



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

January 30, 2017

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

RE: Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 806366
AT&T Site ID: CT1073
73 North Main Street, Marlborough, CT 06447
Latitude: 41° 37' 47.3"/ Longitude: -72° 27' 59.4"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 144-foot level of the existing 155.5-foot monopole tower 73 North Main Street in Marlborough, CT. The tower and property is owned by Crown Castle. AT&T now intends to replace three (3) RRUs with three (3) new RRUS and install twelve (12) tower mounted switches.

This facility was approved by the by the Connecticut Siting Council in Docket No. 169 on October 25, 1995. This approval included the conditions that:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed communications service, sufficient to accommodate the antennas of Springwiche Cellular Limited Partnership and the Town of Marlborough, and not to exceed a total height of 160 feet above ground level (AGL).

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Ms. Amy Traversa, First Selectman, Town of Marlborough, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.

Melanie A. Bachman

January 30, 2017

Page 2

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

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

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Ms. Amy Traversa
Town of Marlborough
26 North Main Street
Marlborough, CT 06447

Town of Marlborough Planning Commission
PO Box 29
26 North Main Street
Marlborough, CT 06447



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Robert Stein
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[Robert Stein](#)
Chairman

Melanie Bachman,
Acting Executive Director

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DOCKET NO. 169 - An application of Bell Atlantic NYNEX Mobile, for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications tower and associated equipment located within a 56+/- acre parcel at 56 East Hampton Road, in Marlborough, Connecticut. The proposed alternatives are located within a 21.7+/- acre parcel at North Main Street and within a 2.5+/- acre parcel at 9-11 South Main Street, in Marlborough, Connecticut.

Connecticut Siting Council

October 25, 1995

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 first alternate site in Marlborough, Connecticut, 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 General Statutes § 16-50k, be issued to Bell Atlantic NYNEX Mobile, Inc. (BANM) for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed first alternate site, located within a 21.7+/- acre parcel at North Main Street, Marlborough, Connecticut. We find the effects on scenic resources and adjacent land uses of the prime site and second alternate site to be significant, and therefore deny certification of these sites.

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed communications service, sufficient to accommodate the antennas of Springwichee Cellular Limited Partnership and the Town of Marlborough, and not to exceed a total height of 160 feet above ground level (AGL).
2. 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 Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include placement of utilities underground, relocation of the tower within the leased parcel to provide the maximum practicable buffer of the tower from adjacent land owners; plans for the tower foundation; specifications for the placement of all antennas to be attached to this tower; plans for the equipment building and security fence; plans for the access road and utility line installation from North Main Street; plans for site clearing and tree trimming; and plans for water drainage and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
4. 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.
5. The Certificate Holder shall permit public or private entities 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.
6. If the facility does not initially provide, or permanently ceases to provide cellular services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.
7. 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.
8. The Certificate Holder shall notify the Council upon completion of construction and provide the final cost to construct the facility.

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Pursuant to General Statutes § 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 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 Connecticut State Agencies.

The parties and intervenors to this proceeding are:

APPLICANT

Bell Atlantic NYNEX Mobile, Inc.

ITS REPRESENTATIVE

Brian C. S. Freeman, Esq.
Kenneth C. Baldwin, Esq.
Robinson & Cole
One Commercial Plaza
Hartford, CT 06103-3597

David S. Malko
General Manager - Engineering
Sandy M. Ranciato
Regulatory Services
Bell Atlantic NYNEX Mobile, Inc.
20 Alexander Drive
Wallingford, CT 06492

INTERVENOR

Springwich Cellular Limited Partnership

ITS REPRESENTATIVE

Peter J. Tyrrell, Esq.
Springwich Cellular Limited Partnership
227 Church Street
New Haven, CT 06510

PARTY

Town of Marlborough

ITS REPRESENTATIVE

William S. Fish, Jr.
Tyler, Cooper & Alcorn
CityPlace, 35th Floor
Hartford, CT 06103-3488

PARTY

Neighbors Endorsing an Appropriate Tower (NEAT)

ITS REPRESENTATIVE

Barry S. Zitser
Perakos, Kindl & Zitser
207 Main Street
Hartford, CT 06106

Content Last Modified on 8/9/2002 11:28:31 AM

Ten Franklin Square New Britain, CT 06051 / 860- 827-2935

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CURRENT OWNER		TOPO.	UTILITIES	STRT./ROAD	LOCATION	CURRENT ASSESSMENT			
VILLAGE PROPERTIES LLC C/O CROWN ATLANTIC CO PMB 353 4017 WASHINGTON RD MCMURRAY, PA 15317 Additional Owners:		2 Above Street		1 Paved		Description	Code	Appraised Value	Assessed Value
						Comm Land	2-1	121,900	85,330
						Comm Bldg	2-2	80,600	56,420
						Comm OB	2-5	826,600	578,620
SUPPLEMENTAL DATA									
Other ID: 2014T		EXEMPT CO							
Census		Lake Area							
Dev. Lot		Photo Retake							
Dev. Map		CB Letter							
GIS ID: 6/26/65T		ASSOC PID#							
						Total		1,029,100	720,370

6079
MARLBOROUGH, CT

VISION

RECORD OF OWNERSHIP		BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.	PREVIOUS ASSESSMENTS (HISTORY)								
VILLAGE PROPERTIES LLC		127/ 9	02/03/1999	U	I		29	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
								2015	2-1	85,330	2014	2-1	90,300	2014	2-1	90,300
								2015	2-2	56,420	2014	2-2	25,270	2014	2-2	25,270
								2015	2-5	578,620	2014	2-5	463,260	2014	2-5	463,260
								Total:		720,370	Total:		578,830	Total:		578,830

EXEMPTIONS				OTHER ASSESSMENTS			
Year	Type	Description	Amount	Code	Description	Number	Amount
Total:							

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD				
NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

APPRAISED VALUE SUMMARY	
Appraised Bldg. Value (Card)	80,600
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	826,600
Appraised Land Value (Bldg)	121,900
Special Land Value	0
Total Appraised Parcel Value	1,029,100
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	1,029,100

NOTES	
CELL TOWER LOCATED BEHIND MARLBORO BARN	CELL TOWER VALUE = \$2083/MONTH-5% VAC-
CELLULAR TOWER; GATED	15% EXPENSES = \$20,184 CAPPED AT 10% =
500 FT LF FALL DOWN ZONE = 5.74 AC	\$201,880 PER SITE X 5 SITES = \$1,009,400
1.84 COMMERCIAL SITE	
3.9 COMMERCIAL EXCESS	

BUILDING PERMIT RECORD									
Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments	
15-101	05/12/2015	CM	Commercial	0	07/27/2015	100		ANTENNA UPGRADE	
1128	12/27/2012	CM	Commercial	0	07/27/2015	100		GROUND MOUNTED C	
500	12/13/2011	CM	Commercial	0	07/27/2015	100		CHANGE SEVEN (7) AN	

VISIT/ CHANGE HISTORY					
Date	Type	IS	ID	Cd.	Purpose/Result
07/27/2015			LM	99	Vacant Land

LAND LINE VALUATION SECTION																			
B #	Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
1	200	Commercial	R	A	181		1.84	76,000.00	0.6150	C	1.0000	1.00	D	1.10			1.00		94,600
1	200	Commercial	R				3.90	7,000.00	1.0000	0	1.0000	1.00		0.00			1.00		27,300

CONSTRUCTION DETAIL				CONSTRUCTION DETAIL (CONTINUED)			
Element	Cd.	Ch.	Description	Element	Cd.	Ch.	Description
Style	91		Support Shed				
Model	94		Commercial				
Grade	03		Average				
Stories	1						
Occupancy	1						
Exterior Wall A	24		Reinforc Concr				
Exterior Wall B							
Roof Structure	01		Flat				
Roof Cover	04		T&G/Rubber				
Interior Wall A	01		Minimum				
Interior Wall B							
Interior Floor A	03		Concrete				
Interior Floor B							
Heating Fuel	01		Coal or Wood				
Heating Type	01		None				
AC Type	03		Central				
Bldg Use	200		Commercial				
Heat/AC	02		HEAT/AC SPLIT				
Frame Type	04		Reinforced Cnc				
Baths/Plumbing	00		None				
Ceiling/Walls	00		None				
Rooms/Prtns	01		Light				
Wall Height	8						
% Conn Wall							

BAS	20	42
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OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)												
Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
SHD1	Shed	FR	Frame	L	360	20.00	1999			5	60	4,300
FN4	Fence 8'			L	322	20.00	2000			5	60	3,900
PAT1	Patio	CR	Concrete	L	192	3.50	2000				60	400
CELL	Cell Tower			L	5	163,600.00	2011		0		100	818,000

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
BAS	First Floor	840	840	840		92,669
Ttl. Gross Liv/Lease Area:		840	840	840		92,669



