STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

December 19, 2011

Douglas Talmadge, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067-3900

RE: **EM-CING-085-111129** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 230 Guinea Road, Monroe, Connecticut.

Dear Mr. Talmadge:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- The tower be strengthened in accordance with recommendations made in the Structural Retrofit Analysis prepared by CHA dated June 17, 2011 and stamped by Thomas O'Brien; and
- Prior to antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower and foundation will not exceed 100 percent of the post-construction structural rating.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 28, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Stephen Vavrek, First Selectman, Town of Monroe
David Killeen, Planning Administrator, Town of Monroe
Christopher B. Fisher, Esq., Cuddy & Feder LLP

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
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E-Mail: siting.council@ct.gov
www.ct.gov/csc

December 5, 2011

The Honorable Stephen Vavrek
First Selectman
Town of Monroe
Town Hall
7 Fan Hill Road
Monroe, CT 06468-1800

RE: **EM-CING-085-111129** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 230 Guinea Road, Monroe, Connecticut.

Dear First Selectman Vavrek:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by December 19, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: David Killeen, Planning Administrator, Town of Monroe

EM-CING-085-111129

New Cingular Wireless PCS, LLC
500 Enterprise Dr, STE 3A
Rocky Hill, CT 06067
Phone: (203)-410-4531
Douglas Talmadge
Real Estate Consultant

November 28, 2011

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 at 230 Guinea Rd, Monroe, CT 06468.

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.

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 equipment will be located in the existing AT&T 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)-410-4531 or email DTalmadge@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Douglas Talmadge
Real Estate Consultant

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS	
SITE ADDRESS:	230 GUINEA ROAD MONROE, CT 06468	
LATITUDE:	41.3419 N	41° 20' 30.84" N
LONGITUDE:	-73.2745 W	73° 16' 28.20" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES	
CURRENT USE:	TELECOMMUNICATIONS FACILITY	
PROPOSED USE:	TELECOMMUNICATIONS FACILITY	
NOC#	866-915-5600	

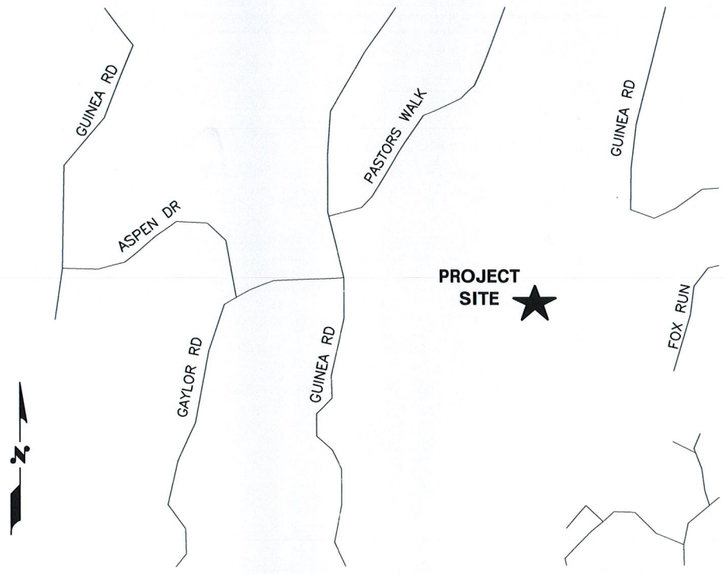
SITE NUMBER: CT2144
SITE NAME: MONROE-GUINEA RD

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:

DEPART CT-160 / ELM ST TOWARD GILBERT AVE 0.1 MI TURN RIGHT ONTO GILBERT AVE 0.6 MI TURN RIGHT ONTO WEST ST 0.5 MI TAKE RAMP LEFT FOR I-91 SOUTH 9.1 MI AT EXIT 18, TAKE RAMP RIGHT FOR I-691 WEST TOWARD WATERBURY / MERIDEN 7.9 MI AT EXIT 1, TAKE RAMP LEFT FOR I-84 WEST TOWARD DANBURY / WATERBURY 24.3 MI AT EXIT 11, TAKE RAMP RIGHT TOWARD DERBY / NEW HAVEN 0.9 MI TURN RIGHT ONTO MILE HILL RD / WASSERMAN WAY 0.2 MI TURN RIGHT ONTO CT-34 / BERKSHIRE RD 0.2 MI BEAR RIGHT ONTO TODDY HILL RD 2.4 MI ROAD NAME CHANGES TO BOTSFORD HILL RD 1.2 MI TURN LEFT ONTO CT-25 / S MAIN ST 0.3 MI TURN RIGHT ONTO BEAR HILLS RD 0.8 MI TURN LEFT ONTO PINE TREE HILL RD 0.4 MI ROAD NAME CHANGES TO GUINEA RD 0.4 MI ARRIVE AT 230 GUINEA RD, TOWN OF MONROE, CT 06468



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF CINGULAR WIRELESS. 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 CINGULAR WIRELESS REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL

BEFORE YOU DIG

CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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

SITE NUMBER: CT2144
SITE NAME: MONROE-GUINEA RD
230 GUINEA ROAD
MONROE, CT 06468
FAIRFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APVD
0	11/03/11	ISSUED FOR CONSTRUCTION	NB	DC	DEH

SCALE: NOT SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24173
LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
1344.01	T-1	0

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

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

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – NEXLINK
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	REF.	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ.	REQUIRED	TYP	TYPICAL

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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

SITE NUMBER: CT2144
SITE NAME: MONROE-GUINEA RD
230 GUINEA ROAD
MONROE, CT 06468
FAIRFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	11/03/11	ISSUED FOR CONSTRUCTION	NB	DC	DH

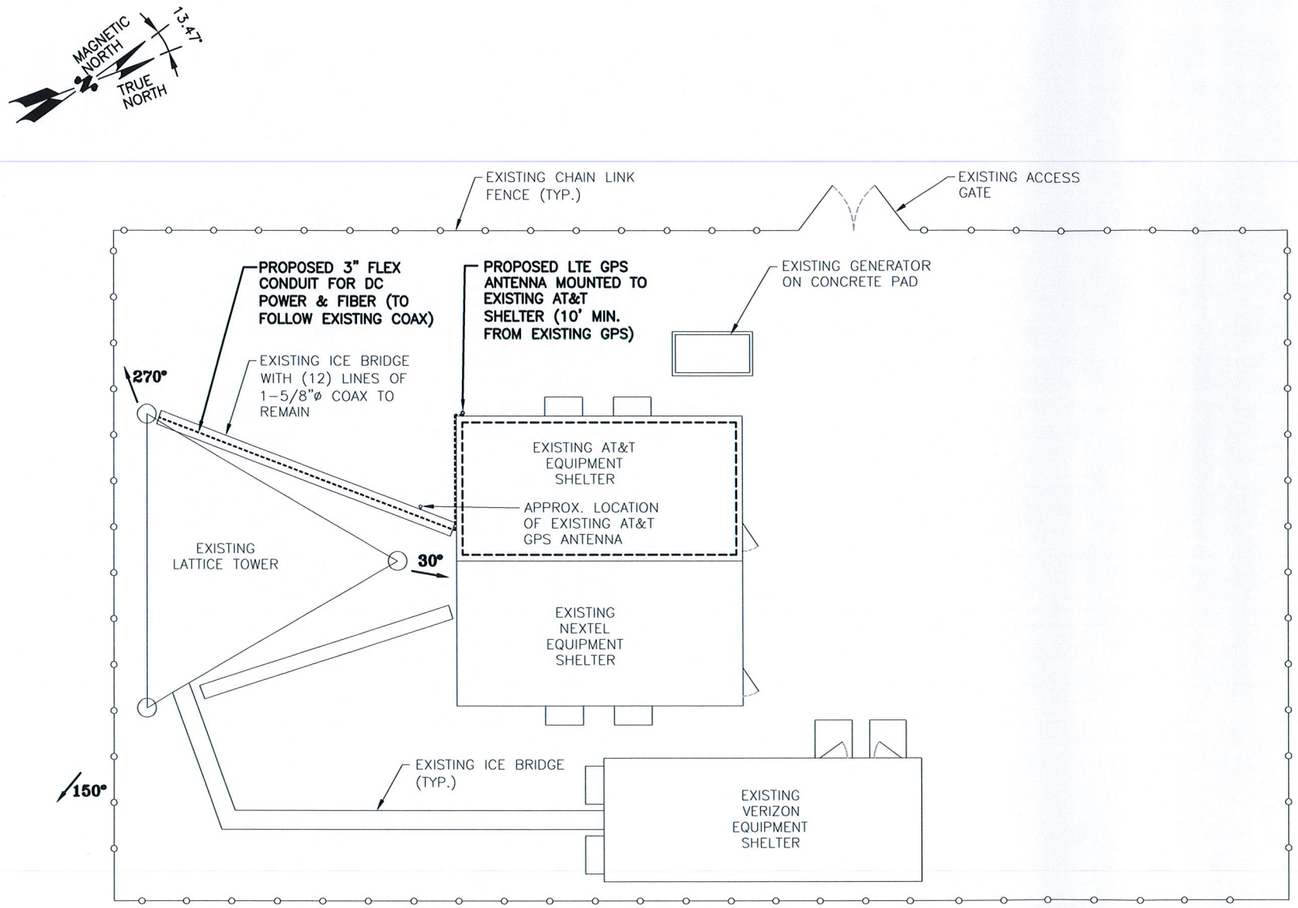
SCALE: NOT SHOWN | DESIGNED BY: DC | DRAWN BY: NB

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

AT&T

GENERAL NOTES
(LTE)

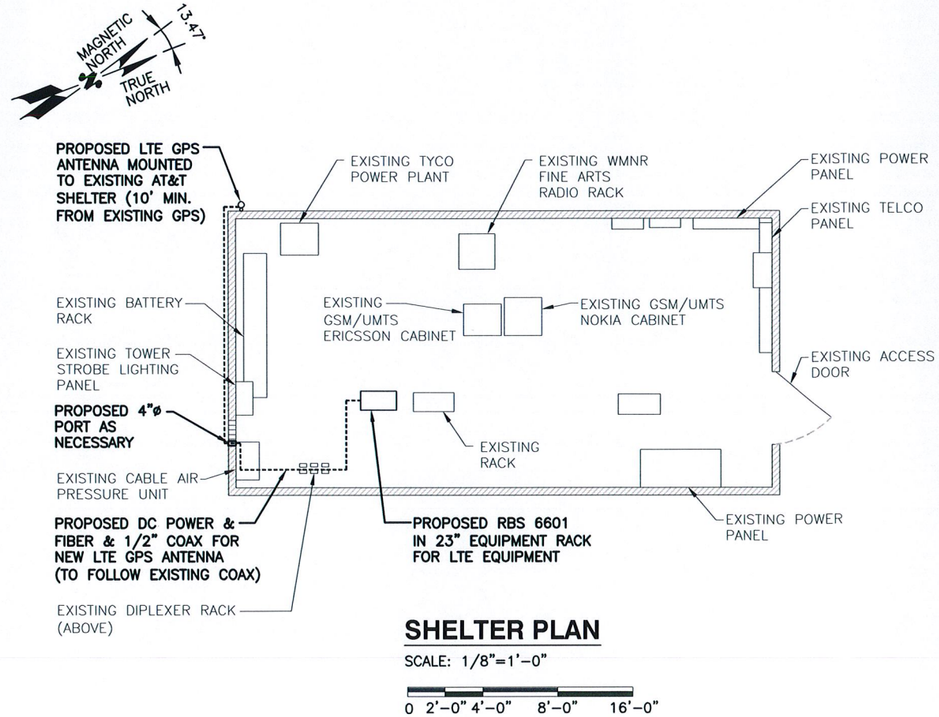
JOB NUMBER	DRAWING NUMBER	REV
2144.01	GN-1	0



COMPOUND PLAN

SCALE: 1/8"=1'-0"

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



SHELTER PLAN

SCALE: 1/8"=1'-0"

0 2'-0" 4'-0" 8'-0" 16'-0"

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BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
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230 GUINEA ROAD
MONROE, CT 60468
FAIRFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK APP'D
0	11/03/11	ISSUED FOR CONSTRUCTION	NB	DC DPH

SCALE: NOT SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 21179
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLAN (LTE)

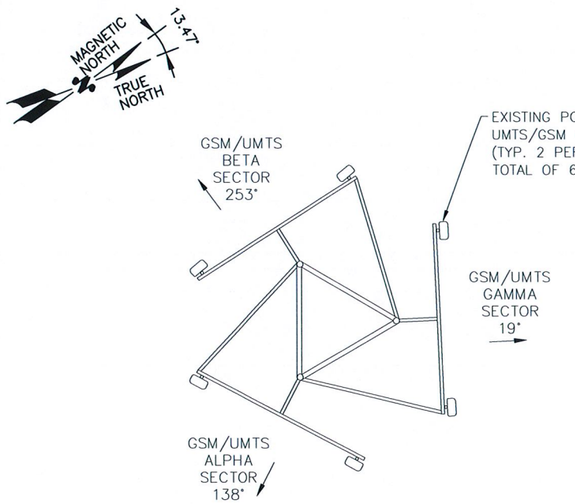
JOB NUMBER	DRAWING NUMBER	REV
2144.01	A-1	0

NOTE:

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

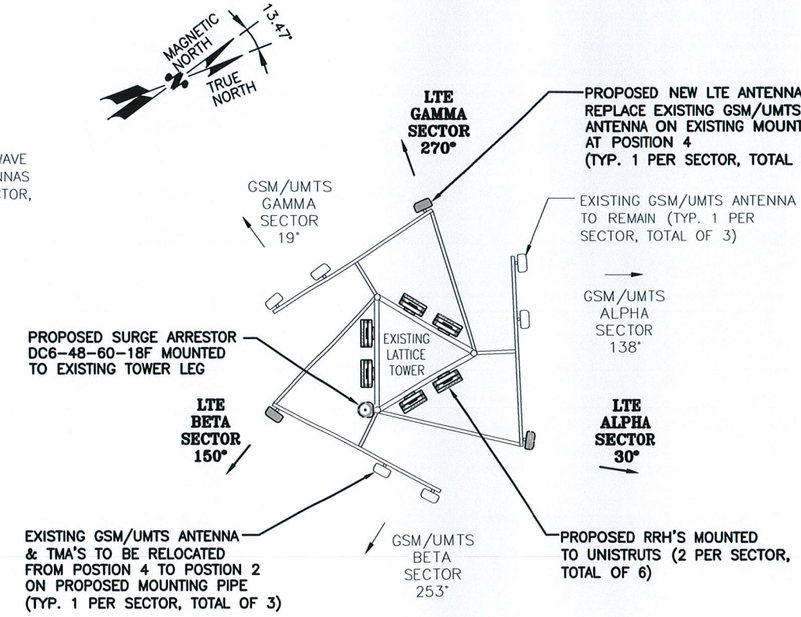
NOTE:*

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



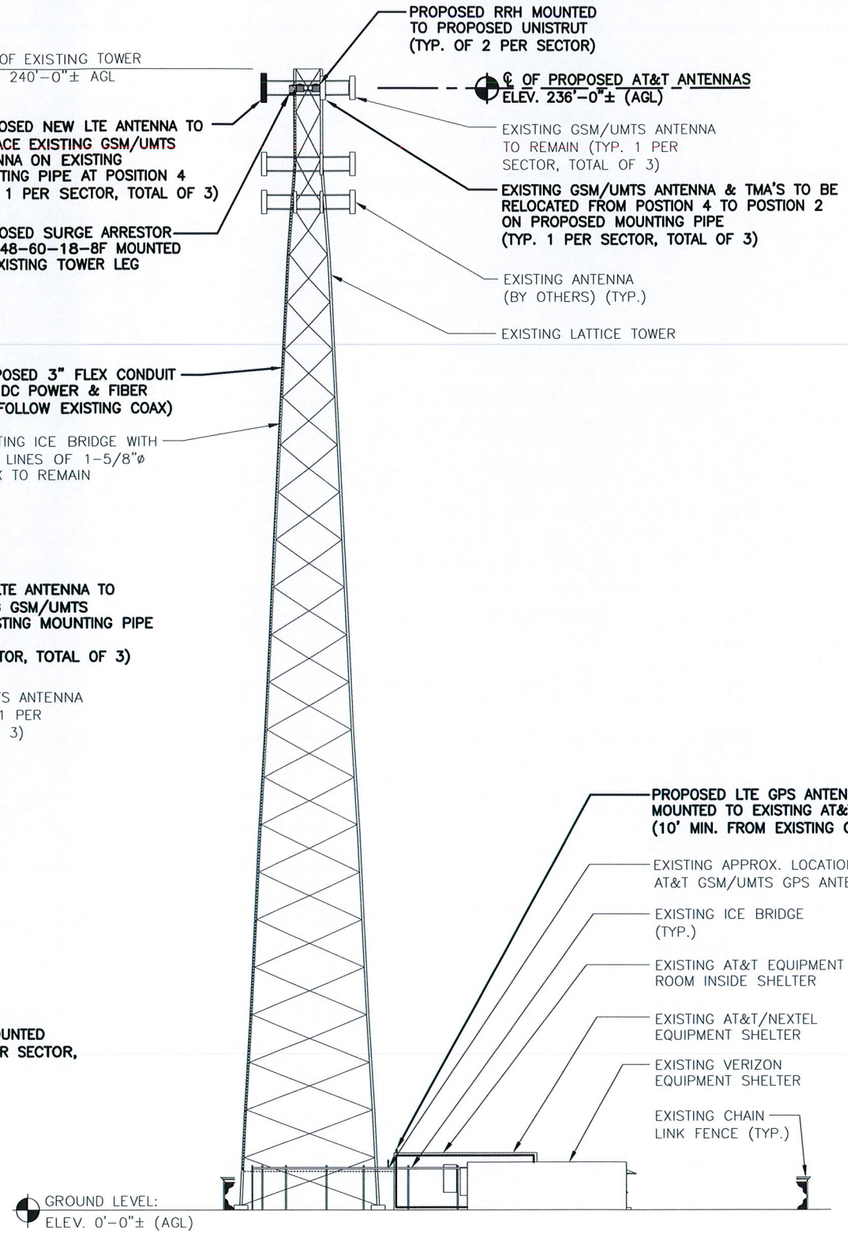
EXISTING ANTENNA PLAN

SCALE: N.T.S.



PROPOSED ANTENNA PLAN

SCALE: N.T.S.



PROPOSED EAST ELEVATION

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0" 64'-0"

NOTE:

NOT ALL EQUIPMENT SHOWN FOR CLARITY.

Hudson Design Group LLC
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0	11/03/11	ISSUED FOR CONSTRUCTION	NB	DC	DPH

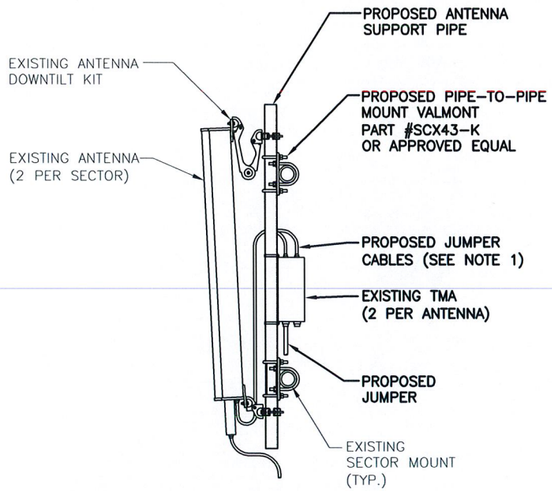
SCALE: NOT SHOWN | DESIGNED BY: DC | DRAWN BY: NB

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

AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
9144.01	A-2	0

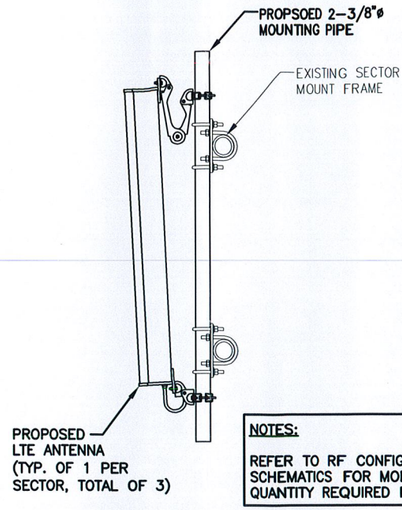


NOTES:

REFER TO RF CONFIG & SECTOR SCHEMATICS FOR MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

PROPOSED UMTS/GSM ANTENNA DETAIL

SCALE: N.T.S.

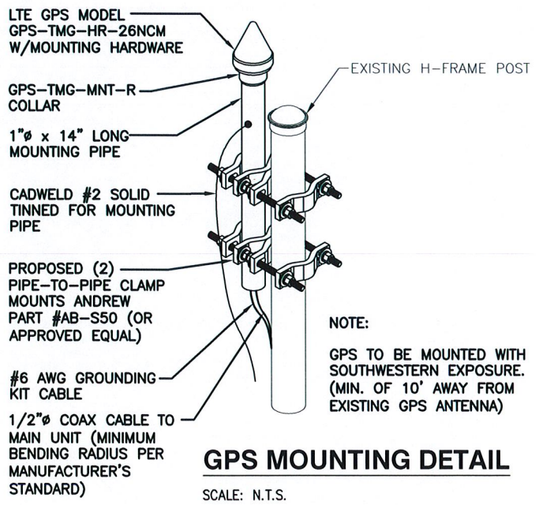


NOTES:

REFER TO RF CONFIG & SECTOR SCHEMATICS FOR MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

PROPOSED LTE ANTENNA DETAIL

SCALE: N.T.S.

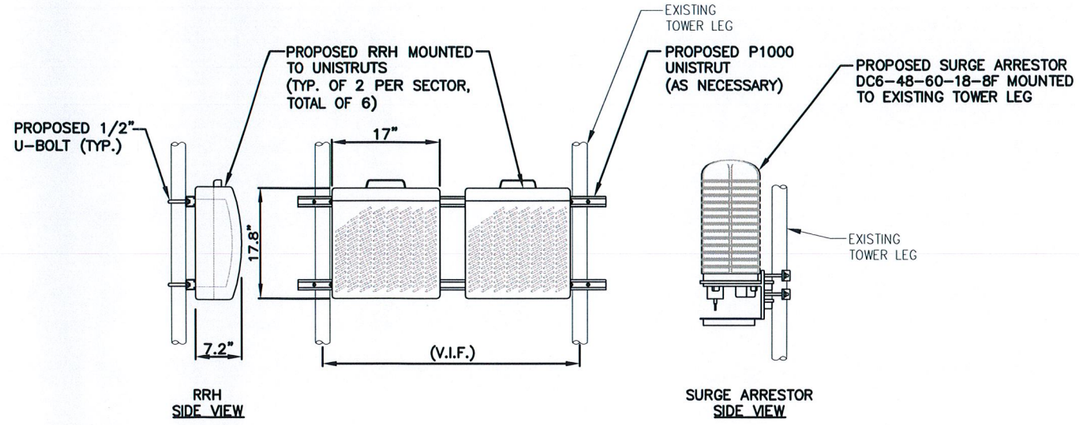


NOTE:

GPS TO BE MOUNTED WITH SOUTHWESTERN EXPOSURE. (MIN. OF 10' AWAY FROM EXISTING GPS ANTENNA)

GPS MOUNTING DETAIL

SCALE: N.T.S.



PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.

