Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

HAND DELIVERED

January 26, 2016

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 48 Cow Hill Road, Clinton

Dear Ms. Bachman:

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

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

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

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

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

1. The height of the overall structure will not increase.

2. The proposed changes will not extend the site boundaries.

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

4. The changes will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes.

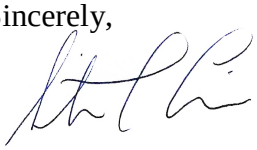
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The proposed changes will not impair the structural integrity of the facility, as determined in a certification provided by a professional engineer licensed in Connecticut.

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

Please feel free to call me at (860) 830-0380 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine
Real Estate Consultant

cc: TownCEO – Honorable Bruce N. Farmer, 1st Selectman, Town of Clinton
Property owner of Record – Raymond Heser
Tower Owner / Operator – Crown Castle (by email)

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

48 Cow Hill Road, Clinton
Geographic Coordinates: N 41-17-19 W 72-32-21
AT&T Site CT2024
CSC Approvals: Docket 148
Exempt Mods 7/02, 7/07, 3/11

Tower Owner/Manager: Crown Castle

Land Owner of Record: Raymond Heser

Equipment Configuration: 212-ft Self-Supporting Lattice Tower

Current and/or Approved: Sector Mounts
Six Powerwave 7770 antennas @ 190 ft c.l.
Three KMW AM-X-CD-14-65-00T-RET antennas @ 190 ft c.l.
Six ADC TMA's @ 190 ft
Six Powerwave diplexers @ 190 ft
Six Ericsson RRUS-11 remote radio heads @190 ft
One Raycap DC6-48-60-18-8F @ 190 ft
Twelve runs 1 5/8 inch coax
Two DC lines and one fiber line
Equipment room in common shelter

Planned Modifications:
Remove three Powerwave 7770 antennas.
Remove six existing Powerwave diplexers.
Install three Andrew SBNHH-1D65A antennas @ 190 ft c.l.
Install one Raycap DC6-48-60-18-8F surge arrestor @ 190 ft.
Install three Ericsson RRUS-32 remote radio heads @ 190 ft.
Install two additional DC lines and one additional fiber lines.

Original Permitting: Bell Atlantic Mobile's Cow Hill Road facility was approved in 1992 by the Council in Docket 148 (see the attached Decision and Order). AT&T's present Notice contains no proposed modifications that would violate the conditions of approval.

Lease Area:

The attached excerpt from the Docket 148 D&M Plan shows the tower, fenced compound, and equipment building layout within a trapezoidal lease area as originally approved in 1992. A Bell Atlantic notice of exempt modification approved by the Council on December 17, 1996 shows that the facility was constructed with a somewhat larger fenced compound within the same lease area but with different tower and equipment building positioning (see the attached site plan excerpt). All subsequent site modifications, including AT&T's current Notice, depict the lease area, the fenced compound, and the general site layout *as approved in 1996* (see AT&T's attached construction drawings). Since all proposed modifications will occur either on the existing tower structure or within AT&T's existing equipment room, the proposed modifications will not extend either AT&T's lease area or the existing overall site boundaries approved by the Council.

Power Density:

Worst-case calculations with 10 dB reduction for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at six feet above ground level beside the tower, of approximately 9.9 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 9.9 % of the standard.

Existing

Carrier & Technology	Frequency (MHz)	Centerline Ht (feet)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *							9.26
AT&T LTE *	740	190	1	500	0.0053	0.4933	0.11
AT&T UMTS *	880	190	1	500	0.0053	0.5867	0.09
AT&T GSM *	880	190	6	296	0.0189	0.5867	0.32
AT&T GSM *	1900	190	3	427	0.0136	1.0000	0.14
Total							**9.92%**

***** Per CSC records.

Proposed

Carrier & Technology	Frequency (MHz)	Antennas (Total for All Sectors)	Centerline Ht (feet)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *								9.26
AT&T LTE	740	KMW AM-X-CD-14 3 Antennas	190	2	500	0.0106	0.4933	0.22
AT&T LTE	1900	KMW AM-X-CD-14 3 Antennas	190	2	500	0.0106	1.0000	0.11
AT&T LTE	2300	Andrew SBNHH 3 Antennas	190	2	500	0.0106	1.0000	0.11
AT&T UMTS	880	PW 7750 3 Antennas	190	1	500	0.0053	0.5867	0.09
AT&T UMTS	1900	PW 7750 3 Antennas	190	1	500	0.0053	1.0000	0.05
AT&T GSM	880	Andrew SBNHH 3 Antennas	190	1	296	0.0031	0.5867	0.05
Total								**9.88%**

***** Per CSC records.

Structural Information:

The attached structural analysis demonstrates that the tower and foundation have adequate structural capacity to accommodate the proposed equipment modifications. (Jacobs Engineering, 12/31/15)

DOCKET NO. 148 - An application of Metro Mobile CTS of Hartford, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telephone tower and associated equipment in the Town of Clinton, Connecticut. The proposed site is located on an interior portion of a 59 acre parcel off Glenwood Road approximately 3,500 feet north of I-95. The alternate site is located on a six acre parcel off Cow Hill Road, approximately 300 feet north of I-95.

Connecticut

Siting

Council

May 5, 1992

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed Clinton, Connecticut, alternate site including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need as provided by section 16-50k of the Connecticut General Statutes (CGS), be issued to Metro Mobile CTS of Hartford, Inc., (Metro Mobile), for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and equipment building at the proposed alternate site off Cow Hill Road in Clinton, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The self-supporting lattice tower shall be no taller than necessary to provide the proposed communications service and in no event shall the tower exceed a total height of 223 feet above ground level, with antennas and appurtenances.

2. Prior to the commencement of construction, the Certificate Holder shall prepare a Development and Management (D&M) plan for this site in compliance with sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall

include detailed plans of the tower, tower foundation, tower anti-climb sections, tower marking and lighting, and the locations of the equipment buildings, access road, and security fence, and all cellular antennas on the tower. In addition, the D&M plan shall include detailed plans for clearing; a site plan orienting the facility, utilities, and access road avoiding inland wetlands; and detailed plans for erosion and sedimentation control.

3. If and when tower marking and lighting become unnecessary pursuant to a determination by the Federal Aviation Administration, within six months of such determination, such tower marking and lighting shall be removed at the expense of the Certificate Holder.

4. The Certificate Holder shall comply with any existing and future radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

6. The Certificate Holder shall permit public or private entities, including Springwich Cellular Limited Partnership (Springwich) which by contract was allowed to share space on the tower, and the Town of Clinton, to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. Provisions shall also be made for the location of a separate Springwich equipment building.

7. If the facility does not initially provide, or permanently ceases to provide cellular service following completion of construction, this Decision and Order shall be void, and the tower and all associated equipment shall be dismantled and removed or reapplication for any new use shall be made to the Council before any such new use is made.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three

years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the New Haven Register, Clinton Recorder, Hartford Courant, and the Middletown Press.

By this Decision and Order, the Council disposes of the legal rights, duties and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of State Agencies.

The parties and intervenor to this proceeding are:

PARTY	ITS REPRESENTATIVE
Metro Mobile CTS of Hartford 20 Alexander Drive Wallingford, CT 06492 Attn: David S. Malko Mgr. Engr, & Reg. Serv.	Earl W. Phillips, Jr., Esq. Robinson & Cole One Commercial Plaza Hartford, CT 06103-3597 (203) 275-8200
Town of Clinton	Lynda Batter Munro Gould, Larson, Bennet and Munro 35 Plains Road P.O. Box 959 Essex, CT 06426
INTERVENOR	
Springwich Cellular Limited Partnership	Peter J. Tyrrell Senior Attorney Springwich Cellular Limited Partnership 227 Church St., Rm. 1021 New Haven, CT 06506 (203) 771-7381

CERTIFICATION

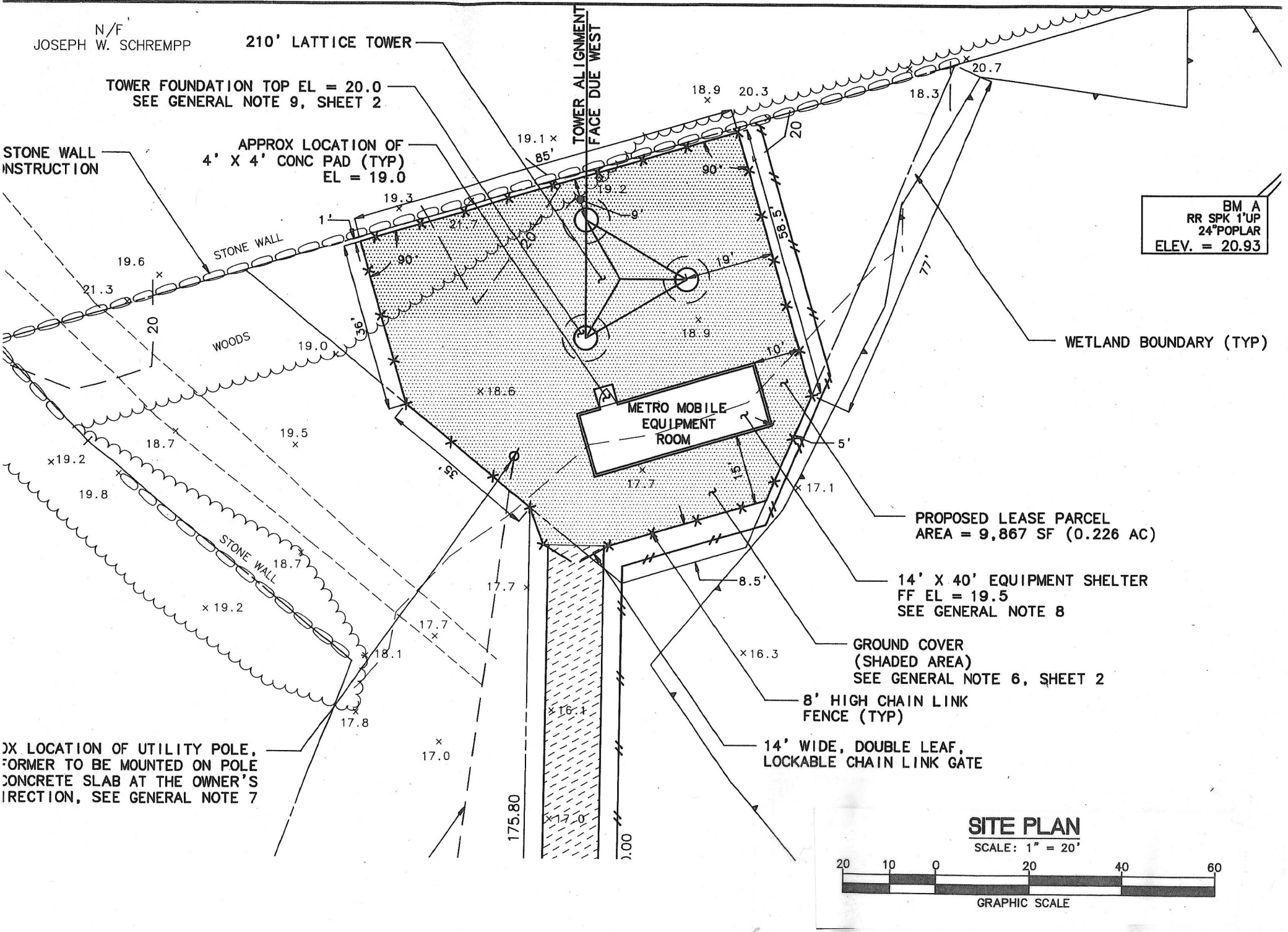
The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in DOCKET NO. 148 - An application of Metro Mobile CTS of Hartford, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telephone tower and associated equipment in the Town of Clinton, Connecticut, and voted as follows to approve the proposed alternate tower site off of Cow Hill Road, approximately 300 feet north of I-95:

Council Members	Vote Cast
Mortimer A. Gelston Chairman	Yes
Commissioner Clifton A. Leonhardt Designee: Commissioner Richard G. Patterson	Yes
Commissioner Timothy R.E. Keeney Designee: Brian Emerick	Absent
Harry E. Covey	Yes
Daniel P. Lynch, Jr.	Yes
Gloria Dibble Pond	Absent
Paulann H. Sheets	Absent
William H. Smith	Yes
Colin C. Tait	Absent

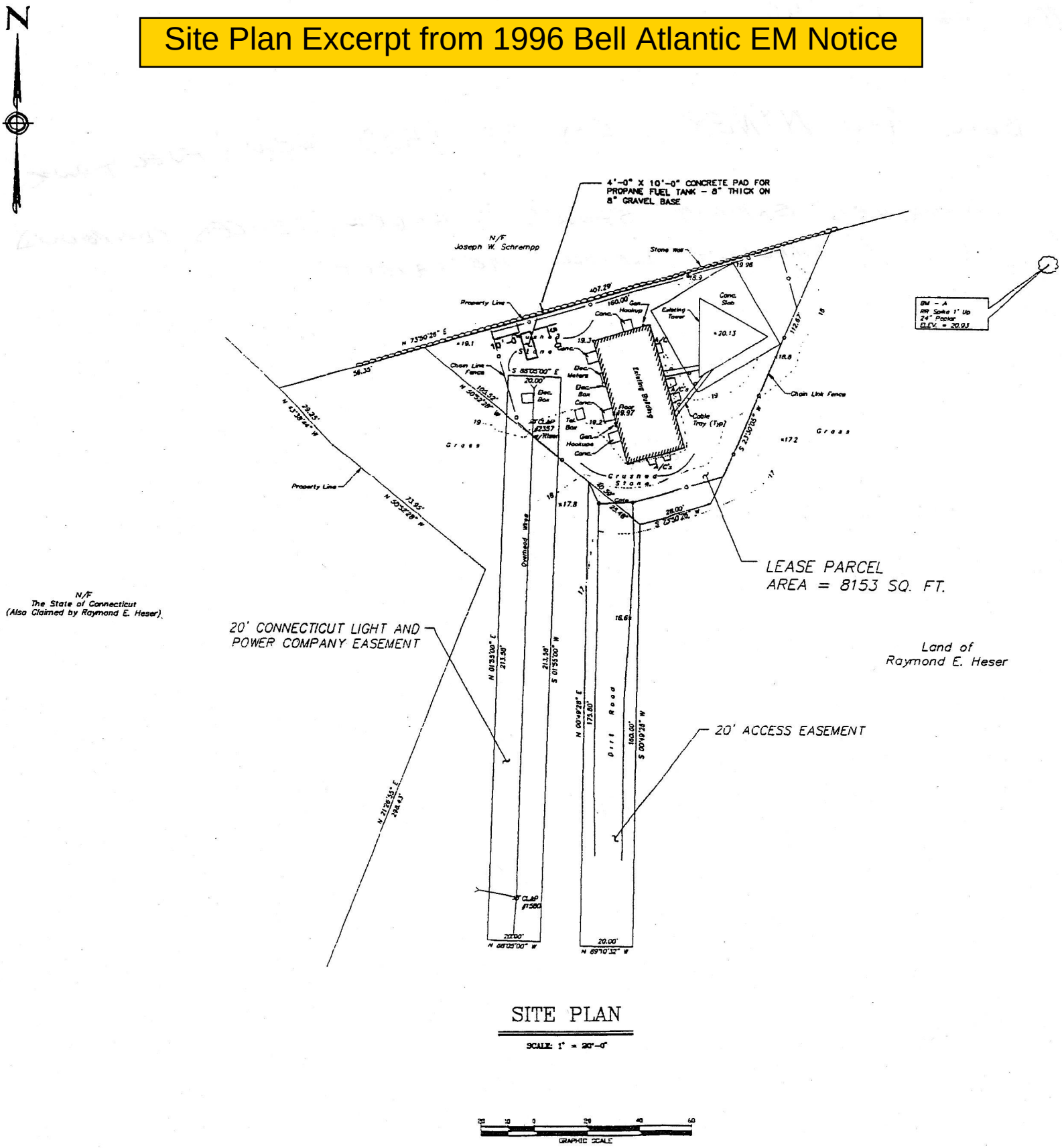
Dated at New Britain, Connecticut, May 5, 1992.

6060E-2

Site Plan Excerpt from Docket 148 D&M Plan



Site Plan Excerpt from 1996 Bell Atlantic EM Notice



PROJECT INFORMATION

SCOPE OF WORK:	TELECOMMUNICATIONS FACILITY UPGRADE (LTE-3C PROJECT 2016):
SITE ADDRESS:	49 COW HILL ROAD CLINTON, CT 06413
LATITUDE:	41.288936 N, 41° 17' 20.17" N
LONGITUDE:	72.538471 W, 72° 32' 18.5" W
TYPE OF SITE:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
TOWER HEIGHT:	212'±
RAD CENTER:	190'±
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

at&t

SITE NUMBER: CT2024

SITE NAME: CLINTON

PROJECT: LTE 3C 2016 UPGRADE

DRAWING INDEX

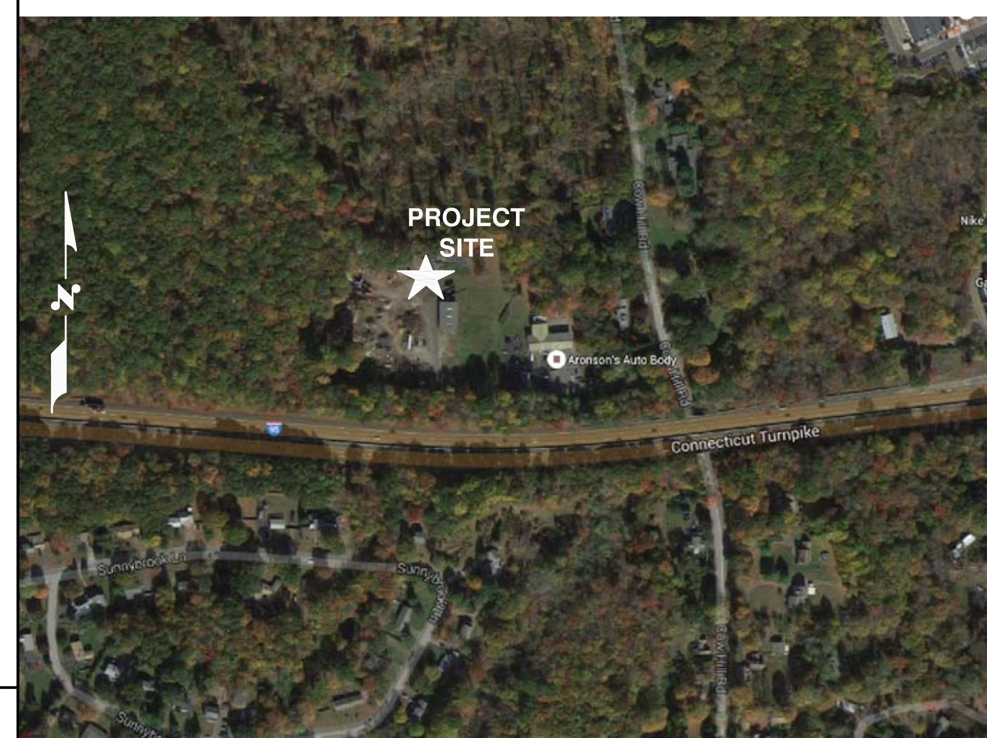
SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
RF-1	RF-PLUMBING DIAGRAM	1
G-1	GROUNDING DETAILS	1

CROWN CASTLE SITE NAME: HRT105
CROWN CASTLE SITE #: 806363

VICINITY MAP

DIRECTIONS TO SITE:

FROM ROCKY HILL, CT: MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 3.8 MILES. MERGE ONTO CT-9 S VIA EXIT 22S ON THE LEFT TOWARD MIDDLETOWN / OLD SAYBROOK. 13.9 MILES. TAKE THE CT-81 EXIT- EXIT 9- TOWARD KILLINGWORTH / CLINTON. 0.2 MILES. TURN RIGHT ONTO KILLINGWORTH RD / CT-81. CONTINUE TO FOLLOW CT-81. PASS THROUGH 1 ROUNDABOUT. 12.5 MILES. TURN RIGHT ONTO WOODLAND DR. 0.3 MILES. TURN LEFT ONTO COW HILL RD. 0.6 MILES. END AT 49 COW HILL RD. CLINTON, CT 06413.



