Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

March 20, 2017

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 842870**
AT&T Site ID: CT5099
434 Boston Post Road, Milford, CT 06460
Latitude: 41° 13' 42.69"/ Longitude: -73° 4' 12.47"

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 141-foot level of the existing 150-foot self-support tower at 434 Boston Post Road in Milford, CT. The tower is owned by Crown Castle; the City of Milford owns the property. AT&T intends to replace three (3) antennas with three (3) new antennas, replace three (3) RRU11st with three (3) RRU32s, and install three (3) TMAs, and one (1) filter.

A request for original zoning documents was sent to the City of Milford but a reply has not been received at this time.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Benjamin G. Blake, Mayor, City of Milford, as well as the property owner, and tower owner.

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

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

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

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

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Benjamin G. Blake, Mayor
City of Milford
110 River Street
Milford, CT 06460

City of Milford Planning & Zoning
110 River Street
Milford, CT 06460

City of Milford, CT

Property Listing Report

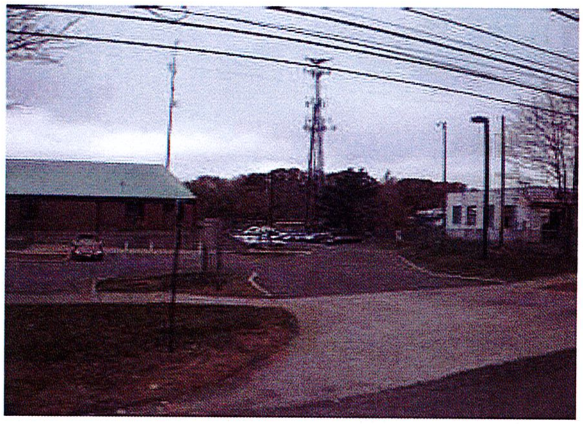
Map Block Lot	064 930 6 A	Account	023341

Property Information

Property Location	434 BOSTON POST RD
Owner	CITY OF MILFORD
Co-Owner	C/O AT&T MBLTY-TAX DEPT
Mailing Address	575 MOROSGO DR ATLANTA GA 30324
Land Use	434V CELL TOWER MDL-00
Land Class	I
Zoning Code	
Census Tract	

Neighborhood	D
Acreage	0
Utilities	All Public,Public Sewer
Lot Setting/Desc	
Additional Info	

Photo



Sketch

Primary Construction Details

Year Built		Bedrooms		Exterior Walls	
Stories		Full Bathrooms		Interior Walls	
Building Style		Half Bathrooms		Heating Type	
Building Use		Bath Style		Heating Fuel	
Building Condition		Kitchen Style		AC Type	
Floors		Roof Style		Gross Bldg Area	
Total Rooms		Roof Cover		Total Living Area	

Report Created On 3/20/2017

City of Milford, CT

Property Listing Report **Map Block Lot** 064 930 6 A **Account** 023341

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		
Extras	0	
Improvements		
Outbuildings	450000	315000
Land	0	0
Total	450000	315000

Outbuilding and Extra Items

Type	Description
CEL TWR SITE	1 UNITS

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CITY OF MILFORD	02435/0430	11/22/1999	

Report Created On 3/20/2017

City of Milford, Connecticut. Assessment Parcel Map

Parcel ID: **15282** Address:

1 inch = 100 feet

Map Produced: July 2016

SITE NAME: MILFORD
FA NUMBER: 10071130
SITE NUMBER: CTL05099
RETROFIT-MRCTB018063
MULTI-CARRIER-MRCTB018847
434 BOSTON POST ROAD
MILFORD, CT 06460
NEW HAVEN COUNTY

CROWN SITE NAME: MILFORD
CROWN SITE NUMBER: 842870

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, SUITE 106
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862-2105
CONTACT:	TODD OLIVER
PHONE:	(774) 369-3618
E-MAIL:	TODD.OLIVER@SMARTLINKLLC.COM

SITE ACQUISITION

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, SUITE 106
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862-2105
CONTACT:	TODD OLIVER
PHONE:	(774) 369-3618
E-MAIL:	TODD.OLIVER@SMARTLINKLLC.COM

ENGINEER

COMPANY:	MASER CONSULTING CONNECTICUT
ADDRESS:	331 NEWMAN SPRINGS ROAD
CITY, STATE, ZIP:	RED BANK, NJ 07701-5699
CONTACT:	FRANK PAZDEN
PHONE:	(732) 383-1950
E-MAIL:	FPAZDEN@MASERCONSULTING.COM

RF ENGINEER

COMPANY:	NEW CINGULAR WIRELESS PCS, LLC
ADDRESS:	550 COCHITUATE ROAD
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701
CONTACT:	MATEEN MD
E-MAIL:	MM093Q@ATT.COM

CONSTRUCTION MANAGER

COMPANY:	SMARTLINK, LLC.
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, SUITE 106
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862-2105
CONTACT:	MARK DONNELLY
PHONE:	(617) 515-2080
E-MAIL:	MARK.DONNELLY@SMARTLINKLLC.COM

SITE INFORMATION

APPLICANT/LESSEE

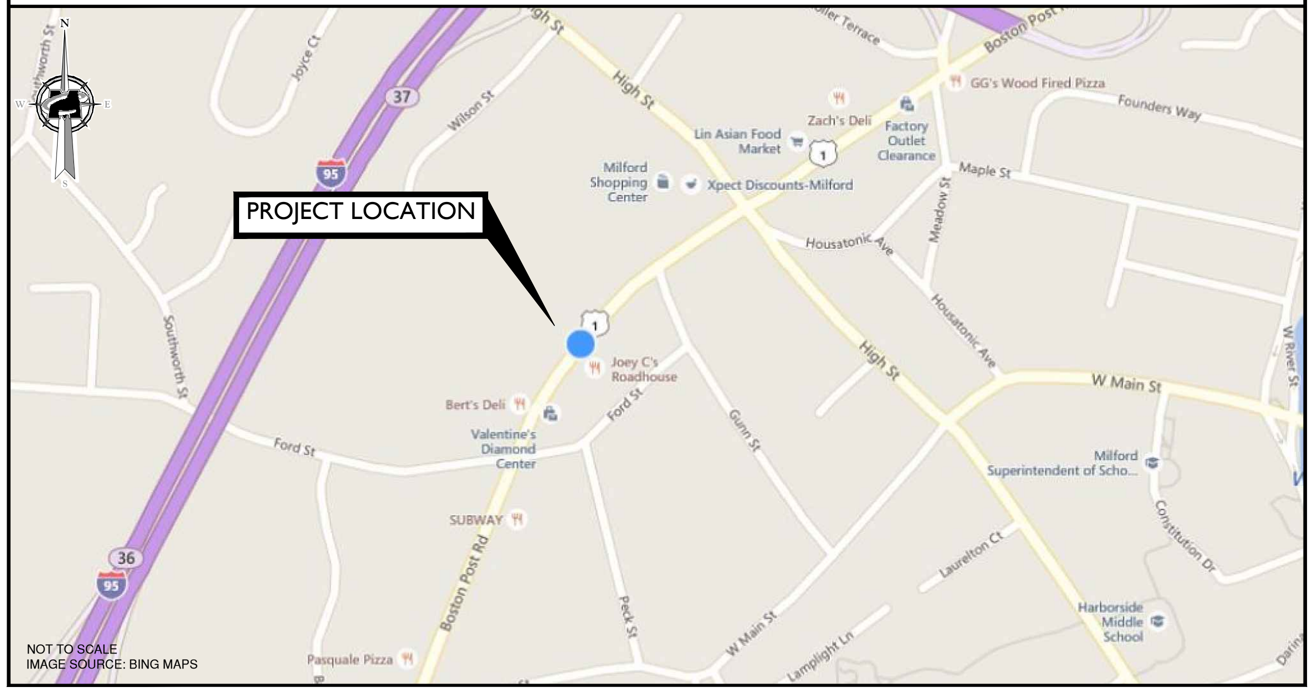
at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

TOWER OWNER:

NAME:	CROWN CASTLE
ADDRESS:	12 GILL STREET, SUITE 5800
CITY, STATE, ZIP:	WOBURN, MA 01801
SITE ID #:	842870
LATITUDE:	41.2274919° N
LONGITUDE:	73.0705989° W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING EQUIPMENT SHELTER AND TOWER
ZONING/JURISDICTION:	CITY OF MILFORD
PROPOSED USE:	UNMANNED TELECOMMUNICATIONS FACILITY
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
CONSTRUCTION TYPE:	IIB
USE GROUP:	U

VICINITY MAP



NOT TO SCALE
IMAGE SOURCE: BING MAPS

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES.

1. 2016 CONNECTICUT STATE BUILDING CODE INCORPORATING THE 2012 IBC
2. NATIONAL ELECTRIC CODE 2014
3. NATIONAL FIRE PROTECTION ASSOCIATION 70 - 2015
4. LIGHTNING PROTECTION CODE 201
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRICTION 360-10.
7. EIA/TIA-222 REVISION G
8. TIA 607 FOR GROUNDING
9. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
10. IEEE C2 LATEST EDITION
11. TELCORDIA GR-1275 12. ANSI T1.311

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
A-1	COMPOUND PLAN AND EQUIPMENT PLAN
A-2	ELEVATION VIEW AND ANTENNA SCHEDULE
A-3	ANTENNA LAYOUTS
A-4	DETAILS
A-5	DETAILS
A-6	RF PLUMBING DIAGRAMS
G-1	GROUNDING DETAILS

PROJECT DESCRIPTION/SCOPE OF WORK

THIS PROJECT WILL BE COMPRISED OF:

- (3) NEW PANEL ANTENNAS TO REPLACE (3) EXISTING ANTENNAS, (1) PER SECTOR
- (3) NEW RRUS TO REPLACE (3) EXISTING RRUS, (1) PER SECTOR
- ADD (1) IDL2 AND (1) DUS TO EXISTING LTE RACK
- ADD (2) WCS FILTERS

PROPOSED PROJECT SCOPE BASED ON RFDS ID# 1166200, VERSION 2.0, LAST UPDATED 07/25/16, AND RFDS ID# 745882, VERSION 3.0, LAST UPDATED 10/19/16

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smartlink
85 RANGEWAY ROAD
BUILDING 3, SUITE 102
NORTH BILLERICA, CT 01862-2105
TEL: (774) 369-3613

at&t
NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

811
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PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:
WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	16946018A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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1	01/25/17	FOR CONSTRUCTION	RA	FEP
0	12/23/16	ISSUED FOR REVIEW	AJC	FEP

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28188

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

SITE NAME:

MILFORD
FA# 10071130
SITE # CTL05099

434 BOSTON POST ROAD
MILFORD, CT 06460
NEW HAVEN COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
TITLE SHEET

SHEET NUMBER :
T-1

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING 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 GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. 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.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" 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.

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

   CONTRACTOR - SMARTLINK
   SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
3. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
4. 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.
   - 2016 CONNECTICUT STATE BUILDING CODE INCORPORATING THE 2012 IBC
   - 2014 NATIONAL ELECTRICAL CODE - NFPA 70
   - 2015 NFPA 1

- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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.
- 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.
- THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
- THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION.
- SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
- 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.
- ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
- ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
- 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.
- CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
- 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.
- 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.
- 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 ALERT OF DANGEROUS EXPOSURE LEVELS.

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TEL: (774) 369-3613

at&t
NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:
WWW.CALL811.COM

SCALE : AS SHOWN
JOB NUMBER : 16946018A

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1	01/25/17	FOR CONSTRUCTION	RA	FEP
0	12/23/16	ISSUED FOR REVIEW	AJC	FEP
REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28188

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

SITE NAME:

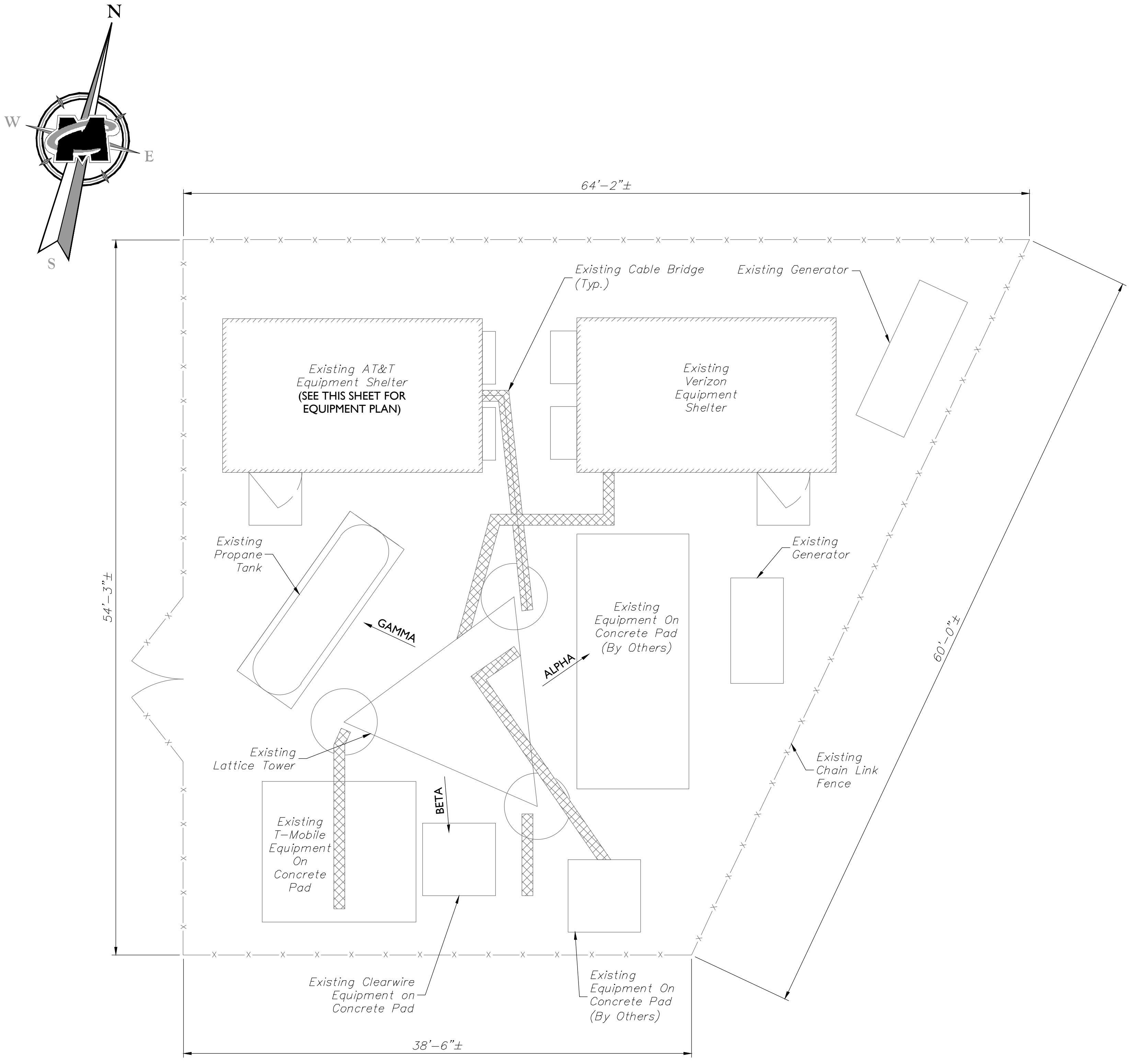
MILFORD
FA# 10071130
SITE # CTL05099

434 BOSTON POST ROAD
MILFORD, CT 06460
NEW HAVEN COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

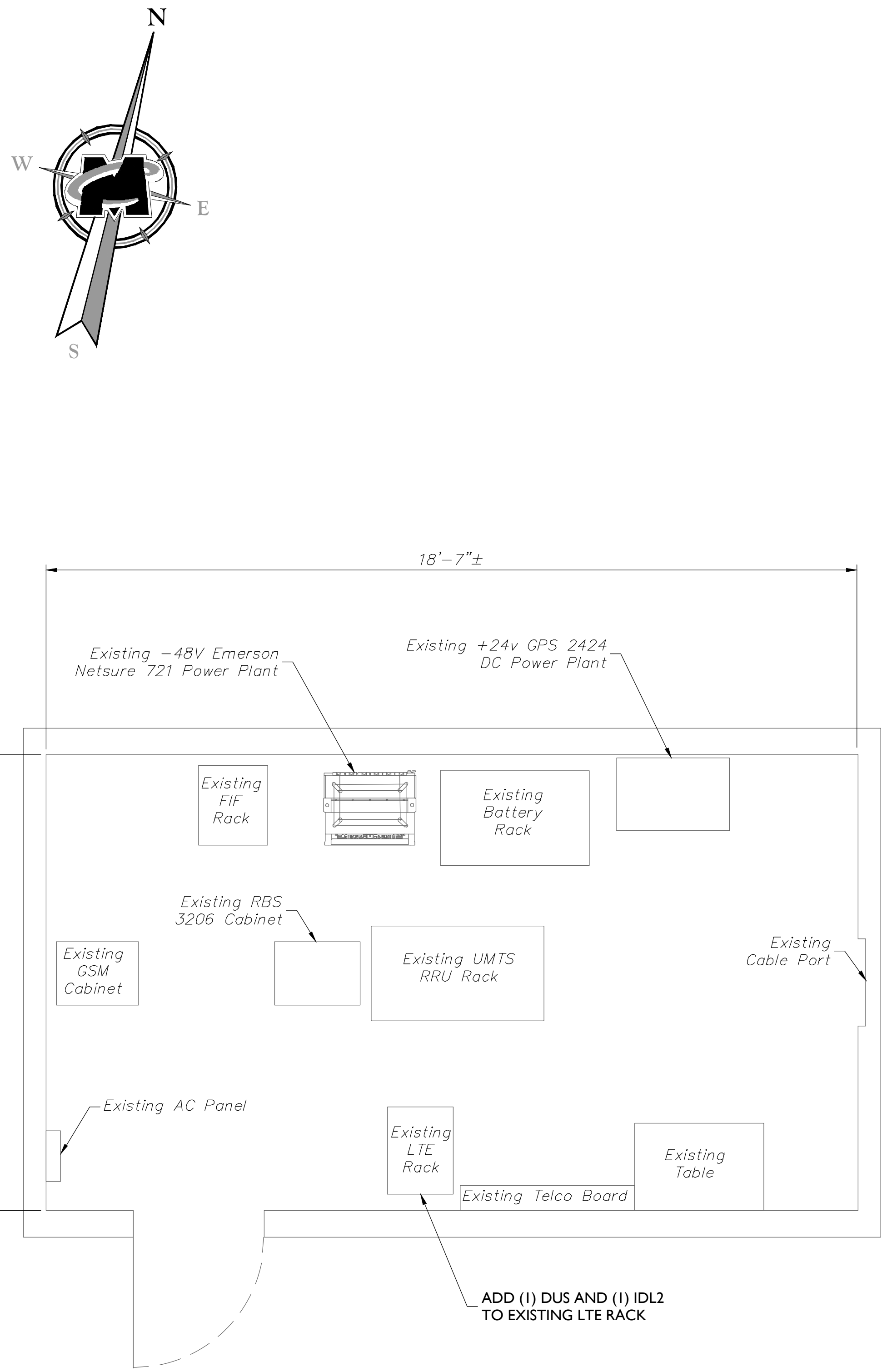
SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
GN-1



COMPOUND PLAN

GRAPHIC SCALE
5 0 2.5 5 10
(IN FEET)
SCALE: 1" = 5' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)



EQUIPMENT PLAN

GRAPHIC SCALE
2 0 1 2 4
(IN FEET)
SCALE: 1" = 2' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

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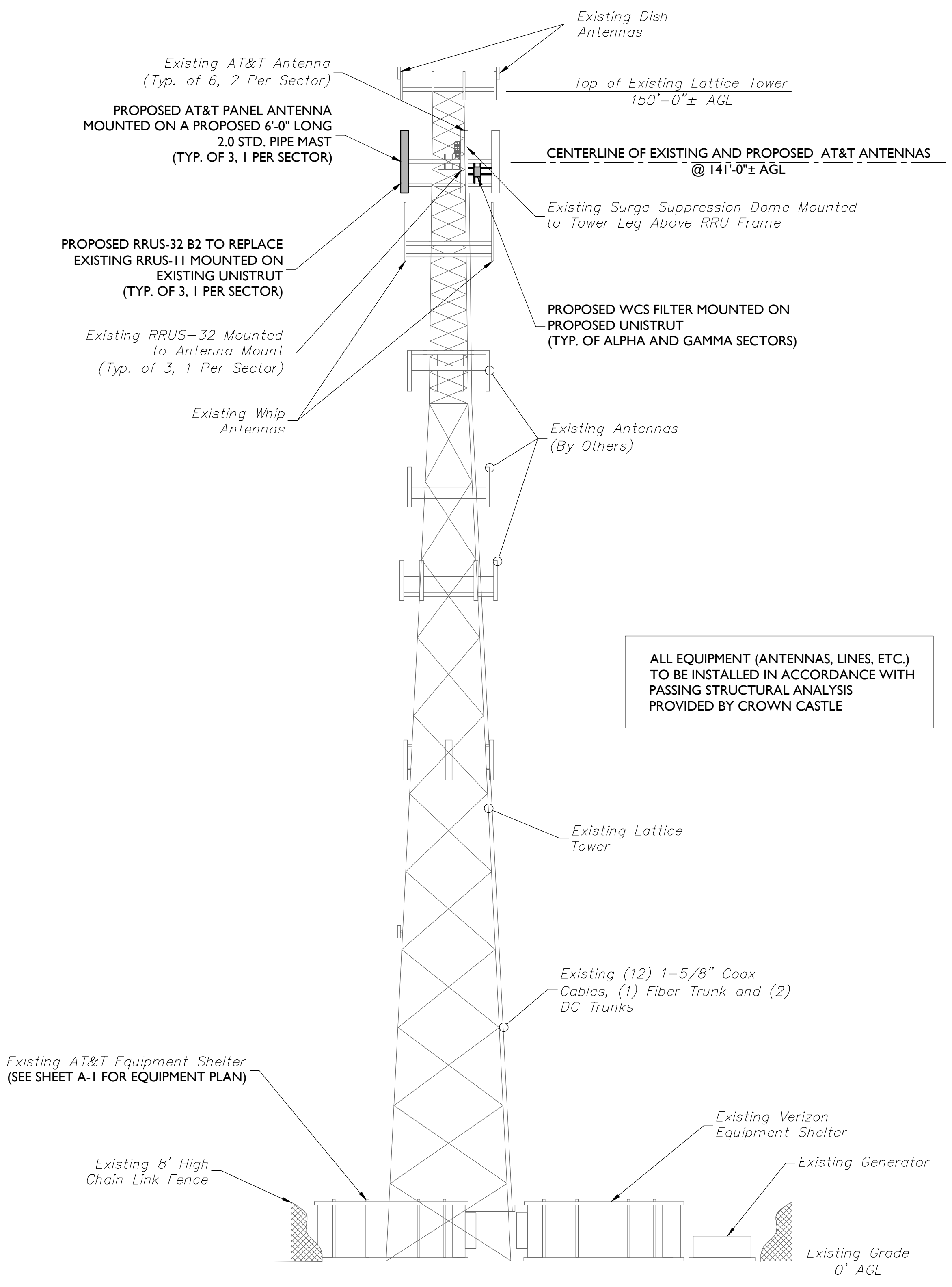
SHEET TITLE :
COMPOUND PLAN
AND EQUIPMENT
PLAN

SHEET NUMBER :
A-1



ALL EQUIPMENT (ANTENNAS, LINES, ETC.) TO BE INSTALLED IN ACCORDANCE WITH PASSING STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE

ELEVATION VIEW

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

SCALE: 1" = 10' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)

PROPOSED ANTENNA AND RRUS CONFIGURATION

SECTOR		EXISTING ANTENNA CONFIGURATION	PROPOSED ANTENNA CONFIGURATION	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	RRUS CONFIGURATION	STATUS
ALPHA	A1	Powerwave 7770	Powerwave 7770	UMTS 850/1900	REMAIN	55.00	11.00	5.00	35.00	30°	141'	-	-
	A2	CCI OPA-65R-LCUU-H4K	CCI OPA-65R-LCUU-H4K	WCS LTE	REMAIN	48.00	14.40	7.30	57.00	30°	141'	(1) RRUS-32 **(1) WCS-IMFQ-AMT FILTER**	REMAIN **NEW**
	A3	VACANT MAST	**VACANT MAST**		**REMOVE**	-	-	-	-	-	-	-	-
	A4	KMW AM-X-CD-14-65-OOT-RET	**Andrew SBNHH-1D65A**	**LTE 1900**	**NEW**	**55.00**	**11.90**	**7.10**	**33.50**	**30°**	**141'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**
BETA	B1	Powerwave 7770	Powerwave 7770	UMTS 850/1900	REMAIN	55.00	11.00	5.00	35.00	150°	141'	-	-
	B2	CCI OPA-65R-LCUU-H4K	CCI OPA-65R-LCUU-H4K	WCS LTE	REMAIN	48.00	14.40	7.30	57.00	150°	141'	(1) RRUS-32	REMAIN
	B3	VACANT MAST	**VACANT MAST**	-	**REMOVE**	-	-	-	-	-	-	-	-
	B4	KMW AM-X-CD-14-65-OOT-RET	**Andrew SBNHH-1D65A**	**LTE 1900**	**NEW**	**55.00**	**11.90**	**7.10**	**33.50**	**150°**	**141'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**
GAMMA	C1	Powerwave 7770	Powerwave 7770	UMTS 850/1900	REMAIN	55.00	11.00	5.00	35.00	270°	141'	-	-
	C2	CCI OPA-65R-LCUU-H4K	CCI OPA-65R-LCUU-H4K	WCS LTE	REMAIN	48.00	14.40	7.30	57.00	270°	141'	(1) RRUS-32 **(1) WCS-IMFQ-AMT FILTER**	REMAIN **NEW**
	C3	VACANT MAST	**VACANT MAST**	-	**REMOVE**	-	-	-	-	-	-	-	-
	C4	KMW AM-X-CD-14-65-OOT-RET	**Andrew SBNHH-1D65A**	**LTE 1900**	**NEW**	**55.00**	**11.90**	**7.10**	**33.50**	**270°**	**141'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**

ANTENNA SCHEDULE

NOTE:

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STRUCTURAL NOTES:

1. NO CONSTRUCTION OF THE PROPOSED LOADING SHOWN SHALL PROCEED UNTIL ADEQUACY OF THE EXISTING STRUCTURE AND FOUNDATION, INCLUDING THE PROPOSED AT&T ANTENNA MOUNTING CONFIGURATION SHOWN HEREIN, HAS BEEN COMPLETED.
2. THE STRUCTURE ELEVATION IS SHOWN FOR INFORMATIONAL PURPOSES ONLY AND MAY NOT REFLECT AS-BUILT FIELD CONDITIONS FOR ALL EXISTING INVENTORY LOADING/ANTENNAS/APPURTENANCES ON STRUCTURE. REFER TO THE LATEST STRUCTURAL ANALYSIS FOR EXISTING STRUCTURE LOADING AND THE PROPOSED METHOD OF ATTACHMENT OF THE PROPOSED ANTENNAS/CABLES.
3. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

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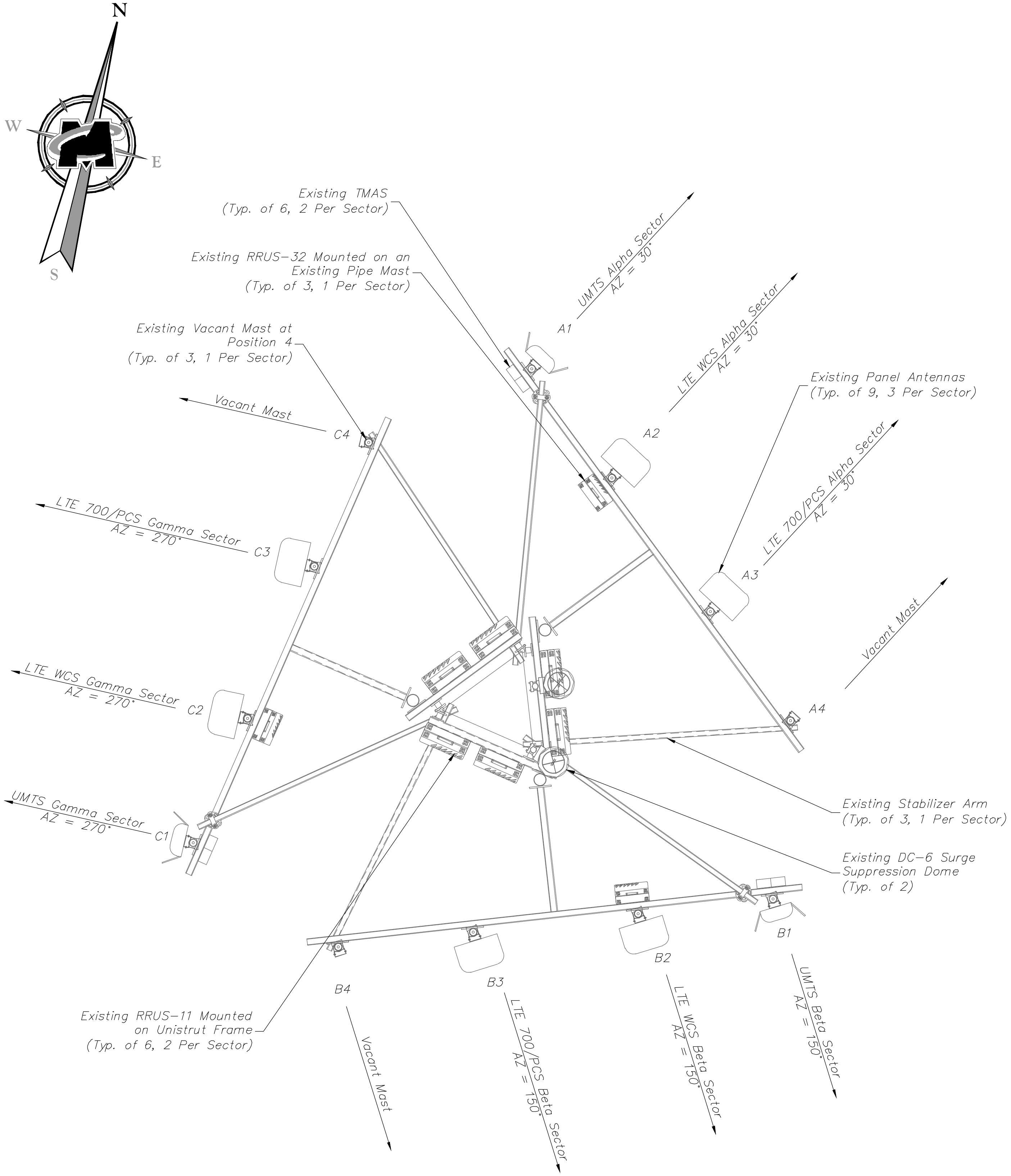
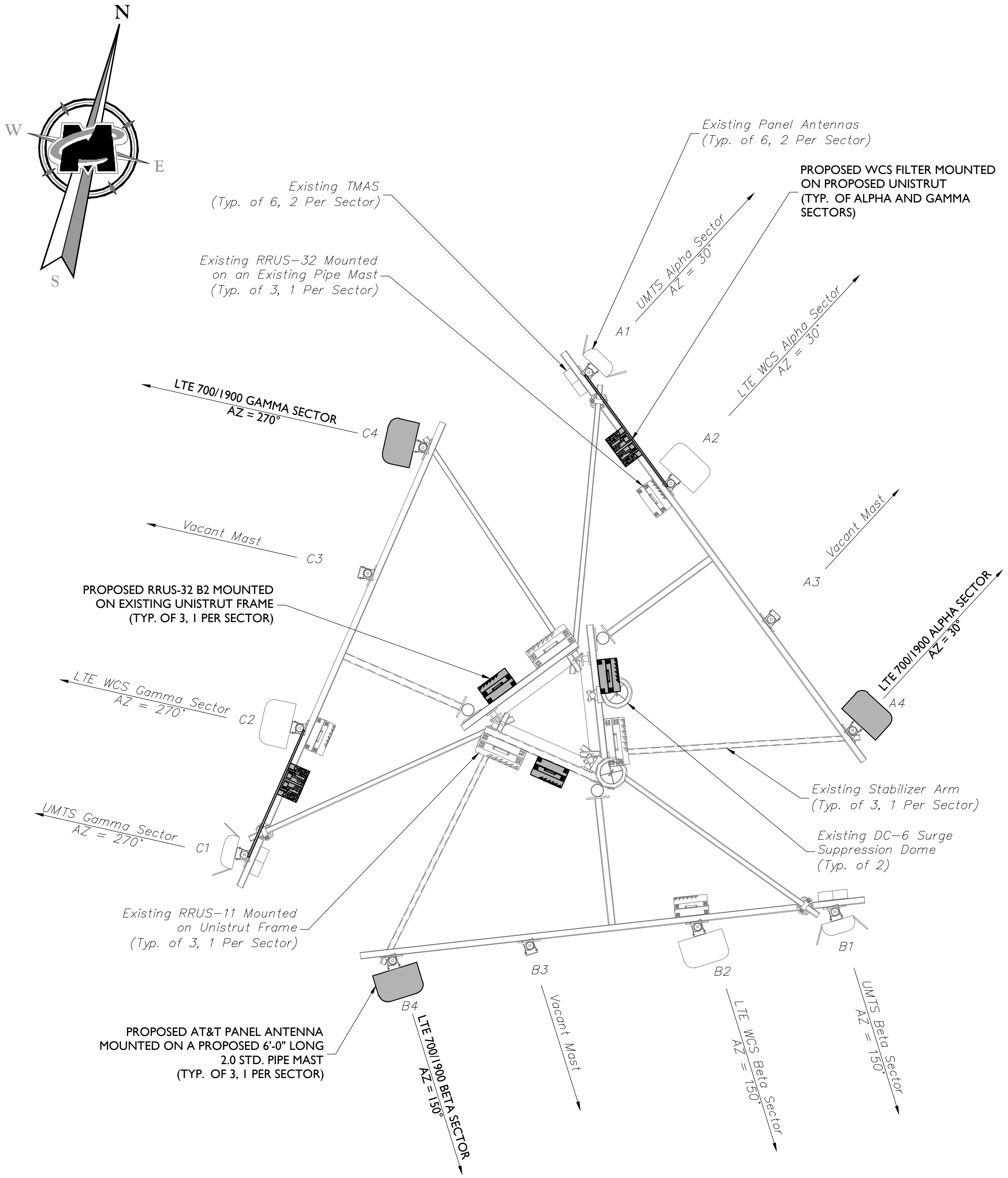
SHEET TITLE :
ELEVATION VIEW AND
ANTENNA SCHEDULE

