EM-CING-028-130122

less PCS, LLC
[illegible] General Patton Dr.
Naugatuck, CT 06770
Phone: (203)-217-6200
Christopher Bisson
Real Estate Consultant

ORIGINAL

RECEIVED
JAN 22 2013
CONNECTICUT
SITING COUNCIL

January 18, 2013

Hand Delivered

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at268 Windham Ave., Colchester, CT 06415, know to AT&T as site CT2284.

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

UMTS offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration based on the supplied structural modification plan dated 4/26/2012 requiring the restacking of the existing coaxial cables.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound as all proposed equipment will be located in the existing AT&T equipment shelter.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more GSM channels for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons New Cingular Wireless PCS, LLC respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (203)-217-6200 or email CBisson@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Christopher Bisson
Real Estate Consultant

PROJECT INFORMATION

SCOPE OF WORK:	TELECOMMUNICATIONS FACILITY UPGRADE (LTE): 1. INSTALL (3) NEW LTE ANTENNAS, (6) RRH'S, (1) SURGE ARRESTOR, (1) FIBER LINE, (2) DC POWER LINES & (1) GPS ANTENNA 2. INSTALL (1) LTE 6601 CABINET	
SITE ADDRESS:	268 WINDHAM AVENUE COLCHESTER, CT 06415 CONNECTICUT STATE POLICE TOWER #50, COLCHESTER, CT	
LATITUDE: LONGITUDE:	41.59263 N 72.32117 W	41° 35' 33.5" N 72° 19' 16.2" W
CURRENT USE: PROPOSED USE:	TELECOMMUNICATIONS FACILITY TELECOMMUNICATIONS FACILITY	

at&t

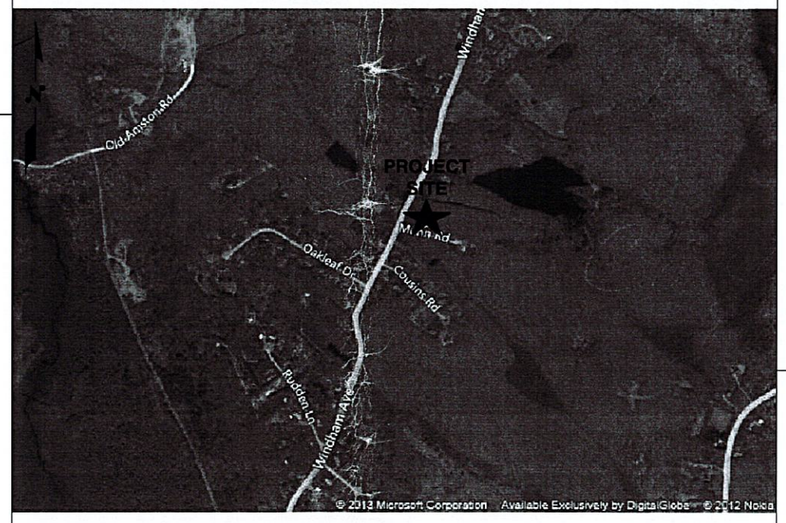
SITE NUMBER: CT2284
SITE NAME: COLCHESTER MUNN ROAD STATE POLICE

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. TURN LEFT ONTO CAPITOL BLVD. TURN LEFT ONTO WEST ST. MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD 4.5 MILES. MERGE ONTO CT-3 N VIA EXIT 25 TOWARD GLASTONBURY. MERGE ONTO CT-2 E TOWARD NORWICH 19.5 MILES. TAKE THE CT-16 EXIT, EXIT 18, TOWARD COLCHESTER. TURN RIGHT ONTO CT-16/MIDDLETOWN RD. CONTINUE TO FOLLOW CT-16 .5 MILES. TURN LEFT ONTO BROADWAY ST/CT-85/CT-16. TAKE THE FIRST RIGHT ONTO CT-16/LEBANON AVE. TURN SLIGHT LEFT ONTO WINDHAM AVE. 268 WINDHAM AVE IS ON THE RIGHT.



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 REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL

BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455 OR DIAL 811

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
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FAX: (978) 336-5586

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800 MARSHALL PHELPS ROAD UNIT# 2A
WINDSOR, CT 06095

SITE NUMBER: CT2284
SITE NAME: COLCHESTER MUNN ROAD STATE POLICE
268 WINDHAM AVENUE
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NEW LONDON COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP
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0	08/15/12	ISSUED FOR REVIEW	RM	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

STATE OF CONNECTICUT · DEREK J. CROASER · No. 28551 · LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2284.01	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) 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 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 THE BRIDGE AND THE TOWER 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 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

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

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – PINNACLE WIRELESS
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. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY 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: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

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, NINTH EDITION;

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

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	OREF	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TYPICAL

Hudson Design Group LLC
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BUILDING 20 NORTH, SUITE 3090
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TEL: (978) 557-5553
FAX: (978) 336-5586

Pinnacle Wireless
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT# 2A
WINDSOR, CT 06095

SITE NUMBER: CT2284
SITE NAME: COLCHESTER
MUNN ROAD STATE POLICE
268 WINDHAM AVENUE
COLCHESTER, CT 06415
NEW LONDON COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	01/17/13	ISSUED FOR PERMITTING	MJS	DC	BPH
0	08/15/12	ISSUED FOR REVIEW	RM	DC	BPH

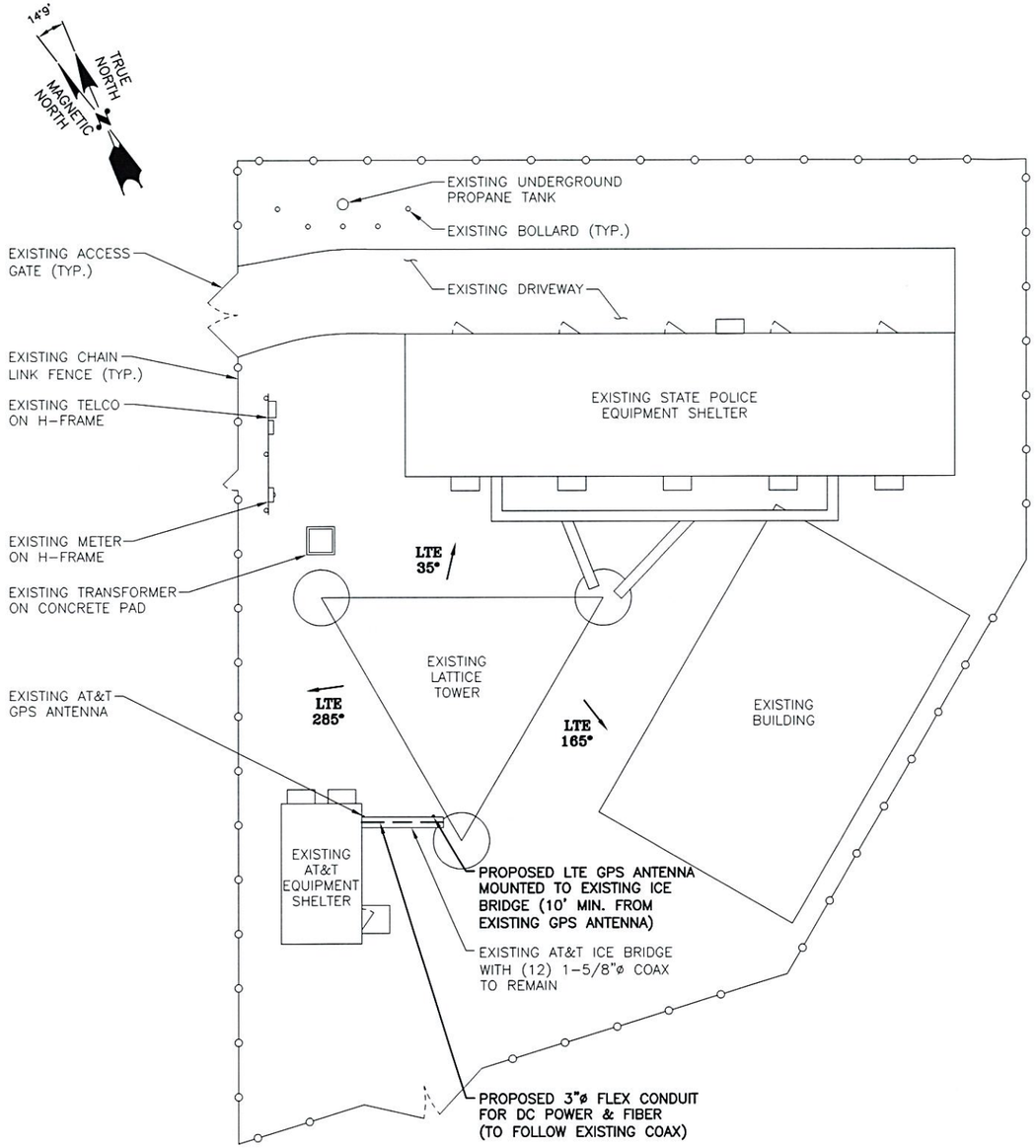
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

STATE OF CONNECTICUT · DANIEL C. CRAGER · No. 25551 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2284.01	GN-1	1



COMPOUND PLAN

SCALE: 3/32"=1'-0"

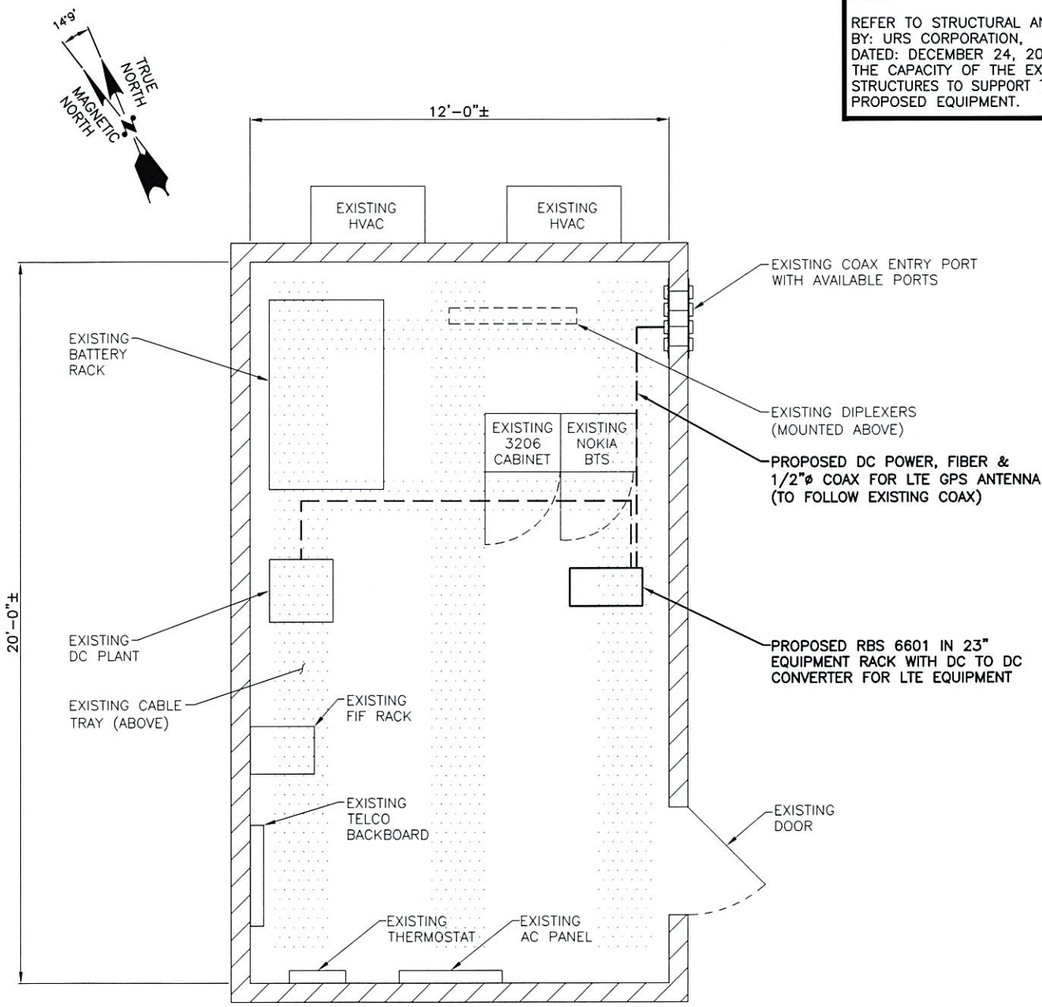
0 5'-4" 10'-8" 21'-4" 32'-0"

NOTE:

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

NOTE:

REFER TO STRUCTURAL ANALYSIS BY: URS CORPORATION, DATED: DECEMBER 24, 2012 FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



EQUIPMENT PLAN

SCALE: 1/2"= 1'-0"

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

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STATE OF CONNECTICUT
DEREK S. CRASKE
No. 28451
LICENSED PROFESSIONAL ENGINEER

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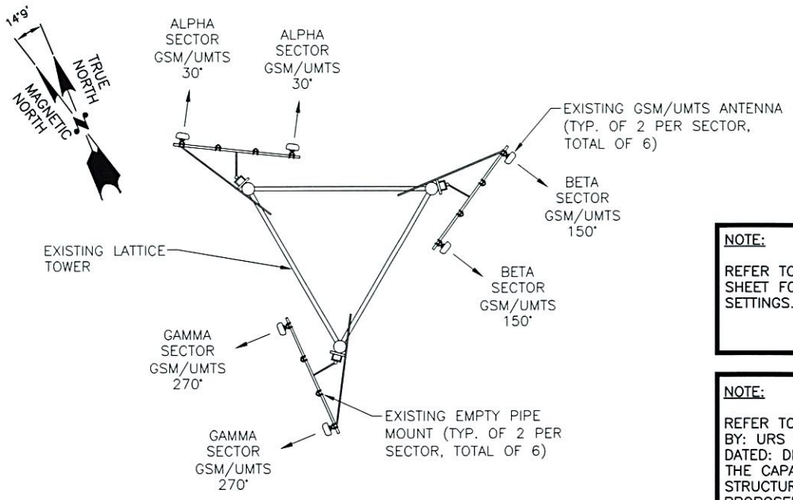
COMPOUND AND EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2284.01	A-1	1



EXISTING GSM/UMTS ANTENNA PLAN

SCALE: N.T.S.

NOTE:

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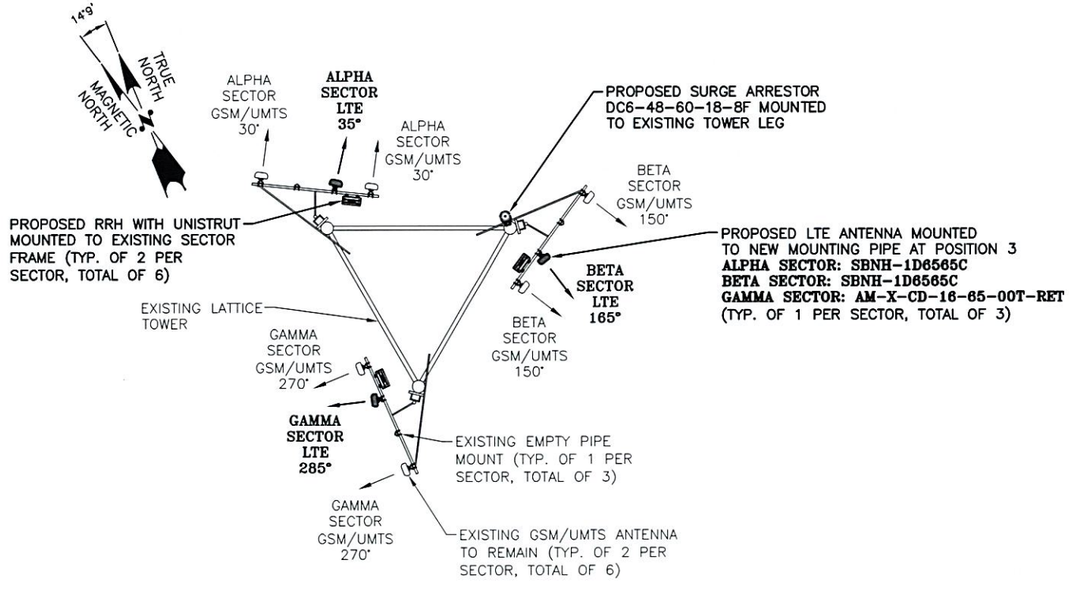
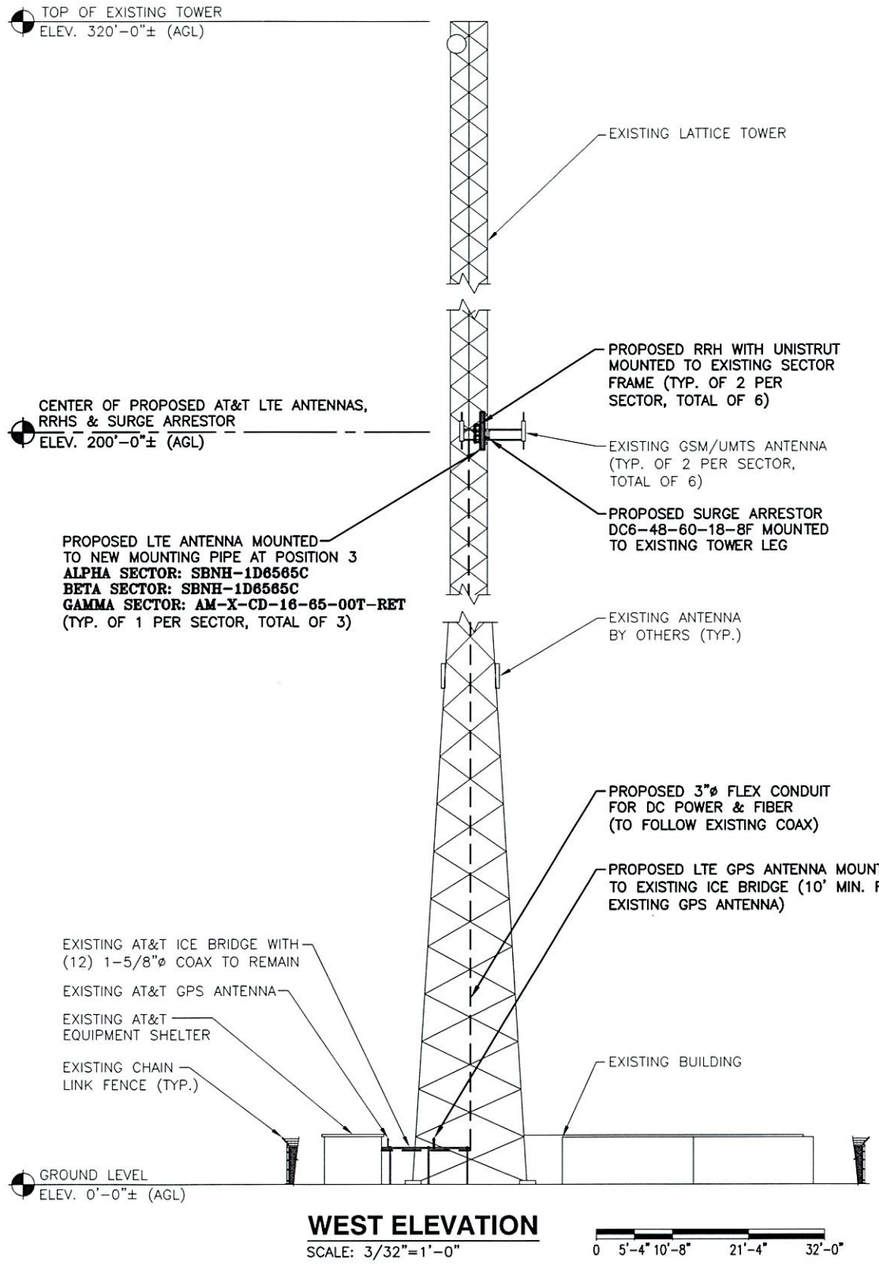


PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



WEST ELEVATION

SCALE: 3/32"=1'-0"

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

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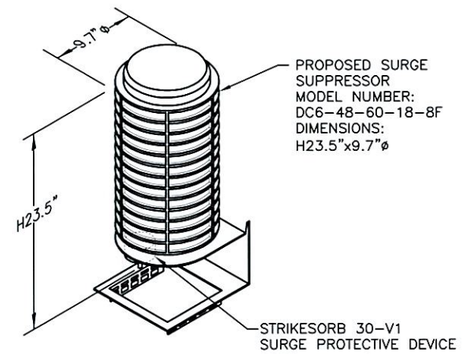
STATE OF CONNECTICUT
DENNIS L. CREASEY
No. 19551
LICENSED PROFESSIONAL ENGINEER

AT&T

ELEVATION & ANTENNA PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2284.01	A-2	1



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.

NOTE:

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

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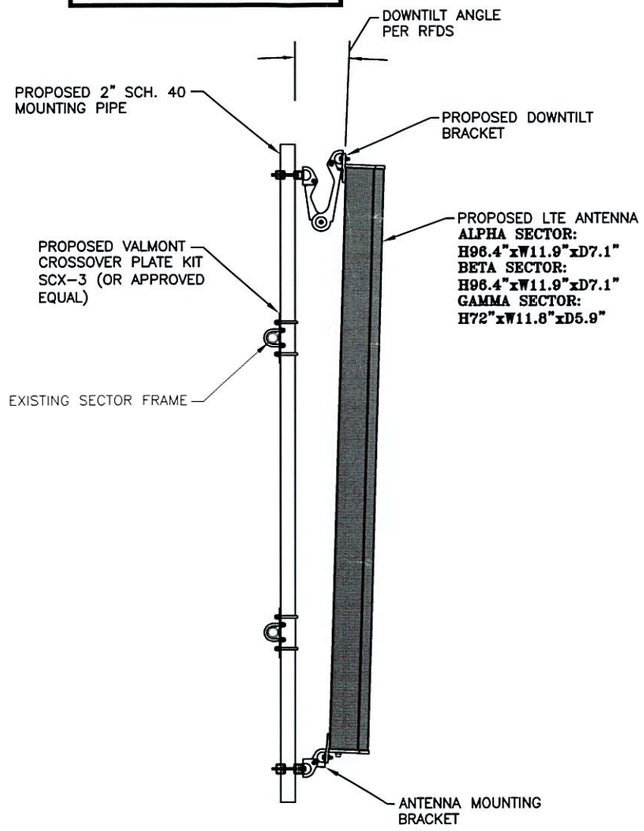
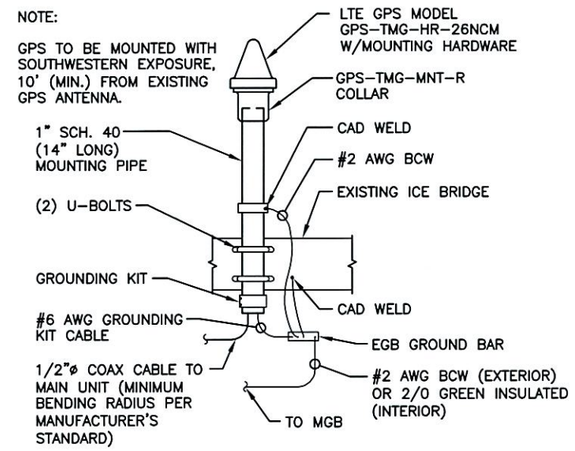


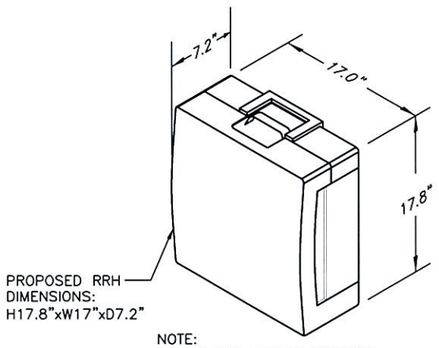
PROPOSED LTE ANTENNA DETAIL

SCALE: N.T.S.



GPS MOUNTING DETAIL

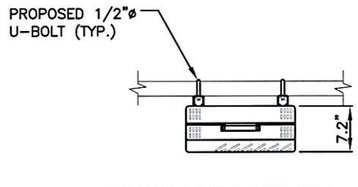
SCALE: N.T.S.

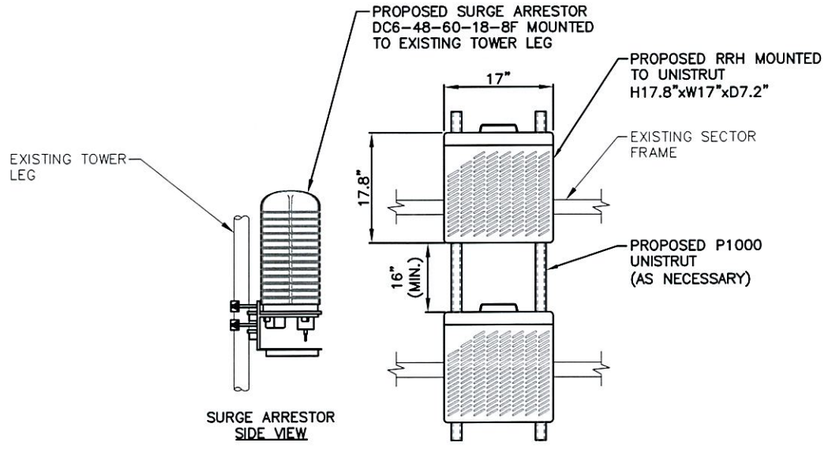


NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

RRH DETAIL

SCALE: N.T.S.





PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

Pinnacle Wireless
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT# 2A
WINDSOR, CT 06095

SITE NUMBER: CT2284
SITE NAME: COLCHESTER
MUNN ROAD STATE POLICE
268 WINDHAM AVENUE
COLCHESTER, CT 06415
NEW LONDON COUNTY

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

NO.	DATE	REVISIONS	BY	CHK APP'D
1	01/17/13	ISSUED FOR PERMITTING	MJS	DC DPH
0	08/15/12	ISSUED FOR REVIEW	RM	DC DPH

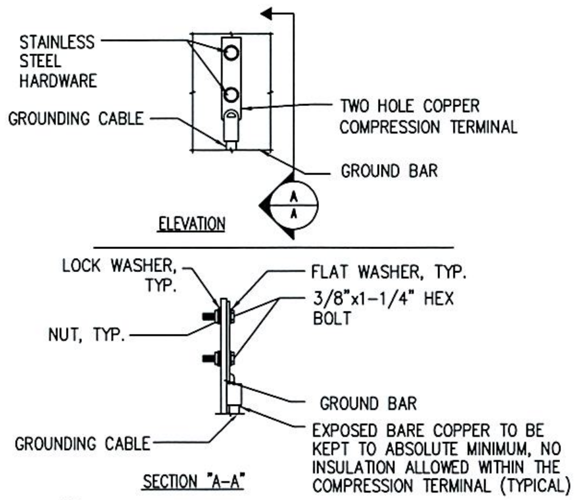
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

STATE OF CONNECTICUT · DEREK J. CREGGER · No. 22541 · LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
(LTE)

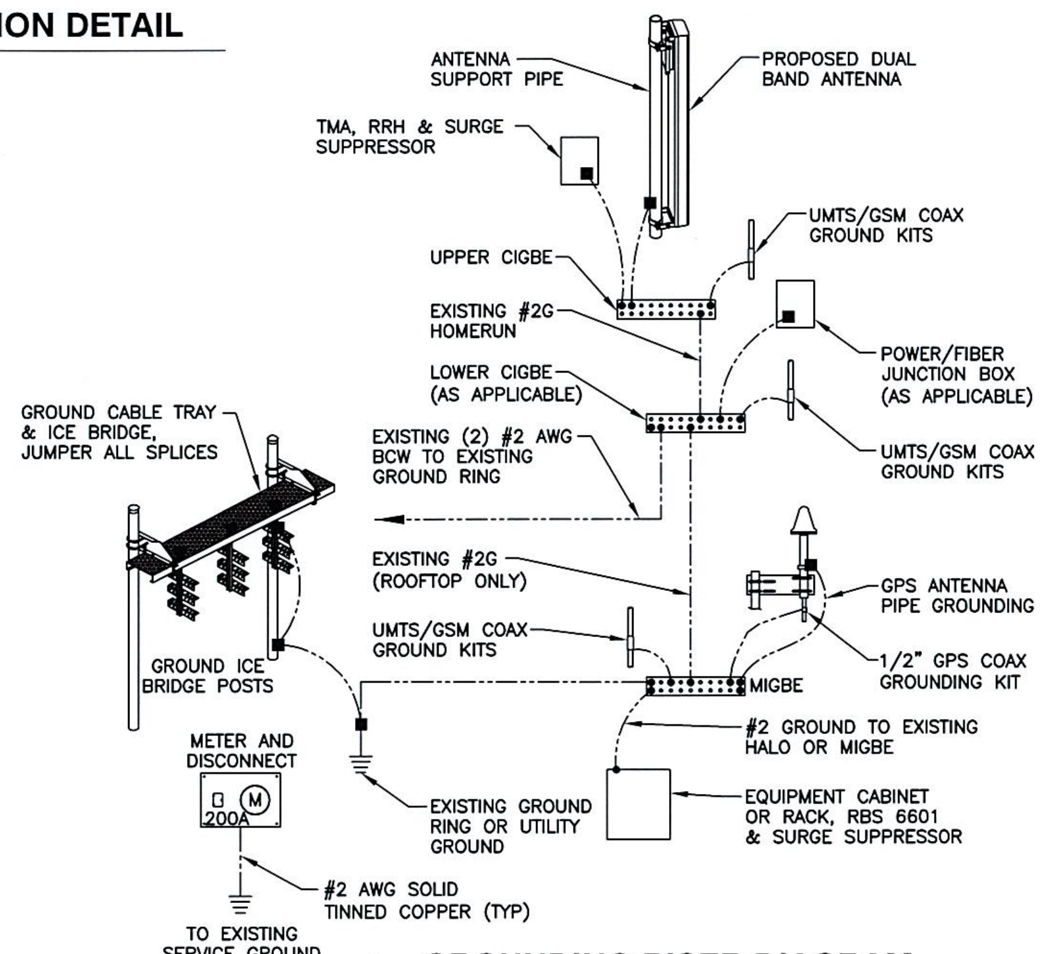
JOB NUMBER	DRAWING NUMBER	REV
2284.01	A-3	1



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

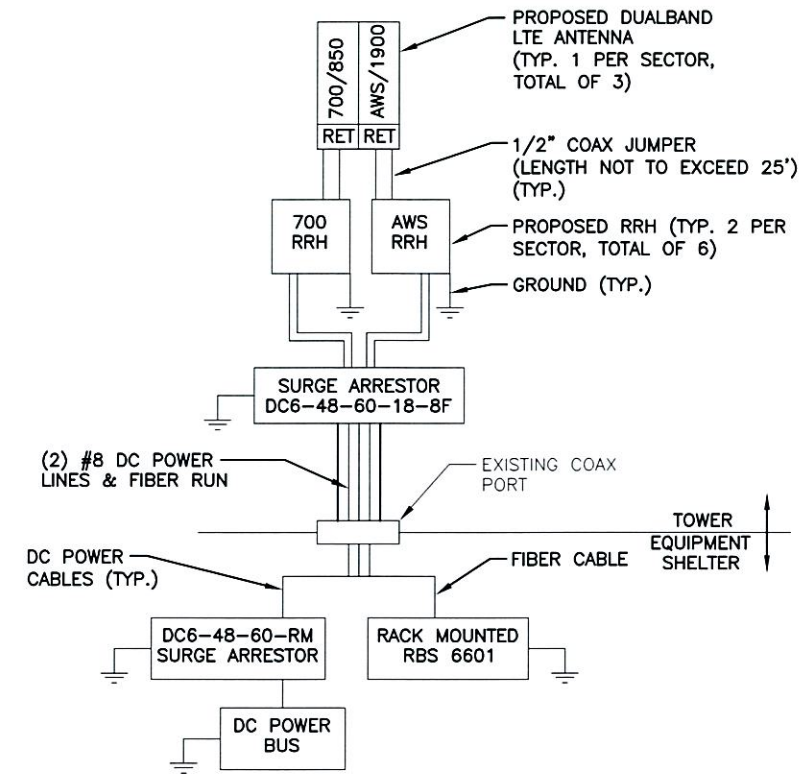
1 TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.



