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	51	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	52	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	53	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	56	LCF78-50J (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	57	LCF78-50J (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	60	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	61	FB-L98B-02 (10mm Fiber)	75.00 - 83.33	0.6000	0.6000
T9	62	RSS 8 - AWG 2 (0.645")	75.00 - 83.33	0.6000	0.6000
T10	6	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	7	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	8	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	9	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	10	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	11	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	13	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	18	Hybrid HCS 6x12 6 AWG (1-1/4")	50.00 - 75.00	0.6000	0.6000
T10	29	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	30	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	31	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	32	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	33	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	34	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	36	EW63	50.00 - 75.00	0.6000	0.6000
T10	37	EW63	50.00 - 75.00	0.6000	0.6000
T10	38	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	39	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	40	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	41	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	42	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	43	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	44	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	45	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	46	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	47	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	48	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	49	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	50	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	51	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	52	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	53	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	56	LCF78-50J (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	57	LCF78-50J (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	60	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	61	FB-L98B-02 (10mm Fiber)	50.00 - 75.00	0.6000	0.6000
T10	62	RSS 8 - AWG 2 (0.645")	50.00 - 75.00	0.6000	0.6000
T11	6	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	7	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	8	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	9	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	10	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	11	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	13	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	18	Hybrid HCS 6x12 6 AWG (1-1/4")	37.50 - 50.00	0.6000	0.6000
T11	29	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	30	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	31	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	32	LDF4-50A (1/2 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	33	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	34	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	36	EW63	37.50 - 50.00	0.6000	0.6000
T11	37	EW63	37.50 - 50.00	0.6000	0.6000
T11	38	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	39	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	40	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	41	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	42	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	43	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	44	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	45	LDF4-50A (1/2 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	46	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	47	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	48	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	49	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	50	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	51	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	52	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	53	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	56	LCF78-50J (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	57	LCF78-50J (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	60	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	61	FB-L98B-02 (10mm Fiber)	37.50 - 50.00	0.6000	0.6000
T11	62	RSS 8 - AWG 2 (0.645")	37.50 - 50.00	0.6000	0.6000
T12	4	LDF4-50A (1/2 FOAM)	25.00 - 29.50	0.6000	0.6000
T12	5	LDF4-50A (1/2 FOAM)	25.00 - 34.00	0.6000	0.6000
T12	6	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	7	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	8	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	9	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	10	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	11	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	13	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	18	Hybrid HCS 6x12 6 AWG (1-1/4")	25.00 - 37.50	0.6000	0.6000
T12	29	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	30	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	31	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	32	LDF4-50A (1/2 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	33	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	34	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	36	EW63	25.00 - 37.50	0.6000	0.6000
T12	37	EW63	25.00 - 37.50	0.6000	0.6000
T12	38	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	39	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	40	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	41	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	42	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	43	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	44	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	45	LDF4-50A (1/2 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	46	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	47	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	48	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	49	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	50	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	51	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	52	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	53	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	56	LCF78-50J (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	57	LCF78-50J (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	60	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	61	FB-L98B-02 (10mm Fiber)	25.00 - 37.50	0.6000	0.6000
T12	62	RSS 8 - AWG 2 (0.645")	25.00 - 37.50	0.6000	0.6000
T13	2	LDF4-50A (1/2 FOAM)	12.50 - 17.50	0.6000	0.6000
T13	3	LDF4-50A (1/2 FOAM)	12.50 - 19.50	0.6000	0.6000
T13	4	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	5	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	6	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	7	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	8	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	9	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	10	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	11	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	13	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	18	Hybrid HCS 6x12 6 AWG (1-1/4")	12.50 - 25.00	0.6000	0.6000
T13	29	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	30	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	31	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	32	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	33	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	34	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	36	EW63	12.50 - 25.00	0.6000	0.6000
T13	37	EW63	12.50 - 25.00	0.6000	0.6000
T13	38	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	39	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	40	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	41	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	42	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	43	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	44	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	45	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	46	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	47	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	48	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	49	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	50	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	51	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	52	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	53	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	56	LCF78-50J (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	57	LCF78-50J (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	60	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	61	FB-L98B-02 (10mm Fiber)	12.50 - 25.00	0.6000	0.6000
T13	62	RSS 8 - AWG 2 (0.645")	12.50 - 25.00	0.6000	0.6000
T14	2	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	3	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	4	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	5	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	6	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	7	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	8	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	9	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	10	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	11	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	13	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	18	Hybrid HCS 6x12 6 AWG (1-1/4")	8.00 - 12.50	0.6000	0.6000
T14	29	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	30	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	31	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	32	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	33	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	34	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	36	EW63	8.00 - 12.50	0.6000	0.6000
T14	37	EW63	8.00 - 12.50	0.6000	0.6000
T14	38	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	39	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	40	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	41	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	42	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	43	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	44	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	45	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	46	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	47	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	48	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	49	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	50	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	51	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	52	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	53	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	56	LCF78-50J (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	57	LCF78-50J (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	60	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	61	FB-L98B-02 (10mm Fiber)	8.00 - 12.50	0.6000	0.6000
T14	62	RSS 8 - AWG 2 (0.645")	8.00 - 12.50	0.6000	0.6000

Discrete Tower Loads

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
* Stainless Inc. Tower Mapping (12/11/2019)									
3' Yagi (DNK-1 (St# 54))	A	From Leg	4.000 0.000 0.000	0.0000	17.500	No Ice 1/2" Ice 1" Ice	2.083 3.787 5.517	2.083 3.787 5.517	0.031 0.053 0.085
1.5" Dia 3' Omni (DNK-2 (St# 53))	A	From Leg	4.000 0.000 0.000	0.0000	19.500	No Ice 1/2" Ice 1" Ice	0.944 1.393 1.782	0.944 1.393 1.782	0.022 0.033 0.047
4' Side Mount Standoff (1) (DNK 1,2 (St# 53,54))	A	From Leg	0.000 0.000 0.000	0.0000	18.000	No Ice 1/2" Ice 1" Ice	2.720 4.910 7.100	2.720 4.910 7.100	0.050 0.089 0.128
1.5" Dia 3' Omni (inverted)	A	From Leg	4.000	0.0000	29.500	No Ice	0.944	0.944	0.022

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
(DNK-3 (St# 52))			0.000			1/2" Ice	1.393	1.393	0.033
			0.000			1" Ice	1.782	1.782	0.047
1.5" Dia 3' Omni	A	From Leg	4.000	0.0000	27.000 - 34.000	No Ice	0.944	0.944	0.022
(DNK-4 (St# 51))			0.000			1/2" Ice	1.393	1.393	0.033
			0.000			1" Ice	1.782	1.782	0.047
4' Side Mount Standoff (1)	A	From Leg	0.000	0.0000	26.000	No Ice	2.720	2.720	0.050
(DNK-3,4 (St# 51,52))			0.000			1/2" Ice	4.910	4.910	0.089
			0.000			1" Ice	7.100	7.100	0.128
GPS	C	From Leg	1.000	0.0000	81.000	No Ice	1.000	1.000	0.010
(DNK-5 (St# 50))			0.000			1/2" Ice	1.500	1.500	0.015
			0.000			1" Ice	2.000	2.000	0.020
1' Side Arm	C	From Leg	0.000	0.0000	81.000	No Ice	2.500	2.500	0.055
(DNK-5 (St# 50))			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
3' Yagi	A	From Leg	1.000	0.0000	81.000	No Ice	2.083	2.083	0.031
(DNK-6 (St# 49))			0.000			1/2" Ice	3.787	3.787	0.053
			-1.000			1" Ice	5.517	5.517	0.085
20' 4-Bay Dipole	A	From Leg	0.000	0.0000	89.500	No Ice	4.000	4.000	0.055
(DNK-7 (St# 48))			0.000			1/2" Ice	6.000	6.000	0.100
			1.000			1" Ice	8.000	8.000	0.145
1' Side Arm	A	From Leg	0.500	0.0000	82.500	No Ice	2.500	2.500	0.055
(DNK-6,7 (St# 48,49))			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
1' Side Arm	A	From Leg	0.000	0.0000	102.000	No Ice	2.500	2.500	0.055
(Un-used Mount)			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
19.5"x19.5" Panel Antenna	C	From Leg	1.500	0.0000	123.000	No Ice	1.200	0.131	0.010
(DNK-10 (St# 46))			0.000			1/2" Ice	1.337	0.208	0.016
			0.000			1" Ice	1.481	0.290	0.024
1' Side Arm	C	From Leg	0.500	0.0000	123.000	No Ice	2.500	2.500	0.055
(DNK-10 (St# 46))			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
2' Sidearm	B	From Leg	0.000	0.0000	111.000	No Ice	3.900	3.900	0.087
(DNK-8 (St# 47))			0.000			1/2" Ice	4.400	4.400	0.097
			0.000			1" Ice	4.900	4.900	0.107
Decibel DB210-C Dipole	A	From Leg	1.500	0.0000	125.000	No Ice	0.800	0.800	0.005
(Single)			0.000			1/2" Ice	1.440	1.440	0.007
(DNK-9 (St# 45))			0.000			1" Ice	2.080	2.080	0.009
1' Side Arm	A	From Leg	0.500	0.0000	125.000	No Ice	2.500	2.500	0.055
(DNK-9 (St# 45))			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
* Stainless Inc. Tower Mapping (12/11/2019)									
2" Dia 14' Omni (inverted)	C	From Leg	3.000	0.0000	149.000	No Ice	2.000	2.000	0.010
(DNK-32 (St# 25))			0.000			1/2" Ice	3.030	3.030	0.025
			0.000			1" Ice	4.060	4.060	0.040
Pirod 4' Side Mount Standoff	C	From Leg	0.000	0.0000	156.000	No Ice	2.720	2.720	0.050
(1)			0.000			1/2" Ice	4.910	4.910	0.089
(DNK-32, 33 (St# 24,25))			0.000			1" Ice	7.100	7.100	0.128
3" Dia 9' Omni	C	From Leg	1.000	0.0000	160.000	No Ice	4.000	4.000	0.055
(DNK-33 (St# 24))			0.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
1' Side Arm	A	From Leg	0.000	0.0000	156.000	No Ice	2.500	2.500	0.055
(DNK-37 (St# 23))			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
1 Bay Dipole ANT400D	A	From Leg	0.000	0.0000	151.000	No Ice	1.879	0.518	0.013
(DNK-34 (St# 22))			0.000			1/2" Ice	2.093	0.742	0.028

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*
			0.000			1" Ice	2.317	0.984	0.045
10'6"x4" Pipe Mount	A	From Leg	0.000	0.0000	156.000	No Ice	2.875	2.875	0.114
(DNK-34 (St# 22))			0.000			1/2" Ice	5.615	5.615	0.147
			0.000			1" Ice	6.252	6.252	0.187
ANT450F6	A	From Leg	0.000	0.0000	161.000	No Ice	1.900	1.900	0.008
(DNK-35 (St# 21))			0.000			1/2" Ice	2.728	2.728	0.022
			0.000			1" Ice	3.401	3.401	0.042
2' Sidearm	A	From Leg	0.000	0.0000	157.000	No Ice	3.900	3.900	0.087
(DNK-35 (St# 21))			0.000			1/2" Ice	4.400	4.400	0.097
			0.000			1" Ice	4.900	4.900	0.107
Telewave 150F2 Omni	B	From Leg	3.000	0.0000	166.500	No Ice	1.281	1.281	0.016
((St # 20))			0.000			1/2" Ice	1.598	1.598	0.026
			0.000			1" Ice	1.911	1.911	0.040
Pirod 4' Side Mount Standoff	B	From Leg	0.000	0.0000	164.000	No Ice	2.720	2.720	0.050
(1)			0.000			1/2" Ice	4.910	4.910	0.089
((St # 20))			0.000			1" Ice	7.100	7.100	0.128
1' Side Arm	B	From Leg	0.000	0.0000	176.000	No Ice	2.500	2.500	0.055
(DNK-44 (St# 18))			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
1' Side Arm	A	From Leg	0.000	0.0000	176.000	No Ice	2.500	2.500	0.055
(DNK-45 (St# 17))			0.000			1/2" Ice	3.363	3.363	0.073
			0.000			1" Ice	4.226	4.226	0.091
11"x8"x12" Junction Box	A	From Face	0.000	0.0000	178.000	No Ice	0.733	1.100	0.025
((St# 16))			0.000			1/2" Ice	0.843	1.231	0.036
			0.000			1" Ice	0.959	1.370	0.050
(Inverted) 3" Dia 20' Omni	C	From Leg	6.000	0.0000	170.000	No Ice	4.000	4.000	0.055
(DNK-38 (St# 15))			-3.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
(Inverted) 3" Dia 20' Omni	C	From Leg	6.000	0.0000	170.000	No Ice	4.000	4.000	0.055
(DNK-39 (St# 14))			3.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
Pirod 6' Side Mount Standoff	C	From Leg	0.000	0.0000	177.500	No Ice	4.970	4.970	0.070
(1)			0.000			1/2" Ice	6.120	6.120	0.130
(DNK-38,39 (St# 13,14,15,16))			0.000			1" Ice	7.270	7.270	0.190
3" Dia 20' Omni	C	From Leg	6.000	0.0000	185.500	No Ice	4.000	4.000	0.055
(DNK-59 (St# 13))			0.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
(inverted) 10' 8 Bay Di-Pole	C	From Face	4.000	0.0000	170.000	No Ice	4.000	4.000	0.055
(DNK-41 (St# 12))			-6.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
1 Bay Dipole ANT400D	C	From Leg	1.000	0.0000	181.000	No Ice	1.879	0.518	0.013
(DNK-51 (St# 11))			0.000			1/2" Ice	2.093	0.742	0.028
			0.000			1" Ice	2.317	0.984	0.045
2" Dia 10' Omni	C	From Leg	0.500	0.0000	186.000	No Ice	2.000	2.000	0.010
(DNK-52 (St# 10))			0.000			1/2" Ice	3.030	3.030	0.025
			0.000			1" Ice	4.060	4.060	0.040
432E-83I-01T TTA Unit	B	From Face	0.500	0.0000	177.500	No Ice	2.850	0.973	0.025
(DNK-47 (St# 9))			0.000			1/2" Ice	3.059	1.111	0.045
			0.000			1" Ice	3.276	1.255	0.067
3" Dia 12' Omni	C	From Face	0.500	0.0000	185.500	No Ice	2.000	2.000	0.010
(DNK-48 (St# 8))			0.000			1/2" Ice	3.030	3.030	0.025
			0.000			1" Ice	4.060	4.060	0.040
(inverted) 10' 8 Bay Di-Pole	C	From Face	4.000	0.0000	170.000	No Ice	4.000	4.000	0.055
(DNK-40 (St# 7))			6.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
3" Dia 20' Omni	A	From Leg	6.000	0.0000	185.500	No Ice	4.000	4.000	0.055

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
(DNK-57 (St# 6))			0.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
1" Dia 8' Omni	A	From Leg	2.000	0.0000	182.500	No Ice	2.000	2.000	0.005
(DNK-58 (St# 5))			0.000			1/2" Ice	3.030	3.030	0.018
			0.000			1" Ice	4.060	4.060	0.031
6' Side-Arm(1)	B	From Leg	0.000	0.0000	177.500	No Ice	10.600	10.600	0.140
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	0.212
			0.000			1" Ice	20.200	20.200	0.284
6' Side-Arm(1)	C	From Leg	0.000	0.0000	177.500	No Ice	10.600	10.600	0.140
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	0.212
			0.000			1" Ice	20.200	20.200	0.284
6' Side-Arm(1)	C	From Face	0.000	-45.0000	177.500	No Ice	10.600	10.600	0.140
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	0.212
			0.000			1" Ice	20.200	20.200	0.284
6' Side-Arm(1)	C	From Face	0.000	45.0000	177.500	No Ice	10.600	10.600	0.140
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	0.212
			0.000			1" Ice	20.200	20.200	0.284
(inverted) 2" Dia 10' Omni	A	From Face	4.000	0.0000	173.000	No Ice	2.000	2.000	0.010
(DNK-42 (St# 4))			0.000			1/2" Ice	3.030	3.030	0.025
			0.000			1" Ice	4.060	4.060	0.040
2" Dia 10' Omni	A	From Leg	0.500	0.0000	185.000	No Ice	2.000	2.000	0.010
(DNK-53 (St# 3))			0.000			1/2" Ice	3.030	3.030	0.025
			0.000			1" Ice	4.060	4.060	0.040
10' - 2 Bay Dipole	A	From Leg	0.500	0.0000	185.000	No Ice	1.408	1.408	0.010
(DNK-54 (St# 2))			0.000			1/2" Ice	1.556	1.556	0.028
			0.000			1" Ice	1.712	1.712	0.048
20' 4-Bay Dipole	A	From Leg	0.500	0.0000	181.000	No Ice	4.000	4.000	0.055
(DNK-55 (St# 1))			0.000			1/2" Ice	6.000	6.000	0.100
			0.000			1" Ice	8.000	8.000	0.145
Lightning Rod 2"x15'	A	From Leg	0.000	0.0000	200.000	No Ice	3.000	3.000	0.080
(DNK-56 (L.R.))			0.000			1/2" Ice	4.525	4.525	0.103
			0.000			1" Ice	6.067	6.067	0.136
6' Side-Arm(1)	A	From Leg	0.000	0.0000	179.000	No Ice	10.600	10.600	0.140
(Mts for St# 4-1 Antennas)			0.000			1/2" Ice	15.400	15.400	0.212
			0.000			1" Ice	20.200	20.200	0.284
6' Side-Arm(1)	B	From Face	0.000	45.0000	179.000	No Ice	10.600	10.600	0.140
(Mts for St# 4-1 Antennas)			0.000			1/2" Ice	15.400	15.400	0.212
			0.000			1" Ice	20.200	20.200	0.284
Telewave ANT220F2 - Omni	C	From Leg	4.000	0.0000	162.000	No Ice	1.022	1.022	0.014
Antenna			0.000			1/2" Ice	1.290	1.290	0.023
(Eversource)			0.000			1" Ice	1.560	1.560	0.035
Sitepro1 USF-4U Mount	C	From Leg	0.000	0.0000	159.000	No Ice	2.483	5.145	0.165
Assembly (Ca = 1.4 assumed)			0.000			1/2" Ice	3.247	6.910	0.318
(Eversource)			0.000			1" Ice	4.029	8.675	0.474
Comprod 871F-70 Dipole	C	From Leg	1.000	0.0000	124.000	No Ice	1.700	0.468	0.013
(Eversource)			0.000			1/2" Ice	1.894	0.672	0.027
			0.000			1" Ice	2.097	0.890	0.044
Sitepro1 USF-4U Mount	C	From Leg	0.000	0.0000	121.000	No Ice	2.483	5.145	0.165
Assembly (Ca = 1.4 assumed)			0.000			1/2" Ice	3.247	6.910	0.318
(Eversource)			0.000			1" Ice	4.029	8.675	0.474
2' Sidearm	A	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	0.087
(T-Mobile)			0.000			1/2" Ice	4.400	4.400	0.097
			0.000			1" Ice	4.900	4.900	0.107
2' Sidearm	B	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	0.087
(T-Mobile)			0.000			1/2" Ice	4.400	4.400	0.097
			0.000			1" Ice	4.900	4.900	0.107
2' Sidearm	C	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	0.087

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
(T-Mobile)			0.000			1/2" Ice	4.400	4.400	0.097
			0.000			1" Ice	4.900	4.900	0.107
(2) TMA 10"x8"x5"	A	From Leg	1.000	0.0000	130.000	No Ice	0.667	0.417	0.020
(T-Mobile)			0.000			1/2" Ice	0.770	0.504	0.026
			0.000			1" Ice	0.881	0.598	0.034
(2) TMA 10"x8"x5"	B	From Leg	1.000	0.0000	130.000	No Ice	0.667	0.417	0.020
(T-Mobile)			0.000			1/2" Ice	0.770	0.504	0.026
			0.000			1" Ice	0.881	0.598	0.034
(2) TMA 10"x8"x5"	C	From Leg	1.000	0.0000	130.000	No Ice	0.667	0.417	0.020
(T-Mobile)			0.000			1/2" Ice	0.770	0.504	0.026
			0.000			1" Ice	0.881	0.598	0.034
(2) CBC1923Q-43 Diplexer	A	From Leg	1.000	0.0000	130.000	No Ice	0.322	0.127	0.008
(T-Mobile)			0.000			1/2" Ice	0.398	0.174	0.011
			0.000			1" Ice	0.481	0.229	0.016
(2) CBC1923Q-43 Diplexer	B	From Leg	1.000	0.0000	130.000	No Ice	0.322	0.127	0.008
(T-Mobile)			0.000			1/2" Ice	0.398	0.174	0.011
			0.000			1" Ice	0.481	0.229	0.016
(2) CBC1923Q-43 Diplexer	C	From Leg	1.000	0.0000	130.000	No Ice	0.322	0.127	0.008
(T-Mobile)			0.000			1/2" Ice	0.398	0.174	0.011
			0.000			1" Ice	0.481	0.229	0.016
ATSBT-TOP-FM-4G	A	From Leg	1.000	0.0000	130.000	No Ice	0.174	0.095	0.050
(T-Mobile)			0.000			1/2" Ice	0.229	0.140	0.052
			0.000			1" Ice	0.292	0.193	0.054
ATSBT-TOP-FM-4G	B	From Leg	1.000	0.0000	130.000	No Ice	0.174	0.095	0.050
(T-Mobile)			0.000			1/2" Ice	0.229	0.140	0.052
			0.000			1" Ice	0.292	0.193	0.054
ATSBT-TOP-FM-4G	C	From Leg	1.000	0.0000	130.000	No Ice	0.174	0.095	0.050
(T-Mobile)			0.000			1/2" Ice	0.229	0.140	0.052
			0.000			1" Ice	0.292	0.193	0.054
DBXNH-6565B	A	From Leg	4.000	0.0000	130.000	No Ice	8.173	5.405	0.050
(T-Mobile)			1.000			1/2" Ice	8.633	5.863	0.101
			0.000			1" Ice	9.100	6.327	0.157
DBXNH-6565B	B	From Leg	4.000	0.0000	130.000	No Ice	8.173	5.405	0.050
(T-Mobile)			1.000			1/2" Ice	8.633	5.863	0.101
			0.000			1" Ice	9.100	6.327	0.157
DBXNH-6565B	C	From Leg	4.000	0.0000	130.000	No Ice	8.173	5.405	0.050
(T-Mobile)			1.000			1/2" Ice	8.633	5.863	0.101
			0.000			1" Ice	9.100	6.327	0.157
Pirod 12' PCS T-Frame (1)	A	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	0.565
104569			0.000			1/2" Ice	18.973	10.444	0.588
(Sprint)			0.000			1" Ice	25.347	13.160	0.650
Pirod 12' PCS T-Frame (1)	B	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	0.565
104569			0.000			1/2" Ice	18.973	10.444	0.588
(Sprint)			0.000			1" Ice	25.347	13.160	0.650
Pirod 12' PCS T-Frame (1)	C	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	0.565
104569			0.000			1/2" Ice	18.973	10.444	0.588
(Sprint)			0.000			1" Ice	25.347	13.160	0.650
APXVTM14-C-120 Panel	A	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	0.072
Antenna			-3.500			1/2" Ice	6.716	3.967	0.112
(Sprint)			0.000			1" Ice	7.097	4.333	0.156
APXVTM14-C-120 Panel	B	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	0.072
Antenna			-3.500			1/2" Ice	6.716	3.967	0.112
(Sprint)			0.000			1" Ice	7.097	4.333	0.156
APXVTM14-C-120 Panel	C	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	0.072
Antenna			-3.500			1/2" Ice	6.716	3.967	0.112
(Sprint)			0.000			1" Ice	7.097	4.333	0.156
NNVV-65B-R4 Panel	A	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	0.085

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
Antenna			3.500			1/2" Ice	12.766	6.207	0.157
(Sprint)			0.000			1" Ice	13.268	6.671	0.236
NNVV-65B-R4 Panel	B	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	0.085
Antenna			3.500			1/2" Ice	12.766	6.207	0.157
(Sprint)			0.000			1" Ice	13.268	6.671	0.236
NNVV-65B-R4 Panel	C	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	0.085
Antenna			3.500			1/2" Ice	12.766	6.207	0.157
(Sprint)			0.000			1" Ice	13.268	6.671	0.236
ALU TD-RRH-8x20-25	A	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	0.076
(Sprint)			3.500			1/2" Ice	4.281	1.705	0.103
			0.000			1" Ice	4.540	1.891	0.134
ALU TD-RRH-8x20-25	B	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	0.076
(Sprint)			3.500			1/2" Ice	4.281	1.705	0.103
			0.000			1" Ice	4.540	1.891	0.134
ALU TD-RRH-8x20-25	C	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	0.076
(Sprint)			3.500			1/2" Ice	4.281	1.705	0.103
			0.000			1" Ice	4.540	1.891	0.134
(2) ALU 800MHz 2x50W	A	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	0.064
(Sprint)			3.500			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
(2) ALU 800MHz 2x50W	B	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	0.064
(Sprint)			3.500			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
(2) ALU 800MHz 2x50W	C	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	0.064
(Sprint)			3.500			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
ALU 4x45-1900 MHz RRH	A	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	0.070
Unit			-3.500			1/2" Ice	2.709	2.709	0.095
(Sprint)			0.000			1" Ice	2.926	2.926	0.124
ALU 4x45-1900 MHz RRH	B	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	0.070
Unit			-3.500			1/2" Ice	2.709	2.709	0.095
(Sprint)			0.000			1" Ice	2.926	2.926	0.124
ALU 4x45-1900 MHz RRH	C	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	0.070
Unit			-3.500			1/2" Ice	2.709	2.709	0.095
(Sprint)			0.000			1" Ice	2.926	2.926	0.124
13-ft Sector Frame	A	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	0.350
(AT&T - Existing)			0.000			1/2" Ice	16.000	16.000	0.525
			0.000			1" Ice	20.000	20.000	0.700
13-ft Sector Frame	B	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	0.350
(AT&T - Existing)			0.000			1/2" Ice	16.000	16.000	0.525
			0.000			1" Ice	20.000	20.000	0.700
13-ft Sector Frame	C	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	0.350
(AT&T - Existing)			0.000			1/2" Ice	16.000	16.000	0.525
			0.000			1" Ice	20.000	20.000	0.700
DMP65R-BU4D	A	From Face	4.000	0.0000	148.000	No Ice	8.000	3.506	0.068
(AT&T - Proposed)			4.000			1/2" Ice	8.381	3.810	0.119
			0.000			1" Ice	8.770	4.121	0.174
840-370964	A	From Face	4.000	0.0000	148.000	No Ice	6.077	3.039	0.065
(AT&T - Proposed)			-4.000			1/2" Ice	6.415	3.343	0.103
			0.000			1" Ice	6.761	3.646	0.147
DMP65R-BU4D	B	From Face	4.000	0.0000	148.000	No Ice	8.000	3.506	0.068
(AT&T - Proposed)			4.000			1/2" Ice	8.381	3.810	0.119
			0.000			1" Ice	8.770	4.121	0.174
840-370964	B	From Face	4.000	0.0000	148.000	No Ice	6.077	3.039	0.065
(AT&T - Proposed)			-4.000			1/2" Ice	6.415	3.343	0.103
			0.000			1" Ice	6.761	3.646	0.147
DMP65R-BU4D	C	From Face	4.000	0.0000	148.000	No Ice	8.000	3.506	0.068

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
(AT&T - Proposed)			4.000			1/2" Ice	8.381	3.810	0.119
			0.000			1" Ice	8.770	4.121	0.174
840-370964	C	From Face	4.000	0.0000	148.000	No Ice	6.077	3.039	0.065
(AT&T - Proposed)			-4.000			1/2" Ice	6.415	3.343	0.103
			0.000			1" Ice	6.761	3.646	0.147
4449 B5/B12	A	From Face	4.000	0.0000	148.000	No Ice	1.968	1.408	0.071
(AT&T - Proposed)			4.000			1/2" Ice	2.144	1.564	0.090
			0.000			1" Ice	2.328	1.727	0.111
4449 B5/B12	B	From Face	4.000	0.0000	148.000	No Ice	1.968	1.408	0.071
(AT&T - Proposed)			4.000			1/2" Ice	2.144	1.564	0.090
			0.000			1" Ice	2.328	1.727	0.111
4449 B5/B12	C	From Face	4.000	0.0000	148.000	No Ice	1.968	1.408	0.071
(AT&T - Proposed)			4.000			1/2" Ice	2.144	1.564	0.090
			0.000			1" Ice	2.328	1.727	0.111
8843 B2/B66A	A	From Face	4.000	0.0000	148.000	No Ice	1.639	1.353	0.072
(AT&T - Proposed)			4.000			1/2" Ice	1.799	1.500	0.090
			0.000			1" Ice	1.966	1.655	0.110
8843 B2/B66A	B	From Face	4.000	0.0000	148.000	No Ice	1.639	1.353	0.072
(AT&T - Proposed)			4.000			1/2" Ice	1.799	1.500	0.090
			0.000			1" Ice	1.966	1.655	0.110
8843 B2/B66A	C	From Face	4.000	0.0000	148.000	No Ice	1.639	1.353	0.072
(AT&T - Proposed)			4.000			1/2" Ice	1.799	1.500	0.090
			0.000			1" Ice	1.966	1.655	0.110
RVZDC-6627-PF-48	C	From Leg	0.000	0.0000	148.000	No Ice	3.250	2.150	0.030
(AT&T - Proposed)			0.000			1/2" Ice	3.477	2.347	0.058
			0.000			1" Ice	3.712	2.551	0.090

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
6' w/Radome	A	Paraboloid	From	0.500	Worst		178.000	6.000	No Ice	28.274	0.380
(DNK-45 (St# 17))		w/Radome	Leg	0.000					1/2" Ice	29.065	0.450
				0.000					1" Ice	29.856	0.520
6' w/Radome	B	Paraboloid	From	1.000	Worst		176.000	6.000	No Ice	28.274	0.380
(DNK-44 (St# 18))		w/Radome	Leg	0.000					1/2" Ice	29.065	0.450
				0.000					1" Ice	29.856	0.520
4' Paraflector	B	Grid	From	2.000	Worst		111.000	4.000	No Ice	16.000	0.034
[PRF-950]			Leg	0.000					1/2" Ice	16.674	0.048
(DNK-8 (St# 47))				0.000					1" Ice	17.347	0.062
4' Paraflector	A	Grid	From	2.000	Worst		156.000	4.000	No Ice	16.000	0.034
[PRF-950]			Leg	0.000					1/2" Ice	16.674	0.048
(DNK-37 (St# 23))				0.000					1" Ice	17.347	0.062

222-H Verification Constants

Constant	*Value*
K_d	0.85
Ice Thickness Importance Factor	1.15
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	n/a
K_t	1
f	1
K_e	1

222-H Section Verification ArRr By Element

Section Elevation *ft*	*Elem. Num.*	*Size*	*C*	*C w/Ice*	*Face*	*e*	*e w/Ice*	A_r ft^2	A_r *w/Ice* ft^2	A_rR_r ft^2	A_rR_r *w/Ice* ft^2
T1 180.000-175.000	1	Stainless P5x0.250	72.2	38.448	C	0.173	0.306	2.086	3.221	0.942	1.935
	1	Stainless P5x0.250	72.2	38.448	A	0.173	0.306	2.086	3.221	0.942	1.935
	2	Stainless P5x0.250	72.2	38.448	C	0.173	0.306	2.086	3.221	0.942	1.935
	2	Stainless P5x0.250	72.2	38.448	B	0.173	0.306	2.086	3.221	0.942	1.935
	3	Stainless P5x0.250	72.2	38.448	B	0.173	0.306	2.086	3.221	0.942	1.935
	3	Stainless P5x0.250	72.2	38.448	A	0.173	0.306	2.086	3.221	0.942	1.935
					A		Sum:	4.171	6.441	1.883	3.871
					B			4.171	6.441	1.883	3.871
					C			4.171	6.441	1.883	3.871
T2 175.000-166.667	13	Stainless P5x0.250	71.91	38.241	C	0.135	0.239	3.476	5.361	1.514	3.122
	13	Stainless P5x0.250	71.91	38.241	A	0.135	0.239	3.476	5.361	1.514	3.122
	14	Stainless P5x0.250	71.91	38.241	C	0.135	0.239	3.476	5.361	1.514	3.122
	14	Stainless P5x0.250	71.91	38.241	B	0.135	0.239	3.476	5.361	1.514	3.122
	15	Stainless P5x0.250	71.91	38.241	B	0.135	0.239	3.476	5.361	1.514	3.122
	15	Stainless P5x0.250	71.91	38.241	A	0.135	0.239	3.476	5.361	1.514	3.122
					A		Sum:	6.952	10.721	3.028	6.244
					B			6.952	10.721	3.028	6.244
					C			6.952	10.721	3.028	6.244
T3 166.667-158.333	25	Stainless P5x0.250	71.532	37.974	C	0.13	0.23	3.476	5.351	1.512	3.106
	25	Stainless P5x0.250	71.532	37.974	A	0.13	0.23	3.476	5.351	1.512	3.106
	26	Stainless P5x0.250	71.532	37.974	C	0.13	0.23	3.476	5.351	1.512	3.106
	26	Stainless P5x0.250	71.532	37.974	B	0.13	0.23	3.476	5.351	1.512	3.106
	27	Stainless P5x0.250	71.532	37.974	B	0.13	0.23	3.476	5.351	1.512	3.106
	27	Stainless P5x0.250	71.532	37.974	A	0.13	0.23	3.476	5.351	1.512	3.106
					A		Sum:	6.952	10.702	3.023	6.212
					B			6.952	10.702	3.023	6.212
					C			6.952	10.702	3.023	6.212
T4 158.333-150.000	37	Stainless P5x0.250	71.137	37.695	C	0.126	0.222	3.476	5.341	1.511	3.091
	37	Stainless P5x0.250	71.137	37.695	A	0.126	0.222	3.476	5.341	1.511	3.091
	38	Stainless P5x0.250	71.137	37.695	C	0.126	0.222	3.476	5.341	1.511	3.091
	38	Stainless P5x0.250	71.137	37.695	B	0.126	0.222	3.476	5.341	1.511	3.091
	39	Stainless P5x0.250	71.137	37.695	B	0.126	0.222	3.476	5.341	1.511	3.091
	39	Stainless P5x0.250	71.137	37.695	A	0.126	0.222	3.476	5.341	1.511	3.091
					A		Sum:	6.952	10.683	3.022	6.183
					B			6.952	10.683	3.022	6.183

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
					C			6.952	10.683	3.022	6.183
T5	49	Stainless P5x0.300	70.286	37.095	C	0.145	0.265	10.428	15.960	4.651	9.400
150.000-125.000											
	49	Stainless P5x0.300	70.286	37.095	A	0.145	0.265	10.428	15.960	4.651	9.400
	50	Stainless P5x0.300	70.286	37.095	C	0.145	0.265	10.428	15.960	4.651	9.400
	50	Stainless P5x0.300	70.286	37.095	B	0.145	0.265	10.428	15.960	4.651	9.400
	51	Stainless P5x0.300	70.286	37.095	B	0.145	0.265	10.428	15.960	4.651	9.400
	51	Stainless P5x0.300	70.286	37.095	A	0.145	0.265	10.428	15.960	4.651	9.400
					A		Sum:	20.856	31.921	9.303	18.799
					B			20.856	31.921	9.303	18.799
					C			20.856	31.921	9.303	18.799
T6	124	Stainless P5x0.400	68.817	36.07	C	0.142	0.254	10.428	15.850	4.698	9.288
125.000-100.000											
	124	Stainless P5x0.400	68.817	36.07	A	0.142	0.254	10.428	15.850	4.698	9.288
	125	Stainless P5x0.400	68.817	36.07	C	0.142	0.254	10.428	15.850	4.698	9.288
	125	Stainless P5x0.400	68.817	36.07	B	0.142	0.254	10.428	15.850	4.698	9.288
	126	Stainless P5x0.400	68.817	36.07	B	0.142	0.254	10.428	15.850	4.698	9.288
	126	Stainless P5x0.400	68.817	36.07	A	0.142	0.254	10.428	15.850	4.698	9.288
					A		Sum:	20.856	31.701	9.397	18.576
					B			20.856	31.701	9.397	18.576
					C			20.856	31.701	9.397	18.576
T7	199	Stainless P5x0.500	67.665	35.273	C	0.137	0.244	3.476	5.255	1.574	3.066
100.000-91.667											
	199	Stainless P5x0.500	67.665	35.273	A	0.137	0.244	3.476	5.255	1.574	3.066
	200	Stainless P5x0.500	67.665	35.273	C	0.137	0.244	3.476	5.255	1.574	3.066
	200	Stainless P5x0.500	67.665	35.273	B	0.137	0.244	3.476	5.255	1.574	3.066
	201	Stainless P5x0.500	67.665	35.273	B	0.137	0.244	3.476	5.255	1.574	3.066
	201	Stainless P5x0.500	67.665	35.273	A	0.137	0.244	3.476	5.255	1.574	3.066
					A		Sum:	6.952	10.509	3.149	6.132
					B			6.952	10.509	3.149	6.132
					C			6.952	10.509	3.149	6.132
T8					A		Sum:	0.000	0.000	0.000	0.000
91.667-83.333					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T9					A		Sum:	0.000	0.000	0.000	0.000
83.333-75.000					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T10	280	Stainless P6.875x0.400	88.946	41.608	C	0.135	0.212	14.338	19.451	5.898	11.217
75.000-50.000											
	280	Stainless P6.875x0.400	88.946	41.608	A	0.135	0.212	14.338	19.451	5.898	11.217
	281	Stainless P6.875x0.400	88.946	41.608	C	0.135	0.212	14.338	19.451	5.898	11.217
	281	Stainless P6.875x0.400	88.946	41.608	B	0.135	0.212	14.338	19.451	5.898	11.217
	282	Stainless P6.875x0.400	88.946	41.608	B	0.135	0.212	14.338	19.451	5.898	11.217
	282	Stainless P6.875x0.400	88.946	41.608	A	0.135	0.212	14.338	19.451	5.898	11.217
					A		Sum:	28.676	38.903	11.795	22.434
					B			28.676	38.903	11.795	22.434
					C			28.676	38.903	11.795	22.434
T11	331	Stainless P6.875x0.500	85.668	39.706	C	0.13	0.202	7.169	9.636	2.930	5.538
50.000-37.500											
	331	Stainless P6.875x0.500	85.668	39.706	A	0.13	0.202	7.169	9.636	2.930	5.538
	332	Stainless P6.875x0.500	85.668	39.706	C	0.13	0.202	7.169	9.636	2.930	5.538