SHEET NUMBER :
A-2



EXISTING - ANTENNA LAYOUT

NOT TO SCALE



PROPOSED - ANTENNA LAYOUT

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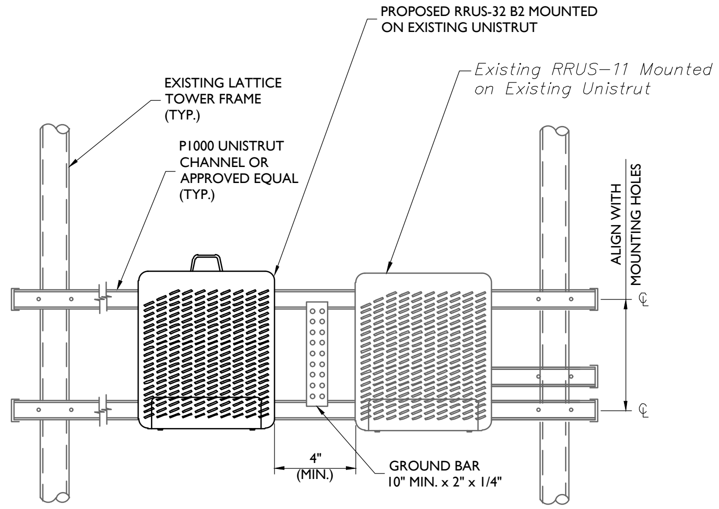
SHEET TITLE :
ANTENNA LAYOUTS

SHEET NUMBER :
A-3

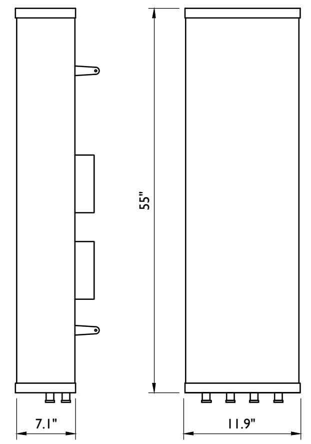


NOTES:

1. ALCATEL-LUCENT (ALU) VIA AT&T SUPPLIES THE RRUS AND DC-6. SUBCONTRACTOR SHALL SUPPLY ALL OTHER MATERIALS AND INSTALL ALL MOUNTING HARDWARE. ALU INSTALLS RRUS AND MAKES CABLE TERMINATIONS.
2. INSTALL VERTICAL UNISTRUT CHANNELS AS REQUIRED TO ALIGN FRAME WITH EQUIPMENT MOUNTING HOLES. FASTEN UNISTRUT CHANNELS TOGETHER WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
3. MOUNT RRU'S TO UNISTRUT PER MANUFACTURER'S SPECIFICATIONS.
4. NO PAINTING OF THE RRUS IS ALLOWED.

RRUS MOUNTED TO UNISTRUT FRAME DETAIL

NOT TO SCALE

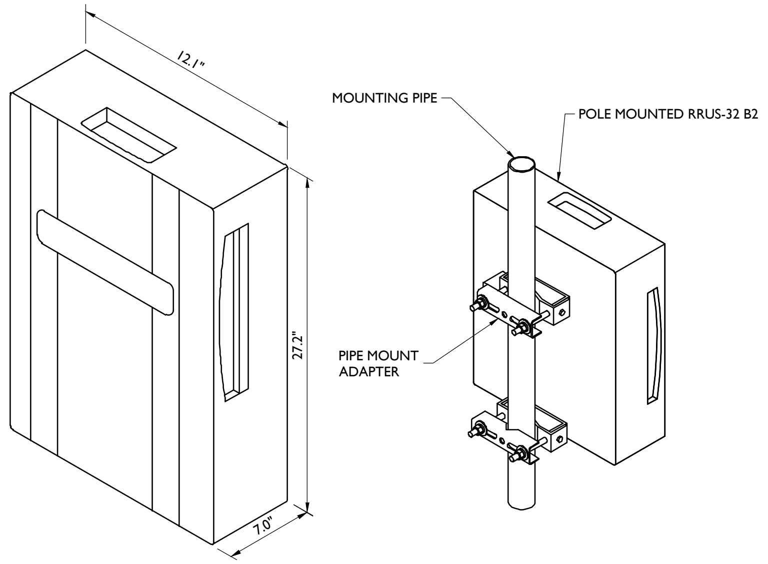


WEIGHT = 33.5 LBS

SBNHH-1D65A

ANTENNA DETAIL

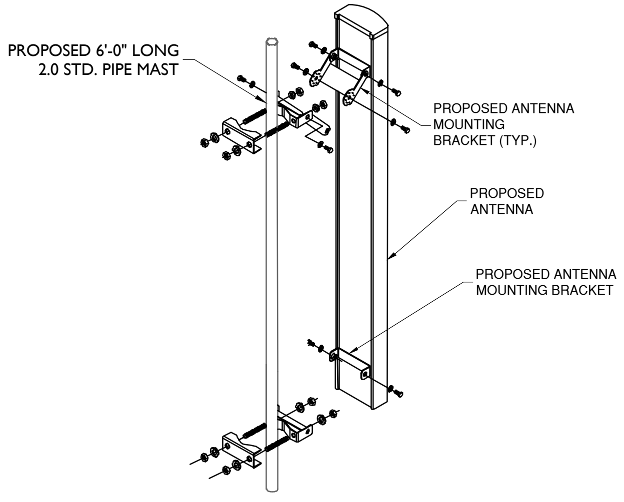
NOT TO SCALE



RRUS—32 B2 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0" (INCLUDES SUNSHIELD)
WEIGHT: 53 LBS

RRUS-32 B2 DETAIL

NOT TO SCALE



ANTENNA MOUNTING DETAIL

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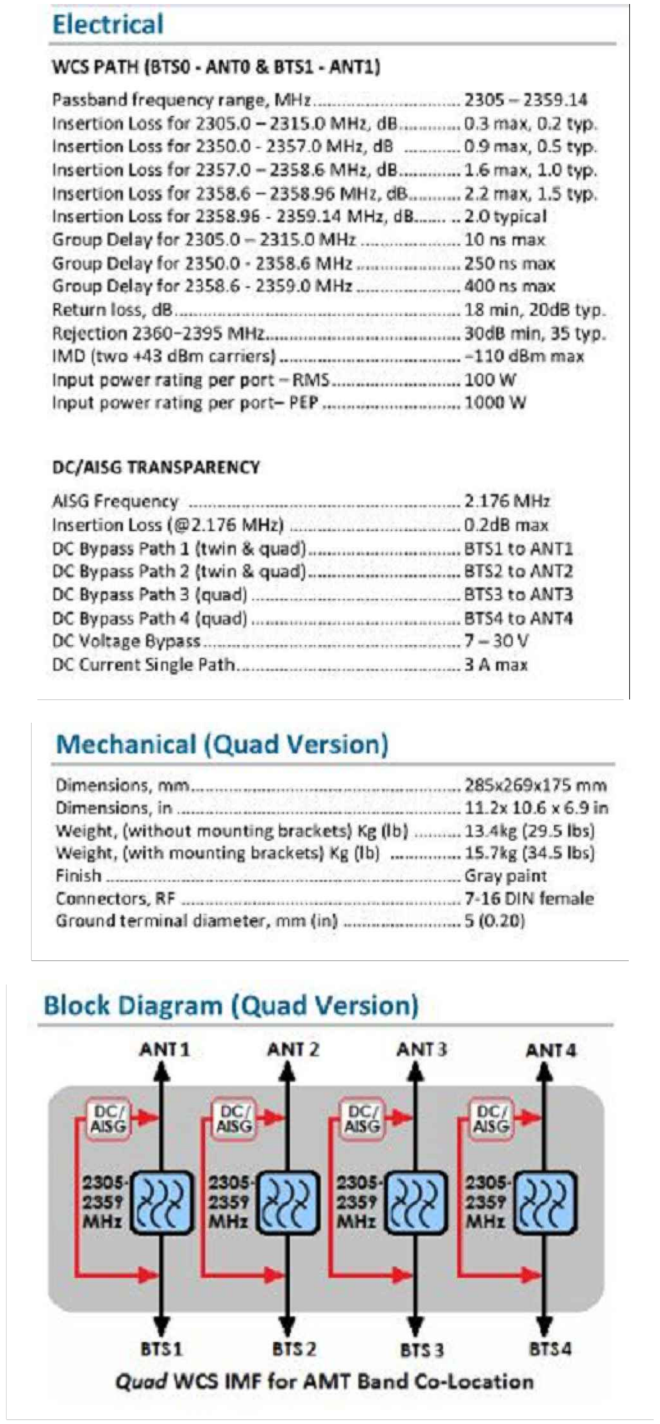
SHEET TITLE : DETAILS

SHEET NUMBER : A-4

NOTES:

1. ALL UNISTRUT CHANNELS SHALL BE P1000 UNLESS OTHERWISE NOTED.
2. ALL FIELD CUT ENDS SHALL BE FIELD GALVANIZED ACCORDING TO ATSM-A780.
3. ALL FASTENERS BETWEEN UNISTRUT CONNECTIONS ARE 1/2" Ø. ALL DRILLED HOLES SHALL BE 9/16" Ø.
4. MOUNT WCS FILTER TO UNISTRUT WITH 3/8" Ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR (4) PER DEVICE, THROUGH MANUFACTURER'S MOUNTING HOLES, SUBCONTRACTOR SHALL SUPPLY. REFER TO THE MANUFACTURER'S WRITTEN SPECIFICATIONS FOR STEP-BY-STEP INSTRUCTIONS FOR SECURING FILTER TO UNISTRUT FRAMES.
5. PART NUMBERS SHOWN ARE UNISTRUT MANUFACTURER OR APPROVED EQUAL.



Electrical

WCS PATH (BTS0 - ANT0 & BTS1 - ANT1)

Passband frequency range, MHz	2305 – 2359.14
Insertion Loss for 2305.0 – 2315.0 MHz, dB	0.3 max, 0.2 typ.
Insertion Loss for 2350.0 - 2357.0 MHz, dB	0.9 max, 0.5 typ.
Insertion Loss for 2357.0 – 2358.6 MHz, dB	1.6 max, 1.0 typ.
Insertion Loss for 2358.6 – 2358.96 MHz, dB	2.2 max, 1.5 typ.
Insertion Loss for 2358.96 - 2359.14 MHz, dB	2.0 typical
Group Delay for 2305.0 – 2315.0 MHz	10 ns max
Group Delay for 2350.0 - 2358.6 MHz	250 ns max
Group Delay for 2358.6 - 2359.0 MHz	400 ns max
Return loss, dB	18 min, 20dB typ.
Rejection 2360–2395 MHz	30dB min, 35 typ.
IMD (two +43 dBm carriers)	–110 dBm max
Input power rating per port – RMS	100 W
Input power rating per port– PEP	1000 W

DC/AISG TRANSPARENCY

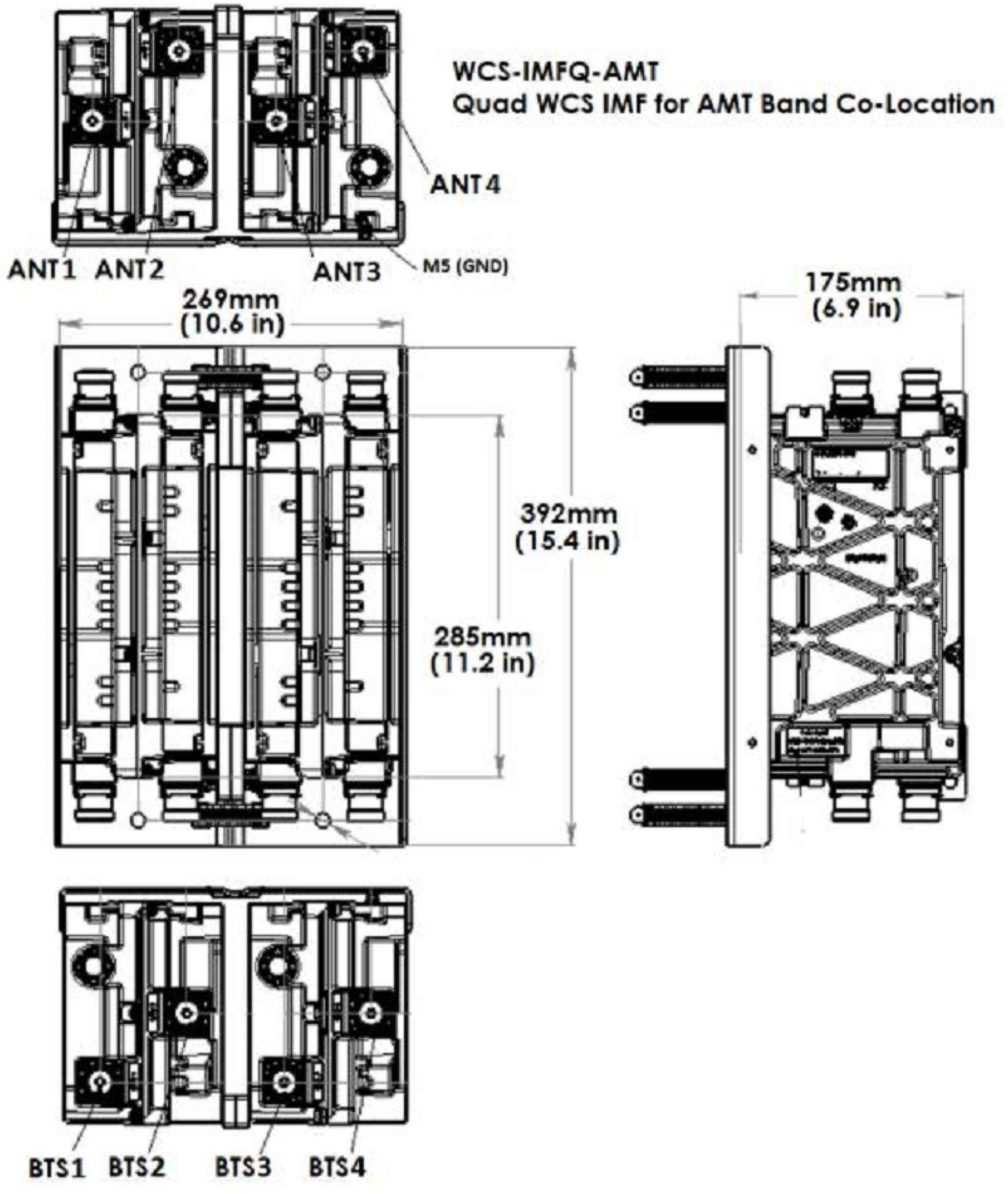
AISG Frequency	2.176 MHz
Insertion Loss (@2.176 MHz)	0.2dB max
DC Bypass Path 1 (twin & quad)	BTS1 to ANT1
DC Bypass Path 2 (twin & quad)	BTS2 to ANT2
DC Bypass Path 3 (quad)	BTS3 to ANT3
DC Bypass Path 4 (quad)	BTS4 to ANT4
DC Voltage Bypass	7 – 30 V
DC Current Single Path	3 A max

Mechanical (Quad Version)

Dimensions, mm	285x269x175 mm
Dimensions, in	11.2x 10.6 x 6.9 in
Weight, (without mounting brackets) Kg (lb)	13.4kg (29.5 lbs)
Weight, (with mounting brackets) Kg (lb)	15.7kg (34.5 lbs)
Finish	Gray paint
Connectors, RF	7-16 DIN female
Ground terminal diameter, mm (in)	5 (0.20)

Block Diagram (Quad Version)

Quad WCS IMF for AMT Band Co-Location



WCS - IMFQ - AMT FILTER DETAILS

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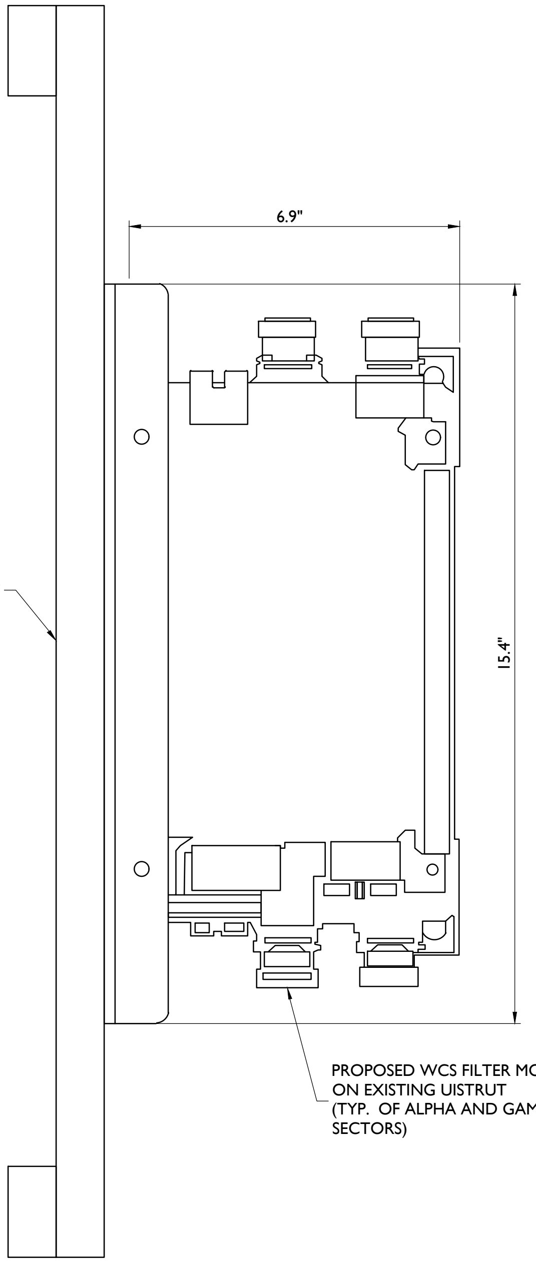

PROPOSED UNISTRUT

PROPOSED WCS FILTER MOUNTED ON EXISTING UNISTRUT (TYP. OF ALPHA AND GAMMA SECTORS)

WCS - IMFQ - AMT FILTER MOUNTING DETAIL

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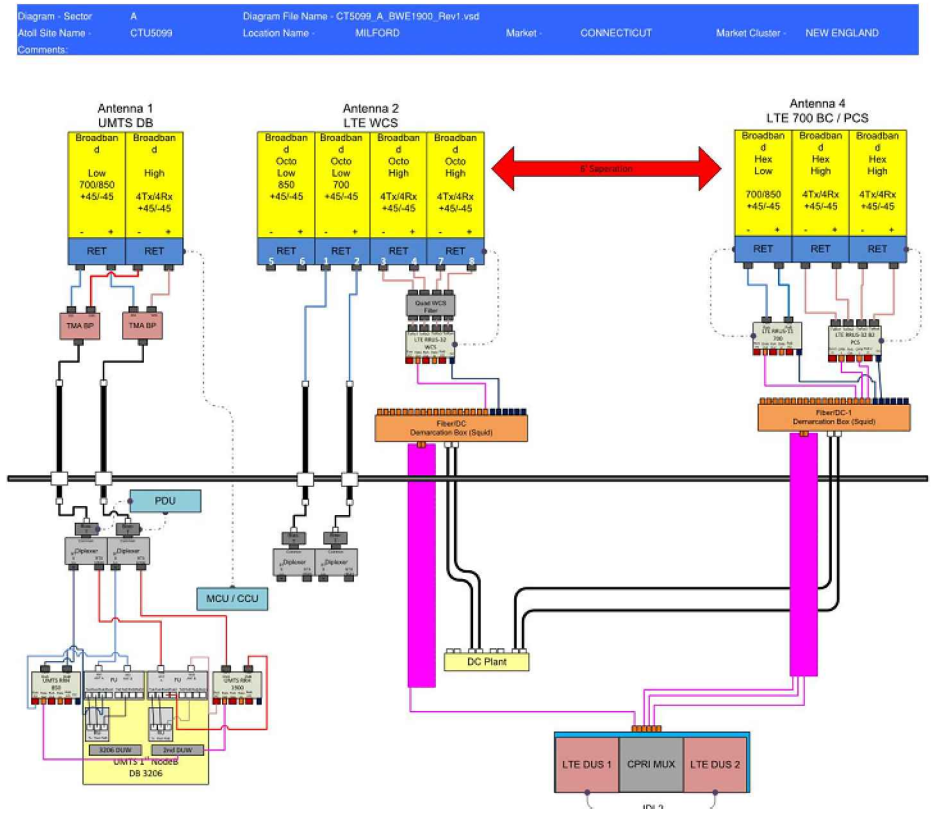
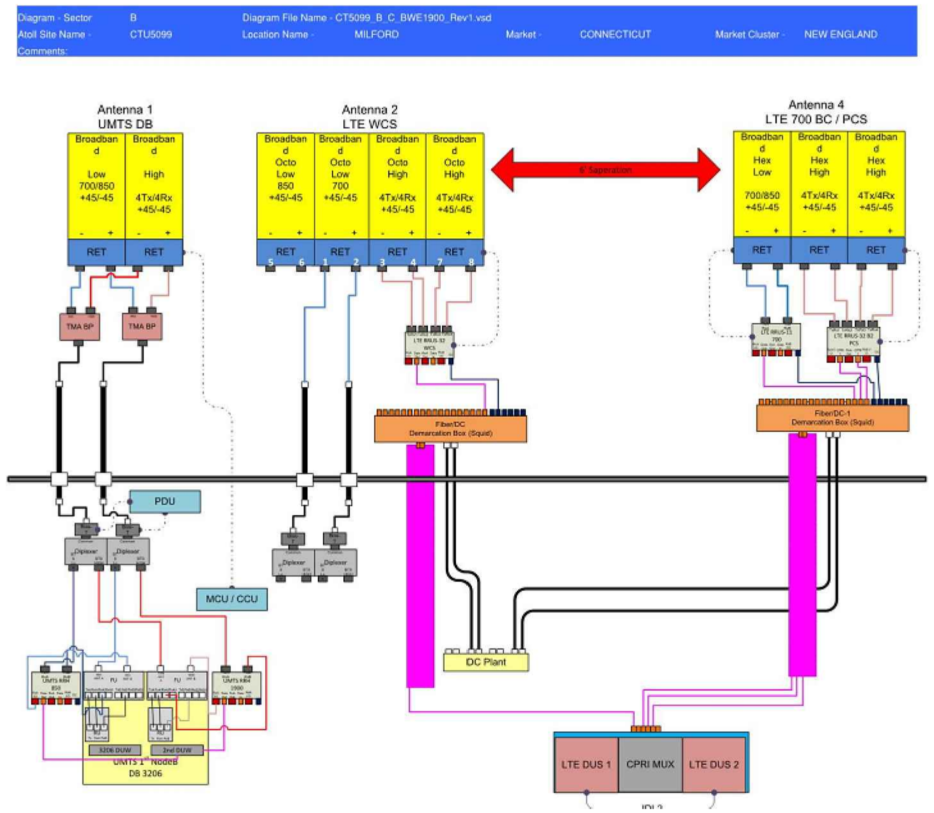
SHEET TITLE : DETAILS

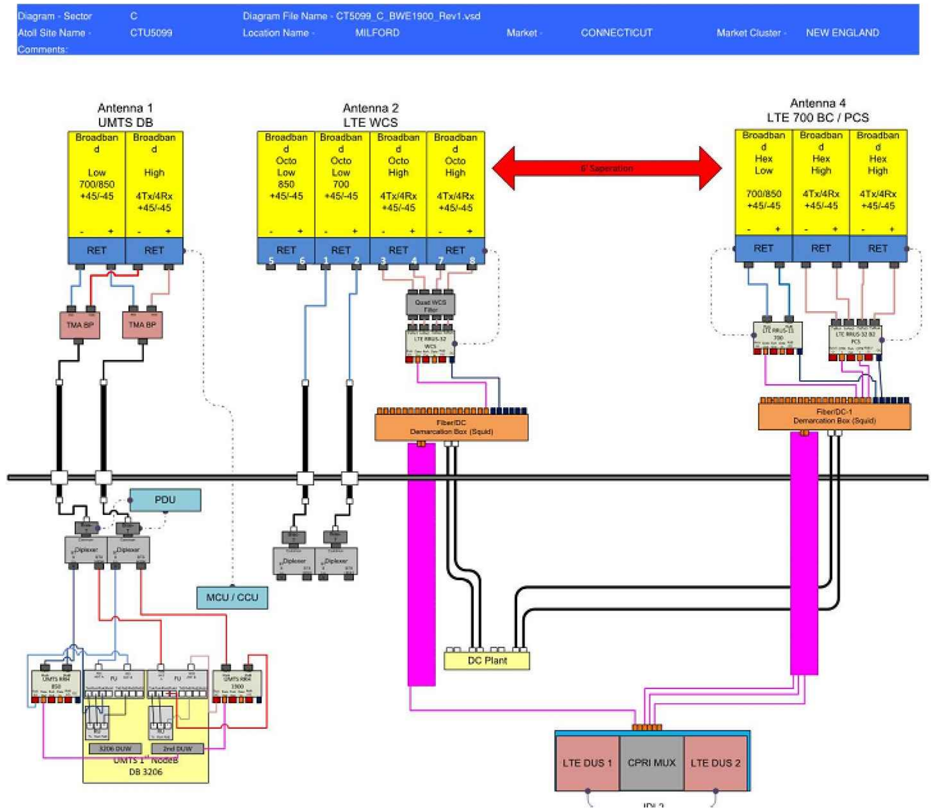
SHEET NUMBER : A-5



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

BASED ON RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND_CONNECTICUT_CTU5099_2017-LTE-Multi-Carrier_1xBBU-RRH-Add_mm093q_PTN_10071130_5798_04-13-2016_Preliminary-Submitted-for-Approval_v2.00"

RF PLUMBING DIAGRAMS

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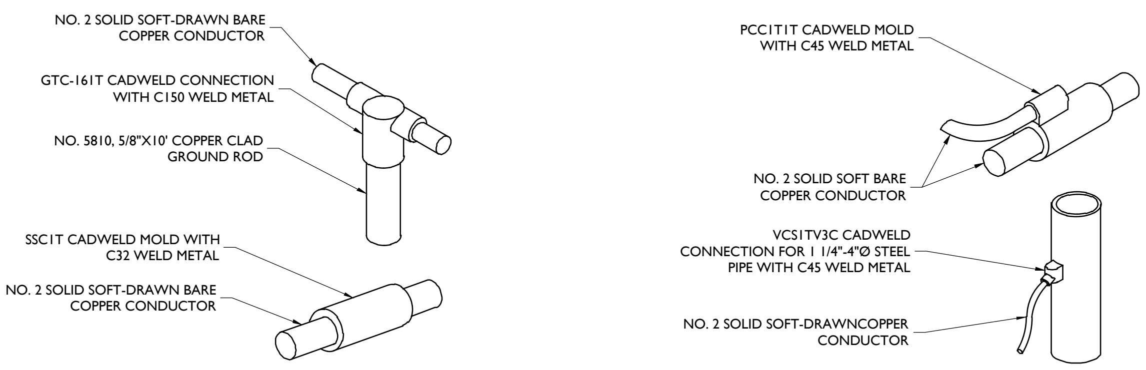
SHEET TITLE :
RF PLUMBING DIAGRAMS

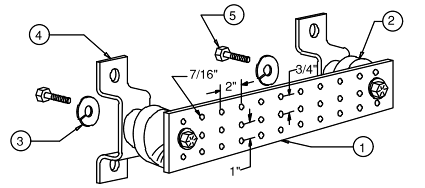
SHEET NUMBER :
A-6



CADWELD DETAILS

NOT TO SCALE

NOT TO SCALE



LEGEND

1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4

3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8

4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-5056

5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

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

SECTION "P" - SURGE PRODUCERS

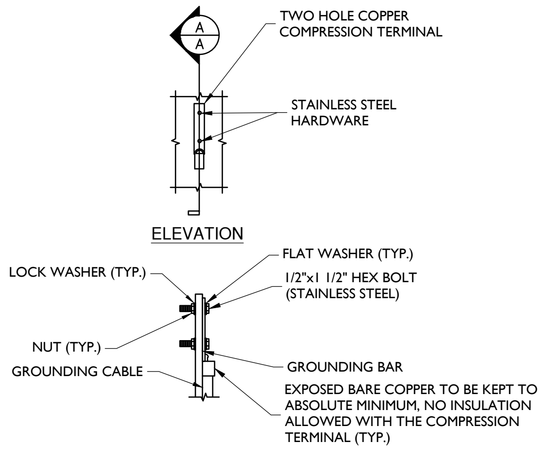
CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLT RETURN BAR (#2)
RECTIFIER FRAMES.