3 GROUNDING RISER DIAGRAM

N.T.S.



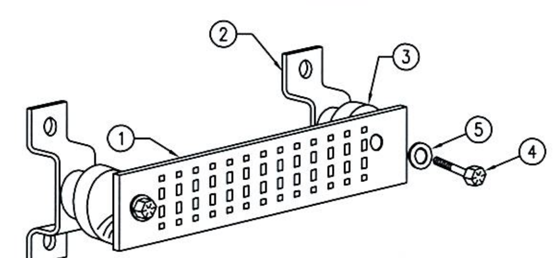
NOTE:

CONTRACTOR TO CONFIRM ALL PARTS & INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

2 LTE PLUMBING DIAGRAM

N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



4 GROUND BAR DETAIL

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

SECTION "A" - SURGE ABSORBERS

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

Hudson Design Group LLC
1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090 N. ANDOVER, MA 01845
TEL: (978) 557-5553 FAX: (978) 336-5586

Pinnacle Wireless
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT# 2A
WINDSOR, CT 06095

SITE NUMBER: CT2284
SITE NAME: COLCHESTER
MUNN ROAD STATE POLICE
268 WINDHAM AVENUE
COLCHESTER, CT 06415
NEW LONDON COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	01/17/13	ISSUED FOR PERMITTING	MJS	DC	DPH
0	08/15/12	ISSUED FOR REVIEW	RM	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

STATE OF CONNECTICUT · LICENSED PROFESSIONAL ENGINEER · No. 26351

AT&T
PLUMBING DIAGRAM & GROUNDING DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2284.01	G-1	1

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

at&t

CT2284

(Colchester Munn Road State Police)

112 Munn Road, Colchester, CT 06415

(a.k.a Windham Ave/Nunn Rd)

December 11, 2012

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the lattice tower located at 112 Munn Road in Colchester, CT. The coordinates of the tower are 41° 35' 33.46" N, 72° 19' 16.16" W.

AT&T is proposing the following modifications:

1) Install three multi-band (700/850/1900/2100 MHz) antennas for their LTE network (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

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

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

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

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

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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

4. Calculation Results

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

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular	200	880	6	296	0.0160	0.5867	2.72%
Cingular	200	1930	3	427	0.0115	1.0000	1.15%
Antenna no. 2 (CSP/FBI)	320	154.665	1	330	0.0002	0.2000	0.09%
Antenna no. 3 (CSP)	315	2141	1	1015	0.0000	1.0000	0.00%
Antenna no. 4 (SHP)	294	151.355	1	398	0.0002	0.2000	0.12%
Antenna no. 5 (DEP)	292	44.72	1	175	0.0001	0.2000	0.06%
Antenna no. 6	257	153.935	1	100	0.0001	0.2000	0.04%
Antenna no. 7 (OEM)	243	45.2	1	178	0.0002	0.2000	0.08%
Antenna no. 8 (CSP)	227	42.04	1	330	0.0003	0.2000	0.17%
Antenna no. 9 (DEP)	138	75.5	1	125	0.0004	0.2000	0.18%
Antenna no. 10 (CSP)	97	2138	1	569	0.0000	1.0000	0.00%
Antenna no. 11 (CSP)	90	2133.2	1	252	0.0000	1.0000	0.00%
Antenna no. 12 (CSP)	105	6795	1	5750	0.0005	1.0000	0.05%
Antenna no. 13 (CSP)	112	10567.5	1	1545	0.0000	1.0000	0.00%
Antenna no. 14	320	867.4	5	200	0.0005	0.5783	0.09%
Antenna no. 15	320	867.5	5	200	0.0005	0.5783	0.09%
Antenna no. 18 (FBI)	100	453.625	1	473	0.0023	0.3024	0.77%
Antenna no. 31 (CTT)	100	406	1	10	0.0001	0.2707	0.02%
Verizon	220	880	9	170	0.0114	0.5867	1.94%
Verizon PCS	220	1900	3	452	0.0101	1.0000	1.01%
Verizon Microwave	115	6004.5	1	4265.8	0.1160	1.0000	11.60%
Verizon Microwave	175	6093.45	1	4265.8	0.0501	1.0000	5.01%
AT&T UMTS	200	880	2	565	0.0010	0.5867	0.17%
AT&T UMTS	200	1900	2	875	0.0016	1.0000	0.16%
AT&T LTE	200	734	1	1375	0.0012	0.4893	0.25%
AT&T GSM	200	880	1	283	0.0003	0.5867	0.04%
AT&T GSM	200	1900	4	525	0.0019	1.0000	0.19%
						Total	**22.14%**

Table 1: Carrier Information[1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 7/26/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the URS Corporation Structural Analysis dated December 4, 2012.

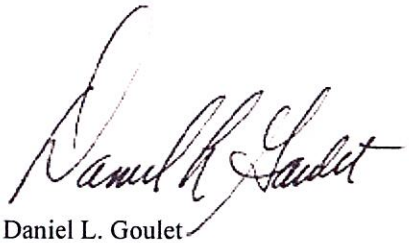
5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **22.14% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

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



Daniel L. Goulet
C Squared Systems, LLC

December 11, 2012
Date

Attachment A: References

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

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

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

(A) Limits for Occupational/Controlled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

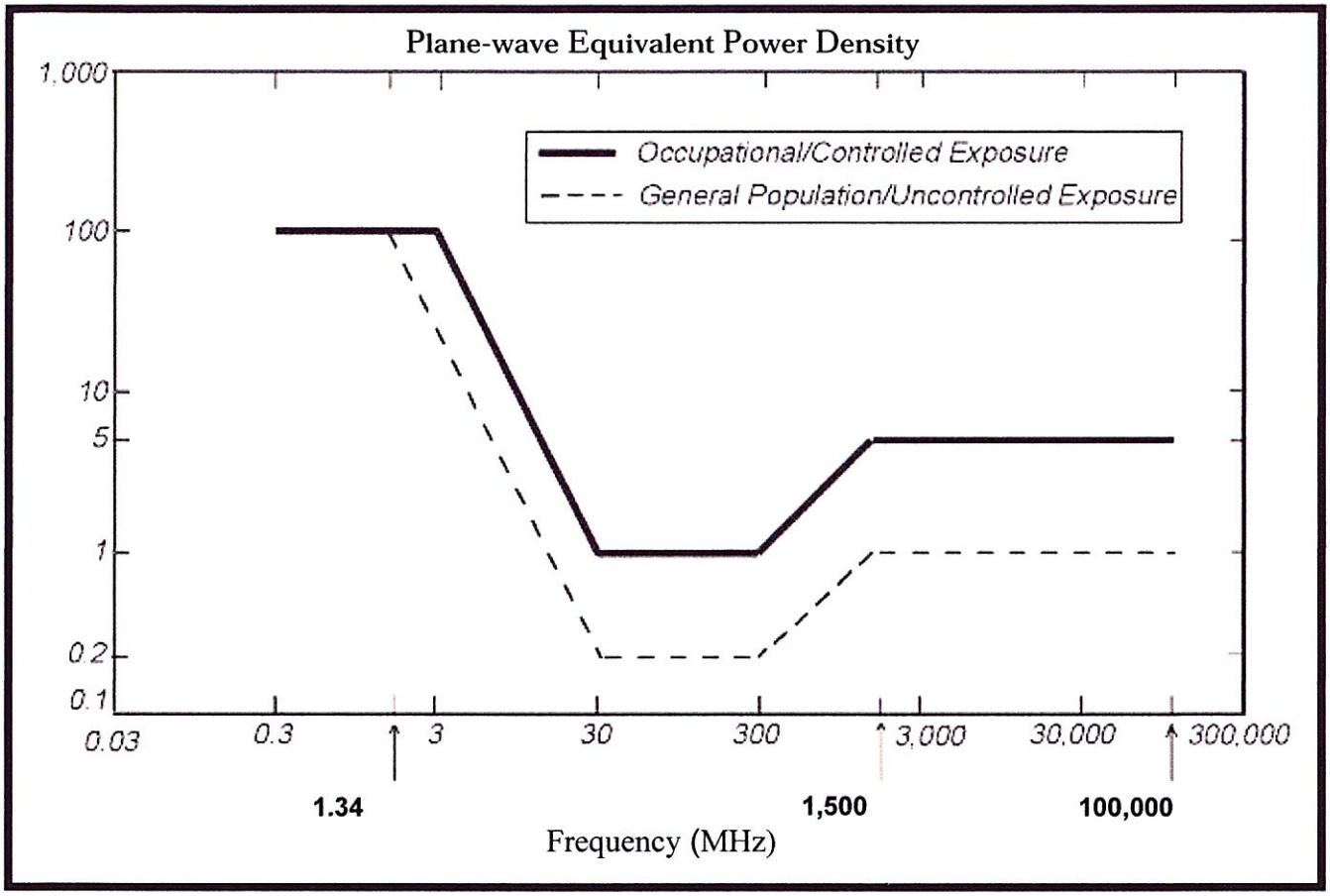
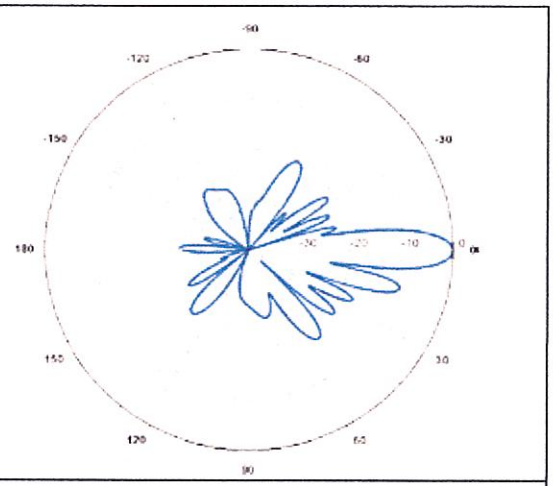


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

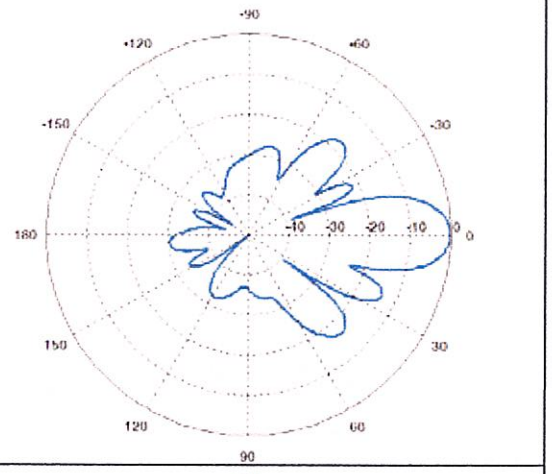
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.9" x 7.1"



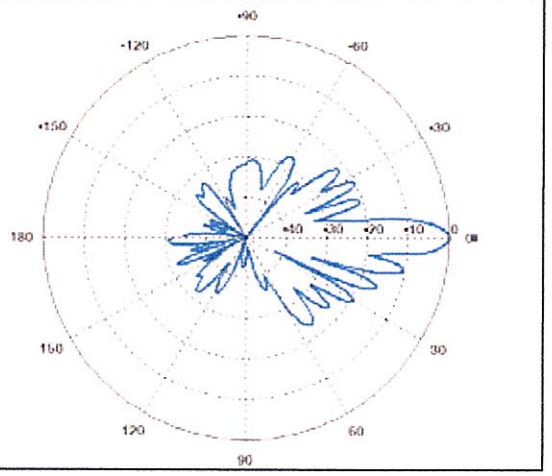
850 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	82°
Polarization:	Dual Linear ± 45°
Size L x W x D:	55.0" x 11.0" x 5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	86°
Polarization:	Dual Linear ± 45°
Size L x W x D:	55.0" x 11.0" x 5.0"



DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 320' SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR NEW ANTENNA ARRANGEMENT

AT&T Site #: CT-2284
CSP Tower #50: Colchester
Address: 112 Munn Road
Colchester, Connecticut

prepared for

at&t

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

prepared by

URS

URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882

36917385.00000
CTK-019

December 4, 2012

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis and evaluation of the existing 320' self-supporting lattice tower structure located at 112 Munn Road in Colchester, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code, the TIA/EIA-222-F standard, and the Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile), 90 mph (fastest mile) concurrent with ½" ice, and 90 mph (fastest mile) concurrent with 1/2" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report. The proposed AT&T modification is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Install **(2) SBNH-1D6565C Panel Antennas (Alpha & Beta Sectors)** **(1) AM-X-CD-16-65-00T-RET Panel Antenna (Gamma Sector)** **(6) RRH (2 per Sector)** **(1) Surge Suppressor** **(1) 3" Flex Conduit with Fiber & DC Cables**	**AT&T (proposed)**	**@ 200'**

The results of the analysis indicate that the tower structure and foundation are considered structurally adequate with the wind load specified above and all existing and proposed antenna loading. Tower deflection of the tower is within the Connecticut State Police requirements. See Section 4 of this report for additional information.

Note: Prior to the installation of proposed AT&T antenna arrangement it shall be required to verify the completion of tower and foundation reinforcement included in "Detailed Structural Analysis and Reinforcement of 320' Self-Supporting Lattice Tower and Foundation for New Antenna Arrangement", signed and sealed July 13, 2012, by URS Corporation for Verizon Wireless.

1. EXECUTIVE SUMMARY *(continued)*

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower

2) Tower geometry and structural member sizes taken from original construction drawings (Rohn File #: 43233AE) prepared by Rohn Industries, Inc., approved May 10, 2001.

3) Previous structural analysis performed by URS Corporation for Verizon Wireless, project number VZ1-166 / 36930991, signed and sealed October 12, 2006.

4) Previous structural analysis and reinforcement performed by URS Corporation for Verizon Wireless, project number VZ5-122 (Rev 2), signed and sealed July 13, 2012.

5) Antenna inventory provided by Connecticut State Police via e-mail on June 12, 2012.

6) Construction drawings prepared by Hudson Design Group, LLC., job number 2284.01, dated August 15, 2012.

7) AT&T RFDS, revision V01, dated September 19, 2012.

8) Antenna and mount configuration as specified on the following page of this report.

9) Coax cable orientation as specified in section 6 of this report.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation

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

RAS/kab

cc: ICA – URS
CF/Book

2. INTRODUCTION

The subject tower is located at 112 Munn Road in Colchester, Connecticut. The structure is a 320' self-supporting lattice tower structure designed by Rohn Industries, Inc and subsequently modified.

The inventory provided by the Connecticut State Police is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(1) PD128 antenna	CSP/FBI (existing)	Side Arm Mount	320'	(1) 7/8" coax cable
(1) PD128 antenna	CSP (existing)	Side Arm Mount	318'	(1) 7/8" coax cable
(1) 8 FT dish	CSP (existing)	Dish Mount	315'	(1) 7/8" coax cable
(3) 6 FT dishes	(wind load)	(3) Dish Mount	308'	(3) EW63 coax cables
(1) DB224 antenna	SHF (existing)	Side Arm Mount	294'	(1) 7/8" coax cable
(1) PD320 antenna	DEP (existing)	Side Arm Mount	292'	(1) 7/8" coax cable
(2) DB809 antenna	CSP (existing)	Side Arm Mount	285'	(2) 1 5/8" coax cables
(3) SC479-HF1LDF (1) BCD806-09NE (1) Tower Top Amplifier	CSP 51-55 (existing)	(3) Side Arm Mounts	280'	(4) 1 5/8" coax cables (1) 1/2" coax cable
(2) OGT9 antenna	CSP (existing)	Side Arm Mount	275'	(2) 1 5/8" coax cables
(1) PD440 antenna	OEM (existing)	Side Arm Mount	257'	(1) 7/8" coax cable
(1) PD128 antenna	OEM (existing)	Side Arm Mount	243'	(1) 7/8" coax cable
(1) PD320 antenna	CSP (existing)	Side Arm Mount	227'	(1) 7/8" coax cable
(3) BXA-70063-6CF (6) LPA-80080/4CF (3) BXA-171085/8BF (6) Diplexers	Verizon (existing)	(3) T-Arms	220'	(12) 1 5/8" coax cables
(6) Powerwave 7770.00 antennas, (6) LPG21401 TMA's and (6) LPG13519 Diplexers	AT&T (existing)	(3) T-Arms	200'	(24) 1 5/8" coax cables
(2) SBNH-1D6565C (Alpha & Beta Sectors) (1) AM-X-CD-16-65-00T-RET (Gamma Sector) (6) RRH (2 per Sector) (1) Surge Suppressor	**AT&T (proposed)**	***Shared with Above***	**200'**	**(1) 3" Flex Conduit with Fiber & DC Cables**
(1) DB-583	NEU – 48 (existing)	Side Arm Mount	174'	(1) 7/8" coax cable
(1) DB-630	NEU – 32 (existing)	Side Arm Mount	170'	(1) 7/8" coax cable
(1) DB586-Y	NEU – 49 (existing)	Side Arm Mount	166'	(1) 7/8" coax cable

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) BA1012 antenna	OEM (existing)	Side Arm Mount	140'	(1) 7/8" coax cable
(1) PD688S antenna	NEU (existing)	Side Arm Mount	140'	(1) 7/8" coax cable
(1) DB212 antenna	NEU (existing)	Side Arm Mount	140'	(1) 7/8" coax cable
(1) PD156S antenna	DEP (existing)	Flush Mount	138'	(1) 7/8" coax cable
(1) 4 FT dish	CSP (existing)	Dish Mount	112'	(1) EW108 coax cable
(1) 6 FT dish	CSP (existing)	Dish Mount	105'	(1) EW65 coax cable
(1) PD458 antenna	CTT (existing)	Side Arm Mount	100'	(1) 7/8" coax cable
(1) DB437 antenna	FBI (existing)	Side Arm Mount (listed above)	100'	(1) 7/8" coax cable
(1) 6 FT dish	CSP (existing)	Dish Mount	97'	(1) 7/8" coax cable
(1) 4 FT dish	CSP (existing)	Dish Mount	90'	(1) 7/8" coax cable

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

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with the 2005 Connecticut State Building Code, TIA/EIA-222-F—Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction—Allowable Stress Design (ASD).

The analysis was conducted using TNX Tower 6.0. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 90 mph (fastest mile) Wind Load + Tower Dead Load
Load Condition 2 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The analysis indicates that the tower superstructure has sufficient capacity to carry the loads applied. Additionally the foundation has sufficient capacity to support the proposed loading. The tower top twist and sway values were compared with the allowable values per the Connecticut State Police and found to be within the allowable values.

TABLE 1: Tower Deflection (Sway) and Rotation (Twist) at the top of the tower:

Description	Current	Allowable	Pass/Fail
Tower Sway (degrees)	0.7430	0.750	Pass
Tower Twist (degrees)	0.3546	0.750	Pass

TABLE 2: Tower Base Reactions:

Base Reactions	Original Tower Reactions	Proposed Tower Reactions
Axial Load (kips)	-	175
Shear per Leg (kips)	-	94
Total Shear (kips)	121.6	154
Uplift per Leg (kips)	549.0	628
Comp.per Leg (kips)	667.4	769
O.T. Moment (ft-kips)	21038.1	25050

For detailed proposed tower reactions, see drawing no. E-1 in section 6 of this report.

TABLE 3: Critical Tower Component Stress vs. Capacity Summary:

Component/ (Section No.)	Existing Component Size	Controlling Component/Elevation	Stress (% capacity)	Pass/Fail
Tower Legs (T14)	ROHN 12EH	Compression / 30'-60'	89.2%	Pass
Diagonal (T11)	ROHN 3EH	Compression / 100'-120'	90.0%	Pass
Horizontals (T13)	ROHN 3EH	Compression / 60'-80'	91.9%	Pass
Top Girts (T1)	L1.75x1.75x3/16	Compression / 300'-320'	2.6%	Pass
Redundant Horiz. Bracing (T15)	ROHN 1.5STD	Compression / 0'-30'	89.4%	Pass
Redundant Diag. Bracing (T12)	ROHN 2STD	Compression / 80'-100'	97.5%	Pass
Bolt Checks	7/8" A325	Bolt Shear / 120'-140'	97.5%	Pass
Anchor Bolts	1 dia. A345	Tension & Shear	52%	Pass
Foundation	Caisson	Compression	91.4%	Pass

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that the tower superstructure steel stresses are within the allowable limits. Additionally the foundation has the capacity to support the proposed loading. The tower twist and sway are within the allowable limits.

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.

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

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

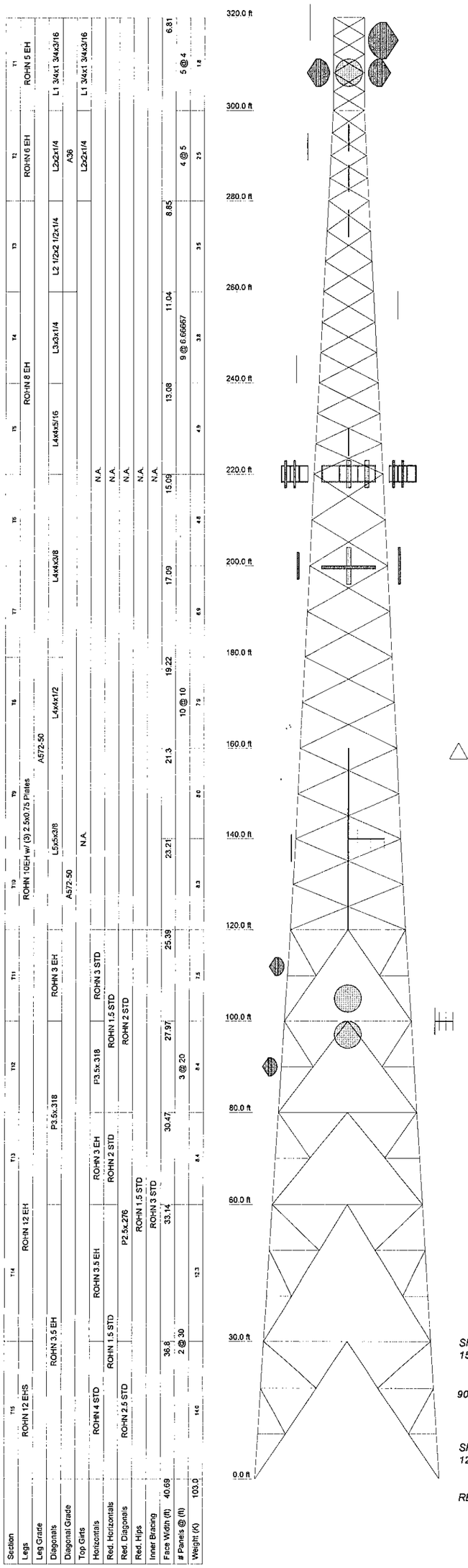
URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of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

Ongoing and Periodic Inspection and Maintenance:

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

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Dual Lights	320	(2) Diplexer (Verizon)	220
PD128 (CSP)	320	Mounting Frame (Verizon)	220
6' Side Mount Standoff	320	Mounting Frame (Verizon)	220
PD128 (CSP)	318	Mounting Frame (Verizon)	220
6' Side Mount Standoff	318	BXA-70063/6CF (Verizon)	220
6'8"x4" Pipe Mount (CSP)	315	(2) 7770.00 (ATT)	200
8 FT DISH	315	(2) 7770.00 (ATT)	200
5'3"x4" Pipe Mount (CSP future)	308	(2) LPG21401 TMA (ATT)	200
5'3"x4" Pipe Mount (CSP future)	308	(2) LPG21401 TMA (ATT)	200
5'3"x4" Pipe Mount (CSP future)	308	(2) LPG21401 TMA (ATT)	200
6 FT DISH	308	(2) LPG13519 Diplexer (ATT)	200
6 FT DISH	308	(2) LPG13519 Diplexer (ATT)	200
6 FT DISH	308	(2) LPG13519 Diplexer (ATT)	200
DB224 (SHF)	294	SBNH-1D6565C (ATT)	200
6' Side Mount Standoff	294	SBNH-1D6565C (ATT)	200
PD320 (DEP)	292	KMW AM-X-CD-16-65 (ATT)	200
6' Side Mount Standoff	292	(2) RRU (ATT)	200
(2) DB809 (CSP)	285	(2) RRU (ATT)	200
6' Side Mount Standoff	285	(2) RRU (ATT)	200
6' Side Mount Standoff	280	Surge Suppressor (ATT)	200
SC479-HF1LDF (CSP - 54)	280	PiROD 12' Lightweight T-Frame (ATT)	200
6' Side Mount Standoff	280	PiROD 12' Lightweight T-Frame (ATT)	200
TMA (CSP - 55)	280	PiROD 12' Lightweight T-Frame (ATT)	200
SC479-HF1LDF (CSP - 52)	280	(2) 7770.00 (ATT)	200
SC479-HF1LDF (CSP - 53)	280	DB583 (NEU - 48)	174
BCD-80609 (CSP - 51)	280	6' Side Mount Standoff	174
6' Side Mount Standoff	280	DB-930 (NEU - 32)	170
(2) OGT9 (CSP)	275	6' Side Mount Standoff	170
6' Side Mount Standoff	276	DB586-Y (NEU - 49)	166
PD440 (OEM)	257	6' Side Mount Standoff	166
6' Side Mount Standoff	257	6' Side Mount Standoff	140
PD128 (OEM)	243	6' Side Mount Standoff	140
6' Side Mount Standoff	243	PD688S-4 (NEU)	140
PD320 (CSP)	227	DB212-1 (NEU)	140
6' Side Mount Standoff	227	BA1012-0 (OEM)	140
BXA-171085-8BF (Verizon)	220	PD156S (DEP)	138
LPA-80080-4CF-EDIN (Verizon)	220	3'4"x4" Pipe Mount (DEP)	138
LPA-80080-4CF-EDIN (Verizon)	220	4 FT DISH	112
BXA-70063/6CF (Verizon)	220	3'4"x4" Pipe Mount (CSP)	112
BXA-171085-8BF (Verizon)	220	6 FT DISH	105
LPA-80080-4CF-EDIN (Verizon)	220	5'3"x4" Pipe Mount (CSP)	105
LPA-80080-4CF-EDIN (Verizon)	220	6' Side Mount Standoff	100
BXA-70063/6CF (Verizon)	220	DB437 (FBI)	100
BXA-171085-8BF (Verizon)	220	PD458 (CTT)	100
LPA-80080-4CF-EDIN (Verizon)	220	5'3"x4" Pipe Mount (CSP)	97
LPA-80080-4CF-EDIN (Verizon)	220	6 FT DISH	97
(2) Diplexer (Verizon)	220	4 FT DISH	90
(2) Diplexer (Verizon)	220	3'4"x4" Pipe Mount (CSP)	90

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for a 90 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.
4. TOWER RATING: 97.5%

MAX. CORNER REACTIONS AT BASE:
DOWN: 769 K
UPLIFT: -628 K
SHEAR: 94 K

AXIAL
175 K
SHEAR 154 K *MOMENT 25050 kip-ft*

TORQUE 328 kip-ft
90 mph WIND - 0.5000 in ICE
AXIAL
124 K
SHEAR 123 K *MOMENT 20243 kip-ft*

TORQUE 204 kip-ft
REACTIONS - 90 mph WIND

URS Corporation
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Rocky Hill, CT 06067
Phone: (860) 529-8882
FAX: (860) 529-3991

Job: *320' Rohn SSVMW*			
Project: *CSP Tower - Colchester, CT*			
Client: AT&T	Drawn by: Kevin_Barker	App'd:	
Code: TIA/EIA-222-F	Date: 12/04/12	Scale: NTS	
Path: P:\06\ER\Files\Reinforced 320' Rohn SSVMW.eri		Dwg No. E-1	

