



STATE OF CONNECTICUT  
*CONNECTICUT SITING COUNCIL*

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

Web Site: [portal.ct.gov/csc](http://portal.ct.gov/csc)

**VIA ELECTRONIC MAIL**

January 15, 2021

Duncan J. Forsyth, Esq.  
Halloran & Sage LLP  
1 Godwin Square, 225 Asylum Street  
Hartford, CT 06103  
[forsyth@halloransage.com](mailto:forsyth@halloransage.com)

RE: **EM-VER-020-201224** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 719 George Washington Turnpike, Burlington, Connecticut.

Dear Attorney Forsyth:

The Connecticut Siting Council (Council) is in receipt of your correspondence of January 11, 2021 submitted in response to a request for an exempt modification filed with the Council by Verizon Wireless (Verizon) on December 24, 2020 for an exempt modification to the telecommunications facility located at 719 George Washington Turnpike in Burlington. Thank you for taking the time to submit comments.

Before making a final decision on any request for an exempt modification, the Council carefully considers the proposal in accordance with the required feasibility criteria under 16-50j-72 of the Regulations of Connecticut State Agencies. Entities requesting an exempt modification for an existing telecommunications facility must demonstrate that the proposal is consistent with the exempt modification criteria, including, but not limited to, changes on an existing site that do not increase the tower height; extend the boundaries of the site by any dimension; increase noise levels at the site boundary by 6 decibels or more, or to levels that exceed state criteria; increase radio frequency power density at the site boundary to or above standards adopted by the Federal Communications Commission; cause a significant adverse change or alteration in the physical or environmental characteristics of the site; *or impair the structural integrity of the facility.* (Emphasis added).

The January 11, 2021 correspondence submitted on behalf of the Town of Burlington expresses valid concerns regarding the May 8, 2020 Structural Analysis (SA) submitted with the December 24, 2020 Verizon exempt modification request and conducted by Nexius on behalf of Verizon indicating a tower stress level at 115.2% of its acceptable capacity if Verizon's proposed equipment is installed on the facility. The Nexius SA accounts for similar T-Mobile and AT&T equipment installations that were approved by the Council in 2019.

The Council did not receive written notification of T-Mobile and AT&T's completion of their approved equipment installations prior to the submission of Verizon's December 24, 2020 exempt modification request.<sup>1</sup> A condition of the Council's approval for the equipment installations of both T-Mobile and AT&T is to provide written notification of completion of the installations prior to the expiration of the approval,

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<sup>1</sup> Verizon submitted an exempt modification request to the Council in April 2020 that was rendered incomplete due to the absence of the previously approved T-Mobile and AT&T equipment installations from the SA submitted with the request. On June 19, 2020, Verizon provided the Council with written notification of withdrawal of the request.

or to submit a written request for an extension of time to complete the installation at least 60 days prior to the expiration of the approval.

On July 8, 2019 and November 18, 2019, the Council approved exempt modification requests for equipment installations from T-Mobile and AT&T, respectively, each of which included SAs indicating tower stress levels below 100%. These requests, including, but not limited to, the SAs and the Council's decision letters, are available on the Council's "Decisions by Town" web page for the Town of Burlington under the filing numbers EM-T-Mobile-020-190614 and EM-CING-020-191015 or by following the links below:

[https://portal.ct.gov/-/media/CSC/2\\_EMS-medialibrary/Burlington/GeorgeWashingtonTpke/T\\_Mobile/emtmobile020190614dcltrGeorgewashingtontpkepdf.pdf](https://portal.ct.gov/-/media/CSC/2_EMS-medialibrary/Burlington/GeorgeWashingtonTpke/T_Mobile/emtmobile020190614dcltrGeorgewashingtontpkepdf.pdf)

[https://portal.ct.gov/-/media/CSC/2\\_EMS-medialibrary/Burlington/GeorgeWashingtonTpke/ATT\\_CING/emcing020191015decisiongeorgewashingtontpkepdf.pdf](https://portal.ct.gov/-/media/CSC/2_EMS-medialibrary/Burlington/GeorgeWashingtonTpke/ATT_CING/emcing020191015decisiongeorgewashingtontpkepdf.pdf)

Please be advised that the Council's approval of T-Mobile's above-referenced equipment installation expired on July 8, 2020 and the Council's approval of AT&T's above-referenced equipment installation expired on November 18, 2020 per Condition No. 7 of each respective Council decision letter. Neither carrier submitted written notification of completion of construction per Condition 5 nor a written request for an extension to complete construction per Condition 8.

On April 23, 2020, the Council received a request for an exempt modification at the subject facility from Verizon. The Council issued written notice of an incomplete request for exempt modification on April 30, 2020 due to the absence of the previously approved T-Mobile and AT&T equipment installations from the SA submitted with the request. Please note that the April 17, 2020 SA provided with Verizon's request indicated a tower stress level of 97.7% without accounting for the approved AT&T and T-Mobile equipment loading. Verizon withdrew the request on June 17, 2020.

On December 24, 2020, the Council received another request for an exempt modification at the subject facility from Verizon with a statement indicating the Council's deadline for construction and notice of equipment installation completion has expired for both the AT&T and T-Mobile requests referenced above and therefore, the equipment approved in those requests did not need to be included in its SA. Please note that the structural analysis dated May 8, 2020 and attached to the Town's correspondence was not submitted to the Council with either of the Verizon requests for exempt modification.

The December 24, 2020 Verizon request for an exempt modification, EM-VER-020-201224, is currently under review. Unfortunately, it is not evident at this time whether T-Mobile and AT&T completed their approved equipment installations at the facility within the Council's deadline for completion of construction. In an effort to elicit a confirmation from AT&T and T-Mobile as to the status of their approved, but now expired without extension, equipment installations, and to ensure the Town's concerns about its emergency communications equipment are addressed, a copy of the January 11, 2021 correspondence and this correspondence is being provided to representatives for AT&T, T-Mobile and Verizon.

A response, that is copied to all of the recipients of this correspondence, from the representatives of AT&T, T-Mobile and Verizon by close of business on January 22, 2021 would be appreciated. If a response is not received by that date and the SA issues associated with the respective carrier equipment installations on the facility remain unresolved, the Council may initiate a feasibility proceeding pursuant to the Tower Sharing Policy under Connecticut General Statutes §16-50aa.

Thank you for your attention to this matter.

Sincerely,

*s/Melanie Bachman*

Melanie Bachman  
Executive Director

MAB/IN/emr

C: The Honorable Theodore C. Shafer, First Selectman, Town of Burlington  
Michael Boucher, Fire Chief, Town of Burlington  
Kenneth C. Baldwin, Esq., Robinson & Cole LLP  
Lucia Chiocchio, Esq., Cuddy + Feder LLP  
Mark Richard, Site Development Manager, T-Mobile

January 11, 2021

**Via Email: [siting.council@ct.gov](mailto:siting.council@ct.gov)**

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

Re: **EM-VER-020-201224** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 719 George Washington Turnpike, Burlington, CT

Dear Ms Bachman:

This office represents the Town of Burlington and we have been asked to respond to the above referenced application by Cellco Partnership d/b/a Verizon Wireless concerning proposed modifications of the telecommunications facility located at 719 George Washington Turnpike which is owned by the Town of Burlington and located at the Town's Main Fire Station.

