



**Centek Engineering, Inc.**  
3-2 North Branford Road  
Branford, Connecticut 06405  
Phone: (203) 488-0580  
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**Steven L. Levine**  
Real Estate Consultant

HAND DELIVERED

October 5, 2015

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

**Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 85 (aka 15) Miner Lane, Waterford**

Dear Ms. Bachman:

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

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

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

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

The changes to the facility do not constitute modifications as defined in Connecticut General

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

1. The height of the overall structure will not increase.
2. The proposed changes will not extend the site boundaries.
3. The proposed changes will not increase the noise level at the site boundary by six decibels or more, or to levels that exceed state and local criteria.
4. The changes will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The structure and its foundation can support the proposed antennas and equipment.

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

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

Sincerely,



Steven L. Levine  
Real Estate Consultant

cc: Town CEO – Honorable Dan Steward, 1<sup>st</sup> Selectman, Town of Waterford  
Land Owner of Record – Town of Waterford  
Tower Owner / Operator – American Tower

Attachments

**NEW CINGULAR WIRELESS PCS, LLC  
Equipment Modification**

85 (aka 15) Miner Lane, Waterford  
AT&T Site CT2023  
CSC Approvals: Docket 67.2  
Petition 886  
Exempt Mods 9/02, 1/09, 4/11

**Tower Owner/Manager:** American Tower

**Land Owner of Record:** Town of Waterford

**Lease Area:** The Miner Lane facility was approved by the Council in Docket 67.2 as a 150 ft monopole. In Petition 886, the Council approved replacement of the tower with a 180 ft monopole and expansion of the fenced compound. (See attached site plan from Petition 886.) Since all proposed equipment modifications will occur either on the existing tower structure or within AT&T's existing equipment shelter, the proposed modifications will not extend either AT&T's lease area or the overall site boundaries approved in Petition 886.

**Equipment Configuration:** Monopole

**Current and/or approved:** Six Powerwave 7770 antennas @ 153 ft c.l.  
Three KMW AM-X-CD-14-65-00T-RET antennas @ 153 ft c.l.  
Six Powerwave TMA's and six Powerwave diplexers @ 153 ft  
Six Ericsson RRUS-11 remote radio heads @ 153 ft  
One Raycap DC6-48-60-18-8F surge arrestor @ 153 ft  
Twelve runs 1 ¼ inch coax  
Two DC lines and one fiber line  
Equipment shelter

**Planned Modifications:** Install three Andrew SBNHH-1D65A antennas @ 153 ft c.l.  
Remove existing six TMA's and six diplexers.  
Install six Powerwave TMA's & six Powerwave diplexers @ 153 ft.  
Install one Raycap DC6-48-60-18-8F surge arrestor @ 153 ft.  
Install three Ericsson RRUS-11 remote radio heads with A-2 modules @ 153 ft.  
Install two additional DC lines and one additional fiber line.

**Power Density:**

Worst-case calculations with 10 dB reduction for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at six feet above ground level beside the tower, of approximately 4.2 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 3.1 % of the standard.

**Existing**

Carrier & Technology	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm <sup>2</sup> )	Standard Limits (mW/cm <sup>2</sup> )	Percent of Limit
Other Users *							2.34
AT&T LTE *	153	740 - 746	1	500	0.0083	0.4933	0.17
AT&T UMTS *	153	880 - 894	1	500	0.0083	0.5867	0.14
AT&T UMTS *	153	1900 Band	2	500	0.0166	1.0000	0.17
AT&T GSM *	153	880 - 894	7	296	0.0345	0.5867	0.59
AT&T GSM *	153	1900 Band	11	427	0.0782	1.0000	0.78
<b>Total</b>							<b>4.19%</b>

\* Per CSC records

**Proposed**

Carrier & Technology	Centerline Ht (feet)	Antenna	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm <sup>2</sup> )	Standard Limits (mW/cm <sup>2</sup> )	Percent of Limit
Other Users *								2.34
AT&T LTE	153	KMW	700 Band	1	500	0.0083	0.4667	0.18
AT&T LTE	153	KMW	1900 Band	1	500	0.0083	1.0000	0.08
AT&T LTE	153	Andrew	2300 Band	1	500	0.0083	1.0000	0.08
AT&T UMTS	153	PW	880 - 894	2	500	0.0166	0.5867	0.28
AT&T UMTS	153	PW	1900 Band	1	500	0.0083	1.0000	0.08
AT&T GSM	153	PW	880 - 894	1	296	0.0049	0.5867	0.08
<b>Total</b>								<b>3.14%</b>

\* Per CSC Records

**Structural information:**

The attached structural analysis demonstrates that the tower and foundation has adequate structural capacity to accommodate the proposed equipment modifications. (American Tower Corp, 9/10/15)



**PROJECT INFORMATION**

SCOPE OF WORK: TELECOMMUNICATIONS FACILITY UPGRADE (LTE-3C 2015):  
 TOWER:  
 REMOVE: (3) GSM/UMTS ANTENNAS  
 INSTALL: (3) NEW LTE 3C ANTENNAS, (3) RRH'S, (3) A2 MODULE.  
 (1) SURGE ARRESTOR, (2) DC POWER LINES AND (1) FIBER RUN  
 EXISTING TO REMAIN: (12) LINES OF COAX, (2) DC POWER LINES, (1) FIBER RUN,  
 (1) SURGE ARRESTOR, (3) GSM/UMTS ANTENNAS, (3) LTE ANTENNAS,  
 (6) RRH'S, (6) TMA'S & (16) DIPLEXERS  
 EQUIPMENT ROOM:  
 INSTALL: (1) POWER PLANT, (2) LTE DUS  
 TOWER OWNER: CROWN CASTLE INTERNATIONAL CORP.  
 500 WEST CUMMINGS PARK #3600  
 WOBURN, MA 01801  
 SITE ADDRESS: 15 MINER LANE  
 WATERFORD, CT 06385  
 LATITUDE: 41.3291031° N 41° 19' 44.8" N  
 LONGITUDE: 72.1246100° W 72° 7' 28.6" W  
 TYPE OF SITE: LATTICE TOWER/ INDOOR EQUIPMENT  
 OVERALL  
 TOWER HEIGHT: 181'-0"±  
 RAD CENTER: 153'-0"±



**SITE NUMBER: CT2023**  
**SITE NAME: WATERFORD**

**DRAWING INDEX**

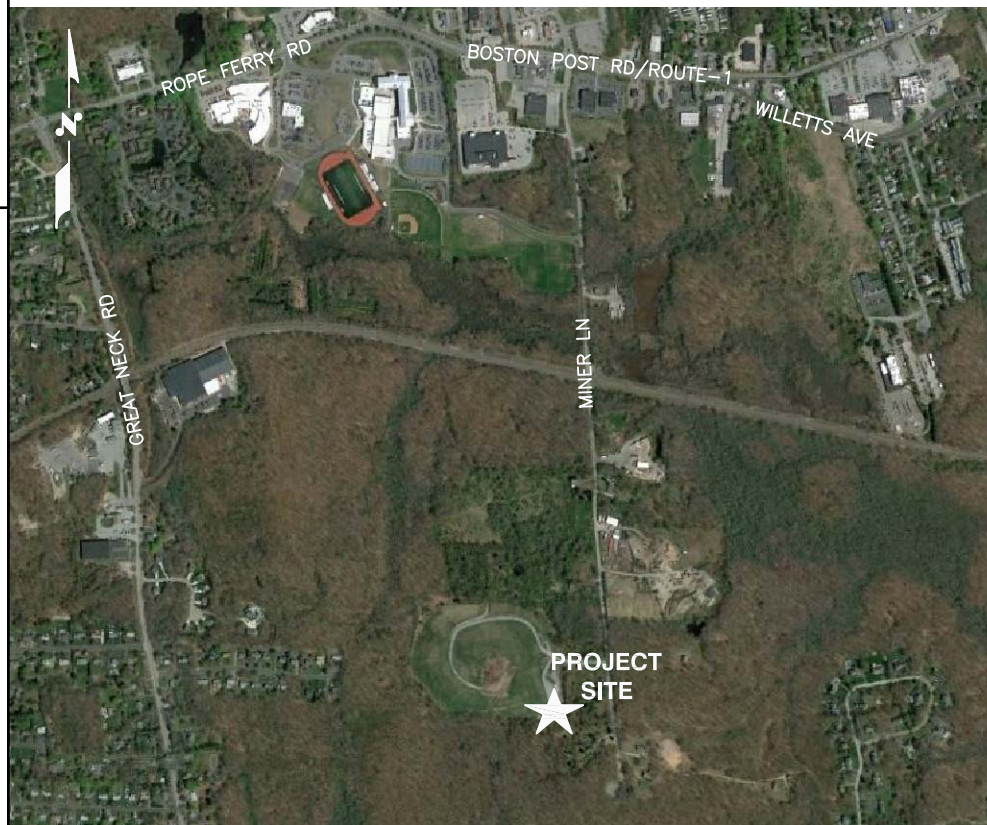
**REV**

- T-1 TITLE SHEET**
- GN-1 GENERAL NOTES**
- A-1 COMPOUND AND EQUIPMENT PLAN**
- A-2 ANTENNA LAYOUT AND ELEVATION**
- A-3 DETAILS**
- G-1 PLUMBING DIAGRAMS & DETAILS**

- 2**
- 2**
- 2**
- 2**
- 2**
- 2**

**VICINITY MAP**

DIRECTIONS TO SITE:  
 START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.3 MI. TURN LEFT ONTO WEST ST. 0.3 MI. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 1.4 MI. MERGE ONTO CT-9 S VIA EXIT 22S ON THE LEFT TOWARD MIDDLETOWN / OLD SAYBROOK. 29.3 MI. MERGE ONTO I-95 N / GOVERNOR JOHN DAVIS LODGE TURNPIKE VIA THE EXIT ON THE LEFT TOWARD NEW LONDON / PROVIDENCE. 10.2 MI. TAKE THE US-1 EXIT, EXIT 75, TOWARD WATERFORD. 0.2 MI. TURN SLIGHT RIGHT ONTO BOSTON POST RD / US-1. 4.5 MI. TURN RIGHT ONTO MINER LN. 0.2 MI. 15 MINER LN IS ON THE RIGHT.



**GENERAL NOTES**

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



72 HOURS

BEFORE YOU DIG



CALL TOLL FREE 888-DIG-SAFE OR DIAL 811

**UNDERGROUND SERVICE ALERT**

1600 OSGOOD STREET  
 BUILDING 20 NORTH, SUITE 3090  
 N. ANDOVER, MA 01845  
 TEL: (978) 557-5553  
 FAX: (978) 334-5586

27 NORTHWESTERN DR.  
 SALEM, NH 03079

**SITE NUMBER: CT2023**  
**SITE NAME: WATERFORD**

15 MINER LANE  
 WATERFORD, CT 06385  
 NEW LONDON COUNTY

550 COCHITUATE ROAD  
 FRAMINGHAM, MA 01701

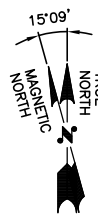
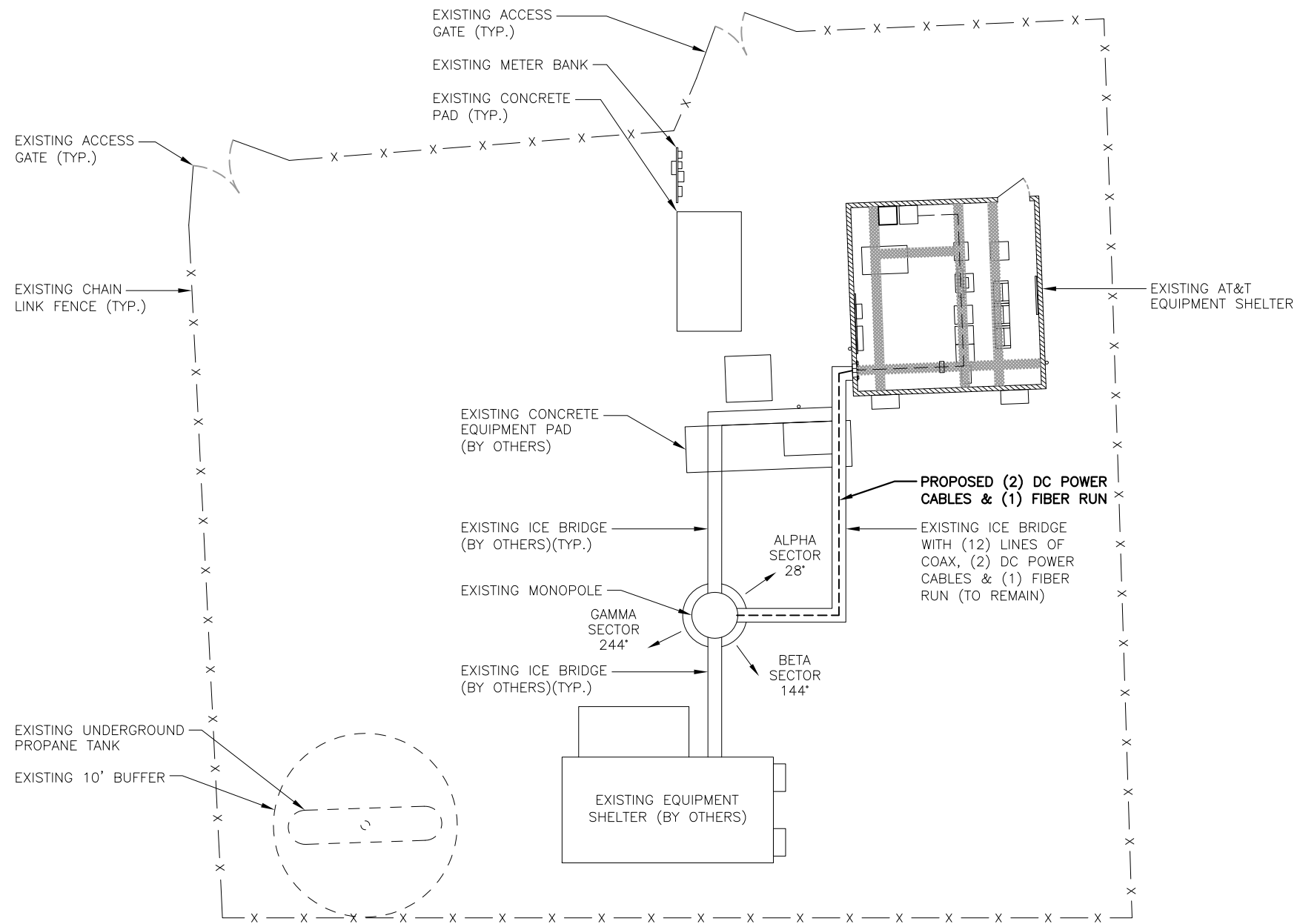
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1	08/31/15	ISSUED FOR REVIEW	EB	AT	DPH
A	08/10/15	ISSUED FOR REVIEW	MC	AT	DPH

SCALE: AS SHOWN    DESIGNED BY: AT    DRAWN BY: MC

AT&T		
TITLE SHEET (LTE 3C)		
JOB NUMBER	DRAWING NUMBER	REV
2023.00	T-1	2

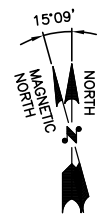
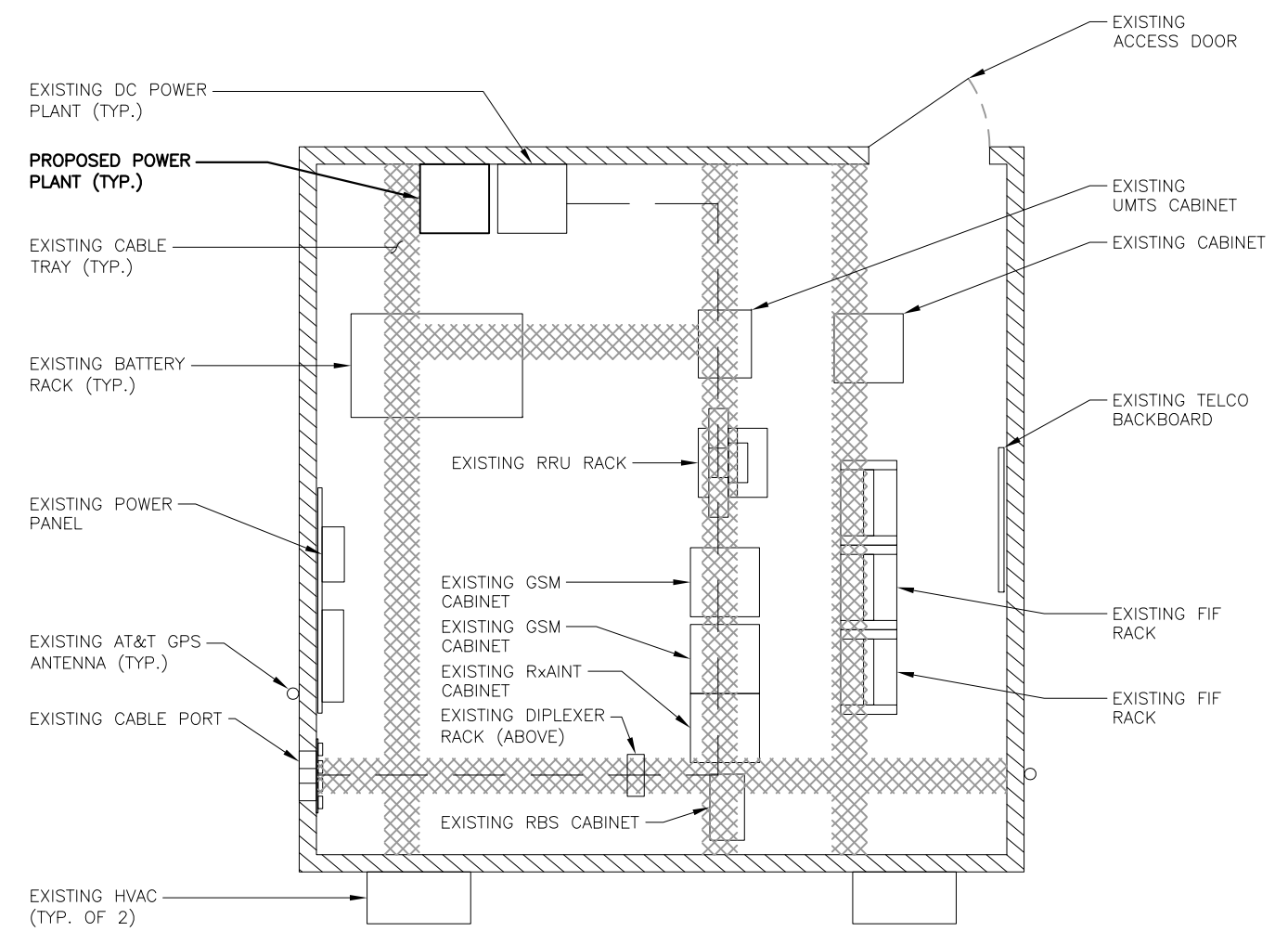
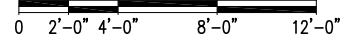
**NOTE:**  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**NOTE:**  
REFER TO MOUNT ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: APRIL 16, 2015, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



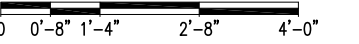
**COMPOUND PLAN**  
22x34 SCALE: 1/4"=1'-0"  
11x17 SCALE: 1/8"=1'-0"

1  
A-1



**EQUIPMENT PLAN**  
22x34 SCALE: 3/4"=1'-0"  
11x17 SCALE: 3/8"=1'-0"

2  
A-1



**Hudson Design Group LLC**  
1600 OSGOOD STREET  
BUILDING 20 NORTH, SUITE 3090  
N. ANDOVER, MA 01845  
TEL: (978) 557-5533  
FAX: (978) 336-5586

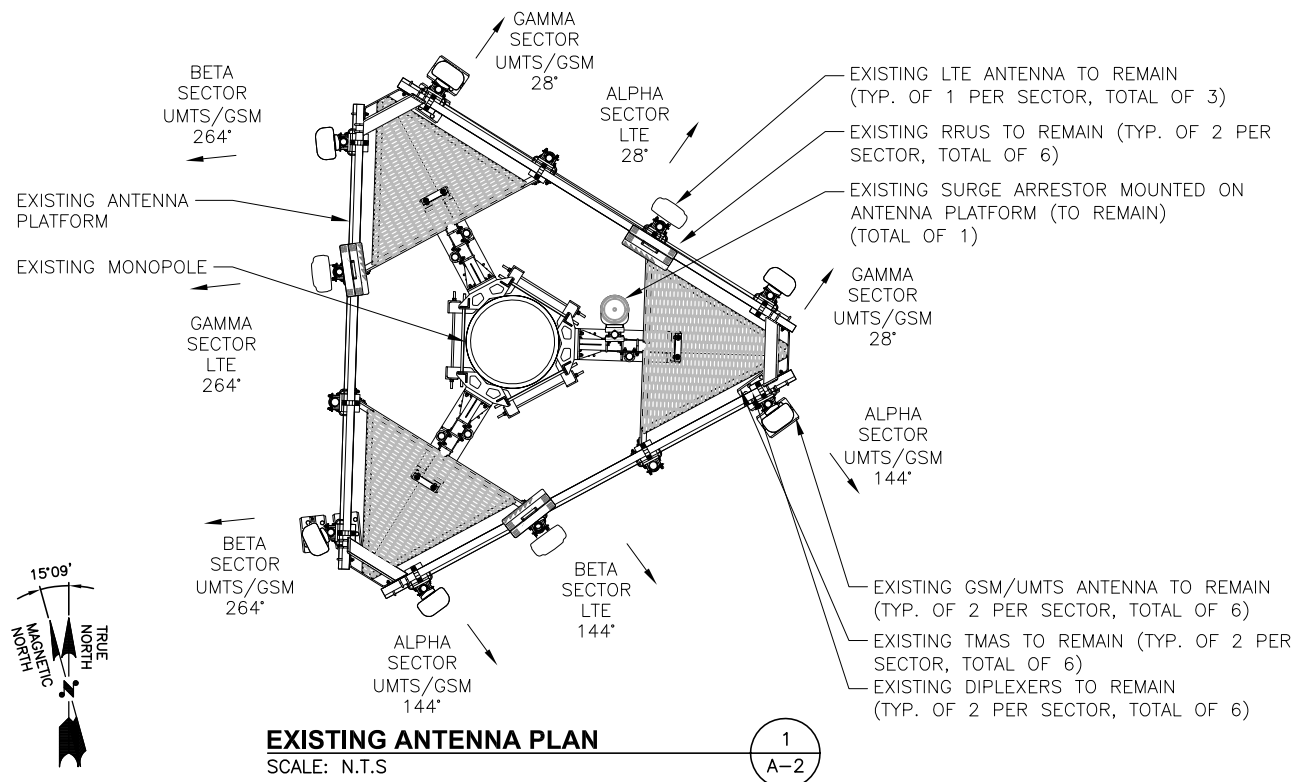
**SAI**  
27 NORTHWESTERN DR.  
SALEM, NH 03079