GENERAL NOTES

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

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-888-DIG-SAFE
OR CALL 811

UNDERGROUND SERVICE ALERT

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

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT2024
SITE NAME: CLINTON
CCI SITE #806363
49 COW HILL ROAD
CLINTON, CT 06413
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	01/18/16	ISSUED FOR CONSTRUCTION	RB	AT	DHG
0	01/18/16	ISSUED FOR REVIEW	RB	AT	DHG
A	12/22/15	ISSUED FOR REVIEW	SG	AT	DHG

SCALE: AS SHOWN | DESIGNED BY: SG | DRAWN BY: VT

STATE OF CONNECTICUT REGISTERED PROFESSIONAL ENGINEER LICENSED

AT&T
TITLE SHEET
(LTE 3C)

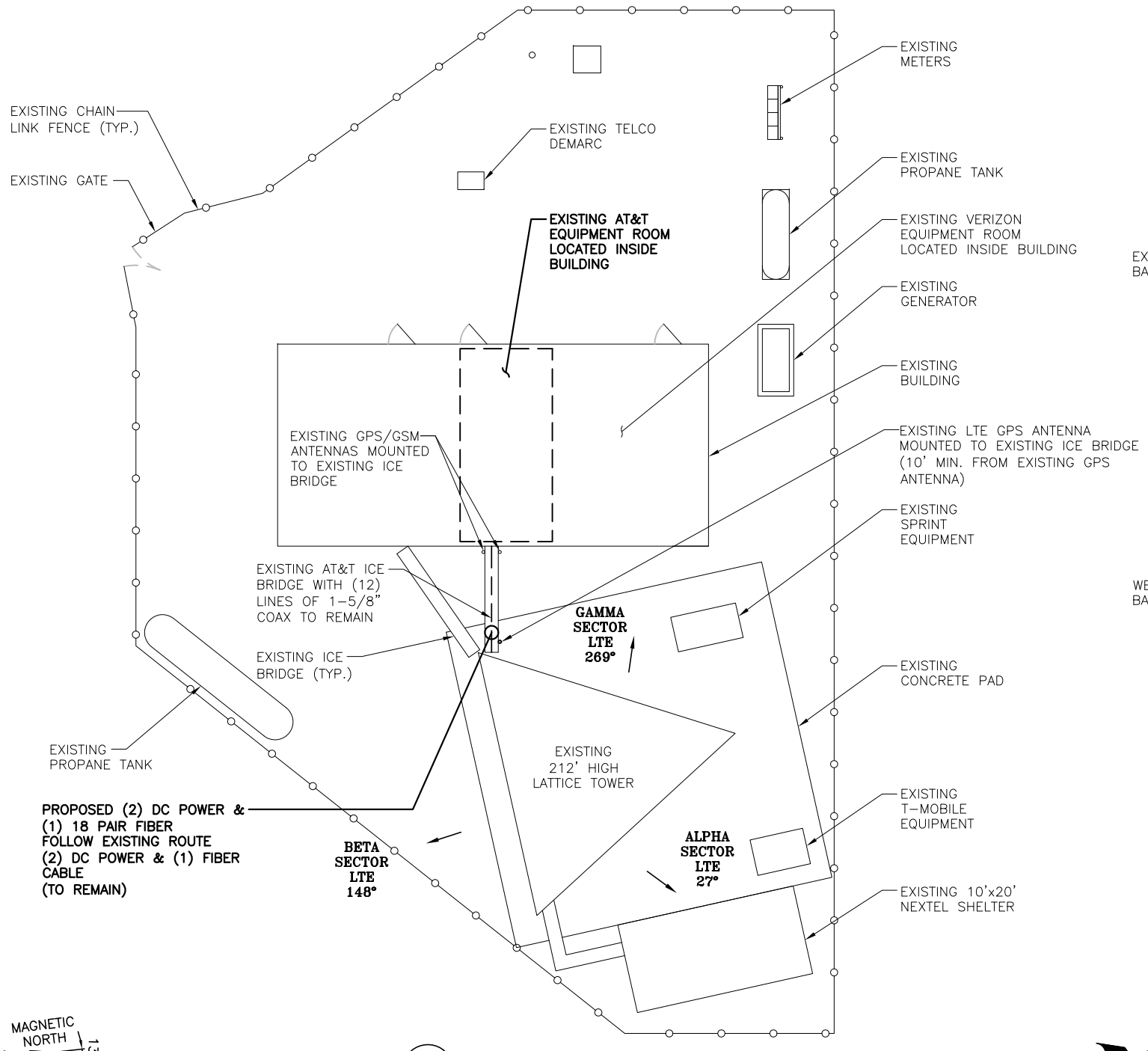
SITE NUMBER	DRAWING NUMBER	REV
CT2024	T-1	1

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC.
DATED: JANUARY 05, 2016

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

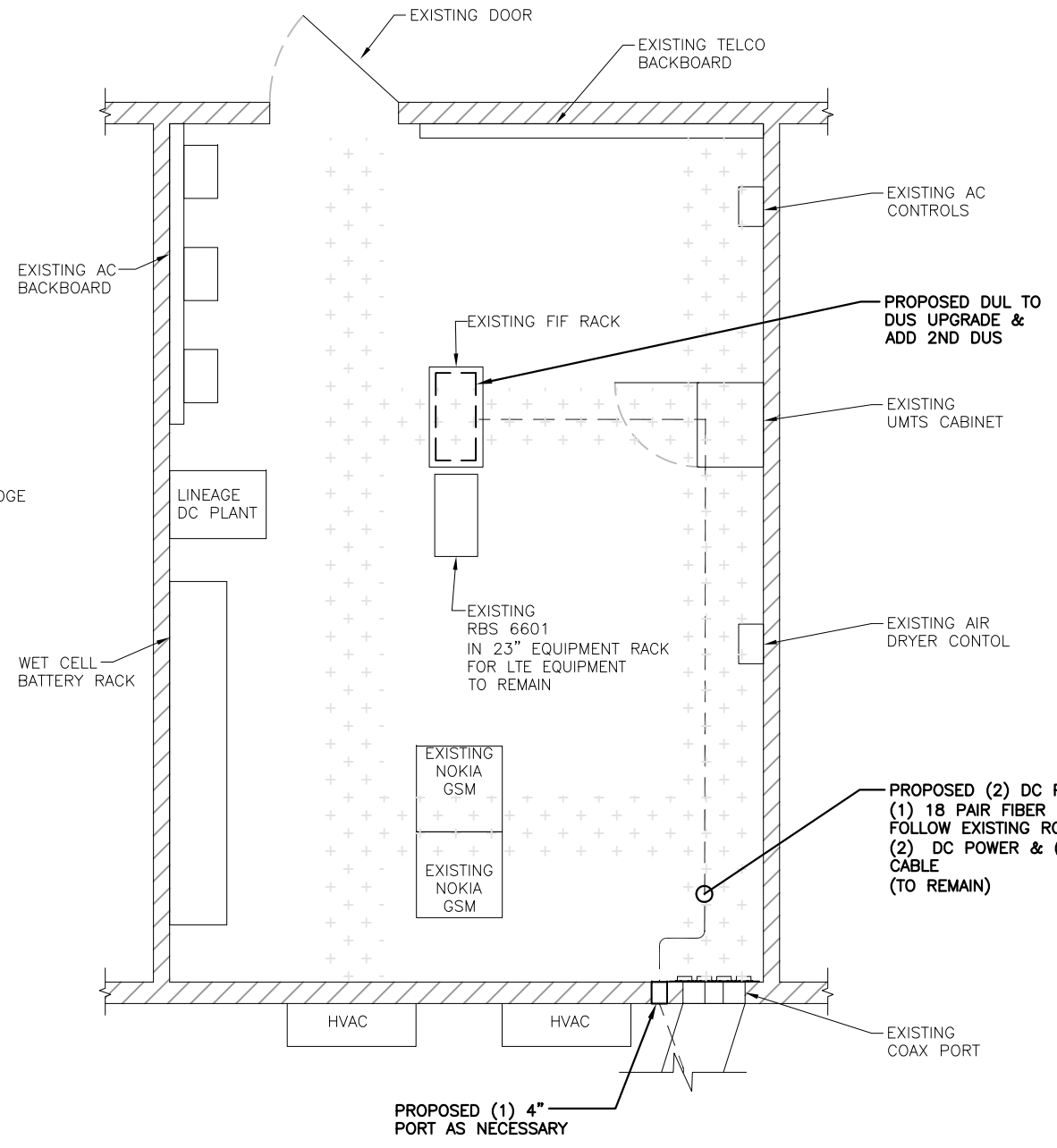
NOTE:
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



MAGNETIC NORTH 13°49' TRUE NORTH

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

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



MAGNETIC NORTH 13°49' TRUE NORTH

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

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

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

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT2024
SITE NAME: CLINTON
CCI SITE #806363
49 COW HILL ROAD
CLINTON, CT 06413
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	01/18/16	ISSUED FOR CONSTRUCTION	RB	AT	DHG
0	01/18/16	ISSUED FOR REVIEW	RB	AT	DHG
A	12/22/15	ISSUED FOR REVIEW	SG	AT	DHG

SCALE: AS SHOWN | DESIGNED BY: SG | DRAWN BY: VT

STATE OF CONNECTICUT · DEREK J. CREASER · No. 25871 · LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLANS
(LTE 3C)

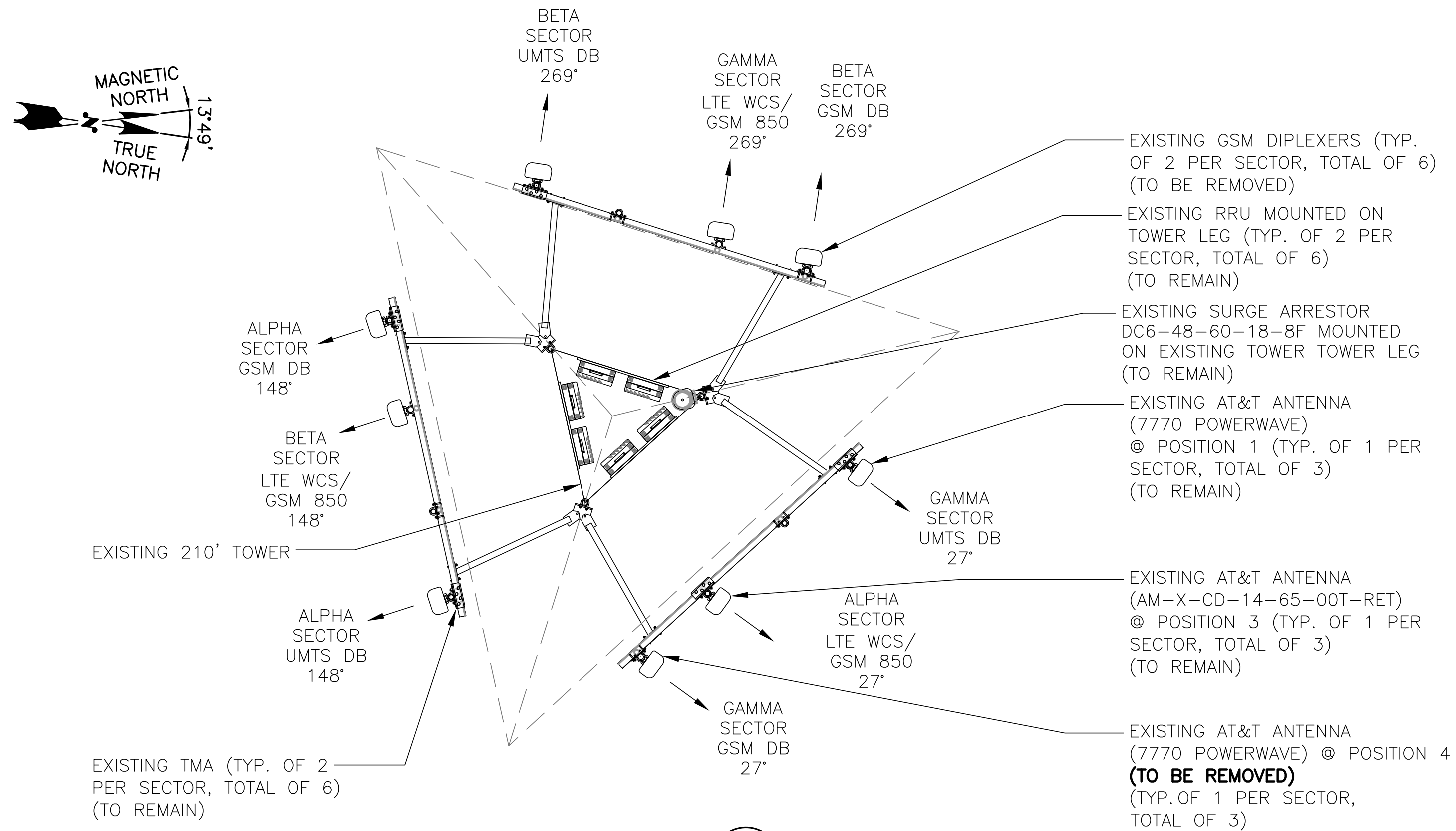
SITE NUMBER	DRAWING NUMBER	REV
CT2024	A-1	1

NOTE:

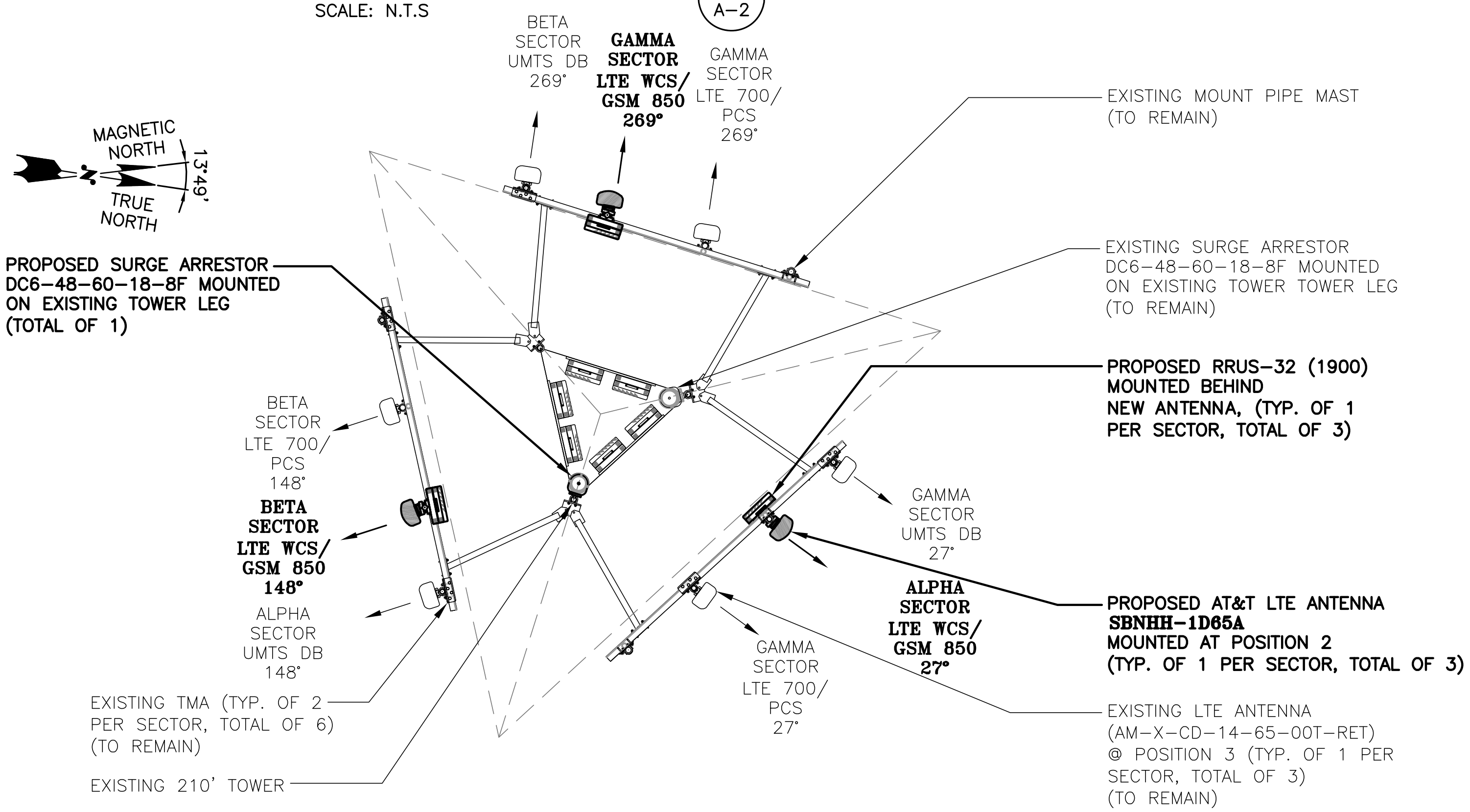
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC.
DATED: JANUARY 05, 2016

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

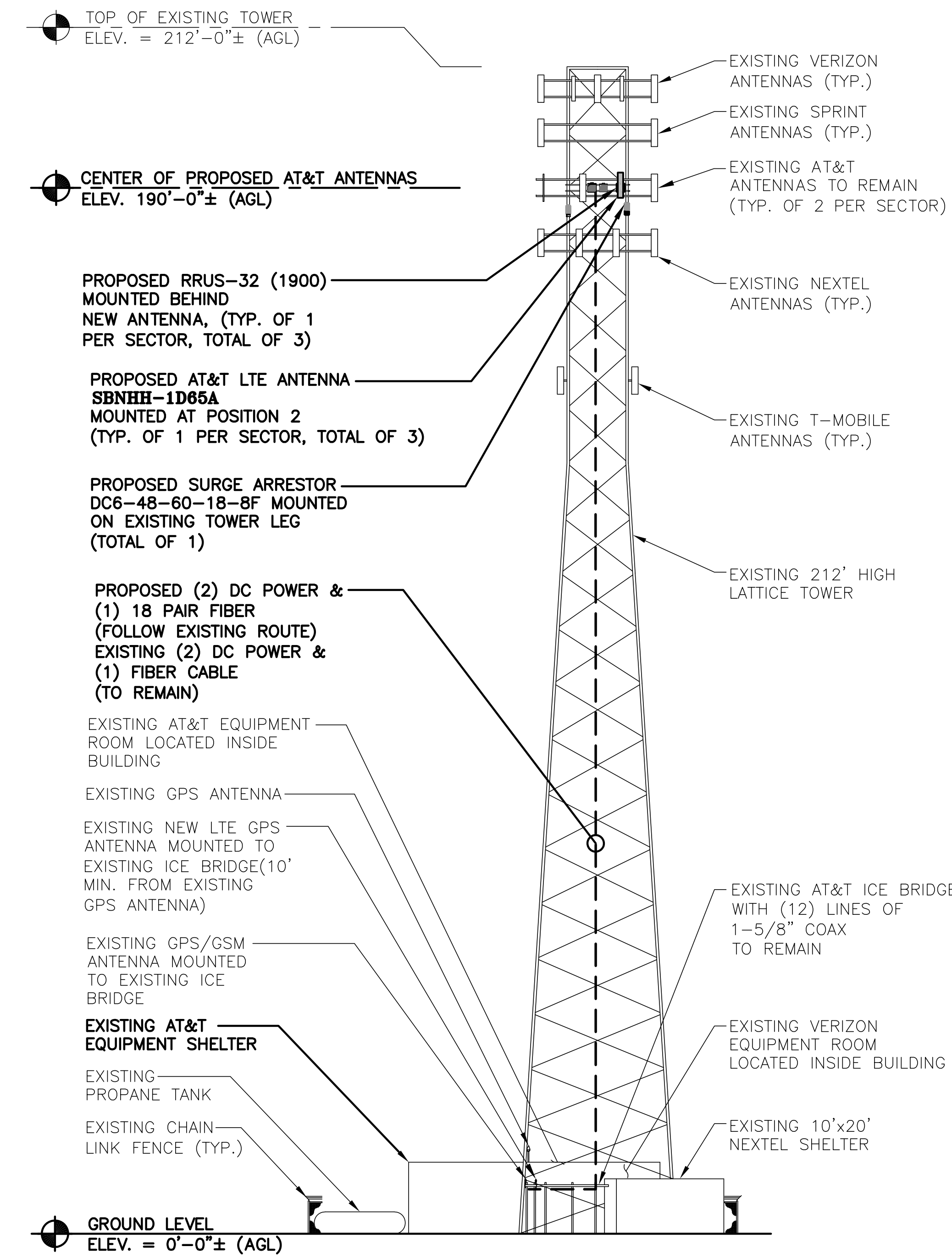
NOTE:
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



EXISTING ANTENNA LAYOUT (1 / A-2)
SCALE: N.T.S



PROPOSED ANTENNA LAYOUT (2 / A-2)
SCALE: N.T.S



ELEVATION (3 / A-2)
22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"
0 8'-0" 16'-0" 32'-0" 48'-0"

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

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT2024
SITE NAME: CLINTON
CCI SITE #806363
49 COW HILL ROAD
CLINTON, CT 06413
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	01/18/16	ISSUED FOR CONSTRUCTION	RB	AT	DHG
0	01/18/16	ISSUED FOR REVIEW	RB	AT	DHG
A	12/22/15	ISSUED FOR REVIEW	SG	AT	DHG

SCALE: AS SHOWN | DESIGNED BY: SG | DRAWN BY: VT

STATE OF CONNECTICUT · LICENSED PROFESSIONAL ENGINEER

AT&T
ANTENNA LAYOUTS & ELEVATION
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CT2024	A-2	1

Date: **December 30, 2015**

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group. Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
(770)701-2500

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2024
	Carrier Site Name:	CLINTON-COW HILL ROAD
Crown Castle Designation:	**Crown Castle BU Number:**	806363
	Crown Castle Site Name:	HRT 105 943201
	Crown Castle JDE Job Number:	360894
	Crown Castle Work Order Number:	1170596
	Crown Castle Application Number:	325918 Rev. 3
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1170596
Site Data:	**48 COW HILL ROAD, CLINTON, Middlesex County, CT**	
	Latitude *41° 17' 20.2"*, Longitude *-72° 32' 18.5"*	
	212.625 Foot - Self Support Tower	

Dear Sean Dempsey,

Jacobs Engineering Group, Inc. 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 857953, in accordance with application 325918, revision 1.