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)

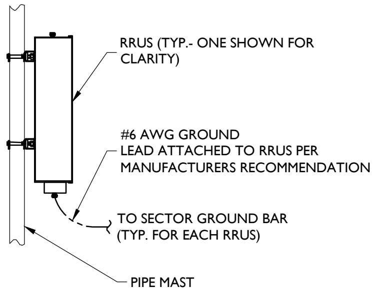
MASTER GROUND BAR

NOT TO SCALE



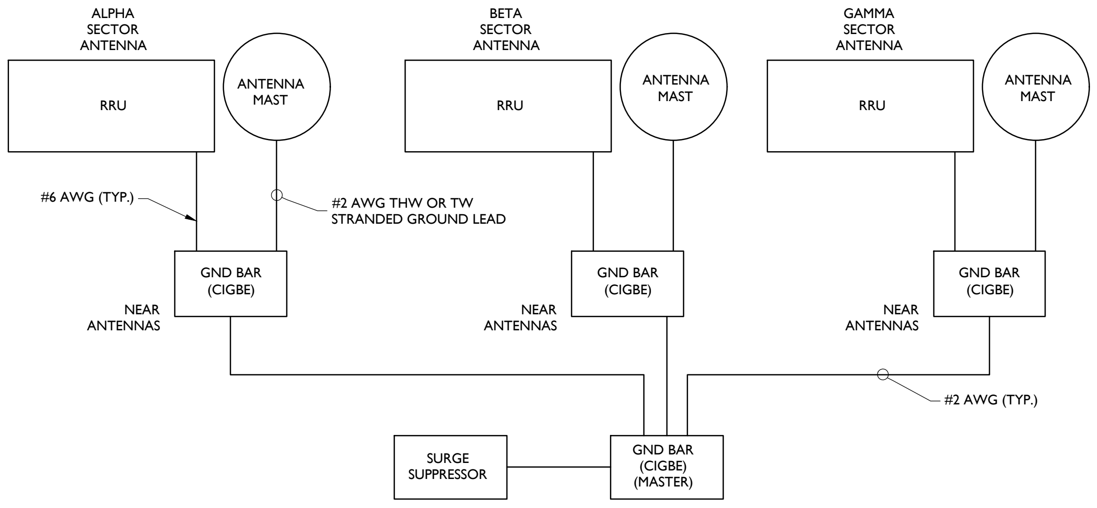
TYPICAL GROUND BAR CONNECTION DETAIL

NOT TO SCALE



RRH GROUNDING

NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM

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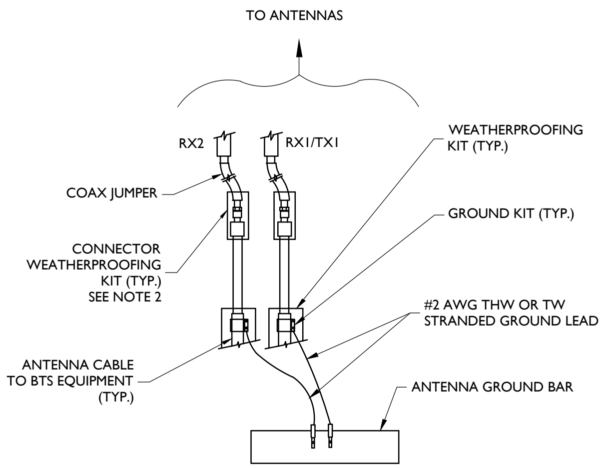
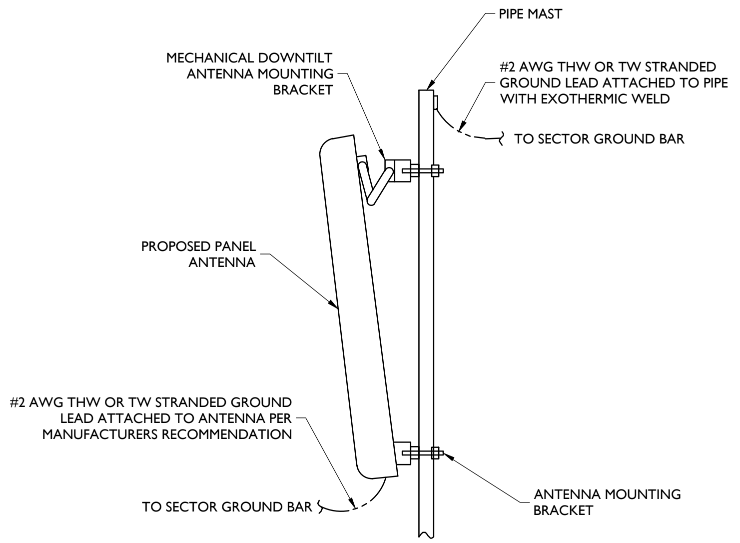


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

TYPICAL GROUND WIRE TO GROUNDING BAR

NOT TO SCALE



ANTENNA GROUNDING

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811
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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	16946018A

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1	01/25/17	FOR CONSTRUCTION	RA	FEP
0	12/23/16	ISSUED FOR REVIEW	AJC	FEP
REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28188

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

SITE NAME:

MILFORD
FA# 10071130
SITE # CTL05099

434 BOSTON POST ROAD
MILFORD, CT 06460
NEW HAVEN COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
GROUNDING DETAILS

SHEET NUMBER :
G-1

B+T GRP

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

October 03, 2016

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6607

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL05099
	Carrier Site Name:	Milford
Crown Castle Designation:	**Crown Castle BU Number:**	842870
	Crown Castle Site Name:	MILFORD
	Crown Castle JDE Job Number:	397088
	Crown Castle Work Order Number:	1302866
	Crown Castle Application Number:	361977 Rev. 2
Engineering Firm Designation:	**B+T Group Project Number:**	91292.007.01
Site Data:	**434 Boston Post Road, Milford, New Haven County, CT** **Latitude *41° 13' 42.69"*, Longitude *-73° 4' 12.47"*** **150 Foot - Self Support Tower**	

Dear Charles McGuirt,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 950473, in accordance with application 361977, revision 2.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment	**Sufficient Capacity**

Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

All equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *B+T Group* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully submitted by:
B+T Engineering, Inc.

Jacob Johnson, E.I.T.
Project Engineer

Chad E. Tuttle, P.E.
Engineer of Record
COA: PEC.0001564 Expires: 02/10/2017

CHAD TUTTLE
No. 28924

10-3-16

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1) INTRODUCTION

This tower is a 150 ft. Self-Support tower designed by PiRod Inc. in March of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. This tower has been modified by GPD Group in 2012 and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 0.75-inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
141.0	141.0	3	Andrew	SBNHH-1D65A	2 1	7/8 3/8	--
		3	Cci Antennas	OPA-65R-LCUU-H4			
		1	Commscope	WCS-IMFQ-AMT			
		3	Ericsson	RRUS 32 B2			
		3	Ericsson	RRUS 32 B30			
		3	Powerwave Tech.	LGP21401			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	160.0	2	Sinclair	SC226-SFXSNM	6 1	5/8 3/8	1
	151.0	2	Radiowaves	HPLPD1-18			
	150.0	1	--	Platform Mount [LP 405-1]			
141.0	141.0	**3**	**Ericsson**	**RRUS 11 B12**	**--**	**--**	**3**
		3	**Kmw Comm.**	**AM-X-CD-14-65-00T-RET**			
		3	**Powerwave Tech.**	**LGP21401**			
		3	**Powerwave Tech.**	**7020.00**			
		3	**Powerwave Tech.**	**7770.00**			
		3	Ericsson	RRUS 11 B2	12 2 1	1-5/8 5/8 3/8	1
		3	Powerwave Tech.	7020.00			
		3	Powerwave Tech.	7770.00			
		3	Powerwave Tech.	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		1	--	Sector Mount [SM 410-3]			
130.0	130.0	2	Terrawave	M5160160P10006	2	7/8	1
		2	--	Side Arm Mount [SO 301-1]			
118.0	128.0	1	Sinclair	SC229-SFXLDF	2	7/8	1
		1	Sinclair	SC320			
	118.0	2	--	Side Arm Mount [SO 306-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
114.0	114.0	1	--	Sector Mount [SM 307-3]	13	1-5/8	1
	112.0	3	Commscope	LNX-6515DS-VTM			
		3	Ericsson	ERICSSON AIR 21 B2A B4P			
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	KRY 112 71			
		3	Ericsson	RRUS 11 B12			
103.0	103.0	3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER	--	--	1
		3	Alcatel Lucent	PCS 1900MHz 2x40W			
100.0	100.0	3	Rfs Celwave	APXVSPP18-C-A20	3	1-1/4	1
		1	--	Sector Mount [SM 406-3]			
88.0	90.0	6	Antel	BXA-171063/8CF	12	1-5/8	1
		6	Antel	LPA-80063/4CF			
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z			
		6	Rfs Celwave	FD9R6004/2C-3L			
		3	Swedcom	SWCP 2x5514			
	88.0	1	--	Sector Mount [SM 408-3]			
65.0	65.0	3	Rfs Celwave	APXV18-206517S-C	6	1-5/8	2
50.0	50.0	1	Pctel	GPS-TMG-HR-26NCM	1	1/2	1

Notes:
1) Existing Equipment
2) Abandoned Equipment; Considered In This Analysis
3) Equipment To Be Removed; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150	150	4	Celwave	PD201	7	1 5/8
		3	Scala	PR950		
		1	Generic	LP Platform		
140	140	12	Allgon	7184	12	1 5/8
		3	Generic	T-Frames		
125	125	1	Celwave	PD201	1	1 5/8
		1	Generic	3’ Stand off		
115	115	1	Celwave	PD201	2	1 5/8
		1	Celwave	PD220-DT		
		2	Generic	3’ Stand off		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate, Rev# 2	361977	CCI Sites
Tower Manufacturer Drawing	PiRod Inc., Eng. File No. A-116849-Q-92250	4480661	CCI Sites
Tower Modification Drawing	GPD Group, Job No. 2012762.86,	4713244	CCI Sites
Post Modification Inspection	GPD Group, Job No. 2012858.01,	4713239	CCI Sites
Foundation Drawing	PiRod Inc., Eng. File No. A-116849-Q-92250	4480652	CCI Sites
Geotech Report	Clarence Welti Associates, Date: 01/17/2000	5359323	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 09/22/2016	CCI Sites

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer’s specifications.
2) The tower and structures have been maintained in accordance with the manufacturer’s specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Mount areas and weights are assumed based on photographs provided.
5) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically, and must be replaced if damaged or cracked. Refer to crown document ENG-BUL-10122, Tower Base Plate Grout Inspection and Classification.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	150 - 147.583	Leg	1 1/2	1	-3.853	51.350	7.5	Pass
T2	147.583 - 130	Leg	1 1/2	13	-23.936	51.350	46.6	Pass
T3	130 - 110	Leg	2	71	-62.652	111.705	56.1	Pass
T4	110 - 100	Leg	Pirod 105244	135	-68.987	142.493	48.4	Pass
T5	100 - 80	Leg	Pirod 105216	146	-106.416	142.493	74.7	Pass
T6	80 - 60	Leg	Pirod 105217	167	-160.237	214.859	74.6	Pass
T7	60 - 40	Leg	Pirod 105218	185	-201.445	300.681	67.0	Pass
T8	40 - 20	Leg	Pirod 105218	202	-240.868	300.681	80.1	Pass
T9	20 - 0	Leg	Pirod 105219	217	-277.581	399.868	69.4	Pass
T1	150 - 147.583	Diagonal	3/4	7	-1.396	5.311	26.3	Pass
T2	147.583 - 130	Diagonal	3/4	22	-2.969	4.879	60.9	Pass
T3	130 - 110	Diagonal	7/8	79	-5.169	7.820	66.1	Pass
T4	110 - 100	Diagonal	L2 1/2x2 1/2x3/16	140	-8.576	13.558	63.2 68.9 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T5	100 - 80	Diagonal	L2 1/2x2 1/2x3/8	155	-14.230	20.328	70.0	Pass
T6	80 - 60	Diagonal	L3x3x3/16	174	-8.357	14.947	55.9 72.0 (b)	Pass
T7	60 - 40	Diagonal	L3x3x3/16	189	-8.317	12.112	68.7 71.3 (b)	Pass
T8	40 - 20	Diagonal	L3x3x5/16	208	-9.027	15.594	57.9	Pass
T9	20 - 0	Diagonal	L3x3x5/16	222	-10.434	12.868	81.1	Pass
T2	147.583 - 130	Horizontal	7/8	35	-0.329	5.109	6.4	Pass
T3	130 - 110	Horizontal	3/4	127	-0.714	2.563	27.9	Pass
T5	100 - 80	Horizontal	L3x3x3/16	159	-8.951	17.168	52.1 94.3 (b)	Pass
T1	150 - 147.583	Top Girt	5x1/2	4	-0.949	9.674	9.8	Pass
T2	147.583 - 130	Top Girt	7/8	17	-0.112	5.917	1.9	Pass
T3	130 - 110	Top Girt	7/8	74	-1.281	4.878	26.3	Pass
T4	110 - 100	Top Girt	L3x3x3/16	137	0.885	28.679	3.1 7.6 (b)	Pass
T5	100 - 80	Top Girt	L3x3x3/16	150	-6.178	19.238	32.1 65.3 (b)	Pass
T6	80 - 60	Top Girt	L3x3x3/16	171	-6.558	13.961	47.0 68.1 (b)	Pass
T2	147.583 - 130	Bottom Girt	7/8	19	-1.209	4.831	25.0	Pass
T3	130 - 110	Bottom Girt	7/8	76	-1.537	3.967	38.7	Pass
							Summary	
						Leg (T8)	80.1	Pass
						Diagonal (T9)	81.1	Pass
						Horizontal (T5)	94.3	Pass
						Top Girt (T6)	68.1	Pass
						Bottom Girt (T3)	38.7	Pass
						Bolt Checks	94.3	Pass
						Rating =	94.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	43.7	Pass
1	Base Foundation (Structure)	Base	14.7	Pass
1	Base Foundation (Soil Interaction)	Base	36.9	Pass

Structure Rating (max from all components) =	94.3%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

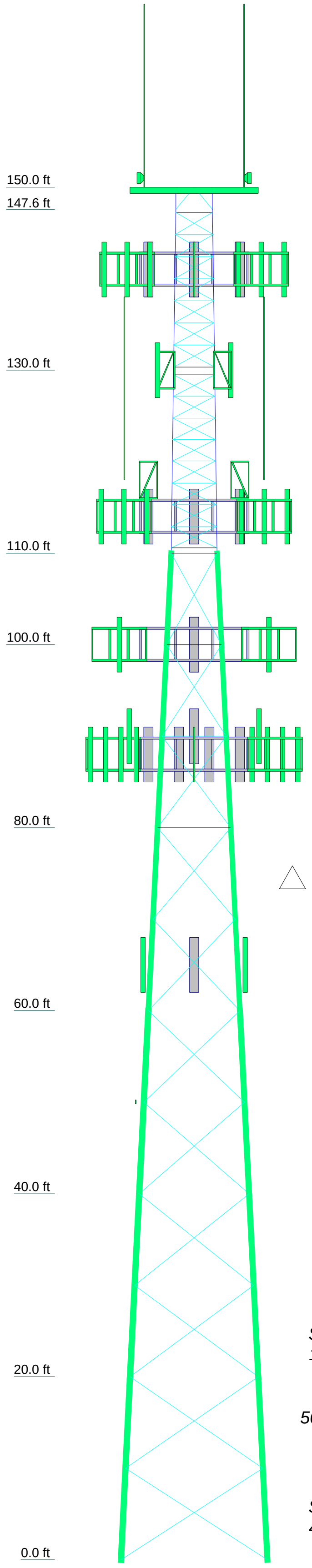
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the final load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	SR 1 1/2	A572-50	SR 3/4	A572-50	B	C	C	4	8 @ 2.41667	0.2
T2					SR 7/8	SR 7/8	SR 7/8	4.0625		0.7
T3	SR 2		SR 7/8				SR 3/4	4.5	8 @ 2.36458	1.3
T4	Pirod 105244		A	A36	L3x3x3/16	N.A.	N.A.	5	11 @ 10	1.1
T5	Pirod 105216		L2 1/2x2 1/2x3/8				L3x3x3/16	6		2.6
T6	Pirod 105217		L3x3x3/16					8		2.6
T7	Pirod 105218				N.A.		N.A.	10		3.0
T8			L3x3x5/16					12		3.5
T9	Pirod 105219							14		4.2
								16		19.2



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	C	N.A.
B	5x1/2		

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 New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0'
8. TOWER RATING: 94.3%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 288 K
SHEAR: 31 K

UPLIFT: -254 K
SHEAR: 28 K

AXIAL
160 K
SHEAR
15 K
MOMENT
1233 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 0.750 in ICE

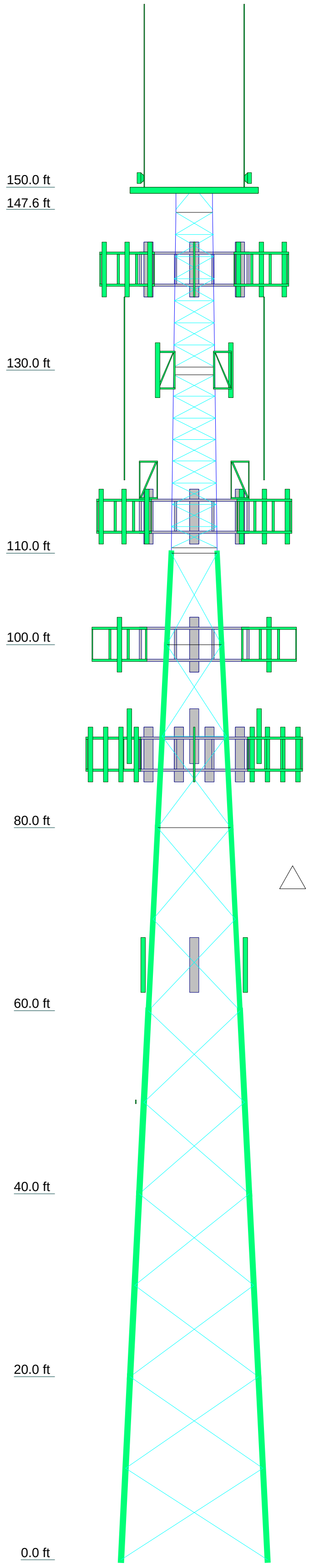
AXIAL
50 K
SHEAR
47 K
MOMENT
3767 kip-ft

TORQUE 6 kip-ft
REACTIONS - 97 mph WIND

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: **91292.006.01 - MILFORD, CT (BU# 84287**		
Project:		
Client: Crown Castle	Drawn by: Manasa	App'd:
Code: TIA-222-G	Date: 10/01/16	Scale: NTS
Path: C:\Users\Indevor\Desktop\Compile 91292 842870 Milford---Manasa-----Akshay---OCD\Tnx 007 01\91292 007 01 MILFORD CT---With horizontal.eri		Dwg No. E-1

Section	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Pirod 105219	Pirod 105218		Pirod 105217	Pirod 105216	Pirod 105244	SR 2	SR 1 1/2	
Leg Grade	A572-50								
Diagonals	L3x3x5/16		L3x3x3/16		L2 1/2x2 1/2x3/8	A	SR 7/8	SR 3/4	
Diagonal Grade	A36						A572-50		
Top Girts	N.A.			L3x3x3/16			SR 7/8		B
Bottom Girts	N.A.						SR 7/8		C
Horizontals	N.A.				L3x3x3/16	N.A.	SR 3/4	SR 7/8	C
Face Width (ft) 16	14	12	10	8	6	5	4.5	4.0625	4
# Panels @ (ft)	11 @ 10						8 @ 2.36458	8 @ 2.41667	
Weight (K) 19.2	4.2	3.5	3.0	2.6	2.6	1.1	1.3	0.7	0.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
(3) 6' x 2" Mount Pipe (E)	150
(3) 6' x 2" Mount Pipe (E)	150
(3) 6' x 2" Mount Pipe (E)	150
SC226-SFXSNM (E-CL per TIA)	150
SC226-SFXSNM (E-CL per TIA)	150
1' x 6" x 3" (E-Camera)	150
Platform Mount [LP 405-1] (E)	150
HPLPD1-18 (E-Per photo)	150
HPLPD1-18 (E-Per photo)	150
SBNHH-1D65A w/ Mount Pipe (P)	141
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	141
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	141
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	141
LGP21401 (P)	141
LGP21401 (P)	141
LGP21401 (P)	141
RRUS 32 B2 (P)	141
RRUS 32 B2 (P)	141
RRUS 32 B2 (P)	141
RRUS 32 B30 (P)	141
RRUS 32 B30 (P)	141
RRUS 32 B30 (P)	141
WCS-IMFQ-AMT (P)	141
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7770.00 w/ Mount Pipe (E)	141
7770.00 w/ Mount Pipe (E)	141
LGP21401 (E)	141
LGP21401 (E)	141
LGP21401 (E)	141
7020.00 (E)	141
7020.00 (E)	141
7020.00 (E)	141
RRUS 11 B2 (E)	141
RRUS 11 B2 (E)	141
RRUS 11 B2 (E)	141
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KRY 112 71 (E)	114
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RRUS 11 B12 (E)	114
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APXVSPP18-C-A20 w/ Mount Pipe (E)	100
6' x 2" Mount Pipe (E-Empty pipe as per photo)	100
6' x 2" Mount Pipe (E-Empty pipe as per photo)	100
6' x 2" Mount Pipe (E-Empty pipe as per photo)	100
Sector Mount [SM 406-3] (E)	100
APXVSPP18-C-A20 w/ Mount Pipe (E)	100
APXVSPP18-C-A20 w/ Mount Pipe (E)	100
(2) BXA-171063/8CF w/ Mount Pipe (E)	88
SWCP 2x5514 w/ Mount Pipe (E)	88
SWCP 2x5514 w/ Mount Pipe (E)	88
SWCP 2x5514 w/ Mount Pipe (E)	88
(2) LPA-80063/4CF w/ Mount Pipe (E)	88
(2) LPA-80063/4CF w/ Mount Pipe (E)	88
(2) LPA-80063/4CF w/ Mount Pipe (E)	88
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(2) FD9R6004/2C-3L (E)	88
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(2) BXA-171063/8CF w/ Mount Pipe (E)	88
APXV18-206517S-C w/ Mount Pipe (AB-Leg connected)	65
APXV18-206517S-C w/ Mount Pipe (AB-Leg connected)	65
APXV18-206517S-C w/ Mount Pipe (AB-Leg connected)	65
GPS-TMG-HR-26NCM (E)	50
4' x 2" Pipe Mount (E)	50

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	C	N.A.
B	5x1/2		

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 New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.

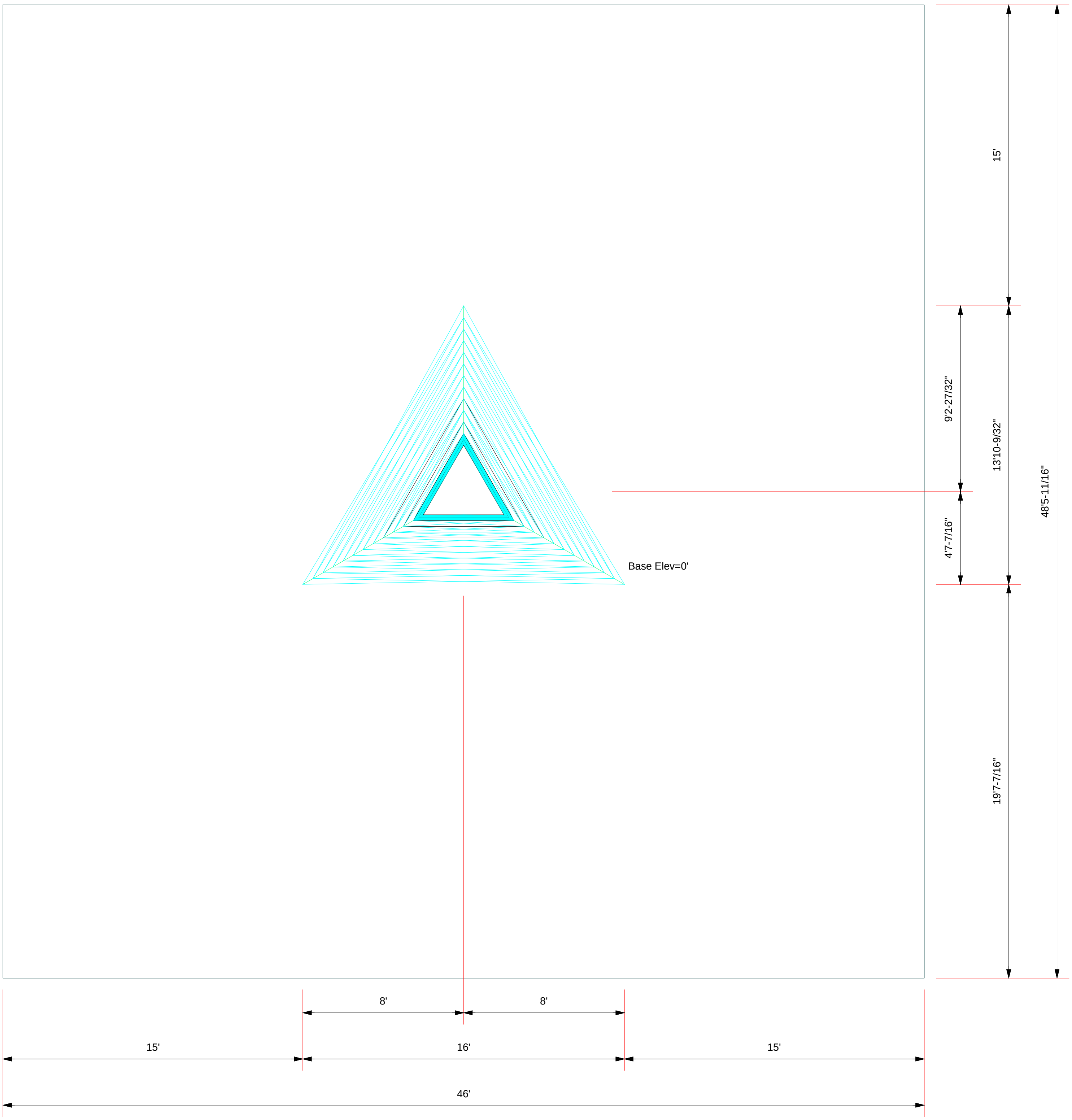
B+T GRP

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: **91292.006.01 - MILFORD, CT (BU# 84287**		
Project:		
Client: Crown Castle	Drawn by: Manasa	App'd:
Code: TIA-222-G	Date: 10/01/16	Scale: NTS
Path: C:\Users\Indevor\Desktop\Compile 91292 842870 Milford---Manasa-----Akshay---QCD\Tnx 007 01\91292 007 01 MILFORD CT---With horizontal.eri		Dwg No. E-1

Plot Plan

Total Area - 0.05 Acres



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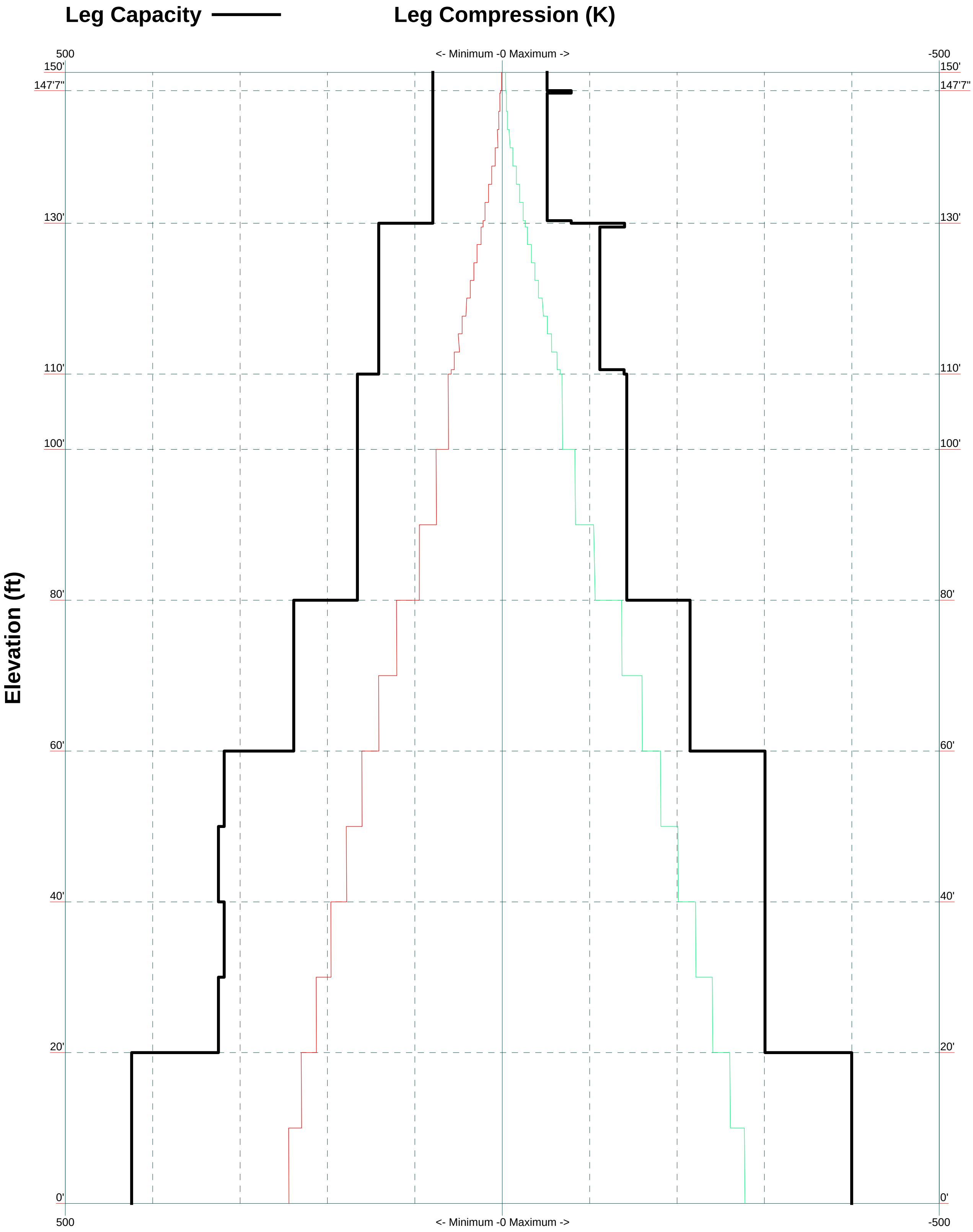
Code: TIA-222-G
Date: 10/01/16
Scale: NTS
Path: C:\Users\Indevor\Desktop\Compile 91292 842870 Milford---Manasa-----Akshay---OCD\Tnx 007 01\91292 007 01 MILFORD CT---With horizontal eri
Dwg No. E-2