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	332	Stainless P6.875x0.500	85.668	39.706	B	0.13	0.202	7.169	9.636	2.930	5.538
	333	Stainless P6.875x0.500	85.668	39.706	B	0.13	0.202	7.169	9.636	2.930	5.538
	333	Stainless P6.875x0.500	85.668	39.706	A	0.13	0.202	7.169	9.636	2.930	5.538
					A		Sum:	14.338	19.272	5.860	11.077
					B			14.338	19.272	5.860	11.077
					C			14.338	19.272	5.860	11.077
T12	358	Stainless	82.687	38	C	0.127	0.195	7.169	9.554	2.919	5.480
37.500-25.000		P6.875x0.500									
	358	Stainless P6.875x0.500	82.687	38	A	0.127	0.195	7.169	9.554	2.919	5.480
	359	Stainless P6.875x0.500	82.687	38	C	0.127	0.195	7.169	9.554	2.919	5.480
	359	Stainless P6.875x0.500	82.687	38	B	0.127	0.195	7.169	9.554	2.919	5.480
	360	Stainless P6.875x0.500	82.687	38	B	0.127	0.195	7.169	9.554	2.919	5.480
	360	Stainless P6.875x0.500	82.687	38	A	0.127	0.195	7.169	9.554	2.919	5.480
					A		Sum:	14.338	19.109	5.839	10.960
					B			14.338	19.109	5.839	10.960
					C			14.338	19.109	5.839	10.960
T13	385	Stainless	78.358	35.563	C	0.124	0.187	7.169	9.436	2.910	5.401
25.000-12.500		P6.875x0.500									
	385	Stainless P6.875x0.500	78.358	35.563	A	0.124	0.187	7.169	9.436	2.910	5.401
	386	Stainless P6.875x0.500	78.358	35.563	C	0.124	0.187	7.169	9.436	2.910	5.401
	386	Stainless P6.875x0.500	78.358	35.563	B	0.124	0.187	7.169	9.436	2.910	5.401
	387	Stainless P6.875x0.500	78.358	35.563	B	0.124	0.187	7.169	9.436	2.910	5.401
	387	Stainless P6.875x0.500	78.358	35.563	A	0.124	0.187	7.169	9.436	2.910	5.401
					A		Sum:	14.338	18.871	5.819	10.802
					B			14.338	18.871	5.819	10.802
					C			14.338	18.871	5.819	10.802
T14	412	Stainless	76.589	33.891	C	0.121	0.177	7.169	9.200	2.942	5.252
12.500-0.000		P6.875x0.500									
	412	Stainless P6.875x0.500	76.589	33.891	A	0.121	0.177	7.169	9.200	2.942	5.252
	413	Stainless P6.875x0.500	76.589	33.891	C	0.121	0.177	7.169	9.200	2.942	5.252
	413	Stainless P6.875x0.500	76.589	33.891	B	0.121	0.177	7.169	9.200	2.942	5.252
	414	Stainless P6.875x0.500	76.589	33.891	B	0.121	0.177	7.169	9.200	2.942	5.252
	414	Stainless P6.875x0.500	76.589	33.891	A	0.121	0.177	7.169	9.200	2.942	5.252
					A		Sum:	14.338	18.400	5.885	10.504
					B			14.338	18.400	5.885	10.504
					C			14.338	18.400	5.885	10.504

222-H Section Verification Tables - No Ice

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	Face	e	A_rR_r
ft	ft	ft				in	ksf			ft^2
T1 180.000-175.000	177.500		1.428	1	1		0.065	A	0.173	1.883
								B	0.173	1.883
								C	0.173	1.883
T2 175.000-166.667	170.833		1.417	1	1		0.065	A	0.135	3.028
								B	0.135	3.028
								C	0.135	3.028
T3 166.667-158.333	162.500		1.402	1	1		0.064	A	0.13	3.023
								B	0.13	3.023
								C	0.13	3.023
T4 158.333-150.000	154.167		1.386	1	1		0.063	A	0.126	3.022
								B	0.126	3.022
								C	0.126	3.022
T5 150.000-125.000	137.500		1.353	1	1		0.062	A	0.145	9.303
								B	0.145	9.303
								C	0.145	9.303
T6 125.000-100.000	112.500		1.297	1	1		0.059	A	0.142	9.397
								B	0.142	9.397
								C	0.142	9.397
T7 100.000-91.667	95.833		1.254	1	1		0.057	A	0.137	3.149
								B	0.137	3.149
								C	0.137	3.149
T8 91.667-83.333	87.500		1.231	1	1		0.056	A	0.137	0.000
								B	0.137	0.000
								C	0.137	0.000
T9 83.333-75.000	79.167		1.205	1	1		0.055	A	0.135	0.000
								B	0.135	0.000
								C	0.135	0.000
T10 75.000-50.000	62.500		1.146	1	1		0.052	A	0.135	11.795
								B	0.135	11.795
								C	0.135	11.795
T11 50.000-37.500	43.750		1.063	1	1		0.049	A	0.13	5.860
								B	0.13	5.860
								C	0.13	5.860
T12 37.500-25.000	31.250		0.991	1	1		0.045	A	0.127	5.839
								B	0.127	5.839
								C	0.127	5.839
T13 25.000-12.500	18.750		0.89	1	1		0.041	A	0.124	5.819
								B	0.124	5.819
								C	0.124	5.819
T14 12.500-0.000	6.250		0.85	1	1		0.039	A	0.121	5.885
								B	0.121	5.885
								C	0.121	5.885

222-H Section Verification Tables - Ice

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	Face	e	A_rR_r
ft	ft	ft				in	ksf			ft^2
T1 180.000-175.000	177.500	177.500	1.428	1	1	1.361	0.008	A	0.306	7.207
								B	0.306	7.207
								C	0.306	7.207
T2 175.000-166.667	170.833	170.833	1.417	1	1	1.356	0.008	A	0.239	10.217
								B	0.239	10.217

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft^2
								C	0.239	10.217
T3 166.667-158.333	162.500	162.500	1.402	1	1	1.349	0.008	A	0.23	10.294
								B	0.23	10.294
								C	0.23	10.294
T4 158.333-150.000	154.167	154.167	1.386	1	1	1.342	0.008	A	0.222	10.373
								B	0.222	10.373
								C	0.222	10.373
T5 150.000-125.000	137.500	137.500	1.353	1	1	1.326	0.007	A	0.265	38.684
								B	0.265	38.684
								C	0.265	38.684
T6 125.000-100.000	112.500	112.500	1.297	1	1	1.300	0.007	A	0.254	39.908
								B	0.254	39.908
								C	0.254	39.908
T7 100.000-91.667	95.833	95.833	1.254	1	1	1.279	0.007	A	0.244	13.529
								B	0.244	13.529
								C	0.244	13.529
T8 91.667-83.333	87.500	87.500	1.231	1	1	1.268	0.007	A	0.234	7.516
								B	0.234	7.516
								C	0.234	7.516
T9 83.333-75.000	79.167	79.167	1.205	1	1	1.255	0.007	A	0.229	7.642
								B	0.229	7.642
								C	0.229	7.642
T10 75.000-50.000	62.500	62.500	1.146	1	1	1.226	0.006	A	0.212	39.901
								B	0.212	39.901
								C	0.212	39.901
T11 50.000-37.500	43.750	43.750	1.063	1	1	1.183	0.006	A	0.202	19.902
								B	0.202	19.902
								C	0.202	19.902
T12 37.500-25.000	31.250	31.250	0.991	1	1	1.144	0.005	A	0.195	19.754
								B	0.195	19.754
								C	0.195	19.754
T13 25.000-12.500	18.750	18.750	0.89	1	1	1.087	0.005	A	0.187	19.404
								B	0.187	19.404
								C	0.187	19.404
T14 12.500-0.000	6.250	6.250	0.85	1	1	0.974	0.005	A	0.177	18.429
								B	0.177	18.429
								C	0.177	18.429

222-H Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft^2
T1 180.000-175.000	177.500		1.428	1	1		0.011	A	0.173	2.379
								B	0.173	2.379
								C	0.173	2.379
T2 175.000-166.667	170.833		1.417	1	1		0.011	A	0.135	3.936
								B	0.135	3.936
								C	0.135	3.936
T3 166.667-158.333	162.500		1.402	1	1		0.011	A	0.13	3.933
								B	0.13	3.933
								C	0.13	3.933
T4 158.333-150.000	154.167		1.386	1	1		0.011	A	0.126	3.931
								B	0.126	3.931
								C	0.126	3.931
T5 150.000-125.000	137.500		1.353	1	1		0.011	A	0.145	11.826

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
								B	0.145	11.826
								C	0.145	11.826
T6 125.000-100.000	112.500		1.297	1	1		0.010	A	0.142	11.821
								B	0.142	11.821
								C	0.142	11.821
T7 100.000-91.667	95.833		1.254	1	1		0.010	A	0.137	3.937
								B	0.137	3.937
								C	0.137	3.937
T8 91.667-83.333	87.500		1.231	1	1		0.010	A	0.137	0.000
								B	0.137	0.000
								C	0.137	0.000
T9 83.333-75.000	79.167		1.205	1	1		0.009	A	0.135	0.000
								B	0.135	0.000
								C	0.135	0.000
T10 75.000-50.000	62.500		1.146	1	1		0.009	A	0.135	16.237
								B	0.135	16.237
								C	0.135	16.237
T11 50.000-37.500	43.750		1.063	1	1		0.008	A	0.13	8.112
								B	0.13	8.112
								C	0.13	8.112
T12 37.500-25.000	31.250		0.991	1	1		0.008	A	0.127	8.109
								B	0.127	8.109
								C	0.127	8.109
T13 25.000-12.500	18.750		0.89	1	1		0.007	A	0.124	8.107
								B	0.124	8.107
								C	0.124	8.107
T14 12.500-0.000	6.250		0.85	1	1		0.007	A	0.121	8.104
								B	0.121	8.104
								C	0.121	8.104

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	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	177.500	1.428	0.065	56.082	A	5.526	4.171	4.171	43.02	6.027	0.000
180.000-175.0					B	5.526	4.171		43.02	0.000	0.000
00					C	5.526	4.171		43.02	1.708	0.000
T2	170.833	1.417	0.065	97.919	A	6.293	6.952	6.952	52.49	15.103	0.000
175.000-166.6					B	6.293	6.952		52.49	0.000	0.000
67					C	6.293	6.952		52.49	3.108	0.000
T3	162.500	1.402	0.064	103.475	A	6.518	6.952	6.952	51.61	18.612	0.000
166.667-158.3					B	6.518	6.952		51.61	0.000	0.000
33					C	6.518	6.952		51.61	3.512	0.000
T4	154.167	1.386	0.063	109.031	A	6.746	6.952	6.952	50.75	23.331	0.000
158.333-150.0					B	6.746	6.952		50.75	0.000	0.000
00					C	6.746	6.952		50.75	4.025	0.000
T5	137.500	1.353	0.062	360.425	A	31.437	20.856	20.856	39.88	76.895	0.000
150.000-125.0					B	31.437	20.856		39.88	0.000	0.000
00					C	31.437	20.856		39.88	51.270	0.000
T6	112.500	1.297	0.059	410.425	A	37.501	20.856	20.856	35.74	83.524	0.000
125.000-100.0					B	37.501	20.856		35.74	0.000	0.000
00					C	37.501	20.856		35.74	90.274	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	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
T7	95.833	1.254	0.057	147.919	A	13.268	6.952	6.952	34.38	28.423	0.000
100.000-91.667					B	13.268	6.952		34.38	0.000	0.000
					C	13.268	6.952		34.38	30.128	0.000
T8	87.500	1.231	0.056	154.157	A	21.130	0.000	7.473	35.37	28.423	0.000
91.667-83.333					B	21.130	0.000		35.37	0.000	0.000
					C	21.130	0.000		35.37	30.128	0.000
T9	79.167	1.205	0.055	159.712	A	21.520	0.000	7.473	34.73	29.571	0.000
83.333-75.000					B	21.520	0.000		34.73	0.000	0.000
					C	21.520	0.000		34.73	30.128	0.000
T10	62.500	1.146	0.052	514.334	A	40.858	28.676	28.676	41.24	94.593	0.000
75.000-50.000					B	40.858	28.676		41.24	0.000	0.000
					C	40.858	28.676		41.24	90.384	0.000
T11	43.750	1.063	0.049	275.917	A	21.483	14.338	14.338	40.03	47.297	0.000
50.000-37.500					B	21.483	14.338		40.03	0.000	0.000
					C	21.483	14.338		40.03	45.192	0.000
T12	31.250	0.991	0.045	288.417	A	22.193	14.338	14.338	39.25	48.147	0.000
37.500-25.000					B	22.193	14.338		39.25	0.000	0.000
					C	22.193	14.338		39.25	45.192	0.000
T13	18.750	0.89	0.041	300.917	A	22.909	14.338	14.338	38.49	49.628	0.000
25.000-12.500					B	22.909	14.338		38.49	0.000	0.000
					C	22.909	14.338		38.49	45.192	0.000
T14	6.250	0.85	0.039	313.417	A	23.630	14.338	14.338	37.76	18.161	0.000
12.500-0.000					B	23.630	14.338		37.76	0.000	0.000
					C	23.630	14.338		37.76	16.269	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	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	177.500	1.428	0.008	1.361	57.217	A	5.526	11.995	6.441	36.77	17.321	0.000
180.000-175.000						B	5.526	11.995		36.77	0.000	0.000
						C	5.526	11.995		36.77	5.109	0.000
T2	170.833	1.417	0.008	1.356	99.804	A	6.293	17.545	10.721	44.98	41.220	0.000
175.000-166.667						B	6.293	17.545		44.98	0.000	0.000
						C	6.293	17.545		44.98	9.886	0.000
T3	162.500	1.402	0.008	1.349	105.350	A	6.518	17.735	10.702	44.13	52.106	0.000
166.667-158.333						B	6.518	17.735		44.13	0.000	0.000
						C	6.518	17.735		44.13	11.245	0.000
T4	154.167	1.386	0.008	1.342	110.895	A	6.746	17.923	10.683	43.30	65.460	0.000
158.333-150.000						B	6.746	17.923		43.30	0.000	0.000
						C	6.746	17.923		43.30	12.969	0.000
T5	137.500	1.353	0.007	1.326	365.956	A	31.437	65.685	31.921	32.87	215.903	0.000
150.000-125.000						B	31.437	65.685		32.87	0.000	0.000
						C	31.437	65.685		32.87	150.754	0.000
T6	112.500	1.297	0.007	1.300	415.846	A	37.501	68.105	31.701	30.02	235.371	0.000
125.000-100.000						B	37.501	68.105		30.02	0.000	0.000
						C	37.501	68.105		30.02	227.544	0.000
T7	95.833	1.254	0.007	1.279	149.698	A	13.268	23.188	10.509	28.83	79.598	0.000
100.000-91.667						B	13.268	23.188		28.83	0.000	0.000
						C	13.268	23.188		28.83	75.543	0.000
T8	87.500	1.231	0.007	1.268	155.919	A	23.480	12.933	9.823	26.98	79.134	0.000
91.667-83.333						B	23.480	12.933		26.98	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	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
						C	23.480	12.933		26.98	75.304	0.000
T9	79.167	1.205	0.007	1.255	161.457	A	23.847	13.171	9.800	26.47	81.786	0.000
83.333-75.000						B	23.847	13.171		26.47	0.000	0.000
						C	23.847	13.171		26.47	75.043	0.000
T10	62.500	1.146	0.006	1.226	519.446	A	40.858	69.193	38.903	35.35	260.082	0.000
75.000-50.000						B	40.858	69.193		35.35	0.000	0.000
						C	40.858	69.193		35.35	223.310	0.000
T11	43.750	1.063	0.006	1.183	278.384	A	21.483	34.627	19.272	34.35	127.142	0.000
50.000-37.500						B	21.483	34.627		34.35	0.000	0.000
						C	21.483	34.627		34.35	110.324	0.000
T12	31.250	0.991	0.005	1.144	290.802	A	22.193	34.439	19.109	33.74	128.439	0.000
37.500-25.000						B	22.193	34.439		33.74	0.000	0.000
						C	22.193	34.439		33.74	109.112	0.000
T13	18.750	0.89	0.005	1.087	303.183	A	22.909	33.900	18.871	33.22	131.028	0.000
25.000-12.500						B	22.909	33.900		33.22	0.000	0.000
						C	22.909	33.900		33.22	107.351	0.000
T14	6.250	0.85	0.005	0.974	315.447	A	23.630	32.283	18.400	32.91	45.328	0.000
12.500-0.000						B	23.630	32.283		32.91	0.000	0.000
						C	23.630	32.283		32.91	37.390	0.000

Tower Pressure - Service

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z ksf	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	177.500	1.428	0.011	56.082	A	5.526	4.171	4.171	43.02	6.027	0.000
180.000-175.0					B	5.526	4.171		43.02	0.000	0.000
00					C	5.526	4.171		43.02	1.708	0.000
T2	170.833	1.417	0.011	97.919	A	6.293	6.952	6.952	52.49	15.103	0.000
175.000-166.6					B	6.293	6.952		52.49	0.000	0.000
67					C	6.293	6.952		52.49	3.108	0.000
T3	162.500	1.402	0.011	103.475	A	6.518	6.952	6.952	51.61	18.612	0.000
166.667-158.3					B	6.518	6.952		51.61	0.000	0.000
33					C	6.518	6.952		51.61	3.512	0.000
T4	154.167	1.386	0.011	109.031	A	6.746	6.952	6.952	50.75	23.331	0.000
158.333-150.0					B	6.746	6.952		50.75	0.000	0.000
00					C	6.746	6.952		50.75	4.025	0.000
T5	137.500	1.353	0.011	360.425	A	31.437	20.856	20.856	39.88	76.895	0.000
150.000-125.0					B	31.437	20.856		39.88	0.000	0.000
00					C	31.437	20.856		39.88	51.270	0.000
T6	112.500	1.297	0.010	410.425	A	37.501	20.856	20.856	35.74	83.524	0.000
125.000-100.0					B	37.501	20.856		35.74	0.000	0.000
00					C	37.501	20.856		35.74	90.274	0.000
T7	95.833	1.254	0.010	147.919	A	13.268	6.952	6.952	34.38	28.423	0.000
100.000-91.66					B	13.268	6.952		34.38	0.000	0.000
7					C	13.268	6.952		34.38	30.128	0.000
T8	87.500	1.231	0.010	154.157	A	21.130	0.000	7.473	35.37	28.423	0.000
91.667-83.333					B	21.130	0.000		35.37	0.000	0.000
					C	21.130	0.000		35.37	30.128	0.000
T9	79.167	1.205	0.009	159.712	A	21.520	0.000	7.473	34.73	29.571	0.000
83.333-75.000					B	21.520	0.000		34.73	0.000	0.000
					C	21.520	0.000		34.73	30.128	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T10	62.500	1.146	0.009	514.334	A	40.858	28.676	28.676	41.24	94.593	0.000
75.000-50.000					B	40.858	28.676		41.24	0.000	0.000
					C	40.858	28.676		41.24	90.384	0.000
T11	43.750	1.063	0.008	275.917	A	21.483	14.338	14.338	40.03	47.297	0.000
50.000-37.500					B	21.483	14.338		40.03	0.000	0.000
					C	21.483	14.338		40.03	45.192	0.000
T12	31.250	0.991	0.008	288.417	A	22.193	14.338	14.338	39.25	48.147	0.000
37.500-25.000					B	22.193	14.338		39.25	0.000	0.000
					C	22.193	14.338		39.25	45.192	0.000
T13	18.750	0.89	0.007	300.917	A	22.909	14.338	14.338	38.49	49.628	0.000
25.000-12.500					B	22.909	14.338		38.49	0.000	0.000
					C	22.909	14.338		38.49	45.192	0.000
T14	6.250	0.85	0.007	313.417	A	23.630	14.338	14.338	37.76	18.161	0.000
12.500-0.000					B	23.630	14.338		37.76	0.000	0.000
					C	23.630	14.338		37.76	16.269	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 ksf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.065	1	1	7.409	1.364	272.829	C
180.000-175.0			B	0.173	2.689		1	1	7.409			
00			C	0.173	2.689		1	1	7.409			
T2	0.058	0.755	A	0.135	2.826	0.065	1	1	9.320	2.053	246.396	C
175.000-166.6			B	0.135	2.826		1	1	9.320			
67			C	0.135	2.826		1	1	9.320			
T3	0.072	0.768	A	0.13	2.846	0.064	1	1	9.542	2.204	264.464	C
166.667-158.3			B	0.13	2.846		1	1	9.542			
33			C	0.13	2.846		1	1	9.542			
T4	0.092	0.781	A	0.126	2.863	0.063	1	1	9.768	2.393	287.121	C
158.333-150.0			B	0.126	2.863		1	1	9.768			
00			C	0.126	2.863		1	1	9.768			
T5	0.514	3.995	A	0.145	2.79	0.062	1	1	40.739	10.029	401.143	C
150.000-125.0			B	0.145	2.79		1	1	40.739			
00			C	0.145	2.79		1	1	40.739			
T6	0.724	4.822	A	0.142	2.8	0.059	1	1	46.898	11.887	475.500	C
125.000-100.0			B	0.142	2.8		1	1	46.898			
00			C	0.142	2.8		1	1	46.898			
T7	0.243	1.971	A	0.137	2.821	0.057	1	1	16.417	3.973	476.722	C
100.000-91.66			B	0.137	2.821		1	1	16.417			
7			C	0.137	2.821		1	1	16.417			
T8	0.243	2.178	A	0.137	2.82	0.056	1	1	21.130	4.532	543.852	C
91.667-83.333			B	0.137	2.82		1	1	21.130			
			C	0.137	2.82		1	1	21.130			
T9	0.248	2.218	A	0.135	2.828	0.055	1	1	21.520	4.530	543.639	C
83.333-75.000			B	0.135	2.828		1	1	21.520			
			C	0.135	2.828		1	1	21.520			
T10	0.763	6.256	A	0.135	2.827	0.052	1	1	52.653	11.583	463.321	C
75.000-50.000			B	0.135	2.827		1	1	52.653			
			C	0.135	2.827		1	1	52.653			
T11	0.381	3.352	A	0.13	2.847	0.049	1	1	27.344	5.514	441.160	C
50.000-37.500			B	0.13	2.847		1	1	27.344			
			C	0.13	2.847		1	1	27.344			
T12	0.383	3.953	A	0.127	2.859	0.045	1	1	28.032	5.246	419.653	C
37.500-25.000			B	0.127	2.859		1	1	28.032			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.127	2.859		1	1	28.032			
T13	0.387	3.858	A	0.124	2.87	0.041	1	1	28.728	4.821	385.713	C
25.000-12.500			B	0.124	2.87		1	1	28.728			
			C	0.124	2.87		1	1	28.728			
T14	0.140	4.407	A	0.121	2.881	0.039	1	1	29.514	3.493	279.444	C
12.500-0.000			B	0.121	2.881		1	1	29.514			
			C	0.121	2.881		1	1	29.514			
Sum Weight:	4.275	39.907						OTM	6413.460 kip-ft	73.623		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.065	0.825	1	6.442	1.220	243.947	C
180.000-175.0			B	0.173	2.689		0.825	1	6.442			
00			C	0.173	2.689		0.825	1	6.442			
T2	0.058	0.755	A	0.135	2.826	0.065	0.825	1	8.219	1.882	225.819	C
175.000-166.6			B	0.135	2.826		0.825	1	8.219			
67			C	0.135	2.826		0.825	1	8.219			
T3	0.072	0.768	A	0.13	2.846	0.064	0.825	1	8.401	2.027	243.229	C
166.667-158.3			B	0.13	2.846		0.825	1	8.401			
33			C	0.13	2.846		0.825	1	8.401			
T4	0.092	0.781	A	0.126	2.863	0.063	0.825	1	8.587	2.210	265.254	C
158.333-150.0			B	0.126	2.863		0.825	1	8.587			
00			C	0.126	2.863		0.825	1	8.587			
T5	0.514	3.995	A	0.145	2.79	0.062	0.825	1	35.238	9.221	368.834	C
150.000-125.0			B	0.145	2.79		0.825	1	35.238			
00			C	0.145	2.79		0.825	1	35.238			
T6	0.724	4.822	A	0.142	2.8	0.059	0.825	1	40.336	10.960	438.409	C
125.000-100.0			B	0.142	2.8		0.825	1	40.336			
00			C	0.142	2.8		0.825	1	40.336			
T7	0.243	1.971	A	0.137	2.821	0.057	0.825	1	14.095	3.653	438.380	C
100.000-91.66			B	0.137	2.821		0.825	1	14.095			
7			C	0.137	2.821		0.825	1	14.095			
T8	0.243	2.178	A	0.137	2.82	0.056	0.825	1	17.432	4.033	483.981	C
91.667-83.333			B	0.137	2.82		0.825	1	17.432			
			C	0.137	2.82		0.825	1	17.432			
T9	0.248	2.218	A	0.135	2.828	0.055	0.825	1	17.754	4.031	483.746	C
83.333-75.000			B	0.135	2.828		0.825	1	17.754			
			C	0.135	2.828		0.825	1	17.754			
T10	0.763	6.256	A	0.135	2.827	0.052	0.825	1	45.503	10.682	427.279	C
75.000-50.000			B	0.135	2.827		0.825	1	45.503			
			C	0.135	2.827		0.825	1	45.503			
T11	0.381	3.352	A	0.13	2.847	0.049	0.825	1	23.584	5.072	405.747	C
50.000-37.500			B	0.13	2.847		0.825	1	23.584			
			C	0.13	2.847		0.825	1	23.584			
T12	0.383	3.953	A	0.127	2.859	0.045	0.825	1	24.148	4.818	385.425	C
37.500-25.000			B	0.127	2.859		0.825	1	24.148			
			C	0.127	2.859		0.825	1	24.148			
T13	0.387	3.858	A	0.124	2.87	0.041	0.825	1	24.719	4.423	353.862	C
25.000-12.500			B	0.124	2.87		0.825	1	24.719			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.124	2.87		0.825	1	24.719			
T14	0.140	4.407	A	0.121	2.881	0.039	0.825	1	25.379	3.099	247.945	C
12.500-0.000			B	0.121	2.881		0.825	1	25.379			
			C	0.121	2.881		0.825	1	25.379			
Sum Weight:	4.275	39.907						OTM	5873.540 kip-ft	67.332		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.065	0.8	1	6.304	1.199	239.821	C
180.000-175.0			B	0.173	2.689		0.8	1	6.304			
00			C	0.173	2.689		0.8	1	6.304			
T2	0.058	0.755	A	0.135	2.826	0.065	0.8	1	8.062	1.857	222.880	C
175.000-166.6			B	0.135	2.826		0.8	1	8.062			
67			C	0.135	2.826		0.8	1	8.062			
T3	0.072	0.768	A	0.13	2.846	0.064	0.8	1	8.238	2.002	240.195	C
166.667-158.3			B	0.13	2.846		0.8	1	8.238			
33			C	0.13	2.846		0.8	1	8.238			
T4	0.092	0.781	A	0.126	2.863	0.063	0.8	1	8.418	2.184	262.130	C
158.333-150.0			B	0.126	2.863		0.8	1	8.418			
00			C	0.126	2.863		0.8	1	8.418			
T5	0.514	3.995	A	0.145	2.79	0.062	0.8	1	34.452	9.105	364.218	C
150.000-125.0			B	0.145	2.79		0.8	1	34.452			
00			C	0.145	2.79		0.8	1	34.452			
T6	0.724	4.822	A	0.142	2.8	0.059	0.8	1	39.398	10.828	433.111	C
125.000-100.0			B	0.142	2.8		0.8	1	39.398			
00			C	0.142	2.8		0.8	1	39.398			
T7	0.243	1.971	A	0.137	2.821	0.057	0.8	1	13.763	3.608	432.903	C
100.000-91.66			B	0.137	2.821		0.8	1	13.763			
7			C	0.137	2.821		0.8	1	13.763			
T8	0.243	2.178	A	0.137	2.82	0.056	0.8	1	16.904	3.962	475.428	C
91.667-83.333			B	0.137	2.82		0.8	1	16.904			
			C	0.137	2.82		0.8	1	16.904			
T9	0.248	2.218	A	0.135	2.828	0.055	0.8	1	17.216	3.960	475.190	C
83.333-75.000			B	0.135	2.828		0.8	1	17.216			
			C	0.135	2.828		0.8	1	17.216			
T10	0.763	6.256	A	0.135	2.827	0.052	0.8	1	44.482	10.553	422.131	C
75.000-50.000			B	0.135	2.827		0.8	1	44.482			
			C	0.135	2.827		0.8	1	44.482			
T11	0.381	3.352	A	0.13	2.847	0.049	0.8	1	23.047	5.009	400.688	C
50.000-37.500			B	0.13	2.847		0.8	1	23.047			
			C	0.13	2.847		0.8	1	23.047			
T12	0.383	3.953	A	0.127	2.859	0.045	0.8	1	23.593	4.757	380.536	C
37.500-25.000			B	0.127	2.859		0.8	1	23.593			
			C	0.127	2.859		0.8	1	23.593			
T13	0.387	3.858	A	0.124	2.87	0.041	0.8	1	24.146	4.366	349.312	C
25.000-12.500			B	0.124	2.87		0.8	1	24.146			
			C	0.124	2.87		0.8	1	24.146			
T14	0.140	4.407	A	0.121	2.881	0.039	0.8	1	24.788	3.043	243.445	C
12.500-0.000			B	0.121	2.881		0.8	1	24.788			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	4.275	39.907	C	0.121	2.881		0.8	1 OTM	24.788 5796.409 kip-ft	66.433		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.065	0.85	1	6.580	1.240	248.073	C
180.000-175.0			B	0.173	2.689		0.85	1	6.580			
00			C	0.173	2.689		0.85	1	6.580			
T2	0.058	0.755	A	0.135	2.826	0.065	0.85	1	8.377	1.906	228.759	C
175.000-166.6			B	0.135	2.826		0.85	1	8.377			
67			C	0.135	2.826		0.85	1	8.377			
T3	0.072	0.768	A	0.13	2.846	0.064	0.85	1	8.564	2.052	246.262	C
166.667-158.3			B	0.13	2.846		0.85	1	8.564			
33			C	0.13	2.846		0.85	1	8.564			
T4	0.092	0.781	A	0.126	2.863	0.063	0.85	1	8.756	2.236	268.378	C
158.333-150.0			B	0.126	2.863		0.85	1	8.756			
00			C	0.126	2.863		0.85	1	8.756			
T5	0.514	3.995	A	0.145	2.79	0.062	0.85	1	36.024	9.336	373.449	C
150.000-125.0			B	0.145	2.79		0.85	1	36.024			
00			C	0.145	2.79		0.85	1	36.024			
T6	0.724	4.822	A	0.142	2.8	0.059	0.85	1	41.273	11.093	443.708	C
125.000-100.0			B	0.142	2.8		0.85	1	41.273			
00			C	0.142	2.8		0.85	1	41.273			
T7	0.243	1.971	A	0.137	2.821	0.057	0.85	1	14.427	3.699	443.857	C
100.000-91.66			B	0.137	2.821		0.85	1	14.427			
7			C	0.137	2.821		0.85	1	14.427			
T8	0.243	2.178	A	0.137	2.82	0.056	0.85	1	17.960	4.104	492.534	C
91.667-83.333			B	0.137	2.82		0.85	1	17.960			
			C	0.137	2.82		0.85	1	17.960			
T9	0.248	2.218	A	0.135	2.828	0.055	0.85	1	18.292	4.103	492.302	C
83.333-75.000			B	0.135	2.828		0.85	1	18.292			
			C	0.135	2.828		0.85	1	18.292			
T10	0.763	6.256	A	0.135	2.827	0.052	0.85	1	46.524	10.811	432.428	C
75.000-50.000			B	0.135	2.827		0.85	1	46.524			
			C	0.135	2.827		0.85	1	46.524			
T11	0.381	3.352	A	0.13	2.847	0.049	0.85	1	24.121	5.135	410.806	C
50.000-37.500			B	0.13	2.847		0.85	1	24.121			
			C	0.13	2.847		0.85	1	24.121			
T12	0.383	3.953	A	0.127	2.859	0.045	0.85	1	24.703	4.879	390.315	C
37.500-25.000			B	0.127	2.859		0.85	1	24.703			
			C	0.127	2.859		0.85	1	24.703			
T13	0.387	3.858	A	0.124	2.87	0.041	0.85	1	25.292	4.480	358.412	C
25.000-12.500			B	0.124	2.87		0.85	1	25.292			
			C	0.124	2.87		0.85	1	25.292			
T14	0.140	4.407	A	0.121	2.881	0.039	0.85	1	25.970	3.156	252.445	C
12.500-0.000			B	0.121	2.881		0.85	1	25.970			
			C	0.121	2.881		0.85	1	25.970			
Sum Weight:	4.275	39.907						OTM	5950.672 kip-ft	68.230		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.272	1.547	A	0.306	2.28	0.008	1	1	12.733	0.281	56.111	C
180.000-175.0			B	0.306	2.28		1	1	12.733			
00			C	0.306	2.28		1	1	12.733			
T2	0.612	1.967	A	0.239	2.471	0.008	1	1	16.510	0.468	56.178	C
175.000-166.6			B	0.239	2.471		1	1	16.510			
67			C	0.239	2.471		1	1	16.510			
T3	0.756	2.001	A	0.23	2.498	0.008	1	1	16.812	0.519	62.235	C
166.667-158.3			B	0.23	2.498		1	1	16.812			
33			C	0.23	2.498		1	1	16.812			
T4	0.939	2.035	A	0.222	2.523	0.008	1	1	17.119	0.579	69.423	C
158.333-150.0			B	0.222	2.523		1	1	17.119			
00			C	0.222	2.523		1	1	17.119			
T5	4.366	9.462	A	0.265	2.392	0.007	1	1	70.121	2.426	97.057	C
150.000-125.0			B	0.265	2.392		1	1	70.121			
00			C	0.265	2.392		1	1	70.121			
T6	5.642	11.004	A	0.254	2.426	0.007	1	1	77.410	2.793	111.709	C
125.000-100.0			B	0.254	2.426		1	1	77.410			
00			C	0.254	2.426		1	1	77.410			
T7	1.871	4.236	A	0.244	2.457	0.007	1	1	26.797	0.922	110.613	C
100.000-91.66			B	0.244	2.457		1	1	26.797			
7			C	0.244	2.457		1	1	26.797			
T8	1.853	4.599	A	0.234	2.488	0.007	1	1	30.996	0.966	115.922	C
91.667-83.333			B	0.234	2.488		1	1	30.996			
			C	0.234	2.488		1	1	30.996			
T9	1.870	4.668	A	0.229	2.501	0.007	1	1	31.489	0.963	115.565	C
83.333-75.000			B	0.229	2.501		1	1	31.489			
			C	0.229	2.501		1	1	31.489			
T10	5.671	12.372	A	0.212	2.557	0.006	1	1	80.759	2.632	105.280	C
75.000-50.000			B	0.212	2.557		1	1	80.759			
			C	0.212	2.557		1	1	80.759			
T11	2.729	6.404	A	0.202	2.591	0.006	1	1	41.386	1.228	98.231	C
50.000-37.500			B	0.202	2.591		1	1	41.386			
			C	0.202	2.591		1	1	41.386			
T12	2.670	7.182	A	0.195	2.614	0.005	1	1	41.947	1.155	92.416	C
37.500-25.000			B	0.195	2.614		1	1	41.947			
			C	0.195	2.614		1	1	41.947			
T13	2.589	6.803	A	0.187	2.639	0.005	1	1	42.313	1.048	83.821	C
25.000-12.500			B	0.187	2.639		1	1	42.313			
			C	0.187	2.639		1	1	42.313			
T14	0.844	7.270	A	0.177	2.674	0.005	1	1	42.059	0.637	50.965	C
12.500-0.000			B	0.177	2.674		1	1	42.059			
			C	0.177	2.674		1	1	42.059			
Sum Weight:	32.684	81.551						OTM	1478.108 kip-ft	16.616		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.272	1.547	A	0.306	2.28	0.008	0.825	1	11.766	0.266	53.199	C
180.000-175.0			B	0.306	2.28		0.825	1	11.766			
00			C	0.306	2.28		0.825	1	11.766			
T2	0.612	1.967	A	0.239	2.471	0.008	0.825	1	15.409	0.450	54.038	C
175.000-166.6			B	0.239	2.471		0.825	1	15.409			
67			C	0.239	2.471		0.825	1	15.409			
T3	0.756	2.001	A	0.23	2.498	0.008	0.825	1	15.672	0.500	60.019	C
166.667-158.3			B	0.23	2.498		0.825	1	15.672			
33			C	0.23	2.498		0.825	1	15.672			
T4	0.939	2.035	A	0.222	2.523	0.008	0.825	1	15.939	0.559	67.132	C
158.333-150.0			B	0.222	2.523		0.825	1	15.939			
00			C	0.222	2.523		0.825	1	15.939			
T5	4.366	9.462	A	0.265	2.392	0.007	0.825	1	64.619	2.344	93.763	C
150.000-125.0			B	0.265	2.392		0.825	1	64.619			
00			C	0.265	2.392		0.825	1	64.619			
T6	5.642	11.004	A	0.254	2.426	0.007	0.825	1	70.847	2.697	107.889	C
125.000-100.0			B	0.254	2.426		0.825	1	70.847			
00			C	0.254	2.426		0.825	1	70.847			
T7	1.871	4.236	A	0.244	2.457	0.007	0.825	1	24.475	0.889	106.642	C
100.000-91.66			B	0.244	2.457		0.825	1	24.475			
7			C	0.244	2.457		0.825	1	24.475			
T8	1.853	4.599	A	0.234	2.488	0.007	0.825	1	26.887	0.908	108.942	C
91.667-83.333			B	0.234	2.488		0.825	1	26.887			
			C	0.234	2.488		0.825	1	26.887			
T9	1.870	4.668	A	0.229	2.501	0.007	0.825	1	27.316	0.905	108.587	C
83.333-75.000			B	0.229	2.501		0.825	1	27.316			
			C	0.229	2.501		0.825	1	27.316			
T10	5.671	12.372	A	0.212	2.557	0.006	0.825	1	73.608	2.535	101.404	C
75.000-50.000			B	0.212	2.557		0.825	1	73.608			
			C	0.212	2.557		0.825	1	73.608			
T11	2.729	6.404	A	0.202	2.591	0.006	0.825	1	37.626	1.180	94.399	C
50.000-37.500			B	0.202	2.591		0.825	1	37.626			
			C	0.202	2.591		0.825	1	37.626			
T12	2.670	7.182	A	0.195	2.614	0.005	0.825	1	38.063	1.109	88.696	C
37.500-25.000			B	0.195	2.614		0.825	1	38.063			
			C	0.195	2.614		0.825	1	38.063			
T13	2.589	6.803	A	0.187	2.639	0.005	0.825	1	38.304	1.004	80.339	C
25.000-12.500			B	0.187	2.639		0.825	1	38.304			
			C	0.187	2.639		0.825	1	38.304			
T14	0.844	7.270	A	0.177	2.674	0.005	0.825	1	37.924	0.594	47.488	C
12.500-0.000			B	0.177	2.674		0.825	1	37.924			
			C	0.177	2.674		0.825	1	37.924			
Sum Weight:	32.684	81.551						OTM	1420.908 kip-ft	15.940		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.272	1.547	A	0.306	2.28	0.008	0.8	1	11.628	0.264	52.783	C
180.000-175.0			B	0.306	2.28		0.8	1	11.628			
00			C	0.306	2.28		0.8	1	11.628			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T2	0.612	1.967	A	0.239	2.471	0.008	0.8	1	15.252	0.448	53.733	C
175.000-166.6			B	0.239	2.471		0.8	1	15.252			
67			C	0.239	2.471		0.8	1	15.252			
T3	0.756	2.001	A	0.23	2.498	0.008	0.8	1	15.509	0.498	59.702	C
166.667-158.3			B	0.23	2.498		0.8	1	15.509			
33			C	0.23	2.498		0.8	1	15.509			
T4	0.939	2.035	A	0.222	2.523	0.008	0.8	1	15.770	0.557	66.804	C
158.333-150.0			B	0.222	2.523		0.8	1	15.770			
00			C	0.222	2.523		0.8	1	15.770			
T5	4.366	9.462	A	0.265	2.392	0.007	0.8	1	63.833	2.332	93.293	C
150.000-125.0			B	0.265	2.392		0.8	1	63.833			
00			C	0.265	2.392		0.8	1	63.833			
T6	5.642	11.004	A	0.254	2.426	0.007	0.8	1	69.910	2.684	107.343	C
125.000-100.0			B	0.254	2.426		0.8	1	69.910			
00			C	0.254	2.426		0.8	1	69.910			
T7	1.871	4.236	A	0.244	2.457	0.007	0.8	1	24.143	0.884	106.075	C
100.000-91.66			B	0.244	2.457		0.8	1	24.143			
7			C	0.244	2.457		0.8	1	24.143			
T8	1.853	4.599	A	0.234	2.488	0.007	0.8	1	26.300	0.900	107.945	C
91.667-83.333			B	0.234	2.488		0.8	1	26.300			
			C	0.234	2.488		0.8	1	26.300			
T9	1.870	4.668	A	0.229	2.501	0.007	0.8	1	26.720	0.897	107.590	C
83.333-75.000			B	0.229	2.501		0.8	1	26.720			
			C	0.229	2.501		0.8	1	26.720			
T10	5.671	12.372	A	0.212	2.557	0.006	0.8	1	72.587	2.521	100.850	C
75.000-50.000			B	0.212	2.557		0.8	1	72.587			
			C	0.212	2.557		0.8	1	72.587			
T11	2.729	6.404	A	0.202	2.591	0.006	0.8	1	37.089	1.173	93.852	C
50.000-37.500			B	0.202	2.591		0.8	1	37.089			
			C	0.202	2.591		0.8	1	37.089			
T12	2.670	7.182	A	0.195	2.614	0.005	0.8	1	37.508	1.102	88.164	C
37.500-25.000			B	0.195	2.614		0.8	1	37.508			
			C	0.195	2.614		0.8	1	37.508			
T13	2.589	6.803	A	0.187	2.639	0.005	0.8	1	37.731	0.998	79.842	C
25.000-12.500			B	0.187	2.639		0.8	1	37.731			
			C	0.187	2.639		0.8	1	37.731			
T14	0.844	7.270	A	0.177	2.674	0.005	0.8	1	37.333	0.587	46.992	C
12.500-0.000			B	0.177	2.674		0.8	1	37.333			
			C	0.177	2.674		0.8	1	37.333			
Sum Weight:	32.684	81.551						OTM	1412.737 kip-ft	15.844		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.272	1.547	A	0.306	2.28	0.008	0.85	1	11.904	0.268	53.615	C
180.000-175.0			B	0.306	2.28		0.85	1	11.904			
00			C	0.306	2.28		0.85	1	11.904			
T2	0.612	1.967	A	0.239	2.471	0.008	0.85	1	15.566	0.453	54.344	C
175.000-166.6			B	0.239	2.471		0.85	1	15.566			
67			C	0.239	2.471		0.85	1	15.566			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T3	0.756	2.001	A	0.23	2.498	0.008	0.85	1	15.834	0.503	60.335	C
166.667-158.3			B	0.23	2.498		0.85	1	15.834			
33			C	0.23	2.498		0.85	1	15.834			
T4	0.939	2.035	A	0.222	2.523	0.008	0.85	1	16.107	0.562	67.459	C
158.333-150.0			B	0.222	2.523		0.85	1	16.107			
00			C	0.222	2.523		0.85	1	16.107			
T5	4.366	9.462	A	0.265	2.392	0.007	0.85	1	65.405	2.356	94.234	C
150.000-125.0			B	0.265	2.392		0.85	1	65.405			
00			C	0.265	2.392		0.85	1	65.405			
T6	5.642	11.004	A	0.254	2.426	0.007	0.85	1	71.785	2.711	108.435	C
125.000-100.0			B	0.254	2.426		0.85	1	71.785			
00			C	0.254	2.426		0.85	1	71.785			
T7	1.871	4.236	A	0.244	2.457	0.007	0.85	1	24.807	0.893	107.210	C
100.000-91.66			B	0.244	2.457		0.85	1	24.807			
7			C	0.244	2.457		0.85	1	24.807			
T8	1.853	4.599	A	0.234	2.488	0.007	0.85	1	27.474	0.916	109.939	C
91.667-83.333			B	0.234	2.488		0.85	1	27.474			
			C	0.234	2.488		0.85	1	27.474			
T9	1.870	4.668	A	0.229	2.501	0.007	0.85	1	27.912	0.913	109.584	C
83.333-75.000			B	0.229	2.501		0.85	1	27.912			
			C	0.229	2.501		0.85	1	27.912			
T10	5.671	12.372	A	0.212	2.557	0.006	0.85	1	74.630	2.549	101.958	C
75.000-50.000			B	0.212	2.557		0.85	1	74.630			
			C	0.212	2.557		0.85	1	74.630			
T11	2.729	6.404	A	0.202	2.591	0.006	0.85	1	38.163	1.187	94.946	C
50.000-37.500			B	0.202	2.591		0.85	1	38.163			
			C	0.202	2.591		0.85	1	38.163			
T12	2.670	7.182	A	0.195	2.614	0.005	0.85	1	38.618	1.115	89.227	C
37.500-25.000			B	0.195	2.614		0.85	1	38.618			
			C	0.195	2.614		0.85	1	38.618			
T13	2.589	6.803	A	0.187	2.639	0.005	0.85	1	38.877	1.010	80.836	C
25.000-12.500			B	0.187	2.639		0.85	1	38.877			
			C	0.187	2.639		0.85	1	38.877			
T14	0.844	7.270	A	0.177	2.674	0.005	0.85	1	38.514	0.600	47.985	C
12.500-0.000			B	0.177	2.674		0.85	1	38.514			
			C	0.177	2.674		0.85	1	38.514			
Sum Weight:	32.684	81.551						OTM	1429.080 kip-ft	16.037		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.011	1	1	7.904	0.246	49.249	C
180.000-175.0			B	0.173	2.689		1	1	7.904			
00			C	0.173	2.689		1	1	7.904			
T2	0.058	0.755	A	0.135	2.826	0.011	1	1	10.229	0.376	45.095	C
175.000-166.6			B	0.135	2.826		1	1	10.229			
67			C	0.135	2.826		1	1	10.229			
T3	0.072	0.768	A	0.13	2.846	0.011	1	1	10.452	0.402	48.183	C
166.667-158.3			B	0.13	2.846		1	1	10.452			
33			C	0.13	2.846		1	1	10.452			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T4	0.092	0.781	A	0.126	2.863	0.011	1	1	10.677	0.434	52.047	C
158.333-150.0			B	0.126	2.863		1	1	10.677			
00			C	0.126	2.863		1	1	10.677			
T5	0.514	3.995	A	0.145	2.79	0.011	1	1	43.263	1.781	71.223	C
150.000-125.0			B	0.145	2.79		1	1	43.263			
00			C	0.145	2.79		1	1	43.263			
T6	0.724	4.822	A	0.142	2.8	0.010	1	1	49.322	2.094	83.763	C
125.000-100.0			B	0.142	2.8		1	1	49.322			
00			C	0.142	2.8		1	1	49.322			
T7	0.243	1.971	A	0.137	2.821	0.010	1	1	17.205	0.699	83.855	C
100.000-91.66			B	0.137	2.821		1	1	17.205			
7			C	0.137	2.821		1	1	17.205			
T8	0.243	2.178	A	0.137	2.82	0.010	1	1	21.130	0.776	93.121	C
91.667-83.333			B	0.137	2.82		1	1	21.130			
			C	0.137	2.82		1	1	21.130			
T9	0.248	2.218	A	0.135	2.828	0.009	1	1	21.520	0.776	93.084	C
83.333-75.000			B	0.135	2.828		1	1	21.520			
			C	0.135	2.828		1	1	21.520			
T10	0.763	6.256	A	0.135	2.827	0.009	1	1	57.094	2.079	83.165	C
75.000-50.000			B	0.135	2.827		1	1	57.094			
			C	0.135	2.827		1	1	57.094			
T11	0.381	3.352	A	0.13	2.847	0.008	1	1	29.596	0.990	79.170	C
50.000-37.500			B	0.13	2.847		1	1	29.596			
			C	0.13	2.847		1	1	29.596			
T12	0.383	3.953	A	0.127	2.859	0.008	1	1	30.303	0.941	75.281	C
37.500-25.000			B	0.127	2.859		1	1	30.303			
			C	0.127	2.859		1	1	30.303			
T13	0.387	3.858	A	0.124	2.87	0.007	1	1	31.016	0.864	69.156	C
25.000-12.500			B	0.124	2.87		1	1	31.016			
			C	0.124	2.87		1	1	31.016			
T14	0.140	4.407	A	0.121	2.881	0.007	1	1	31.734	0.634	50.743	C
12.500-0.000			B	0.121	2.881		1	1	31.734			
			C	0.121	2.881		1	1	31.734			
Sum Weight:	4.275	39.907						OTM	1139.534 kip-ft	13.091		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.011	0.825	1	6.937	0.222	44.304	C
180.000-175.0			B	0.173	2.689		0.825	1	6.937			
00			C	0.173	2.689		0.825	1	6.937			
T2	0.058	0.755	A	0.135	2.826	0.011	0.825	1	9.128	0.346	41.572	C
175.000-166.6			B	0.135	2.826		0.825	1	9.128			
67			C	0.135	2.826		0.825	1	9.128			
T3	0.072	0.768	A	0.13	2.846	0.011	0.825	1	9.311	0.371	44.547	C
166.667-158.3			B	0.13	2.846		0.825	1	9.311			
33			C	0.13	2.846		0.825	1	9.311			
T4	0.092	0.781	A	0.126	2.863	0.011	0.825	1	9.497	0.403	48.303	C
158.333-150.0			B	0.126	2.863		0.825	1	9.497			
00			C	0.126	2.863		0.825	1	9.497			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T5	0.514	3.995	A	0.145	2.79	0.011	0.825	1	37.762	1.642	65.691	C
150.000-125.0			B	0.145	2.79		0.825	1	37.762			
00			C	0.145	2.79		0.825	1	37.762			
T6	0.724	4.822	A	0.142	2.8	0.010	0.825	1	42.759	1.935	77.412	C
125.000-100.0			B	0.142	2.8		0.825	1	42.759			
00			C	0.142	2.8		0.825	1	42.759			
T7	0.243	1.971	A	0.137	2.821	0.010	0.825	1	14.883	0.644	77.290	C
100.000-91.66			B	0.137	2.821		0.825	1	14.883			
7			C	0.137	2.821		0.825	1	14.883			
T8	0.243	2.178	A	0.137	2.82	0.010	0.825	1	17.432	0.691	82.869	C
91.667-83.333			B	0.137	2.82		0.825	1	17.432			
			C	0.137	2.82		0.825	1	17.432			
T9	0.248	2.218	A	0.135	2.828	0.009	0.825	1	17.754	0.690	82.829	C
83.333-75.000			B	0.135	2.828		0.825	1	17.754			
			C	0.135	2.828		0.825	1	17.754			
T10	0.763	6.256	A	0.135	2.827	0.009	0.825	1	49.944	1.925	76.994	C
75.000-50.000			B	0.135	2.827		0.825	1	49.944			
			C	0.135	2.827		0.825	1	49.944			
T11	0.381	3.352	A	0.13	2.847	0.008	0.825	1	25.836	0.914	73.106	C
50.000-37.500			B	0.13	2.847		0.825	1	25.836			
			C	0.13	2.847		0.825	1	25.836			
T12	0.383	3.953	A	0.127	2.859	0.008	0.825	1	26.419	0.868	69.421	C
37.500-25.000			B	0.127	2.859		0.825	1	26.419			
			C	0.127	2.859		0.825	1	26.419			
T13	0.387	3.858	A	0.124	2.87	0.007	0.825	1	27.007	0.796	63.702	C
25.000-12.500			B	0.124	2.87		0.825	1	27.007			
			C	0.124	2.87		0.825	1	27.007			
T14	0.140	4.407	A	0.121	2.881	0.007	0.825	1	27.599	0.567	45.349	C
12.500-0.000			B	0.121	2.881		0.825	1	27.599			
			C	0.121	2.881		0.825	1	27.599			
Sum Weight:	4.275	39.907						OTM	1047.086 kip-ft	12.014		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.011	0.8	1	6.799	0.218	43.598	C
180.000-175.0			B	0.173	2.689		0.8	1	6.799			
00			C	0.173	2.689		0.8	1	6.799			
T2	0.058	0.755	A	0.135	2.826	0.011	0.8	1	8.970	0.342	41.069	C
175.000-166.6			B	0.135	2.826		0.8	1	8.970			
67			C	0.135	2.826		0.8	1	8.970			
T3	0.072	0.768	A	0.13	2.846	0.011	0.8	1	9.148	0.367	44.028	C
166.667-158.3			B	0.13	2.846		0.8	1	9.148			
33			C	0.13	2.846		0.8	1	9.148			
T4	0.092	0.781	A	0.126	2.863	0.011	0.8	1	9.328	0.398	47.768	C
158.333-150.0			B	0.126	2.863		0.8	1	9.328			
00			C	0.126	2.863		0.8	1	9.328			
T5	0.514	3.995	A	0.145	2.79	0.011	0.8	1	36.976	1.623	64.901	C
150.000-125.0			B	0.145	2.79		0.8	1	36.976			
00			C	0.145	2.79		0.8	1	36.976			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T6	0.724	4.822	A	0.142	2.8	0.010	0.8	1	41.822	1.913	76.505	C
125.000-100.0			B	0.142	2.8		0.8	1	41.822			
00			C	0.142	2.8		0.8	1	41.822			
T7	0.243	1.971	A	0.137	2.821	0.010	0.8	1	14.552	0.636	76.352	C
100.000-91.66			B	0.137	2.821		0.8	1	14.552			
7			C	0.137	2.821		0.8	1	14.552			
T8	0.243	2.178	A	0.137	2.82	0.010	0.8	1	16.904	0.678	81.405	C
91.667-83.333			B	0.137	2.82		0.8	1	16.904			
			C	0.137	2.82		0.8	1	16.904			
T9	0.248	2.218	A	0.135	2.828	0.009	0.8	1	17.216	0.678	81.364	C
83.333-75.000			B	0.135	2.828		0.8	1	17.216			
			C	0.135	2.828		0.8	1	17.216			
T10	0.763	6.256	A	0.135	2.827	0.009	0.8	1	48.923	1.903	76.112	C
75.000-50.000			B	0.135	2.827		0.8	1	48.923			
			C	0.135	2.827		0.8	1	48.923			
T11	0.381	3.352	A	0.13	2.847	0.008	0.8	1	25.299	0.903	72.240	C
50.000-37.500			B	0.13	2.847		0.8	1	25.299			
			C	0.13	2.847		0.8	1	25.299			
T12	0.383	3.953	A	0.127	2.859	0.008	0.8	1	25.864	0.857	68.583	C
37.500-25.000			B	0.127	2.859		0.8	1	25.864			
			C	0.127	2.859		0.8	1	25.864			
T13	0.387	3.858	A	0.124	2.87	0.007	0.8	1	26.434	0.787	62.923	C
25.000-12.500			B	0.124	2.87		0.8	1	26.434			
			C	0.124	2.87		0.8	1	26.434			
T14	0.140	4.407	A	0.121	2.881	0.007	0.8	1	27.008	0.557	44.579	C
12.500-0.000			B	0.121	2.881		0.8	1	27.008			
			C	0.121	2.881		0.8	1	27.008			
Sum Weight:	4.275	39.907						OTM	1033.880 kip-ft	11.860		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.026	0.592	A	0.173	2.689	0.011	0.85	1	7.076	0.225	45.011	C
180.000-175.0			B	0.173	2.689		0.85	1	7.076			
00			C	0.173	2.689		0.85	1	7.076			
T2	0.058	0.755	A	0.135	2.826	0.011	0.85	1	9.285	0.351	42.076	C
175.000-166.6			B	0.135	2.826		0.85	1	9.285			
67			C	0.135	2.826		0.85	1	9.285			
T3	0.072	0.768	A	0.13	2.846	0.011	0.85	1	9.474	0.376	45.067	C
166.667-158.3			B	0.13	2.846		0.85	1	9.474			
33			C	0.13	2.846		0.85	1	9.474			
T4	0.092	0.781	A	0.126	2.863	0.011	0.85	1	9.665	0.407	48.838	C
158.333-150.0			B	0.126	2.863		0.85	1	9.665			
00			C	0.126	2.863		0.85	1	9.665			
T5	0.514	3.995	A	0.145	2.79	0.011	0.85	1	38.548	1.662	66.481	C
150.000-125.0			B	0.145	2.79		0.85	1	38.548			
00			C	0.145	2.79		0.85	1	38.548			
T6	0.724	4.822	A	0.142	2.8	0.010	0.85	1	43.697	1.958	78.319	C
125.000-100.0			B	0.142	2.8		0.85	1	43.697			
00			C	0.142	2.8		0.85	1	43.697			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T7	0.243	1.971	A	0.137	2.821	0.010	0.85	1	15.215	0.652	78.228	C
100.000-91.66			B	0.137	2.821		0.85	1	15.215			
7			C	0.137	2.821		0.85	1	15.215			
T8	0.243	2.178	A	0.137	2.82	0.010	0.85	1	17.960	0.703	84.334	C
91.667-83.333			B	0.137	2.82		0.85	1	17.960			
			C	0.137	2.82		0.85	1	17.960			
T9	0.248	2.218	A	0.135	2.828	0.009	0.85	1	18.292	0.702	84.294	C
83.333-75.000			B	0.135	2.828		0.85	1	18.292			
			C	0.135	2.828		0.85	1	18.292			
T10	0.763	6.256	A	0.135	2.827	0.009	0.85	1	50.966	1.947	77.876	C
75.000-50.000			B	0.135	2.827		0.85	1	50.966			
			C	0.135	2.827		0.85	1	50.966			
T11	0.381	3.352	A	0.13	2.847	0.008	0.85	1	26.373	0.925	73.972	C
50.000-37.500			B	0.13	2.847		0.85	1	26.373			
			C	0.13	2.847		0.85	1	26.373			
T12	0.383	3.953	A	0.127	2.859	0.008	0.85	1	26.974	0.878	70.258	C
37.500-25.000			B	0.127	2.859		0.85	1	26.974			
			C	0.127	2.859		0.85	1	26.974			
T13	0.387	3.858	A	0.124	2.87	0.007	0.85	1	27.579	0.806	64.481	C
25.000-12.500			B	0.124	2.87		0.85	1	27.579			
			C	0.124	2.87		0.85	1	27.579			
T14	0.140	4.407	A	0.121	2.881	0.007	0.85	1	28.190	0.576	46.120	C
12.500-0.000			B	0.121	2.881		0.85	1	28.190			
			C	0.121	2.881		0.85	1	28.190			
Sum Weight:	4.275	39.907						OTM	1060.293 kip-ft	12.168		