It is important to note that, on two occasions, the Town has been advised by Verizon representatives that the subject communications facility is currently overstressed, including a prior report by Nexius that stated that the "Tower Stress Level" was at 115.2% of its acceptable capacity. Thus, the current Nexius report can only be viewed as highly suspect. It is important to note that, over the past several years, the only modifications to equipment on the communications tower was done by the three carriers leasing space on the tower, which modifications were allowed based on representations made by those carrier's consultants. The Town is in the process of retaining its own consultant to examine these reports and the current structural integrity of the tower. Thus, the Town requests that no approvals, or work, be allowed on the tower until a total review and analysis can take place. Since Town emergency communications equipment is also located on the tower, any further work impacting the structural integrity of the tower could put public safety in jeopardy.

The report and another advisement from Verizon establishing the overstressed condition of the tower are attached for your review. If you have any questions, or would like to discuss the matter further, please do not hesitate to contact me at 860-944-9910.

Very truly yours,  
HALLORAN & SAGE, LLP

By: *Duncan J. Forsyth*  
Duncan J. Forsyth

cc: Kenneth C. Baldwin, Esq.(via email)  
Theodore C. Shafer, First Selectman (via email)  
Michael Boucher, Fire Chief (via email)  
Kenneth R. Slater, Jr., Esq. (via email)



June 25<sup>th</sup>, 2020

Town of Burlington  
200 Spielman Highway  
Burlington, CT 06013  
Attn: Selectman Shafer

**Via Certified Mail: 7019-1120-0001-4276-3709**

Re: Proposed Modifications to Existing Verizon Wireless Equipment  
Site Name: Burlington, CT  
Site Address: 719 George Washington Turnpike

Dear Selectman Shafer:

Pursuant to my email dated May 27, 2020, it has come to Verizon's attention that the Tower located at the above-captioned address is structurally failing in its existing condition, the tower fails with a stress ratio above 105%. The failing status of the tower is not only a hazard, but it is also putting Verizon's assets at risk.

I would like to work with you on behalf of Verizon to rectify the existing condition of the tower, however there has been a lack of communication from you on this matter. Please reach out so we can work together to plan and execute steps to get the tower to a passing status. If I do not hear back from you by the end of business day on July 3, 2020, Verizon will be notifying the Connecticut Siting Council of the failing structural and corresponding issues.

Thank you for your attention to this matter, I may be reached by phone at 603-475-0347, or via email at [rrafferty@saigrp.com](mailto:rrafferty@saigrp.com).

Respectfully,

A handwritten signature in blue ink, appearing to read 'Rebecca Rafferty', written over a horizontal line.

Rebecca Rafferty  
Site Acquisition Specialist  
SAI Communications, LLC  
12 Industrial Way  
Salem, NH 03079  
Mobile: 603-475-0347

Enclosure:  
Email dated 5/27/2020  
cc: Chief John Haviland

## Rebecca Rafferty

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**From:** Rebecca Rafferty  
**Sent:** Wednesday, May 27, 2020 8:44 AM  
**To:** 'selectmensoffice@burlingtonct.us'; John Haviland  
**Subject:** VZW & Other Carriers-Burlington\_CT Fuze#2559312

**Importance:** High

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

Hi Selectman Shafer & Fire Chief Haviland,

As you may know this site required CSC approval prior to any modifications. At the request of the CSC we updated our Structural Analysis to reflect the current equipment of AT&T and T-Mobile on the tower, please note we did not have prior knowledge of AT&T/T-MOs 2019 modifications when I provided the Structural Analysis dated February 26, 2020 to the both of you. After A&E review, it has come to my attention that even without VZW's current proposed loading and mount structural modifications, just existing condition, the tower fails with stress ratio above 105%". The SAs by ATT and T-MO have some inaccurate data or settings, AT&T ran it under the wrong Structure class and TMO mapping has small discrepancies.

Based on this information, Structural Modification Design will be required in the amount of \$3,500.00, this does not include the mod construction cost. Verizon is looking for feedback so that the carriers can share the costs of the modification design as well as the modification construction costs.

Respectfully,

Rebecca Rafferty

Site Acquisition Specialist

[rrafferty@saigrp.com](mailto:rrafferty@saigrp.com) | C 603-475-0347





# Structural Analysis Report

<b>Property Owner</b>	Town of Burlington
<b>Structural Type</b>	179 ft Monopole Tower
<b>Site Address</b>	719 George Washington Tpke Burlington, CT 06103
<b>Site ID</b>	N/A
<b>Site Name</b>	N/A
<b>Latitude</b>	41.766825
<b>Longitude</b>	-72.961511

<b>Client</b>	<b>Verizon Wireless</b> 20 Alexander Drive, 2 <sup>nd</sup> Floor Wallingford, CT 06492
<b>Site Type</b>	MACRO
<b>Site ID</b>	N/A
<b>Site Name</b>	BURLINGTON_CT
<b>Location Code</b>	46857

<b>Prepared by</b>	Nexius Solutions, Inc. 300 Apollo Drive, Suite 7 Chelmsford, MA 01824
<b>Job/Task Number</b>	VZW46857A01-NX062
<b>Rev</b>	2
<b>Email</b>	structurals@nexius.com
<b>Phone</b>	972-581-9888
<b>Date</b>	05/08/2020
<b>Result</b>	<b>Inadequate (115.2%)</b>



# NEXIUS

**Dear Sir / Madam:**

Nexius Solutions is pleased to submit this **Report** to determine the structural integrity of the referred tower.

Referenced documents used for this analysis are listed in the section DOCUMENTS & REFERENCES. This analysis has been performed in compliance with

- *2018 Connecticut State Building Code (IBC 2015 w/ State Amendments)*
- *ANSI/TIA-222-G w/ Addendums, Structural Standard for Antenna Supporting Structures and Antennas.*

Detailed design parameters are listed in Table 1. Analysis loading is detailed in Table 2 and Table 3.

Based on our analysis we have determined the following result:

Tower Stress Level	<b>Inadequate (115.2%)</b>
Base Plate	<b>Adequate (99.9%)</b>
Foundation	<b>Adequate (90.3%)</b>

Nexius Solutions appreciates the opportunity of providing continued engineering services. Should you have any questions, comments or require additional information, please do not hesitate to contact us.

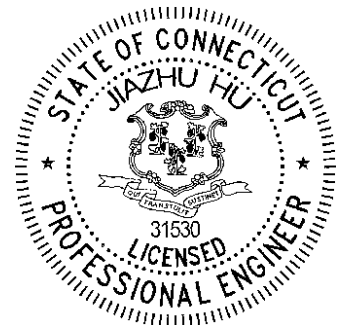
Sincerely,

Analysis Prepared by:

Akshay Doddamani  
Structural Engineer

Approved by:

Jiazhu Hu, P.E.  
Engineering Manager  
License #: 31530



## DOCUMENTS & REFERENCES

- RFDS, Location Code: 46857, Site Name: BURLINGTON\_CT , by Verizon Wireless, dated 01/08/2020.
- Construction Drawings (FOR CONSTRUCTION), Location Code: 46857, Verizon Site Name: BURLINGTON\_CT, by Nexius dated 02/26/2020.
- Structural Analysis, Centek Project No: 19027.15, T-Mobile Site Ref: CTHA539A, by CENTEK Engineering, Inc. dated 04/24/2019.
- Construction Drawings, Site ID: CTHA539A, T-Mobile Site Name: BURLINGTON FIRE DEPARTMENT FLAGPOLE, T-Mobile Site Ref: CTHA539A, by CENTEK Engineering, Inc. dated 05/29/2019.
- Structural Analysis, Job Number: CT1123, AT&T Site Name: BURLINGTON-GEORGE WASH, by HUDSON Design Group, dated 10/01/2019.
- Construction Drawings, Site Number: CT1123, AT&T Site Name: BURLINGTON-GEORGE WASH, by HUDSON Design Group, dated 07/03/2019.
- Structural Analysis, Rev 1, Location Code: 46857, Verizon Site Name: BURLINGTON\_CT, by Nexius dated 04/17/2020.