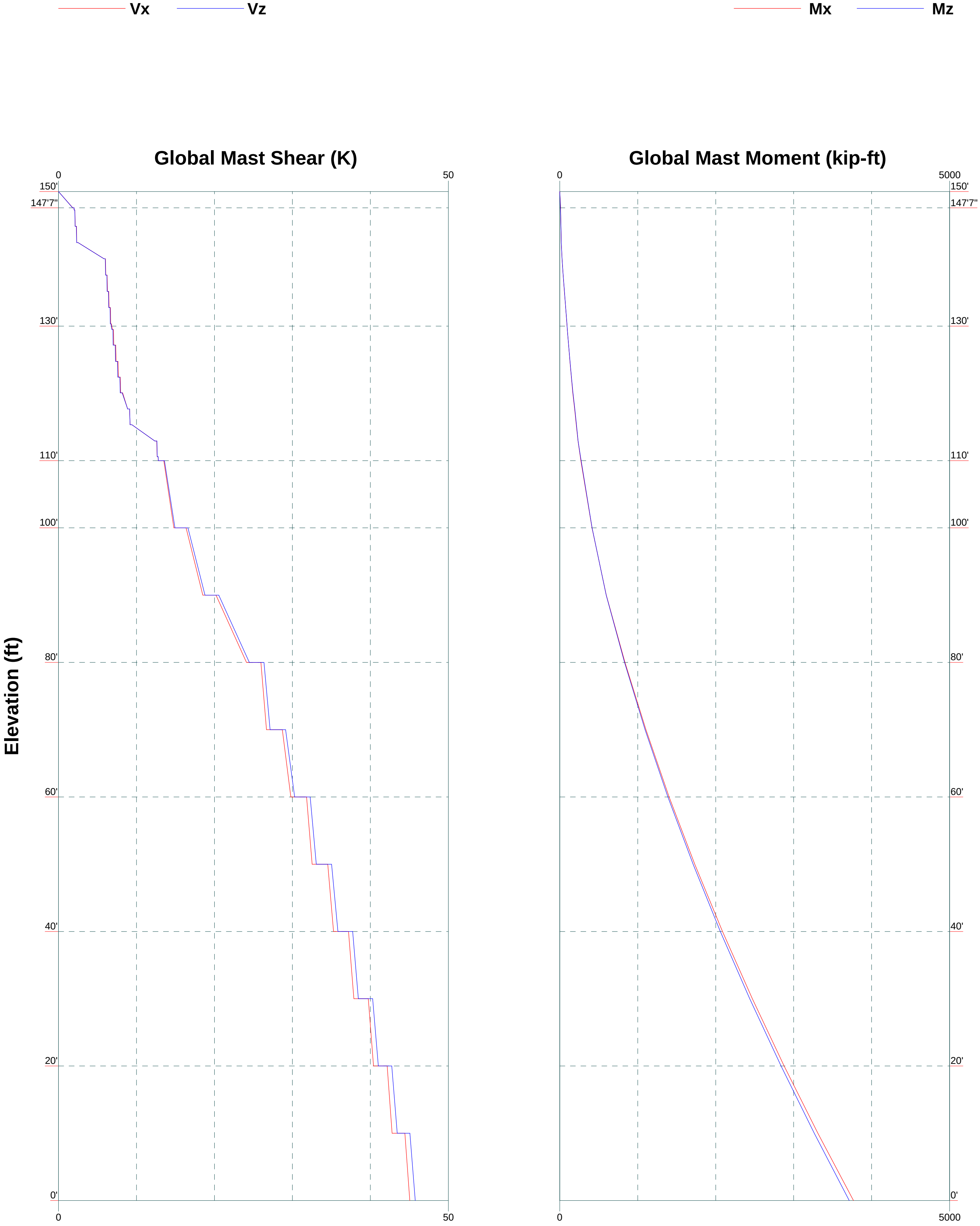
TIA-222-G - 97 mph/50 mph 0.750 in Ice Exposure C



B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: **91292.006.01 - MILFORD, CT (BU# 84287**		
Project:		
Client: Crown Castle	Drawn by: Manasa	App'd:
Code: TIA-222-G	Date: 10/01/16	Scale: NTS
Path:		Dwg No. E-3

TIA-222-G - 97 mph/50 mph 0.750 in Ice Exposure C



B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: ***91292.006.01 - MILFORD, CT (BU# 84287***

Project:

Client: Crown Castle

Drawn by: Manasa

App'd:

Code: TIA-222-G

Date: 10/01/16

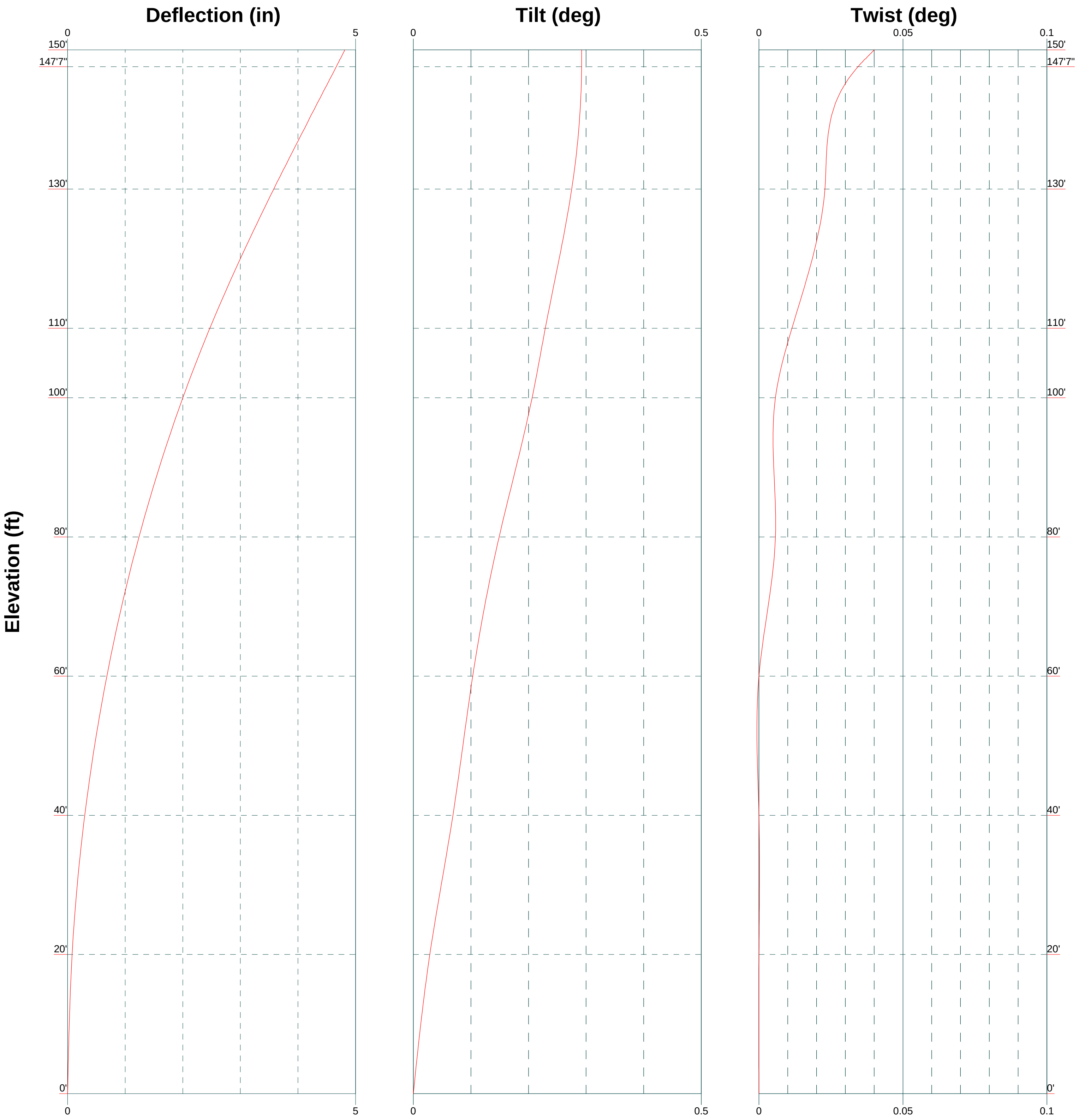
Scale: NTS

Path: C:\Users\Indevor\Desktop\Compile_91292_842870_Milford---Manasa-----Akshay---OCD\Tnx_007_01\91292_007_01_MILFORD_CT---With horizontal.eri

Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values

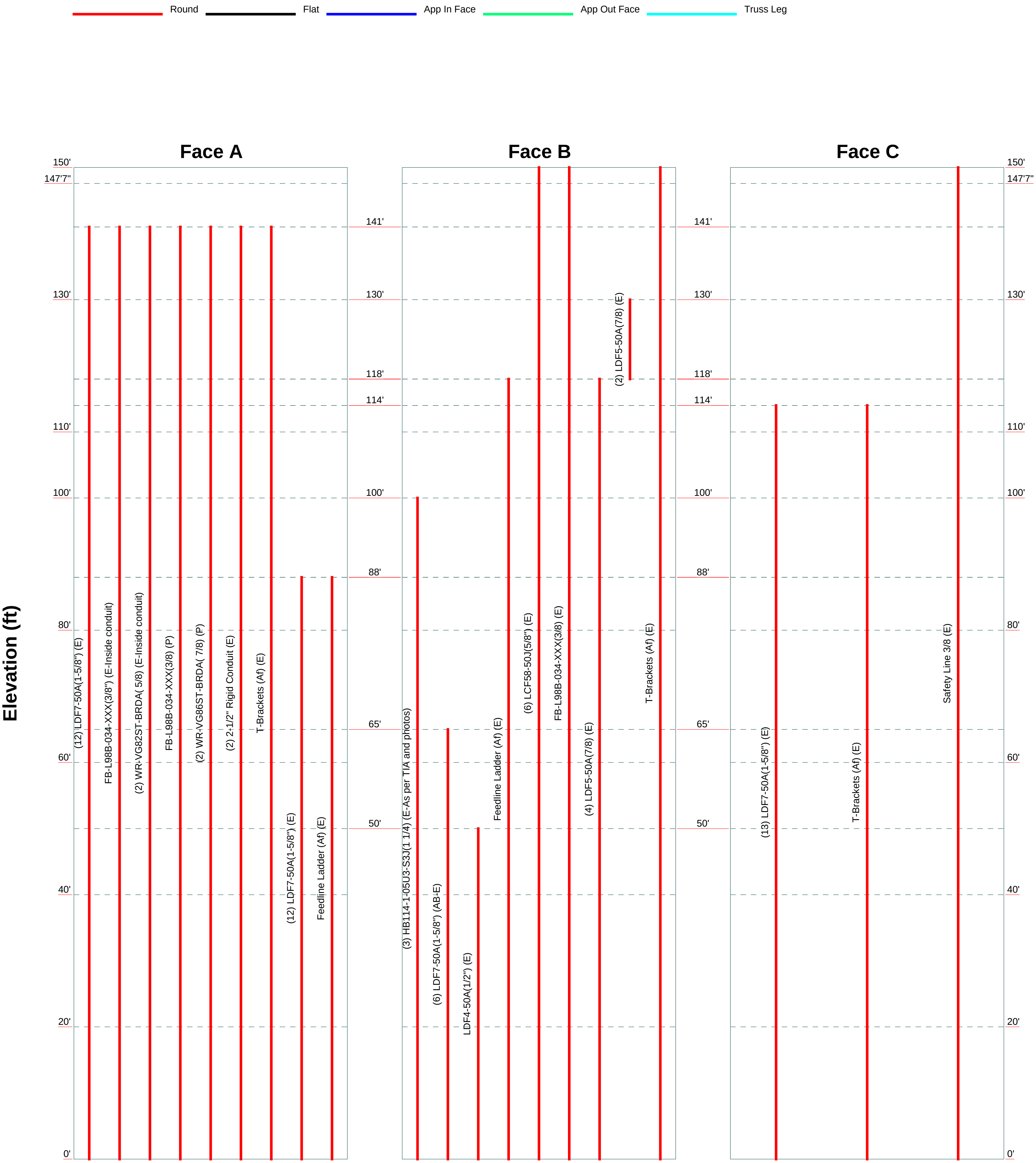


B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: ***91292.006.01 - MILFORD, CT (BU# 84287***
Project:
Client: Crown Castle
Drawn by: Manasa
App'd:
Code: TIA-222-G
Date: 10/01/16
Scale: NTS
Path: C:\Users\Indevor\Desktop\Compile_91292_842870_Milford---Manasa-----Akshay---QCD\Tnx_007_01\91292_007_01_MILFORD_CT---With horizontal.eri
Dwg No. E-5

Feed Line Distribution Chart

0' - 150'



B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: ***91292.006.01 - MILFORD, CT (BU# 84287***

Project:

Client: Crown Castle	Drawn by: Manasa	App'd:
Code: TIA-222-G	Date: 10/01/16	Scale: NTS
Path: C:\Users\Indevor\Desktop\Compile_91292_842870_Milford---Manasa-----Akshay---QCD\Tnx_007_01\91292_007_01_MILFORD_CT---With horizontal.eri		Dwg No. E-7

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 4' at the top and 16' at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in New Haven County, Connecticut.
- Basic wind speed of 97 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0'.
- Nominal ice thickness of 0.750 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

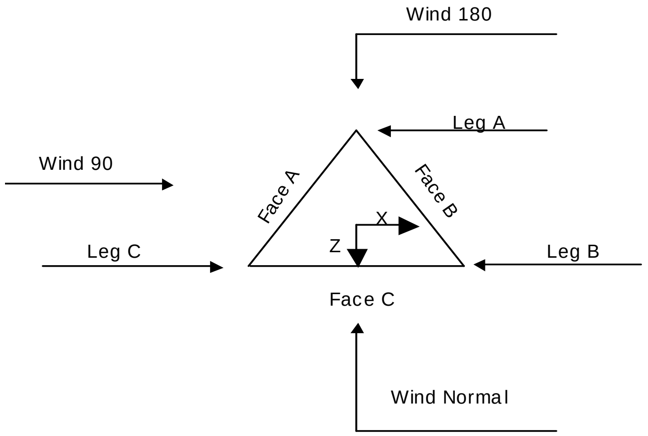
Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
√ Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination
√ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder

Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
√ SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feed Line Torque
√ Include Angle Block Shear Check
Use TIA-222-G Bracing Resist. Exemption
√ Use TIA-222-G Tension Splice Exemption

Poles

Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation* *ft*	*Assembly Database*	*Description*	*Section Width* *ft*	*Number of Sections*	*Section Length* *ft*
T1	150'-147'7"			4'	1	2'5"
T2	147'7"-130'			4'3/4"	1	17'7"
T3	130'-110'			4'6"	1	20'
T4	110'-100'			5'	1	10'
T5	100'-80'			6'	1	20'
T6	80'-60'			8'	1	20'
T7	60'-40'			10'	1	20'
T8	40'-20'			12'	1	20'
T9	20'-0'			14'	1	20'

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation* *ft*	*Diagonal Spacing* *ft*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset* *in*	*Bottom Girt Offset* *in*
T1	150'-147'7"	2'5"	K Brace Down	No	Yes	0.000	0.000
T2	147'7"-130'	2'5"	X Brace	No	Steps	4.000	4.000
T3	130'-110'	2'4-3/8"	X Brace	No	Steps	6.000	7.000
T4	110'-100'	10'	X Brace	No	No	0.000	0.000
T5	100'-80'	10'	X Brace	No	Yes	0.000	0.000
T6	80'-60'	10'	X Brace	No	No	0.000	0.000

Tower Section	*Tower Elevation ft*	*Diagonal Spacing ft*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset in*	*Bottom Girt Offset in*
T7	60'-40'	10'	X Brace	No	No	0.000	0.000
T8	40'-20'	10'	X Brace	No	No	0.000	0.000
T9	20'-0'	10'	X Brace	No	No	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 150'-147'7"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 147'7"-130'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130'-110'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-100'	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 100'-80'	Truss Leg	Pirod 105216	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)
T6 80'-60'	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 60'-40'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 40'-20'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T9 20'-0'	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Top Girt Type*	*Top Girt Size*	*Top Girt Grade*	*Bottom Girt Type*	*Bottom Girt Size*	*Bottom Girt Grade*
T2 147'7"-130'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130'-110'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-100'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T5 100'-80'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T6 80'-60'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation *ft*	*No. of Mid Girts*	*Mid Girt Type*	*Mid Girt Size*	*Mid Girt Grade*	*Horizontal Type*	*Horizontal Size*	*Horizontal Grade*
T1 150'-147'7"	None	Flat Bar		A36 (36 ksi)	Flat Bar	5x1/2	A36 (36 ksi)
T2 147'7"-130'	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130'-110'	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T5 100'-80'	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation *ft*	*Gusset Area (per face)* *ft^2*	*Gusset Thickness* *in*	*Gusset Grade*	*Adjust. Factor A_f*	*Adjust. Factor A_r*	*Weight Mult.*	*Double Angle Stitch Bolt Spacing Diagonals* *in*	*Double Angle Stitch Bolt Spacing Horizontals* *in*	*Double Angle Stitch Bolt Spacing Redundants* *in*
T1 150'-147'7"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	0.000
T2 147'7"-130'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	0.000
T3 130'-110'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	0.000
T4 110'-100'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	0.000	0.000	0.000
T5 100'-80'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	0.000	0.000	0.000
T6 80'-60'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	0.000	0.000	0.000
T7 60'-40'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	0.000	0.000	0.000
T8 40'-20'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	0.000	0.000	0.000
T9 20'-0'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	0.000	0.000	0.000

Tower Section Geometry *(cont'd)*

			K Factors[1]							
Tower Elevation *ft*	*Calc K Single Angles*	*Calc K Solid Rounds*	*Legs*	*X Brace Diags* *X* *Y*	*K Brace Diags* *X* *Y*	*Single Diags* *X* *Y*	*Girts* *X* *Y*	*Horiz.* *X* *Y*	*Sec. Horiz.* *X* *Y*	*Inner Brace* *X* *Y*
T1	No	Yes	1	1	1	1	1	1	1	1
150'-147'7"				1	1	1	1	1	1	1
T2	No	Yes	1	1	1	1	1	1	1	1
147'7"-130'				1	1	1	1	1	1	1
T3 130'-110'	No	Yes	1	1	1	1	1	1	1	1

			K Factors[1]							
Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
				1	1	1	1	1	1	1
T4 110'-100'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 100'-80'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 80'-60'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 60'-40'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 40'-20'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 20'-0'	Yes	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)*

	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 110'-100'	1	0.5	0.85	1	0.5	0.85
T5 100'-80'	1	0.5	0.85	1	0.5	0.85
T6 80'-60'	1	0.5	0.85	1	0.5	0.85
T7 60'-40'	1	0.5	0.85	1	0.5	0.85
T8 40'-20'	1	0.5	0.85	1	0.5	0.85
T9 20'-0'	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 150'-147'7"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
T2 147'7"-130'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
T3 130'-110'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
T4 110'-100'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 100'-80'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 80'-60'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 60'-40'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 40'-20'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 20'-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Connection Type*	*Leg*		*Diagonal*		*Top Girt*		*Bottom Girt*		*Mid Girt*		*Long Horizontal*		*Short Horizontal*	
		Bolt Size in	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*
T1 150'-147'7"	Sleeve DS	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 147'7"-130'	Sleeve DS	0.625 A325N	5	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T3 130'-110'	Flange	1.000 A325N	6	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T4 110'-100'	Flange	1.000 A325N	6	1.000 A325N	1	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T5 100'-80'	Flange	1.000 A325N	6	1.000 A325N	1	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	1.000 A325N	1	0.625 A325N	0
T6 80'-60'	Flange	1.000 A325N	6	1.000 A325N	1	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T7 60'-40'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T8 40'-20'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 20'-0'	Flange	1.250 A687	0	1.250 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

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 klf*
Face A												
LDF7-50A(1-5/8") (E)	A	No	Ar (CaAa)	141' - 0'	-15.000	0.4	12	4	0.750 1.500	1.980		0.001
FB-L98B-034-XXX(3/8") (E-Inside conduit)	A	No	Ar (CaAa)	141' - 0'	-6.000	0.38	1	1	0.394	0.394		0.000
WR-VG82ST-BRDA(5/8) (E-Inside conduit)	A	No	Ar (CaAa)	141' - 0'	-6.000	0.37	2	2	0.645	0.645		0.000
FB-L98B-034-XXX(3/8) (P)	A	No	Ar (CaAa)	141' - 0'	-15.000	0.35	1	1	0.394	0.394		0.000
WR-VG86ST-BRDA(7/8) (P)	A	No	Ar (CaAa)	141' - 0'	-15.000	0.36	2	2	0.850 0.750	0.880		0.001
2-1/2" Rigid Conduit (E)	A	No	Ar (CaAa)	141' - 0'	-6.000	0.38	2	2	2.500	2.500		0.003
M												
T-Brackets (Af) (E)	A	No	Af (CaAa)	141' - 0'	-15.000	0.4	1	1	1.000	1.000		0.008

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* *klf*
LDF7-50A(1-5/8") (E)	A	No	Ar (CaAa)	88' - 0'	0.000	-0.1	12	12	0.750 0.500	1.980		0.001
Feedline Ladder (Af) (E) *M* **Face B**	A	No	Af (CaAa)	88' - 0'	0.000	-0.1	1	1	3.000	3.000		0.008
HB114-1-05U3-S3J(1 1/4) (E-As per TIA and photos) *M*	B	No	Ar (CaAa)	100' - 0'	-2.000	-0.22	3	3	0.850 0.750	1.540		0.001
LDF7-50A(1-5/8") (AB-E) *M*	B	No	Ar (CaAa)	65' - 0'	-2.000	-0.3	6	6	0.850 0.750	1.980		0.001
LDF4-50A(1/2") (E) *M* *M*	B	No	Ar (CaAa)	50' - 0'	-2.000	-0.26	1	1	0.630	0.630		0.000
Feedline Ladder (Af) (E) *M* **Face C**	B	No	Af (CaAa)	118' - 0'	-2.000	-0.28	1	1	3.000	3.000		0.008
LCF58-50J(5/8") (E)	B	No	Ar (CaAa)	150' - 0'	-2.000	0.475	6	4	0.750 1.500	0.840		0.000
FB-L98B-034-XXX(3/8) (E)	B	No	Ar (CaAa)	150' - 0'	-2.000	0.42	1	1	0.394	0.394		0.000
LDF5-50A(7/8) (E)	B	No	Ar (CaAa)	118' - 0'	-2.000	0.44	4	4	0.850 0.750	1.090		0.000
LDF5-50A(7/8) (E) *M*	B	No	Ar (CaAa)	130' - 118'	-2.000	0.44	2	2	0.850 0.750	1.090		0.000
LDF7-50A(1-5/8") (E) *M*	C	No	Ar (CaAa)	114' - 0'	-3.500	0.42	13	7	0.750 1.500	1.980		0.001
T-Brackets (Af) (E)	B	No	Af (CaAa)	150' - 0'	-2.000	0.47	1	1	1.000	1.000		0.008
T-Brackets (Af) (E)	C	No	Af (CaAa)	114' - 0'	-2.500	0.44	1	1	1.000	1.000		0.008
Safety Line 3/8 (E) *M*	C	No	Ar (CaAa)	150' - 0'	0.000	0.5	1	1	0.375	0.375		0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement* ft	*Total Number*	C_AA_A ft^2/ft	*Weight* klf
M							
M							
M							
M							
M							
M							

Feed Line/Linear Appurtenances Section Areas

Tower Section	*Tower Elevation* ft	*Face*	A_R ft^2	A_F ft^2	C_AA_A *In Face* ft^2	C_AA_A *Out Face* ft^2	*Weight* K
T1	150'-147'7"	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.716	0.000	0.024
		C	0.000	0.000	0.091	0.000	0.001
T2	147'7"-130'	A	0.000	0.000	37.690	0.000	0.290
		B	0.000	0.000	12.485	0.000	0.175
		C	0.000	0.000	0.659	0.000	0.004
T3	130'-110'	A	0.000	0.000	68.528	0.000	0.527
		B	0.000	0.000	24.305	0.000	0.285
		C	0.000	0.000	11.713	0.000	0.081
T4	110'-100'	A	0.000	0.000	34.264	0.000	0.263
		B	0.000	0.000	16.460	0.000	0.197
		C	0.000	0.000	27.782	0.000	0.193
T5	100'-80'	A	0.000	0.000	91.536	0.000	0.672
		B	0.000	0.000	42.161	0.000	0.448
		C	0.000	0.000	55.563	0.000	0.386
T6	80'-60'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	48.101	0.000	0.472
		C	0.000	0.000	55.563	0.000	0.386
T7	60'-40'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	66.551	0.000	0.547
		C	0.000	0.000	55.563	0.000	0.386
T8	40'-20'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	67.181	0.000	0.549
		C	0.000	0.000	55.563	0.000	0.386
T9	20'-0'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	67.181	0.000	0.549
		C	0.000	0.000	55.563	0.000	0.386

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	*Tower Elevation* ft	*Face or Leg*	*Ice Thickness* in	A_R ft^2	A_F ft^2	C_AA_A *In Face* ft^2	C_AA_A *Out Face* ft^2	*Weight* K
T1	150'-147'7"	A	1.744	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	5.591	0.000	0.096
		C		0.000	0.000	0.933	0.000	0.011
T2	147'7"-130'	A	1.732	0.000	0.000	76.227	0.000	1.377
		B		0.000	0.000	40.519	0.000	0.696
		C		0.000	0.000	6.749	0.000	0.082
T3	130'-110'	A	1.707	0.000	0.000	137.599	0.000	2.474

Tower Section	*Tower Elevation ft*	*Face or Leg*	*Ice Thickness in*	*A_R ft^2*	*A_F ft^2*	*C_AA_A In Face ft^2*	*C_AA_A Out Face ft^2*	*Weight K*
		B		0.000	0.000	75.499	0.000	1.190
		C		0.000	0.000	21.365	0.000	0.427
T4	110'-100'	A	1.684	0.000	0.000	68.349	0.000	1.224
		B		0.000	0.000	45.059	0.000	0.750
		C		0.000	0.000	38.094	0.000	0.877
T5	100'-80'	A	1.658	0.000	0.000	178.046	0.000	3.107
		B		0.000	0.000	116.438	0.000	1.814
		C		0.000	0.000	75.815	0.000	1.738
T6	80'-60'	A	1.617	0.000	0.000	239.572	0.000	4.061
		B		0.000	0.000	127.645	0.000	1.947
		C		0.000	0.000	75.218	0.000	1.711
T7	60'-40'	A	1.564	0.000	0.000	236.926	0.000	3.960
		B		0.000	0.000	166.951	0.000	2.440
		C		0.000	0.000	74.442	0.000	1.677
T8	40'-20'	A	1.486	0.000	0.000	233.077	0.000	3.814
		B		0.000	0.000	167.413	0.000	2.374
		C		0.000	0.000	73.313	0.000	1.628
T9	20'-0'	A	1.331	0.000	0.000	225.446	0.000	3.534
		B		0.000	0.000	160.888	0.000	2.165
		C		0.000	0.000	71.075	0.000	1.534

Feed Line Center of Pressure

Section	*Elevation ft*	*CP_X in*	*CP_Z in*	*CP_X Ice in*	*CP_Z Ice in*
T1	150'-147'7"	1.766	1.212	1.301	1.151
T2	147'7"-130'	2.286	-1.611	1.498	-0.186
T3	130'-110'	1.529	-1.672	1.252	-0.649
T4	110'-100'	-0.503	-0.405	0.292	-0.444
T5	100'-80'	-1.360	-0.955	-0.415	-0.737
T6	80'-60'	-2.563	-1.549	-1.465	-1.172
T7	60'-40'	-2.799	-2.638	-1.595	-2.005
T8	40'-20'	-3.316	-3.153	-1.885	-2.471
T9	20'-0'	-3.803	-3.606	-2.232	-2.895

Shielding Factor Ka

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T1	27	LCF58-50J(5/8")	147.58 - 150.00	0.6000	0.3569
T1	28	FB-L98B-034-XXX(3/8)	147.58 - 150.00	0.6000	0.3569
T1	38	T-Brackets (Af)	147.58 - 150.00	0.6000	0.3569
T1	40	Safety Line 3/8	147.58 - 150.00	0.6000	0.3569
T2	2	LDF7-50A(1-5/8")	130.00 - 141.00	0.6000	0.5032
T2	3	FB-L98B-034-XXX(3/8")	130.00 - 141.00	0.0000	0.0000
T2	4	WR-VG82ST-BRDA(5/8)	130.00 - 141.00	0.0000	0.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T2	5	FB-L98B-034-XXX(3/8)	130.00 - 141.00	0.6000	0.5032
T2	6	WR-VG86ST-BRDA(7/8)	130.00 - 141.00	0.6000	0.5032
T2	7	2-1/2" Rigid Conduit	130.00 - 141.00	0.6000	0.5032
T2	9	T-Brackets (Af)	130.00 - 141.00	0.6000	0.5032
T2	27	LCF58-50J(5/8")	130.00 - 147.58	0.6000	0.5032
T2	28	FB-L98B-034-XXX(3/8)	130.00 - 147.58	0.6000	0.5032
T2	38	T-Brackets (Af)	130.00 - 147.58	0.6000	0.5032
T2	40	Safety Line 3/8	130.00 - 147.58	0.6000	0.5032
T3	2	LDF7-50A(1-5/8")	110.00 - 130.00	0.6000	0.5136
T3	3	FB-L98B-034-XXX(3/8")	110.00 - 130.00	0.0000	0.0000
T3	4	WR-VG82ST-BRDA(5/8)	110.00 - 130.00	0.0000	0.0000
T3	5	FB-L98B-034-XXX(3/8)	110.00 - 130.00	0.6000	0.5136
T3	6	WR-VG86ST-BRDA(7/8)	110.00 - 130.00	0.6000	0.5136
T3	7	2-1/2" Rigid Conduit	110.00 - 130.00	0.6000	0.5136
T3	9	T-Brackets (Af)	110.00 - 130.00	0.6000	0.5136
T3	24	Feedline Ladder (Af)	110.00 - 118.00	0.6000	0.5136
T3	27	LCF58-50J(5/8")	110.00 - 130.00	0.6000	0.5136
T3	28	FB-L98B-034-XXX(3/8)	110.00 - 130.00	0.6000	0.5136
T3	31	LDF5-50A(7/8)	110.00 - 118.00	0.6000	0.5136
T3	32	LDF5-50A(7/8)	118.00 - 130.00	0.6000	0.5136
T3	34	LDF7-50A(1-5/8")	110.00 - 114.00	0.6000	0.5136
T3	38	T-Brackets (Af)	110.00 - 130.00	0.6000	0.5136
T3	39	T-Brackets (Af)	110.00 - 114.00	0.6000	0.5136
T3	40	Safety Line 3/8	110.00 - 130.00	0.6000	0.5136
T4	2	LDF7-50A(1-5/8")	100.00 - 110.00	0.6000	0.2879
T4	3	FB-L98B-034-XXX(3/8")	100.00 - 110.00	0.0000	0.0000
T4	4	WR-VG82ST-BRDA(5/8)	100.00 - 110.00	0.0000	0.0000
T4	5	FB-L98B-034-XXX(3/8)	100.00 - 110.00	0.6000	0.2879
T4	6	WR-VG86ST-BRDA(7/8)	100.00 - 110.00	0.6000	0.2879
T4	7	2-1/2" Rigid Conduit	100.00 - 110.00	0.6000	0.2879
T4	9	T-Brackets (Af)	100.00 - 110.00	0.6000	0.2879