Hudson Design Groupllc
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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

SITE NUMBER: CT2144
SITE NAME: MONROE-GUINEA RD
230 GUINEA ROAD
MONROE, CT 60468
FAIRFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	11/03/11	ISSUED FOR CONSTRUCTION	NB	DC	DPH

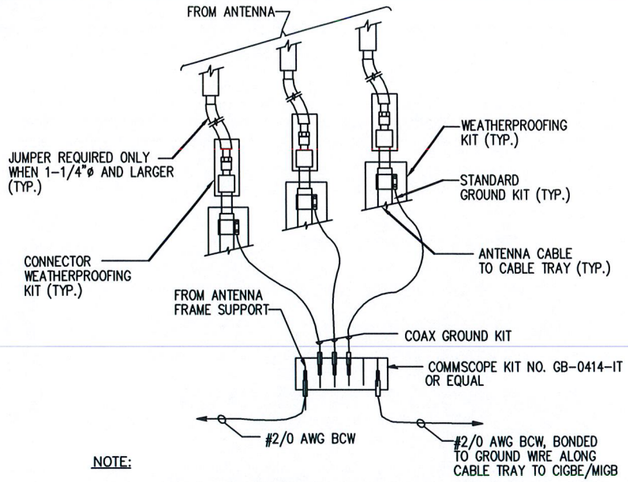
SCALE: NOT SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 21078
LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
9144.01	A-3	0

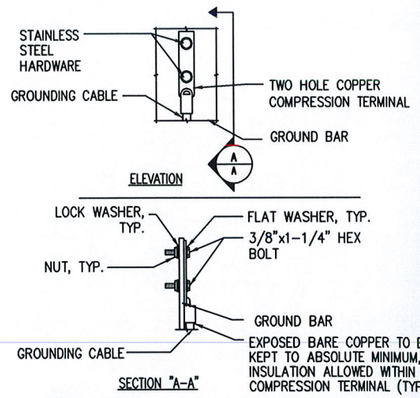


NOTE:

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

1 — GROUND WIRE TO GROUND BAR CONNECTION DETAIL

N.T.S.

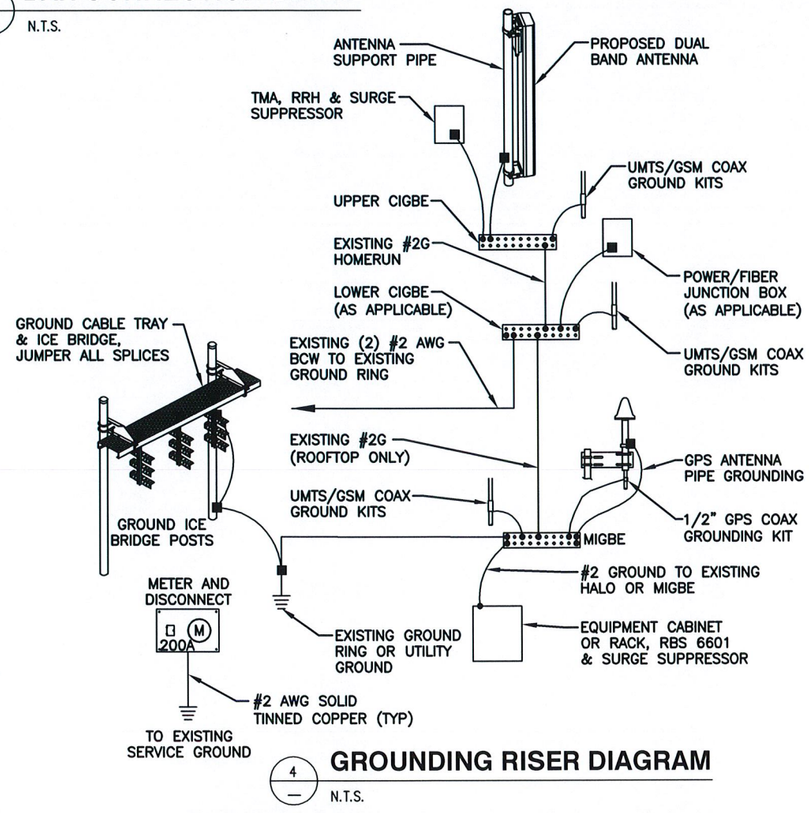


NOTE:

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.

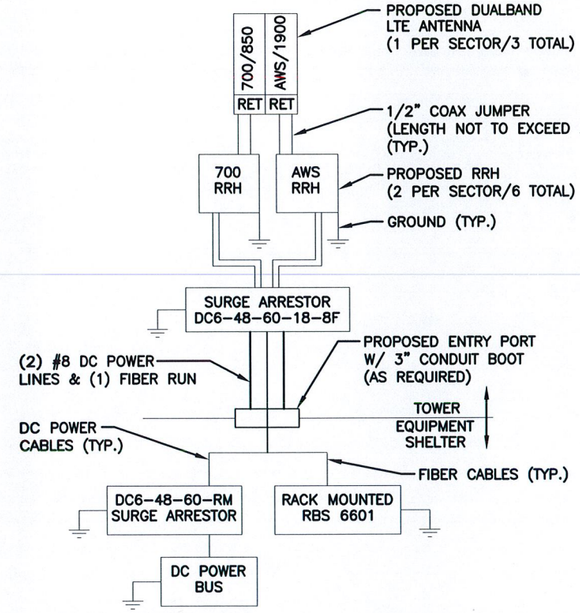
2 — TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.



4 — GROUNDING RISER DIAGRAM

N.T.S.



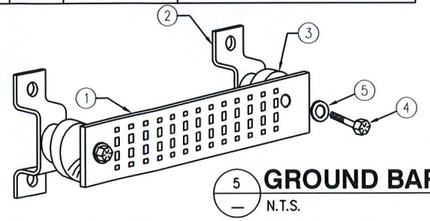
NOTES:

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

3 — 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



5 — 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 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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

SITE NUMBER: CT2144
SITE NAME: MONROE-GUINEA RD
230 GUINEA ROAD
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FAIRFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	11/03/11	ISSUED FOR CONSTRUCTION	NB	DC	DH

SCALE: NOT SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 28178 · LICENSED PROFESSIONAL ENGINEER

AT&T

PLUMBING DIAGRAM & DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2144.01	G-1	0

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

Calculated Radio Frequency Emissions

at&t

CT2144

230 Guinea Road, Monroe, CT 06468

November 7, 2011

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 existing lattice tower located at 230 Guinea Road in Monroe, CT. PageNet, RAW Mobile Data, Nextel and Verizon also have antennas on the tower. The coordinates of the tower are 41-20-30.67 N, 73-16-28.3 W.

AT&T is proposing the following modifications:

1) Add 700 MHz LTE frequencies;
2) Add 1900 MHz UMTS frequencies;
3) Install three 700 MHz LTE antennas (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. All information for PageNet, RAW Mobile Data, Nextel and Verizon comes directly from the current CSC database. 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 pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
AT&T UMTS	236	880	2	565	0.0073	0.5867	0.12%
AT&T UMTS	236	1900	2	875	0.0113	1.0000	0.11%
AT&T LTE	236	734	1	1117	0.0072	0.4893	0.15%
AT&T GSM	236	880	1	296	0.0019	0.5867	0.03%
PageNet		931.5			0.0127	0.6210	2.05%
RAW Mobile Data		936			0.0008	0.6240	0.13%
Nextel	222	858			0.0142	0.5720	2.48%
Verizon	218	869	9	295	0.0201	0.5793	3.47%
Verizon	218	1970	3	181	0.0041	1.0000	0.41%
						Total	**8.95%**

Table 1: Carrier Information[1] [2]

[1] The nominal 10 dB off-beam loss factor for AT&T is derived from the specific AT&T antennas for this site and their associated antenna patterns which are presented in Attachment C. Antenna specifics for PageNet, RAW Mobile Data, Nextel and Verizon were unavailable and therefore do not include any off-beam loss factor.

[2] Blank spaces indicate where information was unavailable from the CSC database.

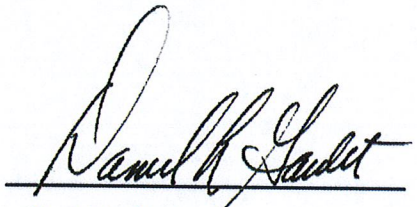
5. Conclusion

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 and existing transmit antennas at the existing facility is below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at the base of the tower is 8.95% 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

November 7, 2011
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[3]

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[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)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

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

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

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

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

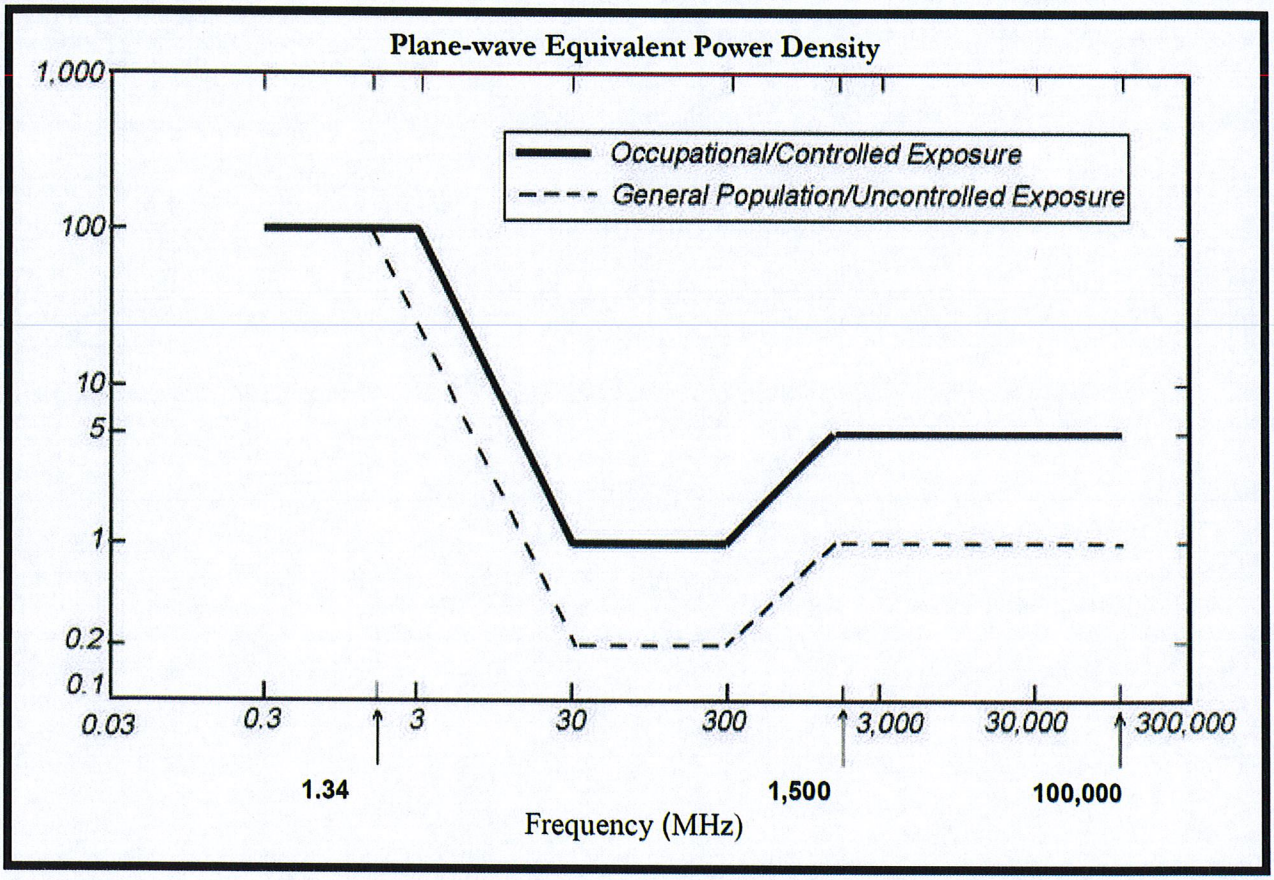
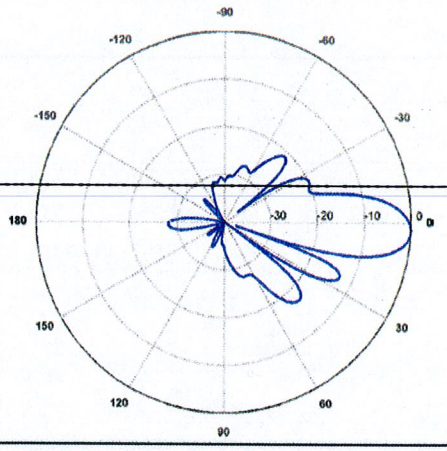
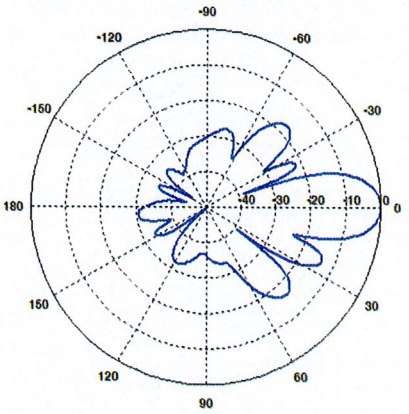
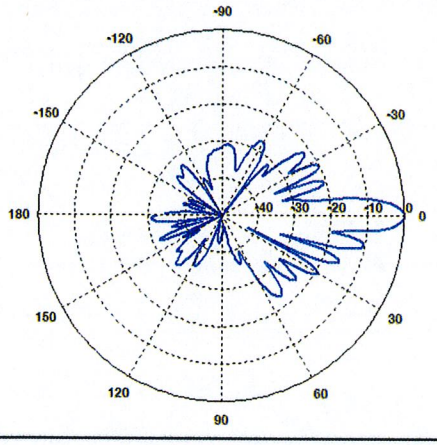


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T's Antenna Model Data Sheets and Electrical Patterns

700 MHz Manufacturer: Powerwave Model #: P65-16-XLH-RR Frequency Band: 698-806 MHz Gain: 12.7 dBd Vertical Beamwidth: 14.7° Horizontal Beamwidth: 66° Polarization: Dual Linear ±45° Size L x W x D: 72.0" x 12.0" x 6.0"	
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"	

Monroe Tower

CT2144

Fairfield County, Connecticut

Prepared for:
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067
June 17, 2011

CHA
2139 Silas Deane Highway
Suite 212
Rocky Hill, CT 06067-2336
Tel: (860) 257-4557
CHA Project No. 22702.1010.28000 R2

June 17, 2011

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067

RE: Structural Retrofit Analysis of the Monroe Tower
CT2144
Located in Fairfield County, CT
CHA Project No. 22702.1010.28000 R2

To Whom It May Concern:

CHA has performed a structural retrofit under the provisions of TIA-EIA-222-F of the referenced lattice tower for the purpose of evaluating its ability to support the existing equipment loads in addition to the new equipment proposed by New Cingular Wireless PCS, LLC. In summary, our analysis indicates that the tower ***is*** structurally capable of supporting the existing and proposed loads upon installation of the tower retrofit sections per our Construction Documents. The tower foundation capacities also require a structural retrofit, which shall be installed in accordance with our Construction Documents.

Our analysis and design is based on the following information:

- Tower member sizes and configuration obtained from a previous structural analysis report by PSG Engineering, Ltd., prepared for SAI Communications, dated October 3, 2005.
- Proposed equipment information, including antenna models and elevations, provided by New Cingular Wireless PCS, LLC.
- Original design base reactions and Coaxial Cable layout data obtained from a previous structural analysis by Walker Engineering, Inc., dated June 13, 2001.
- Tower foundation information obtained from a previous structural analysis report by GPD Associates, dated January 12, 2010.
- A previous Structural Analysis by CHA, dated June 6, 2011.

2139 Silas Deane Highway, Suite 212, Rocky Hill, CT 06067-2336
T 860.257.4557 • F 860.257.7514 • www.chacompanies.com

Our analysis includes data for the following proposed antennas and cables:

New Cingular Wireless:

- (3) Powerwave P65-16-XLH-RR panel antennas mounted on (3) 12" standoff pipes, supported by (3) existing 12' T-arms at an antenna centerline elevation of 236' with (2) #8 DC power cables and (1) 5/8" fiber cable run inside (1) 3" diameter innerduct.
- (6) Remote Radio Units mounted to the existing tower leg, at an antenna centerline elevation of 236'.
- (1) Raycap DC6-48-60-18-8F surge arrester mounted to the existing tower leg, at an antenna centerline elevation of 236'.
- (3) Powerwave TT19-08BP111-001 TMA's attached to existing GSM antenna, to replace (6) existing Powerwave LGP21901 diplexers, at an antenna centerline elevation of 236' AGL.

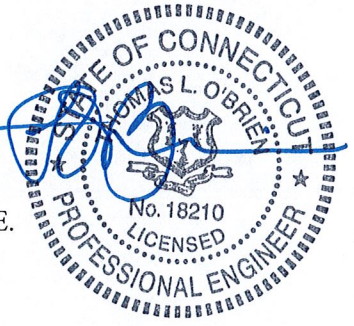
The existing and proposed antenna elevations and coaxial cable sizes have been listed in the attached Executive Summary.

With this information, TIA/EIA-222-F, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures,* and the Connecticut State Building Code the analysis was performed to determine the structural integrity of the tower. Based on the data provided, section properties, member strengths, and projected areas, applicable loads were calculated. Knowing the projected area of the tower and all of its appurtenances, 85 mph wind loads were calculated with and without radial ice loads of 1/2". These wind and ice loads were then reduced to member forces in the tower components through RISA Tower structural analysis software. The member forces were then compared to the maximum allowable stress for each member type.

The analysis indicates that the existing tower ***is*** capable of supporting the existing and proposed loads under TIA/EIA-222-F, upon installation of the recommended retrofits to the tower members and its foundation per our Construction Documents.

As requested, we have included a copy of the governing structural analysis calculations referenced above for your review and use. If you have any questions, or if we can be of further assistance, please do not hesitate to call.

Very truly yours,



Thomas L. O'Brien, P.E.
Partner

CHA

EXECUTIVE SUMMARY

Monroe Tower
CT2144

June 17, 2011

Tower Information:

Tower Owner:	Unknown
Tower Manufacturer:	Rohn.
Tower Height:	240 feet
Tower Type:	Lattice

Proposed Antenna Data:

New Cingular Wireless:

- (3) Powerwave P65-16-XLH-RR panel antennas mounted on (3) 12" standoff pipes, supported on (3) existing 12' T-arms at an antenna centerline elevation of 236' with (2) #8 DC power cables and (1) 5/8" fiber cable run inside (1) 3" diameter innerduct.
- (6) Remote Radio Units mounted to the existing tower leg, at an antenna centerline elevation of 236'.
- (1) Raycap DC6-48-60-18-8F surge arrester mounted to the existing tower leg, at an antenna centerline elevation of 236'.
- (3) Powerwave TT19-08BP111-001 TMA's attached to existing GSM antenna, to replace (6) existing Powerwave LGP21901 diplexers, at an antenna centerline elevation of 236' AGL.

Existing Antenna and Appurtenance Data:

Unknown Carrier:

- (2) Two 10' Whip antennas, mounted on standoff mounts to the tower leg, at the top of the tower with (2) two 1-1/4 coaxial cables.

AT&T:

- (6) Six Powerwave 7770 panel antennas, (6) six Powerwave LGP21901 diplexers and (6) six Powerwave LGP21401 TMA's mounted on existing 12' T-arms at an antenna centerline elevation of 236' with (12) twelve 1-5/8" coaxial cables.

Note: Diplexers to be removed prior to the installation of proposed TMA's.

Unknown Carrier:

- (1) One 6' Yagi antenna mounted to the existing tower leg at an antenna centerline elevation of 229' with (1) one 1/2" coaxial cable.

Nextel:

- (9) Nine Decibel DB844H90E-XY panel antennas mounted on (3) three 10' T-Arms at an antenna centerline elevation of 226' with (9) nine 1 5/8" coaxial cables.

Unknown Carrier:

- (2) Two 10' Whip antennas on standoffs, mounted to the tower leg at an antenna centerline elevation of 206' with (1) one 1-1/4" coaxial cable.

CHA

Code Data:

Applicable Code:
- TIA/EIA-222-F, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
- Connecticut State Building Code

Load Cases:

(1) Weight of Tower, Antennas, and Appurtenances plus Wind Load without radial ice at a wind speed of 85 mph.

(2) Weight of Tower, Antennas, and Appurtenances plus Wind Load on iced tower plus weight of 1/2" radial ice in conjunction with a wind speed of 74 mph.

Tower Leg Members: (A572 Gr. 50 ksi steel)

0 – 20':	ROHN 8 EH
20' – 80':	ROHN 8 EHS
60' – 120':	ROHN 6 EH
120' – 160':	ROHN 5 EH
160' – 180':	ROHN 4 EH
180' – 200':	ROHN 3.5 EH
200' – 220':	ROHN 3 EH
220' – 240':	ROHN 2.5 STD

Tower Diagonal Members:

0' – 20':	ROHN 3 STD (50 ksi)
20' – 40':	ROHN 2.5 EHH (50 ksi)
40' – 60':	L4x4x3/8 (50 ksi) ***(Retrofit Member)***
60' – 80':	L4x4x5/16 (50 ksi)
80' – 100':	L3 ½ x 3 ½ x 3/8 (50 ksi) ***(Retrofit Member)***
100' – 120':	L3 ½ x 3 ½ x 1/4 (50 ksi)
120' – 140':	L3x3x3/8 (50 ksi) ***(Retrofit Member)***
140' – 160':	L2 ½ x 2 ½ x 1/2 (36 ksi) ***(Retrofit Member)***
160' – 180':	L2 ½ x 2 ½ x 1/4 (36 ksi)
180' – 200':	L2 ½ x 2 ½ x 3/16 (36 ksi)
200' – 240':	L1 ¾ x 1 ¾ x 3/16 (36 ksi)

Tower Horizontal Members:

0' – 20':	ROHN 3 STD (50 ksi)
20' – 40':	ROHN 2.5 STD (50 ksi)

Top Girt Members:

220' – 240':	L2x2x1/4 (36 ksi)

Redundant Diagonals:

0' – 40':	ROHN 2 STD. ***(Retrofit Member)***

Diagonals Bolts:

40' – 60':	A325X ***(Retrofit Bolts)***
100' – 120':	A325X ***(Retrofit Bolts)***
120' – 140':	A325X ***(Retrofit Bolts)***
160' – 180':	A325X ***(Retrofit Bolts)***

CHA

Foundation Retrofit:

The uplift capacity of the foundation is below the allowable Factor of Safety of 2.0 in its current condition. Soil will be added above the existing grade at each foundation in order to increase the resistance to uplift. Each foundation will require 1'-3" of additional soil, compacted to a minimum 95%, to adequately resist uplift with a Factor of Safety of 2.0. With this additional soil, the total reveal of the pier will 0'-3".

Conclusion:

The analysis indicates that the existing tower is structurally capable of supporting the existing and proposed loads upon the installation of the proposed retrofit to the tower members in addition to its foundation per our Construction Documents.