## DESIGN STANDARDS & PARAMETERS

TABLE 1 STANDARDS & DESIGN PARAMETERS

Codes and Standards	
Building Code	2018 Connecticut State Building Code (IBC 2015 w/ State Amendments)
TIA Standard	ANSI/TIA-222-G w/ Addendums
Wind Parameters	
Ultimate Wind Speed	120 mph
Nominal Wind Speed	93 mph
Nominal Wind Speed with Ice	50 mph
Radial Ice Thickness	1 in
Exposure Category	C
Structure Class	III
Topographic Category	1
Seismic Design Parameters*	
S <sub>s</sub>	0.182
S <sub>1</sub>	0.064

## RESULTS & RECOMMENDATIONS

The existing structural modification details are not available. It is assumed that the installed tower reinforcement was originally designed, installed and maintained properly and the equivalent thickness(es) for section(s) with tower modifications used in the above referred previous structural analyses are correct. It is further assumed that the proposed mount and tower modifications detailed in the referred construction drawings for other co-located carriers are installed. Based on our analysis, it is determined that the existing tower structure to be **inadequate** to support the existing and proposed loading.

All structural components and connections should be checked for tightness and good condition prior to installing any proposed loading. The analysis is performed based on structural information obtained from provided drawings, site visit and some measurements. The analysis assumes that the provided information is accurate. If the site conditions are different from assumptions or do not meet requirements, the analysis result would not be valid and Nexius should be notified for re-evaluation.

TABLE 2 – PROPOSED ANTENNA AND CABLE INFORMATION

Mount Elev. ft	Ant. Ctr. Elev. ft	Qty	Antenna Manufacturer	Antenna Model	No. of Feed Lines	Feed Line Size in	Note
160.0	160.0	6	CommScope	NHH-65B-R2B	1	12x24 Hybrid Cable	-
		3	Samsung	B2/B66A RRH-BR049			
		3	Samsung	B5/B13 RRH-BR04C			
		1	Raycap	RVZDC-6627-PF-48			

TABLE 3 – EXISTING AND RESERVED ANTENNA AND CABLE INFORMATION

Mount Elev. ft	Ant. Ctr. Elev. ft	Qty	Antenna Manufacturer	Antenna Model	No. of Feed Lines	Feed Line Size in	Note			
179.0	191.0	3	-	20-ft Omni Antenna	3	1-5/8	1			
179.0	179.0	3	RFS	APXVAARR24_43	6 4	1-5/8 Hybriflex 1-1/4	1			
		3	Ericsson	AIR21 B2A/B4P						
		3	Ericsson	AIR32						
		3	Ericsson	4449 B71 B12 RRH						
		1	-	14-ft Low Profile Platform w/ Site Pro 1 handrail kit (p/n HRK14)						
168.0	170.0	3	Powerwave	7770.0	12 2 6	1-5/8 Fiber DC	1			
		3	CCI	HPA65R-BU8A						
		6	Kathrein	800 10966						
		6	Powerwave	LGP21401						
		3	Ericsson	B25 4415						
		3	Ericsson	B2/B66A 8843						
		3	Ericsson	B5/B12 4449						
		3	Raycap	DC6-48-60-18-8F						
		1	-	14-ft Low Profile Platform Reinforced w/ Handrail Kit and Kicker Reinforcement Kit						
1	Valmont	Light duty Tri-bracket								
158.0	160.0	6	Celwave	APL866513	12	1-5/8	1			
		1	-	14-ft Low Profile Platform Reinforced w/ Proposed Handrail kit and Kicker Reinforcement Kit						
		3	Amphenol	BXA-70063-6CF				-	-	2
		3	Amphenol	BXA-171063-8BF						
		6	RFS	FD9R6004/2C-3L						
138.5	138.5	1	-	3-ft Standoff Mount	1	1-5/8	1			
		1	-	20-ft 4-Bay Dipole						
132.5	132.5	1	-	3-ft Yagi	1 1	1-5/8 1/2	1			
		1	-	8-ft Omni Directional Whip						
		1	-	3-ft Standoff Mount						
112.5	112.5	1	-	10-ft Dipole Antenna	1	1-5/8	1			
		1	-	3-ft Standoff Mount						

Notes:

(1) Existing Equipment, (2) Equipment to be removed; Not considered in this analysis

## ANALYSIS

tnxTower, a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for required loading cases. Selected output from the analysis is included in APPENDICES.

## RESULTS – MEMBER CAPACITIES

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Size</i>	<i>Critical Element</i>	<i>P K</i>	<i><math>\phi P_{allow}</math> K</i>	<i>% Capacity</i>	<i>Pass Fail</i>	
L1	179 - 139.5	Pole	TP28.0455x19.5x0.1875	1	-11.15	1062.10	115.2	Fail	
L2	139.5 - 93.4	Pole	TP37.5377x26.8051x0.375	2	-21.63	3187.78	85.3	Pass	
L3	93.4 - 46.31	Pole	TP47.123x35.6737x0.375	3	-35.48	3800.33	101.7	Fail	
L4	46.31 - 0	Pole	TP56.25x44.9739x0.375	4	-54.44	4334.66	113.7	Fail	
							Summary		
							Pole (L1)	115.2	Fail
							Base Plate	99.9	Pass
							<b>RATING</b>	<b>115.2</b>	<b>Fail</b>

## Standard Conditions for Providing Structural Consulting Services on Existing Structures

1. The structure is analyzed to the best of our ability using all information that is provided or can be obtained during fieldwork (if authorized by client). If the existing conditions are not as we have represented in this analysis, the analysis would not be valid, and we should be contacted to evaluate the significance of the deviation and revise the assessment accordingly.
2. The structural analysis has been performed assuming that the structural members, parts and component were originally designed properly and are all in “like new” condition. No allowance was made for excessive corrosion, damaged or missing structural members, loose bolts, misaligned parts, or any reduction in strength due to the age or fatigue of the product.
3. The structural analysis provided is an assessment of the primary load carrying capacity of the structural members, components and parts. We provided a limited scope of service. In some cases, we cannot verify the capacity of every weld, plate, connection detail, etc. In some cases, structural fabrication details are unknown at the time of our analysis, and the detailed field measurement of some of the required details may not be possible. In instances where we cannot perform connection capacity calculations, it is assumed that the existing manufactured connections develop the full capacity of the primary members being connected.
4. We cannot be held responsible for structural members, components and parts that are installed improperly, are loose or have a tendency of working loose over the lifetime. Our analysis has been performed assuming fully tightened connections, and proper installation per manufacturer’s instructions.
5. The structural analysis has been performed using information currently provided by the client and potentially field verified. We have been provided with a loading arrangement for all telecommunications equipment on the structure. Our analysis has been based upon a particular loading arrangement provided. We are not responsible for deviations in the loading arrangements that may occur over time. If deviations in loading arrangements are proposed, then the analysis would not be valid and we should be contacted to revise the analysis.
6. We cannot be held responsible for temporary and unbalanced loads on structure. Our analysis is based on a particular loading arrangement or as-build field condition. We are not responsible for the methods and means of how the loading arrangement is accomplished by the contractor. These methods and means may include rigging of equipment or hardware to lift and locate, temporary hanging of equipment in locations other than the final arrangement, movement and tie off of tower riggers, personnel, and their equipment, etc.
7. It is assumed that all welded connections are performed in the shop under the latest American Welding Society Code. No field welds are permitted or assumed for the existing pre-manufactured equipment.
8. Steel grade and strength are unknown and cannot be field tested. We cannot be held responsible for equipment manufactured from inferior steel or bolts. Our analysis assumes that standard structural grade steel has been used by the equipment manufacturer for all assembled parts of the mounting apparatus. Acceptable steels and connection components are specified by the American Institute of Steel Construction. In case no accurate info available, following material assumptions were used:

Pipe	ASTM A572-65
Anchor Bolts	ASTM A615-75
Base Plate	ASTM A572-60

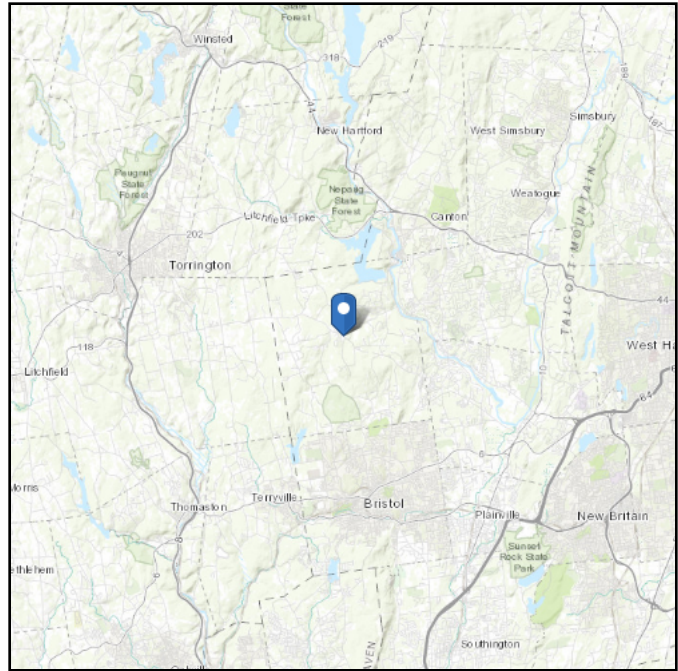
**Appendix #1: Loading Parameters and Calculations**

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 775.03 ft (NAVD 88)  
**Latitude:** 41.766825  
**Longitude:** -72.961511



## Wind

**Results:**

Wind Speed:	119 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	91 Vmph
100-year MRI	97 Vmph

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Mon Feb 24 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

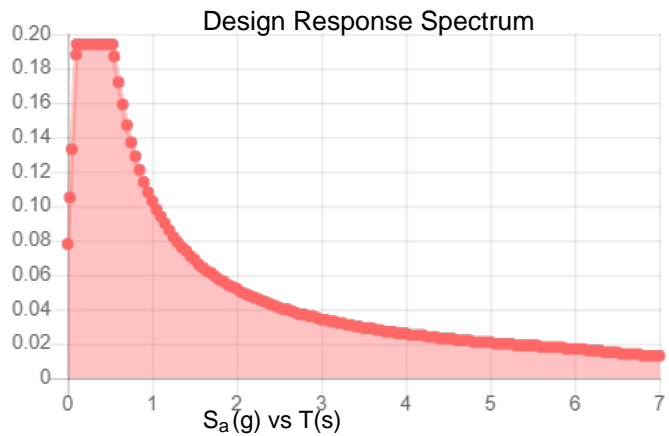
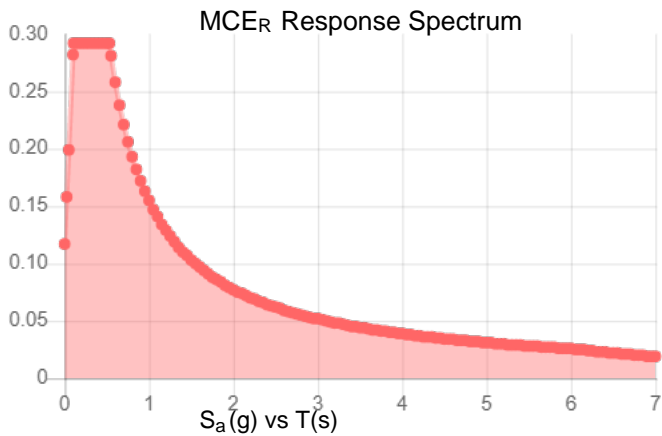
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.182	$S_{DS}$ :	0.194
$S_1$ :	0.064	$S_{D1}$ :	0.103
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.092
$S_{MS}$ :	0.292	PGA <sub>M</sub> :	0.147
$S_{M1}$ :	0.155	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Mon Feb 24 2020

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.



## Ice

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**Results:**

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Mon Feb 24 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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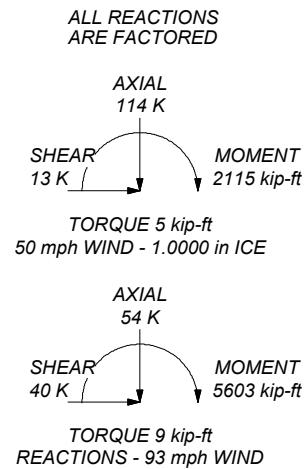
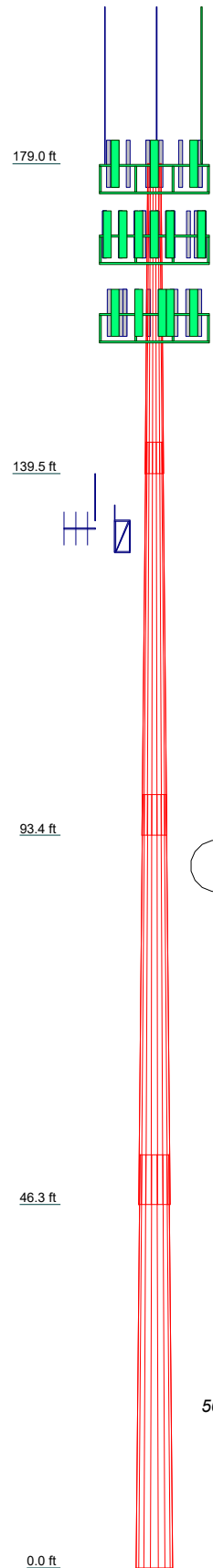
The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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**Appendix #2: tnxTower Output**

Section	1	2	3	4	
Length (ft)	39.50	50.10	52.29	52.70	
Number of Sides	18	18	18	18	
Thickness (in)	0.1875	0.3750	0.3750	0.3750	
Socket Length (ft)	4.00	5.20	6.39	44.9739	
Top Dia (in)	19.5000	26.8051	35.6737	44.9739	
Bot Dia (in)	28.0455	37.5377	47.1230	56.2500	
Grade	A572-65				
Weight (K)	1.9	6.5	8.7	10.7	27.7



### DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' X 2" Dia Omni Antenna w/ Mtg Pipe (Town)	179	B2/B66A 8843 RRH (ATI)	170
20' X 2" Dia Omni Antenna w/ Mtg Pipe (Town)	179	B2/B66A 8843 RRH (ATI)	170
20' X 2" Dia Omni Antenna w/ Mtg Pipe (Town)	179	B2/B66A 8843 RRH (ATI)	170
APXVAARR24-43 w/ Mtg pipe (T-Mobile)	179	B5/B12 4449 RRH (ATI)	170
APXVAARR24-43 w/ Mtg pipe (T-Mobile)	179	B5/B12 4449 RRH (ATI)	170
APXVAARR24-43 w/ Mtg pipe (T-Mobile)	179	B5/B12 4449 RRH (ATI)	170
AIR21 B2A/B4P w/ Mtg Pipe (T-Mobile)	179	DC6-48-60-18-8F (ATI)	170
AIR21 B2A/B4P w/ Mtg Pipe (T-Mobile)	179	DC6-48-60-18-8F (ATI)	170
AIR21 B2A/B4P w/ Mtg Pipe (T-Mobile)	179	DC6-48-60-18-8F (ATI)	170
AIR32 w/ Mtg Pipe (T-Mobile)	179	Valmont Light duty Tri-bracket (1) (ATI)	170
AIR32 w/ Mtg Pipe (T-Mobile)	179	14-ft Platform reinforced w/ Handrail and Kicker kit (ATI)	168
AIR32 w/ Mtg Pipe (T-Mobile)	179	NA510-1 (Added Handrail) (Verizon)	158
4449 B71/B12 RRH (T-Mobile)	179	(2) NHH-65B-R2B w/ Mtg pipe (Verizon)	158
4449 B71/B12 RRH (T-Mobile)	179	(2) NHH-65B-R2B w/ Mtg pipe (Verizon)	158
4449 B71/B12 RRH (T-Mobile)	179	(2) NHH-65B-R2B w/ Mtg pipe (Verizon)	158
14-ft Platform w/ Site Pro 1 Handrail kit (T-Mobile)	177	APL866513 w/Mount Pipe (Verizon)	158
7770.0 w/ Mtg Pipe (ATI)	170	APL866513 w/Mount Pipe (Verizon)	158
7770.0 w/ Mtg Pipe (ATI)	170	APL866513 w/Mount Pipe (Verizon)	158
7770.0 w/ Mtg Pipe (ATI)	170	APL866513 w/Mount Pipe (Verizon)	158
HPA65R-BU8A w/ Mtg Pipe (ATI)	170	APL866513 w/Mount Pipe (Verizon)	158
HPA65R-BU8A w/ Mtg Pipe (ATI)	170	APL866513 w/Mount Pipe (Verizon)	158
HPA65R-BU8A w/ Mtg Pipe (ATI)	170	APL866513 w/Mount Pipe (Verizon)	158
800-10966 W/ mtg pipe (ATI)	170	B2/B66A RRH BR049 (Verizon)	158
800-10966 W/ mtg pipe (ATI)	170	B2/B66A RRH BR049 (Verizon)	158
800-10966 W/ mtg pipe (ATI)	170	Samsung B5/B13 RRH-BR04C (Verizon)	158
800-10966 W/ mtg pipe (ATI)	170	Samsung B5/B13 RRH-BR04C (Verizon)	158
800-10966 W/ mtg pipe (ATI)	170	Samsung B5/B13 RRH-BR04C (Verizon)	158
800-10966 W/ mtg pipe (ATI)	170	Samsung B5/B13 RRH-BR04C (Verizon)	158
800-10966 W/ mtg pipe (ATI)	170	RVZDC-6627-PF-48 (Verizon)	158
LGP21401 (ATI)	170	14' Low Profile Platform (Verizon)	158
LGP21401 (ATI)	170	NA 509-3 (Site Pro 1 Kicker Kit, P/N PRK-1245L) (Verizon)	158
LGP21401 (ATI)	170	20' 4-bay Dipole (Town)	138.5
LGP21401 (ATI)	170	SO 701 (3ft pipe mount side arm)	138.5
LGP21401 (ATI)	170	8' x 2" Omni	132.5
LGP21401 (ATI)	170	3' Yagi	132.5
4415 B25 RRH (ATI)	170	SO 701 (3ft pipe mount side arm)	132.5
4415 B25 RRH (ATI)	170	10' 2-bay Dipole (Town)	112.5
4415 B25 RRH (ATI)	170	SO 701 (3ft pipe mount side arm) (Town)	112.5

### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.

<b>Nexus</b>		Job: <b>VZW468547A01</b>	
300 Apollo Drive, Suite 7		Project: <b>BURLINGTON CT</b>	
Chelmsford, MA 01824		Client: Verizon Wireless	Drawn by: Akshay Doddaman
Phone: 1 (978) 923-7965		Code: TIA-222-G	Date: 05/08/20
FAX:		Path: D:\Structural Analysis\BURLINGTON CT\Rev 2\Analysis\BURLINGTON CT.dwg	Scale: NTS
			Dwg No. E-1

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	<b>Client</b> Verizon Wireless	<b>Designed by</b> Akshay Doddamani

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Basic wind speed of 93 mph.

Structure Class III.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Weld together tower sections have flange connections..

Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	179.00-139.50	39.50	4.00	18	19.5000	28.0455	0.1875	0.7500	A572-65 (65 ksi)
L2	139.50-93.40	50.10	5.20	18	26.8051	37.5377	0.3750	1.5000	A572-65 (65 ksi)
L3	93.40-46.31	52.29	6.39	18	35.6737	47.1230	0.3750	1.5000	A572-65 (65 ksi)
L4	46.31-0.00	52.70		18	44.9739	56.2500	0.3750	1.5000	A572-65 (65 ksi)

## Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	19.7719	11.4934	541.5782	6.8559	9.9060	54.6717	1083.8689	5.7478	3.1020	16.544
	28.4492	16.5790	1625.5317	9.8896	14.2471	114.0955	3253.2023	8.2911	4.6060	24.565
L2	28.0309	31.4585	2776.3466	9.3827	13.6170	203.8882	5556.3464	15.7322	4.0577	10.821
	38.0589	44.2329	7717.8693	13.1928	19.0692	404.7306	15445.8939	22.1207	5.9466	15.858

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Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L3	37.3224	42.0143	6613.8340	12.5311	18.1223	364.9563	13236.3706	21.0112	5.6186	14.983
	47.7921	55.6418	15362.6008	16.5955	23.9385	641.7533	30745.4162	27.8262	7.6336	20.356
L4	46.9982	53.0838	13339.7306	15.8326	22.8467	583.8794	26697.0140	26.5469	7.2554	19.348
	57.0599	66.5052	26231.8094	19.8356	28.5750	917.9986	52498.1354	33.2589	9.2400	24.64

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 179.00-139.50				1	1	1			
L2 139.50-93.40				1	1	1			
L3 93.40-46.31				1	1	1			
L4 46.31-0.00				1	1	1			

### Monopole Base Plate Data

#### Base Plate Data

Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	18
Embedment length	48.0000 in
f <sub>c</sub>	3 ksi
Grout space	3.2500 in
Base plate grade	A572-60
Base plate thickness	2.0000 in
Bolt circle diameter	65.0000 in
Outer diameter	71.0000 in
Inner diameter	56.2500 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.7500 in
Stiffener height	12.0000 in