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T4	24	Feedline Ladder (Af)	100.00 - 110.00	0.6000	0.2879
T4	27	LCF58-50J(5/8")	100.00 - 110.00	0.6000	0.2879
T4	28	FB-L98B-034-XXX(3/8)	100.00 - 110.00	0.6000	0.2879
T4	31	LDF5-50A(7/8)	100.00 - 110.00	0.6000	0.2879
T4	34	LDF7-50A(1-5/8")	100.00 - 110.00	0.6000	0.2879
T4	38	T-Brackets (Af)	100.00 - 110.00	0.6000	0.2879
T4	39	T-Brackets (Af)	100.00 - 110.00	0.6000	0.2879
T4	40	Safety Line 3/8	100.00 - 110.00	0.6000	0.2879
T5	2	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.3979
T5	3	FB-L98B-034-XXX(3/8")	80.00 - 100.00	0.0000	0.0000
T5	4	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.0000	0.0000
T5	5	FB-L98B-034-XXX(3/8)	80.00 - 100.00	0.6000	0.3979
T5	6	WR-VG86ST-BRDA(7/8)	80.00 - 100.00	0.6000	0.3979
T5	7	2-1/2" Rigid Conduit	80.00 - 100.00	0.6000	0.3979
T5	9	T-Brackets (Af)	80.00 - 100.00	0.6000	0.3979
T5	12	LDF7-50A(1-5/8")	80.00 - 88.00	0.6000	0.3979
T5	13	Feedline Ladder (Af)	80.00 - 88.00	0.6000	0.3979
T5	16	HB114-1-05U3-S3J(1 1/4)	80.00 - 100.00	0.6000	0.3979
T5	24	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.3979
T5	27	LCF58-50J(5/8")	80.00 - 100.00	0.6000	0.3979
T5	28	FB-L98B-034-XXX(3/8)	80.00 - 100.00	0.6000	0.3979
T5	31	LDF5-50A(7/8)	80.00 - 100.00	0.6000	0.3979
T5	34	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.3979
T5	38	T-Brackets (Af)	80.00 - 100.00	0.6000	0.3979
T5	39	T-Brackets (Af)	80.00 - 100.00	0.6000	0.3979
T5	40	Safety Line 3/8	80.00 - 100.00	0.6000	0.3979
T6	2	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.5006
T6	3	FB-L98B-034-XXX(3/8")	60.00 - 80.00	0.0000	0.0000
T6	4	WR-VG82ST-BRDA(5/8)	60.00 - 80.00	0.0000	0.0000
T6	5	FB-L98B-034-XXX(3/8)	60.00 - 80.00	0.6000	0.5006
T6	6	WR-VG86ST-BRDA(7/8)	60.00 - 80.00	0.6000	0.5006
T6	7	2-1/2" Rigid Conduit	60.00 - 80.00	0.6000	0.5006
T6	9	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5006
T6	12	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.5006
T6	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5006
T6	16	HB114-1-05U3-S3J(1 1/4)	60.00 - 80.00	0.6000	0.5006
T6	18	LDF7-50A(1-5/8")	60.00 - 65.00	0.6000	0.5006
T6	24	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5006
T6	27	LCF58-50J(5/8")	60.00 - 80.00	0.6000	0.5006
T6	28	FB-L98B-034-XXX(3/8)	60.00 - 80.00	0.6000	0.5006
T6	31	LDF5-50A(7/8)	60.00 - 80.00	0.6000	0.5006
T6	34	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.5006
T6	38	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5006
T6	39	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5006
T6	40	Safety Line 3/8	60.00 - 80.00	0.6000	0.5006
T7	2	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840
T7	3	FB-L98B-034-XXX(3/8")	40.00 - 60.00	0.0000	0.0000
T7	4	WR-VG82ST-BRDA(5/8)	40.00 - 60.00	0.0000	0.0000
T7	5	FB-L98B-034-XXX(3/8)	40.00 - 60.00	0.6000	0.5840
T7	6	WR-VG86ST-BRDA(7/8)	40.00 - 60.00	0.6000	0.5840
T7	7	2-1/2" Rigid Conduit	40.00 - 60.00	0.6000	0.5840
T7	9	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5840
T7	12	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840
T7	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5840

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	K_a *No Ice*	K_a *Ice*
T7	16	HB114-1-05U3-S3J(1 1/4)	40.00 - 60.00	0.6000	0.5840
T7	18	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840
T7	20	LDF4-50A(1/2")	40.00 - 50.00	0.6000	0.5840
T7	24	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5840
T7	27	LCF58-50J(5/8")	40.00 - 60.00	0.6000	0.5840
T7	28	FB-L98B-034-XXX(3/8)	40.00 - 60.00	0.6000	0.5840
T7	31	LDF5-50A(7/8)	40.00 - 60.00	0.6000	0.5840
T7	34	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840
T7	38	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5840
T7	39	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5840
T7	40	Safety Line 3/8	40.00 - 60.00	0.6000	0.5840
T8	2	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	3	FB-L98B-034-XXX(3/8")	20.00 - 40.00	0.0000	0.0000
T8	4	WR-VG82ST-BRDA(5/8)	20.00 - 40.00	0.0000	0.0000
T8	5	FB-L98B-034-XXX(3/8)	20.00 - 40.00	0.6000	0.6000
T8	6	WR-VG86ST-BRDA(7/8)	20.00 - 40.00	0.6000	0.6000
T8	7	2-1/2" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T8	9	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	12	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T8	16	HB114-1-05U3-S3J(1 1/4)	20.00 - 40.00	0.6000	0.6000
T8	18	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	20	LDF4-50A(1/2")	20.00 - 40.00	0.6000	0.6000
T8	24	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T8	27	LCF58-50J(5/8")	20.00 - 40.00	0.6000	0.6000
T8	28	FB-L98B-034-XXX(3/8)	20.00 - 40.00	0.6000	0.6000
T8	31	LDF5-50A(7/8)	20.00 - 40.00	0.6000	0.6000
T8	34	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	38	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	39	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	40	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	2	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	3	FB-L98B-034-XXX(3/8")	0.00 - 20.00	0.0000	0.0000
T9	4	WR-VG82ST-BRDA(5/8)	0.00 - 20.00	0.0000	0.0000
T9	5	FB-L98B-034-XXX(3/8)	0.00 - 20.00	0.6000	0.6000
T9	6	WR-VG86ST-BRDA(7/8)	0.00 - 20.00	0.6000	0.6000
T9	7	2-1/2" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T9	9	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	12	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	13	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T9	16	HB114-1-05U3-S3J(1 1/4)	0.00 - 20.00	0.6000	0.6000
T9	18	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	20	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T9	24	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T9	27	LCF58-50J(5/8")	0.00 - 20.00	0.6000	0.6000
T9	28	FB-L98B-034-XXX(3/8)	0.00 - 20.00	0.6000	0.6000
T9	31	LDF5-50A(7/8)	0.00 - 20.00	0.6000	0.6000
T9	34	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	38	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	39	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	40	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
M									
(3) 6' x 2" Mount Pipe (E)	A	From Leg	4.000	0.000	150'	No Ice	1.425	1.425	0.022
			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
(3) 6' x 2" Mount Pipe (E)	B	From Leg	4.000	0.000	150'	No Ice	1.425	1.425	0.022
			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
(3) 6' x 2" Mount Pipe (E)	C	From Leg	4.000	0.000	150'	No Ice	1.425	1.425	0.022
			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
SC226-SFXSNM (E-CL per TIA)	B	From Leg	4.000	0.000	150'	No Ice	5.748	5.748	0.032
			0'			1/2" Ice	7.776	7.776	0.340
			10'			1" Ice	9.804	9.804	0.661
SC226-SFXSNM (E-CL per TIA)	C	From Leg	4.000	0.000	150'	No Ice	5.748	5.748	0.032
			0'			1/2" Ice	7.776	7.776	0.340
			10'			1" Ice	9.804	9.804	0.661
1' x 6" x 3" (E-Camera)	C	From Leg	4.000	0.000	150'	No Ice	0.600	0.317	0.033
			0'			1/2" Ice	0.704	0.401	0.038
			0'			1" Ice	0.815	0.492	0.044
Platform Mount [LP 405-1] (E)	C	None		0.000	150'	No Ice	20.800	20.800	1.800
						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
M									
SBNHH-1D65A w/ Mount Pipe (P)	A	From Leg	4.000	0.000	141'	No Ice	5.954	5.190	0.061
			0'			1/2" Ice	6.390	5.961	0.114
			0'			1" Ice	6.820	6.658	0.174
SBNHH-1D65A w/ Mount Pipe (P)	B	From Leg	4.000	0.000	141'	No Ice	5.954	5.190	0.061
			0'			1/2" Ice	6.390	5.961	0.114
			0'			1" Ice	6.820	6.658	0.174
SBNHH-1D65A w/ Mount Pipe (P)	C	From Leg	4.000	0.000	141'	No Ice	5.954	5.190	0.061
			0'			1/2" Ice	6.390	5.961	0.114
			0'			1" Ice	6.820	6.658	0.174
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	A	From Leg	4.000	0.000	141'	No Ice	6.175	4.548	0.075
			0'			1/2" Ice	6.575	5.158	0.128
			0'			1" Ice	6.982	5.779	0.187
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	B	From Leg	4.000	0.000	141'	No Ice	6.175	4.548	0.075
			0'			1/2" Ice	6.575	5.158	0.128
			0'			1" Ice	6.982	5.779	0.187
OPA-65R-LCUU-H4 w/ Mount Pipe (P)	C	From Leg	4.000	0.000	141'	No Ice	6.175	4.548	0.075
			0'			1/2" Ice	6.575	5.158	0.128
			0'			1" Ice	6.982	5.779	0.187
LGP21401 (P)	A	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401 (P)	B	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401 (P)	C	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
RRUS 32 B2 (P)	A	From Leg	4.000	0.000	141'	No Ice	2.731	1.668	0.053
			0'			1/2" Ice	2.953	1.855	0.074
			0'			1" Ice	3.182	2.049	0.098
RRUS 32 B2	B	From Leg	4.000	0.000	141'	No Ice	2.731	1.668	0.053

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert ft ft ft*	*Azimuth Adjustment °*	*Placement ft*		*C_AA_A Front ft^2*	*C_AA_A Side ft^2*	*Weight K*
(P)			0'			1/2" Ice	2.953	1.855	0.074
			0'			1" Ice	3.182	2.049	0.098
RRUS 32 B2	C	From Leg	4.000	0.000	141'	No Ice	2.731	1.668	0.053
(P)			0'			1/2" Ice	2.953	1.855	0.074
			0'			1" Ice	3.182	2.049	0.098
RRUS 32 B30	A	From Leg	4.000	0.000	141'	No Ice	2.692	1.573	0.060
(P)			0'			1/2" Ice	2.912	1.756	0.080
			0'			1" Ice	3.138	1.945	0.104
RRUS 32 B30	B	From Leg	4.000	0.000	141'	No Ice	2.692	1.573	0.060
(P)			0'			1/2" Ice	2.912	1.756	0.080
			0'			1" Ice	3.138	1.945	0.104
RRUS 32 B30	C	From Leg	4.000	0.000	141'	No Ice	2.692	1.573	0.060
(P)			0'			1/2" Ice	2.912	1.756	0.080
			0'			1" Ice	3.138	1.945	0.104
WCS-IMFQ-AMT	C	From Leg	4.000	0.000	141'	No Ice	0.989	0.644	0.030
(P)			0'			1/2" Ice	1.114	0.748	0.039
			0'			1" Ice	1.246	0.860	0.051
DC6-48-60-18-8F	A	From Leg	4.000	0.000	141'	No Ice	0.917	0.917	0.019
(P)			0'			1/2" Ice	1.458	1.458	0.037
			0'			1" Ice	1.643	1.643	0.057
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	141'	No Ice	5.746	4.254	0.055
(E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	141'	No Ice	5.746	4.254	0.055
(E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	141'	No Ice	5.746	4.254	0.055
(E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
LGP21401	A	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401	B	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401	C	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
7020.00	A	From Leg	4.000	0.000	141'	No Ice	0.102	0.175	0.002
(E)			0'			1/2" Ice	0.147	0.239	0.005
			0'			1" Ice	0.199	0.311	0.009
7020.00	B	From Leg	4.000	0.000	141'	No Ice	0.102	0.175	0.002
(E)			0'			1/2" Ice	0.147	0.239	0.005
			0'			1" Ice	0.199	0.311	0.009
7020.00	C	From Leg	4.000	0.000	141'	No Ice	0.102	0.175	0.002
(E)			0'			1/2" Ice	0.147	0.239	0.005
			0'			1" Ice	0.199	0.311	0.009
RRUS 11 B2	A	From Leg	4.000	0.000	141'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			0'			1" Ice	3.259	1.485	0.095
RRUS 11 B2	B	From Leg	4.000	0.000	141'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			0'			1" Ice	3.259	1.485	0.095
RRUS 11 B2	C	From Leg	4.000	0.000	141'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			0'			1" Ice	3.259	1.485	0.095
DC6-48-60-18-8F	B	From Leg	4.000	0.000	141'	No Ice	0.917	0.917	0.019

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
(E)			0'			1/2" Ice	1.458	1.458	0.037
			0'			1" Ice	1.643	1.643	0.057
Sector Mount [SM 410-3]	C	None		0.000	141'	No Ice	23.960	23.960	1.100
(1Existing Mount with Mount						1/2" Ice	34.060	34.060	1.600
Mod)						1" Ice	44.160	44.160	2.099
Pipe Mount [PM 601-3]	C	None		0.000	141'	No Ice	4.390	4.390	0.195
(P-Mount Attachmen-Per						1/2" Ice	5.480	5.480	0.237
Previous SA)						1" Ice	6.570	6.570	0.280
M									
M									
M5160160P10006	B	From Leg	2.000	0.000	130'	No Ice	0.917	0.294	0.002
(E)			0'			1/2" Ice	1.049	0.408	0.007
			0'			1" Ice	1.187	0.530	0.014
M5160160P10006	C	From Leg	2.000	0.000	130'	No Ice	0.917	0.294	0.002
(E)			0'			1/2" Ice	1.049	0.408	0.007
			0'			1" Ice	1.187	0.530	0.014
Side Arm Mount [SO 301-1]	B	From Leg	1.000	0.000	130'	No Ice	1.000	0.900	0.023
(E)			0'			1/2" Ice	1.390	1.420	0.033
			0'			1" Ice	1.780	1.940	0.042
Side Arm Mount [SO 301-1]	C	From Leg	1.000	0.000	130'	No Ice	1.000	0.900	0.023
(E)			0'			1/2" Ice	1.390	1.420	0.033
			0'			1" Ice	1.780	1.940	0.042
M									
SC320	B	From Leg	6.000	0.000	118'	No Ice	6.380	6.380	0.025
(E)			0'			1/2" Ice	8.613	8.613	0.071
			10'			1" Ice	10.862	10.862	0.131
SC229-SFXLDF	C	From Leg	6.000	0.000	118'	No Ice	5.950	5.950	0.032
(E)			0'			1/2" Ice	7.967	7.967	0.075
			10'			1" Ice	10.000	10.000	0.130
Side Arm Mount [SO 306-1]	B	From Leg	3.000	0.000	118'	No Ice	0.980	2.180	0.042
(E)			0'			1/2" Ice	1.700	3.800	0.062
			0'			1" Ice	2.420	5.420	0.083
Side Arm Mount [SO 306-1]	C	From Leg	3.000	0.000	118'	No Ice	0.980	2.180	0.042
(E)			0'			1/2" Ice	1.700	3.800	0.062
			0'			1" Ice	2.420	5.420	0.083
10' horizontal x 2" Pipe	B	From Face	1.000	0.000	118'	No Ice	0.833	0.833	0.100
Mount			0'			1/2" Ice	1.765	1.765	0.485
(E-Tie Back as per photo)			0'			1" Ice	2.372	2.372	0.882
10' horizontal x 2" Pipe	C	From Face	1.000	0.000	118'	No Ice	0.833	0.833	0.100
Mount			0'			1/2" Ice	1.765	1.765	0.485
(E-Tie Back as per photo)			0'			1" Ice	2.372	2.372	0.882
M									
ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
B4P			0'			1/2" Ice	6.462	4.649	0.133
(E)			-2'			1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B2A	B	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
B4P			0'			1/2" Ice	6.462	4.649	0.133
(E)			-2'			1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B2A	C	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
B4P			0'			1/2" Ice	6.462	4.649	0.133
(E)			-2'			1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B4A	A	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
B2P			0'			1/2" Ice	6.462	4.649	0.133
(E)			-2'			1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B4A	B	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
B2P			0'			1/2" Ice	6.462	4.649	0.133
(E)			-2'			1" Ice	6.838	5.005	0.180

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
ERICSSON AIR 21 B4A	C	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
B2P			0'			1/2" Ice	6.462	4.649	0.133
(E)			-2'			1" Ice	6.838	5.005	0.180
LNX-6515DS-VTM	A	From Leg	4.000	0.000	114'	No Ice	11.445	7.696	0.050
(E)			0'			1/2" Ice	12.064	8.289	0.116
			-2'			1" Ice	12.689	8.889	0.190
LNX-6515DS-VTM	B	From Leg	4.000	0.000	114'	No Ice	11.445	7.696	0.050
(E)			0'			1/2" Ice	12.064	8.289	0.116
			-2'			1" Ice	12.689	8.889	0.190
LNX-6515DS-VTM	C	From Leg	4.000	0.000	114'	No Ice	11.445	7.696	0.050
(E)			0'			1/2" Ice	12.064	8.289	0.116
			-2'			1" Ice	12.689	8.889	0.190
KRY 112 71	A	From Leg	4.000	0.000	114'	No Ice	0.583	0.398	0.013
(E)			0'			1/2" Ice	0.688	0.488	0.018
			-2'			1" Ice	0.799	0.586	0.025
KRY 112 71	B	From Leg	4.000	0.000	114'	No Ice	0.583	0.398	0.013
(E)			0'			1/2" Ice	0.688	0.488	0.018
			-2'			1" Ice	0.799	0.586	0.025
KRY 112 71	C	From Leg	4.000	0.000	114'	No Ice	0.583	0.398	0.013
(E)			0'			1/2" Ice	0.688	0.488	0.018
			-2'			1" Ice	0.799	0.586	0.025
RRUS 11 B12	A	From Leg	4.000	0.000	114'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			-2'			1" Ice	3.259	1.485	0.095
RRUS 11 B12	B	From Leg	4.000	0.000	114'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			-2'			1" Ice	3.259	1.485	0.095
RRUS 11 B12	C	From Leg	4.000	0.000	114'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			-2'			1" Ice	3.259	1.485	0.095
Sector Mount [SM 307-3]	C	None		0.000	114'	No Ice	26.220	26.220	1.620
(4 M.P. / Sec. Inc.)						1/2" Ice	36.280	36.280	2.148
						1" Ice	46.340	46.340	2.676
M									
800MHz 2X50W RRH	A	From Leg	1.000	0.000	103'	No Ice	2.058	1.932	0.064
W/FILTER			0'			1/2" Ice	2.240	2.109	0.086
(E)			0'			1" Ice	2.429	2.293	0.111
800MHz 2X50W RRH	B	From Leg	1.000	0.000	103'	No Ice	2.058	1.932	0.064
W/FILTER			0'			1/2" Ice	2.240	2.109	0.086
(E)			0'			1" Ice	2.429	2.293	0.111
800MHz 2X50W RRH	C	From Leg	1.000	0.000	103'	No Ice	2.058	1.932	0.064
W/FILTER			0'			1/2" Ice	2.240	2.109	0.086
(E)			0'			1" Ice	2.429	2.293	0.111
PCS 1900MHz 2x40W	A	From Leg	1.000	0.000	103'	No Ice	2.351	1.278	0.044
(E)			0'			1/2" Ice	2.547	1.434	0.062
			0'			1" Ice	2.751	1.598	0.084
PCS 1900MHz 2x40W	B	From Leg	1.000	0.000	103'	No Ice	2.351	1.278	0.044
(E)			0'			1/2" Ice	2.547	1.434	0.062
			0'			1" Ice	2.751	1.598	0.084
PCS 1900MHz 2x40W	C	From Leg	1.000	0.000	103'	No Ice	2.351	1.278	0.044
(E)			0'			1/2" Ice	2.547	1.434	0.062
			0'			1" Ice	2.751	1.598	0.084
(2) 4' x 2" Pipe Mount	A	From Leg	1.000	0.000	103'	No Ice	0.785	0.785	0.029
(E-For TMA As per photo)			0'			1/2" Ice	1.028	1.028	0.035
			0'			1" Ice	1.281	1.281	0.044
(2) 4' x 2" Pipe Mount	B	From Leg	1.000	0.000	103'	No Ice	0.785	0.785	0.029
(E-For TMA As per photo)			0'			1/2" Ice	1.028	1.028	0.035

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		*C_AA_A Front*	*C_AA_A Side*	*Weight*
			ft *ft* *ft*	*°*	*ft*		*ft^2*	*ft^2*	*K*
			0'			1" Ice	1.281	1.281	0.044
(2) 4' x 2" Pipe Mount	C	From Leg	1.000	0.000	103'	No Ice	0.785	0.785	0.029
(E-For TMA As per photo)			0'			1/2" Ice	1.028	1.028	0.035
			0'			1" Ice	1.281	1.281	0.044
Pipe Mount [PM 601-3]	C	None		0.000	103'	No Ice	4.390	4.390	0.195
(E-For TME)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
M									
APXVSPP18-C-A20 w/	A	From Leg	4.000	0.000	100'	No Ice	8.262	6.946	0.083
Mount Pipe			0'			1/2" Ice	8.822	8.127	0.151
(E)			0'			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/	B	From Leg	4.000	0.000	100'	No Ice	8.262	6.946	0.083
Mount Pipe			0'			1/2" Ice	8.822	8.127	0.151
(E)			0'			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/	C	From Leg	4.000	0.000	100'	No Ice	8.262	6.946	0.083
Mount Pipe			0'			1/2" Ice	8.822	8.127	0.151
(E)			0'			1" Ice	9.346	9.021	0.227
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	100'	No Ice	1.425	1.425	0.022
(E-Empty pipe as per photo)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	100'	No Ice	1.425	1.425	0.022
(E-Empty pipe as per photo)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	100'	No Ice	1.425	1.425	0.022
(E-Empty pipe as per photo)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
Sector Mount [SM 406-3]	C	None		0.000	100'	No Ice	19.830	19.830	0.923
(E)						1/2" Ice	29.410	29.410	1.326
						1" Ice	38.990	38.990	1.729
M									
M									
(2) BXA-171063/8CF w/	A	From Leg	4.000	0.000	88'	No Ice	3.140	3.510	0.029
Mount Pipe			0'			1/2" Ice	3.515	4.130	0.062
(E)			2'			1" Ice	3.892	4.757	0.100
(2) BXA-171063/8CF w/	B	From Leg	4.000	0.000	88'	No Ice	3.140	3.510	0.029
Mount Pipe			0'			1/2" Ice	3.515	4.130	0.062
(E)			2'			1" Ice	3.892	4.757	0.100
(2) BXA-171063/8CF w/	C	From Leg	4.000	0.000	88'	No Ice	3.140	3.510	0.029
Mount Pipe			0'			1/2" Ice	3.515	4.130	0.062
(E)			2'			1" Ice	3.892	4.757	0.100
SWCP 2x5514 w/ Mount	A	From Leg	4.000	0.000	88'	No Ice	6.524	6.531	0.039
Pipe			0'			1/2" Ice	6.949	7.240	0.104
(E)			2'			1" Ice	7.375	7.920	0.174
SWCP 2x5514 w/ Mount	B	From Leg	4.000	0.000	88'	No Ice	6.524	6.531	0.039
Pipe			0'			1/2" Ice	6.949	7.240	0.104
(E)			2'			1" Ice	7.375	7.920	0.174
SWCP 2x5514 w/ Mount	C	From Leg	4.000	0.000	88'	No Ice	6.524	6.531	0.039
Pipe			0'			1/2" Ice	6.949	7.240	0.104
(E)			2'			1" Ice	7.375	7.920	0.174
(2) LPA-80063/4CF w/	A	From Leg	4.000	0.000	88'	No Ice	6.385	6.603	0.038
Mount Pipe			0'			1/2" Ice	6.784	7.232	0.104
(E)			2'			1" Ice	7.192	7.876	0.176
(2) LPA-80063/4CF w/	B	From Leg	4.000	0.000	88'	No Ice	6.385	6.603	0.038
Mount Pipe			0'			1/2" Ice	6.784	7.232	0.104
(E)			2'			1" Ice	7.192	7.876	0.176
(2) LPA-80063/4CF w/	C	From Leg	4.000	0.000	88'	No Ice	6.385	6.603	0.038
Mount Pipe			0'			1/2" Ice	6.784	7.232	0.104

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		*C_AA_A Front*	*C_AA_A Side*	*Weight*
			ft *ft* *ft*	*°*	*ft*		*ft²*	*ft²*	*K*
(E)			2'			1" Ice	7.192	7.876	0.176
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	88'	No Ice	0.314	0.076	0.003
(E)			0'			1/2" Ice	0.386	0.119	0.005
			2'			1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	88'	No Ice	0.314	0.076	0.003
(E)			0'			1/2" Ice	0.386	0.119	0.005
			2'			1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	C	From Leg	4.000	0.000	88'	No Ice	0.314	0.076	0.003
(E)			0'			1/2" Ice	0.386	0.119	0.005
			2'			1" Ice	0.466	0.169	0.009
DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	88'	No Ice	4.800	2.000	0.044
(E)			0'			1/2" Ice	5.070	2.193	0.080
			2'			1" Ice	5.348	2.393	0.120
Sector Mount [SM 408-3]	C	None		0.000	88'	No Ice	22.450	22.450	1.019
(E)						1/2" Ice	33.500	33.500	1.475
						1" Ice	44.550	44.550	1.930
Pipe Mount [PM 601-3]	C	None		0.000	88'	No Ice	4.390	4.390	0.195
(E-Mount Attacment)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
M									
M									
APXV18-206517S-C w/	A	From Leg	1.000	0.000	65'	No Ice	5.404	4.700	0.052
Mount Pipe			0'			1/2" Ice	5.960	5.860	0.097
(AB-Leg connected)			0'			1" Ice	6.481	6.734	0.150
APXV18-206517S-C w/	B	From Leg	1.000	0.000	65'	No Ice	5.404	4.700	0.052
Mount Pipe			0'			1/2" Ice	5.960	5.860	0.097
(AB-Leg connected)			0'			1" Ice	6.481	6.734	0.150
APXV18-206517S-C w/	C	From Leg	1.000	0.000	65'	No Ice	5.404	4.700	0.052
Mount Pipe			0'			1/2" Ice	5.960	5.860	0.097
(AB-Leg connected)			0'			1" Ice	6.481	6.734	0.150
M									
GPS-TMG-HR-26NCM	C	From Leg	1.000	0.000	50'	No Ice	0.133	0.133	0.001
(E)			0'			1/2" Ice	0.183	0.183	0.002
			0'			1" Ice	0.239	0.239	0.005
4' x 2" Pipe Mount	C	From Leg	0.500	0.000	50'	No Ice	0.785	0.785	0.029
(E)			0'			1/2" Ice	1.028	1.028	0.035
			0'			1" Ice	1.281	1.281	0.044
M									
M									
M									
M									

Dishes

Description	*Face or Leg*	*Dish Type*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*3 dB Beam Width*	*Elevation*	*Outside Diameter*		*Aperture Area*	*Weight*
				ft	*°*	*°*	*ft*	*ft*		*ft²*	*K*
HPLPD1-18	B	Paraboloid	From	4.000	-27.000		150'	1.140	No Ice	1.021	0.017
(E-Per photo)		w/Shroud (HP)	Leg	0'					1/2" Ice	1.175	0.023
				1'					1" Ice	1.330	0.029
HPLPD1-18	C	Paraboloid	From	4.000	-11.000		150'	1.140	No Ice	1.021	0.017

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
(E-Per photo)		w/Shroud (HP)	Leg	0'					1/2" Ice	1.175	0.023
				1'					1" Ice	1.330	0.029
M											
M											

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105244	1026.861	3133.364	0.563	1.051	7.131	21.759	3.682
Pirod 105216	1998.089	6426.986	0.505	2.151	6.938	22.316	3.682
Pirod 105217	2130.748	6462.604	0.619	2.174	7.398	22.440	5.301
Pirod 105218	2263.469	6487.303	0.755	2.188	7.859	22.525	7.216
Pirod 105218	2263.469	6418.467	0.755	2.147	7.859	22.286	7.216
Pirod 105219	2441.869	6353.817	0.944	2.107	8.479	22.062	9.425

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp

Comb. No.	*Description*
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	*Elevation ft*	*Component Type*	*Condition*	*Gov. Load Comb.*	*Axial K*	*Major Axis Moment kip-ft*	*Minor Axis Moment kip-ft*
T1	150 - 147.583	Leg	Max Tension	15	0.808	0.000	0.000
			Max. Compression	35	-3.853	-0.058	-0.015
			Max. Mx	18	-2.345	-0.137	-0.032
			Max. My	22	-1.672	-0.071	-0.072
			Max. Vy	18	0.065	0.000	0.000
			Max. Vx	19	0.039	0.000	0.000
		Diagonal	Max Tension	21	1.348	0.000	0.000
			Max. Compression	20	-1.396	0.000	0.000
			Max. Mx	26	-0.026	0.006	0.000
			Max. Vy	26	-0.007	0.000	0.000
		Top Girt	Max Tension	23	0.940	-0.051	-0.000
			Max. Compression	18	-0.949	0.023	-0.000
			Max. Mx	2	0.337	-0.095	-0.000
			Max. My	27	0.102	-0.093	-0.001
			Max. Vy	27	0.071	-0.093	-0.001
			Max. Vx	27	-0.000	0.000	0.000
T2	147.583 - 130	Leg	Max Tension	7	22.014	-0.239	-0.011
			Max. Compression	18	-26.285	-0.518	-0.048
			Max. Mx	19	-25.689	-0.518	-0.048
			Max. My	4	-2.666	-0.005	0.478
			Max. Vy	18	-2.280	0.242	0.009
			Max. Vx	4	2.020	0.010	-0.196
		Diagonal	Max Tension	21	2.827	0.000	0.000
			Max. Compression	20	-2.969	0.000	0.000
			Max. Mx	31	0.652	-0.006	0.000
			Max. My	20	-2.657	-0.001	-0.000
			Max. Vy	31	0.010	-0.006	0.000
			Max. Vx	20	0.000	-0.001	-0.000
		Horizontal	Max Tension	14	0.527	0.000	0.000
			Max. Compression	3	-0.329	0.000	0.000
			Max. Mx	26	0.391	0.020	0.000
			Max. Vy	26	-0.018	0.000	0.000
		Top Girt	Max Tension	27	0.167	0.000	0.000
			Max. Compression	7	-0.112	0.000	0.000