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**at&t**  
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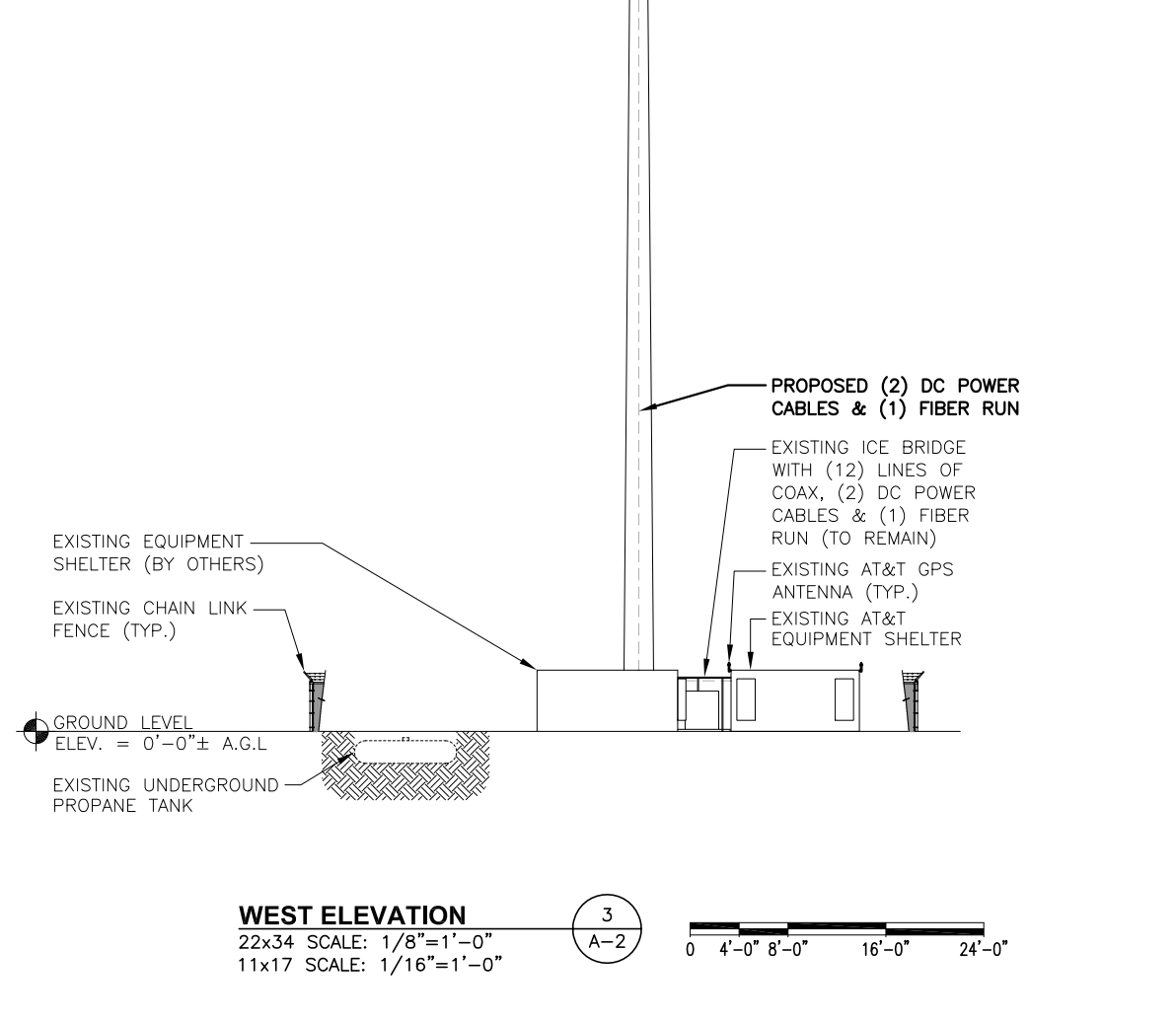
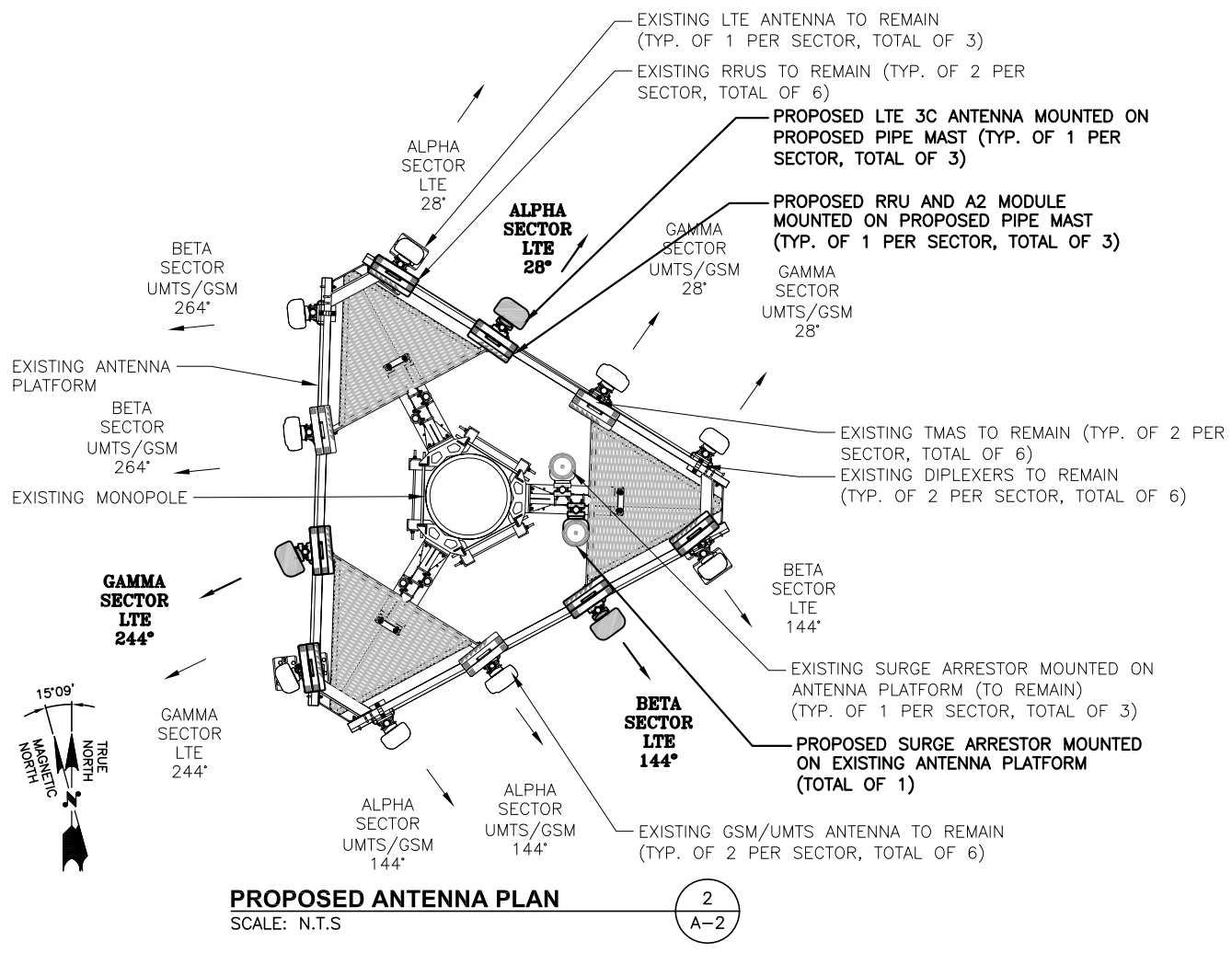
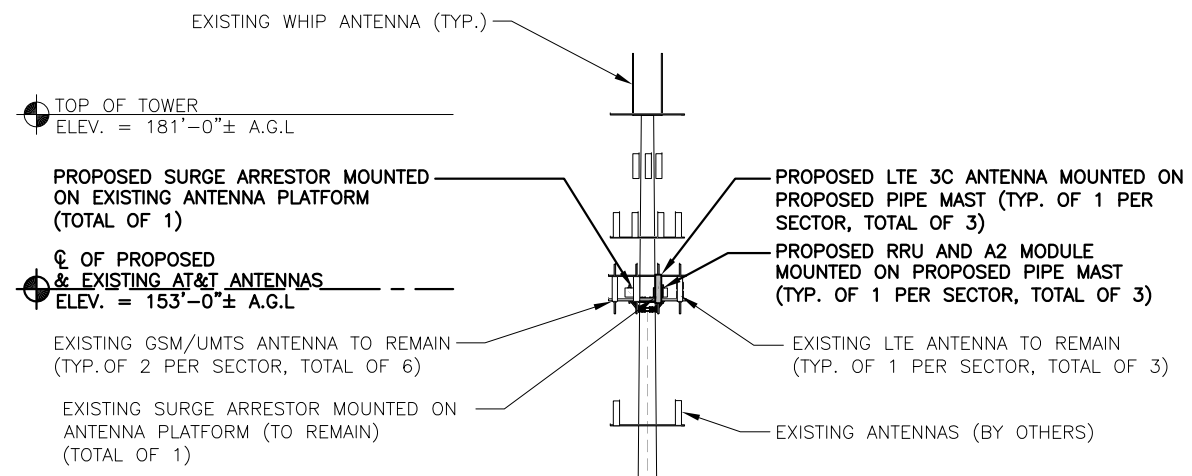
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NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: MC		

<b>AT&amp;T</b>		
<b>ROOF AND EQUIPMENT PLAN (LTE 3C)</b>		
JOB NUMBER	DRAWING NUMBER	REV
2023.00	A-1	2



**NOTE:**  
REFER TO MOUNT ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: APRIL 16, 2015, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

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



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SALEM, NH 03079

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**SITE NAME: WATERFORD**  
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WATERFORD, CT 06385  
NEW LONDON COUNTY

**at&t**  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

2	09/17/15	ISSUED FOR REVIEW	EB	AT	DPH
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A	08/10/15	ISSUED FOR REVIEW	MC	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: MC		

<b>AT&amp;T</b>		
ANTENNA LAYOUT AND ELEVATION (LTE 3C)		
JOB NUMBER	DRAWING NUMBER	REV
2023.00	A-2	2





**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 180 ft Monopole  
**ATC Site Name** : Waterford Rebuild CT, CT  
**ATC Site Number** : 310972  
**Engineering Number** : 63627622  
**Proposed Carrier** : AT&T Mobility  
**Carrier Site Name** : Waterford  
**Carrier Site Number** : CT2023/FA#10034987  
**Site Location** : 15 Miner Lane  
Waterford, CT 06385-3016  
41.329069,-72.124592  
**County** : New London  
**Date** : September 10, 2015  
**Max Usage** : 76%  
**Result** : Pass

Prepared By:  
Adam Cox

**COA: PEC.0001553**



## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180 ft monopole to reflect the change in loading by AT&T Mobility.

## Supporting Documents

<b>Tower Drawings</b>	FWT Job #23766000, dated July 18, 2001
<b>Foundation Drawing</b>	ATC Job #42693971, dated December 8, 2008
<b>Geotechnical Report</b>	Tower Engineering Professionals Project #082973.01, dated November 7, 2008
<b>Modifications</b>	ATC Job #442108F2, dated November 9, 2009

## Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	120 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-G / 2003 IBC w/ 2005 CT Supplement & 2009 CT Amendment
<b>Structure Class:</b>	II
<b>Exposure Category:</b>	B
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.16, S_1 = 0.06$
<b>Site Class:</b>	D - Stiff Soil

## Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

**Existing and Reserved Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
180.0	186.0	1	Andrew DB806D-Y	Low Profile Platform	(2) 1 5/8" Coax (1) 7/8" Coax	Spok Holdings
	185.0	2	10' Omni			Town Of Waterford
	180.0	1	TTA			
170.0	170.0	3	KMW HB-X-WM-17-65-00T-TTLNA	Stand-Offs	(6) 1 5/8" Coax	Clearwire
		3	KMW HB-X-WM-17-65-00T			
160.0	160.0	3	Alcatel-Lucent RRH 2X60-1900	Low Profile Platform	(12) 1 5/8" Coax (2) 1 5/8" Fiber	Verizon
		3	Alcatel-Lucent RRH2X60-AWS			
		3	Alcatel-Lucent RRH2x60 700			
		2	RFS DB-T1-6Z-8AB-0Z			
		3	Antel BX-70063/6CF			
		3	Commscope LNX-6514DS-A1M			
150.0	153.0	1	Raycap DC6-48-60-18-8F ("Squid")	Low Profile Platform	(12) 1 1/4" Coax (2) 0.74" 8 AWG 7 (1) 0.28" RG-6	AT&T Mobility
		6	Ericsson RRUS 11 (Band 12)			
		3	KMW AM-X-CD-14-65-00T-RET			
		6	Powerwave Allgon 7770.00			
	158.0	1	12' Omni		(1) 1 1/4" Coax	USA Mobility
128.0	130.0	3	Ericsson KRY 112 144/1	T-Arms	(12) 1 5/8" Coax (1) 1 1/4" Hybriflex Cable	T-Mobile
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
		3	Ericsson AIR 21, 1.3M, B4A B2P			

**Equipment to be Removed**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	150.0	6	LGP Allgpn LGP21903	-	-	AT&T Mobility
		6	Powerwave Allgon LGP21401			

**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	153.0	1	Raycap DC6-48-60-18-8F	Low Profile Platform	(2) 0.78" 8 AWG 6 (1) 0.39" Fiber Trunk	AT&T Mobility
		6	Powerwave Allgon 7020.00 Dual Band RET			
		6	Powerwave Allgon LGP21901			
		6	Powerwave Allgon LGP17201			
		3	Ericsson RRUS A2 B4			
		3	Ericsson RRUS 11 B4			
		3	Commscope SBNHH-1D65A			

<sup>1</sup>Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.

**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	72%	Pass
Shaft	74%	Pass
Base Plate	31%	Pass
Flanges	27%	Pass

**Foundations**

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	5,266.5	70%
Axial (Kips)	61.4	14%
Shear (Kips)	42.9	76%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information. All anchorages and foundations have a safety factor equal to or greater than 2. Therefore no modification or reinforcement of the foundation will be required.

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
150.0	Raycap DC6-48-60-18-8F	AT&T Mobility	1.121	0.820
	Powerwave Allgon LGP17201			
	Ericsson RRUS A2 B4			
	Ericsson RRUS 11 B4			
	Commscope SBNHH-1D65A			

\*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G



## Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

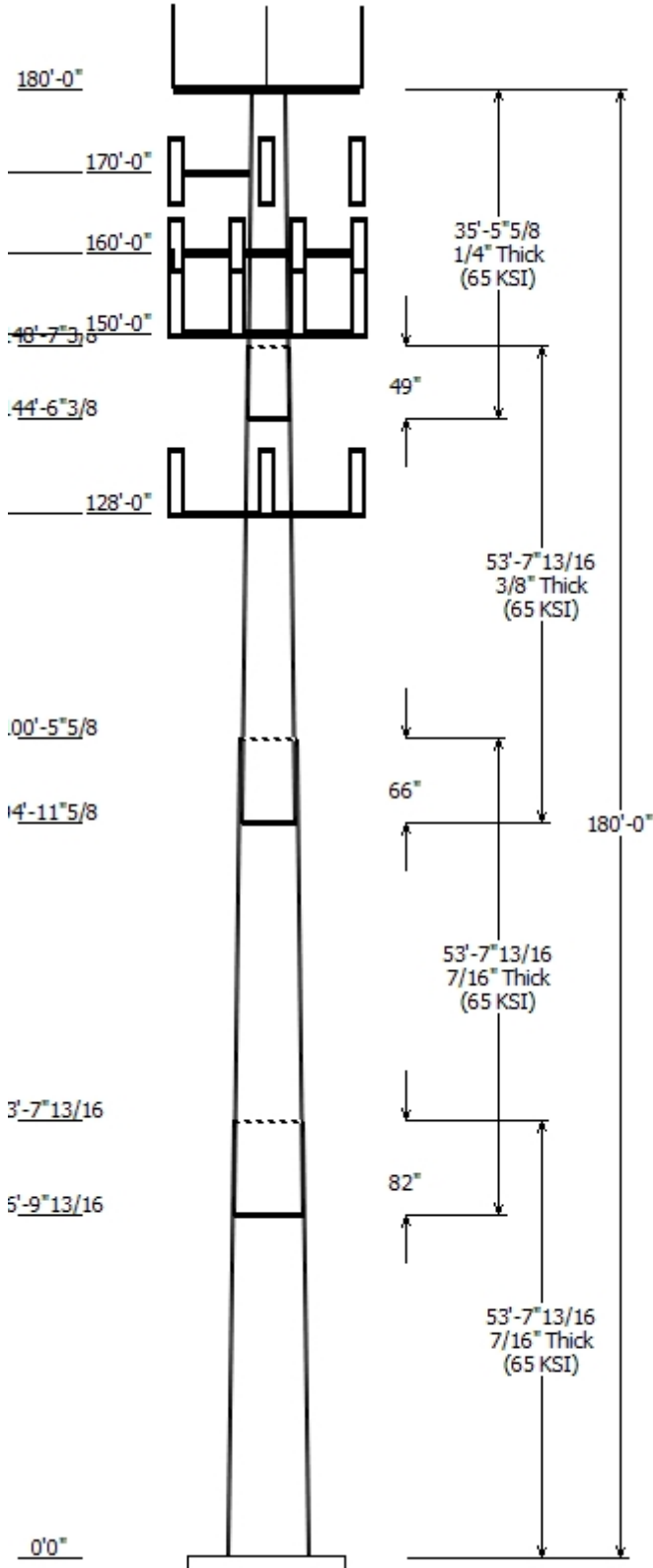
- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

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Job Information	
Pole :	310972
Code :	ANSI/TIA-222-G
Description :	180' FWT monopole
Client :	AT&T MOBILITY
Struct Class :	II
Location :	Waterford Rebuild CT, CT
Shape :	18 Sides
Exposure :	B
Height :	180.00 (ft)
Topo :	1
Base Elev (ft):	0.00
Taper:	0.22873(in/ft)

Sections Properties								
Shaft Section	Length (ft)	Diameter (in)		Thick (in)	Joint Type	Overlap Length (in)	Steel Taper (in/ft)	Grade (ksi)
		Across Flats Top	Across Flats Bottom					
1	53.650	50.17	62.45	0.438		0.000	0.228739	65
2	53.650	40.34	52.61	0.438	Slip Joint	82.000	0.228739	65
3	53.650	30.08	42.35	0.375	Slip Joint	66.000	0.228739	65
4	35.467	23.40	31.51	0.250	Slip Joint	49.000	0.228739	65

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
180.000	180.000	1	TTA
180.000	185.000	2	10' Omni
180.000	186.000	1	Andrew DB806D-Y
180.000	180.000	1	Round Low Profile Platform
170.000	170.000	1	Side Arms
170.000	170.000	3	KMW HB-X-WM-17-65-00T-
170.000	170.000	3	KMW HB-X-WM-17-65-00T
160.000	160.000	6	Commscope HBXX-6517DS-
160.000	160.000	3	Commscope LNX-6514DS-A1M
160.000	160.000	3	Alcatel-Lucent RRH2x60 700
160.000	160.000	3	Alcatel-Lucent RRH2X60-AWS
160.000	160.000	3	Alcatel-Lucent RRH 2X60-1900
160.000	160.000	2	RFS DB-T1-6Z-8AB-0Z
160.000	160.000	1	Round Low Profile Platform
160.000	160.000	3	Antel BXA-70063/6CF_
150.000	153.000	1	Raycap DC6-48-60-18-8F
150.000	153.000	3	Commscope SBNHH-1D65A
150.000	153.000	3	Ericsson RRUS 11 B4
150.000	153.000	3	Ericsson RRUS A2 B4
150.000	153.000	6	Powerwave Allgon LGP17201
150.000	153.000	6	Powerwave Allgon 7020.00
150.000	153.000	6	Powerwave Allgon LGP21901
150.000	158.000	1	12' Omni
150.000	153.000	1	Raycap DC6-48-60-18-8F
150.000	153.000	3	KMW AM-X-CD-14-65-00T-RET
150.000	153.000	6	Ericsson RRUS 11 (Band 12)
150.000	153.000	6	Powerwave Allgon 7770.00
150.000	150.000	1	Flat Low Profile Platform
128.000	130.000	3	Ericsson AIR 21, 1.3M, B4A B2P
128.000	130.000	3	Ericsson AIR 21, 1.3 M, B2A B4
128.000	130.000	3	Ericsson KRY 112 144/1
128.000	128.000	3	Flat T-Arm

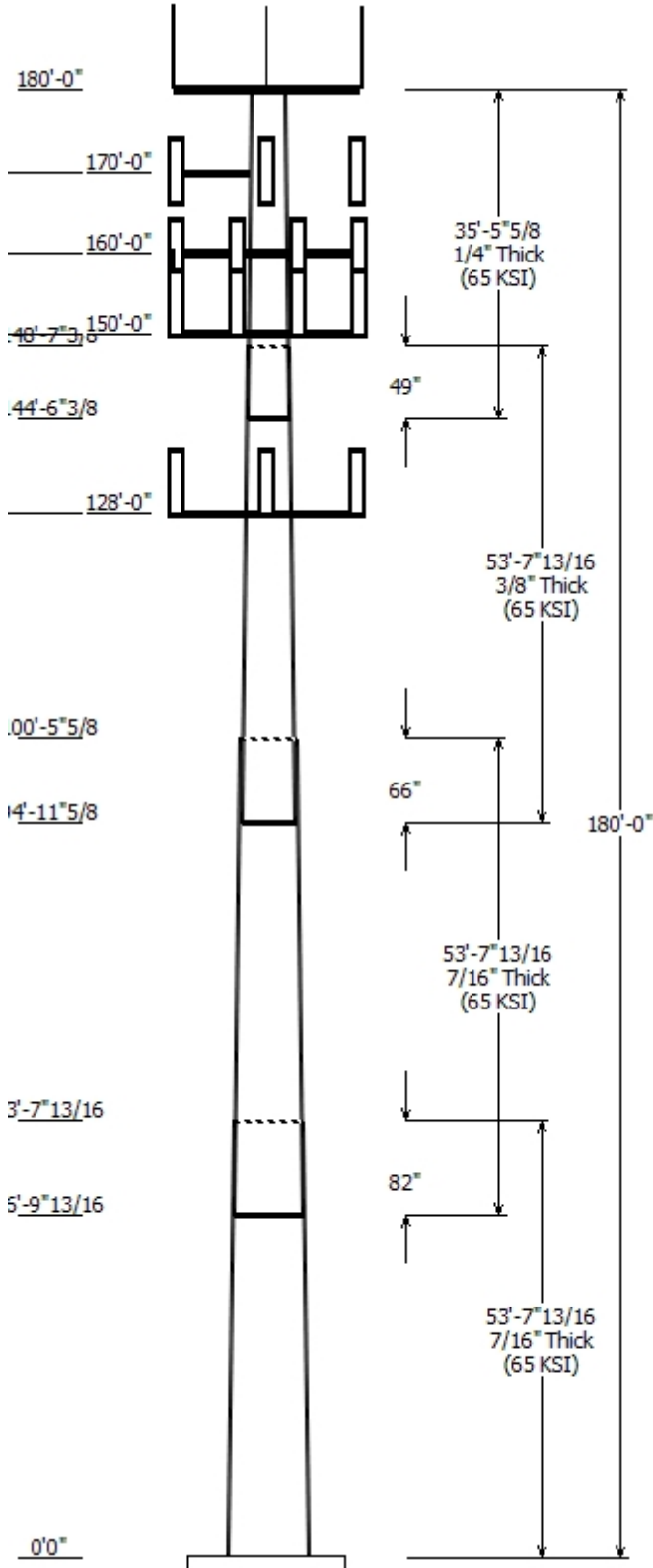
Linear Appurtenance			
Elev (ft) From	To	Description	Exposed To Wind
0.000	128.0	1 1/4" Hybriflex	No
0.000	128.0	1 5/8" Coax	No
0.000	150.0	0.28" RG-6	No
0.000	150.0	0.39" Fiber Trunk	No
0.000	150.0	0.74" 8 AWG 7	No

0.000	150.0	0.78" 8 AWG 6	No
0.000	150.0	1 1/4" Coax	No
0.000	150.0	1 1/4" Coax	No
0.000	160.0	1 5/8" Coax	No
0.000	160.0	1 5/8" Fiber	No
0.000	170.0	1 5/8" Coax	No
0.000	180.0	1 5/8" Coax	No
0.000	180.0	7/8" Coax	No

Load Cases	
1.2D + 1.6W	120 mph with No Ice
0.9D + 1.6W	120 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions			
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	5266.47	42.85	61.37
0.9D + 1.6W	5212.26	42.83	46.01
1.2D + 1.0Di + 1.0Wi	1005.99	8.22	87.78
(1.2 + 0.2Sds) * DL + E ELFM	277.03	2.00	61.14
(1.2 + 0.2Sds) * DL + E EMAM	254.16	2.04	61.14
(0.9 - 0.2Sds) * DL + E ELFM	273.64	2.00	42.90
(0.9 - 0.2Sds) * DL + E EMAM	250.89	2.04	42.90
1.0D + 1.0W	818.34	6.69	51.20

Dish Deflections			
Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000





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

**Steven L. Levine**  
Real Estate Consultant

October 5, 2015

Honorable Dan Steward  
1<sup>st</sup> Selectman, Town of Waterford  
15 Rope Ferry Road  
Waterford, CT 06385

**Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 85 (aka 15) Miner Lane, Waterford (Owner, American Tower)**

Dear Mr. Steward:

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "S. Levine".