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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All modifications and 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 *Jacobs Engineering Group, Inc.* 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.

Structural analysis prepared by:

Nikhil

Nikhil Sharma
Structural Engineer

Reviewed By:

STATE OF CONNECTICUT
MATTHEW E. WATKINS
No. 29955
LICENSED PROFESSIONAL ENGINEER

Matthew E. Watkins, P.E.
Engineering Project Manager

12/30/15

1) INTRODUCTION

This tower is a 212.625 ft Self Support tower designed by ROHN in June of 1992. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E. The tower has been modified per reinforcement drawings prepared by Vertical Structures, in June of 2007.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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
189.0	190.0	3	andrew	SBNHH-1D65A w/ Mount Pipe	1 4	3/8 13/16	-
		3	ericsson	WCS RRUS-32-B30			
	189.0	1	raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved 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
208.0	209.0	3	alcatel lucent	RRH2X60-AWS	2	1-5/8	2
		1	rfs celwave	DB-B1-6C-12AB-0Z			
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		9	andrew	SBNHH-1D65B w/ Mount Pipe			
		6	antel	LPA-80080/6CF w/ Mount Pipe	18 1	1-5/8 1-1/4	1
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
	208.0	1	tower mounts (crown)	Sector Mount [SM 510-3]			
199.0	199.0	1	tower mounts (crown)	Sector Mount [SM 505-3]	4	1-1/4	1
	198.0	3	alcatel lucent	1900MHz RRH (65MHz)			
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		3	alcatel lucent	TD-RRH8x20-25			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
189.0	190.0	3	powerwave technologies	7020.00	2	5/8	3
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP13519			
		3	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe	12 1	1-5/8 3/8	1
		3	powerwave technologies	7020.00			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	189.0	6	adc	Dual Band 800/1900 MHz Masthead			
		6	ericsson	RRUS-11			
		1	tower mounts (crown)	Sector Mount [SM 510-3]			
183.0	183.0	3	rfs celwave	APXV18-206517LS w/ Mount Pipe	6	1-5/8	1
		1	tower mounts (crown)	Pipe Mount [PM 601-3]			
175.0	179.0	2	radiowaves	HPD2-23	4	1/4	1
	176.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4	4
	175.0	1	tower mounts (crown)	Sector Mount [SM 510-3]			
167.0	173.0	1	rfs celwave	1151-3	1	7/8	1
	167.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
164.0	173.0	1	rfs celwave	1151-3	1	7/8	1
	164.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
162.0	162.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]	1	3/8	1
	160.0	1	sinclair	SD310-HL			
147.0	153.0	1	rfs celwave	1151-3	1	7/8	1
	147.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
145.0	148.0	1	sinclair	SD310-HL	1	7/8	1
	145.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
139.0	140.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	7 3 5	1-5/8 7/8 1-1/4	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	139.0	1	tower mounts (crown)	Side Arm Mount [SO 201-3]			
128.0	132.0	1	rfs celwave	1142-2C	1	7/8	1
	128.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
51.0	51.0	1	gps	GPS_A	1	1/2	1
		1	tower mounts (crown)	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; not considered in this analysis.
4) Abandoned Equipment; 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)
212	212	12	sinclair	SRL410C4	-	-
200	200	2	generic	6' Grid Dish	-	-
190	190	9	swedcom	ALP9212N	-	-
100	100	1	decibel	DB222	-	-
90	90	1	decibel	DB225	-	-
80	80	2	decibel	DB225-2	-	-
60	60	1	decibel	DB212-2	-	-
		1	decibel	DB225		
		1	decibel	DB225-2		
50	50	1	decibel	DB212-2	-	-
40	40	1	decibel	DB212	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	262276	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	ROHN	262273	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ROHN	262274	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Structures, Inc.	2169576	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Structures, Inc.	2309344	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Crown Castle	4922028	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. 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	212.625 - 202.458	Leg	ROHN 2.5 STD	1	-2.82	37.41	12.6	Pass
T2	202.458 - 182.292	Leg	ROHN 3 EH	28	-31.61	83.44	37.9	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	67	-78.64	138.58	56.7	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	108	-131.00	205.75	63.7	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	147	-161.87	211.35	76.6	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	174	-196.77	263.18	74.8	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	201	-227.79	263.18	86.6	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	228	-256.74	331.42	77.5	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	255	-284.83	331.21	86.0	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	282	-297.07	433.40	68.5	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	315	-354.76	433.92	81.8	Pass
T1	212.625 - 202.458	Diagonal	ROHN 2 STD	14	-3.91	21.60	18.1	Pass
T2	202.458 - 182.292	Diagonal	ROHN 2 STD	39	-11.40	15.46	73.7	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	77	-11.19	13.36	83.8	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-10.70	11.48	93.2	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	149	-13.78	14.35	96.0	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	176	-12.28	12.58	97.6	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	203	-12.25	21.76	56.3	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	230	-11.99	19.22	62.4	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	257	-12.99	16.87	77.0	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	284	-18.32	27.45	66.7	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	317	-21.36	26.23	81.4	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	13	-2.89	20.30	14.2 16.8 (b)	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-6.20	20.25	30.6 36.2 (b)	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	76	-7.04	17.38	40.5 41.0 (b)	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-7.52	24.67	30.5 43.8 (b)	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	148	-8.29	20.44	40.6 48.3 (b)	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	175	-8.13	14.86	54.7	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	202	-8.70	25.42	34.2 50.6 (b)	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	229	-9.02	19.85	45.4 52.5 (b)	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	256	-10.22	15.70	65.1	Pass
T10	40.6667 -	Horizontal	ROHN 3 STD	283	-10.04	27.89	36.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
	20.3333						40.6 (b)	
T11	20.3333 - 0	Horizontal	ROHN 3 STD	316	-12.42	22.69	54.7	Pass
T1	212.625 - 202.458	Top Girt	ROHN 1.5 STD	4	-0.23	20.34	1.1	Pass
T10	40.6667 - 20.3333	Redund Horz 1 Bracing	ROHN 1.5 STD	295	-5.16	11.80	43.7	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	328	-6.15	9.84	62.6	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	296	-4.77	7.76	61.4	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	329	-5.30	7.19	73.7	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	308	-0.03	10.76	0.2	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	341	-0.02	8.85	0.3	Pass
T10	40.6667 - 20.3333	Redund Hip Diagonal Bracing	ROHN 2.5 STD	307	-0.05	6.86	0.8	Pass
T11	20.3333 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	340	-0.05	6.20	0.8	Pass
T1	212.625 - 202.458	Inner Bracing	L2x2x1/8	17	-0.00	5.83	0.3	Pass
T2	202.458 - 182.292	Inner Bracing	L2x2x1/8	40	-0.01	5.73	0.3	Pass
T3	182.292 - 162.104	Inner Bracing	L2x2x1/8	79	-0.01	4.22	0.3	Pass
T4	162.104 - 141.896	Inner Bracing	L2x2x1/8	119	-0.01	2.89	0.4	Pass
T5	141.896 - 121.688	Inner Bracing	L2x2x1/8	158	-0.01	2.19	0.4	Pass
T6	121.688 - 101.479	Inner Bracing	L2 1/2x2 1/2x3/16	185	-0.01	3.45	0.5	Pass
T7	101.479 - 81.2708	Inner Bracing	L3x3x3/16	211	-0.01	4.55	0.5	Pass
T8	81.2708 - 61	Inner Bracing	L3 1/2x3 1/2x1/4	238	-0.01	7.40	0.4	Pass
T9	61 - 40.6667	Inner Bracing	L3 1/2x3 1/2x1/4	267	-0.01	5.90	0.4	Pass
T10	40.6667 - 20.3333	Inner Bracing	ROHN 3 STD	311	-0.01	19.74	0.4	Pass
T11	20.3333 - 0	Inner Bracing	ROHN 3 STD	345	-0.01	16.16	0.4	Pass
							Summary	
						Leg (T7)	86.6	Pass
						Diagonal (T6)	97.6	Pass
						Horizontal (T9)	65.1	Pass
						Top Girt (T1)	1.1	Pass
						Redund Horz 1 Bracing (T11)	62.6	Pass
						Redund Diag 1 Bracing (T11)	73.7	Pass
						Redund Hip 1 Bracing (T11)	0.3	Pass
						Redund Hip Diagonal	0.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Bracing (T11)		
						Inner Bracing (T7)	0.5	Pass
						Bolt Checks	67.9	Pass
						RATING =	**97.6**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
-	Anchor Rods	0	68.0	Pass
1	Base Foundation Structural	0	24.4	Pass
1	Base Foundation Soil Interaction	0	65.9	Pass

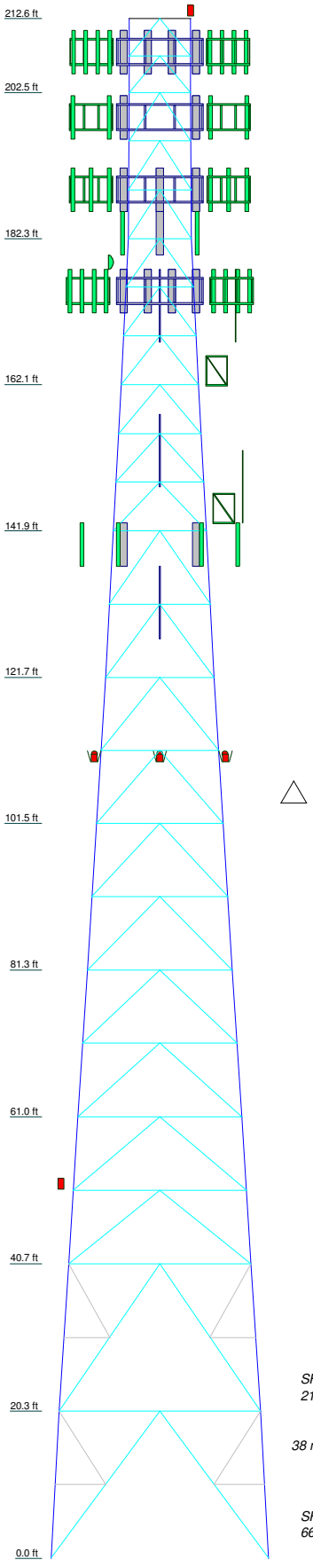
Structure Rating (max from all components) =	97.6%

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 support the existing, reserved and proposed loads. No modifications are required at this time.

Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 8 EH		ROHN 8 EHS		ROHN 6 EH		ROHN 6 EHS	ROHN 5 EH	ROHN 4 EH	ROHN 3 EH	A
Leg Grade	A572-50										
Diagonals	ROHN 3 STD					ROHN 2.5 STD					
Diagonal Grade	A572-50										
Top Girts	N.A.										B
Horizontals	ROHN 3 STD			ROHN 2.5 STD			ROHN 2 STD			ROHN 1.5 STD	
Red. Horizontals	ROHN 1.5 STD					N.A.					
Red. Diagonals	ROHN 2 STD					N.A.					
Red. Hips	ROHN 1.5 STD					N.A.					
Inner Bracing	ROHN 3 STD		L3 1/2x3 1/2x1/4		L3x3x3/16	L2 1/2x2 1/2x3/16		L2x2x1/8			
Face Width (ft)	30.0417	27.8333	25.1771	22.6771	20.0417	17.5417	15.0417	12.7917	10.7083	8.625	8.54167
# Panels @ (ft)		1 @ 20.25	1 @ 20.3333	2 @ 10.1667	2 @ 10.1354	6 @ 10.1042		3 @ 6.73611	3 @ 6.72917	3 @ 6.72222	2 @ 5.08333
Weight (K)	37.5	5.7	5.6	4.9	4.7	4.0	3.3	2.7	2.4	1.8	1.5	0.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	212	7020.00	189
(2) LPA-80080/6CF w/ Mount Pipe	208	(2) RRUS-11	189
(2) LPA-80080/6CF w/ Mount Pipe	208	(2) RRUS-11	189
(2) LPA-80080/6CF w/ Mount Pipe	208	(2) RRUS-11	189
DB-T1-6Z-8AB-0Z	208	DC6-48-60-18-8F	189
(3) SBNHH-1D65B w/ Mount Pipe	208	SBNHH-1D65A w/ Mount Pipe	189
(3) SBNHH-1D65B w/ Mount Pipe	208	SBNHH-1D65A w/ Mount Pipe	189
(3) SBNHH-1D65B w/ Mount Pipe	208	SBNHH-1D65A w/ Mount Pipe	189
RRH2X60-PCS	208	WCS RRUS-32-B30	189
RRH2X60-PCS	208	WCS RRUS-32-B30	189
RRH2X60-PCS	208	WCS RRUS-32-B30	189
RRH2x60-700	208	DC6-48-60-18-8F	189
RRH2x60-700	208	Sector Mount [SM 510-3]	189
RRH2x60-700	208	APXV18-206517LS w/ Mount Pipe	183
RRH2X60-AWS	208	APXV18-206517LS w/ Mount Pipe	183
RRH2X60-AWS	208	APXV18-206517LS w/ Mount Pipe	183
RRH2X60-AWS	208	Pipe Mount [PM 601-3]	183
DB-B1-6C-12AB-0Z	208	(4) DB844H90E-XY w/ Mount Pipe	175
Sector Mount [SM 510-3]	208	(4) DB844H90E-XY w/ Mount Pipe	175
APXVSPP18-C-A20 w/ Mount Pipe	199	(4) DB844H90E-XY w/ Mount Pipe	175
APXVSPP18-C-A20 w/ Mount Pipe	199	Sector Mount [SM 510-3]	175
APXVSPP18-C-A20 w/ Mount Pipe	199	6' x 2" Mount Pipe	175
APXVTM14-C-120 w/ Mount Pipe	199	6' x 2" Mount Pipe	175
APXVTM14-C-120 w/ Mount Pipe	199	HPD2-23	175
APXVTM14-C-120 w/ Mount Pipe	199	HPD2-23	175
800MHz 2X50W RRH W/FILTER	199	1151-3	167
800MHz 2X50W RRH W/FILTER	199	Side Arm Mount [SO 308-1]	167
800MHz 2X50W RRH W/FILTER	199	1151-3	164
1900MHz RRH (65MHz)	199	Side Arm Mount [SO 308-1]	164
1900MHz RRH (65MHz)	199	SD310-HL	162
1900MHz RRH (65MHz)	199	Side Arm Mount [SO 308-1]	162
TD-RRH8x20-25	199	1151-3	147
TD-RRH8x20-25	199	Side Arm Mount [SO 308-1]	147
TD-RRH8x20-25	199	SD310-HL	145
Sector Mount [SM 505-3]	199	Side Arm Mount [SO 308-1]	145
(3) 4' x 2" Pipe Mount	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	139
(3) 4' x 2" Pipe Mount	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	139
(3) 4' x 2" Pipe Mount	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	139
7770.00 w/ Mount Pipe	189	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	139
7770.00 w/ Mount Pipe	189	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	139
7770.00 w/ Mount Pipe	189	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe	189	KRY 112 144/1	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe	189	KRY 112 144/1	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe	189	KRY 112 144/1	139
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	189	Side Arm Mount [SO 201-3]	139
		1142-2C	128
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	189	Side Arm Mount [SO 308-1]	128
		Side Lighting	110
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	189	Side Lighting	110
		Side Lighting	110
7020.00	189	GPS_A	51
7020.00	189	Side Arm Mount [SO 701-1]	51

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD	B	ROHN 1.5 STD

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.6%

MAX. CORNER REACTIONS AT BASE:
DOWN: 353 K
SHEAR: 40 K

UPLIFT: -292 K
SHEAR: 35 K

AXIAL
160 K

SHEAR
21 K

MOMENT
2624 kip-ft

TORQUE 11 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
86 K

SHEAR
66 K

MOMENT
8441 kip-ft

TORQUE 39 kip-ft
REACTIONS - 85 mph WIND

Jacobs Engineering Group, Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: ***HRT 105 943201***			
Project: ***BU 806363 WO 1170596***			
Client: Crown Castle	Drawn by: J. Earnest	App'd:	
Code: TIA/EIA-222-F	Date: 12/30/15	Scale: NTS	
Path: c:\pwworking\telecommunications\earnestj\dms74484\BU 806363 WO 1170596.eri		Dwg No. E-1	

Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

January 26, 2016

Honorable Bruce N. Farmer
1st Selectman, Town of Clinton
54 East Main Street
Clinton, CT 06413

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 48 Cow Hill Road, Clinton (Owner, Crown Castle)

Dear Mr. Farmer:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact the undersigned at 860-830-0380 or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

January 26, 2016

Mr. Raymond Heser
110 Killingworth Turnpike
Clinton, CT 06413

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 48 Cow Hill Road, Clinton (Owner, Crown Castle)

Dear Mr. Heser:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact the undersigned at 860-830-0380 or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

Date: **December 30, 2015**

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group. Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
(770)701-2500

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2024
	Carrier Site Name:	CLINTON-COW HILL ROAD
Crown Castle Designation:	**Crown Castle BU Number:**	806363
	Crown Castle Site Name:	HRT 105 943201
	Crown Castle JDE Job Number:	360894
	Crown Castle Work Order Number:	1170596
	Crown Castle Application Number:	325918 Rev. 3
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1170596
Site Data:	**48 COW HILL ROAD, CLINTON, Middlesex County, CT**	
	Latitude *41° 17' 20.2"*, Longitude *-72° 32' 18.5"*	
	212.625 Foot - Self Support Tower	

Dear Sean Dempsey,

Jacobs Engineering Group, Inc. 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 857953, in accordance with application 325918, revision 1.

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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All modifications and 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 *Jacobs Engineering Group, Inc.* 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.