TNX TOWER FEEDLINE DISTRIBUTION CHART

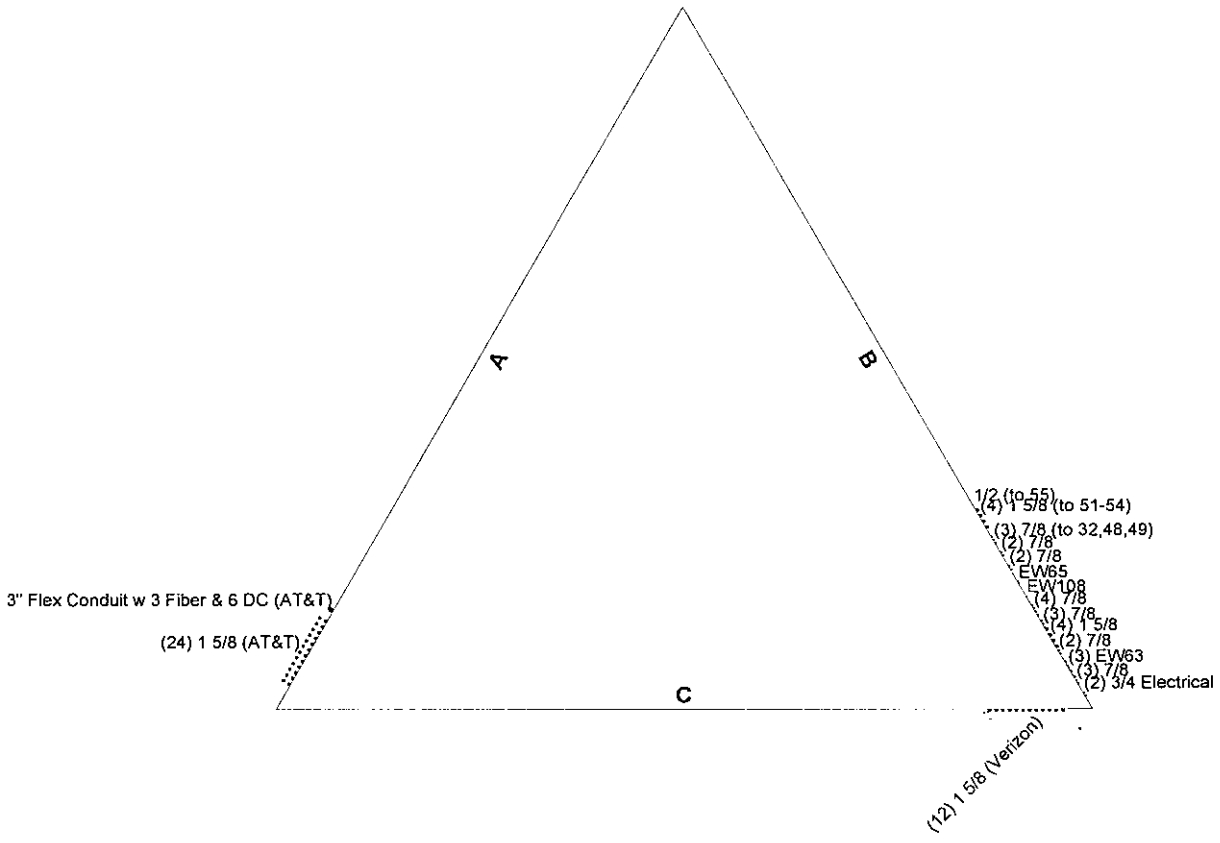
36917385
CTK-019

320' Self-Supporting Lattice Tower
Colchester, CT

12/4/2012

TNX TOWER FEEDLINE PLAN

Feedline Plan



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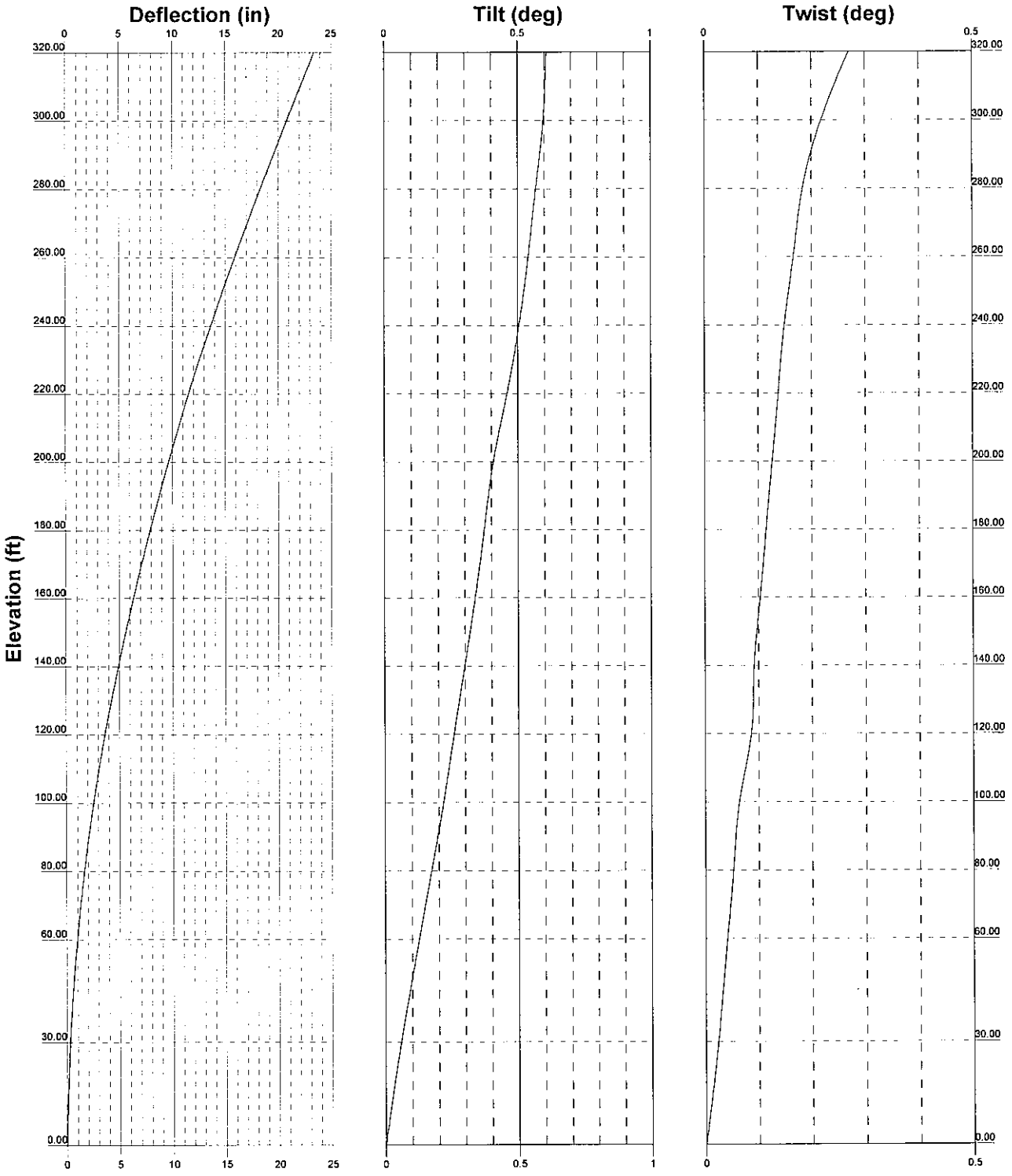
Path: P:\08\ERI Files\Reinforced 320' Rohn SSVMW.en	Dwg No. E-7

TNX TOWER DEFLECTION, TILT, TWIST

TIA/EIA-222-F - Service - 90 mph

Maximum Values



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Client: AT&T	Drawn by: Kevin_Barker	App'd:	
Code: TIA/EIA-222-F	Date: 12/04/12	Scale: NTS	
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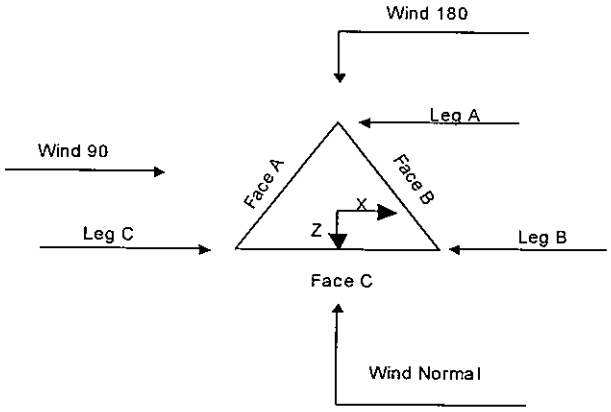
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 320.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.81 ft at the top and 40.69 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 90 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 90 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 90 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	320.00-300.00			6.81	1	20.00
T2	300.00-280.00			6.81	1	20.00
T3	280.00-260.00			8.85	1	20.00
T4	260.00-240.00			11.04	1	20.00
T5	240.00-220.00			13.08	1	20.00
T6	220.00-200.00			15.09	1	20.00
T7	200.00-180.00			17.09	1	20.00
T8	180.00-160.00			19.22	1	20.00
T9	160.00-140.00			21.30	1	20.00
T10	140.00-120.00			23.21	1	20.00
T11	120.00-100.00			25.39	1	20.00
T12	100.00-80.00			27.97	1	20.00
T13	80.00-60.00			30.47	1	20.00
T14	60.00-30.00			33.14	1	30.00
T15	30.00-0.00			36.80	1	30.00

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

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	320.00-300.00	4.00	X Brace	No	No	0.0000	0.0000
T2	300.00-280.00	5.00	X Brace	No	No	0.0000	0.0000
T3	280.00-260.00	6.67	X Brace	No	No	0.0000	0.0000
T4	260.00-240.00	6.67	X Brace	No	No	0.0000	0.0000
T5	240.00-220.00	6.67	X Brace	No	No	0.0000	0.0000
T6	220.00-200.00	10.00	X Brace	No	No	0.0000	0.0000
T7	200.00-180.00	10.00	X Brace	No	No	0.0000	0.0000
T8	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T9	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T10	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T11	120.00-100.00	20.00	K1 Down	No	Yes	0.0000	0.0000
T12	100.00-80.00	20.00	K1 Down	No	Yes	0.0000	0.0000
T13	80.00-60.00	20.00	K1 Down	No	Yes	0.0000	0.0000
T14	60.00-30.00	30.00	K2 Down	No	Yes	0.0000	0.0000
T15	30.00-0.00	30.00	K2 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 320.00-300.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 300.00-280.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 280.00-260.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T4 260.00-240.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T5 240.00-220.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T6 220.00-200.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A572-50 (50 ksi)
T7 200.00-180.00	Arbitrary Shape	ROHN 10EH w/ (3) 2.5x0.75 Plates	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A572-50 (50 ksi)
T8 180.00-160.00	Arbitrary Shape	ROHN 10EH w/ (3) 2.5x0.75 Plates	A572-50 (50 ksi)	Equal Angle	L4x4x1/2	A572-50 (50 ksi)
T9 160.00-140.00	Arbitrary Shape	ROHN 10EH w/ (3) 2.5x0.75 Plates	A572-50 (50 ksi)	Equal Angle	L5x5x3/8	A572-50 (50 ksi)
T10 140.00-120.00	Arbitrary Shape	ROHN 10EH w/ (3) 2.5x0.75 Plates	A572-50 (50 ksi)	Equal Angle	L5x5x3/8	A572-50 (50 ksi)
T11 120.00-100.00	Arbitrary Shape	ROHN 10EH w/ (3) 2.5x0.75 Plates	A572-50 (50 ksi)	Pipe	ROHN 3 EH	A572-50 (50 ksi)
T12 100.00-80.00	Arbitrary Shape	ROHN 10EH w/ (3) 2.5x0.75 Plates	A572-50 (50 ksi)	Pipe	P3.5x.318	A572-50 (50 ksi)
T13 80.00-60.00	Pipe	ROHN 12 EH	A572-50 (50 ksi)	Pipe	P3.5x.318	A572-50 (50 ksi)
T14 60.00-30.00	Pipe	ROHN 12 EH	A572-50 (50 ksi)	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)
T15 30.00-0.00	Pipe	ROHN 12 EHS	A572-50 (50 ksi)	Pipe	ROHN 3.5 EH	A572-50 (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 320.00-300.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 300.00-280.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		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
T11 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T12 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Pipe	P3.5x.318	A572-50 (50 ksi)
T13 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 3 EH	A572-50 (50 ksi)
T14 60.00-30.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)
T15 30.00-0.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 4 STD	A572-50 (50 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
T11 120.00-100.00	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T12 100.00-80.00	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T13 80.00-60.00	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T14 60.00-30.00	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T15 30.00-0.00	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T11	A572-50	Horizontal (1)	Pipe	ROHN 1.5 STD	1
120.00-100.00	(50 ksi)	Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal		ROHN 2.5 STD	1
T12	A572-50	Horizontal (1)	Pipe	ROHN 1.5 STD	1
100.00-80.00	(50 ksi)	Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal		ROHN 2.5 STD	1
T13	A572-50	Horizontal (1)	Pipe	ROHN 2 STD	1
80.00-60.00	(50 ksi)	Diagonal (1)	Pipe	P2.5x.276	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal		ROHN 3 STD	1
T14	A572-50	Horizontal (1)	Pipe	ROHN 1.5 STD	1
60.00-30.00	(50 ksi)	Horizontal (2)		P2.5x.276	
		Diagonal (1)	Pipe	P2.5x.276	1
		Diagonal (2)		ROHN 2.5 STD	
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip (2)		ROHN 2 STD	
		Hip Diagonal		ROHN 2 STD	1
T15	A572-50	Horizontal (1)	Pipe	ROHN 1.5 STD	1
30.00-0.00	(50 ksi)	Horizontal (2)		ROHN 2.5 EH	
		Diagonal (1)	Pipe	ROHN 2.5 STD	1
		Diagonal (2)		ROHN 2.5 STD	
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip (2)		ROHN 2 STD	
		Hip Diagonal		ROHN 2.5 STD	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
T1	0.00	0.0000	A36	1	1	1	36.0000	36.0000
320.00-300.00			(36 ksi)					
T2	0.00	0.0000	A36	1	1	1	36.0000	36.0000
300.00-280.00			(36 ksi)					
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000
280.00-260.00			(36 ksi)					
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000
260.00-240.00			(36 ksi)					
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000
240.00-220.00			(36 ksi)					
T6	0.00	0.0000	A36	1	1	1	36.0000	36.0000
220.00-200.00			(36 ksi)					
T7	0.00	0.0000	A36	1	1	1	36.0000	36.0000
200.00-180.00			(36 ksi)					
T8	0.00	0.0000	A36	1	1	1	36.0000	36.0000
180.00-160.00			(36 ksi)					
T9	0.00	0.0000	A36	1	1	1	36.0000	36.0000
160.00-140.00			(36 ksi)					
T10	0.00	0.0000	A36	1	1	1	36.0000	36.0000
140.00-120.00			(36 ksi)					
T11	0.00	0.0000	A36	1	1	1	36.0000	36.0000
120.00-100.00			(36 ksi)					
T12	0.00	0.0000	A36	1	1	1	36.0000	36.0000

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
100.00-80.00			(36 ksi)					
T13	0.00	0.0000	A36	1	1	1	36.0000	36.0000
80.00-60.00			(36 ksi)					
T14	0.00	0.0000	A36	1	1	1	36.0000	36.0000
60.00-30.00			(36 ksi)					
T15 30.00-0.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					

Tower Section Geometry *(cont'd)*

Tower Elevation	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
ft										
T1	Yes	No	1	1	1	1	1	1	1	1
320.00-300.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
300.00-280.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
280.00-260.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
260.00-240.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
240.00-220.00				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
220.00-200.00				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
200.00-180.00				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T11	No	No	1	1	0.95	1	1	1	1	1
120.00-100.00				1	0.95	1	1	1	1	1
T12	No	No	1	1	0.95	1	1	1	1	1
100.00-80.00				1	0.95	1	1	1	1	1
T13	No	No	1	1	0.95	1	1	1	1	1
80.00-60.00				1	0.95	1	1	1	1	1
T14	No	No	1	1	1	1	1	1	1	1
60.00-30.00				1	1	1	1	1	1	1
T15	No	No	1	1	1	1	1	1	1	1
30.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 320.00-300.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 300.00-280.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 280.00-260.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 260.00-240.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 240.00-220.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 220.00-200.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 200.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 60.00-30.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 30.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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	Flange	1.0000	6	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
320.00-300.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T2	Flange	1.0000	8	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
300.00-280.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T3	Flange	1.0000	8	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
280.00-260.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T4	Flange	1.0000	8	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
260.00-240.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T5	Flange	1.0000	8	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
240.00-220.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T6	Flange	1.0000	12	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
220.00-200.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T7	Flange	1.0000	12	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
200.00-180.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T8	Flange	1.0000	12	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
180.00-160.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T9	Flange	1.0000	12	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
160.00-140.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T10	Flange	1.0000	12	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
140.00-120.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T11	Flange	1.0000	12	0.7500	3	0.6250	0	0.6250	0	0.6250	0	0.7500	2	0.6250	0
120.00-100.00		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T12	Flange	1.0000	16	0.7500	3	0.6250	0	0.6250	0	0.6250	0	0.7500	2	0.6250	0
100.00-80.00		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T13	Flange	1.0000	16	0.7500	3	0.6250	0	0.6250	0	0.6250	0	0.7500	2	0.6250	0
80.00-60.00		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T14	Flange	1.0000	16	0.8750	3	0.6250	0	0.6250	0	0.6250	0	0.7500	2	0.6250	0
60.00-30.00		A325N		A325X		A325N		A325N		A325N		A325X		A325N	
T15 30.00-0.00	Flange	1.0000	24	0.8750	3	0.6250	0	0.6250	0	0.6250	0	0.7500	2	0.6250	0
		A325N		A325X		A325N		A325N		A325N		A325X		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon)	C	Yes	Ar (CfAe)	220.00 - 0.00	0.0000	-0.42	12	12	1.9800	1.9800		1.04
3/4 Electrical	B	Yes	Ar (CfAe)	320.00 - 0.00	0.0000	0.48	2	2	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	320.00 - 0.00	0.0000	0.46	3	3	1.1100	1.1100		0.54
EW63	B	Yes	Af (CfAe)	308.00 - 0.00	0.0000	0.44	3	3	1.5742	1.5742	5.0668	0.51
7/8	B	Yes	Ar (CfAe)	294.00 - 0.00	0.0000	0.42	2	2	1.1100	1.1100		0.54
1 5/8	B	Yes	Ar (CfAe)	280.00 - 0.00	0.0000	0.4	4	4	1.9800	1.9800		1.04
7/8	B	Yes	Ar (CfAe)	250.00 - 0.00	0.0000	0.38	3	3	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	140.00 - 0.00	0.0000	0.36	4	4	1.1100	1.1100		0.54
EW108	B	Yes	Af (CfAe)	112.00 - 0.00	0.0000	0.34	1	1	0.5899	0.5899	2.0063	0.15
EW65	B	Yes	Af (CfAe)	105.00 - 0.00	0.0000	0.32	1	1	1.5742	1.5742	5.0668	0.51
7/8	B	Yes	Ar (CfAe)	105.00 - 0.00	0.0000	0.3	2	2	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	95.00 - 0.00	0.0000	0.28	2	2	1.1100	1.1100		0.54
1 5/8 (AT&T)	A	Yes	Ar (CfAe)	200.00 - 0.00	0.0000	-0.42	24	12	1.9800	1.9800		1.04
7/8 (to 32,48,49)	B	Yes	Ar (CfAe)	174.00 - 0.00	0.0000	0.26	3	3	1.1100	1.1100		0.54
1 5/8 (to 51-54)	B	Yes	Ar (CfAe)	280.00 - 0.00	0.0000	0.23	4	4	1.9800	1.9800		1.04
1/2 (to 55)	B	Yes	Ar (CfAe)	280.00 - 0.00	0.0000	0.21	1	1	0.5800	0.5800		0.25
3" Flex Conduit w 3 Fiber & 6 DC (AT&T)	A	Yes	Ar (CfAe)	200.00 - 0.00	0.0000	-0.36	1	1	0.0000	3.0000		3.00

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	320.00-300.00	A	0.000	0.000	0.000	0.000	0.00
		B	9.250	3.148	0.000	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.00
T2	300.00-280.00	A	0.000	0.000	0.000	0.000	0.00
		B	11.840	7.871	0.000	0.000	0.10
		C	0.000	0.000	0.000	0.000	0.00
T3	280.00-260.00	A	0.000	0.000	0.000	0.000	0.00
		B	40.317	7.871	0.000	0.000	0.28
		C	0.000	0.000	0.000	0.000	0.00
T4	260.00-240.00	A	0.000	0.000	0.000	0.000	0.00
		B	43.092	7.871	0.000	0.000	0.29
		C	0.000	0.000	0.000	0.000	0.00
T5	240.00-220.00	A	0.000	0.000	0.000	0.000	0.00
		B	45.867	7.871	0.000	0.000	0.31
		C	0.000	0.000	0.000	0.000	0.00
T6	220.00-200.00	A	0.000	0.000	0.000	0.000	0.00
		B	45.867	7.871	0.000	0.000	0.31
		C	39.600	0.000	0.000	0.000	0.25
T7	200.00-180.00	A	44.600	0.000	0.000	0.000	0.56
		B	45.867	7.871	0.000	0.000	0.31
		C	39.600	0.000	0.000	0.000	0.25
T8	180.00-160.00	A	44.600	0.000	0.000	0.000	0.56
		B	49.752	7.871	0.000	0.000	0.33
		C	39.600	0.000	0.000	0.000	0.25
T9	160.00-140.00	A	44.600	0.000	0.000	0.000	0.56
		B	51.417	7.871	0.000	0.000	0.34
		C	39.600	0.000	0.000	0.000	0.25
T10	140.00-120.00	A	44.600	0.000	0.000	0.000	0.56
		B	58.817	7.871	0.000	0.000	0.39
		C	39.600	0.000	0.000	0.000	0.25
T11	120.00-100.00	A	44.600	0.000	0.000	0.000	0.56
		B	59.742	9.117	0.000	0.000	0.40
		C	39.600	0.000	0.000	0.000	0.25
T12	100.00-80.00	A	44.600	0.000	0.000	0.000	0.56
		B	65.292	11.478	0.000	0.000	0.44
		C	39.600	0.000	0.000	0.000	0.25
T13	80.00-60.00	A	44.600	0.000	0.000	0.000	0.56
		B	66.217	11.478	0.000	0.000	0.44
		C	39.600	0.000	0.000	0.000	0.25
T14	60.00-30.00	A	66.900	0.000	0.000	0.000	0.84
		B	99.325	17.217	0.000	0.000	0.66
		C	59.400	0.000	0.000	0.000	0.37
T15	30.00-0.00	A	66.900	0.000	0.000	0.000	0.84
		B	99.325	17.217	0.000	0.000	0.66
		C	59.400	0.000	0.000	0.000	0.37

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	320.00-300.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		17.583	4.482	0.000	0.000	0.20
		C		0.000	0.000	0.000	0.000	0.00
T2	300.00-280.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		22.507	11.204	0.000	0.000	0.31
		C		0.000	0.000	0.000	0.000	0.00
T3	280.00-260.00	A	0.500	0.000	0.000	0.000	0.000	0.00

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		66.983	11.204	0.000	0.000	0.75
		C		0.000	0.000	0.000	0.000	0.00
T4	260.00-240.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		72.258	11.204	0.000	0.000	0.80
		C		0.000	0.000	0.000	0.000	0.00
T5	240.00-220.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		77.533	11.204	0.000	0.000	0.84
		C		0.000	0.000	0.000	0.000	0.00
T6	220.00-200.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		77.533	11.204	0.000	0.000	0.84
		C		59.600	0.000	0.000	0.000	0.61
T7	200.00-180.00	A	0.500	66.267	0.000	0.000	0.000	1.33
		B		77.533	11.204	0.000	0.000	0.84
		C		59.600	0.000	0.000	0.000	0.61
T8	180.00-160.00	A	0.500	66.267	0.000	0.000	0.000	1.33
		B		84.918	11.204	0.000	0.000	0.91
		C		59.600	0.000	0.000	0.000	0.61
T9	160.00-140.00	A	0.500	66.267	0.000	0.000	0.000	1.33
		B		88.083	11.204	0.000	0.000	0.93
		C		59.600	0.000	0.000	0.000	0.61
T10	140.00-120.00	A	0.500	66.267	0.000	0.000	0.000	1.33
		B		102.150	11.204	0.000	0.000	1.06
		C		59.600	0.000	0.000	0.000	0.61
T11	120.00-100.00	A	0.500	66.267	0.000	0.000	0.000	1.33
		B		103.908	13.395	0.000	0.000	1.09
		C		59.600	0.000	0.000	0.000	0.61
T12	100.00-80.00	A	0.500	66.267	0.000	0.000	0.000	1.33
		B		114.458	17.033	0.000	0.000	1.22
		C		59.600	0.000	0.000	0.000	0.61
T13	80.00-60.00	A	0.500	66.267	0.000	0.000	0.000	1.33
		B		116.217	17.033	0.000	0.000	1.23
		C		59.600	0.000	0.000	0.000	0.61
T14	60.00-30.00	A	0.500	99.400	0.000	0.000	0.000	1.99
		B		174.325	25.550	0.000	0.000	1.85
		C		89.400	0.000	0.000	0.000	0.92
T15	30.00-0.00	A	0.500	99.400	0.000	0.000	0.000	1.99
		B		174.325	25.550	0.000	0.000	1.85
		C		89.400	0.000	0.000	0.000	0.92

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	320.00-300.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.193	1.139	2.088
		C	0.000	0.000	0.000	0.000
T2	300.00-280.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.549	1.727	3.099
		C	0.000	0.000	0.000	0.000
T3	280.00-260.00	A	0.000	0.000	0.000	0.000
		B	0.000	2.407	3.631	6.017
		C	0.000	0.000	0.000	0.000
T4	260.00-240.00	A	0.000	0.000	0.000	0.000
		B	0.000	2.433	4.370	7.300
		C	0.000	0.000	0.000	0.000
T5	240.00-220.00	A	0.000	0.000	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		B	0.000	2.501	5.948	10.006
		C	0.000	0.000	0.000	0.000
T6	220.00-200.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.775	4.219	7.098
		C	0.000	1.170	3.109	4.680
T7	200.00-180.00	A	0.000	1.261	3.395	5.045
		B	0.000	1.721	4.091	6.882
		C	0.000	1.134	3.015	4.537
T8	180.00-160.00	A	0.000	1.232	3.316	4.927
		B	0.000	1.818	4.285	7.271
		C	0.000	1.108	2.945	4.432
T9	160.00-140.00	A	0.000	1.211	4.075	6.055
		B	0.000	1.845	5.417	9.224
		C	0.000	1.089	3.618	5.446
T10	140.00-120.00	A	0.000	1.194	4.019	5.972
		B	0.000	2.073	6.010	10.366
		C	0.000	1.074	3.569	5.371
T11	120.00-100.00	A	3.027	6.088	0.000	0.000
		B	4.673	10.972	0.000	0.000
		C	2.688	5.475	0.000	0.000
T12	100.00-80.00	A	3.143	6.191	0.000	0.000
		B	5.410	12.544	0.000	0.000
		C	2.791	5.568	0.000	0.000
T13	80.00-60.00	A	3.191	6.210	0.000	0.000
		B	5.559	12.747	0.000	0.000
		C	2.834	5.585	0.000	0.000
T14	60.00-30.00	A	5.000	9.791	0.000	0.000
		B	8.709	20.099	0.000	0.000
		C	4.439	8.806	0.000	0.000
T15	30.00-0.00	A	4.860	9.479	0.000	0.000
		B	8.467	19.457	0.000	0.000
		C	4.315	8.525	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	320.00-300.00	4.3910	2.2719	5.3628	2.7845
T2	300.00-280.00	6.6750	3.3779	8.1423	4.1324
T3	280.00-260.00	13.5720	5.3391	16.3759	6.5045
T4	260.00-240.00	15.5497	6.1662	19.0392	7.6193
T5	240.00-220.00	15.9322	6.3531	20.0227	8.0533
T6	220.00-200.00	29.2415	15.3142	34.7775	18.0552
T7	200.00-180.00	11.2583	17.6275	14.6976	20.9504
T8	180.00-160.00	13.1755	19.3184	17.2716	22.9216
T9	160.00-140.00	13.5242	19.3316	18.0088	23.2615
T10	140.00-120.00	16.3016	21.0941	21.8543	25.4336
T11	120.00-100.00	20.3325	25.5904	26.2878	29.7627
T12	100.00-80.00	23.5752	27.1534	30.5515	31.6946
T13	80.00-60.00	26.0887	29.7614	33.6433	34.5555
T14	60.00-30.00	28.4346	32.4328	36.5046	37.4960
T15	30.00-0.00	30.4875	34.7691	39.3011	40.3647