Steven L. Levine  
Real Estate Consultant

Enclosure





**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 180 ft Monopole  
**ATC Site Name** : Waterford Rebuild CT, CT  
**ATC Site Number** : 310972  
**Engineering Number** : 63627622  
**Proposed Carrier** : AT&T Mobility  
**Carrier Site Name** : Waterford  
**Carrier Site Number** : CT2023/FA#10034987  
**Site Location** : 15 Miner Lane  
Waterford, CT 06385-3016  
41.329069,-72.124592  
**County** : New London  
**Date** : September 10, 2015  
**Max Usage** : 76%  
**Result** : Pass

Reviewed by:  
Scott Wirgau, PE  
Structural Team Leader



Prepared By:  
Adam Cox

Sep 16 2015 2:39 PM

COA: PEC.0001553



**Table of Contents**

Introduction .....	1
Supporting Documents .....	1
Analysis .....	1
Conclusion .....	1
Existing and Reserved Equipment .....	2
Equipment to be Removed .....	2
Proposed Equipment .....	2
Structure Usages.....	3
Foundations .....	3
Deflection, Twist, and Sway .....	3
Standard Conditions.....	4
Calculations .....	Attached



## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180 ft monopole to reflect the change in loading by AT&T Mobility.

## Supporting Documents

<b>Tower Drawings</b>	FWT Job #23766000, dated July 18, 2001
<b>Foundation Drawing</b>	ATC Job #42693971, dated December 8, 2008
<b>Geotechnical Report</b>	Tower Engineering Professionals Project #082973.01, dated November 7, 2008
<b>Modifications</b>	ATC Job #442108F2, dated November 9, 2009

## Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	120 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-G / 2003 IBC w/ 2005 CT Supplement & 2009 CT Amendment
<b>Structure Class:</b>	II
<b>Exposure Category:</b>	B
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.16, S_1 = 0.06$
<b>Site Class:</b>	D - Stiff Soil

## Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.



**Existing and Reserved Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
180.0	186.0	1	Andrew DB806D-Y	Low Profile Platform	(2) 1 5/8" Coax (1) 7/8" Coax	Spok Holdings
	185.0	2	10' Omni			Town Of Waterford
	180.0	1	TTA			
170.0	170.0	3	KMW HB-X-WM-17-65-00T-TTLNA	Stand-Offs	(6) 1 5/8" Coax	Clearwire
		3	KMW HB-X-WM-17-65-00T			
160.0	160.0	3	Alcatel-Lucent RRH 2X60-1900	Low Profile Platform	(12) 1 5/8" Coax (2) 1 5/8" Fiber	Verizon
		3	Alcatel-Lucent RRH2X60-AWS			
		3	Alcatel-Lucent RRH2x60 700			
		2	RFS DB-T1-6Z-8AB-0Z			
		3	Antel BX-70063/6CF_			
		3	Commscope LNX-6514DS-A1M			
150.0	153.0	1	Raycap DC6-48-60-18-8F ("Squid")	Low Profile Platform	(12) 1 1/4" Coax (2) 0.74" 8 AWG 7 (1) 0.28" RG-6	AT&T Mobility
		6	Ericsson RRUS 11 (Band 12)			
		3	KMW AM-X-CD-14-65-00T-RET			
		6	Powerwave Allgon 7770.00			
	158.0	1	12' Omni			
128.0	130.0	3	Ericsson KRY 112 144/1	T-Arms	(12) 1 5/8" Coax (1) 1 1/4" Hybriflex Cable	T-Mobile
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
		3	Ericsson AIR 21, 1.3M, B4A B2P			

**Equipment to be Removed**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	150.0	6	LGP Allgpn LGP21903	-	-	AT&T Mobility
		6	Powerwave Allgon LGP21401			

**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	153.0	1	Raycap DC6-48-60-18-8F	Low Profile Platform	(2) 0.78" 8 AWG 6 (1) 0.39" Fiber Trunk	AT&T Mobility
		6	Powerwave Allgon 7020.00 Dual Band RET			
		6	Powerwave Allgon LGP21901			
		6	Powerwave Allgon LGP17201			
		3	Ericsson RRUS A2 B4			
		3	Ericsson RRUS 11 B4			
		3	Commscope SBNHH-1D65A			

<sup>1</sup>Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	72%	Pass
Shaft	74%	Pass
Base Plate	31%	Pass
Flanges	27%	Pass

**Foundations**

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	5,266.5	70%
Axial (Kips)	61.4	14%
Shear (Kips)	42.9	76%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information. All anchorages and foundations have a safety factor equal to or greater than 2. Therefore no modification or reinforcement of the foundation will be required.

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
150.0	Raycap DC6-48-60-18-8F	AT&T Mobility	1.121	0.820
	Powerwave Allgon LGP17201			
	Ericsson RRUS A2 B4			
	Ericsson RRUS 11 B4			
	Commscope SBNHH-1D65A			

\*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G



## **Standard Conditions**

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

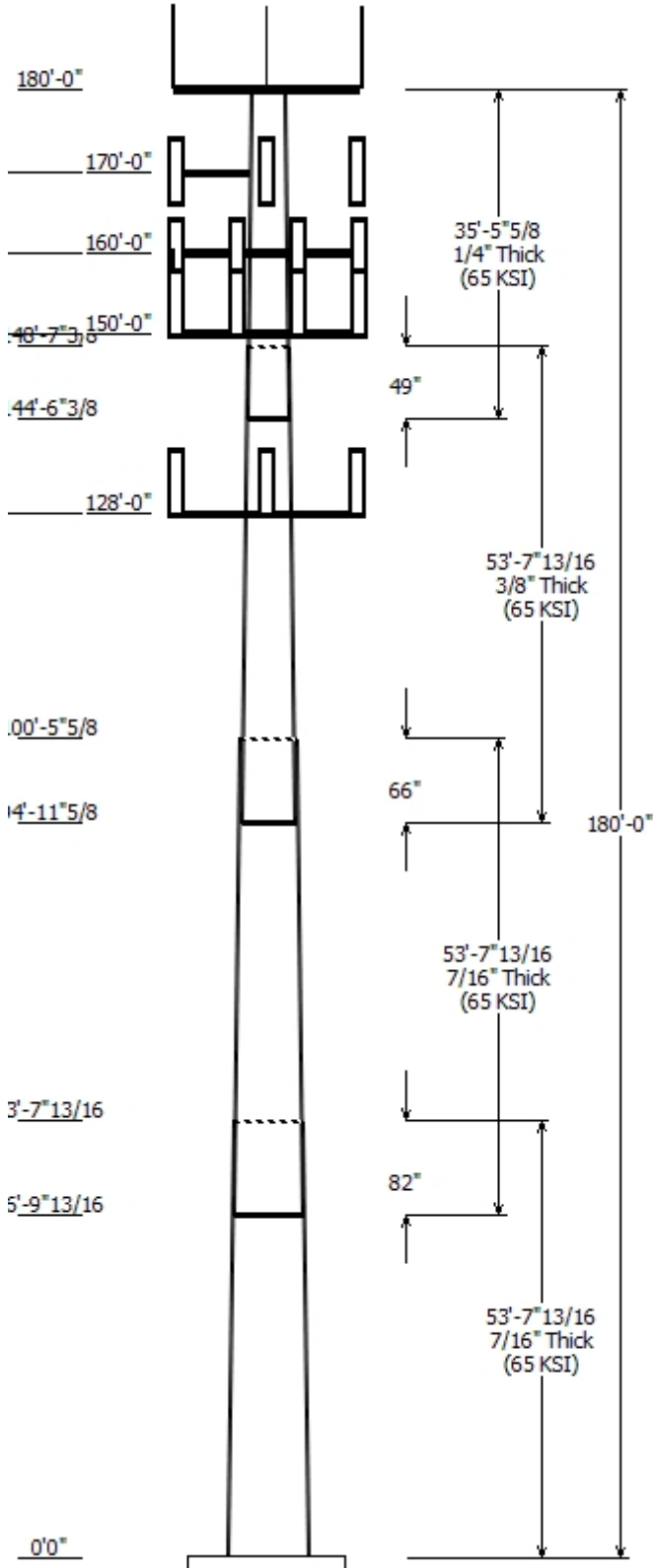
- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

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Job Information	
Pole :	310972
Code :	ANSI/TIA-222-G
Description :	180' FWT monopole
Client :	AT&T MOBILITY
Struct Class :	II
Location :	Waterford Rebuild CT, CT
Shape :	18 Sides
Exposure :	B
Height :	180.00 (ft)
Topo :	1
Base Elev (ft):	0.00
Taper:	0.22873(in/ft)

Sections Properties								
Shaft Section	Length (ft)	Diameter (in)		Thick (in)	Joint Type	Overlap		Steel Grade (ksi)
		Across Flats Top	Across Flats Bottom			Length (in)	Taper (in/ft)	
1	53.650	50.17	62.45	0.438		0.000	0.228739	65
2	53.650	40.34	52.61	0.438	Slip Joint	82.000	0.228739	65
3	53.650	30.08	42.35	0.375	Slip Joint	66.000	0.228739	65
4	35.467	23.40	31.51	0.250	Slip Joint	49.000	0.228739	65

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
180.000	180.000	1	TTA
180.000	185.000	2	10' Omni
180.000	186.000	1	Andrew DB806D-Y
180.000	180.000	1	Round Low Profile Platform
170.000	170.000	1	Side Arms
170.000	170.000	3	KMW HB-X-WM-17-65-00T-
170.000	170.000	3	KMW HB-X-WM-17-65-00T
160.000	160.000	6	Commscope HBXX-6517DS-
160.000	160.000	3	Commscope LNX-6514DS-A1M
160.000	160.000	3	Alcatel-Lucent RRH2x60 700
160.000	160.000	3	Alcatel-Lucent RRH2X60-AWS
160.000	160.000	3	Alcatel-Lucent RRH 2X60-1900
160.000	160.000	2	RFS DB-T1-6Z-8AB-0Z
160.000	160.000	1	Round Low Profile Platform
160.000	160.000	3	Antel BXA-70063/6CF_
150.000	153.000	1	Raycap DC6-48-60-18-8F
150.000	153.000	3	Commscope SBNHH-1D65A
150.000	153.000	3	Ericsson RRUS 11 B4
150.000	153.000	3	Ericsson RRUS A2 B4
150.000	153.000	6	Powerwave Allgon LGP17201
150.000	153.000	6	Powerwave Allgon 7020.00
150.000	153.000	6	Powerwave Allgon LGP21901
150.000	158.000	1	12' Omni
150.000	153.000	1	Raycap DC6-48-60-18-8F
150.000	153.000	3	KMW AM-X-CD-14-65-00T-RET
150.000	153.000	6	Ericsson RRUS 11 (Band 12)
150.000	153.000	6	Powerwave Allgon 7770.00
150.000	150.000	1	Flat Low Profile Platform
128.000	130.000	3	Ericsson AIR 21, 1.3M, B4A B2P
128.000	130.000	3	Ericsson AIR 21, 1.3 M, B2A B4
128.000	130.000	3	Ericsson KRY 112 144/1
128.000	128.000	3	Flat T-Arm

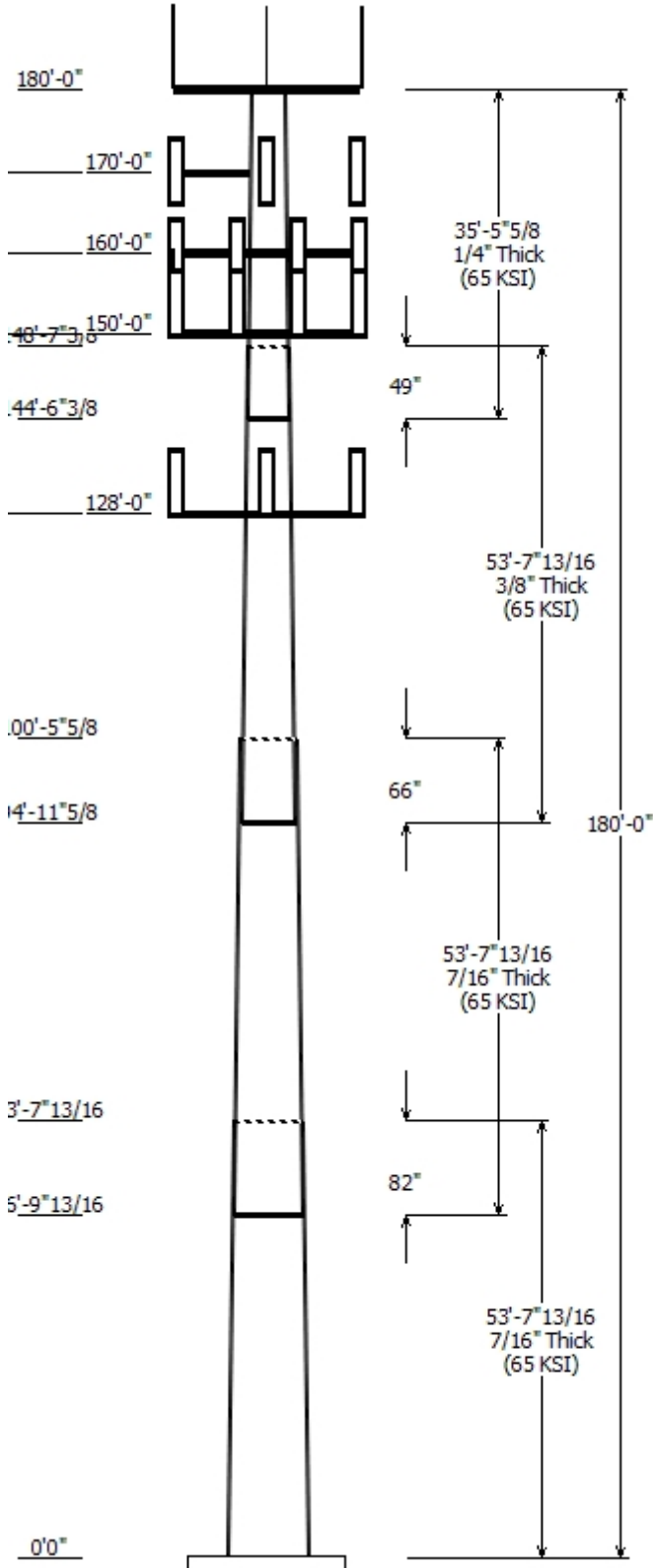
Linear Appurtenance			
Elev (ft) From	To	Description	Exposed To Wind
0.000	128.0	1 1/4" Hybriflex	No
0.000	128.0	1 5/8" Coax	No
0.000	150.0	0.28" RG-6	No
0.000	150.0	0.39" Fiber Trunk	No
0.000	150.0	0.74" 8 AWG 7	No

0.000	150.0	0.78" 8 AWG 6	No
0.000	150.0	1 1/4" Coax	No
0.000	150.0	1 1/4" Coax	No
0.000	160.0	1 5/8" Coax	No
0.000	160.0	1 5/8" Fiber	No
0.000	170.0	1 5/8" Coax	No
0.000	180.0	1 5/8" Coax	No
0.000	180.0	7/8" Coax	No

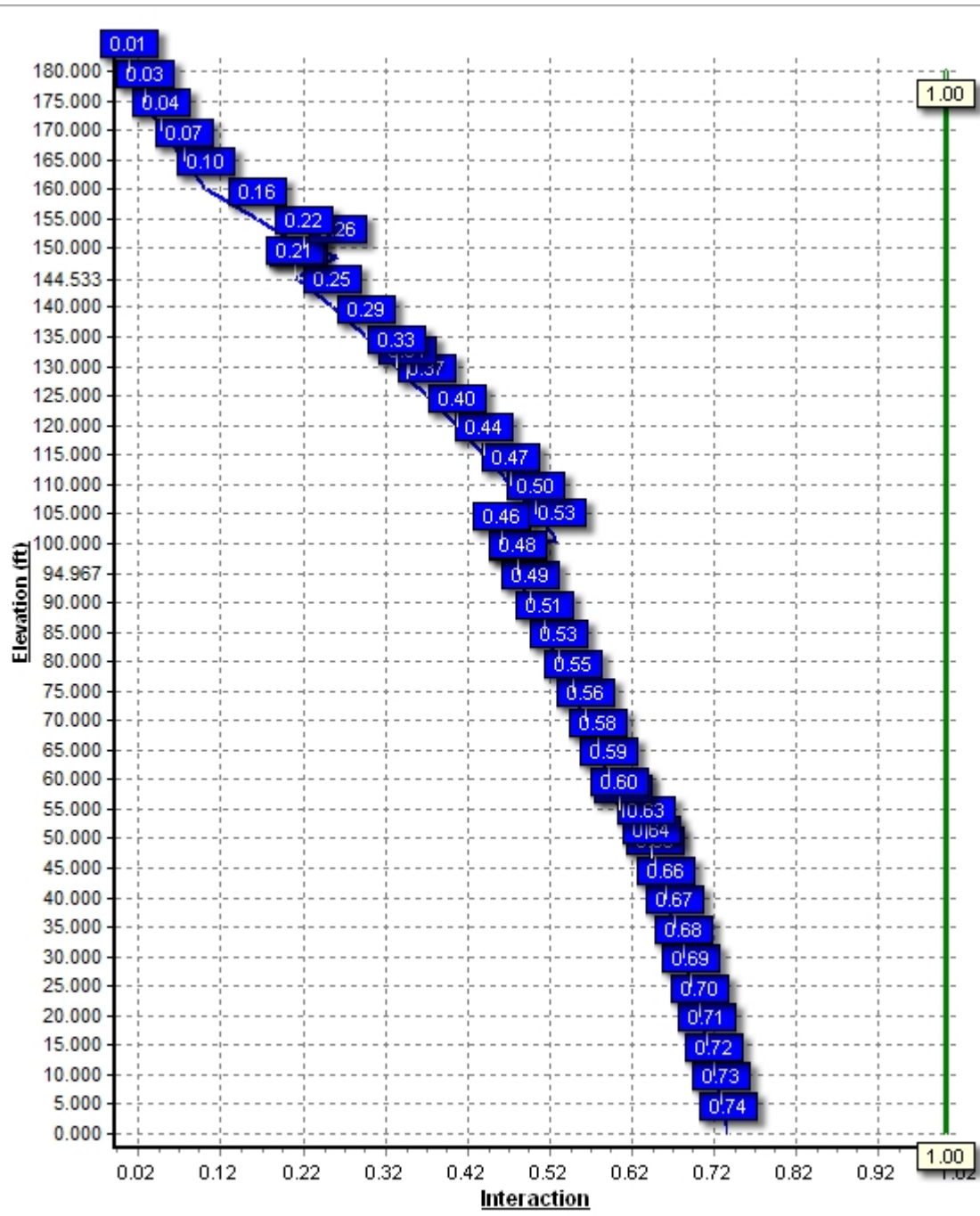
Load Cases	
1.2D + 1.6W	120 mph with No Ice
0.9D + 1.6W	120 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions			
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	5266.47	42.85	61.37
0.9D + 1.6W	5212.26	42.83	46.01
1.2D + 1.0Di + 1.0Wi	1005.99	8.22	87.78
(1.2 + 0.2Sds) * DL + E ELFM	277.03	2.00	61.14
(1.2 + 0.2Sds) * DL + E EMAM	254.16	2.04	61.14
(0.9 - 0.2Sds) * DL + E ELFM	273.64	2.00	42.90
(0.9 - 0.2Sds) * DL + E EMAM	250.89	2.04	42.90
1.0D + 1.0W	818.34	6.69	51.20

Dish Deflections			
Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000







Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:03 AM

Customer: AT&T MOBILITY

**Analysis Parameters**

Location:	New London County, CT		
Code:	ANSI/TIA-222-G	Height (ft):	180
Shape:	18 Sides	Base Diameter (in):	62.45
Pole Type:	Taper	Top Diameter (in):	23.40
Pole Manufacturer:	FWT Inc	Taper (in/ft) :	0.229

**Ice & Wind Parameters**

Structure Class:	II	Design Wind Speed Without Ice:	120 mph
Exposure Category:	B	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0.0 ft	Design Ice Thickness:	0.50 in

**Seismic Parameters**

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	2.36		
T <sub>L</sub> (sec):	6	p:	1.3
S <sub>s</sub> :	0.160	S <sub>1</sub> :	0.058
F <sub>a</sub> :	1.600	F <sub>v</sub> :	2.400
S <sub>ds</sub> :	0.171	S <sub>d1</sub> :	0.093
		C <sub>s</sub> :	0.030
		C <sub>s</sub> Max:	0.030
		C <sub>s</sub> Min:	0.030

**Load Cases**

1.2D + 1.6W	120 mph with No Ice
0.9D + 1.6W	120 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:03 AM

Customer: AT&T MOBILITY

**Shaft Section Properties**

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Bottom						Top							
						Weight (lb)	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)
1-18	53.650	0.4375	65		0.00	14,165	62.45	0.00	86.11	41836.9	23.76	142.74	50.17	53.65	69.07	21590.2	18.81	114.69	0.228739
2-18	53.650	0.4375	65	Slip	82.00	11,672	52.61	46.82	72.45	24923.1	19.80	120.27	40.34	100.47	55.41	11149.8	14.85	92.22	0.228739
3-18	53.650	0.3750	65	Slip	66.00	7,788	42.35	94.97	49.96	11123.0	18.50	112.94	30.08	148.62	35.36	3941.8	12.73	80.21	0.228739
4-18	35.467	0.2500	65	Slip	49.00	2,605	31.51	144.53	24.81	3063.7	20.82	126.06	23.40	180.00	18.37	1244.1	15.10	93.61	0.228739
Shaft Weight						36,229													