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight klf
LDF7-50A (1-5/8 FOAM) (Town)	B	No	Yes	Inside Pole	179.00 - 3.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
LDF7-50A (1-5/8 FOAM) (Town)	B	No	Yes	Inside Pole	138.50 - 3.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
LDF7-50A (1-5/8 FOAM) (Town)	B	No	Yes	Inside Pole	132.50 - 3.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
LDF4-50A (1/2	B	No	Yes	Inside Pole	128.50 - 3.00	1	No Ice	0.00	0.00

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>AA</sub>	Weight
							ft <sup>2</sup> /ft	klf
FOAM (Town)							1/2" Ice 1" Ice	0.00 0.00
LDF7-50A (1-5/8)	B	No	Yes	Inside Pole	113.00 - 3.00	1	No Ice	0.00
FOAM (Town)							1/2" Ice 1" Ice	0.00 0.00
LDF7-50A (1-5/8)	B	No	Yes	Inside Pole	160.00 - 3.00	12	No Ice	0.00
FOAM (Verizon)							1/2" Ice 1" Ice	0.00 0.00
HYbrid Cable 12X24 (Verizon)	B	No	Yes	Inside Pole	160.00 - 3.00	1	No Ice	0.00
HYBRIFLEX 1-1/4" (T-Mobile)	C	No	Yes	Inside Pole	179.00 - 3.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
LDF7-50A (1-5/8) FOAM (T-Mobile)	C	No	Yes	Inside Pole	179.00 - 3.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
FB-L98B-002 (Fiber) (AT&T)	C	No	Yes	Inside Pole	170.00 - 3.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
WR-VG122ST-BRD A (DC Cable) (AT&T)	C	No	Yes	Inside Pole	170.00 - 3.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
LDF7-50A (1-5/8) FOAM (AT&T)	C	No	Yes	Inside Pole	170.00 - 3.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
LDF4P-50A (1/2) FOAM (Town)	B	No	Yes	Inside Pole	132.50 - 3.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	179.00-139.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.33
		C	0.000	0.000	0.000	0.000	0.91
L2	139.50-93.40	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.74
		C	0.000	0.000	0.000	0.000	1.23
L3	93.40-46.31	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.79
		C	0.000	0.000	0.000	0.000	1.26
L4	46.31-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.73
		C	0.000	0.000	0.000	0.000	1.16

### Feed Line/Linear Appurtenances Section Areas - With Ice

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	179.00-139.50	A	2.924	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.33
		C		0.000	0.000	0.000	0.000	0.91
L2	139.50-93.40	A	2.834	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.74
		C		0.000	0.000	0.000	0.000	1.23
L3	93.40-46.31	A	2.693	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.79
		C		0.000	0.000	0.000	0.000	1.26
L4	46.31-0.00	A	2.416	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.73
		C		0.000	0.000	0.000	0.000	1.16

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
---------------	----------------------	-------------	-------------------------	--------------------------	-----------------------

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
***** 191 ft *****									
20' X 2" Dia Omni Antenna w/ Mtg Pipe (Town)	A	From Face	3.00	0.0000	179.00	No Ice	4.00	4.00	0.02
			-6.00			1/2" Ice	6.03	6.03	0.05
			10.00			1" Ice	8.07	8.07	0.09
20' X 2" Dia Omni Antenna w/ Mtg Pipe (Town)	B	From Face	3.00	0.0000	179.00	No Ice	4.00	4.00	0.02
			-6.00			1/2" Ice	6.03	6.03	0.05
			10.00			1" Ice	8.07	8.07	0.09
20' X 2" Dia Omni Antenna w/ Mtg Pipe (Town)	C	From Face	3.00	0.0000	179.00	No Ice	4.00	4.00	0.02
			-6.00			1/2" Ice	6.03	6.03	0.05
			10.00			1" Ice	8.07	8.07	0.09
***** 160 ft *****									
(2) NHH-65B-R2B w/ Mtg pipe (Verizon)	A	From Face	2.75	0.0000	158.00	No Ice	8.62	7.35	0.08
			-2.00			1/2" Ice	9.25	8.38	0.16
			2.00			1" Ice	9.87	9.27	0.24
(2) NHH-65B-R2B w/ Mtg pipe (Verizon)	B	From Face	2.75	0.0000	158.00	No Ice	8.62	7.35	0.08
			-2.00			1/2" Ice	9.25	8.38	0.16
			2.00			1" Ice	9.87	9.27	0.24
(2) NHH-65B-R2B w/ Mtg pipe (Verizon)	C	From Face	2.75	0.0000	158.00	No Ice	8.62	7.35	0.08
			-2.00			1/2" Ice	9.25	8.38	0.16
			2.00			1" Ice	9.87	9.27	0.24
APL866513 w/Mount Pipe (Verizon)	A	From Face	2.75	0.0000	158.00	No Ice	4.76	5.28	0.04
			-5.00			1/2" Ice	5.39	6.31	0.09
			2.00			1" Ice	5.89	7.06	0.15
APL866513 w/Mount Pipe (Verizon)	B	From Face	2.75	0.0000	158.00	No Ice	4.76	5.28	0.04
			-5.00			1/2" Ice	5.39	6.31	0.09
			2.00			1" Ice	5.89	7.06	0.15
APL866513 w/Mount Pipe	C	From Face	2.75	0.0000	158.00	No Ice	4.76	5.28	0.04