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Dual Lights	C	None		0.0000	320.00	No Ice	4.00	4.00	0.25
						1/2" Ice	4.80	4.80	0.40
5'3"x4" Pipe Mount	A	From Leg	0.50	0.0000	308.00	No Ice	1.88	1.88	0.06
(CSP future)			0.00			1/2" Ice	2.21	2.21	0.07
			0.00						
5'3"x4" Pipe Mount	B	From Leg	0.50	0.0000	308.00	No Ice	1.88	1.88	0.06
(CSP future)			0.00			1/2" Ice	2.21	2.21	0.07
			0.00						
5'3"x4" Pipe Mount	C	From Leg	0.50	0.0000	308.00	No Ice	1.88	1.88	0.06
(CSP future)			0.00			1/2" Ice	2.21	2.21	0.07
			0.00						
PD128	C	From Leg	6.00	0.0000	320.00	No Ice	1.00	1.00	0.01
(CSP)			0.00			1/2" Ice	1.80	1.80	0.02
			0.00						
6' Side Mount Standoff	C	None		0.0000	320.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
PD128	C	From Leg	6.00	0.0000	318.00	No Ice	1.00	1.00	0.01
(CSP)			0.00			1/2" Ice	1.80	1.80	0.02
			0.00						
6' Side Mount Standoff	C	None		0.0000	318.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
6'8"x4" Pipe Mount	C	From Leg	0.50	0.0000	315.00	No Ice	2.60	2.60	0.07
(CSP)			0.00			1/2" Ice	3.01	3.01	0.09
			0.00						
DB224	A	From Leg	6.00	0.0000	294.00	No Ice	3.15	3.15	0.03
(SHF)			0.00			1/2" Ice	5.67	5.67	0.04
			0.00						
6' Side Mount Standoff	A	None		0.0000	294.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
PD320	C	From Leg	6.00	0.0000	292.00	No Ice	2.25	2.25	0.03
(DEP)			0.00			1/2" Ice	4.05	4.05	0.04
			0.00						
6' Side Mount Standoff	C	None		0.0000	292.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
(2) DB809	A	From Leg	6.00	0.0000	285.00	No Ice	3.39	3.39	0.03
(CSP)			0.00			1/2" Ice	4.55	4.55	0.06
			0.00						
6' Side Mount Standoff	A	None		0.0000	285.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
BCD-80609	A	From Leg	6.00	0.0000	280.00	No Ice	2.95	2.95	0.03
(CSP - 51)			0.00			1/2" Ice	4.11	4.11	0.05
			0.00						
6' Side Mount Standoff	A	None		0.0000	280.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
SC479-HF1LDF	A	From Leg	6.00	0.0000	280.00	No Ice	5.06	5.06	0.03
(CSP - 52)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00						
SC479-HF1LDF	B	From Leg	6.00	0.0000	280.00	No Ice	5.06	5.06	0.03
(CSP - 53)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00						
6' Side Mount Standoff	B	None		0.0000	280.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17

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
SC479-HF1LDF	C	From Leg	6.00	0.0000	280.00	No Ice	5.06	5.06	0.03
(CSP - 54)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00						
6' Side Mount Standoff	C	None		0.0000	280.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
TMA	C	None		0.0000	280.00	No Ice	0.78	0.39	0.02
(CSP - 55)						1/2" Ice	0.90	0.48	0.02
(2) OGT9	A	From Leg	6.00	0.0000	275.00	No Ice	3.15	3.15	0.03
(CSP)			0.00			1/2" Ice	5.67	5.67	0.04
			0.00						
6' Side Mount Standoff	A	None		0.0000	275.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
PD440	B	From Leg	6.00	0.0000	257.00	No Ice	1.38	1.38	0.02
(OEM)			0.00			1/2" Ice	2.48	2.48	0.02
			0.00						
6' Side Mount Standoff	B	None		0.0000	257.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
PD128	C	From Leg	6.00	0.0000	243.00	No Ice	1.00	1.00	0.01
(OEM)			0.00			1/2" Ice	1.80	1.80	0.02
			0.00						
6' Side Mount Standoff	C	None		0.0000	243.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
PD320	A	From Leg	6.00	0.0000	227.00	No Ice	2.25	2.25	0.03
(CSP)			0.00			1/2" Ice	4.05	4.05	0.04
			0.00						
6' Side Mount Standoff	A	None		0.0000	227.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
Mounting Frame	A	From Leg	5.00	0.0000	220.00	No Ice	17.00	17.00	0.56
(Verizon)			0.00			1/2" Ice	20.00	20.00	0.70
			0.00						
Mounting Frame	B	From Leg	5.00	0.0000	220.00	No Ice	17.00	17.00	0.56
(Verizon)			0.00			1/2" Ice	20.00	20.00	0.70
			0.00						
Mounting Frame	C	From Leg	5.00	0.0000	220.00	No Ice	17.00	17.00	0.56
(Verizon)			0.00			1/2" Ice	20.00	20.00	0.70
			0.00						
BXA-70063/6CF	A	From Leg	5.00	0.0000	220.00	No Ice	7.73	3.76	0.02
(Verizon)			0.00			1/2" Ice	8.27	4.19	0.06
			0.00						
BXA-171085-8BF	A	From Leg	5.00	0.0000	220.00	No Ice	2.00	1.50	0.02
(Verizon)			4.00			1/2" Ice	2.30	1.80	0.04
			0.00						
LPA-80080-4CF-EDIN	A	From Leg	5.00	0.0000	220.00	No Ice	2.62	6.06	0.02
(Verizon)			6.00			1/2" Ice	2.92	6.45	0.05
			0.00						
LPA-80080-4CF-EDIN	A	From Leg	5.00	0.0000	220.00	No Ice	2.62	6.06	0.02
(Verizon)			-4.00			1/2" Ice	2.92	6.45	0.05
			0.00						
BXA-70063/6CF	B	From Leg	5.00	0.0000	220.00	No Ice	7.73	3.76	0.02
(Verizon)			0.00			1/2" Ice	8.27	4.19	0.06
			0.00						
BXA-171085-8BF	B	From Leg	5.00	0.0000	220.00	No Ice	2.00	1.50	0.02
(Verizon)			4.00			1/2" Ice	2.30	1.80	0.04
			0.00						
LPA-80080-4CF-EDIN	B	From Leg	5.00	0.0000	220.00	No Ice	2.62	6.06	0.02
(Verizon)			6.00			1/2" Ice	2.92	6.45	0.05
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LPA-80080-4CF-EDIN	B	From Leg	5.00	0.0000	220.00	No Ice	2.62	6.06	0.02
(Verizon)			-4.00			1/2" Ice	2.92	6.45	0.05
			0.00						
BXA-70063/6CF	C	From Leg	5.00	0.0000	220.00	No Ice	7.73	3.76	0.02
(Verizon)			0.00			1/2" Ice	8.27	4.19	0.06
			0.00						
BXA-171085-8BF	C	From Leg	5.00	0.0000	220.00	No Ice	2.00	1.50	0.02
(Verizon)			4.00			1/2" Ice	2.30	1.80	0.04
			0.00						
LPA-80080-4CF-EDIN	C	From Leg	5.00	0.0000	220.00	No Ice	2.62	6.06	0.02
(Verizon)			6.00			1/2" Ice	2.92	6.45	0.05
			0.00						
LPA-80080-4CF-EDIN	C	From Leg	5.00	0.0000	220.00	No Ice	2.62	6.06	0.02
(Verizon)			-4.00			1/2" Ice	2.92	6.45	0.05
			0.00						
(2) Diplexer	A	From Leg	5.00	0.0000	220.00	No Ice	0.23	0.17	0.01
(Verizon)			0.00			1/2" Ice	0.30	0.24	0.01
			0.00						
(2) Diplexer	B	From Leg	5.00	0.0000	220.00	No Ice	0.23	0.17	0.01
(Verizon)			0.00			1/2" Ice	0.30	0.24	0.01
			0.00						
(2) Diplexer	C	From Leg	5.00	0.0000	220.00	No Ice	0.23	0.17	0.01
(Verizon)			0.00			1/2" Ice	0.30	0.24	0.01
			0.00						
PiROD 12' Lightweight	A	None		0.0000	200.00	No Ice	10.20	10.20	0.25
T-Frame						1/2" Ice	16.20	16.20	0.35
(AT&T)									
PiROD 12' Lightweight	B	None		0.0000	200.00	No Ice	10.20	10.20	0.25
T-Frame						1/2" Ice	16.20	16.20	0.35
(AT&T)									
PiROD 12' Lightweight	C	None		0.0000	200.00	No Ice	10.20	10.20	0.25
T-Frame						1/2" Ice	16.20	16.20	0.35
(AT&T)									
(2) 7770.00	A	From Leg	3.00	0.0000	200.00	No Ice	10.03	5.60	0.02
(AT&T)			0.00			1/2" Ice	10.61	6.15	0.07
			0.00						
(2) 7770.00	B	From Leg	3.00	0.0000	200.00	No Ice	10.03	5.60	0.02
(AT&T)			0.00			1/2" Ice	10.61	6.15	0.07
			0.00						
(2) 7770.00	C	From Leg	3.00	0.0000	200.00	No Ice	10.03	5.60	0.02
(AT&T)			0.00			1/2" Ice	10.61	6.15	0.07
			0.00						
(2) LPG21401 TMA	A	From Leg	3.00	0.0000	200.00	No Ice	0.95	0.37	0.02
(AT&T)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LPG21401 TMA	B	From Leg	3.00	0.0000	200.00	No Ice	0.95	0.37	0.02
(AT&T)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LPG21401 TMA	C	From Leg	3.00	0.0000	200.00	No Ice	0.95	0.37	0.02
(AT&T)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LPG13519 Diplexer	A	From Leg	3.00	0.0000	200.00	No Ice	0.27	0.18	0.01
(AT&T)			0.00			1/2" Ice	0.34	0.25	0.01
			0.00						
(2) LPG13519 Diplexer	B	From Leg	3.00	0.0000	200.00	No Ice	0.27	0.18	0.01
(AT&T)			0.00			1/2" Ice	0.34	0.25	0.01
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LPG13519 Diplexer	C	From Leg	3.00	0.0000	200.00	No Ice	0.27	0.18	0.01
(AT&T)			0.00			1/2" Ice	0.34	0.25	0.01
			0.00						
SBNH-1D6565C	A	From Leg	3.00	0.0000	200.00	No Ice	11.41	7.70	0.06
(AT&T)			0.00			1/2" Ice	12.03	8.29	0.13
			0.00						
SBNH-1D6565C	B	From Leg	3.00	0.0000	200.00	No Ice	11.41	7.70	0.06
(AT&T)			0.00			1/2" Ice	12.03	8.29	0.13
			0.00						
KMW AM-X-CD-16-65	C	From Leg	3.00	0.0000	200.00	No Ice	8.26	4.64	0.05
(AT&T)			0.00			1/2" Ice	8.81	5.09	0.09
			0.00						
(2) RRU	A	From Leg	3.00	0.0000	200.00	No Ice	1.40	0.70	0.01
(AT&T)			0.00			1/2" Ice	1.56	0.82	0.02
			0.00						
(2) RRU	B	From Leg	3.00	0.0000	200.00	No Ice	1.40	0.70	0.01
(AT&T)			0.00			1/2" Ice	1.56	0.82	0.02
			0.00						
(2) RRU	C	From Leg	3.00	0.0000	200.00	No Ice	1.40	0.70	0.01
(AT&T)			0.00			1/2" Ice	1.56	0.82	0.02
			0.00						
Surge Suppressor	A	From Leg	3.00	0.0000	200.00	No Ice	0.53	0.53	0.05
(AT&T)			0.00			1/2" Ice	0.65	0.65	0.06
			0.00						
DB583	B	From Leg	6.00	0.0000	174.00	No Ice	0.54	0.54	0.01
(NEU - 48)			0.00			1/2" Ice	0.71	0.71	0.01
			0.00						
DB-630	C	From Leg	6.00	0.0000	170.00	No Ice	0.59	0.59	0.01
(NEU - 32)			0.00			1/2" Ice	0.80	0.80	0.01
			0.00						
6' Side Mount Standoff	C	None		0.0000	170.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
6' Side Mount Standoff	B	None		0.0000	174.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
DB586-Y	B	From Leg	6.00	0.0000	166.00	No Ice	1.01	1.01	0.01
(NEU - 49)			0.00			1/2" Ice	1.28	1.28	0.02
			0.00						
6' Side Mount Standoff	B	None		0.0000	166.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
PD688S-4	A	From Leg	6.00	0.0000	140.00	No Ice	0.35	0.35	0.00
(NEU)			0.00			1/2" Ice	0.63	0.63	0.00
			0.00						
DB212-I	B	None		0.0000	140.00	No Ice	4.40	4.40	0.03
(NEU)						1/2" Ice	8.42	8.42	0.07
6' Side Mount Standoff	B	None		0.0000	140.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
BA1012-0	A	From Leg	6.00	0.0000	140.00	No Ice	0.47	0.47	0.00
(OEM)			0.00			1/2" Ice	0.96	0.96	0.01
			0.00						
6' Side Mount Standoff	A	None		0.0000	140.00	No Ice	6.50	6.50	0.10
						1/2" Ice	8.50	8.50	0.17
PD156S	C	From Leg	1.00	0.0000	138.00	No Ice	0.44	0.44	0.01
(DEP)			0.00			1/2" Ice	0.79	0.79	0.01
			0.00						
3'4"x4" Pipe Mount	C	From Leg	0.50	0.0000	138.00	No Ice	1.05	1.05	0.04
(DEP)			0.00			1/2" Ice	1.27	1.27	0.05
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
3'4"x4" Pipe Mount (CSP)	C	From Leg	0.50 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice	1.05 1.27	1.05 1.27	0.04 0.05
5'3"x4" Pipe Mount (CSP)	A	From Leg	0.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	1.88 2.21	1.88 2.21	0.06 0.07
PD458 (CTT)	B	From Leg	6.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	2.88 4.34	2.88 4.34	0.02 0.05
DB437 (FBI)	B	From Leg	6.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	0.45 0.81	0.45 0.81	0.01 0.01
6' Side Mount Standoff	B	None		0.0000	100.00	No Ice 1/2" Ice	6.50 8.50	6.50 8.50	0.10 0.17
5'3"x4" Pipe Mount (CSP)	A	From Leg	0.50 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice	1.88 2.21	1.88 2.21	0.06 0.07
3'4"x4" Pipe Mount (CSP)	C	From Leg	0.50 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice	1.05 1.27	1.05 1.27	0.04 0.05

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
8 FT DISH	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		315.00	8.00	No Ice 1/2" Ice	50.30 51.29	0.25 0.51
4 FT DISH	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		112.00	4.00	No Ice 1/2" Ice	12.56 13.09	0.17 0.24
6 FT DISH	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		105.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.14 0.29
6 FT DISH	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		97.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.14 0.29
4 FT DISH	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		90.00	4.00	No Ice 1/2" Ice	12.56 13.09	0.17 0.24
6 FT DISH	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		308.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.14 0.29
6 FT DISH	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		308.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.14 0.29
6 FT DISH	C	Paraboloid w/Radome	From Leg	1.00 0.00	Worst		308.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.14 0.29

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 ft²	Weight K
				0.00						

Tower Pressures - No Ice

$G_H = 1.084$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg % %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	310.00	1.897	39	145.472	A	11.659	18.543	18.543	61.40	0.000	0.000
320.00-300.00					B	13.669	27.793		44.72	0.000	0.000
					C	11.659	18.543		61.40	0.000	0.000
T2	290.00	1.861	39	167.656	A	12.596	22.122	22.122	63.72	0.000	0.000
300.00-280.00					B	18.740	33.962		41.97	0.000	0.000
					C	12.596	22.122		63.72	0.000	0.000
T3	270.00	1.823	38	213.297	A	13.934	28.807	28.807	67.40	0.000	0.000
280.00-260.00					B	18.174	69.124		33.00	0.000	0.000
					C	13.934	28.807		67.40	0.000	0.000
T4	250.00	1.783	37	255.594	A	19.443	28.800	28.800	59.70	0.000	0.000
260.00-240.00					B	22.944	71.891		30.37	0.000	0.000
					C	19.443	28.800		59.70	0.000	0.000
T5	230.00	1.741	36	296.093	A	29.581	28.798	28.798	49.33	0.000	0.000
240.00-220.00					B	31.505	74.665		27.12	0.000	0.000
					C	29.581	28.798		49.33	0.000	0.000
T6	210.00	1.697	35	336.193	A	24.136	28.798	28.798	54.40	0.000	0.000
220.00-200.00					B	27.787	74.665		28.11	0.000	0.000
					C	21.026	68.398		32.20	0.000	0.000
T7	190.00	1.649	34	389.387	A	22.640	91.405	46.805	41.04	0.000	0.000
200.00-180.00					B	29.815	92.671		38.21	0.000	0.000
					C	23.020	86.405		42.77	0.000	0.000
T8	170.00	1.597	33	431.485	A	25.076	91.400	46.800	40.18	0.000	0.000
180.00-160.00					B	31.978	96.552		36.41	0.000	0.000
					C	25.448	86.400		41.84	0.000	0.000
T9	150.00	1.541	32	471.380	A	34.459	91.387	46.787	37.18	0.000	0.000
160.00-140.00					B	40.988	98.204		33.61	0.000	0.000
					C	34.916	86.387		38.57	0.000	0.000
T10	130.00	1.48	31	512.289	A	37.675	91.409	46.809	36.26	0.000	0.000
140.00-120.00					B	43.556	105.625		31.38	0.000	0.000
					C	38.126	86.409		37.59	0.000	0.000
T11	110.00	1.411	29	559.905	A	0.000	123.316	46.846	37.99	0.000	0.000
120.00-100.00					B	9.117	133.181		32.92	0.000	0.000
					C	0.000	111.395		42.05	0.000	0.000
T12	90.00	1.332	28	610.701	A	0.000	128.422	46.838	36.47	0.000	0.000
100.00-80.00					B	11.478	143.014		30.32	0.000	0.000
					C	0.000	116.109		40.34	0.000	0.000
T13	70.00	1.24	26	657.397	A	0.000	128.553	42.626	33.16	0.000	0.000
80.00-60.00					B	11.478	142.880		27.62	0.000	0.000
					C	0.000	114.066		37.37	0.000	0.000
T14	45.00	1.093	23	1081.03	A	0.000	190.198	63.908	33.60	0.000	0.000
60.00-30.00				4	B	17.217	215.369		27.48	0.000	0.000
					C	0.000	176.169		36.28	0.000	0.000
T15 30.00-0.00	15.00	1	21	1194.29	A	0.000	198.468	63.928	32.21	0.000	0.000
				2	B	17.217	222.667		26.65	0.000	0.000
					C	0.000	182.273		35.07	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.084$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 320.00-300.00	310.00	1.897	39	0.5000	147.138	A	11.659	28.539	21.877	54.42	0.000	0.000
						B	14.053	44.929		37.09	0.000	0.000
						C	11.659	28.539		54.42	0.000	0.000
T2 300.00-280.00	290.00	1.861	39	0.5000	169.325	A	12.596	31.759	25.461	57.40	0.000	0.000
						B	20.701	52.716		34.68	0.000	0.000
						C	12.596	31.759		57.40	0.000	0.000
T3 280.00-260.00	270.00	1.823	38	0.5000	214.966	A	13.934	37.721	32.147	62.24	0.000	0.000
						B	19.121	102.297		26.48	0.000	0.000
						C	13.934	37.721		62.24	0.000	0.000
T4 260.00-240.00	250.00	1.783	37	0.5000	257.263	A	19.443	38.620	32.139	55.35	0.000	0.000
						B	23.348	108.445		24.39	0.000	0.000
						C	19.443	38.620		55.35	0.000	0.000
T5 240.00-220.00	230.00	1.741	36	0.5000	297.762	A	29.581	39.533	32.137	46.50	0.000	0.000
						B	30.780	114.564		22.11	0.000	0.000
						C	29.581	39.533		46.50	0.000	0.000
T6 220.00-200.00	210.00	1.697	35	0.5000	337.862	A	24.136	38.171	32.137	51.58	0.000	0.000
						B	28.242	113.929		22.60	0.000	0.000
						C	19.456	96.601		27.69	0.000	0.000
T7 200.00-180.00	190.00	1.649	34	0.5000	391.056	A	20.990	121.658	50.144	35.15	0.000	0.000
						B	30.357	132.466		30.80	0.000	0.000
						C	21.498	115.119		36.70	0.000	0.000
T8 180.00-160.00	170.00	1.597	33	0.5000	433.154	A	23.465	122.273	50.140	34.40	0.000	0.000
						B	32.325	140.338		29.04	0.000	0.000
						C	23.960	115.730		35.89	0.000	0.000
T9 160.00-140.00	150.00	1.541	32	0.5000	473.048	A	32.479	122.888	50.126	32.26	0.000	0.000
						B	40.514	144.071		27.16	0.000	0.000
						C	33.088	116.343		33.54	0.000	0.000
T10 140.00-120.00	130.00	1.48	31	0.5000	513.958	A	35.723	123.560	50.149	31.48	0.000	0.000
						B	42.533	158.564		24.94	0.000	0.000
						C	36.323	117.013		32.70	0.000	0.000
T11 120.00-100.00	110.00	1.411	29	0.5000	561.575	A	0.000	156.922	50.188	31.98	0.000	0.000
						B	13.395	184.785		25.32	0.000	0.000
						C	0.000	141.081		35.57	0.000	0.000
T12 100.00-80.00	90.00	1.332	28	0.5000	612.371	A	0.000	162.761	50.180	30.83	0.000	0.000
						B	17.033	199.433		23.18	0.000	0.000
						C	0.000	146.385		34.28	0.000	0.000
T13 80.00-60.00	70.00	1.24	26	0.5000	659.068	A	0.000	163.668	45.969	28.09	0.000	0.000
						B	17.033	200.752		21.11	0.000	0.000
						C	0.000	144.968		31.71	0.000	0.000
T14 60.00-30.00	45.00	1.093	23	0.5000	1083.539	A	0.000	243.361	68.920	28.32	0.000	0.000
						B	25.550	302.941		20.98	0.000	0.000
						C	0.000	224.271		30.73	0.000	0.000
T15 30.00-0.00	15.00	1	21	0.5000	1196.797	A	0.000	253.262	68.942	27.22	0.000	0.000
						B	25.550	311.982		20.43	0.000	0.000
						C	0.000	231.762		29.75	0.000	0.000