Google Directions

Zoom

Google Maps

Town of Marlborough

Property Record Card

Property

Address 73 NO MAIN ST

ID 6/26/65T

Ownership

Name VILLAGE PROPERTIES LLC

Address PMB 353 MCMURRAY, PA 15317

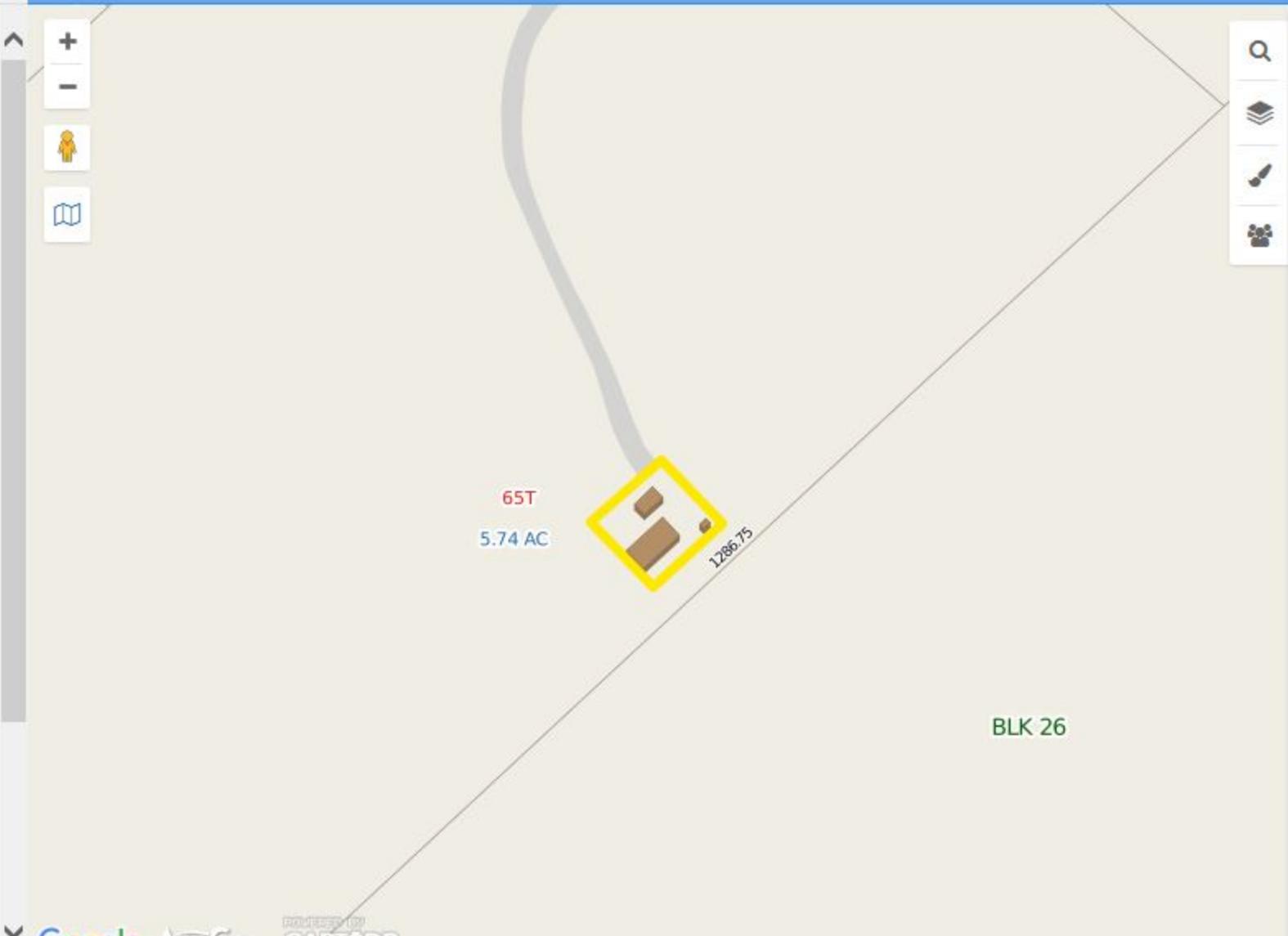
Valuation

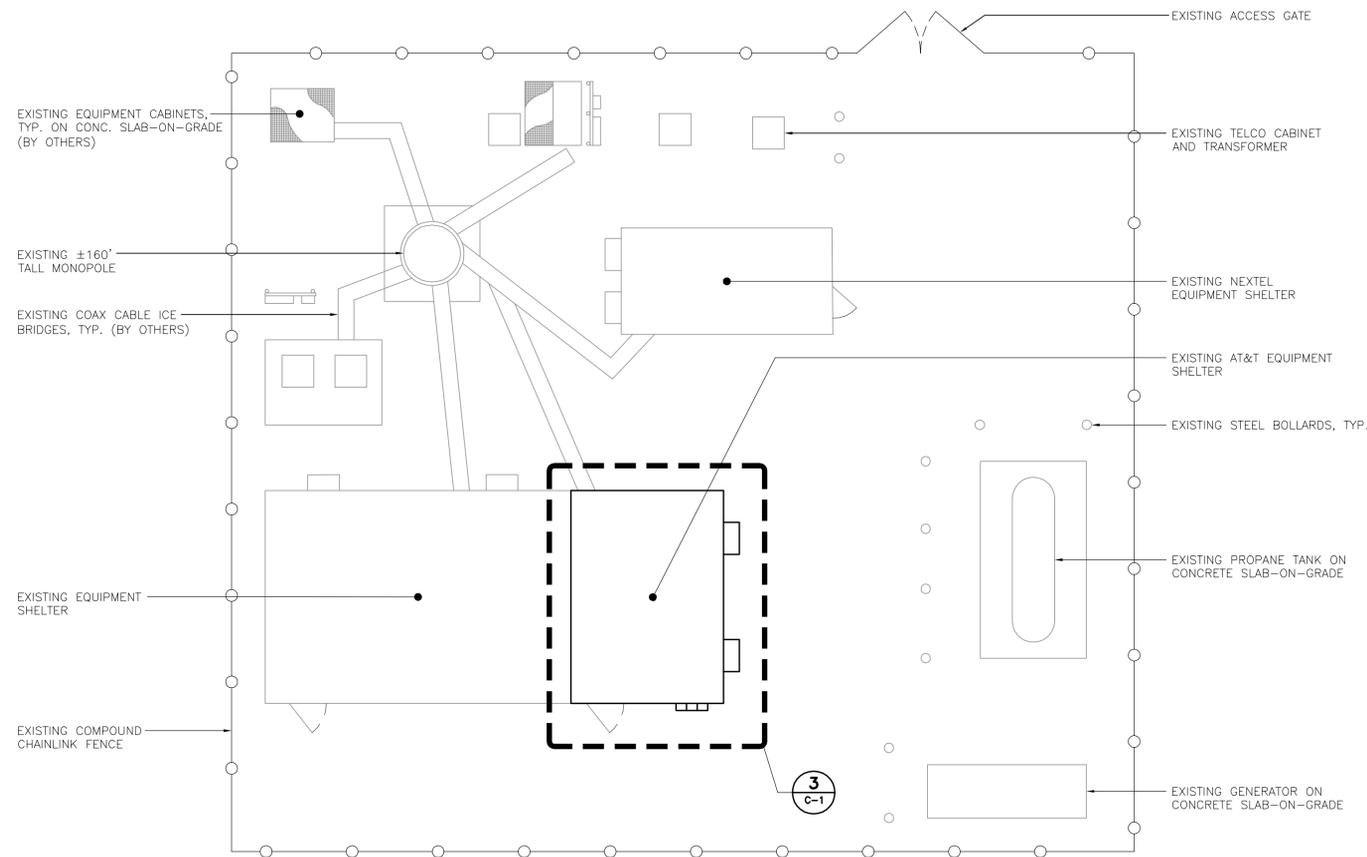
Total \$1029100

Assessment

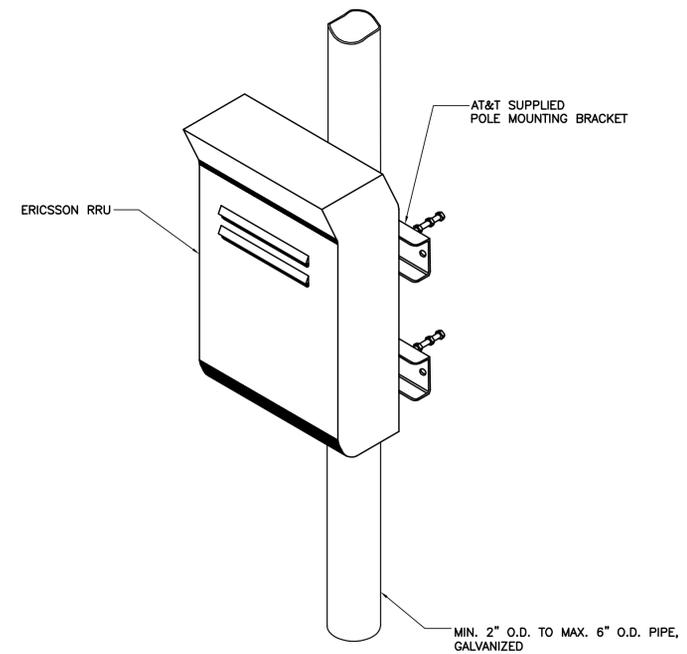
Land \$121900

Last Sale \$0.00 on 1999-02-03





2 COMPOUND PLAN
 SCALE: 1/8" = 1'-0"
 NORTH

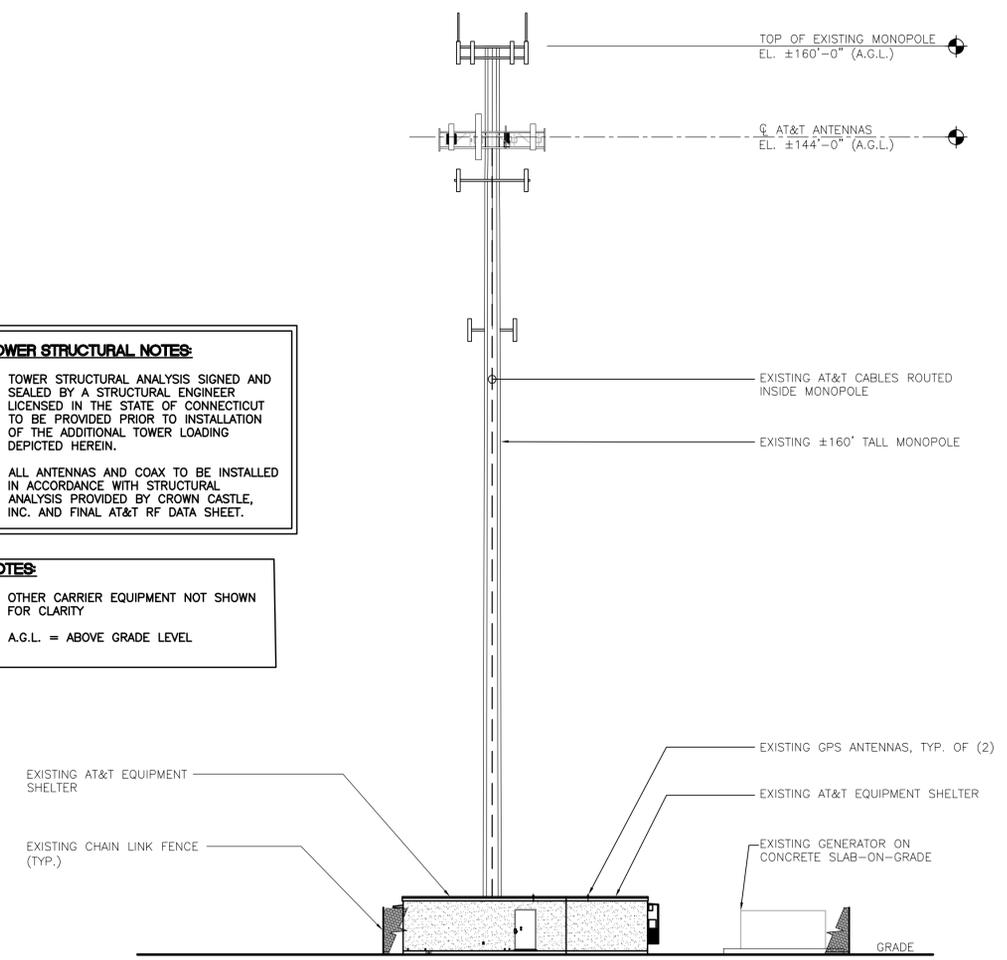


- NOTES:**
- AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
 - NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

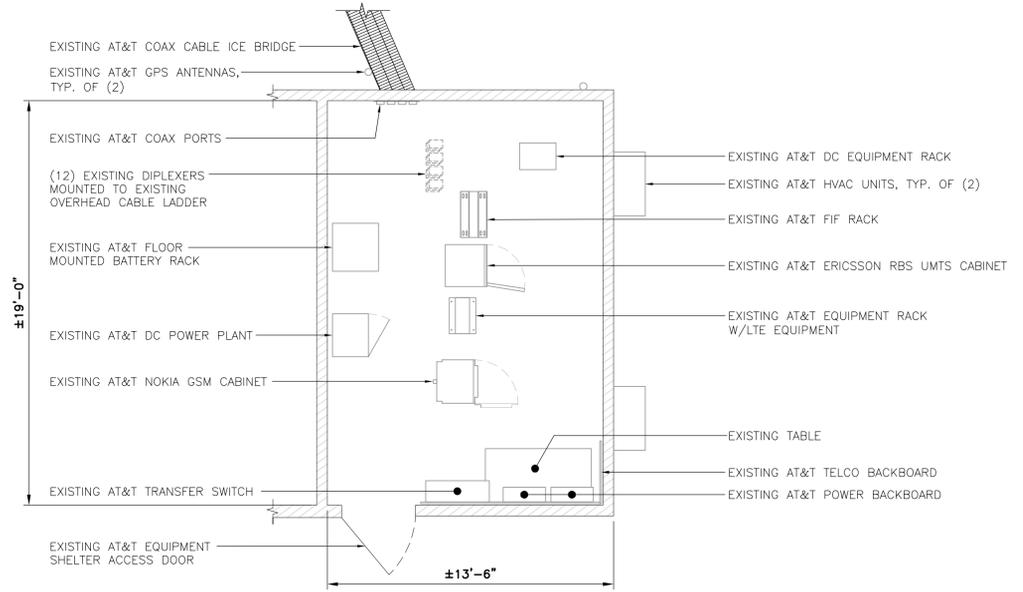
4 TYPICAL RRUS MOUNTING DETAILS
 SCALE: NONE

- TOWER STRUCTURAL NOTES:**
- TOWER STRUCTURAL ANALYSIS SIGNED AND SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT TO BE PROVIDED PRIOR TO INSTALLATION OF THE ADDITIONAL TOWER LOADING DEPICTED HEREIN.
 - ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

- NOTES:**
- OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
 - A.G.L. = ABOVE GRADE LEVEL

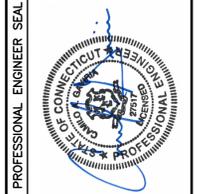


1 NORTHWEST ELEVATION
 SCALE: 1" = 15'



3 EQUIPMENT LAYOUT PLAN
 SCALE: 1/4" = 1'-0"
 NORTH

REV.	DATE	BY	CHKD	DESCRIPTION
0	01/19/17	KAWUR		CAG CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

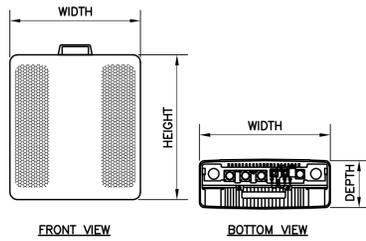


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 Branford, CT 06405
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AT&T MOBILITY
 WIRELESS COMMUNICATIONS FACILITY
MARLBOROUGH - COUNTRY BARN
CT1073 - LTE BWE
 73 NORTH MAIN STREET
 MARLBOROUGH, CT 06447

DATE: 01/19/17
 SCALE: AS NOTED
 JOB NO. 17004.07

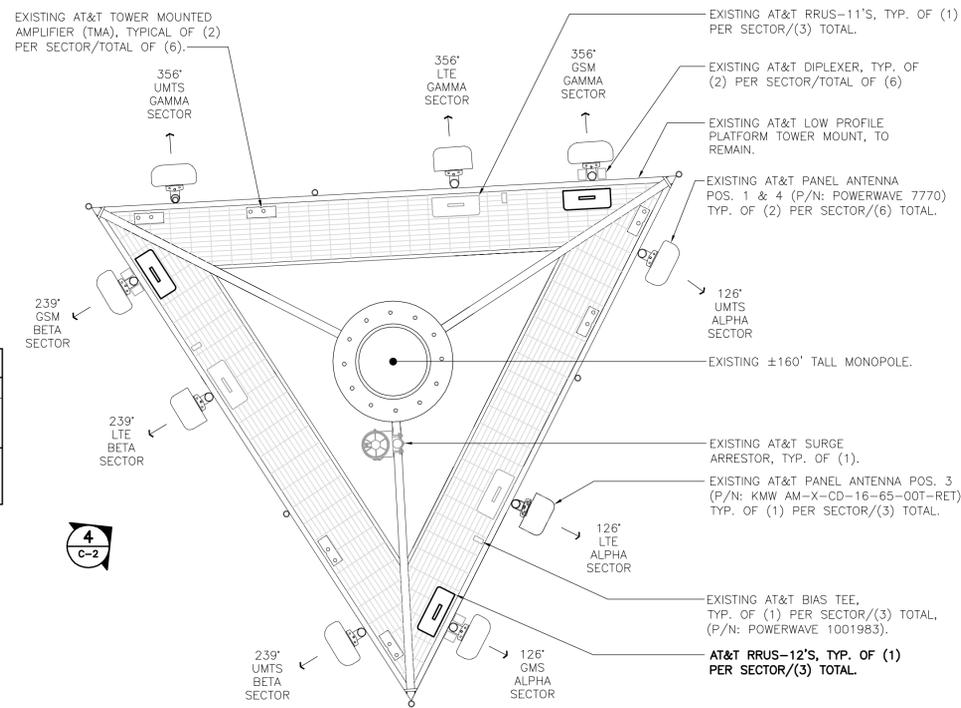
PLANS, ELEVATION AND DETAILS



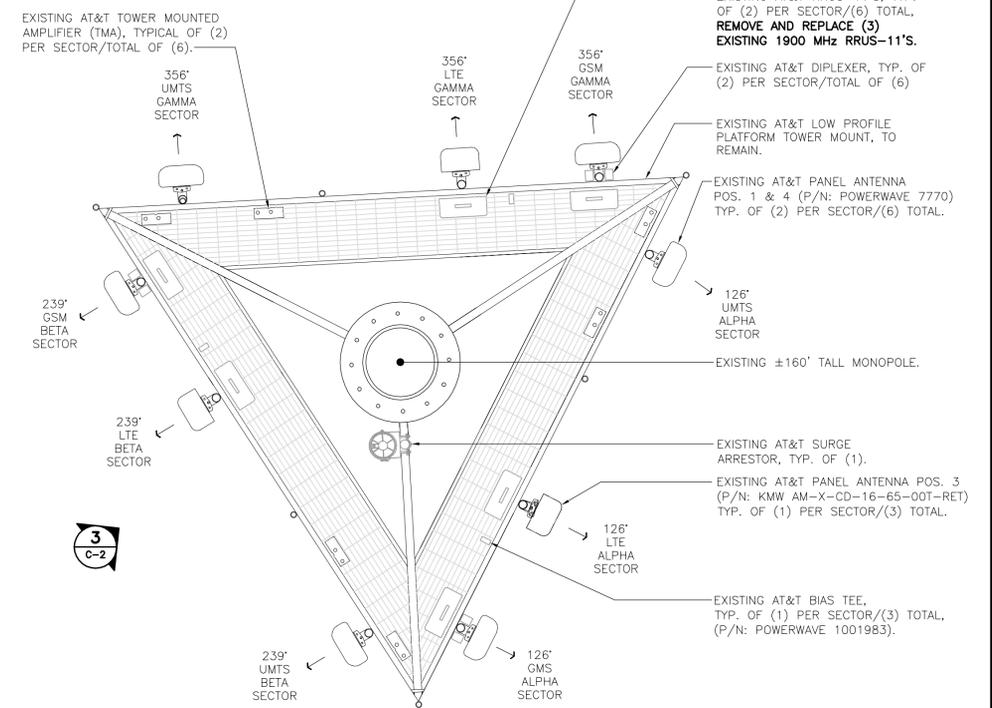
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRU 12	20.4"L x 18.5"W x 7.5"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