Structural analysis prepared by:

Nikhil

Nikhil Sharma
Structural Engineer

Reviewed By:

STATE OF CONNECTICUT
MATTHEW E. WATKINS
No. 29955
LICENSED PROFESSIONAL ENGINEER

Matthew E. Watkins, P.E.
Engineering Project Manager

12/30/15

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 212.625 ft Self Support tower designed by ROHN in June of 1992. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E. The tower has been modified per reinforcement drawings prepared by Vertical Structures, in June of 2007.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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
189.0	190.0	3	andrew	SBNHH-1D65A w/ Mount Pipe	1 4	3/8 13/16	-
		3	ericsson	WCS RRUS-32-B30			
	189.0	1	raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved 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
208.0	209.0	3	alcatel lucent	RRH2X60-AWS	2	1-5/8	2
		1	rfs celwave	DB-B1-6C-12AB-0Z			
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		9	andrew	SBNHH-1D65B w/ Mount Pipe			
		6	antel	LPA-80080/6CF w/ Mount Pipe	18 1	1-5/8 1-1/4	1
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
	208.0	1	tower mounts (crown)	Sector Mount [SM 510-3]			
199.0	199.0	1	tower mounts (crown)	Sector Mount [SM 505-3]	4	1-1/4	1
	198.0	3	alcatel lucent	1900MHz RRH (65MHz)			
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		3	alcatel lucent	TD-RRH8x20-25			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
189.0	190.0	3	powerwave technologies	7020.00	2	5/8	3
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP13519			
		3	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe	12 1	1-5/8 3/8	1
		3	powerwave technologies	7020.00			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	189.0	6	adc	Dual Band 800/1900 MHz Masthead			
		6	ericsson	RRUS-11			
		1	tower mounts (crown)	Sector Mount [SM 510-3]			
183.0	183.0	3	rfs celwave	APXV18-206517LS w/ Mount Pipe	6	1-5/8	1
		1	tower mounts (crown)	Pipe Mount [PM 601-3]			
175.0	179.0	2	radiowaves	HPD2-23	4	1/4	1
	176.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4	4
	175.0	1	tower mounts (crown)	Sector Mount [SM 510-3]			
167.0	173.0	1	rfs celwave	1151-3	1	7/8	1
	167.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
164.0	173.0	1	rfs celwave	1151-3	1	7/8	1
	164.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
162.0	162.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]	1	3/8	1
	160.0	1	sinclair	SD310-HL			
147.0	153.0	1	rfs celwave	1151-3	1	7/8	1
	147.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
145.0	148.0	1	sinclair	SD310-HL	1	7/8	1
	145.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
139.0	140.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	7 3 5	1-5/8 7/8 1-1/4	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	139.0	1	tower mounts (crown)	Side Arm Mount [SO 201-3]			
128.0	132.0	1	rfs celwave	1142-2C	1	7/8	1
	128.0	1	tower mounts (crown)	Side Arm Mount [SO 308-1]			
51.0	51.0	1	gps	GPS_A	1	1/2	1
		1	tower mounts (crown)	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; not considered in this analysis.
4) Abandoned Equipment; 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)
212	212	12	sinclair	SRL410C4	-	-
200	200	2	generic	6' Grid Dish	-	-
190	190	9	swedcom	ALP9212N	-	-
100	100	1	decibel	DB222	-	-
90	90	1	decibel	DB225	-	-
80	80	2	decibel	DB225-2	-	-
60	60	1	decibel	DB212-2	-	-
		1	decibel	DB225		
		1	decibel	DB225-2		
50	50	1	decibel	DB212-2	-	-
40	40	1	decibel	DB212	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	262276	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	ROHN	262273	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ROHN	262274	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Structures, Inc.	2169576	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Structures, Inc.	2309344	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Crown Castle	4922028	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. 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	212.625 - 202.458	Leg	ROHN 2.5 STD	1	-2.82	37.41	12.6	Pass
T2	202.458 - 182.292	Leg	ROHN 3 EH	28	-31.61	83.44	37.9	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	67	-78.64	138.58	56.7	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	108	-131.00	205.75	63.7	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	147	-161.87	211.35	76.6	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	174	-196.77	263.18	74.8	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	201	-227.79	263.18	86.6	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	228	-256.74	331.42	77.5	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	255	-284.83	331.21	86.0	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	282	-297.07	433.40	68.5	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	315	-354.76	433.92	81.8	Pass
T1	212.625 - 202.458	Diagonal	ROHN 2 STD	14	-3.91	21.60	18.1	Pass
T2	202.458 - 182.292	Diagonal	ROHN 2 STD	39	-11.40	15.46	73.7	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	77	-11.19	13.36	83.8	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-10.70	11.48	93.2	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	149	-13.78	14.35	96.0	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	176	-12.28	12.58	97.6	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	203	-12.25	21.76	56.3	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	230	-11.99	19.22	62.4	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	257	-12.99	16.87	77.0	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	284	-18.32	27.45	66.7	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	317	-21.36	26.23	81.4	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	13	-2.89	20.30	14.2 16.8 (b)	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-6.20	20.25	30.6 36.2 (b)	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	76	-7.04	17.38	40.5 41.0 (b)	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-7.52	24.67	30.5 43.8 (b)	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	148	-8.29	20.44	40.6 48.3 (b)	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	175	-8.13	14.86	54.7	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	202	-8.70	25.42	34.2 50.6 (b)	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	229	-9.02	19.85	45.4 52.5 (b)	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	256	-10.22	15.70	65.1	Pass
T10	40.6667 -	Horizontal	ROHN 3 STD	283	-10.04	27.89	36.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
	20.3333						40.6 (b)	
T11	20.3333 - 0	Horizontal	ROHN 3 STD	316	-12.42	22.69	54.7	Pass
T1	212.625 - 202.458	Top Girt	ROHN 1.5 STD	4	-0.23	20.34	1.1	Pass
T10	40.6667 - 20.3333	Redund Horz 1 Bracing	ROHN 1.5 STD	295	-5.16	11.80	43.7	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	328	-6.15	9.84	62.6	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	296	-4.77	7.76	61.4	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	329	-5.30	7.19	73.7	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	308	-0.03	10.76	0.2	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	341	-0.02	8.85	0.3	Pass
T10	40.6667 - 20.3333	Redund Hip Diagonal Bracing	ROHN 2.5 STD	307	-0.05	6.86	0.8	Pass
T11	20.3333 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	340	-0.05	6.20	0.8	Pass
T1	212.625 - 202.458	Inner Bracing	L2x2x1/8	17	-0.00	5.83	0.3	Pass
T2	202.458 - 182.292	Inner Bracing	L2x2x1/8	40	-0.01	5.73	0.3	Pass
T3	182.292 - 162.104	Inner Bracing	L2x2x1/8	79	-0.01	4.22	0.3	Pass
T4	162.104 - 141.896	Inner Bracing	L2x2x1/8	119	-0.01	2.89	0.4	Pass
T5	141.896 - 121.688	Inner Bracing	L2x2x1/8	158	-0.01	2.19	0.4	Pass
T6	121.688 - 101.479	Inner Bracing	L2 1/2x2 1/2x3/16	185	-0.01	3.45	0.5	Pass
T7	101.479 - 81.2708	Inner Bracing	L3x3x3/16	211	-0.01	4.55	0.5	Pass
T8	81.2708 - 61	Inner Bracing	L3 1/2x3 1/2x1/4	238	-0.01	7.40	0.4	Pass
T9	61 - 40.6667	Inner Bracing	L3 1/2x3 1/2x1/4	267	-0.01	5.90	0.4	Pass
T10	40.6667 - 20.3333	Inner Bracing	ROHN 3 STD	311	-0.01	19.74	0.4	Pass
T11	20.3333 - 0	Inner Bracing	ROHN 3 STD	345	-0.01	16.16	0.4	Pass
							Summary	
						Leg (T7)	86.6	Pass
						Diagonal (T6)	97.6	Pass
						Horizontal (T9)	65.1	Pass
						Top Girt (T1)	1.1	Pass
						Redund Horz 1 Bracing (T11)	62.6	Pass
						Redund Diag 1 Bracing (T11)	73.7	Pass
						Redund Hip 1 Bracing (T11)	0.3	Pass
						Redund Hip Diagonal	0.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Bracing (T11)		
						Inner Bracing (T7)	0.5	Pass
						Bolt Checks	67.9	Pass
						RATING =	**97.6**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
-	Anchor Rods	0	68.0	Pass
1	Base Foundation Structural	0	24.4	Pass
1	Base Foundation Soil Interaction	0	65.9	Pass

Structure Rating (max from all components) =	97.6%

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

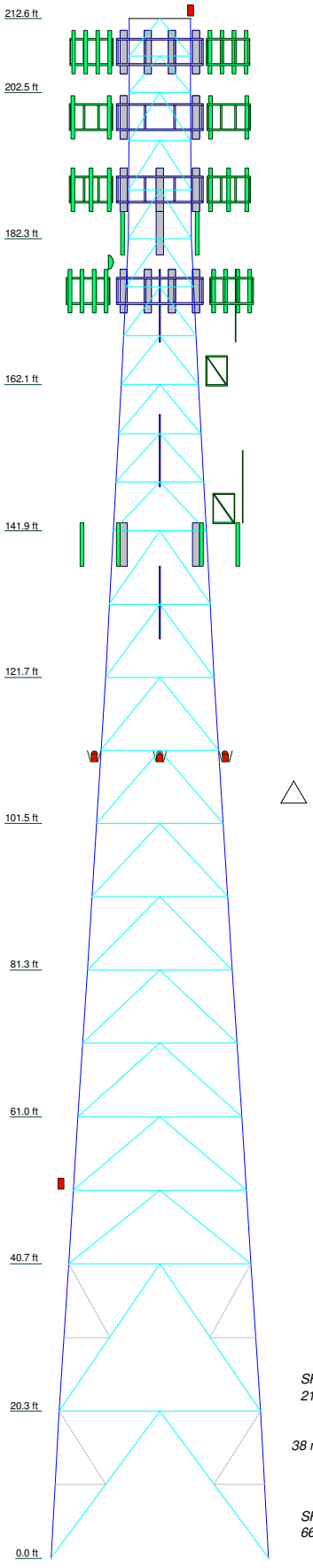
4.1) Recommendations

The tower and its foundation have sufficient capacity to support the existing, reserved and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 8 EH		ROHN 8 EHS		ROHN 6 EH		ROHN 6 EHS	ROHN 5 EH	ROHN 4 EH	ROHN 3 EH	A
Leg Grade	A572-50										
Diagonals	ROHN 3 STD					ROHN 2.5 STD					
Diagonal Grade	A572-50										
Top Girts	N.A.										B
Horizontals	ROHN 3 STD			ROHN 2.5 STD			ROHN 2 STD			ROHN 1.5 STD	
Red. Horizontals	ROHN 1.5 STD					N.A.					
Red. Diagonals	ROHN 2 STD					N.A.					
Red. Hips	ROHN 1.5 STD					N.A.					
Inner Bracing	ROHN 3 STD		L3 1/2x3 1/2x1/4		L3x3x3/16	L2 1/2x2 1/2x3/16		L2x2x1/8			
Face Width (ft)	30.0417	27.8333	25.1771	22.6771	20.0417	17.5417	15.0417	12.7917	10.7083	8.625	8.54167
# Panels @ (ft)		1 @ 20.25	1 @ 20.3333	2 @ 10.1667	2 @ 10.1354	6 @ 10.1042		3 @ 6.73611	3 @ 6.72917	3 @ 6.72222	2 @ 5.08333
Weight (K)	37.5	5.7	5.6	4.9	4.7	4.0	3.3	2.7	2.4	1.8	1.5	0.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	212	7020.00	189
(2) LPA-80080/6CF w/ Mount Pipe	208	(2) RRUS-11	189
(2) LPA-80080/6CF w/ Mount Pipe	208	(2) RRUS-11	189
(2) LPA-80080/6CF w/ Mount Pipe	208	(2) RRUS-11	189
DB-T1-6Z-8AB-0Z	208	DC6-48-60-18-8F	189
(3) SBNHH-1D65B w/ Mount Pipe	208	SBNHH-1D65A w/ Mount Pipe	189
(3) SBNHH-1D65B w/ Mount Pipe	208	SBNHH-1D65A w/ Mount Pipe	189
(3) SBNHH-1D65B w/ Mount Pipe	208	SBNHH-1D65A w/ Mount Pipe	189
RRH2X60-PCS	208	WCS RRUS-32-B30	189
RRH2X60-PCS	208	WCS RRUS-32-B30	189
RRH2X60-PCS	208	WCS RRUS-32-B30	189
RRH2x60-700	208	DC6-48-60-18-8F	189
RRH2x60-700	208	Sector Mount [SM 510-3]	189
RRH2x60-700	208	APXV18-206517LS w/ Mount Pipe	183
RRH2X60-AWS	208	APXV18-206517LS w/ Mount Pipe	183
RRH2X60-AWS	208	APXV18-206517LS w/ Mount Pipe	183
RRH2X60-AWS	208	Pipe Mount [PM 601-3]	183
DB-B1-6C-12AB-0Z	208	(4) DB844H90E-XY w/ Mount Pipe	175
Sector Mount [SM 510-3]	208	(4) DB844H90E-XY w/ Mount Pipe	175
APXVSPP18-C-A20 w/ Mount Pipe	199	(4) DB844H90E-XY w/ Mount Pipe	175
APXVSPP18-C-A20 w/ Mount Pipe	199	Sector Mount [SM 510-3]	175
APXVSPP18-C-A20 w/ Mount Pipe	199	6' x 2" Mount Pipe	175
APXVTM14-C-120 w/ Mount Pipe	199	6' x 2" Mount Pipe	175
APXVTM14-C-120 w/ Mount Pipe	199	HPD2-23	175
APXVTM14-C-120 w/ Mount Pipe	199	HPD2-23	175
800MHz 2X50W RRH W/FILTER	199	1151-3	167
800MHz 2X50W RRH W/FILTER	199	Side Arm Mount [SO 308-1]	167
800MHz 2X50W RRH W/FILTER	199	1151-3	164
1900MHz RRH (65MHz)	199	Side Arm Mount [SO 308-1]	164
1900MHz RRH (65MHz)	199	SD310-HL	162
1900MHz RRH (65MHz)	199	Side Arm Mount [SO 308-1]	162
TD-RRH8x20-25	199	1151-3	147
TD-RRH8x20-25	199	Side Arm Mount [SO 308-1]	147
TD-RRH8x20-25	199	SD310-HL	145
Sector Mount [SM 505-3]	199	Side Arm Mount [SO 308-1]	145
(3) 4' x 2" Pipe Mount	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	139
(3) 4' x 2" Pipe Mount	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	139
(3) 4' x 2" Pipe Mount	199	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	139
7770.00 w/ Mount Pipe	189	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	139
7770.00 w/ Mount Pipe	189	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	139
7770.00 w/ Mount Pipe	189	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe	189	KRY 112 144/1	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe	189	KRY 112 144/1	139
AM-X-CD-14-65-00T-RET w/ Mount Pipe	189	KRY 112 144/1	139
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	189	Side Arm Mount [SO 201-3]	139
		1142-2C	128
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	189	Side Arm Mount [SO 308-1]	128
		Side Lighting	110
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	189	Side Lighting	110
		Side Lighting	110
7020.00	189	GPS_A	51
7020.00	189	Side Arm Mount [SO 701-1]	51

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD	B	ROHN 1.5 STD

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.6%

MAX. CORNER REACTIONS AT BASE:
DOWN: 353 K
SHEAR: 40 K

UPLIFT: -292 K
SHEAR: 35 K

AXIAL
160 K

SHEAR
21 K

MOMENT
2624 kip-ft

TORQUE 11 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
86 K

SHEAR
66 K

MOMENT
8441 kip-ft

TORQUE 39 kip-ft
REACTIONS - 85 mph WIND

Jacobs Engineering Group, Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: ***HRT 105 943201***			
Project: ***BU 806363 WO 1170596***			
Client: Crown Castle	Drawn by: J. Earnest	App'd:	
Code: TIA/EIA-222-F	Date: 12/30/15	Scale: NTS	
Path: c:\pwworking\telecommunications\earnestj\dms74484\BU 806363 WO 1170596.eri		Dwg No. E-1	

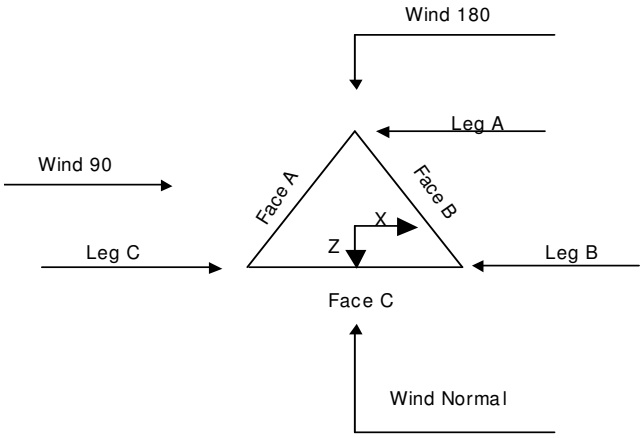
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 212.63 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 8.50 ft at the top and 30.04 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate	√	Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks	√	Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.	√	Include Angle Block Shear Check
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends		Include Shear-Torsion Interaction
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	212.63-202.46			8.50	1	10.17
T2	202.46-182.29			8.54	1	20.17
T3	182.29-162.10			8.63	1	20.19
T4	162.10-141.90			10.71	1	20.21
T5	141.90-121.69			12.79	1	20.21
T6	121.69-101.48			15.04	1	20.21
T7	101.48-81.27			17.54	1	20.21
T8	81.27-61.00			20.04	1	20.27
T9	61.00-40.67			22.68	1	20.33
T10	40.67-20.33			25.18	1	20.33
T11	20.33-0.00			27.83	1	20.33