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	13.087					
Bracing Weight	26.820					
Total Member Self-Weight	39.907			-3.758	5.311	
Total Weight	53.724			-3.758	5.311	
Wind 0 deg - No Ice		0.000	-99.985	-10391.920	5.311	1.523
Wind 30 deg - No Ice		47.296	-81.920	-8599.383	-4957.375	-20.708
Wind 45 deg - No Ice		66.252	-66.252	-6967.517	-6958.447	-30.074
Wind 60 deg - No Ice		80.363	-46.398	-4889.313	-8456.718	-37.390
Wind 90 deg - No Ice		94.593	0.000	-3.758	-9920.062	-44.054
Wind 120 deg - No Ice		86.590	49.993	5190.322	-8991.101	-38.913
Wind 135 deg - No Ice		68.794	68.794	7178.160	-7176.608	-32.228
Wind 150 deg - No Ice		47.296	81.920	8591.866	-4957.375	-23.346
Wind 180 deg - No Ice		0.000	92.795	9767.351	5.311	-1.523
Wind 210 deg - No Ice		-47.296	81.920	8591.866	4967.997	20.708
Wind 225 deg - No Ice		-66.252	66.252	6960.000	6969.069	30.074
Wind 240 deg - No Ice		-86.590	49.993	5190.322	9001.723	37.390
Wind 270 deg - No Ice		-94.593	0.000	-3.758	9930.684	44.054
Wind 300 deg - No Ice		-80.363	-46.398	-4889.313	8467.340	38.913
Wind 315 deg - No Ice		-66.252	-66.252	-6967.517	6969.069	32.228
Wind 330 deg - No Ice		-47.296	-81.920	-8599.383	4967.997	23.346
Member Ice	41.644					

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 Ice	134.966			-40.959	18.921	
Wind 0 deg - Ice		0.000	-22.164	-2355.536	18.921	-3.032
Wind 30 deg - Ice		10.793	-18.693	-2002.981	-1113.853	-10.068
Wind 45 deg - Ice		15.195	-15.195	-1637.166	-1577.286	-12.669
Wind 60 deg - Ice		18.526	-10.696	-1165.562	-1928.948	-14.407
Wind 90 deg - Ice		21.585	0.000	-40.959	-2246.627	-14.885
Wind 120 deg - Ice		19.195	11.082	1116.329	-1985.561	-11.375
Wind 135 deg - Ice		15.468	15.468	1578.359	-1600.398	-8.381
Wind 150 deg - Ice		10.793	18.693	1921.063	-1113.853	-4.817
Wind 180 deg - Ice		0.000	21.392	2208.246	18.921	3.032
Wind 210 deg - Ice		-10.793	18.693	1921.063	1151.695	10.068
Wind 225 deg - Ice		-15.195	15.195	1555.247	1615.127	12.669
Wind 240 deg - Ice		-19.195	11.082	1116.329	2023.403	14.407
Wind 270 deg - Ice		-21.585	0.000	-40.959	2284.469	14.885
Wind 300 deg - Ice		-18.526	-10.696	-1165.562	1966.789	11.375
Wind 315 deg - Ice		-15.195	-15.195	-1637.166	1615.127	8.381
Wind 330 deg - Ice		-10.793	-18.693	-2002.981	1151.695	4.817
Total Weight	53.724			-3.758	5.311	
Wind 0 deg - Service		0.000	-17.622	-1827.556	2.445	0.261
Wind 30 deg - Service		8.349	-14.461	-1514.726	-869.321	-3.608
Wind 45 deg - Service		11.699	-11.699	-1228.308	-1221.080	-5.237
Wind 60 deg - Service		14.195	-8.195	-863.342	-1484.623	-6.509
Wind 90 deg - Service		16.699	0.000	-4.783	-1741.087	-7.667
Wind 120 deg - Service		15.261	8.811	906.603	-1576.123	-6.770
Wind 135 deg - Service		12.134	12.134	1256.096	-1258.434	-5.606
Wind 150 deg - Service		8.349	14.461	1505.159	-869.321	-4.059
Wind 180 deg - Service		0.000	16.391	1712.335	2.445	-0.261
Wind 210 deg - Service		-8.349	14.461	1505.159	874.210	3.608
Wind 225 deg - Service		-11.699	11.699	1218.741	1225.969	5.237
Wind 240 deg - Service		-15.261	8.811	906.603	1581.012	6.509
Wind 270 deg - Service		-16.699	0.000	-4.783	1745.976	7.667
Wind 300 deg - Service		-14.195	-8.195	-863.342	1489.512	6.770
Wind 315 deg - Service		-11.699	-11.699	-1228.308	1225.969	5.606
Wind 330 deg - Service		-8.349	-14.461	-1514.726	874.210	4.059

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 45 deg - No Ice
7	0.9 Dead+1.0 Wind 45 deg - No Ice
8	1.2 Dead+1.0 Wind 60 deg - No Ice
9	0.9 Dead+1.0 Wind 60 deg - No Ice
10	1.2 Dead+1.0 Wind 90 deg - No Ice
11	0.9 Dead+1.0 Wind 90 deg - No Ice
12	1.2 Dead+1.0 Wind 120 deg - No Ice
13	0.9 Dead+1.0 Wind 120 deg - No Ice
14	1.2 Dead+1.0 Wind 135 deg - No Ice
15	0.9 Dead+1.0 Wind 135 deg - No Ice
16	1.2 Dead+1.0 Wind 150 deg - No Ice
17	0.9 Dead+1.0 Wind 150 deg - No Ice

Comb. No.	Description
18	1.2 Dead+1.0 Wind 180 deg - No Ice
19	0.9 Dead+1.0 Wind 180 deg - No Ice
20	1.2 Dead+1.0 Wind 210 deg - No Ice
21	0.9 Dead+1.0 Wind 210 deg - No Ice
22	1.2 Dead+1.0 Wind 225 deg - No Ice
23	0.9 Dead+1.0 Wind 225 deg - No Ice
24	1.2 Dead+1.0 Wind 240 deg - No Ice
25	0.9 Dead+1.0 Wind 240 deg - No Ice
26	1.2 Dead+1.0 Wind 270 deg - No Ice
27	0.9 Dead+1.0 Wind 270 deg - No Ice
28	1.2 Dead+1.0 Wind 300 deg - No Ice
29	0.9 Dead+1.0 Wind 300 deg - No Ice
30	1.2 Dead+1.0 Wind 315 deg - No Ice
31	0.9 Dead+1.0 Wind 315 deg - No Ice
32	1.2 Dead+1.0 Wind 330 deg - No Ice
33	0.9 Dead+1.0 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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	180 - 175	Leg	Max Tension	9	0.553	-0.999	-0.062
			Max. Compression	35	-2.698	0.194	0.042
			Max. Mx	28	-0.027	1.724	0.158
			Max. My	26	-1.195	-0.012	1.958

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	18	-1.525	0.000	0.000
			Max. Vx	26	-2.090	0.000	0.000
		Diagonal	Max Tension	23	2.522	0.000	0.000
			Max. Compression	22	-2.644	0.000	0.000
			Max. Mx	34	-0.151	0.091	0.000
			Max. My	34	-0.124	0.000	-0.003
			Max. Vy	34	0.049	0.000	0.000
			Max. Vx	34	0.002	0.000	0.000
		Top Girt	Max Tension	9	2.248	0.012	0.004
			Max. Compression	24	-2.297	0.000	0.000
			Max. Mx	48	-0.349	0.055	0.013
			Max. My	48	-0.141	0.055	0.013
			Max. Vy	48	0.051	0.055	0.013
			Max. Vx	48	0.003	0.000	0.000
T2	175 - 166.667	Leg	Max Tension	9	2.737	-0.999	-0.062
			Max. Compression	2	-4.773	0.279	0.229
			Max. Mx	8	2.540	-1.004	-0.062
			Max. My	32	-0.790	-0.021	1.072
			Max. Vy	3	0.356	0.992	0.098
			Max. Vx	32	0.471	-0.021	1.072
		Diagonal	Max Tension	17	6.613	0.000	0.000
			Max. Compression	16	-6.720	0.000	0.000
			Max. Mx	34	-0.097	0.132	0.000
			Max. My	34	-0.082	0.000	-0.005
			Max. Vy	34	-0.052	0.000	0.000
			Max. Vx	34	0.002	0.000	0.000
		Horizontal	Max Tension	30	4.034	0.000	0.000
			Max. Compression	15	-4.029	0.012	0.004
			Max. Mx	48	-0.111	0.047	0.016
			Max. My	48	-0.111	0.047	0.016
			Max. Vy	48	0.041	0.047	0.016
			Max. Vx	35	-0.004	0.000	0.000
T3	166.667 - 158.333	Leg	Max Tension	9	10.892	-0.267	-0.054
			Max. Compression	24	-14.054	0.503	-0.270
			Max. Mx	12	-13.942	0.505	0.217
			Max. My	26	-1.741	-0.004	-0.658
			Max. Vy	13	-0.346	0.504	0.217
			Max. Vx	2	-0.419	-0.248	0.393
		Diagonal	Max Tension	21	7.063	0.000	0.000
			Max. Compression	20	-7.174	0.000	0.000
			Max. Mx	34	-0.087	0.141	0.000
			Max. My	34	-0.076	0.000	-0.005
			Max. Vy	34	-0.055	0.000	0.000
			Max. Vx	34	0.002	0.000	0.000
		Top Girt	Max Tension	20	4.237	0.000	0.000
			Max. Compression	21	-4.199	0.000	0.000
			Max. Mx	48	-0.109	0.054	0.017
			Max. My	35	0.116	0.051	0.017
			Max. Vy	48	-0.043	0.054	0.017
			Max. Vx	35	0.004	0.000	0.000
T4	158.333 - 150	Leg	Max Tension	19	20.095	-0.479	-0.054
			Max. Compression	2	-24.568	0.582	0.086
			Max. Mx	18	19.111	-0.672	-0.087
			Max. My	26	-2.477	-0.056	-1.282
			Max. Vy	12	0.406	0.505	0.217
			Max. Vx	10	0.668	-0.004	0.657
		Diagonal	Max Tension	21	8.886	0.000	0.000
			Max. Compression	20	-9.004	0.000	0.000
			Max. Mx	34	-0.132	0.151	0.000
			Max. My	34	-0.065	0.000	-0.006

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	34	0.057	0.000	0.000
			Max. Vx	34	0.002	0.000	0.000
		Top Girt	Max Tension	6	5.521	0.017	0.007
			Max. Compression	23	-5.484	0.000	0.000
			Max. Mx	48	-0.071	0.061	0.018
			Max. My	48	-0.071	0.061	0.018
			Max. Vy	48	0.046	0.061	0.018
			Max. Vx	35	-0.004	0.000	0.000
T5	150 - 125	Leg	Max Tension	29	59.356	0.100	-0.059
			Max. Compression	2	-71.841	-0.943	0.069
			Max. Mx	2	-71.757	1.374	-0.035
			Max. My	26	-5.433	-0.185	-1.601
			Max. Vy	2	2.035	1.111	-0.032
			Max. Vx	26	-1.209	-0.056	-1.282
		Diagonal	Max Tension	21	17.523	-0.011	-0.004
			Max. Compression	20	-17.891	0.000	0.000
			Max. Mx	24	-1.248	-0.076	0.005
			Max. My	35	-0.122	-0.049	0.011
			Max. Vy	35	0.049	-0.049	0.011
			Max. Vx	48	0.003	0.000	0.000
		Horizontal	Max Tension	6	11.587	0.032	-0.006
			Max. Compression	23	-11.575	0.000	0.000
			Max. Mx	48	-0.171	0.107	0.002
			Max. My	12	2.013	0.009	-0.022
			Max. Vy	48	0.064	0.107	0.002
			Max. Vx	12	-0.003	0.009	-0.022
		Redund Horz 1 Bracing	Max Tension	26	1.683	0.000	0.000
			Max. Compression	27	-1.593	0.000	0.000
			Max. Mx	34	0.224	-0.015	0.000
			Max. My	34	0.224	0.000	0.000
			Max. Vy	34	0.017	0.000	0.000
			Max. Vx	34	0.000	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	26	1.281	0.000	0.000
			Max. Compression	27	-1.253	0.000	0.000
			Max. Mx	34	-0.024	-0.022	0.000
			Max. My	34	-0.024	0.000	-0.001
			Max. Vy	34	0.016	0.000	0.000
			Max. Vx	34	0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.005	0.000	0.000
			Max. Compression	18	-0.009	0.000	0.000
			Max. Mx	34	-0.006	-0.068	0.000
			Max. Vy	34	-0.038	0.000	0.000
T6	125 - 100	Leg	Max Tension	29	122.179	1.027	-0.052
			Max. Compression	24	-141.714	-1.561	-0.085
			Max. Mx	24	-141.677	2.194	0.044
			Max. My	26	-8.505	-0.212	-1.622
			Max. Vy	24	1.008	1.918	0.089
			Max. Vx	20	-0.749	-0.205	1.454
		Diagonal	Max Tension	5	19.702	-0.050	0.004
			Max. Compression	4	-20.148	0.000	0.000
			Max. Mx	14	4.477	-0.119	-0.005
			Max. My	35	-0.395	-0.065	-0.013
			Max. Vy	50	0.060	-0.069	0.013
			Max. Vx	35	-0.004	0.000	0.000
		Horizontal	Max Tension	4	14.069	0.066	-0.001
			Max. Compression	5	-13.977	0.049	-0.001
			Max. Mx	48	0.029	0.156	0.004
			Max. My	12	1.315	0.021	-0.033
			Max. Vy	48	-0.085	0.156	0.004

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	12	-0.005	0.020	-0.032
		Redund Horz 1 Bracing	Max Tension	6	1.495	0.000	0.000
			Max. Compression	15	-1.314	0.000	0.000
			Max. Mx	34	0.253	-0.020	0.000
			Max. My	34	0.278	0.000	0.000
			Max. Vy	34	-0.019	0.000	0.000
			Max. Vx	34	0.000	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	23	1.012	0.000	0.000
			Max. Compression	6	-1.044	0.000	0.000
			Max. Mx	34	-0.030	-0.027	0.000
			Max. My	34	-0.029	0.000	-0.001
			Max. Vy	34	0.019	0.000	0.000
			Max. Vx	34	0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.007	0.000	0.000
			Max. Compression	18	-0.012	0.000	0.000
			Max. Mx	34	-0.008	-0.087	0.000
			Max. Vy	34	0.043	0.000	0.000
T7	100 - 91.6667	Leg	Max Tension	29	144.428	1.161	-0.078
			Max. Compression	24	-166.605	-1.586	-0.086
			Max. Mx	24	-166.471	2.221	0.066
			Max. My	26	-9.326	-0.208	-1.644
			Max. Vy	24	0.974	2.221	0.066
			Max. Vx	26	0.693	-0.208	-1.644
		Diagonal	Max Tension	5	20.269	-0.059	0.004
			Max. Compression	4	-20.786	0.000	0.000
			Max. Mx	20	9.144	-0.115	0.006
			Max. My	48	-0.684	-0.035	-0.013
			Max. Vy	50	-0.062	-0.075	0.013
			Max. Vx	35	0.004	0.000	0.000
		Horizontal	Max Tension	4	14.801	-0.113	0.003
			Max. Compression	5	-14.704	-0.085	0.002
			Max. Mx	48	-0.171	-0.240	-0.007
			Max. My	12	0.333	-0.047	0.061
			Max. Vy	48	-0.126	-0.240	-0.007
			Max. Vx	12	0.008	-0.047	0.061
		Redund Horz 1 Bracing	Max Tension	6	1.605	0.000	0.000
			Max. Compression	25	-1.431	0.000	0.000
			Max. Mx	34	0.276	-0.021	0.000
			Max. My	34	0.274	0.000	0.000
			Max. Vy	34	0.020	0.000	0.000
			Max. Vx	34	-0.000	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	25	1.064	0.000	0.000
			Max. Compression	6	-1.069	0.000	0.000
			Max. Mx	34	-0.018	-0.028	0.000
			Max. My	34	-0.017	0.000	-0.001
			Max. Vy	34	0.019	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.013	0.000	0.000
			Max. Compression	8	-0.019	0.000	0.000
			Max. Mx	34	-0.009	-0.093	0.000
			Max. Vy	34	0.044	0.000	0.000
T8	91.6667 - 83.3333	Leg	Max Tension	29	166.926	1.195	-0.084
			Max. Compression	24	-192.076	-1.450	-0.104
			Max. Mx	24	-191.983	2.107	0.077
			Max. My	26	-10.345	-0.210	-1.939
			Max. Vy	24	-0.999	2.107	0.077

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	26	0.807	-0.210	-1.939
		Diagonal	Max Tension	5	20.897	-0.036	0.004
			Max. Compression	14	-21.478	0.000	0.000
			Max. Mx	24	-0.011	-0.099	0.006
			Max. My	35	-0.326	-0.077	0.013
			Max. Vy	50	0.064	-0.078	0.013
			Max. Vx	48	0.004	0.000	0.000
		Horizontal	Max Tension	4	15.566	-0.120	0.003
			Max. Compression	15	-15.436	-0.104	-0.013
			Max. Mx	48	-0.139	-0.249	-0.007
			Max. My	12	0.298	-0.065	0.062
			Max. Vy	48	0.130	-0.249	-0.007
			Max. Vx	12	-0.008	-0.065	0.062
		Redund Horz 1 Bracing	Max Tension	6	1.623	0.000	0.000
			Max. Compression	25	-1.467	0.000	0.000
			Max. Mx	34	0.270	-0.023	0.000
			Max. My	34	0.267	0.000	0.001
			Max. Vy	34	-0.020	0.000	0.000
			Max. Vx	34	0.000	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	24	1.069	0.000	0.000
			Max. Compression	6	-1.051	0.000	0.000
			Max. Mx	34	-0.002	-0.029	0.000
			Max. My	34	-0.001	0.000	-0.001
			Max. Vy	34	0.020	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.012	0.000	0.000
			Max. Compression	8	-0.019	0.000	0.000
			Max. Mx	34	-0.009	-0.100	0.000
			Max. Vy	34	0.045	0.000	0.000
T9	83.3333 - 75	Leg	Max Tension	29	189.430	1.063	-0.086
			Max. Compression	24	-217.707	-2.812	-0.122
			Max. Mx	24	-217.707	-2.812	-0.122
			Max. My	26	-11.388	-0.358	-3.260
			Max. Vy	24	1.354	2.508	0.085
			Max. Vx	26	1.156	-0.358	-3.260
		Diagonal	Max Tension	5	21.880	-0.041	0.005
			Max. Compression	14	-22.598	0.000	0.000
			Max. Mx	14	6.160	-0.104	-0.006
			Max. My	48	-0.645	-0.053	0.014
			Max. Vy	50	-0.066	-0.082	0.014
			Max. Vx	35	0.004	0.000	0.000
		Horizontal	Max Tension	4	16.576	-0.128	0.003
			Max. Compression	15	-16.436	-0.111	-0.013
			Max. Mx	48	0.229	-0.266	-0.007
			Max. My	12	1.448	-0.070	0.063
			Max. Vy	48	0.134	-0.266	-0.007
			Max. Vx	12	-0.008	-0.070	0.063
		Redund Horz 1 Bracing	Max Tension	30	2.137	0.000	0.000
			Max. Compression	13	-1.973	0.000	0.000
			Max. Mx	34	0.318	-0.024	0.000
			Max. My	34	0.333	0.000	0.001
			Max. Vy	34	0.021	0.000	0.000
			Max. Vx	34	-0.000	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	13	1.389	0.000	0.000
			Max. Compression	30	-1.370	0.000	0.000
			Max. Mx	34	-0.044	-0.031	0.000
			Max. My	34	-0.025	0.000	0.001