Tower Pressure - Service

$G_H = 1.084$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{Leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	310.00	1.897	39	145.472	A	11.659	18.543	18.543	61.40	0.000	0.000
320.00-300.00					B	13.669	27.793		44.72	0.000	0.000
					C	11.659	18.543		61.40	0.000	0.000
T2	290.00	1.861	39	167.656	A	12.596	22.122	22.122	63.72	0.000	0.000
300.00-280.00					B	18.740	33.962		41.97	0.000	0.000
					C	12.596	22.122		63.72	0.000	0.000
T3	270.00	1.823	38	213.297	A	13.934	28.807	28.807	67.40	0.000	0.000
280.00-260.00					B	18.174	69.124		33.00	0.000	0.000
					C	13.934	28.807		67.40	0.000	0.000
T4	250.00	1.783	37	255.594	A	19.443	28.800	28.800	59.70	0.000	0.000
260.00-240.00					B	22.944	71.891		30.37	0.000	0.000
					C	19.443	28.800		59.70	0.000	0.000
T5	230.00	1.741	36	296.093	A	29.581	28.798	28.798	49.33	0.000	0.000
240.00-220.00					B	31.505	74.665		27.12	0.000	0.000
					C	29.581	28.798		49.33	0.000	0.000
T6	210.00	1.697	35	336.193	A	24.136	28.798	28.798	54.40	0.000	0.000
220.00-200.00					B	27.787	74.665		28.11	0.000	0.000
					C	21.026	68.398		32.20	0.000	0.000
T7	190.00	1.649	34	389.387	A	22.640	91.405	46.805	41.04	0.000	0.000
200.00-180.00					B	29.815	92.671		38.21	0.000	0.000
					C	23.020	86.405		42.77	0.000	0.000
T8	170.00	1.597	33	431.485	A	25.076	91.400	46.800	40.18	0.000	0.000
180.00-160.00					B	31.978	96.552		36.41	0.000	0.000
					C	25.448	86.400		41.84	0.000	0.000
T9	150.00	1.541	32	471.380	A	34.459	91.387	46.787	37.18	0.000	0.000
160.00-140.00					B	40.988	98.204		33.61	0.000	0.000
					C	34.916	86.387		38.57	0.000	0.000
T10	130.00	1.48	31	512.289	A	37.675	91.409	46.809	36.26	0.000	0.000
140.00-120.00					B	43.556	105.625		31.38	0.000	0.000
					C	38.126	86.409		37.59	0.000	0.000
T11	110.00	1.411	29	559.905	A	0.000	123.316	46.846	37.99	0.000	0.000
120.00-100.00					B	9.117	133.181		32.92	0.000	0.000
					C	0.000	111.395		42.05	0.000	0.000
T12	90.00	1.332	28	610.701	A	0.000	128.422	46.838	36.47	0.000	0.000
100.00-80.00					B	11.478	143.014		30.32	0.000	0.000
					C	0.000	116.109		40.34	0.000	0.000
T13	70.00	1.24	26	657.397	A	0.000	128.553	42.626	33.16	0.000	0.000
80.00-60.00					B	11.478	142.880		27.62	0.000	0.000
					C	0.000	114.066		37.37	0.000	0.000
T14	45.00	1.093	23	1081.03	A	0.000	190.198	63.908	33.60	0.000	0.000
60.00-30.00				4	B	17.217	215.369		27.48	0.000	0.000
					C	0.000	176.169		36.28	0.000	0.000
T15 30.00-0.00	15.00	1	21	1194.29	A	0.000	198.468	63.928	32.21	0.000	0.000
				2	B	17.217	222.667		26.65	0.000	0.000
					C	0.000	182.273		35.07	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	1	1	22.637	3.05	152.67	B
320.00-300.00			B	0.285	2.337	0.611	1	1	30.662			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.208	2.571	0.592	1	1	22.637			
T2	0.10	2.50	A	0.207	2.573	0.592	1	1	25.689	3.76	187.98	B
300.00-280.00			B	0.314	2.259	0.62	1	1	39.810			
			C	0.207	2.573	0.592	1	1	25.689			
T3	0.28	3.48	A	0.2	2.595	0.59	1	1	30.944	5.32	266.04	B
280.00-260.00			B	0.409	2.046	0.655	1	1	63.480			
			C	0.2	2.595	0.59	1	1	30.944			
T4	0.29	3.83	A	0.189	2.634	0.588	1	1	36.382	5.87	293.58	B
260.00-240.00			B	0.371	2.124	0.64	1	1	68.970			
			C	0.189	2.634	0.588	1	1	36.382			
T5	0.31	4.90	A	0.197	2.605	0.59	1	1	46.567	6.65	332.47	B
240.00-220.00			B	0.359	2.152	0.636	1	1	78.960			
			C	0.197	2.605	0.59	1	1	46.567			
T6	0.56	4.82	A	0.157	2.744	0.583	1	1	40.915	6.43	321.64	B
220.00-200.00			B	0.305	2.283	0.617	1	1	73.883			
			C	0.266	2.39	0.606	1	1	62.481			
T7	1.12	6.87	A	0.293	2.315	0.614	1	1	78.739	7.31	365.28	B
200.00-180.00			B	0.315	2.258	0.62	1	1	87.314			
			C	0.281	2.348	0.61	1	1	75.751			
T8	1.14	7.91	A	0.27	2.379	0.607	1	1	80.571	7.55	377.51	B
180.00-160.00			B	0.298	2.302	0.615	1	1	91.383			
			C	0.259	2.41	0.604	1	1	77.657			
T9	1.15	8.04	A	0.267	2.388	0.606	1	1	89.871	8.10	405.12	B
160.00-140.00			B	0.295	2.309	0.614	1	1	101.331			
			C	0.257	2.416	0.604	1	1	87.074			
T10	1.19	8.32	A	0.252	2.432	0.602	1	1	92.738	8.35	417.74	B
140.00-120.00			B	0.291	2.32	0.613	1	1	108.330			
			C	0.243	2.458	0.6	1	1	89.983			
T11	1.20	7.49	A	0.22	2.53	0.595	1	1	73.341	6.87	343.68	B
120.00-100.00			B	0.254	2.425	0.603	1	1	89.417			
			C	0.199	2.599	0.59	1	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	1	1	76.097	7.10	354.97	B
100.00-80.00			B	0.253	2.429	0.603	1	1	97.664			
			C	0.19	2.629	0.588	1	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	1	1	75.783	6.71	335.38	B
80.00-60.00			B	0.235	2.484	0.598	1	1	96.937			
			C	0.174	2.687	0.585	1	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	1	1	111.416	9.07	302.30	B
60.00-30.00			B	0.215	2.546	0.594	1	1	145.061			
			C	0.163	2.724	0.584	1	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	1	1	115.922	8.67	288.87	B
30.00-0.00			B	0.201	2.593	0.591	1	1	148.718			
			C	0.153	2.762	0.582	1	1	106.061			
Sum Weight:	13.67	103.04						OTM	15197.38 kip-ft	100.82		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	0.825	1	20.596	2.82	140.76	B
320.00-300.00			B	0.285	2.337	0.611	0.825	1	28.270			
			C	0.208	2.571	0.592	0.825	1	20.596			
T2	0.10	2.50	A	0.207	2.573	0.592	0.825	1	23.485	3.45	172.49	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
300.00-280.00			B	0.314	2.259	0.62	0.825	1	36.530			
			C	0.207	2.573	0.592	0.825	1	23.485			
T3	0.28	3.48	A	0.2	2.595	0.59	0.825	1	28.505	5.05	252.71	B
280.00-260.00			B	0.409	2.046	0.655	0.825	1	60.299			
			C	0.2	2.595	0.59	0.825	1	28.505			
T4	0.29	3.83	A	0.189	2.634	0.588	0.825	1	32.980	5.53	276.49	B
260.00-240.00			B	0.371	2.124	0.64	0.825	1	64.955			
			C	0.189	2.634	0.588	0.825	1	32.980			
T5	0.31	4.90	A	0.197	2.605	0.59	0.825	1	41.390	6.19	309.25	B
240.00-220.00			B	0.359	2.152	0.636	0.825	1	73.446			
			C	0.197	2.605	0.59	0.825	1	41.390			
T6	0.56	4.82	A	0.157	2.744	0.583	0.825	1	36.691	6.01	300.47	B
220.00-200.00			B	0.305	2.283	0.617	0.825	1	69.020			
			C	0.266	2.39	0.606	0.825	1	58.802			
T7	1.12	6.87	A	0.293	2.315	0.614	0.825	1	74.777	6.87	343.45	B
200.00-180.00			B	0.315	2.258	0.62	0.825	1	82.096			
			C	0.281	2.348	0.61	0.825	1	71.722			
T8	1.14	7.91	A	0.27	2.379	0.607	0.825	1	76.182	7.09	354.39	B
180.00-160.00			B	0.298	2.302	0.615	0.825	1	85.786			
			C	0.259	2.41	0.604	0.825	1	73.203			
T9	1.15	8.04	A	0.267	2.388	0.606	0.825	1	83.841	7.53	376.44	B
160.00-140.00			B	0.295	2.309	0.614	0.825	1	94.158			
			C	0.257	2.416	0.604	0.825	1	80.964			
T10	1.19	8.32	A	0.252	2.432	0.602	0.825	1	86.145	7.77	388.35	B
140.00-120.00			B	0.291	2.32	0.613	0.825	1	100.708			
			C	0.243	2.458	0.6	0.825	1	83.311			
T11	1.20	7.49	A	0.22	2.53	0.595	0.825	1	73.341	6.75	337.55	B
120.00-100.00			B	0.254	2.425	0.603	0.825	1	87.822			
			C	0.199	2.599	0.59	0.825	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	0.825	1	76.097	6.95	347.67	B
100.00-80.00			B	0.253	2.429	0.603	0.825	1	95.655			
			C	0.19	2.629	0.588	0.825	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	0.825	1	75.783	6.57	328.43	B
80.00-60.00			B	0.235	2.484	0.598	0.825	1	94.928			
			C	0.174	2.687	0.585	0.825	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	0.825	1	111.416	8.88	296.02	B
60.00-30.00			B	0.215	2.546	0.594	0.825	1	142.048			
			C	0.163	2.724	0.584	0.825	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	0.825	1	115.922	8.49	283.02	B
30.00-0.00			B	0.201	2.593	0.591	0.825	1	145.705			
			C	0.153	2.762	0.582	0.825	1	106.061			
Sum Weight:	13.67	103.04						OTM	14309.11 kip-ft	95.94		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	0.8	1	20.305	2.78	139.06	B
320.00-300.00			B	0.285	2.337	0.611	0.8	1	27.929			
			C	0.208	2.571	0.592	0.8	1	20.305			
T2	0.10	2.50	A	0.207	2.573	0.592	0.8	1	23.170	3.41	170.28	B
300.00-280.00			B	0.314	2.259	0.62	0.8	1	36.062			
			C	0.207	2.573	0.592	0.8	1	23.170			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T3	0.28	3.48	A	0.2	2.595	0.59	0.8	1	28.157	5.02	250.81	B
280.00-260.00			B	0.409	2.046	0.655	0.8	1	59.845			
			C	0.2	2.595	0.59	0.8	1	28.157			
T4	0.29	3.83	A	0.189	2.634	0.588	0.8	1	32.494	5.48	274.05	B
260.00-240.00			B	0.371	2.124	0.64	0.8	1	64.381			
			C	0.189	2.634	0.588	0.8	1	32.494			
T5	0.31	4.90	A	0.197	2.605	0.59	0.8	1	40.651	6.12	305.94	B
240.00-220.00			B	0.359	2.152	0.636	0.8	1	72.659			
			C	0.197	2.605	0.59	0.8	1	40.651			
T6	0.56	4.82	A	0.157	2.744	0.583	0.8	1	36.088	5.95	297.45	B
220.00-200.00			B	0.305	2.283	0.617	0.8	1	68.325			
			C	0.266	2.39	0.606	0.8	1	58.276			
T7	1.12	6.87	A	0.293	2.315	0.614	0.8	1	74.211	6.81	340.33	B
200.00-180.00			B	0.315	2.258	0.62	0.8	1	81.351			
			C	0.281	2.348	0.61	0.8	1	71.147			
T8	1.14	7.91	A	0.27	2.379	0.607	0.8	1	75.556	7.02	351.08	B
180.00-160.00			B	0.298	2.302	0.615	0.8	1	84.987			
			C	0.259	2.41	0.604	0.8	1	72.567			
T9	1.15	8.04	A	0.267	2.388	0.606	0.8	1	82.980	7.45	372.35	B
160.00-140.00			B	0.295	2.309	0.614	0.8	1	93.134			
			C	0.257	2.416	0.604	0.8	1	80.091			
T10	1.19	8.32	A	0.252	2.432	0.602	0.8	1	85.203	7.68	384.15	B
140.00-120.00			B	0.291	2.32	0.613	0.8	1	99.619			
			C	0.243	2.458	0.6	0.8	1	82.358			
T11	1.20	7.49	A	0.22	2.53	0.595	0.8	1	73.341	6.73	336.67	B
120.00-100.00			B	0.254	2.425	0.603	0.8	1	87.594			
			C	0.199	2.599	0.59	0.8	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	0.8	1	76.097	6.93	346.63	B
100.00-80.00			B	0.253	2.429	0.603	0.8	1	95.368			
			C	0.19	2.629	0.588	0.8	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	0.8	1	75.783	6.55	327.44	B
80.00-60.00			B	0.235	2.484	0.598	0.8	1	94.641			
			C	0.174	2.687	0.585	0.8	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	0.8	1	111.416	8.85	295.13	B
60.00-30.00			B	0.215	2.546	0.594	0.8	1	141.618			
			C	0.163	2.724	0.584	0.8	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	0.8	1	115.922	8.47	282.19	B
30.00-0.00			B	0.201	2.593	0.591	0.8	1	145.275			
			C	0.153	2.762	0.582	0.8	1	106.061			
Sum Weight:	13.67	103.04						OTM	14182.22 kip-ft	95.24		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	0.85	1	20.888	2.85	142.46	B
320.00-300.00			B	0.285	2.337	0.611	0.85	1	28.612			
			C	0.208	2.571	0.592	0.85	1	20.888			
T2	0.10	2.50	A	0.207	2.573	0.592	0.85	1	23.800	3.49	174.71	B
300.00-280.00			B	0.314	2.259	0.62	0.85	1	36.999			
			C	0.207	2.573	0.592	0.85	1	23.800			
T3	0.28	3.48	A	0.2	2.595	0.59	0.85	1	28.854	5.09	254.62	B
280.00-260.00			B	0.409	2.046	0.655	0.85	1	60.754			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.2	2.595	0.59	0.85	1	28.854			
T4	0.29	3.83	A	0.189	2.634	0.588	0.85	1	33.466	5.58	278.93	B
260.00-240.00			B	0.371	2.124	0.64	0.85	1	65.528			
			C	0.189	2.634	0.588	0.85	1	33.466			
T5	0.31	4.90	A	0.197	2.605	0.59	0.85	1	42.130	6.25	312.57	B
240.00-220.00			B	0.359	2.152	0.636	0.85	1	74.234			
			C	0.197	2.605	0.59	0.85	1	42.130			
T6	0.56	4.82	A	0.157	2.744	0.583	0.85	1	37.294	6.07	303.50	B
220.00-200.00			B	0.305	2.283	0.617	0.85	1	69.714			
			C	0.266	2.39	0.606	0.85	1	59.327			
T7	1.12	6.87	A	0.293	2.315	0.614	0.85	1	75.343	6.93	346.57	B
200.00-180.00			B	0.315	2.258	0.62	0.85	1	82.842			
			C	0.281	2.348	0.61	0.85	1	72.298			
T8	1.14	7.91	A	0.27	2.379	0.607	0.85	1	76.809	7.15	357.69	B
180.00-160.00			B	0.298	2.302	0.615	0.85	1	86.586			
			C	0.259	2.41	0.604	0.85	1	73.839			
T9	1.15	8.04	A	0.267	2.388	0.606	0.85	1	84.703	7.61	380.54	B
160.00-140.00			B	0.295	2.309	0.614	0.85	1	95.183			
			C	0.257	2.416	0.604	0.85	1	81.837			
T10	1.19	8.32	A	0.252	2.432	0.602	0.85	1	87.087	7.85	392.55	B
140.00-120.00			B	0.291	2.32	0.613	0.85	1	101.797			
			C	0.243	2.458	0.6	0.85	1	84.264			
T11	1.20	7.49	A	0.22	2.53	0.595	0.85	1	73.341	6.77	338.43	B
120.00-100.00			B	0.254	2.425	0.603	0.85	1	88.050			
			C	0.199	2.599	0.59	0.85	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	0.85	1	76.097	6.97	348.71	B
100.00-80.00			B	0.253	2.429	0.603	0.85	1	95.942			
			C	0.19	2.629	0.588	0.85	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	0.85	1	75.783	6.59	329.42	B
80.00-60.00			B	0.235	2.484	0.598	0.85	1	95.215			
			C	0.174	2.687	0.585	0.85	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	0.85	1	111.416	8.91	296.92	B
60.00-30.00			B	0.215	2.546	0.594	0.85	1	142.479			
			C	0.163	2.724	0.584	0.85	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	0.85	1	115.922	8.52	283.86	B
30.00-0.00			B	0.201	2.593	0.591	0.85	1	146.136			
			C	0.153	2.762	0.582	0.85	1	106.061			
Sum Weight:	13.67	103.04						OTM	14436.01 kip-ft	96.64		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.20	2.46	A	0.273	2.37	0.608	1	1	29.013	3.81	190.48	B
320.00-300.00			B	0.401	2.062	0.652	1	1	43.345			
			C	0.273	2.37	0.608	1	1	29.013			
T2	0.31	3.23	A	0.262	2.402	0.605	1	1	31.810	4.67	233.49	B
300.00-280.00			B	0.434	2.001	0.666	1	1	55.804			
			C	0.262	2.402	0.605	1	1	31.810			
T3	0.75	4.32	A	0.24	2.467	0.599	1	1	36.545	7.05	352.66	B
280.00-260.00			B	0.565	1.83	0.733	1	1	94.075			
			C	0.24	2.467	0.599	1	1	36.545			
T4	0.80	4.83	A	0.226	2.512	0.596	1	1	42.460	7.53	376.42	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
260.00-240.00			B	0.512	1.885	0.704	1	1	99.676			
			C	0.226	2.512	0.596	1	1	42.460			
T5	0.84	6.22	A	0.232	2.492	0.597	1	1	53.201	8.25	412.39	B
240.00-220.00			B	0.488	1.916	0.692	1	1	110.003			
			C	0.232	2.492	0.597	1	1	53.201			
T6	1.46	5.95	A	0.184	2.649	0.587	1	1	46.555	7.99	399.33	B
220.00-200.00			B	0.421	2.024	0.66	1	1	103.470			
			C	0.344	2.187	0.63	1	1	80.332			
T7	2.79	8.67	A	0.365	2.138	0.638	1	1	98.591	8.86	442.76	B
200.00-180.00			B	0.416	2.033	0.658	1	1	117.574			
			C	0.349	2.173	0.632	1	1	94.281			
T8	2.85	9.78	A	0.336	2.204	0.628	1	1	100.219	9.18	458.82	B
180.00-160.00			B	0.399	2.067	0.651	1	1	123.691			
			C	0.322	2.238	0.623	1	1	96.065			
T9	2.88	10.22	A	0.328	2.223	0.625	1	1	109.286	9.66	482.90	B
160.00-140.00			B	0.39	2.084	0.648	1	1	133.822			
			C	0.316	2.255	0.621	1	1	105.325			
T10	3.00	10.60	A	0.31	2.27	0.619	1	1	112.204	10.06	502.77	B
140.00-120.00			B	0.391	2.082	0.648	1	1	145.295			
			C	0.298	2.3	0.615	1	1	108.333			
T11	3.03	9.36	A	0.279	2.352	0.61	1	1	95.694	8.95	447.60	B
120.00-100.00			B	0.353	2.165	0.634	1	1	130.459			
			C	0.251	2.434	0.602	1	1	84.957			
T12	3.16	10.41	A	0.266	2.391	0.606	1	1	98.638	9.29	464.36	B
100.00-80.00			B	0.353	2.163	0.634	1	1	143.420			
			C	0.239	2.471	0.599	1	1	87.705			
T13	3.18	9.99	A	0.248	2.443	0.601	1	1	98.438	8.81	440.72	B
80.00-60.00			B	0.33	2.218	0.626	1	1	142.641			
			C	0.22	2.531	0.595	1	1	86.209			
T14	4.76	14.76	A	0.225	2.516	0.596	1	1	144.977	11.93	397.74	B
60.00-30.00			B	0.303	2.288	0.617	1	1	212.426			
			C	0.207	2.573	0.592	1	1	132.735			
T15	4.76	16.66	A	0.212	2.558	0.593	1	1	150.144	11.38	379.46	B
30.00-0.00			B	0.282	2.345	0.611	1	1	216.036			
			C	0.194	2.617	0.589	1	1	136.537			
Sum Weight:	34.77	127.46						OTM	19039.49 kip-ft	127.41		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.20	2.46	A	0.273	2.37	0.608	0.825	1	26.972	3.59	179.67	B
320.00-300.00			B	0.401	2.062	0.652	0.825	1	40.885			
			C	0.273	2.37	0.608	0.825	1	26.972			
T2	0.31	3.23	A	0.262	2.402	0.605	0.825	1	29.606	4.37	218.33	B
300.00-280.00			B	0.434	2.001	0.666	0.825	1	52.181			
			C	0.262	2.402	0.605	0.825	1	29.606			
T3	0.75	4.32	A	0.24	2.467	0.599	0.825	1	34.107	6.80	340.11	B
280.00-260.00			B	0.565	1.83	0.733	0.825	1	90.729			
			C	0.24	2.467	0.599	0.825	1	34.107			
T4	0.80	4.83	A	0.226	2.512	0.596	0.825	1	39.057	7.22	360.99	B
260.00-240.00			B	0.512	1.885	0.704	0.825	1	95.590			
			C	0.226	2.512	0.596	0.825	1	39.057			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T5	0.84	6.22	A	0.232	2.492	0.597	0.825	1	48.024	7.84	392.20	B
240.00-220.00			B	0.488	1.916	0.692	0.825	1	104.616			
			C	0.232	2.492	0.597	0.825	1	48.024			
T6	1.46	5.95	A	0.184	2.649	0.587	0.825	1	42.331	7.61	380.25	B
220.00-200.00			B	0.421	2.024	0.66	0.825	1	98.528			
			C	0.344	2.187	0.63	0.825	1	76.927			
T7	2.79	8.67	A	0.365	2.138	0.638	0.825	1	94.918	8.46	422.75	B
200.00-180.00			B	0.416	2.033	0.658	0.825	1	112.262			
			C	0.349	2.173	0.632	0.825	1	90.519			
T8	2.85	9.78	A	0.336	2.204	0.628	0.825	1	96.113	8.76	437.84	B
180.00-160.00			B	0.399	2.067	0.651	0.825	1	118.034			
			C	0.322	2.238	0.623	0.825	1	91.872			
T9	2.88	10.22	A	0.328	2.223	0.625	0.825	1	103.602	9.15	457.31	B
160.00-140.00			B	0.39	2.084	0.648	0.825	1	126.732			
			C	0.316	2.255	0.621	0.825	1	99.534			
T10	3.00	10.60	A	0.31	2.27	0.619	0.825	1	105.953	9.54	477.01	B
140.00-120.00			B	0.391	2.082	0.648	0.825	1	137.852			
			C	0.298	2.3	0.615	0.825	1	101.976			
T11	3.03	9.36	A	0.279	2.352	0.61	0.825	1	95.694	8.79	439.56	B
120.00-100.00			B	0.353	2.165	0.634	0.825	1	128.115			
			C	0.251	2.434	0.602	0.825	1	84.957			
T12	3.16	10.41	A	0.266	2.391	0.606	0.825	1	98.638	9.09	454.71	B
100.00-80.00			B	0.353	2.163	0.634	0.825	1	140.439			
			C	0.239	2.471	0.599	0.825	1	87.705			
T13	3.18	9.99	A	0.248	2.443	0.601	0.825	1	98.438	8.63	431.51	B
80.00-60.00			B	0.33	2.218	0.626	0.825	1	139.661			
			C	0.22	2.531	0.595	0.825	1	86.209			
T14	4.76	14.76	A	0.225	2.516	0.596	0.825	1	144.977	11.68	389.36	B
60.00-30.00			B	0.303	2.288	0.617	0.825	1	207.955			
			C	0.207	2.573	0.592	0.825	1	132.735			
T15	4.76	16.66	A	0.212	2.558	0.593	0.825	1	150.144	11.15	371.61	B
30.00-0.00			B	0.282	2.345	0.611	0.825	1	211.564			
			C	0.194	2.617	0.589	0.825	1	136.537			
Sum Weight:	34.77	127.46						OTM	18212.80 kip-ft	122.67		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.20	2.46	A	0.273	2.37	0.608	0.8	1	26.681	3.56	178.13	B
320.00-300.00			B	0.401	2.062	0.652	0.8	1	40.534			
			C	0.273	2.37	0.608	0.8	1	26.681			
T2	0.31	3.23	A	0.262	2.402	0.605	0.8	1	29.291	4.32	216.17	B
300.00-280.00			B	0.434	2.001	0.666	0.8	1	51.664			
			C	0.262	2.402	0.605	0.8	1	29.291			
T3	0.75	4.32	A	0.24	2.467	0.599	0.8	1	33.759	6.77	338.32	B
280.00-260.00			B	0.565	1.83	0.733	0.8	1	90.250			
			C	0.24	2.467	0.599	0.8	1	33.759			
T4	0.80	4.83	A	0.226	2.512	0.596	0.8	1	38.571	7.18	358.78	B
260.00-240.00			B	0.512	1.885	0.704	0.8	1	95.006			
			C	0.226	2.512	0.596	0.8	1	38.571			
T5	0.84	6.22	A	0.232	2.492	0.597	0.8	1	47.285	7.79	389.31	B
240.00-220.00			B	0.488	1.916	0.692	0.8	1	103.847			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.232	2.492	0.597	0.8	1	47.285			
T6	1.46	5.95	A	0.184	2.649	0.587	0.8	1	41.728	7.55	377.53	B
220.00-200.00			B	0.421	2.024	0.66	0.8	1	97.822			
			C	0.344	2.187	0.63	0.8	1	76.441			
T7	2.79	8.67	A	0.365	2.138	0.638	0.8	1	94.393	8.40	419.89	B
200.00-180.00			B	0.416	2.033	0.658	0.8	1	111.503			
			C	0.349	2.173	0.632	0.8	1	89.981			
T8	2.85	9.78	A	0.336	2.204	0.628	0.8	1	95.526	8.70	434.84	B
180.00-160.00			B	0.399	2.067	0.651	0.8	1	117.226			
			C	0.322	2.238	0.623	0.8	1	91.273			
T9	2.88	10.22	A	0.328	2.223	0.625	0.8	1	102.790	9.07	453.66	B
160.00-140.00			B	0.39	2.084	0.648	0.8	1	125.719			
			C	0.316	2.255	0.621	0.8	1	98.707			
T10	3.00	10.60	A	0.31	2.27	0.619	0.8	1	105.060	9.47	473.33	B
140.00-120.00			B	0.391	2.082	0.648	0.8	1	136.789			
			C	0.298	2.3	0.615	0.8	1	101.068			
T11	3.03	9.36	A	0.279	2.352	0.61	0.8	1	95.694	8.77	438.41	B
120.00-100.00			B	0.353	2.165	0.634	0.8	1	127.780			
			C	0.251	2.434	0.602	0.8	1	84.957			
T12	3.16	10.41	A	0.266	2.391	0.606	0.8	1	98.638	9.07	453.33	B
100.00-80.00			B	0.353	2.163	0.634	0.8	1	140.013			
			C	0.239	2.471	0.599	0.8	1	87.705			
T13	3.18	9.99	A	0.248	2.443	0.601	0.8	1	98.438	8.60	430.19	B
80.00-60.00			B	0.33	2.218	0.626	0.8	1	139.235			
			C	0.22	2.531	0.595	0.8	1	86.209			
T14	4.76	14.76	A	0.225	2.516	0.596	0.8	1	144.977	11.65	388.17	B
60.00-30.00			B	0.303	2.288	0.617	0.8	1	207.316			
			C	0.207	2.573	0.592	0.8	1	132.735			
T15	4.76	16.66	A	0.212	2.558	0.593	0.8	1	150.144	11.11	370.49	B
30.00-0.00			B	0.282	2.345	0.611	0.8	1	210.926			
			C	0.194	2.617	0.589	0.8	1	136.537			
Sum Weight:	34.77	127.46						OTM	18094.70 kip-ft	122.00		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.20	2.46	A	0.273	2.37	0.608	0.85	1	27.264	3.62	181.22	B
320.00-300.00			B	0.401	2.062	0.652	0.85	1	41.237			
			C	0.273	2.37	0.608	0.85	1	27.264			
T2	0.31	3.23	A	0.262	2.402	0.605	0.85	1	29.920	4.41	220.50	B
300.00-280.00			B	0.434	2.001	0.666	0.85	1	52.699			
			C	0.262	2.402	0.605	0.85	1	29.920			
T3	0.75	4.32	A	0.24	2.467	0.599	0.85	1	34.455	6.84	341.90	B
280.00-260.00			B	0.565	1.83	0.733	0.85	1	91.207			
			C	0.24	2.467	0.599	0.85	1	34.455			
T4	0.80	4.83	A	0.226	2.512	0.596	0.85	1	39.544	7.26	363.19	B
260.00-240.00			B	0.512	1.885	0.704	0.85	1	96.174			
			C	0.226	2.512	0.596	0.85	1	39.544			
T5	0.84	6.22	A	0.232	2.492	0.597	0.85	1	48.764	7.90	395.08	B
240.00-220.00			B	0.488	1.916	0.692	0.85	1	105.386			
			C	0.232	2.492	0.597	0.85	1	48.764			
T6	1.46	5.95	A	0.184	2.649	0.587	0.85	1	42.935	7.66	382.98	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
220.00-200.00			B	0.421	2.024	0.66	0.85	1	99.234			
			C	0.344	2.187	0.63	0.85	1	77.413			
T7	2.79	8.67	A	0.365	2.138	0.638	0.85	1	95.443	8.51	425.61	B
200.00-180.00			B	0.416	2.033	0.658	0.85	1	113.021			
			C	0.349	2.173	0.632	0.85	1	91.056			
T8	2.85	9.78	A	0.336	2.204	0.628	0.85	1	96.700	8.82	440.83	B
180.00-160.00			B	0.399	2.067	0.651	0.85	1	118.842			
			C	0.322	2.238	0.623	0.85	1	92.471			
T9	2.88	10.22	A	0.328	2.223	0.625	0.85	1	104.414	9.22	460.97	B
160.00-140.00			B	0.39	2.084	0.648	0.85	1	127.745			
			C	0.316	2.255	0.621	0.85	1	100.362			
T10	3.00	10.60	A	0.31	2.27	0.619	0.85	1	106.846	9.61	480.69	B
140.00-120.00			B	0.391	2.082	0.648	0.85	1	138.915			
			C	0.298	2.3	0.615	0.85	1	102.884			
T11	3.03	9.36	A	0.279	2.352	0.61	0.85	1	95.694	8.81	440.71	B
120.00-100.00			B	0.353	2.165	0.634	0.85	1	128.450			
			C	0.251	2.434	0.602	0.85	1	84.957			
T12	3.16	10.41	A	0.266	2.391	0.606	0.85	1	98.638	9.12	456.09	B
100.00-80.00			B	0.353	2.163	0.634	0.85	1	140.865			
			C	0.239	2.471	0.599	0.85	1	87.705			
T13	3.18	9.99	A	0.248	2.443	0.601	0.85	1	98.438	8.66	432.82	B
80.00-60.00			B	0.33	2.218	0.626	0.85	1	140.086			
			C	0.22	2.531	0.595	0.85	1	86.209			
T14	4.76	14.76	A	0.225	2.516	0.596	0.85	1	144.977	11.72	390.56	B
60.00-30.00			B	0.303	2.288	0.617	0.85	1	208.594			
			C	0.207	2.573	0.592	0.85	1	132.735			
T15	4.76	16.66	A	0.212	2.558	0.593	0.85	1	150.144	11.18	372.73	B
30.00-0.00			B	0.282	2.345	0.611	0.85	1	212.203			
			C	0.194	2.617	0.589	0.85	1	136.537			
Sum Weight:	34.77	127.46						OTM	18330.90 kip-ft	123.35		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	1	1	22.637	3.05	152.67	B
320.00-300.00			B	0.285	2.337	0.611	1	1	30.662			
			C	0.208	2.571	0.592	1	1	22.637			
T2	0.10	2.50	A	0.207	2.573	0.592	1	1	25.689	3.76	187.98	B
300.00-280.00			B	0.314	2.259	0.62	1	1	39.810			
			C	0.207	2.573	0.592	1	1	25.689			
T3	0.28	3.48	A	0.2	2.595	0.59	1	1	30.944	5.32	266.04	B
280.00-260.00			B	0.409	2.046	0.655	1	1	63.480			
			C	0.2	2.595	0.59	1	1	30.944			
T4	0.29	3.83	A	0.189	2.634	0.588	1	1	36.382	5.87	293.58	B
260.00-240.00			B	0.371	2.124	0.64	1	1	68.970			
			C	0.189	2.634	0.588	1	1	36.382			
T5	0.31	4.90	A	0.197	2.605	0.59	1	1	46.567	6.65	332.47	B
240.00-220.00			B	0.359	2.152	0.636	1	1	78.960			
			C	0.197	2.605	0.59	1	1	46.567			
T6	0.56	4.82	A	0.157	2.744	0.583	1	1	40.915	6.43	321.64	B
220.00-200.00			B	0.305	2.283	0.617	1	1	73.883			
			C	0.266	2.39	0.606	1	1	62.481			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T7	1.12	6.87	A	0.293	2.315	0.614	1	1	78.739	7.31	365.28	B
200.00-180.00			B	0.315	2.258	0.62	1	1	87.314			
			C	0.281	2.348	0.61	1	1	75.751			
T8	1.14	7.91	A	0.27	2.379	0.607	1	1	80.571	7.55	377.51	B
180.00-160.00			B	0.298	2.302	0.615	1	1	91.383			
			C	0.259	2.41	0.604	1	1	77.657			
T9	1.15	8.04	A	0.267	2.388	0.606	1	1	89.871	8.10	405.12	B
160.00-140.00			B	0.295	2.309	0.614	1	1	101.331			
			C	0.257	2.416	0.604	1	1	87.074			
T10	1.19	8.32	A	0.252	2.432	0.602	1	1	92.738	8.35	417.74	B
140.00-120.00			B	0.291	2.32	0.613	1	1	108.330			
			C	0.243	2.458	0.6	1	1	89.983			
T11	1.20	7.49	A	0.22	2.53	0.595	1	1	73.341	6.87	343.68	B
120.00-100.00			B	0.254	2.425	0.603	1	1	89.417			
			C	0.199	2.599	0.59	1	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	1	1	76.097	7.10	354.97	B
100.00-80.00			B	0.253	2.429	0.603	1	1	97.664			
			C	0.19	2.629	0.588	1	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	1	1	75.783	6.71	335.38	B
80.00-60.00			B	0.235	2.484	0.598	1	1	96.937			
			C	0.174	2.687	0.585	1	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	1	1	111.416	9.07	302.30	B
60.00-30.00			B	0.215	2.546	0.594	1	1	145.061			
			C	0.163	2.724	0.584	1	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	1	1	115.922	8.67	288.87	B
30.00-0.00			B	0.201	2.593	0.591	1	1	148.718			
			C	0.153	2.762	0.582	1	1	106.061			
Sum Weight:	13.67	103.04						OTM	15197.38 kip-ft	100.82		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	0.825	1	20.596	2.82	140.76	B
320.00-300.00			B	0.285	2.337	0.611	0.825	1	28.270			
			C	0.208	2.571	0.592	0.825	1	20.596			
T2	0.10	2.50	A	0.207	2.573	0.592	0.825	1	23.485	3.45	172.49	B
300.00-280.00			B	0.314	2.259	0.62	0.825	1	36.530			
			C	0.207	2.573	0.592	0.825	1	23.485			
T3	0.28	3.48	A	0.2	2.595	0.59	0.825	1	28.505	5.05	252.71	B
280.00-260.00			B	0.409	2.046	0.655	0.825	1	60.299			
			C	0.2	2.595	0.59	0.825	1	28.505			
T4	0.29	3.83	A	0.189	2.634	0.588	0.825	1	32.980	5.53	276.49	B
260.00-240.00			B	0.371	2.124	0.64	0.825	1	64.955			
			C	0.189	2.634	0.588	0.825	1	32.980			
T5	0.31	4.90	A	0.197	2.605	0.59	0.825	1	41.390	6.19	309.25	B
240.00-220.00			B	0.359	2.152	0.636	0.825	1	73.446			
			C	0.197	2.605	0.59	0.825	1	41.390			
T6	0.56	4.82	A	0.157	2.744	0.583	0.825	1	36.691	6.01	300.47	B
220.00-200.00			B	0.305	2.283	0.617	0.825	1	69.020			
			C	0.266	2.39	0.606	0.825	1	58.802			
T7	1.12	6.87	A	0.293	2.315	0.614	0.825	1	74.777	6.87	343.45	B
200.00-180.00			B	0.315	2.258	0.62	0.825	1	82.096			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.281	2.348	0.61	0.825	1	71.722			
T8	1.14	7.91	A	0.27	2.379	0.607	0.825	1	76.182	7.09	354.39	B
180.00-160.00			B	0.298	2.302	0.615	0.825	1	85.786			
			C	0.259	2.41	0.604	0.825	1	73.203			
T9	1.15	8.04	A	0.267	2.388	0.606	0.825	1	83.841	7.53	376.44	B
160.00-140.00			B	0.295	2.309	0.614	0.825	1	94.158			
			C	0.257	2.416	0.604	0.825	1	80.964			
T10	1.19	8.32	A	0.252	2.432	0.602	0.825	1	86.145	7.77	388.35	B
140.00-120.00			B	0.291	2.32	0.613	0.825	1	100.708			
			C	0.243	2.458	0.6	0.825	1	83.311			
T11	1.20	7.49	A	0.22	2.53	0.595	0.825	1	73.341	6.75	337.55	B
120.00-100.00			B	0.254	2.425	0.603	0.825	1	87.822			
			C	0.199	2.599	0.59	0.825	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	0.825	1	76.097	6.95	347.67	B
100.00-80.00			B	0.253	2.429	0.603	0.825	1	95.655			
			C	0.19	2.629	0.588	0.825	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	0.825	1	75.783	6.57	328.43	B
80.00-60.00			B	0.235	2.484	0.598	0.825	1	94.928			
			C	0.174	2.687	0.585	0.825	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	0.825	1	111.416	8.88	296.02	B
60.00-30.00			B	0.215	2.546	0.594	0.825	1	142.048			
			C	0.163	2.724	0.584	0.825	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	0.825	1	115.922	8.49	283.02	B
30.00-0.00			B	0.201	2.593	0.591	0.825	1	145.705			
			C	0.153	2.762	0.582	0.825	1	106.061			
Sum Weight:	13.67	103.04						OTM	14309.11 kip-ft	95.94		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	0.8	1	20.305	2.78	139.06	B
320.00-300.00			B	0.285	2.337	0.611	0.8	1	27.929			
			C	0.208	2.571	0.592	0.8	1	20.305			
T2	0.10	2.50	A	0.207	2.573	0.592	0.8	1	23.170	3.41	170.28	B
300.00-280.00			B	0.314	2.259	0.62	0.8	1	36.062			
			C	0.207	2.573	0.592	0.8	1	23.170			
T3	0.28	3.48	A	0.2	2.595	0.59	0.8	1	28.157	5.02	250.81	B
280.00-260.00			B	0.409	2.046	0.655	0.8	1	59.845			
			C	0.2	2.595	0.59	0.8	1	28.157			
T4	0.29	3.83	A	0.189	2.634	0.588	0.8	1	32.494	5.48	274.05	B
260.00-240.00			B	0.371	2.124	0.64	0.8	1	64.381			
			C	0.189	2.634	0.588	0.8	1	32.494			
T5	0.31	4.90	A	0.197	2.605	0.59	0.8	1	40.651	6.12	305.94	B
240.00-220.00			B	0.359	2.152	0.636	0.8	1	72.659			
			C	0.197	2.605	0.59	0.8	1	40.651			
T6	0.56	4.82	A	0.157	2.744	0.583	0.8	1	36.088	5.95	297.45	B
220.00-200.00			B	0.305	2.283	0.617	0.8	1	68.325			
			C	0.266	2.39	0.606	0.8	1	58.276			
T7	1.12	6.87	A	0.293	2.315	0.614	0.8	1	74.211	6.81	340.33	B
200.00-180.00			B	0.315	2.258	0.62	0.8	1	81.351			
			C	0.281	2.348	0.61	0.8	1	71.147			
T8	1.14	7.91	A	0.27	2.379	0.607	0.8	1	75.556	7.02	351.08	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
180.00-160.00			B	0.298	2.302	0.615	0.8	1	84.987			
			C	0.259	2.41	0.604	0.8	1	72.567			
T9	1.15	8.04	A	0.267	2.388	0.606	0.8	1	82.980	7.45	372.35	B
160.00-140.00			B	0.295	2.309	0.614	0.8	1	93.134			
			C	0.257	2.416	0.604	0.8	1	80.091			
T10	1.19	8.32	A	0.252	2.432	0.602	0.8	1	85.203	7.68	384.15	B
140.00-120.00			B	0.291	2.32	0.613	0.8	1	99.619			
			C	0.243	2.458	0.6	0.8	1	82.358			
T11	1.20	7.49	A	0.22	2.53	0.595	0.8	1	73.341	6.73	336.67	B
120.00-100.00			B	0.254	2.425	0.603	0.8	1	87.594			
			C	0.199	2.599	0.59	0.8	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	0.8	1	76.097	6.93	346.63	B
100.00-80.00			B	0.253	2.429	0.603	0.8	1	95.368			
			C	0.19	2.629	0.588	0.8	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	0.8	1	75.783	6.55	327.44	B
80.00-60.00			B	0.235	2.484	0.598	0.8	1	94.641			
			C	0.174	2.687	0.585	0.8	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	0.8	1	111.416	8.85	295.13	B
60.00-30.00			B	0.215	2.546	0.594	0.8	1	141.618			
			C	0.163	2.724	0.584	0.8	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	0.8	1	115.922	8.47	282.19	B
30.00-0.00			B	0.201	2.593	0.591	0.8	1	145.275			
			C	0.153	2.762	0.582	0.8	1	106.061			
Sum Weight:	13.67	103.04						OTM	14182.22 kip-ft	95.24		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	1.79	A	0.208	2.571	0.592	0.85	1	20.888	2.85	142.46	B
320.00-300.00			B	0.285	2.337	0.611	0.85	1	28.612			
			C	0.208	2.571	0.592	0.85	1	20.888			
T2	0.10	2.50	A	0.207	2.573	0.592	0.85	1	23.800	3.49	174.71	B
300.00-280.00			B	0.314	2.259	0.62	0.85	1	36.999			
			C	0.207	2.573	0.592	0.85	1	23.800			
T3	0.28	3.48	A	0.2	2.595	0.59	0.85	1	28.854	5.09	254.62	B
280.00-260.00			B	0.409	2.046	0.655	0.85	1	60.754			
			C	0.2	2.595	0.59	0.85	1	28.854			
T4	0.29	3.83	A	0.189	2.634	0.588	0.85	1	33.466	5.58	278.93	B
260.00-240.00			B	0.371	2.124	0.64	0.85	1	65.528			
			C	0.189	2.634	0.588	0.85	1	33.466			
T5	0.31	4.90	A	0.197	2.605	0.59	0.85	1	42.130	6.25	312.57	B
240.00-220.00			B	0.359	2.152	0.636	0.85	1	74.234			
			C	0.197	2.605	0.59	0.85	1	42.130			
T6	0.56	4.82	A	0.157	2.744	0.583	0.85	1	37.294	6.07	303.50	B
220.00-200.00			B	0.305	2.283	0.617	0.85	1	69.714			
			C	0.266	2.39	0.606	0.85	1	59.327			
T7	1.12	6.87	A	0.293	2.315	0.614	0.85	1	75.343	6.93	346.57	B
200.00-180.00			B	0.315	2.258	0.62	0.85	1	82.842			
			C	0.281	2.348	0.61	0.85	1	72.298			
T8	1.14	7.91	A	0.27	2.379	0.607	0.85	1	76.809	7.15	357.69	B
180.00-160.00			B	0.298	2.302	0.615	0.85	1	86.586			
			C	0.259	2.41	0.604	0.85	1	73.839			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T9	1.15	8.04	A	0.267	2.388	0.606	0.85	1	84.703	7.61	380.54	B
160.00-140.00			B	0.295	2.309	0.614	0.85	1	95.183			
			C	0.257	2.416	0.604	0.85	1	81.837			
T10	1.19	8.32	A	0.252	2.432	0.602	0.85	1	87.087	7.85	392.55	B
140.00-120.00			B	0.291	2.32	0.613	0.85	1	101.797			
			C	0.243	2.458	0.6	0.85	1	84.264			
T11	1.20	7.49	A	0.22	2.53	0.595	0.85	1	73.341	6.77	338.43	B
120.00-100.00			B	0.254	2.425	0.603	0.85	1	88.050			
			C	0.199	2.599	0.59	0.85	1	65.744			
T12	1.25	8.42	A	0.21	2.562	0.593	0.85	1	76.097	6.97	348.71	B
100.00-80.00			B	0.253	2.429	0.603	0.85	1	95.942			
			C	0.19	2.629	0.588	0.85	1	68.322			
T13	1.25	8.35	A	0.196	2.611	0.59	0.85	1	75.783	6.59	329.42	B
80.00-60.00			B	0.235	2.484	0.598	0.85	1	95.215			
			C	0.174	2.687	0.585	0.85	1	66.769			
T14	1.88	12.30	A	0.176	2.678	0.586	0.85	1	111.416	8.91	296.92	B
60.00-30.00			B	0.215	2.546	0.594	0.85	1	142.479			
			C	0.163	2.724	0.584	0.85	1	102.802			
T15	1.88	14.02	A	0.166	2.713	0.584	0.85	1	115.922	8.52	283.86	B
30.00-0.00			B	0.201	2.593	0.591	0.85	1	146.136			
			C	0.153	2.762	0.582	0.85	1	106.061			
Sum Weight:	13.67	103.04						OTM	14436.01 kip-ft	96.64		