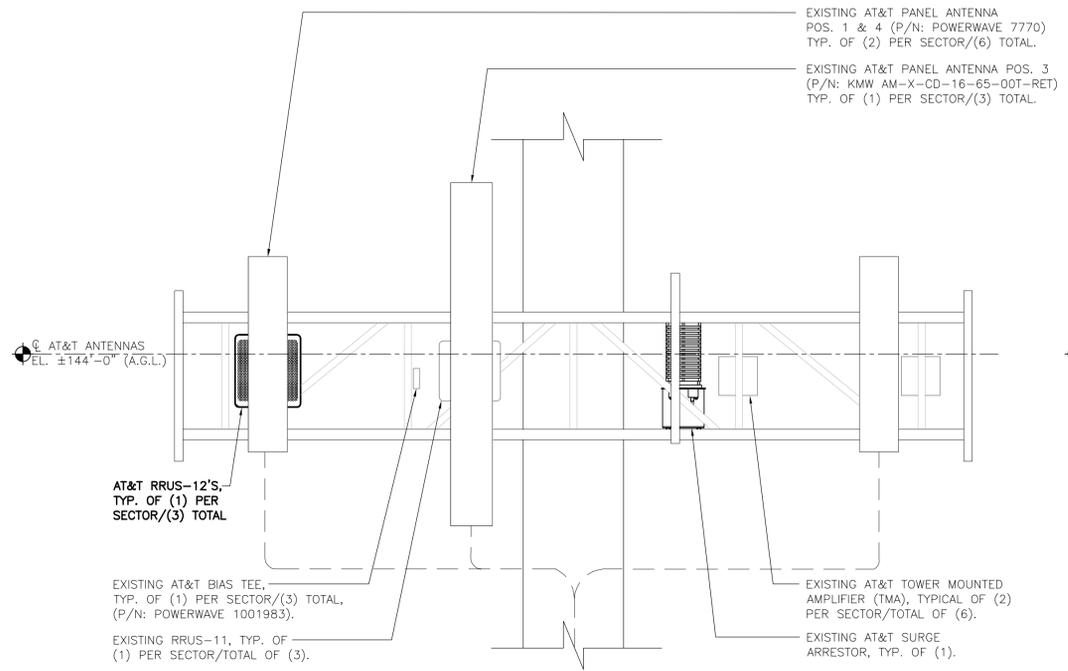
5 ERICSSON RRU 12 DETAIL
SCALE: 1" = 1'-0"



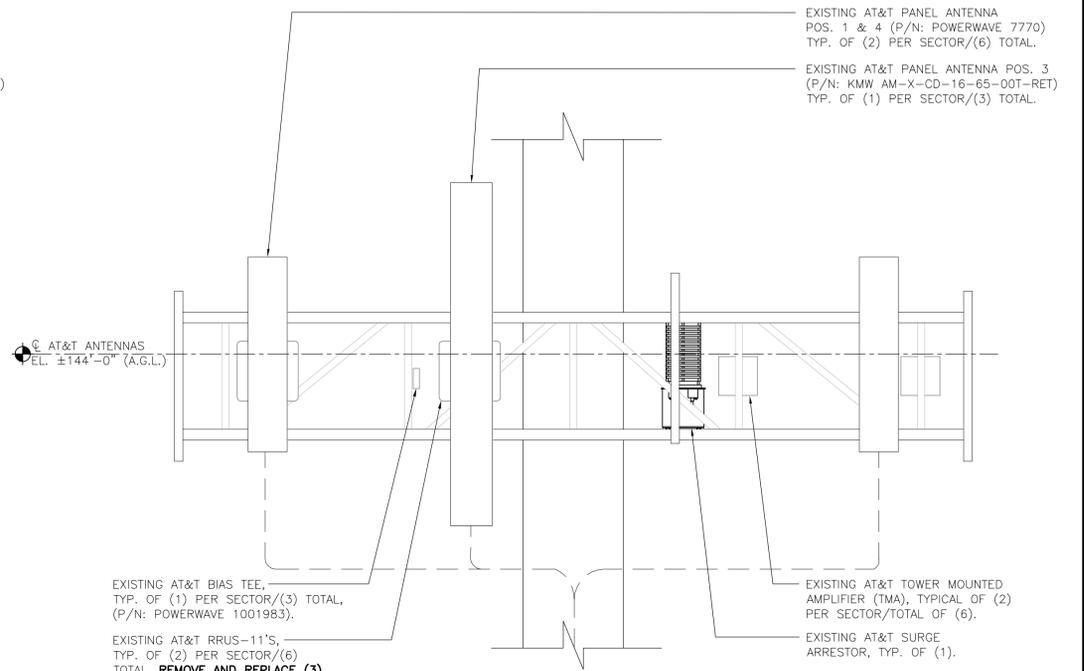
2 PROPOSED ANTENNA PLAN
SCALE: 3/8" = 1'-0"
NORTH



1 EXISTING ANTENNA PLAN
SCALE: 3/8" = 1'-0"
NORTH

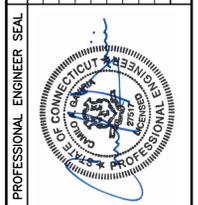


4 PROPOSED ANTENNA PLAN
SCALE: 1/2" = 1'-0"
NOTE: EXISTING DIPLEXERS BEHIND ANTENNA POSITION 4 NOT SHOWN FOR CLARITY.



3 EXISTING ANTENNA PLAN
SCALE: 1/2" = 1'-0"
NOTE: EXISTING DIPLEXERS BEHIND ANTENNA POSITION 4 NOT SHOWN FOR CLARITY.

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
0	01/19/17	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

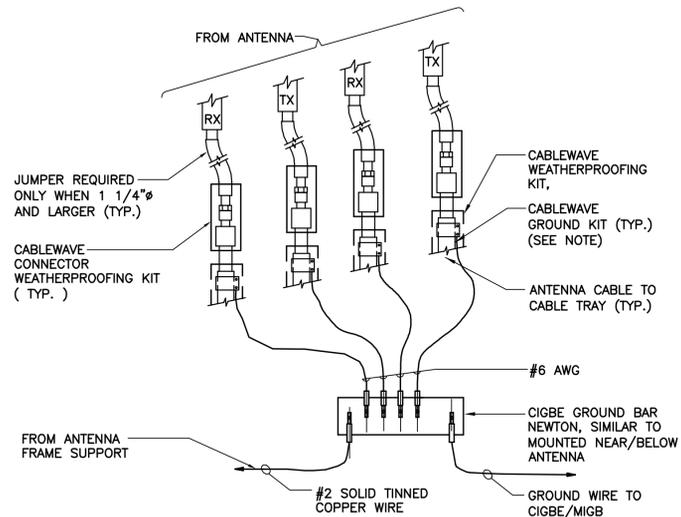


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WIRELESS COMMUNICATIONS FACILITY
MARLBOROUGH - COUNTRY BARN
CT1073 - LTE BWE
73 NORTH MAIN STREET
MARLBOROUGH, CT 06447

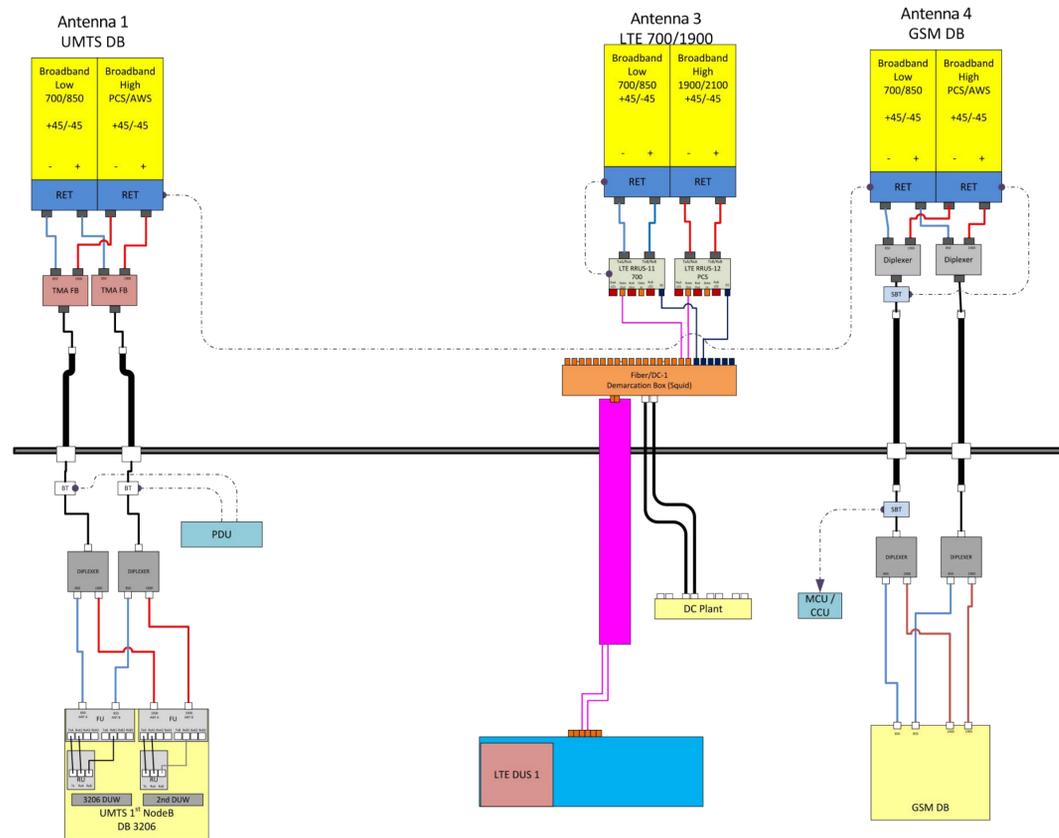
DATE: 01/19/17
SCALE: AS NOTED
JOB NO. 17004.07

LTE BWE
EQUIPMENT
DETAILS



1 CONNECTION OF GROUND WIRES TO GROUND BAR
NOT TO SCALE

Diagram - Sector	A	Diagram File Name -	CT1073_A_B_C_BronzStand_Rev2.vsd
Atoll Site Name -	CTV1073	Location Name -	MARLBOROUGH-COUNTRY BARN
Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:			



2 RFDS PLUMBING DIAGRAM
NOT TO SCALE

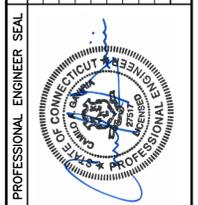
ELECTRICAL NOTES

- PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
- INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
- CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
- MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
- PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
- CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
- ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
- PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
- ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION.
- MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
- THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
- THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
- THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
- DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
- ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
- GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
- EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
- CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

- CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:
 - TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
 - CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
 - GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.
- TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.
- THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.
- CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

REV.	0	DATE	01/19/17	DRAWN BY	KAWUR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
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MARLBOROUGH, CT 06447

DATE:	01/19/17
SCALE:	AS NOTED
JOB NO.	17004.07

TYPICAL ELECTRICAL DETAILS & NOTES

Date: January 13, 2017

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



Crown Castle
2000 Corporate Dr.
Canonsburg PA 15317
(724) 416-9125

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: 10035085
Carrier Site Name: CT1073

Crown Castle Designation: Crown Castle BU Number: 806366
Crown Castle Site Name: HRT 107(C) 943204
Crown Castle JDE Job Number: 414992
Crown Castle Work Order Number: 1347449
Crown Castle Application Number: 373777 Rev. 0

Engineering Firm Designation: Crown Castle Project Number: 1347449

Site Data: 73 North Main Street, MARLBOROUGH, Hartford County, CT
Latitude 41° 37' 47.3", Longitude -72° 27' 59.4"
155.5 Foot - Monopole Tower

Dear Sean Dempsey,

Crown Castle 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 1347449, in accordance with application 373777, revision 0.

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 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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 Crown Castle 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: Dolly Hsu, E.I.T. / RTC / DLT

Respectfully submitted by:


Maribel Dentinger, P.E.