Tower Superstructure:

The tower members are stressed at the following governing capacities for the load cases 1 & 2:

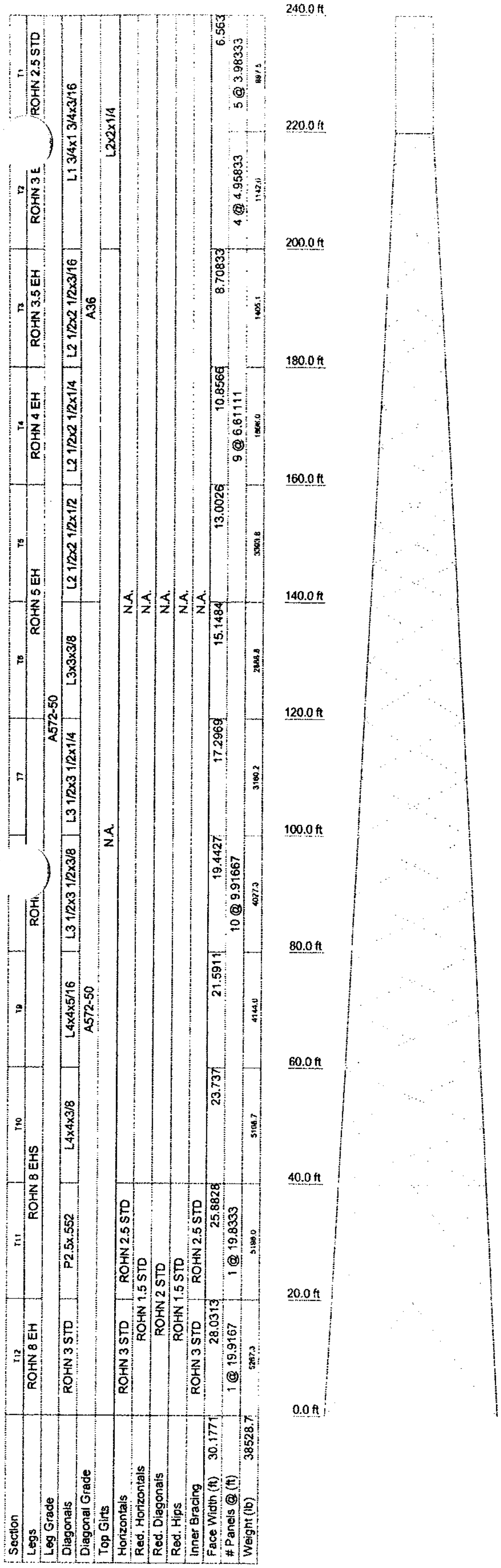
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
T1	240 - 220	Leg	ROHN 2.5 STD	3	-20088.10	55151.68	36.4	Pass
		Diagonal	L1 3/4x1 3/4x3/16	9	-3709.19	7403.75	50.1	Pass
							67.5 (b)	
		Top Girt	L2x2x1/4	4	-349.61	4957.60	7.1	Pass
T2	220 - 200	Leg	ROHN 3 EH	39	-47539.70	96334.44	49.3	Pass
		Diagonal	L1 3/4x1 3/4x3/16	48	-3957.21	4257.48	92.9	Pass
		Top Girt	L2x2x1/4	42	-29.29	5025.96	0.6	Pass
T3	200 - 180	Leg	ROHN 3.5 EH	69	-74795.00	110691.92	67.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	75	-5143.28	7910.71	65.0	Pass
							93.6 (b)	
T4	180 - 160	Leg	ROHN 4 EH	90	-102998.00	139493.11	73.8	Pass
		Diagonal	L2 1/2x2 1/2x1/4	96	-6061.14	7820.50	77.5	Pass
T5	160 - 140	Leg	ROHN 5 EH	111	-132446.00	206710.97	64.1	Pass
		Diagonal	L2 1/2x2 1/2x1/2	117	-7104.72	11415.01	62.2	Pass
							90.5 (b)	
T6	140 - 120	Leg	ROHN 5 EH	132	-161992.00	178226.09	90.9	Pass
		Diagonal	L3x3x3/8	138	-8569.24	10515.28	81.5	Pass
T7	120 - 100	Leg	ROHN 6 EH	147	-192012.00	265116.36	72.4	Pass
							80.6 (b)	
		Diagonal	L3 1/2x3 1/2x1/4	153	-9488.45	9897.26	95.9	Pass
T8	100 - 80	Leg	ROHN 6 EH	162	-222700.00	265116.36	84.0	Pass
		Diagonal	L3 1/2x3 1/2x3/8	168	-10449.40	11973.82	87.3	Pass
T9	80 - 60	Leg	ROHN 6 EH	177	-253572.00	265116.36	95.6	Pass
		Diagonal	L4x4x5/16	183	-11380.30	13067.74	87.1	Pass
							92.0 (b)	
T10	60 - 40	Leg	ROHN 8 EHS	192	-284928.00	333152.68	85.5	Pass
		Diagonal	L4x4x3/8	198	-12420.50	13455.84	92.3	Pass
T11	40 - 20	Leg	ROHN 8 EHS	207	-315072.00	333152.68	94.6	Pass
		Diagonal	P2.5x.552	228	-21825.80	26902.34	81.1	Pass
		Horizontal	ROHN 2.5 STD	224	-11985.20	13346.66	89.8	Pass
		Redund Horz 1 Bracing	ROHN 1.5 STD	220	-5465.07	11286.52	48.4	Pass
		Redund Diag 1 Bracing	ROHN 2 STD	227	-4881.64	7795.70	62.6	Pass
		Redund Hip 1 Bracing	ROHN 1.5 STD	231	-58.28	10219.87	0.6	Pass
		Redund Hip	ROHN 1.5 STD	232	-43.65	1851.98	2.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
		Diagonal Bracing						
		Inner Bracing	ROHN 2.5 STD	235	-7.45	9464.35	0.5	Pass
T12	20 - 0	Leg	ROHN 8 EH	240	-315075.00	435619.05	72.3	Pass
		Diagonal	ROHN 3 STD	261	-20797.50	26704.92	77.9	Pass
		Horizontal	ROHN 3 STD	257	-12178.20	22349.48	54.5	Pass
		Redund Horz 1 Bracing	ROHN 1.5 STD	259	-5465.09	9685.00	56.4	Pass
		Redund Diag 1 Bracing	ROHN 2 STD	254	-4631.94	7305.11	63.4	Pass
		Redund Hip 1 Bracing	ROHN 1.5 STD	264	-54.64	8717.45	0.6	Pass
		Redund Hip Diagonal Bracing	ROHN 1.5 STD	265	-49.43	1683.49	2.9	Pass
		Inner Bracing	ROHN 3 STD	270	-7.96	15917.80	0.3	Pass
							Summary	
						Leg (T9)	95.6	Pass
						Diagonal (T7)	95.9	Pass
						Horizontal (T11)	89.8	Pass
						Top Girt (T1)	7.1	Pass
						Redund Horz 1 Bracing (T12)	56.4	Pass
						Redund Diag 1 Bracing (T12)	63.4	Pass
						Redund Hip 1 Bracing (T12)	0.6	Pass
						Redund Hip Diagonal Bracing (T12)	2.9	Pass
						Inner Bracing (T11)	0.5	Pass
						Bolt Checks	93.6	Pass
						RATING =	**95.9**	**Pass**

*The governing tower member is stressed at 95.9%.

TOWER ELEVATION



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10' WHIP	245	P-65-16-XLH-RR	236
10' WHIP	245	TT19-08BP111-001	236
(2) RRU	238	TT19-08BP111-001	236
(2) RRU	238	TT19-08BP111-001	236
(2) RRU	238	Surge Arrestor	235
P-65-16-XLH-RR	236	Conn Hill - 72" Yagi	229
PiROD 12' Lightweight T-Frame	236	PiROD 10' Lightweight T-Frame	226
PiROD 12' Lightweight T-Frame	236	PiROD 10' Lightweight T-Frame	226
PiROD 12' Lightweight T-Frame	236	PiROD 10' Lightweight T-Frame	226
(2) 4' x 6" Panel w/ Mounting Pipe	236	(3) DB844H90E-XY w/Mount Pipe	226
(2) 4' x 6" Panel w/ Mounting Pipe	236	(3) DB844H90E-XY w/Mount Pipe	226
(2) 4' x 6" Panel w/ Mounting Pipe	236	(3) DB844H90E-XY w/Mount Pipe	226
P-65-16-XLH-RR	236	10' WHIP	206

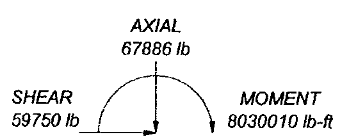
MATERIAL STRENGTH

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

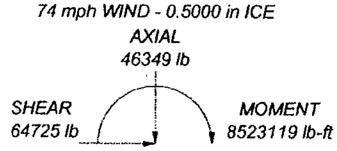
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.

MAX. CORNER REACTIONS AT BASE:
DOWN: 341579 lb
UPLIFT: -300773 lb
SHEAR: 38312 lb



TORQUE 74099 lb-ft
74 mph WIND - 0.5000 in ICE



TORQUE 83242 lb-ft
REACTIONS - 85 mph WIND

CHA Consulting, Inc. 2139 Silas Deane Highway, Suite 212, Rocky Hill, CT 06067-2336, Phone: (860) 257-4557, FAX:	Job: **22702-1010 CT2144**		
	Project: *Monroe*		
	Client: New Cingular Wireless	Drawn by: Tony Marruso	App'd:
	Code: TIA/EIA-222-F	Date: 06/13/11	Scale: NTS
	Path:		Dwg No. E-1

FOUNDATION RE-ANALYSIS

AM	06/13/11	CHA		1 OF 1	
COMP. BY	DATE	CLOUGH HARBOUR & ASSOCIATES LLP			
JJS	06/13/11				
CHK. BY	DATE				
Project Name: SAI Cingular				Proj No.:	22702-1010-28000
Acct No.:	CT2144	Site Name: Monroe Tower		Site Loc.:	CT
Subject:	Foundation Calculations			County.:	Fairfield

VARIABLES

3 = MAT DEPTH (FT)
16 = MAT WIDTH (FT) (SHORTER OF 2)
16 = MAT LENGTH (FT)

0.25 = REVEAL (FT)
= SQUARE PIER WIDTH (FT) <===One of these has to be Zero
4 = DIAMETER OF CIRCULAR PIER (FT) <===One of these has to be Zero
6 = TOTAL LENGTH OF PIER (FT) WITH REVEAL
13 = DESIGN WATER TABLE (FT BELOW GROUND LEVEL)
35 = SOIL ANGLE OF INTERNAL FRICTION (DEG)
200 = (ASSUMED) NET HORIZONTAL SOIL PRESSURE
0.4 = COEFFICIENT OF FRICTION

38.3 = SHEAR (KIP)
40.8 = AXIAL (KIP)
0 = AXIAL UPLIFT (KIP)
500 = MOMENT (FT-KIP)

0.12 = ASSUMED UNIT WEIGHT OF SOIL (KCF)
0.15 = UNIT WEIGHT OF CONCRETE (KCF)
30 = BEARING CAPACITY (KSF)

GEOMETRY & WEIGHT

768 = VOL OF MAT (FT^3)
115.2 = WEIGHT OF MAT (KIP)

0.00 = VOL OF SQUARE PIER (FT^3)
0.00 = WEIGHT OF SQUARE PIER (KIP)
75.40 = VOL OF CIRCULAR PIER (FT^3)
11.31 = WEIGHT OF CIRCULAR PIER (KIP)

75.40 = VOL OF PROPOSED PIER (FT^3)
11.31 = WEIGHT OF PROPOSED PIER (KIP)

0 = VOL OF DIRT OVER MAT MINUS VOL OF SQUARE PIER (FT^3)
0 = WEIGHT OF DIRT DIRECTLY ABOVE MAT (KIP)
1399.74 = VOL OF DIRT OVER MAT MINUS VOL OF CIRCULAR PIER (FT^3)
167.97 = WEIGHT OF SOIL DIRECTLY ABOVE MAT (KIP)
309.16 = WEIGHT OF FAILURE CONE OF SOIL ABOVE FOOTING (KIP)

1399.74 = VOL OF DIRT OVER PROPOSED FOOTING (FT^3)
167.97 = WEIGHT OF DIRT OVER PROPOSED FOOTING (KIP)

OVERTURNING

844.7 = TOTAL OVERTURNING MOMENT (FT-K)
5155.55 = RESISTING MOMENT (USE DIRT DIRECTLY OVER FTG) (F
2 = MIN SAFETY FACTOR

OK = RESULT

BEARING CAPACITY

2.55 = POSITIVE BEARING (KSF) FOR SQUARE MAT *
0.07 = NEGETIVE BEARING (KSF) FOR SQUARE MAT *
30 = MIN ALLOWABLE BEARING

OK = RESULT

UPLIFT

301.8 =TOTAL UPLIFT FORCE ON FOOTING

603.64 =RESISTING FORCE DUE TO FOUNDATION AND SOIL

2.0 = SAFETY FACTOR

OK = RESULT

* CHANGE I (MOMENT OF INERTIA) IF NOT SQUARE

SLIDING

603.64 = TOTAL AXIAL FORCE (K) (NORMAL WEIGHT)
0.40 = COEFFICIENT OF FRICTION
1.50 = MIN SAFETY FACTOR
241.46 = FRICTION FORCE (K)
69.60 = PASSIVE FORCE (K)
207.37 = ALLOWABLE FORCE (K)

OK = RESULT

RETROFIT ANALYSIS SUMMARY
PER TIA/EIA-222-F
(Existing and Proposed Equipment)

RISATower	Job	Page
	22702-1010 CT2144	1 of 43
CHA Consulting, Inc. 2139 Silas Deane Highway, Suite 212 Rocky Hill, CT 06067-2336 Phone: (860) 257-4557 FAX:	Project Monroe	Date 11:10:08 06/13/11
	Client New Cingular Wireless	Designed by Tony Marruso

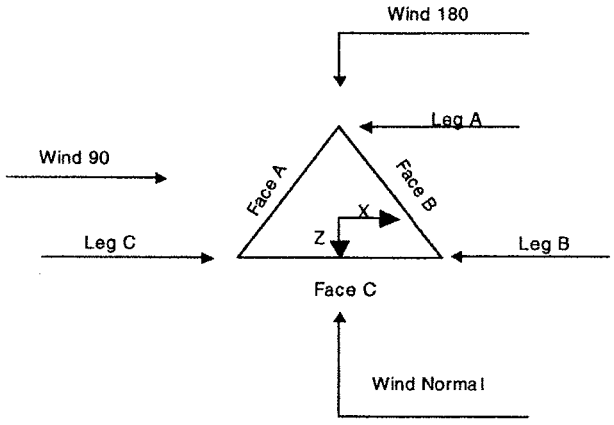
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 240.00 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 6.56 ft at the top and 30.18 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
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	240.00-220.00			6.56	1	20.00
T2	220.00-200.00			6.56	1	20.00
T3	200.00-180.00			8.71	1	20.00
T4	180.00-160.00			10.86	1	20.00
T5	160.00-140.00			13.00	1	20.00
T6	140.00-120.00			15.15	1	20.00
T7	120.00-100.00			17.30	1	20.00
T8	100.00-80.00			19.44	1	20.00
T9	80.00-60.00			21.59	1	20.00
T10	60.00-40.00			23.74	1	20.00
T11	40.00-20.00			25.88	1	20.00
T12	20.00-0.00			28.03	1	20.00

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
T1	240.00-220.00	3.98	X Brace	No	No	0.0000	1.0000
T2	220.00-200.00	4.96	X Brace	No	No	1.0000	1.0000
T3	200.00-180.00	6.61	X Brace	No	No	1.0000	1.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T4	180.00-160.00	6.61	X Brace	No	No	1.0000	1.0000
T5	160.00-140.00	6.61	X Brace	No	No	1.0000	1.0000
T6	140.00-120.00	9.92	X Brace	No	No	1.0000	1.0000
T7	120.00-100.00	9.92	X Brace	No	No	1.0000	1.0000
T8	100.00-80.00	9.92	X Brace	No	No	1.0000	1.0000
T9	80.00-60.00	9.92	X Brace	No	No	1.0000	1.0000
T10	60.00-40.00	9.92	X Brace	No	No	1.0000	1.0000
T11	40.00-20.00	19.83	K1 Down	No	Yes	1.0000	1.0000
T12	20.00-0.00	19.92	K1 Down	No	Yes	1.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 240.00-220.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 220.00-200.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 200.00-180.00	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 180.00-160.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 160.00-140.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T6 140.00-120.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A572-50 (50 ksi)
T7 120.00-100.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T8 100.00-80.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x3/8	A572-50 (50 ksi)
T9 80.00-60.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T10 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A572-50 (50 ksi)
T11 40.00-20.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	P2.5x.552	A572-50 (50 ksi)
T12 20.00-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	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 240.00-220.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2 220.00-200.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Flat Bar		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 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A36 (36 ksi)
T12 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 3 STD	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T11 40.00-20.00	Solid Round		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T12 20.00-0.00	Solid Round		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 40.00-20.00	A36 (36 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal		ROHN 1.5 STD	1
T12 20.00-0.00	A36 (36 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal		ROHN 1.5 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 240.00-220.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 220.00-200.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 200.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
T4 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T12 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 240.00-220.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 220.00-200.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 200.00-180.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 180.00-160.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 160.00-140.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 140.00-120.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 120.00-100.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 100.00-80.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 80.00-60.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 60.00-40.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T11 40.00-20.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T12 20.00-0.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry (cont'd)

Tower Elevation ft	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 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
T2 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
T3 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
T4 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
T5 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
T6 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
T7 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
T8 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
T9 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
T10 60.00-40.00	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 40.00-20.00	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 20.00-0.00	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 240.00-220.00	Flange	0.7500 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 220.00-200.00	Flange	0.8750 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 200.00-180.00	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 180.00-160.00	Flange	1.0000 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 160.00-140.00	Flange	1.0000 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 140.00-120.00	Flange	1.0000 A325N	4	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 120.00-100.00	Flange	1.0000 A325N	4	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 100.00-80.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 80.00-60.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

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.
T10	Flange	1.0000	6	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
60.00-40.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T11	Flange	1.0000	6	0.7500	3	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0
40.00-20.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T12 20.00-0.00	Flange	1.0000	10	0.7500	3	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		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
LDF6-50A (1-1/4 FOAM)	A	No	Ar (CaAa)	240.00 - 10.00	0.0000	-0.45	2	2	1.5500	1.5500		0.66
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CaAa)	236.00 - 10.00	0.0000	-0.45	12	6	1.9800	1.9800		0.82
LDF4P-50A (1/2 FOAM)	B	No	Ar (CaAa)	229.00 - 10.00	0.0000	-0.34	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM)	A	No	Ar (CaAa)	226.00 - 10.00	0.0000	0.45	8	8	1.9800	1.9800		0.82
LDF6-50A (1-1/4 FOAM)	B	Yes	Ar (CaAa)	206.00 - 10.00	0.0000	-0.35	2	2	1.5500	1.5500		0.66
3" Rigid Conduit	B	No	Ar (CfAe)	236.00 - 10.00	0.0000	-0.36	1	1	3.0000	3.0000		3.50

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	240.00-220.00	A	0.000	0.000	15.704	0.000	65.76
		B	4.000	0.000	36.042	0.000	214.79
		C	0.000	0.000	0.000	0.000	0.00
T2	220.00-200.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	47.464	0.000	277.72
		C	0.000	0.000	0.000	0.000	0.00
T3	200.00-180.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T4	180.00-160.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T5	160.00-140.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T6	140.00-120.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T7	120.00-100.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	0.000	0.000	0.00
T8	100.00-80.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T9	80.00-60.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T10	60.00-40.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T11	40.00-20.00	A	0.000	0.000	37.880	0.000	157.60
		B	5.000	0.000	51.804	0.000	296.20
		C	0.000	0.000	0.000	0.000	0.00
T12	20.00-0.00	A	0.000	0.000	18.940	0.000	78.80
		B	2.500	0.000	25.902	0.000	148.10
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	240.00-220.00	A	0.500	0.000	0.000	24.504	0.000	188.57
		B		5.333	0.000	38.542	0.000	546.08
		C		0.000	0.000	0.000	0.000	0.00
T2	220.00-200.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	52.664	0.000	712.90
		C		0.000	0.000	0.000	0.000	0.00
T3	200.00-180.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T4	180.00-160.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T5	160.00-140.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T6	140.00-120.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T7	120.00-100.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T8	100.00-80.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T9	80.00-60.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T10	60.00-40.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T11	40.00-20.00	A	0.500	0.000	0.000	57.880	0.000	450.08
		B		6.667	0.000	59.804	0.000	766.44
		C		0.000	0.000	0.000	0.000	0.00
T12	20.00-0.00	A	0.500	0.000	0.000	28.940	0.000	225.04
		B		3.333	0.000	29.902	0.000	383.22
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	240.00-220.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.261	1.483	2.232
		C	0.000	0.000	0.000	0.000
T2	220.00-200.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.424	1.666	2.525
		C	0.000	0.000	0.000	0.000
T3	200.00-180.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.157	1.886	2.893
		C	0.000	0.000	0.000	0.000
T4	180.00-160.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.096	1.785	2.739
		C	0.000	0.000	0.000	0.000
T5	160.00-140.00	A	0.000	0.000	0.000	0.000
		B	0.000	1.058	1.725	2.646
		C	0.000	0.000	0.000	0.000
T6	140.00-120.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.748	1.464	2.245
		C	0.000	0.000	0.000	0.000
T7	120.00-100.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.726	1.655	2.540
		C	0.000	0.000	0.000	0.000
T8	100.00-80.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.709	1.618	2.482
		C	0.000	0.000	0.000	0.000
T9	80.00-60.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.697	1.817	2.787
		C	0.000	0.000	0.000	0.000
T10	60.00-40.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.687	1.793	2.750
		C	0.000	0.000	0.000	0.000
T11	40.00-20.00	A	0.000	0.000	0.000	0.000
		B	1.495	3.199	0.000	0.000
		C	0.000	0.000	0.000	0.000
T12	20.00-0.00	A	0.000	0.000	0.000	0.000
		B	0.809	1.678	0.000	0.000
		C	0.000	0.000	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	240.00-220.00	-0.2835	-7.0626	-0.6613	-6.0980
T2	220.00-200.00	-0.2495	-9.5006	-0.5423	-8.8870
T3	200.00-180.00	-0.2681	-11.7365	-0.5751	-11.1723
T4	180.00-160.00	-0.3600	-13.9146	-0.7105	-13.2797
T5	160.00-140.00	-0.4420	-15.7873	-0.8321	-15.1415
T6	140.00-120.00	-0.5342	-18.2511	-0.9751	-17.6674
T7	120.00-100.00	-0.6014	-19.5269	-1.0777	-19.0755
T8	100.00-80.00	-0.6827	-21.5063	-1.2007	-21.0151

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T9	80.00-60.00	-0.7497	-22.8377	-1.3035	-22.4241
T10	60.00-40.00	-0.7949	-23.7558	-1.3776	-23.5226
T11	40.00-20.00	-0.9072	-26.9814	-1.5380	-26.2144
T12	20.00-0.00	-0.7082	-20.7350	-1.2078	-20.4194

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
P-65-16-XLH-RR	A	From Leg	4.00	0.00	0.0000	236.00	No Ice	8.40	5.46	60.00
			0.00				1/2" Ice	8.95	5.91	110.86
P-65-16-XLH-RR	B	From Leg	4.00	0.00	0.0000	236.00	No Ice	8.40	5.46	60.00
			0.00				1/2" Ice	8.95	5.91	110.86
P-65-16-XLH-RR	C	From Leg	4.00	0.00	0.0000	236.00	No Ice	8.40	5.46	60.00
			0.00				1/2" Ice	8.95	5.91	110.86
(2) RRU	A	None			0.0000	238.00	No Ice	0.00	0.97	44.00
							1/2" Ice	0.00	1.12	56.83
(2) RRU	B	None			0.0000	238.00	No Ice	0.00	0.97	44.00
							1/2" Ice	0.00	1.12	56.83
(2) RRU	C	None			0.0000	238.00	No Ice	0.00	0.97	44.00
							1/2" Ice	0.00	1.12	56.83
Surge Arrestor	C	None			0.0000	235.00	No Ice	1.08	0.66	16.00
							1/2" Ice	1.23	0.77	24.84
PiROD 12' Lightweight T-Frame	A	None			0.0000	236.00	No Ice	10.20	10.20	253.00
							1/2" Ice	16.20	16.20	355.00
PiROD 12' Lightweight T-Frame	B	None			0.0000	236.00	No Ice	10.20	10.20	253.00
							1/2" Ice	16.20	16.20	355.00
PiROD 12' Lightweight T-Frame	C	None			0.0000	236.00	No Ice	10.20	10.20	253.00
							1/2" Ice	16.20	16.20	355.00
(2) 4' x 6" Panel w/ Mounting Pipe	A	From Leg	4.00	0.00	0.0000	236.00	No Ice	2.87	3.06	43.16
			0.00				1/2" Ice	3.18	3.61	72.70
(2) 4' x 6" Panel w/ Mounting Pipe	B	From Leg	4.00	0.00	0.0000	236.00	No Ice	2.87	3.06	43.16
			0.00				1/2" Ice	3.18	3.61	72.70
(2) 4' x 6" Panel w/ Mounting Pipe	C	From Leg	4.00	0.00	0.0000	236.00	No Ice	2.87	3.06	43.16
			0.00				1/2" Ice	3.18	3.61	72.70
10' WHIP	A	From Leg	3.00	0.00	0.0000	245.00	No Ice	3.00	3.00	25.00
			0.00				1/2" Ice	4.03	4.03	46.79
10' WHIP	C	From Leg	3.00	0.00	0.0000	245.00	No Ice	3.00	3.00	25.00
			0.00				1/2" Ice	4.03	4.03	46.79
Conn Hill - 72" Yagi	B	From Leg	3.00	0.00	0.0000	229.00	No Ice	4.07	6.24	92.14
			0.00				1/2" Ice	10.14	13.44	137.53
(3) DB844H90E-XY	A	From Leg	4.00		0.0000	226.00	No Ice	3.58	5.40	35.55