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	57.25					
Bracing Weight	45.79					
Total Member Self-Weight	103.04			72.00	-9.21	
Total Weight	124.33			72.00	-9.21	
Wind 0 deg - No Ice		-0.00	-123.69	-20462.82	-8.91	159.06
Wind 30 deg - No Ice		59.75	-103.50	-17052.16	-9895.50	200.95
Wind 45 deg - No Ice		84.01	-84.01	-13820.00	-13900.96	203.49
Wind 60 deg - No Ice		102.29	-59.06	-9687.57	-16913.28	192.17
Wind 90 deg - No Ice		119.51	0.00	72.30	-19782.31	136.34
Wind 120 deg - No Ice		107.12	61.85	10339.66	-17792.73	43.38
Wind 135 deg - No Ice		84.02	84.02	13964.42	-13901.38	-11.98
Wind 150 deg - No Ice		59.76	103.50	17196.45	-9896.02	-64.60
Wind 180 deg - No Ice		0.00	118.12	19591.65	-9.51	-151.40
Wind 210 deg - No Ice		-59.75	103.50	17196.15	9877.08	-200.95
Wind 225 deg - No Ice		-84.01	84.01	13963.99	13882.54	-203.49
Wind 240 deg - No Ice		-107.12	61.84	10339.15	17774.01	-202.44
Wind 270 deg - No Ice		-119.51	-0.00	71.70	19763.89	-136.34
Wind 300 deg - No Ice		-102.29	-59.06	-9688.09	16895.16	-40.77
Wind 315 deg - No Ice		-84.02	-84.02	-13820.42	13882.96	11.98
Wind 330 deg - No Ice		-59.76	-103.50	-17052.46	9877.60	64.60
Member Ice	24.42					
Total Weight Ice	174.58			184.66	-54.16	
Wind 0 deg - Ice		-0.00	-154.69	-25213.19	-54.11	259.53
Wind 30 deg - Ice		75.32	-130.45	-21196.84	-12398.71	324.93
Wind 45 deg - Ice		106.04	-106.04	-17189.73	-17428.51	327.32
Wind 60 deg - Ice		129.28	-74.64	-12041.82	-21231.04	307.45

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
Wind 90 deg - Ice		150.63	0.00	184.71	-24743.35	213.12
Wind 120 deg - Ice		133.97	77.35	12883.63	-22049.31	60.69
Wind 135 deg - Ice		106.04	106.04	17559.12	-17428.58	-27.53
Wind 150 deg - Ice		75.32	130.45	21566.20	-12398.80	-111.81
Wind 180 deg - Ice		0.00	149.28	24637.71	-54.21	-249.69
Wind 210 deg - Ice		-75.32	130.45	21566.15	12290.39	-324.93
Wind 225 deg - Ice		-106.04	106.04	17559.05	17320.19	-327.32
Wind 240 deg - Ice		-133.97	77.35	12883.53	21940.93	-320.22
Wind 270 deg - Ice		-150.63	-0.00	184.60	24635.03	-213.12
Wind 300 deg - Ice		-129.28	-74.64	-12041.92	21122.78	-57.76
Wind 315 deg - Ice		-106.04	-106.04	-17189.81	17320.26	27.53
Wind 330 deg - Ice		-75.32	-130.45	-21196.89	12290.48	111.81
Total Weight	124.33			72.00	-9.21	
Wind 0 deg - Service		-0.00	-123.69	-20539.27	5.92	159.06
Wind 30 deg - Service		59.75	-103.50	-17128.61	-9880.67	200.95
Wind 45 deg - Service		84.01	-84.01	-13896.45	-13886.13	203.49
Wind 60 deg - Service		102.29	-59.06	-9764.02	-16898.45	192.17
Wind 90 deg - Service		119.51	0.00	-4.16	-19767.48	136.34
Wind 120 deg - Service		107.12	61.85	10263.21	-17777.90	43.38
Wind 135 deg - Service		84.02	84.02	13887.96	-13886.56	-11.98
Wind 150 deg - Service		59.76	103.50	17120.00	-9881.19	-64.60
Wind 180 deg - Service		0.00	118.12	19515.19	5.32	-151.40
Wind 210 deg - Service		-59.75	103.50	17119.70	9891.91	-200.95
Wind 225 deg - Service		-84.01	84.01	13887.54	13897.37	-203.49
Wind 240 deg - Service		-107.12	61.84	10262.69	17788.84	-202.44
Wind 270 deg - Service		-119.51	-0.00	-4.76	19778.71	-136.34
Wind 300 deg - Service		-102.29	-59.06	-9764.54	16909.98	-40.77
Wind 315 deg - Service		-84.02	-84.02	-13896.88	13897.79	11.98
Wind 330 deg - Service		-59.76	-103.50	-17128.91	9892.42	64.60

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+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp

Comb. No.	Description
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
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 Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	320 - 300	Leg	Max Tension	27	14.72	0.03	0.05
			Max. Compression	24	-18.31	-0.57	-0.35
			Max. Mx	30	-17.68	0.69	-0.11
			Max. My	28	-1.19	0.20	0.93
			Max. Vy	23	-1.17	0.19	-0.15
			Max. Vx	19	1.21	0.00	-0.11
		Diagonal	Max Tension	23	4.31	0.00	0.00
			Max. Compression	31	-4.34	0.00	0.00
			Max. Mx	25	1.05	0.01	-0.00
			Max. My	29	-3.55	0.01	0.01
			Max. Vy	25	0.01	0.01	-0.00
			Max. Vx	29	-0.00	0.01	0.01
		Top Girt	Max Tension	24	0.07	0.00	0.00
			Max. Compression	27	-0.09	0.00	0.00
			Max. Mx	18	-0.01	-0.02	0.00
			Max. My	28	-0.01	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T2	300 - 280	Leg	Max Tension	27	42.82	-0.09	-0.00
			Max. Compression	24	-49.83	0.71	0.03
			Max. Mx	24	-49.83	0.71	0.03
			Max. My	20	-2.30	0.03	-0.55
			Max. Vy	27	-0.26	-0.19	-0.05
			Max. Vx	31	-0.56	-0.01	-0.20
		Diagonal	Max Tension	34	5.02	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	34	-5.05	0.00	0.00
			Max. Mx	33	3.05	0.02	-0.00
			Max. My	29	-3.95	0.01	0.01
			Max. Vy	32	0.01	0.02	-0.00
			Max. Vx	29	-0.00	0.00	0.00
		Top Girt	Max Tension	21	0.01	0.00	0.00
			Max. Compression	30	-0.04	0.00	0.00
			Max. Mx	18	-0.01	-0.03	0.00
			Max. My	28	0.01	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T3	280 - 260	Leg	Max Tension	22	75.89	-0.55	-0.01
			Max. Compression	24	-87.90	1.10	0.05
			Max. Mx	32	74.50	-1.10	-0.06
			Max. My	20	-5.95	-0.01	-1.16
			Max. Vy	27	-0.91	-0.68	0.11
			Max. Vx	31	-0.97	0.00	-0.30
		Diagonal	Max Tension	34	7.79	0.00	0.00
			Max. Compression	34	-7.83	0.00	0.00
			Max. Mx	33	4.06	0.04	-0.00
			Max. My	19	-7.26	0.02	-0.01
			Max. Vy	33	0.02	0.04	-0.00
			Max. Vx	19	0.00	0.00	0.00
T4	260 - 240	Leg	Max Tension	22	113.23	-0.66	0.00
			Max. Compression	24	-130.53	2.14	0.11
			Max. Mx	19	-129.32	2.14	-0.33
			Max. My	20	-8.35	0.05	-1.99
			Max. Vy	30	-0.40	2.14	0.22
			Max. Vx	28	-0.44	0.05	1.98
		Diagonal	Max Tension	34	9.40	0.00	0.00
			Max. Compression	34	-9.50	0.00	0.00
			Max. Mx	27	5.69	0.06	0.01
			Max. My	19	-8.71	0.02	-0.02
			Max. Vy	27	0.03	0.06	0.01
			Max. Vx	19	0.00	0.00	0.00
T5	240 - 220	Leg	Max Tension	22	152.24	-0.93	-0.03
			Max. Compression	24	-175.97	1.90	0.06
			Max. Mx	19	-143.64	2.14	-0.33
			Max. My	20	-8.72	0.05	-1.99
			Max. Vy	30	0.32	2.14	0.22
			Max. Vx	28	0.33	0.05	1.98
		Diagonal	Max Tension	34	11.51	0.00	0.00
			Max. Compression	34	-11.57	0.00	0.00
			Max. Mx	22	7.59	0.14	-0.02
			Max. My	19	-10.12	0.02	-0.03
			Max. Vy	27	0.06	0.14	0.02
			Max. Vx	27	-0.01	0.00	0.00
T6	220 - 200	Leg	Max Tension	22	192.97	-0.86	-0.29
			Max. Compression	24	-224.98	2.08	-0.02
			Max. Mx	19	-222.43	2.09	-0.20
			Max. My	20	-13.50	-0.13	-3.18
			Max. Vy	32	-1.80	-1.79	-0.06
			Max. Vx	28	1.62	0.05	0.75
		Diagonal	Max Tension	34	15.71	0.00	0.00
			Max. Compression	34	-15.92	0.00	0.00
			Max. Mx	24	11.19	0.23	0.02
			Max. My	27	-13.25	0.09	0.06
			Max. Vy	24	-0.08	0.23	0.02
			Max. Vx	27	-0.01	0.00	0.00
T7	200 - 180	Leg	Max Tension	22	240.83	-2.34	-0.06
			Max. Compression	24	-283.36	3.93	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	19	-280.14	3.94	-0.41
			Max. My	28	-19.77	0.04	4.30
			Max. Vy	32	0.40	-3.79	0.01
			Max. Vx	20	0.65	-0.07	-3.10
		Diagonal	Max Tension	34	17.98	0.00	0.00
			Max. Compression	34	-18.18	0.00	0.00
			Max. Mx	27	11.17	0.22	0.03
			Max. My	27	-15.66	0.13	0.05
			Max. Vy	27	0.08	0.22	0.03
			Max. Vx	27	-0.01	0.00	0.00
T8	180 - 160	Leg	Max Tension	27	290.03	-2.95	0.07
			Max. Compression	24	-342.82	2.67	-0.04
			Max. Mx	19	-308.43	3.94	-0.41
			Max. My	28	-20.81	0.03	4.30
			Max. Vy	32	-0.48	-2.94	0.07
			Max. Vx	28	0.58	0.03	4.30
		Diagonal	Max Tension	34	19.77	0.00	0.00
			Max. Compression	34	-19.96	0.00	0.00
			Max. Mx	27	12.48	0.32	0.04
			Max. My	21	-15.49	0.24	-0.06
			Max. Vy	27	0.11	0.32	0.04
			Max. Vx	21	0.01	0.00	0.00
T9	160 - 140	Leg	Max Tension	27	340.80	-2.81	0.08
			Max. Compression	24	-404.02	4.69	-0.09
			Max. Mx	24	-404.02	4.69	-0.09
			Max. My	28	-26.74	-0.24	4.06
			Max. Vy	19	-0.43	4.66	-0.08
			Max. Vx	28	0.68	-0.24	4.06
		Diagonal	Max Tension	31	22.13	0.00	0.00
			Max. Compression	31	-22.65	0.00	0.00
			Max. Mx	30	14.32	0.40	0.05
			Max. My	21	-16.83	0.24	-0.07
			Max. Vy	27	0.13	0.40	0.05
			Max. Vx	21	0.01	0.00	0.00
T10	140 - 120	Leg	Max Tension	27	389.63	-3.15	0.09
			Max. Compression	24	-464.38	-3.87	-0.07
			Max. Mx	24	-434.16	4.69	-0.09
			Max. My	26	-30.23	-0.97	-6.26
			Max. Vy	19	0.85	2.80	-0.07
			Max. Vx	28	-0.90	-0.21	6.18
		Diagonal	Max Tension	31	22.93	0.00	0.00
			Max. Compression	31	-23.34	0.00	0.00
			Max. Mx	25	13.02	0.47	0.05
			Max. My	22	-20.01	0.28	-0.10
			Max. Vy	28	0.14	0.44	0.07
			Max. Vx	22	0.01	0.00	0.00
T11	120 - 100	Leg	Max Tension	27	397.56	1.28	-0.07
			Max. Compression	24	-477.56	-13.38	-0.31
			Max. Mx	24	-476.77	19.49	0.45
			Max. My	28	-36.70	-2.64	16.52
			Max. Vy	24	3.57	19.48	0.45
			Max. Vx	28	-2.81	-2.64	16.52
		Diagonal	Max Tension	31	34.18	-0.17	-0.03
			Max. Compression	30	-36.00	0.00	0.00
			Max. Mx	27	23.54	-0.23	0.07
			Max. My	31	-35.44	-0.06	-0.16
			Max. Vy	27	0.06	-0.23	0.07
			Max. Vx	31	-0.01	0.00	0.00
		Horizontal	Max Tension	31	19.31	-0.21	0.00
			Max. Compression	31	-19.52	-0.22	0.00
			Max. Mx	27	-4.32	-0.28	-0.04

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	19	3.44	-0.14	0.04
			Max. Vy	27	0.09	-0.28	-0.04
			Max. Vx	19	-0.00	-0.14	0.04
		Redund Horz 1 Bracing	Max Tension	24	8.29	0.00	0.00
			Max. Compression	24	-8.29	0.00	0.00
			Max. Mx	18	0.51	0.02	0.00
			Max. My	20	6.96	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	24	7.52	0.00	0.00
			Max. Compression	24	-7.52	0.00	0.00
			Max. Mx	23	6.42	0.05	0.00
			Max. My	30	3.67	0.00	0.00
			Max. Vy	23	-0.02	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-0.10	0.00	0.00
			Max. Mx	18	-0.01	0.02	0.00
			Max. My	30	-0.05	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	23	0.17	0.00	0.00
			Max. Compression	30	-0.11	0.00	0.00
			Max. Mx	24	0.13	0.17	0.00
			Max. My	28	0.04	0.00	0.00
			Max. Vy	24	-0.04	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Inner Bracing	Max Tension	22	0.01	0.00	0.00
			Max. Compression	23	-0.04	0.00	0.00
			Max. Mx	18	-0.01	0.20	0.00
			Max. My	30	-0.00	0.00	0.00
			Max. Vy	18	-0.06	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
T12	100 - 80	Leg	Max Tension	27	434.75	7.01	2.27
			Max. Compression	24	-525.11	-19.13	-0.32
			Max. Mx	24	-524.43	22.62	0.42
			Max. My	28	-38.71	-2.66	16.51
			Max. Vy	24	4.43	22.62	0.42
			Max. Vx	28	2.95	-2.66	16.51
		Diagonal	Max Tension	31	37.07	-0.27	-0.05
			Max. Compression	30	-39.32	0.00	0.00
			Max. Mx	27	26.36	-0.34	0.10
			Max. My	31	-38.75	-0.04	-0.22
			Max. Vy	27	0.09	-0.34	0.10
			Max. Vx	31	0.02	-0.04	-0.22
		Horizontal	Max Tension	31	21.69	-0.39	-0.00
			Max. Compression	30	-22.86	-0.47	-0.03
			Max. Mx	27	4.70	-0.53	-0.06
			Max. My	19	5.39	-0.25	0.06
			Max. Vy	27	-0.14	-0.53	-0.06
			Max. Vx	19	-0.00	-0.25	0.06
		Redund Horz 1 Bracing	Max Tension	24	9.11	0.00	0.00
			Max. Compression	24	-9.11	0.00	0.00
			Max. Mx	18	0.70	0.03	0.00
			Max. My	20	7.66	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	20	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	24	7.73	0.00	0.00
			Max. Compression	24	-7.73	0.00	0.00
			Max. Mx	23	6.60	0.05	0.00
			Max. My	30	4.25	0.00	0.00
			Max. Vy	23	-0.02	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-0.11	0.00	0.00
			Max. Mx	18	-0.01	0.03	0.00
			Max. My	30	-0.06	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	23	0.17	0.00	0.00
			Max. Compression	30	-0.11	0.00	0.00
			Max. Mx	24	0.13	0.20	0.00
			Max. My	28	0.04	0.00	0.00
			Max. Vy	24	-0.05	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Inner Bracing	Max Tension	22	0.01	0.00	0.00
			Max. Compression	19	-0.04	0.00	0.00
			Max. Mx	18	-0.01	0.25	0.00
			Max. My	30	-0.00	0.00	0.00
			Max. Vy	18	-0.07	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
T13	80 - 60	Leg	Max Tension	27	474.45	11.68	1.72
			Max. Compression	24	-575.80	-22.18	-0.45
			Max. Mx	24	-575.45	31.35	0.35
			Max. My	28	-45.53	-3.92	22.18
			Max. Vy	24	5.45	31.35	0.35
			Max. Vx	28	-3.39	-3.92	22.18
		Diagonal	Max Tension	31	35.56	-0.32	-0.06
			Max. Compression	30	-38.58	0.00	0.00
			Max. Mx	27	25.58	-0.42	0.11
			Max. My	31	-37.43	-0.03	-0.21
			Max. Vy	27	0.10	-0.41	0.11
			Max. Vx	31	0.02	-0.03	-0.21
		Horizontal	Max Tension	31	21.73	-0.38	-0.00
			Max. Compression	30	-23.05	-0.43	-0.02
			Max. Mx	27	-5.35	-0.47	-0.04
			Max. My	19	5.44	-0.29	0.04
			Max. Vy	27	0.13	-0.47	-0.04
			Max. Vx	19	-0.00	-0.29	0.04
		Redund Horz 1 Bracing	Max Tension	24	10.00	0.00	0.00
			Max. Compression	24	-10.00	0.00	0.00
			Max. Mx	18	0.65	0.04	0.00
			Max. My	20	8.40	0.00	-0.00
			Max. Vy	18	-0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	24	7.99	0.00	0.00
			Max. Compression	24	-7.99	0.00	0.00
			Max. Mx	23	6.83	0.10	0.00
			Max. My	30	5.27	0.00	0.00
			Max. Vy	23	-0.03	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Redund Hip 1	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Bracing					
			Max. Compression	23	-0.10	0.00	0.00
			Max. Mx	18	-0.01	0.03	0.00
			Max. My	29	-0.01	0.00	0.00
			Max. Vy	18	-0.02	0.00	0.00
			Max. Vx	29	-0.00	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	23	0.15	0.00	0.00
			Max. Compression	30	-0.11	0.00	0.00
			Max. Mx	24	0.12	0.29	0.00
			Max. My	28	0.05	0.00	0.00
			Max. Vy	24	-0.07	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Inner Bracing	Max Tension	22	0.00	0.00	0.00
			Max. Compression	19	-0.04	0.00	0.00
			Max. Mx	18	-0.01	0.29	0.00
			Max. My	30	-0.01	0.00	0.00
			Max. Vy	18	-0.08	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
T14	60 - 30	Leg	Max Tension	27	514.52	12.76	2.22
			Max. Compression	24	-627.39	4.23	0.34
			Max. Mx	24	-619.02	39.09	0.56
			Max. My	28	-51.45	-2.82	30.16
			Max. Vy	24	7.29	39.09	0.56
			Max. Vx	20	4.31	-2.81	-30.16
		Diagonal	Max Tension	31	51.64	-0.38	-0.09
			Max. Compression	30	-54.59	0.00	0.00
			Max. Mx	27	39.39	-0.49	0.28
			Max. My	31	-50.43	0.29	-0.49
			Max. Vy	30	-0.10	-0.22	0.23
			Max. Vx	30	0.06	0.37	-0.48
		Horizontal	Max Tension	31	25.51	-0.56	-0.00
			Max. Compression	31	-26.43	-0.56	-0.00
			Max. Mx	27	-5.69	-0.75	-0.05
			Max. My	19	4.41	-0.36	0.06
			Max. Vy	27	0.17	-0.75	-0.05
			Max. Vx	19	-0.00	-0.36	0.06
		Redund Horz 1 Bracing	Max Tension	24	10.89	0.00	0.00
			Max. Compression	24	-10.89	0.00	0.00
			Max. Mx	18	0.88	0.02	0.00
			Max. My	30	-0.47	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
		Redund Horz 2 Bracing	Max Tension	24	10.89	0.00	0.00
			Max. Compression	24	-10.89	0.00	0.00
			Max. Mx	18	0.88	0.15	0.00
			Max. My	29	10.18	0.00	-0.00
			Max. Vy	18	-0.05	0.00	0.00
			Max. Vx	29	0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	24	10.99	0.00	0.00
			Max. Compression	24	-10.99	0.00	0.00
			Max. Mx	23	9.38	0.07	0.00
			Max. My	23	9.38	0.00	-0.00
			Max. Vy	23	-0.02	0.00	0.00
			Max. Vx	23	0.00	0.00	0.00
		Redund Diag 2 Bracing	Max Tension	24	7.12	0.00	0.00
			Max. Compression	24	-7.12	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	30	7.10	0.15	0.00
			Max. My	30	7.10	0.00	0.00
			Max. Vy	30	-0.04	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	23	0.02	0.00	0.00
			Max. Compression	23	-0.25	0.00	0.00
			Max. Mx	18	-0.01	0.02	0.00
			Max. My	30	-0.12	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
		Redund Hip 2 Bracing	Max Tension	27	0.02	0.00	0.00
			Max. Compression	27	-0.09	0.00	0.00
			Max. Mx	18	-0.02	0.08	0.00
			Max. My	28	-0.00	0.00	0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	23	0.40	0.00	0.00
			Max. Compression	29	-0.16	0.00	0.00
			Max. Mx	30	0.13	0.18	0.00
			Max. My	20	-0.01	0.00	-0.00
			Max. Vy	30	0.04	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Inner Bracing	Max Tension	30	0.04	0.00	0.00
			Max. Compression	31	-0.06	0.00	0.00
			Max. Mx	18	-0.01	0.34	0.00
			Max. My	30	0.04	0.00	0.00
			Max. Vy	18	0.08	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
T15	30 - 0	Leg	Max Tension	27	574.31	24.19	4.11
			Max. Compression	24	-703.02	6.75	0.48
			Max. Mx	24	-701.83	-32.96	-1.08
			Max. My	28	-55.84	-2.83	30.16
			Max. Vy	24	-4.05	6.75	0.48
			Max. Vx	20	-4.04	-2.81	-30.16
		Diagonal	Max Tension	31	48.39	-0.34	-0.08
			Max. Compression	31	-49.96	0.00	0.00
			Max. Mx	27	33.13	-0.43	0.22
			Max. My	31	-47.99	0.19	-0.42
			Max. Vy	30	-0.09	-0.25	0.21
			Max. Vx	30	0.05	0.26	-0.41
		Horizontal	Max Tension	22	25.87	0.00	0.00
			Max. Compression	30	-28.36	-0.65	-0.04
			Max. Mx	27	6.33	-0.73	-0.07
			Max. My	19	8.06	-0.40	0.08
			Max. Vy	27	-0.17	-0.73	-0.07
			Max. Vx	19	-0.00	-0.40	0.08
		Redund Horz 1 Bracing	Max Tension	24	12.20	0.00	0.00
			Max. Compression	24	-12.20	0.00	0.00
			Max. Mx	33	8.50	0.02	0.00
			Max. Vy	33	-0.01	0.00	0.00
		Redund Horz 2 Bracing	Max Tension	24	12.20	0.00	0.00
			Max. Compression	24	-12.20	0.00	0.00
			Max. Mx	31	0.85	0.18	0.00
			Max. My	22	-2.10	0.00	0.00
			Max. Vy	31	-0.06	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Redund Diag 1 Bracing	Max Tension	24	11.35	0.00	0.00
			Max. Compression	24	-11.35	0.00	0.00
			Max. Mx	19	11.21	0.06	0.00
			Max. My	31	3.23	0.00	0.00
			Max. Vy	19	-0.02	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
		Redund Diag 2 Bracing	Max Tension	24	7.63	0.00	0.00
			Max. Compression	24	-7.63	0.00	0.00
			Max. Mx	30	7.60	0.18	0.00
			Max. My	22	2.86	0.00	-0.00
			Max. Vy	30	-0.05	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	23	0.02	0.00	0.00
			Max. Compression	23	-0.21	0.00	0.00
			Max. Mx	18	-0.01	0.02	0.00
			Max. Vy	18	-0.01	0.00	0.00
		Redund Hip 2 Bracing	Max Tension	27	0.02	0.00	0.00
			Max. Compression	27	-0.07	0.00	0.00
			Max. Mx	18	-0.02	0.10	0.00
			Max. My	20	-0.05	0.00	0.00
			Max. Vy	18	-0.03	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	23	0.34	0.00	0.00
			Max. Compression	29	-0.16	0.00	0.00
			Max. Mx	31	0.15	0.31	0.00
			Max. My	21	0.25	0.00	-0.00
			Max. Vy	31	-0.06	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Inner Bracing	Max Tension	21	0.03	0.00	0.00
			Max. Compression	31	-0.06	0.00	0.00
			Max. Mx	18	-0.01	0.42	0.00
			Max. My	22	-0.04	0.00	-0.00
			Max. Vy	18	-0.09	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	766.38	83.59	-43.14
	Max. H_x	30	766.38	83.59	-43.14
	Max. H_z	21	-601.46	-69.45	38.66
	Min. Vert	22	-621.50	-73.36	37.20
	Min. H_x	22	-621.50	-73.36	37.20
	Min. H_z	30	766.38	83.59	-43.14
Leg B	Max. Vert	24	769.04	-81.86	-46.23
	Max. H_x	32	-618.84	71.48	40.36
	Max. H_z	33	-598.81	66.85	43.19
	Min. Vert	32	-618.84	71.48	40.36
	Min. H_x	24	769.04	-81.86	-46.23
	Min. H_z	25	722.61	-74.77	-47.17
Leg A	Max. Vert	19	759.87	3.54	93.85