Sr. Project Engineer
tnxTower Report - version

7.0.5.1



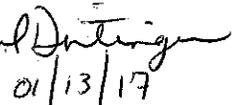

01/13/17

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing and Reserved Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Table 6 - Tower Component Stresses vs. Capacity – LC7

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 155.5 ft Monopole tower designed by FWT, Inc. in December of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 101 mph with no ice, 50 mph with 1-inch ice thickness and 60 mph under service loads, exposure category B.

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
144.0	144.0	3	ericsson	RRUS 12	-	-	-
		12	kathrein	860 10025			
		3	powerwave technologies	1001940			

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
156.0	159.0	3	alcatel lucent	RRH2x60-700	-	-	2
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		3	decibel	DB809K-Y	3	1-5/8	4
		3	alcatel lucent	RRH2x60-AWS	14	1-5/8	1
		3	alcatel lucent	RRH2x60-PCS			
		5	commscope	LNx-6514DS-A1M w/ Mount Pipe			
		1	commscope	LNx-8513DS-VTM w/ Mount Pipe			
	2	rfs celwave	DB-T1-6Z-8AB-0Z				
1	156.0	1	tower mounts	Platform Mount [LP 1001-1]			
144.0	144.0	3	ericsson	RRUS-11	12	3/8 3/4 1-1/4	1
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP 17201			
		6	powerwave technologies	LGP21903			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 1001-1]			
3	ericsson	RRUS-11	-	-	3		
135.0	135.0	3	kathrein	742 213 w/ Mount Pipe	6	1-1/4	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
126.0	128.0	2	kreco	CO-41A	1 4	1-5/8 7/8	2
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	FD9R6004/1C-3L			
		1	telewave	ANT450F6			
		1	telewave	ANT450Y7-WR			
	126.0	2	tower mounts	T-Arm Mount [TA 602-3]	6	1-1/4	1
100.0	100.0	6	andrew	ETM19V2S12UB	12	1-1/4	1
		3	commscope	ATBT-BOTTOM-24V			
		3	commscope	LNx-6515DS-VTM w/ Mount Pipe			
		1	tower mounts	Side Arm Mount [SO 701-3]			
		3	ems wireless	RV90-17-00DP w/ Mount Pipe			

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)
157.75	157.75	12	Swedcom	ALP-9212-N	-	-
144.25	144.25	9	Swedcom	ALP-9212-N	-	-
132.00	132.00	2	Celwave	PD1142	-	-
		1	Celwave	PD201		
		2	Celwave	PD220		
		9	Decibel	DB980		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2208816	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FWT, Inc.	823125	CCISITES
4-TOWER MANUFACTURER DRAWINGS	FWT, Inc.	823126	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle 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
L1	155.5 - 110	Pole	TP64.606x58.6x0.375	1	-25.44	3989.11	14.9	Pass
L2	110 - 72.5	Pole	TP68.805x62.8x0.4375	2	-44.38	5321.74	27.7	Pass
L3	72.5 - 36	Pole	TP72.748x66.8082x0.5	3	-66.20	6775.62	36.6	Pass
L4	36 - 0	Pole	TP76.5x70.56x0.5	4	-94.78	6928.62	55.3	Pass
							Summary	
						Pole (L4)	55.3	Pass
						Rating =	55.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	55.8	Pass
1	Base Plate	0	25.1	Pass
1	Base Foundation Structure	0	33.8	Pass
1	Base Foundation Soil Interaction	0	31.6	Pass

Structure Rating (max from all components) =	55.8%
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Notes:

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

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB809K-Y	156	1001940	144
DB809K-Y	156	1001940	144
DB809K-Y	156	(4) 860 10025	144
LNX-8513DS-VTM w/ Mount Pipe	156	(4) 860 10025	144
LNX-6514DS-A1M w/ Mount Pipe	156	(4) 860 10025	144
(2) LNX-6514DS-A1M w/ Mount Pipe	156	RRUS 12	144
(2) LNX-6514DS-A1M w/ Mount Pipe	156	RRUS 12	144
RRH2x60-AWS	156	RRUS 12	144
RRH2x60-AWS	156	(2) 6' x 2" Mount Pipe	144
RRH2x60-AWS	156	(2) 6' x 2" Mount Pipe	144
RRH2x60-PCS	156	(2) 6' x 2" Mount Pipe	144
RRH2x60-PCS	156	Platform Mount [LP 1001-1]	144
RRH2x60-PCS	156	742 213 w/ Mount Pipe	135
(2) DB-T1-6Z-8AB-0Z	156	742 213 w/ Mount Pipe	135
(2) SBNHH-1D65B w/ Mount Pipe	156	742 213 w/ Mount Pipe	135
(2) SBNHH-1D65B w/ Mount Pipe	156	T-Arm Mount [TA 602-3]	127
(2) SBNHH-1D65B w/ Mount Pipe	156	APXVSP18-C-A20 w/ Mount Pipe	126
RRH2x60-700	156	APXVSP18-C-A20 w/ Mount Pipe	126
RRH2x60-700	156	FD9R6004/1C-3L	126
RRH2x60-700	156	FD9R6004/1C-3L	126
(2) 4' x 2" Pipe Mount	156	FD9R6004/1C-3L	126
(2) 4' x 2" Pipe Mount	156	ANT450F6	126
(2) 4' x 2" Pipe Mount	156	CO-41A	126
Platform Mount [LP 1001-1]	156	CO-41A	126
(2) 7770.00 w/ Mount Pipe	144	ANT450Y7-WR	126
(2) 7770.00 w/ Mount Pipe	144	6' x 2" Mount Pipe	126
(2) 7770.00 w/ Mount Pipe	144	6' x 2" Mount Pipe	126
AM-X-CD-16-65-00T-RET w/ Mount Pipe	144	6' x 2" Mount Pipe	126
AM-X-CD-16-65-00T-RET w/ Mount Pipe	144	APXVSP18-C-A20 w/ Mount Pipe	126
AM-X-CD-16-65-00T-RET w/ Mount Pipe	144	T-Arm Mount [TA 602-3]	125
(2) LGP 17201	144	LNX-6515DS-VTM w/ Mount Pipe	100
(2) LGP 17201	144	LNX-6515DS-VTM w/ Mount Pipe	100
(2) LGP 17201	144	LNX-6515DS-VTM w/ Mount Pipe	100
(2) LGP21903	144	RV90-17-00DP w/ Mount Pipe	100
(2) LGP21903	144	RV90-17-00DP w/ Mount Pipe	100
RRUS-11	144	RV90-17-00DP w/ Mount Pipe	100
RRUS-11	144	ATBT-BOTTOM-24V	100
RRUS-11	144	ATBT-BOTTOM-24V	100
RRUS-11	144	ATBT-BOTTOM-24V	100
DC6-48-60-18-8F	144	(2) ETM19V2S12UB	100
1001940	144	(2) ETM19V2S12UB	100
		(2) ETM19V2S12UB	100
		Side Arm Mount [SO 701-3]	100

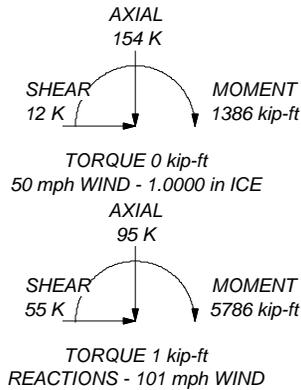
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 55.3%

ALL REACTIONS ARE FACTORED



155.5 ft

110.0 ft

72.5 ft

36.0 ft

0.0 ft

Section	1	2	3	4	
Length (ft)	45.50	45.50	45.00	45.00	
Number of Sides	12	12	12	12	
Thickness (in)	0.3750	0.4375	0.5000	0.5000	
Socket Length (ft)	8.00	8.50	9.00		
Top Dia (in)	58.6000	62.8000	66.8082	70.5600	
Bot Dia (in)	64.6060	68.8050	72.7480	76.5000	
Grade			A572-65		
Weight (K)	11.4	14.3	17.1	18.0	60.8

Crown Castle
 2000 Corporate Drive
 Canonsburg, PA
 Phone: 724-416-2000
 FAX:

Job: **BU# 806366**
 Project:
 Client: Crown Castle Drawn by: rconway App'd:
 Code: TIA-222-G Date: 01/13/17 Scale: NTS
 Path: R:\SA Models - Letters\Work Area\Draws\WIP\806366 WO 1347449\RTC Pre-QA\806366.dwg Dwg No. E-1

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 101 mph.
- 3) Structure Class II.
- 4) Exposure Category B.
- 5) Topographic Category 1.
- 6) Crest Height 0.00 ft.
- 7) Nominal ice thickness of 1.0000 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56 pcf.
- 10) A wind speed of 50 mph is used in combination with ice.
- 11) Temperature drop of 50 °F.
- 12) Deflections calculated using a wind speed of 60 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.
- 16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	---

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	155.50-110.00	45.50	8.00	12	58.6000	64.6060	0.3750	1.5000	A572-65 (65 ksi)
L2	110.00-72.50	45.50	8.50	12	62.8000	68.8050	0.4375	1.7500	A572-65 (65 ksi)
L3	72.50-36.00	45.00	9.00	12	66.8082	72.7480	0.5000	2.0000	A572-65 (65 ksi)
L4	36.00-0.00	45.00		12	70.5600	76.5000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	60.6672	70.3067	30422.968 0	20.8446	30.3548	1002.2457	61645.181 3	34.6028	14.6998	39.199
	66.8851	77.5589	40842.013 1	22.9947	33.4659	1220.4065	82756.991 3	38.1721	16.3094	43.492
L2	66.1084	87.8532	43610.436 1	22.3258	32.5304	1340.6056	88366.567 0	43.2387	15.6579	35.789
	71.2322	96.3127	57460.444 0	24.4756	35.6410	1612.2011	116430.43 78	47.4022	17.2672	39.468
L3	70.3265	106.7562	59911.926 8	23.7383	34.6066	1731.2263	121397.80 66	52.5421	16.5646	33.129
	75.3143	116.3193	77497.789 3	25.8648	37.6835	2056.5463	157031.53 18	57.2488	18.1565	36.313
L4	74.2790	112.7967	70668.018 4	25.0815	36.5501	1933.4563	143192.56 43	55.5151	17.5701	35.14
	79.1986	122.3600	90209.568 0	27.2080	39.6270	2276.4673	182789.04 18	60.2219	19.1620	38.324

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 155.50- 110.00				1	1	1			
L2 110.00- 72.50				1	1	1			
L3 72.50- 36.00				1	1	1			
L4 36.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diamete r in	Perimete r in	Weight plf

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf	

561(1-5/8")	C	No	Inside Pole	155.50 - 8.00	14	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.35 1.35 1.35
LDF7-50A(1-5/8")	A	No	Inside Pole	155.50 - 8.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82

UCF114-50JA(1 1/4")	B	No	Inside Pole	144.00 - 8.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.55 0.55 0.55
FB-L98B-002-75000(3/8")	B	No	Inside Pole	144.00 - 8.00	1	No Ice 1/2" Ice	0.00 0.00	0.06 0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
WR-VG86ST-BRD(3/4)	B	No	Inside Pole	144.00 - 8.00	2	1" Ice	0.00	0.06
						No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
2" Conduit	B	No	Inside Pole	144.00 - 8.00	1	1" Ice	0.00	0.59
						No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
***						1" Ice	0.00	2.80
AVA6-50(1-1/4")	A	No	Inside Pole	135.00 - 8.00	6	No Ice	0.00	0.45
						1/2" Ice	0.00	0.45
						1" Ice	0.00	0.45

LDF6-50A(1-1/4")	C	No	Inside Pole	126.00 - 8.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
LDF5-50A(7/8")	C	No	Inside Pole	126.00 - 0.00	4	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
HYBRID 12C4 2-FOC SHLD PVC(1-5/8)	C	No	Inside Pole	126.00 - 0.00	1	No Ice	0.00	2.30
						1/2" Ice	0.00	2.30
						1" Ice	0.00	2.30

LDF6-50A(1-1/4")	A	No	Inside Pole	100.00 - 8.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
AVA6-50(1-1/4")	A	No	Inside Pole	100.00 - 8.00	6	No Ice	0.00	0.45
						1/2" Ice	0.00	0.45
						1" Ice	0.00	0.45

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	155.50-110.00	A	0.000	0.000	0.000	0.000	0.18
		B	0.000	0.000	0.000	0.000	0.36
		C	0.000	0.000	0.000	0.000	0.98
L2	110.00-72.50	A	0.000	0.000	0.000	0.000	0.38
		B	0.000	0.000	0.000	0.000	0.40
		C	0.000	0.000	0.000	0.000	0.99
L3	72.50-36.00	A	0.000	0.000	0.000	0.000	0.43
		B	0.000	0.000	0.000	0.000	0.39
		C	0.000	0.000	0.000	0.000	0.97
L4	36.00-0.00	A	0.000	0.000	0.000	0.000	0.33
		B	0.000	0.000	0.000	0.000	0.30
		C	0.000	0.000	0.000	0.000	0.77

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	155.50-110.00	A	2.299	0.000	0.000	0.000	0.000	0.18
		B		0.000	0.000	0.000	0.000	0.36
		C		0.000	0.000	0.000	0.000	0.98
L2	110.00-72.50	A	2.214	0.000	0.000	0.000	0.000	0.38
		B		0.000	0.000	0.000	0.000	0.40
		C		0.000	0.000	0.000	0.000	0.99
L3	72.50-36.00	A	2.103	0.000	0.000	0.000	0.000	0.43
		B		0.000	0.000	0.000	0.000	0.39
		C		0.000	0.000	0.000	0.000	0.97
L4	36.00-0.00	A	1.880	0.000	0.000	0.000	0.000	0.33

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
		B		0.000	0.000	0.000	0.000	0.30
		C		0.000	0.000	0.000	0.000	0.77