**Discrete Appurtenance Properties**

Attach Elev (ft)	Description	Qty	No Ice			Ice			Distance From Face (ft)	Vert Ecc (ft)
			Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor		
180.00	10' Omni	2	25.00	3.000	1.00	161.76	5.977	1.00	0.000	5.000
180.00	Andrew DB806D-Y	1	27.00	3.380	1.00	180.24	7.023	1.00	0.000	6.000
180.00	Round Low Profile Platform	1	1500.00	21.700	1.00	2,160.24	41.265	1.00	0.000	0.000
180.00	TTA	1	10.00	1.200	0.50	56.83	1.675	0.50	0.000	0.000
170.00	KMW HB-X-WM-17-65-00T	3	30.00	1.920	1.00	142.94	4.246	1.00	0.000	0.000
170.00	KMW HB-X-WM-17-65-00T-Side Arms	3	15.90	0.970	0.50	51.27	1.426	0.50	0.000	0.000
170.00	Alcatel-Lucent RRH 2X60-	1	560.00	8.500	1.00	1,034.32	15.700	1.00	0.000	0.000
160.00	Alcatel-Lucent RRH2x60 700	3	39.60	1.880	0.50	107.01	2.463	0.50	0.000	0.000
160.00	Alcatel-Lucent RRH2X60-	3	56.70	2.150	0.67	141.18	2.808	0.67	0.000	0.000
160.00	Alcatel-Lucent RRH2X60-	3	44.00	1.880	0.50	111.41	2.463	0.50	0.000	0.000
160.00	Antel BXA-70063/6CF_	3	17.00	7.570	0.75	185.23	8.825	0.75	0.000	0.000
160.00	Commscope HBXX-6517DS-	6	40.80	8.530	0.81	217.94	10.941	0.81	0.000	0.000
160.00	Commscope LNX-6514DS-	3	38.80	8.170	0.83	243.42	9.484	0.83	0.000	0.000
160.00	RFS DB-T1-6Z-8AB-0Z	2	44.00	4.800	0.67	182.70	5.678	0.67	0.000	0.000
160.00	Round Low Profile Platform	1	1500.00	21.700	1.00	2,152.40	41.032	1.00	0.000	0.000
150.00	12' Omni	1	40.00	3.600	1.00	199.25	7.640	1.00	0.000	8.000
150.00	Commscope SBNHH-1D65A	3	33.50	5.880	0.83	297.08	8.617	0.83	0.000	3.000
150.00	Ericsson RRUS 11 (Band 12)	6	50.00	2.570	0.67	131.45	3.221	0.67	0.000	3.000
150.00	Ericsson RRUS 11 B4	3	50.70	2.790	0.67	137.07	3.469	0.67	0.000	3.000
150.00	Ericsson RRUS A2 B4	3	22.00	2.060	0.67	77.35	2.663	0.67	0.000	3.000
150.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,148.92	45.222	1.00	0.000	0.000
150.00	KMW AM-X-CD-14-65-00T-	3	36.40	4.990	0.78	167.62	5.975	0.78	0.000	3.000
150.00	Powerwave Allgon 7020.00	6	2.20	0.400	0.50	17.94	0.624	0.50	0.000	3.000
150.00	Powerwave Allgon 7770.00	6	35.00	5.510	0.77	170.01	6.559	0.77	0.000	3.000
150.00	Powerwave Allgon LGP17201	6	31.00	1.670	0.50	79.52	2.210	0.50	0.000	3.000
150.00	Powerwave Allgon LGP21901	6	5.50	0.230	0.50	18.05	0.426	0.50	0.000	3.000
150.00	Raycap DC6-48-60-18-8F	1	20.00	1.110	1.00	100.47	2.521	1.00	0.000	3.000
150.00	Raycap DC6-48-60-18-8F	1	31.80	1.280	1.00	124.70	2.853	1.00	0.000	3.000
128.00	Ericsson AIR 21, 1.3 M, B2A	3	83.00	6.050	0.86	248.64	7.128	0.86	0.000	2.000
128.00	Ericsson AIR 21, 1.3M, B4A	3	81.50	6.090	0.85	247.09	7.173	0.85	0.000	2.000
128.00	Ericsson KRY 112 144/1	3	11.00	0.410	0.50	26.97	0.629	0.50	0.000	2.000
128.00	Flat T-Arm	3	250.00	12.900	0.67	455.89	20.956	0.67	0.000	0.000
Totals		94	8744.10			20,576.25			Number of Loadings :	32

**Linear Appurtenance Properties**

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Projected Width (in)	Exposed To Wind	Carrier	
0.00	180.00	2	1 5/8" Coax	1.98	0.82	N	0.00	N	Town of Waterford
0.00	180.00	1	7/8" Coax	1.09	0.33	N	0.00	N	Spok Holdings
0.00	170.00	6	1 5/8" Coax	1.98	0.82	N	0.00	N	Clearwire Corporation
0.00	160.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon Wireless

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Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:03 AM

Customer: AT&T MOBILITY

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0.00	160.00	2	1 5/8" Fiber	1.63	1.61	N	0.00	N	Verizon Wireless
0.00	150.00	1	0.28" RG-6	0.28	0.03	N	0.00	N	AT&T Mobility
0.00	150.00	0	0.39" Fiber Trunk	0.39	0.06	N	0.00	N	AT&T Mobility
0.00	150.00	2	0.74" 8 AWG 7	0.74	0.49	N	0.00	N	AT&T Mobility
0.00	150.00	2	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	150.00	12	1 1/4" Coax	1.55	0.63	N	0.00	N	AT&T Mobility
0.00	150.00	1	1 1/4" Coax	1.55	0.63	N	0.00	N	USA Mobility
0.00	128.00	1	1 1/4" Hybriflex	1.54	1.00	N	0.00	N	T-Mobile
0.00	128.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	T-Mobile

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:03 AM

Customer: AT&T MOBILITY

**Segment Properties** (Max Len : 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Fy (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)
0.00		0.4375	62.450	86.109	41,836.9	23.76	142.74	73.5	1319.	0.0	0.0
5.00		0.4375	61.306	84.521	39,564.6	23.30	140.13	74.0	1271.	0.0	1,451.5
10.00		0.4375	60.163	82.933	37,376.0	22.84	137.51	74.5	1223.	0.0	1,424.5
15.00		0.4375	59.019	81.345	35,269.7	22.38	134.90	75.1	1177.	0.0	1,397.5
20.00		0.4375	57.875	79.757	33,244.0	21.92	132.29	75.6	1131.	0.0	1,370.5
25.00		0.4375	56.732	78.168	31,297.5	21.45	129.67	76.2	1086.	0.0	1,343.5
30.00		0.4375	55.588	76.580	29,428.4	20.99	127.06	76.7	1042.	0.0	1,316.4
35.00		0.4375	54.444	74.992	27,635.3	20.53	124.44	77.3	999.8	0.0	1,289.4
40.00		0.4375	53.300	73.404	25,916.5	20.07	121.83	77.8	957.7	0.0	1,262.4
45.00		0.4375	52.157	71.816	24,270.5	19.61	119.22	78.3	916.5	0.0	1,235.4
46.82	Bot - Section 2	0.4375	51.741	71.239	23,690.2	19.44	118.27	78.5	901.8	0.0	442.2
50.00		0.4375	51.013	70.228	22,695.7	19.15	116.60	78.9	876.3	0.0	1,545.6
53.65	Top - Section 1	0.4375	51.053	70.284	22,749.8	19.17	116.69	78.9	877.7	0.0	1,745.2
55.00		0.4375	50.744	69.855	22,335.9	19.04	115.99	79.0	867.0	0.0	321.9
60.00		0.4375	49.601	68.267	20,846.9	18.58	113.37	79.5	827.8	0.0	1,175.0
65.00		0.4375	48.457	66.679	19,425.6	18.12	110.76	80.1	789.6	0.0	1,148.0
70.00		0.4375	47.313	65.091	18,070.4	17.66	108.14	80.6	752.3	0.0	1,121.0
75.00		0.4375	46.170	63.502	16,779.7	17.20	105.53	81.2	715.8	0.0	1,093.9
80.00		0.4375	45.026	61.914	15,552.1	16.74	102.92	81.7	680.3	0.0	1,066.9
85.00		0.4375	43.882	60.326	14,385.8	16.28	100.30	82.3	645.7	0.0	1,039.9
90.00		0.4375	42.738	58.738	13,279.3	15.81	97.69	82.6	612.0	0.0	1,012.9
94.97	Bot - Section 3	0.4375	41.602	57.161	12,237.8	15.36	95.09	82.6	579.4	0.0	979.4
95.00		0.4375	41.595	57.150	12,231.0	15.35	95.07	82.6	579.2	0.0	12.1
100.0		0.4375	40.451	55.562	11,239.5	14.89	92.46	82.6	547.3	0.0	1,797.1
100.4	Top - Section 2	0.3750	41.094	48.464	10,152.6	17.91	109.58	80.3	486.6	0.0	165.2
105.0		0.3750	40.057	47.230	9,396.6	17.42	106.82	80.9	462.0	0.0	738.1
110.0		0.3750	38.914	45.869	8,607.3	16.89	103.77	81.5	435.7	0.0	792.0
115.0		0.3750	37.770	44.508	7,863.5	16.35	100.72	82.2	410.1	0.0	768.8
120.0		0.3750	36.626	43.147	7,163.9	15.81	97.67	82.6	385.2	0.0	745.7
125.0		0.3750	35.483	41.785	6,507.0	15.27	94.62	82.6	361.2	0.0	722.5
128.0		0.3750	34.796	40.969	6,132.8	14.95	92.79	82.6	347.1	0.0	422.4
130.0		0.3750	34.339	40.424	5,891.6	14.74	91.57	82.6	337.9	0.0	277.0
135.0		0.3750	33.195	39.063	5,316.2	14.20	88.52	82.6	315.4	0.0	676.2
140.0		0.3750	32.052	37.702	4,779.6	13.66	85.47	82.6	293.7	0.0	653.0
144.5	Bot - Section 4	0.3750	31.015	36.467	4,325.4	13.17	82.71	82.6	274.7	0.0	572.1
145.0		0.3750	30.908	36.340	4,280.3	13.12	82.42	82.6	272.8	0.0	97.1
148.6	Top - Section 3	0.2500	30.581	24.066	2,797.2	20.16	122.32	77.7	180.2	0.0	741.4
150.0		0.2500	30.264	23.815	2,710.6	19.93	121.06	78.0	176.4	0.0	112.7
155.0		0.2500	29.120	22.908	2,412.4	19.13	116.48	78.9	163.2	0.0	397.5
160.0		0.2500	27.977	22.000	2,136.9	18.32	111.91	79.9	150.4	0.0	382.0
165.0		0.2500	26.833	21.093	1,883.2	17.51	107.33	80.8	138.2	0.0	366.6
170.0		0.2500	25.689	20.185	1,650.5	16.71	102.76	81.7	126.5	0.0	351.2
175.0		0.2500	24.546	19.278	1,437.7	15.90	98.18	82.6	115.4	0.0	335.7
180.0		0.2500	23.402	18.370	1,244.1	15.10	93.61	82.6	104.7	0.0	320.3
											36,229.5

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:03 AM

Customer: AT&T MOBILITY

<b>Load Case:</b> 1.2D + 1.6W	120 mph with No Ice	24 Iterations
Gust Response Factor : 1.10		Wind Importance Factor : 1.00
Dead Load Factor : 1.20		
Wind Load Factor : 1.60		

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		367.1	0.0					0.0	0.0	367.1	0.0	0.0	0.0
5.00		727.4	1,741.8					0.0	247.0	727.4	1,988.8	0.0	0.0
10.00		713.9	1,709.4					0.0	247.0	713.9	1,956.4	0.0	0.0
15.00		700.3	1,677.0					0.0	247.0	700.3	1,924.0	0.0	0.0
20.00		686.7	1,644.6					0.0	247.0	686.7	1,891.6	0.0	0.0
25.00		673.1	1,612.2					0.0	247.0	673.1	1,859.1	0.0	0.0
30.00		667.4	1,579.7					0.0	247.0	667.4	1,826.7	0.0	0.0
35.00		675.2	1,547.3					0.0	247.0	675.2	1,794.3	0.0	0.0
40.00		686.8	1,514.9					0.0	247.0	686.8	1,761.9	0.0	0.0
45.00		472.4	1,482.5					0.0	247.0	472.4	1,729.4	0.0	0.0
46.82	Bot - Section 2	353.0	530.6					0.0	89.7	353.0	620.3	0.0	0.0
50.00		487.3	1,854.7					0.0	157.2	487.3	2,011.9	0.0	0.0
53.65	Top - Section 1	357.5	2,094.2					0.0	180.3	357.5	2,274.5	0.0	0.0
55.00		455.5	386.3					0.0	66.7	455.5	452.9	0.0	0.0
60.00		717.8	1,410.0					0.0	247.0	717.8	1,657.0	0.0	0.0
65.00		717.5	1,377.6					0.0	247.0	717.5	1,624.6	0.0	0.0
70.00		715.6	1,345.1					0.0	247.0	715.6	1,592.1	0.0	0.0
75.00		712.2	1,312.7					0.0	247.0	712.2	1,559.7	0.0	0.0
80.00		707.5	1,280.3					0.0	247.0	707.5	1,527.3	0.0	0.0
85.00		701.6	1,247.9					0.0	247.0	701.6	1,494.9	0.0	0.0
90.00		692.3	1,215.4					0.0	247.0	692.3	1,462.4	0.0	0.0
94.97	Bot - Section 3	345.4	1,175.2					0.0	245.3	345.4	1,420.6	0.0	0.0
95.00		349.7	14.6					0.0	1.6	349.7	16.2	0.0	0.0
100.00		379.5	2,156.6					0.0	247.0	379.5	2,403.6	0.0	0.0
100.47	Top - Section 2	342.7	198.2					0.0	23.1	342.7	221.3	0.0	0.0
105.00		648.1	885.7					0.0	223.9	648.1	1,109.6	0.0	0.0
110.00		669.8	950.4					0.0	247.0	669.8	1,197.4	0.0	0.0
115.00		658.4	922.6					0.0	247.0	658.4	1,169.6	0.0	0.0
120.00		646.3	894.8					0.0	247.0	646.3	1,141.8	0.0	0.0
125.00		508.9	867.0					0.0	247.0	508.9	1,114.0	0.0	0.0
128.00	Appertunance(s)	313.4	506.9	2,938.9	0.0	3,335.5	1,531.8	0.0	148.2	3,252.3	2,186.9	0.0	0.0
130.00		431.1	332.4					0.0	72.8	431.1	405.1	0.0	0.0
135.00		605.8	811.4					0.0	182.0	605.8	993.4	0.0	0.0
140.00		564.1	783.6					0.0	182.0	564.1	965.6	0.0	0.0
144.53	Bot - Section 4	292.2	686.5					0.0	165.0	292.2	851.4	0.0	0.0
145.00		236.9	116.6					0.0	17.0	236.9	133.5	0.0	0.0
148.62	Top - Section 3	288.6	889.7					0.0	131.6	288.6	1,021.3	0.0	0.0
150.00	Appertunance(s)	359.6	135.2	6,516.4	0.0	15,443.4	3,314.2	0.0	50.3	6,876.0	3,499.7	0.0	0.0
155.00		552.8	477.0					0.0	119.7	552.8	596.7	0.0	0.0
160.00	Appertunance(s)	535.9	458.4	6,818.9	0.0	0.0	2,905.3	0.0	119.7	7,354.8	3,483.4	0.0	0.0
165.00		518.6	439.9					0.0	41.3	518.6	481.2	0.0	0.0
170.00	Appertunance(s)	500.7	421.4	1,113.9	0.0	0.0	837.2	0.0	41.3	1,614.6	1,300.0	0.0	0.0
175.00		482.4	402.9					0.0	11.8	482.4	414.7	0.0	0.0
180.00	Appertunance(s)	236.6	384.3	2,279.6	0.0	3,653.4	1,904.4	0.0	11.8	2,516.1	2,300.5	0.0	0.0
<b>Totals:</b>										43,123.0	61,437.4	0.00	0.00

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:05 AM

Customer: AT&T MOBILITY

**Load Case:** 1.2D + 1.6W

120 mph with No Ice

24 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-61.37	-42.85	0.00	-5,266.47	0.00	5,266.47	5,692.71	2,846.36	14,517.2	7,269.40	0.00	0.00	0.735
5.00	-59.25	-42.30	0.00	-5,052.22	0.00	5,052.22	5,628.96	2,814.48	14,088.0	7,054.49	0.09	-0.18	0.727
10.00	-57.17	-41.76	0.00	-4,840.70	0.00	4,840.70	5,563.66	2,781.83	13,661.1	6,840.71	0.37	-0.35	0.718
15.00	-55.12	-41.22	0.00	-4,631.91	0.00	4,631.91	5,496.81	2,748.41	13,236.6	6,628.15	0.84	-0.53	0.709
20.00	-53.11	-40.68	0.00	-4,425.82	0.00	4,425.82	5,428.41	2,714.21	12,814.8	6,416.94	1.50	-0.72	0.700
25.00	-51.13	-40.15	0.00	-4,222.41	0.00	4,222.41	5,358.46	2,679.23	12,395.9	6,207.17	2.35	-0.90	0.690
30.00	-49.18	-39.61	0.00	-4,021.66	0.00	4,021.66	5,286.96	2,643.48	11,980.1	5,998.96	3.39	-1.09	0.680
35.00	-47.27	-39.06	0.00	-3,823.60	0.00	3,823.60	5,213.91	2,606.96	11,567.6	5,792.42	4.63	-1.28	0.669
40.00	-45.40	-38.48	0.00	-3,628.32	0.00	3,628.32	5,139.31	2,569.66	11,158.7	5,587.66	6.08	-1.47	0.658
45.00	-43.59	-38.06	0.00	-3,435.91	0.00	3,435.91	5,063.17	2,531.58	10,753.6	5,384.80	7.72	-1.66	0.647
46.82	-42.92	-37.77	0.00	-3,366.76	0.00	3,366.76	5,035.12	2,517.56	10,607.3	5,311.58	8.37	-1.74	0.643
50.00	-40.83	-37.31	0.00	-3,246.54	0.00	3,246.54	4,985.47	2,492.73	10,352.4	5,183.93	9.57	-1.86	0.635
53.65	-38.51	-36.95	0.00	-3,110.35	0.00	3,110.35	4,988.22	2,494.11	10,366.4	5,190.94	11.05	-2.01	0.607
55.00	-37.99	-36.56	0.00	-3,060.47	0.00	3,060.47	4,966.99	2,483.49	10,258.8	5,137.04	11.63	-2.06	0.604
60.00	-36.25	-35.90	0.00	-2,877.69	0.00	2,877.69	4,887.38	2,443.69	9,862.94	4,938.80	13.89	-2.25	0.590
65.00	-34.54	-35.23	0.00	-2,698.21	0.00	2,698.21	4,806.22	2,403.11	9,471.52	4,742.80	16.35	-2.44	0.576
70.00	-32.86	-34.55	0.00	-2,522.06	0.00	2,522.06	4,723.50	2,361.75	9,084.82	4,549.16	19.01	-2.63	0.562
75.00	-31.22	-33.87	0.00	-2,349.30	0.00	2,349.30	4,639.24	2,319.62	8,703.04	4,357.99	21.87	-2.83	0.546
80.00	-29.62	-33.19	0.00	-2,179.94	0.00	2,179.94	4,553.43	2,276.72	8,326.42	4,169.40	24.93	-3.02	0.530
85.00	-28.06	-32.50	0.00	-2,014.00	0.00	2,014.00	4,466.07	2,233.04	7,955.16	3,983.49	28.19	-3.21	0.512
90.00	-26.54	-31.81	0.00	-1,851.51	0.00	1,851.51	4,363.95	2,181.97	7,566.58	3,788.91	31.65	-3.40	0.495
94.97	-25.09	-31.42	0.00	-1,693.51	0.00	1,693.51	4,246.75	2,123.37	7,163.59	3,587.12	35.29	-3.59	0.478
95.00	-25.04	-31.11	0.00	-1,692.46	0.00	1,692.46	4,245.96	2,122.98	7,160.92	3,585.78	35.32	-3.59	0.478
100.00	-22.61	-30.62	0.00	-1,536.89	0.00	1,536.89	4,127.97	2,063.99	6,766.43	3,388.25	39.18	-3.78	0.459
100.47	-22.37	-30.30	0.00	-1,522.61	0.00	1,522.61	3,503.95	1,751.98	5,854.85	2,931.78	39.55	-3.80	0.526
105.00	-21.21	-29.65	0.00	-1,385.24	0.00	1,385.24	3,439.10	1,719.55	5,598.81	2,803.57	43.23	-3.96	0.501
110.00	-19.96	-28.96	0.00	-1,237.01	0.00	1,237.01	3,366.09	1,683.04	5,320.54	2,664.22	47.49	-4.16	0.471
115.00	-18.75	-28.28	0.00	-1,092.19	0.00	1,092.19	3,291.53	1,645.77	5,046.81	2,527.15	51.95	-4.36	0.438
120.00	-17.58	-27.60	0.00	-950.79	0.00	950.79	3,205.58	1,602.79	4,763.20	2,385.14	56.60	-4.54	0.404
125.00	-16.44	-27.05	0.00	-812.77	0.00	812.77	3,104.44	1,552.22	4,465.90	2,236.27	61.45	-4.71	0.369
128.00	-14.50	-23.64	0.00	-728.30	0.00	728.30	3,043.76	1,521.88	4,292.12	2,149.25	64.44	-4.82	0.344
130.00	-14.09	-23.21	0.00	-681.01	0.00	681.01	3,003.31	1,501.66	4,178.19	2,092.20	66.47	-4.88	0.330
135.00	-13.09	-22.55	0.00	-564.97	0.00	564.97	2,902.18	1,451.09	3,900.05	1,952.92	71.66	-5.03	0.294
140.00	-12.14	-21.93	0.00	-452.22	0.00	452.22	2,801.04	1,400.52	3,631.49	1,818.44	77.00	-5.17	0.253
144.53	-11.29	-21.57	0.00	-352.81	0.00	352.81	2,709.35	1,354.68	3,396.28	1,700.66	81.96	-5.28	0.212
145.00	-11.17	-21.33	0.00	-342.74	0.00	342.74	2,699.91	1,349.96	3,372.51	1,688.76	82.47	-5.29	0.207
148.62	-10.16	-20.96	0.00	-265.59	0.00	265.59	1,682.77	841.39	2,096.43	1,049.77	86.50	-5.36	0.260
150.00	-7.30	-13.79	0.00	-221.15	0.00	221.15	1,670.84	835.42	2,059.67	1,031.37	88.06	-5.39	0.219
155.00	-6.74	-13.20	0.00	-152.19	0.00	152.19	1,626.74	813.37	1,928.26	965.56	93.74	-5.48	0.162
160.00	-3.98	-5.54	0.00	-86.21	0.00	86.21	1,581.08	790.54	1,799.26	900.97	99.52	-5.55	0.098
165.00	-3.54	-4.98	0.00	-58.48	0.00	58.48	1,533.87	766.94	1,672.89	837.69	105.35	-5.60	0.072
170.00	-2.41	-3.25	0.00	-33.56	0.00	33.56	1,485.12	742.56	1,549.38	775.84	111.23	-5.64	0.045
175.00	-2.04	-2.73	0.00	-17.31	0.00	17.31	1,432.25	716.13	1,426.40	714.26	117.14	-5.66	0.026
180.00	0.00	-2.52	0.00	-3.65	0.00	3.65	1,364.83	682.42	1,294.62	648.27	123.06	-5.67	0.006

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:05 AM

Customer: AT&T MOBILITY

**Load Case:** 0.9D + 1.6W

120 mph with No Ice (Reduced DL)