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_x	32	393.45	10.04	48.03
	Max. H_z	19	759.87	3.54	93.85
	Min. Vert	27	-628.03	-3.67	-82.24
	Min. H_x	24	-300.50	-10.86	-40.03
	Min. H_z	27	-628.03	-3.67	-82.24

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	124.33	-0.00	-0.00	71.99	-9.21	0.00
Dead+Wind 0 deg - No Ice	124.32	-0.00	-123.47	-20127.15	-8.64	159.07
Dead+Wind 30 deg - No Ice	124.32	59.68	-103.33	-16769.08	-9738.71	201.03
Dead+Wind 45 deg - No Ice	124.32	83.90	-83.88	-13592.12	-13678.60	203.62
Dead+Wind 60 deg - No Ice	124.32	102.15	-58.98	-9530.01	-16639.65	192.33
Dead+Wind 90 deg - No Ice	124.32	119.32	-0.02	65.81	-19458.77	136.54
Dead+Wind 120 deg - No Ice	124.32	106.93	61.74	10171.50	-17502.00	43.54
Dead+Wind 135 deg - No Ice	124.32	83.86	83.88	13736.10	-13667.16	-11.86
Dead+Wind 150 deg - No Ice	124.32	59.64	103.35	16919.20	-9728.77	-64.52
Dead+Wind 180 deg - No Ice	124.32	0.00	117.95	19275.93	-9.13	-151.40
Dead+Wind 210 deg - No Ice	124.32	-59.64	103.35	16918.99	9710.27	-201.01
Dead+Wind 225 deg - No Ice	124.32	-83.86	83.88	13735.77	13648.48	-203.59
Dead+Wind 240 deg - No Ice	124.32	-106.92	61.74	10171.06	17483.16	-202.58
Dead+Wind 270 deg - No Ice	124.32	-119.32	-0.02	65.23	19440.03	-136.51
Dead+Wind 300 deg - No Ice	124.32	-102.15	-58.98	-9530.54	16621.47	-40.90
Dead+Wind 315 deg - No Ice	124.32	-83.90	-83.89	-13592.54	13660.74	11.88
Dead+Wind 330 deg - No Ice	124.32	-59.68	-103.33	-16769.36	9721.14	64.54
Dead+Ice+Temp	174.58	-0.00	-0.00	184.51	-54.12	-0.00
Dead+Wind 0 deg+Ice+Temp	174.55	0.00	-154.32	-24726.48	-53.51	259.63
Dead+Wind 30 deg+Ice+Temp	174.56	75.18	-130.15	-20786.96	-12171.88	325.28
Dead+Wind 45 deg+Ice+Temp	174.56	105.84	-105.80	-16860.26	-17106.86	327.78
Dead+Wind 60 deg+Ice+Temp	174.56	129.03	-74.49	-11814.58	-20835.17	307.98
Dead+Wind 90 deg+Ice+Temp	174.56	150.30	-0.04	174.27	-24274.55	213.68
Dead+Wind 120 deg+Ice+Temp	174.55	133.64	77.15	12639.54	-21627.37	61.12
Dead+Wind 135 deg+Ice+Temp	174.56	105.77	105.80	17228.43	-17088.46	-27.23
Dead+Wind 150 deg+Ice+Temp	174.56	75.12	130.18	21165.01	-12155.68	-111.63
Dead+Wind 180 deg+Ice+Temp	174.56	0.00	148.99	24181.29	-53.24	-249.78
Dead+Wind 210 deg+Ice+Temp	174.56	-75.12	130.19	21164.98	12048.54	-325.23
Dead+Wind 225 deg+Ice+Temp	174.56	-105.77	105.81	17228.36	16980.71	-327.72
Dead+Wind 240 deg+Ice+Temp	174.55	-133.64	77.16	12639.45	21519.04	-320.71
Dead+Wind 270 deg+Ice+Temp	174.56	-150.30	-0.04	174.26	24165.80	-213.65
Dead+Wind 300 deg+Ice+Temp	174.56	-129.03	-74.50	-11814.35	20726.96	-58.14
Dead+Wind 315 deg+Ice+Temp	174.56	-105.84	-105.81	-16859.96	16999.07	27.26
Dead+Wind 330 deg+Ice+Temp	174.56	-75.18	-130.15	-20786.67	12064.47	111.67
Dead+Wind 0 deg - Service	124.32	-0.00	-123.47	-20127.15	-8.64	159.07
Dead+Wind 30 deg - Service	124.32	59.68	-103.33	-16769.08	-9738.71	201.03
Dead+Wind 45 deg - Service	124.32	83.90	-83.88	-13592.12	-13678.60	203.62
Dead+Wind 60 deg - Service	124.32	102.15	-58.98	-9530.01	-16639.65	192.33
Dead+Wind 90 deg - Service	124.32	119.32	-0.02	65.81	-19458.77	136.54
Dead+Wind 120 deg - Service	124.32	106.93	61.74	10171.50	-17502.00	43.54
Dead+Wind 135 deg - Service	124.32	83.86	83.88	13736.10	-13667.16	-11.86
Dead+Wind 150 deg - Service	124.32	59.64	103.35	16919.20	-9728.77	-64.52
Dead+Wind 180 deg - Service	124.32	0.00	117.95	19275.93	-9.13	-151.40
Dead+Wind 210 deg - Service	124.32	-59.64	103.35	16918.99	9710.27	-201.01
Dead+Wind 225 deg - Service	124.32	-83.86	83.88	13735.77	13648.48	-203.59
Dead+Wind 240 deg - Service	124.32	-106.92	61.74	10171.06	17483.16	-202.58

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
Dead+Wind 270 deg - Service	124.32	-119.32	-0.02	65.23	19440.03	-136.51
Dead+Wind 300 deg - Service	124.32	-102.15	-58.98	-9530.54	16621.47	-40.90
Dead+Wind 315 deg - Service	124.32	-83.90	-83.89	-13592.54	13660.74	11.88
Dead+Wind 330 deg - Service	124.32	-59.68	-103.33	-16769.36	9721.14	64.54

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-124.33	0.00	0.00	124.33	0.00	0.000%
2	-0.00	-124.33	-123.69	0.00	124.32	123.47	0.125%
3	59.75	-124.33	-103.50	-59.68	124.32	103.33	0.110%
4	84.01	-124.33	-84.01	-83.90	124.32	83.88	0.101%
5	102.29	-124.33	-59.06	-102.15	124.32	58.98	0.096%
6	119.51	-124.33	0.00	-119.32	124.32	0.02	0.110%
7	107.12	-124.33	61.85	-106.93	124.32	-61.74	0.126%
8	84.02	-124.33	84.02	-83.86	124.32	-83.88	0.119%
9	59.76	-124.33	103.50	-59.64	124.32	-103.35	0.111%
10	0.00	-124.33	118.12	-0.00	124.32	-117.95	0.096%
11	-59.75	-124.33	103.50	59.64	124.32	-103.35	0.110%
12	-84.01	-124.33	84.01	83.86	124.32	-83.88	0.119%
13	-107.12	-124.33	61.84	106.92	124.32	-61.74	0.127%
14	-119.51	-124.33	-0.00	119.32	124.32	0.02	0.111%
15	-102.29	-124.33	-59.06	102.15	124.32	58.98	0.096%
16	-84.02	-124.33	-84.02	83.90	124.32	83.89	0.100%
17	-59.76	-124.33	-103.50	59.68	124.32	103.33	0.109%
18	0.00	-174.58	0.00	0.00	174.58	0.00	0.000%
19	-0.00	-174.58	-154.69	-0.00	174.55	154.32	0.160%
20	75.32	-174.58	-130.45	-75.18	174.56	130.15	0.143%
21	106.04	-174.58	-106.04	-105.84	174.56	105.80	0.132%
22	129.28	-174.58	-74.64	-129.03	174.56	74.49	0.128%
23	150.63	-174.58	0.00	-150.30	174.56	0.04	0.145%
24	133.97	-174.58	77.35	-133.64	174.55	-77.15	0.163%
25	106.04	-174.58	106.04	-105.77	174.56	-105.80	0.155%
26	75.32	-174.58	130.45	-75.12	174.56	-130.18	0.146%
27	0.00	-174.58	149.28	-0.00	174.56	-148.99	0.128%
28	-75.32	-174.58	130.45	75.12	174.56	-130.19	0.144%
29	-106.04	-174.58	106.04	105.77	174.56	-105.81	0.154%
30	-133.97	-174.58	77.35	133.64	174.55	-77.16	0.163%
31	-150.63	-174.58	-0.00	150.30	174.56	0.04	0.145%
32	-129.28	-174.58	-74.64	129.03	174.56	74.50	0.127%
33	-106.04	-174.58	-106.04	105.84	174.56	105.81	0.131%
34	-75.32	-174.58	-130.45	75.18	174.56	130.15	0.142%
35	-0.00	-124.33	-123.69	0.00	124.32	123.47	0.125%
36	59.75	-124.33	-103.50	-59.68	124.32	103.33	0.110%
37	84.01	-124.33	-84.01	-83.90	124.32	83.88	0.101%
38	102.29	-124.33	-59.06	-102.15	124.32	58.98	0.096%
39	119.51	-124.33	0.00	-119.32	124.32	0.02	0.110%
40	107.12	-124.33	61.85	-106.93	124.32	-61.74	0.126%
41	84.02	-124.33	84.02	-83.86	124.32	-83.88	0.119%
42	59.76	-124.33	103.50	-59.64	124.32	-103.35	0.111%
43	0.00	-124.33	118.12	-0.00	124.32	-117.95	0.096%
44	-59.75	-124.33	103.50	59.64	124.32	-103.35	0.110%
45	-84.01	-124.33	84.01	83.86	124.32	-83.88	0.119%
46	-107.12	-124.33	61.84	106.92	124.32	-61.74	0.127%
47	-119.51	-124.33	-0.00	119.32	124.32	0.02	0.111%
48	-102.29	-124.33	-59.06	102.15	124.32	58.98	0.096%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
49	-84.02	-124.33	-84.02	83.90	124.32	83.89	0.100%
50	-59.76	-124.33	-103.50	59.68	124.32	103.33	0.109%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00027773	0.00036689
3	Yes	4	0.00024658	0.00033557
4	Yes	4	0.00022422	0.00031506
5	Yes	4	0.00021514	0.00030574
6	Yes	4	0.00024829	0.00033508
7	Yes	4	0.00027827	0.00036715
8	Yes	4	0.00026839	0.00035306
9	Yes	4	0.00024809	0.00033559
10	Yes	4	0.00021492	0.00030543
11	Yes	4	0.00024650	0.00033560
12	Yes	4	0.00026787	0.00035425
13	Yes	4	0.00027905	0.00036972
14	Yes	4	0.00024942	0.00033680
15	Yes	4	0.00021485	0.00030353
16	Yes	4	0.00022411	0.00031194
17	Yes	4	0.00024690	0.00033286
18	Yes	4	0.00000001	0.00000323
19	Yes	4	0.00038792	0.00049110
20	Yes	4	0.00034899	0.00045291
21	Yes	4	0.00032151	0.00042696
22	Yes	4	0.00031095	0.00041581
23	Yes	4	0.00035277	0.00045387
24	Yes	4	0.00038928	0.00049223
25	Yes	4	0.00037718	0.00047643
26	Yes	4	0.00035156	0.00045319
27	Yes	4	0.00031014	0.00041497
28	Yes	4	0.00034947	0.00045421
29	Yes	4	0.00037682	0.00047927
30	Yes	4	0.00039087	0.00049671
31	Yes	4	0.00035414	0.00045521
32	Yes	4	0.00030978	0.00041057
33	Yes	4	0.00032100	0.00042103
34	Yes	4	0.00034951	0.00044836
35	Yes	4	0.00027773	0.00036689
36	Yes	4	0.00024658	0.00033557
37	Yes	4	0.00022422	0.00031506
38	Yes	4	0.00021514	0.00030574
39	Yes	4	0.00024829	0.00033508
40	Yes	4	0.00027827	0.00036715
41	Yes	4	0.00026839	0.00035306
42	Yes	4	0.00024809	0.00033559
43	Yes	4	0.00021492	0.00030543
44	Yes	4	0.00024650	0.00033560
45	Yes	4	0.00026787	0.00035425
46	Yes	4	0.00027905	0.00036972
47	Yes	4	0.00024942	0.00033680
48	Yes	4	0.00021485	0.00030353
49	Yes	4	0.00022411	0.00031194

50	Yes	4	0.00024690	0.00033286

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	320 - 300	23.393	40	0.6056	0.2673
T2	300 - 280	20.807	40	0.5960	0.2184
T3	280 - 260	18.292	40	0.5690	0.1828
T4	260 - 240	15.883	40	0.5412	0.1648
T5	240 - 220	13.604	40	0.5043	0.1473
T6	220 - 200	11.516	40	0.4592	0.1353
T7	200 - 180	9.629	40	0.4073	0.1248
T8	180 - 160	7.901	40	0.3742	0.1130
T9	160 - 140	6.330	40	0.3373	0.1037
T10	140 - 120	4.900	40	0.2976	0.0937
T11	120 - 100	3.635	40	0.2557	0.0831
T12	100 - 80	2.548	40	0.2154	0.0650
T13	80 - 60	1.660	40	0.1741	0.0529
T14	60 - 30	0.974	35	0.1265	0.0412
T15	30 - 0	0.302	35	0.0568	0.0206

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
320.00	Dual Lights	40	23.393	0.6056	0.2673	244905
318.00	PD128	40	23.133	0.6052	0.2622	244905
315.00	8 FT DISH	40	22.743	0.6044	0.2545	244905
308.00	6 FT DISH	40	21.836	0.6017	0.2371	102044
294.00	DB224	40	20.043	0.5892	0.2058	54306
292.00	PD320	40	19.789	0.5865	0.2019	52334
285.00	(2) DB809	40	18.911	0.5763	0.1898	46434
280.00	BCD-80609	40	18.292	0.5690	0.1828	43445
275.00	(2) OGT9	40	17.679	0.5621	0.1772	42573
257.00	PD440	40	15.532	0.5364	0.1623	37177
243.00	PD128	40	13.935	0.5103	0.1497	25346
227.00	PD320	40	12.223	0.4763	0.1390	22759
220.00	Mounting Frame	40	11.516	0.4592	0.1353	22653
200.00	PiROD 12' Lightweight T-Frame	40	9.629	0.4073	0.1248	32414
174.00	DB583	40	7.414	0.3640	0.1101	31117
170.00	DB-630	40	7.097	0.3566	0.1082	32669
166.00	DB586-Y	40	6.786	0.3490	0.1065	34385
140.00	PD688S-4	40	4.900	0.2976	0.0937	28175
138.00	PD156S	40	4.766	0.2935	0.0927	27945
112.00	4 FT DISH	40	3.177	0.2394	0.0762	25830
105.00	6 FT DISH	40	2.801	0.2253	0.0695	24239
100.00	PD458	40	2.548	0.2154	0.0650	23398
97.00	6 FT DISH	40	2.402	0.2094	0.0627	23314
90.00	4 FT DISH	40	2.079	0.1953	0.0582	23535

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	320 - 300	28.850	24	0.7430	0.3546
T2	300 - 280	25.683	24	0.7315	0.3051
T3	280 - 260	22.598	24	0.7002	0.2681
T4	260 - 240	19.630	24	0.6677	0.2487
T5	240 - 220	16.815	24	0.6232	0.2260
T6	220 - 200	14.232	24	0.5680	0.2093
T7	200 - 180	11.898	24	0.5039	0.1942
T8	180 - 160	9.761	24	0.4629	0.1771
T9	160 - 140	7.818	24	0.4173	0.1634
T10	140 - 120	6.050	24	0.3682	0.1485
T11	120 - 100	4.487	24	0.3163	0.1328
T12	100 - 80	3.147	24	0.2663	0.1052
T13	80 - 60	2.053	24	0.2152	0.0855
T14	60 - 30	1.206	19	0.1564	0.0665
T15	30 - 0	0.378	19	0.0703	0.0333

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
320.00	Dual Lights	24	28.850	0.7430	0.3546	209405
318.00	PD128	24	28.532	0.7424	0.3494	209405
315.00	8 FT DISH	24	28.055	0.7414	0.3417	209405
308.00	6 FT DISH	24	26.944	0.7382	0.3241	87252
294.00	DB224	24	24.747	0.7236	0.2920	47905
292.00	PD320	24	24.436	0.7205	0.2880	46586
285.00	(2) DB809	24	23.359	0.7087	0.2754	42491
280.00	BCD-80609	24	22.598	0.7002	0.2681	40147
275.00	(2) OGT9	24	21.844	0.6923	0.2624	38653
257.00	PD440	24	19.197	0.6619	0.2456	31298
243.00	PD128	24	17.224	0.6305	0.2293	20856
227.00	PD320	24	15.107	0.5890	0.2145	18446
220.00	Mounting Frame	24	14.232	0.5680	0.2093	18265
200.00	PiROD 12' Lightweight T-Frame	24	11.898	0.5039	0.1942	26220
174.00	DB583	24	9.159	0.4503	0.1728	25093
170.00	DB-630	24	8.767	0.4412	0.1701	26310
166.00	DB586-Y	24	8.382	0.4318	0.1675	27650
140.00	PD688S-4	24	6.050	0.3682	0.1485	22891
138.00	PD156S	24	5.884	0.3631	0.1472	22655
112.00	4 FT DISH	24	3.923	0.2961	0.1223	20659
105.00	6 FT DISH	24	3.460	0.2787	0.1120	19679
100.00	PD458	24	3.147	0.2663	0.1052	19157
97.00	6 FT DISH	24	2.967	0.2590	0.1016	19104
90.00	4 FT DISH	24	2.569	0.2415	0.0944	19242

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	320	Leg	A325N	1.0000	6	2.45	34.56	0.071 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	4.31	6.12	0.704 ✓	1.333	Member Bearing
T2	300	Leg	A325N	1.0000	8	5.34	34.56	0.154 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	5.02	8.16	0.615 ✓	1.333	Member Bearing
T3	280	Leg	A325N	1.0000	8	9.49	34.56	0.275 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	7.79	9.06	0.859 ✓	1.333	Member Bearing
T4	260	Leg	A325N	1.0000	8	14.15	34.56	0.410 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	9.40	10.16	0.926 ✓	1.333	Member Bearing
T5	240	Leg	A325N	1.0000	8	19.03	34.56	0.551 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	11.51	12.70	0.906 ✓	1.333	Member Bearing
T6	220	Leg	A325N	1.0000	12	16.08	34.56	0.465 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	15.92	13.25	1.201 ✓	1.333	Bolt Shear
T7	200	Leg	A325N	1.0000	12	20.07	34.56	0.581 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.8750	1	18.18	18.04	1.008 ✓	1.333	Bolt Shear
T8	180	Leg	A325N	1.0000	12	24.16	34.56	0.699 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.8750	1	19.96	18.04	1.106 ✓	1.333	Bolt Shear
T9	160	Leg	A325N	1.0000	12	28.40	34.56	0.822 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.8750	1	22.65	18.04	1.256 ✓	1.333	Bolt Shear
T10	140	Leg	A325N	1.0000	12	32.47	34.56	0.940 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.8750	1	23.34	18.04	1.294 ✓	1.333	Bolt Shear
T11	120	Leg	A325N	1.0000	12	33.06	34.55	0.957 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	3	12.00	13.25	0.905 ✓	1.333	Bolt Shear
		Horizontal	A325X	0.7500	2	9.76	13.25	0.736 ✓	1.333	Bolt Shear
T12	100	Leg	A325N	1.0000	16	27.09	34.56	0.784 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	3	13.11	13.25	0.989 ✓	1.333	Bolt Shear
		Horizontal	A325X	0.7500	2	11.43	13.25	0.863 ✓	1.333	Bolt Shear
T13	80	Leg	A325N	1.0000	16	29.59	34.55	0.856 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	3	12.86	13.25	0.970 ✓	1.333	Bolt Shear
		Horizontal	A325X	0.7500	2	11.52	13.25	0.870 ✓	1.333	Bolt Shear
T14	60	Leg	A325N	1.0000	16	31.41	34.55	0.909 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.8750	3	18.20	18.04	1.009 ✓	1.333	Bolt Shear
		Horizontal	A325X	0.7500	2	13.22	13.25	0.997 ✓	1.333	Bolt Shear
T15	30	Leg	A325N	1.0000	24	23.62	34.56	0.684 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.8750	3	16.65	18.04	0.923 ✓	1.333	Bolt Shear
		Horizontal	A325X	0.7500	2	14.18	13.25	1.070 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	320 - 300	ROHN 5 EH	20.00	4.00	26.1 K=1.00	27.622	6.1120	-18.31	168.82	0.108 ✓
T2	300 - 280	ROHN 6 EH	20.03	5.01	27.4 K=1.00	27.470	8.4049	-49.83	230.89	0.216 ✓
T3	280 - 260	ROHN 8 EH	20.04	6.68	27.9 K=1.00	27.414	12.7627	-87.90	349.88	0.251 ✓
T4	260 - 240	ROHN 8 EH	20.03	6.68	27.8 K=1.00	27.415	12.7627	-130.53	349.89	0.373 ✓
T5	240 - 220	ROHN 8 EH	20.03	6.68	27.8 K=1.00	27.415	12.7627	-175.97	349.89	0.503 ✓
T6	220 - 200	ROHN 8 EH	20.03	10.02	41.8 K=1.00	25.582	12.7627	-224.99	326.50	0.689 ✓
T7	200 - 180	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.04	10.02	30.5 K=1.00	27.087	21.7355	-283.36	588.76	0.481 ✓
T8	180 - 160	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.04	10.02	30.5 K=1.00	27.088	21.7355	-342.82	588.76	0.582 ✓
T9	160 - 140	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.03	10.02	30.5 K=1.00	27.089	21.7355	-404.02	588.79	0.686 ✓
T10	140 - 120	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.04	10.02	30.5 K=1.00	27.087	21.7355	-464.38	588.75	0.789 ✓
T11	120 - 100	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.06	10.03	30.6 K=1.00	27.084	21.7355	-477.57	588.68	0.811 ✓
T12	100 - 80	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.05	10.03	30.5 K=1.00	27.085	21.7355	-525.11	588.70	0.892 ✓
T13	80 - 60	ROHN 12 EH	20.06	10.03	27.8 K=1.00	27.425	19.2423	-575.80	527.71	1.091 ✓
T14	60 - 30	ROHN 12 EH	30.07	10.02	27.8 K=1.00	27.426	19.2423	-627.39	527.74	1.189 ✓
T15	30 - 0	ROHN 12 EHS	30.08	10.03	28.0 K=1.00	27.392	23.8074	-703.01	652.14	1.078 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	320 - 300	L1 3/4x1 3/4x3/16	7.90	3.54	123.8 K=1.00	9.724	0.6211	-4.34	6.04	0.718 ✓
T2	300 - 280	L2x2x1/4	9.94	4.67	143.2 K=1.00	7.285	0.9380	-5.05	6.83	0.739 ✓
T3	280 - 260	L2 1/2x2 1/2x1/4	12.59	5.94	145.2 K=1.00	7.087	1.1900	-7.83	8.43	0.928 ✓
T4	260 - 240	L3x3x1/4	14.38	6.83	138.5 K=1.00	7.790	1.4400	-9.50	11.22	0.847 ✓
T5	240 - 220	L4x4x5/16	16.19	7.74	118.1	10.713	2.4000	-11.57	25.71	0.450

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=1.01					✓
T6	220 - 200	L4x4x3/8	19.37	9.41	143.3 K=1.00	7.268	2.8600	-15.92	20.79	0.766 ✓
T7	200 - 180	L4x4x3/8	21.20	10.07	153.4 K=1.00	6.348	2.8600	-18.18	18.16	1.001 ✓
T8	180 - 160	L4x4x1/2	23.06	11.01	168.9 K=1.00	5.236	3.7500	-19.96	19.63	1.016 ✓
T9	160 - 140	L5x5x3/8	24.84	11.87	143.9 K=1.00	7.208	3.6100	-22.65	26.02	0.871 ✓
T10	140 - 120	L5x5x3/8	26.78	12.89	156.2 K=1.00	6.118	3.6100	-23.34	22.08	1.057 ✓
T11	120 - 100	ROHN 3 EH	24.42	12.21	122.5 K=0.95	9.956	3.0159	-36.00	30.03	1.199 ✓
T12	100 - 80	P3.5x.318	25.15	12.58	109.7 K=0.95	12.404	3.6784	-39.32	45.63	0.862 ✓
T13	80 - 60	P3.5x.318	25.98	12.99	113.4 K=0.95	11.623	3.6784	-38.58	42.75	0.902 ✓
T14	60 - 30	ROHN 3.5 EH	35.21	11.74	107.8 K=1.00	12.854	3.6784	-54.59	47.28	1.155 ✓
T15	30 - 0	ROHN 3.5 EH	36.27	12.09	111.0 K=1.00	12.116	3.6784	-49.96	44.57	1.121 ✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	120 - 100	ROHN 3 STD	25.39	12.11	124.9 K=1.00	9.572	2.2285	-19.52	21.33	0.915 ✓
T12	100 - 80	P3.5x.318	27.97	13.40	123.1 K=1.00	9.859	3.6784	-22.86	36.26	0.630 ✓
T13	80 - 60	ROHN 3 EH	30.47	14.65	154.7 K=1.00	6.238	3.0159	-23.05	18.81	1.225 ✓
T14	60 - 30	ROHN 3.5 EH	33.14	16.04	147.3 K=1.00	6.883	3.6784	-26.43	25.32	1.044 ✓
T15	30 - 0	ROHN 4 STD	36.80	17.87	142.0 K=1.00	7.401	3.1741	-28.36	23.49	1.207 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	320 - 300	L1 3/4x1 3/4x3/16	6.81	6.35	182.6 K=0.82	4.480	0.6211	-0.09	2.78	0.034 ✓
T2	300 - 280	L2x2x1/4	6.81	6.35	166.0 K=0.85	5.420	0.9380	-0.04	5.08	0.008 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	120 - 100	ROHN 1.5 STD	6.35	5.76	111.1 K=1.00	12.101	0.7995	-8.29	9.67	0.857 ✓
T12	100 - 80	ROHN 1.5 STD	6.99	6.41	123.5 K=1.00	9.788	0.7995	-9.11	7.82	1.165 ✓
T13	80 - 60	ROHN 2 STD	7.62	7.09	108.0 K=1.00	12.795	1.0745	-10.00	13.75	0.727 ✓
T14	60 - 30	ROHN 1.5 STD	5.52	4.99	96.2 K=1.00	15.570	0.7995	-10.89	12.45	0.875 ✓
T15	30 - 0	ROHN 1.5 STD	6.13	5.60	108.0 K=1.00	12.809	0.7995	-12.20	10.24	1.192 ✓