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	34	-0.020	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.012	0.000	0.000
			Max. Compression	8	-0.018	0.000	0.000
			Max. Mx	34	-0.009	-0.106	0.000
			Max. Vy	34	-0.046	0.000	0.000
T10	75 - 50	Leg	Max Tension	29	245.707	5.053	-0.121
			Max. Compression	24	-282.232	-7.002	-0.116
			Max. Mx	24	-282.003	8.608	0.097
			Max. My	26	-12.449	-0.558	-3.659
			Max. Vy	24	2.604	8.608	0.097
			Max. Vx	26	-1.001	-0.558	-3.659
		Diagonal	Max Tension	5	29.536	-0.276	0.012
			Max. Compression	14	-30.824	0.000	0.000
			Max. Mx	30	18.474	-0.391	0.015
			Max. My	35	-0.443	-0.154	-0.030
			Max. Vy	49	-0.101	-0.179	0.030
			Max. Vx	48	0.006	0.000	0.000
		Horizontal	Max Tension	4	18.441	0.111	-0.002
			Max. Compression	15	-18.610	0.116	0.014
			Max. Mx	48	0.053	0.286	0.008
			Max. My	12	1.889	-0.019	-0.066
			Max. Vy	48	-0.120	0.286	0.008
			Max. Vx	12	-0.008	-0.023	-0.065
		Redund Horz 1 Bracing	Max Tension	20	3.251	0.000	0.000
			Max. Compression	21	-2.894	0.000	0.000
			Max. Mx	34	0.464	-0.034	0.000
			Max. My	34	0.484	0.000	0.001
			Max. Vy	34	0.027	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	21	2.452	0.000	0.000
			Max. Compression	20	-2.518	0.000	0.000
			Max. Mx	34	-0.126	-0.050	0.000
			Max. My	34	-0.113	0.000	-0.002
			Max. Vy	34	0.026	0.000	0.000
			Max. Vx	34	0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.011	0.000	0.000
			Max. Compression	8	-0.020	0.000	0.000
			Max. Mx	34	-0.012	-0.135	0.000
			Max. Vy	34	0.054	0.000	0.000
T11	50 - 37.5	Leg	Max Tension	29	281.144	5.724	-0.123
			Max. Compression	24	-323.014	-6.369	-0.167
			Max. Mx	24	-322.952	8.535	0.116
			Max. My	26	-15.310	-0.587	-4.583
			Max. Vy	24	-2.584	8.535	0.116
			Max. Vx	26	1.180	-0.587	-4.583
		Diagonal	Max Tension	5	29.883	-0.204	0.011
			Max. Compression	14	-31.264	0.000	0.000
			Max. Mx	30	18.801	-0.311	0.015
			Max. My	48	-0.803	-0.078	0.029
			Max. Vy	49	0.098	-0.173	0.029
			Max. Vx	46	-0.006	0.000	0.000
		Horizontal	Max Tension	4	19.275	0.119	-0.003
			Max. Compression	15	-19.430	0.117	0.014
			Max. Mx	48	-0.298	0.292	0.007
			Max. My	12	0.357	0.011	-0.065
			Max. Vy	48	-0.121	0.292	0.007
			Max. Vx	12	0.007	0.011	-0.065
		Redund Horz 1	Max Tension	20	3.357	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Bracing					
			Max. Compression	21	-2.997	0.000	0.000
			Max. Mx	34	0.468	-0.036	0.000
			Max. My	34	0.487	0.000	0.001
			Max. Vy	34	0.028	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	21	2.443	0.000	0.000
			Max. Compression	20	-2.507	0.000	0.000
			Max. Mx	34	-0.116	-0.053	0.000
			Max. My	34	-0.106	0.000	-0.002
			Max. Vy	34	0.026	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.009	0.000	0.000
			Max. Compression	8	-0.019	0.000	0.000
			Max. Mx	34	-0.012	-0.145	0.000
			Max. Vy	34	0.055	0.000	0.000
T12	37.5 - 25	Leg	Max Tension	29	316.111	5.111	-0.176
			Max. Compression	24	-363.537	-7.614	-0.151
			Max. Mx	24	-363.493	9.258	0.111
			Max. My	26	-16.375	-0.587	-4.583
			Max. Vy	24	2.810	9.258	0.111
			Max. Vx	26	-1.177	-0.587	-4.583
		Diagonal	Max Tension	17	30.678	-0.293	0.013
			Max. Compression	14	-32.318	0.000	0.000
			Max. Mx	30	19.205	-0.391	0.017
			Max. My	48	-0.957	-0.085	0.031
			Max. Vy	49	0.107	-0.200	0.031
			Max. Vx	46	-0.006	0.000	0.000
		Top Girt	Max Tension	16	20.283	-0.258	0.006
			Max. Compression	15	-20.510	-0.250	-0.022
			Max. Mx	48	0.151	-0.528	-0.011
			Max. My	12	1.910	-0.035	0.112
			Max. Vy	48	-0.205	-0.528	-0.011
			Max. Vx	12	0.012	-0.035	0.112
		Redund Horz 1 Bracing	Max Tension	20	3.540	0.000	0.000
			Max. Compression	21	-3.165	0.000	0.000
			Max. Mx	34	0.487	-0.039	0.000
			Max. My	34	0.502	0.000	0.001
			Max. Vy	34	0.028	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	21	2.529	0.000	0.000
			Max. Compression	20	-2.572	0.000	0.000
			Max. Mx	34	-0.104	-0.055	0.000
			Max. My	34	-0.095	0.000	-0.002
			Max. Vy	34	-0.027	0.000	0.000
			Max. Vx	34	0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.017	0.000	0.000
			Max. Compression	8	-0.028	0.000	0.000
			Max. Mx	34	-0.014	-0.155	0.000
			Max. Vy	34	0.056	0.000	0.000
T13	25 - 12.5	Leg	Max Tension	29	351.234	6.192	-0.164
			Max. Compression	2	-404.599	-7.537	-0.012
			Max. Mx	24	-404.253	9.947	0.133
			Max. My	26	-18.842	-0.640	-4.758
			Max. Vy	24	2.926	9.947	0.133
			Max. Vx	26	1.223	-0.640	-4.758
		Diagonal	Max Tension	17	31.285	-0.290	0.013
			Max. Compression	14	-32.973	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	30	19.380	-0.401	0.017
			Max. My	35	-0.472	-0.184	0.031
			Max. Vy	49	-0.109	-0.207	0.031
			Max. Vx	38	-0.006	0.000	0.000
		Horizontal	Max Tension	16	21.152	0.207	-0.005
			Max. Compression	15	-21.260	0.197	0.011
			Max. Mx	48	-0.251	0.410	0.004
			Max. My	12	1.927	0.044	-0.064
			Max. Vy	48	-0.154	0.410	0.004
			Max. Vx	12	0.007	0.044	-0.064
		Redund Horz 1 Bracing	Max Tension	20	3.736	0.000	0.000
			Max. Compression	21	-3.344	0.000	0.000
			Max. Mx	34	0.505	-0.041	0.000
			Max. My	34	0.517	0.000	0.001
			Max. Vy	34	-0.028	0.000	0.000
			Max. Vx	34	0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	21	2.605	0.000	0.000
			Max. Compression	20	-2.644	0.000	0.000
			Max. Mx	34	-0.103	-0.056	0.000
			Max. My	34	-0.094	0.000	-0.002
			Max. Vy	34	0.027	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.006	0.000	0.000
			Max. Compression	8	-0.018	0.000	0.000
			Max. Mx	34	-0.013	-0.214	0.000
			Max. Vy	34	0.074	0.000	0.000
T14	12.5 - 0	Leg	Max Tension	29	387.045	6.097	-0.188
			Max. Compression	2	-446.712	0.000	0.000
			Max. Mx	2	-446.621	8.860	0.004
			Max. My	26	-20.187	-0.640	-4.758
			Max. Vy	2	-2.703	8.860	0.004
			Max. Vx	26	-1.112	-0.640	-4.758
		Diagonal	Max Tension	17	31.243	-0.344	0.014
			Max. Compression	14	-32.828	0.000	0.000
			Max. Mx	30	21.081	-0.454	0.018
			Max. My	43	-1.432	-0.085	0.031
			Max. Vy	49	0.109	-0.217	0.031
			Max. Vx	40	-0.006	0.000	0.000
		Top Girt	Max Tension	16	21.785	-0.377	0.009
			Max. Compression	15	-22.094	-0.354	-0.020
			Max. Mx	48	-0.449	-0.664	-0.008
			Max. My	12	0.573	-0.096	0.113
			Max. Vy	48	-0.237	-0.664	-0.008
			Max. Vx	12	0.012	-0.096	0.113
		Redund Horz 1 Bracing	Max Tension	14	2.625	0.000	0.000
			Max. Compression	33	-2.346	0.000	0.000
			Max. Mx	34	0.354	-0.041	0.000
			Max. My	34	0.339	0.000	0.001
			Max. Vy	34	0.027	0.000	0.000
			Max. Vx	34	-0.001	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	32	1.871	0.000	0.000
			Max. Compression	15	-1.814	0.000	0.000
			Max. Mx	34	0.023	-0.055	0.000
			Max. My	34	0.034	0.000	-0.002
			Max. Vy	34	0.026	0.000	0.000
			Max. Vx	34	0.001	0.000	0.000
		Inner Bracing	Max Tension	13	0.013	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	18	-0.028	0.000	0.000
			Max. Mx	34	-0.015	-0.218	0.000
			Max. Vy	34	-0.073	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	488.515	48.868	-29.216
	Max. H_x	24	488.515	48.868	-29.216
	Max. H_z	7	-411.496	-40.706	27.445
	Min. Vert	9	-423.148	-43.096	25.875
	Min. H_x	9	-423.148	-43.096	25.875
	Min. H_z	24	488.515	48.868	-29.216
Leg B	Max. Vert	12	488.005	-48.847	-29.240
	Max. H_x	29	-423.530	43.081	25.910
	Max. H_z	31	-411.879	40.684	27.492
	Min. Vert	29	-423.530	43.081	25.910
	Min. H_x	12	488.005	-48.847	-29.240
	Min. H_z	14	462.137	-44.653	-29.922
Leg A	Max. Vert	2	488.573	0.032	56.929
	Max. H_x	27	16.273	11.651	1.196
	Max. H_z	2	488.573	0.032	56.929
	Min. Vert	19	-423.105	-0.038	-50.259
	Min. H_x	10	21.698	-11.658	1.595
	Min. H_z	19	-423.105	-0.038	-50.259

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	53.724	0.000	0.000	-3.758	5.311	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	64.469	-0.000	-99.985	-10112.647	6.373	1.524
0.9 Dead+1.0 Wind 0 deg - No Ice	48.351	-0.000	-99.985	-10111.520	4.780	1.524
1.2 Dead+1.0 Wind 30 deg - No Ice	64.469	47.296	-81.920	-8371.739	-4824.449	-20.707
0.9 Dead+1.0 Wind 30 deg - No Ice	48.351	47.296	-81.920	-8370.612	-4826.042	-20.707
1.2 Dead+1.0 Wind 45 deg - No Ice	64.469	66.252	-66.252	-6783.704	-6772.821	-30.073
0.9 Dead+1.0 Wind 45 deg - No Ice	48.351	66.252	-66.252	-6782.577	-6774.415	-30.073
1.2 Dead+1.0 Wind 60 deg - No Ice	64.469	80.363	-46.398	-4760.917	-8231.965	-37.389
0.9 Dead+1.0 Wind 60 deg - No Ice	48.351	80.363	-46.398	-4759.789	-8233.558	-37.389
1.2 Dead+1.0 Wind 90 deg - No Ice	64.469	94.593	-0.000	-4.510	-9655.271	-44.054
0.9 Dead+1.0 Wind 90 deg - No	48.351	94.593	-0.000	-3.383	-9656.864	-44.054

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
Ice						
1.2 Dead+1.0 Wind 120 deg - No Ice	64.469	86.590	49.993	5049.559	-8747.531	-38.914
0.9 Dead+1.0 Wind 120 deg - No Ice	48.351	86.590	49.993	5050.686	-8749.124	-38.914
1.2 Dead+1.0 Wind 135 deg - No Ice	64.469	68.794	68.794	6985.163	-6983.300	-32.228
0.9 Dead+1.0 Wind 135 deg - No Ice	48.351	68.794	68.794	6986.291	-6984.893	-32.228
1.2 Dead+1.0 Wind 150 deg - No Ice	64.469	47.296	81.920	8362.719	-4824.449	-23.347
0.9 Dead+1.0 Wind 150 deg - No Ice	48.351	47.296	81.920	8363.847	-4826.042	-23.347
1.2 Dead+1.0 Wind 180 deg - No Ice	64.469	0.000	92.795	9508.303	6.373	-1.524
0.9 Dead+1.0 Wind 180 deg - No Ice	48.351	0.000	92.795	9509.431	4.780	-1.524
1.2 Dead+1.0 Wind 210 deg - No Ice	64.469	-47.296	81.920	8362.719	4837.195	20.707
0.9 Dead+1.0 Wind 210 deg - No Ice	48.351	-47.296	81.920	8363.847	4835.602	20.707
1.2 Dead+1.0 Wind 225 deg - No Ice	64.469	-66.252	66.252	6774.684	6785.567	30.073
0.9 Dead+1.0 Wind 225 deg - No Ice	48.351	-66.252	66.252	6775.812	6783.974	30.073
1.2 Dead+1.0 Wind 240 deg - No Ice	64.469	-86.590	49.993	5049.559	8760.276	37.389
0.9 Dead+1.0 Wind 240 deg - No Ice	48.351	-86.590	49.993	5050.686	8758.683	37.389
1.2 Dead+1.0 Wind 270 deg - No Ice	64.469	-94.593	0.000	-4.510	9668.017	44.054
0.9 Dead+1.0 Wind 270 deg - No Ice	48.351	-94.593	0.000	-3.383	9666.424	44.054
1.2 Dead+1.0 Wind 300 deg - No Ice	64.469	-80.363	-46.398	-4760.917	8244.711	38.914
0.9 Dead+1.0 Wind 300 deg - No Ice	48.351	-80.363	-46.398	-4759.789	8243.117	38.914
1.2 Dead+1.0 Wind 315 deg - No Ice	64.469	-66.252	-66.252	-6783.704	6785.567	32.228
0.9 Dead+1.0 Wind 315 deg - No Ice	48.351	-66.252	-66.252	-6782.577	6783.974	32.228
1.2 Dead+1.0 Wind 330 deg - No Ice	64.469	-47.296	-81.920	-8371.739	4837.195	23.347
0.9 Dead+1.0 Wind 330 deg - No Ice	48.351	-47.296	-81.920	-8370.612	4835.602	23.347
1.2 Dead+1.0 Ice	145.711	0.000	0.000	-41.711	19.982	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	145.711	0.000	-22.164	-2285.996	19.982	-3.032
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	145.711	10.793	-18.693	-1944.535	-1078.614	-10.068
1.2 Dead+1.0 Wind 45 deg+1.0 Ice	145.711	15.195	-15.195	-1589.811	-1528.118	-12.669
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	145.711	18.526	-10.696	-1132.458	-1869.248	-14.407
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	145.711	21.585	0.000	-41.711	-2177.211	-14.885
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	145.711	19.195	11.082	1080.431	-1923.626	-11.375
1.2 Dead+1.0 Wind 135 deg+1.0 Ice	145.711	15.468	15.468	1528.588	-1550.317	-8.381
1.2 Dead+1.0 Wind 150	145.711	10.793	18.693	1861.113	-1078.614	-4.817

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
deg+1.0 Ice						
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	145.711	0.000	21.392	2139.784	19.982	3.032
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	145.711	-10.793	18.693	1861.113	1118.578	10.068
1.2 Dead+1.0 Wind 225 deg+1.0 Ice	145.711	-15.195	15.195	1506.389	1568.081	12.669
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	145.711	-19.195	11.082	1080.431	1963.589	14.407
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	145.711	-21.585	0.000	-41.711	2217.174	14.885
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	145.711	-18.526	-10.696	-1132.458	1909.212	11.375
1.2 Dead+1.0 Wind 315 deg+1.0 Ice	145.711	-15.195	-15.195	-1589.811	1568.081	8.381
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	145.711	-10.793	-18.693	-1944.535	1118.578	4.817
Dead+Wind 0 deg - Service	53.724	0.000	-17.622	-1777.078	5.311	0.261
Dead+Wind 30 deg - Service	53.724	8.349	-14.461	-1473.290	-843.124	-3.607
Dead+Wind 45 deg - Service	53.724	11.699	-11.699	-1194.616	-1185.547	-5.237
Dead+Wind 60 deg - Service	53.724	14.195	-8.195	-839.451	-1442.151	-6.509
Dead+Wind 90 deg - Service	53.724	16.699	0.000	-3.758	-1691.558	-7.667
Dead+Wind 120 deg - Service	53.724	15.261	8.811	882.901	-1530.429	-6.770
Dead+Wind 135 deg - Service	53.724	12.134	12.134	1223.139	-1221.586	-5.606
Dead+Wind 150 deg - Service	53.724	8.349	14.461	1465.773	-843.124	-4.059
Dead+Wind 180 deg - Service	53.724	0.000	16.391	1667.627	5.311	-0.261
Dead+Wind 210 deg - Service	53.724	-8.349	14.461	1465.773	853.745	3.607
Dead+Wind 225 deg - Service	53.724	-11.699	11.699	1187.099	1196.169	5.237
Dead+Wind 240 deg - Service	53.724	-15.261	8.811	882.901	1541.051	6.509
Dead+Wind 270 deg - Service	53.724	-16.699	0.000	-3.758	1702.180	7.667
Dead+Wind 300 deg - Service	53.724	-14.195	-8.195	-839.451	1452.773	6.770
Dead+Wind 315 deg - Service	53.724	-11.699	-11.699	-1194.616	1196.169	5.606
Dead+Wind 330 deg - Service	53.724	-8.349	-14.461	-1473.290	853.745	4.059

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-53.724	0.000	0.000	53.724	0.000	0.000%
2	0.000	-64.469	-99.985	0.000	64.469	99.985	0.000%
3	0.000	-48.351	-99.985	0.000	48.351	99.985	0.000%
4	47.296	-64.469	-81.920	-47.296	64.469	81.920	0.000%
5	47.296	-48.351	-81.920	-47.296	48.351	81.920	0.000%
6	66.252	-64.469	-66.252	-66.252	64.469	66.252	0.000%
7	66.252	-48.351	-66.252	-66.252	48.351	66.252	0.000%
8	80.363	-64.469	-46.398	-80.363	64.469	46.398	0.000%
9	80.363	-48.351	-46.398	-80.363	48.351	46.398	0.000%
10	94.593	-64.469	0.000	-94.593	64.469	0.000	0.000%
11	94.593	-48.351	0.000	-94.593	48.351	0.000	0.000%
12	86.590	-64.469	49.993	-86.590	64.469	-49.993	0.000%
13	86.590	-48.351	49.993	-86.590	48.351	-49.993	0.000%
14	68.794	-64.469	68.794	-68.794	64.469	-68.794	0.000%
15	68.794	-48.351	68.794	-68.794	48.351	-68.794	0.000%
16	47.296	-64.469	81.920	-47.296	64.469	-81.920	0.000%
17	47.296	-48.351	81.920	-47.296	48.351	-81.920	0.000%
18	0.000	-64.469	92.795	-0.000	64.469	-92.795	0.000%
19	0.000	-48.351	92.795	-0.000	48.351	-92.795	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
20	-47.296	-64.469	81.920	47.296	64.469	-81.920	0.000%
21	-47.296	-48.351	81.920	47.296	48.351	-81.920	0.000%
22	-66.252	-64.469	66.252	66.252	64.469	-66.252	0.000%
23	-66.252	-48.351	66.252	66.252	48.351	-66.252	0.000%
24	-86.590	-64.469	49.993	86.590	64.469	-49.993	0.000%
25	-86.590	-48.351	49.993	86.590	48.351	-49.993	0.000%
26	-94.593	-64.469	0.000	94.593	64.469	-0.000	0.000%
27	-94.593	-48.351	0.000	94.593	48.351	-0.000	0.000%
28	-80.363	-64.469	-46.398	80.363	64.469	46.398	0.000%
29	-80.363	-48.351	-46.398	80.363	48.351	46.398	0.000%
30	-66.252	-64.469	-66.252	66.252	64.469	66.252	0.000%
31	-66.252	-48.351	-66.252	66.252	48.351	66.252	0.000%
32	-47.296	-64.469	-81.920	47.296	64.469	81.920	0.000%
33	-47.296	-48.351	-81.920	47.296	48.351	81.920	0.000%
34	0.000	-145.711	0.000	-0.000	145.711	0.000	0.000%
35	0.000	-145.711	-22.164	-0.000	145.711	22.164	0.000%
36	10.793	-145.711	-18.693	-10.793	145.711	18.693	0.000%
37	15.195	-145.711	-15.195	-15.195	145.711	15.195	0.000%
38	18.526	-145.711	-10.696	-18.526	145.711	10.696	0.000%
39	21.585	-145.711	0.000	-21.585	145.711	0.000	0.000%
40	19.195	-145.711	11.082	-19.195	145.711	-11.082	0.000%
41	15.468	-145.711	15.468	-15.468	145.711	-15.468	0.000%
42	10.793	-145.711	18.693	-10.793	145.711	-18.693	0.000%
43	0.000	-145.711	21.392	-0.000	145.711	-21.392	0.000%
44	-10.793	-145.711	18.693	10.793	145.711	-18.693	0.000%
45	-15.195	-145.711	15.195	15.195	145.711	-15.195	0.000%
46	-19.195	-145.711	11.082	19.195	145.711	-11.082	0.000%
47	-21.585	-145.711	0.000	21.585	145.711	-0.000	0.000%
48	-18.526	-145.711	-10.696	18.526	145.711	10.696	0.000%
49	-15.195	-145.711	-15.195	15.195	145.711	15.195	0.000%
50	-10.793	-145.711	-18.693	10.793	145.711	18.693	0.000%
51	0.000	-53.724	-17.622	0.000	53.724	17.622	0.000%
52	8.349	-53.724	-14.461	-8.349	53.724	14.461	0.000%
53	11.699	-53.724	-11.699	-11.699	53.724	11.699	0.000%
54	14.195	-53.724	-8.195	-14.195	53.724	8.195	0.000%
55	16.699	-53.724	0.000	-16.699	53.724	0.000	0.000%
56	15.261	-53.724	8.811	-15.261	53.724	-8.811	0.000%
57	12.134	-53.724	12.134	-12.134	53.724	-12.134	0.000%
58	8.349	-53.724	14.461	-8.349	53.724	-14.461	0.000%
59	0.000	-53.724	16.391	0.000	53.724	-16.391	0.000%
60	-8.349	-53.724	14.461	8.349	53.724	-14.461	0.000%
61	-11.699	-53.724	11.699	11.699	53.724	-11.699	0.000%
62	-15.261	-53.724	8.811	15.261	53.724	-8.811	0.000%
63	-16.699	-53.724	0.000	16.699	53.724	0.000	0.000%
64	-14.195	-53.724	-8.195	14.195	53.724	8.195	0.000%
65	-11.699	-53.724	-11.699	11.699	53.724	11.699	0.000%
66	-8.349	-53.724	-14.461	8.349	53.724	14.461	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	2.943	62	0.1202	0.0131
T2	175 - 166.667	2.816	62	0.1201	0.0124
T3	166.667 - 158.333	2.601	62	0.1198	0.0116

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T4	158.333 - 150	2.386	62	0.1187	0.0114
T5	150 - 125	2.174	62	0.1165	0.0103
T6	125 - 100	1.568	62	0.1054	0.0076
T7	100 - 91.6667	1.035	62	0.0881	0.0055
T8	91.6667 - 83.3333	0.879	62	0.0818	0.0050
T9	83.3333 - 75	0.733	62	0.0763	0.0045
T10	75 - 50	0.596	62	0.0704	0.0039
T11	50 - 37.5	0.276	51	0.0475	0.0025
T12	37.5 - 25	0.157	51	0.0369	0.0018
T13	25 - 12.5	0.073	51	0.0253	0.0012
T14	12.5 - 0	0.018	56	0.0131	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	62	2.943	0.1202	0.0131	121827
186.000	2" Dia 10' Omni	62	2.943	0.1202	0.0131	121827
185.500	3" Dia 20' Omni	62	2.943	0.1202	0.0131	121827
185.000	2" Dia 10' Omni	62	2.943	0.1202	0.0131	121827
182.500	1" Dia 8' Omni	62	2.943	0.1202	0.0131	121827
181.000	1 Bay Dipole ANT400D	62	2.943	0.1202	0.0131	121827
179.000	6' Side-Arm(1)	62	2.918	0.1202	0.0130	121827
178.000	6' w/Radome	62	2.892	0.1202	0.0128	121827
177.500	Pirod 6' Side Mount Standoff (1)	62	2.880	0.1201	0.0128	121827
176.000	6' w/Radome	62	2.842	0.1201	0.0126	121827
173.000	(inverted) 2" Dia 10' Omni	62	2.765	0.1200	0.0122	140757
170.000	(Inverted) 3" Dia 20' Omni	62	2.687	0.1200	0.0118	485836
166.500	Telewave 150F2 Omni	62	2.596	0.1198	0.0116	348873
164.000	Pirod 4' Side Mount Standoff (1)	62	2.532	0.1196	0.0116	300347
162.000	Telewave ANT220F2 - Omni Antenna	62	2.480	0.1193	0.0116	356207
161.000	ANT450F6	62	2.455	0.1191	0.0115	398557
160.000	3" Dia 9' Omni	62	2.429	0.1190	0.0115	435885
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	62	2.403	0.1188	0.0114	454248
157.000	2' Sidearm	62	2.352	0.1184	0.0113	402524
156.000	4' Paraflector [PRF-950]	62	2.327	0.1181	0.0112	352369
151.000	1 Bay Dipole ANT400D	62	2.199	0.1168	0.0104	188290
149.000	2" Dia 14' Omni (inverted)	62	2.149	0.1162	0.0101	166831
148.000	13-ft Sector Frame	62	2.124	0.1159	0.0100	160731
137.000	Pirod 12' PCS T-Frame (1) 104569	62	1.852	0.1116	0.0087	131869
130.000	2' Sidearm	62	1.685	0.1082	0.0080	119073
125.000	Decibel DB210-C Dipole (Single)	62	1.568	0.1054	0.0076	109799
124.000	Comprod 871F-70 Dipole	62	1.545	0.1048	0.0075	107331
123.000	19.5"x19.5" Panel Antenna	62	1.523	0.1042	0.0074	104718
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	62	1.477	0.1030	0.0072	99395
111.000	4' Paraflector [PRF-950]	62	1.258	0.0963	0.0064	78480
102.000	1' Side Arm	62	1.074	0.0896	0.0057	66773
89.500	20' 4-Bay Dipole	62	0.840	0.0803	0.0049	103620
82.500	1' Side Arm	62	0.719	0.0758	0.0044	87593
81.000	GPS	62	0.693	0.0748	0.0043	76023
34.000	1.5" Dia 3' Omni	51	0.130	0.0338	0.0016	52376
30.500	1.5" Dia 3' Omni	51	0.106	0.0306	0.0015	61311
29.500	1.5" Dia 3' Omni (inverted)	51	0.100	0.0296	0.0014	64492

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
27.000	1.5" Dia 3' Omni	51	0.084	0.0273	0.0013	72228
26.000	4' Side Mount Standoff (1)	51	0.079	0.0263	0.0013	73964
19.500	1.5" Dia 3' Omni	51	0.045	0.0200	0.0009	55187
18.000	4' Side Mount Standoff (1)	56	0.038	0.0186	0.0009	50458
17.500	3' Yagi	56	0.036	0.0181	0.0008	49056

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	16.758	24	0.6832	0.0744
T2	175 - 166.667	16.037	24	0.6830	0.0702
T3	166.667 - 158.333	14.809	24	0.6818	0.0659
T4	158.333 - 150	13.588	24	0.6752	0.0644
T5	150 - 125	12.380	24	0.6630	0.0581
T6	125 - 100	8.933	24	0.5999	0.0430
T7	100 - 91.6667	5.894	24	0.5013	0.0316
T8	91.6667 - 83.3333	5.009	24	0.4655	0.0287
T9	83.3333 - 75	4.174	24	0.4346	0.0257
T10	75 - 50	3.394	24	0.4007	0.0225
T11	50 - 37.5	1.572	2	0.2705	0.0144
T12	37.5 - 25	0.895	2	0.2100	0.0102
T13	25 - 12.5	0.414	2	0.1444	0.0070
T14	12.5 - 0	0.104	12	0.0744	0.0033

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	24	16.758	0.6832	0.0744	22096
186.000	2" Dia 10' Omni	24	16.758	0.6832	0.0744	22096
185.500	3" Dia 20' Omni	24	16.758	0.6832	0.0744	22096
185.000	2" Dia 10' Omni	24	16.758	0.6832	0.0744	22096
182.500	1" Dia 8' Omni	24	16.758	0.6832	0.0744	22096
181.000	1 Bay Dipole ANT400D	24	16.758	0.6832	0.0744	22096
179.000	6' Side-Arm(1)	24	16.615	0.6832	0.0736	22096
178.000	6' w/Radome	24	16.471	0.6831	0.0727	22096
177.500	Pirod 6' Side Mount Standoff (1)	24	16.399	0.6831	0.0723	22096
176.000	6' w/Radome	24	16.182	0.6830	0.0710	22096
173.000	(inverted) 2" Dia 10' Omni	24	15.744	0.6829	0.0687	25678
170.000	(Inverted) 3" Dia 20' Omni	24	15.302	0.6827	0.0669	94295
166.500	Telewave 150F2 Omni	24	14.785	0.6817	0.0659	59740
164.000	Pirod 4' Side Mount Standoff (1)	24	14.417	0.6804	0.0657	50636
162.000	Telewave ANT220F2 - Omni Antenna	24	14.124	0.6789	0.0655	60555
161.000	ANT450F6	24	13.978	0.6780	0.0653	68203
160.000	3" Dia 9' Omni	24	13.831	0.6770	0.0651	75282
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	24	13.686	0.6759	0.0647	79458
157.000	2' Sidearm	24	13.394	0.6736	0.0636	71985

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.000	4' Paraflector [PRF-950]	24	13.248	0.6723	0.0630	63370
151.000	1 Bay Dipole ANT400D	24	12.524	0.6647	0.0589	33881
149.000	2" Dia 14' Omni (inverted)	24	12.236	0.6612	0.0572	30026
148.000	13-ft Sector Frame	24	12.093	0.6594	0.0564	28911
137.000	Pirod 12' PCS T-Frame (1) 104569	24	10.548	0.6351	0.0491	23456
130.000	2' Sidearm	24	9.596	0.6156	0.0454	21063
125.000	Decibel DB210-C Dipole (Single)	24	8.933	0.5999	0.0430	19366
124.000	Comprod 871F-70 Dipole	24	8.802	0.5965	0.0425	18929
123.000	19.5"x19.5" Panel Antenna	24	8.672	0.5931	0.0420	18465
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	24	8.413	0.5861	0.0410	17520
111.000	4' Paraflector [PRF-950]	24	7.165	0.5480	0.0362	13814
102.000	1' Side Arm	24	6.116	0.5101	0.0323	11743
89.500	20' 4-Bay Dipole	24	4.787	0.4572	0.0280	18238
82.500	1' Side Arm	24	4.093	0.4315	0.0254	15478
81.000	GPS	24	3.948	0.4257	0.0248	13415
34.000	1.5" Dia 3' Omni	2	0.741	0.1923	0.0093	9189
30.500	1.5" Dia 3' Omni	2	0.603	0.1740	0.0084	10751
29.500	1.5" Dia 3' Omni (inverted)	2	0.567	0.1687	0.0082	11306
27.000	1.5" Dia 3' Omni	2	0.480	0.1552	0.0076	12662
26.000	4' Side Mount Standoff (1)	2	0.446	0.1498	0.0073	12967
19.500	1.5" Dia 3' Omni	2	0.253	0.1141	0.0054	9685
18.000	4' Side Mount Standoff (1)	12	0.215	0.1057	0.0050	8857
17.500	3' Yagi	12	0.203	0.1029	0.0048	8612

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	180	Diagonal	A325X	0.750	1	2.522	17.944	0.141 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	1.124	10.263	0.110 ✔	1	Member Block Shear
T2	175	Leg	A325X	0.750	6	0.456	30.101	0.015 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	6.613	17.944	0.369 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	2.017	7.188	0.281 ✔	1	Member Block Shear
T3	166.667	Diagonal	A325X	0.750	1	7.063	17.944	0.394 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	2.118	7.188	0.295 ✔	1	Member Block Shear
T4	158.333	Diagonal	A325X	0.750	1	8.886	17.944	0.495 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	2.760	7.188	0.384 ✔	1	Member Block Shear
T5	150	Leg	A325X	0.750	6	5.000	30.101	0.166 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	17.523	29.906	0.586 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	5.793	10.263	0.564 ✔	1	Member Block Shear
T6	125	Leg	A325X	0.750	6	13.274	30.101	0.441 ✔	1	Bolt Tension

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
		Diagonal	A325X	0.750	1	19.702	25.230	0.781 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	7.035	12.829	0.548 ✔	1	Member Block Shear
T7	100	Leg	A325X	1.000	6	24.071	54.517	0.442 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	20.269	25.230	0.803 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	7.401	20.527	0.361 ✔	1	Member Block Shear
T8	91.6667	Diagonal	A325X	0.750	1	20.897	25.230	0.828 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	7.783	20.527	0.379 ✔	1	Member Block Shear
T9	83.3333	Diagonal	A325X	0.750	1	21.880	25.230	0.867 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	8.288	20.527	0.404 ✔	1	Member Block Shear
T10	75	Leg	A325X	1.000	8	26.383	54.517	0.484 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	29.536	31.538	0.937 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	9.220	11.623	0.793 ✔	1	Member Block Shear
T11	50	Leg	A325X	1.000	8	35.143	54.517	0.645 ✔	1	Bolt Tension
		Diagonal	A325X	1.000	1	29.883	40.676	0.735 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	9.637	11.623	0.829 ✔	1	Member Block Shear
T12	37.5	Diagonal	A325X	1.000	1	30.678	45.703	0.671 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	10.142	23.245	0.436 ✔	1	Member Block Shear
T13	25	Leg	A325X	1.000	8	43.904	54.517	0.805 ✔	1	Bolt Tension
		Diagonal	A325X	1.000	1	31.285	45.703	0.685 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	10.630	17.257	0.616 ✔	1	Bolt Shear
T14	12.5	Diagonal	A325X	1.000	1	31.243	45.703	0.684 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	10.893	29.057	0.375 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 175	Stainless P5x0.250	5.005	5.005	35.7 K=1.00	3.731	-2.698	152.928	0.018 [1] ✔
T2	175 - 166.667	Stainless P5x0.250	8.342	8.342	59.5 K=1.00	3.731	-4.773	129.561	0.037 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	166.667 - 158.333	Stainless P5x0.250	8.342	8.342	59.5 K=1.00	3.731	-14.054	129.561	0.108 [1] ✔
T4	158.333 - 150	Stainless P5x0.250	8.342	8.342	59.5 K=1.00	3.731	-24.568	129.561	0.190 [1] ✔
T5	150 - 125	Stainless P5x0.300	25.027	4.171	30.1 K=1.00	4.430	-71.841	186.589	0.385 [1] ✔
T6	125 - 100	Stainless P5x0.400	25.027	4.171	30.7 K=1.00	5.781	-141.714	242.845	0.584 [1] ✔
T7	100 - 91.6667	Stainless P5x0.500	8.342	4.171	31.3 K=1.00	7.069	-166.605	296.141	0.563 [1] ✔
T8	91.6667 - 83.3333	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1 K=1.00	9.027	-192.076	320.254	0.600 [1] ✔
T9	83.3333 - 75	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1 K=1.00	9.027	-217.707	320.254	0.680 [1] ✔
T10	75 - 50	Stainless P6.875x0.400	25.027	6.257	32.7 K=1.00	8.137	-282.232	399.956	0.706 [1] ✔
T11	50 - 37.5	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-323.014	490.874	0.658 [1] ✔
T12	37.5 - 25	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-363.537	490.874	0.741 [1] ✔
T13	25 - 12.5	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-404.599	490.874	0.824 [1] ✔
T14	12.5 - 0	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-446.712	490.874	0.910 [1] ✔

[1] P_u / ϕP_n controls

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	180 - 175	2L2 1/2x2x3/16x3/8	7.434	6.882	113.4 K=1.00	1.620	-2.644	32.407	0.082 [1] ✔
T2	175 - 166.667	2L2 1/2x2x3/16x3/8	10.174	9.540	156.4 K=1.00	1.620	-6.720	18.117	0.371 [1] ✔
T3	166.667 - 158.333	2L2 1/2x2x3/16x3/8	10.369	9.748	159.7 K=1.00	1.620	-7.174	17.421	0.412 [1] ✔
T4	158.333 - 150	2L2 1/2x2x3/16x3/8	10.570	9.961	163.0 K=1.00	1.620	-9.004	16.746	0.538 [1] ✔
T5	150 - 125	2L2 1/2x2x5/16x3/8	11.213	10.631	156.4 K=1.00	2.620	-17.891	30.219	0.592 [1] ✔
T6	125 - 100	2L3x2 1/2x1/4x3/8	11.905	11.343	150.5 K=1.00	2.630	-20.148	32.035	0.629 [1] ✔
T7	100 - 91.6667	2L3x2 1/2x1/4x3/8	12.145	11.588	153.7 K=1.00	2.630	-20.786	30.775	0.675 [1] ✔
T8	91.6667 - 83.3333	2L3x2 1/2x1/4x3/8	12.390	11.838	144.1 K=1.00	2.630	-21.478	34.813	0.617 [1] ✔
T9	83.3333 - 75	2L3x2 1/2x1/4x3/8	12.639	12.091	147.1 K=1.00	2.630	-22.598	33.452	0.676 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	75 - 50	2L3 1/2x3 1/2x5/16x3/8	16.327	15.611	150.6 K=1.00	4.180	-30.824	51.371	0.600 [1]
T11	50 - 37.5	2L 'a' > 60.591 in - 291 2L3 1/2x3x5/16x3/8	16.653	15.887	146.7 K=1.00	3.870	-31.264	49.786	0.628 [1]
T12	37.5 - 25	2L3 1/2x3 1/2x5/16x3/8	16.988	16.231	156.6 K=1.00	4.180	-32.318	47.602	0.679 [1]
T13	25 - 12.5	2L 'a' > 62.998 in - 370 2L3 1/2x3 1/2x5/16x3/8	17.330	16.583	145.4 K=1.00	4.180	-32.973	54.945	0.600 [1]
T14	12.5 - 0	2L3 1/2x3 1/2x5/16x3/8	17.680	16.942	148.5 K=1.00	4.180	-32.828	52.756	0.622 [1]