Section No.	*Elevation ft*	*Component Type*	*Condition*	*Gov. Load Comb.*	*Axial K*	*Major Axis Moment kip-ft*	*Minor Axis Moment kip-ft*
			Max. Mx	26	0.042	0.017	0.000
			Max. Vy	26	-0.016	0.000	0.000
		Bottom Girt	Max Tension	14	1.327	0.000	0.000
			Max. Compression	3	-1.209	0.000	0.000
			Max. Mx	26	0.054	0.020	0.000
			Max. Vy	26	-0.018	0.000	0.000
T3	130 - 110	Leg	Max Tension	7	58.379	-2.112	-0.184
			Max. Compression	10	-66.320	2.107	-0.156
			Max. Mx	19	-65.047	2.116	0.191
			Max. My	4	-5.088	-0.009	-1.573
			Max. Vy	14	4.603	-2.113	0.035
			Max. Vx	4	3.340	-0.009	-1.573
		Diagonal	Max Tension	21	5.040	0.000	0.000
			Max. Compression	20	-5.169	0.000	0.000
			Max. Mx	31	1.060	-0.008	0.000
			Max. My	20	-3.518	-0.001	-0.001
			Max. Vy	31	0.013	-0.008	0.000
			Max. Vx	20	0.000	0.000	0.000
		Horizontal	Max Tension	14	0.840	0.000	0.000
			Max. Compression	3	-0.714	0.000	0.000
			Max. Mx	26	0.309	0.021	0.000
			Max. Vy	26	-0.017	0.000	0.000
		Top Girt	Max Tension	18	1.300	0.000	0.000
			Max. Compression	7	-1.281	0.000	0.000
			Max. Mx	26	0.017	0.020	0.000
			Max. Vy	26	0.018	0.000	0.000
		Bottom Girt	Max Tension	14	1.662	0.000	0.000
			Max. Compression	3	-1.537	0.000	0.000
			Max. Mx	26	0.164	0.024	0.000
			Max. Vy	26	-0.020	0.000	0.000
T4	110 - 100	Leg	Max Tension	7	61.934	-2.112	-0.184
			Max. Compression	10	-68.986	4.452	-0.142
			Max. Mx	10	-68.986	4.452	-0.142
			Max. My	4	-4.707	0.023	-4.508
			Max. Vy	14	0.506	-4.405	0.027
			Max. Vx	8	-0.562	0.001	4.273
		Diagonal	Max Tension	7	7.343	0.058	-0.008
			Max. Compression	18	-8.576	0.000	0.000
			Max. Mx	4	3.899	0.061	-0.003
			Max. My	20	-6.471	-0.045	0.012
			Max. Vy	32	0.030	0.051	-0.007
			Max. Vx	30	0.003	0.000	0.000
		Top Girt	Max Tension	14	0.885	0.000	0.000
			Max. Compression	11	-0.559	0.000	0.000
			Max. Mx	26	0.508	-0.053	0.000
			Max. My	26	0.592	0.000	0.002
			Max. Vy	26	-0.042	0.000	0.000
			Max. Vx	26	-0.001	0.000	0.000
T5	100 - 80	Leg	Max Tension	7	94.957	-4.530	0.048
			Max. Compression	18	-106.416	4.904	-0.045
			Max. Mx	18	-106.416	4.904	-0.045
			Max. My	8	-5.463	-0.109	5.018
			Max. Vy	6	-0.949	-4.122	0.018
			Max. Vx	12	-1.277	-0.131	-4.998
		Diagonal	Max Tension	5	12.101	0.000	0.000
			Max. Compression	4	-14.230	0.000	0.000
			Max. Mx	18	0.243	0.131	0.007
			Max. My	30	-5.516	0.004	-0.012
			Max. Vy	33	0.049	0.085	-0.010
			Max. Vx	30	0.004	0.000	0.000
		Horizontal	Max Tension	6	11.022	0.000	0.000

Section No.	*Elevation ft*	*Component Type*	*Condition*	*Gov. Load Comb.*	*Axial K*	*Major Axis Moment kip-ft*	*Minor Axis Moment kip-ft*
			Max. Compression	19	-8.951	0.000	0.000
			Max. Mx	26	3.637	-0.102	0.000
			Max. My	26	3.705	0.000	0.003
			Max. Vy	26	0.058	0.000	0.000
			Max. Vx	26	-0.002	0.000	0.000
		Top Girt	Max Tension	6	7.632	0.000	0.000
			Max. Compression	19	-6.178	0.000	0.000
			Max. Mx	26	2.488	-0.075	0.000
			Max. My	26	2.572	0.000	0.002
			Max. Vy	26	-0.050	0.000	0.000
			Max. Vx	26	-0.001	0.000	0.000
T6	80 - 60	Leg	Max Tension	7	141.495	-4.032	0.004
			Max. Compression	18	-160.237	5.306	0.003
			Max. Mx	18	-160.237	5.306	0.003
			Max. My	4	-9.765	-0.338	-7.059
			Max. Vy	10	-0.366	5.290	-0.020
			Max. Vx	24	-0.618	-0.348	7.058
		Diagonal	Max Tension	8	8.411	0.000	0.000
			Max. Compression	8	-8.357	0.000	0.000
			Max. Mx	18	6.902	0.116	0.009
			Max. My	20	-8.048	-0.055	0.018
			Max. Vy	27	-0.054	0.114	0.012
			Max. Vx	30	0.004	0.000	0.000
		Top Girt	Max Tension	6	7.951	0.000	0.000
			Max. Compression	19	-6.558	0.000	0.000
			Max. Mx	26	2.502	-0.130	0.000
			Max. My	26	2.535	0.000	0.004
			Max. Vy	26	0.065	0.000	0.000
			Max. Vx	26	0.002	0.000	0.000
T7	60 - 40	Leg	Max Tension	7	178.488	-4.594	0.016
			Max. Compression	18	-201.445	6.182	0.004
			Max. Mx	18	-201.445	6.182	0.004
			Max. My	24	-11.806	0.068	5.748
			Max. Vy	10	-0.286	6.162	-0.064
			Max. Vx	24	-0.280	0.068	5.748
		Diagonal	Max Tension	8	8.325	0.000	0.000
			Max. Compression	8	-8.379	0.000	0.000
			Max. Mx	27	1.985	0.110	0.013
			Max. My	36	-2.676	0.066	0.014
			Max. Vy	37	0.060	0.101	0.013
			Max. Vx	36	-0.004	0.000	0.000
T8	40 - 20	Leg	Max Tension	7	213.047	-4.466	0.034
			Max. Compression	2	-240.868	5.584	0.016
			Max. Mx	18	-221.110	6.182	0.004
			Max. My	24	-12.449	0.068	5.748
			Max. Vy	33	0.499	-4.399	-0.023
			Max. Vx	20	-0.364	-0.199	-5.623
		Diagonal	Max Tension	17	8.791	0.000	0.000
			Max. Compression	16	-9.027	0.000	0.000
			Max. Mx	27	2.631	0.162	0.019
			Max. My	32	3.020	0.139	-0.019
			Max. Vy	37	0.079	0.143	0.019
			Max. Vx	32	0.004	0.000	0.000
T9	20 - 0	Leg	Max Tension	7	244.506	-5.106	0.038
			Max. Compression	2	-277.581	0.000	0.000
			Max. Mx	27	-137.639	5.884	-0.050
			Max. My	20	-15.757	-0.389	-8.660
			Max. Vy	33	-0.811	-4.399	-0.023
			Max. Vx	20	-0.984	-0.389	-8.660
		Diagonal	Max Tension	17	9.765	0.000	0.000
			Max. Compression	2	-10.434	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	27	1.178	0.173	0.018
			Max. My	38	4.494	0.132	0.024
			Max. Vy	37	0.081	0.169	0.018
			Max. Vx	38	-0.005	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	288.193	26.687	-15.581
	Max. H_x	18	288.193	26.687	-15.581
	Max. H_z	7	-253.646	-23.901	13.912
	Min. Vert	7	-253.646	-23.901	13.912
	Min. H_x	7	-253.646	-23.901	13.912
	Min. H_z	18	288.193	26.687	-15.581
Leg B	Max. Vert	10	286.514	-26.717	-15.358
	Max. H_x	23	-253.672	23.955	13.735
	Max. H_z	23	-253.672	23.955	13.735
	Min. Vert	23	-253.672	23.955	13.735
	Min. H_x	10	286.514	-26.717	-15.358
	Min. H_z	10	286.514	-26.717	-15.358
Leg A	Max. Vert	2	288.410	-0.217	30.866
	Max. H_x	21	12.624	1.601	1.030
	Max. H_z	2	288.410	-0.217	30.866
	Min. Vert	15	-252.206	0.188	-27.577
	Min. H_x	8	17.997	-1.624	1.470
	Min. H_z	15	-252.206	0.188	-27.577

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	41.392	0.000	0.000	-10.514	6.108	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	49.670	0.068	-46.574	-3766.909	-0.824	-5.723
0.9 Dead+1.6 Wind 0 deg - No Ice	37.252	0.068	-46.574	-3763.755	-2.656	-5.723
1.2 Dead+1.6 Wind 30 deg - No Ice	49.670	22.997	-39.714	-3218.043	-1851.711	-4.780
0.9 Dead+1.6 Wind 30 deg - No Ice	37.252	22.997	-39.714	-3214.889	-1853.543	-4.780
1.2 Dead+1.6 Wind 60 deg - No Ice	49.670	39.258	-22.664	-1855.471	-3185.741	-3.155
0.9 Dead+1.6 Wind 60 deg - No Ice	37.252	39.258	-22.664	-1852.316	-3187.573	-3.155
1.2 Dead+1.6 Wind 90 deg - No Ice	49.670	45.884	-0.062	-19.960	-3697.581	-0.965
0.9 Dead+1.6 Wind 90 deg - No Ice	37.252	45.884	-0.062	-16.806	-3699.413	-0.965
1.2 Dead+1.6 Wind 120 deg - No Ice	49.670	40.356	23.226	1857.218	-3247.051	2.031

Load Combination	*Vertical* *K*	*Shear$_x$* *K*	*Shear$_z$* *K*	*Overturning Moment, M$_x$* *kip-ft*	*Overturning Moment, M$_z$* *kip-ft*	*Torque* *kip-ft*
0.9 Dead+1.6 Wind 120 deg - No Ice	37.252	40.356	23.226	1860.372	-3248.883	2.031
1.2 Dead+1.6 Wind 150 deg - No Ice	49.670	22.898	39.662	3187.032	-1840.336	4.517
0.9 Dead+1.6 Wind 150 deg - No Ice	37.252	22.898	39.662	3190.186	-1842.168	4.517
1.2 Dead+1.6 Wind 180 deg - No Ice	49.670	-0.054	45.241	3663.571	13.435	5.499
0.9 Dead+1.6 Wind 180 deg - No Ice	37.252	-0.054	45.241	3666.725	11.603	5.499
1.2 Dead+1.6 Wind 210 deg - No Ice	49.670	-22.998	39.703	3191.174	1866.417	4.761
0.9 Dead+1.6 Wind 210 deg - No Ice	37.252	-22.998	39.703	3194.328	1864.585	4.761
1.2 Dead+1.6 Wind 240 deg - No Ice	49.670	-40.409	23.323	1868.129	3267.624	3.432
0.9 Dead+1.6 Wind 240 deg - No Ice	37.252	-40.409	23.323	1871.284	3265.791	3.432
1.2 Dead+1.6 Wind 270 deg - No Ice	49.670	-45.886	0.058	-6.018	3712.559	0.932
0.9 Dead+1.6 Wind 270 deg - No Ice	37.252	-45.886	0.058	-2.864	3710.727	0.932
1.2 Dead+1.6 Wind 300 deg - No Ice	49.670	-39.215	-22.570	-1844.829	3195.972	-2.141
0.9 Dead+1.6 Wind 300 deg - No Ice	37.252	-39.215	-22.570	-1841.675	3194.139	-2.141
1.2 Dead+1.6 Wind 330 deg - No Ice	49.670	-22.908	-39.658	-3211.735	1856.518	-4.550
0.9 Dead+1.6 Wind 330 deg - No Ice	37.252	-22.908	-39.658	-3208.581	1854.686	-4.550
1.2 Dead+1.0 Ice+1.0 Temp	159.501	0.000	0.000	-38.382	24.423	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	159.501	0.014	-14.517	-1229.083	22.635	-0.752
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	159.501	7.223	-12.504	-1068.634	-571.023	-0.375
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	159.501	12.461	-7.203	-632.317	-1002.562	0.061
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	159.501	14.423	-0.013	-39.964	-1163.614	0.462
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	159.501	12.560	7.246	555.357	-1005.359	0.826
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	159.501	7.203	12.493	990.686	-568.624	0.973
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	159.501	-0.011	14.390	1147.560	25.691	0.759
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	159.501	-7.223	12.501	991.456	619.881	0.370
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	159.501	-12.570	7.265	557.639	1055.424	-0.039
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	159.501	-14.424	0.012	-36.988	1212.541	-0.470
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	159.501	-12.452	-7.184	-630.104	1050.566	-0.848
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	159.501	-7.206	-12.492	-1067.315	617.857	-0.982
Dead+Wind 0 deg - Service	41.392	0.016	-11.137	-908.288	4.158	-1.369
Dead+Wind 30 deg - Service	41.392	5.499	-9.497	-777.037	-438.449	-1.143
Dead+Wind 60 deg - Service	41.392	9.388	-5.420	-451.201	-757.460	-0.755
Dead+Wind 90 deg - Service	41.392	10.972	-0.015	-12.270	-879.857	-0.231
Dead+Wind 120 deg - Service	41.392	9.650	5.554	436.624	-772.121	0.486
Dead+Wind 150 deg - Service	41.392	5.476	9.484	754.626	-435.729	1.080

Load Combination	*Vertical* *K*	*Shear$_x$* *K*	*Shear$_z$* *K*	*Overturning Moment, M$_x$* *kip-ft*	*Overturning Moment, M$_z$* *kip-ft*	*Torque* *kip-ft*
Dead+Wind 180 deg - Service	41.392	-0.013	10.819	868.583	7.568	1.315
Dead+Wind 210 deg - Service	41.392	-5.500	9.494	755.617	450.677	1.139
Dead+Wind 240 deg - Service	41.392	-9.663	5.577	439.234	785.751	0.821
Dead+Wind 270 deg - Service	41.392	-10.973	0.014	-8.936	892.150	0.223
Dead+Wind 300 deg - Service	41.392	-9.378	-5.397	-448.656	768.617	-0.512
Dead+Wind 330 deg - Service	41.392	-5.478	-9.484	-775.528	448.310	-1.088

Solution Summary

	Sum of Applied Forces			*Sum of Reactions*			
Load Comb.	*PX* *K*	*PY* *K*	*PZ* *K*	*PX* *K*	*PY* *K*	*PZ* *K*	*% Error*
1	0.000	-41.392	0.000	0.000	41.392	0.000	0.000%
2	0.068	-49.670	-46.574	-0.068	49.670	46.574	0.000%
3	0.068	-37.252	-46.574	-0.068	37.252	46.574	0.000%
4	22.997	-49.670	-39.714	-22.997	49.670	39.714	0.000%
5	22.997	-37.252	-39.714	-22.997	37.252	39.714	0.000%
6	39.258	-49.670	-22.664	-39.258	49.670	22.664	0.000%
7	39.258	-37.252	-22.664	-39.258	37.252	22.664	0.000%
8	45.884	-49.670	-0.062	-45.884	49.670	0.062	0.000%
9	45.884	-37.252	-0.062	-45.884	37.252	0.062	0.000%
10	40.356	-49.670	23.226	-40.356	49.670	-23.226	0.000%
11	40.356	-37.252	23.226	-40.356	37.252	-23.226	0.000%
12	22.898	-49.670	39.662	-22.898	49.670	-39.662	0.000%
13	22.898	-37.252	39.662	-22.898	37.252	-39.662	0.000%
14	-0.054	-49.670	45.241	0.054	49.670	-45.241	0.000%
15	-0.054	-37.252	45.241	0.054	37.252	-45.241	0.000%
16	-22.998	-49.670	39.703	22.998	49.670	-39.703	0.000%
17	-22.998	-37.252	39.703	22.998	37.252	-39.703	0.000%
18	-40.409	-49.670	23.323	40.409	49.670	-23.323	0.000%
19	-40.409	-37.252	23.323	40.409	37.252	-23.323	0.000%
20	-45.886	-49.670	0.058	45.886	49.670	-0.058	0.000%
21	-45.886	-37.252	0.058	45.886	37.252	-0.058	0.000%
22	-39.215	-49.670	-22.570	39.215	49.670	22.570	0.000%
23	-39.215	-37.252	-22.570	39.215	37.252	22.570	0.000%
24	-22.908	-49.670	-39.658	22.908	49.670	39.658	0.000%
25	-22.908	-37.252	-39.658	22.908	37.252	39.658	0.000%
26	0.000	-159.501	0.000	0.000	159.501	0.000	0.000%
27	0.014	-159.501	-14.517	-0.014	159.501	14.517	0.000%
28	7.223	-159.501	-12.504	-7.223	159.501	12.504	0.000%
29	12.461	-159.501	-7.203	-12.461	159.501	7.203	0.000%
30	14.423	-159.501	-0.013	-14.423	159.501	0.013	0.000%
31	12.560	-159.501	7.246	-12.560	159.501	-7.246	0.000%
32	7.203	-159.501	12.493	-7.203	159.501	-12.493	0.000%
33	-0.011	-159.501	14.390	0.011	159.501	-14.390	0.000%
34	-7.223	-159.501	12.501	7.223	159.501	-12.501	0.000%
35	-12.570	-159.501	7.265	12.570	159.501	-7.265	0.000%
36	-14.424	-159.501	0.012	14.424	159.501	-0.012	0.000%
37	-12.452	-159.501	-7.184	12.452	159.501	7.184	0.000%
38	-7.206	-159.501	-12.492	7.206	159.501	12.492	0.000%
39	0.016	-41.392	-11.137	-0.016	41.392	11.137	0.000%
40	5.499	-41.392	-9.497	-5.499	41.392	9.497	0.000%
41	9.388	-41.392	-5.420	-9.388	41.392	5.420	0.000%
42	10.972	-41.392	-0.015	-10.972	41.392	0.015	0.000%
43	9.650	-41.392	5.554	-9.650	41.392	-5.554	0.000%
44	5.476	-41.392	9.484	-5.476	41.392	-9.484	0.000%
45	-0.013	-41.392	10.819	0.013	41.392	-10.819	0.000%
46	-5.500	-41.392	9.494	5.500	41.392	-9.494	0.000%

	Sum of Applied Forces			*Sum of Reactions*			
Load Comb.	*PX K*	*PY K*	*PZ K*	*PX K*	*PY K*	*PZ K*	*% Error*
47	-9.663	-41.392	5.577	9.663	41.392	-5.577	0.000%
48	-10.973	-41.392	0.014	10.973	41.392	-0.014	0.000%
49	-9.378	-41.392	-5.397	9.378	41.392	5.397	0.000%
50	-5.478	-41.392	-9.484	5.478	41.392	9.484	0.000%

Maximum Tower Deflections - Service Wind

Section No.	*Elevation ft*	*Horz. Deflection in*	*Gov. Load Comb.*	*Tilt °*	*Twist °*
T1	150 - 147.583	4.814	39	0.295	0.038
T2	147.583 - 130	4.664	39	0.294	0.036
T3	130 - 110	3.580	39	0.275	0.025
T4	110 - 100	2.470	39	0.231	0.013
T5	100 - 80	2.001	39	0.205	0.007
T6	80 - 60	1.240	39	0.150	0.004
T7	60 - 40	0.682	39	0.103	0.002
T8	40 - 20	0.298	39	0.067	0.001
T9	20 - 0	0.079	39	0.029	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	*Appurtenance*	*Gov. Load Comb.*	*Deflection in*	*Tilt °*	*Twist °*	*Radius of Curvature ft*
151'	HPLPD1-18	39	4.814	0.295	0.038	988998
150'	(3) 6' x 2" Mount Pipe	39	4.814	0.295	0.038	988998
141'	SBNHH-1D65A w/ Mount Pipe	39	4.254	0.290	0.031	127418
130'	M5160160P10006	39	3.580	0.275	0.025	34810
118'	SC320	39	2.890	0.250	0.018	22131
114'	ERICSSON AIR 21 B2A B4P	39	2.675	0.240	0.016	19813
103'	800MHz 2X50W RRH W/FILTER	39	2.135	0.213	0.008	19072
100'	APXVSPP18-C-A20 w/ Mount Pipe	39	2.001	0.205	0.007	19611
88'	(2) BXA-171063/8CF w/ Mount Pipe	39	1.518	0.172	0.004	22105
65'	APXV18-206517S-C w/ Mount Pipe	39	0.804	0.113	0.003	26824
50'	GPS-TMG-HR-26NCM	39	0.469	0.084	0.002	28741

Maximum Tower Deflections - Design Wind

Section No.	*Elevation ft*	*Horz. Deflection in*	*Gov. Load Comb.*	*Tilt °*	*Twist °*
T1	150 - 147.583	20.079	19	1.234	0.158
T2	147.583 - 130	19.450	19	1.232	0.151
T3	130 - 110	14.910	19	1.148	0.104
T4	110 - 100	10.275	19	0.962	0.054
T5	100 - 80	8.322	19	0.856	0.028

Section No.	*Elevation* *ft*	*Horz. Deflection* *in*	*Gov. Load Comb.*	*Tilt* *°*	*Twist* *°*
T6	80 - 60	5.155	19	0.622	0.017
T7	60 - 40	2.832	19	0.427	0.010
T8	40 - 20	1.238	19	0.276	0.005
T9	20 - 0	0.329	18	0.120	0.003

Critical Deflections and Radius of Curvature - Design Wind

Elevation *ft*	*Appurtenance*	*Gov. Load Comb.*	*Deflection* *in*	*Tilt* *°*	*Twist* *°*	*Radius of Curvature* *ft*
151'	HPLPD1-18	19	20.079	1.234	0.158	59620
150'	(3) 6' x 2" Mount Pipe	19	20.079	1.234	0.158	59620
141'	SBNHH-1D65A w/ Mount Pipe	19	17.731	1.214	0.131	32305
130'	M5160160P10006	19	14.910	1.148	0.104	8417
118'	SC320	19	12.027	1.042	0.075	5362
114'	ERICSSON AIR 21 B2A B4P	19	11.131	1.002	0.065	4802
103'	800MHz 2X50W RRH W/FILTER	19	8.880	0.888	0.034	4598
100'	APXVSPP18-C-A20 w/ Mount Pipe	19	8.322	0.856	0.028	4715
88'	(2) BXA-171063/8CF w/ Mount Pipe	19	6.312	0.715	0.019	5292
65'	APXV18-206517S-C w/ Mount Pipe	19	3.342	0.470	0.012	6443
50'	GPS-TMG-HR-26NCM	19	1.948	0.350	0.007	6909

Bolt Design Data

Section No.	*Elevation* *ft*	*Component Type*	*Bolt Grade*	*Bolt Size* *in*	*Number Of Bolts*	*Maximum Load per Bolt* *K*	*Allowable Load* *K*	*Ratio Load / Allowable*	*Allowable Ratio*	*Criteria*
T2	147.583	Leg	A325N	0.625	5	5.257	24.851	0.212 ✓	1	Bolt DS
T3	130	Leg	A325N	1.000	6	9.730	53.014	0.184 ✓	1	Bolt Tension
T4	110	Leg	A325N	1.000	6	10.322	53.014	0.195 ✓	1	Bolt Tension
		Diagonal	A325N	1.000	1	7.343	10.663	0.689 ✓	1	Member Block Shear
		Top Girt	A325N	1.000	1	0.885	11.682	0.076 ✓	1	Member Block Shear
T5	100	Leg	A325N	1.000	6	15.826	53.014	0.299 ✓	1	Bolt Tension
		Diagonal	A325N	1.000	1	12.102	21.326	0.567 ✓	1	Member Block Shear
		Horizontal	A325N	1.000	1	11.022	11.682	0.943 ✓	1	Member Block Shear
		Top Girt	A325N	1.000	1	7.632	11.682	0.653 ✓	1	Member Block Shear
T6	80	Leg	A325N	1.000	6	23.583	53.014	0.445 ✓	1	Bolt Tension
		Diagonal	A325N	1.000	1	8.411	11.682	0.720 ✓	1	Member Block Shear
		Top Girt	A325N	1.000	1	7.951	11.682	0.681 ✓	1	Member Block Shear
T7	60	Leg	A325N	1.000	6	29.744	53.014	0.561 ✓	1	Bolt Tension

Section No.	*Elevation* *ft*	*Component Type*	*Bolt Grade*	*Bolt Size* *in*	*Number Of Bolts*	*Maximum Load per Bolt* *K*	*Allowable Load* *K*	*Ratio* *Load / Allowable*	*Allowable Ratio*	*Criteria*
		Diagonal	A325N	1.000	1	8.325	11.682	0.713 ✓	1	Member Block Shear
T8	40	Leg	A325N	1.000	6	35.508	53.014	0.670 ✓	1	Bolt Tension
		Diagonal	A325N	1.000	1	8.791	19.471	0.452 ✓	1	Member Block Shear
T9	20	Diagonal	A325N	1.250	1	9.765	23.701	0.412 ✓	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	*Elevation* *ft*	*Size*	*L* *ft*	L_u *ft*	*Kl/r*	*A* in^2	P_u *K*	ϕP_n *K*	*Ratio* $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	1 1/2	2'5"	2'5"	77.3 K=1.00	1.767	-3.853	51.350	0.075 [1] ✓
T2	147.583 - 130	1 1/2	17'7-1/32"	2'5"	77.3 K=1.00	1.767	-23.936	51.350	0.466 [1] ✓
T3	130 - 110	2	20'1/32"	2'4-3/8"	56.8 K=1.00	3.142	-62.652	111.705	0.561 [1] ✓
T4	110 - 100	Pirod 105244	10'7/32"	10'7/32"	45.4 K=1.00	3.682	-68.987	142.493	0.484 [1] ✓
T5	100 - 80	Pirod 105216	20'13/32"	10'7/32"	45.4 K=1.00	3.682	-106.416	142.493	0.747 [1] ✓
T6	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8 K=1.00	5.301	-160.237	214.859	0.746 [1] ✓
T7	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	7.216	-201.445	300.681	0.670 [1] ✓
T8	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	7.216	-240.868	300.681	0.801 [1] ✓
T9	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4 K=1.00	9.425	-277.581	399.868	0.694 [1] ✓

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	*Elevation* *ft*	*Diagonal Size*	L_d *ft*	*Kl/r*	ϕP_n *K*	*A* in^2	V_u *K*	ϕV_n *K*	*Stress Ratio*
T4	110 - 100	0.5	1'5-25/32"	121.0	165.670	0.196	0.566	3.389	0.168 ✓
T5	100 - 80	0.5	1'5-25/32"	121.0	165.670	0.196	1.279	3.292	0.389 ✓

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T6	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.621	3.335	0.187 ✓
T7	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.300	3.378	0.089 ✓
T8	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.499	3.378	0.148 ✓
T9	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	0.985	6.958	0.142 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	3/4	3'1-7/8"	3'23/32"	137.1 K=0.70	0.442	-1.396	5.311	0.263 [1] ✓
T2	147.583 - 130	3/4	5'7/8"	2'5-25/32"	143.0 K=0.90	0.442	-2.969	4.879	0.609 [1] ✓
T3	130 - 110	7/8	5'5-29/32"	2'8-1/32"	131.8 K=0.90	0.601	-5.169	7.820	0.661 [1] ✓
T4	110 - 100	L2 1/2x2 1/2x3/16	11'5"	4'11-25/32"	120.8 K=1.00	0.902	-8.576	13.558	0.632 [1] ✓
T5	100 - 80	L2 1/2x2 1/2x3/8	12'6-1/32"	5'7-17/32"	138.7 K=1.00	1.730	-14.230	20.328	0.700 [1] ✓
T6	80 - 60	L3x3x3/16	13'9-9/16"	6'3-15/16"	127.4 K=1.00	1.090	-8.357	14.947	0.559 [1] ✓
T7	60 - 40	L3x3x3/16	15'2-29/32"	7'31/32"	142.6 K=1.00	1.090	-8.317	12.112	0.687 [1] ✓
T8	40 - 20	L3x3x5/16	16'9-5/8"	7'10-19/32"	160.6 K=1.00	1.780	-9.027	15.594	0.579 [1] ✓
T9	20 - 0	L3x3x5/16	18'5-3/8"	8'8-1/8"	176.8 K=1.00	1.780	-10.434	12.868	0.811 [1] ✓

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	147.583 - 130	7/8	4'4-7/16"	4'2-15/16"	163.1 K=0.70	0.601	-0.329	5.109	0.064 [1] ✓
T3	130 - 110	3/4	4'6-7/8"	4'4-7/8"	197.3 K=0.70	0.442	-0.714	2.563	0.279 [1] ✓
T5	100 - 80	L3x3x3/16	7'	5'7"	116.2 K=1.03	1.090	-8.951	17.168	0.521 [1] ✓

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	*Elevation*	*Size*	*L*	L_u	*Kl/r*	*A*	P_u	ϕP_n	*Ratio* $\frac{P_u}{\phi P_n}$
	ft		*ft*	*ft*		*in²*	*K*	*K*	
T1	150 - 147.583	5x1/2	4'	2'10-7/8''	241.6 K=1.00	2.500	-0.949	9.674	0.098 [1] ✓
T2	147.583 - 130	KL/R > 200 (C) - 4 7/8	4'27/32"	3'11-11/32"	151.5 K=0.70	0.601	-0.112	5.917	0.019 [1] ✓
T3	130 - 110	7/8	4'6-5/32''	4'4-5/32''	166.9 K=0.70	0.601	-1.281	4.878	0.263 [1] ✓
T4	110 - 100	L3x3x3/16	5'	4'5"	104.5 K=1.17	1.090	-0.559	19.587	0.029 [1] ✓
T5	100 - 80	L3x3x3/16	6'	4'7"	106.1 K=1.15	1.090	-6.178	19.238	0.321 [1] ✓
T6	80 - 60	L3x3x3/16	8'	6'7"	132.6 K=1.00	1.090	-6.558	13.961	0.470 [1] ✓

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	*Elevation*	*Size*	*L*	L_u	*Kl/r*	*A*	P_u	ϕP_n	*Ratio* $\frac{P_u}{\phi P_n}$
	ft		*ft*	*ft*		*in²*	*K*	*K*	
T2	147.583 - 130	7/8	4'5-29/32"	4'4-13/32"	167.7 K=0.70	0.601	-1.209	4.831	0.250 [1] ✓
T3	130 - 110	7/8	4'11-13/16"	4'9-13/16"	185.0 K=0.70	0.601	-1.537	3.967	0.387 [1] ✓

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	*Elevation*	*Size*	*L*	L_u	*Kl/r*	*A*	P_u	ϕP_n	*Ratio* $\frac{P_u}{\phi P_n}$
	ft		*ft*	*ft*		*in²*	*K*	*K*	
T1	150 - 147.583	1 1/2	2'5"	2'5"	77.3	1.767	0.808	79.522	0.010 [1] ✓
T2	147.583 - 130	1 1/2	17'7-1/32"	4"	10.7	1.767	22.014	79.522	0.277 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	130 - 110	2	20'1/32"	7"	14.0	3.142	58.379	141.372	0.413 [1] ✓
T4	110 - 100	Pirod 105244	10'7/32"	10'7/32"	45.4	3.682	61.934	165.670	0.374 [1] ✓
T5	100 - 80	Pirod 105216	20'13/32"	10'7/32"	45.4	3.682	94.957	165.670	0.573 [1] ✓
T6	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8	5.301	141.495	238.565	0.593 [1] ✓
T7	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4	7.216	178.461	324.713	0.550 [1] ✓
T8	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4	7.216	213.047	324.713	0.656 [1] ✓
T9	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4	9.425	244.506	424.115	0.577 [1] ✓

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	110 - 100	0.5	1'5-25/32"	121.0	165.670	0.196	0.566	3.389	0.168 ✓
T5	100 - 80	0.5	1'5-25/32"	121.0	165.670	0.196	1.279	3.292	0.389 ✓
T6	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.621	3.335	0.187 ✓
T7	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.300	3.378	0.089 ✓
T8	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.499	3.378	0.148 ✓
T9	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	0.985	6.958	0.142 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	3/4	3'1-7/8"	3'23/32"	195.8	0.442	1.348	19.880	0.068 [1] ✓
T2	147.583 - 130	3/4	5'7/8"	2'5-25/32"	158.9	0.442	2.827	19.880	0.142 [1] ✓
T3	130 - 110	7/8	5'5-29/32"	2'8-1/32''	146.4	0.601	5.040	27.059	0.186 [1] ✓
T4	110 - 100	L2 1/2x2 1/2x3/16	11'5"	4'11-25/32"	80.1	0.518	7.343	22.546	0.326 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	100 - 80	L2 1/2x2 1/2x3/8	12'6-1/32"	5'7-17/32"	93.0	0.981	12.102	42.678	0.284 [1] ✓
T6	80 - 60	L3x3x3/16	13'9-9/16"	6'3-15/16"	83.5	0.659	8.411	28.679	0.293 [1] ✓
T7	60 - 40	L3x3x3/16	14'6-1/32"	6'8-23/32"	88.6	0.659	8.325	28.679	0.290 [1] ✓
T8	40 - 20	L3x3x5/16	16'9-5/8''	7'10-19/32"	105.3	1.071	8.791	46.603	0.189 [1] ✓
T9	20 - 0	L3x3x5/16	18'5-3/8''	8'8-1/8"	116.2	1.013	9.765	44.054	0.222 [1] ✓