24 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		367.1	0.0					0.0	0.0	367.1	0.0	0.0	0.0
5.00		727.4	1,306.4					0.0	185.2	727.4	1,491.6	0.0	0.0
10.00		713.9	1,282.1					0.0	185.2	713.9	1,467.3	0.0	0.0
15.00		700.3	1,257.7					0.0	185.2	700.3	1,443.0	0.0	0.0
20.00		686.7	1,233.4					0.0	185.2	686.7	1,418.7	0.0	0.0
25.00		673.1	1,209.1					0.0	185.2	673.1	1,394.4	0.0	0.0
30.00		667.4	1,184.8					0.0	185.2	667.4	1,370.0	0.0	0.0
35.00		675.2	1,160.5					0.0	185.2	675.2	1,345.7	0.0	0.0
40.00		686.8	1,136.2					0.0	185.2	686.8	1,321.4	0.0	0.0
45.00		472.4	1,111.8					0.0	185.2	472.4	1,297.1	0.0	0.0
46.82	Bot - Section 2	353.0	397.9					0.0	67.3	353.0	465.3	0.0	0.0
50.00		487.3	1,391.0					0.0	117.9	487.3	1,508.9	0.0	0.0
53.65	Top - Section 1	357.5	1,570.7					0.0	135.2	357.5	1,705.9	0.0	0.0
55.00		455.5	289.7					0.0	50.0	455.5	339.7	0.0	0.0
60.00		717.8	1,057.5					0.0	185.2	717.8	1,242.7	0.0	0.0
65.00		717.5	1,033.2					0.0	185.2	717.5	1,218.4	0.0	0.0
70.00		715.6	1,008.9					0.0	185.2	715.6	1,194.1	0.0	0.0
75.00		712.2	984.5					0.0	185.2	712.2	1,169.8	0.0	0.0
80.00		707.5	960.2					0.0	185.2	707.5	1,145.5	0.0	0.0
85.00		701.6	935.9					0.0	185.2	701.6	1,121.1	0.0	0.0
90.00		692.3	911.6					0.0	185.2	692.3	1,096.8	0.0	0.0
94.97	Bot - Section 3	345.4	881.4					0.0	184.0	345.4	1,065.4	0.0	0.0
95.00		349.7	10.9					0.0	1.2	349.7	12.2	0.0	0.0
100.00		379.5	1,617.4					0.0	185.2	379.5	1,802.7	0.0	0.0
100.47	Top - Section 2	342.7	148.7					0.0	17.3	342.7	165.9	0.0	0.0
105.00		648.1	664.3					0.0	168.0	648.1	832.2	0.0	0.0
110.00		669.8	712.8					0.0	185.2	669.8	898.0	0.0	0.0
115.00		658.4	691.9					0.0	185.2	658.4	877.2	0.0	0.0
120.00		646.3	671.1					0.0	185.2	646.3	856.3	0.0	0.0
125.00		508.9	650.3					0.0	185.2	508.9	835.5	0.0	0.0
128.00	Appertunance(s)	313.4	380.2	2,938.9	0.0	3,335.5	1,148.8	0.0	111.1	3,252.3	1,640.1	0.0	0.0
130.00		431.1	249.3					0.0	54.6	431.1	303.9	0.0	0.0
135.00		605.8	608.6					0.0	136.5	605.8	745.0	0.0	0.0
140.00		564.1	587.7					0.0	136.5	564.1	724.2	0.0	0.0
144.53	Bot - Section 4	292.2	514.9					0.0	123.7	292.2	638.6	0.0	0.0
145.00		236.9	87.4					0.0	12.7	236.9	100.2	0.0	0.0
148.62	Top - Section 3	288.6	667.3					0.0	98.7	288.6	766.0	0.0	0.0
150.00	Appertunance(s)	359.6	101.4	6,516.4	0.0	15,443.4	2,485.6	0.0	37.8	6,876.0	2,624.8	0.0	0.0
155.00		552.8	357.7					0.0	89.8	552.8	447.5	0.0	0.0
160.00	Appertunance(s)	535.9	343.8	6,818.9	0.0	0.0	2,179.0	0.0	89.8	7,354.8	2,612.6	0.0	0.0
165.00		518.6	329.9					0.0	31.0	518.6	360.9	0.0	0.0
170.00	Appertunance(s)	500.7	316.0	1,113.9	0.0	0.0	627.9	0.0	31.0	1,614.6	975.0	0.0	0.0
175.00		482.4	302.1					0.0	8.9	482.4	311.0	0.0	0.0
180.00	Appertunance(s)	236.6	288.2	2,279.6	0.0	3,653.4	1,428.3	0.0	8.9	2,516.1	1,725.4	0.0	0.0
<b>Totals:</b>										<b>43,123.0</b>	<b>46,078.0</b>	<b>0.00</b>	<b>0.00</b>





Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:07 AM

Customer: AT&T MOBILITY

<b>Load Case:</b> 1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice	23 Iterations
Gust Response Factor : 1.10	Ice Dead Load Factor : 1.00	Wind Importance Factor : 1.00
Dead Load Factor : 1.20		Ice Importance Factor : 1.00
Wind Load Factor : 1.00		

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		76.3	0.0					0.0	0.0	76.3	0.0	0.0	0.0
5.00		151.5	2,195.4					0.0	247.0	151.5	2,442.3	0.0	0.0
10.00		149.2	2,207.4					0.0	247.0	149.2	2,454.4	0.0	0.0
15.00		146.8	2,191.9					0.0	247.0	146.8	2,438.9	0.0	0.0
20.00		144.2	2,167.4					0.0	247.0	144.2	2,414.4	0.0	0.0
25.00		141.7	2,138.3					0.0	247.0	141.7	2,385.2	0.0	0.0
30.00		140.7	2,106.2					0.0	247.0	140.7	2,353.2	0.0	0.0
35.00		142.6	2,072.1					0.0	247.0	142.6	2,319.1	0.0	0.0
40.00		145.4	2,036.6					0.0	247.0	145.4	2,283.6	0.0	0.0
45.00		100.1	1,999.9					0.0	247.0	100.1	2,246.9	0.0	0.0
46.82	Bot - Section 2	74.9	718.6					0.0	89.7	74.9	808.4	0.0	0.0
50.00		103.4	2,186.9					0.0	157.2	103.4	2,344.1	0.0	0.0
53.65	Top - Section 1	75.9	2,471.8					0.0	180.3	75.9	2,652.1	0.0	0.0
55.00		96.9	525.8					0.0	66.7	96.9	592.5	0.0	0.0
60.00		152.9	1,918.4					0.0	247.0	152.9	2,165.4	0.0	0.0
65.00		153.1	1,878.9					0.0	247.0	153.1	2,125.9	0.0	0.0
70.00		153.0	1,838.9					0.0	247.0	153.0	2,085.9	0.0	0.0
75.00		152.6	1,798.5					0.0	247.0	152.6	2,045.5	0.0	0.0
80.00		151.9	1,757.7					0.0	247.0	151.9	2,004.7	0.0	0.0
85.00		150.9	1,716.6					0.0	247.0	150.9	1,963.6	0.0	0.0
90.00		149.3	1,675.2					0.0	247.0	149.3	1,922.2	0.0	0.0
94.97	Bot - Section 3	74.6	1,622.8					0.0	245.3	74.6	1,868.2	0.0	0.0
95.00		75.6	17.6					0.0	1.6	75.6	19.3	0.0	0.0
100.00		82.0	2,605.4					0.0	247.0	82.0	2,852.4	0.0	0.0
100.47	Top - Section 2	74.2	240.1					0.0	23.1	74.2	263.2	0.0	0.0
105.00		140.6	1,284.0					0.0	223.9	140.6	1,507.9	0.0	0.0
110.00		145.7	1,379.6					0.0	247.0	145.7	1,626.6	0.0	0.0
115.00		143.6	1,341.7					0.0	247.0	143.6	1,588.7	0.0	0.0
120.00		141.3	1,303.6					0.0	247.0	141.3	1,550.6	0.0	0.0
125.00		111.6	1,265.3					0.0	247.0	111.6	1,512.3	0.0	0.0
128.00	Appertunance(s)	68.9	742.2	438.5	0.0	428.9	2,999.1	0.0	148.2	507.4	3,889.5	0.0	0.0
130.00		95.0	487.6					0.0	72.8	95.0	560.4	0.0	0.0
135.00		133.8	1,188.3					0.0	182.0	133.8	1,370.3	0.0	0.0
140.00		125.0	1,149.6					0.0	182.0	125.0	1,331.6	0.0	0.0
144.53	Bot - Section 4	64.9	1,009.3					0.0	165.0	64.9	1,174.2	0.0	0.0
145.00		52.7	150.2					0.0	17.0	52.7	167.2	0.0	0.0
148.62	Top - Section 3	64.2	1,144.6					0.0	131.6	64.2	1,276.2	0.0	0.0
150.00	Appertunance(s)	80.3	232.0	1,029.8	0.0	2,370.3	7,446.9	0.0	50.3	1,110.1	7,729.2	0.0	0.0
155.00		123.9	814.8					0.0	119.7	123.9	934.5	0.0	0.0
160.00	Appertunance(s)	120.6	784.9	1,019.5	0.0	0.0	6,186.4	0.0	119.7	1,140.1	7,091.0	0.0	0.0
165.00		117.3	754.8					0.0	41.3	117.3	796.2	0.0	0.0
170.00	Appertunance(s)	113.9	724.7	235.2	0.0	0.0	1,636.5	0.0	41.3	349.1	2,402.5	0.0	0.0
175.00		110.4	694.4					0.0	11.8	110.4	706.2	0.0	0.0
180.00	Appertunance(s)	54.3	664.1	477.5	0.0	803.5	2,838.2	0.0	11.8	531.8	3,514.1	0.0	0.0
<b>Totals:</b>										8,267.94	87,780.4	0.00	0.00

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:10 AM

Customer: AT&T MOBILITY

<b>Load Case:</b> 1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice	23 Iterations
Gust Response Factor : 1.10	Ice Dead Load Factor : 1.00	Wind Importance Factor : 1.00
Dead Load Factor : 1.20		Ice Importance Factor : 1.00
Wind Load Factor : 1.00		

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-87.78	-8.22	0.00	-1,005.99	0.00	1,005.99	5,692.71	2,846.36	14,517.2	7,269.40	0.00	0.00	0.154
5.00	-85.33	-8.12	0.00	-964.90	0.00	964.90	5,628.96	2,814.48	14,088.0	7,054.49	0.02	-0.03	0.152
10.00	-82.87	-8.01	0.00	-924.33	0.00	924.33	5,563.66	2,781.83	13,661.1	6,840.71	0.07	-0.07	0.150
15.00	-80.43	-7.91	0.00	-884.26	0.00	884.26	5,496.81	2,748.41	13,236.6	6,628.15	0.16	-0.10	0.148
20.00	-78.01	-7.81	0.00	-844.71	0.00	844.71	5,428.41	2,714.21	12,814.8	6,416.94	0.29	-0.14	0.146
25.00	-75.62	-7.71	0.00	-805.66	0.00	805.66	5,358.46	2,679.23	12,395.9	6,207.17	0.45	-0.17	0.144
30.00	-73.26	-7.61	0.00	-767.11	0.00	767.11	5,286.96	2,643.48	11,980.1	5,998.96	0.65	-0.21	0.142
35.00	-70.94	-7.50	0.00	-729.08	0.00	729.08	5,213.91	2,606.96	11,567.6	5,792.42	0.88	-0.24	0.139
40.00	-68.65	-7.39	0.00	-691.58	0.00	691.58	5,139.31	2,569.66	11,158.7	5,587.66	1.16	-0.28	0.137
45.00	-66.40	-7.31	0.00	-654.64	0.00	654.64	5,063.17	2,531.58	10,753.6	5,384.80	1.47	-0.32	0.135
46.82	-65.59	-7.25	0.00	-641.37	0.00	641.37	5,035.12	2,517.56	10,607.3	5,311.58	1.60	-0.33	0.134
50.00	-63.25	-7.16	0.00	-618.30	0.00	618.30	4,985.47	2,492.73	10,352.4	5,183.93	1.83	-0.36	0.132
53.65	-60.59	-7.09	0.00	-592.17	0.00	592.17	4,988.22	2,494.11	10,366.4	5,190.94	2.11	-0.38	0.126
55.00	-60.00	-7.01	0.00	-582.61	0.00	582.61	4,966.99	2,483.49	10,258.8	5,137.04	2.22	-0.39	0.126
60.00	-57.83	-6.88	0.00	-547.56	0.00	547.56	4,887.38	2,443.69	9,862.94	4,938.80	2.65	-0.43	0.123
65.00	-55.70	-6.74	0.00	-513.18	0.00	513.18	4,806.22	2,403.11	9,471.52	4,742.80	3.12	-0.47	0.120
70.00	-53.61	-6.61	0.00	-479.46	0.00	479.46	4,723.50	2,361.75	9,084.82	4,549.16	3.63	-0.50	0.117
75.00	-51.56	-6.47	0.00	-446.43	0.00	446.43	4,639.24	2,319.62	8,703.04	4,357.99	4.17	-0.54	0.114
80.00	-49.56	-6.33	0.00	-414.09	0.00	414.09	4,553.43	2,276.72	8,326.42	4,169.40	4.76	-0.57	0.110
85.00	-47.59	-6.19	0.00	-382.45	0.00	382.45	4,466.07	2,233.04	7,955.16	3,983.49	5.38	-0.61	0.107
90.00	-45.67	-6.05	0.00	-351.52	0.00	351.52	4,363.95	2,181.97	7,566.58	3,788.91	6.04	-0.65	0.103
94.97	-43.80	-5.96	0.00	-321.49	0.00	321.49	4,246.75	2,123.37	7,163.59	3,587.12	6.73	-0.68	0.100
95.00	-43.78	-5.90	0.00	-321.30	0.00	321.30	4,245.96	2,122.98	7,160.92	3,585.78	6.74	-0.68	0.100
100.00	-40.92	-5.80	0.00	-291.79	0.00	291.79	4,127.97	2,063.99	6,766.43	3,388.25	7.47	-0.72	0.096
100.47	-40.66	-5.73	0.00	-289.09	0.00	289.09	3,503.95	1,751.98	5,854.85	2,931.78	7.54	-0.72	0.110
105.00	-39.15	-5.60	0.00	-263.10	0.00	263.10	3,439.10	1,719.55	5,598.81	2,803.57	8.24	-0.75	0.105
110.00	-37.52	-5.45	0.00	-235.12	0.00	235.12	3,366.09	1,683.04	5,320.54	2,664.22	9.05	-0.79	0.099
115.00	-35.93	-5.31	0.00	-207.85	0.00	207.85	3,291.53	1,645.77	5,046.81	2,527.15	9.90	-0.83	0.093
120.00	-34.38	-5.17	0.00	-181.30	0.00	181.30	3,205.58	1,602.79	4,763.20	2,385.14	10.79	-0.86	0.087
125.00	-32.87	-5.05	0.00	-155.47	0.00	155.47	3,104.44	1,552.22	4,465.90	2,236.27	11.72	-0.90	0.080
128.00	-28.99	-4.49	0.00	-139.90	0.00	139.90	3,043.76	1,521.88	4,292.12	2,149.25	12.29	-0.92	0.075
130.00	-28.42	-4.39	0.00	-130.93	0.00	130.93	3,003.31	1,501.66	4,178.19	2,092.20	12.67	-0.93	0.072
135.00	-27.05	-4.25	0.00	-108.97	0.00	108.97	2,902.18	1,451.09	3,900.05	1,952.92	13.66	-0.96	0.065
140.00	-25.72	-4.11	0.00	-87.72	0.00	87.72	2,801.04	1,400.52	3,631.49	1,818.44	14.68	-0.98	0.057
144.53	-24.55	-4.03	0.00	-69.08	0.00	69.08	2,709.35	1,354.68	3,396.28	1,700.66	15.63	-1.01	0.050
145.00	-24.38	-3.98	0.00	-67.20	0.00	67.20	2,699.91	1,349.96	3,372.51	1,688.76	15.73	-1.01	0.049
148.62	-23.11	-3.90	0.00	-52.81	0.00	52.81	1,682.77	841.39	2,096.43	1,049.77	16.49	-1.02	0.064
150.00	-15.40	-2.65	0.00	-45.05	0.00	45.05	1,670.84	835.42	2,059.67	1,031.37	16.79	-1.03	0.053
155.00	-14.47	-2.52	0.00	-31.79	0.00	31.79	1,626.74	813.37	1,928.26	965.56	17.88	-1.05	0.042
160.00	-7.40	-1.25	0.00	-19.21	0.00	19.21	1,581.08	790.54	1,799.26	900.97	18.99	-1.06	0.026
165.00	-6.60	-1.12	0.00	-12.98	0.00	12.98	1,533.87	766.94	1,672.89	837.69	20.10	-1.07	0.020
170.00	-4.21	-0.72	0.00	-7.40	0.00	7.40	1,485.12	742.56	1,549.38	775.84	21.23	-1.08	0.012
175.00	-3.50	-0.60	0.00	-3.80	0.00	3.80	1,432.25	716.13	1,426.40	714.26	22.37	-1.09	0.008
180.00	0.00	-0.53	0.00	-0.80	0.00	0.80	1,364.83	682.42	1,294.62	648.27	23.51	-1.09	0.001

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:10 AM

Customer: AT&T MOBILITY

**Load Case:** 1.0D + 1.0W

Serviceability 60 mph

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		57.4	0.0					0.0	0.0	57.4	0.0	0.0	0.0
5.00		113.7	1,451.5					0.0	205.8	113.7	1,657.4	0.0	0.0
10.00		111.5	1,424.5					0.0	205.8	111.5	1,630.3	0.0	0.0
15.00		109.4	1,397.5					0.0	205.8	109.4	1,603.3	0.0	0.0
20.00		107.3	1,370.5					0.0	205.8	107.3	1,576.3	0.0	0.0
25.00		105.2	1,343.5					0.0	205.8	105.2	1,549.3	0.0	0.0
30.00		104.3	1,316.4					0.0	205.8	104.3	1,522.3	0.0	0.0
35.00		105.5	1,289.4					0.0	205.8	105.5	1,495.2	0.0	0.0
40.00		107.3	1,262.4					0.0	205.8	107.3	1,468.2	0.0	0.0
45.00		73.8	1,235.4					0.0	205.8	73.8	1,441.2	0.0	0.0
46.82	Bot - Section 2	55.2	442.2					0.0	74.8	55.2	516.9	0.0	0.0
50.00		76.1	1,545.6					0.0	131.0	76.1	1,676.6	0.0	0.0
53.65	Top - Section 1	55.9	1,745.2					0.0	150.3	55.9	1,895.4	0.0	0.0
55.00		71.2	321.9					0.0	55.6	71.2	377.5	0.0	0.0
60.00		112.2	1,175.0					0.0	205.8	112.2	1,380.8	0.0	0.0
65.00		112.1	1,148.0					0.0	205.8	112.1	1,353.8	0.0	0.0
70.00		111.8	1,121.0					0.0	205.8	111.8	1,326.8	0.0	0.0
75.00		111.3	1,093.9					0.0	205.8	111.3	1,299.8	0.0	0.0
80.00		110.5	1,066.9					0.0	205.8	110.5	1,272.7	0.0	0.0
85.00		109.6	1,039.9					0.0	205.8	109.6	1,245.7	0.0	0.0
90.00		108.2	1,012.9					0.0	205.8	108.2	1,218.7	0.0	0.0
94.97	Bot - Section 3	54.0	979.4					0.0	204.5	54.0	1,183.8	0.0	0.0
95.00		54.6	12.1					0.0	1.4	54.6	13.5	0.0	0.0
100.00		59.3	1,797.1					0.0	205.8	59.3	2,003.0	0.0	0.0
100.47	Top - Section 2	53.5	165.2					0.0	19.2	53.5	184.4	0.0	0.0
105.00		101.3	738.1					0.0	186.6	101.3	924.7	0.0	0.0
110.00		104.6	792.0					0.0	205.8	104.6	997.8	0.0	0.0
115.00		102.9	768.8					0.0	205.8	102.9	974.7	0.0	0.0
120.00		101.0	745.7					0.0	205.8	101.0	951.5	0.0	0.0
125.00		79.5	722.5					0.0	205.8	79.5	928.3	0.0	0.0
128.00	Appertunance(s)	49.0	422.4	459.2	0.0	521.2	1,276.5	0.0	123.5	508.2	1,822.4	0.0	0.0
130.00		67.4	277.0					0.0	60.7	67.4	337.6	0.0	0.0
135.00		94.7	676.2					0.0	151.6	94.7	827.8	0.0	0.0
140.00		88.1	653.0					0.0	151.6	88.1	804.7	0.0	0.0
144.53	Bot - Section 4	45.7	572.1					0.0	137.5	45.7	709.5	0.0	0.0
145.00		37.0	97.1					0.0	14.2	37.0	111.3	0.0	0.0
148.62	Top - Section 3	45.1	741.4					0.0	109.7	45.1	851.1	0.0	0.0
150.00	Appertunance(s)	56.2	112.7	1,018.2	0.0	2,413.0	2,761.8	0.0	42.0	1,074.4	2,916.4	0.0	0.0
155.00		86.4	397.5					0.0	99.7	86.4	497.2	0.0	0.0
160.00	Appertunance(s)	83.7	382.0	1,065.4	0.0	0.0	2,421.1	0.0	99.7	1,149.2	2,902.9	0.0	0.0
165.00		81.0	366.6					0.0	34.4	81.0	401.0	0.0	0.0
170.00	Appertunance(s)	78.2	351.2	174.1	0.0	0.0	697.7	0.0	34.4	252.3	1,083.3	0.0	0.0
175.00		75.4	335.7					0.0	9.8	75.4	345.6	0.0	0.0
180.00	Appertunance(s)	37.0	320.3	356.2	0.0	570.8	1,587.0	0.0	9.8	393.1	1,917.1	0.0	0.0
<b>Totals:</b>										6,737.97	51,197.8	0.00	0.00