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
w/Mount Pipe			0.00 0.00			1/2" Ice	4.20	6.49	76.59
(3) DB844H90E-XY	B	From Leg	4.00	0.0000	226.00	No Ice	3.58	5.40	35.55
w/Mount Pipe			0.00 0.00			1/2" Ice	4.20	6.49	76.59
(3) DB844H90E-XY	C	From Leg	4.00	0.0000	226.00	No Ice	3.58	5.40	35.55
w/Mount Pipe			0.00 0.00			1/2" Ice	4.20	6.49	76.59
PiROD 10' Lightweight	A	None		0.0000	226.00	No Ice	9.30	9.30	251.00
T-Frame						1/2" Ice	14.50	14.50	344.00
PiROD 10' Lightweight	B	None		0.0000	226.00	No Ice	9.30	9.30	251.00
T-Frame						1/2" Ice	14.50	14.50	344.00
PiROD 10' Lightweight	C	None		0.0000	226.00	No Ice	9.30	9.30	251.00
T-Frame						1/2" Ice	14.50	14.50	344.00
10' WHIP	C	From Leg	4.00	0.0000	206.00	No Ice	3.00	3.00	25.00
			0.00 0.00			1/2" Ice	4.03	4.03	46.79
SAI									
TT19-08BP111-001	A	None		0.0000	236.00	No Ice	0.64	0.52	25.00
						1/2" Ice	0.76	0.62	30.80
TT19-08BP111-001	B	None		0.0000	236.00	No Ice	0.64	0.52	25.00
						1/2" Ice	0.76	0.62	30.80
TT19-08BP111-001	C	None		0.0000	236.00	No Ice	0.64	0.52	25.00
						1/2" Ice	0.76	0.62	30.80
exist to be removed									

Tower Pressures - No Ice

$G_H = 1.102$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	230.00	1.741	32	136.052	A	11.841	9.583	9.583	44.73	15.704	0.000
240.00-220.00					B	10.358	13.583		40.03	36.042	0.000
					C	11.841	9.583		44.73	0.000	0.000
T2	210.00	1.697	31	158.555	A	11.270	11.689	11.689	50.91	37.880	0.000
220.00-200.00					B	9.604	16.689		44.46	47.464	0.000
					C	11.270	11.689		50.91	0.000	0.000
T3	190.00	1.649	30	202.326	A	14.263	13.359	13.359	48.36	37.880	0.000
200.00-180.00					B	12.377	18.359		43.46	51.804	0.000
					C	14.263	13.359		48.36	0.000	0.000
T4	170.00	1.597	30	246.103	A	16.518	15.029	15.029	47.64	37.880	0.000
180.00-160.00					B	14.733	20.029		43.23	51.804	0.000
					C	16.518	15.029		47.64	0.000	0.000
T5	150.00	1.541	29	290.795	A	18.802	18.579	18.579	49.70	37.880	0.000
160.00-140.00					B	17.077	23.579		45.70	51.804	0.000
					C	18.802	18.579		49.70	0.000	0.000
T6	130.00	1.48	27	333.738	A	18.475	18.579	18.579	50.14	37.880	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
140.00-120.00					B	17.011	23.579		45.77	51.804	0.000
					C	18.475	18.579		50.14	0.000	0.000
T7	110.00	1.411	26	378.454	A	23.627	22.126	22.126	48.36	37.880	0.000
120.00-100.00					B	21.972	27.126		45.06	51.804	0.000
					C	23.627	22.126		48.36	0.000	0.000
T8	90.00	1.332	25	421.396	A	25.874	22.126	22.126	46.10	37.880	0.000
100.00-80.00					B	24.256	27.126		43.06	51.804	0.000
					C	25.874	22.126		46.10	0.000	0.000
T9 80.00-60.00	70.00	1.24	23	464.339	A	32.185	22.126	22.126	40.74	37.880	0.000
					B	30.368	27.126		38.48	51.804	0.000
					C	32.185	22.126		40.74	0.000	0.000
T10	50.00	1.126	21	510.594	A	34.596	28.805	28.805	45.43	37.880	0.000
60.00-40.00					B	32.803	33.805		43.25	51.804	0.000
					C	34.596	28.805		45.43	0.000	0.000
T11	30.00	1	18	553.537	A	0.000	58.255	28.805	49.45	37.880	0.000
40.00-20.00					B	0.000	59.352		48.53	51.804	0.000
					C	0.000	53.439		53.90	0.000	0.000
T12 20.00-0.00	10.00	1	18	596.480	A	0.000	63.717	28.805	45.21	18.940	0.000
					B	0.000	62.883		45.81	25.902	0.000
					C	0.000	58.666		49.10	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.102$

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	230.00	1.741	24	0.5000	137.718	A	11.841	19.608	12.917	41.07	24.504	0.000
240.00-220.00						B	9.609	23.680		38.80	38.542	0.000
						C	11.841	19.608		41.07	0.000	0.000
T2	210.00	1.697	24	0.5000	160.224	A	11.270	21.394	15.029	46.01	57.880	0.000
220.00-200.00						B	8.745	26.637		42.48	52.664	0.000
						C	11.270	21.394		46.01	0.000	0.000
T3	190.00	1.649	23	0.5000	203.995	A	14.263	22.404	16.699	45.54	57.880	0.000
200.00-180.00						B	11.370	27.913		42.51	59.804	0.000
						C	14.263	22.404		45.54	0.000	0.000
T4	170.00	1.597	22	0.5000	247.772	A	16.518	24.976	18.368	44.27	57.880	0.000
180.00-160.00						B	13.779	30.547		41.44	59.804	0.000
						C	16.518	24.976		44.27	0.000	0.000
T5	150.00	1.541	21	0.5000	292.464	A	18.802	29.439	21.919	45.44	57.880	0.000
160.00-140.00						B	16.156	35.048		42.81	59.804	0.000
						C	18.802	29.439		45.44	0.000	0.000
T6	130.00	1.48	21	0.5000	335.407	A	18.475	28.077	21.919	47.08	57.880	0.000
140.00-120.00						B	16.229	33.995		43.64	59.804	0.000
						C	18.475	28.077		47.08	0.000	0.000
T7	110.00	1.411	20	0.5000	380.123	A	23.627	32.216	25.465	45.60	57.880	0.000
120.00-100.00						B	21.088	38.157		42.98	59.804	0.000
						C	23.627	32.216		45.60	0.000	0.000
T8 100.00-80.00	90.00	1.332	18	0.5000	423.065	A	25.874	32.858	25.466	43.36	57.880	0.000
						B	23.392	38.816		40.94	59.804	0.000
						C	25.874	32.858		43.36	0.000	0.000
T9 80.00-60.00	70.00	1.24	17	0.5000	466.008	A	32.185	33.512	25.465	38.76	57.880	0.000
						B	29.398	39.481		36.97	59.804	0.000
						C	32.185	33.512		38.76	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T10 60.00-40.00	50.00	1.126	16	0.5000	512.263	A	34.596	40.794	32.145	42.64	57.880	0.000
						B	31.846	46.773		40.89	59.804	0.000
						C	34.596	40.794		42.64	0.000	0.000
T11 40.00-20.00	30.00	1	14	0.5000	555.206	A	0.000	73.542	32.145	43.71	57.880	0.000
						B	0.000	73.333		43.83	59.804	0.000
						C	0.000	66.191		48.56	0.000	0.000
T12 20.00-0.00	10.00	1	14	0.5000	598.149	A	0.000	79.622	32.145	40.37	28.940	0.000
						B	0.000	77.422		41.52	29.902	0.000
						C	0.000	71.912		44.70	0.000	0.000

Tower Pressure - Service

$G_H = 1.102$

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 240.00-220.00	230.00	1.741	16	136.052	A	11.841	9.583	9.583	44.73	15.704	0.000
					B	10.358	13.583		40.03	36.042	0.000
					C	11.841	9.583		44.73	0.000	0.000
T2 220.00-200.00	210.00	1.697	16	158.555	A	11.270	11.689	11.689	50.91	37.880	0.000
					B	9.604	16.689		44.46	47.464	0.000
					C	11.270	11.689		50.91	0.000	0.000
T3 200.00-180.00	190.00	1.649	15	202.326	A	14.263	13.359	13.359	48.36	37.880	0.000
					B	12.377	18.359		43.46	51.804	0.000
					C	14.263	13.359		48.36	0.000	0.000
T4 180.00-160.00	170.00	1.597	15	246.103	A	16.518	15.029	15.029	47.64	37.880	0.000
					B	14.733	20.029		43.23	51.804	0.000
					C	16.518	15.029		47.64	0.000	0.000
T5 160.00-140.00	150.00	1.541	14	290.795	A	18.802	18.579	18.579	49.70	37.880	0.000
					B	17.077	23.579		45.70	51.804	0.000
					C	18.802	18.579		49.70	0.000	0.000
T6 140.00-120.00	130.00	1.48	14	333.738	A	18.475	18.579	18.579	50.14	37.880	0.000
					B	17.011	23.579		45.77	51.804	0.000
					C	18.475	18.579		50.14	0.000	0.000
T7 120.00-100.00	110.00	1.411	13	378.454	A	23.627	22.126	22.126	48.36	37.880	0.000
					B	21.972	27.126		45.06	51.804	0.000
					C	23.627	22.126		48.36	0.000	0.000
T8 100.00-80.00	90.00	1.332	12	421.396	A	25.874	22.126	22.126	46.10	37.880	0.000
					B	24.256	27.126		43.06	51.804	0.000
					C	25.874	22.126		46.10	0.000	0.000
T9 80.00-60.00	70.00	1.24	11	464.339	A	32.185	22.126	22.126	40.74	37.880	0.000
					B	30.368	27.126		38.48	51.804	0.000
					C	32.185	22.126		40.74	0.000	0.000
T10 60.00-40.00	50.00	1.126	10	510.594	A	34.596	28.805	28.805	45.43	37.880	0.000
					B	32.803	33.805		43.25	51.804	0.000
					C	34.596	28.805		45.43	0.000	0.000
T11 40.00-20.00	30.00	1	9	553.537	A	0.000	58.255	28.805	49.45	37.880	0.000
					B	0.000	59.352		48.53	51.804	0.000
					C	0.000	53.439		53.90	0.000	0.000
T12 20.00-0.00	10.00	1	9	596.480	A	0.000	63.717	28.805	45.21	18.940	0.000
					B	0.000	62.883		45.81	25.902	0.000
					C	0.000	58.666		49.10	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	280.55	897.52	A	0.157	2.744	0.583	1	1	17.425	3577.62	178.88	B
240.00-220.00			B	0.176	2.678	0.586	1	1	18.315			
			C	0.157	2.744	0.583	1	1	17.425			
T2	435.32	1142.02	A	0.145	2.791	0.581	1	1	18.058	4767.63	238.38	B
220.00-200.00			B	0.166	2.714	0.584	1	1	19.350			
			C	0.145	2.791	0.581	1	1	18.058			
T3	453.80	1405.10	A	0.137	2.822	0.58	1	1	22.004	5156.26	257.81	B
200.00-180.00			B	0.152	2.764	0.582	1	1	23.058			
			C	0.137	2.822	0.58	1	1	22.004			
T4	453.80	1896.02	A	0.128	2.853	0.578	1	1	25.210	5325.44	266.27	B
180.00-160.00			B	0.141	2.804	0.58	1	1	26.353			
			C	0.128	2.853	0.578	1	1	25.210			
T5	453.80	3393.80	A	0.129	2.852	0.578	1	1	29.549	5531.08	276.55	B
160.00-140.00			B	0.14	2.809	0.58	1	1	30.752			
			C	0.129	2.852	0.578	1	1	29.549			
T6	453.80	2888.83	A	0.111	2.92	0.576	1	1	29.181	5363.04	268.15	B
140.00-120.00			B	0.122	2.879	0.578	1	1	30.629			
			C	0.111	2.92	0.576	1	1	29.181			
T7	453.80	3160.16	A	0.121	2.881	0.577	1	1	36.404	5661.71	283.09	B
120.00-100.00			B	0.13	2.847	0.579	1	1	37.666			
			C	0.121	2.881	0.577	1	1	36.404			
T8	453.80	4027.29	A	0.114	2.909	0.577	1	1	38.632	5553.22	277.66	B
100.00-80.00			B	0.122	2.877	0.578	1	1	39.924			
			C	0.114	2.909	0.577	1	1	38.632			
T9	453.80	4143.98	A	0.117	2.897	0.577	1	1	44.951	5604.78	280.24	B
80.00-60.00			B	0.124	2.87	0.578	1	1	46.042			
			C	0.117	2.897	0.577	1	1	44.951			
T10	453.80	5108.73	A	0.124	2.869	0.578	1	1	51.241	5477.01	273.85	B
60.00-40.00			B	0.13	2.845	0.579	1	1	52.365			
			C	0.124	2.869	0.578	1	1	51.241			
T11	453.80	5197.95	A	0.105	2.943	0.576	1	1	33.535	3872.45	193.62	B
40.00-20.00			B	0.107	2.935	0.576	1	1	34.179			
			C	0.097	2.978	0.575	1	1	30.714			
T12	226.90	5267.26	A	0.107	2.937	0.576	1	1	36.690	3109.92	155.50	A
20.00-0.00			B	0.105	2.942	0.576	1	1	36.200			
			C	0.098	2.971	0.575	1	1	33.729			
Sum Weight:	5026.97	38528.67						OTM	7171959.7 5 lb-ft	59000.14		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	280.55	897.52	A	0.157	2.744	0.583	0.8	1	15.057	3380.70	169.03	B
240.00-220.00			B	0.176	2.678	0.586	0.8	1	16.243			
			C	0.157	2.744	0.583	0.8	1	15.057			
T2	435.32	1142.02	A	0.145	2.791	0.581	0.8	1	15.804	4587.35	229.37	B
220.00-200.00			B	0.166	2.714	0.584	0.8	1	17.430			
			C	0.145	2.791	0.581	0.8	1	15.804			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T3	453.80	1405.10	A	0.137	2.822	0.58	0.8	1	19.152	4926.28	246.31	B
200.00-180.00			B	0.152	2.764	0.582	0.8	1	20.582			
			C	0.137	2.822	0.58	0.8	1	19.152			
T4	453.80	1896.02	A	0.128	2.853	0.578	0.8	1	21.907	5056.46	252.82	B
180.00-160.00			B	0.141	2.804	0.58	0.8	1	23.406			
			C	0.128	2.853	0.578	0.8	1	21.907			
T5	453.80	3393.80	A	0.129	2.852	0.578	0.8	1	25.788	5229.66	261.48	B
160.00-140.00			B	0.14	2.809	0.58	0.8	1	27.337			
			C	0.129	2.852	0.578	0.8	1	25.788			
T6	453.80	2888.83	A	0.111	2.92	0.576	0.8	1	25.486	5067.72	253.39	B
140.00-120.00			B	0.122	2.879	0.578	0.8	1	27.227			
			C	0.111	2.92	0.576	0.8	1	25.486			
T7	453.80	3160.16	A	0.121	2.881	0.577	0.8	1	31.678	5301.98	265.10	B
120.00-100.00			B	0.13	2.847	0.579	0.8	1	33.272			
			C	0.121	2.881	0.577	0.8	1	31.678			
T8	453.80	4027.29	A	0.114	2.909	0.577	0.8	1	33.457	5174.27	258.71	B
100.00-80.00			B	0.122	2.877	0.578	0.8	1	35.072			
			C	0.114	2.909	0.577	0.8	1	33.457			
T9	453.80	4143.98	A	0.117	2.897	0.577	0.8	1	38.514	5164.33	258.22	B
80.00-60.00			B	0.124	2.87	0.578	0.8	1	39.968			
			C	0.117	2.897	0.577	0.8	1	38.514			
T10	453.80	5108.73	A	0.124	2.869	0.578	0.8	1	44.322	5048.69	252.43	B
60.00-40.00			B	0.13	2.845	0.579	0.8	1	45.805			
			C	0.124	2.869	0.578	0.8	1	44.322			
T11	453.80	5197.95	A	0.105	2.943	0.576	0.8	1	33.535	3872.45	193.62	B
40.00-20.00			B	0.107	2.935	0.576	0.8	1	34.179			
			C	0.097	2.978	0.575	0.8	1	30.714			
T12	226.90	5267.26	A	0.107	2.937	0.576	0.8	1	36.690	3109.92	155.50	A
20.00-0.00			B	0.105	2.942	0.576	0.8	1	36.200			
			C	0.098	2.971	0.575	0.8	1	33.729			
Sum Weight:	5026.97	38528.67						OTM	6789860.6 6 lb-ft	55919.81		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	280.55	897.52	A	0.157	2.744	0.583	0.85	1	15.649	3429.93	171.50	B
240.00-220.00			B	0.176	2.678	0.586	0.85	1	16.761			
			C	0.157	2.744	0.583	0.85	1	15.649			
T2	435.32	1142.02	A	0.145	2.791	0.581	0.85	1	16.367	4632.42	231.62	B
220.00-200.00			B	0.166	2.714	0.584	0.85	1	17.910			
			C	0.145	2.791	0.581	0.85	1	16.367			
T3	453.80	1405.10	A	0.137	2.822	0.58	0.85	1	19.865	4983.77	249.19	B
200.00-180.00			B	0.152	2.764	0.582	0.85	1	21.201			
			C	0.137	2.822	0.58	0.85	1	19.865			
T4	453.80	1896.02	A	0.128	2.853	0.578	0.85	1	22.733	5123.71	256.19	B
180.00-160.00			B	0.141	2.804	0.58	0.85	1	24.143			
			C	0.128	2.853	0.578	0.85	1	22.733			
T5	453.80	3393.80	A	0.129	2.852	0.578	0.85	1	26.728	5305.02	265.25	B
160.00-140.00			B	0.14	2.809	0.58	0.85	1	28.191			
			C	0.129	2.852	0.578	0.85	1	26.728			
T6	453.80	2888.83	A	0.111	2.92	0.576	0.85	1	26.410	5141.55	257.08	B
140.00-120.00			B	0.122	2.879	0.578	0.85	1	28.077			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.111	2.92	0.576	0.85	1	26.410			
T7	453.80	3160.16	A	0.121	2.881	0.577	0.85	1	32.860	5391.91	269.60	B
120.00-100.00			B	0.13	2.847	0.579	0.85	1	34.370			
			C	0.121	2.881	0.577	0.85	1	32.860			
T8	453.80	4027.29	A	0.114	2.909	0.577	0.85	1	34.751	5269.01	263.45	B
100.00-80.00			B	0.122	2.877	0.578	0.85	1	36.285			
			C	0.114	2.909	0.577	0.85	1	34.751			
T9	453.80	4143.98	A	0.117	2.897	0.577	0.85	1	40.123	5274.44	263.72	B
80.00-60.00			B	0.124	2.87	0.578	0.85	1	41.487			
			C	0.117	2.897	0.577	0.85	1	40.123			
T10	453.80	5108.73	A	0.124	2.869	0.578	0.85	1	46.052	5155.77	257.79	B
60.00-40.00			B	0.13	2.845	0.579	0.85	1	47.445			
			C	0.124	2.869	0.578	0.85	1	46.052			
T11	453.80	5197.95	A	0.105	2.943	0.576	0.85	1	33.535	3872.45	193.62	B
40.00-20.00			B	0.107	2.935	0.576	0.85	1	34.179			
			C	0.097	2.978	0.575	0.85	1	30.714			
T12	226.90	5267.26	A	0.107	2.937	0.576	0.85	1	36.690	3109.92	155.50	A
20.00-0.00			B	0.105	2.942	0.576	0.85	1	36.200			
			C	0.098	2.971	0.575	0.85	1	33.729			
Sum Weight:	5026.97	38528.67						OTM	6885385.43 lb-ft	56689.89		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	734.65	1460.78	A	0.228	2.504	0.597	1	1	23.539	3247.31	162.37	C
240.00-220.00			B	0.242	2.463	0.6	1	1	23.812			
			C	0.228	2.504	0.597	1	1	23.539			
T2	1162.98	1708.23	A	0.204	2.583	0.591	1	1	23.918	4479.45	223.97	B
220.00-200.00			B	0.221	2.528	0.595	1	1	24.590			
			C	0.204	2.583	0.591	1	1	23.918			
T3	1216.53	2065.00	A	0.18	2.665	0.586	1	1	27.402	4807.02	240.35	C
200.00-180.00			B	0.193	2.621	0.589	1	1	27.808			
			C	0.18	2.665	0.586	1	1	27.402			
T4	1216.53	2650.91	A	0.167	2.708	0.584	1	1	31.111	4937.93	246.90	B
180.00-160.00			B	0.179	2.668	0.586	1	1	31.690			
			C	0.167	2.708	0.584	1	1	31.111			
T5	1216.53	4267.73	A	0.165	2.717	0.584	1	1	35.991	5089.78	254.49	B
160.00-140.00			B	0.175	2.681	0.586	1	1	36.682			
			C	0.165	2.717	0.584	1	1	35.991			
T6	1216.53	3731.12	A	0.139	2.813	0.58	1	1	34.754	4918.43	245.92	B
140.00-120.00			B	0.15	2.772	0.581	1	1	35.995			
			C	0.139	2.813	0.58	1	1	34.754			
T7	1216.53	4199.52	A	0.147	2.783	0.581	1	1	42.345	5105.54	255.28	B
120.00-100.00			B	0.156	2.75	0.582	1	1	43.310			
			C	0.147	2.783	0.581	1	1	42.345			
T8	1216.53	5137.87	A	0.139	2.813	0.58	1	1	44.926	4998.86	249.94	B
100.00-80.00			B	0.147	2.782	0.581	1	1	45.945			
			C	0.139	2.813	0.58	1	1	44.926			
T9	1216.53	5442.66	A	0.141	2.805	0.58	1	1	51.626	4986.98	249.35	B
80.00-60.00			B	0.148	2.78	0.581	1	1	52.342			
			C	0.141	2.805	0.58	1	1	51.626			
T10	1216.53	6563.82	A	0.147	2.782	0.581	1	1	58.299	4830.50	241.53	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
60.00-40.00			B	0.153	2.759	0.582	1	1	59.068			
			C	0.147	2.782	0.581	1	1	58.299			
T11	1216.53	6347.89	A	0.132	2.837	0.579	1	1	42.577	3645.31	182.27	A
40.00-20.00			B	0.132	2.839	0.579	1	1	42.453			
			C	0.119	2.888	0.577	1	1	38.208			
T12	608.26	6564.97	A	0.133	2.835	0.579	1	1	46.104	2897.09	144.85	A
20.00-0.00			B	0.129	2.849	0.579	1	1	44.792			
			C	0.12	2.884	0.577	1	1	41.520			
Sum Weight:	13454.63	50140.50						OTM	6583661.2 7 lb-ft	53944.21		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	734.65	1460.78	A	0.228	2.504	0.597	0.8	1	21.171	3113.26	155.66	B
240.00-220.00			B	0.242	2.463	0.6	0.8	1	21.890			
			C	0.228	2.504	0.597	0.8	1	21.171			
T2	1162.98	1708.23	A	0.204	2.583	0.591	0.8	1	21.664	4364.78	218.24	B
220.00-200.00			B	0.221	2.528	0.595	0.8	1	22.842			
			C	0.204	2.583	0.591	0.8	1	21.664			
T3	1216.53	2065.00	A	0.18	2.665	0.586	0.8	1	24.550	4653.19	232.66	B
200.00-180.00			B	0.193	2.621	0.589	0.8	1	25.534			
			C	0.18	2.665	0.586	0.8	1	24.550			
T4	1216.53	2650.91	A	0.167	2.708	0.584	0.8	1	27.808	4758.40	237.92	B
180.00-160.00			B	0.179	2.668	0.586	0.8	1	28.934			
			C	0.167	2.708	0.584	0.8	1	27.808			
T5	1216.53	4267.73	A	0.165	2.717	0.584	0.8	1	32.231	4885.66	244.28	B
160.00-140.00			B	0.175	2.681	0.586	0.8	1	33.450			
			C	0.165	2.717	0.584	0.8	1	32.231			
T6	1216.53	3731.12	A	0.139	2.813	0.58	0.8	1	31.059	4714.91	235.75	B
140.00-120.00			B	0.15	2.772	0.581	0.8	1	32.749			
			C	0.139	2.813	0.58	0.8	1	31.059			
T7	1216.53	4199.52	A	0.147	2.783	0.581	0.8	1	37.619	4855.45	242.77	B
120.00-100.00			B	0.156	2.75	0.582	0.8	1	39.092			
			C	0.147	2.783	0.581	0.8	1	37.619			
T8	1216.53	5137.87	A	0.139	2.813	0.58	0.8	1	39.751	4733.83	236.69	B
100.00-80.00			B	0.147	2.782	0.581	0.8	1	41.267			
			C	0.139	2.813	0.58	0.8	1	39.751			
T9	1216.53	5442.66	A	0.141	2.805	0.58	0.8	1	45.189	4677.29	233.86	B
80.00-60.00			B	0.148	2.78	0.581	0.8	1	46.462			
			C	0.141	2.805	0.58	0.8	1	45.189			
T10	1216.53	6563.82	A	0.147	2.782	0.581	0.8	1	51.380	4528.06	226.40	B
60.00-40.00			B	0.153	2.759	0.582	0.8	1	52.699			
			C	0.147	2.782	0.581	0.8	1	51.380			
T11	1216.53	6347.89	A	0.132	2.837	0.579	0.8	1	42.577	3645.31	182.27	A
40.00-20.00			B	0.132	2.839	0.579	0.8	1	42.453			
			C	0.119	2.888	0.577	0.8	1	38.208			
T12	608.26	6564.97	A	0.133	2.835	0.579	0.8	1	46.104	2897.09	144.85	A
20.00-0.00			B	0.129	2.849	0.579	0.8	1	44.792			
			C	0.12	2.884	0.577	0.8	1	41.520			
Sum Weight:	13454.63	50140.50						OTM	6323763.7 7 lb-ft	51827.25		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	734.65	1460.78	A	0.228	2.504	0.597	0.85	1	21.763	3144.76	157.24	B
240.00-220.00			B	0.242	2.463	0.6	0.85	1	22.371			
			C	0.228	2.504	0.597	0.85	1	21.763			
T2	1162.98	1708.23	A	0.204	2.583	0.591	0.85	1	22.227	4393.45	219.67	B
220.00-200.00			B	0.221	2.528	0.595	0.85	1	23.279			
			C	0.204	2.583	0.591	0.85	1	22.227			
T3	1216.53	2065.00	A	0.18	2.665	0.586	0.85	1	25.263	4690.75	234.54	B
200.00-180.00			B	0.193	2.621	0.589	0.85	1	26.103			
			C	0.18	2.665	0.586	0.85	1	25.263			
T4	1216.53	2650.91	A	0.167	2.708	0.584	0.85	1	28.634	4803.28	240.16	B
180.00-160.00			B	0.179	2.668	0.586	0.85	1	29.623			
			C	0.167	2.708	0.584	0.85	1	28.634			
T5	1216.53	4267.73	A	0.165	2.717	0.584	0.85	1	33.171	4936.69	246.83	B
160.00-140.00			B	0.175	2.681	0.586	0.85	1	34.258			
			C	0.165	2.717	0.584	0.85	1	33.171			
T6	1216.53	3731.12	A	0.139	2.813	0.58	0.85	1	31.983	4765.79	238.29	B
140.00-120.00			B	0.15	2.772	0.581	0.85	1	33.561			
			C	0.139	2.813	0.58	0.85	1	31.983			
T7	1216.53	4199.52	A	0.147	2.783	0.581	0.85	1	38.801	4917.97	245.90	B
120.00-100.00			B	0.156	2.75	0.582	0.85	1	40.147			
			C	0.147	2.783	0.581	0.85	1	38.801			
T8	1216.53	5137.87	A	0.139	2.813	0.58	0.85	1	41.045	4800.09	240.00	B
100.00-80.00			B	0.147	2.782	0.581	0.85	1	42.436			
			C	0.139	2.813	0.58	0.85	1	41.045			
T9	1216.53	5442.66	A	0.141	2.805	0.58	0.85	1	46.799	4754.71	237.74	B
80.00-60.00			B	0.148	2.78	0.581	0.85	1	47.932			
			C	0.141	2.805	0.58	0.85	1	46.799			
T10	1216.53	6563.82	A	0.147	2.782	0.581	0.85	1	53.109	4603.67	230.18	B
60.00-40.00			B	0.153	2.759	0.582	0.85	1	54.291			
			C	0.147	2.782	0.581	0.85	1	53.109			
T11	1216.53	6347.89	A	0.132	2.837	0.579	0.85	1	42.577	3645.31	182.27	A
40.00-20.00			B	0.132	2.839	0.579	0.85	1	42.453			
			C	0.119	2.888	0.577	0.85	1	38.208			
T12	608.26	6564.97	A	0.133	2.835	0.579	0.85	1	46.104	2897.09	144.85	A
20.00-0.00			B	0.129	2.849	0.579	0.85	1	44.792			
			C	0.12	2.884	0.577	0.85	1	41.520			
Sum Weight:	13454.63	50140.50						OTM	6388103.1 1 lb-ft	52353.57		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	280.55	897.52	A	0.157	2.744	0.583	1	1	17.425	1782.62	89.13	B
240.00-220.00			B	0.176	2.678	0.586	1	1	18.315			
			C	0.157	2.744	0.583	1	1	17.425			
T2	435.32	1142.02	A	0.145	2.791	0.581	1	1	18.058	2375.56	118.78	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
220.00-200.00			B	0.166	2.714	0.584	1	1	19.350			
			C	0.145	2.791	0.581	1	1	18.058			
T3	453.80	1405.10	A	0.137	2.822	0.58	1	1	22.004	2569.21	128.46	B
200.00-180.00			B	0.152	2.764	0.582	1	1	23.058			
			C	0.137	2.822	0.58	1	1	22.004			
T4	453.80	1896.02	A	0.128	2.853	0.578	1	1	25.210	2653.51	132.68	B
180.00-160.00			B	0.141	2.804	0.58	1	1	26.353			
			C	0.128	2.853	0.578	1	1	25.210			
T5	453.80	3393.80	A	0.129	2.852	0.578	1	1	29.549	2755.97	137.80	B
160.00-140.00			B	0.14	2.809	0.58	1	1	30.752			
			C	0.129	2.852	0.578	1	1	29.549			
T6	453.80	2888.83	A	0.111	2.92	0.576	1	1	29.181	2672.24	133.61	B
140.00-120.00			B	0.122	2.879	0.578	1	1	30.629			
			C	0.111	2.92	0.576	1	1	29.181			
T7	453.80	3160.16	A	0.121	2.881	0.577	1	1	36.404	2821.06	141.05	B
120.00-100.00			B	0.13	2.847	0.579	1	1	37.666			
			C	0.121	2.881	0.577	1	1	36.404			
T8	453.80	4027.29	A	0.114	2.909	0.577	1	1	38.632	2767.00	138.35	B
100.00-80.00			B	0.122	2.877	0.578	1	1	39.924			
			C	0.114	2.909	0.577	1	1	38.632			
T9	453.80	4143.98	A	0.117	2.897	0.577	1	1	44.951	2792.69	139.63	B
80.00-60.00			B	0.124	2.87	0.578	1	1	46.042			
			C	0.117	2.897	0.577	1	1	44.951			
T10	453.80	5108.73	A	0.124	2.869	0.578	1	1	51.241	2729.03	136.45	B
60.00-40.00			B	0.13	2.845	0.579	1	1	52.365			
			C	0.124	2.869	0.578	1	1	51.241			
T11	453.80	5197.95	A	0.105	2.943	0.576	1	1	33.535	1929.52	96.48	B
40.00-20.00			B	0.107	2.935	0.576	1	1	34.179			
			C	0.097	2.978	0.575	1	1	30.714			
T12	226.90	5267.26	A	0.107	2.937	0.576	1	1	36.690	1549.58	77.48	A
20.00-0.00			B	0.105	2.942	0.576	1	1	36.200			
			C	0.098	2.971	0.575	1	1	33.729			
Sum Weight:	5026.97	38528.67						OTM	3573571.6 4 lb-ft	29397.99		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	280.55	897.52	A	0.157	2.744	0.583	0.8	1	15.057	1684.50	84.23	B
240.00-220.00			B	0.176	2.678	0.586	0.8	1	16.243			
			C	0.157	2.744	0.583	0.8	1	15.057			
T2	435.32	1142.02	A	0.145	2.791	0.581	0.8	1	15.804	2285.74	114.29	B
220.00-200.00			B	0.166	2.714	0.584	0.8	1	17.430			
			C	0.145	2.791	0.581	0.8	1	15.804			
T3	453.80	1405.10	A	0.137	2.822	0.58	0.8	1	19.152	2454.62	122.73	B
200.00-180.00			B	0.152	2.764	0.582	0.8	1	20.582			
			C	0.137	2.822	0.58	0.8	1	19.152			
T4	453.80	1896.02	A	0.128	2.853	0.578	0.8	1	21.907	2519.48	125.97	B
180.00-160.00			B	0.141	2.804	0.58	0.8	1	23.406			
			C	0.128	2.853	0.578	0.8	1	21.907			
T5	453.80	3393.80	A	0.129	2.852	0.578	0.8	1	25.788	2605.78	130.29	B
160.00-140.00			B	0.14	2.809	0.58	0.8	1	27.337			
			C	0.129	2.852	0.578	0.8	1	25.788			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	453.80	2888.83	A	0.111	2.92	0.576	0.8	1	25.486	2525.09	126.25	B
140.00-120.00			B	0.122	2.879	0.578	0.8	1	27.227			
			C	0.111	2.92	0.576	0.8	1	25.486			
T7	453.80	3160.16	A	0.121	2.881	0.577	0.8	1	31.678	2641.82	132.09	B
120.00-100.00			B	0.13	2.847	0.579	0.8	1	33.272			
			C	0.121	2.881	0.577	0.8	1	31.678			
T8	453.80	4027.29	A	0.114	2.909	0.577	0.8	1	33.457	2578.18	128.91	B
100.00-80.00			B	0.122	2.877	0.578	0.8	1	35.072			
			C	0.114	2.909	0.577	0.8	1	33.457			
T9	453.80	4143.98	A	0.117	2.897	0.577	0.8	1	38.514	2573.23	128.66	B
80.00-60.00			B	0.124	2.87	0.578	0.8	1	39.968			
			C	0.117	2.897	0.577	0.8	1	38.514			
T10	453.80	5108.73	A	0.124	2.869	0.578	0.8	1	44.322	2515.61	125.78	B
60.00-40.00			B	0.13	2.845	0.579	0.8	1	45.805			
			C	0.124	2.869	0.578	0.8	1	44.322			
T11	453.80	5197.95	A	0.105	2.943	0.576	0.8	1	33.535	1929.52	96.48	B
40.00-20.00			B	0.107	2.935	0.576	0.8	1	34.179			
			C	0.097	2.978	0.575	0.8	1	30.714			
T12	226.90	5267.26	A	0.107	2.937	0.576	0.8	1	36.690	1549.58	77.48	A
20.00-0.00			B	0.105	2.942	0.576	0.8	1	36.200			
			C	0.098	2.971	0.575	0.8	1	33.729			
Sum Weight:	5026.97	38528.67						OTM	3383183.1 7 lb-ft	27863.16		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	280.55	897.52	A	0.157	2.744	0.583	0.85	1	15.649	1709.03	85.45	B
240.00-220.00			B	0.176	2.678	0.586	0.85	1	16.761			
			C	0.157	2.744	0.583	0.85	1	15.649			
T2	435.32	1142.02	A	0.145	2.791	0.581	0.85	1	16.367	2308.19	115.41	B
220.00-200.00			B	0.166	2.714	0.584	0.85	1	17.910			
			C	0.145	2.791	0.581	0.85	1	16.367			
T3	453.80	1405.10	A	0.137	2.822	0.58	0.85	1	19.865	2483.26	124.16	B
200.00-180.00			B	0.152	2.764	0.582	0.85	1	21.201			
			C	0.137	2.822	0.58	0.85	1	19.865			
T4	453.80	1896.02	A	0.128	2.853	0.578	0.85	1	22.733	2552.99	127.65	B
180.00-160.00			B	0.141	2.804	0.58	0.85	1	24.143			
			C	0.128	2.853	0.578	0.85	1	22.733			
T5	453.80	3393.80	A	0.129	2.852	0.578	0.85	1	26.728	2643.33	132.17	B
160.00-140.00			B	0.14	2.809	0.58	0.85	1	28.191			
			C	0.129	2.852	0.578	0.85	1	26.728			
T6	453.80	2888.83	A	0.111	2.92	0.576	0.85	1	26.410	2561.88	128.09	B
140.00-120.00			B	0.122	2.879	0.578	0.85	1	28.077			
			C	0.111	2.92	0.576	0.85	1	26.410			
T7	453.80	3160.16	A	0.121	2.881	0.577	0.85	1	32.860	2686.63	134.33	B
120.00-100.00			B	0.13	2.847	0.579	0.85	1	34.370			
			C	0.121	2.881	0.577	0.85	1	32.860			
T8	453.80	4027.29	A	0.114	2.909	0.577	0.85	1	34.751	2625.39	131.27	B
100.00-80.00			B	0.122	2.877	0.578	0.85	1	36.285			
			C	0.114	2.909	0.577	0.85	1	34.751			
T9	453.80	4143.98	A	0.117	2.897	0.577	0.85	1	40.123	2628.10	131.40	B
80.00-60.00			B	0.124	2.87	0.578	0.85	1	41.487			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.117	2.897	0.577	0.85	1	40.123			
T10	453.80	5108.73	A	0.124	2.869	0.578	0.85	1	46.052	2568.97	128.45	B
60.00-40.00			B	0.13	2.845	0.579	0.85	1	47.445			
			C	0.124	2.869	0.578	0.85	1	46.052			
T11	453.80	5197.95	A	0.105	2.943	0.576	0.85	1	33.535	1929.52	96.48	B
40.00-20.00			B	0.107	2.935	0.576	0.85	1	34.179			
			C	0.097	2.978	0.575	0.85	1	30.714			
T12	226.90	5267.26	A	0.107	2.937	0.576	0.85	1	36.690	1549.58	77.48	A
20.00-0.00			B	0.105	2.942	0.576	0.85	1	36.200			
			C	0.098	2.971	0.575	0.85	1	33.729			
Sum Weight:	5026.97	38528.67						OTM	3430780.2 8 lb-ft	28246.87		