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	147.583 - 130	7/8	4'4-7/16''	4'2-15/16"	232.9	0.601	0.527	27.059	0.019 [1] ✓
T3	130 - 110	3/4	4'6-7/8"	4'4-7/8"	281.9	0.442	0.840	19.880	0.042 [1] ✓
T5	100 - 80	L3x3x3/16	7'	5'7"	76.7	0.659	11.022	28.679	0.384 [1] ✓

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	5x1/2	4'	2'10-7/8''	241.6	2.500	0.940	81.000	0.012 [1] ✓
T2	147.583 - 130	7/8	4'27/32"	3'11-11/32"	216.5	0.601	0.167	27.059	0.006 [1] ✓
T3	130 - 110	7/8	4'6-5/32''	4'4-5/32''	238.4	0.601	1.300	27.059	0.048 [1] ✓
T4	110 - 100	L3x3x3/16	5'	4'5"	61.8	0.659	0.885	28.679	0.031 [1] ✓
T5	100 - 80	L3x3x3/16	6'	4'7"	63.9	0.659	7.632	28.679	0.266 [1] ✓
T6	80 - 60	L3x3x3/16	8'	6'7"	89.5	0.659	7.951	28.679	0.277 [1] ✓

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	147.583 - 130	7/8	4'5-29/32"	4'4-13/32"	239.5	0.601	1.327	27.059	0.049 [1] ✓
T3	130 - 110	7/8	4'11-13/16"	4'9-13/16"	264.3	0.601	1.662	27.059	0.061 [1] ✓

[1] P_u / ϕP_n controls

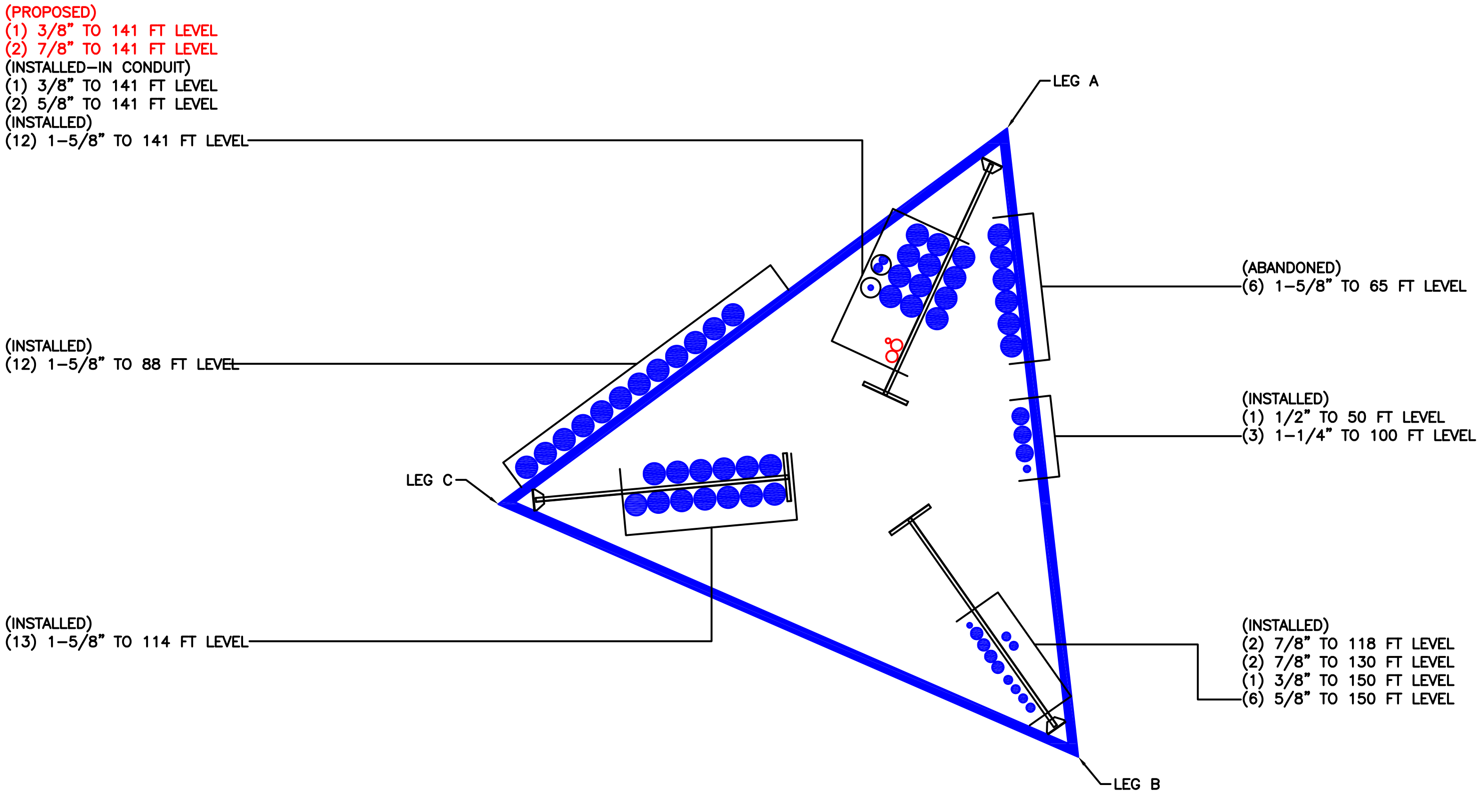
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
T1	150 - 147.583	Leg	1 1/2	1	-3.853	51.350	7.5	Pass
T2	147.583 - 130	Leg	1 1/2	13	-23.936	51.350	46.6	Pass
T3	130 - 110	Leg	2	71	-62.652	111.705	56.1	Pass
T4	110 - 100	Leg	Pirod 105244	135	-68.987	142.493	48.4	Pass
T5	100 - 80	Leg	Pirod 105216	146	-106.416	142.493	74.7	Pass
T6	80 - 60	Leg	Pirod 105217	167	-160.237	214.859	74.6	Pass
T7	60 - 40	Leg	Pirod 105218	185	-201.445	300.681	67.0	Pass
T8	40 - 20	Leg	Pirod 105218	202	-240.868	300.681	80.1	Pass
T9	20 - 0	Leg	Pirod 105219	217	-277.581	399.868	69.4	Pass
T1	150 - 147.583	Diagonal	3/4	7	-1.396	5.311	26.3	Pass
T2	147.583 - 130	Diagonal	3/4	22	-2.969	4.879	60.9	Pass
T3	130 - 110	Diagonal	7/8	79	-5.169	7.820	66.1	Pass
T4	110 - 100	Diagonal	L2 1/2x2 1/2x3/16	140	-8.576	13.558	63.2 68.9 (b)	Pass
T5	100 - 80	Diagonal	L2 1/2x2 1/2x3/8	155	-14.230	20.328	70.0	Pass
T6	80 - 60	Diagonal	L3x3x3/16	174	-8.357	14.947	55.9 72.0 (b)	Pass
T7	60 - 40	Diagonal	L3x3x3/16	189	-8.317	12.112	68.7 71.3 (b)	Pass
T8	40 - 20	Diagonal	L3x3x5/16	208	-9.027	15.594	57.9	Pass
T9	20 - 0	Diagonal	L3x3x5/16	222	-10.434	12.868	81.1	Pass
T2	147.583 - 130	Horizontal	7/8	35	-0.329	5.109	6.4	Pass
T3	130 - 110	Horizontal	3/4	127	-0.714	2.563	27.9	Pass
T5	100 - 80	Horizontal	L3x3x3/16	159	-8.951	17.168	52.1 94.3 (b)	Pass
T1	150 - 147.583	Top Girt	5x1/2	4	-0.949	9.674	9.8	Pass
T2	147.583 - 130	Top Girt	7/8	17	-0.112	5.917	1.9	Pass
T3	130 - 110	Top Girt	7/8	74	-1.281	4.878	26.3	Pass
T4	110 - 100	Top Girt	L3x3x3/16	137	0.885	28.679	3.1 7.6 (b)	Pass
T5	100 - 80	Top Girt	L3x3x3/16	150	-6.178	19.238	32.1 65.3 (b)	Pass
T6	80 - 60	Top Girt	L3x3x3/16	171	-6.558	13.961	47.0 68.1 (b)	Pass
T2	147.583 - 130	Bottom Girt	7/8	19	-1.209	4.831	25.0	Pass
T3	130 - 110	Bottom Girt	7/8	76	-1.537	3.967	38.7	Pass
							Summary	

Section No.	*Elevation ft*	*Component Type*	*Size*	*Critical Element*	*P K*	*øP_{allow} K*	*% Capacity*	*Pass Fail*
						Leg (T8)	80.1	Pass
						Diagonal (T9)	81.1	Pass
						Horizontal (T5)	94.3	Pass
						Top Girt (T6)	68.1	Pass
						Bottom Girt (T3)	38.7	Pass
						Bolt Checks	94.3	Pass
						RATING =	**94.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842870

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9

Rev. 6.1

CROWN CASTLE

Site Data	
BU#:	**823102**
Site Name:	**Choctaw, OK**
App #:	**315271, Rev. 0**

Reactions		
Eta Factor, η	**0.55**	Detail Type
Uplift, Pu:	**254**	kips
Shear, Vu:	**28**	kips

Anchor Rod Data		
Qty:	**6**	
Diam:	**1.25**	in
Rod Material:	**A687**	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi

l_{ar}:		in
Mu = $0.65*l_{ar}*V_u$		ft-kips

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Anchor Rod Results:

Max Rod (Cu+ Vu/ή):	50.8	Kips
Design Axial, Φ*Fu*Anet:	116.3	Kips
Anchor Rod Stress Ratio:	43.7%	

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

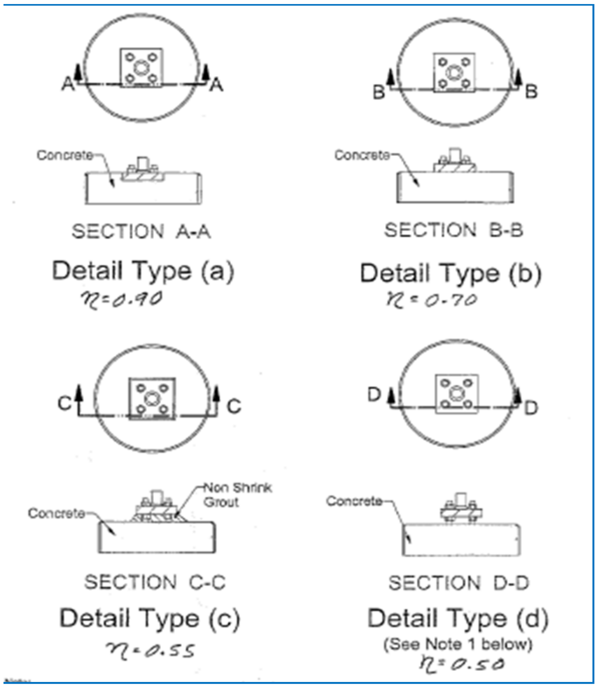


Figure 4-4 of TIA-222-G

Maximum Acceptable Ratio:	**105**	%
Governing Stress Ratio:	**43.7%**	**Pass**

PROJECT **91292.006.01 - MILFORD, CT**
SUBJECT **SST Pad Footing Analysis**
DATE **10-01-16** PAGE **1** OF **1**

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Combined Footing Foundation Analysis

Rev. Type: G

Design Loads:

Input factored loads
Compression per leg (P_C) = **288.0** (k)
Tension per leg (P_T) = **254.0** (k)
Overturning Moment (M_O) = **3,767.0** (k)
Total Tower Horizontal Load = **47.0** (k-ft)
Tower + Appurtenances = **50.0** (k)

Saftey Factors
Soil Uplift = **0.75**
Soil Bearing = **0.75**
Soil Friction = **0.75**
Dead Weight = **0.90**

Tower Information
Tower base width = **16.00** ft

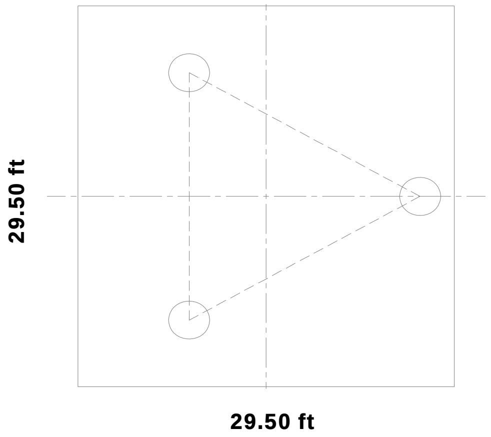
Pad & Pier Dimensions / Properties:

Tower Shape (triangle or square) = **T**
Pier Shape (circular or square) = **Circular**
Pier Diameter (H_P) = **4.50** (ft)
Pier height above grade (D_A) = **0.50** (ft)
Footing Width (W_F) = **29.50** (ft)
Footing Thickness (H_F) = **3.75** (ft)
Depth to BOC (D) = **6.50** (ft)

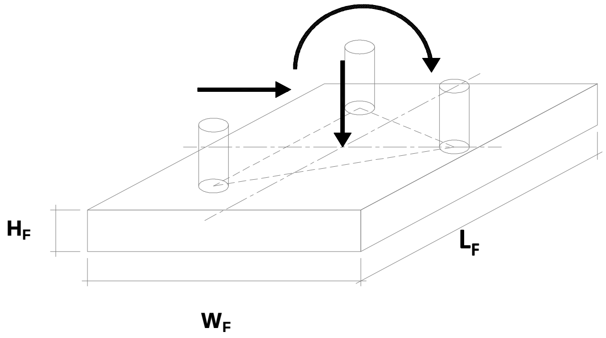
Concrete Strength (F'c) = **3.00** (ksi)
Rebar Strength (Fy) = **60.00** (ksi)

Min. Cover over Rebar = **3.00** (in)
Qty of footing Rebar (1 layer) = **58**
Size of footing Rebar = **# 9**
Qty of Vertical Rebar per Pier = **16**
Size of Pier Vertical Rebar = **# 8**
Qty of Rebar Ties per Pier = **7**
Size of Pier Rebar Ties = **# 4**

Plan View for Triangle or Square Tower



Total Overview



Soil Data:

Ultimate Values
Soil bearing = **6000** (psf)
Soil bearing (ultimate) = 12000 (psf)
Soil Cone for Uplift (θ) = **34** (degrees)
Cohesion (C) = **0.00** (ksf)
Top Soil to Neglect (N) = **3.50** (ft)

Base Sliding (μ) = **0.60**
Soil Density (γ) = **125** (pcf)

Summary of Results

Overturing	36.9%
Soil Bearing	19.7%
Base Sliding	8.9%
One way Shear	1.8%
Punching Shear	14.7%
Pad Moment Capacity	7.6%
Pier Moment Capacity	9.2%

ASCE 7 Windspeed ASCE 7 Ground Snow Load Related Resources Sponsors About ATC Contact

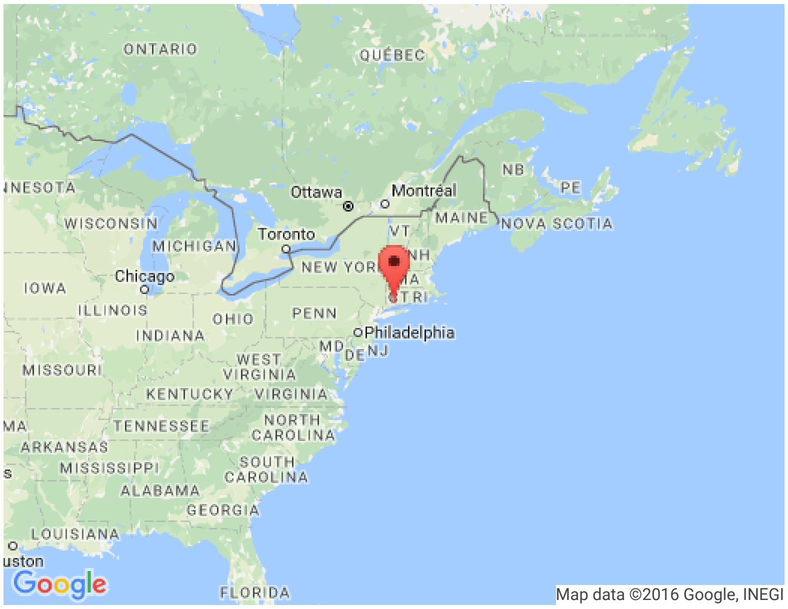
Search Results

Query Date: Fri Sep 23 2016
Latitude: 41.2285
Longitude: -73.0701

ASCE 7-10 Windspeeds
(3-sec peak gust in mph*):

Risk Category I: 114
Risk Category II: 124
Risk Category III-IV: 134
MRI 10-Year:** 77
MRI 25-Year:** 87
MRI 50-Year:** 93
MRI 100-Year:** 100

ASCE 7-05 Windspeed:
111 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
82 (fastest mile in mph)



*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials
to determine if there are community-specific wind speed
requirements that govern.

Print your results

WINDSPEED WEBSITE DISCLAIMER

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MASER CONSULTING
— CONNECTICUT —

331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950
F: 732-383-1984
www.maserconsulting.com

at&t

550 Cochituate Road
Framingham, MA 01701

Multi-Carrier / Retrofit

Antenna Mount Analysis
REV 0

Site Name: Milford
FA#: 10071130
Site ID: CTL05099
Pace ID: MRCTB018063 / MRCTB018847

Site Address: 434 Boston Post Road
Milford, CT 06460
New Haven County

Maser Project Number: 16946018A

December 23, 2016

Analysis Type	Sector Frame
Pass/Fail	Pass
Member Utilization	84%

Reviewed By:

FRANK E. PAZDEN
No. 28188

Prepared by:

Frank E. Pazden, P.E.
Connecticut Professional Engineer
License No. PEN.28188

Lauren Luzier
Engineer

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1. OBJECTIVE

The objective of this report is to determine the capacity of the existing antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

2. CODES, STANDARDS, AND LOADING:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 CT State Building Code and All Subsequent Amendments, Incorporating IBC 2012
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - o Basic Wind Speed – 111 mph (3 Second Gust)
    - o Exposure Category – B
    - o Structure Class – II
    - o Topographic Category – 1
    - o Ice Wind – 50 mph
    - o Ice Thickness – 0.75 in

3. INTRODUCTION

Maser Consulting Connecticut has performed limited field observations on December 1, 2016 to verify the existing condition of the structure and to locate and quantify the existing wireless appurtenances where possible, from ground level. Maser Consulting Connecticut has reviewed the following documents in completing this report:

- Structural Modification Design prepared by Maser Consulting Connecticut, dated February 4, 2016.
- Construction Drawings prepared by Maser Consulting Connecticut, dated February 22, 2016.
- RFDS 1166200 provided by Smartlink, dated July 25, 2016.

The existing **AT&T** equipment is supported on existing antenna support mounts constructed of structural steel antenna support pipes supported by angles and tube arms at a centerline of approximately 141’-0” above ground level. This report is based only upon this information, as well as the information obtained in the field.

The proposed SBNHH-1D65A antennas shall be mounted on a proposed 6'-0" long 2.0 Standard pipe in position 4 for all sectors and the existing antennas in position 3 are to be removed. The proposed RRUS-32 B2 shall replace (3) three existing RRUS-11 and be mounted on the existing unistrut frame.

4. ANALYSIS APPROACH AND ASSUMPTIONS

The analysis approach used in this structural analysis is based on the premise that if the existing antenna support mounts are structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure is deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Risa-3D, a 3D finite element modeling and analysis program, was used to determine the capacity and usage of the existing antenna support mounts.

GENERAL DESIGN ASSUMPTIONS

The following assumptions were utilized in the report:

- All engineering services are performed on the basis that the information used is current and correct.

- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report.

- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.

- It is the responsibility of the client to ensure that the information provided to Maser Consulting and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.

- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.

- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting P.A. is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

SITE SPECIFIC DESIGN ASSUMPTIONS

The following assumptions were utilized in the calculations:

- Structural Steel Pipes are constructed of A53 Grade B Steel.
- Structural Steel Angles, Channels, and Plates are constructed of A36 Steel.
- All modifications have been installed as intended per the previous construction drawings by Maser Consulting Connecticut.

5. LOADING SUMMARY

Quantity	Manufacterer	Antenna/ Appurtenance	Status	Sector
3	Powerwave	7770	Existing	Alpha, Beta, & Gamma
3	CCI	OPA-65R-LCUU-H4	Existing	Alpha, Beta, & Gamma
3	Commscope	SBNHH-1D65A	Proposed	Alpha, Beta, & Gamma
6	Ericsson	RRUS 11	Existing	Alpha, Beta, & Gamma
3	Ericsson	RRUS 32 B2	Proposed	Alpha, Beta, & Gamma
3	Ericsson	RRUS 32	Existing	Alpha, Beta, & Gamma
6	Powerwave	LGP21401	Existing	Alpha, Beta, & Gamma
2	Raycap	DC6-48-60-0-8F	Existing	Alpha & Beta
2	Commscope	WCS-IMFQ-AMT	Proposed	Alpha & Gamma

The worst case loading occurs in the Alpha Sector

Quantity	Manufacterer	Antenna/ Appurtenance	Status
1	Powerwave	7770	Existing
1	CCI	OPA-65R-LCUU-H4	Existing
1	Commscope	SBNHH-1D65A	Proposed
2	Ericsson	RRUS 11	Existing
1	Ericsson	RRUS 32 B2	Proposed
1	Ericsson	RRUS 32	Existing
2	Powerwave	LGP21401	Existing
1	Raycap	DC6-48-60-0-8F	Existing
1	Commscope	WCS-IMFQ-AMT	Proposed

6. CONCLUSION

Maser Consulting P.A. has determined the existing sector frame to have **ADEQUATE** structural capacity to support the proposed and existing loading. The sector frame has been determined to be stressed to a maximum of **84.3%** of its structural capacity with the maximum usage occurring at the HSS support members. Therefore, the proposed **AT&T** installation **CAN** be installed as intended.

Prior to the installation of the proposed equipment, the contractor shall verify that all bolted connections are properly fastened from the original installation. Additionally, the contractor shall inspect all existing hardware and verify that it is in its original condition and free of rust and deterioration. If any deficiencies are noted the contractor shall notify the engineer of the conditions prior to installation of any equipment for additional evaluation.

The conclusions reached by Maser Consulting P.A. in this evaluation are only applicable for the existing structural members supporting the existing and proposed **AT&T** telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure.

Maser Consulting P.A. reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting P.A. in this report are only valid for the discrete and linear appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

ANALYSIS AND DESIGN

I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-G Code, Addendum 2

Wind Load Inputs Parameters

				Reference	Equation
Antenna Centerline	z	***141***	*ft*		
Normal Wind Speed (3 sec. Gust):	V	***111***	*mph*	*Ref. 1, Eqn. 16-33*	
Normal Wind Speed with Ice (3 sec. gust):	V_i	***50.0***	*mph*	*(Figure a5-2a, p. 233)*	
Service Wind Speed:	V_s	***60.0***	*mph*	*(Figure a5-2a, p. 233)*	
Design Ice Thickness:	t_i	***0.75***	*in*	*(Figure A1-2a, p. 233)*	
Exposure Category:		***B***		*Ref. 3, Section 2.6.5.1*	
Structure Class:		***II***		*Ref. 3, Table 2-1*	
Gust Effect Factor:	G_h	***0.85***		*Ref. 3, Section 2.6.7*	
Wind Directionality Factor:	K_d	***0.85***		*Ref. 3, Table 2-2*	
Topographic Category:		***1***		*Ref. 3, Section 2.6.6.2*	

Wind Load Coefficients

Importance Factors:

Non-Iced:	I	***1***		*Ref. 3, Table 2-3*	
Iced:	I_{ice}	***1***		*(Table 2-3, P. 39)*	

Exposure Category Coefficients:

3-s Gust-Speed Power Law Exponent:	α	***7.0***		*Ref. 3, Table 2-4*	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	***1200***	*ft*	*Ref. 3, Table 2-4*	
Min. Value for k_z:	Kz_{min}	***0.70***		*Ref. 3, Table 2-4*	
Terrain Constant:	K_e	***0.90***		*Ref. 3, Table 2-4*	
Velocity Pressure Exposure Coefficient:	K_z	***1.090***		*Ref. 3, Section 2.6.5.2*	$=2.01\cdot(z/z_g)^{2/\alpha}$

Topographic Category Coefficients:

Topographic Constant:	K_t	***N/A***		*Ref. 3, Table 2-5*	
Height Attenuation Factor:	f	***N/A***		*Ref. 3, Table 2-5*	
Height Reduction Factor:	K_h	***N/A***		*Ref. 3, Section 2.6.6.4*	$=e^{(f\cdot z/H)}$
Topographic Factor:	K_{zt}	***1.00***		*Ref.3, Section 2.6.6.4*	$=[1+(K_e\cdot K_t/K_h)]^2$

Ice Accumulation:

Ice Velocity Pressure Exposure Coefficient:	K_{iz}	***1.16***			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	***1.73***	*in*	*(Section 2.6.8, p. 16)*	$=2.0\cdot t_i\cdot I\cdot K_{iz}\cdot K_{zt}$
Ice Density:	ρ_i	***56.00***	*pcf*		

Design Wind Pressures:

Velocity Pressure:	q_z	***29.23***	*psf*	*Ref. 3, Section 2.6.9.6*	$=0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V^2\cdot I$
Velocity Pressure (With Ice):	q_{zi}	***5.93***	*psf*	*(Section 2.6.9.6, P. 25)*	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$
Velocity Pressure (Service):	q_{zs}	***8.54***	*psf*	*(Section 2.6.9.6, P. 25)*	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$

II. CALCULATIONS

▪ *Wind Load on Appurtenances*

Dimensions and Force Coefficients

Antenna/ Appurtenance	*Non-Iced Condition*								*Iced Condition*							
	Mounting Pipe			Equipment					Mounting Pipe			Equipment				
	Length (in)	Diameter (in)	Force Coefficient	Height (in)	Width (in)	Depth (in)	Force Coefficient		Length (in)	Diameter (in)	Force Coefficient	Height (in)	Width (in)	Depth (in)	Force Coefficient	
			C_a				$C_{a\ Front}$	$C_{a\ Side}$			C_a				$C_{a\ Front}$	$C_{a\ Side}$
7770	72.0	2.375	1.200	55.00	11.00	5.00	1.31	1.53	75.5	5.8	0.931	58.47	14.47	8.47	1.27	1.40
OPA-65R-LCUU-H4	72.0	2.375	1.200	48.30	14.40	7.30	1.24	1.38	75.5	5.8	0.931	51.77	17.87	10.77	1.22	1.30
SBNHH-1D65A	72.0	2.375	1.200	55.60	11.90	7.10	1.30	1.43	75.5	5.8	0.931	59.07	15.37	10.57	1.26	1.34
RRUS 11	0.0	0.000	0.000	19.70	17.00	7.20	1.20	1.21	0.0	0.0	0.000	23.17	20.47	10.67	1.20	1.20
RRUS 32 B2	0.0	0.000	0.000	29.90	13.30	9.50	1.20	1.23	0.0	0.0	0.000	33.37	16.77	12.97	1.20	1.20
RRUS 32	0.0	0.000	0.000	29.90	13.30	9.50	1.20	1.23	0.0	0.0	0.000	33.37	16.77	12.97	1.20	1.20
LGP21401	0.0	0.000	0.000	9.90	6.70	5.40	1.20	1.20	0.0	0.0	0.000	13.37	10.17	8.87	1.20	1.20
DC6-48-60-0-8F	0.0	0.000	0.000	31.25	11.00	11.00	0.71	0.71	0.0	0.0	0.000	34.72	14.47	14.47	0.70	0.70
WCS-IMFQ-AMT	0.0	0.000	0.000	15.40	10.60	6.90	1.20	1.20	0.0	0.0	0.000	18.87	14.07	10.37	1.20	1.20

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition				Iced Condition			
		Wind Force (lbs.)		Controlling Wind Force (lbs.)	Gravity (lbs.)	Wind Force (lbs.)		Controlling Wind Force (lbs.)	Gravity (lbs.)
		F_N	F_T			F_N	F_T		
7770	2	72.6	54.1	**72.6**	**25.0**	20.9	19.3	**20.9**	**71.3**
OPA-65R-LCUU-H4	2	80.1	59.8	**80.1**	**30.2**	22.6	19.9	**22.6**	**81.7**
SBNHH-1D65A	2	78.0	66.3	**78.0**	**24.3**	22.0	21.8	**22.0**	**81.3**
RRUS 11	1	69.3	29.6	**69.3**	**65.0**	19.9	10.4	**19.9**	**82.6**
RRUS 32 B2	1	82.3	60.2	**82.3**	**67.9**	23.5	18.2	**23.5**	**106.5**
RRUS 32	1	82.3	60.2	**82.3**	**67.9**	23.5	18.2	**23.5**	**106.5**
LGP21401	1	13.7	11.1	**13.7**	**31.0**	5.7	5.0	**5.7**	**24.4**
DC6-48-60-0-8F	1	42.0	42.0	**42.0**	**47.8**	12.3	12.3	**12.3**	**106.0**
WCS-IMFQ-AMT	1	33.8	22.0	**33.8**	**49.5**	11.2	8.2	**11.2**	**47.9**
	0								

** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS*

▪ *Wind Load on Framing Members*

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition					
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)
Pipe	Pipe 2.0	90	Round	2.38	1.20	5.90	5.84	5.84	93.47	1.00	2.45	8.71
Pipe	Pipe 2.0	30	Round	2.38	0.93	4.55	5.84	5.84	33.47	0.77	1.89	8.71
Pipe	Pipe 2.0	172	Round	2.38	1.20	5.90	5.84	5.84	175.47	1.20	2.95	8.71
Square HSS	HSS 2.25X2.25	80	Square	2.25	2.00	9.32	5.72	5.72	83.47	1.65	3.97	10.42
Pipe	Pipe 4.0	80	Round	4.50	1.04	9.68	7.97	7.97	83.47	0.88	2.94	13.21
Pipe	Pipe 1.5	127	Round	1.90	1.20	4.72	5.37	5.37	130.47	1.18	2.67	7.70

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor:

$$I := \begin{cases} 1.0 & \text{if Class} = \text{"II"} \\ 1.15 & \text{if Class} = \text{"III"} \end{cases} = 1$$

Table 2-3, Pg. 39

Force Coefficient:
(Square)

$$C_{f\_square}(h,w) := \begin{cases} 1.2 & \text{if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18}\cdot\left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Force Coefficient:
(Round)

$$C_{f\_round}(h,w) := \begin{cases} 0.7 & \text{if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18}\cdot\left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Terrain Exposure Constants:

Table 2-4, P. 40

$$\alpha := \begin{cases} 7.0 & \text{if Exp} = \text{"B"} \\ 9.5 & \text{if Exp} = \text{"C"} \\ 11.5 & \text{if Exp} = \text{"D"} \end{cases} \qquad Z_g := \begin{cases} 1200\text{ft} & \text{if Exp} = \text{"B"} \\ 900\text{ft} & \text{if Exp} = \text{"C"} \\ 700\text{ft} & \text{if Exp} = \text{"D"} \end{cases} \qquad K_{zmin} := \begin{cases} 0.70 & \text{if Exp} = \text{"B"} \\ 0.85 & \text{if Exp} = \text{"C"} \\ 1.03 & \text{if Exp} = \text{"D"} \end{cases}$$