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	155.50-110.00	0.0000	0.0000	0.0000	0.0000
L2	110.00-72.50	0.0000	0.0000	0.0000	0.0000
L3	72.50-36.00	0.0000	0.0000	0.0000	0.0000
L4	36.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
*GOOD DB809K-Y	A	From Face	4.00 0.00 3.00	0.0000	156.00	No Ice 2.85 1/2" 4.03 Ice 5.21	2.85 4.03 5.21	0.03 0.05 0.08
DB809K-Y	B	From Face	4.00 0.00 3.00	0.0000	156.00	No Ice 2.85 1/2" 4.03 Ice 5.21 1" Ice	2.85 4.03 5.21	0.03 0.05 0.08
DB809K-Y	C	From Face	4.00 0.00 3.00	0.0000	156.00	No Ice 2.85 1/2" 4.03 Ice 5.21 1" Ice	2.85 4.03 5.21	0.03 0.05 0.08
*GOOD LNx-8513DS-VTM w/ Mount Pipe	A	From Face	4.00 0.00 3.00	0.0000	156.00	No Ice 8.41 1/2" 8.97 Ice 9.50 1" Ice	7.08 8.27 9.18	0.06 0.13 0.21
LNx-6514DS-A1M w/ Mount Pipe	A	From Face	4.00 0.00 3.00	0.0000	156.00	No Ice 8.41 1/2" 8.97 Ice 9.50 1" Ice	7.08 8.27 9.18	0.06 0.13 0.21
(2) LNx-6514DS-A1M w/ Mount Pipe	B	From Face	4.00 0.00 3.00	0.0000	156.00	No Ice 8.41 1/2" 8.97 Ice 9.50 1" Ice	7.08 8.27 9.18	0.06 0.13 0.21
(2) LNx-6514DS-A1M w/ Mount Pipe	C	From Face	4.00 0.00 3.00	0.0000	156.00	No Ice 8.41 1/2" 8.97 Ice 9.50 1" Ice	7.08 8.27 9.18	0.06 0.13 0.21

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A ₁ Front	C _A A ₂ Side	Weight
			Horz Lateral	Vert					
RRH2x60-AWS	A	From Face	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
RRH2x60-AWS	B	From Face	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
RRH2x60-AWS	C	From Face	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
RRH2x60-PCS	A	From Face	4.00	0.0000	156.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			3.00			Ice	2.59	2.09	0.10
RRH2x60-PCS	B	From Face	4.00	0.0000	156.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			3.00			Ice	2.59	2.09	0.10
RRH2x60-PCS	C	From Face	4.00	0.0000	156.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			3.00			Ice	2.59	2.09	0.10
(2) DB-T1-6Z-8AB-OZ	A	From Face	4.00	0.0000	156.00	No Ice	4.80	2.00	0.04
			0.00			1/2"	5.07	2.19	0.08
			3.00			Ice	5.35	2.39	0.12
(2) SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00	0.0000	156.00	No Ice	8.39	7.08	0.08
			0.00			1/2"	8.95	8.28	0.15
			3.00			Ice	9.48	9.19	0.22
(2) SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00	0.0000	156.00	No Ice	8.39	7.08	0.08
			0.00			1/2"	8.95	8.28	0.15
			3.00			Ice	9.48	9.19	0.22
(2) SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00	0.0000	156.00	No Ice	8.39	7.08	0.08
			0.00			1/2"	8.95	8.28	0.15
			3.00			Ice	9.48	9.19	0.22
RRH2x60-700	A	From Face	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
RRH2x60-700	B	From Face	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
RRH2x60-700	C	From Face	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
(2) 4' x 2" Pipe Mount	A	From Leg	4.00	0.0000	156.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
(2) 4' x 2" Pipe Mount	B	From Leg	4.00	0.0000	156.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
(2) 4' x 2" Pipe Mount	C	From Leg	4.00	0.0000	156.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
Platform Mount [LP 1001-	C	None		0.0000	156.00	No Ice	47.70	47.70	3.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A ₁ Front ft ²	C _A A ₂ Side ft ²	Weight K
1]						1/2" Ice 59.50 71.30	59.50 71.30	3.62 4.22
						1" Ice		
*good (2) 7770.00 w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
(2) LGP 17201	A	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) LGP 17201	B	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) LGP 17201	C	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) LGP21903	A	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.02
(2) LGP21903	B	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.02
(2) LGP21903	C	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.02
RRUS-11	A	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	B	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	C	From Face	4.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice 2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
DC6-48-60-18-8F	C	From Face	4.00	0.0000	144.00	No Ice	0.79	0.02

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
			0.00			1/2"	1.27	1.27	0.04
			0.00			Ice	1.45	1.45	0.05
1001940	A	From Leg	4.00	0.0000	144.00	1" Ice	0.18	0.08	0.00
			0.00			No Ice	0.23	0.13	0.00
			0.00			1/2"	0.30	0.18	0.01
			0.00			Ice			
1001940	B	From Leg	4.00	0.0000	144.00	1" Ice	0.18	0.08	0.00
			0.00			No Ice	0.23	0.13	0.00
			0.00			1/2"	0.30	0.18	0.01
			0.00			Ice			
1001940	C	From Leg	4.00	0.0000	144.00	1" Ice	0.18	0.08	0.00
			0.00			No Ice	0.23	0.13	0.00
			0.00			1/2"	0.30	0.18	0.01
			0.00			Ice			
(4) 860 10025	A	From Leg	4.00	0.0000	144.00	1" Ice	0.14	0.12	0.00
			0.00			No Ice	0.20	0.17	0.00
			0.00			1/2"	0.26	0.23	0.01
			0.00			Ice			
(4) 860 10025	B	From Leg	4.00	0.0000	144.00	1" Ice	0.14	0.12	0.00
			0.00			No Ice	0.20	0.17	0.00
			0.00			1/2"	0.26	0.23	0.01
			0.00			Ice			
(4) 860 10025	B	From Leg	4.00	0.0000	144.00	1" Ice	0.14	0.12	0.00
			0.00			No Ice	0.20	0.17	0.00
			0.00			1/2"	0.26	0.23	0.01
			0.00			Ice			
RRUS 12	A	From Leg	4.00	0.0000	144.00	1" Ice	3.15	1.29	0.06
			0.00			No Ice	3.36	1.44	0.08
			0.00			1/2"	3.59	1.60	0.11
			0.00			Ice			
RRUS 12	B	From Leg	4.00	0.0000	144.00	1" Ice	3.15	1.29	0.06
			0.00			No Ice	3.36	1.44	0.08
			0.00			1/2"	3.59	1.60	0.11
			0.00			Ice			
RRUS 12	C	From Leg	4.00	0.0000	144.00	1" Ice	3.15	1.29	0.06
			0.00			No Ice	3.36	1.44	0.08
			0.00			1/2"	3.59	1.60	0.11
			0.00			Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	144.00	1" Ice	1.43	1.43	0.02
			0.00			No Ice	1.92	1.92	0.03
			0.00			1/2"	2.29	2.29	0.05
			0.00			Ice			
(2) 6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	144.00	1" Ice	1.43	1.43	0.02
			0.00			No Ice	1.92	1.92	0.03
			0.00			1/2"	2.29	2.29	0.05
			0.00			Ice			
(2) 6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	144.00	1" Ice	1.43	1.43	0.02
			0.00			No Ice	1.92	1.92	0.03
			0.00			1/2"	2.29	2.29	0.05
			0.00			Ice			
Platform Mount [LP 1001-1]	C	None		0.0000	144.00	1" Ice	47.70	47.70	3.02
						No Ice	59.50	59.50	3.62
						1/2"	71.30	71.30	4.22
						Ice			
						1" Ice			
*good 742 213 w/ Mount Pipe	A	From Leg	1.00	0.0000	135.00	No Ice	5.37	4.62	0.05
			0.00			1/2"	5.95	6.00	0.09
			0.00			Ice	6.50	6.98	0.15
			0.00			1" Ice			
742 213 w/ Mount Pipe	B	From Leg	1.00	0.0000	135.00	No Ice	5.37	4.62	0.05
			0.00			1/2"	5.95	6.00	0.09
			0.00			Ice	6.50	6.98	0.15
			0.00			1" Ice			
742 213 w/ Mount Pipe	C	From Leg	1.00	0.0000	135.00	No Ice	5.37	4.62	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A ₁ Front ft ²	C _A A ₂ Side ft ²	Weight K	
			0.00			1/2"	5.95	6.00	0.09
			0.00			Ice	6.50	6.98	0.15
						1" Ice			
*good APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	126.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			2.00			Ice	9.35	9.02	0.23
						1" Ice			
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	126.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			2.00			Ice	9.35	9.02	0.23
						1" Ice			
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	126.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			2.00			Ice	9.35	9.02	0.23
						1" Ice			
FD9R6004/1C-3L	A	From Leg	4.00	0.0000	126.00	No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
			2.00			Ice	0.47	0.17	0.01
						1" Ice			
FD9R6004/1C-3L	B	From Leg	4.00	0.0000	126.00	No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
			2.00			Ice	0.47	0.17	0.01
						1" Ice			
FD9R6004/1C-3L	C	From Leg	4.00	0.0000	126.00	No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
			2.00			Ice	0.47	0.17	0.01
						1" Ice			
ANT450F6	A	From Leg	4.00	0.0000	126.00	No Ice	1.90	1.90	0.01
			0.00			1/2"	2.73	2.73	0.02
			2.00			Ice	3.40	3.40	0.04
						1" Ice			
CO-41A	B	From Leg	4.00	0.0000	126.00	No Ice	3.15	3.15	0.01
			0.00			1/2"	4.38	4.38	0.04
			2.00			Ice	5.63	5.63	0.07
						1" Ice			
CO-41A	C	From Leg	4.00	0.0000	126.00	No Ice	3.15	3.15	0.01
			0.00			1/2"	4.38	4.38	0.04
			2.00			Ice	5.63	5.63	0.07
						1" Ice			
ANT450Y7-WR	A	From Leg	4.00	0.0000	126.00	No Ice	0.94	0.94	0.01
			0.00			1/2"	1.22	1.22	0.01
			2.00			Ice	1.50	1.50	0.01
						1" Ice			
6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	126.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	126.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	126.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
T-Arm Mount [TA 602-3]	C	None		0.0000	127.00	No Ice	11.59	11.59	0.77
						1/2"	15.44	15.44	0.99
						Ice	19.29	19.29	1.21
						1" Ice			
T-Arm Mount [TA 602-3]	C	None		0.0000	125.00	No Ice	11.59	11.59	0.77
						1/2"	15.44	15.44	0.99
						Ice	19.29	19.29	1.21
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	3.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2"	12.40	11.37	0.17
			0.00			Ice	13.14	12.91	0.27
						1" Ice			
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	3.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2"	12.40	11.37	0.17
			0.00			Ice	13.14	12.91	0.27
						1" Ice			
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	3.00	0.0000	100.00	No Ice	11.68	9.84	0.08
			0.00			1/2"	12.40	11.37	0.17
			0.00			Ice	13.14	12.91	0.27
						1" Ice			
RV90-17-00DP w/ Mount Pipe	A	From Leg	3.00	0.0000	100.00	No Ice	4.59	3.32	0.04
			0.00			1/2"	5.02	4.09	0.08
			0.00			Ice	5.44	4.78	0.12
						1" Ice			
RV90-17-00DP w/ Mount Pipe	B	From Leg	3.00	0.0000	100.00	No Ice	4.59	3.32	0.04
			0.00			1/2"	5.02	4.09	0.08
			0.00			Ice	5.44	4.78	0.12
						1" Ice			
RV90-17-00DP w/ Mount Pipe	C	From Leg	3.00	0.0000	100.00	No Ice	4.59	3.32	0.04
			0.00			1/2"	5.02	4.09	0.08
			0.00			Ice	5.44	4.78	0.12
						1" Ice			
ATBT-BOTTOM-24V	A	From Leg	3.00	0.0000	100.00	No Ice	0.10	0.06	0.00
			0.00			1/2"	0.15	0.10	0.00
			0.00			Ice	0.20	0.15	0.01
						1" Ice			
ATBT-BOTTOM-24V	B	From Leg	3.00	0.0000	100.00	No Ice	0.10	0.06	0.00
			0.00			1/2"	0.15	0.10	0.00
			0.00			Ice	0.20	0.15	0.01
						1" Ice			
ATBT-BOTTOM-24V	C	From Leg	3.00	0.0000	100.00	No Ice	0.10	0.06	0.00
			0.00			1/2"	0.15	0.10	0.00
			0.00			Ice	0.20	0.15	0.01
						1" Ice			
(2) ETM19V2S12UB	A	From Leg	3.00	0.0000	100.00	No Ice	0.67	0.20	0.01
			0.00			1/2"	0.77	0.27	0.02
			0.00			Ice	0.88	0.34	0.02
						1" Ice			
(2) ETM19V2S12UB	B	From Leg	3.00	0.0000	100.00	No Ice	0.67	0.20	0.01
			0.00			1/2"	0.77	0.27	0.02
			0.00			Ice	0.88	0.34	0.02
						1" Ice			
(2) ETM19V2S12UB	C	From Leg	3.00	0.0000	100.00	No Ice	0.67	0.20	0.01
			0.00			1/2"	0.77	0.27	0.02
			0.00			Ice	0.88	0.34	0.02
						1" Ice			
Side Arm Mount [SO 701-3]	C	None		0.0000	100.00	No Ice	2.83	2.83	0.20
						1/2"	3.92	3.92	0.24
						Ice	5.01	5.01	0.28
						1" Ice			

Load Combinations

Comb. No.	Description
1	Dead Only

Comb. No.	Description
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	155.5 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.16	2.03	0.61
			Max. Mx	20	-25.44	727.50	5.24
			Max. My	2	-25.45	5.49	721.51
			Max. Vy	20	-27.53	727.50	5.24
			Max. Vx	2	-27.39	5.49	721.51
			Max. Torque	16			-1.28
L2	110 - 72.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86.31	2.03	0.61
			Max. Mx	20	-44.38	1952.68	9.88
			Max. My	2	-44.39	10.14	1941.46
			Max. Vy	20	-38.49	1952.68	9.88