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:12 AM

Customer: AT&T MOBILITY

Load Case: 1.0D + 1.0W

Serviceability 60 mph

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-51.20	-6.69	0.00	-818.34	0.00	818.34	5,692.71	2,846.36	14,517.2	7,269.40	0.00	0.00	0.122
5.00	-49.54	-6.60	0.00	-784.88	0.00	784.88	5,628.96	2,814.48	14,088.0	7,054.49	0.01	-0.03	0.120
10.00	-47.90	-6.51	0.00	-751.87	0.00	751.87	5,563.66	2,781.83	13,661.1	6,840.71	0.06	-0.05	0.119
15.00	-46.30	-6.42	0.00	-719.30	0.00	719.30	5,496.81	2,748.41	13,236.6	6,628.15	0.13	-0.08	0.117
20.00	-44.72	-6.34	0.00	-687.18	0.00	687.18	5,428.41	2,714.21	12,814.8	6,416.94	0.23	-0.11	0.115
25.00	-43.16	-6.25	0.00	-655.50	0.00	655.50	5,358.46	2,679.23	12,395.9	6,207.17	0.36	-0.14	0.114
30.00	-41.64	-6.16	0.00	-624.25	0.00	624.25	5,286.96	2,643.48	11,980.1	5,998.96	0.53	-0.17	0.112
35.00	-40.14	-6.07	0.00	-593.44	0.00	593.44	5,213.91	2,606.96	11,567.6	5,792.42	0.72	-0.20	0.110
40.00	-38.67	-5.98	0.00	-563.07	0.00	563.07	5,139.31	2,569.66	11,158.7	5,587.66	0.94	-0.23	0.108
45.00	-37.23	-5.91	0.00	-533.17	0.00	533.17	5,063.17	2,531.58	10,753.6	5,384.80	1.20	-0.26	0.106
46.82	-36.71	-5.87	0.00	-522.43	0.00	522.43	5,035.12	2,517.56	10,607.3	5,311.58	1.30	-0.27	0.106
50.00	-35.03	-5.79	0.00	-503.75	0.00	503.75	4,985.47	2,492.73	10,352.4	5,183.93	1.49	-0.29	0.104
53.65	-33.13	-5.74	0.00	-482.60	0.00	482.60	4,988.22	2,494.11	10,366.4	5,190.94	1.72	-0.31	0.100
55.00	-32.76	-5.68	0.00	-474.86	0.00	474.86	4,966.99	2,483.49	10,258.8	5,137.04	1.81	-0.32	0.099
60.00	-31.37	-5.57	0.00	-446.48	0.00	446.48	4,887.38	2,443.69	9,862.94	4,938.80	2.16	-0.35	0.097
65.00	-30.02	-5.47	0.00	-418.62	0.00	418.62	4,806.22	2,403.11	9,471.52	4,742.80	2.54	-0.38	0.095
70.00	-28.69	-5.36	0.00	-391.29	0.00	391.29	4,723.50	2,361.75	9,084.82	4,549.16	2.95	-0.41	0.092
75.00	-27.39	-5.25	0.00	-364.49	0.00	364.49	4,639.24	2,319.62	8,703.04	4,357.99	3.40	-0.44	0.090
80.00	-26.11	-5.15	0.00	-338.22	0.00	338.22	4,553.43	2,276.72	8,326.42	4,169.40	3.87	-0.47	0.087
85.00	-24.86	-5.04	0.00	-312.49	0.00	312.49	4,466.07	2,233.04	7,955.16	3,983.49	4.38	-0.50	0.084
90.00	-23.64	-4.93	0.00	-287.29	0.00	287.29	4,363.95	2,181.97	7,566.58	3,788.91	4.92	-0.53	0.081
94.97	-22.46	-4.87	0.00	-262.79	0.00	262.79	4,246.75	2,123.37	7,163.59	3,587.12	5.48	-0.56	0.079
95.00	-22.45	-4.82	0.00	-262.63	0.00	262.63	4,245.96	2,122.98	7,160.92	3,585.78	5.48	-0.56	0.079
100.00	-20.44	-4.75	0.00	-238.51	0.00	238.51	4,127.97	2,063.99	6,766.43	3,388.25	6.08	-0.59	0.075
100.47	-20.26	-4.70	0.00	-236.29	0.00	236.29	3,503.95	1,751.98	5,854.85	2,931.78	6.14	-0.59	0.086
105.00	-19.33	-4.60	0.00	-214.99	0.00	214.99	3,439.10	1,719.55	5,598.81	2,803.57	6.71	-0.62	0.082
110.00	-18.33	-4.49	0.00	-191.99	0.00	191.99	3,366.09	1,683.04	5,320.54	2,664.22	7.37	-0.65	0.078
115.00	-17.36	-4.39	0.00	-169.53	0.00	169.53	3,291.53	1,645.77	5,046.81	2,527.15	8.07	-0.68	0.072
120.00	-16.40	-4.28	0.00	-147.59	0.00	147.59	3,205.58	1,602.79	4,763.20	2,385.14	8.79	-0.70	0.067
125.00	-15.47	-4.20	0.00	-126.18	0.00	126.18	3,104.44	1,552.22	4,465.90	2,236.27	9.54	-0.73	0.061
128.00	-13.66	-3.67	0.00	-113.06	0.00	113.06	3,043.76	1,521.88	4,292.12	2,149.25	10.01	-0.75	0.057
130.00	-13.32	-3.60	0.00	-105.72	0.00	105.72	3,003.31	1,501.66	4,178.19	2,092.20	10.32	-0.76	0.055
135.00	-12.49	-3.50	0.00	-87.72	0.00	87.72	2,902.18	1,451.09	3,900.05	1,952.92	11.13	-0.78	0.049
140.00	-11.69	-3.41	0.00	-70.22	0.00	70.22	2,801.04	1,400.52	3,631.49	1,818.44	11.96	-0.80	0.043
144.53	-10.98	-3.35	0.00	-54.78	0.00	54.78	2,709.35	1,354.68	3,396.28	1,700.66	12.73	-0.82	0.036
145.00	-10.87	-3.31	0.00	-53.22	0.00	53.22	2,699.91	1,349.96	3,372.51	1,688.76	12.81	-0.82	0.036
148.62	-10.02	-3.26	0.00	-41.23	0.00	41.23	1,682.77	841.39	2,096.43	1,049.77	13.44	-0.83	0.045
150.00	-7.12	-2.14	0.00	-34.31	0.00	34.31	1,670.84	835.42	2,059.67	1,031.37	13.68	-0.84	0.038
155.00	-6.62	-2.05	0.00	-23.60	0.00	23.60	1,626.74	813.37	1,928.26	965.56	14.56	-0.85	0.029
160.00	-3.73	-0.86	0.00	-13.35	0.00	13.35	1,581.08	790.54	1,799.26	900.97	15.46	-0.86	0.017
165.00	-3.33	-0.77	0.00	-9.06	0.00	9.06	1,533.87	766.94	1,672.89	837.69	16.37	-0.87	0.013
170.00	-2.26	-0.50	0.00	-5.20	0.00	5.20	1,485.12	742.56	1,549.38	775.84	17.28	-0.87	0.008
175.00	-1.91	-0.42	0.00	-2.68	0.00	2.68	1,432.25	716.13	1,426.40	714.26	18.20	-0.88	0.005
180.00	0.00	-0.39	0.00	-0.57	0.00	0.57	1,364.83	682.42	1,294.62	648.27	19.12	-0.88	0.001

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:12 AM

Customer: AT&T MOBILITY

### Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.16
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.06
Long-Period Transition Period ( $T_L$ ):	6
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.60
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.17
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.09
Seismic Response Coefficient ( $C_s$ ):	0.03
Upper Limit $C_s$	0.03
Lower Limit $C_s$	0.03
Period based on Rayleigh Method (sec):	2.36
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.93
Total Unfactored Dead Load:	51.20 k
Seismic Base Shear (E):	2.00 k

#### Load Case (1.2 + 0.2S<sub>ds</sub>) \* DL + E ELFM

#### Seismic Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
43	177.50	330	7,147	0.019	39	407
42	172.50	346	7,081	0.019	38	426
41	167.50	386	7,465	0.020	40	476
40	162.50	401	7,324	0.020	40	495
39	157.50	482	8,284	0.022	45	595
38	152.50	497	8,034	0.022	43	614
37	149.31	155	2,399	0.006	13	191
36	146.81	851	12,779	0.035	69	1,050
35	144.77	111	1,626	0.004	9	137
34	142.27	710	10,028	0.027	54	876
33	137.50	805	10,649	0.029	58	993
32	132.50	828	10,201	0.028	55	1,022
31	129.00	338	3,951	0.011	21	417
30	126.50	546	6,152	0.017	33	674
29	122.50	928	9,834	0.027	53	1,146
28	117.50	951	9,301	0.025	50	1,174
27	112.50	975	8,761	0.024	47	1,203
26	107.50	998	8,217	0.022	44	1,231
25	102.73	925	6,977	0.019	38	1,141
24	100.23	184	1,327	0.004	7	228
23	97.50	2,003	13,665	0.037	74	2,472
22	94.98	14	88	0.000	0	17
21	92.48	1,184	7,294	0.020	39	1,461

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

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Customer: AT&T MOBILITY

20	87.50	1,219	6,749	0.018	36	1,504
19	82.50	1,246	6,159	0.017	33	1,537
18	77.50	1,273	5,578	0.015	30	1,571
17	72.50	1,300	5,009	0.014	27	1,604
16	67.50	1,327	4,455	0.012	24	1,637
15	62.50	1,354	3,919	0.011	21	1,671
14	57.50	1,381	3,404	0.009	18	1,704
13	54.32	377	834	0.002	5	466
12	51.82	1,895	3,825	0.010	21	2,339
11	48.41	1,677	2,966	0.008	16	2,069
10	45.91	517	826	0.002	4	638
9	42.50	1,441	1,984	0.005	11	1,779
8	37.50	1,468	1,588	0.004	9	1,812
7	32.50	1,495	1,227	0.003	7	1,845
6	27.50	1,522	906	0.002	5	1,879
5	22.50	1,549	626	0.002	3	1,912
4	17.50	1,576	392	0.001	2	1,945
3	12.50	1,603	209	0.001	1	1,979
2	7.50	1,630	79	0.000	0	2,012
1	2.50	1,657	10	0.000	0	2,045
TTA	180.00	10	222	0.001	1	12
10' Omni	180.00	50	1,112	0.003	6	62
Andrew DB806D-Y	180.00	27	601	0.002	3	33
Round Low Profile PI	180.00	1,500	33,363	0.090	180	1,851
KMW HB-X-WM-17-65-00	170.00	48	950	0.003	5	59
KMW HB-X-WM-17-65-00	170.00	90	1,793	0.005	10	111
Side Arms	170.00	560	11,156	0.030	60	691
Alcatel-Lucent RRH 2	160.00	119	2,106	0.006	11	147
Alcatel-Lucent RRH2X	160.00	132	2,340	0.006	13	163
Alcatel-Lucent RRH2x	160.00	170	3,015	0.008	16	210
RFS DB-T1-6Z-8AB-0Z	160.00	88	1,560	0.004	8	109
Antel BXA-70063/6CF_	160.00	51	904	0.002	5	63
Commscope LNX-6514DS	160.00	116	2,063	0.006	11	144
Commscope HBXX-6517D	160.00	245	4,339	0.012	23	302
Round Low Profile PI	160.00	1,500	26,587	0.072	144	1,851
Powerwave Allgon LGP	150.00	33	516	0.001	3	41
Powerwave Allgon 702	150.00	13	207	0.001	1	16
Raycap DC6-48-60-18-	150.00	20	313	0.001	2	25
Raycap DC6-48-60-18-	150.00	32	498	0.001	3	39
Powerwave Allgon LGP	150.00	186	2,911	0.008	16	230
Ericsson RRUS A2 B4	150.00	66	1,033	0.003	6	81
Ericsson RRUS 11 (Ba	150.00	300	4,695	0.013	25	370
Ericsson RRUS 11 B4	150.00	152	2,381	0.006	13	188
12' Omni	150.00	40	626	0.002	3	49
KMW AM-X-CD-14-65-00	150.00	109	1,709	0.005	9	135
Powerwave Allgon 777	150.00	210	3,287	0.009	18	259
Commscope SBNHH-1D65	150.00	101	1,573	0.004	9	124
Flat Low Profile Pla	150.00	1,500	23,477	0.064	127	1,851
Ericsson KRY 112 144	128.00	33	380	0.001	2	41
Ericsson AIR 21, 1.3	128.00	249	2,871	0.008	16	307
Ericsson AIR 21, 1.3	128.00	244	2,819	0.008	15	302
Flat T-Arm	128.00	750	8,646	0.023	47	926
		51,198	369,380	1.000	1,997	63,185

**Load Case (0.9 - 0.2Sds) \* DL + E ELFM**

**Seismic (Reduced DL) Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
43	177.50	330	7,147	0.019	39	286
42	172.50	346	7,081	0.019	38	299

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41	167.50	386	7,465	0.020	40	334
40	162.50	401	7,324	0.020	40	347
39	157.50	482	8,284	0.022	45	417
38	152.50	497	8,034	0.022	43	431
37	149.31	155	2,399	0.006	13	134
36	146.81	851	12,779	0.035	69	737
35	144.77	111	1,626	0.004	9	96
34	142.27	710	10,028	0.027	54	614
33	137.50	805	10,649	0.029	58	697
32	132.50	828	10,201	0.028	55	717
31	129.00	338	3,951	0.011	21	292
30	126.50	546	6,152	0.017	33	473
29	122.50	928	9,834	0.027	53	804
28	117.50	951	9,301	0.025	50	824
27	112.50	975	8,761	0.024	47	844
26	107.50	998	8,217	0.022	44	864
25	102.73	925	6,977	0.019	38	801
24	100.23	184	1,327	0.004	7	160
23	97.50	2,003	13,665	0.037	74	1,734
22	94.98	14	88	0.000	0	12
21	92.48	1,184	7,294	0.020	39	1,025
20	87.50	1,219	6,749	0.018	36	1,055
19	82.50	1,246	6,159	0.017	33	1,079
18	77.50	1,273	5,578	0.015	30	1,102
17	72.50	1,300	5,009	0.014	27	1,125
16	67.50	1,327	4,455	0.012	24	1,149
15	62.50	1,354	3,919	0.011	21	1,172
14	57.50	1,381	3,404	0.009	18	1,196
13	54.32	377	834	0.002	5	327
12	51.82	1,895	3,825	0.010	21	1,641
11	48.41	1,677	2,966	0.008	16	1,452
10	45.91	517	826	0.002	4	448
9	42.50	1,441	1,984	0.005	11	1,248
8	37.50	1,468	1,588	0.004	9	1,271
7	32.50	1,495	1,227	0.003	7	1,295
6	27.50	1,522	906	0.002	5	1,318
5	22.50	1,549	626	0.002	3	1,341
4	17.50	1,576	392	0.001	2	1,365
3	12.50	1,603	209	0.001	1	1,388
2	7.50	1,630	79	0.000	0	1,412
1	2.50	1,657	10	0.000	0	1,435
TTA	180.00	10	222	0.001	1	9
10' Omni	180.00	50	1,112	0.003	6	43
Andrew DB806D-Y	180.00	27	601	0.002	3	23
Round Low Profile PI	180.00	1,500	33,363	0.090	180	1,299
KMW HB-X-WM-17-65-00	170.00	48	950	0.003	5	41
KMW HB-X-WM-17-65-00	170.00	90	1,793	0.005	10	78
Side Arms	170.00	560	11,156	0.030	60	485
Alcatel-Lucent RRH 2	160.00	119	2,106	0.006	11	103
Alcatel-Lucent RRH2X	160.00	132	2,340	0.006	13	114
Alcatel-Lucent RRH2x	160.00	170	3,015	0.008	16	147
RFS DB-T1-6Z-8AB-OZ	160.00	88	1,560	0.004	8	76
Antel BXA-70063/6CF_	160.00	51	904	0.002	5	44
Commscope LNX-6514DS	160.00	116	2,063	0.006	11	101
Commscope HBXX-6517D	160.00	245	4,339	0.012	23	212
Round Low Profile PI	160.00	1,500	26,587	0.072	144	1,299
Powerwave Allgon LGP	150.00	33	516	0.001	3	29
Powerwave Allgon 702	150.00	13	207	0.001	1	11
Raycap DC6-48-60-18-	150.00	20	313	0.001	2	17
Raycap DC6-48-60-18-	150.00	32	498	0.001	3	28
Powerwave Allgon LGP	150.00	186	2,911	0.008	16	161
Ericsson RRUS A2 B4	150.00	66	1,033	0.003	6	57
Ericsson RRUS 11 (Ba	150.00	300	4,695	0.013	25	260
Ericsson RRUS 11 B4	150.00	152	2,381	0.006	13	132



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12' Omni	150.00	40	626	0.002	3	35
KMW AM-X-CD-14-65-00	150.00	109	1,709	0.005	9	95
Powerwave Allgon 777	150.00	210	3,287	0.009	18	182
Commscope SBNHH-1D65	150.00	101	1,573	0.004	9	87
Flat Low Profile Pla	150.00	1,500	23,477	0.064	127	1,299
Ericsson KRY 112 144	128.00	33	380	0.001	2	29
Ericsson AIR 21, 1.3	128.00	249	2,871	0.008	16	216
Ericsson AIR 21, 1.3	128.00	244	2,819	0.008	15	212
Flat T-Arm	128.00	750	8,646	0.023	47	649
		51,198	369,380	1.000	1,997	44,331

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**Load Case (1.2 + 0.2Sds) \* DL + E ELMF**

**Seismic Equivalent Lateral Forces Method**

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-61.14	-2.00	0.00	-277.03	0.00	277.03	5,692.71	2,846.36	14,517.2	7,269.40	0.00	0.00	0.049
5.00	-59.13	-2.01	0.00	-267.02	0.00	267.02	5,628.96	2,814.48	14,088.0	7,054.49	0.00	-0.01	0.048
10.00	-57.15	-2.02	0.00	-256.97	0.00	256.97	5,563.66	2,781.83	13,661.1	6,840.71	0.02	-0.02	0.048
15.00	-55.20	-2.02	0.00	-246.88	0.00	246.88	5,496.81	2,748.41	13,236.6	6,628.15	0.04	-0.03	0.047
20.00	-53.29	-2.03	0.00	-236.76	0.00	236.76	5,428.41	2,714.21	12,814.8	6,416.94	0.08	-0.04	0.047
25.00	-51.41	-2.03	0.00	-226.61	0.00	226.61	5,358.46	2,679.23	12,395.9	6,207.17	0.12	-0.05	0.046
30.00	-49.57	-2.03	0.00	-216.45	0.00	216.45	5,286.96	2,643.48	11,980.1	5,998.96	0.18	-0.06	0.045
35.00	-47.75	-2.03	0.00	-206.29	0.00	206.29	5,213.91	2,606.96	11,567.6	5,792.42	0.25	-0.07	0.045
40.00	-45.97	-2.03	0.00	-196.14	0.00	196.14	5,139.31	2,569.66	11,158.7	5,587.66	0.32	-0.08	0.044
45.00	-45.34	-2.03	0.00	-186.01	0.00	186.01	5,063.17	2,531.58	10,753.6	5,384.80	0.41	-0.09	0.043
46.82	-43.27	-2.01	0.00	-182.33	0.00	182.33	5,035.12	2,517.56	10,607.3	5,311.58	0.45	-0.09	0.043
50.00	-40.93	-1.99	0.00	-175.93	0.00	175.93	4,985.47	2,492.73	10,352.4	5,183.93	0.51	-0.10	0.042
53.65	-40.46	-1.99	0.00	-168.67	0.00	168.67	4,988.22	2,494.11	10,366.4	5,190.94	0.59	-0.11	0.041
55.00	-38.76	-1.97	0.00	-165.98	0.00	165.98	4,966.99	2,483.49	10,258.8	5,137.04	0.62	-0.11	0.040
60.00	-37.09	-1.95	0.00	-156.12	0.00	156.12	4,887.38	2,443.69	9,862.94	4,938.80	0.74	-0.12	0.039
65.00	-35.45	-1.93	0.00	-146.34	0.00	146.34	4,806.22	2,403.11	9,471.52	4,742.80	0.87	-0.13	0.038
70.00	-33.84	-1.91	0.00	-136.68	0.00	136.68	4,723.50	2,361.75	9,084.82	4,549.16	1.02	-0.14	0.037
75.00	-32.27	-1.88	0.00	-127.13	0.00	127.13	4,639.24	2,319.62	8,703.04	4,357.99	1.17	-0.15	0.036
80.00	-30.73	-1.85	0.00	-117.73	0.00	117.73	4,553.43	2,276.72	8,326.42	4,169.40	1.34	-0.16	0.035
85.00	-29.23	-1.81	0.00	-108.49	0.00	108.49	4,466.07	2,233.04	7,955.16	3,983.49	1.51	-0.17	0.034
90.00	-27.77	-1.77	0.00	-99.43	0.00	99.43	4,363.95	2,181.97	7,566.58	3,788.91	1.70	-0.18	0.033
94.97	-27.75	-1.78	0.00	-90.62	0.00	90.62	4,246.75	2,123.37	7,163.59	3,587.12	1.89	-0.19	0.032
95.00	-25.28	-1.70	0.00	-90.56	0.00	90.56	4,245.96	2,122.98	7,160.92	3,585.78	1.90	-0.19	0.031
100.00	-25.05	-1.69	0.00	-82.08	0.00	82.08	4,127.97	2,063.99	6,766.43	3,388.25	2.10	-0.20	0.030
100.47	-23.91	-1.65	0.00	-81.29	0.00	81.29	3,503.95	1,751.98	5,854.85	2,931.78	2.12	-0.20	0.035
105.00	-22.68	-1.61	0.00	-73.81	0.00	73.81	3,439.10	1,719.55	5,598.81	2,803.57	2.32	-0.21	0.033
110.00	-21.48	-1.56	0.00	-65.78	0.00	65.78	3,366.09	1,683.04	5,320.54	2,664.22	2.55	-0.22	0.031
115.00	-20.30	-1.51	0.00	-57.99	0.00	57.99	3,291.53	1,645.77	5,046.81	2,527.15	2.79	-0.23	0.029
120.00	-19.16	-1.45	0.00	-50.46	0.00	50.46	3,205.58	1,602.79	4,763.20	2,385.14	3.04	-0.24	0.027
125.00	-18.48	-1.42	0.00	-43.21	0.00	43.21	3,104.44	1,552.22	4,465.90	2,236.27	3.30	-0.25	0.025
128.00	-16.49	-1.31	0.00	-38.95	0.00	38.95	3,043.76	1,521.88	4,292.12	2,149.25	3.46	-0.26	0.024
130.00	-15.47	-1.25	0.00	-36.34	0.00	36.34	3,003.31	1,501.66	4,178.19	2,092.20	3.57	-0.26	0.023
135.00	-14.48	-1.19	0.00	-30.08	0.00	30.08	2,902.18	1,451.09	3,900.05	1,952.92	3.85	-0.27	0.020
140.00	-13.60	-1.13	0.00	-24.13	0.00	24.13	2,801.04	1,400.52	3,631.49	1,818.44	4.14	-0.28	0.018
144.53	-13.46	-1.13	0.00	-18.99	0.00	18.99	2,709.35	1,354.68	3,396.28	1,700.66	4.40	-0.28	0.016
145.00	-12.41	-1.05	0.00	-18.47	0.00	18.47	2,699.91	1,349.96	3,372.51	1,688.76	4.43	-0.28	0.016
148.62	-12.22	-1.04	0.00	-14.66	0.00	14.66	1,682.77	841.39	2,096.43	1,049.77	4.65	-0.29	0.021
150.00	-8.20	-0.74	0.00	-13.23	0.00	13.23	1,670.84	835.42	2,059.67	1,031.37	4.73	-0.29	0.018
155.00	-7.61	-0.69	0.00	-9.52	0.00	9.52	1,626.74	813.37	1,928.26	965.56	5.04	-0.29	0.015
160.00	-4.13	-0.40	0.00	-6.05	0.00	6.05	1,581.08	790.54	1,799.26	900.97	5.35	-0.30	0.009
165.00	-3.65	-0.36	0.00	-4.03	0.00	4.03	1,533.87	766.94	1,672.89	837.69	5.66	-0.30	0.007
170.00	-2.36	-0.24	0.00	-2.22	0.00	2.22	1,485.12	742.56	1,549.38	775.84	5.98	-0.31	0.004
175.00	-1.96	-0.20	0.00	-1.01	0.00	1.01	1,432.25	716.13	1,426.40	714.26	6.30	-0.31	0.003
180.00	0.00	-0.19	0.00	0.00	0.00	0.00	1,364.83	682.42	1,294.62	648.27	6.62	-0.31	0.000

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**Load Case (0.9 - 0.2Sds) \* DL + E ELFM**