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01 \cdot \left(\dfrac{z}{Z_g} \right)^{\frac{2}{\alpha}}, K_{zmin} \right] \\ K_z \leftarrow \min\left(K_z, 2.01\right) \end{array} \right.$$

$$K_z := Kz(z)$$

Section 2.6.5, P. 13

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{l} 1.0 \;\; \text{if} \;\; Topo = "1" \\ \text{otherwise} \\ \quad \left| \begin{array}{l} K_e \leftarrow \left| \begin{array}{l} 0.90 \;\; \text{if} \;\; Exp = "B" \\ 1.00 \;\; \text{if} \;\; Exp = "C" \\ 1.10 \;\; \text{if} \;\; Exp = "D" \end{array} \right. \\ K_t \leftarrow \left| \begin{array}{l} 0.43 \;\; \text{if} \;\; Topo = "2" \\ 0.53 \;\; \text{if} \;\; Topo = "3" \\ 0.72 \;\; \text{if} \;\; Topo = "4" \end{array} \right. \\ f \leftarrow \left| \begin{array}{l} 1.25 \;\; \text{if} \;\; Topo = "2" \\ 2.00 \;\; \text{if} \;\; Topo = "3" \\ 1.50 \;\; \text{if} \;\; Topo = "4" \end{array} \right. \\ K_h \leftarrow e^{\left(\frac{f \cdot z}{CH} \right)} \\ \left(1 + \dfrac{K_e \cdot K_t}{K_h} \right)^2 \end{array} \right. \end{array} \right.$$

Section 2.6.6.4, p. 14

Table 2-4 p. 40

Table 2-5 p. 40

Table 2-5 p. 40

Section 2.6.6.4, P. 14

Section 2.6.6.4, P. 14

$$K_{zt} := Kzt(z)$$

Velocity Pressure:

Section 2.6.9.6, P. 25

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I \cdot psf$$

LOAD EQUATIONS

WIND LOAD

Area (Normal):	$AN_{area} = H_{ant} \cdot Want$
Area (Side):	$AT_{area} = H_{ant} \cdot Dant$
Force Coefficient (Normal):	$C_{fn} = C_{fsquare}(H_{ant}, Want)$
Force Coefficient (Side):	$C_{fs} = C_{fsquare}(H_{ant}, Dant)$
Pipe Area (Normal):	$AN_p = \max[(L_p - H_{ant}) * Dp , 0]$
Pipe Area (Side):	$AT_p = L_p \cdot Dp$
Force Coefficient (Normal):	$C_{fp} = C_{fround}(Lp, Dp)$
Normal Effective Projected Area:	$E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$
Side Effective Projected Area:	$E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$
Effective Projected Area:	$EPA = max(E_{pan}, Epat)$
Wind Force:	$F_{ant} = q_z \cdot Gh \cdot EPA$

ICE DEAD LOAD

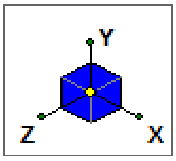
Largest Out-to-Out Dimension:	$D_{ant} = \sqrt{D_{ant}{}^2 + W_{ant}{}^2}$
Cross Sectional Area of Ice:	$A_{ice\_ant} = \pi \cdot tiz \cdot (Dant + tiz)$
Total Ice Dead Load:	$DL_{ice\_ant} = \boldsymbol{\rho}_\mathbf{i} \cdot (Aice_{\_ant} \cdot Hant)$

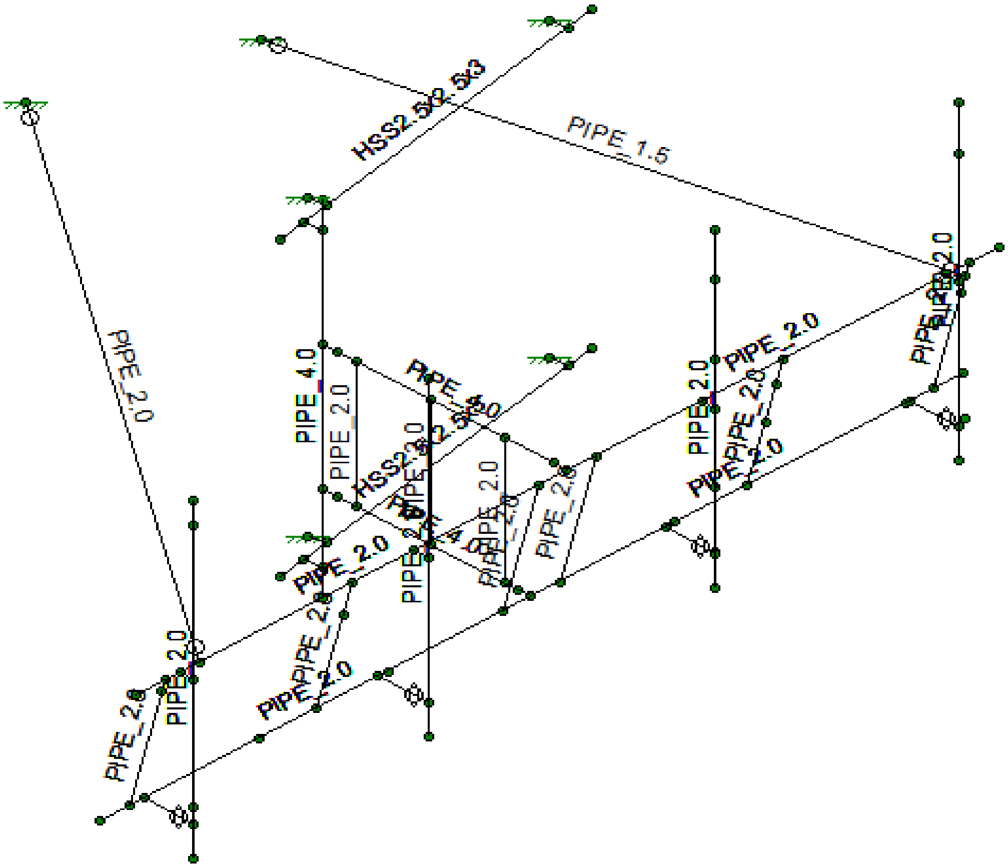
ICE WIND LOAD

Dimensions:	$H_{i_{ant}} = H_{ant} + 2tiz$
	$W_{i_{ant}} = W_{ant} + 2tiz$
	$D_{i_{ant}} = D_{ant} + 2tiz$
Area (Normal):	$AIN_{area} = H_{i\_ant} \cdot W_{i\_ant}$
Area (Side):	$AIT_{area} = H_{i\_ant} \cdot D_{i\_ant}$
Force Coefficient (Normal):	$Ci_{fn} = C_{fsquare}(H_{i\_ant}, W_{i\_ant})$
Force Coefficient (Side):	$Ci_{fs} = C_{fsquare}(H_{i\_ant}, D_{i\_ant})$
Pipe Area (Normal):	$AN_p = \max[(L_{ip} - H_{i\_ant}) * D_{ip} , 0]$
Pipe Area (Side):	$AT_p = L_{ip} \cdot Dip$
Force Coefficient (Normal):	$C_{fp} = C_{fround}(L_{ip}, D_{ip})$
Normal Effective Projected Area:	$E_{pain} = (Ci_{fn} \cdot ANarea) + (Cfp \cdot ANp)$
Side Effective Projected Area:	$E_{pait} = (Ci_{fs} \cdot ATarea) + (Cfp \cdot ATp)$
Effective Projected Area:	$EPA_i = max(E_{pain}, Epait)$
Wind Force:	$F_{i\_ant} = q_z \cdot Gh \cdot EPAi$

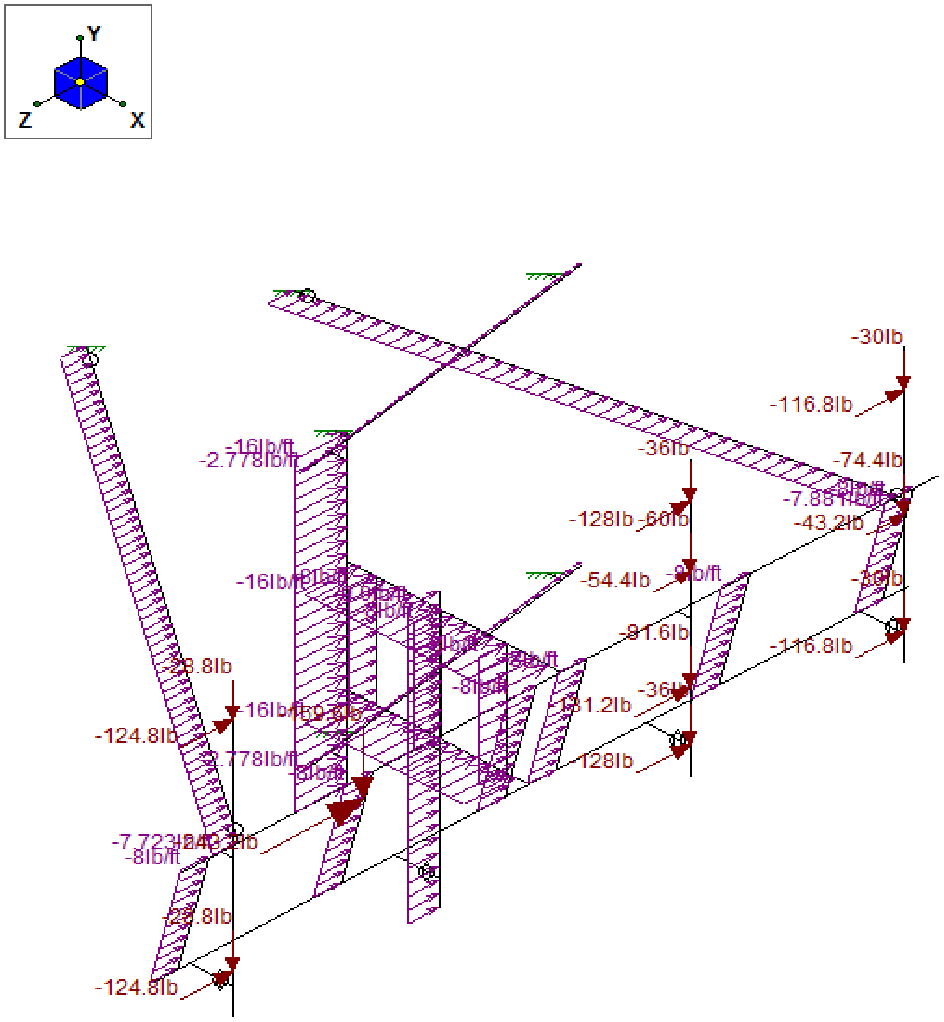
III. ATTACHMENTS

RISA MODEL


Y
Z
X

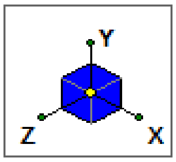

HSS2.5X2.5X3
PIPE_1.5
PIPE_2.0
PIPE_4.0
PIPE_2.0
HSS2.5X2.5X3
PIPE_4.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0

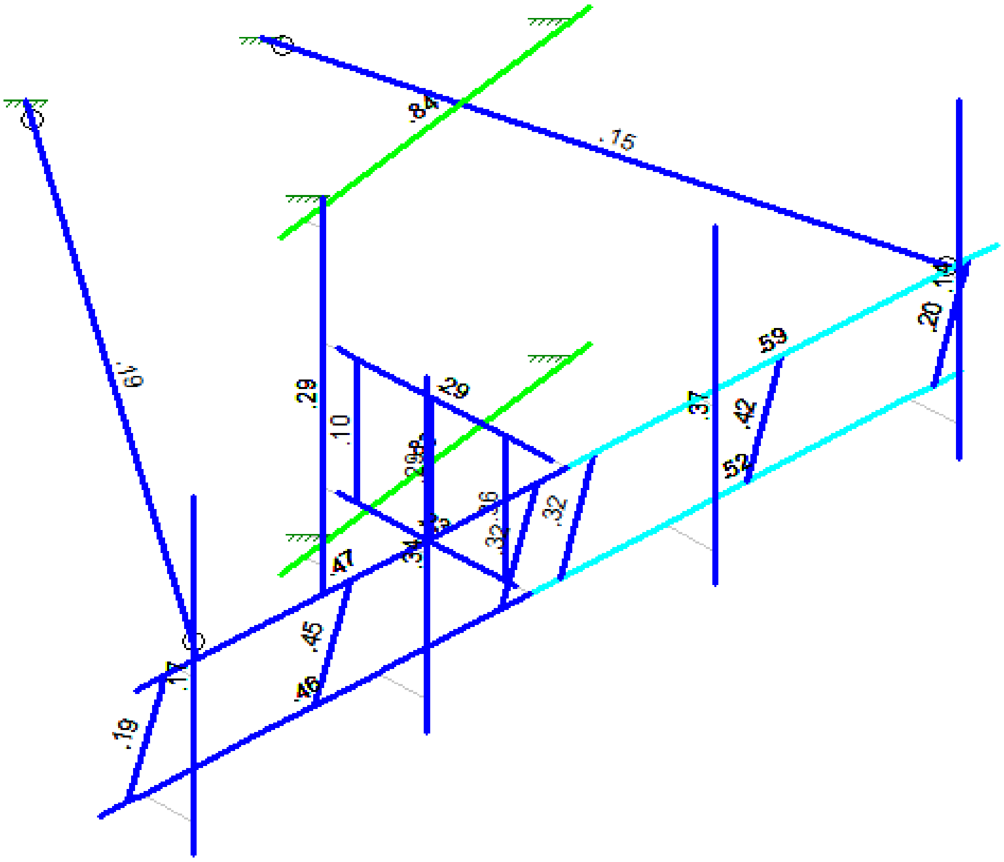
RISA WORST CASE LOADING



Loads: LC 11, 1.2D+1.6W10
Envelope Only Solution

RISA CODE CHECK





Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mounts	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
2	Horizontal	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
3	Stand off Arm	HSS2.5x2.5x2	Beam	Tube	A500 Gr. B...	Typical	1.07	.998	.998	1.61
4	Stand off Pipe	PIPE_4.0	Beam	Pipe	A53 Gr. B	Typical	2.96	6.82	6.82	13.6
5	Stablizer Arm	PIPE_1.5	Beam	Pipe	A53 Gr. B	Typical	.749	.293	.293	.586
6	Kicker Angle	L3.5x3.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.7	2	2	.039

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1A	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+6	1e+6	1e+6	1e+6

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N4	N6			RIGID	None	None	RIGID	Typical
2	M2	N2	N5			RIGID	None	None	RIGID	Typical
3	M3	N8	N10			HSS2.5x2.5x3	Beam	Tube	A500 Gr. ...	Typical
4	M4	N7	N9			HSS2.5x2.5x3	Beam	Tube	A500 Gr. ...	Typical
5	M5	N12	N16			RIGID	None	None	RIGID	Typical
6	M6	N11	N15			RIGID	None	None	RIGID	Typical
7	M9	N3	N1			PIPE_4.0	Beam	Pipe	A53 Gr. B	Typical
8	M10	N19	N17			RIGID	None	None	RIGID	Typical
9	M11	N20	N18			RIGID	None	None	RIGID	Typical
10	M12	N19	N21			PIPE_4.0	Beam	Pipe	A53 Gr. B	Typical
11	M13	N20	N23			PIPE_4.0	Beam	Pipe	A53 Gr. B	Typical
12	M14	N21	N22			RIGID	None	None	RIGID	Typical
13	M15	N23	N24			RIGID	None	None	RIGID	Typical
14	M20	N45	N46			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
15	M21	N43	N44			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
16	M22	N41	N42			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
17	M23	N39	N40			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
18	M24	N37	N38			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
19	M25	N47	N57			RIGID	None	None	RIGID	Typical
20	M26	N49	N58			RIGID	None	None	RIGID	Typical
21	M27	N51	N59			RIGID	None	None	RIGID	Typical
22	M28	N53	N60			RIGID	None	None	RIGID	Typical
23	MP1	N61	N64			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
24	MP2	N62	N65			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
25	MP3	N63	N66			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
26	M35	N70	N71			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
27	M37	N25	N26			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
28	M38	N27	N28			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
29	M39	N29	N30			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
30	M40	N75	N74			Stablizer Arm	Beam	Pipe	A53 Gr. B	Typical
31	M41	N76	N77			RIGID	None	None	RIGID	Typical
32	M42	N78	N79			RIGID	None	None	RIGID	Typical
33	M33	N31	N22			Horizontal	Beam	Pipe	A53 Gr. B	Typical
34	M34	N34	N24			Horizontal	Beam	Pipe	A53 Gr. B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
35	M35A	N66A	N67			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
36	M36	N22	N33			Horizontal	Beam	Pipe	A53 Gr. B	Typical
37	M37A	N24	N32			Horizontal	Beam	Pipe	A53 Gr. B	Typical
38	M38A	N80A	N76A			PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical
39	M39A	N87	N91			RIGID	None	None	RIGID	Typical
40	M40A	N88	N92			RIGID	None	None	RIGID	Typical
41	M41A	N89	N93			RIGID	None	None	RIGID	Typical
42	M42A	N90	N94			RIGID	None	None	RIGID	Typical

Plate Primary Data

Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
No Data to Print ...						

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N68	L	Y	-25
2	N71A	L	Y	-25
3	N69	L	Y	-30
4	N72	L	Y	-30
5	N73	L	Y	-62
6	N75A	L	Y	-68
7	N74A	L	Y	-133
8	N92A	L	Y	-50
9	N93A	L	Y	-24
10	N94A	L	Y	-24

Joint Loads and Enforced Displacements (BLC 2 : Wx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N68	L	X	73
2	N71A	L	X	73
3	N69	L	X	80
4	N72	L	X	80
5	N73	L	X	27
6	N75A	L	X	82
7	N74A	L	X	152
8	N92A	L	X	34
9	N93A	L	X	78
10	N94A	L	X	78

Joint Loads and Enforced Displacements (BLC 3 : Wz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N68	L	Z	73
2	N71A	L	Z	73
3	N69	L	Z	80
4	N72	L	Z	80
5	N73	L	Z	27
6	N75A	L	Z	82
7	N74A	L	Z	152

Joint Loads and Enforced Displacements (BLC 3 : Wz) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
8	N92A	L	Z	34
9	N93A	L	Z	78
10	N94A	L	Z	78

Joint Loads and Enforced Displacements (BLC 4 : Wx Ice)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N68	L	X	21
2	N71A	L	X	21
3	N69	L	X	23
4	N72	L	X	23
5	N73	L	X	11.4
6	N75A	L	X	23.5
7	N74A	L	X	43.4
8	N92A	L	X	11
9	N93A	L	X	22
10	N94A	L	X	22

Joint Loads and Enforced Displacements (BLC 5 : Wz Ice)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N68	L	Z	21
2	N71A	L	Z	21
3	N69	L	Z	23
4	N72	L	Z	23
5	N73	L	Z	11.4
6	N75A	L	Z	23.5
7	N74A	L	Z	43.4
8	N92A	L	Z	11
9	N93A	L	Z	22
10	N94A	L	Z	22

Joint Loads and Enforced Displacements (BLC 6 : Ice Weight)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N68	L	Y	-71.5
2	N71A	L	Y	-71.5
3	N69	L	Y	-82
4	N72	L	Y	-82
5	N73	L	Y	-49
6	N75A	L	Y	-106.5
7	N74A	L	Y	-189
8	N92A	L	Y	-48
9	N93A	L	Y	-81
10	N94A	L	Y	-81

Member Point Loads

Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
No Data to Print ...			

Member Distributed Loads (BLC 2 : Wx)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M33	PX	6	6	0	0
2	M37A	PX	6	6	0	0
3	M36	PX	6	6	0	0
4	M34	PX	6	6	0	0
5	M21	PX	5	5	0	0
6	M20	PX	5	5	0	0
7	M37	PX	5	5	0	0
8	M38	PX	5	5	0	0
9	M39	PX	5	5	0	0
10	M22	PX	5	5	0	0
11	M35A	PX	5	5	0	0
12	M23	PX	5	5	0	0
13	M24	PX	5	5	0	0
14	M38A	PX	6	6	0	0
15	MP3	PX	6	6	0	0
16	M3	PX	10	10	0	0
17	M9	PX	10	10	0	0
18	M13	PX	10	10	0	0
19	M4	PX	10	10	0	0
20	M13	PX	10	10	0	0
21	M12	PX	10	10	0	0
22	M40	PX	5	5	0	0

Member Distributed Loads (BLC 3 : Wz)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M33	PZ	6	6	0	0
2	M37A	PZ	6	6	0	0
3	M36	PZ	6	6	0	0
4	M34	PZ	6	6	0	0
5	M20	PZ	5	5	0	0
6	M21	PZ	5	5	0	0
7	M37	PZ	5	5	0	0
8	M38	PZ	5	5	0	0
9	M39	PZ	5	5	0	0
10	M35A	PZ	5	5	0	0
11	M22	PZ	5	5	0	0
12	M23	PZ	5	5	0	0
13	M24	PZ	5	5	0	0
14	M38A	PZ	6	6	0	0
15	MP3	PZ	6	6	0	0
16	M40	PZ	5	5	0	0
17	M3	PZ	10	10	0	0
18	M12	PZ	10	10	0	0
19	M13	PZ	10	10	0	0
20	M4	PZ	10	10	0	0
21	M9	PZ	10	10	0	0

Member Distributed Loads (BLC 4 : Wx Ice)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M33	PX	3	3	0	0

Member Distributed Loads (BLC 4 : Wx Ice) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
2	M37A	PX	3	3	0	0
3	M36	PX	3	3	0	0
4	M34	PX	3	3	0	0
5	M20	PX	2	2	0	0
6	M21	PX	2	2	0	0
7	M37	PX	2	2	0	0
8	M38	PX	2	2	0	0
9	M39	PX	2	2	0	0
10	M22	PX	2	2	0	0
11	M35A	PX	2	2	0	0
12	M23	PX	2	2	0	0
13	M24	PX	2	2	0	0
14	M38A	PX	3	3	0	0
15	MP3	PX	3	3	0	0
16	M3	PX	-4	-4	0	0
17	M4	PX	-4	-4	0	0
18	M12	PX	3	3	0	0
19	M13	PX	3	3	0	0
20	M9	PX	3	3	0	0
21	M40	PX	3	3	0	0

Member Distributed Loads (BLC 5 : Wz Ice)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M33	PZ	3	3	0	0
2	M37A	PZ	3	3	0	0
3	M34	PZ	3	3	0	0
4	M36	PZ	3	3	0	0
5	M20	PZ	2	2	0	0
6	M21	PZ	2	2	0	0
7	M37	PZ	2	2	0	0
8	M38	PZ	2	2	0	0
9	M39	PZ	2	2	0	0
10	M22	PZ	2	2	0	0
11	M35A	PZ	2	2	0	0
12	M23	PZ	2	2	0	0
13	M24	PZ	2	2	0	0
14	M38A	PZ	3	3	0	0
15	MP3	PZ	3	3	0	0
16	M40	PZ	-3	-3	0	0
17	M9	PZ	-3	-3	0	0
18	M12	PZ	-3	-3	0	0
19	M13	PZ	-3	-3	0	0
20	M3	PZ	-4	-4	0	0
21	M4	PZ	-4	-4	0	0

Member Distributed Loads (BLC 6 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M33	Y	-9	-9	0	0
2	M37A	Y	-9	-9	0	0
3	M34	Y	-9	-9	0	0
4	M36	Y	-9	-9	0	0

Member Distributed Loads (BLC 6 : Ice Weight) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
5	M20	Y	-9	-9	0	0
6	M21	Y	-9	-9	0	0
7	M37	Y	-9	-9	0	0
8	M38	Y	-9	-9	0	0
9	M39	Y	-9	-9	0	0
10	M22	Y	-9	-9	0	0
11	M35A	Y	-9	-9	0	0
12	M23	Y	-9	-9	0	0
13	M24	Y	-9	-9	0	0
14	M38A	Y	-9	-9	0	0
15	MP3	Y	-9	-9	0	0
16	M3	Y	-10.42	-10.42	0	0
17	M4	Y	-10.42	-10.42	0	0
18	M9	Y	-13	-13	0	0
19	M12	Y	-13	-13	0	0
20	M13	Y	-13	-13	0	0
21	M40	Y	-8	-8	0	0

Basic Load Cases

	BLC Descr...	Category	X Gr...	Y Gr..	Z Gr...	Joint	Point	Distr...	Area(Member)	Surf...
1	Dead	DL		-1.05		10				
2	Wx	WL				10		22		
3	Wz	WL				10		21		
4	Wx Ice	WL				10		21		
5	Wz Ice	WL				10		21		
6	Ice Weight	OL1				10		21		

Load Combinations

	Description	Solve	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.4D	Yes	Y		1	1.4														
2	1.2D+1.6W1	Yes	Y		1	1.2	2	1.6	3											
3	1.2D+1.6W2	Yes	Y		1	1.2	2	1.386	3	.8										
4	1.2D+1.6W3	Yes	Y		1	1.2	2	.8	3	1.386										
5	1.2D+1.6W4	Yes	Y		1	1.2	2		3	1.6										
6	1.2D+1.6W5	Yes	Y		1	1.2	2	-.8	3	1.386										
7	1.2D+1.6W6	Yes	Y		1	1.2	2	-1.3...	3	.8										
8	1.2D+1.6W7	Yes	Y		1	1.2	2	-1.6	3											
9	1.2D+1.6W8	Yes	Y		1	1.2	2	-1.3...	3	-.8										
10	1.2D+1.6W9	Yes	Y		1	1.2	2	-.8	3	-1.3...										
11	1.2D+1.6W10	Yes	Y		1	1.2	2		3	-1.6										
12	1.2D+1.6W11	Yes	Y		1	1.2	2	.8	3	-1.3...										
13	1.2D+1.6W12	Yes	Y		1	1.2	2	1.386	3	-.8										
14	1.2D+1.0 Ice	Yes	Y		1	1.2	6	1												
15	1.2D+1.0ICE+1.0W1ICE	Yes	Y		1	1.2	6	1	4	1	5									
16	1.2D+1.0ICE+1.0W2ICE	Yes	Y		1	1.2	6	1	4	.866	5	.5								
17	1.2D+1.0ICE+1.0W3ICE	Yes	Y		1	1.2	6	1	4	.5	5	.866								
18	1.2D+1.0ICE+1.0W4ICE	Yes	Y		1	1.2	6	1	4		5	1								
19	1.2D+1.0ICE+1.0W5ICE	Yes	Y		1	1.2	6	1	4	-.5	5	.866								
20	1.2D+1.0ICE+1.0W6ICE	Yes	Y		1	1.2	6	1	4	-.866	5	.5								

Load Combinations (Continued)

	Description	Solve	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
21	1.2D+1.0ICE+1.0W7ICE	Yes	Y		1	1.2	6	1	4	-1	5									
22	1.2D+1.0ICE+1.0W8ICE	Yes	Y		1	1.2	6	1	4	-.866	5	-.5								
23	1.2D+1.0ICE+1.0W9ICE	Yes	Y		1	1.2	6	1	4	-.5	5	-.866								
24	1.2D+1.0ICE+1.0W10ICE	Yes	Y		1	1.2	6	1	4		5	-1								
25	1.2D+1.0ICE+1.0W11ICE	Yes	Y		1	1.2	6	1	4	.5	5	-.866								
26	1.2D+1.0ICE+1.0W12ICE	Yes	Y		1	1.2	6	1	4	.866	5	-.5								

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[...	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M3	HSS2.5x2.5x3	.843	11.667	11	.207	6.667	z	26	39015....	63756	4.554	4.554	3	H1-1b
2	M4	HSS2.5x2.5x3	.831	6.667	11	.168	6.667	z	20	39015....	63756	4.554	4.554	3	H1-1b
3	M9	PIPE_4.0	.291	28.333	12	.340	73.3...		11	80883....	93240	10.631	10.631	2...	H3-6
4	M12	PIPE_4.0	.288	0	11	.146	0		12	89138....	93240	10.631	10.631	2...	H1-1b
5	M13	PIPE_4.0	.233	0	20	.110	35.1...		24	90372....	93240	10.631	10.631	2...	H1-1b
6	M20	PIPE_2.0	.187	30.07	15	.037	0		26	29799....	32130	1.872	1.872	2...	H1-1b
7	M21	PIPE_2.0	.445	0	15	.088	30.07		26	29799....	32130	1.872	1.872	1...	H1-1b
8	M22	PIPE_2.0	.324	30.07	24	.064	30.07		24	29799....	32130	1.872	1.872	2...	H1-1b
9	M23	PIPE_2.0	.417	0	18	.075	0		23	29799....	32130	1.872	1.872	2...	H1-1b
10	M24	PIPE_2.0	.198	30.07	16	.063	2.819		4	29799....	32130	1.872	1.872	2...	H1-1b
11	MP1	PIPE_2.0	.138	36.75	24	.043	36.75		4	20866....	32130	1.872	1.872	3	H1-1b
12	MP2	PIPE_2.0	.372	36.75	24	.056	36.75		12	20866....	32130	1.872	1.872	3	H1-1b
13	MP3	PIPE_2.0	.345	36.75	19	.061	64.5		25	20866....	32130	1.872	1.872	1...	H1-1b
14	M35	PIPE_2.0	.174	36	11	.022	62.25		12	20866....	32130	1.872	1.872	3	H1-1b
15	M37	PIPE_2.0	.095	0	26	.041	29.12		11	29939....	32130	1.872	1.872	2...	H1-1b
16	M38	PIPE_2.0	.293	0	26	.068	29.12		11	29939....	32130	1.872	1.872	2...	H1-1b
17	M39	PIPE_2.0	.360	29.12	25	.082	29.12		11	29939....	32130	1.872	1.872	2...	H1-1b
18	M40	PIPE_1.5	.151	63.592	18	.041	0		11	4092.1...	23593.5	1.105	1.105	1...	H1-1b
19	M33	PIPE_2.0	.475	83.438	18	.159	84.3...		16	16368....	32130	1.872	1.872	2...	H1-1b
20	M34	PIPE_2.0	.524	90	24	.310	90		21	16368....	32130	1.872	1.872	2...	H1-1b
21	M35A	PIPE_2.0	.324	30.07	19	.066	30.07		18	29799....	32130	1.872	1.872	2...	H1-1b
22	M36	PIPE_2.0	.592	0	12	.163	5.625		25	16368....	32130	1.872	1.872	2...	H1-1b
23	M37A	PIPE_2.0	.457	0	18	.297	0		16	16368....	32130	1.872	1.872	2...	H1-1b
24	M38A	PIPE_2.0	.190	85.864	26	.019	0		5	4803.1...	32130	1.872	1.872	1...	H1-1b

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N15	max	48.584	8	52.487	26	8.567	11	-.013	6	.03	8	.021	26
2		min	-48.584	2	20.358	6	-8.567	5	-.033	26	-.03	2	.008	6
3	N16	max	48.584	8	52.487	20	8.567	11	-.013	12	.03	8	.021	19
4		min	-48.584	2	20.358	12	-8.567	5	-.033	19	-.03	2	.008	12
5	N74	max	390.74	9	58.17	22	78.701	2	.033	11	.001	11	.004	5
6		min	-495.389	3	.443	3	-59.387	8	-.025	5	0	5	-.006	11
7	N77	max	-182.842	8	1960.677	17	1159.962	11	.233	6	2.921	5	.47	5
8		min	-2007.437	15	-124.04	10	-1057.311	5	-.601	12	-3.592	11	-.228	11
9	N79	max	2289.239	21	1275.585	10	776.512	11	.275	12	3.459	5	.442	11
10		min	370.723	2	-368.556	4	-808.616	5	-.406	6	-3.042	11	-.228	5
11	N76A	max	522.034	8	93.653	21	356.258	8	.017	11	0	11	.013	11
12		min	-636.264	2	.332	13	-439.086	2	-.018	5	0	5	-.013	5
13	Totals:	max	2144.964	8	3170.356	24	1895.096	11						

Envelope Joint Reactions (Continued)

Joint			X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
14		min	-2144.966	2	1255.452	5	-1895.095	5						