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	72.5 - 36	Pole	Max. Vx	2	-38.35	10.14	1941.46
			Max. Torque	16			-0.97
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-116.46	2.03	0.61
			Max. Mx	20	-66.20	3488.66	14.40
			Max. My	2	-66.20	14.67	3472.34
			Max. Vy	20	-46.57	3488.66	14.40
			Max. Vx	2	-46.42	14.67	3472.34
L4	36 - 0	Pole	Max. Torque	16			-0.97
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-154.28	2.03	0.61
			Max. Mx	20	-94.78	5774.69	19.99
			Max. My	2	-94.78	20.26	5752.07
			Max. Vy	20	-54.76	5774.69	19.99
			Max. Vx	2	-54.62	20.26	5752.07
			Max. Torque	16			-0.97

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	154.28	0.00	0.00
	Max. H _x	20	94.80	54.73	0.12
	Max. H _z	2	94.80	0.12	54.59
	Max. M _x	2	5752.07	0.12	54.59
	Max. M _z	8	5773.72	-54.73	-0.12
	Max. Torsion	4	0.97	-27.26	47.22
	Min. Vert	5	71.10	-27.26	47.22
	Min. H _x	8	94.80	-54.73	-0.12
	Min. H _z	14	94.80	-0.12	-54.59
	Min. M _x	14	-5751.64	-0.12	-54.59
	Min. M _z	20	-5774.69	54.73	0.12
	Min. Torsion	16	-0.97	27.26	-47.22

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	79.00	0.00	0.00	-0.17	0.39	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	94.80	-0.12	-54.59	-5752.07	20.26	-0.91
0.9 Dead+1.6 Wind 0 deg - No Ice	71.10	-0.12	-54.59	-5727.77	20.04	-0.91
1.2 Dead+1.6 Wind 30 deg - No Ice	94.80	27.26	-47.22	-4971.58	-2869.50	-0.97
0.9 Dead+1.6 Wind 30 deg - No Ice	71.10	27.26	-47.22	-4950.58	-2857.53	-0.96
1.2 Dead+1.6 Wind 60 deg - No Ice	94.80	47.34	-27.19	-2859.02	-4990.24	-0.76
0.9 Dead+1.6 Wind 60 deg - No Ice	71.10	47.34	-27.19	-2846.92	-4969.32	-0.76
1.2 Dead+1.6 Wind 90 deg - No Ice	94.80	54.73	0.12	19.56	-5773.72	-0.36
0.9 Dead+1.6 Wind 90 deg - No Ice	71.10	54.73	0.12	19.52	-5749.49	-0.36
1.2 Dead+1.6 Wind 120 deg - No Ice	94.80	47.46	27.40	2892.83	-5010.01	0.13
0.9 Dead+1.6 Wind 120 deg - No Ice	71.10	47.46	27.40	2880.68	-4988.99	0.13

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.6 Wind 150 deg - No Ice	94.80	27.47	47.34	4990.92	-2903.74	0.59
0.9 Dead+1.6 Wind 150 deg - No Ice	71.10	27.47	47.34	4969.93	-2891.60	0.59
1.2 Dead+1.6 Wind 180 deg - No Ice	94.80	0.12	54.59	5751.64	-19.29	0.89
0.9 Dead+1.6 Wind 180 deg - No Ice	71.10	0.12	54.59	5727.45	-19.32	0.89
1.2 Dead+1.6 Wind 210 deg - No Ice	94.80	-27.26	47.22	4971.16	2870.47	0.97
0.9 Dead+1.6 Wind 210 deg - No Ice	71.10	-27.26	47.22	4950.26	2858.25	0.96
1.2 Dead+1.6 Wind 240 deg - No Ice	94.80	-47.34	27.19	2858.59	4991.21	0.78
0.9 Dead+1.6 Wind 240 deg - No Ice	71.10	-47.34	27.19	2846.60	4970.04	0.77
1.2 Dead+1.6 Wind 270 deg - No Ice	94.80	-54.73	-0.12	-19.99	5774.69	0.38
0.9 Dead+1.6 Wind 270 deg - No Ice	71.10	-54.73	-0.12	-19.84	5750.21	0.37
1.2 Dead+1.6 Wind 300 deg - No Ice	94.80	-47.46	-27.40	-2893.26	5010.98	-0.13
0.9 Dead+1.6 Wind 300 deg - No Ice	71.10	-47.46	-27.40	-2881.00	4989.71	-0.13
1.2 Dead+1.6 Wind 330 deg - No Ice	94.80	-27.47	-47.34	-4991.35	2904.71	-0.60
0.9 Dead+1.6 Wind 330 deg - No Ice	71.10	-27.47	-47.34	-4970.25	2892.33	-0.60
1.2 Dead+1.0 Ice+1.0 Temp	154.28	0.00	0.00	-0.61	2.03	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	154.28	-0.02	-12.26	-1378.51	5.65	-0.15
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	154.28	6.12	-10.60	-1192.15	-685.72	-0.15
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	154.28	10.62	-6.11	-686.53	-1192.78	-0.10
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	154.28	12.28	0.02	2.87	-1379.67	-0.03
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	154.28	10.65	6.15	691.33	-1196.30	0.05
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	154.28	6.16	10.62	1194.38	-691.81	0.12
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	154.28	0.02	12.26	1377.22	-1.37	0.15
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	154.28	-6.12	10.60	1190.86	690.00	0.15
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	154.28	-10.62	6.11	685.24	1197.06	0.10
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	154.28	-12.28	-0.02	-4.16	1383.95	0.03
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	154.28	-10.65	-6.15	-692.62	1200.58	-0.05
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	154.28	-6.16	-10.62	-1195.67	696.09	-0.12
Dead+Wind 0 deg - Service	79.00	-0.02	-10.77	-1132.23	4.29	-0.18
Dead+Wind 30 deg - Service	79.00	5.38	-9.32	-978.62	-564.45	-0.19
Dead+Wind 60 deg - Service	79.00	9.34	-5.37	-562.83	-981.84	-0.15
Dead+Wind 90 deg - Service	79.00	10.80	0.02	3.71	-1136.04	-0.07
Dead+Wind 120 deg - Service	79.00	9.37	5.41	569.22	-985.73	0.03
Dead+Wind 150 deg - Service	79.00	5.42	9.34	982.15	-571.19	0.12
Dead+Wind 180 deg - Service	79.00	0.02	10.77	1131.87	-3.49	0.18
Dead+Wind 210 deg - Service	79.00	-5.38	9.32	978.26	565.26	0.19
Dead+Wind 240 deg - Service	79.00	-9.34	5.37	562.48	982.65	0.15
Dead+Wind 270 deg - Service	79.00	-10.80	-0.02	-4.07	1136.85	0.07

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - Service	79.00	-9.37	-5.41	-569.57	986.54	-0.03
Dead+Wind 330 deg - Service	79.00	-5.42	-9.34	-982.51	572.00	-0.12

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-79.00	0.00	0.00	79.00	0.00	0.000%
2	-0.12	-94.80	-54.59	0.12	94.80	54.59	0.000%
3	-0.12	-71.10	-54.59	0.12	71.10	54.59	0.000%
4	27.26	-94.80	-47.22	-27.26	94.80	47.22	0.000%
5	27.26	-71.10	-47.22	-27.26	71.10	47.22	0.000%
6	47.34	-94.80	-27.19	-47.34	94.80	27.19	0.000%
7	47.34	-71.10	-27.19	-47.34	71.10	27.19	0.000%
8	54.73	-94.80	0.12	-54.73	94.80	-0.12	0.000%
9	54.73	-71.10	0.12	-54.73	71.10	-0.12	0.000%
10	47.46	-94.80	27.40	-47.46	94.80	-27.40	0.000%
11	47.46	-71.10	27.40	-47.46	71.10	-27.40	0.000%
12	27.47	-94.80	47.34	-27.47	94.80	-47.34	0.000%
13	27.47	-71.10	47.34	-27.47	71.10	-47.34	0.000%
14	0.12	-94.80	54.59	-0.12	94.80	-54.59	0.000%
15	0.12	-71.10	54.59	-0.12	71.10	-54.59	0.000%
16	-27.26	-94.80	47.22	27.26	94.80	-47.22	0.000%
17	-27.26	-71.10	47.22	27.26	71.10	-47.22	0.000%
18	-47.34	-94.80	27.19	47.34	94.80	-27.19	0.000%
19	-47.34	-71.10	27.19	47.34	71.10	-27.19	0.000%
20	-54.73	-94.80	-0.12	54.73	94.80	0.12	0.000%
21	-54.73	-71.10	-0.12	54.73	71.10	0.12	0.000%
22	-47.46	-94.80	-27.40	47.46	94.80	27.40	0.000%
23	-47.46	-71.10	-27.40	47.46	71.10	27.40	0.000%
24	-27.47	-94.80	-47.34	27.47	94.80	47.34	0.000%
25	-27.47	-71.10	-47.34	27.47	71.10	47.34	0.000%
26	0.00	-154.28	0.00	0.00	154.28	0.00	0.000%
27	-0.02	-154.28	-12.26	0.02	154.28	12.26	0.000%
28	6.12	-154.28	-10.60	-6.12	154.28	10.60	0.000%
29	10.62	-154.28	-6.11	-10.62	154.28	6.11	0.000%
30	12.28	-154.28	0.02	-12.28	154.28	-0.02	0.000%
31	10.65	-154.28	6.15	-10.65	154.28	-6.15	0.000%
32	6.16	-154.28	10.62	-6.16	154.28	-10.62	0.000%
33	0.02	-154.28	12.26	-0.02	154.28	-12.26	0.000%
34	-6.12	-154.28	10.60	6.12	154.28	-10.60	0.000%
35	-10.62	-154.28	6.11	10.62	154.28	-6.11	0.000%
36	-12.28	-154.28	-0.02	12.28	154.28	0.02	0.000%
37	-10.65	-154.28	-6.15	10.65	154.28	6.15	0.000%
38	-6.16	-154.28	-10.62	6.16	154.28	10.62	0.000%
39	-0.02	-79.00	-10.77	0.02	79.00	10.77	0.000%
40	5.38	-79.00	-9.32	-5.38	79.00	9.32	0.000%
41	9.34	-79.00	-5.37	-9.34	79.00	5.37	0.000%
42	10.80	-79.00	0.02	-10.80	79.00	-0.02	0.000%
43	9.37	-79.00	5.41	-9.37	79.00	-5.41	0.000%
44	5.42	-79.00	9.34	-5.42	79.00	-9.34	0.000%
45	0.02	-79.00	10.77	-0.02	79.00	-10.77	0.000%
46	-5.38	-79.00	9.32	5.38	79.00	-9.32	0.000%
47	-9.34	-79.00	5.37	9.34	79.00	-5.37	0.000%
48	-10.80	-79.00	-0.02	10.80	79.00	0.02	0.000%
49	-9.37	-79.00	-5.41	9.37	79.00	5.41	0.000%
50	-5.42	-79.00	-9.34	5.42	79.00	9.34	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00006878
3	Yes	4	0.00000001	0.00003745
4	Yes	4	0.00000001	0.00063398
5	Yes	4	0.00000001	0.00041220
6	Yes	4	0.00000001	0.00065969
7	Yes	4	0.00000001	0.00042961
8	Yes	4	0.00000001	0.00006070
9	Yes	4	0.00000001	0.00003054
10	Yes	4	0.00000001	0.00066477
11	Yes	4	0.00000001	0.00043238
12	Yes	4	0.00000001	0.00065368
13	Yes	4	0.00000001	0.00042493
14	Yes	4	0.00000001	0.00006413
15	Yes	4	0.00000001	0.00003360
16	Yes	4	0.00000001	0.00066164
17	Yes	4	0.00000001	0.00043101
18	Yes	4	0.00000001	0.00063763
19	Yes	4	0.00000001	0.00041454
20	Yes	4	0.00000001	0.00006280
21	Yes	4	0.00000001	0.00003236
22	Yes	4	0.00000001	0.00066172
23	Yes	4	0.00000001	0.00043017
24	Yes	4	0.00000001	0.00067104
25	Yes	4	0.00000001	0.00043664
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00089005
28	Yes	4	0.00000001	0.00090576
29	Yes	4	0.00000001	0.00090622
30	Yes	4	0.00000001	0.00088977
31	Yes	4	0.00000001	0.00091029
32	Yes	4	0.00000001	0.00090935
33	Yes	4	0.00000001	0.00088853
34	Yes	4	0.00000001	0.00090728
35	Yes	4	0.00000001	0.00090969
36	Yes	4	0.00000001	0.00089466
37	Yes	4	0.00000001	0.00091551
38	Yes	4	0.00000001	0.00091358
39	Yes	4	0.00000001	0.00001026
40	Yes	4	0.00000001	0.00001373
41	Yes	4	0.00000001	0.00001409
42	Yes	4	0.00000001	0.00001024
43	Yes	4	0.00000001	0.00001410
44	Yes	4	0.00000001	0.00001395
45	Yes	4	0.00000001	0.00001024
46	Yes	4	0.00000001	0.00001414
47	Yes	4	0.00000001	0.00001378
48	Yes	4	0.00000001	0.00001026
49	Yes	4	0.00000001	0.00001408
50	Yes	4	0.00000001	0.00001423

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155.5 - 110	5.920	49	0.2734	0.0002
L2	118 - 72.5	3.819	49	0.2550	0.0001
L3	81 - 36	2.002	49	0.2044	0.0001
L4	45 - 0	0.696	49	0.1310	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.00	DB809K-Y	49	5.920	0.2734	0.0002	445968
144.00	(2) 7770.00 w/ Mount Pipe	49	5.263	0.2699	0.0002	193899
135.00	742 213 w/ Mount Pipe	49	4.754	0.2663	0.0001	108772
127.00	T-Arm Mount [TA 602-3]	49	4.308	0.2619	0.0001	78240
126.00	APXVSPP18-C-A20 w/ Mount Pipe	49	4.253	0.2612	0.0001	75587
125.00	T-Arm Mount [TA 602-3]	49	4.199	0.2605	0.0001	73109
100.00	LNx-6515DS-VTM w/ Mount Pipe	49	2.892	0.2342	0.0001	47727