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	212.63-202.46	5.08	K Brace Down	No	Yes	0.0000	0.0000
T2	202.46-182.29	6.72	K Brace Down	No	Yes	0.0000	0.0000
T3	182.29-162.10	6.73	K Brace Down	No	Yes	0.0000	0.0000
T4	162.10-141.90	6.74	K Brace Down	No	Yes	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	141.90-121.69	10.10	K Brace Down	No	Yes	0.0000	0.0000
T6	121.69-101.48	10.10	K Brace Down	No	Yes	0.0000	0.0000
T7	101.48-81.27	10.10	K Brace Down	No	Yes	0.0000	0.0000
T8	81.27-61.00	10.14	K Brace Down	No	Yes	0.0000	0.0000
T9	61.00-40.67	10.17	K Brace Down	No	Yes	0.0000	0.0000
T10	40.67-20.33	20.33	K1 Down	No	Yes	0.0000	0.0000
T11	20.33-0.00	20.25	K1 Down	No	Yes	0.0000	1.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 212.63-202.46	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 202.46-182.29	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 182.29-162.10	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 162.10-141.90	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 141.90-121.69	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T6 121.69-101.48	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 101.48-81.27	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T8 81.27-61.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 61.00-40.67	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T10 40.67-20.33	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.33-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 212.63-202.46	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 202.46-182.29	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T3 182.29-162.10	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T4 162.10-141.90	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 141.90-121.69	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T6 121.69-101.48	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 101.48-81.27	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 81.27-61.00	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 61.00-40.67	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T10 40.67-20.33	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.33-0.00	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 212.63-202.46	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T2 202.46-182.29	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 182.29-162.10	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 162.10-141.90	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 141.90-121.69	Single Angle		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 121.69-101.48	Single Angle		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 101.48-81.27	Single Angle		A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 81.27-61.00	Single Angle		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 61.00-40.67	Single Angle		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 40.67-20.33	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.33-0.00	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T10 40.67-20.33	A36 (36 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
		Hip Diagonal		ROHN 2.5 STD	1
T11	A36	Horizontal (1)	Pipe	ROHN 1.5 STD	1
20.33-0.00	(36 ksi)	Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal		ROHN 2.5 STD	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 212.63-202.46	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T2 202.46-182.29	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T3 182.29-162.10	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T4 162.10-141.90	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T5 141.90-121.69	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T6 121.69-101.48	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T7 101.48-81.27	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T8 81.27-61.00	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T9 61.00-40.67	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T10 40.67-20.33	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000
T11 20.33-0.00	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	30.0000	30.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	1	1	1	1	1	1	1
212.63-202.46				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
202.46-182.29				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
182.29-162.10				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
162.10-141.90				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
141.90-121.69				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
121.69-101.48				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
101.48-81.27				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
81.27-61.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
61.00-40.67				1	1	1	1	1	1	1
T10	No	No	1	1	1	1	1	1	1	1
40.67-20.33				1	1	1	1	1	1	1
T11	No	No	1	1	1	1	1	1	1	1
20.33-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
212.63-202.46														
T2	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
202.46-182.29														
T3	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
182.29-162.10														
T4	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
162.10-141.90														
T5	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
141.90-121.69														
T6	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
121.69-101.48														
T7	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
101.48-81.27														
T8 81.27-61.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T9 61.00-40.67	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T10	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
40.67-20.33														
T11 20.33-0.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 212.63-202.46	Flange	0.7500 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T2 202.46-182.29	Flange	0.8750 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T3 182.29-162.10	Flange	1.0000 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T4 162.10-141.90	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T5 141.90-121.69	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T6 121.69-101.48	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T7 101.48-81.27	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T8 81.27-61.00	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T9 61.00-40.67	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T10 40.67-20.33	Flange	1.0000 A325N	8	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.7500 A325N	2	0.6250 A325X	0
T11 20.33-0.00	Flange	1.0000 A354-BC	10	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.7500 A325N	2	0.6250 A325X	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 plf
LDF4-50A(1/2")	A	Yes	Ar (CfAe)	51.00 - 0.00	0.0000	0.48	1	1	0.6300	0.6300		0.15
HB114-1-08U4-M5J(1 1/4")	A	Yes	Ar (CfAe)	199.00 - 0.00	0.0000	0.45	4	4	1.0000 1.5400	1.5400		1.08
Feedline Ladder (Af)	A	Yes	Af (CfAe)	199.00 - 0.00	0.0000	0.46	1	1	3.0000	3.0000	12.0000	8.40
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	128.00 - 0.00	0.0000	-0.36	5	5	1.0900	1.0900		0.33
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	145.00 - 128.00	0.0000	-0.36	4	4	1.0900	1.0900		0.33
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	147.00 - 145.00	0.0000	-0.36	3	3	1.0900	1.0900		0.33
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	164.00 - 147.00	0.0000	-0.36	2	2	1.0900	1.0900		0.33
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	167.00 - 164.00	0.0000	-0.36	1	1	1.0900	1.0900		0.33
FSJ2-50(3/8")	A	Yes	Ar (CfAe)	162.00 - 0.00	0.0000	-0.38	1	1	0.4250	0.4250		0.08
CR 50 1873(1-5/8")	A	Yes	Ar (CfAe)	189.00 - 0.00	0.0000	-0.44	12	6	1.0000	1.9800		0.83
FSJ2-50(3/8")	A	Yes	Ar (CfAe)	189.00 - 0.00	0.0000	-0.4	1	1	0.4250	0.4250		0.08
ATCB-B01-100K(1/4")	A	Yes	Ar (CfAe)	175.00 - 0.00	0.0000	-0.48	4	4	0.3150	0.3150		0.07
Feedline Ladder (Af) ***	A	Yes	Af (CfAe)	189.00 - 0.00	0.0000	-0.4	1	1	3.0000	3.0000	12.0000	8.40
LDF7-50A(1-	B	Yes	Ar (CfAe)	139.00 - 0.00	0.0000	-0.45	15	8	1.0000	1.9800		0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
5/8")												
Feedline Ladder (Af)	B	Yes	Af (CfAe)	139.00 - 0.00	0.0000	-0.45	1	1	3.0000	3.0000	12.0000	8.40
LDF6-50A(1-1/4")	B	Yes	Ar (CfAe)	175.00 - 0.00	0.0000	0.45	12	12	1.0000 1.5500	1.5500		0.66
Feedline Ladder (Af) ***	B	Yes	Af (CfAe)	175.00 - 0.00	0.0000	0.45	1	1	3.0000	3.0000	12.0000	8.40
AVA7-50(1-5/8)	C	Yes	Ar (CfAe)	208.00 - 0.00	0.0000	0.43	21	12	1.0000	2.0100		0.70
Feedline Ladder (Af)	C	Yes	Af (CfAe)	208.00 - 0.00	0.0000	0.43	1	1	3.0000	3.0000	12.0000	8.40
AVA7-50(1-5/8)	C	Yes	Ar (CfAe)	183.00 - 0.00	0.0000	-0.45	6	6	1.0000 2.0100	2.0100		0.70
Feedline Ladder (Af) ***	C	Yes	Af (CfAe)	183.00 - 0.00	0.0000	-0.45	1	1	3.0000	3.0000	12.0000	8.40
FB-L98B-034-XXX(3/8")	A	Yes	Ar (CfAe)	189.00 - 0.00	0.0000	-0.4	1	1	0.3937	0.3937		0.06
PWRT-608-S(13/16")	A	Yes	Ar (CfAe)	189.00 - 0.00	0.0000	-0.3	4	2	0.8200	0.8200		0.62

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	212.63-202.46	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	11.139	1.385	0.000	0.000	0.13
T2	202.46-182.29	A	16.593	5.854	0.000	0.000	0.35
		B	0.000	0.000	0.000	0.000	0.00
		C	41.247	5.219	0.000	0.000	0.47
T3	182.29-162.10	A	36.456	10.094	0.000	0.000	0.69
		B	19.989	3.224	0.000	0.000	0.21
		C	60.865	10.094	0.000	0.000	0.72
T4	162.10-141.90	A	41.771	10.104	0.000	0.000	0.70
		B	31.323	5.052	0.000	0.000	0.33
		C	60.928	10.104	0.000	0.000	0.72
T5	141.90-121.69	A	45.274	10.104	0.000	0.000	0.72
		B	54.175	9.380	0.000	0.000	0.69
		C	60.928	10.104	0.000	0.000	0.72
T6	121.69-101.48	A	46.536	10.104	0.000	0.000	0.72
		B	57.998	10.104	0.000	0.000	0.75
		C	60.928	10.104	0.000	0.000	0.72
T7	101.48-81.27	A	46.536	10.104	0.000	0.000	0.72
		B	57.998	10.104	0.000	0.000	0.75
		C	60.928	10.104	0.000	0.000	0.72
T8	81.27-61.00	A	46.680	10.135	0.000	0.000	0.72
		B	58.177	10.135	0.000	0.000	0.75
		C	61.117	10.135	0.000	0.000	0.72
T9	61.00-40.67	A	47.366	10.167	0.000	0.000	0.73
		B	58.357	10.167	0.000	0.000	0.75
		C	61.305	10.167	0.000	0.000	0.73
T10	40.67-20.33	A	47.891	10.167	0.000	0.000	0.73
		B	58.357	10.167	0.000	0.000	0.75
		C	61.305	10.167	0.000	0.000	0.73

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
T11	20.33-0.00	A	47.891	10.167	0.000	0.000	0.73
		B	58.357	10.167	0.000	0.000	0.75
		C	61.305	10.167	0.000	0.000	0.73

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	212.63-202.46	A	0.935	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		1.792	17.252	0.000	0.000	0.50
T2	202.46-182.29	A	0.927	10.892	28.121	0.000	0.000	0.95
		B		0.000	0.000	0.000	0.000	0.00
		C		6.721	63.900	0.000	0.000	1.83
T3	182.29-162.10	A	0.914	27.557	57.216	0.000	0.000	2.03
		B		3.631	34.678	0.000	0.000	0.69
		C		12.916	95.215	0.000	0.000	2.56
T4	162.10-141.90	A	0.901	36.023	63.181	0.000	0.000	2.17
		B		5.644	54.312	0.000	0.000	1.07
		C		12.838	95.253	0.000	0.000	2.54
T5	141.90-121.69	A	0.886	35.631	70.110	0.000	0.000	2.25
		B		11.005	90.404	0.000	0.000	2.23
		C		12.735	95.184	0.000	0.000	2.52
T6	121.69-101.48	A	0.868	35.159	72.556	0.000	0.000	2.25
		B		11.792	96.368	0.000	0.000	2.40
		C		12.617	95.105	0.000	0.000	2.50
T7	101.48-81.27	A	0.847	34.605	72.464	0.000	0.000	2.22
		B		11.653	96.276	0.000	0.000	2.38
		C		12.479	95.013	0.000	0.000	2.47
T8	81.27-61.00	A	0.822	34.034	72.575	0.000	0.000	2.20
		B		11.520	96.461	0.000	0.000	2.35
		C		12.348	95.194	0.000	0.000	2.45
T9	61.00-40.67	A	0.790	35.160	72.652	0.000	0.000	2.17
		B		11.335	96.611	0.000	0.000	2.32
		C		12.165	95.340	0.000	0.000	2.42
T10	40.67-20.33	A	0.750	35.784	72.471	0.000	0.000	2.13
		B		11.065	96.431	0.000	0.000	2.27
		C		11.895	95.160	0.000	0.000	2.37
T11	20.33-0.00	A	0.750	35.784	72.471	0.000	0.000	2.13
		B		11.065	96.431	0.000	0.000	2.27
		C		11.895	95.160	0.000	0.000	2.37

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	212.63-202.46	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.149	3.288	0.000	0.000
T2	202.46-182.29	A	1.755	5.785	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	3.634	10.312	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T3	182.29-162.10	A	3.393	11.596	0.000	0.000
		B	1.692	5.204	0.000	0.000
		C	5.172	14.716	0.000	0.000
T4	162.10-141.90	A	3.808	13.068	0.000	0.000
		B	2.670	7.871	0.000	0.000
		C	5.214	14.216	0.000	0.000
T5	141.90-121.69	A	3.340	10.775	0.000	0.000
		B	3.834	10.327	0.000	0.000
		C	4.285	10.993	0.000	0.000
T6	121.69-101.48	A	3.203	10.218	0.000	0.000
		B	3.851	10.260	0.000	0.000
		C	4.016	10.219	0.000	0.000
T7	101.48-81.27	A	3.704	10.848	0.000	0.000
		B	4.453	10.934	0.000	0.000
		C	4.645	10.890	0.000	0.000
T8	81.27-61.00	A	3.566	10.268	0.000	0.000
		B	4.288	10.398	0.000	0.000
		C	4.472	10.357	0.000	0.000
T9	61.00-40.67	A	3.499	9.928	0.000	0.000
		B	4.168	9.940	0.000	0.000
		C	4.347	9.900	0.000	0.000
T10	40.67-20.33	A	3.922	11.368	0.000	0.000
		B	4.629	11.289	0.000	0.000
		C	4.828	11.244	0.000	0.000
T11	20.33-0.00	A	3.738	10.828	0.000	0.000
		B	4.412	10.753	0.000	0.000
		C	4.602	10.709	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	212.63-202.46	-9.9547	7.2253	-7.2426	5.2565
T2	202.46-182.29	-16.3969	6.4868	-12.9636	5.4808
T3	182.29-162.10	-5.8182	12.5721	-4.8367	10.4916
T4	162.10-141.90	-4.1961	14.9776	-3.5054	12.7557
T5	141.90-121.69	-4.5822	7.9603	-4.3729	7.7414
T6	121.69-101.48	-5.4205	7.7493	-5.2909	7.8027
T7	101.48-81.27	-5.8772	8.3702	-5.7925	8.5658
T8	81.27-61.00	-6.1804	8.7757	-6.2228	9.2072
T9	61.00-40.67	-6.7980	9.3933	-6.8414	9.6018
T10	40.67-20.33	-7.3116	9.8503	-7.2249	9.7437
T11	20.33-0.00	-7.8856	10.6076	-7.8108	10.5018

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Flash Beacon Lighting	B	From Leg	0.00 0.00	0.0000	212.00	No Ice 1/2" Ice	2.70 3.10	2.70 3.10	0.05 0.07
			1.00			1" Ice	3.50	3.50	0.09
						2" Ice	4.30	4.30	0.13
						4" Ice	5.90	5.90	0.21
Side Lighting	A	From Leg	1.00 0.00	0.0000	110.00	No Ice 1/2" Ice	0.13 0.19	0.13 0.19	0.01 0.01
			0.00			1" Ice	0.27	0.27	0.01
						2" Ice	0.44	0.44	0.02
						4" Ice	0.93	0.93	0.05
Side Lighting	B	From Leg	1.00 0.00	0.0000	110.00	No Ice 1/2" Ice	0.13 0.19	0.13 0.19	0.01 0.01
			0.00			1" Ice	0.27	0.27	0.01
						2" Ice	0.44	0.44	0.02
						4" Ice	0.93	0.93	0.05
Side Lighting	C	From Leg	1.00 0.00	0.0000	110.00	No Ice 1/2" Ice	0.13 0.19	0.13 0.19	0.01 0.01
			0.00			1" Ice	0.27	0.27	0.01
						2" Ice	0.44	0.44	0.02
						4" Ice	0.93	0.93	0.05
level 208									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Face	4.00 0.00	0.0000	208.00	No Ice 1/2" Ice	4.56 5.11	10.73 11.99	0.05 0.11
			1.00			1" Ice	5.61	12.97	0.19
						2" Ice	6.65	14.98	0.36
						4" Ice	8.83	19.22	0.86
(2) LPA-80080/6CF w/ Mount Pipe	B	From Face	4.00 0.00	0.0000	208.00	No Ice 1/2" Ice	4.56 5.11	10.73 11.99	0.05 0.11
			1.00			1" Ice	5.61	12.97	0.19
						2" Ice	6.65	14.98	0.36
						4" Ice	8.83	19.22	0.86
(2) LPA-80080/6CF w/ Mount Pipe	C	From Face	4.00 0.00	0.0000	208.00	No Ice 1/2" Ice	4.56 5.11	10.73 11.99	0.05 0.11
			1.00			1" Ice	5.61	12.97	0.19
						2" Ice	6.65	14.98	0.36
						4" Ice	8.83	19.22	0.86
DB-T1-6Z-8AB-0Z	C	From Face	4.00 0.00	0.0000	208.00	No Ice 1/2" Ice	5.60 5.92	2.33 2.56	0.04 0.08
			1.00			1" Ice	6.24	2.79	0.12
						2" Ice	6.91	3.28	0.21
						4" Ice	8.37	4.37	0.45
(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	208.00	No Ice 1/2" Ice	8.86 9.62	7.30 8.58	0.07 0.14
			1.00			1" Ice	10.34	9.72	0.22
						2" Ice	11.73	11.66	0.41
						4" Ice	14.64	15.92	0.94
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	208.00	No Ice 1/2" Ice	8.86 9.62	7.30 8.58	0.07 0.14
			1.00			1" Ice	10.34	9.72	0.22
						2" Ice	11.73	11.66	0.41
						4" Ice	14.64	15.92	0.94
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	208.00	No Ice 1/2" Ice	8.86 9.62	7.30 8.58	0.07 0.14
			1.00			1" Ice	10.34	9.72	0.22
						2" Ice	11.73	11.66	0.41
						4" Ice	14.64	15.92	0.94
RRH2X60-PCS	A	From Leg	4.00	0.0000	208.00	No Ice	2.57	2.01	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.79	2.22	0.08
			1.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
RRH2X60-PCS	B	From Leg	4.00	0.0000	208.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			1.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
RRH2X60-PCS	C	From Leg	4.00	0.0000	208.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			1.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
RRH2x60-700	A	From Leg	4.00	0.0000	208.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	B	From Leg	4.00	0.0000	208.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	C	From Leg	4.00	0.0000	208.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-AWS	A	From Leg	4.00	0.0000	208.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-AWS	B	From Leg	4.00	0.0000	208.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-AWS	C	From Leg	4.00	0.0000	208.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
DB-B1-6C-12AB-0Z	A	From Leg	4.00	0.0000	208.00	No Ice	3.92	2.56	0.02
			0.00			1/2" Ice	4.20	2.79	0.05
			1.00			1" Ice	4.48	3.04	0.08
						2" Ice	5.07	3.56	0.16
						4" Ice	6.35	4.70	0.36
Sector Mount [SM 510-3]	C	None		0.0000	208.00	No Ice	40.10	40.10	2.40
						1/2" Ice	57.33	57.33	3.09
						1" Ice	74.56	74.56	3.78
						2" Ice	109.02	109.02	5.17
						4" Ice	177.94	177.94	7.94
level 199									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	199.00	No Ice	8.50	6.95	0.08
			0.00			1/2" Ice	9.15	8.13	0.15

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
			-1.00			1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	7.13 7.66 8.18	4.96 5.75 6.47	0.08 0.13 0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	7.13 7.66 8.18	4.96 5.75 6.47	0.08 0.13 0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	7.13 7.66 8.18	4.96 5.75 6.47	0.08 0.13 0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
800MHz 2X50W RRH W/FILTER	A	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.68	0.06 0.09 0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.68	0.06 0.09 0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.68	0.06 0.09 0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
1900MHz RRH (65MHz)	A	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	2.70 2.94 3.18	2.77 3.01 3.26	0.06 0.08 0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
1900MHz RRH (65MHz)	B	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	2.70 2.94 3.18	2.77 3.01 3.26	0.06 0.08 0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
1900MHz RRH (65MHz)	C	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice	2.70 2.94 3.18	2.77 3.01 3.26	0.06 0.08 0.11
						2" Ice	3.70	3.78	0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.85	4.93	0.35
TD-RRH8x20-25	A	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
Sector Mount [SM 505-3]	C	None		0.0000	199.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	34.86 49.79 64.72 94.58 154.30	34.86 49.79 64.72 94.58 154.30	1.73 2.32 2.91 4.09 6.46
(3) 4' x 2" Pipe Mount	A	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
(3) 4' x 2" Pipe Mount	B	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
(3) 4' x 2" Pipe Mount	C	From Leg	4.00 0.00 -1.00	0.0000	199.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
level 189 7770.00 w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.03 0.08 0.13 0.25 0.61