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
T2	175 - 166.667	L2 1/2x2 1/2x3/16	11.000	5.094	122.7 K=0.99	0.902	-4.029	17.101	0.236 [1]
T5	150 - 125	L3x2 1/2x1/4	14.333	6.760	145.7 K=0.95	1.310	-11.576	17.668	0.655 [1]
T6	125 - 100	L3x3x5/16	16.333	7.760	149.1 K=0.94	1.780	-13.977	22.924	0.610 [1]
T7	100 - 91.6667	2L3x3x1/4	17.000	8.094	104.4 K=1.00	2.880	-14.704	68.122	0.216 [1]
T8	91.6667 - 83.3333	2L3x3x1/4	17.667	8.427	108.7 K=1.00	2.880	-15.436	65.133	0.237 [1]
T9	83.3333 - 75	2L3x3x1/4	18.333	8.760	113.0 K=1.00	2.880	-16.436	62.023	0.265 [1]
T10	75 - 50	L4x4x1/4	20.000	9.516	138.0 K=0.96	1.940	-18.610	29.137	0.639 [1]
T11	50 - 37.5	L4x4x1/4	21.000	10.016	143.8 K=0.95	1.940	-19.430	26.853	0.724 [1]
T13	25 - 12.5	L4x4x3/8	23.000	11.016	156.4 K=0.93	2.860	-21.260	33.454	0.636 [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 $\frac{P_u}{\phi P_n}$

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	180 - 175	L3x3x1/4	10.599	4.893	109.6 K=1.10	1.440	-2.297	32.261	0.071 [1] ✔
T3	166.667 - 158.333	L2 1/2x2 1/2x3/16	11.667	5.427	128.9 K=0.98	0.902	-4.199	15.549	0.270 [1] ✔
T4	158.333 - 150	L2 1/2x2 1/2x3/16	12.333	5.760	135.0 K=0.97	0.902	-5.484	14.163	0.387 [1] ✔
T12	37.5 - 25	2L4x4x1/4	22.000	10.516	100.9 K=1.00	3.880	-20.510	93.171	0.220 [1] ✔
T14	12.5 - 0	2L4x4x5/16	24.000	11.516	111.4 K=1.00	4.800	-22.094	105.319	0.210 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	3.417	3.208	108.9 K=1.11	0.715	-1.593	16.149	0.099 [1] ✔
T6	125 - 100	L2x2x3/16	4.083	3.875	119.0 K=1.01	0.715	-2.457	14.276	0.172 [1] ✔
T7	100 - 91.6667	L2x2x3/16	4.250	4.042	123.1 K=1.00	0.715	-2.888	13.476	0.214 [1] ✔
T8	91.6667 - 83.3333	L2x2x3/16	4.417	4.208	128.2 K=1.00	0.715	-3.330	12.457	0.267 [1] ✔
T9	83.3333 - 75	L2x2x3/16	4.583	4.375	133.2 K=1.00	0.715	-3.774	11.526	0.327 [1] ✔
T10	75 - 50	L2 1/2x2 1/2x3/16	5.000	4.714	117.1 K=1.03	0.902	-4.892	18.463	0.265 [1] ✔
T11	50 - 37.5	L2 1/2x2 1/2x3/16	5.250	4.964	120.3 K=1.00	0.902	-5.599	17.688	0.317 [1] ✔
T12	37.5 - 25	L2 1/2x2 1/2x3/16	5.500	5.214	126.4 K=1.00	0.902	-6.302	16.162	0.390 [1] ✔
T13	25 - 12.5	L2 1/2x2 1/2x3/16	5.750	5.464	132.4 K=1.00	0.902	-7.013	14.717	0.477 [1] ✔
T14	12.5 - 0	L2 1/2x2 1/2x3/16	6.000	5.714	138.5 K=1.00	0.902	-7.743	13.457	0.575 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	5.285	4.957	151.0	0.715	-1.253	8.980	0.139 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	125 - 100	L2x2x3/16	5.719	5.415	164.9 K=1.00	0.715	-1.720	7.523	0.229 [1]
T7	100 - 91.6667	L2x2x3/16	5.835	5.537	168.6 K=1.00	0.715	-1.982	7.196	0.276 [1]
T8	91.6667 - 83.3333	L2x2x3/16	5.953	5.661	172.4 K=1.00	0.715	-2.244	6.885	0.326 [1]
T9	83.3333 - 75	L2x2x3/16	6.073	5.786	176.2 K=1.00	0.715	-2.500	6.589	0.379 [1]
T10	75 - 50	L2 1/2x2 1/2x3/16	7.851	7.378	178.9 K=1.00	0.902	-3.841	8.070	0.476 [1]
T11	50 - 37.5	L2 1/2x2 1/2x3/16	8.005	7.547	183.0 K=1.00	0.902	-4.269	7.713	0.553 [1]
T12	37.5 - 25	L2 1/2x2 1/2x3/16	8.164	7.718	187.1 K=1.00	0.902	-4.677	7.374	0.634 [1]
T13	25 - 12.5	L2 1/2x2 1/2x3/16	8.327	7.893	191.3 K=1.00	0.902	-5.078	7.051	0.720 [1]
T14	12.5 - 0	L2 1/2x2 1/2x3/16	8.494	8.071	195.7 K=1.00	0.902	-5.481	6.744	0.813 [1]

[1] P_u / ϕP_n controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2 1/2x2x3/16	7.167	7.167	201.4 K=1.00	0.809	-0.009	5.708	0.002 [1]
T6	125 - 100	L2 1/2x2x3/16	8.167	8.167	229.5 K=1.00	0.809	-0.012	4.396	0.003 [1]
T7	100 - 91.6667	L2 1/2x2x3/16	8.500	8.500	238.9 K=1.00	0.809	-0.019	4.058	0.005 [1]
T8	91.6667 - 83.3333	L2 1/2x2x3/16	8.833	8.833	248.2 K=1.00	0.809	-0.019	3.757	0.005 [1]
T9	83.3333 - 75	L2 1/2x2x3/16	9.167	9.167	257.6 K=1.00	0.809	-0.018	3.489	0.005 [1]
T10	75 - 50	KL/R > 250 (C) - 279 L2 1/2x2 1/2x3/16	10.000	10.000	242.4 K=1.00	0.902	-0.019	4.393	0.004 [1]
T11	50 - 37.5	L2 1/2x2 1/2x3/16	10.500	10.500	254.5 K=1.00	0.902	-0.019	3.985	0.005 [1]
T12	37.5 - 25	KL/R > 250 (C) - 357 L2 1/2x2 1/2x3/16	11.000	11.000	266.7 K=1.00	0.902	-0.028	3.631	0.008 [1]
T13	25 - 12.5	KL/R > 250 (C) - 384 L3x3x1/4	11.500	11.500	233.1 K=1.00	1.440	-0.018	7.585	0.002 [1]
T14	12.5 - 0	L3x3x1/4	12.000	12.000	243.2 K=1.00	1.440	-0.028	6.966	0.004 [1]

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	

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

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	180 - 175	Stainless P5x0.250	5.005	5.005	35.7	3.731	0.553	167.879	0.003 [1] ✔
T2	175 - 166.667	Stainless P5x0.250	8.342	8.342	59.5	3.731	2.737	167.879	0.016 [1] ✔
T3	166.667 - 158.333	Stainless P5x0.250	8.342	8.342	59.5	3.731	10.892	167.879	0.065 [1] ✔
T4	158.333 - 150	Stainless P5x0.250	8.342	8.342	59.5	3.731	20.095	167.879	0.120 [1] ✔
T5	150 - 125	Stainless P5x0.300	25.027	4.171	30.1	4.430	59.356	199.334	0.298 [1] ✔
T6	125 - 100	Stainless P5x0.400	25.027	4.171	30.7	5.781	122.179	260.124	0.470 [1] ✔
T7	100 - 91.6667	Stainless P5x0.500	8.342	4.171	31.3	7.069	144.428	318.086	0.454 [1] ✔
T8	91.6667 - 83.3333	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1	9.027	166.926	341.202	0.489 [1] ✔
T9	83.3333 - 75	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1	9.027	189.430	341.202	0.555 [1] ✔
T10	75 - 50	Stainless P6.875x0.400	25.027	6.257	32.7	8.137	245.707	439.383	0.559 [1] ✔
T11	50 - 37.5	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	281.144	540.747	0.520 [1] ✔
T12	37.5 - 25	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	316.111	540.747	0.585 [1] ✔
T13	25 - 12.5	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	351.234	540.747	0.650 [1] ✔
T14	12.5 - 0	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	387.045	540.747	0.716 [1] ✔

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
T1	180 - 175	2L2 1/2x2x3/16x3/8	7.434	6.882	108.2	0.969	2.522	42.147	0.060 [1] ✔
T2	175 - 166.667	2L2 1/2x2x3/16x3/8	10.174	9.540	148.5	0.969	6.613	42.147	0.157 [1] ✔
T3	166.667 - 158.333	2L2 1/2x2x3/16x3/8	10.369	9.748	151.6	0.969	7.063	42.147	0.168 [1] ✔
T4	158.333 - 150	2L2 1/2x2x3/16x3/8	10.570	9.961	154.8	0.969	8.886	42.147	0.211 [1] ✔
T5	150 - 125	2L2 1/2x2x5/16x3/8	11.213	10.631	138.0	1.555	17.523	67.636	0.259 [1] ✔
T6	125 - 100	2L3x2 1/2x1/4x3/8	11.905	11.343	123.3	1.644	19.702	71.530	0.275 [1] ✔
T7	100 - 91.6667	2L3x2 1/2x1/4x3/8	12.145	11.588	125.9	1.644	20.269	71.530	0.283 [1] ✔
T8	91.6667 - 83.3333	2L3x2 1/2x1/4x3/8	12.390	11.838	128.6	1.644	20.897	71.530	0.292 [1] ✔
T9	83.3333 - 75	2L3x2 1/2x1/4x3/8	12.639	12.091	131.3	1.644	21.880	71.530	0.306 [1] ✔
T10	75 - 50	2L3 1/2x3 1/2x5/16x3/8	16.327	15.611	119.1	2.725	29.536	118.531	0.249 [1] ✔
T11	50 - 37.5	2L 'a' > 60.591 in - 301 2L3 1/2x3x5/16x3/8	16.653	15.887	144.2	2.375	29.883	103.319	0.289 [1] ✔
T12	37.5 - 25	2L3 1/2x3 1/2x5/16x3/8	16.988	16.231	124.2	2.608	30.678	127.123	0.241 [1] ✔
T13	25 - 12.5	2L 'a' > 62.998 in - 373 2L3 1/2x3 1/2x5/16x3/8	17.330	16.583	126.9	2.608	31.285	127.123	0.246 [1] ✔
T14	12.5 - 0	2L3 1/2x3 1/2x5/16x3/8	17.680	16.942	129.6	2.608	31.243	127.123	0.246 [1] ✔

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
T2	175 - 166.667	L2 1/2x2 1/2x3/16	11.000	5.094	122.4	0.571	4.034	24.840	0.162 [1] ✔
T5	150 - 125	L3x2 1/2x1/4	14.333	6.760	111.1	0.842	11.587	36.622	0.316 [1] ✔
T6	125 - 100	L3x3x5/16	16.333	7.760	103.6	1.159	14.069	50.426	0.279 [1] ✔
T7	100 - 91.6667	2L3x3x1/4	17.000	8.094	107.0	1.879	14.801	81.726	0.181 [1] ✔
T8	91.6667 - 83.3333	2L3x3x1/4	17.667	8.427	111.3	1.879	15.566	81.726	0.190 [1] ✔
T9	83.3333 - 75	2L3x3x1/4	18.333	8.760	115.6	1.879	16.576	81.726	0.203 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	75 - 50	L4x4x1/4	20.000	9.516	93.3	1.314	18.441	57.175	0.323 [1] ✔
T11	50 - 37.5	L4x4x1/4	21.000	10.016	98.1	1.314	19.275	57.175	0.337 [1] ✔
T13	25 - 12.5	L4x4x3/8	23.000	11.016	109.4	1.934	21.152	94.285	0.224 [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	180 - 175	L3x3x1/4	10.599	4.893	98.5	0.939	2.248	40.863	0.055 [1] ✔
T3	166.667 - 158.333	L2 1/2x2 1/2x3/16	11.667	5.427	130.1	0.571	4.237	24.840	0.171 [1] ✔
T4	158.333 - 150	L2 1/2x2 1/2x3/16	12.333	5.760	137.9	0.571	5.521	24.840	0.222 [1] ✔
T12	37.5 - 25	2L4x4x1/4	22.000	10.516	102.8	2.629	20.283	114.351	0.177 [1] ✔
T14	12.5 - 0	2L4x4x5/16	24.000	11.516	113.4	3.248	21.785	141.307	0.154 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	3.417	3.208	62.4	0.715	1.683	23.166	0.073 [1] ✔
T6	125 - 100	L2x2x3/16	4.083	3.875	75.4	0.715	2.457	23.166	0.106 [1] ✔
T7	100 - 91.6667	L2x2x3/16	4.250	4.042	78.6	0.715	2.888	23.166	0.125 [1] ✔
T8	91.6667 - 83.3333	L2x2x3/16	4.417	4.208	81.8	0.715	3.330	23.166	0.144 [1] ✔
T9	83.3333 - 75	L2x2x3/16	4.583	4.375	85.1	0.715	3.774	23.166	0.163 [1] ✔
T10	75 - 50	L2 1/2x2 1/2x3/16	5.000	4.714	72.7	0.902	4.892	29.225	0.167 [1] ✔
T11	50 - 37.5	L2 1/2x2 1/2x3/16	5.250	4.964	76.6	0.902	5.599	29.225	0.192 [1] ✔
T12	37.5 - 25	L2 1/2x2 1/2x3/16	5.500	5.214	80.4	0.902	6.302	29.225	0.216 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T13	25 - 12.5	L2 1/2x2 1/2x3/16	5.750	5.464	84.3	0.902	7.013	29.225	0.240 [1]
T14	12.5 - 0	L2 1/2x2 1/2x3/16	6.000	5.714	88.1	0.902	7.743	29.225	0.265 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	5.285	4.957	96.4	0.715	1.281	23.166	0.055 [1]
T6	125 - 100	L2x2x3/16	5.496	5.192	101.0	0.715	1.800	23.166	0.078 [1]
T7	100 - 91.6667	L2x2x3/16	5.835	5.537	107.7	0.715	1.982	23.166	0.086 [1]
T8	91.6667 - 83.3333	L2x2x3/16	5.953	5.661	110.1	0.715	2.244	23.166	0.097 [1]
T9	83.3333 - 75	L2x2x3/16	6.073	5.786	112.5	0.715	2.500	23.166	0.108 [1]
T10	75 - 50	L2 1/2x2 1/2x3/16	7.703	7.230	111.5	0.902	3.967	29.225	0.136 [1]
T11	50 - 37.5	L2 1/2x2 1/2x3/16	8.005	7.547	116.4	0.902	4.269	29.225	0.146 [1]
T12	37.5 - 25	L2 1/2x2 1/2x3/16	8.164	7.718	119.1	0.902	4.677	29.225	0.160 [1]
T13	25 - 12.5	L2 1/2x2 1/2x3/16	8.327	7.893	121.7	0.902	5.078	29.225	0.174 [1]
T14	12.5 - 0	L2 1/2x2 1/2x3/16	8.494	8.071	124.5	0.902	5.481	29.225	0.188 [1]

[1] P_u / ϕP_n controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2 1/2x2x3/16	7.167	7.167	143.4	0.809	0.005	26.212	0.000 [1]
T6	125 - 100	L2 1/2x2x3/16	7.500	7.500	150.1	0.809	0.007	26.212	0.000 [1]
T7	100 - 91.6667	L2 1/2x2x3/16	8.500	8.500	170.1	0.809	0.013	26.212	0.000 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	91.6667 - 83.3333	L2 1/2x2x3/16	8.833	8.833	176.7	0.809	0.012	26.212	0.000 [1]
T9	83.3333 - 75	L2 1/2x2x3/16	9.167	9.167	183.4	0.809	0.012	26.212	0.000 [1]
T10	75 - 50	L2 1/2x2 1/2x3/16	9.500	9.500	146.5	0.902	0.011	29.225	0.000 [1]
T11	50 - 37.5	L2 1/2x2 1/2x3/16	10.500	10.500	162.0	0.902	0.009	29.225	0.000 [1]
T12	37.5 - 25	L2 1/2x2 1/2x3/16	11.000	11.000	169.7	0.902	0.017	29.225	0.001 [1]
T13	25 - 12.5	L3x3x1/4	11.500	11.500	148.4	1.440	0.006	46.656	0.000 [1]
T14	12.5 - 0	L3x3x1/4	12.000	12.000	154.8	1.440	0.013	46.656	0.000 [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	180 - 175	Leg	Stainless P5x0.250	1	-1.823	152.928	3.4	Pass
		Leg	Stainless P5x0.250	2	-2.063	152.928	3.6	Pass
		Leg	Stainless P5x0.250	3	-2.698	152.928	4.1	Pass
T2	175 - 166.667	Leg	Stainless P5x0.250	13	-4.600	129.561	3.6	Pass
		Leg	Stainless P5x0.250	14	-4.742	129.561	3.7	Pass
		Leg	Stainless P5x0.250	15	-4.773	129.561	3.7	Pass
T3	166.667 - 158.333	Leg	Stainless P5x0.250	25	-14.054	129.561	10.8	Pass
		Leg	Stainless P5x0.250	26	-13.942	129.561	10.8	Pass
		Leg	Stainless P5x0.250	27	-13.930	129.561	10.8	Pass
T4	158.333 - 150	Leg	Stainless P5x0.250	37	-24.352	129.561	18.8	Pass
		Leg	Stainless P5x0.250	38	-24.145	129.561	18.6	Pass
		Leg	Stainless P5x0.250	39	-24.568	129.561	19.0	Pass
T5	150 - 125	Leg	Stainless P5x0.300	49	-71.691	186.589	38.4	Pass
		Leg	Stainless P5x0.300	50	-71.436	186.589	38.3	Pass
		Leg	Stainless P5x0.300	51	-71.841	186.589	38.5	Pass
T6	125 - 100	Leg	Stainless P5x0.400	124	-141.714	242.845	58.4	Pass
		Leg	Stainless P5x0.400	125	-141.314	242.845	58.2	Pass
		Leg	Stainless P5x0.400	126	-141.621	242.845	58.3	Pass
T7	100 - 91.6667	Leg	Stainless P5x0.500	199	-166.605	296.141	56.3	Pass
		Leg	Stainless P5x0.500	200	-166.202	296.141	56.1	Pass
		Leg	Stainless P5x0.500	201	-166.487	296.141	56.2	Pass
T8	91.6667 - 83.3333	Leg	1/3 Pipe w/ 5"x0.5 Stainless	226	-192.076	320.254	60.0	Pass
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	227	-191.669	320.254	59.8	Pass
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	228	-191.999	320.254	60.0	Pass
T9	83.3333 - 75	Leg	1/3 Pipe w/ 5"x0.5 Stainless	253	-217.707	320.254	68.0	Pass
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	254	-217.217	320.254	67.8	Pass
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	255	-217.638	320.254	68.0	Pass
T10	75 - 50	Leg	Stainless P6.875x0.400	280	-282.232	399.956	70.6	Pass
		Leg	Stainless P6.875x0.400	281	-281.728	399.956	70.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Leg	Stainless P6.875x0.400	282	-282.109	399.956	70.5	Pass
T11	50 - 37.5	Leg	Stainless P6.875x0.500	331	-323.014	490.874	65.8	Pass
		Leg	Stainless P6.875x0.500	332	-322.498	490.874	65.7	Pass
		Leg	Stainless P6.875x0.500	333	-322.860	490.874	65.8	Pass
T12	37.5 - 25	Leg	Stainless P6.875x0.500	358	-363.537	490.874	74.1	Pass
		Leg	Stainless P6.875x0.500	359	-363.012	490.874	74.0	Pass
		Leg	Stainless P6.875x0.500	360	-363.490	490.874	74.0	Pass
T13	25 - 12.5	Leg	Stainless P6.875x0.500	385	-404.526	490.874	82.4	Pass
		Leg	Stainless P6.875x0.500	386	-403.990	490.874	82.3	Pass
		Leg	Stainless P6.875x0.500	387	-404.599	490.874	82.4	Pass
T14	12.5 - 0	Leg	Stainless P6.875x0.500	412	-446.652	490.874	91.0	Pass
		Leg	Stainless P6.875x0.500	413	-446.124	490.874	90.9	Pass
		Leg	Stainless P6.875x0.500	414	-446.712	490.874	91.0	Pass
T1	180 - 175	Diagonal	2L2 1/2x2x3/16x3/8	7	-1.406	32.407	4.3 7.2 (b)	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	8	-1.406	32.407	4.3 7.2 (b)	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	9	-2.547	32.407	7.9 13.4 (b)	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	10	-2.521	32.407	7.8 13.5 (b)	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	11	-2.624	32.407	8.1 14.1 (b)	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	12	-2.644	32.407	8.2 14.0 (b)	Pass
T2	175 - 166.667	Diagonal	2L2 1/2x2x3/16x3/8	17	-5.685	18.117	31.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	18	-5.670	18.117	31.3	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	20	-6.720	18.117	37.1	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	21	-6.716	18.117	37.1	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	23	-6.190	18.117	34.2	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	24	-6.209	18.117	34.3	Pass
T3	166.667 - 158.333	Diagonal	2L2 1/2x2x3/16x3/8	31	-6.876	17.421	39.5	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	32	-6.871	17.421	39.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	33	-7.032	17.421	40.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	34	-7.034	17.421	40.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	35	-7.172	17.421	41.2	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	36	-7.174	17.421	41.2	Pass
T4	158.333 - 150	Diagonal	2L2 1/2x2x3/16x3/8	43	-7.540	16.746	45.0	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	44	-7.547	16.746	45.1	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	45	-8.392	16.746	50.1	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	46	-8.329	16.746	49.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	47	-8.999	16.746	53.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	48	-9.004	16.746	53.8	Pass
T5	150 - 125	Diagonal	2L2 1/2x2x5/16x3/8	53	-15.929	30.219	52.7	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	56	-15.936	30.219	52.7	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	60	-17.231	30.219	57.0	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	63	-17.119	30.219	56.6	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	67	-17.886	30.219	59.2	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	70	-17.891	30.219	59.2	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	77	-13.773	31.150	44.2 45.1 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	80	-13.781	31.150	44.2 45.1 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	84	-14.850	31.150	47.7 48.6 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	87	-14.838	31.150	47.6 48.7 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	91	-15.693	31.150	50.4 51.5 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	94	-15.698	31.150	50.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							51.5 (b)	
		Diagonal	2L2 1/2x2x5/16x3/8	101	-10.719	32.093	33.4	Pass
							35.0 (b)	
		Diagonal	2L2 1/2x2x5/16x3/8	104	-10.727	32.093	33.4	Pass
							35.0 (b)	
		Diagonal	2L2 1/2x2x5/16x3/8	108	-11.730	32.093	36.6	Pass
							38.1 (b)	
		Diagonal	2L2 1/2x2x5/16x3/8	111	-11.650	32.093	36.3	Pass
							38.1 (b)	
		Diagonal	2L2 1/2x2x5/16x3/8	115	-12.577	32.093	39.2	Pass
							41.2 (b)	
		Diagonal	2L2 1/2x2x5/16x3/8	118	-12.581	32.093	39.2	Pass
							41.2 (b)	
T6	125 - 100	Diagonal	2L3x2 1/2x1/4x3/8	128	-18.789	32.035	58.7	Pass
							72.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	131	-18.801	32.035	58.7	Pass
							72.7 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	135	-19.980	32.035	62.4	Pass
							76.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	138	-19.815	32.035	61.9	Pass
							76.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	142	-20.148	32.035	62.9	Pass
							78.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	145	-20.145	32.035	62.9	Pass
							78.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	152	-17.907	32.865	54.5	Pass
							69.3 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	155	-17.920	32.865	54.5	Pass
							69.3 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	159	-19.028	32.865	57.9	Pass
							73.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	162	-18.870	32.865	57.4	Pass
							73.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	166	-19.520	32.865	59.4	Pass
							75.7 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	169	-19.517	32.865	59.4	Pass
							75.7 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	176	-16.810	33.703	49.9	Pass
							65.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	179	-16.828	33.703	49.9	Pass
							65.0 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	183	-17.953	33.703	53.3	Pass
							68.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	186	-17.752	33.703	52.7	Pass
							68.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	190	-18.846	33.703	55.9	Pass
							73.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	193	-18.842	33.703	55.9	Pass
							73.1 (b)	
T7	100 - 91.6667	Diagonal	2L3x2 1/2x1/4x3/8	203	-19.441	30.775	63.2	Pass
							75.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	206	-19.453	30.775	63.2	Pass
							75.0 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	210	-20.723	30.775	67.3	Pass
							79.4 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	213	-20.535	30.775	66.7	Pass
							79.4 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	217	-20.786	30.775	67.5	Pass
							80.3 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	220	-20.782	30.775	67.5	Pass
							80.3 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T8	91.6667 - 83.3333	Diagonal	2L3x2 1/2x1/4x3/8	230	-20.007	34.813	57.5 77.3 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	233	-20.019	34.813	57.5 77.2 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	237	-21.478	34.813	61.7 82.2 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	240	-21.255	34.813	61.1 82.2 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	244	-21.425	34.813	61.5 82.8 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	247	-21.423	34.813	61.5 82.8 (b)	Pass
T9	83.3333 - 75	Diagonal	2L3x2 1/2x1/4x3/8	257	-20.932	33.452	62.6 80.7 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	260	-20.947	33.452	62.6 80.7 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	264	-22.598	33.452	67.6 85.8 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	267	-22.236	33.452	66.5 85.9 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	271	-22.462	33.452	67.1 86.7 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	274	-22.461	33.452	67.1 86.7 (b)	Pass
T10	75 - 50	Diagonal	2L3 1/2x3 1/2x5/16x3/8	284	-28.407	51.371	55.3 87.7 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	287	-28.423	51.371	55.3 87.6 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	291	-30.824	51.371	60.0 93.3 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	294	-30.202	51.371	58.8 93.3 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	298	-30.319	51.371	59.0 93.6 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	301	-30.315	51.371	59.0 93.7 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	308	-27.430	52.611	52.1 84.8 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	311	-27.446	52.611	52.2 84.7 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	315	-29.712	52.611	56.5 90.2 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	318	-29.161	52.611	55.4 90.2 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	322	-29.361	52.611	55.8 90.8 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	325	-29.358	52.611	55.8 90.8 (b)	Pass
T11	50 - 37.5	Diagonal	2L3 1/2x3x5/16x3/8	335	-28.798	49.786	57.8 68.9 (b)	Pass
		Diagonal	2L3 1/2x3x5/16x3/8	338	-28.814	49.786	57.9 68.9 (b)	Pass
		Diagonal	2L3 1/2x3x5/16x3/8	342	-31.264	49.786	62.8 73.4 (b)	Pass
		Diagonal	2L3 1/2x3x5/16x3/8	345	-30.612	49.786	61.5 73.4 (b)	Pass
		Diagonal	2L3 1/2x3x5/16x3/8	349	-30.660	49.786	61.6 73.5 (b)	Pass
		Diagonal	2L3 1/2x3x5/16x3/8	352	-30.655	49.786	61.6 73.5 (b)	Pass
T12	37.5 - 25	Diagonal	2L3 1/2x3 1/2x5/16x3/8	364	-29.689	47.602	62.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							62.9 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	367	-29.705	47.602	62.4	Pass
							62.9 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	370	-32.318	47.602	67.9	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	373	-31.622	47.602	66.4	Pass
							67.1 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	376	-31.613	47.602	66.4	Pass
							67.1 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	379	-31.610	47.602	66.4	Pass
							67.1 (b)	
T13	25 - 12.5	Diagonal	2L3 1/2x3 1/2x5/16x3/8	389	-30.047	54.945	54.7	Pass
							63.7 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	392	-30.064	54.945	54.7	Pass
							63.7 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	396	-32.973	54.945	60.0	Pass
							68.4 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	399	-32.223	54.945	58.6	Pass
							68.5 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	403	-32.170	54.945	58.5	Pass
							68.3 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	406	-32.172	54.945	58.6	Pass
							68.3 (b)	
T14	12.5 - 0	Diagonal	2L3 1/2x3 1/2x5/16x3/8	418	-30.029	52.756	56.9	Pass
							63.5 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	421	-30.047	52.756	57.0	Pass
							63.4 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	424	-32.828	52.756	62.2	Pass
							68.3 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	427	-32.260	52.756	61.1	Pass
							68.4 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	430	-32.185	52.756	61.0	Pass
							68.2 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	433	-32.188	52.756	61.0	Pass
							68.2 (b)	
T2	175 - 166.667	Horizontal	L2 1/2x2 1/2x3/16	16	-3.487	17.101	20.4	Pass
							24.0 (b)	
		Horizontal	L2 1/2x2 1/2x3/16	19	-4.029	17.101	23.6	Pass
							28.1 (b)	
		Horizontal	L2 1/2x2 1/2x3/16	22	-3.829	17.101	22.4	Pass
							26.4 (b)	
T5	150 - 125	Horizontal	L3x2 1/2x1/4	52	-10.171	17.668	57.6	Pass
		Horizontal	L3x2 1/2x1/4	59	-11.349	17.668	64.2	Pass
		Horizontal	L3x2 1/2x1/4	66	-11.576	17.668	65.5	Pass
		Horizontal	L3x2 1/2x1/4	76	-7.997	19.156	41.7	Pass
		Horizontal	L3x2 1/2x1/4	83	-9.053	19.156	47.3	Pass
		Horizontal	L3x2 1/2x1/4	90	-9.351	19.156	48.8	Pass
		Horizontal	L3x2 1/2x1/4	100	-6.375	20.840	30.6	Pass
		Horizontal	L3x2 1/2x1/4	107	-7.305	20.840	35.1	Pass
		Horizontal	L3x2 1/2x1/4	114	-7.659	20.840	36.7	Pass
							37.1 (b)	
T6	125 - 100	Horizontal	L3x3x5/16	127	-13.003	22.924	56.7	Pass
		Horizontal	L3x3x5/16	134	-13.885	22.924	60.6	Pass
		Horizontal	L3x3x5/16	141	-13.977	22.924	61.0	Pass
		Horizontal	L3x3x5/16	151	-12.042	24.603	48.9	Pass
		Horizontal	L3x3x5/16	158	-12.911	24.603	52.5	Pass
		Horizontal	L3x3x5/16	165	-13.335	24.603	54.2	Pass
		Horizontal	L3x3x5/16	175	-11.128	26.472	42.0	Pass
							43.6 (b)	
		Horizontal	L3x3x5/16	182	-12.094	26.472	45.7	Pass
							46.5 (b)	
		Horizontal	L3x3x5/16	189	-12.576	26.472	47.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							49.2 (b)	
T7	100 - 91.6667	Horizontal	2L3x3x1/4	202	-13.678	68.122	20.1	Pass
							33.6 (b)	
		Horizontal	2L3x3x1/4	209	-14.648	68.122	21.5	Pass
							35.6 (b)	
		Horizontal	2L3x3x1/4	216	-14.704	68.122	21.6	Pass
							36.1 (b)	
T8	91.6667 - 83.3333	Horizontal	2L3x3x1/4	229	-14.338	65.133	22.0	Pass
							35.3 (b)	
		Horizontal	2L3x3x1/4	236	-15.436	65.133	23.7	Pass
							37.6 (b)	
		Horizontal	2L3x3x1/4	243	-15.419	65.133	23.7	Pass
							37.9 (b)	
T9	83.3333 - 75	Horizontal	2L3x3x1/4	256	-15.211	62.023	24.5	Pass
							37.5 (b)	
		Horizontal	2L3x3x1/4	263	-16.436	62.023	26.5	Pass
							40.0 (b)	
		Horizontal	2L3x3x1/4	270	-16.404	62.023	26.4	Pass
							40.4 (b)	
T10	75 - 50	Horizontal	L4x4x1/4	283	-17.097	29.137	58.7	Pass
							73.9 (b)	
		Horizontal	L4x4x1/4	290	-18.610	29.137	63.9	Pass
							79.0 (b)	
		Horizontal	L4x4x1/4	297	-18.354	29.137	63.0	Pass
							79.3 (b)	
		Horizontal	L4x4x1/4	307	-16.226	31.725	51.1	Pass
							70.4 (b)	
		Horizontal	L4x4x1/4	314	-17.601	31.725	55.5	Pass
							75.2 (b)	
		Horizontal	L4x4x1/4	321	-17.463	31.725	55.0	Pass
							75.7 (b)	
T11	50 - 37.5	Horizontal	L4x4x1/4	334	-17.884	26.853	66.6	Pass
							77.5 (b)	
		Horizontal	L4x4x1/4	341	-19.430	26.853	72.4	Pass
							82.8 (b)	
		Horizontal	L4x4x1/4	348	-19.156	26.853	71.3	Pass
							82.9 (b)	
T13	25 - 12.5	Horizontal	L4x4x3/8	388	-19.417	33.454	58.0	Pass
		Horizontal	L4x4x3/8	395	-21.260	33.454	63.6	Pass
		Horizontal	L4x4x3/8	402	-20.890	33.454	62.4	Pass
T1	180 - 175	Top Girt	L3x3x1/4	4	-1.387	32.261	4.3	Pass
							6.7 (b)	
		Top Girt	L3x3x1/4	5	-2.243	32.261	7.0	Pass
							10.7 (b)	
		Top Girt	L3x3x1/4	6	-2.297	32.261	7.1	Pass
							11.0 (b)	
T3	166.667 - 158.333	Top Girt	L2 1/2x2 1/2x3/16	28	-4.023	15.549	25.9	Pass
							28.2 (b)	
		Top Girt	L2 1/2x2 1/2x3/16	29	-4.178	15.549	26.9	Pass
							28.9 (b)	
		Top Girt	L2 1/2x2 1/2x3/16	30	-4.199	15.549	27.0	Pass
							29.5 (b)	
T4	158.333 - 150	Top Girt	L2 1/2x2 1/2x3/16	40	-4.565	14.163	32.2	Pass
		Top Girt	L2 1/2x2 1/2x3/16	41	-5.246	14.163	37.0	Pass
		Top Girt	L2 1/2x2 1/2x3/16	42	-5.484	14.163	38.7	Pass
T12	37.5 - 25	Top Girt	2L4x4x1/4	361	-18.839	93.171	20.2	Pass
							40.8 (b)	
		Top Girt	2L4x4x1/4	362	-20.510	93.171	22.0	Pass
							43.6 (b)	
		Top Girt	2L4x4x1/4	363	-20.165	93.171	21.6	Pass
							43.6 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T14	12.5 - 0	Top Girt	2L4x4x5/16	415	-19.997	105.319	19.0 34.7 (b)	Pass
		Top Girt	2L4x4x5/16	416	-22.094	105.319	21.0 37.5 (b)	Pass
		Top Girt	2L4x4x5/16	417	-21.559	105.319	20.5 37.4 (b)	Pass
T5	150 - 125	Redund Horz 1 Bracing	L2x2x3/16	54	-1.243	15.696	7.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	57	-1.238	15.696	7.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	61	-1.238	15.696	7.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	64	-1.245	15.696	7.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	68	-1.245	15.696	7.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	71	-1.243	15.696	7.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	78	-1.590	16.149	9.8	Pass
		Redund Horz 1 Bracing	L2x2x3/16	81	-1.593	16.149	9.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	85	-1.574	16.149	9.7	Pass
		Redund Horz 1 Bracing	L2x2x3/16	88	-1.570	16.149	9.7	Pass
		Redund Horz 1 Bracing	L2x2x3/16	92	-1.515	16.149	9.4	Pass
		Redund Horz 1 Bracing	L2x2x3/16	95	-1.517	16.149	9.4	Pass
		Redund Horz 1 Bracing	L2x2x3/16	102	-1.243	16.591	7.5	Pass
		Redund Horz 1 Bracing	L2x2x3/16	105	-1.238	16.591	7.5	Pass
		Redund Horz 1 Bracing	L2x2x3/16	109	-1.238	16.591	7.5	Pass
		Redund Horz 1 Bracing	L2x2x3/16	112	-1.245	16.591	7.5	Pass
		Redund Horz 1 Bracing	L2x2x3/16	116	-1.245	16.591	7.5	Pass
		Redund Horz 1 Bracing	L2x2x3/16	119	-1.243	16.591	7.5	Pass
T6	125 - 100	Redund Horz 1 Bracing	L2x2x3/16	129	-2.457	14.276	17.2	Pass
		Redund Horz 1 Bracing	L2x2x3/16	132	-2.450	14.276	17.2	Pass
		Redund Horz 1 Bracing	L2x2x3/16	136	-2.450	14.276	17.2	Pass
		Redund Horz 1 Bracing	L2x2x3/16	139	-2.455	14.276	17.2	Pass
		Redund Horz 1 Bracing	L2x2x3/16	143	-2.455	14.276	17.2	Pass
		Redund Horz 1 Bracing	L2x2x3/16	146	-2.457	14.276	17.2	Pass
		Redund Horz 1 Bracing	L2x2x3/16	153	-2.457	14.760	16.6	Pass
		Redund Horz 1 Bracing	L2x2x3/16	156	-2.450	14.760	16.6	Pass
		Redund Horz 1 Bracing	L2x2x3/16	160	-2.450	14.760	16.6	Pass
		Redund Horz 1	L2x2x3/16	163	-2.455	14.760	16.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Bracing Redund Horz 1	L2x2x3/16	167	-2.455	14.760	16.6	Pass
		Bracing Redund Horz 1	L2x2x3/16	170	-2.457	14.760	16.6	Pass
		Bracing Redund Horz 1	L2x2x3/16	177	-2.457	15.233	16.1	Pass
		Bracing Redund Horz 1	L2x2x3/16	180	-2.450	15.233	16.1	Pass
		Bracing Redund Horz 1	L2x2x3/16	184	-2.450	15.233	16.1	Pass
		Bracing Redund Horz 1	L2x2x3/16	187	-2.455	15.233	16.1	Pass
		Bracing Redund Horz 1	L2x2x3/16	191	-2.455	15.233	16.1	Pass
		Bracing Redund Horz 1	L2x2x3/16	194	-2.457	15.233	16.1	Pass
T7	100 - 91.6667	Bracing Redund Horz 1	L2x2x3/16	204	-2.888	13.476	21.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	207	-2.881	13.476	21.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	211	-2.881	13.476	21.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	214	-2.886	13.476	21.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	218	-2.886	13.476	21.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	221	-2.888	13.476	21.4	Pass
T8	91.6667 - 83.3333	Bracing Redund Horz 1	L2x2x3/16	231	-3.330	12.457	26.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	234	-3.322	12.457	26.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	238	-3.322	12.457	26.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	241	-3.328	12.457	26.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	245	-3.328	12.457	26.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	248	-3.330	12.457	26.7	Pass
T9	83.3333 - 75	Bracing Redund Horz 1	L2x2x3/16	258	-3.774	11.526	32.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	261	-3.765	11.526	32.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	265	-3.765	11.526	32.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	268	-3.773	11.526	32.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	272	-3.773	11.526	32.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	275	-3.774	11.526	32.7	Pass
T10	75 - 50	Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	285	-4.892	18.463	26.5	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	288	-4.884	18.463	26.5	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	292	-4.884	18.463	26.5	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	295	-4.890	18.463	26.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	299	-4.890	18.463	26.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	302	-4.892	18.463	26.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	309	-4.892	19.178	25.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	312	-4.884	19.178	25.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	316	-4.884	19.178	25.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	319	-4.890	19.178	25.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	323	-4.890	19.178	25.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	326	-4.892	19.178	25.5	Pass
T11	50 - 37.5	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	336	-5.599	17.688	31.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	339	-5.590	17.688	31.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	343	-5.590	17.688	31.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	346	-5.597	17.688	31.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	350	-5.597	17.688	31.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	353	-5.599	17.688	31.7	Pass
T12	37.5 - 25	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	365	-6.302	16.162	39.0	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	368	-6.293	16.162	38.9	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	371	-6.293	16.162	38.9	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	374	-6.301	16.162	39.0	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	377	-6.301	16.162	39.0	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	380	-6.302	16.162	39.0	Pass
T13	25 - 12.5	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	390	-7.012	14.717	47.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	393	-7.003	14.717	47.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	397	-7.003	14.717	47.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	400	-7.013	14.717	47.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	404	-7.013	14.717	47.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	407	-7.012	14.717	47.6	Pass
T14	12.5 - 0	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	419	-7.742	13.457	57.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	422	-7.733	13.457	57.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	425	-7.733	13.457	57.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	428	-7.743	13.457	57.5	Pass
		Redund Horz 1	L2 1/2x2 1/2x3/16	431	-7.743	13.457	57.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Bracing						
		Redund Horz 1	L2 1/2x2 1/2x3/16	434	-7.742	13.457	57.5	Pass
		Bracing						
T5	150 - 125	Redund Diag 1	L2x2x3/16	55	-0.935	8.614	10.8	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	58	-0.931	8.614	10.8	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	62	-0.931	8.614	10.8	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	65	-0.936	8.614	10.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	69	-0.936	8.614	10.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	72	-0.935	8.614	10.8	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	79	-1.253	8.980	13.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	82	-1.251	8.980	13.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	86	-1.235	8.980	13.7	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	89	-1.238	8.980	13.8	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	93	-1.195	8.980	13.3	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	96	-1.194	8.980	13.3	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	103	-0.991	9.356	10.6	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	106	-0.988	9.356	10.6	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	110	-0.988	9.356	10.6	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	113	-0.993	9.356	10.6	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	117	-0.993	9.356	10.6	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	120	-0.991	9.356	10.6	Pass
		Bracing						
T6	125 - 100	Redund Diag 1	L2x2x3/16	130	-1.720	7.523	22.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	133	-1.716	7.523	22.8	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	137	-1.716	7.523	22.8	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	140	-1.719	7.523	22.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	144	-1.719	7.523	22.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	147	-1.720	7.523	22.9	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	154	-1.758	7.847	22.4	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	157	-1.753	7.847	22.3	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	161	-1.753	7.847	22.3	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	164	-1.757	7.847	22.4	Pass
		Bracing						
		Redund Diag 1	L2x2x3/16	168	-1.757	7.847	22.4	Pass
		Bracing						