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155.5 - 110	30.072	22	1.3886	0.0010
L2	118 - 72.5	19.405	22	1.2956	0.0006
L3	81 - 36	10.171	22	1.0386	0.0003
L4	45 - 0	3.536	22	0.6657	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.00	DB809K-Y	22	30.072	1.3886	0.0010	88124
144.00	(2) 7770.00 w/ Mount Pipe	22	26.734	1.3708	0.0009	38314
135.00	742 213 w/ Mount Pipe	22	24.149	1.3526	0.0008	21493
127.00	T-Arm Mount [TA 602-3]	22	21.888	1.3303	0.0007	15459
126.00	APXVSPP18-C-A20 w/ Mount Pipe	22	21.608	1.3270	0.0007	14935
125.00	T-Arm Mount [TA 602-3]	22	21.330	1.3236	0.0006	14445
100.00	LNx-6515DS-VTM w/ Mount Pipe	22	14.693	1.1900	0.0004	9413

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	155.5 - 110	TP64.606x58.6x0.375	45.50	0.00	0.0	76.283	-25.44	3989.11	0.006
	(1)					8			
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	45.50	0.00	0.0	94.732	-44.38	5321.74	0.008
						4			
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	45.00	0.00	0.0	114.40	-66.20	6775.62	0.010
						70			
L4	36 - 0 (4)	TP76.5x70.56x0.5	45.00	0.00	0.0	122.36	-94.78	6928.62	0.014
						00			

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux}	ϕM_{nx}	Ratio	M_{uy}	ϕM_{ny}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	730.47	5144.30	0.142	0.00	5144.30	0.000
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	1958.36	7300.90	0.268	0.00	7300.90	0.000
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	3496.97	9817.58	0.356	0.00	9817.58	0.000
L4	36 - 0 (4)	TP76.5x70.56x0.5	5786.27	10742.08	0.539	0.00	10742.08	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u	ϕV_n	Ratio	Actual T_u	ϕT_n	Ratio
			K	K	$\frac{V_u}{\phi V_n}$	kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	27.61	1994.56	0.014	0.13	10431.00	0.000
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	38.56	2660.87	0.014	0.13	14803.92	0.000
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	46.64	3387.81	0.014	0.13	19907.00	0.000
L4	36 - 0 (4)	TP76.5x70.56x0.5	54.83	3464.31	0.016	0.13	21781.58	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	155.5 - 110 (1)	0.006	0.142	0.000	0.014	0.000	0.149	1.000	4.8.2 ✓
L2	110 - 72.5 (2)	0.008	0.268	0.000	0.014	0.000	0.277	1.000	4.8.2 ✓
L3	72.5 - 36 (3)	0.010	0.356	0.000	0.014	0.000	0.366	1.000	4.8.2 ✓
L4	36 - 0 (4)	0.014	0.539	0.000	0.016	0.000	0.553	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	155.5 - 110	Pole	TP64.606x58.6x0.375	1	-25.44	3989.11	14.9	Pass
L2	110 - 72.5	Pole	TP68.805x62.8x0.4375	2	-44.38	5321.74	27.7	Pass
L3	72.5 - 36	Pole	TP72.748x66.8082x0.5	3	-66.20	6775.62	36.6	Pass
L4	36 - 0	Pole	TP76.5x70.56x0.5	4	-94.78	6928.62	55.3	Pass
Summary								
Pole (L4)							55.3	Pass
RATING =							55.3	Pass

APPENDIX B
BASE LEVEL DRAWING



(INSTALLED)
(12) 1-1/4" TO 100 FT LEVEL

(INSTALLED)
(6) 1-1/4" TO 135 FT LEVEL

(ABANDONED)
(3) 1-5/8" TO 156 FT LEVEL

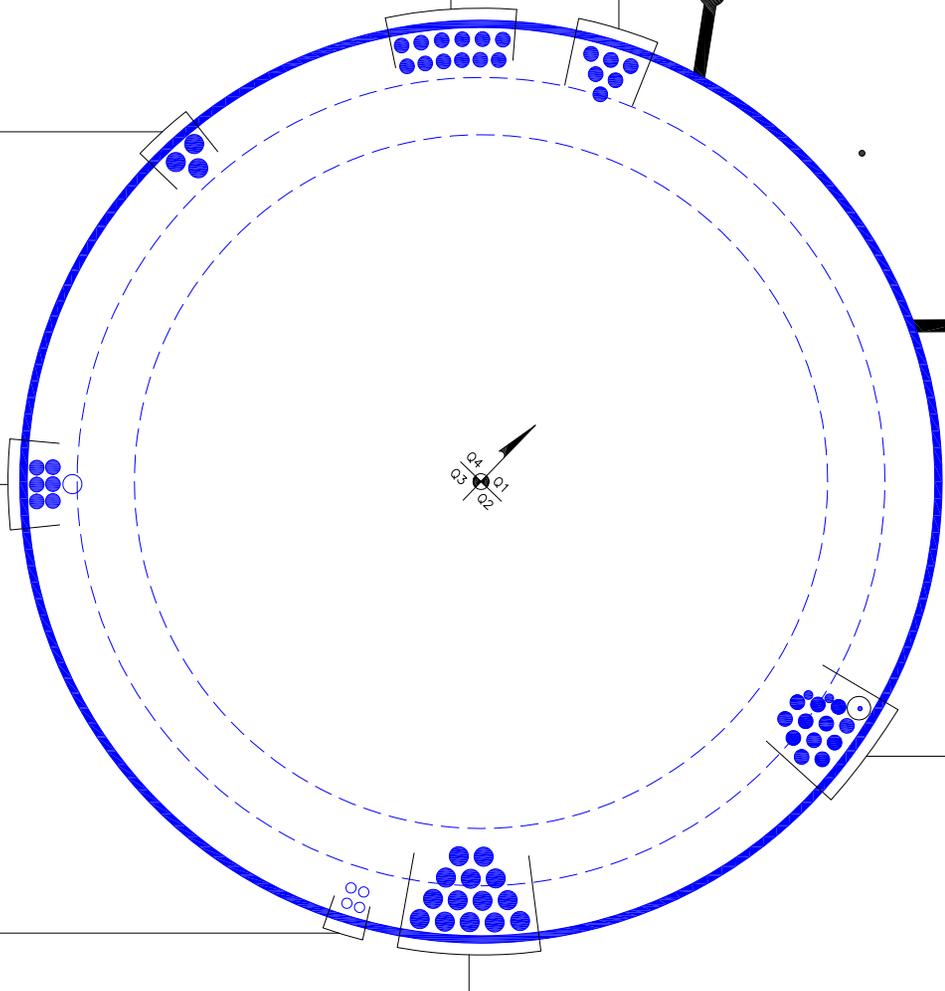
(RESERVED)
(1) 1-5/8" TO 126 FT LEVEL
(INSTALLED)
(6) 1-1/4" TO 126 FT LEVEL

CLIMBING PEGS
W/SAFETY CLIMB

(RESERVED)
(4) 7/8" TO 126 FT LEVEL

(INSTALLED-IN 2" CONDUIT)
(1) 3/8" TO 144 FT LEVEL
(INSTALLED)
(2) 3/4" TO 144 FT LEVEL
(12) 1-1/4" TO 144 FT LEVEL

(INSTALLED)
(14) 1-5/8" TO 156 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, UngROUTED, Circular Base Plate - Any Rod Material

TIA Rev G

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: 806366
Site Name: HRT 107(C) 943204
App #: 373777 Rev. 0
Pole Manufacturer: Other

Anchor Rod Data

Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	84.75	in

Plate Data

Diam:	91	in
Thick:	3.25	in
Grade:	60	ksi
Single-Rod B-eff:	10.25	in

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	76.5	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu:	5786	ft-kips
Axial, Pu:	95	kips
Shear, Vu:	55	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results

Max Rod (Cu+ Vu/η): 145.1 Kips
 Allowable Axial, Φ*Fu*Anet: 260.0 Kips
 Anchor Rod Stress Ratio: 55.8% **Pass**

Rigid
AISC LRFD
φ*Tn

Base Plate Results

Base Plate Stress: 13.6 ksi
 Allowable Plate Stress: 54.0 ksi
 Base Plate Stress Ratio: 25.1% **Pass**

Flexural Check

Rigid
AISC LRFD
φ*Fy
Y.L. Length:
36.47

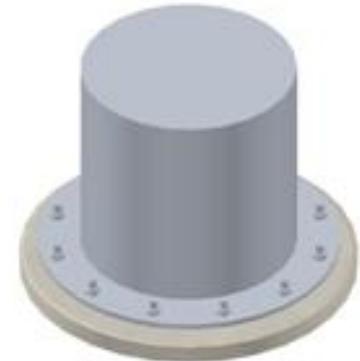
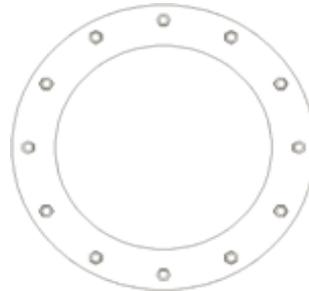
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Monopole Pier and Pad Foundation



BU # : 806366

Site Name: HRT 107(C) 943204

App. Number: 373777 Rev. 0

TIA-222 Revision: G

Design Reactions		
Shear, S:	55	kips
Moment, M:	5786	ft-kips
Tower Height, H:	155.5	ft
Tower Weight, Wt:	95	kips
Base Diameter, BD:	6.38	ft

Foundation Dimensions		
Depth, D:	7.5	ft
Pad Width, W:	33.25	ft
Neglected Depth, N:	4.5	ft
Thickness, T:	4.50	ft
Pier Diameter, Pd:	9.00	ft
Ext. Above Grade, E:	0.50	ft
BP Dist. Above Pier:	3	in.
Clear Cover, Cc:	3.0	in

Soil Properties		
Soil Unit Weight, γ:	0.130	kcf
Ult. Bearing Capacity, Bc:	21.0	ksf
Angle of Friction, Φ:	40	deg
Cohesion, C_o:	0.000	ksf
Passive Pressure, P_p:	0.000	ksf
Base Friction, μ:	0.40	

Material Properties		
Rebar Yield Strength, F_y:	60000	psi
Concrete Strength, F'_c:	4000	psi
Concrete Unit Weight, δ_c:	0.150	kcf
Seismic Zone, z:	1	

Rebar Properties		
Pier Rebar Size, S_p:	11	
Pier Rebar Quantity, m_p:	59	30
Pad Rebar Size, S_{pad}:	11	
Pad Rebar Quantity, m_{pad}:	25	13
Pier Tie Size, S_t:	5	4
Tie Quantity, m_t:	7	5

Design Checks			
	Capacity/ Availability	Demand/ Limits	Check
<i>Req'd Pier Diam. (ft)</i>	9	8.375	OK
<i>Overturing (ft-kips)</i>	18285.76	5786.00	31.6%
<i>Shear Capacity (kips)</i>	404.88	55.00	13.6%
<i>Bearing (ksf)</i>	15.75	2.04	13.0%
<i>Pad Shear - 1-way (kips)</i>	1903.79	526.13	27.6%
<i>Pad Shear - 2-way (kips)</i>	4745.62	171.34	3.6%
<i>Pad Moment Capacity (k-ft)</i>	8675.41	2089.97	24.1%
<i>Pier Moment Capacity (k-ft)</i>	17679.39	5978.50	33.8%

Maximum Allowable Moment of a Circular Pier

Axial Load (Negative for Compression) = kips

Pier Properties		Material Properties	
Concrete:		Concrete compressive strength =	<input type="text" value="4000"/> psi
Pier Diameter =	<input type="text" value="9.0"/> ft	Reinforcement yield strength =	<input type="text" value="60000"/> psi
Concrete Area =	9160.9 in ²	Modulus of elasticity =	<input type="text" value="29000"/> ksi
Reinforcement:		Reinforcement yield strain =	<input type="text" value="0.00207"/>
Clear Cover =	<input type="text" value="3.00"/> in	Limiting compressive strain =	<input type="text" value="0.003"/>
Cage Diameter =	8.38 ft	Seismic Properties	
Bar Size =	<input type="text" value="11"/>	Seismic Zone =	<input type="text" value="1"/>
Bar Diameter =	1.41 in		
Bar Area =	1.56 in ²		
Number of Bars =	<input type="text" value="59"/>		

Minimum Area of Steel

Required area of steel = 45.80 in²
 Provided area of steel = 92.04 in²

OK

Axial Loading

Load factor =
 Reduction factor = 0.9
 Factored axial load = -105.556 kips

Neutral Axis

Distance from extreme edge to neutral axis = **18.30** in
 Equivalent compression zone factor = 0.85
 Distance from extreme edge to
 equivalent compression zone factor = 15.55 in
 Distance from centroid to neutral axis = 35.70 in

Compression Zone

Area of steel in compression zone = 20.28 in²
 Angle from centroid of pier to intersection of
 equivalent compression zone and edge of pier = 44.60 deg
 Area of concrete in compression = 812.24 in²
 Force in concrete = $0.85 * f_c * Acc$ = 2761.62 kips
 Total reinforcement forces = -2656.07 kips
 Factored axial load = -105.56 kips
 Force in concrete = -2761.62 kips
 Sum of the forces in concrete = 0.00 kips

OK

Maximum Moment

First moment of the concrete
 area in compression about the centroid = 36349.10 in³
 Distance between centroid of concrete
 in compression and centroid of pier = 44.75 in
 Moment of concrete in compression = 123586.95 in-kips
 Total reinforcement moment = 112138.28 in-kips
 Nominal moment strength of column = 235725.24 in-kips
 Factored moment strength of column = 212152.71 in-kips