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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
APXVAARR24-43 w/ Mtg pipe (T-Mobile)	A	From Face	3.00	0.0000	179.00	No Ice	17.13	10.79	0.14
			5.00			1/2" Ice	17.75	12.21	0.26
			0.00			1" Ice	18.39	13.49	0.39
APXVAARR24-43 w/ Mtg pipe (T-Mobile)	B	From Face	3.00	0.0000	179.00	No Ice	17.13	10.79	0.14
			5.00			1/2" Ice	17.75	12.21	0.26
			0.00			1" Ice	18.39	13.49	0.39
APXVAARR24-43 w/ Mtg pipe (T-Mobile)	C	From Face	3.00	0.0000	179.00	No Ice	17.13	10.79	0.14
			5.00			1/2" Ice	17.75	12.21	0.26
			0.00			1" Ice	18.39	13.49	0.39
AIR21 B2A/B4P w/ Mtg Pipe (T-Mobile)	A	From Face	3.00	0.0000	179.00	No Ice	6.90	6.22	0.18
			-5.00			1/2" Ice	7.62	7.40	0.24
			0.00			1" Ice	8.27	8.43	0.31
AIR21 B2A/B4P w/ Mtg Pipe (T-Mobile)	B	From Face	3.00	0.0000	179.00	No Ice	6.90	6.22	0.18
			-5.00			1/2" Ice	7.62	7.40	0.24
			0.00			1" Ice	8.27	8.43	0.31
AIR21 B2A/B4P w/ Mtg Pipe (T-Mobile)	C	From Face	3.00	0.0000	179.00	No Ice	6.90	6.22	0.18
			-5.00			1/2" Ice	7.62	7.40	0.24
			0.00			1" Ice	8.27	8.43	0.31
AIR32 w/ Mtg Pipe (T-Mobile)	A	From Face	3.00	0.0000	179.00	No Ice	7.29	6.61	0.16
			0.00			1/2" Ice	8.01	7.80	0.23
			0.00			1" Ice	8.67	8.83	0.30
AIR32 w/ Mtg Pipe (T-Mobile)	B	From Face	3.00	0.0000	179.00	No Ice	7.29	6.61	0.16
			0.00			1/2" Ice	8.01	7.80	0.23
			0.00			1" Ice	8.67	8.83	0.30
AIR32 w/ Mtg Pipe (T-Mobile)	C	From Face	3.00	0.0000	179.00	No Ice	7.29	6.61	0.16
			0.00			1/2" Ice	8.01	7.80	0.23
			0.00			1" Ice	8.67	8.83	0.30
4449 B71/B12 RRH (T-Mobile)	A	From Face	3.00	0.0000	179.00	No Ice	1.65	1.16	0.08
			5.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B71/B12 RRH (T-Mobile)	B	From Face	3.00	0.0000	179.00	No Ice	1.65	1.16	0.08
			5.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B71/B12 RRH (T-Mobile)	C	From Face	3.00	0.0000	179.00	No Ice	1.65	1.16	0.08
			5.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
14-ft Platform w/ Site Pro 1 Handrail kit (T-Mobile)	C	From Face	0.00	0.0000	177.00	No Ice	23.46	23.46	1.58
			0.00			1/2" Ice	30.94	30.94	1.96
			0.00			1" Ice	38.42	38.42	2.34
***** 170 ft *****									
7770.0 w/ Mtg Pipe (AT&T)	A	From Face	3.00	0.0000	170.00	No Ice	6.08	4.59	0.06
			-6.00			1/2" Ice	6.69	5.66	0.11
			0.00			1" Ice	7.21	6.45	0.17
7770.0 w/ Mtg Pipe (AT&T)	B	From Face	3.00	0.0000	170.00	No Ice	6.08	4.59	0.06
			-6.00			1/2" Ice	6.69	5.66	0.11
			0.00			1" Ice	7.21	6.45	0.17
7770.0 w/ Mtg Pipe (AT&T)	C	From Face	3.00	0.0000	170.00	No Ice	6.08	4.59	0.06
			-6.00			1/2" Ice	6.69	5.66	0.11
			0.00			1" Ice	7.21	6.45	0.17
HPA65R-BU8A w/ Mtg Pipe (AT&T)	A	From Face	3.00	0.0000	170.00	No Ice	11.23	9.94	0.08
			-2.00			1/2" Ice	11.85	11.37	0.17
			0.00			1" Ice	12.47	12.64	0.27
HPA65R-BU8A w/ Mtg Pipe (AT&T)	B	From Face	3.00	0.0000	170.00	No Ice	11.23	9.94	0.08
			-2.00			1/2" Ice	11.85	11.37	0.17
			0.00			1" Ice	12.47	12.64	0.27
HPA65R-BU8A w/ Mtg Pipe (AT&T)	C	From Face	3.00	0.0000	170.00	No Ice	11.23	9.94	0.08
			-2.00			1/2" Ice	11.85	11.37	0.17

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<b>Project</b>	BURLINGTON_CT	<b>Date</b>	14:12:39 05/08/20
<b>Client</b>	Verizon Wireless	<b>Designed by</b>	Akshay Doddamani

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Lateral						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
800-10966 W/ mtg pipe (AT&T)	A	From Face	0.00		0.0000	170.00	1" Ice	12.47	12.64	0.27
			3.00				No Ice	17.36	9.40	0.14
			4.00				1/2" Ice	17.99	10.82	0.26
			0.00				1" Ice	18.63	12.09	0.38
800-10966 W/ mtg pipe (AT&T)	B	From Face	3.00		0.0000	170.00	No Ice	17.36	9.40	0.14
			4.00				1/2" Ice	17.99	10.82	0.26
			0.00				1" Ice	18.63	12.09	0.38
			3.00				No Ice	17.36	9.40	0.14
800-10966 W/ mtg pipe (AT&T)	C	From Face	4.00		0.0000	170.00	1/2" Ice	17.99	10.82	0.26
			0.00				1" Ice	18.63	12.09	0.38
			3.00				No Ice	17.36	9.40	0.14
			4.00				1/2" Ice	17.99	10.82	0.26
800-10966 W/ mtg pipe (AT&T)	A	From Face	0.00		0.0000	170.00	1" Ice	18.63	12.09	0.38
			3.00				No Ice	17.36	9.40	0.14
			4.00				1/2" Ice	17.99	10.82	0.26
			0.00				1" Ice	18.63	12.09	0.38
800-10966 W/ mtg pipe (AT&T)	B	From Face	3.00		0.0000	170.00	No Ice	17.36	9.40	0.14
			4.00				1/2" Ice	17.99	10.82	0.26
			0.00				1" Ice	18.63	12.09	0.38
			3.00				No Ice	17.36	9.40	0.14
800-10966 W/ mtg pipe (AT&T)	C	From Face	4.00		0.0000	170.00	1/2" Ice	17.99	10.82	0.26
			0.00				1" Ice	18.63	12.09	0.38
			3.00				No Ice	17.36	9.40	0.14
			4.00				1/2" Ice	17.99	10.82	0.26
LGP21401 (AT&T)	A	From Face	0.00		0.0000	170.00	1" Ice	18.63	12.09	0.38
			3.00				No Ice	1.10	0.35	0.01
			-6.00				1/2" Ice	1.24	0.44	0.02
			0.00				1" Ice	1.38	0.54	0.03
LGP21401 (AT&T)	B	From Face	3.00		0.0000	170.00	No Ice	1.10	0.35	0.01
			-6.00				1/2" Ice	1.24	0.44	0.02
			0.00				1" Ice	1.38	0.54	0.03
			3.00				No Ice	1.10	0.35	0.01
LGP21401 (AT&T)	C	From Face	-6.00		0.0000	170.00	1/2" Ice	1.24	0.44	0.02
			0.00				1" Ice	1.38	0.54	0.03
			3.00				No Ice	1.10	0.35	0.01
			-6.00				1/2" Ice	1.24	0.44	0.02
LGP21401 (AT&T)	A	From Face	0.00		0.0000	170.00	1" Ice	1.38	0.54	0.03
			3.00				No Ice	1.10	0.35	0.01
			-6.00				1/2" Ice	1.24	0.44	0.02
			0.00				1" Ice	1.38	0.54	0.03
LGP21401 (AT&T)	B	From Face	3.00		0.0000	170.00	No Ice	1.10	0.35	0.01
			-6.00				1/2" Ice	1.24	0.44	0.02
			0.00				1" Ice	1.38	0.54	0.03
			3.00				No Ice	1.10	0.35	0.01
LGP21401 (AT&T)	C	From Face	-6.00		0.0000	170.00	1/2" Ice	1.24	0.44	0.02
			0.00				1" Ice	1.38	0.54	0.03
			3.00				No Ice	1.10	0.35	0.01
			-6.00				1/2" Ice	1.24	0.44	0.02
4415 B25 RRH (AT&T)	A	From Face	0.00		0.0000	170.00	1" Ice	1.38	0.54	0.03
			3.00				No Ice	1.84	0.82	0.05
			-2.00				1/2" Ice	2.01	0.94	0.06
			0.00				1" Ice	2.19	1.07	0.08
4415 B25 RRH (AT&T)	B	From Face	3.00		0.0000	170.00	No Ice	1.84	0.82	0.05
			-2.00				1/2" Ice	2.01	0.94	0.06
			0.00				1" Ice	2.19	1.07	0.08
			3.00				No Ice	1.84	0.82	0.05
4415 B25 RRH (AT&T)	C	From Face	-2.00		0.0000	170.00	1/2" Ice	2.01	0.94	0.06
			0.00				1" Ice	2.19	1.07	0.08
			3.00				No Ice	1.84	0.82	0.05
			-2.00				1/2" Ice	2.01	0.94	0.06
B2/B66A 8843 RRH (AT&T)	A	From Face	0.00		0.0000	170.00	1" Ice	2.19	1.07	0.08
			3.00				No Ice	1.64	1.35	0.07
			2.00				1/2" Ice	1.80	1.50	0.09
			0.00				1" Ice	1.97	1.65	0.11
B2/B66A 8843 RRH (AT&T)	B	From Face	3.00		0.0000	170.00	No Ice	1.64	1.35	0.07
			2.00				1/2" Ice	1.80	1.50	0.09
			0.00				1" Ice	1.97	1.65	0.11
			3.00				No Ice	1.64	1.35	0.07
B2/B66A 8843 RRH (AT&T)	C	From Face	2.00		0.0000	170.00	1/2" Ice	1.80	1.50	0.09
			0.00				1" Ice	1.97	1.65	0.11
			3.00				No Ice	1.64	1.35	0.07
			2.00				1/2" Ice	1.80	1.50	0.09
B5/B12 4449 RRH (AT&T)	A	From Face	0.00		0.0000	170.00	1" Ice	1.97	1.65	0.11
			3.00				No Ice	1.64	1.29	0.07
			6.00				1/2" Ice	1.80	1.44	0.09