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Redund Diag 1 Bracing	L2x2x3/16	171	-1.758	7.847	22.4	Pass
		Redund Diag 1 Bracing	L2x2x3/16	178	-1.800	8.183	22.0	Pass
		Redund Diag 1 Bracing	L2x2x3/16	181	-1.795	8.183	21.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	185	-1.795	8.183	21.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	188	-1.799	8.183	22.0	Pass
		Redund Diag 1 Bracing	L2x2x3/16	192	-1.799	8.183	22.0	Pass
		Redund Diag 1 Bracing	L2x2x3/16	195	-1.800	8.183	22.0	Pass
T7	100 - 91.6667	Redund Diag 1 Bracing	L2x2x3/16	205	-1.982	7.196	27.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	208	-1.978	7.196	27.5	Pass
		Redund Diag 1 Bracing	L2x2x3/16	212	-1.978	7.196	27.5	Pass
		Redund Diag 1 Bracing	L2x2x3/16	215	-1.981	7.196	27.5	Pass
		Redund Diag 1 Bracing	L2x2x3/16	219	-1.981	7.196	27.5	Pass
		Redund Diag 1 Bracing	L2x2x3/16	222	-1.982	7.196	27.6	Pass
T8	91.6667 - 83.3333	Redund Diag 1 Bracing	L2x2x3/16	232	-2.244	6.885	32.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	235	-2.239	6.885	32.5	Pass
		Redund Diag 1 Bracing	L2x2x3/16	239	-2.239	6.885	32.5	Pass
		Redund Diag 1 Bracing	L2x2x3/16	242	-2.243	6.885	32.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	246	-2.243	6.885	32.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	249	-2.244	6.885	32.6	Pass
T9	83.3333 - 75	Redund Diag 1 Bracing	L2x2x3/16	259	-2.500	6.589	37.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	262	-2.494	6.589	37.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	266	-2.494	6.589	37.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	269	-2.499	6.589	37.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	273	-2.499	6.589	37.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	276	-2.500	6.589	37.9	Pass
T10	75 - 50	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	286	-3.841	8.070	47.6	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	289	-3.834	8.070	47.5	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	293	-3.834	8.070	47.5	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	296	-3.840	8.070	47.6	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	300	-3.840	8.070	47.6	Pass
		Redund Diag 1	L2 1/2x2 1/2x3/16	303	-3.841	8.070	47.6	Pass

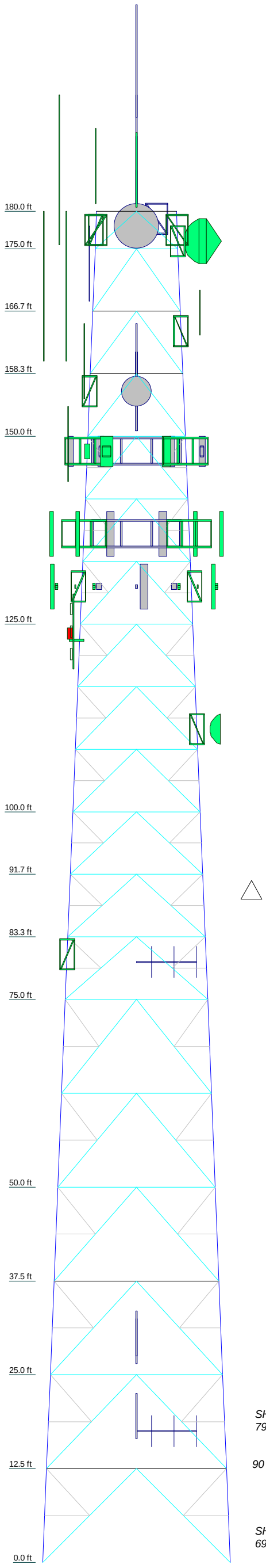
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Bracing						
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	310	-3.967	8.405	47.2	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	313	-3.960	8.405	47.1	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	317	-3.960	8.405	47.1	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	320	-3.965	8.405	47.2	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	324	-3.965	8.405	47.2	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	327	-3.967	8.405	47.2	Pass
T11	50 - 37.5	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	337	-4.269	7.713	55.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	340	-4.262	7.713	55.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	344	-4.262	7.713	55.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	347	-4.267	7.713	55.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	351	-4.267	7.713	55.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	354	-4.269	7.713	55.3	Pass
T12	37.5 - 25	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	366	-4.677	7.374	63.4	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	369	-4.670	7.374	63.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	372	-4.670	7.374	63.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	375	-4.676	7.374	63.4	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	378	-4.676	7.374	63.4	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	381	-4.677	7.374	63.4	Pass
T13	25 - 12.5	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	391	-5.077	7.051	72.0	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	394	-5.071	7.051	71.9	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	398	-5.071	7.051	71.9	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	401	-5.078	7.051	72.0	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	405	-5.078	7.051	72.0	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	408	-5.077	7.051	72.0	Pass
T14	12.5 - 0	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	420	-5.480	6.744	81.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	423	-5.474	6.744	81.2	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	426	-5.474	6.744	81.2	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	429	-5.481	6.744	81.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	432	-5.481	6.744	81.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	435	-5.480	6.744	81.3	Pass
		Bracing						

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	150 - 125	Inner Bracing	L2 1/2x2x3/16	73	-0.009	5.708	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	74	-0.009	5.708	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	75	-0.009	5.708	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	97	-0.008	6.279	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	98	-0.008	6.279	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	99	-0.008	6.279	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	121	-0.008	6.939	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	122	-0.008	6.939	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	123	-0.008	6.939	0.4	Pass
T6	125 - 100	Inner Bracing	L2 1/2x2x3/16	148	-0.012	4.396	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	149	-0.012	4.396	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	150	-0.012	4.396	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	172	-0.012	4.778	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	173	-0.012	4.778	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	174	-0.012	4.778	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	196	-0.012	5.212	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	197	-0.012	5.212	0.4	Pass
		Inner Bracing	L2 1/2x2x3/16	198	-0.012	5.212	0.4	Pass
T7	100 - 91.6667	Inner Bracing	L2 1/2x2x3/16	223	-0.019	4.058	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	224	-0.019	4.058	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	225	-0.019	4.058	0.5	Pass
T8	91.6667 - 83.3333	Inner Bracing	L2 1/2x2x3/16	250	-0.019	3.757	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	251	-0.019	3.757	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	252	-0.019	3.757	0.5	Pass
T9	83.3333 - 75	Inner Bracing	L2 1/2x2x3/16	277	-0.018	3.489	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	278	-0.018	3.489	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	279	-0.018	3.489	0.5	Pass
T10	75 - 50	Inner Bracing	L2 1/2x2 1/2x3/16	304	-0.019	4.393	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	305	-0.019	4.393	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	306	-0.019	4.393	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	328	-0.020	4.867	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	329	-0.020	4.867	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	330	-0.020	4.867	0.6	Pass
T11	50 - 37.5	Inner Bracing	L2 1/2x2 1/2x3/16	355	-0.019	3.985	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	356	-0.019	3.985	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	357	-0.019	3.985	0.6	Pass
T12	37.5 - 25	Inner Bracing	L2 1/2x2 1/2x3/16	382	-0.028	3.631	0.8	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	383	-0.028	3.631	0.8	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	384	-0.028	3.631	0.8	Pass
T13	25 - 12.5	Inner Bracing	L3x3x1/4	409	-0.018	7.585	0.5	Pass
		Inner Bracing	L3x3x1/4	410	-0.018	7.585	0.5	Pass
		Inner Bracing	L3x3x1/4	411	-0.018	7.585	0.5	Pass
T14	12.5 - 0	Inner Bracing	L3x3x1/4	436	-0.028	6.966	0.5	Pass
		Inner Bracing	L3x3x1/4	437	-0.028	6.966	0.5	Pass
		Inner Bracing	L3x3x1/4	438	-0.028	6.966	0.5	Pass
							Summary	
						Leg (T14)	91.0	Pass
						Diagonal (T10)	93.7	Pass
						Horizontal (T11)	82.9	Pass
						Top Girt (T12)	43.6	Pass
						Redund Horz 1 Bracing (T14)	57.5	Pass
						Redund Diag 1 Bracing	81.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						(T14) Inner Bracing (T12)	0.8	Pass
						Bolt Checks	93.7	Pass
						RATING =	**93.7**	**Pass**

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Section														
Legs		Stainless P5x0.250			Stainless P5x0.300					Stainless P6.875x0.400				
Leg Grade					A513-50							A572-60		
Diagonals			2L2 1/2x2x3/16x3/8		2L2 1/2x2x5/16x3/8		2L3x2 1/2x1/4x3/8			2L3 1/2x3 1/2x5/16x3/8			2L3 1/2x3 1/2x5/16x3/8	
Diagonal Grade						A36							A529-50	
Top Girts	L3x3x1/4	N.A.	L2 1/2x2 1/2x3/16				N.A.						N.A.	2L4x4x5/16
Horizontals	N.A.	B	N.A.		L3x2 1/2x1/4		L3x3x5/16	2L3x3x1/4		L4x4x1/4			L4x4x3/8	N.A.
Red. Horizontals			N.A.				L2x2x3/16					L2 1/2x2 1/2x3/16		
Red. Diagonals			N.A.				L2x2x3/16					L2 1/2x2 1/2x3/16		
Inner Bracing			N.A.				L2 1/2x2 1/2x3/16			L2 1/2x2 1/2x3/16			L3x3x1/4	
Face Width (ft)	10.599	11	11.6667	12.3333	13									
# Panels @ (ft)	1 @ 5				12 @ 8.33333									
Weight (K)	0.6	0.8	0.8	0.8	4.0	4.8	2.0	2.2	2.2	6.3	3.4	4.0	3.9	4.4

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Section														
Legs		Stainless P5x0.250			Stainless P5x0.300					Stainless P6.875x0.400				
Leg Grade					A513-50							A572-60		
Diagonals			2L2 1/2x2x3/16x3/8		2L2 1/2x2x5/16x3/8		2L3x2 1/2x1/4x3/8			2L3 1/2x3 1/2x5/16x3/8			2L3 1/2x3 1/2x5/16x3/8	
Diagonal Grade						A36							A529-50	
Top Girts	L3x3x1/4	N.A.	L2 1/2x2 1/2x3/16				N.A.						N.A.	2L4x4x5/16
Horizontals	N.A.	B	N.A.		L3x2 1/2x1/4		L3x3x5/16	2L3x3x1/4		L4x4x1/4			L4x4x3/8	N.A.
Red. Horizontals			N.A.				L2x2x3/16					L2 1/2x2 1/2x3/16		
Red. Diagonals			N.A.				L2x2x3/16					L2 1/2x2 1/2x3/16		
Inner Bracing			N.A.				L2 1/2x2 1/2x3/16			L2 1/2x2 1/2x3/16			L3x3x1/4	
Face Width (ft)	10.599	11	11.6667	12.3333	13									
# Panels @ (ft)	1 @ 5				12 @ 8.33333									
Weight (K)	0.6	0.8	0.8	0.8	4.0	4.8	2.0	2.2	2.2	6.3	3.4	4.0	3.9	4.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x15' (DNK-56 (L.R.))	200	8843 B2/B66A (ATI - Proposed)	148
2" Dia 10' Omni (DNK-52 (St# 10))	186	8843 B2/B66A (ATI - Proposed)	148
3" Dia 20' Omni (DNK-59 (St# 13))	185.5	RVZDC-6627-PF-48 (ATI - Proposed)	148
3" Dia 12' Omni (DNK-48 (St# 8))	185.5	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
3" Dia 20' Omni (DNK-57 (St# 6))	185.5	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
2" Dia 10' Omni (DNK-53 (St# 3))	185	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
10' - 2 Bay Dipole (DNK-54 (St# 2))	185	APXVTM14-C-120 Panel Antenna (Sprint)	137
1" Dia 8' Omni (DNK-58 (St# 5))	182.5	APXVTM14-C-120 Panel Antenna (Sprint)	137
1 Bay Dipole ANT400D (DNK-51 (St# 11))	181	APXVTM14-C-120 Panel Antenna (Sprint)	137
20' 4-Bay Dipole (DNK-55 (St# 1))	181	NNVV-65B-R4 Panel Antenna (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	NNVV-65B-R4 Panel Antenna (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	NNVV-65B-R4 Panel Antenna (Sprint)	137
11"x8"x12" Junction Box ((St# 16))	178	ALU TD-RRH-8x20-25 (Sprint)	137
6' w/Radome (DNK-45 (St# 17))	178	ALU TD-RRH-8x20-25 (Sprint)	137
Pirod 6' Side Mount Standoff (1) (DNK-38,39 (St# 13,14,15,16))	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
		(2) ALU 800MHz 2x50W (Sprint)	137
432E-83I-01T TTA Unit (DNK-47 (St# 9))	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
1' Side Arm (DNK-44 (St# 18))	176	(2) TMA 10"x8"x5" (T-Mobile)	130
1' Side Arm (DNK-45 (St# 17))	176	(2) TMA 10"x8"x5" (T-Mobile)	130
6' w/Radome (DNK-44 (St# 18))	176	(2) TMA 10"x8"x5" (T-Mobile)	130
(inverted) 2" Dia 10' Omni (DNK-42 (St# 4))	173	(2) CBC1923Q-43 Diplexer (T-Mobile)	130
(Inverted) 3" Dia 20' Omni (DNK-38 (St# 15))	170	(2) CBC1923Q-43 Diplexer (T-Mobile)	130
(Inverted) 3" Dia 20' Omni (DNK-39 (St# 14))	170	(2) CBC1923Q-43 Diplexer (T-Mobile)	130
(inverted) 10' 8 Bay Di-Pole (DNK-41 (St# 12))	170	ATSBT-TOP-FM-4G (T-Mobile)	130
(inverted) 10' 8 Bay Di-Pole (DNK-40 (St# 7))	170	ATSBT-TOP-FM-4G (T-Mobile)	130
Telewave 150F2 Omni ((St # 20))	166.5	ATSBT-TOP-FM-4G (T-Mobile)	130
Pirod 4' Side Mount Standoff (1) ((St # 20))	164	DBXNH-6565B (T-Mobile)	130
Telewave ANT220F2 - Omni Antenna (Eversource)	162	DBXNH-6565B (T-Mobile)	130
ANT450F6 (DNK-35 (St# 21))	161	DBXNH-6565B (T-Mobile)	130
3" Dia 9' Omni (DNK-33 (St# 24))	160	2' Sidearm (T-Mobile)	130
Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource)	159	2' Sidearm (T-Mobile)	130
		2' Sidearm (T-Mobile)	130
2' Sidearm (DNK-35 (St# 21))	157	1' Side Arm (DNK-9 (St# 45))	125
1' Side Arm (DNK-37 (St# 23))	156	Decibel DB210-C Dipole (Single) (DNK-9 (St# 45))	125
Pirod 4' Side Mount Standoff (1) (DNK-32, 33 (St# 24,25))	156	Comprod 871F-70 Dipole (Eversource)	124
		19.5"x19.5" Panel Antenna (DNK-10 (St# 46))	123
10'6"x4" Pipe Mount (DNK-34 (St# 22))	156	1' Side Arm (DNK-10 (St# 46))	123
4' Paraflector [PRF-950] (DNK-37 (St# 23))	156	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource)	121
1 Bay Dipole ANT400D (DNK-34 (St# 22))	151		
2" Dia 14' Omni (inverted) (DNK-32 (St# 25))	149	2' Sidearm (DNK-8 (St# 47))	111
13-ft Sector Frame (ATI - Existing)	148	4' Paraflector [PRF-950] (DNK-8 (St# 47))	111
13-ft Sector Frame (ATI - Existing)	148	1' Side Arm (Un-used Mount)	102
13-ft Sector Frame (ATI - Existing)	148	20' 4-Bay Dipole (DNK-7 (St# 48))	89.5
DMP65R-BU4D (ATI - Proposed)	148	1' Side Arm (DNK-6,7 (St# 48,49))	82.5
840-370964 (ATI - Proposed)	148	3' Yagi (DNK-6 (St# 49))	81
DMP65R-BU4D (ATI - Proposed)	148	1' Side Arm (DNK-5 (St# 50))	81
840-370964 (ATI - Proposed)	148	GPS (DNK-5 (St# 50))	81
DMP65R-BU4D (ATI - Proposed)	148	1.5" Dia 3' Omni (DNK-4 (St# 51))	34 - 27
840-370964 (ATI - Proposed)	148	1.5" Dia 3' Omni (inverted) (DNK-3 (St# 52))	29.5
4449 B5/B12 (ATI - Proposed)	148	4' Side Mount Standoff (1) (DNK-3,4 (St# 51,52))	26
4449 B5/B12 (ATI - Proposed)	148	1.5" Dia 3' Omni (DNK-2 (St# 53))	19.5
4449 B5/B12 (ATI - Proposed)	148	4' Side Mount Standoff (1) (DNK 1,2 (St# 53,54))	18
8843 B2/B66A (ATI - Proposed)	148	3' Yagi (DNK-1 (St# 54))	17.5

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Stainless P5x0.500	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

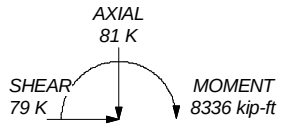
GRADE	Fy	Fu	GRADE	Fy	Fu
A513-50	50 ksi	66 ksi	A572-60	60 ksi	75 ksi
A36	36 ksi	58 ksi	A529-50	50 ksi	65 ksi
A500-42	42 ksi	58 ksi			

TOWER DESIGN NOTES

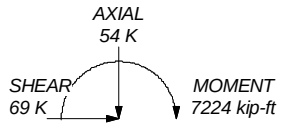
1. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.

MAX. CORNER REACTIONS AT BASE:
DOWN: 412 K
SHEAR: 46 K

UPLIFT: -349 K
SHEAR: 40 K



TORQUE 71 kip-ft
90 mph WIND - 0.500 in ICE



TORQUE 46 kip-ft
REACTIONS - 95 mph WIND

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

Job:	***21082.01 - CT2047***		
Project:	***180-ft Lattice Tower (CSP #36)***		
Client: AT&T		Drawn by: TJL	App'd:
Code: TIA/EIA-222-F		Date: 07/21/21	Scale: NTS
Path: J:\Jobs\21082\00.WI\01_CT2047 CSP #36 Westbrook\05_Structural\Calculations\Twist and Sway\180-ft Lattice Tower CSP #36.eri			Dwg No. E-1

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice
19	Dead+Wind 0 deg+Ice
20	Dead+Wind 30 deg+Ice
21	Dead+Wind 45 deg+Ice
22	Dead+Wind 60 deg+Ice
23	Dead+Wind 90 deg+Ice
24	Dead+Wind 120 deg+Ice
25	Dead+Wind 135 deg+Ice
26	Dead+Wind 150 deg+Ice
27	Dead+Wind 180 deg+Ice
28	Dead+Wind 210 deg+Ice
29	Dead+Wind 225 deg+Ice
30	Dead+Wind 240 deg+Ice
31	Dead+Wind 270 deg+Ice
32	Dead+Wind 300 deg+Ice
33	Dead+Wind 315 deg+Ice
34	Dead+Wind 330 deg+Ice
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	11.143	46	0.4602	0.0721
T2	175 - 166.667	10.658	46	0.4600	0.0694
T3	166.667 - 158.333	9.831	46	0.4592	0.0672
T4	158.333 - 150	9.008	46	0.4547	0.0654
T5	150 - 125	8.193	46	0.4465	0.0589
T6	125 - 100	5.868	46	0.4028	0.0435
T7	100 - 91.6667	3.836	46	0.3338	0.0313
T8	91.6667 - 83.3333	3.249	46	0.3090	0.0283
T9	83.3333 - 75	2.698	46	0.2877	0.0253
T10	75 - 50	2.185	46	0.2645	0.0221
T11	50 - 37.5	1.000	35	0.1768	0.0140
T12	37.5 - 25	0.564	35	0.1367	0.0098
T13	25 - 12.5	0.257	35	0.0936	0.0067
T14	12.5 - 0	0.062	40	0.0481	0.0031

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	46	11.143	0.4602	0.0721	32698
186.000	2" Dia 10' Omni	46	11.143	0.4602	0.0721	32698
185.500	3" Dia 20' Omni	46	11.143	0.4602	0.0721	32698
185.000	2" Dia 10' Omni	46	11.143	0.4602	0.0721	32698
182.500	1" Dia 8' Omni	46	11.143	0.4602	0.0721	32698
181.000	1 Bay Dipole ANT400D	46	11.143	0.4602	0.0721	32698
179.000	6' Side-Arm(1)	46	11.047	0.4602	0.0715	32698
178.000	6' w/Radome	46	10.950	0.4601	0.0710	32698
177.500	Pirod 6' Side Mount Standoff (1)	46	10.901	0.4601	0.0707	32698
176.000	6' w/Radome	46	10.755	0.4601	0.0699	32698
173.000	(inverted) 2" Dia 10' Omni	46	10.461	0.4600	0.0687	37820
170.000	(Inverted) 3" Dia 20' Omni	46	10.163	0.4598	0.0678	132089
166.500	Telewave 150F2 Omni	46	9.814	0.4592	0.0672	93624
164.000	Pirod 4' Side Mount Standoff (1)	46	9.566	0.4582	0.0669	77794
162.000	Telewave ANT220F2 - Omni Antenna	46	9.369	0.4572	0.0666	91841
161.000	ANT450F6	46	9.270	0.4566	0.0664	102724
160.000	3" Dia 9' Omni	46	9.172	0.4560	0.0661	112754
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	46	9.073	0.4553	0.0657	118808
157.000	2' Sidearm	46	8.877	0.4537	0.0646	109082
156.000	4' Paraflector [PRF-950]	46	8.779	0.4528	0.0639	97169
151.000	1 Bay Dipole ANT400D	46	8.290	0.4476	0.0598	53878
149.000	2" Dia 14' Omni (inverted)	46	8.097	0.4453	0.0581	47460
148.000	13-ft Sector Frame	46	8.000	0.4440	0.0573	45394
137.000	Pirod 12' PCS T-Frame (1) 104569	46	6.957	0.4273	0.0499	33768
130.000	2' Sidearm	46	6.315	0.4138	0.0461	29149
125.000	Decibel DB210-C Dipole (Single)	46	5.868	0.4028	0.0435	26358
124.000	Comprod 871F-70 Dipole	46	5.780	0.4004	0.0430	25765
123.000	19.5"x19.5" Panel Antenna	46	5.693	0.3980	0.0425	25165
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	46	5.519	0.3931	0.0414	23985
111.000	4' Paraflector [PRF-950]	46	4.683	0.3664	0.0363	19322
102.000	1' Side Arm	46	3.984	0.3399	0.0321	16636
89.500	20' 4-Bay Dipole	46	3.103	0.3032	0.0276	25694
82.500	1' Side Arm	46	2.645	0.2855	0.0250	21973
81.000	GPS	46	2.550	0.2816	0.0244	19248

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
34.000	1.5" Dia 3' Omni	35	0.466	0.1251	0.0089	14099
30.500	1.5" Dia 3' Omni	35	0.378	0.1130	0.0080	16338
29.500	1.5" Dia 3' Omni (inverted)	35	0.354	0.1095	0.0078	17124
27.000	1.5" Dia 3' Omni	35	0.299	0.1007	0.0072	19022
26.000	4' Side Mount Standoff (1)	35	0.278	0.0972	0.0069	19448
19.500	1.5" Dia 3' Omni	35	0.155	0.0738	0.0051	14862
18.000	4' Side Mount Standoff (1)	40	0.132	0.0684	0.0047	13668
17.500	3' Yagi	40	0.124	0.0666	0.0045	13312

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	14.384	19	0.5960	0.1250
T2	175 - 166.667	13.755	19	0.5957	0.1215
T3	166.667 - 158.333	12.684	19	0.5947	0.1177
T4	158.333 - 150	11.619	19	0.5888	0.1144
T5	150 - 125	10.563	19	0.5780	0.1022
T6	125 - 100	7.558	19	0.5200	0.0734
T7	100 - 91.6667	4.938	19	0.4305	0.0520
T8	91.6667 - 83.3333	4.181	19	0.3984	0.0470
T9	83.3333 - 75	3.471	19	0.3709	0.0420
T10	75 - 50	2.810	19	0.3409	0.0368
T11	50 - 37.5	1.284	19	0.2277	0.0233
T12	37.5 - 25	0.724	19	0.1760	0.0165
T13	25 - 12.5	0.329	19	0.1205	0.0112
T14	12.5 - 0	0.079	24	0.0619	0.0052

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	19	14.384	0.5960	0.1250	26434
186.000	2" Dia 10' Omni	19	14.384	0.5960	0.1250	26434
185.500	3" Dia 20' Omni	19	14.384	0.5960	0.1250	26434
185.000	2" Dia 10' Omni	19	14.384	0.5960	0.1250	26434
182.500	1" Dia 8' Omni	19	14.384	0.5960	0.1250	26434
181.000	1 Bay Dipole ANT400D	19	14.384	0.5960	0.1250	26434
179.000	6' Side-Arm(1)	19	14.259	0.5960	0.1242	26434
178.000	6' w/Radome	19	14.133	0.5959	0.1235	26434
177.500	Pirod 6' Side Mount Standoff (1)	19	14.070	0.5959	0.1231	26434
176.000	6' w/Radome	19	13.881	0.5958	0.1221	26434
173.000	(inverted) 2" Dia 10' Omni	19	13.499	0.5956	0.1203	30899
170.000	(Inverted) 3" Dia 20' Omni	19	13.113	0.5954	0.1188	118896
166.500	Telewave 150F2 Omni	19	12.663	0.5946	0.1177	70666
164.000	Pirod 4' Side Mount Standoff (1)	19	12.342	0.5934	0.1171	63284
162.000	Telewave ANT220F2 - Omni Antenna	19	12.086	0.5920	0.1166	82523
161.000	ANT450F6	19	11.959	0.5912	0.1162	92360
160.000	3" Dia 9' Omni	19	11.831	0.5904	0.1156	101441

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	19	11.704	0.5894	0.1149	106940
157.000	2' Sidearm	19	11.449	0.5874	0.1129	98210
156.000	4' Paraflector [PRF-950]	19	11.322	0.5862	0.1117	87453
151.000	1 Bay Dipole ANT400D	19	10.689	0.5795	0.1038	38351
149.000	2" Dia 14' Omni (inverted)	19	10.437	0.5764	0.1006	33112
148.000	13-ft Sector Frame	19	10.312	0.5747	0.0991	31655
137.000	Pirod 12' PCS T-Frame (1) 104569	19	8.963	0.5524	0.0852	24899
130.000	2' Sidearm	19	8.134	0.5345	0.0781	22054
125.000	Decibel DB210-C Dipole (Single)	19	7.558	0.5200	0.0734	20207
124.000	Comprod 871F-70 Dipole	19	7.445	0.5169	0.0725	19784
123.000	19.5"x19.5" Panel Antenna	19	7.332	0.5138	0.0715	19347
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	19	7.108	0.5074	0.0696	18469
111.000	4' Paraflector [PRF-950]	19	6.030	0.4726	0.0605	14950
102.000	1' Side Arm	19	5.128	0.4384	0.0533	12908
89.500	20' 4-Bay Dipole	19	3.992	0.3910	0.0457	19788
82.500	1' Side Arm	19	3.402	0.3681	0.0415	16939
81.000	GPS	19	3.279	0.3630	0.0405	14848
34.000	1.5" Dia 3' Omni	19	0.597	0.1610	0.0149	10954
30.500	1.5" Dia 3' Omni	19	0.484	0.1455	0.0135	12686
29.500	1.5" Dia 3' Omni (inverted)	19	0.454	0.1410	0.0131	13294
27.000	1.5" Dia 3' Omni	19	0.383	0.1296	0.0121	14762
26.000	4' Side Mount Standoff (1)	19	0.356	0.1251	0.0117	15092
19.500	1.5" Dia 3' Omni	19	0.199	0.0950	0.0086	11544
18.000	4' Side Mount Standoff (1)	24	0.168	0.0880	0.0079	10619
17.500	3' Yagi	24	0.159	0.0857	0.0077	10343

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Subject:	Anchor Bolt Analysis
Location:	180-ft Lattice Tower Westbrook, CT
Rev. 0: 7/21/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21082.01

Anchor Bolt Analysis:

Input Data:

Tower Reactions:

Tension Force =	Tension := 424·kips	(Input From tnxTower)
Compression Force =	Compression := 489·kips	(Input From tnxTower)
Shear Force =	Shear := 57·kips	(Input From tnxTower)

Anchor Bolt Data:

ASTM 36		(Assumed Conservative Grade)
Number of Anchor Bolts =	N := 9	(User Input)
Bolt Ultimate Strength =	F_u := 58·ksi	(User Input)
Bolt Yield Strength =	F_y := 36·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Anchor Bolts =	D := 1.75·in	(User Input)
Threads per Inch =	n := 5	(User Input)
Length from Top of Pier to Bottom of Leveling Nut =	L_{ar} := 0·in	(User Input)

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 2.405 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 1.899 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 1.555 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.389 \cdot in$

Elastic Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.369 \cdot in^3$

Plastic Section Modulus of Bolt = $Z_x := \frac{D_n^3}{6} = 0.627 \cdot in^3$

Anchor Bolt Design Strength:

Resistance Factor for Flexure = $\phi_f := 0.9$

Resistance Factor for Compression = $\phi_c := 0.9$

Resistance Factor for Tension = $\phi_t := 0.75$

Resistance Factor for Shear = $\phi_v := 0.75$

Design Tensile Strength = $\Phi R_{nt} := \phi_t \cdot F_u \cdot A_n = 82.6 \cdot k$

Design Compression Strength = $\Phi R_{nc} := \phi_c \cdot F_y \cdot A_g = 77.9 \cdot k$

Design Shear Strength (Tension) = $\Phi R_{nv} := \phi_v \cdot 0.5 F_u \cdot A_g = 52.3 \cdot k$

Design Shear Strength (Compression) = $\Phi R_{nvc} := \phi_c \cdot 0.6 F_y \cdot A_g \cdot 0.75 = 35.1 \cdot k$

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Subject:	Anchor Bolt Analysis
Location:	180-ft Lattice Tower Westbrook, CT
Rev. 0: 7/21/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21082.01

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $P_{ut} := \frac{Tension}{N} = 47.1 \cdot kips$

Maximum Compressive Force = $P_{uc} := \frac{Compression}{N} = 54.3 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 6.3 \cdot kips$

Condition1 = $Condition1 := if\left[\left[\left(\frac{P_{ut}}{\Phi R_{nt}}\right)^2 + \left(\frac{V_u}{\Phi R_{nv}}\right)^2\right] \le 1.00, "OK", "Overstressed"\right]$

Condition1 = "OK"

Condition2 = $Condition2 := if\left[\left[\left(\frac{P_{uc}}{\Phi R_{nc}}\right) + \left(\frac{V_u}{\Phi R_{nvc}}\right)^2\right] \le 1.00, "OK", "Overstressed"\right]$

Condition2 = "OK"

Bolt % of Capacity = $\max\left[\left(\frac{P_{ut}}{\Phi R_{nt}}\right)^2 + \left(\frac{V_u}{\Phi R_{nv}}\right)^2, \left(\frac{P_{uc}}{\Phi R_{nc}}\right) + \left(\frac{V_u}{\Phi R_{nvc}}\right)^2\right] = 73 \cdot \%$

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Branford, CT 06405 F: (203) 488-8587

Subject:	PAD AND PIER
Location:	180-ft Lattice Tower Westbrook, CT
Rev. 0: 7/21/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21082.01

Pad & Pier Foundation

Input Data:

Max. Loads at Tower Leg:

Uplift =	Uplift := 424·kips	(User Input from tnxTower)
Compression =	Comp := 489·kips	(User Input from tnxTower)
Max Shear =	Shear := 57·kips	(User Input from tnxTower)

Pier and Pad Properties:

Pier Height =	$P_H := 11 \cdot ft$	(User Input)
Pier Projection Above Grade =	$P_P := 1 \cdot ft$	(User Input)
Pier Diameter =	$P_d := 4 \cdot ft$	(User Input)
Pad Thickness =	$PD_t := 2 \cdot ft$	(User Input)
Pad Width =	$PD_w := 16.25 \cdot ft$	(User Input)
Reinforcemnet Bar Diameter =	$d_{bar} := 1 \cdot in$	(User Input)
Number of Reinforcemnet Bars =	$N_{bar} := 20$	(User Input)
Reinforcemnet Bar Strength =	$f_y := 60 \cdot ksi$	(User Input)
Eccentricity of Anchor Bolts from CL of Pier =	$OS_{bolts} := 9 \cdot in$	(User Input)

Subgrade Properties:

Concrete Unit Weight =	$\gamma c := 150 \cdot pcf$	(User Input)
Water Unit Weight =	$\gamma w := 62.4 \cdot pcf$	(User Input)
Soil Unit Weight =	$\gamma s := 110 \cdot pcf$	(User Input)
Uplift Angle =	$\phi := 34 \cdot deg$	(User Input)
Soil Bearing Capacity =	$q_u := 6 \cdot ksf$	(User Input)
Distance to Water Table =	$D_{wt} := 20 \cdot ft$	(User Input)
Concrete Compressive Strength =	$f_c := 3 \cdot ksi$	(User Input)

Calculated Data:

Active Pressure =

$$K_a := \frac{(1 - \sin(\phi))}{(1 + \sin(\phi))} = 0.283$$

$$P_a := \frac{1}{2}\cdot\left(P_H + PD_t\right)^2\cdot P_d\cdot\gamma s\cdot K_a = 10.51\cdot kips$$

Passive Pressure =

$$K_p := \frac{(1 + \sin(\phi))}{(1 - \sin(\phi))} = 3.537$$

$$P_p := \frac{1}{2}\cdot\left(P_H + PD_t\right)^2\cdot P_d\cdot\gamma s\cdot K_p = 131.51\cdot kips$$

Area of Reinforcement Bar =

$$A_{bar} := \frac{\pi\cdot d_{bar}^{\,2}}{4} = 0.785\cdot in^2$$

Area of Pier =

$$A_{pier} := \pi\cdot\frac{P_d^{\,2}}{4} = 12.57\,ft^2$$

Cross Sectional Area of Pad =

$$A_{pad} := PD_w^{\,2} = 264.06\,ft^2$$

Section Modulus of Pad =

$$S_{pad} := \frac{PD_w\cdot PD_w^{\,2}}{6} = 715.2\cdot ft^3$$

Volume of Concrete =

$$V_{Conc} := P_H\cdot\left(A_{pier}\right) + A_{pad}\cdot PD_t = 666.4\cdot ft^3$$

$$H_s := P_H - P_P = 10\,ft$$

$$B_1 := PD_w^{\,2} = 264.1\,ft^2$$

$$B_2 := \left(2\cdot\tan(\phi)\cdot H_s + PD_w\right)^2 = 884.5\,ft^2$$

Volume of Soil =

$$V_{Soil} := \left[\frac{\left(H_s\right)}{3}\cdot\left(B_1 + B_2 + \sqrt{B_1\cdot B_2}\right)\right] - \left(H_s\cdot A_{pier}\right) = 5313.7\cdot ft^3$$

Mass of Soil Above Footing =

$$Mass_{Soil.AF} := \left(PD_w^{\,2} - A_{pier}\right)\cdot H_s\cdot\gamma s = 276.6\cdot kips$$

Mass of Soil Tot =

$$Mass_{Soil.Tot} := V_{Soil}\cdot\gamma s = 584.5\cdot kips$$

Mass of Concrete =

$$Mass_{Conc} := V_{Conc}\cdot\gamma c = 100\cdot kips$$

Total Mass =

$$Mass_{Tot} := 0.9Mass_{Soil.AF} + 0.75\left(Mass_{Soil.Tot} - Mass_{Soil.AF}\right) + 0.9Mass_{Conc} = 569.84\cdot kips$$

Check Uplift:

Required Factor of Safety =

$F_S := 1$

$\text{ActualFS} := \frac{\text{Mass}_{Tot}}{\text{Uplift}} = 1.34$

$\text{Uplift\_Check} := \text{if}\left(\frac{\text{Mass}_{Tot}}{\text{Uplift}} \geq F_S, \text{"OK"}, \text{"Overstressed"}\right)$

Uplift_Check = "OK"

Check Bearing:

$P_{tot} := \text{Comp} + 1.2 \cdot \text{Mass}_{Conc} + 1.2\text{Mass}_{Soil.AF} = 941 \cdot \text{kips}$

$\text{Bearing} := \frac{P_{tot}}{A_{pad}} = 3.56 \cdot \text{ksf}$

$\text{Bearing\_Check} := \text{if}\left(\text{Bearing} \leq 0.75 q_u, \text{"OK"}, \text{"No Good"}\right)$

Bearing_Check = "OK"

Check Punching Shear:

$p_u := \frac{\left(\text{Comp} + 1.2 A_{pier} \cdot P_H \cdot \gamma c\right)}{A_{pad}} + \frac{\left[\text{Shear} \cdot \left(P_H + PD_t\right) + \text{Comp} \cdot OS_{bolts} + \left(P_a - P_p\right)\frac{\left(P_H + PD_t\right)}{3}\right]}{S_{pad}} = 2.76 \cdot \text{ksf}$

$d := PD_t - \left(3 \cdot \text{in} + d_{bar}\right) = 1.667\,\text{ft}$

$b_o := \left(P_d + d\right) \cdot \pi = 17.802\,\text{ft}$

$\text{Aout}_{bo} := A_{pad} - \pi \cdot \frac{\left(P_d + d\right)^2}{4} = 238.842\,\text{ft}^2$

$V_u := \text{Aout}_{bo} \cdot p_u = 659.644 \cdot \text{kips}$

$\phi V_c := 0.75 \cdot 4 \cdot \sqrt{\left(f_c \cdot \frac{\text{lb}}{\text{in}^2}\right)} \cdot b_o \cdot d = 702.1 \cdot \text{kips}$

$\text{Punching\_Shear\_Check} := \text{if}\left(V_u \leq \phi V_c, \text{"OK"}, \text{"No Good"}\right)$

Punching_Shear_Check = "OK"

Check Beam Shear:

$$V_u := p_u \cdot PD_w \cdot \left[\frac{\left(PD_w - P_d\right)}{2} - \frac{d}{2} \right] = 237.5 \cdot kips$$

$$\phi V_c := 0.75 \cdot 2 \cdot \sqrt{\left(f_c \cdot \frac{lb}{in^2} \right)} \cdot PD_w \cdot d = 320.4 \cdot kips$$

$$Beam\_Shear\_Check := if\left(V_u \le \phi V_c, "OK", "No\ Good"\right)$$

Beam_Shear_Check = "OK"

Check Bending:

$$As_{provided} := N_{bar} \cdot A_{bar} = 15.708 \cdot in^2$$

$$M_{req} := \frac{p_u \cdot PD_w \cdot \left(\frac{PD_w - P_d}{2} \right)^2}{2} = 841.848 \cdot kip \cdot ft$$

$$a := \frac{As_{provided} \cdot f_y}{0.85 \cdot f_c \cdot PD_w} = 1.895 \cdot in$$

$$M_{Avail} := 0.9 \cdot As_{provided} \cdot f_y \cdot \left(d - \frac{a}{2} \right) = 1347 \cdot kip \cdot ft$$

$$Bending\_Check := if\left(M_{Avail} > M_{req}, "OK", "No\ Good"\right)$$

Bending_Check = "OK"

September 4, 2019
February 20, 2020 (Rev. 1)
May 7, 2021 (Rev. 2)
September 3, 2021 (Rev. 3)

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:		
	Site Number:	CT2047 (LTE 3C/4C)
	FA Number:	10035035
	PACE Number:	MRCTB040425
	PT Number:	2051A0PR28
	Site Name:	WESTBROOK-SPENCER RD
	Site Address:	315 Spencer Plain Road Westbrook, CT 06498

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:

- (1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs.)
- **(3) 840-370964 Antennas (47.7"x14.9"x6.5" – Wt. = 64 lbs. /each)**
- **(3) DMP65R-BU4DA Antennas (48.0"x20.7"x7.7" – Wt. = 68 lbs. /each)**
- **(3) 8843 B2/B66A RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**

**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 June 16, 2016. HDG's preformed a ground audit on May 5, 2019.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-G, 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-G Annex B, the max basic wind speed for this site is equal to 120 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 0.75 in. Per the AT&T Mount Technical Directive and Appendix N of the 2018 Connecticut State Building Code, an ultimate wind speed of 135 mph converted to a nominal wind speed of 105 mph and an escalated ice thickness of 1.74 in was used for this analysis.

- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.

- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.

- HDG considers this site to have a minimum spectral response acceleration parameter at short periods, Min. SS, of 0.250 and a maximum spectral response acceleration parameter at a period of 1 second, Max. SS, of 0.280.

- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worse case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.

- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worse case location on the mount.

- The existing mount is secured to the existing tower with U-Bolts. The connection is 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:

- **Reinforce existing horizontal steel angles with proposed L3x3x1/4 steel angles (typ. of 1 per sector, total of 3).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (LTE 3C/4C/5C) Mount Rating	11	LC31	108%	**FAIL**
Modified (LTE 3C/4C/5C) Mount Rating	12	LC31	91%	**PASS**

Reference Documents:

- Mount mapping report prepared by ProVertic LLC dated June 21, 2016.

This determination was based on the following limitations and assumptions:

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

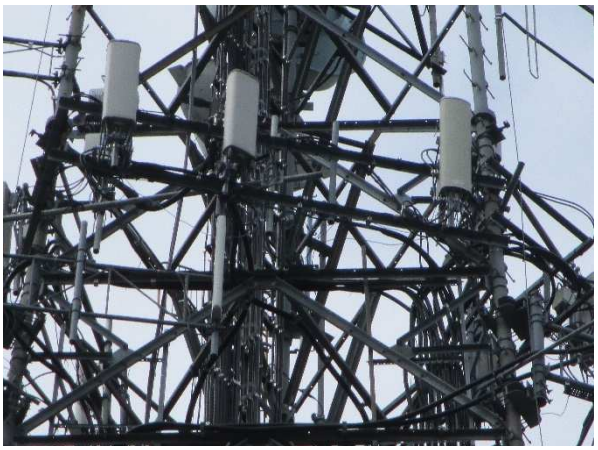
Please feel free to contact our office should you have any questions.

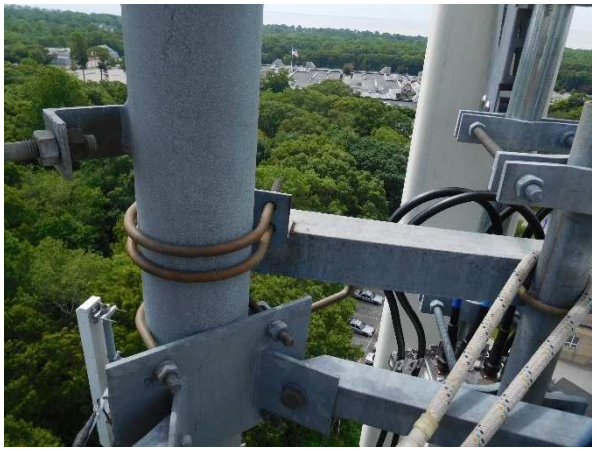
Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:





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Design Group LLC

Wind & Ice
Calculations

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	148	(ft)
z_g=	1200	(ft)
α=	7.0	

K_z= 1.105

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

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_e
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

2.6.6.4 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

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

K_{zt}= 1

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

Category= **1**

K_h=	1	
K_e=	0.9	(from Table 2-4)
K_t=		(from Table 2-5)
f=		(from Table 2-5)
z=	148	
H=		(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	
K_{iz} =	1.16	(from Sec. 2.6.8)

2.6.8 Design Ice Thickness

Max Ice Thickness = t_i = 0.75 in

Importance Factor, I_{ice} = I_{ice}= 1.00 (from Table 2-3)

$t_{iz} = 2.0*t_i*I_{ice}*K_{iz}*(Kzt)^{0.35}$ $\quad t_{iz}$ = 1.74 in

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL Checked By: MSC

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2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

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

h=	180	Gh=	0.85

2.6.7.2 Guyed Masts Gh= 0.85

2.6.7.3 Pole Structures Gh= 1.1

2.6.9 Appurtenances Gh= 1.0

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

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

2.6.9.2 Design Wind Force on Appurtenances

State Code Ultimate Design Wind Speed: V_{ult} = 135 mph

Nomial Design Wind Speed, $V_{asd} = V_{ult}\sqrt{(0.6)}$ V_{asd} = 105 mph

V_{asd} per the AT&T Mount Technical Directive and the 2018 Connecticut State Building Code, Latest Edition.
Per TIA-222-G, V_{min} = 100 mph V_{max} = 120 mph

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

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

q_z=	**26.30**	K_z=	1.105	
$q_{z\ (ice)}$=	**6.01**	K_{zt}=	1.0	
$q_{z\ (30)}$=	**2.16**	K_d=	0.85	(from Table 2-2)
		V_{asd}=	105	mph
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph
		I=	1.0	(from Table 2-3)
		I_{wice}=	1.0	(from Table 2-3)

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

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-8

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
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{-1.0})$
	C > 64 (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 = **1.74** **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)
840-370964 Antenna	47.7	14.9	6.5	4.94	3.20	1.23	**160**	**48**	**13**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.32	1.20	**218**	**62**	**18**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.20	**43**	**15**	**4**
8843 B2/B66A RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.20	**36**	**13**	**3**
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	2.73	1.21	**18**	**8**	**1**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**52**	**18**	**4**
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.90	1.20	**37**	**14**	**3**
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	3.81	1.26	**19**	**9**	**2**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**30**	**11**	**2**
2" Pipe	2.4	12.0	-	0.20	0.20	1.20	**6**		
2x2 Angle	2.0	12.0	-	0.17	0.17	2.00	**9**		
3x3 Angle	3.0	12.0	-	0.25	0.25	2.00	**13**		

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.74	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)
840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	160	80	140
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	218	92	186
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	43	36	41
8843 B2/B66A RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	22	43	27
8843 B2/B66A RRH (Shielded)	14.9	3.3	13.2	0.34	1.37	4.52	1.13	1.29	1.20	12	43	19
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	52	37	48
4449 B5/B12 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	26	52	33
4449 B5/B12 RRH (Shielded)	17.9	3.3	13.2	0.41	1.64	5.42	1.36	1.33	1.20	14	52	24

WIND LOADS WITH ICE:

840-370964 Antenna	51.2	18.4	10.0	6.54	3.55	2.78	5.13	1.21	1.32	48	28	43
DMP65R-BU4DA Antenna	51.5	24.2	11.2	8.65	4.00	2.13	4.60	1.20	1.29	62	31	55
8843 B2/B66A RRH	18.4	16.7	14.4	2.13	1.84	1.10	1.28	1.20	1.20	15	13	15
8843 B2/B66A RRH (Side)	18.4	8.3	16.7	1.07	2.13	2.20	1.10	1.20	1.20	8	15	10
8843 B2/B66A RRH (Shielded)	18.4	4.2	16.7	0.53	2.13	4.41	1.10	1.28	1.20	4	15	7
4449 B5/B12 RRH	21.4	16.7	12.9	2.48	1.91	1.28	1.66	1.20	1.20	18	14	17
4449 B5/B12 RRH (Side)	21.4	8.3	16.7	1.24	2.48	2.56	1.28	1.20	1.20	9	18	11
4449 B5/B12 RRH (Shielded)	21.4	4.2	16.7	0.62	2.48	5.13	1.28	1.32	1.20	5	18	8

WIND LOADS AT 30 MPH:

840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	13	7	12
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	18	8	15
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	4	3	3
8843 B2/B66A RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	2	4	2
8843 B2/B66A RRH (Shielded)	14.9	3.3	13.2	0.34	1.37	4.52	1.13	1.29	1.20	1	4	2
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	4	3	4
4449 B5/B12 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	2	4	3
4449 B5/B12 RRH (Shielded)	17.9	3.3	13.2	0.41	1.64	5.42	1.36	1.33	1.20	1	4	2

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.74	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)
840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**160**	**80**	**100**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**218**	**92**	**124**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**43**	**36**	**37**
8843 B2/B66A RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	**32**	**43**	**40**
8843 B2/B66A RRH (Shielded)	14.9	7.4	13.2	0.77	1.37	2.01	1.13	1.20	1.20	**24**	**43**	**38**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**52**	**37**	**41**
4449 B5/B12 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	**39**	**52**	**49**
4449 B5/B12 RRH (Shielded)	17.9	7.4	13.2	0.92	1.64	2.41	1.36	1.20	1.20	**29**	**52**	**46**

WIND LOADS WITH ICE:

840-370964 Antenna	51.2	18.4	10.0	6.54	3.55	2.78	5.13	1.21	1.32	**48**	**28**	**33**
DMP65R-BU4DA Antenna	51.5	24.2	11.2	8.65	4.00	2.13	4.60	1.20	1.29	**62**	**31**	**39**
8843 B2/B66A RRH	18.4	16.7	14.4	2.13	1.84	1.10	1.28	1.20	1.20	**15**	**13**	**14**
8843 B2/B66A RRH (Side)	18.4	12.5	16.7	1.60	2.13	1.47	1.10	1.20	1.20	**12**	**15**	**14**
8843 B2/B66A RRH (Shielded)	18.4	9.4	16.7	1.20	2.13	1.96	1.10	1.20	1.20	**9**	**15**	**14**
4449 B5/B12 RRH	21.4	16.7	12.9	2.48	1.91	1.28	1.66	1.20	1.20	**18**	**14**	**15**
4449 B5/B12 RRH (Side)	21.4	12.5	16.7	1.86	2.48	1.71	1.28	1.20	1.20	**13**	**18**	**17**
4449 B5/B12 RRH (Shielded)	21.4	9.4	16.7	1.39	2.48	2.28	1.28	1.20	1.20	**10**	**18**	**16**

WIND LOADS AT 30 MPH:

840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**13**	**7**	**8**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**18**	**8**	**10**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**4**	**3**	**3**
8843 B2/B66A RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	**3**	**4**	**3**
8843 B2/B66A RRH (Shielded)	14.9	7.4	13.2	0.77	1.37	2.01	1.13	1.20	1.20	**2**	**4**	**3**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**4**	**3**	**3**
4449 B5/B12 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	**3**	**4**	**4**
4449 B5/B12 RRH (Shielded)	17.9	7.4	13.2	0.92	1.64	2.41	1.36	1.20	1.20	**2**	**4**	**4**

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.74	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)
840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**160**	**80**	**80**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**218**	**92**	**92**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**43**	**36**	**36**
8843 B2/B66A RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	**36**	**43**	**43**
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	**18**	**43**	**43**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**52**	**37**	**37**
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	**37**	**52**	**52**
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	**19**	**52**	**52**

WIND LOADS WITH ICE:

840-370964 Antenna	51.2	18.4	10.0	6.54	3.55	2.78	5.13	1.21	1.32	**48**	**28**	**28**
DMP65R-BU4DA Antenna	51.5	24.2	11.2	8.65	4.00	2.13	4.60	1.20	1.29	**62**	**31**	**31**
8843 B2/B66A RRH	18.4	16.7	14.4	2.13	1.84	1.10	1.28	1.20	1.20	**15**	**13**	**13**
8843 B2/B66A RRH (Side)	18.4	14.4	16.7	1.84	2.13	1.28	1.10	1.20	1.20	**13**	**15**	**15**
8843 B2/B66A RRH (Shielded)	18.4	8.9	16.7	1.14	2.13	2.06	1.10	1.20	1.20	**8**	**15**	**15**
4449 B5/B12 RRH	21.4	16.7	12.9	2.48	1.91	1.28	1.66	1.20	1.20	**18**	**14**	**14**
4449 B5/B12 RRH (Side)	21.4	12.9	16.7	1.91	2.48	1.66	1.28	1.20	1.20	**14**	**18**	**18**
4449 B5/B12 RRH (Shielded)	21.4	8.2	16.7	1.22	2.48	2.61	1.28	1.21	1.20	**9**	**18**	**18**

WIND LOADS AT 30 MPH:

840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**13**	**7**	**7**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**18**	**8**	**8**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**4**	**3**	**3**
8843 B2/B66A RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	**3**	**4**	**4**
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	**1**	**4**	**4**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**4**	**3**	**3**
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	**3**	**4**	**4**
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	**2**	**4**	**4**

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.74	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)
840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**160**	**80**	**100**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**218**	**92**	**124**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**43**	**36**	**37**
8843 B2/B66A RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	**32**	**43**	**40**
8843 B2/B66A RRH (Shielded)	14.9	7.4	13.2	0.77	1.37	2.01	1.13	1.20	1.20	**24**	**43**	**38**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**52**	**37**	**41**
4449 B5/B12 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	**39**	**52**	**49**
4449 B5/B12 RRH (Shielded)	17.9	7.4	13.2	0.92	1.64	2.41	1.36	1.20	1.20	**29**	**52**	**46**

WIND LOADS WITH ICE:

840-370964 Antenna	51.2	18.4	10.0	6.54	3.55	2.78	5.13	1.21	1.32	**48**	**28**	**33**
DMP65R-BU4DA Antenna	51.5	24.2	11.2	8.65	4.00	2.13	4.60	1.20	1.29	**62**	**31**	**39**
8843 B2/B66A RRH	18.4	16.7	14.4	2.13	1.84	1.10	1.28	1.20	1.20	**15**	**13**	**14**
8843 B2/B66A RRH (Side)	18.4	12.5	16.7	1.60	2.13	1.47	1.10	1.20	1.20	**12**	**15**	**14**
8843 B2/B66A RRH (Shielded)	18.4	9.4	16.7	1.20	2.13	1.96	1.10	1.20	1.20	**9**	**15**	**14**
4449 B5/B12 RRH	21.4	16.7	12.9	2.48	1.91	1.28	1.66	1.20	1.20	**18**	**14**	**15**
4449 B5/B12 RRH (Side)	21.4	12.5	16.7	1.86	2.48	1.71	1.28	1.20	1.20	**13**	**18**	**17**
4449 B5/B12 RRH (Shielded)	21.4	9.4	16.7	1.39	2.48	2.28	1.28	1.20	1.20	**10**	**18**	**16**

WIND LOADS AT 30 MPH:

840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**13**	**7**	**8**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**18**	**8**	**10**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**4**	**3**	**3**
8843 B2/B66A RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	**3**	**4**	**3**
8843 B2/B66A RRH (Shielded)	14.9	7.4	13.2	0.77	1.37	2.01	1.13	1.20	1.20	**2**	**4**	**3**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**4**	**3**	**3**
4449 B5/B12 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	**3**	**4**	**4**
4449 B5/B12 RRH (Shielded)	17.9	7.4	13.2	0.92	1.64	2.41	1.36	1.20	1.20	**2**	**4**	**4**

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.74	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)
840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**160**	**80**	**140**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**218**	**92**	**186**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**43**	**36**	**41**
8843 B2/B66A RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	**22**	**43**	**27**
8843 B2/B66A RRH (Shielded)	14.9	3.3	13.2	0.34	1.37	4.52	1.13	1.29	1.20	**12**	**43**	**19**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**52**	**37**	**48**
4449 B5/B12 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	**26**	**52**	**33**
4449 B5/B12 RRH (Shielded)	17.9	3.3	13.2	0.41	1.64	5.42	1.36	1.33	1.20	**14**	**52**	**24**

WIND LOADS WITH ICE:

840-370964 Antenna	51.2	18.4	10.0	6.54	3.55	2.78	5.13	1.21	1.32	**48**	**28**	**43**
DMP65R-BU4DA Antenna	51.5	24.2	11.2	8.65	4.00	2.13	4.60	1.20	1.29	**62**	**31**	**55**
8843 B2/B66A RRH	18.4	16.7	14.4	2.13	1.84	1.10	1.28	1.20	1.20	**15**	**13**	**15**
8843 B2/B66A RRH (Side)	18.4	8.3	16.7	1.07	2.13	2.20	1.10	1.20	1.20	**8**	**15**	**10**
8843 B2/B66A RRH (Shielded)	18.4	4.2	16.7	0.53	2.13	4.41	1.10	1.28	1.20	**4**	**15**	**7**
4449 B5/B12 RRH	21.4	16.7	12.9	2.48	1.91	1.28	1.66	1.20	1.20	**18**	**14**	**17**
4449 B5/B12 RRH (Side)	21.4	8.3	16.7	1.24	2.48	2.56	1.28	1.20	1.20	**9**	**18**	**11**
4449 B5/B12 RRH (Shielded)	21.4	4.2	16.7	0.62	2.48	5.13	1.28	1.32	1.20	**5**	**18**	**8**

WIND LOADS AT 30 MPH:

840-370964 Antenna	47.7	14.9	6.5	4.94	2.15	3.20	7.34	1.23	1.41	**13**	**7**	**12**
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	**18**	**8**	**15**
8843 B2/B66A RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	**4**	**3**	**3**
8843 B2/B66A RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	**2**	**4**	**2**
8843 B2/B66A RRH (Shielded)	14.9	3.3	13.2	0.34	1.37	4.52	1.13	1.29	1.20	**1**	**4**	**2**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	**4**	**3**	**4**
4449 B5/B12 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	**2**	**4**	**3**
4449 B5/B12 RRH (Shielded)	17.9	3.3	13.2	0.41	1.64	5.42	1.36	1.33	1.20	**1**	**4**	**2**

Date: 8/31/2021
Project Name: WESTBROOK-SPENCER RD
Project No.: CT2047
Designed By: RL **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice:	1.74	in.
Density of ice:	56	pcf

840-370964 Antenna

Weight of ice based on total radial SF area:

Height (in):	47.7	
Width (in):	14.9	
Depth (in):	6.5	
Total weight of ice on object:	152	lbs
Weight of object:	64.0	lbs
Combined weight of ice and object:	216	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:	203	lbs
Weight of object:	68.0	lbs
Combined weight of ice and object:	271	lbs

8843 B2/B66A RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.9	
Total weight of ice on object:	50	lbs
Weight of object:	72.0	lbs
Combined weight of ice and object:	122	lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:	57	lbs
Weight of object:	73.0	lbs
Combined weight of ice and object:	130	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:	49	lbs
Weight of object:	33	lbs
Combined weight of ice and object:	82	lbs

2" pipe

Per foot weight of ice:

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

L 2x2 Angles

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:	10	plf

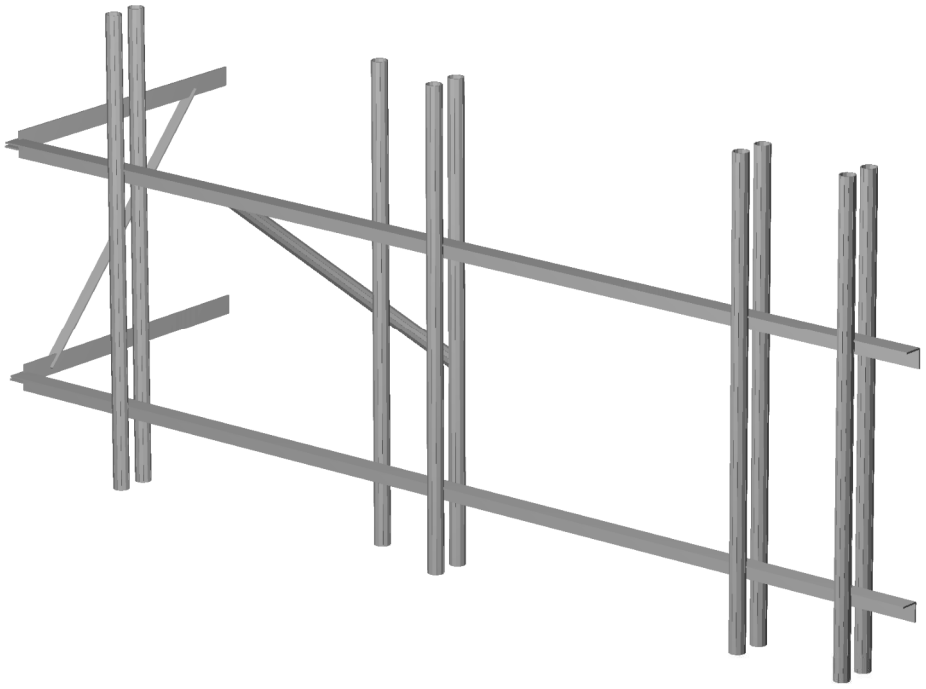
L 3x3 Angles

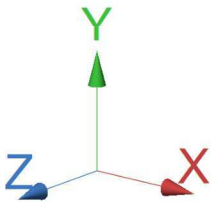
Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:	13	plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

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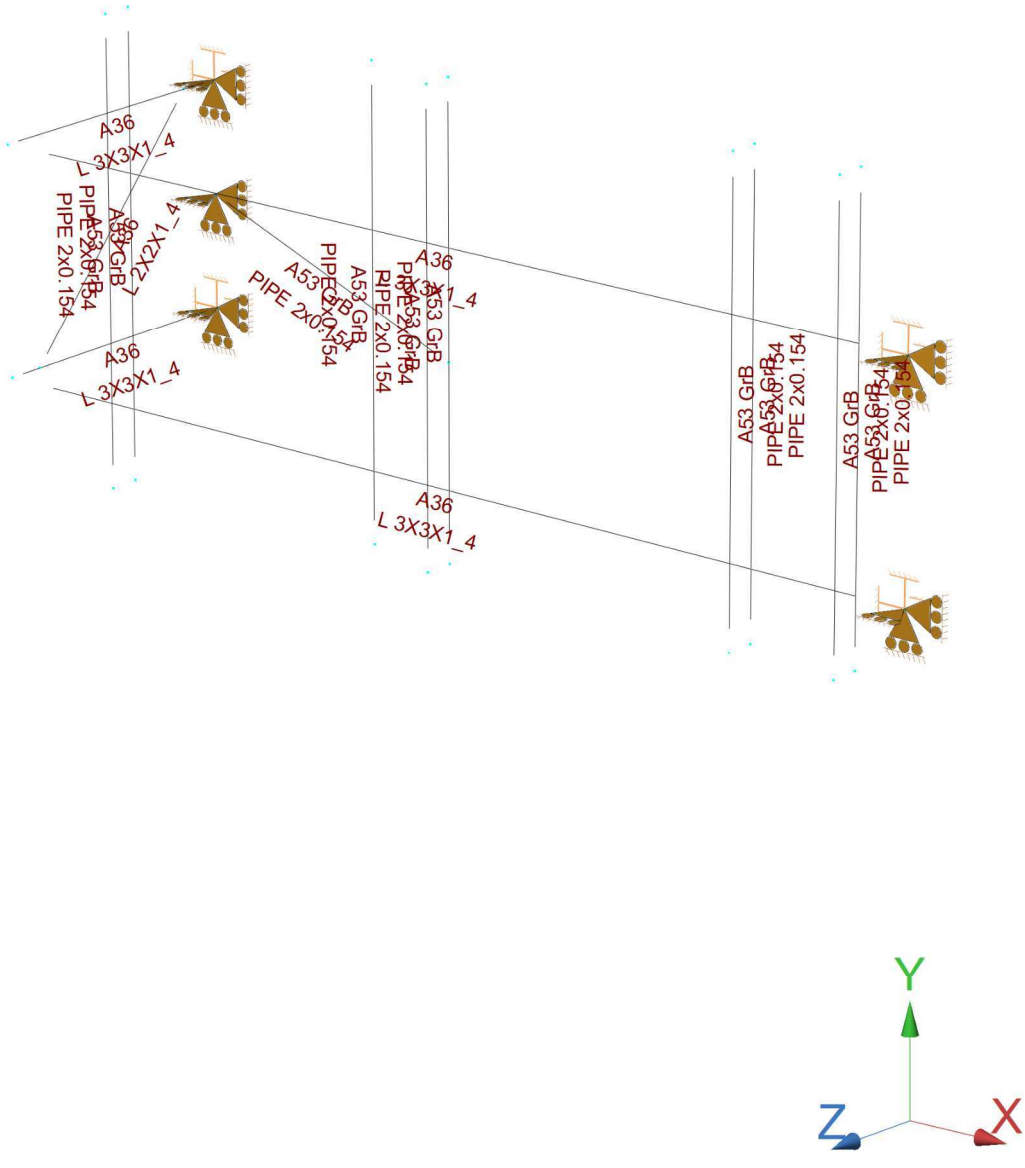
Z
X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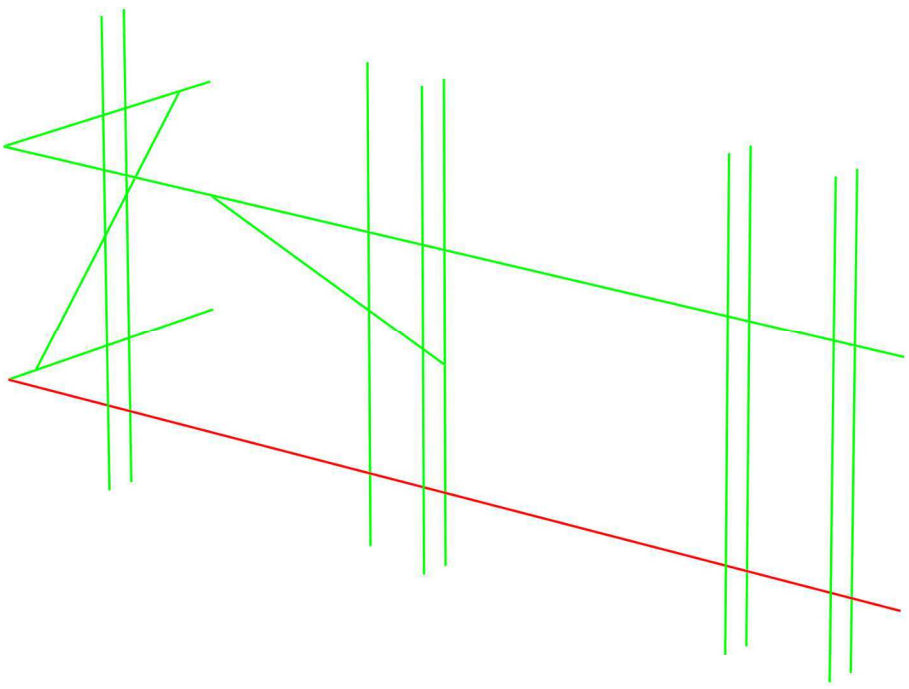
X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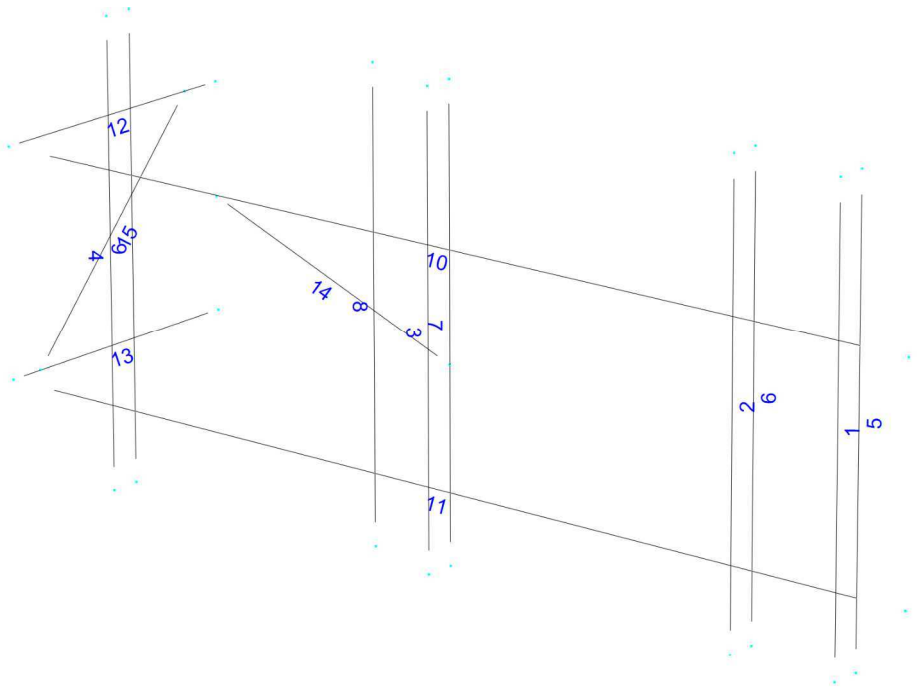
Not designed
Error on design
Design O.K.
With warnings
Y
Z
X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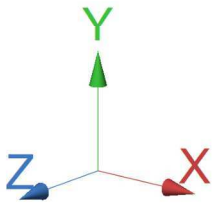
11


Y
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Current Date: 8/31/2021 3:45 PM
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Load data

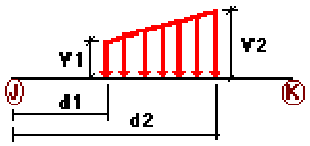
GLOSSARY

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 on Left End	No	LL
LL2	250 lb Live Load on Center	No	LL
LL3	250 lb Live Load on Right End	No	LL
LLa1	500 lb Live Load on Antenna 1	No	LL
LLa2	500 lb Live Load on Antenna 2	No	LL
LLa3	500 lb Live Load on Antenna 3	No	LL
LLa4	500 lb Live Load on Antenna 4	No	LL

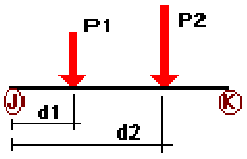
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	11	z	-0.013	-0.013	0.00	No	100.00	Yes
	10	z	-0.013	-0.013	0.00	No	100.00	Yes
	13	z	-0.013	-0.013	0.00	No	100.00	Yes
	12	z	-0.013	-0.013	0.00	No	100.00	Yes
	15	z	-0.008	-0.008	0.00	No	100.00	Yes
	14	z	-0.006	-0.006	0.00	No	100.00	Yes
	1	z	-0.006	-0.006	0.00	No	100.00	Yes
	2	z	-0.006	-0.006	0.00	No	100.00	Yes
	8	z	-0.006	-0.006	0.00	No	100.00	Yes
W30	11	z	-0.013	-0.013	0.00	No	100.00	Yes
	10	z	-0.013	-0.013	0.00	No	100.00	Yes
	13	z	-0.013	-0.013	0.00	No	100.00	Yes
	12	z	-0.013	-0.013	0.00	No	100.00	Yes
	15	z	-0.008	-0.008	0.00	No	100.00	Yes
	14	z	-0.006	-0.006	0.00	No	100.00	Yes
	5	z	-0.006	-0.006	0.00	No	100.00	Yes
	6	z	-0.006	-0.006	0.00	No	100.00	Yes
	1	z	-0.006	-0.006	0.00	No	100.00	Yes
	2	z	-0.006	-0.006	0.00	No	100.00	Yes
	3	z	-0.006	-0.006	0.00	No	100.00	Yes
	4	z	-0.006	-0.006	0.00	No	100.00	Yes
	7	z	-0.006	-0.006	0.00	No	100.00	Yes
	8	z	-0.006	-0.006	0.00	No	100.00	Yes
	9	z	-0.006	-0.006	0.00	No	100.00	Yes
W60	11	x	-0.013	-0.013	0.00	No	100.00	Yes
	10	x	-0.013	-0.013	0.00	No	100.00	Yes
	13	x	-0.013	-0.013	0.00	No	100.00	Yes
	12	x	-0.013	-0.013	0.00	No	100.00	Yes
	15	x	-0.008	-0.008	0.00	No	100.00	Yes
	14	x	-0.006	-0.006	0.00	No	100.00	Yes
	5	x	-0.006	-0.006	0.00	No	100.00	Yes
	6	x	-0.006	-0.006	0.00	No	100.00	Yes
	1	x	-0.006	-0.006	0.00	No	100.00	Yes
	2	x	-0.006	-0.006	0.00	No	100.00	Yes
	3	x	-0.006	-0.006	0.00	No	100.00	Yes
	4	x	-0.006	-0.006	0.00	No	100.00	Yes
	7	x	-0.006	-0.006	0.00	No	100.00	Yes
	8	x	-0.006	-0.006	0.00	No	100.00	Yes
	9	x	-0.006	-0.006	0.00	No	100.00	Yes
W90	13	x	-0.013	-0.013	0.00	No	100.00	Yes
	12	x	-0.013	-0.013	0.00	No	100.00	Yes
	15	x	-0.008	-0.008	0.00	No	100.00	Yes
	14	x	-0.006	-0.006	0.00	No	100.00	Yes
	5	x	-0.006	-0.006	0.00	No	100.00	Yes
	6	x	-0.006	-0.006	0.00	No	100.00	Yes
	1	x	-0.006	-0.006	0.00	No	100.00	Yes
	2	x	-0.006	-0.006	0.00	No	100.00	Yes
	3	x	-0.006	-0.006	0.00	No	100.00	Yes
	4	x	-0.006	-0.006	0.00	No	100.00	Yes
	7	x	-0.006	-0.006	0.00	No	100.00	Yes
	8	x	-0.006	-0.006	0.00	No	100.00	Yes
	9	x	-0.006	-0.006	0.00	No	100.00	Yes
W120	11	x	-0.013	-0.013	0.00	No	100.00	Yes
	10	x	-0.013	-0.013	0.00	No	100.00	Yes
	13	x	-0.013	-0.013	0.00	No	100.00	Yes
	12	x	-0.013	-0.013	0.00	No	100.00	Yes
	15	x	-0.008	-0.008	0.00	No	100.00	Yes
	14	x	-0.006	-0.006	0.00	No	100.00	Yes
	5	x	-0.006	-0.006	0.00	No	100.00	Yes
	6	x	-0.006	-0.006	0.00	No	100.00	Yes