Discrete Appurtenance Pressures - No Ice $G_H = 1.102$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
P-65-16-XLH-RR	0.0000	60.00	0.00	-7.79	236.00	1.754	32	8.40	5.46
P-65-16-XLH-RR	120.0000	60.00	6.75	3.89	236.00	1.754	32	8.40	5.46
P-65-16-XLH-RR	240.0000	60.00	-6.75	3.89	236.00	1.754	32	8.40	5.46
RRU	0.0000	88.00	0.00	0.00	238.00	1.759	33	0.00	1.95
RRU	0.0000	88.00	0.00	0.00	238.00	1.759	33	0.00	1.95
RRU	0.0000	88.00	0.00	0.00	238.00	1.759	33	0.00	1.95
Surge Arrestor	0.0000	16.00	0.00	0.00	235.00	1.752	32	1.08	0.66
PiROD 12' Lightweight T-Frame	0.0000	253.00	0.00	0.00	236.00	1.754	32	10.20	10.20
PiROD 12' Lightweight T-Frame	0.0000	253.00	0.00	0.00	236.00	1.754	32	10.20	10.20
PiROD 12' Lightweight T-Frame	0.0000	253.00	0.00	0.00	236.00	1.754	32	10.20	10.20
4' x 6" Panel w/ Mounting Pipe	0.0000	86.32	0.00	-7.79	236.00	1.754	32	5.73	6.12
4' x 6" Panel w/ Mounting Pipe	120.0000	86.32	6.75	3.89	236.00	1.754	32	5.73	6.12
4' x 6" Panel w/ Mounting Pipe	240.0000	86.32	-6.75	3.89	236.00	1.754	32	5.73	6.12
10' WHIP	0.0000	25.00	0.00	-6.79	245.00	1.773	33	3.00	3.00
10' WHIP	240.0000	25.00	-5.88	3.39	245.00	1.773	33	3.00	3.00
Comm Hill - 72" Yagi	120.0000	92.14	5.88	3.39	229.00	1.739	32	4.07	6.24
DB844H90E-XY w/Mount Pipe	0.0000	106.65	0.00	-7.79	226.00	1.733	32	10.74	16.19
DB844H90E-XY w/Mount Pipe	120.0000	106.65	6.75	3.89	226.00	1.733	32	10.74	16.19
DB844H90E-XY w/Mount Pipe	240.0000	106.65	-6.75	3.89	226.00	1.733	32	10.74	16.19
PiROD 10' Lightweight T-Frame	0.0000	251.00	0.00	0.00	226.00	1.733	32	9.30	9.30
PiROD 10' Lightweight T-Frame	0.0000	251.00	0.00	0.00	226.00	1.733	32	9.30	9.30
PiROD 10' Lightweight T-Frame	0.0000	251.00	0.00	0.00	226.00	1.733	32	9.30	9.30
10' WHIP	240.0000	25.00	-7.50	4.33	206.00	1.688	31	3.00	3.00
TT19-08BP111-001	0.0000	25.00	0.00	0.00	236.00	1.754	32	0.64	0.52
TT19-08BP111-001	0.0000	25.00	0.00	0.00	236.00	1.754	32	0.64	0.52
TT19-08BP111-001	0.0000	25.00	0.00	0.00	236.00	1.754	32	0.64	0.52

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
	Sum Weight:	2793.05							

Discrete Appurtenance Pressures - With Ice $G_H = 1.102$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
P-65-16-XLH-RR	0.0000	110.86	0.00	-7.79	236.00	1.754	24	8.95	5.91	0.5000
P-65-16-XLH-RR	120.0000	110.86	6.75	3.89	236.00	1.754	24	8.95	5.91	0.5000
P-65-16-XLH-RR	240.0000	110.86	-6.75	3.89	236.00	1.754	24	8.95	5.91	0.5000
RRU	0.0000	113.65	0.00	0.00	238.00	1.759	24	0.00	2.24	0.5000
RRU	0.0000	113.65	0.00	0.00	238.00	1.759	24	0.00	2.24	0.5000
RRU	0.0000	113.65	0.00	0.00	238.00	1.759	24	0.00	2.24	0.5000
Surge Arrestor	0.0000	24.84	0.00	0.00	235.00	1.752	24	1.23	0.77	0.5000
PiROD 12' Lightweight T-Frame	0.0000	355.00	0.00	0.00	236.00	1.754	24	16.20	16.20	0.5000
PiROD 12' Lightweight T-Frame	0.0000	355.00	0.00	0.00	236.00	1.754	24	16.20	16.20	0.5000
PiROD 12' Lightweight T-Frame	0.0000	355.00	0.00	0.00	236.00	1.754	24	16.20	16.20	0.5000
4' x 6" Panel w/ Mounting Pipe	0.0000	145.41	0.00	-7.79	236.00	1.754	24	6.35	7.22	0.5000
4' x 6" Panel w/ Mounting Pipe	120.0000	145.41	6.75	3.89	236.00	1.754	24	6.35	7.22	0.5000
4' x 6" Panel w/ Mounting Pipe	240.0000	145.41	-6.75	3.89	236.00	1.754	24	6.35	7.22	0.5000
10' WHIP	0.0000	46.79	0.00	-6.79	245.00	1.773	25	4.03	4.03	0.5000
10' WHIP	240.0000	46.79	-5.88	3.39	245.00	1.773	25	4.03	4.03	0.5000
Conn Hill - 72" Yagi	120.0000	137.53	5.88	3.39	229.00	1.739	24	10.14	13.44	0.5000
DB844H90E-XY w/Mount Pipe	0.0000	229.78	0.00	-7.79	226.00	1.733	24	12.60	19.47	0.5000
DB844H90E-XY w/Mount Pipe	120.0000	229.78	6.75	3.89	226.00	1.733	24	12.60	19.47	0.5000
DB844H90E-XY w/Mount Pipe	240.0000	229.78	-6.75	3.89	226.00	1.733	24	12.60	19.47	0.5000
PiROD 10' Lightweight T-Frame	0.0000	344.00	0.00	0.00	226.00	1.733	24	14.50	14.50	0.5000
PiROD 10' Lightweight T-Frame	0.0000	344.00	0.00	0.00	226.00	1.733	24	14.50	14.50	0.5000
PiROD 10' Lightweight T-Frame	0.0000	344.00	0.00	0.00	226.00	1.733	24	14.50	14.50	0.5000
10' WHIP	240.0000	46.79	-7.50	4.33	206.00	1.688	23	4.03	4.03	0.5000
TT19-08BP111-001	0.0000	30.80	0.00	0.00	236.00	1.754	24	0.76	0.62	0.5000
TT19-08BP111-001	0.0000	30.80	0.00	0.00	236.00	1.754	24	0.76	0.62	0.5000
TT19-08BP111-001	0.0000	30.80	0.00	0.00	236.00	1.754	24	0.76	0.62	0.5000
	Sum Weight:	4291.24								

Discrete Appurtenance Pressures - Service $G_H = 1.102$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
P-65-16-XLH-RR	0.0000	60.00	0.00	-7.79	236.00	1.754	16	8.40	5.46

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
P-65-16-XLH-RR	120.0000	60.00	6.75	3.89	236.00	1.754	16	8.40	5.46
P-65-16-XLH-RR	240.0000	60.00	-6.75	3.89	236.00	1.754	16	8.40	5.46
RRU	0.0000	88.00	0.00	0.00	238.00	1.759	16	0.00	1.95
RRU	0.0000	88.00	0.00	0.00	238.00	1.759	16	0.00	1.95
RRU	0.0000	88.00	0.00	0.00	238.00	1.759	16	0.00	1.95
Surge Arrestor	0.0000	16.00	0.00	0.00	235.00	1.752	16	1.08	0.66
PiROD 12' Lightweight T-Frame	0.0000	253.00	0.00	0.00	236.00	1.754	16	10.20	10.20
PiROD 12' Lightweight T-Frame	0.0000	253.00	0.00	0.00	236.00	1.754	16	10.20	10.20
PiROD 12' Lightweight T-Frame	0.0000	253.00	0.00	0.00	236.00	1.754	16	10.20	10.20
4' x 6" Panel w/ Mounting Pipe	0.0000	86.32	0.00	-7.79	236.00	1.754	16	5.73	6.12
4' x 6" Panel w/ Mounting Pipe	120.0000	86.32	6.75	3.89	236.00	1.754	16	5.73	6.12
4' x 6" Panel w/ Mounting Pipe	240.0000	86.32	-6.75	3.89	236.00	1.754	16	5.73	6.12
10' WHIP	0.0000	25.00	0.00	-6.79	245.00	1.773	16	3.00	3.00
10' WHIP	240.0000	25.00	-5.88	3.39	245.00	1.773	16	3.00	3.00
Conn Hill - 72" Yagi	120.0000	92.14	5.88	3.39	229.00	1.739	16	4.07	6.24
DB844H90E-XY w/Mount Pipe	0.0000	106.65	0.00	-7.79	226.00	1.733	16	10.74	16.19
DB844H90E-XY w/Mount Pipe	120.0000	106.65	6.75	3.89	226.00	1.733	16	10.74	16.19
DB844H90E-XY w/Mount Pipe	240.0000	106.65	-6.75	3.89	226.00	1.733	16	10.74	16.19
PiROD 10' Lightweight T-Frame	0.0000	251.00	0.00	0.00	226.00	1.733	16	9.30	9.30
PiROD 10' Lightweight T-Frame	0.0000	251.00	0.00	0.00	226.00	1.733	16	9.30	9.30
PiROD 10' Lightweight T-Frame	0.0000	251.00	0.00	0.00	226.00	1.733	16	9.30	9.30
10' WHIP	240.0000	25.00	-7.50	4.33	206.00	1.688	16	3.00	3.00
TT19-08BP111-001	0.0000	25.00	0.00	0.00	236.00	1.754	16	0.64	0.52
TT19-08BP111-001	0.0000	25.00	0.00	0.00	236.00	1.754	16	0.64	0.52
TT19-08BP111-001	0.0000	25.00	0.00	0.00	236.00	1.754	16	0.64	0.52
	Sum Weight:	2793.05							