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.03 0.08 0.13 0.25 0.61
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.03 0.08 0.13 0.25 0.61
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	A	From Face	4.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	B	From Face	4.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	C	From Face	4.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
7020.00	A	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
7020.00	B	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
7020.00	C	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
(2) RRUS-11	A	From Face	4.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	B	From Face	4.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	C	From Face	4.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
DC6-48-60-18-8F	A	From Leg	4.00 0.00	0.0000	189.00	No Ice 1/2" Ice	1.47 1.67	1.47 1.67	0.03 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			1" Ice	1.88	1.88	0.07
						2" Ice	2.33	2.33	0.12
						4" Ice	3.38	3.38	0.25
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.45 6.91 7.38 8.36 10.42	5.19 5.85 6.56 8.08 11.40	0.07 0.12 0.19 0.33 0.73
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.45 6.91 7.38 8.36 10.42	5.19 5.85 6.56 8.08 11.40	0.07 0.12 0.19 0.33 0.73
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.45 6.91 7.38 8.36 10.42	5.19 5.85 6.56 8.08 11.40	0.07 0.12 0.19 0.33 0.73
WCS RRUS-32-B30	A	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	0.08 0.10 0.14 0.21 0.41
WCS RRUS-32-B30	B	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	0.08 0.10 0.14 0.21 0.41
WCS RRUS-32-B30	C	From Leg	4.00 0.00 1.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	0.08 0.10 0.14 0.21 0.41
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0.03 0.05 0.07 0.12 0.25
Sector Mount [SM 510-3]	C	None		0.0000	189.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	40.10 57.33 74.56 109.02 177.94	40.10 57.33 74.56 109.02 177.94	2.40 3.09 3.78 5.17 7.94
level 183									
APXV18-206517LS w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
APXV18-206517LS w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
APXV18-206517LS w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	5.29 5.84 6.36	4.67 5.82 6.69	0.05 0.10 0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	7.42	8.46	0.28
						4" Ice	9.77	12.21	0.67
Pipe Mount [PM 601-3]	C	None		0.0000	183.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
						2" Ice	8.75	8.75	0.36
						4" Ice	13.11	13.11	0.53
level 175									
(4) DB844H90E-XY w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	175.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.12
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.56
(4) DB844H90E-XY w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	175.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.12
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.56
(4) DB844H90E-XY w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	175.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.12
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.56
Sector Mount [SM 510-3]	C	None		0.0000	175.00	No Ice	40.10	40.10	2.40
						1/2" Ice	57.33	57.33	3.09
						1" Ice	74.56	74.56	3.78
						2" Ice	109.02	109.02	5.17
						4" Ice	177.94	177.94	7.94
6' x 2" Mount Pipe	A	From Face	0.50 -3.00 4.00	0.0000	175.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	C	From Face	0.50 3.00 4.00	0.0000	175.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
level 167									
1151-3	A	From Leg	6.00 0.00 6.00	0.0000	167.00	No Ice	4.18	4.18	0.02
						1/2" Ice	5.73	5.73	0.05
						1" Ice	7.30	7.30	0.09
						2" Ice	10.48	10.48	0.20
						4" Ice	14.75	14.75	0.54
Side Arm Mount [SO 308-1]	A	From Leg	3.00 0.00 0.00	0.0000	167.00	No Ice	0.98	3.03	0.05
						1/2" Ice	1.70	5.22	0.08
						1" Ice	2.42	7.41	0.10
						2" Ice	3.86	11.79	0.16
						4" Ice	6.74	20.55	0.26
level 164									
1151-3	B	From Leg	6.00 0.00 9.00	0.0000	164.00	No Ice	4.18	4.18	0.02
						1/2" Ice	5.73	5.73	0.05
						1" Ice	7.30	7.30	0.09
						2" Ice	10.48	10.48	0.20
						4" Ice	14.75	14.75	0.54
Side Arm Mount [SO 308-1]	B	From Leg	3.00 0.00	0.0000	164.00	No Ice	0.98	3.03	0.05
						1/2" Ice	1.70	5.22	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.42	7.41	0.10
						2" Ice	3.86	11.79	0.16
						4" Ice	6.74	20.55	0.26
level 162									
SD310-HL	A	From Leg	6.00	0.0000	162.00	No Ice	1.11	1.11	6.50
			0.00			1/2" Ice	1.36	1.36	6.51
			-2.00			1" Ice	1.62	1.62	6.52
						2" Ice	2.17	2.17	6.56
						4" Ice	3.58	3.58	6.67
Side Arm Mount [SO 308-1]	A	From Leg	3.00	0.0000	162.00	No Ice	0.98	3.03	0.05
			0.00			1/2" Ice	1.70	5.22	0.08
			0.00			1" Ice	2.42	7.41	0.10
						2" Ice	3.86	11.79	0.16
						4" Ice	6.74	20.55	0.26
level 147									
1151-3	A	From Leg	6.00	0.0000	147.00	No Ice	4.18	4.18	0.02
			0.00			1/2" Ice	5.73	5.73	0.05
			6.00			1" Ice	7.30	7.30	0.09
						2" Ice	10.48	10.48	0.20
						4" Ice	14.75	14.75	0.54
Side Arm Mount [SO 308-1]	A	From Leg	3.00	0.0000	147.00	No Ice	0.98	3.03	0.05
			0.00			1/2" Ice	1.70	5.22	0.08
			0.00			1" Ice	2.42	7.41	0.10
						2" Ice	3.86	11.79	0.16
						4" Ice	6.74	20.55	0.26
level 145									
SD310-HL	B	From Leg	6.00	0.0000	145.00	No Ice	1.11	1.11	6.50
			0.00			1/2" Ice	1.36	1.36	6.51
			3.00			1" Ice	1.62	1.62	6.52
						2" Ice	2.17	2.17	6.56
						4" Ice	3.58	3.58	6.67
Side Arm Mount [SO 308-1]	B	From Leg	3.00	0.0000	145.00	No Ice	0.98	3.03	0.05
			0.00			1/2" Ice	1.70	5.22	0.08
			0.00			1" Ice	2.42	7.41	0.10
						2" Ice	3.86	11.79	0.16
						4" Ice	6.74	20.55	0.26
level 139									
ERICSSON AIR 21 B2A	A	From Leg	2.00	0.0000	139.00	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			1.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A	B	From Leg	2.00	0.0000	139.00	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			1.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A	C	From Leg	2.00	0.0000	139.00	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			1.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	A	From Leg	2.00	0.0000	139.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			1.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ERICSSON AIR 21 B4A	B	From Leg	2.00	0.0000	139.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			1.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	C	From Leg	2.00	0.0000	139.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			1.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
KRY 112 144/1	A	From Leg	2.00	0.0000	139.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			1.00			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
KRY 112 144/1	B	From Leg	2.00	0.0000	139.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			1.00			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
KRY 112 144/1	C	From Leg	2.00	0.0000	139.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			1.00			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
Side Arm Mount [SO 201-3]	C	None		0.0000	139.00	No Ice	5.71	5.71	0.29
						1/2" Ice	7.91	7.91	0.35
						1" Ice	10.11	10.11	0.41
						2" Ice	14.51	14.51	0.54
						4" Ice	23.31	23.31	0.79
level 128									
1142-2C	A	From Leg	6.00	0.0000	128.00	No Ice	2.09	2.09	0.02
			0.00			1/2" Ice	3.37	3.37	0.04
			4.00			1" Ice	4.67	4.67	0.07
						2" Ice	7.32	7.32	0.14
						4" Ice	10.79	10.79	0.39
Side Arm Mount [SO 308-1]	A	From Leg	3.00	0.0000	128.00	No Ice	0.98	3.03	0.05
			0.00			1/2" Ice	1.70	5.22	0.08
			0.00			1" Ice	2.42	7.41	0.10
						2" Ice	3.86	11.79	0.16
						4" Ice	6.74	20.55	0.26
level 51									
GPS_A	C	From Leg	2.00	0.0000	51.00	No Ice	0.30	0.30	0.00
			0.00			1/2" Ice	0.37	0.37	0.00
			0.00			1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
Side Arm Mount [SO 701-1]	C	From Leg	1.00	0.0000	51.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HPD2-23	C	Paraboloid w/o Radome	From Leg	2.00 0.00 4.00	-90.0000		175.00	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	0.03 0.04 0.06 0.10 0.17
HPD2-23	C	Paraboloid w/o Radome	From Leg	2.00 0.00 4.00	-36.0000		175.00	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	0.03 0.04 0.06 0.10 0.17

***

Load Combinations

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

Comb. No.	Description
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	212.625 - 202.458	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-3.55	0.08	-0.00
			Max. Mx	8	-0.58	0.59	-0.01
			Max. My	11	-1.32	-0.00	0.61
			Max. Vy	8	2.13	-0.38	-0.01
			Max. Vx	7	2.13	0.00	-0.37
		Diagonal	Max Tension	3	3.85	0.00	0.00
			Max. Compression	3	-3.91	0.00	0.00
			Max. Mx	14	-0.05	0.03	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Horizontal	Max Tension	8	2.88	0.00	0.00
			Max. Compression	2	-2.89	-0.01	-0.00
			Max. Mx	21	0.06	-0.02	-0.00
			Max. My	8	-1.34	-0.01	-0.01
			Max. Vy	21	-0.02	-0.02	-0.00
			Max. Vx	8	-0.00	-0.01	-0.01
		Top Girt	Max Tension	4	0.23	0.00	0.00
			Max. Compression	10	-0.23	-0.01	-0.00
			Max. Mx	21	-0.03	-0.01	-0.00
			Max. My	2	0.11	-0.00	0.00
			Max. Vy	21	0.02	-0.01	-0.00
			Max. Vx	2	-0.00	-0.00	0.00
		Inner Bracing	Max Tension	2	0.00	0.00	0.00
			Max. Compression	8	-0.00	0.00	0.00
			Max. Mx	14	-0.00	-0.01	0.00
			Max. Vy	14	0.01	0.00	0.00
T2	202.458 - 182.292	Leg	Max Tension	8	23.62	0.15	-0.04
			Max. Compression	10	-31.61	0.32	0.01
			Max. Mx	8	3.32	1.57	-0.06
			Max. My	7	-2.92	-0.00	1.60
			Max. Vy	4	-1.34	0.15	0.01
			Max. Vx	7	-1.40	-0.00	0.11
		Diagonal	Max Tension	9	11.33	0.00	0.00
			Max. Compression	9	-11.40	0.00	0.00
			Max. Mx	14	-0.05	0.03	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Horizontal	Max Tension	9	6.21	0.00	0.00
			Max. Compression	3	-6.20	-0.01	-0.00
			Max. Mx	25	-0.49	-0.02	-0.00
			Max. My	2	0.50	0.00	0.01
			Max. Vy	25	0.02	-0.02	-0.00
			Max. Vx	2	-0.00	0.00	0.01
		Inner Bracing	Max Tension	2	0.01	0.00	0.00
			Max. Compression	8	-0.01	0.00	0.00
			Max. Mx	14	-0.00	-0.01	0.00
			Max. Vy	14	0.01	0.00	0.00
T3	182.292 -	Leg	Max Tension	8	65.42	-0.23	0.04

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	162.104						
			Max. Compression	10	-78.64	0.25	0.09
			Max. Mx	8	50.76	-0.39	0.01
			Max. My	13	-5.18	-0.05	0.46
			Max. Vy	4	-1.01	-0.36	0.01
			Max. Vx	13	1.05	-0.05	0.46
		Diagonal	Max Tension	3	11.32	0.00	0.00
			Max. Compression	3	-11.39	0.00	0.00
			Max. Mx	14	-0.06	0.04	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Horizontal	Max Tension	3	7.04	-0.01	-0.00
			Max. Compression	3	-7.04	-0.01	-0.00
			Max. Mx	25	-0.51	-0.03	-0.00
			Max. My	2	1.53	0.00	0.01
			Max. Vy	25	0.02	-0.03	-0.00
			Max. Vx	2	-0.00	0.00	0.01
		Inner Bracing	Max Tension	2	0.01	0.00	0.00
			Max. Compression	8	-0.01	0.00	0.00
			Max. Mx	14	-0.00	-0.02	0.00
			Max. Vy	14	0.01	0.00	0.00
T4	162.104 - 141.896	Leg	Max Tension	4	107.00	-1.22	-0.05
			Max. Compression	2	-131.00	0.31	0.00
			Max. Mx	12	95.96	-1.53	0.03
			Max. My	7	-5.72	0.00	-1.20
			Max. Vy	8	-0.67	-0.23	0.04
			Max. Vx	3	0.24	-0.33	-1.19
		Diagonal	Max Tension	9	10.88	0.00	0.00
			Max. Compression	9	-10.97	0.00	0.00
			Max. Mx	14	-0.20	0.06	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Horizontal	Max Tension	5	7.46	0.00	0.00
			Max. Compression	11	-7.53	-0.02	-0.00
			Max. Mx	17	-0.69	-0.05	-0.00
			Max. My	6	0.65	0.00	0.02
			Max. Vy	17	0.03	-0.05	-0.00
			Max. Vx	6	-0.00	0.00	0.00
		Inner Bracing	Max Tension	6	0.01	0.00	0.00
			Max. Compression	8	-0.01	0.00	0.00
			Max. Mx	14	-0.00	-0.03	0.00
			Max. Vy	14	0.02	0.00	0.00
T5	141.896 - 121.688	Leg	Max Tension	4	135.37	-1.00	0.02
			Max. Compression	2	-161.86	0.69	0.05
			Max. Mx	12	108.03	-1.53	0.03
			Max. My	7	-6.32	0.00	-1.20
			Max. Vy	12	-0.49	-1.53	0.03
			Max. Vx	7	-0.46	0.00	-1.20
		Diagonal	Max Tension	11	13.86	0.00	0.00
			Max. Compression	11	-14.00	0.00	0.00
			Max. Mx	14	-0.04	0.12	0.00
			Max. Vy	14	-0.04	0.00	0.00
		Horizontal	Max Tension	5	8.23	0.00	0.00
			Max. Compression	11	-8.29	-0.03	-0.00
			Max. Mx	17	0.82	-0.06	-0.00
			Max. My	10	0.25	0.00	0.02
			Max. Vy	17	-0.03	-0.06	-0.00
			Max. Vx	10	-0.00	0.00	0.02
		Inner Bracing	Max Tension	10	0.00	0.00	0.00
			Max. Compression	8	-0.01	0.00	0.00
			Max. Mx	14	-0.00	-0.03	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	14	0.02	0.00	0.00
T6	121.688 - 101.479	Leg	Max Tension	4	165.69	-0.71	-0.02
			Max. Compression	2	-196.77	0.98	0.06
			Max. Mx	4	165.32	-1.01	-0.03
			Max. My	13	-9.90	-0.03	1.05
			Max. Vy	4	0.12	-1.01	-0.03
			Max. Vx	13	-0.14	-0.03	1.05
		Diagonal	Max Tension	11	12.34	0.00	0.00
			Max. Compression	11	-12.52	0.00	0.00
			Max. Mx	14	-0.09	0.15	0.00
			Max. Vy	14	-0.04	0.00	0.00
		Horizontal	Max Tension	5	8.08	0.00	0.00
			Max. Compression	11	-8.13	-0.04	-0.00
			Max. Mx	17	0.96	-0.07	-0.00
			Max. My	10	1.25	-0.01	0.01
			Max. Vy	17	-0.04	-0.07	-0.00
			Max. Vx	10	0.00	0.00	0.00
		Inner Bracing	Max Tension	10	0.00	0.00	0.00
			Max. Compression	12	-0.01	0.00	0.00
			Max. Mx	14	-0.01	-0.06	0.00
			Max. Vy	14	-0.03	0.00	0.00
T7	101.479 - 81.2708	Leg	Max Tension	4	191.78	-0.67	-0.02
			Max. Compression	2	-227.79	0.85	0.04
			Max. Mx	4	178.96	-1.01	-0.03
			Max. My	13	-10.87	-0.03	1.05
			Max. Vy	4	-0.12	-1.01	-0.03
			Max. Vx	13	0.14	-0.03	1.05
		Diagonal	Max Tension	11	12.05	0.00	0.00
			Max. Compression	11	-12.34	0.00	0.00
			Max. Mx	14	-0.17	0.22	0.00
			Max. Vy	14	-0.06	0.00	0.00
		Horizontal	Max Tension	5	8.65	0.00	0.00
			Max. Compression	11	-8.70	-0.07	-0.00
			Max. Mx	17	1.09	-0.14	-0.00
			Max. My	10	-0.06	-0.02	0.02
			Max. Vy	17	0.06	-0.14	-0.00
			Max. Vx	10	-0.00	-0.02	0.02
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-0.01	0.00	0.00
			Max. Mx	14	-0.01	-0.10	0.00
			Max. Vy	14	-0.04	0.00	0.00
T8	81.2708 - 61	Leg	Max Tension	4	215.38	-1.39	-0.01
			Max. Compression	2	-256.74	0.80	0.04
			Max. Mx	4	203.74	-1.39	-0.01
			Max. My	13	-14.07	-0.05	1.29
			Max. Vy	4	0.16	-1.39	-0.01
			Max. Vx	13	-0.16	-0.05	1.29
		Diagonal	Max Tension	11	11.59	0.00	0.00
			Max. Compression	11	-11.99	0.00	0.00
			Max. Mx	14	-0.25	0.27	0.00
			Max. Vy	14	-0.07	0.00	0.00
		Horizontal	Max Tension	5	8.98	0.00	0.00
			Max. Compression	11	-9.02	-0.09	-0.00
			Max. Mx	21	1.22	-0.16	-0.00
			Max. My	10	1.28	-0.05	0.02
			Max. Vy	21	-0.07	-0.16	-0.00
			Max. Vx	10	0.00	-0.05	0.02
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-0.01	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	14	-0.01	-0.16	0.00
			Max. Vy	14	-0.06	0.00	0.00
T9	61 - 40.6667	Leg	Max Tension	4	237.89	-1.95	0.00
			Max. Compression	2	-284.83	-2.79	0.13
			Max. Mx	2	-284.83	-2.79	0.13
			Max. My	13	-18.43	-0.50	3.48
			Max. Vy	2	0.56	2.18	0.01
			Max. Vx	13	-0.38	-0.50	3.48
		Diagonal	Max Tension	11	12.53	0.00	0.00
			Max. Compression	11	-12.99	0.00	0.00
			Max. Mx	14	-0.30	0.31	0.00
			Max. Vy	14	0.08	0.00	0.00
		Horizontal	Max Tension	5	10.18	0.00	0.00
			Max. Compression	11	-10.22	-0.11	-0.00
			Max. Mx	21	1.38	-0.19	-0.00
			Max. My	10	0.91	-0.07	0.02
			Max. Vy	21	-0.07	-0.19	-0.00
			Max. Vx	10	-0.00	-0.07	0.02
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	17	-0.01	0.00	0.00
			Max. Mx	14	-0.01	-0.20	0.00
			Max. Vy	14	0.07	0.00	0.00
T10	40.6667 - 20.3333	Leg	Max Tension	4	247.01	1.67	-0.05
			Max. Compression	2	-297.07	-8.27	0.27
			Max. Mx	2	-296.82	9.49	-0.20
			Max. My	13	-20.52	-1.04	5.48
			Max. Vy	2	1.80	9.49	-0.20
			Max. Vx	13	-0.92	-1.04	5.48
		Diagonal	Max Tension	11	17.36	-0.16	-0.04
			Max. Compression	11	-18.32	0.00	0.00
			Max. Mx	12	12.20	-0.19	0.07
			Max. My	11	-18.24	0.02	-0.11
			Max. Vy	25	-0.05	-0.14	0.01
			Max. Vx	11	0.01	0.00	0.00
		Horizontal	Max Tension	5	10.01	0.00	0.00
			Max. Compression	11	-10.04	-0.17	-0.00
			Max. Mx	21	-1.45	-0.28	-0.01
			Max. My	10	1.72	-0.09	0.02
			Max. Vy	21	0.10	-0.28	-0.01
			Max. Vx	10	0.00	-0.09	0.02
		Redund Horz 1 Bracing	Max Tension	2	5.16	0.00	0.00
			Max. Compression	2	-5.16	0.00	0.00
			Max. Mx	14	0.77	0.03	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	4.77	0.00	0.00
			Max. Compression	2	-4.77	0.00	0.00
			Max. Mx	14	0.78	0.05	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	11	0.01	0.00	0.00
			Max. Compression	5	-0.03	0.00	0.00
			Max. Mx	14	-0.01	0.03	0.00
			Max. Vy	14	0.02	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	6	0.06	0.00	0.00
			Max. Compression	12	-0.06	0.00	0.00
			Max. Mx	14	0.04	0.20	0.00
			Max. Vy	14	-0.05	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-0.01	0.00	0.00
			Max. Mx	14	-0.01	0.23	0.00
			Max. Vy	14	-0.07	0.00	0.00
T11	20.3333 - 0	Leg	Max Tension	4	293.39	1.39	0.02
			Max. Compression	2	-354.76	0.00	-0.00
			Max. Mx	2	-322.58	8.85	-0.18
			Max. My	13	-22.50	-1.05	5.47
			Max. Vy	10	-17.82	0.00	0.00
			Max. Vx	13	-6.87	0.00	0.00
		Diagonal	Max Tension	11	20.43	-0.15	-0.03
			Max. Compression	11	-21.36	0.00	0.00
			Max. Mx	12	15.94	-0.19	0.07
			Max. My	11	-21.28	-0.01	-0.11
			Max. Vy	24	0.06	-0.15	-0.00
			Max. Vx	11	-0.01	0.00	0.00
		Horizontal	Max Tension	5	12.39	0.00	0.00
			Max. Compression	11	-12.42	-0.21	-0.00
			Max. Mx	21	1.81	-0.30	-0.01
			Max. My	10	-0.64	-0.13	0.02
			Max. Vy	21	-0.10	-0.30	-0.01
			Max. Vx	10	0.00	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	2	6.15	0.00	0.00
			Max. Compression	2	-6.15	0.00	0.00
			Max. Mx	14	0.91	0.03	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	5.30	0.00	0.00
			Max. Compression	2	-5.30	0.00	0.00
			Max. Mx	14	0.85	0.06	0.00
			Max. Vy	14	0.02	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	11	0.01	0.00	0.00
			Max. Compression	5	-0.02	0.00	0.00
			Max. Mx	14	-0.01	0.03	0.00
			Max. Vy	14	-0.02	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	6	0.06	0.00	0.00
			Max. Compression	12	-0.06	0.00	0.00
			Max. Mx	14	0.04	0.23	0.00
			Max. Vy	14	-0.06	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-0.01	0.00	0.00
			Max. Mx	14	-0.01	0.29	0.00
			Max. Vy	14	0.08	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	348.74	34.54	-19.62
	Max. H_x	10	348.74	34.54	-19.62
	Max. H_z	3	-250.31	-24.52	17.88
	Min. Vert	4	-291.77	-30.43	17.28
	Min. H_x	4	-291.77	-30.43	17.28

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_z	9	302.96	28.09	-19.90
Leg B	Max. Vert	6	351.44	-34.77	-19.25
	Max. H_x	12	-288.14	30.60	16.79
	Max. H_z	13	-246.64	24.87	17.08
	Min. Vert	12	-288.14	30.60	16.79
	Min. H_x	6	351.44	-34.77	-19.25
	Min. H_z	6	351.44	-34.77	-19.25
Leg A	Max. Vert	2	352.96	-0.45	39.85
	Max. H_x	11	30.02	5.62	2.15
	Max. H_z	2	352.96	-0.45	39.85
	Min. Vert	8	-288.54	0.49	-34.91
	Min. H_x	5	30.65	-5.58	2.20
	Min. H_z	8	-288.54	0.49	-34.91