**Seismic (Reduced DL) Equivalent Lateral Forces Method**

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-42.90	-2.00	0.00	-273.64	0.00	273.64	5,692.71	2,846.36	14,517.2	7,269.40	0.00	0.00	0.045
5.00	-41.48	-2.01	0.00	-263.64	0.00	263.64	5,628.96	2,814.48	14,088.0	7,054.49	0.00	-0.01	0.045
10.00	-40.09	-2.01	0.00	-253.61	0.00	253.61	5,563.66	2,781.83	13,661.1	6,840.71	0.02	-0.02	0.044
15.00	-38.73	-2.01	0.00	-243.56	0.00	243.56	5,496.81	2,748.41	13,236.6	6,628.15	0.04	-0.03	0.044
20.00	-37.39	-2.02	0.00	-233.49	0.00	233.49	5,428.41	2,714.21	12,814.8	6,416.94	0.08	-0.04	0.043
25.00	-36.07	-2.02	0.00	-223.40	0.00	223.40	5,358.46	2,679.23	12,395.9	6,207.17	0.12	-0.05	0.043
30.00	-34.77	-2.02	0.00	-213.32	0.00	213.32	5,286.96	2,643.48	11,980.1	5,998.96	0.18	-0.06	0.042
35.00	-33.50	-2.01	0.00	-203.24	0.00	203.24	5,213.91	2,606.96	11,567.6	5,792.42	0.24	-0.07	0.042
40.00	-32.25	-2.00	0.00	-193.18	0.00	193.18	5,139.31	2,569.66	11,158.7	5,587.66	0.32	-0.08	0.041
45.00	-31.81	-2.00	0.00	-183.16	0.00	183.16	5,063.17	2,531.58	10,753.6	5,384.80	0.41	-0.09	0.040
46.82	-30.35	-1.99	0.00	-179.52	0.00	179.52	5,035.12	2,517.56	10,607.3	5,311.58	0.44	-0.09	0.040
50.00	-28.71	-1.97	0.00	-173.19	0.00	173.19	4,985.47	2,492.73	10,352.4	5,183.93	0.50	-0.10	0.039
53.65	-28.39	-1.97	0.00	-166.01	0.00	166.01	4,988.22	2,494.11	10,366.4	5,190.94	0.58	-0.11	0.038
55.00	-27.19	-1.95	0.00	-163.35	0.00	163.35	4,966.99	2,483.49	10,258.8	5,137.04	0.61	-0.11	0.037
60.00	-26.02	-1.93	0.00	-153.61	0.00	153.61	4,887.38	2,443.69	9,862.94	4,938.80	0.73	-0.12	0.036
65.00	-24.87	-1.91	0.00	-143.96	0.00	143.96	4,806.22	2,403.11	9,471.52	4,742.80	0.86	-0.13	0.036
70.00	-23.74	-1.88	0.00	-134.43	0.00	134.43	4,723.50	2,361.75	9,084.82	4,549.16	1.00	-0.14	0.035
75.00	-22.64	-1.85	0.00	-125.02	0.00	125.02	4,639.24	2,319.62	8,703.04	4,357.99	1.15	-0.15	0.034
80.00	-21.56	-1.82	0.00	-115.75	0.00	115.75	4,553.43	2,276.72	8,326.42	4,169.40	1.32	-0.16	0.032
85.00	-20.51	-1.78	0.00	-106.65	0.00	106.65	4,466.07	2,233.04	7,955.16	3,983.49	1.49	-0.17	0.031
90.00	-19.48	-1.75	0.00	-97.72	0.00	97.72	4,363.95	2,181.97	7,566.58	3,788.91	1.67	-0.18	0.030
94.97	-19.47	-1.75	0.00	-89.06	0.00	89.06	4,246.75	2,123.37	7,163.59	3,587.12	1.87	-0.19	0.029
95.00	-17.74	-1.67	0.00	-89.00	0.00	89.00	4,245.96	2,122.98	7,160.92	3,585.78	1.87	-0.19	0.029
100.00	-17.58	-1.66	0.00	-80.65	0.00	80.65	4,127.97	2,063.99	6,766.43	3,388.25	2.07	-0.20	0.028
100.47	-16.77	-1.62	0.00	-79.88	0.00	79.88	3,503.95	1,751.98	5,854.85	2,931.78	2.09	-0.20	0.032
105.00	-15.91	-1.58	0.00	-72.52	0.00	72.52	3,439.10	1,719.55	5,598.81	2,803.57	2.29	-0.21	0.030
110.00	-15.07	-1.53	0.00	-64.62	0.00	64.62	3,366.09	1,683.04	5,320.54	2,664.22	2.51	-0.22	0.029
115.00	-14.24	-1.48	0.00	-56.97	0.00	56.97	3,291.53	1,645.77	5,046.81	2,527.15	2.75	-0.23	0.027
120.00	-13.44	-1.43	0.00	-49.57	0.00	49.57	3,205.58	1,602.79	4,763.20	2,385.14	3.00	-0.24	0.025
125.00	-12.97	-1.39	0.00	-42.44	0.00	42.44	3,104.44	1,552.22	4,465.90	2,236.27	3.25	-0.25	0.023
128.00	-11.57	-1.29	0.00	-38.27	0.00	38.27	3,043.76	1,521.88	4,292.12	2,149.25	3.41	-0.25	0.022
130.00	-10.85	-1.23	0.00	-35.69	0.00	35.69	3,003.31	1,501.66	4,178.19	2,092.20	3.52	-0.26	0.021
135.00	-10.16	-1.17	0.00	-29.55	0.00	29.55	2,902.18	1,451.09	3,900.05	1,952.92	3.79	-0.27	0.019
140.00	-9.54	-1.11	0.00	-23.71	0.00	23.71	2,801.04	1,400.52	3,631.49	1,818.44	4.07	-0.27	0.016
144.53	-9.45	-1.10	0.00	-18.66	0.00	18.66	2,709.35	1,354.68	3,396.28	1,700.66	4.34	-0.28	0.014
145.00	-8.71	-1.03	0.00	-18.14	0.00	18.14	2,699.91	1,349.96	3,372.51	1,688.76	4.36	-0.28	0.014
148.62	-8.57	-1.02	0.00	-14.41	0.00	14.41	1,682.77	841.39	2,096.43	1,049.77	4.58	-0.28	0.019
150.00	-5.75	-0.73	0.00	-13.00	0.00	13.00	1,670.84	835.42	2,059.67	1,031.37	4.66	-0.28	0.016
155.00	-5.34	-0.68	0.00	-9.36	0.00	9.36	1,626.74	813.37	1,928.26	965.56	4.96	-0.29	0.013
160.00	-2.90	-0.40	0.00	-5.95	0.00	5.95	1,581.08	790.54	1,799.26	900.97	5.27	-0.29	0.008
165.00	-2.56	-0.36	0.00	-3.96	0.00	3.96	1,533.87	766.94	1,672.89	837.69	5.58	-0.30	0.006
170.00	-1.66	-0.24	0.00	-2.18	0.00	2.18	1,485.12	742.56	1,549.38	775.84	5.89	-0.30	0.004
175.00	-1.37	-0.20	0.00	-0.99	0.00	0.99	1,432.25	716.13	1,426.40	714.26	6.21	-0.30	0.002
180.00	0.00	-0.19	0.00	0.00	0.00	0.00	1,364.83	682.42	1,294.62	648.27	6.52	-0.30	0.000

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:12 AM

Customer: AT&T MOBILITY

### Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.16
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.06
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.60
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.17
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.09
Period Based on Rayleigh Method (sec):	2.36
Redundancy Factor ( $\rho$ ):	1.30

#### Load Case (1.2 + 0.2Sds) \* DL + E EMAM

#### Seismic Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
43	177.50	330	1.838	1.716	1.044	0.296	85	407
42	172.50	346	1.736	1.263	0.871	0.241	72	426
41	167.50	386	1.637	0.896	0.721	0.191	64	476
40	162.50	401	1.540	0.605	0.592	0.146	51	495
39	157.50	482	1.447	0.379	0.482	0.106	44	595
38	152.50	497	1.357	0.207	0.388	0.072	31	614
37	149.31	155	1.300	0.121	0.336	0.052	7	191
36	146.81	851	1.257	0.066	0.300	0.038	28	1,050
35	144.77	111	1.223	0.027	0.272	0.028	3	137
34	142.27	710	1.181	-0.013	0.241	0.016	10	876
33	137.50	805	1.103	-0.068	0.189	-0.003	-2	993
32	132.50	828	1.024	-0.103	0.144	-0.019	-13	1,022
31	129.00	338	0.971	-0.116	0.117	-0.027	-8	417
30	126.50	546	0.933	-0.121	0.101	-0.031	-15	674
29	122.50	928	0.875	-0.121	0.078	-0.035	-28	1,146
28	117.50	951	0.805	-0.113	0.055	-0.036	-30	1,174
27	112.50	975	0.738	-0.098	0.038	-0.033	-28	1,203
26	107.50	998	0.674	-0.079	0.025	-0.026	-23	1,231
25	102.73	925	0.616	-0.059	0.016	-0.017	-13	1,141
24	100.23	184	0.586	-0.048	0.013	-0.011	-2	228
23	97.50	2,003	0.555	-0.036	0.010	-0.005	-8	2,472
22	94.98	14	0.526	-0.026	0.008	0.002	0	17
21	92.48	1,184	0.499	-0.016	0.007	0.008	8	1,461
20	87.50	1,219	0.447	0.003	0.006	0.019	20	1,504
19	82.50	1,246	0.397	0.019	0.007	0.028	30	1,537
18	77.50	1,273	0.350	0.033	0.009	0.035	39	1,571
17	72.50	1,300	0.307	0.044	0.012	0.040	45	1,604
16	67.50	1,327	0.266	0.052	0.015	0.043	50	1,637
15	62.50	1,354	0.228	0.059	0.020	0.045	53	1,671
14	57.50	1,381	0.193	0.064	0.024	0.045	54	1,704
13	54.32	377	0.172	0.066	0.027	0.045	15	466
12	51.82	1,895	0.157	0.067	0.029	0.045	74	2,339
11	48.41	1,677	0.137	0.069	0.032	0.045	65	2,069
10	45.91	517	0.123	0.070	0.034	0.044	20	638

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

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Customer: AT&T MOBILITY

9	42.50	1,441	0.105	0.071	0.036	0.043	54	1,779
8	37.50	1,468	0.082	0.072	0.039	0.043	54	1,812
7	32.50	1,495	0.062	0.072	0.041	0.042	54	1,845
6	27.50	1,522	0.044	0.071	0.042	0.040	53	1,879
5	22.50	1,549	0.030	0.068	0.040	0.039	52	1,912
4	17.50	1,576	0.018	0.063	0.037	0.036	49	1,945
3	12.50	1,603	0.009	0.054	0.031	0.032	44	1,979
2	7.50	1,630	0.003	0.039	0.022	0.024	34	2,012
1	2.50	1,657	0.000	0.015	0.008	0.011	15	2,045
TTA	180.00	10	1.890	1.980	1.140	0.325	3	12
10' Omni	180.00	50	1.890	1.980	1.140	0.325	14	62
Andrew DB806D-Y	180.00	27	1.890	1.980	1.140	0.325	8	33
Round Low Profile PI	180.00	1,500	1.890	1.980	1.140	0.325	423	1,851
KMW HB-X-WM-17-65-00	170.00	48	1.686	1.069	0.793	0.215	9	59
KMW HB-X-WM-17-65-00	170.00	90	1.686	1.069	0.793	0.215	17	111
Side Arms	170.00	560	1.686	1.069	0.793	0.215	104	691
Alcatel-Lucent RRH 2	160.00	119	1.493	0.485	0.535	0.126	13	147
Alcatel-Lucent RRH2X	160.00	132	1.493	0.485	0.535	0.126	14	163
Alcatel-Lucent RRH2x	160.00	170	1.493	0.485	0.535	0.126	19	210
RFS DB-T1-6Z-8AB-0Z	160.00	88	1.493	0.485	0.535	0.126	10	109
Antel BXA-70063/6CF_	160.00	51	1.493	0.485	0.535	0.126	6	63
Commscope LNX-	160.00	116	1.493	0.485	0.535	0.126	13	144
Commscope HBXX-	160.00	245	1.493	0.485	0.535	0.126	27	302
Round Low Profile PI	160.00	1,500	1.493	0.485	0.535	0.126	163	1,851
Powerwave Allgon LGP	150.00	33	1.312	0.138	0.347	0.056	2	41
Powerwave Allgon 702	150.00	13	1.312	0.138	0.347	0.056	1	16
Raycap DC6-48-60-18-	150.00	20	1.312	0.138	0.347	0.056	1	25
Raycap DC6-48-60-18-	150.00	32	1.312	0.138	0.347	0.056	2	39
Powerwave Allgon LGP	150.00	186	1.312	0.138	0.347	0.056	9	230
Ericsson RRUS A2 B4	150.00	66	1.312	0.138	0.347	0.056	3	81
Ericsson RRUS 11 (Ba	150.00	300	1.312	0.138	0.347	0.056	15	370
Ericsson RRUS 11 B4	150.00	152	1.312	0.138	0.347	0.056	7	188
12' Omni	150.00	40	1.312	0.138	0.347	0.056	2	49
KMW AM-X-CD-14-65-00	150.00	109	1.312	0.138	0.347	0.056	5	135
Powerwave Allgon 777	150.00	210	1.312	0.138	0.347	0.056	10	259
Commscope SBNHH-	150.00	101	1.312	0.138	0.347	0.056	5	124
Flat Low Profile Pla	150.00	1,500	1.312	0.138	0.347	0.056	73	1,851
Ericsson KRY 112 144	128.00	33	0.956	-0.118	0.111	-0.028	-1	41
Ericsson AIR 21, 1.3	128.00	249	0.956	-0.118	0.111	-0.028	-6	307
Ericsson AIR 21, 1.3	128.00	244	0.956	-0.118	0.111	-0.028	-6	302
Flat T-Arm	128.00	750	0.956	-0.118	0.111	-0.028	-18	926
		51,198	72.999	21.662	22.734	5.262	2,051	63,185

**Load Case (0.9 - 0.2Sds) \* DL + E EMAM**

**Seismic (Reduced DL) Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
43	177.50	330	1.838	1.716	1.044	0.296	85	286
42	172.50	346	1.736	1.263	0.871	0.241	72	299
41	167.50	386	1.637	0.896	0.721	0.191	64	334
40	162.50	401	1.540	0.605	0.592	0.146	51	347
39	157.50	482	1.447	0.379	0.482	0.106	44	417
38	152.50	497	1.357	0.207	0.388	0.072	31	431
37	149.31	155	1.300	0.121	0.336	0.052	7	134
36	146.81	851	1.257	0.066	0.300	0.038	28	737
35	144.77	111	1.223	0.027	0.272	0.028	3	96
34	142.27	710	1.181	-0.013	0.241	0.016	10	614
33	137.50	805	1.103	-0.068	0.189	-0.003	-2	697
32	132.50	828	1.024	-0.103	0.144	-0.019	-13	717

Site Number: 310972

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

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Customer: AT&T MOBILITY

31	129.00	338	0.971	-0.116	0.117	-0.027	-8	292
30	126.50	546	0.933	-0.121	0.101	-0.031	-15	473
29	122.50	928	0.875	-0.121	0.078	-0.035	-28	804
28	117.50	951	0.805	-0.113	0.055	-0.036	-30	824
27	112.50	975	0.738	-0.098	0.038	-0.033	-28	844
26	107.50	998	0.674	-0.079	0.025	-0.026	-23	864
25	102.73	925	0.616	-0.059	0.016	-0.017	-13	801
24	100.23	184	0.586	-0.048	0.013	-0.011	-2	160
23	97.50	2,003	0.555	-0.036	0.010	-0.005	-8	1,734
22	94.98	14	0.526	-0.026	0.008	0.002	0	12
21	92.48	1,184	0.499	-0.016	0.007	0.008	8	1,025
20	87.50	1,219	0.447	0.003	0.006	0.019	20	1,055
19	82.50	1,246	0.397	0.019	0.007	0.028	30	1,079
18	77.50	1,273	0.350	0.033	0.009	0.035	39	1,102
17	72.50	1,300	0.307	0.044	0.012	0.040	45	1,125
16	67.50	1,327	0.266	0.052	0.015	0.043	50	1,149
15	62.50	1,354	0.228	0.059	0.020	0.045	53	1,172
14	57.50	1,381	0.193	0.064	0.024	0.045	54	1,196
13	54.32	377	0.172	0.066	0.027	0.045	15	327
12	51.82	1,895	0.157	0.067	0.029	0.045	74	1,641
11	48.41	1,677	0.137	0.069	0.032	0.045	65	1,452
10	45.91	517	0.123	0.070	0.034	0.044	20	448
9	42.50	1,441	0.105	0.071	0.036	0.043	54	1,248
8	37.50	1,468	0.082	0.072	0.039	0.043	54	1,271
7	32.50	1,495	0.062	0.072	0.041	0.042	54	1,295
6	27.50	1,522	0.044	0.071	0.042	0.040	53	1,318
5	22.50	1,549	0.030	0.068	0.040	0.039	52	1,341
4	17.50	1,576	0.018	0.063	0.037	0.036	49	1,365
3	12.50	1,603	0.009	0.054	0.031	0.032	44	1,388
2	7.50	1,630	0.003	0.039	0.022	0.024	34	1,412
1	2.50	1,657	0.000	0.015	0.008	0.011	15	1,435
TTA	180.00	10	1.890	1.980	1.140	0.325	3	9
10' Omni	180.00	50	1.890	1.980	1.140	0.325	14	43
Andrew DB806D-Y	180.00	27	1.890	1.980	1.140	0.325	8	23
Round Low Profile PI	180.00	1,500	1.890	1.980	1.140	0.325	423	1,299
KMW HB-X-WM-17-65-00	170.00	48	1.686	1.069	0.793	0.215	9	41
KMW HB-X-WM-17-65-00	170.00	90	1.686	1.069	0.793	0.215	17	78
Side Arms	170.00	560	1.686	1.069	0.793	0.215	104	485
Alcatel-Lucent RRH 2	160.00	119	1.493	0.485	0.535	0.126	13	103
Alcatel-Lucent RRH2X	160.00	132	1.493	0.485	0.535	0.126	14	114
Alcatel-Lucent RRH2x	160.00	170	1.493	0.485	0.535	0.126	19	147
RFS DB-T1-6Z-8AB-OZ	160.00	88	1.493	0.485	0.535	0.126	10	76
Antel BXA-70063/6CF_	160.00	51	1.493	0.485	0.535	0.126	6	44
Commscope LNX-	160.00	116	1.493	0.485	0.535	0.126	13	101
Commscope HBXX-	160.00	245	1.493	0.485	0.535	0.126	27	212
Round Low Profile PI	160.00	1,500	1.493	0.485	0.535	0.126	163	1,299
Powerwave Allgon LGP	150.00	33	1.312	0.138	0.347	0.056	2	29
Powerwave Allgon 702	150.00	13	1.312	0.138	0.347	0.056	1	11
Raycap DC6-48-60-18-	150.00	20	1.312	0.138	0.347	0.056	1	17
Raycap DC6-48-60-18-	150.00	32	1.312	0.138	0.347	0.056	2	28
Powerwave Allgon LGP	150.00	186	1.312	0.138	0.347	0.056	9	161
Ericsson RRUS A2 B4	150.00	66	1.312	0.138	0.347	0.056	3	57
Ericsson RRUS 11 (Ba	150.00	300	1.312	0.138	0.347	0.056	15	260
Ericsson RRUS 11 B4	150.00	152	1.312	0.138	0.347	0.056	7	132
12' Omni	150.00	40	1.312	0.138	0.347	0.056	2	35
KMW AM-X-CD-14-65-00	150.00	109	1.312	0.138	0.347	0.056	5	95
Powerwave Allgon 777	150.00	210	1.312	0.138	0.347	0.056	10	182
Commscope SBNHH-	150.00	101	1.312	0.138	0.347	0.056	5	87
Flat Low Profile Pla	150.00	1,500	1.312	0.138	0.347	0.056	73	1,299
Ericsson KRY 112 144	128.00	33	0.956	-0.118	0.111	-0.028	-1	29
Ericsson AIR 21, 1.3	128.00	249	0.956	-0.118	0.111	-0.028	-6	216
Ericsson AIR 21, 1.3	128.00	244	0.956	-0.118	0.111	-0.028	-6	212
Flat T-Arm	128.00	750	0.956	-0.118	0.111	-0.028	-18	649

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**Site Number: 310972**

**Code: ANSI/TIA-222-G**

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**Site Name: Waterford Rebuild CT, CT**

**Engineering Number: 63627622**

**9/15/2015 11:45:12 AM**

**Customer: AT&T MOBILITY**

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51,198

72.999

21.662

22.734

5.262

2,051

44,331

**Load Case (1.2 + 0.2Sds) \* DL + E EMAM**

**Seismic Equivalent Modal Analysis Method**

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-61.14	-2.04	0.00	-254.16	0.00	254.16	5,692.71	2,846.36	14,517.2	7,269.40	0.00	0.00	0.046
5.00	-59.13	-2.01	0.00	-243.96	0.00	243.96	5,628.96	2,814.48	14,088.0	7,054.49	0.00	-0.01	0.045
10.00	-57.15	-1.98	0.00	-233.89	0.00	233.89	5,563.66	2,781.83	13,661.1	6,840.71	0.02	-0.02	0.044
15.00	-55.20	-1.94	0.00	-224.01	0.00	224.01	5,496.81	2,748.41	13,236.6	6,628.15	0.04	-0.03	0.044
20.00	-53.29	-1.89	0.00	-214.32	0.00	214.32	5,428.41	2,714.21	12,814.8	6,416.94	0.07	-0.03	0.043
25.00	-51.41	-1.84	0.00	-204.87	0.00	204.87	5,358.46	2,679.23	12,395.9	6,207.17	0.11	-0.04	0.043
30.00	-49.57	-1.80	0.00	-195.64	0.00	195.64	5,286.96	2,643.48	11,980.1	5,998.96	0.16	-0.05	0.042
35.00	-47.75	-1.75	0.00	-186.66	0.00	186.66	5,213.91	2,606.96	11,567.6	5,792.42	0.22	-0.06	0.041
40.00	-45.97	-1.70	0.00	-177.91	0.00	177.91	5,139.31	2,569.66	11,158.7	5,587.66	0.29	-0.07	0.041
45.00	-45.34	-1.69	0.00	-169.41	0.00	169.41	5,063.17	2,531.58	10,753.6	5,384.80	0.37	-0.08	0.040
46.82	-43.27	-1.62	0.00	-166.35	0.00	166.35	5,035.12	2,517.56	10,607.3	5,311.58	0.41	-0.08	0.040
50.00	-40.93	-1.55	0.00	-161.19	0.00	161.19	4,985.47	2,492.73	10,352.4	5,183.93	0.46	-0.09	0.039
53.65	-40.46	-1.54	0.00	-155.54	0.00	155.54	4,988.22	2,494.11	10,366.4	5,190.94	0.54	-0.10	0.038
55.00	-38.76	-1.48	0.00	-153.46	0.00	153.46	4,966.99	2,483.49	10,258.8	5,137.04	0.56	-0.10	0.038
60.00	-37.09	-1.43	0.00	-146.05	0.00	146.05	4,887.38	2,443.69	9,862.94	4,938.80	0.67	-0.11	0.037
65.00	-35.45	-1.39	0.00	-138.88	0.00	138.88	4,806.22	2,403.11	9,471.52	4,742.80	0.80	-0.12	0.037
70.00	-33.85	-1.34	0.00	-131.94	0.00	131.94	4,723.50	2,361.75	9,084.82	4,549.16	0.93	-0.13	0.036
75.00	-32.27	-1.31	0.00	-125.22	0.00	125.22	4,639.24	2,319.62	8,703.04	4,357.99	1.07	-0.14	0.036
80.00	-30.74	-1.28	0.00	-118.69	0.00	118.69	4,553.43	2,276.72	8,326.42	4,169.40	1.22	-0.15	0.035
85.00	-29.23	-1.26	0.00	-112.30	0.00	112.30	4,466.07	2,233.04	7,955.16	3,983.49	1.38	-0.16	0.035
90.00	-27.77	-1.25	0.00	-105.99	0.00	105.99	4,363.95	2,181.97	7,566.58	3,788.91	1.56	-0.17	0.034
94.97	-27.75	-1.26	0.00	-99.77	0.00	99.77	4,246.75	2,123.37	7,163.59	3,587.12	1.74	-0.18	0.034
95.00	-25.28	-1.26	0.00	-99.73	0.00	99.73	4,245.96	2,122.98	7,160.92	3,585.78	1.74	-0.18	0.034
100.00	-25.05	-1.26	0.00	-93.43	0.00	93.43	4,127.97	2,063.99	6,766.43	3,388.25	1.94	-0.19	0.034
100.47	-23.91	-1.27	0.00	-92.84	0.00	92.84	3,503.95	1,751.98	5,854.85	2,931.78	1.96	-0.20	0.038
105.00	-22.68	-1.30	0.00	-87.07	0.00	87.07	3,439.10	1,719.55	5,598.81	2,803.57	2.15	-0.21	0.038
110.00	-21.48	-1.33	0.00	-80.58	0.00	80.58	3,366.09	1,683.04	5,320.54	2,664.22	2.37	-0.22	0.037
115.00	-20.30	-1.36	0.00	-73.96	0.00	73.96	3,291.53	1,645.77	5,046.81	2,527.15	2.61	-0.23	0.035
120.00	-19.16	-1.38	0.00	-67.18	0.00	67.18	3,205.58	1,602.79	4,763.20	2,385.14	2.86	-0.24	0.034
125.00	-18.48	-1.40	0.00	-60.27	0.00	60.27	3,104.44	1,552.22	4,465.90	2,236.27	3.12	-0.26	0.033
128.00	-16.49	-1.43	0.00	-56.07	0.00	56.07	3,043.76	1,521.88	4,292.12	2,149.25	3.28	-0.26	0.032
130.00	-15.47	-1.44	0.00	-53.22	0.00	53.22	3,003.31	1,501.66	4,178.19	2,092.20	3.39	-0.27	0.031
135.00	-14.48	-1.44	0.00	-46.01	0.00	46.01	2,902.18	1,451.09	3,900.05	1,952.92	3.68	-0.28	0.029
140.00	-13.60	-1.43	0.00	-38.81	0.00	38.81	2,801.04	1,400.52	3,631.49	1,818.44	3.98	-0.29	0.026
144.53	-13.46	-1.43	0.00	-32.33	0.00	32.33	2,709.35	1,354.68	3,396.28	1,700.66	4.26	-0.30	0.024
145.00	-12.41	-1.39	0.00	-31.66	0.00	31.66	2,699.91	1,349.96	3,372.51	1,688.76	4.29	-0.30	0.023
148.62	-12.22	-1.39	0.00	-26.62	0.00	26.62	1,682.77	841.39	2,096.43	1,049.77	4.53	-0.31	0.033
150.00	-8.20	-1.20	0.00	-24.70	0.00	24.70	1,670.84	835.42	2,059.67	1,031.37	4.62	-0.31	0.029
155.00	-7.61	-1.16	0.00	-18.69	0.00	18.69	1,626.74	813.37	1,928.26	965.56	4.95	-0.32	0.024
160.00	-4.12	-0.82	0.00	-12.91	0.00	12.91	1,581.08	790.54	1,799.26	900.97	5.29	-0.33	0.017
165.00	-3.65	-0.76	0.00	-8.80	0.00	8.80	1,533.87	766.94	1,672.89	837.69	5.65	-0.34	0.013
170.00	-2.36	-0.55	0.00	-5.02	0.00	5.02	1,485.12	742.56	1,549.38	775.84	6.01	-0.35	0.008
175.00	-1.96	-0.46	0.00	-2.30	0.00	2.30	1,432.25	716.13	1,426.40	714.26	6.37	-0.35	0.005
180.00	0.00	-0.45	0.00	0.00	0.00	0.00	1,364.83	682.42	1,294.62	648.27	6.74	-0.35	0.000