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	16864.40					
Bracing Weight	21664.27					
Total Member Self-Weight	38528.67			-40847.38	87.80	
Total Weight	46348.69			-40847.38	87.80	
Wind 0 deg - No Ice		33.26	-64724.56	-8537476.81	-7528.36	-2800.88
Wind 30 deg - No Ice		31216.76	-54069.01	-7154771.76	-4107138.36	-43840.95
Wind 60 deg - No Ice		53368.84	-30850.92	-4104708.35	-7023493.54	-72228.04
Wind 90 deg - No Ice		62375.91	-33.26	-48463.55	-8201172.93	-83014.22
Wind 120 deg - No Ice		56003.22	32333.48	4200871.54	-7346784.89	-73474.46
Wind 150 deg - No Ice		31159.15	54035.75	7065460.83	-4093946.77	-39173.27
Wind 180 deg - No Ice		-33.26	61644.23	8073682.96	7703.96	2659.55
Wind 210 deg - No Ice		-31216.76	54069.01	7073077.00	4107313.95	43840.95

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 240 deg - No Ice		-56036.48	32391.08	4214063.13	7354576.65	76275.34
Wind 270 deg - No Ice		-62375.91	33.26	-33231.22	8201348.53	83014.22
Wind 300 deg - No Ice		-53335.58	-30793.31	-4091516.76	7016052.97	69568.49
Wind 330 deg - No Ice		-31159.15	-54035.75	-7147155.60	4094122.37	39173.27
Member Ice	11611.83					
Total Weight Ice	67886.37			-109834.24	1905.55	
Wind 0 deg - Ice		37.90	-59750.15	-8036260.22	-6772.45	-3793.01
Wind 30 deg - Ice		29090.70	-50386.57	-6809301.16	-3866033.48	-39926.03
Wind 60 deg - Ice		49892.86	-28849.42	-3950613.84	-6633163.88	-64806.38
Wind 90 deg - Ice		58115.76	-37.90	-118512.24	-7718941.78	-73514.66
Wind 120 deg - Ice		51688.31	29842.26	3845863.39	-6849563.72	-63774.68
Wind 150 deg - Ice		29025.06	50348.67	6580954.68	-3851002.75	-33588.63
Wind 180 deg - Ice		-37.90	57633.19	7556694.24	10583.54	3614.40
Wind 210 deg - Ice		-29090.70	50386.57	6589632.68	3869844.58	39926.03
Wind 240 deg - Ice		-51726.20	29907.89	3860894.12	6862052.81	67567.68
Wind 270 deg - Ice		-58115.76	37.90	-101156.24	7722752.87	73514.66
Wind 300 deg - Ice		-49854.97	-28783.78	-3935583.11	6628296.97	61191.98
Wind 330 deg - Ice		-29025.06	-50348.67	-6800623.16	3854813.84	33588.63
Total Weight	46348.69			-40847.38	87.80	
Wind 0 deg - Service		16.57	-32250.30	-4233278.56	-4002.24	-1395.60
Wind 30 deg - Service		15554.37	-26940.96	-3544318.25	-2046714.49	-21844.63
Wind 60 deg - Service		26592.08	-15372.08	-2024563.47	-3499846.48	-35989.06
Wind 90 deg - Service		31080.04	-16.57	-3458.80	-4086648.67	-41363.49
Wind 120 deg - Service		27904.72	16110.80	2113856.96	-3660932.83	-36610.11
Wind 150 deg - Service		15525.67	26924.39	3541195.57	-2040141.52	-19518.86
Wind 180 deg - Service		-16.57	30715.46	4043562.30	3587.57	1325.17
Wind 210 deg - Service		-15554.37	26940.96	3544990.47	2046299.81	21844.63
Wind 240 deg - Service		-27921.29	16139.50	2120429.93	3664313.06	38005.70
Wind 270 deg - Service		-31080.04	16.57	4131.01	4086234.00	41363.49
Wind 300 deg - Service		-26575.51	-15343.38	-2017990.50	3495636.90	34663.89
Wind 330 deg - Service		-15525.67	-26924.39	-3540523.35	2039726.85	19518.86

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	IBC .6 Dead+Wind 0 deg - No Ice
4	Dead+Wind 30 deg - No Ice
5	IBC .6 Dead+Wind 30 deg - No Ice
6	Dead+Wind 60 deg - No Ice
7	IBC .6 Dead+Wind 60 deg - No Ice
8	Dead+Wind 90 deg - No Ice
9	IBC .6 Dead+Wind 90 deg - No Ice
10	Dead+Wind 120 deg - No Ice
11	IBC .6 Dead+Wind 120 deg - No Ice
12	Dead+Wind 150 deg - No Ice
13	IBC .6 Dead+Wind 150 deg - No Ice
14	Dead+Wind 180 deg - No Ice
15	IBC .6 Dead+Wind 180 deg - No Ice
16	Dead+Wind 210 deg - No Ice
17	IBC .6 Dead+Wind 210 deg - No Ice
18	Dead+Wind 240 deg - No Ice
19	IBC .6 Dead+Wind 240 deg - No Ice
20	Dead+Wind 270 deg - No Ice

Comb. No.	Description
21	IBC .6 Dead+Wind 270 deg - No Ice
22	Dead+Wind 300 deg - No Ice
23	IBC .6 Dead+Wind 300 deg - No Ice
24	Dead+Wind 330 deg - No Ice
25	IBC .6 Dead+Wind 330 deg - No Ice
26	Dead+Ice+Temp
27	Dead+Wind 0 deg+Ice+Temp
28	IBC .6 Dead+Wind 0 deg+.6 Ice+Temp
29	Dead+Wind 30 deg+Ice+Temp
30	IBC .6 Dead+Wind 30 deg+.6 Ice+Temp
31	Dead+Wind 60 deg+Ice+Temp
32	IBC .6 Dead+Wind 60 deg+.6 Ice+Temp
33	Dead+Wind 90 deg+Ice+Temp
34	IBC .6 Dead+Wind 90 deg+.6 Ice+Temp
35	Dead+Wind 120 deg+Ice+Temp
36	IBC .6 Dead+Wind 120 deg+.6 Ice+Temp
37	Dead+Wind 150 deg+Ice+Temp
38	IBC .6 Dead+Wind 150 deg+.6 Ice+Temp
39	Dead+Wind 180 deg+Ice+Temp
40	IBC .6 Dead+Wind 180 deg+.6 Ice+Temp
41	Dead+Wind 210 deg+Ice+Temp
42	IBC .6 Dead+Wind 210 deg+.6 Ice+Temp
43	Dead+Wind 240 deg+Ice+Temp
44	IBC .6 Dead+Wind 240 deg+.6 Ice+Temp
45	Dead+Wind 270 deg+Ice+Temp
46	IBC .6 Dead+Wind 270 deg+.6 Ice+Temp
47	Dead+Wind 300 deg+Ice+Temp
48	IBC .6 Dead+Wind 300 deg+.6 Ice+Temp
49	Dead+Wind 330 deg+Ice+Temp
50	IBC .6 Dead+Wind 330 deg+.6 Ice+Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 60 deg - Service
54	Dead+Wind 90 deg - Service
55	Dead+Wind 120 deg - Service
56	Dead+Wind 150 deg - Service
57	Dead+Wind 180 deg - Service
58	Dead+Wind 210 deg - Service
59	Dead+Wind 240 deg - Service
60	Dead+Wind 270 deg - Service
61	Dead+Wind 300 deg - Service
62	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	240 - 220	Leg	Max Tension	7	17063.85	194.99	-83.83
			Max. Compression	27	-20088.09	6.65	197.21
			Max. Mx	45	-2187.33	-578.07	-9.90
			Max. My	39	-6044.26	-35.04	568.33
			Max. Vy	18	-4116.23	154.19	-127.41
			Max. Vx	2	-4823.58	2.80	197.78
		Diagonal	Max Tension	24	3671.08	0.00	0.00
			Max. Compression	12	-3709.19	0.00	0.00
			Max. Mx	27	3098.87	12.62	-0.20
			Max. My	4	-1692.55	2.76	3.21
			Max. Vy	27	-9.67	12.62	-0.20

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	4	-0.84	2.76	3.21
		Top Girt	Max Tension	7	338.10	0.00	0.00
			Max. Compression	27	-349.61	0.00	0.00
			Max. Mx	26	-10.49	-27.62	0.00
			Max. My	33	-10.93	0.00	0.00
			Max. Vy	26	16.83	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T2	220 - 200	Leg	Max Tension	7	42888.56	-257.76	40.24
			Max. Compression	27	-47539.71	257.78	-2.62
			Max. Mx	18	-19543.20	499.58	-43.04
			Max. My	20	-2034.40	0.01	-278.62
			Max. Vy	18	-4973.69	272.61	-41.99
			Max. Vx	20	2016.91	0.01	-278.62
		Diagonal	Max Tension	16	3943.54	0.00	0.00
			Max. Compression	16	-3957.21	0.00	0.00
			Max. Mx	31	2917.86	16.34	1.87
			Max. My	47	-3299.66	7.85	-3.43
			Max. Vy	31	11.68	16.34	1.87
			Max. Vx	47	1.04	0.00	0.00
		Top Girt	Max Tension	23	4.19	0.00	0.00
			Max. Compression	33	-29.29	0.00	0.00
			Max. Mx	26	-18.77	-27.68	0.00
			Max. My	33	-15.57	0.00	0.86
			Max. Vy	26	16.85	0.00	0.00
			Max. Vx	33	-0.52	0.00	0.00
T3	200 - 180	Leg	Max Tension	7	68546.22	120.87	19.38
			Max. Compression	27	-74795.03	358.71	2.94
			Max. Mx	18	-46598.14	687.60	-68.39
			Max. My	20	-2069.25	-0.57	-447.19
			Max. Vy	18	-6419.47	386.83	-58.05
			Max. Vx	20	2578.93	-13.22	-431.36
		Diagonal	Max Tension	16	5078.47	0.00	0.00
			Max. Compression	16	-5143.28	0.00	0.00
			Max. Mx	31	3570.54	41.99	4.68
			Max. My	33	-2597.24	22.85	7.51
			Max. Vy	31	21.27	41.99	4.68
			Max. Vx	33	-1.76	0.00	0.00
T4	180 - 160	Leg	Max Tension	7	94431.04	-75.61	34.99
			Max. Compression	2	-102998.03	757.03	3.65
			Max. Mx	19	-72927.17	923.43	-99.73
			Max. My	8	-3214.90	-10.25	647.00
			Max. Vy	18	-7940.50	760.41	-92.15
			Max. Vx	20	3137.61	19.07	-530.48
		Diagonal	Max Tension	16	5944.42	0.00	0.00
			Max. Compression	16	-6061.14	0.00	0.00
			Max. Mx	27	4475.49	58.72	4.30
			Max. My	31	-4725.91	22.60	10.12
			Max. Vy	31	28.64	57.51	7.32
			Max. Vx	31	-2.19	0.00	0.00
T5	160 - 140	Leg	Max Tension	7	120523.37	289.15	-4.83
			Max. Compression	2	-132446.15	397.72	2.28
			Max. Mx	18	-102071.17	1423.40	-147.64
			Max. My	20	-3833.50	23.52	-792.63
			Max. Vy	18	-9185.74	399.97	-56.54
			Max. Vx	20	4045.93	-19.65	-482.39
		Diagonal	Max Tension	16	7060.41	0.00	0.00
			Max. Compression	16	-7104.72	0.00	0.00
			Max. Mx	31	4410.35	103.93	12.03
			Max. My	31	-6061.27	64.11	17.72
			Max. Vy	31	50.42	103.93	12.03
			Max. Vx	33	-3.47	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T6	140 - 120	Leg	Max Tension	7	146873.43	-115.45	22.79
			Max. Compression	2	-161991.86	983.03	3.70
			Max. Mx	19	-129383.06	1167.89	-125.19
			Max. My	8	-6108.13	-24.47	1027.87
			Max. Vy	18	-10779.45	988.98	-100.08
			Max. Vx	20	4483.20	2.03	-633.83
		Diagonal	Max Tension	16	8395.91	0.00	0.00
			Max. Compression	16	-8569.24	0.00	0.00
			Max. Mx	27	6313.79	153.98	13.64
			Max. My	31	-6599.45	70.32	27.51
			Max. Vy	31	57.92	150.90	-16.29
			Max. Vx	31	-4.46	0.00	0.00
T7	120 - 100	Leg	Max Tension	7	173441.72	-53.49	47.33
			Max. Compression	2	-192012.45	1080.58	5.67
			Max. Mx	18	-160639.82	1889.99	-181.22
			Max. My	20	-7757.96	20.26	-1017.78
			Max. Vy	18	-12405.26	1085.62	-140.59
			Max. Vx	20	5030.03	20.26	-1017.78
		Diagonal	Max Tension	16	9265.01	0.00	0.00
			Max. Compression	16	-9488.45	0.00	0.00
			Max. Mx	31	5858.11	154.69	19.32
			Max. My	45	-4962.57	115.25	-26.40
			Max. Vy	31	57.21	154.69	19.32
			Max. Vx	45	3.98	0.00	0.00
T8	100 - 80	Leg	Max Tension	7	200081.07	166.63	-9.88
			Max. Compression	2	-222699.62	997.11	3.62
			Max. Mx	18	-190459.40	2120.15	-233.48
			Max. My	20	-7761.41	31.21	-1437.93
			Max. Vy	18	-14005.50	1000.52	-88.67
			Max. Vx	8	-5516.03	41.62	612.65
		Diagonal	Max Tension	16	10292.79	0.00	0.00
			Max. Compression	16	-10449.42	0.00	0.00
			Max. Mx	31	6375.79	234.83	28.74
			Max. My	33	-5323.28	165.09	34.77
			Max. Vy	31	82.05	234.83	28.74
			Max. Vx	45	5.16	0.00	0.00
T9	80 - 60	Leg	Max Tension	7	226701.72	-385.69	43.34
			Max. Compression	2	-253572.11	1766.46	5.96
			Max. Mx	18	-220945.86	2171.14	-192.57
			Max. My	8	-10530.77	-86.45	1262.88
			Max. Vy	18	-15790.70	1772.09	-159.94
			Max. Vx	8	-5840.35	66.58	698.86
		Diagonal	Max Tension	16	11114.14	0.00	0.00
			Max. Compression	16	-11380.26	0.00	0.00
			Max. Mx	27	8067.32	284.61	28.75
			Max. My	31	-9092.43	166.15	44.49
			Max. Vy	31	90.89	279.80	34.76
			Max. Vx	31	-5.89	0.00	0.00
T10	60 - 40	Leg	Max Tension	7	253188.06	2855.02	76.52
			Max. Compression	2	-284927.53	-2449.38	13.51
			Max. Mx	2	-284923.55	-3871.30	9.05
			Max. My	8	-13569.27	-338.50	3733.74
			Max. Vy	18	-17125.55	-2410.86	-186.10
			Max. Vx	20	6640.35	-331.94	-3732.89
		Diagonal	Max Tension	16	12171.85	0.00	0.00
			Max. Compression	16	-12420.54	0.00	0.00
			Max. Mx	27	8909.46	358.33	39.57
			Max. My	31	-9970.90	240.04	58.24
			Max. Vy	29	110.77	350.05	-39.11
			Max. Vx	31	-7.16	0.00	0.00
T11	40 - 20	Leg	Max Tension	7	278468.65	8214.65	262.62

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	2	-315072.34	-8891.70	23.81
			Max. Mx	2	-282432.33	10562.05	-15.72
			Max. My	8	-15560.86	-725.44	4422.09
			Max. Vy	18	-17109.50	-982.51	-308.54
			Max. Vx	21	7599.02	-424.20	-4412.09
		Diagonal	Max Tension	17	21560.99	-201.79	88.76
			Max. Compression	16	-21825.79	0.00	0.00
			Max. Mx	31	14181.38	-306.13	68.78
			Max. My	10	-21474.04	20.84	-103.34
			Max. Vy	31	80.64	-306.09	68.96
			Max. Vx	10	8.61	20.85	-103.34
		Horizontal	Max Tension	16	11711.10	0.00	0.00
			Max. Compression	17	-11985.15	-76.47	-0.08
			Max. Mx	31	-2786.28	-221.00	-14.55
			Max. My	18	1502.11	-71.99	16.79
			Max. Vy	31	67.95	-221.00	-14.55
			Max. Vx	18	-1.38	-71.99	16.79
		Redund Horz 1 Bracing	Max Tension	2	5465.07	0.00	0.00
			Max. Compression	2	-5465.07	0.00	0.00
			Max. Mx	26	314.54	21.93	0.00
			Max. My	45	4426.81	0.00	-0.00
			Max. Vy	26	13.55	0.00	0.00
			Max. Vx	45	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	4881.64	0.00	0.00
			Max. Compression	2	-4881.64	0.00	0.00
			Max. Mx	27	4728.43	46.73	0.00
			Max. My	49	4051.90	0.00	-0.14
			Max. Vy	27	-16.16	0.00	0.00
			Max. Vx	49	0.05	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	16	-58.28	0.00	0.00
			Max. Mx	26	-9.42	21.93	0.00
			Max. My	35	-13.10	0.00	0.00
			Max. Vy	26	13.55	0.00	0.00
			Max. Vx	35	0.00	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	41	59.91	0.00	0.00
			Max. Compression	35	-43.65	0.00	0.00
			Max. Mx	49	58.25	91.88	0.00
			Max. My	35	31.16	0.00	0.13
			Max. Vy	49	-24.16	0.00	0.00
			Max. Vx	35	-0.03	0.00	0.00
		Inner Bracing	Max Tension	5	7.68	0.00	0.00
			Max. Compression	43	-13.00	0.00	0.00
			Max. Mx	26	-7.45	164.67	0.00
			Max. My	27	-1.88	0.00	0.35
			Max. Vy	26	-50.88	0.00	0.00
			Max. Vx	27	-0.11	0.00	0.00
T12	20 - 0	Leg	Max Tension	7	278466.75	6932.52	376.18
			Max. Compression	2	-315074.65	-7518.37	28.55
			Max. Mx	2	-315070.41	-8891.75	23.82
			Max. My	8	-15565.12	-712.39	5056.61
			Max. Vy	18	-16567.81	-7402.88	-550.79
			Max. Vx	21	7601.25	-417.58	-5046.64
		Diagonal	Max Tension	17	20383.75	-118.86	96.04
			Max. Compression	16	-20797.47	0.00	0.00
			Max. Mx	31	13194.05	-211.59	56.13
			Max. My	4	-20582.29	-7.55	-105.78

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	31	54.84	-211.56	56.21
			Max. Vx	4	-8.49	0.00	0.00
		Horizontal	Max Tension	16	11852.84	0.00	0.00
			Max. Compression	19	-12178.21	-151.85	-12.78
			Max. Mx	31	-2793.46	-288.66	-22.50
			Max. My	18	2643.92	-121.47	26.04
			Max. Vy	31	90.87	-288.66	-22.50
			Max. Vx	18	-1.92	-121.47	26.04
		Redund Horz 1 Bracing	Max Tension	2	5465.09	0.00	0.00
			Max. Compression	2	-5465.09	0.00	0.00
			Max. Mx	45	448.89	25.72	0.00
			Max. My	33	-975.34	0.00	-0.00
			Max. Vy	45	-14.67	0.00	0.00
			Max. Vx	33	0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	4631.94	0.00	0.00
			Max. Compression	2	-4631.94	0.00	0.00
			Max. Mx	43	4394.62	52.22	0.00
			Max. My	31	1497.61	0.00	0.09
			Max. Vy	43	-17.58	0.00	0.00
			Max. Vx	31	-0.03	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	16	-54.64	0.00	0.00
			Max. Mx	26	-6.76	25.72	0.00
			Max. My	35	-5.56	0.00	0.00
			Max. Vy	26	-14.67	0.00	0.00
			Max. Vx	35	-0.00	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	16	76.37	0.00	0.00
			Max. Compression	35	-49.43	0.00	0.00
			Max. Mx	47	61.06	104.07	0.00
			Max. My	47	61.06	0.00	-0.07
			Max. Vy	47	-26.10	0.00	0.00
			Max. Vx	47	0.02	0.00	0.00
		Inner Bracing	Max Tension	19	6.02	0.00	0.00
			Max. Compression	43	-18.50	0.00	0.00
			Max. Mx	26	-7.87	246.36	0.00
			Max. My	47	-12.58	0.00	-0.24
			Max. Vy	26	-70.29	0.00	0.00
			Max. Vx	47	0.07	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	339226.67	32426.76	-20384.52
	Max. H_x	18	339226.67	32426.76	-20384.52
	Max. H_z	7	-300772.84	-29536.11	18683.72
	Min. Vert	7	-300772.84	-29536.11	18683.72
	Min. H_x	7	-300772.84	-29536.11	18683.72
	Min. H_z	18	339226.67	32426.76	-20384.52
Leg B	Max. Vert	10	338714.36	-32421.51	-20320.08
	Max. H_x	23	-300270.85	29530.45	18618.60
	Max. H_z	23	-300270.85	29530.45	18618.60

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg A	Min. Vert	23	-300270.85	29530.45	18618.60
	Min. H_x	10	338714.36	-32421.51	-20320.08
	Min. H_z	10	338714.36	-32421.51	-20320.08
	Max. Vert	2	341579.19	-52.32	38311.77
	Max. H_x	21	9926.59	7287.97	711.49
	Max. H_z	2	341579.19	-52.32	38311.77
	Min. Vert	15	-299364.69	52.87	-34898.46
	Min. H_x	9	10510.98	-7287.95	753.71
	Min. H_z	15	-299364.69	52.87	-34898.46

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	46348.69	-0.00	0.00	-40852.79	87.43	-0.10
Dead+Wind 0 deg - No Ice	46348.69	33.26	-64724.57	-8523115.86	-7529.86	-2799.62
IBC .6 Dead+Wind 0 deg - No Ice	27809.21	33.26	-64724.57	-8497666.01	-7552.72	-2800.42
Dead+Wind 30 deg - No Ice	46348.69	31216.75	-54069.01	-7141731.54	-4099411.69	-43966.65
IBC .6 Dead+Wind 30 deg - No Ice	27809.21	31216.75	-54069.01	-7117804.67	-4095100.51	-43919.58
Dead+Wind 60 deg - No Ice	46348.69	53368.84	-30850.91	-4097278.22	-7009981.70	-72430.07
IBC .6 Dead+Wind 60 deg - No Ice	27809.21	53368.84	-30850.91	-4076568.72	-7002577.74	-72348.49
Dead+Wind 90 deg - No Ice	46348.69	62375.91	-33.26	-48861.44	-8185896.45	-83242.46
IBC .6 Dead+Wind 90 deg - No Ice	27809.21	62375.91	-33.26	-32438.91	-8177258.20	-83147.58
Dead+Wind 120 deg - No Ice	46348.69	56003.24	32333.47	4193230.32	-7334231.51	-73686.21
IBC .6 Dead+Wind 120 deg - No Ice	27809.21	56003.23	32333.47	4205180.75	-7326546.96	-73612.18
Dead+Wind 150 deg - No Ice	46348.69	31159.15	54035.74	7052047.14	-4086393.47	-39304.01
IBC .6 Dead+Wind 150 deg - No Ice	27809.21	31159.15	54035.74	7060953.16	-4082099.12	-39255.42
Dead+Wind 180 deg - No Ice	46348.69	-33.26	61644.23	8057833.06	7776.26	2645.71
IBC .6 Dead+Wind 180 deg - No Ice	27809.21	-33.26	61644.23	8065893.85	7708.29	2646.14
Dead+Wind 210 deg - No Ice	46348.69	-31216.76	54069.00	7059682.44	4099816.04	43961.39
IBC .6 Dead+Wind 210 deg - No Ice	27809.21	-31216.76	54069.00	7068577.63	4095433.46	43914.24
Dead+Wind 240 deg - No Ice	46348.69	-56036.49	32391.08	4206456.76	7342055.34	76484.00
IBC .6 Dead+Wind 240 deg - No Ice	27809.21	-56036.49	32391.08	4218387.77	7334268.12	76399.18
Dead+Wind 270 deg - No Ice	46348.69	-62375.91	33.26	-33562.34	8186074.34	83240.81
IBC .6 Dead+Wind 270 deg - No Ice	27809.21	-62375.91	33.26	-17166.35	8177366.99	83146.05
Dead+Wind 300 deg - No Ice	46348.69	-53335.58	-30793.31	-4084055.37	7002521.21	69770.74
IBC .6 Dead+Wind 300 deg - No Ice	27809.21	-53335.58	-30793.31	-4063359.28	6995055.68	69686.81
Dead+Wind 330 deg - No Ice	46348.69	-31159.14	-54035.75	-7134081.56	4086356.33	39296.63
IBC .6 Dead+Wind 330 deg - No Ice	27809.21	-31159.15	-54035.75	-7110165.89	4081995.96	39247.99
Dead+Ice+Temp	67886.37	-0.00	0.00	-110129.41	1907.73	0.04
Dead+Wind 0 deg+Ice+Temp	67886.37	37.90	-59750.16	-8030007.23	-6815.01	-3800.06
IBC .6 Dead+Wind 0 deg+.6 Ice+Temp	40731.82	37.89	-59750.16	-7972481.77	-7531.14	-3798.20
Dead+Wind 30 deg+Ice+Temp	67886.37	29090.69	-50386.57	-6803460.86	-3862312.55	-40232.87