<b>tnxTower</b>  <b>Nexius</b> 300 Apollo Drive, Suite 7 Chelmsford, MA 01824 Phone: 1 (978) 923-7965 FAX:	<b>Job</b>	VZW468547A01	<b>Page</b>	8 of 9
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	<b>Client</b>	Verizon Wireless	<b>Designed by</b>	Akshay Doddamani

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Lateral						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
B5/B12 4449 RRH (AT&T)	B	From Face		0.00	0.0000	170.00	1" Ice	1.97	1.59	0.11
				3.00			No Ice	1.64	1.29	0.07
				6.00			1/2" Ice	1.80	1.44	0.09
				0.00			1" Ice	1.97	1.59	0.11
B5/B12 4449 RRH (AT&T)	C	From Face		3.00	0.0000	170.00	No Ice	1.64	1.29	0.07
				6.00			1/2" Ice	1.80	1.44	0.09
				0.00			1" Ice	1.97	1.59	0.11
				0.00			1" Ice	1.97	1.59	0.11
DC6-48-60-18-8F (AT&T)	A	From Face		1.00	0.0000	170.00	No Ice	2.74	4.78	0.03
				0.00			1/2" Ice	2.96	5.06	0.06
				0.00			1" Ice	3.20	5.35	0.10
				0.00			1" Ice	3.20	5.35	0.10
DC6-48-60-18-8F (AT&T)	B	From Face		1.00	0.0000	170.00	No Ice	2.74	4.78	0.03
				0.00			1/2" Ice	2.96	5.06	0.06
				0.00			1" Ice	3.20	5.35	0.10
				0.00			1" Ice	3.20	5.35	0.10
DC6-48-60-18-8F (AT&T)	C	From Face		1.00	0.0000	170.00	No Ice	2.74	4.78	0.03
				0.00			1/2" Ice	2.96	5.06	0.06
				0.00			1" Ice	3.20	5.35	0.10
				0.00			1" Ice	3.20	5.35	0.10
14-ft Platform reinforced w/ Handrail and Kicker kit (AT&T)	C	From Face		0.00	0.0000	168.00	No Ice	35.30	35.30	1.85
				0.00			1/2" Ice	47.90	47.90	2.25
				0.00			1" Ice	60.50	60.50	2.66
				0.00			1" Ice	60.50	60.50	2.66
Valmont Light duty Tri-bracket (1) (AT&T)	C	From Face		0.00	0.0000	170.00	No Ice	1.76	1.76	0.05
				0.00			1/2" Ice	2.08	2.08	0.07
				0.00			1" Ice	2.40	2.40	0.09
				0.00			1" Ice	2.40	2.40	0.09
***** 132.5 ft ***** 8' x 2" Omni	A	From Face		4.00	0.0000	132.50	No Ice	1.60	1.60	0.02
				-6.00			1/2" Ice	2.42	2.42	0.03
				4.00			1" Ice	3.24	3.24	0.05
				4.00			1" Ice	3.24	3.24	0.05
3' Yagi	A	From Face		4.00	0.0000	132.50	No Ice	2.08	2.08	0.03
				-6.00			1/2" Ice	3.79	3.79	0.05
				0.00			1" Ice	5.50	5.50	0.07
				0.00			1" Ice	5.50	5.50	0.07
SO 701 (3ft pipe mount side arm)	A	From Face		0.00	0.0000	132.50	No Ice	0.30	0.30	0.01
				-6.00			1/2" Ice	0.61	0.61	0.05
				0.00			1" Ice	0.81	0.81	0.09
				0.00			1" Ice	0.81	0.81	0.09

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	179 - 139.5	Pole	TP28.0455x19.5x0.1875	1	-11.15	1062.10	115.2	Fail <b>X</b>	
L2	139.5 - 93.4	Pole	TP37.5377x26.8051x0.375	2	-21.63	3187.78	85.3	Pass	
L3	93.4 - 46.31	Pole	TP47.123x35.6737x0.375	3	-35.48	3800.33	101.7	Fail <b>X</b>	
L4	46.31 - 0	Pole	TP56.25x44.9739x0.375	4	-54.44	4334.66	113.7	Fail <b>X</b>	
							Summary		
							Pole (L1)	115.2	Fail <b>X</b>
							Base Plate	99.9	Pass
							<b>RATING =</b>	<b>115.2</b>	<b>Fail <b>X</b></b>

**Appendix #3: Foundation Capacity Check**

## Drilled Pier Foundation



BU #:   
 Site Name: BURLINGTON\_CT  
 Order Number: VZW468547A01

TIA-222 Revision: G  
 Tower Type: Monopole

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	5603	
Axial Force (kips)	54	
Shear Force (kips)	40	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	27	ft
Ext. Above Grade	1	ft
Pier Section 1		
<i>From 1' above grade to 27' below grade</i>		
Pier Diameter	7.5	ft
Rebar Quantity	24	
Rebar Size	11	
Clear Cover to Ties	3	in
Tie Size	4	

Analysis Results		
Soil Lateral Capacity		
	Compression	Uplift
D <sub>v=0</sub> (ft from TOC)	6.78	-
Soil Safety Factor	2.88	-
Max Moment (kip-ft)	5970.20	-
Rating	46.1%	-
Soil Vertical Capacity		
	Compression	Uplift
Skin Friction (kips)	803.42	-
End Bearing (kips)	99.40	-
Weight of Concrete (kips)	222.66	-
Total Capacity (kips)	902.82	-
Axial (kips)	276.66	-
Rating	30.6%	-
Reinforced Concrete Capacity		
	Compression	Uplift
Critical Depth (ft from TOC)	7.25	-
Critical Moment (kip-ft)	5967.79	-
Critical Moment Capacity	6608.48	-
Rating	90.3%	-
<b>Soil Interaction Rating</b>		<b>46.1%</b>
<b>Structural Foundation Rating</b>		<b>90.3%</b>

Check Limitation	
N/A	<input type="checkbox"/>

Soil Profile				
Groundwater Depth	n/a	ft	# of Layers	2

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ <sub>soil</sub> (pcf)	γ <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.33	3.33	130	150		0	0.000	0.000			0	n/a	Cohesionless
2	3.33	27	23.67	130	150		34	1.921	1.921			3	n/a	Cohesionless