**Load Case (0.9 - 0.2Sds) \* DL + E EMAM**

**Seismic (Reduced DL) Equivalent Modal Analysis Method**

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-42.90	-2.04	0.00	-250.89	0.00	250.89	5,692.71	2,846.36	14,517.2	7,269.40	0.00	0.00	0.042
5.00	-41.48	-2.01	0.00	-240.70	0.00	240.70	5,628.96	2,814.48	14,088.0	7,054.49	0.00	-0.01	0.041
10.00	-40.09	-1.97	0.00	-230.66	0.00	230.66	5,563.66	2,781.83	13,661.1	6,840.71	0.02	-0.02	0.041
15.00	-38.73	-1.93	0.00	-220.80	0.00	220.80	5,496.81	2,748.41	13,236.6	6,628.15	0.04	-0.03	0.040
20.00	-37.39	-1.88	0.00	-211.16	0.00	211.16	5,428.41	2,714.21	12,814.8	6,416.94	0.07	-0.03	0.040
25.00	-36.07	-1.83	0.00	-201.76	0.00	201.76	5,358.46	2,679.23	12,395.9	6,207.17	0.11	-0.04	0.039
30.00	-34.77	-1.78	0.00	-192.60	0.00	192.60	5,286.96	2,643.48	11,980.1	5,998.96	0.16	-0.05	0.039
35.00	-33.50	-1.73	0.00	-183.69	0.00	183.69	5,213.91	2,606.96	11,567.6	5,792.42	0.22	-0.06	0.038
40.00	-32.26	-1.68	0.00	-175.03	0.00	175.03	5,139.31	2,569.66	11,158.7	5,587.66	0.29	-0.07	0.038
45.00	-31.81	-1.66	0.00	-166.63	0.00	166.63	5,063.17	2,531.58	10,753.6	5,384.80	0.37	-0.08	0.037
46.82	-30.36	-1.60	0.00	-163.60	0.00	163.60	5,035.12	2,517.56	10,607.3	5,311.58	0.40	-0.08	0.037
50.00	-28.71	-1.53	0.00	-158.51	0.00	158.51	4,985.47	2,492.73	10,352.4	5,183.93	0.46	-0.09	0.036
53.65	-28.39	-1.51	0.00	-152.93	0.00	152.93	4,988.22	2,494.11	10,366.4	5,190.94	0.53	-0.10	0.035
55.00	-27.19	-1.46	0.00	-150.88	0.00	150.88	4,966.99	2,483.49	10,258.8	5,137.04	0.56	-0.10	0.035
60.00	-26.02	-1.41	0.00	-143.58	0.00	143.58	4,887.38	2,443.69	9,862.94	4,938.80	0.66	-0.11	0.034
65.00	-24.87	-1.36	0.00	-136.52	0.00	136.52	4,806.22	2,403.11	9,471.52	4,742.80	0.78	-0.12	0.034
70.00	-23.74	-1.32	0.00	-129.71	0.00	129.71	4,723.50	2,361.75	9,084.82	4,549.16	0.91	-0.13	0.034
75.00	-22.64	-1.28	0.00	-123.11	0.00	123.11	4,639.24	2,319.62	8,703.04	4,357.99	1.05	-0.14	0.033
80.00	-21.56	-1.25	0.00	-116.71	0.00	116.71	4,553.43	2,276.72	8,326.42	4,169.40	1.20	-0.15	0.033
85.00	-20.51	-1.23	0.00	-110.44	0.00	110.44	4,466.07	2,233.04	7,955.16	3,983.49	1.36	-0.16	0.032
90.00	-19.48	-1.23	0.00	-104.27	0.00	104.27	4,363.95	2,181.97	7,566.58	3,788.91	1.53	-0.17	0.032
94.97	-19.47	-1.23	0.00	-98.18	0.00	98.18	4,246.75	2,123.37	7,163.59	3,587.12	1.71	-0.18	0.032
95.00	-17.74	-1.23	0.00	-98.14	0.00	98.14	4,245.96	2,122.98	7,160.92	3,585.78	1.72	-0.18	0.032
100.00	-17.58	-1.24	0.00	-91.97	0.00	91.97	4,127.97	2,063.99	6,766.43	3,388.25	1.91	-0.19	0.031
100.47	-16.78	-1.25	0.00	-91.40	0.00	91.40	3,503.95	1,751.98	5,854.85	2,931.78	1.93	-0.19	0.036
105.00	-15.91	-1.27	0.00	-85.74	0.00	85.74	3,439.10	1,719.55	5,598.81	2,803.57	2.12	-0.20	0.035
110.00	-15.07	-1.30	0.00	-79.38	0.00	79.38	3,366.09	1,683.04	5,320.54	2,664.22	2.33	-0.21	0.034
115.00	-14.24	-1.33	0.00	-72.88	0.00	72.88	3,291.53	1,645.77	5,046.81	2,527.15	2.57	-0.23	0.033
120.00	-13.44	-1.36	0.00	-66.24	0.00	66.24	3,205.58	1,602.79	4,763.20	2,385.14	2.81	-0.24	0.032
125.00	-12.97	-1.37	0.00	-59.45	0.00	59.45	3,104.44	1,552.22	4,465.90	2,236.27	3.07	-0.25	0.031
128.00	-11.57	-1.41	0.00	-55.34	0.00	55.34	3,043.76	1,521.88	4,292.12	2,149.25	3.23	-0.26	0.030
130.00	-10.85	-1.42	0.00	-52.53	0.00	52.53	3,003.31	1,501.66	4,178.19	2,092.20	3.34	-0.26	0.029
135.00	-10.15	-1.42	0.00	-45.44	0.00	45.44	2,902.18	1,451.09	3,900.05	1,952.92	3.62	-0.28	0.027
140.00	-9.54	-1.41	0.00	-38.35	0.00	38.35	2,801.04	1,400.52	3,631.49	1,818.44	3.92	-0.29	0.024
144.53	-9.44	-1.41	0.00	-31.96	0.00	31.96	2,709.35	1,354.68	3,396.28	1,700.66	4.20	-0.30	0.022
145.00	-8.71	-1.37	0.00	-31.31	0.00	31.31	2,699.91	1,349.96	3,372.51	1,688.76	4.23	-0.30	0.022
148.62	-8.57	-1.37	0.00	-26.34	0.00	26.34	1,682.77	841.39	2,096.43	1,049.77	4.46	-0.31	0.030
150.00	-5.75	-1.19	0.00	-24.45	0.00	24.45	1,670.84	835.42	2,059.67	1,031.37	4.54	-0.31	0.027
155.00	-5.33	-1.14	0.00	-18.51	0.00	18.51	1,626.74	813.37	1,928.26	965.56	4.87	-0.32	0.022
160.00	-2.89	-0.81	0.00	-12.80	0.00	12.80	1,581.08	790.54	1,799.26	900.97	5.21	-0.33	0.016
165.00	-2.56	-0.75	0.00	-8.73	0.00	8.73	1,533.87	766.94	1,672.89	837.69	5.56	-0.34	0.012
170.00	-1.66	-0.54	0.00	-4.98	0.00	4.98	1,485.12	742.56	1,549.38	775.84	5.91	-0.34	0.008
175.00	-1.37	-0.46	0.00	-2.28	0.00	2.28	1,432.25	716.13	1,426.40	714.26	6.27	-0.34	0.004
180.00	0.00	-0.45	0.00	0.00	0.00	0.00	1,364.83	682.42	1,294.62	648.27	6.63	-0.34	0.000

Site Number: 310972

Code: ANSI/TIA-222-G

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Site Name: Waterford Rebuild CT, CT

Engineering Number: 63627622

9/15/2015 11:45:12 AM

Customer: AT&T MOBILITY

**Analysis Summary**

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	42.85	0.00	61.37	0.00	0.00	5266.47	0.00	0.74
0.9D + 1.6W	42.83	0.00	46.01	0.00	0.00	5212.26	0.00	0.73
1.2D + 1.0Di + 1.0Wi	8.22	0.00	87.78	0.00	0.00	1005.99	0.00	0.15
(1.2 + 0.2Sds) * DL + E ELFM	2.00	0.00	61.14	0.00	0.00	277.03	0.00	0.05
(1.2 + 0.2Sds) * DL + E EMAM	2.04	0.00	61.14	0.00	0.00	254.16	0.00	0.05
(0.9 - 0.2Sds) * DL + E ELFM	2.00	0.00	42.90	0.00	0.00	273.64	0.00	0.05
(0.9 - 0.2Sds) * DL + E EMAM	2.04	0.00	42.90	0.00	0.00	250.89	0.00	0.04
1.0D + 1.0W	6.69	0.00	51.20	0.00	0.00	818.34	0.00	0.12

<b>Base/Flange Plate</b>	Plate Type	<b>Baseplate</b>
	Pole Diameter	62.45 in
	Pole Thickness	0.4375 in
	Plate Diameter	75 in
	Plate Thickness	2.75 in
	Plate Fy	60 ksi
	Weld Length	0.3125 in
	$\phi_s$ Resistance	1001.50 k-in
	Applied	307.18 k-in
<b>Stiffeners</b>	#	0

Code Rev. **G**

Date **9/10/2015**  
 Engineer **AMC**  
 Site # **310972**  
 Carrier **AT&T**

Moment **5266.5 k-ft**  
 Axial **61.4 k**

<b>Bolts</b>	#	<b>20</b>
	Bolt Circle (R)adial / (S)quare	69 in R
	Diameter	2.25 in
	Hole Diameter	2.625 in
	Type	A615-75
	Fy	75 ksi
	Fu	100 ksi
	$\phi_s$ Resistance	259.82 k
	Applied	186.17 k
<b>Reinforcement</b>	#	0
	#	0
<b>Extra Bolts O</b>	#	0

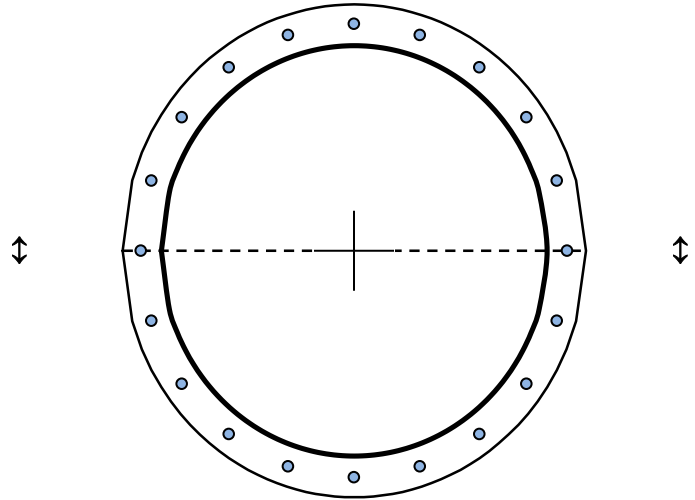


Plate Stress Ratio:  
**0.31** (Pass)

Bolt Stress Ratio:  
**0.72** (Pass)

<b>Base/Flange Plate</b>	Plate Type	<b>Flange @ 148.6 ft</b>
	Pole Diameter	30.4375 in
	Pole Thickness	0.25 in
	Plate Diameter	37.5 in
	Plate Thickness	2 in
	Plate Fy	50 ksi
	Weld Length	0.3125 in
	$\phi_s$ Resistance	179.29 k-in
	Applied	17.77 k-in
	<b>Stiffeners</b>	#

Code Rev. **G**

Date **9/10/2015**  
 Engineer **AMC**  
 Site # **310972**  
 Carrier **AT&T**

Moment **265.6 k-ft**  
 Axial **10.2 k**

Required Flange Thickness:  
**0.63 in** OK

<b>Bolts</b>	#	<b>24</b>
	Bolt Circle (R)adial / (S)quare	34.5 in R
	Diameter	1 in
	Hole Diameter	1.0625 in
	Type	A325
	Fy	92 ksi
	Fu	120 ksi
	$\phi_s$ Resistance	54.52 k
	Applied	14.97 k
	<b>Reinforcement</b>	#
<b>Extra Bolts O</b>	#	0

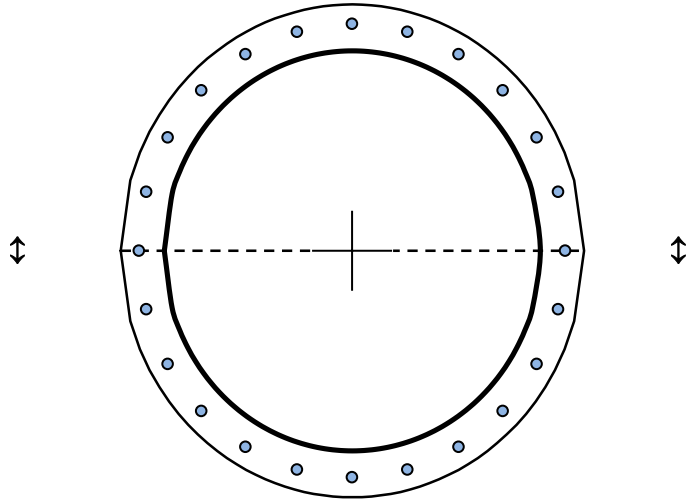


Plate Stress Ratio:  
**0.10** (Pass)

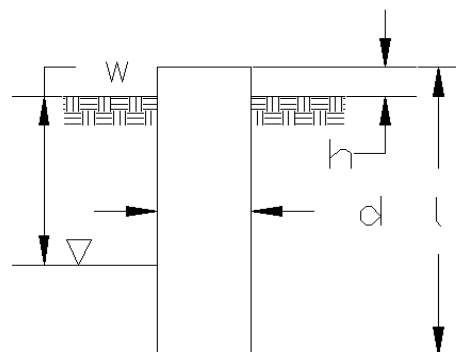
Bolt Stress Ratio:  
**0.27** (Pass)

Site Name: Waterford CT, CT  
 Site Number: 310972  
 Engineer: Adam Cox  
 Engineering Number: 63627622  
 Date: 09/15/15

Program Last Updated: 5/13/2014  
 American Tower Corporation

**Design Base Loads (Factored) - Analysis per TIA-222-G Standards**

Analyze or Design a Foundation? Analyze  
 Foundation Mapped: N  
 Moment (M): 5266.5 k-ft  
 Shear/Leg (V): 42.9 k  
 Axial Load (P): 61.4 k  
 Uplift/Leg (U): 0.0 k  
 Tower Type (GT / SST / MP): MP



Diameter of Caisson (d): 8.0 ft  
 Caisson Embedment (L-h): 26.0 ft  
 Caisson Height Above Ground (h): 0.5 ft  
 Depth Below Ground Surface to Water Table (w): 99.0 ft  
 Unit Weight of Concrete: 150.0 pcf  
 Unit Weight of Water: 62.4 pcf  
 Tension Skin Friction/Compression Skin Friction: 1.00  
 Pullout Angle: 30.0 degrees

**Engineer Notes**

**Soil Mechanical Properties**

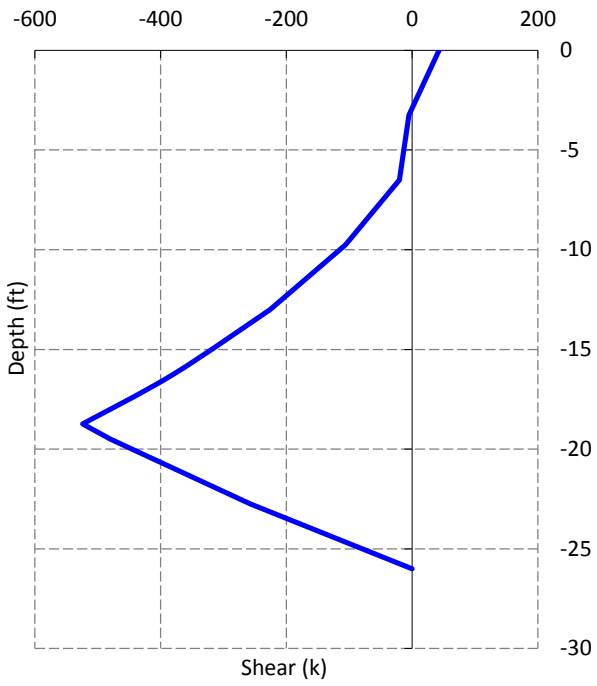
Depth (ft)		$\gamma_{Soil}$	Cohesion	$\phi$	Ultimate Skin	Ultimate Bearing
Top	Bottom	(pcf)	(psf)	(degree)	Friction (psf)	Pressure (psf)
0.0	4.0	110	0	0	0	0
4.0	20.0	110	0	33	1000	0
20.0	27.0	110	0	33	1400	12000

Required Embedment: 23.9 ft - OK, Caisson Embedment Satisfactory  
 Volume of Concrete: 1332.0 ft<sup>3</sup> = 49.3 yd<sup>3</sup>  
 Weight of Concrete (Buoyancy Effect Considered): 199.8 k  
 Average Soil Unit Weight: 110.0 pcf  
 Skin Friction Resistance: 613.2 k  
 Compressive Bearing Resistance: 603.2 k  
 Pullout Weight (Minus Concrete Weight): 1214.4 k  
 Nominal Uplift Capacity per Leg ( $\phi_s T_n$ ): 609.8 k  
 Nominal Compressive Capacity per Leg ( $\phi_s P_n$ ): 912.3 k  
 $P_u$ : 124.1 k  
 $T_u / \phi_s T_n$ : 0.00 Result: OK  
 $P_u / \phi_s P_n$ : 0.14 Result: OK  
 Total Lateral Resistance: 2469.0 k  
 Inflection Point (Below Ground Surface): 18.7 ft  
 Design Overturning Moment At Inflection Point ( $M_D$ ): 6090.7 k-ft  
 Nominal Moment Capacity ( $\phi_s M_n$ ): 8656.0 k-ft  
 $M_D / \phi_s M_n$ : 0.70 Result: OK  
 $\phi_s$ : 0.75

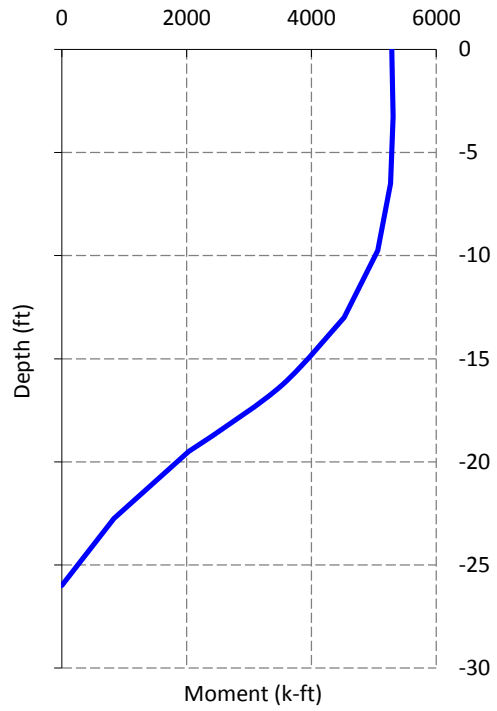
## Caisson Strength Capacity

Concrete Compressive Strength ( $f'_c$ ):	4000 psi
Vertical Steel Rebar Size #:	10
Vertical Steel Rebar Area:	1.27 in <sup>2</sup>
# of Vertical Steel Rebars:	40
Vertical Steel Rebar Yield Strength ( $F_y$ ):	60 ksi
Horizontal Tie / Stirrup Size #:	5
Horizontal Tie / Stirrup Area:	0.31 in <sup>2</sup>
Design Horizontal Tie / Stirrup Spacing:	6.0 in
Horizontal Tie / Stirrup Steel Yield Strength ( $F_y$ ):	40 ksi
Rebar Cage Diameter:	88.0 in
Strength Bending/Tension Reduction Factor ( $\phi_B$ ):	0.90 ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor ( $\phi_V$ ):	0.75 ACI318-05 - 9.3.2.3
Strength Compression Reduction Factor ( $\phi_P$ ):	0.65 ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000 ksi
Design Moment ( $M_u$ ):	5309.2 k-ft
Nominal Moment Capacity ( $\phi_B M_n$ ):	9838.8 k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$ :	0.54 Result: OK
Design Shear ( $V_u$ ):	524.1 k
Nominal Shear Capacity ( $\phi_V V_n$ ):	689.6 k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$ :	0.76 Result: OK
Design Tension ( $T_u$ ):	0.0 k
Nominal Tension Capacity ( $\phi_T T_n$ ):	2743.2 k - ACI318-05 - 10.2
$T_u/\phi_T T_n$ :	0.00 Result: OK
Design Compression ( $P_u$ ):	124.1 k
Nominal Compression Capacity ( $\phi_P P_n$ ):	12707.4 k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$ :	0.01 Result: OK
Bending Reinforcement Ratio:	0.007 ACI318-05 - 10.8.4 & 10.9.1
$M_u/\phi_B M_n + T_u/\phi_T T_n$ :	0.54 Result: OK

Design Factored Shear / Depth



Design Factored Moment / Depth



Nominal and Factored Moment Capacity and Factored Design Loads