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
IBC .6 Dead+Wind 30 deg+.6 Ice+Temp	40731.82	29090.69	-50386.57	-6747785.98	-3856456.31	-40106.56
Dead+Wind 60 deg+Ice+Temp	67886.37	49892.86	-28849.42	-3947478.61	-6626559.56	-65317.56
IBC .6 Dead+Wind 60 deg+.6 Ice+Temp	40731.82	49892.86	-28849.41	-3896675.82	-6615959.59	-65103.61
Dead+Wind 90 deg+Ice+Temp	67886.37	58115.76	-37.90	-119221.50	-7711610.06	-74098.59
IBC .6 Dead+Wind 90 deg+.6 Ice+Temp	40731.82	58115.76	-37.90	-74968.16	-7699166.38	-73851.80
Dead+Wind 120 deg+Ice+Temp	67886.37	51688.32	29842.25	3841854.74	-6843852.13	-64292.40
IBC .6 Dead+Wind 120 deg+.6 Ice+Temp	40731.82	51688.32	29842.25	3879360.86	-6832933.43	-64075.79
Dead+Wind 150 deg+Ice+Temp	67886.37	29025.07	50348.67	6574057.51	-3847379.31	-33883.33
IBC .6 Dead+Wind 150 deg+.6 Ice+Temp	40731.82	29025.06	50348.67	6606872.04	-3841557.04	-33762.67
Dead+Wind 180 deg+Ice+Temp	67886.37	-37.89	57633.19	7548673.22	10661.70	3613.80
IBC .6 Dead+Wind 180 deg+.6 Ice+Temp	40731.82	-37.89	57633.19	7579796.22	9872.18	3608.32
Dead+Wind 210 deg+Ice+Temp	67886.37	-29090.70	50386.56	6582774.21	3866331.85	40232.91
IBC .6 Dead+Wind 210 deg+.6 Ice+Temp	40731.82	-29090.70	50386.56	6615569.45	3858938.95	40106.60
Dead+Wind 240 deg+Ice+Temp	67886.37	-51726.21	29907.89	3856957.69	6856408.07	68092.01
IBC .6 Dead+Wind 240 deg+.6 Ice+Temp	40731.82	-51726.21	29907.89	3894430.21	6843935.14	67872.10
Dead+Wind 270 deg+Ice+Temp	67886.37	-58115.76	37.89	-101773.66	7715432.42	74098.21
IBC .6 Dead+Wind 270 deg+.6 Ice+Temp	40731.82	-58115.76	37.89	-57559.54	7701457.28	73851.44
Dead+Wind 300 deg+Ice+Temp	67886.37	-49854.97	-28783.78	-3932380.52	6621662.67	61694.88
IBC .6 Dead+Wind 300 deg+.6 Ice+Temp	40731.82	-49854.97	-28783.78	-3881606.75	6609547.63	61482.38
Dead+Wind 330 deg+Ice+Temp	67886.37	-29025.06	-50348.67	-6794732.01	3851019.43	33883.72
IBC .6 Dead+Wind 330 deg+.6 Ice+Temp	40731.82	-29025.06	-50348.67	-6739077.03	3843671.42	33763.07
Dead+Wind 0 deg - Service	46348.69	16.57	-32250.30	-4267452.11	-3715.51	-1393.73
Dead+Wind 30 deg - Service	46348.69	15554.37	-26940.96	-3579105.69	-2042631.78	-21902.75
Dead+Wind 60 deg - Service	46348.69	26592.08	-15372.08	-2062085.60	-3492906.57	-36093.60
Dead+Wind 90 deg - Service	46348.83	31076.81	-27.14	-44833.63	-4078812.19	-41667.32
Dead+Wind 120 deg - Service	46348.69	27904.72	16110.80	2068838.54	-3654546.06	-36726.90
Dead+Wind 150 deg - Service	46348.69	15525.67	26924.39	3493344.32	-2036092.31	-19579.25
Dead+Wind 180 deg - Service	46348.69	-16.57	30715.46	3994596.22	3907.81	1323.30
Dead+Wind 210 deg - Service	46348.69	-15554.37	26940.96	3497153.83	2042866.37	21903.15
Dead+Wind 240 deg - Service	46348.69	-27921.29	16139.50	2075423.92	3658523.11	38117.47
Dead+Wind 270 deg - Service	46348.69	-31080.04	16.57	-37212.04	4078988.83	41480.06
Dead+Wind 300 deg - Service	46348.69	-26575.51	-15343.38	-2055501.50	3489275.45	34766.49
Dead+Wind 330 deg - Service	46348.69	-15525.67	-26924.39	-3575297.16	2036216.88	19581.43

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	-0.00	-46348.69	0.00	0.00	46348.69	-0.00	0.000%
2	33.26	-46348.69	-64724.56	-33.26	46348.69	64724.57	0.000%
3	33.26	-27809.21	-64724.56	-33.26	27809.21	64724.57	0.000%
4	31216.76	-46348.69	-54069.01	-31216.75	46348.69	54069.01	0.000%
5	31216.76	-27809.21	-54069.01	-31216.75	27809.21	54069.01	0.000%
6	53368.84	-46348.69	-30850.92	-53368.84	46348.69	30850.91	0.000%
7	53368.84	-27809.21	-30850.92	-53368.84	27809.21	30850.91	0.000%
8	62375.91	-46348.69	-33.26	-62375.91	46348.69	33.26	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
9	62375.91	-27809.21	-33.26	-62375.91	27809.21	33.26	0.000%
10	56003.22	-46348.69	32333.48	-56003.24	46348.69	-32333.47	0.000%
11	56003.22	-27809.21	32333.48	-56003.23	27809.21	-32333.47	0.000%
12	31159.15	-46348.69	54035.75	-31159.15	46348.69	-54035.74	0.000%
13	31159.15	-27809.21	54035.75	-31159.15	27809.21	-54035.74	0.000%
14	-33.26	-46348.69	61644.23	33.26	46348.69	-61644.23	0.000%
15	-33.26	-27809.21	61644.23	33.26	27809.21	-61644.23	0.000%
16	-31216.76	-46348.69	54069.01	31216.76	46348.69	-54069.00	0.000%
17	-31216.76	-27809.21	54069.01	31216.76	27809.21	-54069.00	0.000%
18	-56036.48	-46348.69	32391.08	56036.49	46348.69	-32391.08	0.000%
19	-56036.48	-27809.21	32391.08	56036.49	27809.21	-32391.08	0.000%
20	-62375.91	-46348.69	33.26	62375.91	46348.69	-33.26	0.000%
21	-62375.91	-27809.21	33.26	62375.91	27809.21	-33.26	0.000%
22	-53335.58	-46348.69	-30793.31	53335.58	46348.69	30793.31	0.000%
23	-53335.58	-27809.21	-30793.31	53335.58	27809.21	30793.31	0.000%
24	-31159.15	-46348.69	-54035.75	31159.14	46348.69	54035.75	0.000%
25	-31159.15	-27809.21	-54035.75	31159.15	27809.21	54035.75	0.000%
26	-0.00	-67886.37	0.00	0.00	67886.37	-0.00	0.000%
27	37.90	-67886.37	-59750.15	-37.90	67886.37	59750.16	0.000%
28	37.90	-40731.82	-59750.15	-37.89	40731.82	59750.16	0.000%
29	29090.70	-67886.37	-50386.57	-29090.69	67886.37	50386.57	0.000%
30	29090.70	-40731.82	-50386.57	-29090.69	40731.82	50386.57	0.000%
31	49892.86	-67886.37	-28849.41	-49892.86	67886.37	28849.42	0.000%
32	49892.86	-40731.82	-28849.41	-49892.86	40731.82	28849.41	0.000%
33	58115.76	-67886.37	-37.90	-58115.76	67886.37	37.90	0.000%
34	58115.76	-40731.82	-37.90	-58115.76	40731.82	37.90	0.000%
35	51688.31	-67886.37	29842.26	-51688.32	67886.37	-29842.25	0.000%
36	51688.31	-40731.82	29842.26	-51688.32	40731.82	-29842.25	0.000%
37	29025.06	-67886.37	50348.67	-29025.07	67886.37	-50348.67	0.000%
38	29025.06	-40731.82	50348.67	-29025.06	40731.82	-50348.67	0.000%
39	-37.90	-67886.37	57633.19	37.89	67886.37	-57633.19	0.000%
40	-37.90	-40731.82	57633.19	37.89	40731.82	-57633.19	0.000%
41	-29090.70	-67886.37	50386.57	29090.70	67886.37	-50386.56	0.000%
42	-29090.70	-40731.82	50386.57	29090.70	40731.82	-50386.56	0.000%
43	-51726.20	-67886.37	29907.89	51726.21	67886.37	-29907.89	0.000%
44	-51726.20	-40731.82	29907.89	51726.21	40731.82	-29907.89	0.000%
45	-58115.76	-67886.37	37.90	58115.76	67886.37	-37.89	0.000%
46	-58115.76	-40731.82	37.90	58115.76	40731.82	-37.89	0.000%
47	-49854.97	-67886.37	-28783.78	49854.97	67886.37	28783.78	0.000%
48	-49854.97	-40731.82	-28783.78	49854.97	40731.82	28783.78	0.000%
49	-29025.06	-67886.37	-50348.67	29025.06	67886.37	50348.67	0.000%
50	-29025.06	-40731.82	-50348.67	29025.06	40731.82	50348.67	0.000%
51	16.57	-46348.69	-32250.30	-16.57	46348.69	32250.30	0.000%
52	15554.37	-46348.69	-26940.96	-15554.37	46348.69	26940.96	0.000%
53	26592.08	-46348.69	-15372.08	-26592.08	46348.69	15372.08	0.000%
54	31080.04	-46348.69	-16.57	-31076.81	46348.83	27.14	0.020%
55	27904.72	-46348.69	16110.80	-27904.72	46348.69	-16110.80	0.000%
56	15525.67	-46348.69	26924.39	-15525.67	46348.69	-26924.39	0.000%
57	-16.57	-46348.69	30715.46	16.57	46348.69	-30715.46	0.000%
58	-15554.37	-46348.69	26940.96	15554.37	46348.69	-26940.96	0.000%
59	-27921.29	-46348.69	16139.50	27921.29	46348.69	-16139.50	0.000%
60	-31080.04	-46348.69	16.57	31080.04	46348.69	-16.57	0.000%
61	-26575.51	-46348.69	-15343.38	26575.51	46348.69	15343.38	0.000%
62	-15525.67	-46348.69	-26924.39	15525.67	46348.69	26924.39	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00002407
3	Yes	4	0.00000001	0.00002082
4	Yes	4	0.00000001	0.00002504
5	Yes	4	0.00000001	0.00002335
6	Yes	4	0.00000001	0.00001715
7	Yes	4	0.00000001	0.00001888
8	Yes	4	0.00000001	0.00002031
9	Yes	4	0.00000001	0.00001874
10	Yes	4	0.00000001	0.00003572
11	Yes	4	0.00000001	0.00002956
12	Yes	4	0.00000001	0.00002416
13	Yes	4	0.00000001	0.00002271
14	Yes	4	0.00000001	0.00002899
15	Yes	4	0.00000001	0.00001863
16	Yes	4	0.00000001	0.00002433
17	Yes	4	0.00000001	0.00002296
18	Yes	4	0.00000001	0.00003418
19	Yes	4	0.00000001	0.00003000
20	Yes	4	0.00000001	0.00002041
21	Yes	4	0.00000001	0.00001878
22	Yes	4	0.00000001	0.00001697
23	Yes	4	0.00000001	0.00001866
24	Yes	4	0.00000001	0.00002464
25	Yes	4	0.00000001	0.00002301
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00008934
28	Yes	4	0.00000001	0.00002702
29	Yes	4	0.00000001	0.00003356
30	Yes	4	0.00000001	0.00002646
31	Yes	4	0.00000001	0.00001528
32	Yes	4	0.00000001	0.00001282
33	Yes	4	0.00000001	0.00002807
34	Yes	4	0.00000001	0.00002180
35	Yes	4	0.00000001	0.00004651
36	Yes	4	0.00000001	0.00003723
37	Yes	4	0.00000001	0.00003148
38	Yes	4	0.00000001	0.00002517
39	Yes	4	0.00000001	0.00001430
40	Yes	4	0.00000001	0.00001198
41	Yes	4	0.00000001	0.00003152
42	Yes	4	0.00000001	0.00002518
43	Yes	4	0.00000001	0.00004660
44	Yes	4	0.00000001	0.00003728
45	Yes	4	0.00000001	0.00002835
46	Yes	4	0.00000001	0.00002206
47	Yes	4	0.00000001	0.00001510
48	Yes	4	0.00000001	0.00001261
49	Yes	4	0.00000001	0.00003292
50	Yes	4	0.00000001	0.00002581
51	Yes	4	0.00000001	0.00000448
52	Yes	4	0.00000001	0.00000422
53	Yes	4	0.00000001	0.00000218
54	Yes	4	0.00000001	0.00005618
55	Yes	4	0.00000001	0.00000462
56	Yes	4	0.00000001	0.00000402
57	Yes	4	0.00000001	0.00000206
58	Yes	4	0.00000001	0.00000403
59	Yes	4	0.00000001	0.00000463
60	Yes	4	0.00000001	0.00000360
61	Yes	4	0.00000001	0.00000218
62	Yes	4	0.00000001	0.00000416

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	240 - 220	12.011	51	0.4761	0.0739
T2	220 - 200	10.009	51	0.4566	0.0700
T3	200 - 180	8.126	51	0.4134	0.0608
T4	180 - 160	6.456	51	0.3601	0.0522
T5	160 - 140	5.016	51	0.3061	0.0442
T6	140 - 120	3.794	51	0.2618	0.0392
T7	120 - 100	2.764	51	0.2138	0.0342
T8	100 - 80	1.895	51	0.1773	0.0276
T9	80 - 60	1.193	51	0.1386	0.0228
T10	60 - 40	0.649	51	0.0985	0.0177
T11	40 - 20	0.265	51	0.0628	0.0131
T12	20 - 0	0.091	59	0.0271	0.0075

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
245.00	10' WHIP	51	12.011	0.4761	0.0739	158926
238.00	(2) RRU	51	11.809	0.4747	0.0737	158926
236.00	P-65-16-XLH-RR	51	11.607	0.4733	0.0734	158926
235.00	Surge Arrestor	51	11.506	0.4726	0.0733	158926
229.00	Conn Hill - 72" Yagi	51	10.902	0.4676	0.0723	72239
226.00	(3) DB844H90E-XY w/Mount Pipe	51	10.602	0.4645	0.0717	56759
206.00	10' WHIP	51	8.671	0.4282	0.0638	24098

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	240 - 220	23.971	2	0.9494	0.1484
T2	220 - 200	19.977	2	0.9106	0.1405
T3	200 - 180	16.221	2	0.8244	0.1221
T4	180 - 160	12.890	2	0.7183	0.1048
T5	160 - 140	10.016	2	0.6106	0.0887
T6	140 - 120	7.579	2	0.5223	0.0788
T7	120 - 100	5.522	2	0.4265	0.0687
T8	100 - 80	3.787	2	0.3538	0.0554
T9	80 - 60	2.385	2	0.2766	0.0458
T10	60 - 40	1.298	2	0.1966	0.0355
T11	40 - 20	0.532	2	0.1254	0.0264
T12	20 - 0	0.182	18	0.0542	0.0152

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
245.00	10' WHIP	2	23.971	0.9494	0.1484	80155
238.00	(2) RRU	2	23.568	0.9466	0.1479	80155
236.00	P-65-16-XLH-RR	2	23.165	0.9438	0.1474	80155
235.00	Surge Arrestor	2	22.963	0.9424	0.1471	80155
229.00	Conn Hill - 72" Yagi	2	21.759	0.9325	0.1452	36434
226.00	(3) DB844H90E-XY w/Mount Pipe	2	21.161	0.9263	0.1439	28627
206.00	10' WHIP	2	17.309	0.8540	0.1280	12100

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	240	Diagonal	A325N	0.5000	1	3709.19	4123.34	0.900 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	349.61	4123.34	0.085 ✓	1.333	Bolt Shear
T2	220	Leg	A325N	0.8750	4	4329.19	26392.20	0.164 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3957.21	4123.34	0.960 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	29.29	4123.34	0.007 ✓	1.333	Bolt Shear
T3	200	Leg	A325N	0.8750	4	10722.20	26340.70	0.407 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	5143.28	4123.34	1.247 ✓	1.333	Bolt Shear
T4	180	Leg	A325N	1.0000	4	17136.40	34411.40	0.498 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.5000	1	6061.14	5890.49	1.029 ✓	1.333	Bolt Shear
T5	160	Leg	A325N	1.0000	4	23607.70	34338.00	0.688 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.5000	1	7104.72	5890.49	1.206 ✓	1.333	Bolt Shear
T6	140	Leg	A325N	1.0000	4	30130.90	34269.40	0.879 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	8569.24	9203.88	0.931 ✓	1.333	Bolt Shear
T7	120	Leg	A325N	1.0000	4	36718.00	34166.10	1.075 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	9488.45	9203.88	1.031 ✓	1.333	Bolt Shear
T8	100	Leg	A325N	1.0000	6	28906.90	34329.80	0.842 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	10449.40	9277.52	1.126 ✓	1.333	Bolt Shear
T9	80	Leg	A325N	1.0000	6	33346.50	34271.10	0.973 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	11380.30	9277.52	1.227 ✓	1.333	Bolt Shear
T10	60	Leg	A325N	1.0000	6	37783.40	34198.50	1.105 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	12420.50	13253.60	0.937 ✓	1.333	Bolt Shear
T11	40	Leg	A325N	1.0000	6	42198.00	34157.90	1.235 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	3	7275.26	9277.52	0.784 ✓	1.333	Bolt Shear
T12	20	Leg	A325N	1.0000	10	27846.70	34405.90	0.809 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	3	6932.49	9277.52	0.747 ✓	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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	240 - 220	ROHN 2.5 STD	20.00	3.98	50.5 K=1.00	24.280	1.7040	-20088.10	41374.10	0.486 ✓
T2	220 - 200	ROHN 3 EH	20.04	4.97	52.5 K=1.00	23.962	3.0159	-47539.70	72268.90	0.658 ✓
T3	200 - 180	ROHN 3.5 EH	20.04	6.62	60.8 K=1.00	22.575	3.6784	-74795.00	83039.70	0.901 ✓
T4	180 - 160	ROHN 4 EH	20.04	6.62	53.8 K=1.00	23.743	4.4074	-102998.00	104646.00	0.984 ✓
T5	160 - 140	ROHN 5 EH	20.04	6.62	43.2 K=1.00	25.372	6.1120	-132446.00	155072.00	0.854 ✓
T6	140 - 120	ROHN 5 EH	20.04	9.94	64.8 K=1.00	21.876	6.1120	-161992.00	133703.00	1.212 ✓
T7	120 - 100	ROHN 6 EH	20.04	9.94	54.3 K=1.00	23.663	8.4049	-192012.00	198887.00	0.965 ✓
T8	100 - 80	ROHN 6 EH	20.04	9.94	54.3 K=1.00	23.663	8.4049	-222700.00	198887.00	1.120 ✓
T9	80 - 60	ROHN 6 EH	20.04	9.94	54.3 K=1.00	23.663	8.4049	-253572.00	198887.00	1.275 ✓
T10	60 - 40	ROHN 8 EHS	20.04	9.94	40.8 K=1.00	25.715	9.7193	-284928.00	249927.00	1.140 ✓
T11	40 - 20	ROHN 8 EHS	20.04	9.94	40.8 K=1.00	25.715	9.7193	-315072.00	249927.00	1.261 ✓
T12	20 - 0	ROHN 8 EH	20.04	9.98	41.6 K=1.00	25.605	12.7627	-315075.00	326796.00	0.964 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	240 - 220	L1 3/4x1 3/4x3/16	7.68	3.70	129.2 K=1.00	8.943	0.6211	-3709.19	5554.20	0.668 ✓
T2	220 - 200	L1 3/4x1 3/4x3/16	9.78	4.88	170.4 K=1.00	5.142	0.6211	-3957.21	3193.91	1.239 ✓
T3	200 - 180	L2 1/2x2 1/2x3/16	12.40	6.21	150.7 K=1.00	6.579	0.9020	-5143.28	5934.52	0.867 ✓
T4	180 - 160	L2 1/2x2 1/2x1/4	14.27	7.12	174.0 K=1.00	4.930	1.1900	-6061.14	5866.84	1.033 ✓
T5	160 - 140	L2 1/2x2 1/2x1/2	16.20	8.04	198.1 K=1.00	3.806	2.2500	-7104.72	8563.40	0.830 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	140 - 120	L3x3x3/8	19.47	9.78	199.9 K=1.00	3.739	2.1100	-8569.24	7888.43	1.086 ✓
T7	120 - 100	L3 1/2x3 1/2x1/4	21.35	10.66	184.4 K=1.00	4.393	1.6900	-9488.45	7424.80	1.278 ✓
T8	100 - 80	L3 1/2x3 1/2x3/8	23.27	11.62	203.0 K=1.00	3.622	2.4800	-10449.40	8982.61	1.163 ✓
T9	80 - 60	KL/R > 200 (C) - 168 L4x4x5/16	25.23	12.60	191.2 K=1.00	4.085	2.4000	-11380.30	9803.26	1.161 ✓
T10	60 - 40	L4x4x3/8	27.21	13.51	205.7 K=1.00	3.530	2.8600	-12420.50	10094.40	1.230 ✓
T11	40 - 20	KL/R > 200 (C) - 198 P2.5x.552	24.29	12.15	172.6 K=1.00	5.010	4.0285	-21825.80	20181.80	1.081 ✓
T12	20 - 0	ROHN 3 STD	24.99	12.50	128.9 K=1.00	8.990	2.2285	-20797.50	20033.70	1.038 ✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	40 - 20	ROHN 2.5 STD	25.89	12.59	159.4 K=1.00	5.876	1.7040	-11985.20	10012.50	1.197 ✓
T12	20 - 0	ROHN 3 STD	28.04	13.66	140.9 K=1.00	7.524	2.2285	-12178.20	16766.30	0.726 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	240 - 220	L2x2x1/4	6.56	6.32	194.1 K=1.00	3.965	0.9380	-349.61	3719.13	0.094 ✓
T2	220 - 200	L2x2x1/4	6.57	6.28	192.7 K=1.00	4.020	0.9380	-29.29	3770.41	0.008 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	40 - 20	ROHN 1.5 STD	6.47	6.11	117.8 K=1.00	10.591	0.7995	-5465.07	8467.01	0.645 ✓
T12	20 - 0	ROHN 1.5 STD	7.01	6.65	128.2	9.088	0.7995	-5465.09	7265.57	0.752