Redundant Horizontal (2) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T14	60 - 30	P2.5x.276	11.05	10.52	136.6 K=1.00	8.008	2.2535	-10.89	18.05	0.603 ✓
T15	30 - 0	ROHN 2.5 EH	12.27	11.74	152.4 K=1.00	6.430	2.2535	-12.20	14.49	0.842 ✓

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	120 - 100	ROHN 2 STD	11.52	10.34	157.6 K=1.00	6.009	1.0745	-7.52	6.46	1.165 ✓
T12	100 - 80	ROHN 2 STD	11.86	10.77	164.3 K=1.00	5.534	1.0745	-7.73	5.95	1.300 ✓
T13	80 - 60	P2.5x.276	12.18	11.16	145.0 K=1.00	7.107	2.2535	-7.99	16.02	0.499 ✓
T14	60 - 30	P2.5x.276	11.15	9.95	129.2 K=1.00	8.953	2.2535	-10.99	20.18	0.545 ✓
T15	30 - 0	ROHN 2.5 STD	11.41	10.31	130.6 K=1.00	8.759	1.7040	-11.35	14.93	0.761 ✓

Redundant Diagonal (2) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T14	60 - 30	ROHN 2.5 STD	14.46	13.72	173.8 K=1.00	4.943	1.7040	-7.12	8.42	0.846 ✓
T15	30 - 0	ROHN 2.5 STD	15.33	14.63	185.3 K=1.00	4.347	1.7040	-7.63	7.41	1.030 ✓

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T11	120 - 100	ROHN 1.5 STD	6.35	6.35	122.3 K=1.00	9.977	0.7995	-0.10	7.98	0.012 ✓
T12	100 - 80	ROHN 1.5 STD	6.99	6.99	134.8 K=1.00	8.221	0.7995	-0.11	6.57	0.016 ✓
T13	80 - 60	ROHN 1.5 STD	7.62	7.62	146.8 K=1.00	6.928	0.7995	-0.10	5.54	0.018 ✓
T14	60 - 30	ROHN 1.5 STD	5.52	5.52	106.5 K=1.00	13.175	0.7995	-0.25	10.53	0.024 ✓
T15	30 - 0	ROHN 1.5 STD	6.13	6.13	118.2 K=1.00	10.686	0.7995	-0.21	8.54	0.025 ✓

Redundant Hip (2) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T14	60 - 30	ROHN 2 STD	11.05	11.05	168.4 K=1.00	5.265	1.0745	-0.09	5.66	0.016 ✓
T15	30 - 0	ROHN 2 STD	12.27	12.27	187.0 K=1.00	4.270	1.0745	-0.07	4.59	0.015 ✓

Redundant Hip Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T11	120 - 100	ROHN 2.5 STD	15.15	15.15	191.9 K=1.00	4.054	1.7040	-0.11	6.91	0.015 ✓
T12	100 - 80	ROHN 2.5 STD	16.00	16.00	202.6 K=1.00	3.637	1.7040	-0.11	6.20	0.018 ✓
T13	80 - 60	ROHN 3 STD	16.88	16.88	174.1	4.929	2.2285	-0.11	10.98	0.010

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=1.00					✓
T14	60 - 30	ROHN 2 STD	17.91	17.91	273.1 K=1.00	2.003	1.0745	-0.13	2.15	0.062 ✓
T15	30 - 0	KL/R > 250 (C) - 351 ROHN 2.5 STD	19.28	19.28	244.2 K=1.00	2.503	1.7040	-0.13	4.27	0.030 ✓

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	120 - 100	ROHN 3 STD	12.69	12.69	130.9 K=1.00	8.712	2.2285	-0.04	19.41	0.002 ✓
T12	100 - 80	ROHN 3 STD	13.99	13.99	144.2 K=1.00	7.179	2.2285	-0.04	16.00	0.003 ✓
T13	80 - 60	ROHN 3 STD	15.24	15.24	157.1 K=1.00	6.049	2.2285	-0.04	13.48	0.003 ✓
T14	60 - 30	ROHN 3 STD	16.57	16.57	170.9 K=1.00	5.114	2.2285	-0.06	11.40	0.005 ✓
T15	30 - 0	ROHN 3 STD	18.40	18.40	189.8 K=1.00	4.147	2.2285	-0.06	9.24	0.006 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	320 - 300	ROHN 5 EH	20.00	4.00	26.1	30.000	6.1120	14.72	183.36	0.080 ✓
T2	300 - 280	ROHN 6 EH	20.03	5.01	27.4	30.000	8.4049	42.69	252.15	0.169 ✓
T3	280 - 260	ROHN 8 EH	20.04	6.68	27.9	30.000	12.7627	75.89	382.88	0.198 ✓
T4	260 - 240	ROHN 8 EH	20.03	6.68	27.8	30.000	12.7627	113.23	382.88	0.296 ✓
T5	240 - 220	ROHN 8 EH	20.03	6.68	27.8	30.000	12.7627	152.24	382.88	0.398 ✓
T6	220 - 200	ROHN 8 EH	20.03	10.02	41.8	30.000	12.7627	192.97	382.88	0.504 ✓
T7	200 - 180	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.04	10.02	30.5	30.000	21.7355	240.83	652.07	0.369 ✓
T8	180 - 160	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.04	10.02	30.5	30.000	21.7355	289.98	652.07	0.445

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	160 - 140	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.03	10.02	30.5	30.000	21.7355	340.80	652.07	0.523
T10	140 - 120	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.04	10.02	30.5	30.000	21.7355	389.63	652.07	0.598
T11	120 - 100	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.06	10.03	30.6	30.000	21.7355	397.56	652.07	0.610
T12	100 - 80	ROHN 10EH w/ (3) 2.5x0.75 Plates	20.05	10.03	30.5	30.000	21.7355	434.75	652.07	0.667
T13	80 - 60	ROHN 12 EH	20.06	10.03	27.8	30.000	19.2423	474.45	577.27	0.822
T14	60 - 30	ROHN 12 EH	30.07	10.02	27.8	30.000	19.2423	514.52	577.27	0.891
T15	30 - 0	ROHN 12 EHS	30.08	10.03	28.0	30.000	23.8074	574.31	714.22	0.804

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	320 - 300	L1 3/4x1 3/4x3/16	7.90	3.54	82.2	29.000	0.3604	4.31	10.45	0.412
T2	300 - 280	L2x2x1/4	9.94	4.67	94.6	29.000	0.5629	5.02	16.32	0.307
T3	280 - 260	L2 1/2x2 1/2x1/4	12.59	5.94	95.0	29.000	0.7284	7.79	21.12	0.369
T4	260 - 240	L3x3x1/4	14.38	6.83	90.0	32.500	0.9159	9.40	29.77	0.316
T5	240 - 220	L4x4x5/16	16.19	7.74	76.3	32.500	1.5949	11.51	51.84	0.222
T6	220 - 200	L4x4x3/8	19.37	9.41	93.3	32.500	1.8989	15.71	61.71	0.254
T7	200 - 180	L4x4x3/8	21.20	10.07	99.9	32.500	1.8637	17.98	60.57	0.297
T8	180 - 160	L4x4x1/2	23.06	11.01	109.9	32.500	2.4375	19.77	79.22	0.250
T9	160 - 140	L5x5x3/8	24.84	11.87	92.6	32.500	2.4262	22.13	78.85	0.281
T10	140 - 120	L5x5x3/8	26.78	12.89	100.4	32.500	2.4262	22.93	78.85	0.291
T11	120 - 100	ROHN 3 EH	24.42	12.21	128.9	30.000	3.0159	34.18	90.48	0.378
T12	100 - 80	P3.5x.318	25.15	12.58	115.5	30.000	3.6784	37.07	110.35	0.336
T13	80 - 60	P3.5x.318	25.98	12.99	119.3	30.000	3.6784	35.56	110.35	0.322
T14	60 - 30	ROHN 3.5 EH	35.21	11.74	107.8	30.000	3.6784	51.64	110.35	0.468
T15	30 - 0	ROHN 3.5 EH	36.27	12.09	111.0	30.000	3.6784	48.39	110.35	0.438

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	120 - 100	ROHN 3 STD	25.39	12.11	124.9	30.000	2.2285	19.31	66.85	0.289
T12	100 - 80	P3.5x.318	27.97	13.40	123.1	30.000	3.6784	21.69	110.35	0.197
T13	80 - 60	ROHN 3 EH	30.47	14.65	154.7	30.000	3.0159	21.73	90.48	0.240
T14	60 - 30	ROHN 3.5 EH	33.14	16.04	147.3	30.000	3.6784	25.51	110.35	0.231
T15	30 - 0	ROHN 4 STD	36.80	17.87	142.0	30.000	3.1741	25.87	95.22	0.272

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	320 - 300	L1 3/4x1 3/4x3/16	6.81	6.35	141.8	21.600	0.6211	0.07	13.42	0.005
T2	300 - 280	L2x2x1/4	6.81	6.35	125.1	21.600	0.9380	0.01	20.26	0.001

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	120 - 100	ROHN 1.5 STD	6.35	5.76	111.1	30.000	0.7995	8.29	23.98	0.346
T12	100 - 80	ROHN 1.5 STD	6.99	6.41	123.5	30.000	0.7995	9.11	23.98	0.380
T13	80 - 60	ROHN 2 STD	7.62	7.09	108.0	30.000	1.0745	10.00	32.24	0.310
T14	60 - 30	ROHN 1.5 STD	5.52	4.99	96.2	30.000	0.7995	10.89	23.98	0.454
T15	30 - 0	ROHN 1.5 STD	6.13	5.60	108.0	30.000	0.7995	12.20	23.98	0.509

Redundant Horizontal (2) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T14	60 - 30	P2.5x.276	11.05	10.52	136.6	30.000	2.2535	10.89	67.61	0.161 ✓
T15	30 - 0	ROHN 2.5 EH	12.27	11.74	152.4	30.000	2.2535	12.20	67.61	0.180 ✓

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T11	120 - 100	ROHN 2 STD	11.52	10.34	157.6	30.000	1.0745	7.52	32.24	0.233 ✓
T12	100 - 80	ROHN 2 STD	11.86	10.77	164.3	30.000	1.0745	7.73	32.24	0.240 ✓
T13	80 - 60	P2.5x.276	12.18	11.16	145.0	30.000	2.2535	7.99	67.61	0.118 ✓
T14	60 - 30	P2.5x.276	11.15	9.95	129.2	30.000	2.2535	10.99	67.61	0.163 ✓
T15	30 - 0	ROHN 2.5 STD	11.41	10.31	130.6	30.000	1.7040	11.35	51.12	0.222 ✓

Redundant Diagonal (2) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T14	60 - 30	ROHN 2.5 STD	14.46	13.72	173.8	30.000	1.7040	7.12	51.12	0.139 ✓
T15	30 - 0	ROHN 2.5 STD	15.33	14.63	185.3	30.000	1.7040	7.63	51.12	0.149 ✓

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T14	60 - 30	ROHN 1.5 STD	5.52	5.52	106.5	30.000	0.7995	0.02	23.98	0.001 ✓
T15	30 - 0	ROHN 1.5 STD	6.13	6.13	118.2	30.000	0.7995	0.02	23.98	0.001

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	

Redundant Hip (2) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T14	60 - 30	ROHN 2 STD	11.05	11.05	168.4	30.000	1.0745	0.02	32.24	0.001
T15	30 - 0	ROHN 2 STD	12.27	12.27	187.0	30.000	1.0745	0.02	32.24	0.000

Redundant Hip Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T11	120 - 100	ROHN 2.5 STD	15.15	15.15	191.9	30.000	1.7040	0.17	51.12	0.003
T12	100 - 80	ROHN 2.5 STD	16.00	16.00	202.6	30.000	1.7040	0.17	51.12	0.003
T13	80 - 60	ROHN 3 STD	16.88	16.88	174.1	30.000	2.2285	0.15	66.85	0.002
T14	60 - 30	ROHN 2 STD	14.10	14.10	214.9	30.000	1.0745	0.40	32.24	0.012
T15	30 - 0	ROHN 2.5 STD	14.88	14.88	188.4	30.000	1.7040	0.34	51.12	0.007

Inner Bracing Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T11	120 - 100	ROHN 3 STD	12.69	12.69	130.9	30.000	2.2285	0.01	66.85	0.000
T12	100 - 80	ROHN 3 STD	13.99	13.99	144.2	30.000	2.2285	0.01	66.85	0.000
T13	80 - 60	ROHN 3 STD	15.24	15.24	157.1	30.000	2.2285	0.00	66.85	0.000
T14	60 - 30	ROHN 3 STD	16.57	16.57	170.9	30.000	2.2285	0.04	66.85	0.001
T15	30 - 0	ROHN 3 STD	18.40	18.40	189.8	30.000	2.2285	0.03	66.85	0.000

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	320 - 300	Leg	ROHN 5 EH	2	-18.31	225.04	8.1	Pass
T2	300 - 280	Leg	ROHN 6 EH	38	-49.83	307.77	16.2	Pass
T3	280 - 260	Leg	ROHN 8 EH	68	-87.90	466.39	18.8 20.6 (b)	Pass
T4	260 - 240	Leg	ROHN 8 EH	89	-130.53	466.41	28.0 30.7 (b)	Pass
T5	240 - 220	Leg	ROHN 8 EH	110	-175.97	466.41	37.7 41.3 (b)	Pass
T6	220 - 200	Leg	ROHN 8 EH	131	-224.99	435.22	51.7	Pass
T7	200 - 180	Leg	ROHN 10EH w/ (3) 2.5x0.75 Plates	146	-283.36	784.81	36.1 43.6 (b)	Pass
T8	180 - 160	Leg	ROHN 10EH w/ (3) 2.5x0.75 Plates	161	-342.82	784.82	43.7 52.5 (b)	Pass
T9	160 - 140	Leg	ROHN 10EH w/ (3) 2.5x0.75 Plates	176	-404.02	784.85	51.5 61.7 (b)	Pass
T10	140 - 120	Leg	ROHN 10EH w/ (3) 2.5x0.75 Plates	191	-464.38	784.80	59.2 70.5 (b)	Pass
T11	120 - 100	Leg	ROHN 10EH w/ (3) 2.5x0.75 Plates	206	-477.57	784.72	60.9 71.8 (b)	Pass
T12	100 - 80	Leg	ROHN 10EH w/ (3) 2.5x0.75 Plates	239	-525.11	784.74	66.9	Pass
T13	80 - 60	Leg	ROHN 12 EH	272	-575.80	703.44	81.9	Pass
T14	60 - 30	Leg	ROHN 12 EH	305	-627.39	703.48	89.2	Pass
T15	30 - 0	Leg	ROHN 12 EHS	356	-703.01	869.31	80.9	Pass
T1	320 - 300	Diagonal	L1 3/4x1 3/4x3/16	7	-4.34	8.05	53.9	Pass
T2	300 - 280	Diagonal	L2x2x1/4	46	-5.05	9.11	55.4	Pass
T3	280 - 260	Diagonal	L2 1/2x2 1/2x1/4	73	-7.83	11.24	69.6	Pass
T4	260 - 240	Diagonal	L3x3x1/4	94	-9.50	14.95	63.5 69.4 (b)	Pass
T5	240 - 220	Diagonal	L4x4x5/16	115	-11.57	34.27	33.8 68.0 (b)	Pass
T6	220 - 200	Diagonal	L4x4x3/8	136	-15.92	27.71	57.5 90.1 (b)	Pass
T7	200 - 180	Diagonal	L4x4x3/8	151	-18.18	24.20	75.1 75.6 (b)	Pass
T8	180 - 160	Diagonal	L4x4x1/2	166	-19.96	26.17	76.2 83.0 (b)	Pass
T9	160 - 140	Diagonal	L5x5x3/8	178	-22.65	34.69	65.3 94.2 (b)	Pass
T10	140 - 120	Diagonal	L5x5x3/8	193	-23.34	29.44	79.3 97.1 (b)	Pass
T11	120 - 100	Diagonal	ROHN 3 EH	209	-36.00	40.02	90.0	Pass
T12	100 - 80	Diagonal	P3.5x.318	242	-39.32	60.82	64.6 74.2 (b)	Pass
T13	80 - 60	Diagonal	P3.5x.318	275	-38.58	56.99	67.7 72.8 (b)	Pass
T14	60 - 30	Diagonal	ROHN 3.5 EH	308	-54.59	63.03	86.6	Pass
T15	30 - 0	Diagonal	ROHN 3.5 EH	359	-49.96	59.41	84.1	Pass
T11	120 - 100	Horizontal	ROHN 3 STD	208	-19.52	28.44	68.6	Pass
T12	100 - 80	Horizontal	P3.5x.318	241	-22.86	48.34	47.3 64.7 (b)	Pass
T13	80 - 60	Horizontal	ROHN 3 EH	274	-23.05	25.08	91.9	Pass
T14	60 - 30	Horizontal	ROHN 3.5 EH	307	-26.43	33.75	78.3	Pass
T15	30 - 0	Horizontal	ROHN 4 STD	358	-28.36	31.31	90.6	Pass
T1	320 - 300	Top Girt	L1 3/4x1 3/4x3/16	4	-0.09	3.71	2.6	Pass
T2	300 - 280	Top Girt	L2x2x1/4	40	-0.04	6.78	0.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T11	120 - 100	Redund Horz 1 Bracing	ROHN 1.5 STD	213	-8.29	12.90	64.3	Pass
T12	100 - 80	Redund Horz 1 Bracing	ROHN 1.5 STD	250	-9.11	10.43	87.4	Pass
T13	80 - 60	Redund Horz 1 Bracing	ROHN 2 STD	279	-10.00	18.33	54.5	Pass
T14	60 - 30	Redund Horz 1 Bracing	ROHN 1.5 STD	314	-10.89	16.59	65.6	Pass
T15	30 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	371	-12.20	13.65	89.4	Pass
T14	60 - 30	Redund Horz 2 Bracing	P2.5x.276	315	-10.89	24.06	45.3	Pass
T15	30 - 0	Redund Horz 2 Bracing	ROHN 2.5 EH	366	-12.20	19.31	63.2	Pass
T11	120 - 100	Redund Diag 1 Bracing	ROHN 2 STD	214	-7.52	8.61	87.4	Pass
T12	100 - 80	Redund Diag 1 Bracing	ROHN 2 STD	247	-7.73	7.93	97.5	Pass
T13	80 - 60	Redund Diag 1 Bracing	P2.5x.276	280	-7.99	21.35	37.4	Pass
T14	60 - 30	Redund Diag 1 Bracing	P2.5x.276	316	-10.99	26.89	40.9	Pass
T15	30 - 0	Redund Diag 1 Bracing	ROHN 2.5 STD	373	-11.35	19.90	57.1	Pass
T14	60 - 30	Redund Diag 2 Bracing	ROHN 2.5 STD	317	-7.12	11.23	63.5	Pass
T15	30 - 0	Redund Diag 2 Bracing	ROHN 2.5 STD	374	-7.63	9.87	77.2	Pass
T11	120 - 100	Redund Hip 1 Bracing	ROHN 1.5 STD	233	-0.10	10.63	0.9	Pass
T12	100 - 80	Redund Hip 1 Bracing	ROHN 1.5 STD	266	-0.11	8.76	1.2	Pass
T13	80 - 60	Redund Hip 1 Bracing	ROHN 1.5 STD	299	-0.10	7.38	1.4	Pass
T14	60 - 30	Redund Hip 1 Bracing	ROHN 1.5 STD	348	-0.25	14.04	1.8	Pass
T15	30 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	399	-0.21	11.39	1.9	Pass
T14	60 - 30	Redund Hip 2 Bracing	ROHN 2 STD	345	-0.09	7.54	1.2	Pass
T15	30 - 0	Redund Hip 2 Bracing	ROHN 2 STD	396	-0.07	6.12	1.2	Pass
T11	120 - 100	Redund Hip Diagonal Bracing	ROHN 2.5 STD	223	-0.11	9.21	1.2	Pass
T12	100 - 80	Redund Hip Diagonal Bracing	ROHN 2.5 STD	256	-0.11	8.26	1.3	Pass
T13	80 - 60	Redund Hip Diagonal Bracing	ROHN 3 STD	289	-0.11	14.64	0.7	Pass
T14	60 - 30	Redund Hip Diagonal Bracing	ROHN 2 STD	351	-0.13	2.87	4.7	Pass
T15	30 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	402	-0.13	5.69	2.3	Pass
T11	120 - 100	Inner Bracing	ROHN 3 STD	236	-0.02	25.88	0.3	Pass
T12	100 - 80	Inner Bracing	ROHN 3 STD	268	-0.04	21.33	0.4	Pass
T13	80 - 60	Inner Bracing	ROHN 3 STD	302	-0.01	13.48	0.4	Pass
T14	60 - 30	Inner Bracing	ROHN 3 STD	352	-0.06	15.19	0.4	Pass
T15	30 - 0	Inner Bracing	ROHN 3 STD	403	-0.06	12.32	0.5	Pass
							Summary	
						Leg (T14)	89.2	Pass
						Diagonal (T10)	97.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Horizontal (T13)	91.9	Pass
						Top Girt (T1)	2.6	Pass
						Redund Horz 1 Bracing (T15)	89.4	Pass
						Redund Horz 2 Bracing (T15)	63.2	Pass
						Redund Diag 1 Bracing (T12)	97.5	Pass
						Redund Diag 2 Bracing (T15)	77.2	Pass
						Redund Hip 1 Bracing (T15)	1.9	Pass
						Redund Hip 2 Bracing (T14)	1.2	Pass
						Redund Hip Diagonal Bracing (T14)	4.7	Pass
						Inner Bracing (T15)	0.5	Pass
						Bolt Checks	97.1	Pass
						RATING =	**97.5**	**Pass**

ANCHOR BOLT ANALYSIS

ANCHOR BOLT ANALYSIS

Input Data

Max Pier Reactions:

Uplift:	Uplift := 628·kips	*user input*	
Shear:	Shear := 94·kips	*user input*	
Compression:	Compression := 769·kips	*user input*	

Anchor Bolt Data:

Use ASTM A354 Grade BC

Number of Anchor Bolts = N	N := 24	*user input*	
Bolt Ultimate Strength:	F_u := 125·ksi	*user input*	
Bolt Yield Strength:	Fy := 109·ksi	*user input*	
Bolt Modulus:	E := 29000·ksi	*user input*	
Thickness of Anchor Bolts	D := 1in	*user input*	
Threads per Inch:	n := 8	*user input*	
Coefficient of Friction:	μ := 0.55	*user input*	(for baseplate with grout ASCE 10-97)

Anchor Bolt Area:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 0.785\cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 \qquad A_n = 0.606\cdot in^2$$

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$AllowableTension := 1.33\cdot(0.33\cdot A_g\cdot F_u) \qquad AllowableTension = 43.1\cdot kips$$

Note: 1.33 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{net.area} := 1.33\cdot(0.60\cdot A_n\cdot Fy) \qquad F_{net.area} = 52.7\cdot kips$$

Note: 1.33 increase allowed per TIA/EIA

Applied Tension:

$$MaxTension := \frac{Uplift}{N} \qquad MaxTension = 26.2\cdot kips$$

Check Stresses:

$$\frac{MaxTension}{F_{net.area}} = 0.50$$

$$Condition1 := if\left(\frac{MaxTension}{F_{net.area}} \le 1.00, "OK", "Overstressed"\right)$$

Condition1 = "OK"

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Stell Transmission Structures

Required Area:

$$A_{s1} := \frac{Uplift}{Fy} + \frac{Shear}{\mu \cdot 0.85 \cdot Fy} \qquad A_{s1} = 7.6 \cdot in^2$$

$$A_{s2} := \left| \frac{Shear - (0.3 \cdot Compression)}{\mu \cdot 0.85 \cdot Fy} \right| \qquad A_{s2} = 2.7 \cdot in^2$$

Provided Area:

$$A_{sprovided} := A_n \cdot N \qquad A_{sprovided} = 14.5 \cdot in^2$$

$$Condition2 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s1}}{A_{sprovided}} = 0.52$$

Condition2 = "OK"

$$Condition3 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s2}}{A_{sprovided}} = 0.18$$

Condition3 = "OK"

FOUNDATION ANALYSIS

URS

Job	320' Rohn SSVMW - Colchester, CT	Project No.	CTK-019	Page / Sheet	1 of 3
Description	Evaluation of Drilled Pier Caisson	Computed by	KAB	Date	12/04/12
		Checked by		Date	

3 SIDED SELF SUPPORTING TOWER FOUNDATION DRILLED PIER

Compression:	$DownLoad := 769 \cdot kips$	$\gamma c := 150pcf$	Concrete unit weight
Uplift:	$uplift := 628 \cdot kips$	$\gamma w := 62.4pcf$	Water unit weight
Depth Neglected for Skin Friction at the top	$Depthunbond := 4 \cdot ft$	$\gamma s := 120pcf$	Soil unit weight
Drill Caisson length	$CasissonLength := 35.5 \cdot ft$	$Pier\phi := 7.5 \cdot ft$	Pier diameter
Water Table Below grade:	$Wd := 10 \cdot ft$	$hg := 0.5 \cdot ft$	Height of Pier Above grade
Ave allowable Shear at Depth of 4' to 10'	$f1 := 380psf$ Per BL Companies Report 9.13.2000	$SoilBearingCapacity := 6.7ksf$	Allowable Bearing Pressure at Depth 35'
Ave allowable Shear at Depth of 10' to 35'	$f2 := 700psf$		

Loading:

$$TotalDownLoad := DownLoad + \pi \cdot \frac{Pier\phi^2}{4} \cdot [hg \cdot \gamma c + [(\gamma c - \gamma s) \cdot (CasissonLength - hg)]]$$

$$TotalDownLoad = 818.7 \cdot kips$$

$$Pierweight := \pi \cdot \frac{Pier\phi^2}{4} \cdot [(Wd + hg) \cdot \gamma c + (CasissonLength - Wd - hg) \cdot (\gamma c - \gamma w)]$$

$$Pierweight = 166.33 \cdot kips$$

$$Soilshear := \pi \cdot Pier\phi \cdot [f1 \cdot (Wd - Depthunbond) + f2 \cdot (CasissonLength - Wd - hg)]$$

$$Soilshear = 466.06 \cdot kips$$

Compression Capacity:

$$TotalDownLoadCapacity := Soilshear + SoilBearingCapacity \cdot \left(\pi \cdot \frac{Pier\phi^2}{4} \right)$$

$$TotalDownLoadCapacity = 762.05 \cdot kips$$

$$CheckDownLoadCapacity := if(TotalDownLoad < TotalDownLoadCapacity, "Okay", "No Good")$$

$CheckDownLoadCapacity = "No Good"$

Foundation Previously Reinforced
See Below for Calc

$$\frac{TotalDownLoad}{TotalDownLoadCapacity} = 107.4 \cdot \%$$

Tension Capacity:

TotalUpLiftCapacity := Soilshear + Pierweight

TotalUpLiftCapacity = 632.39·kips

CheckUpLiftCapacity := if(uplift < TotalUpLiftCapacity, "Okay", "No Good")

CheckUpLiftCapacity = "Okay"

Foundation Previously Reinforced
See Below for Calc

$$\frac{\text{uplift}}{\text{TotalUpLiftCapacity}} = 99.3\cdot\%$$

Check Cone Failure

$$\text{ConeFailureCapacity} := \frac{[(\text{CasissonLength} - \text{hg})\cdot\tan(30\cdot\text{deg})\cdot 2 + \text{Pier}\phi]^2\cdot\pi}{4}\cdot\frac{\text{CasissonLength} - \text{hg}}{3}\cdot\gamma s$$

ConeFailureCapacity = 2524.37·kips

CheckConeFailureCapacity := if(uplift < ConeFailureCapacity, "Okay", "No Good")

CheckConeFailureCapacity = "Okay"

$$\frac{\text{uplift}}{\text{ConeFailureCapacity}} = 24.9\cdot\%$$

Foundation Modification:

Concrete added around existing caisson foundations

$L_{modification} := 12ft$

$Depth_{modification} := 4ft$

$$Area_{modification} := L_{modification}^2 - \pi\cdot\frac{Pier\phi^2}{4} \qquad Area_{modification} = 99.82\,ft^2$$

$Weight_{modification} := Area_{modification}\cdot Depth_{modification}\cdot\gamma c$ $\qquad Weight_{modification} = 59.89\cdot kip$

$SoilBearingCapacity_{4ft} := 2ksf$ Soil Bearing Capacity at 4' Below --> Based on Boring Logs

$TotalDownLoad_2 := TotalDownLoad + Weight_{modification}$ $TotalDownLoad_2 = 878.59 \cdot kip$

$TotalDownLoadCapacity_2 := TotalDownLoadCapacity + Area_{modification} \cdot SoilBearingCapacity_{4ft}$

$TotalDownLoadCapacity_2 = 961.69 \cdot kip$

$CheckDownLoadCapacity_2 := if(TotalDownLoad_2 < TotalDownLoadCapacity_2, "Okay", "No Good")$

$CheckDownLoadCapacity_2 = "Okay"$ $\frac{TotalDownLoad_2}{TotalDownLoadCapacity_2} = 91.4 \cdot \%$

$TotalUpLiftCapacity_2 := TotalUpLiftCapacity + Weight_{modification}$

$TotalUpLiftCapacity_2 = 692.28 \cdot kips$

$CheckUpLiftCapacity_2 := if(uplift < TotalUpLiftCapacity_2, "Okay", "No Good")$

$CheckUpLiftCapacity_2 = "Okay"$ $\frac{uplift}{TotalUpLiftCapacity_2} = 90.7 \cdot \%$

Foundation Modification Reinforcement:

Maximum Shear on Modification

$V_{mod} := SoilBearingCapacity_{4ft} \cdot Area_{modification}$ $V_{mod} = 199.64 \cdot kip$

$A_{vf} := \frac{V_{mod}}{0.44 \cdot 60ksi \cdot 0.6}$ Required area of shear-friction reinforcement per ACI R11.6.4.1

$A_{vf} = 12.6 \cdot in^2$

$\frac{A_{vf}}{.31in^2} = 40.66$ Use 3 rings of 15 #5 bars