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	85.51	0.00	0.00	-28.02	-47.50	0.00
Dead+Wind 0 deg - No Ice	85.51	0.03	-66.03	-8441.23	-53.31	-25.07
Dead+Wind 30 deg - No Ice	85.51	32.48	-56.50	-7252.59	-4188.63	-6.93
Dead+Wind 60 deg - No Ice	85.51	56.05	-32.49	-4187.09	-7204.09	13.33
Dead+Wind 90 deg - No Ice	85.51	65.04	-0.16	-55.69	-8345.06	29.40
Dead+Wind 120 deg - No Ice	85.51	57.04	32.92	4161.71	-7298.84	38.73
Dead+Wind 150 deg - No Ice	85.51	32.47	56.30	7161.20	-4188.68	35.74
Dead+Wind 180 deg - No Ice	85.51	-0.05	64.74	8248.47	-39.43	23.73
Dead+Wind 210 deg - No Ice	85.51	-32.55	56.34	7168.91	4106.00	5.66
Dead+Wind 240 deg - No Ice	85.51	-57.08	32.98	4171.64	7211.89	-14.53
Dead+Wind 270 deg - No Ice	85.51	-65.04	-0.06	-39.55	8250.99	-30.76
Dead+Wind 300 deg - No Ice	85.51	-55.99	-32.43	-4178.58	7100.04	-38.19
Dead+Wind 330 deg - No Ice	85.51	-32.42	-56.44	-7243.29	4083.89	-36.40
Dead+Ice+Temp	160.41	0.00	0.00	29.95	49.41	0.00
Dead+Wind 0 deg+Ice+Temp	160.41	0.02	-20.62	-2534.98	46.19	-7.24
Dead+Wind 30 deg+Ice+Temp	160.41	9.57	-16.57	-2063.98	-1157.39	-1.77
Dead+Wind 60 deg+Ice+Temp	160.41	16.13	-9.33	-1155.34	-1997.16	3.38
Dead+Wind 90 deg+Ice+Temp	160.41	19.13	-0.05	21.78	-2364.36	7.79
Dead+Wind 120 deg+Ice+Temp	160.41	17.86	10.28	1306.95	-2169.24	11.39
Dead+Wind 150 deg+Ice+Temp	160.41	9.55	16.52	2113.96	-1154.11	9.43
Dead+Wind 180 deg+Ice+Temp	160.41	-0.02	18.58	2387.79	53.14	6.03
Dead+Wind 210 deg+Ice+Temp	160.41	-9.58	16.54	2117.61	1259.01	1.49
Dead+Wind 240 deg+Ice+Temp	160.41	-17.88	10.31	1312.49	2271.79	-4.34
Dead+Wind 270 deg+Ice+Temp	160.41	-19.13	-0.00	29.24	2463.39	-8.10
Dead+Wind 300 deg+Ice+Temp	160.41	-16.11	-9.30	-1150.12	2092.02	-9.67
Dead+Wind 330 deg+Ice+Temp	160.41	-9.53	-16.55	-2059.97	1250.71	-9.58
Dead+Wind 0 deg - Service	85.51	0.01	-22.85	-2939.16	-49.51	-8.68
Dead+Wind 30 deg - Service	85.51	11.24	-19.55	-2527.87	-1480.41	-2.40
Dead+Wind 60 deg - Service	85.51	19.39	-11.24	-1467.15	-2523.83	4.61
Dead+Wind 90 deg - Service	85.51	22.50	-0.05	-37.59	-2918.62	10.17
Dead+Wind 120 deg - Service	85.51	19.74	11.39	1421.72	-2556.61	13.40
Dead+Wind 150 deg - Service	85.51	11.24	19.48	2459.60	-1480.43	12.37
Dead+Wind 180 deg - Service	85.51	-0.02	22.40	2835.82	-44.70	8.21
Dead+Wind 210 deg - Service	85.51	-11.26	19.50	2462.27	1389.70	1.96
Dead+Wind 240 deg - Service	85.51	-19.75	11.41	1425.15	2464.40	-5.03
Dead+Wind 270 deg - Service	85.51	-22.51	-0.02	-32.01	2823.95	-10.64
Dead+Wind 300 deg - Service	85.51	-19.37	-11.22	-1464.20	2425.70	-13.22
Dead+Wind 330 deg - Service	85.51	-11.22	-19.53	-2524.65	1382.05	-12.60

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-85.51	0.00	0.00	85.51	0.00	0.000%
2	0.03	-85.51	-66.03	-0.03	85.51	66.03	0.000%
3	32.48	-85.51	-56.50	-32.48	85.51	56.50	0.000%
4	56.05	-85.51	-32.49	-56.05	85.51	32.49	0.000%
5	65.04	-85.51	-0.16	-65.04	85.51	0.16	0.000%
6	57.04	-85.51	32.92	-57.04	85.51	-32.92	0.000%
7	32.47	-85.51	56.30	-32.47	85.51	-56.30	0.000%
8	-0.05	-85.51	64.74	0.05	85.51	-64.74	0.000%
9	-32.55	-85.51	56.34	32.55	85.51	-56.34	0.000%
10	-57.08	-85.51	32.98	57.08	85.51	-32.98	0.000%
11	-65.04	-85.51	-0.06	65.04	85.51	0.06	0.000%
12	-55.99	-85.51	-32.43	55.99	85.51	32.43	0.000%
13	-32.42	-85.51	-56.44	32.42	85.51	56.44	0.000%
14	0.00	-160.41	0.00	0.00	160.41	0.00	0.000%
15	0.02	-160.41	-20.62	-0.02	160.41	20.62	0.000%
16	9.57	-160.41	-16.57	-9.57	160.41	16.57	0.000%
17	16.13	-160.41	-9.33	-16.13	160.41	9.33	0.000%
18	19.13	-160.41	-0.05	-19.13	160.41	0.05	0.000%
19	17.86	-160.41	10.28	-17.86	160.41	-10.28	0.000%
20	9.55	-160.41	16.52	-9.55	160.41	-16.52	0.000%
21	-0.02	-160.41	18.58	0.02	160.41	-18.58	0.000%
22	-9.58	-160.41	16.54	9.58	160.41	-16.54	0.000%
23	-17.88	-160.41	10.31	17.88	160.41	-10.31	0.000%
24	-19.13	-160.41	-0.00	19.13	160.41	0.00	0.000%
25	-16.11	-160.41	-9.30	16.11	160.41	9.30	0.000%
26	-9.53	-160.41	-16.55	9.53	160.41	16.55	0.000%
27	0.01	-85.51	-22.85	-0.01	85.51	22.85	0.000%
28	11.24	-85.51	-19.55	-11.24	85.51	19.55	0.000%
29	19.39	-85.51	-11.24	-19.39	85.51	11.24	0.000%
30	22.50	-85.51	-0.05	-22.50	85.51	0.05	0.000%
31	19.74	-85.51	11.39	-19.74	85.51	-11.39	0.000%
32	11.24	-85.51	19.48	-11.24	85.51	-19.48	0.000%
33	-0.02	-85.51	22.40	0.02	85.51	-22.40	0.000%
34	-11.26	-85.51	19.50	11.26	85.51	-19.50	0.000%
35	-19.75	-85.51	11.41	19.75	85.51	-11.41	0.000%
36	-22.51	-85.51	-0.02	22.51	85.51	0.02	0.000%
37	-19.37	-85.51	-11.22	19.37	85.51	11.22	0.000%
38	-11.22	-85.51	-19.53	11.22	85.51	19.53	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	6.421	28	0.2740	0.0484
T2	202.458 - 182.292	5.830	28	0.2736	0.0482
T3	182.292 - 162.104	4.645	28	0.2597	0.0426
T4	162.104 - 141.896	3.550	29	0.2313	0.0307
T5	141.896 - 121.688	2.609	28	0.1947	0.0230
T6	121.688 - 101.479	1.854	28	0.1560	0.0176
T7	101.479 - 81.2708	1.247	27	0.1243	0.0133

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T8	81.2708 - 61	0.786	27	0.0923	0.0104
T9	61 - 40.6667	0.440	27	0.0652	0.0078
T10	40.6667 - 20.3333	0.199	35	0.0386	0.0052
T11	20.3333 - 0	0.065	35	0.0191	0.0025

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
212.00	Flash Beacon Lighting	28	6.385	0.2740	0.0484	145852
208.00	(2) LPA-80080/6CF w/ Mount Pipe	28	6.153	0.2742	0.0484	145852
199.00	APXVSPP18-C-A20 w/ Mount Pipe	28	5.627	0.2726	0.0478	143463
189.00	7770.00 w/ Mount Pipe	28	5.036	0.2662	0.0454	69740
183.00	APXV18-206517LS w/ Mount Pipe	28	4.686	0.2604	0.0429	39247
179.00	HPD2-23	28	4.458	0.2559	0.0408	37633
175.00	(4) DB844H90E-XY w/ Mount Pipe	28	4.234	0.2508	0.0384	36926
167.00	1151-3	29	3.802	0.2393	0.0333	31638
164.00	1151-3	29	3.647	0.2345	0.0317	30002
162.00	SD310-HL	29	3.545	0.2312	0.0307	29165
147.00	1151-3	28	2.828	0.2042	0.0246	24949
145.00	SD310-HL	28	2.741	0.2006	0.0239	24059
139.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	28	2.490	0.1891	0.0221	24069
128.00	1142-2C	28	2.073	0.1676	0.0191	32040
110.00	Side Lighting	27	1.486	0.1372	0.0149	33580
51.00	GPS_A	27	0.308	0.0517	0.0065	45607

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	18.016	2	0.7617	0.1397
T2	202.458 - 182.292	16.374	2	0.7605	0.1390
T3	182.292 - 162.104	13.080	2	0.7187	0.1228
T4	162.104 - 141.896	10.049	2	0.6344	0.0887
T5	141.896 - 121.688	7.435	2	0.5376	0.0662
T6	121.688 - 101.479	5.312	2	0.4359	0.0507
T7	101.479 - 81.2708	3.580	2	0.3504	0.0384
T8	81.2708 - 61	2.259	2	0.2620	0.0301
T9	61 - 40.6667	1.267	2	0.1858	0.0223
T10	40.6667 - 20.3333	0.575	10	0.1105	0.0149
T11	20.3333 - 0	0.187	10	0.0548	0.0072

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
212.00	Flash Beacon Lighting	2	17.916	0.7618	0.1397	51984
208.00	(2) LPA-80080/6CF w/ Mount Pipe	2	17.272	0.7621	0.1397	51984
199.00	APXVSPP18-C-A20 w/ Mount Pipe	2	15.807	0.7573	0.1379	51180
189.00	7770.00 w/ Mount Pipe	2	14.163	0.7386	0.1310	26228
183.00	APXV18-206517LS w/ Mount Pipe	2	13.193	0.7210	0.1238	14452
179.00	HPD2-23	2	12.561	0.7071	0.1177	13428
175.00	(4) DB844H90E-XY w/ Mount Pipe	2	11.942	0.6915	0.1107	13338
167.00	1151-3	2	10.749	0.6569	0.0961	12522
164.00	1151-3	2	10.318	0.6432	0.0915	12216
162.00	SD310-HL	2	10.035	0.6339	0.0885	11953
147.00	1151-3	2	8.049	0.5630	0.0709	9439
145.00	SD310-HL	2	7.805	0.5532	0.0690	9136
139.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	7.102	0.5229	0.0637	9171
128.00	1142-2C	2	5.929	0.4663	0.0552	11983
110.00	Side Lighting	2	4.262	0.3859	0.0431	12092
51.00	GPS_A	2	0.888	0.1474	0.0187	16055

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	212.625	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	1.30	6.44	0.202 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	1.44	6.44	0.224 ✔	1.333	Bolt Shear
T2	202.458	Leg	A325N	0.8750	4	5.91	26.45	0.223 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.80	6.44	0.590 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.11	6.44	0.482 ✔	1.333	Bolt Shear
T3	182.292	Leg	A325N	1.0000	4	16.36	34.56	0.473 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.80	6.44	0.589 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.52	6.44	0.546 ✔	1.333	Bolt Shear
T4	162.104	Leg	A325N	1.0000	6	17.83	34.56	0.516 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.66	6.44	0.568 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.76	6.44	0.584 ✔	1.333	Bolt Shear
T5	141.896	Leg	A325N	1.0000	6	22.56	34.56	0.653 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.67	6.44	0.724 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.15	6.44	0.643 ✔	1.333	Bolt Shear
T6	121.688	Leg	A325N	1.0000	6	27.61	34.56	0.799 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.17	6.44	0.648 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.06	6.44	0.631 ✔	1.333	Bolt Shear
T7	101.479	Leg	A325N	1.0000	8	23.97	34.56	0.694 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.11	6.44	0.638 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.35	6.44	0.675 ✔	1.333	Bolt Shear

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
T8	81.2708	Leg	A325N	1.0000	8	26.92	34.56	0.779 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.00	6.44	0.620 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.51	6.44	0.700 ✔	1.333	Bolt Shear
T9	61	Leg	A325N	1.0000	8	29.74	34.56	0.860 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.33	6.44	0.672 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	5.11	6.44	0.793 ✔	1.333	Bolt Shear
T10	40.6667	Leg	A325N	1.0000	8	30.79	34.56	0.891 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.7500	3	6.11	9.28	0.658 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.7500	2	5.02	9.28	0.541 ✔	1.333	Bolt Shear
T11	20.3333	Leg	A354-BC	1.0000	10	29.34	32.40	0.906 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.7500	3	7.12	9.28	0.767 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.7500	2	6.21	9.28	0.670 ✔	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 2.5 STD	10.17	5.08	64.4 K=1.00	21.955	1.7040	-3.28	37.41	0.088* ✔
T2	202.458 - 182.292	ROHN 3 EH	20.17	6.72	71.0 K=1.00	20.754	3.0159	-31.61	62.59	0.505 ✔
T3	182.292 - 162.104	ROHN 4 EH	20.22	6.74	54.8 K=1.00	23.588	4.4074	-78.64	103.96	0.756 ✔
T4	162.104 - 141.896	ROHN 5 EH	20.24	6.75	44.0 K=1.00	25.253	6.1120	-131.00	154.35	0.849 ✔
T5	141.896 - 121.688	ROHN 6 EHS	20.25	10.13	54.6 K=1.00	23.618	6.7133	-161.87	158.55	1.021 ✔
T6	121.688 - 101.479	ROHN 6 EH	20.26	10.13	55.4 K=1.00	23.490	8.4049	-196.77	197.43	0.997 ✔
T7	101.479 - 81.2708	ROHN 6 EH	20.26	10.13	55.4 K=1.00	23.490	8.4049	-227.79	197.43	1.154 ✔
T8	81.2708 - 61	ROHN 8 EHS	20.33	10.16	41.8 K=1.00	25.581	9.7193	-256.74	248.63	1.033 ✔
T9	61 - 40.6667	ROHN 8 EHS	20.38	10.19	41.9 K=1.00	25.564	9.7193	-284.83	248.47	1.146 ✔
T10	40.6667 - 20.3333	ROHN 8 EH	20.39	10.20	42.5 K=1.00	25.475	12.7627	-297.07	325.13	0.914 ✔
T11	20.3333 - 0	ROHN 8 EH	20.37	10.14	42.3 K=1.00	25.505	12.7627	-354.76	325.52	1.090 ✔

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

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 2 STD	6.64	6.45	98.4 K=1.00	15.079	1.0745	-3.91	16.20	0.242 ✔
T2	202.458 - 182.292	ROHN 2 STD	7.99	7.72	117.6 K=1.00	10.790	1.0745	-11.40	11.59	0.983 ✔
T3	182.292 - 162.104	ROHN 2 STD	8.60	8.30	126.5 K=1.00	9.325	1.0745	-11.19	10.02	1.116 ✔
T4	162.104 - 141.896	ROHN 2 STD	9.29	8.95	136.5 K=1.00	8.013	1.0745	-10.70	8.61	1.242 ✔
T5	141.896 - 121.688	ROHN 2.5 STD	12.60	12.14	153.7 K=1.00	6.318	1.7040	-13.78	10.77	1.280 ✔
T6	121.688 - 101.479	ROHN 2.5 STD	13.38	12.96	164.2 K=1.00	5.539	1.7040	-12.28	9.44	1.301 ✔
T7	101.479 - 81.2708	ROHN 3 STD	14.24	13.84	142.8 K=1.00	7.327	2.2285	-12.25	16.33	0.750 ✔
T8	81.2708 - 61	ROHN 3 STD	15.21	14.73	151.9 K=1.00	6.470	2.2285	-11.99	14.42	0.831 ✔
T9	61 - 40.6667	ROHN 3 STD	16.19	15.72	162.2 K=1.00	5.679	2.2285	-12.99	12.66	1.027 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	24.65	12.33	127.1 K=1.00	9.242	2.2285	-18.32	20.59	0.889 ✔
T11	20.3333 - 0	ROHN 3 STD	25.22	12.61	130.0 K=1.00	8.831	2.2285	-21.36	19.68	1.085 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.52	4.14	79.8 K=1.00	19.051	0.7995	-2.89	15.23	0.190 ✔
T2	202.458 - 182.292	ROHN 1.5 STD	8.60	4.15	80.0 K=1.00	19.004	0.7995	-6.20	15.19	0.408 ✔
T3	182.292 - 162.104	ROHN 1.5 STD	10.01	4.82	92.9 K=1.00	16.310	0.7995	-7.04	13.04	0.540 ✔
T4	162.104 - 141.896	ROHN 2 STD	12.10	5.82	88.7 K=1.00	17.221	1.0745	-7.52	18.50	0.407 ✔
T5	141.896 - 121.688	ROHN 2 STD	13.92	6.68	101.9 K=1.00	14.269	1.0745	-8.29	15.33	0.541 ✔
T6	121.688 -	ROHN 2 STD	16.29	7.87	120.0	10.374	1.0745	-8.13	11.15	0.729

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
	101.479				K=1.00					✔
T7	101.479 - 81.2708	ROHN 2.5 STD	18.79	9.12	115.5 K=1.00	11.192	1.7040	-8.70	19.07	0.456 ✔
T8	81.2708 - 61	ROHN 2.5 STD	21.36	10.32	130.7 K=1.00	8.739	1.7040	-9.02	14.89	0.605 ✔
T9	61 - 40.6667	ROHN 2.5 STD	23.93	11.60	147.0 K=1.00	6.913	1.7040	-10.22	11.78	0.867 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	25.18	12.23	126.1 K=1.00	9.388	2.2285	-10.04	20.92	0.480 ✔
T11	20.3333 - 0	ROHN 3 STD	27.83	13.56	139.8 K=1.00	7.639	2.2285	-12.42	17.02	0.730 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.50	4.13	79.6 K=1.00	19.091	0.7995	-0.23	15.26	0.015 ✔

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.29	5.93	114.4 K=1.00	11.073	0.7995	-5.16	8.85	0.583 ✔
T11	20.3333 - 0	ROHN 1.5 STD	6.96	6.60	127.2 K=1.00	9.231	0.7995	-6.15	7.38	0.834 ✔

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2 STD	11.63	10.89	166.0 K=1.00	5.420	1.0745	-4.77	5.82	0.818 ✔
T11	20.3333 - 0	ROHN 2 STD	11.99	11.32	172.5 K=1.00	5.018	1.0745	-5.30	5.39	0.983 ✔

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.29	6.29	121.3 K=1.00	10.093	0.7995	-0.03	8.07	0.003 ✔
T11	20.3333 - 0	ROHN 1.5 STD	6.96	6.96	134.1 K=1.00	8.302	0.7995	-0.02	6.64	0.004 ✔

Redundant Hip Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2.5 STD	15.20	15.20	192.6 K=1.00	4.027	1.7040	-0.05	6.86	0.008* ✔
T11	20.3333 - 0	ROHN 2.5 STD	15.99	15.99	202.6 K=1.00	3.639	1.7040	-0.05	6.20	0.008* ✔

* DL controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	L2x2x1/8	4.26	4.26	128.6 K=1.00	9.029	0.4844	-0.00	4.37	0.001 ✔
T2	202.458 - 182.292	L2x2x1/8	4.30	4.30	129.8 K=1.00	8.870	0.4844	-0.01	4.30	0.002 ✔
T3	182.292 - 162.104	L2x2x1/8	4.66	4.66	140.7 K=1.00	7.548	0.4844	-0.01	3.66	0.002 ✔
T4	162.104 - 141.896	L2x2x1/8	6.05	6.05	182.6 K=1.00	4.480	0.4844	-0.01	2.17	0.003 ✔
T5	141.896 - 121.688	L2x2x1/8	6.96	6.96	210.0 K=1.00	3.385	0.4844	-0.01	1.64	0.004 ✔
T6	121.688 - 101.479	L2 1/2x2 1/2x3/16	8.15	8.15	197.5 K=1.00	3.829	0.9020	-0.01	3.45	0.002* ✔
T7	101.479 - 81.2708	L3x3x3/16	9.40	9.40	189.2 K=1.00	4.173	1.0900	-0.01	4.55	0.002* ✔
T8	81.2708 - 61	L3 1/2x3 1/2x1/4	10.68	10.68	184.7 K=1.00	4.379	1.6900	-0.01	7.40	0.001* ✔
T9	61 - 40.6667	L3 1/2x3 1/2x1/4	11.96	11.96	206.9 K=1.00	3.490	1.6900	-0.01	5.90	0.002* ✔
T10	40.6667 - 20.3333	ROHN 3 STD	12.59	12.59	129.8 K=1.00	8.860	2.2285	-0.01	19.74	0.001* ✔
T11	20.3333 - 0	ROHN 3 STD	13.92	13.92	143.5 K=1.00	7.250	2.2285	-0.01	16.16	0.001* ✔