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	lb	lb	
					K=1.00					✓

Redundant Diagonal (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	lb	lb	
T11	40 - 20	ROHN 2 STD	11.56	10.87	165.6 K=1.00	5.443	1.0745	-4881.64	5848.24	0.835 ✓
T12	20 - 0	ROHN 2 STD	11.88	11.22	171.1 K=1.00	5.100	1.0745	-4631.94	5480.20	0.845 ✓

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	lb	lb	
T11	40 - 20	ROHN 1.5 STD	6.47	6.47	124.8 K=1.00	9.590	0.7995	-58.28	7666.82	0.008 ✓
T12	20 - 0	ROHN 1.5 STD	7.01	7.01	135.1 K=1.00	8.180	0.7995	-54.64	6539.72	0.008 ✓

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	lb	lb	
T11	40 - 20	ROHN 1.5 STD	15.21	15.21	293.1 K=1.00	1.738	0.7995	-43.65	1389.33	0.031 ✓
		KL/R > 250 (C) - 232								
T12	20 - 0	ROHN 1.5 STD	15.95	15.95	307.5 K=1.00	1.580	0.7995	-49.43	1262.93	0.039 ✓
		KL/R > 250 (C) - 265								

Inner Bracing 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	lb	lb	
T11	40 - 20	ROHN 2.5 STD	12.95	12.95	164.0 K=1.00	5.554	1.7040	-13.00	9464.35	0.001 ✓
T12	20 - 0	ROHN 3 STD	14.02	14.02	144.6	7.143	2.2285	-18.50	15917.80	0.001

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=1.00					✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	240 - 220	ROHN 2.5 STD	20.00	3.98	50.5	30.000	1.7040	17063.80	51121.50	0.334 ✓
T2	220 - 200	ROHN 3 EH	20.04	4.97	52.5	30.000	3.0159	42888.60	90477.90	0.474 ✓
T3	200 - 180	ROHN 3.5 EH	20.04	6.62	60.8	30.000	3.6784	68546.20	110352.00	0.621 ✓
T4	180 - 160	ROHN 4 EH	20.04	6.62	53.8	30.000	4.4074	94431.00	132223.00	0.714 ✓
T5	160 - 140	ROHN 5 EH	20.04	6.62	43.2	30.000	6.1120	120523.00	183359.00	0.657 ✓
T6	140 - 120	ROHN 5 EH	20.04	9.94	64.8	30.000	6.1120	146873.00	183359.00	0.801 ✓
T7	120 - 100	ROHN 6 EH	20.04	9.94	54.3	30.000	8.4049	173442.00	252148.00	0.688 ✓
T8	100 - 80	ROHN 6 EH	20.04	9.94	54.3	30.000	8.4049	200081.00	252148.00	0.794 ✓
T9	80 - 60	ROHN 6 EH	20.04	9.94	54.3	30.000	8.4049	226702.00	252148.00	0.899 ✓
T10	60 - 40	ROHN 8 EHS	20.04	9.94	40.8	30.000	9.7193	253188.00	291579.00	0.868 ✓
T11	40 - 20	ROHN 8 EHS	20.04	9.94	40.8	30.000	9.7193	278469.00	291579.00	0.955 ✓
T12	20 - 0	ROHN 8 EH	20.04	9.98	41.6	30.000	12.7627	278467.00	382882.00	0.727 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	240 - 220	L1 3/4x1 3/4x3/16	7.68	3.70	124.0	29.000	0.3779	3671.08	10960.00	0.335 ✓
T2	220 - 200	L1 3/4x1 3/4x3/16	9.78	4.88	160.1	29.000	0.3779	3943.54	10960.00	0.360 ✓
T3	200 - 180	L2 1/2x2 1/2x3/16	12.40	6.21	140.5	29.000	0.5886	5078.47	17069.70	0.298 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T4	180 - 160	L2 1/2x2 1/2x1/4	14.27	7.12	163.6	29.000	0.7753	5944.42	22484.10	0.264 ✓
T5	160 - 140	L2 1/2x2 1/2x1/2	16.20	8.04	192.6	29.000	1.4531	7060.41	42140.60	0.168 ✓
T6	140 - 120	L3x3x3/8	19.47	9.78	188.7	32.500	1.3716	8395.91	44575.80	0.188 ✓
T7	120 - 100	L3 1/2x3 1/2x1/4	21.35	10.66	172.8	32.500	1.1269	9265.01	36623.40	0.253 ✓
T8	100 - 80	L3 1/2x3 1/2x3/8	23.27	11.62	192.3	32.500	1.6139	10292.80	52452.00	0.196 ✓
T9	80 - 60	L4x4x5/16	25.23	12.60	180.2	32.500	1.5949	11114.10	51835.00	0.214 ✓
T10	60 - 40	L4x4x3/8	27.21	13.51	194.9	32.500	1.8989	12171.80	61714.50	0.197 ✓
T11	40 - 20	P2.5x.552	24.29	12.15	172.6	30.000	4.0285	21561.00	120854.00	0.178 ✓
T12	20 - 0	ROHN 3 STD	24.99	12.50	128.9	30.000	2.2285	20383.70	66854.10	0.305 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	40 - 20	ROHN 2.5 STD	25.89	12.59	159.4	21.600	1.7040	11711.10	36807.50	0.318 ✓
T12	20 - 0	ROHN 3 STD	28.04	13.66	140.9	21.600	2.2285	11852.80	48134.90	0.246 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	240 - 220	L2x2x1/4	6.56	6.32	124.6	29.000	0.5863	338.10	17003.10	0.020 ✓
T2	220 - 200	L2x2x1/4	6.57	6.28	123.7	29.000	0.5863	4.19	17003.10	0.000 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	40 - 20	ROHN 1.5 STD	6.47	6.11	117.8	21.600	0.7995	5465.07	17268.30	0.316 ✓
T12	20 - 0	ROHN 1.5 STD	7.01	6.65	128.2	21.600	0.7995	5465.09	17268.30	0.316 ✓

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	40 - 20	ROHN 2 STD	11.56	10.87	165.6	21.600	1.0745	4881.64	23209.90	0.210 ✓
T12	20 - 0	ROHN 2 STD	11.88	11.22	171.1	21.600	1.0745	4631.94	23209.90	0.200 ✓

Redundant Hip Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	40 - 20	ROHN 1.5 STD	15.21	15.21	293.1	21.600	0.7995	59.91	17268.30	0.003 ✓
T12	20 - 0	ROHN 1.5 STD	15.95	15.95	307.5	21.600	0.7995	76.37	17268.30	0.004 ✓

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	40 - 20	ROHN 2.5 STD	12.95	12.95	164.0	30.000	1.7040	7.68	51121.50	0.000 ✓
T12	20 - 0	ROHN 3 STD	14.02	14.02	144.6	30.000	2.2285	6.02	66854.10	0.000 ✓

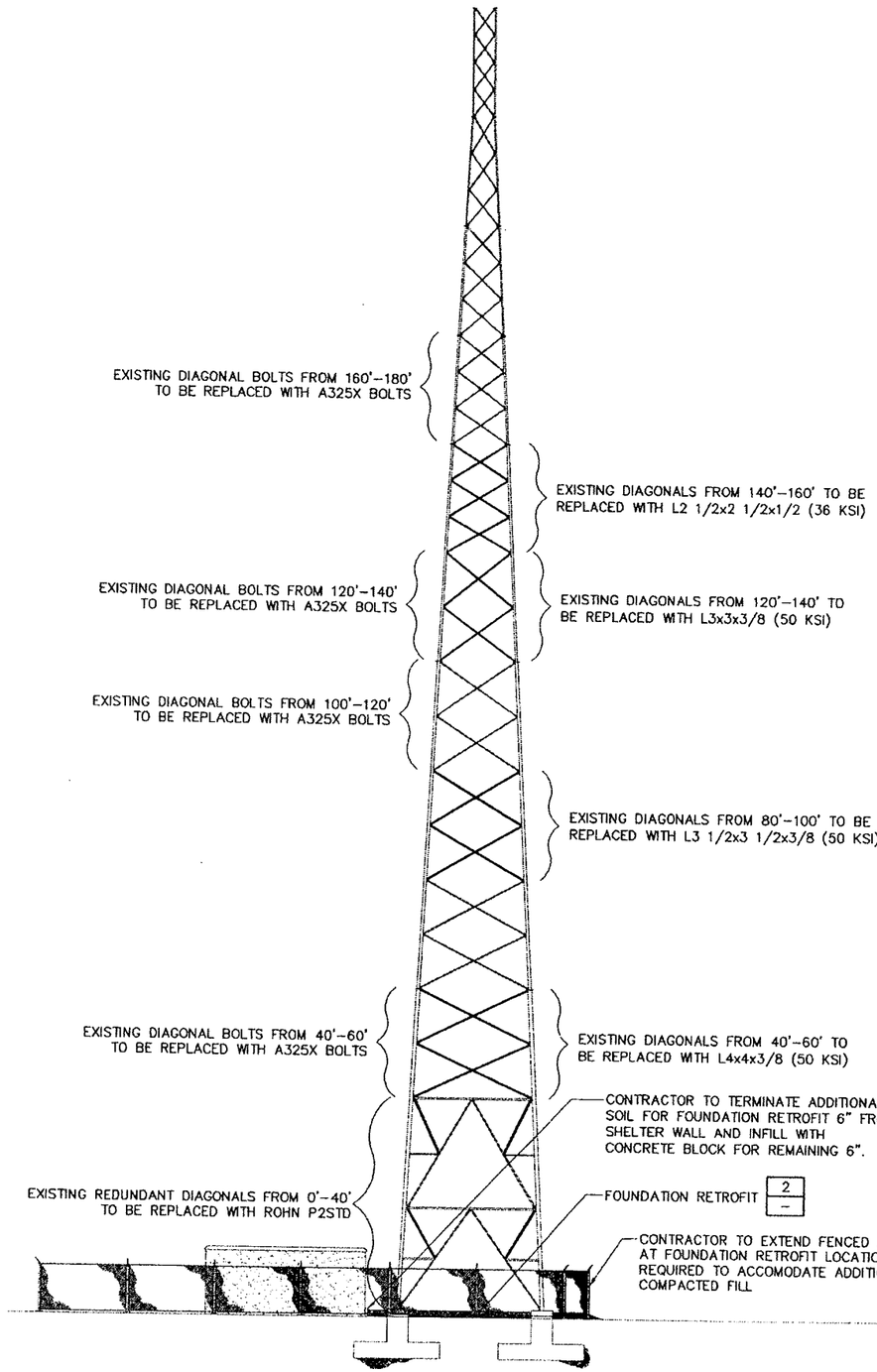
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	240 - 220	Leg	ROHN 2.5 STD	3	-20088.10	55151.68	36.4	Pass
		Diagonal	L1 3/4x1 3/4x3/16	9	-3709.19	7403.75	50.1 67.5 (b)	Pass

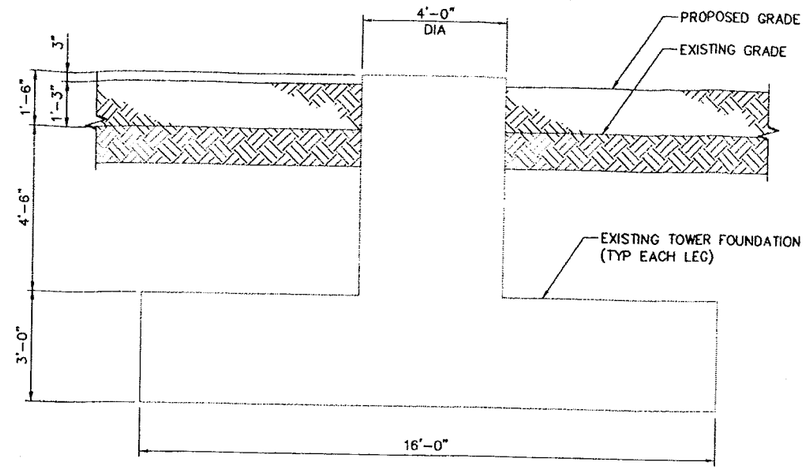
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
		Top Girt	L2x2x1/4	4	-349.61	4957.60	7.1	Pass
T2	220 - 200	Leg	ROHN 3 EH	39	-47539.70	96334.44	49.3	Pass
		Diagonal	L1 3/4x1 3/4x3/16	48	-3957.21	4257.48	92.9	Pass
		Top Girt	L2x2x1/4	42	-29.29	5025.96	0.6	Pass
T3	200 - 180	Leg	ROHN 3.5 EH	69	-74795.00	110691.92	67.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	75	-5143.28	7910.71	65.0	Pass
							93.6 (b)	
T4	180 - 160	Leg	ROHN 4 EH	90	-102998.00	139493.11	73.8	Pass
		Diagonal	L2 1/2x2 1/2x1/4	96	-6061.14	7820.50	77.5	Pass
T5	160 - 140	Leg	ROHN 5 EH	111	-132446.00	206710.97	64.1	Pass
		Diagonal	L2 1/2x2 1/2x1/2	117	-7104.72	11415.01	62.2	Pass
							90.5 (b)	
T6	140 - 120	Leg	ROHN 5 EH	132	-161992.00	178226.09	90.9	Pass
		Diagonal	L3x3x3/8	138	-8569.24	10515.28	81.5	Pass
T7	120 - 100	Leg	ROHN 6 EH	147	-192012.00	265116.36	72.4	Pass
							80.6 (b)	
		Diagonal	L3 1/2x3 1/2x1/4	153	-9488.45	9897.26	95.9	Pass
T8	100 - 80	Leg	ROHN 6 EH	162	-222700.00	265116.36	84.0	Pass
		Diagonal	L3 1/2x3 1/2x3/8	168	-10449.40	11973.82	87.3	Pass
T9	80 - 60	Leg	ROHN 6 EH	177	-253572.00	265116.36	95.6	Pass
		Diagonal	L4x4x5/16	183	-11380.30	13067.74	87.1	Pass
							92.0 (b)	
T10	60 - 40	Leg	ROHN 8 EHS	192	-284928.00	333152.68	85.5	Pass
		Diagonal	L4x4x3/8	198	-12420.50	13455.84	92.3	Pass
T11	40 - 20	Leg	ROHN 8 EHS	207	-315072.00	333152.68	94.6	Pass
		Diagonal	P2.5x.552	228	-21825.80	26902.34	81.1	Pass
		Horizontal	ROHN 2.5 STD	224	-11985.20	13346.66	89.8	Pass
		Redund Horz 1 Bracing	ROHN 1.5 STD	220	-5465.07	11286.52	48.4	Pass
		Redund Diag 1 Bracing	ROHN 2 STD	227	-4881.64	7795.70	62.6	Pass
		Redund Hip 1 Bracing	ROHN 1.5 STD	231	-58.28	10219.87	0.6	Pass
		Redund Hip Diagonal Bracing	ROHN 1.5 STD	232	-43.65	1851.98	2.4	Pass
		Inner Bracing	ROHN 2.5 STD	235	-7.45	9464.35	0.5	Pass
T12	20 - 0	Leg	ROHN 8 EH	240	-315075.00	435619.05	72.3	Pass
		Diagonal	ROHN 3 STD	261	-20797.50	26704.92	77.9	Pass
		Horizontal	ROHN 3 STD	257	-12178.20	22349.48	54.5	Pass
		Redund Horz 1 Bracing	ROHN 1.5 STD	259	-5465.09	9685.00	56.4	Pass
		Redund Diag 1 Bracing	ROHN 2 STD	254	-4631.94	7305.11	63.4	Pass
		Redund Hip 1 Bracing	ROHN 1.5 STD	264	-54.64	8717.45	0.6	Pass
		Redund Hip Diagonal Bracing	ROHN 1.5 STD	265	-49.43	1683.49	2.9	Pass
		Inner Bracing	ROHN 3 STD	270	-7.96	15917.80	0.3	Pass
							Summary	
						Leg (T9)	95.6	Pass
						Diagonal (T7)	95.9	Pass
						Horizontal (T11)	89.8	Pass
						Top Girt (T1)	7.1	Pass
						Redund Horz 1 Bracing (T12)	56.4	Pass
						Redund	63.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						Diag 1 Bracing (T12)		
						Redund Hip 1 Bracing (T12)	0.6	Pass
						Redund Hip Diagonal Bracing (T12)	2.9	Pass
						Inner Bracing (T11)	0.5	Pass
						Bolt Checks	93.6	Pass
						RATING =	**95.9**	**Pass**

TOWER RETROFIT DRAWINGS



1/– TOWER RETROFIT ELEVATION
SCALE: NTS



NOTE:

CONTRACTOR TO TERMINATE ADDITIONAL SOIL FOR FOUNDATION RETROFIT 6" FROM SHELTER WALL AND INFILL WITH CONCRETE BLOCK FOR REMAINING 6".

2/– FOUNDATION RETROFIT DETAIL
SCALE: NTS

CONSTRUCTION SEQUENCE NOTES:

1. TOWER MEMBER REPLACEMENT WORK SHALL NOT BE PERFORMED DURING PERIODS WHEN THE WIND GUST SPEED EXCEEDS 15 MPH
2. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND REPORT DISCREPENCIES TO THE ENGINEER PRIOR TO FABRICATION.
3. CONTRACTOR SHALL TEMPORARILY BRACE TOWER TO MAINTAIN STRUCTURAL STABILITY WHILE MEMBERS ARE REPLACED.
4. MEMBERS SHALL BE REMOVED ON ONE FACE AT A TIME AND REPLACED WITH NEW MEMBERS. AT NO TIME SHALL ANOTHER FACE BE STARTED WITHOUT COMPLETING WORK THAT HAS ALREADY BEGUN.
5. CONTRACTOR SHALL PROTECT ALL EXISTING MEMBERS WHICH ARE TO REMAIN OR BE REUSED. ANY EXISTING MEMBERS DAMAGED DURING CONSTRUCTION WHICH ARE TO BE REUSED ARE TO BE REPLACED AT THE COST OF THE CONTRACTOR.
6. BOLT HOLES IN NEW MEMBERS SHALL BE DRILLED TO MATCH THOSE IN EXISTING MEMBERS.

SOIL PREPARATION NOTES:

1. STRUCTURAL FILL AND BACKFILL: SOUND, DURABLE, SAND, GRAVEL, STONE, OR BLENDS OF THESE MATERIALS, FREE FROM ORGANIC, FROZEN OR OTHER DELETERIOUS MATERIALS, AND MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE	PERCENT PASSING
4"	100"
No. 40	0 – 70
No. 200	0 – 10

a. FINES PASSING NO. 200 SHALL BE NON–PLASTIC.
b. PARTICLE SIZE ANALYSIS SHALL SHOWN NO GAP GRADING.

2. THE SOIL ABOVE STRUCTURES AND PADS AND 5 FEET AROUND THEIR PERIMETER SHALL BE TREATED AS FOLLOWS:
   A. STRIP THE AREA OF ALL VEGETATION AND REMOVE ALL ORGANICS.
   B. PERFORM ANY CUT OPERATIONS.
   C. PROOF ROLL THE SITE WITH A TANDEM AXLE LOADED DUMP TRUCK IN TWO DIRECTIONS. ANY AREAS WHICH ARE NOTED TO RUT OR PUMP EXCESSIVELY SHALL BE UNDERCUT BY 12" AND BACKFILLED WITH COMPACTED STRUCTURAL FILL ACCORDING TO THE COMPACTION REQUIREMENTS NOTED BELOW.
   D. THE FILL REQUIRED TO RAISE THE SUBGRADE ABOVE EXISTING SLAB SHALL BE EITHER IMPORTED STRUCTURAL FILL OR ON SITE MATERIAL MEETING THE REQUIREMENTS OF STRUCTURAL FILL. THE STRUCTURAL FILL SHALL HAVE A PLASTICITY INDEX BETWEEN 4 AND 12 AND A LIQUID LIMIT LESS THAN 40. PLACE ALL FILL (ON SITE OR SELECT) FILL IN 8–INCH LIFTS AND COMPACT TO AT LEAST 95% OF THE STANDARD PROCTOR DENSITY AT A MOISTURE CONTENT WITHIN –3 AND +3 PERCENTAGE POINTS OF OPTIMUM.
   E. EACH LIFT SHALL BE TESTED FOR MOISTURE CONTENT AND IN PLACE DENSITY AT A RATE OF ONE TEST PER 3,000 SQUARE FEET (MIN OF THREE PER LIFT).
3. CONTRACTOR SHALL FINISH GRADE, THEN TAPER TO EXISTING GRADE, IF REQUIRED, AT A MAXIMUM SLOPE OF 3:1.

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NEW CINGULAR WIRELESS PCS, LLC
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2339
Main: (860) 257-4057 · www.chaenvplan.com

CHA PROJECT NO:
22702 – 1010 – 43000

NO.	SUBMITTAL		
0	06/17/11	ISSUED FOR REVIEW	
	BY: BAS	CHK: AM	APP'D: JPS

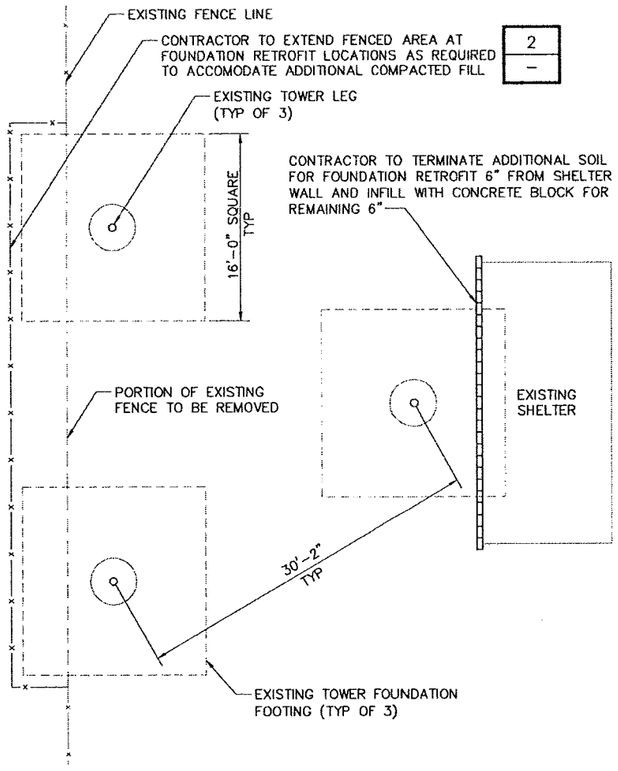
STATE OF CONNECTICUT
JOHN P. SOBIECH
No. 17827
LICENSED PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE ID:
CT2144
SITE NAME:
MONROE
SITE ADDRESS:
230 GUINEA ROAD
MONROE, CT
06468
FAIRFIELD COUNTY

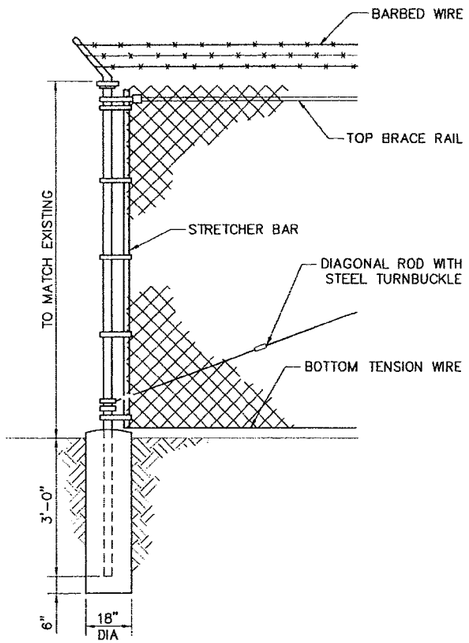
SHEET TITLE
RETROFIT DETAILS

SHEET NUMBER
SK–1



1 — FOUNDATION RETROFIT PLAN

SCALE: NTS



NOTE:

POSTS TO BE INSTALLED AT 10'-0" MAXIMUM SPACING.

2 — WOVEN WIRE CORNER, GATE, END, OR PULL POST

NO SCALE

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500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

CHA
2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4667 - www.chacompanies.com

CHA PROJECT NO:
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SHEET TITLE
RETROFIT DETAILS

SHEET NUMBER
SK-2