Maximum Allowable Moment = ft-kips

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compression (in ²)	Stress (ksi)	Axial force (kips)
1	0.00	0.00	-35.70	-38.45	-0.0058532	0.00	-60.00	-93.60
2	6.10	5.35	-30.36	-33.10	-0.0049767	0.00	-60.00	-93.60
3	12.20	10.63	-25.07	-27.81	-0.0041102	0.00	-60.00	-93.60
4	18.31	15.80	-19.91	-22.65	-0.0032634	0.00	-60.00	-93.60
5	24.41	20.78	-14.92	-17.66	-0.0024459	0.00	-60.00	-93.60
6	30.51	25.53	-10.17	-12.91	-0.0016671	0.00	-48.35	-75.42
7	36.61	29.99	-5.71	-8.45	-0.0009357	0.00	-27.13	-42.33
8	42.71	34.12	-1.59	-4.33	-0.00026	0.00	-7.54	-11.76
9	48.81	37.85	2.15	-0.60	0.0003523	0.00	10.22	15.94
10	54.92	41.16	5.46	2.71	0.0008943	1.56	25.94	35.16
11	61.02	44.00	8.29	5.55	0.0013599	1.56	39.44	56.22
12	67.12	46.34	10.64	7.89	0.0017437	1.56	50.57	73.58
13	73.22	48.15	12.45	9.71	0.0020415	1.56	59.20	87.05
14	79.32	49.42	13.72	10.98	0.0022498	1.56	60.00	88.30
15	85.42	50.13	14.43	11.69	0.0023663	1.56	60.00	88.30
16	91.53	50.28	14.58	11.83	0.0023897	1.56	60.00	88.30
17	97.63	49.85	14.15	11.40	0.0023196	1.56	60.00	88.30
18	103.73	48.86	13.16	10.41	0.002157	1.56	60.00	88.30
19	109.83	47.31	11.61	8.87	0.0019036	1.56	55.20	80.81
20	115.93	45.23	9.53	6.78	0.0015623	1.56	45.31	65.38
21	122.03	42.64	6.94	4.19	0.001137	1.56	32.97	46.14
22	128.14	39.56	3.86	1.11	0.0006325	1.56	18.34	23.31
23	134.24	36.03	0.33	-2.41	5.454E-05	0.00	1.58	2.47
24	140.34	32.10	-3.60	-6.35	-0.0005904	0.00	-17.12	-26.71
25	146.44	27.80	-7.90	-10.64	-0.0012949	0.00	-37.55	-58.58
26	152.54	23.19	-12.51	-15.26	-0.0020511	0.00	-59.48	-92.79
27	158.64	18.32	-17.39	-20.13	-0.0028504	0.00	-60.00	-93.60
28	164.75	13.23	-22.47	-25.21	-0.0036837	0.00	-60.00	-93.60
29	170.85	8.00	-27.70	-30.45	-0.0045416	0.00	-60.00	-93.60
30	176.95	2.68	-33.02	-35.77	-0.0054143	0.00	-60.00	-93.60
31	183.05	-2.68	-38.38	-41.12	-0.0062921	0.00	-60.00	-93.60
32	189.15	-8.00	-43.70	-46.45	-0.0071648	0.00	-60.00	-93.60
33	195.25	-13.23	-48.93	-51.68	-0.0080227	0.00	-60.00	-93.60
34	201.36	-18.32	-54.02	-56.76	-0.008856	0.00	-60.00	-93.60
35	207.46	-23.19	-58.89	-61.64	-0.0096553	0.00	-60.00	-93.60
36	213.56	-27.80	-63.50	-66.25	-0.0104115	0.00	-60.00	-93.60
37	219.66	-32.10	-67.80	-70.55	-0.011116	0.00	-60.00	-93.60
38	225.76	-36.03	-71.74	-74.48	-0.0117609	0.00	-60.00	-93.60
39	231.86	-39.56	-75.26	-78.01	-0.0123389	0.00	-60.00	-93.60
40	237.97	-42.64	-78.34	-81.08	-0.0128434	0.00	-60.00	-93.60
41	244.07	-45.23	-80.93	-83.68	-0.0132687	0.00	-60.00	-93.60
42	250.17	-47.31	-83.01	-85.76	-0.01361	0.00	-60.00	-93.60
43	256.27	-48.86	-84.56	-87.30	-0.0138634	0.00	-60.00	-93.60
44	262.37	-49.85	-85.55	-88.30	-0.014026	0.00	-60.00	-93.60
45	268.47	-50.28	-85.98	-88.72	-0.014096	0.00	-60.00	-93.60
46	274.58	-50.13	-85.84	-88.58	-0.0140727	0.00	-60.00	-93.60
47	280.68	-49.42	-85.13	-87.87	-0.0139562	0.00	-60.00	-93.60

USGS Design Maps Summary Report

User-Specified Input

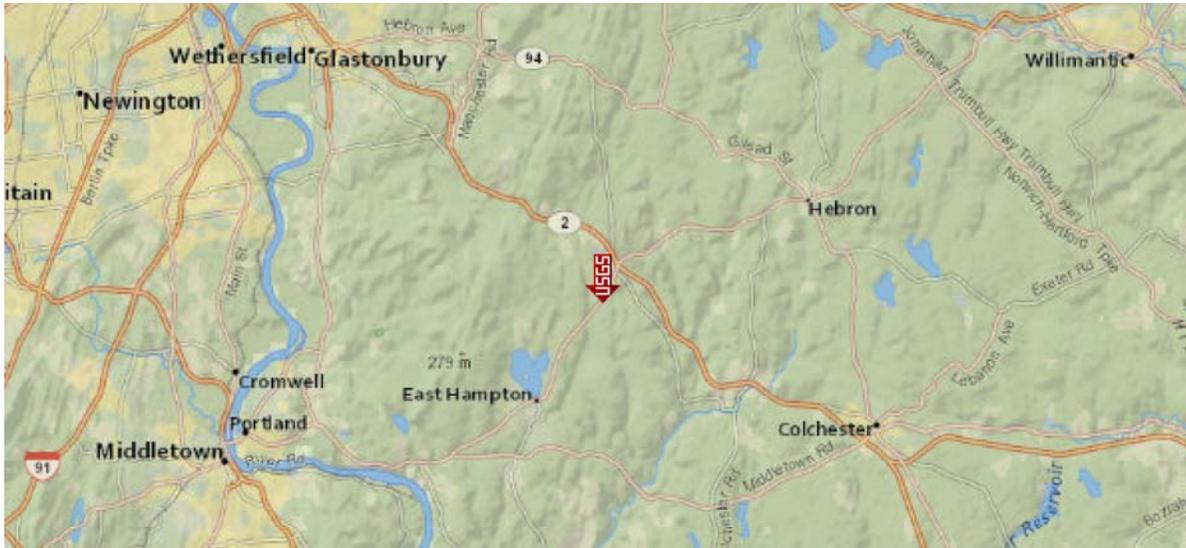
Report Title 806366
 Wed January 11, 2017 21:10:41 UTC

Building Code Reference Document 2012/2015 International Building Code
 (which utilizes USGS hazard data available in 2008)

Site Coordinates 41.62981°N, 72.4665°W

Site Soil Classification Site Class D – “Stiff Soil”

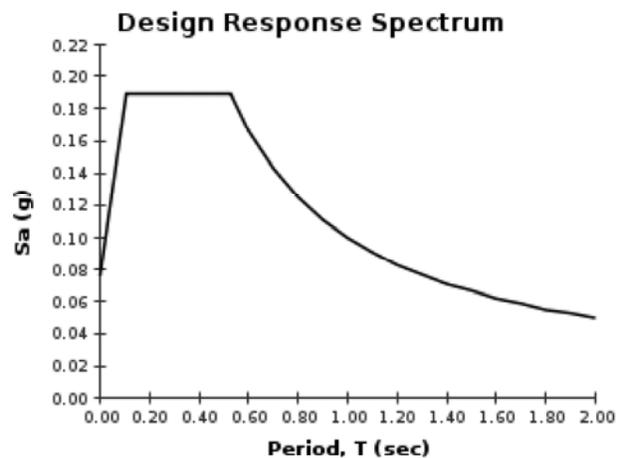
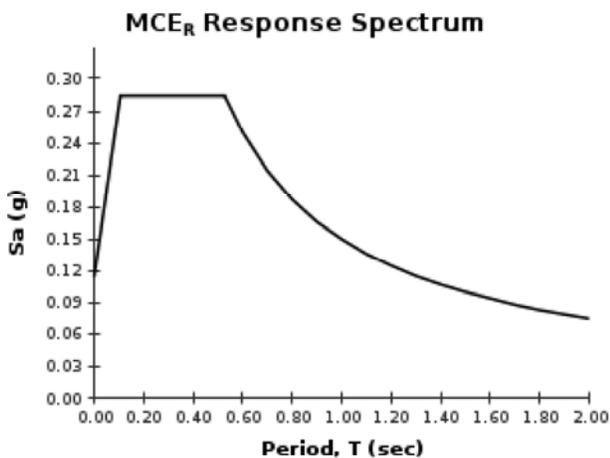
Risk Category I/II/III



USGS-Provided Output

$S_s = 0.177 \text{ g}$	$S_{MS} = 0.284 \text{ g}$	$S_{DS} = 0.189 \text{ g}$
$S_1 = 0.062 \text{ g}$	$S_{M1} = 0.150 \text{ g}$	$S_{D1} = 0.100 \text{ g}$

For information on how the S_s and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.



CCISeismic - Design Category

Per 2012/2015 IBC

Site BU: 806366
 Work Order: 1347449
 Application: 373777 Rev. 0



	Degrees	Minutes	Seconds		
Site Latitude =	41	37	47.30	41.6298	degrees
Site Longitude =	-72	27	59.40	-72.4665	degrees
Ground Supported Structure =	Yes				
Structure Class =	II				(Table 2-1)
Site Class =	D - Stiff Soil				(Table 2-11)
Spectral response acceleration short periods, S_S =	0.177				USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.062				
Importance Factor, I =	1.0				(Table 2-3)
Acceleration-based site coefficient, F_a =	1.6				(Table 2-12)
Velocity-based site coefficient, F_v =	2.4				(Table 2-13)
Design spectral response acceleration short period, S_{DS} =	0.189				(2.7.6)
Design spectral response acceleration 1 s period, S_{D1} =	0.099				(2.7.6)
Seismic Design Category - Short Period Response =	B				ASCE 7-05 Table 11.6-1
Seismic Design Category - 1s Period Response =	B				ASCE 7-05 Table 11.6-2
Worst Case Seismic Design Category =	B				ASCE 7-05 Tables 11.6-1 and 6-2



Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT1073

Marlborough Country Barn
43 North Main Street
Marlborough, CT 6447

January 26, 2017

Centerline Communications Project Number: 950006-025

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	17.26 %



January 26, 2017

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT1073 – Marlborough Country Barn**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility located at **43 North Main Street, Marlborough, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.



CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **43 North Main Street, Marlborough, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60
GSM	850 MHz	2	30
GSM	1900 MHz (PCS)	2	30

Table 1: Channel Data Table



The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	144
A	2	KMW AM-X-CD-16-65-00T-RET	144
A	3	Powerwave 7770	144
B	1	Powerwave 7770	144
B	2	KMW AM-X-CD-16-65-00T-RET	144
B	3	Powerwave 7770	144
C	1	Powerwave 7770	144
C	2	KMW AM-X-CD-16-65-00T-RET	144
C	3	Powerwave 7770	144

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.52
Antenna A2	KMW AM-X-CD-16-65-00T-RET	700 MHz / 1900 MHz (PCS)	13.35 / 15.25	4	240	6,614.85	1.81
Antenna A3	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.52
Sector A Composite MPE%							2.85
Antenna B1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.52
Antenna B2	KMW AM-X-CD-16-65-00T-RET	700 MHz / 1900 MHz (PCS)	13.35 / 15.25	4	240	6,614.85	1.81
Antenna B3	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.52
Sector B Composite MPE%							2.85
Antenna C1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.52
Antenna C2	KMW AM-X-CD-16-65-00T-RET	700 MHz / 1900 MHz (PCS)	13.35 / 15.25	4	240	6,614.85	1.81
Antenna C3	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.52
Sector C Composite MPE%							2.85

Table 3: AT&T Emissions Levels



The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
AT&T – Max Sector Value	2.85 %
MetroPCS	0.41 %
Verizon Wireless	3.59 %
T-Mobile	3.44 %
Town	6.03 %
Sprint	0.94 %
Site Total MPE %:	17.26 %

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	2.85 %
AT&T Sector B Total:	2.85 %
AT&T Sector C Total:	2.85 %
Site Total:	17.26 %

Table 5: Site MPE Summary



Per FCC OET 65, carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	144	1.56	850 MHz	567	0.28%
AT&T 1900 MHz (PCS) UMTS	2	656.33	144	2.48	1900 MHz (PCS)	1000	0.25%
AT&T 700 MHz LTE	2	1,297.63	144	4.90	700 MHz	467	1.05%
AT&T 1900 MHz (PCS) LTE	2	2,009.79	144	7.59	1900 MHz (PCS)	1000	0.76%
AT&T 850 MHz GSM	2	414.12	144	1.56	850 MHz	567	0.28%
AT&T 1900 MHz (PCS) GSM	2	656.33	144	2.48	1900 MHz (PCS)	1000	0.25%
						Total:	2.85%

Table 6: AT&T Maximum Sector MPE Power Values



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	2.85 %
Sector B:	2.85 %
Sector C:	2.85 %
AT&T Maximum Total (per sector):	2.85 %
Site Total:	17.26 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **17.26 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

A handwritten signature in black ink, appearing to read 'Scott Heffernan', is positioned above the printed name.

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