* DL controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	202.458 - 182.292	ROHN 3 EH	20.17	6.72	71.0	30.000	3.0159	23.62	90.48	0.261 ✔
T3	182.292 - 162.104	ROHN 4 EH	20.22	6.74	54.8	30.000	4.4074	65.42	132.22	0.495 ✔
T4	162.104 - 141.896	ROHN 5 EH	20.24	6.75	44.0	30.000	6.1120	107.00	183.36	0.584 ✔
T5	141.896 - 121.688	ROHN 6 EHS	20.25	10.13	54.6	30.000	6.7133	135.37	201.40	0.672 ✔
T6	121.688 - 101.479	ROHN 6 EH	20.26	10.13	55.4	30.000	8.4049	165.69	252.15	0.657 ✔
T7	101.479 - 81.2708	ROHN 6 EH	20.26	10.13	55.4	30.000	8.4049	191.78	252.15	0.761 ✔
T8	81.2708 - 61	ROHN 8 EHS	20.33	10.16	41.8	30.000	9.7193	215.38	291.58	0.739 ✔
T9	61 - 40.6667	ROHN 8 EHS	20.38	10.19	41.9	30.000	9.7193	237.89	291.58	0.816 ✔
T10	40.6667 - 20.3333	ROHN 8 EH	20.39	10.20	42.5	30.000	12.7627	247.01	382.88	0.645 ✔
T11	20.3333 - 0	ROHN 8 EH	20.37	0.08	0.3	30.000	12.7627	293.39	382.88	0.766 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 2 STD	6.64	6.45	98.4	30.000	1.0745	3.85	32.24	0.119 ✔
T2	202.458 - 182.292	ROHN 2 STD	7.99	7.72	117.6	30.000	1.0745	11.33	32.24	0.352 ✔
T3	182.292 - 162.104	ROHN 2 STD	8.39	8.09	123.3	30.000	1.0745	11.32	32.24	0.351 ✔
T4	162.104 - 141.896	ROHN 2 STD	8.83	8.49	129.4	30.000	1.0745	10.88	32.24	0.338 ✔
T5	141.896 - 121.688	ROHN 2.5 STD	12.27	11.81	149.6	30.000	1.7040	13.86	51.12	0.271 ✔
T6	121.688 - 101.479	ROHN 2.5 STD	12.98	12.56	159.1	30.000	1.7040	12.34	51.12	0.241 ✔
T7	101.479 - 81.2708	ROHN 3 STD	13.80	13.41	138.3	30.000	2.2285	12.05	66.85	0.180 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T8	81.2708 - 61	ROHN 3 STD	15.21	14.73	151.9	30.000	2.2285	11.59	66.85	0.173 ✔
T9	61 - 40.6667	ROHN 3 STD	16.19	15.72	162.2	30.000	2.2285	12.53	66.85	0.187 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	24.65	12.33	127.1	30.000	2.2285	17.36	66.85	0.260 ✔
T11	20.3333 - 0	ROHN 3 STD	25.22	12.61	130.0	30.000	2.2285	20.43	66.85	0.306 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.52	4.14	79.8	30.000	0.7995	2.88	23.98	0.120 ✔
T2	202.458 - 182.292	ROHN 1.5 STD	8.60	4.15	80.0	30.000	0.7995	6.21	23.98	0.259 ✔
T3	182.292 - 162.104	ROHN 1.5 STD	10.01	4.82	92.9	30.000	0.7995	7.04	23.98	0.293 ✔
T4	162.104 - 141.896	ROHN 2 STD	12.10	5.82	88.7	30.000	1.0745	7.46	32.24	0.231 ✔
T5	141.896 - 121.688	ROHN 2 STD	13.92	6.68	101.9	30.000	1.0745	8.23	32.24	0.255 ✔
T6	121.688 - 101.479	ROHN 2 STD	16.29	7.87	120.0	30.000	1.0745	8.08	32.24	0.251 ✔
T7	101.479 - 81.2708	ROHN 2.5 STD	18.79	9.12	115.5	30.000	1.7040	8.65	51.12	0.169 ✔
T8	81.2708 - 61	ROHN 2.5 STD	21.36	10.32	130.7	30.000	1.7040	8.98	51.12	0.176 ✔
T9	61 - 40.6667	ROHN 2.5 STD	23.93	11.60	147.0	30.000	1.7040	10.18	51.12	0.199 ✔
T10	40.6667 - 20.3333	ROHN 3 STD	25.18	12.23	126.1	30.000	2.2285	10.01	66.85	0.150 ✔
T11	20.3333 - 0	ROHN 3 STD	27.83	13.56	139.8	30.000	2.2285	12.39	66.85	0.185 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.50	4.13	79.6	30.000	0.7995	0.23	23.98	0.009 ✔

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.29	5.93	114.4	21.600	0.7995	5.16	17.27	0.299 ✔
T11	20.3333 - 0	ROHN 1.5 STD	6.96	6.60	127.2	21.600	0.7995	6.15	17.27	0.356 ✔

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2 STD	11.63	10.89	166.0	21.600	1.0745	4.77	23.21	0.205 ✔
T11	20.3333 - 0	ROHN 2 STD	11.99	11.32	172.5	21.600	1.0745	5.30	23.21	0.228 ✔

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.29	6.29	121.3	21.600	0.7995	0.01	17.27	0.001 ✔
T11	20.3333 - 0	ROHN 1.5 STD	6.96	6.96	134.1	21.600	0.7995	0.01	17.27	0.001 ✔

Redundant Hip Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	40.6667 - 20.3333	ROHN 2.5 STD	15.20	15.20	192.6	21.600	1.7040	0.04	36.81	0.001* ✔
T11	20.3333 - 0	ROHN 2.5 STD	15.99	15.99	202.6	21.600	1.7040	0.04	36.81	0.001* ✔

* DL controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	212.625 - 202.458	L2x2x1/8	4.26	4.26	81.6	21.600	0.4844	0.00	10.46	0.000 ✔
T2	202.458 - 182.292	L2x2x1/8	4.30	4.30	82.4	21.600	0.4844	0.01	10.46	0.001 ✔
T3	182.292 - 162.104	L2x2x1/8	4.31	4.31	82.6	21.600	0.4844	0.01	10.46	0.001 ✔
T4	162.104 - 141.896	L2x2x1/8	5.35	5.35	102.6	21.600	0.4844	0.01	10.46	0.001 ✔
T5	141.896 - 121.688	L2x2x1/8	6.40	6.40	122.6	21.600	0.4844	0.00	10.46	0.000 ✔
T6	121.688 - 101.479	L2 1/2x2 1/2x3/16	7.52	7.52	116.0	21.600	0.9020	0.00	19.48	0.000 ✔

Section Capacity Table

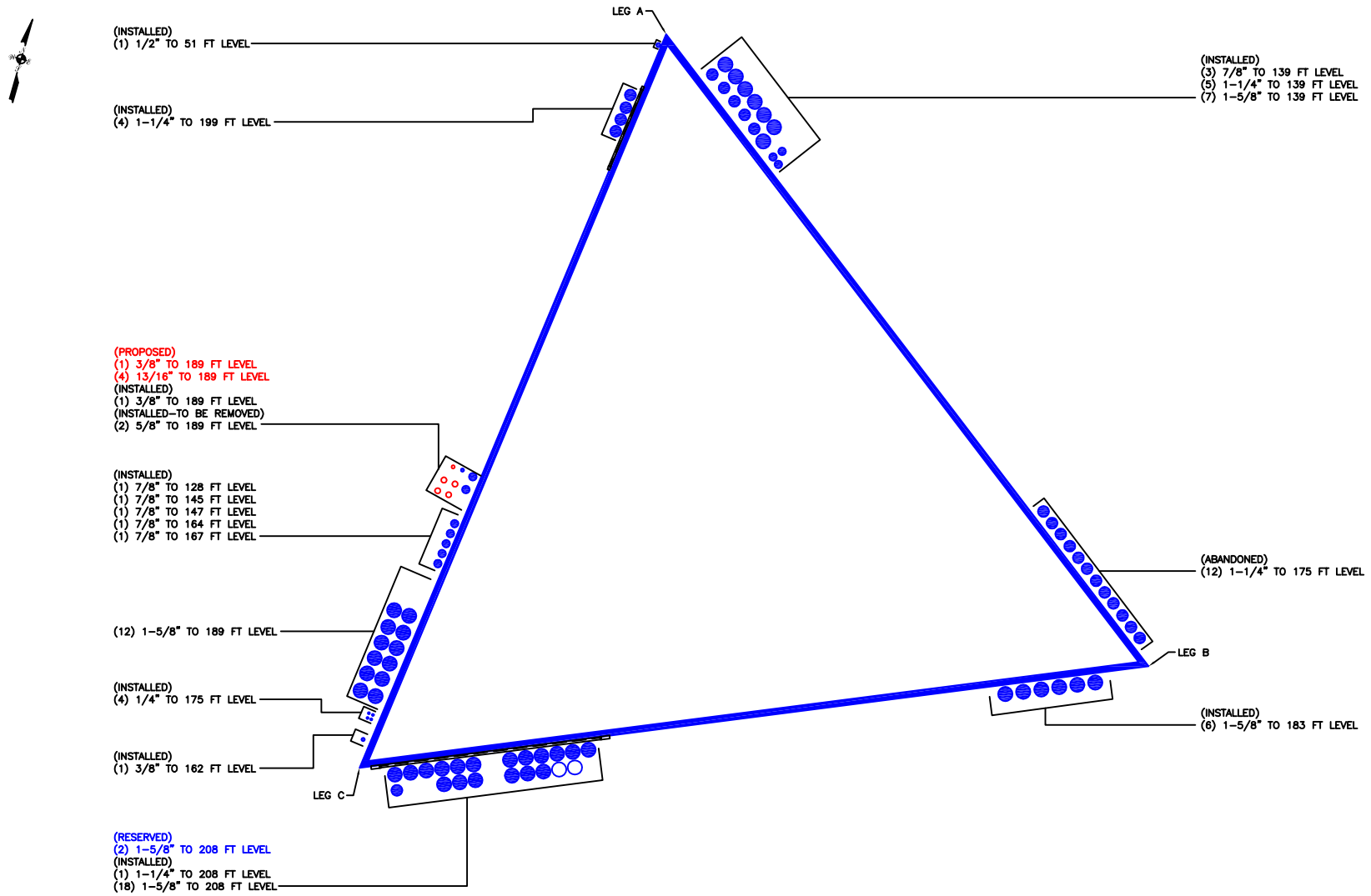
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	212.625 - 202.458	Leg	ROHN 2.5 STD	1	-2.82	37.41	12.6	Pass
T2	202.458 - 182.292	Leg	ROHN 3 EH	28	-31.61	83.44	37.9	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	67	-78.64	138.58	56.7	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	108	-131.00	205.75	63.7	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	147	-161.87	211.35	76.6	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	174	-196.77	263.18	74.8	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	201	-227.79	263.18	86.6	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	228	-256.74	331.42	77.5	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	255	-284.83	331.21	86.0	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	282	-297.07	433.40	68.5	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	315	-354.76	433.92	81.8	Pass
T1	212.625 - 202.458	Diagonal	ROHN 2 STD	14	-3.91	21.60	18.1	Pass
T2	202.458 - 182.292	Diagonal	ROHN 2 STD	39	-11.40	15.46	73.7	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	77	-11.19	13.36	83.8	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-10.70	11.48	93.2	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	149	-13.78	14.35	96.0	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	176	-12.28	12.58	97.6	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	203	-12.25	21.76	56.3	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	230	-11.99	19.22	62.4	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	257	-12.99	16.87	77.0	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	284	-18.32	27.45	66.7	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	317	-21.36	26.23	81.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	13	-2.89	20.30	14.2 16.8 (b)	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-6.20	20.25	30.6 36.2 (b)	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	76	-7.04	17.38	40.5 41.0 (b)	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-7.52	24.67	30.5 43.8 (b)	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	148	-8.29	20.44	40.6 48.3 (b)	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	175	-8.13	14.86	54.7	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	202	-8.70	25.42	34.2 50.6 (b)	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	229	-9.02	19.85	45.4 52.5 (b)	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	256	-10.22	15.70	65.1	Pass
T10	40.6667 - 20.3333	Horizontal	ROHN 3 STD	283	-10.04	27.89	36.0 40.6 (b)	Pass
T11	20.3333 - 0	Horizontal	ROHN 3 STD	316	-12.42	22.69	54.7	Pass
T1	212.625 - 202.458	Top Girt	ROHN 1.5 STD	4	-0.23	20.34	1.1	Pass
T10	40.6667 - 20.3333	Redund Horz 1 Bracing	ROHN 1.5 STD	295	-5.16	11.80	43.7	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	328	-6.15	9.84	62.6	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	296	-4.77	7.76	61.4	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	329	-5.30	7.19	73.7	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	308	-0.03	10.76	0.2	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	341	-0.02	8.85	0.3	Pass
T10	40.6667 - 20.3333	Redund Hip Diagonal Bracing	ROHN 2.5 STD	307	-0.05	6.86	0.8	Pass
T11	20.3333 - 0	Redund Hip Diagonal Bracing	ROHN 2.5 STD	340	-0.05	6.20	0.8	Pass
T1	212.625 - 202.458	Inner Bracing	L2x2x1/8	17	-0.00	5.83	0.3	Pass
T2	202.458 - 182.292	Inner Bracing	L2x2x1/8	40	-0.01	5.73	0.3	Pass
T3	182.292 - 162.104	Inner Bracing	L2x2x1/8	79	-0.01	4.22	0.3	Pass
T4	162.104 - 141.896	Inner Bracing	L2x2x1/8	119	-0.01	2.89	0.4	Pass
T5	141.896 - 121.688	Inner Bracing	L2x2x1/8	158	-0.01	2.19	0.4	Pass
T6	121.688 - 101.479	Inner Bracing	L2 1/2x2 1/2x3/16	185	-0.01	3.45	0.5	Pass
T7	101.479 - 81.2708	Inner Bracing	L3x3x3/16	211	-0.01	4.55	0.5	Pass
T8	81.2708 - 61	Inner Bracing	L3 1/2x3 1/2x1/4	238	-0.01	7.40	0.4	Pass
T9	61 - 40.6667	Inner Bracing	L3 1/2x3 1/2x1/4	267	-0.01	5.90	0.4	Pass
T10	40.6667 - 20.3333	Inner Bracing	ROHN 3 STD	311	-0.01	19.74	0.4	Pass
T11	20.3333 - 0	Inner Bracing	ROHN 3 STD	345	-0.01	16.16	0.4	Pass
							Summary	
							Leg (T7) 86.6	Pass
							Diagonal (T6) 97.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Horizontal (T9)	65.1	Pass
						Top Girt (T1)	1.1	Pass
						Redund Horz 1 Bracing (T11)	62.6	Pass
						Redund Diag 1 Bracing (T11)	73.7	Pass
						Redund Hip 1 Bracing (T11)	0.3	Pass
						Redund Hip Diagonal Bracing (T11)	0.8	Pass
						Inner Bracing (T7)	0.5	Pass
						Bolt Checks	67.9	Pass
						RATING =	**97.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806363 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

05/12/13	UPDATED PER WORK ORDER # 677332 874783	AK
14/03/14	UPDATED PER WORK ORDER # 727317	TDG
06/05/14	AS-BUILT INFORMATION ADDED PER WORK ORDER # 757830	MAG
10/10/14	UPDATED PER WORK ORDER # 845203	ARR
24/11/14	UPDATED PER WORK ORDER # 968474	AH
11/12/2014	UPDATED PER WORK ORDER 979442 978540	BMH
19/2/2015	UPDATED PER WORK ORDER 1003679	KAH
3/6/2015	UPDATED PER WORK ORDER 1089809	BMH
22/12/2015	UPDATED PER WORK ORDER 1170570	MP

DRAWN BY: SJK
CHECKED BY:
DRAWING DATE: 15/05/07

SITE NUMBER:
SITE NAME:

SITE NAME

HRT 105 943201

BUSINESS UNIT NUMBER

806363

SITE ADDRESS

48 COW HILL ROAD
CLINTON, CT 06413
MIDDLESEX COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING	SCALE: N.T.S.	1

PLOT DATE: 12/22/2015 FILE NAME: 806363_BASELEVEL.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

Project Name:	HRT 105 943201	JACOBS® Jacobs Engineering Group. Inc.	Created On: 10/6/2014
Project Number:	BU#806363		Checked By: JTE / DW
Job Number:	WO#1170596		Revised On: 12/2/2014
Date:	12/30/2015		Revision No.: 1.0

Self Support Single Pad Stability Checks

Foundation Properties		
Foundation Type:	Single Pad	
Length (Short Side):	40.25	ft
Width (Long Side):	40.25	ft
Thickness:	4.5	ft
Bearing Depth:	4	ft

Reactions	
Code:	F
Axial:	86
Shear:	66
Moment:	8441

Factored Loads	
0.9 Axial:	77.4
1.2 Axial:	103.2
Shear:	89.1
Moment:	11395.35

Soil Properties		
Unit Weight:	120	pcf
Friction Angle:	35	
Cohesion:	0	psf
Friction Coefficient (μ):	0.3	
Ultimate Bearing Strength:	8	ksf
Water Table:	3	ft

Calculate Bearing Length

Sliding Resistance:		
K_p:	3.690172	
Friction Resistance:	291.18	kip
Passive Resistance:	142.59	kip
Total Resistance:	433.77	kip
Sliding Capacity:	20.5%	Pass

Overturning Check		
Orthogonal Direction		
Eccentricity:	18.12	ft
Allowable Moment:	17300.8	kip-ft
Moment Capacity:	65.9%	Pass
Diagonal Direction:		
Eccentricity:	14.1	ft
Allowable Moment:	19112.3	kip-ft
Moment Capacity:	59.6%	Pass

Bearing Check		
Orthogonal Direction		
Compressive Force:	1415.5	kip
Eccentricity:	8.25	ft
q_{max}:	1.974	ksf
Bearing Capacity:	32.9%	Pass
Diagonal Direction		
Compressive Force:	1415.5	kip
Eccentricity:	5.83	ft
q_{max}:	1.733	ksf
Bearing Capacity:	28.9%	Pass

Project Name:	HRT 105 943201	JACOBS® Jacobs Engineering Group. Inc.	Created On: 10/6/2014
Project Number:	BU#806363		Checked By: JTE / DW
Job Number:	WO#1170596		Revised On: 12/2/2014
Date:	12/30/2015		Revision No.: 1.0

Self Support Single Pad Structural Checks

Structural Properties		
Tower Width:	30.04	ft
f'_c:	3000	psi
Concrete Density:	150	pcf
Clear Cover:	3	in
Flexual Rebar Strength:	60	ksi
Tie Strength:	40	ksi

Pad Reinforcement (1 Level):			
Short Side		*Long Side*	
Size:	7	Size:	7
Quantity:	55	Quantity:	55

Maximum Single Pier Reactions		
Max Compression:	353	kip
Max Comp. Shear:	40	kip
Max Uplift:	292	kip
Max Uplift Shear:	35	kip
Tower and Foundation Centroids Are Alligned		

Pad Beam Shear		
Overturning over Length		
V_c:	2629.0	kip
φV_n:	1971.7	kip
Critical Shear:	265.4	kip
Beam Shear Capacity:	13.5%	Pass
Overturning over Width		
V_c:	2629.0	kip
φV_n:	1971.7	kip
Critical Shear:	265.4	kip
Beam Shear Capacity:	13.5%	Pass

Pad Flexural Strength		
Overturning Capacity Independent of Direction		
φM_n:	7259.2	kip-ft
Applied Moment:	1771.3	kip-ft
Flexural Capacity:	24.4%	Pass