	1	x	-0.006	-0.006	0.00	No	100.00	Yes
	2	x	-0.006	-0.006	0.00	No	100.00	Yes
	3	x	-0.006	-0.006	0.00	No	100.00	Yes
	4	x	-0.006	-0.006	0.00	No	100.00	Yes
	7	x	-0.006	-0.006	0.00	No	100.00	Yes
	8	x	-0.006	-0.006	0.00	No	100.00	Yes
	9	x	-0.006	-0.006	0.00	No	100.00	Yes
W150	11	z	0.013	0.013	0.00	No	100.00	Yes
	10	z	0.013	0.013	0.00	No	100.00	Yes
	13	z	0.013	0.013	0.00	No	100.00	Yes
	12	z	0.013	0.013	0.00	No	100.00	Yes
	15	z	0.008	0.008	0.00	No	100.00	Yes
	14	z	0.006	0.006	0.00	No	100.00	Yes
	5	z	0.006	0.006	0.00	No	100.00	Yes
	6	z	0.006	0.006	0.00	No	100.00	Yes
	1	z	0.006	0.006	0.00	No	100.00	Yes
	2	z	0.006	0.006	0.00	No	100.00	Yes
	3	z	0.006	0.006	0.00	No	100.00	Yes
	4	z	0.006	0.006	0.00	No	100.00	Yes
	7	z	0.006	0.006	0.00	No	100.00	Yes
	8	z	0.006	0.006	0.00	No	100.00	Yes
	9	z	0.006	0.006	0.00	No	100.00	Yes
Di	11	y	-0.013	-0.013	0.00	No	100.00	Yes
	10	y	-0.013	-0.013	0.00	No	100.00	Yes
	13	y	-0.013	-0.013	0.00	No	100.00	Yes
	12	y	-0.013	-0.013	0.00	No	100.00	Yes
	15	y	-0.01	-0.01	0.00	No	100.00	Yes
	14	y	-0.009	-0.009	0.00	No	100.00	Yes
	5	y	-0.009	-0.009	0.00	No	100.00	Yes
	6	y	-0.009	-0.009	0.00	No	100.00	Yes
	1	y	-0.009	-0.009	0.00	No	100.00	Yes
	2	y	-0.009	-0.009	0.00	No	100.00	Yes
	3	y	-0.009	-0.009	0.00	No	100.00	Yes
	4	y	-0.009	-0.009	0.00	No	100.00	Yes
	7	y	-0.009	-0.009	0.00	No	100.00	Yes
	8	y	-0.009	-0.009	0.00	No	100.00	Yes
	9	y	-0.009	-0.009	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	3	y	-0.032	1.50	No
		y	-0.032	4.50	No
	4	y	-0.034	1.50	No
		y	-0.034	4.50	No
	8	y	-0.033	1.50	No
	9	y	-0.072	1.50	No
		y	-0.073	1.50	No
Wo	3	z	-0.08	1.50	No

		z	-0.08	4.50	No
	4	z	-0.109	1.50	No
		z	-0.109	4.50	No
	8	z	-0.03	1.50	No
	9	z	-0.018	1.50	No
		z	-0.019	1.50	No
W30	3	2	-0.07	1.50	No
		2	-0.07	4.50	No
	4	2	-0.094	1.50	No
		2	-0.094	4.50	No
	8	2	-0.03	1.50	No
	9	2	-0.024	1.50	No
W60	3	2	-0.05	1.50	No
		2	-0.05	4.50	No
	4	2	-0.062	1.50	No
		2	-0.062	4.50	No
	8	2	-0.03	1.50	No
	9	2	-0.046	1.50	No
W90	3	x	-0.04	1.50	No
		x	-0.04	4.50	No
	4	x	-0.047	1.50	No
		x	-0.047	4.50	No
	8	x	-0.03	1.50	No
	9	x	-0.052	1.50	No
W120	3	3	0.05	1.50	No
		3	0.05	4.50	No
	4	3	0.062	1.50	No
		3	0.062	4.50	No
	8	3	0.03	1.50	No
	9	3	0.046	1.50	No
W150	3	3	0.07	1.50	No
		3	0.07	4.50	No
	4	3	0.094	1.50	No
		3	0.094	4.50	No
	8	3	0.03	1.50	No
	9	3	0.024	1.50	No
Di	3	y	-0.076	1.50	No
		y	-0.076	4.50	No
	4	y	-0.102	1.50	No
		y	-0.102	4.50	No
	8	y	-0.049	1.50	No
	9	y	-0.05	1.50	No
		y	-0.057	1.50	No
WI0	3	z	-0.025	1.50	No
		z	-0.025	4.50	No
	4	z	-0.032	1.50	No
		z	-0.032	4.50	No
	8	z	-0.011	1.50	No
	9	z	-0.008	1.50	No
		z	-0.009	1.50	No
WI30	3	2	-0.022	1.50	No
		2	-0.022	4.50	No
	4	2	-0.028	1.50	No
		2	-0.028	4.50	No
	8	2	-0.011	1.50	No
	9	2	-0.008	1.50	No
WI60	3	2	-0.017	1.50	No
		2	-0.017	4.50	No
	4	2	-0.02	1.50	No
		2	-0.02	4.50	No

	8	2	-0.011	1.50	No
	9	2	-0.016	1.50	No
WI90	3	x	-0.015	1.50	No
		x	-0.015	4.50	No
	4	x	-0.016	1.50	No
		x	-0.016	4.50	No
	8	x	-0.011	1.50	No
	9	x	-0.018	1.50	No
WI120	3	3	0.017	1.50	No
		3	0.017	4.50	No
	4	3	0.02	1.50	No
		3	0.02	4.50	No
	8	3	0.011	1.50	No
	9	3	0.016	1.50	No
WI150	3	3	0.022	1.50	No
		3	0.022	4.50	No
	4	3	0.028	1.50	No
		3	0.028	4.50	No
	8	3	0.011	1.50	No
	9	3	0.008	1.50	No
WL0	3	z	-0.007	1.50	No
		z	-0.007	4.50	No
	4	z	-0.009	1.50	No
		z	-0.009	4.50	No
	8	z	-0.002	1.50	No
	9	z	-0.002	1.50	No
		z	-0.002	1.50	No
WL30	3	2	-0.006	1.50	No
		2	-0.006	4.50	No
	4	2	-0.008	1.50	No
		2	-0.008	4.50	No
	8	2	-0.002	1.50	No
	9	2	-0.002	1.50	No
WL60	3	2	-0.005	1.50	No
		2	-0.005	4.50	No
	4	2	-0.006	1.50	No
		2	-0.006	4.50	No
	8	2	-0.002	1.50	No
	9	2	-0.004	1.50	No
WL90	3	x	-0.004	1.50	No
		x	-0.004	4.50	No
	4	x	-0.004	1.50	No
		x	-0.004	4.50	No
	8	x	-0.002	1.50	No
	9	x	-0.005	1.50	No
WL120	3	3	0.005	1.50	No
		3	0.005	4.50	No
	4	3	0.006	1.50	No
		3	0.006	4.50	No
	8	3	0.002	1.50	No
	9	3	0.004	1.50	No
WL150	3	3	0.006	1.50	No
		3	0.006	4.50	No
	4	3	0.008	1.50	No
		3	0.008	4.50	No
	8	3	0.002	1.50	No
	9	3	0.003	1.50	No
LL1	10	y	-0.25	100.00	Yes
LL2	10	y	-0.25	50.00	Yes
LL3	10	y	-0.25	0.00	Yes

LLa1	1	y	-0.50	50.00	Yes
LLa2	2	y	-0.50	50.00	Yes
LLa3	3	y	-0.50	50.00	Yes
LLa4	4	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load on Left End	No	0.00	0.00	0.00
LL2	250 lb Live Load on Center	No	0.00	0.00	0.00
LL3	250 lb Live Load on Right End	No	0.00	0.00	0.00
LLa1	500 lb Live Load on Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load on Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load on Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load on Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	0.00	0.00	0.00
Di	0.00	0.00	0.00
WI0	0.00	0.00	0.00
WI30	0.00	0.00	0.00

WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

Current Date: 8/31/2021 3:47 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT2047\LTE (3C 4C)\Rev. 3\CT2047.retx

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

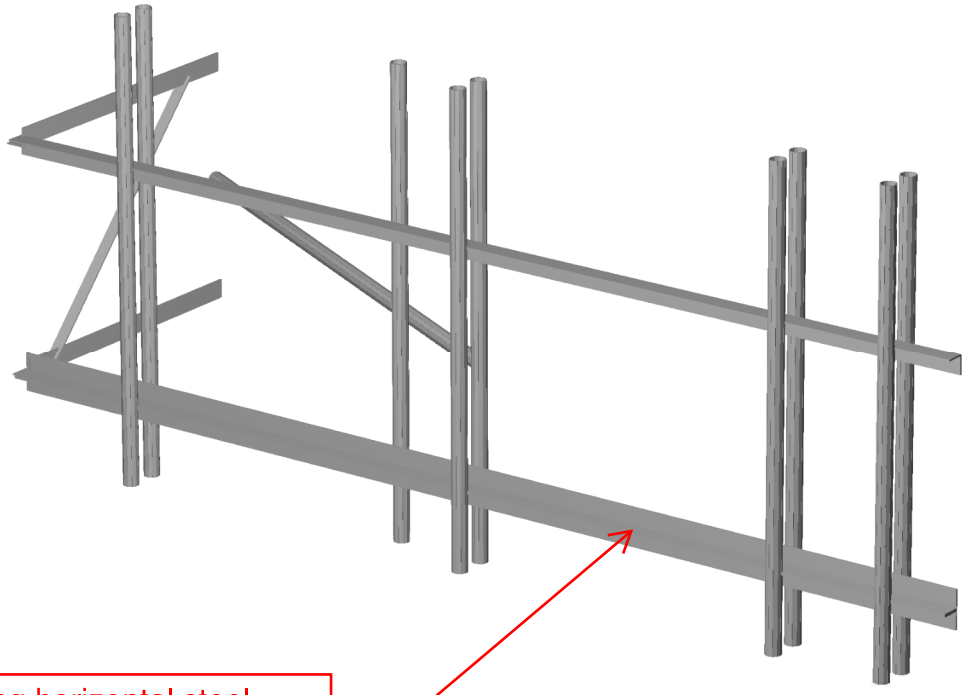
LC1=1.2D+1.6Wo
LC2=1.2D+1.6W30
LC3=1.2D+1.6W60
LC4=1.2D+1.6W90
LC5=1.2D+1.6W120
LC6=1.2D+1.6W150
LC7=1.2D-1.6Wo
LC8=1.2D-1.6W30
LC9=1.2D-1.6W60
LC10=1.2D-1.6W90
LC11=1.2D-1.6W120
LC12=1.2D-1.6W150
LC13=0.9D+1.6Wo
LC14=0.9D+1.6W30
LC15=0.9D+1.6W60
LC16=0.9D+1.6W90
LC17=0.9D+1.6W120
LC18=0.9D+1.6W150
LC19=0.9D-1.6Wo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

LC53=1.2D+WL0+LLa2
LC54=1.2D+WL30+LLa2
LC55=1.2D+WL60+LLa2
LC56=1.2D+WL90+LLa2
LC57=1.2D+WL120+LLa2
LC58=1.2D+WL150+LLa2
LC59=1.2D-WL0+LLa2
LC60=1.2D-WL30+LLa2
LC61=1.2D-WL60+LLa2
LC62=1.2D-WL90+LLa2
LC63=1.2D-WL120+LLa2
LC64=1.2D-WL150+LLa2
LC65=1.2D+WL0+LLa3
LC66=1.2D+WL30+LLa3
LC67=1.2D+WL60+LLa3
LC68=1.2D+WL90+LLa3
LC69=1.2D+WL120+LLa3
LC70=1.2D+WL150+LLa3
LC71=1.2D-WL0+LLa3
LC72=1.2D-WL30+LLa3
LC73=1.2D-WL60+LLa3
LC74=1.2D-WL90+LLa3
LC75=1.2D-WL120+LLa3
LC76=1.2D-WL150+LLa3
LC77=1.2D+WL0+LLa4
LC78=1.2D+WL30+LLa4
LC79=1.2D+WL60+LLa4
LC80=1.2D+WL90+LLa4
LC81=1.2D+WL120+LLa4
LC82=1.2D+WL150+LLa4
LC83=1.2D-WL0+LLa4
LC84=1.2D-WL30+LLa4
LC85=1.2D-WL60+LLa4
LC86=1.2D-WL90+LLa4
LC87=1.2D-WL120+LLa4
LC88=1.2D-WL150+LLa4

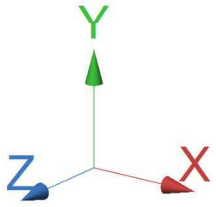
Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2X2X1_4	**15**	LC30 at 0.00%	**0.35**	**OK**	Eq. H2-1
	L 3X3X1_4	**11**	LC31 at 87.50%	**1.08**	**N.G.**	Eq. H2-1
		10	LC12 at 0.00%	0.78	OK	Eq. H2-1
		13	LC31 at 12.50%	0.29	OK	Eq. H2-1
		12	LC38 at 100.00%	0.97	OK	Sec. F1
	PIPE 2x0.154	**14**	LC1 at 31.25%	0.19	OK	Eq. H1-1b
		5	LC34 at 82.50%	0.17	OK	Eq. H1-1b
		6	LC32 at 82.50%	0.36	OK	Eq. H1-1b
		1	LC47 at 77.08%	0.05	OK	Eq. H1-1b
		2	LC59 at 29.17%	0.09	OK	Eq. H1-1b
		3	LC6 at 75.00%	0.24	OK	Eq. H1-1b
		4	LC31 at 77.08%	0.16	OK	Eq. H1-1b
		7	LC6 at 58.33%	**0.94**	**OK**	Eq. H1-1b
		8	LC83 at 81.25%	0.14	OK	Eq. H1-1b
		9	LC31 at 82.50%	0.82	OK	Eq. H1-1b

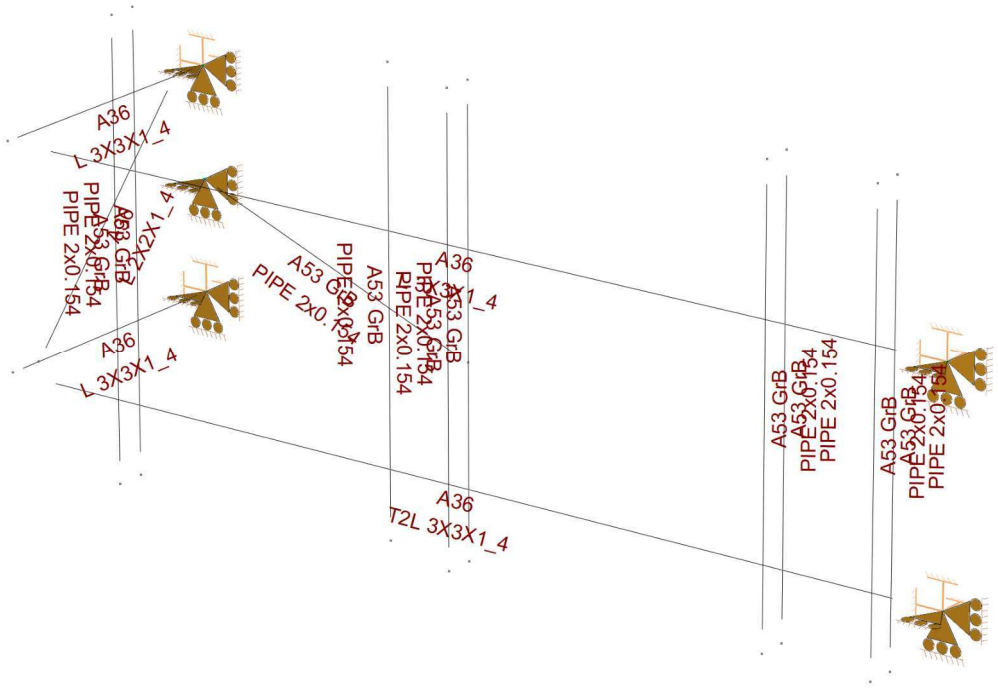
HUDSON
Design Group LLC

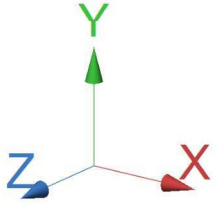
Mount Calculations
(Modified Conditions)



Reinforce existing horizontal steel angles with proposed L3x3x1/4 steel angles (typ. of 1 per sector, total of 3).




A36
L 3X3X1_4
PIPE 2x0.154
A53 GrB
A36
T2L 3X3X1_4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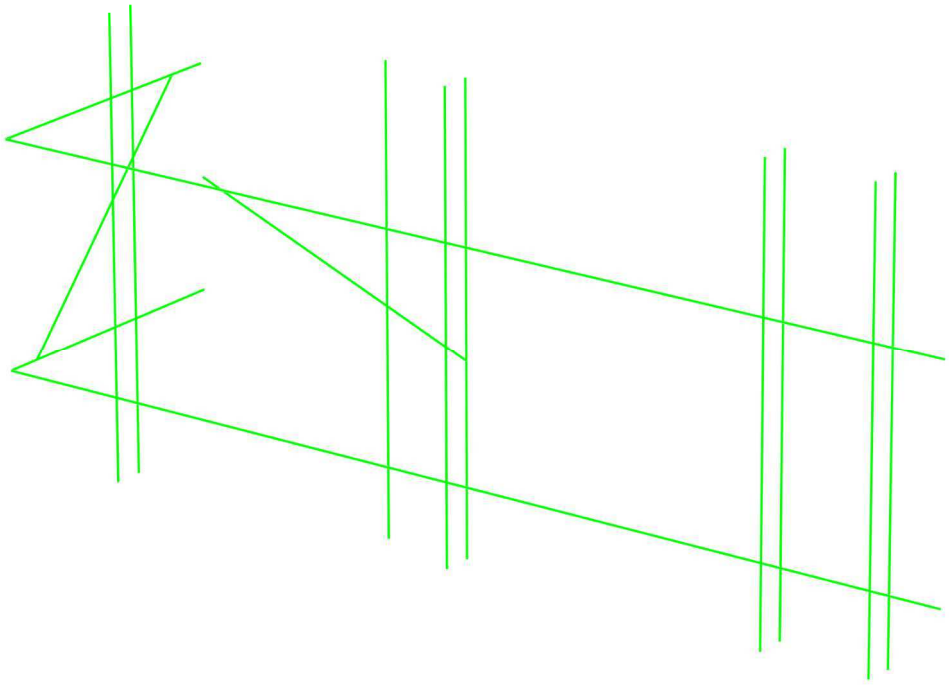
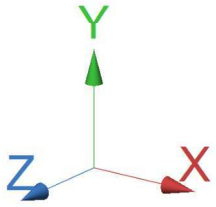
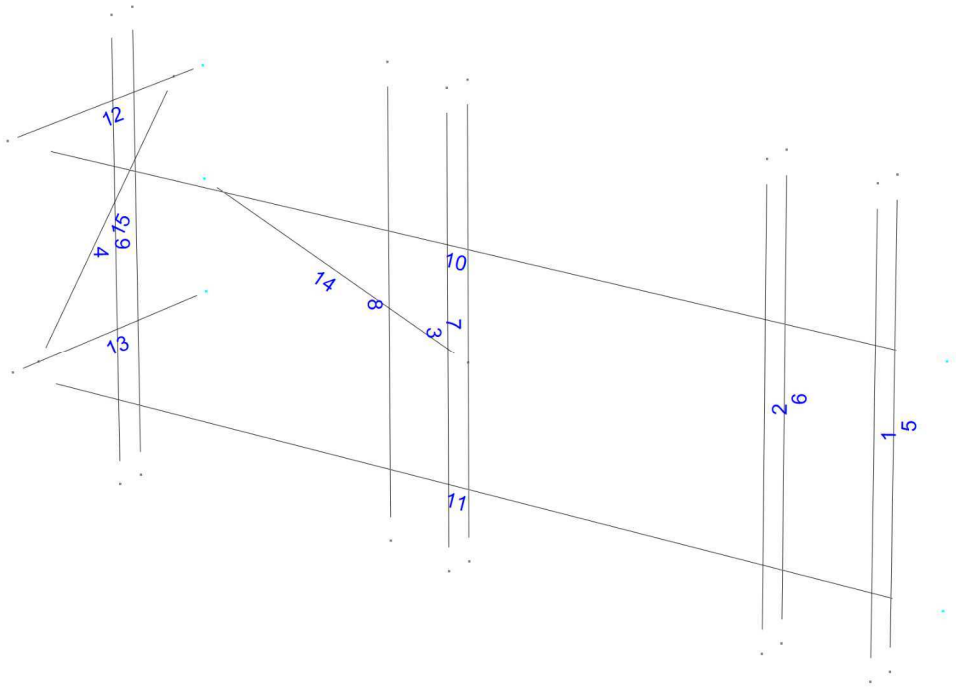
X

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



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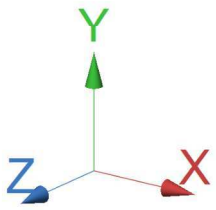
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Current Date: 8/31/2021 3:53 PM
Units system: English
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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

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

LC53=1.2D+WL0+LLa2
LC54=1.2D+WL30+LLa2
LC55=1.2D+WL60+LLa2
LC56=1.2D+WL90+LLa2
LC57=1.2D+WL120+LLa2
LC58=1.2D+WL150+LLa2
LC59=1.2D-WL0+LLa2
LC60=1.2D-WL30+LLa2
LC61=1.2D-WL60+LLa2
LC62=1.2D-WL90+LLa2
LC63=1.2D-WL120+LLa2
LC64=1.2D-WL150+LLa2
LC65=1.2D+WL0+LLa3
LC66=1.2D+WL30+LLa3
LC67=1.2D+WL60+LLa3
LC68=1.2D+WL90+LLa3
LC69=1.2D+WL120+LLa3
LC70=1.2D+WL150+LLa3
LC71=1.2D-WL0+LLa3
LC72=1.2D-WL30+LLa3
LC73=1.2D-WL60+LLa3
LC74=1.2D-WL90+LLa3
LC75=1.2D-WL120+LLa3
LC76=1.2D-WL150+LLa3
LC77=1.2D+WL0+LLa4
LC78=1.2D+WL30+LLa4
LC79=1.2D+WL60+LLa4
LC80=1.2D+WL90+LLa4
LC81=1.2D+WL120+LLa4
LC82=1.2D+WL150+LLa4
LC83=1.2D-WL0+LLa4
LC84=1.2D-WL30+LLa4
LC85=1.2D-WL60+LLa4
LC86=1.2D-WL90+LLa4
LC87=1.2D-WL120+LLa4
LC88=1.2D-WL150+LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2X2X1_4	**15**	LC31 at 0.00%	**0.34**	**OK**	Eq. H2-1
	L 3X3X1_4	**10**	LC24 at 0.00%	0.72	OK	Eq. H2-1
		13	LC31 at 12.50%	0.46	OK	Eq. H3-8
		12	LC31 at 100.00%	**0.91**	**OK**	Eq. H3-8
	PIPE 2x0.154	**14**	LC1 at 37.50%	0.18	OK	Eq. H1-1b
		5	LC52 at 82.50%	0.14	OK	Eq. H1-1b
		6	LC32 at 82.50%	0.25	OK	Eq. H1-1b
		1	LC47 at 77.08%	0.06	OK	Eq. H1-1b
		2	LC59 at 77.08%	0.07	OK	Eq. H1-1b
		3	LC6 at 75.00%	0.20	OK	Eq. H1-1b
		4	LC32 at 77.08%	0.11	OK	Eq. H1-1b
		7	LC7 at 57.29%	**0.85**	**OK**	Eq. H1-1b
		8	LC1 at 33.33%	0.07	OK	Eq. H1-1b
		9	LC31 at 82.50%	0.50	OK	Eq. H1-1b
	T2L 3X3X1_4	**11**	LC36 at 0.00%	**0.46**	**OK**	Eq. H2-1

Current Date: 8/31/2021 3:55 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT2047\LTE (3C 4C)\Rev. 3\CT2047 (Mod).retx

Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
5	-13.67	0.00	-3.83	0
20	-13.67	1.50	-3.83	0
6	-13.67	3.00	-3.83	0
3	0.00	3.00	0.00	0
1	0.00	0.00	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
5	1	1	1	1	1	1
20	1	1	1	0	0	0
6	1	1	1	1	1	1
3	1	1	1	1	1	1
1	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
11	1	2		T2L 3X3X1_4	A36	0.00	0.00	0.00
10	3	4		L 3X3X1_4	A36	0.00	0.00	0.00
13	2	5		L 3X3X1_4	A36	0.00	0.00	0.00
12	4	6		L 3X3X1_4	A36	0.00	0.00	0.00
15	7	8		L 2X2X1_4	A36	0.00	0.00	0.00
14	19	20		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
5	87	86		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	78	77		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
1	93	92		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
2	85	84		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
3	76	75		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
4	102	101		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	18	17		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
8	104	103		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
9	95	94		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
11	90.00	0	0.00	0.00	0.00
10	180.00	0	0.00	0.00	0.00
13	-90.00	0	0.00	0.00	0.00
12	-90.00	0	0.00	0.00	0.00
15	90.00	0	0.00	0.00	0.00
1	45.00	0	0.00	0.00	0.00
3	45.00	0	0.00	0.00	0.00
4	45.00	0	0.00	0.00	0.00
8	45.00	0	0.00	0.00	0.00
9	45.00	0	0.00	0.00	0.00

Hinges

	Node-J				Node-K						
Member	M33	M22	V3	V2	M33	M22	V3	V2	TOR	AXL	Axial rigidity
13	1	1	0	0	0	0	0	0	0	0	Full
12	1	1	0	0	0	0	0	0	0	0	Full
15	0	0	0	0	0	0	0	0	0	0	Tension only
14	0	1	0	0	0	0	0	0	0	0	Full

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

1 CENTRAL PARK PLAZA • NEW BRITAIN, CONN. 06051

PHONE: 827-2604

PETITION NO. 61
Westbrook, Connecticut
March 31, 1982

Commissioner Boucher, Dr. Horsfall, and Duncan Reid made a final field inspection of the new telecommunication tower at the State Police Barracks in Westbrook.

This petition involved replacing an existing 60 foot monotube telecommunication tower with a 180 foot self-supporting lattice tower. Valley Shore Emergency Communications, Inc. is the owner-operator and shares the facility with the Department of Transportation and the Department of Public Safety. The tower supports three microwave "dish" antennas and four "stick" antennas. There is no equipment shelter; associated equipment is housed in the nearby State Police Garage. The facility is used for State Police communications, motorist aid call box communications, and local emergency communications.

The monotube tower has been dismantled and removed from the site. The new tower extends approximately 100 feet above the treeline and is visible from selected locations on nearby Route 166 and from several locations on I-95. Otherwise, it appears to be screened by trees and ridges. No significant adverse environmental impacts resulted from construction.

Final approval is recommended.

Duncan C. Reid
Environmentalist
4/1/82

315 SPENCER PLAINS RD

Location	315 SPENCER PLAINS RD	**Mblu**	165/ / 015/ /
Acct#	S0513700	**Owner**	CONNECTICUT STATE OF
Assessment	$925,500	**Appraisal**	$1,322,140
PID	3667	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$988,230	$333,910	$1,322,140

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$691,760	$233,740	$925,500

Owner of Record

Owner	CONNECTICUT STATE OF
Co-Owner	
Address	315 SPENCER PLAINS RD WESTBROOK, CT 06498

Sale Price	$0
Certificate	
Book & Page	0046/0350
Sale Date	01/01/1901
Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
CONNECTICUT STATE OF	$0		0046/0350	25	01/01/1901

Building Information

Building 1 : Section 1

Year Built:	1958
Living Area:	8,282
Replacement Cost:	$1,272,938
Building Percent Good:	62
Replacement Cost Less Depreciation:	$789,220

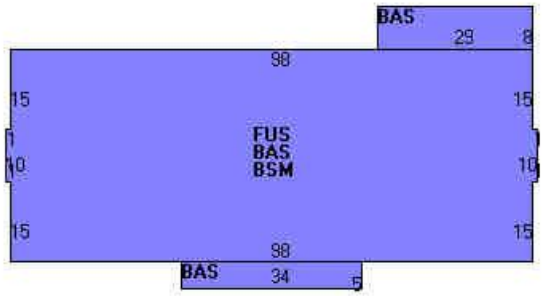
Building Attributes

Field	Description
Style:	Other State
Model	Comm/Ind
Grade	A
Stories:	1.0
Occupancy	1.00
Exterior Wall 1	Brick
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Linoleum
Interior Floor 2	Carpet
Heating Fuel	Oil
Heating Type	Hot Water
AC Percent	100
Foundation	Poured Conc
Bldg Use	Exempt Comm
Total Rooms	0
Total Bedrms	0
Total Fixtures	4
% Sprinklers	0
1st Floor Use:	
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	9.00
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos2/WestbrookCTPhotos//\00\00\07\37.JPG)

Building Layout



(http://images.vgsi.com/photos2/WestbrookCTPhotos//Sketches/3667_366

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	4,342	4,342
FUS	Finished Upper Story	3,940	3,940
BSM	Basement	3,940	0
		12,222	8,282

Building 2 : Section 1

Year Built: 1958
Living Area: 5,832
Replacement Cost: $290,737
Building Percent Good: 62
Replacement Cost Less Depreciation: $180,260

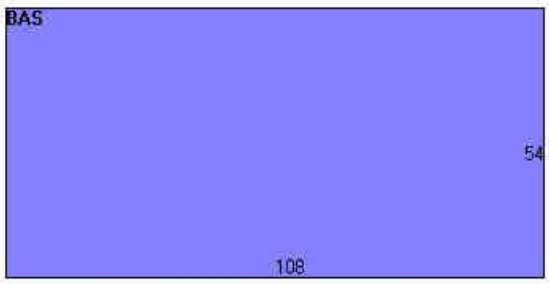
Building Attributes : Bldg 2 of 2	
Field	Description
Style:	Comm Garage

Model	Svc Sta/Garage
Grade	C+
Stories:	1.0
Occupancy	0.00
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Hot Air
AC Percent	0
Foundation	Slab
Bldg Use	Exempt Ind
Total Rooms	0
Total Bedrms	0
Total Fixtures	4
% Sprinklers	0
1st Floor Use:	
Heat/AC	NONE
Frame Type	REINF. CONCR
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	20.00
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos2/WestbrookCTPhotos//\00\00\00\22.JPG)

Building Layout



(http://images.vgsi.com/photos2/WestbrookCTPhotos//Sketches/3667_517

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	5,832	5,832
		5,832	5,832

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	920
Description	Exempt Comm
Zone	LDR

Land Line Valuation

Size (Acres)	3.2
Depth	
Assessed Value	$233,740

Neighborhood	COM	**Appraised Value**	$333,910
Alt Land Appr	No		
Category			

Outbuildings

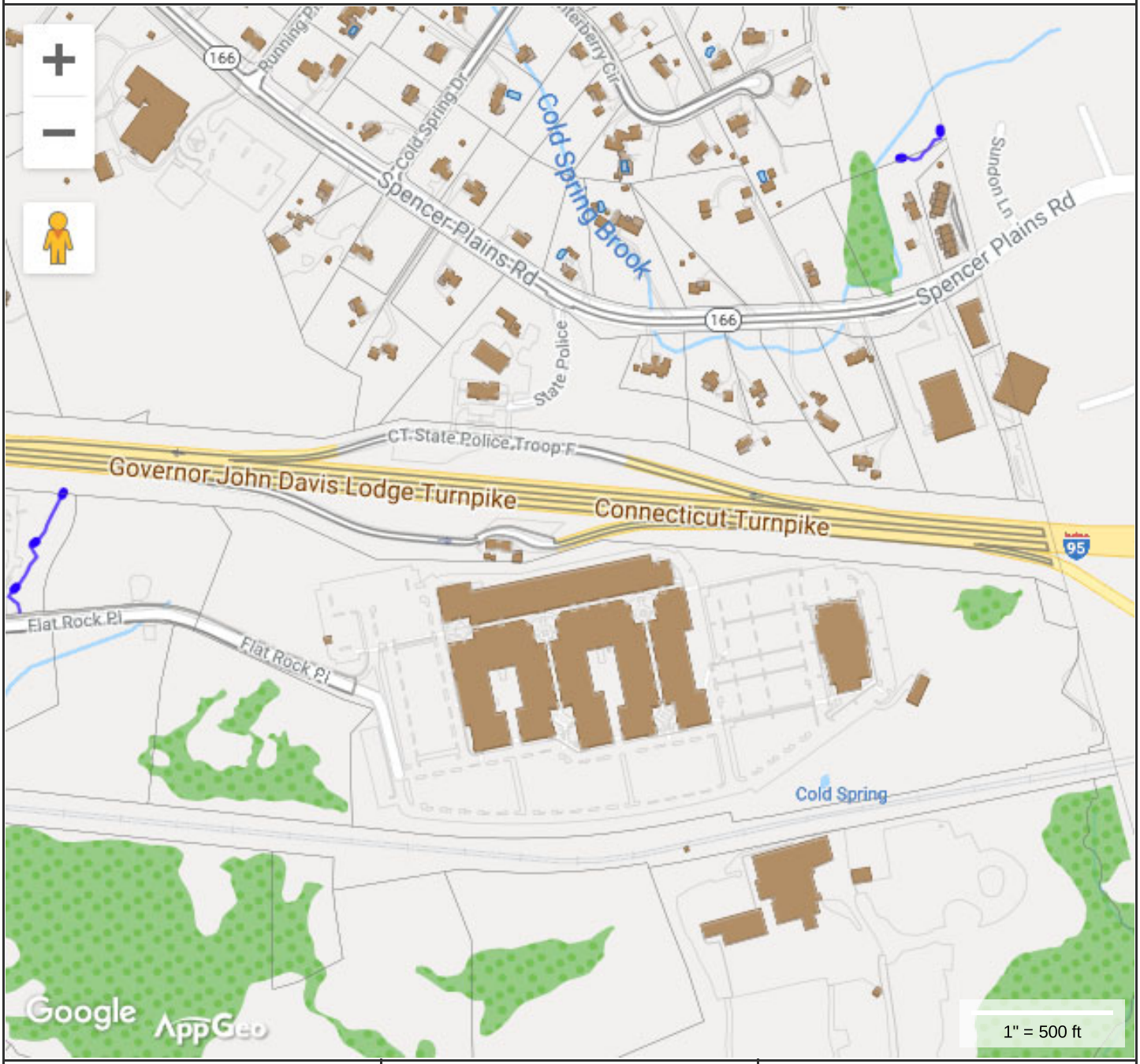
Outbuildings							Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**	**Comment**
PAV1	Paving			25000.00 S.F.	$18,750	1	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$988,230	$333,910	$1,322,140
2018	$988,230	$333,910	$1,322,140
2017	$988,230	$333,910	$1,322,140

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$691,760	$233,740	$925,500
2018	$691,760	$233,740	$925,500
2017	$691,760	$233,740	$925,500

315 SPENCER PLAINS RD

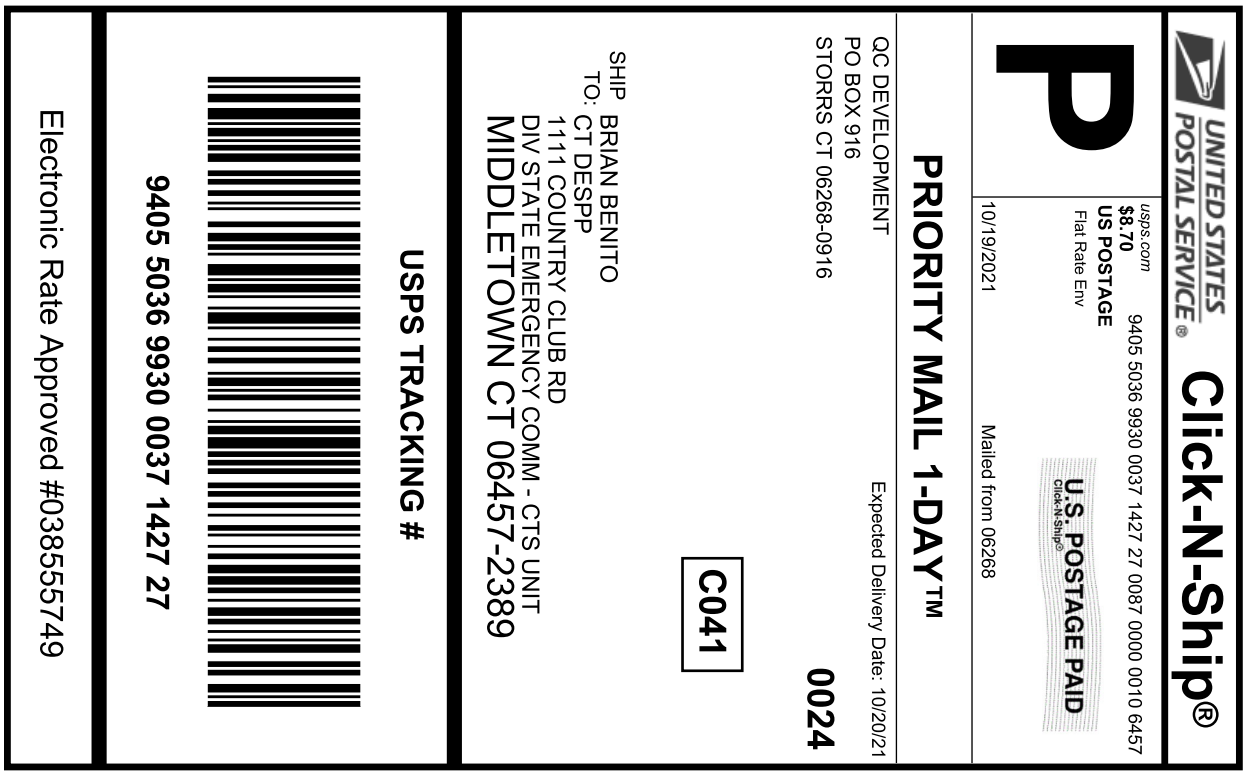


MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

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

Geometry updated October 2018
Data updated 11/19/2018

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.



Cut on dotted line.

Instructions

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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 0037 1427 27

Trans. #:	546323201
Print Date:	10/19/2021
Ship Date:	10/19/2021
Expected Delivery Date:	10/20/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

To: BRIAN BENITO
CT DESPP
1111 COUNTRY CLUB RD
DIV STATE EMERGENCY COMM - CTS UNIT
MIDDLETOWN CT 06457-2389

* 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

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0037 1427 34 0087 0000 0010 6498

usps.com
$8.70
US POSTAGE
Flat Rate Env

10/19/2021 Mailed from 06268

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Click-N-Ship®

PRIORITY MAIL 1-DAY™

Expected Delivery Date: 10/20/21

QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

0024

R003

SHIP TO: MR. NOEL BISHOP
TOWN OF WESTBROOK
866 BOSTON POST RD
CC: ERIC KNAPP - PLANNING & ZONING
WESTBROOK CT 06498-1881

USPS TRACKING #

9405 5036 9930 0037 1427 34

Electronic Rate Approved #038555749

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5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0037 1427 34

Trans. #:	546323201
Print Date:	10/19/2021
Ship Date:	10/19/2021
Expected Delivery Date:	10/20/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

To: MR. NOEL BISHOP
TOWN OF WESTBROOK
866 BOSTON POST RD
CC: ERIC KNAPP - PLANNING & ZONING
WESTBROOK CT 06498-1881

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

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FAQs >

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Remove ×

Tracking Number: 9405503699300037142727

Expected Delivery by

WEDNESDAY
20 OCTOBER 2021 ⓘ
by
9:00pm ⓘ

USPS Tracking Plus™ Available ⌄

Feedback

Departed Post Office

October 19, 2021 at 4:47 pm
STORRS MANSFIELD, CT 06268

Change Delivery Instructions ⌄

Text & Email Updates ⌄

Delivery Instructions ⌄

Tracking History ⌄

USPS Tracking Plus™ ⌄

Product Information ⌄

See Less

Remove

Tracking Number: 9405503699300037142734

Expected Delivery by

WEDNESDAY

20 OCTOBER 2021

by **9:00pm**

USPS Tracking Plus™ Available

Departed Post Office

October 19, 2021 at 4:47 pm
STORRS MANSFIELD, CT 06268

Change Delivery Instructions

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FAQs