Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

January 9, 2018

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

RE: Notice of Exempt Modification // Site: Waterbury CT (ATC: 302476)
(1) Farmdale Drive (aka Off Garden Circle), Waterbury, CT 06704
N 41.57066 // W 72.0176

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless currently maintains 12 antennas at the 150-foot mount on the existing 150-foot guyed monopole tower, located at Farmdale Drive (off Garden Circle), Waterbury, CT. The tower is owned by American Tower. The property is owned by AT&T Mobility, LLC as successor to Springwich Cellular Tower Holdings, LLC. Verizon Wireless now intends to remove 9 of its antennas to replace with 6 and install side-by-side mounts for these 6 LTE (850/1900/2100 MHz) replacements for its PCS/AWS/LTE upgrade. Additionally, Verizon Wireless will relocate 3 remote radio heads (RRHs) and thereby install 12 new RRHs on the tower with its new antennas, remove existing coax and add 1 new hybrid fiber cable; while updating certain leased equipment rights, as reflected by the final configuration outlined in the structural analysis and proposed hereby.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Neil O'Leary, Mayor for the City of Waterbury, City Planner James A. Sequin, AICP, including for the City Plan Commission and Planning Department, American Tower, the tower owner, and to the ground owner, Springwich Cellular Tower Holdings, LLC (AT&T).

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2). Enclosed to accommodate this filing are construction drawings dated December 22, 2017 by A.T. Engineering Service, PLLC, a structural analysis

dated January 5, 2018 by A.T. Engineering Service, PLLC and radio frequency (RF) analysis table showing worst-case RF emission calculation by Verizon Wireless RF Design Engineering.

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

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

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

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

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

6. The existing structure and its foundation can support the proposed loading, as shown in the attached structural analysis by A.T. Engineering Service, PLLC, dated January 5, 2018.

For the foregoing reasons, Verizon Wireless respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

Attachments

cc: Neil O'Leary, Mayor - as elected official - 1Z9Y45030327954353
James A. Sequin, City Planner - as P&Z official - 1Z9Y45030328628963
American Tower Corporation - as tower owner - 1Z9Y45030326296576
AT&T Mobility, LLC c/o Springwich - as property owner - 1Z9Y45030331857183

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Structural Analysis Report

Structure	:	**150 ft Guyed Monopole**
ATC Site Name	:	**Wtbr - Waterbury, CT**
ATC Site Number	:	**302476**
Engineering Number	:	**OAA718489_C3_02**
Proposed Carrier	:	**Verizon Wireless**
Carrier Site Name	:	**Waterbury_CT**
Carrier Site Number	:	**PSLC# 117721**
Site Location	:	**352 Garden Circle** **Waterbury, CT 06704-2833** **41.570700,-73.017600**
County	:	**New Haven**
Date	:	**January 5, 2018**
Max Usage	:	**95%**
Result	:	**Pass**

Prepared By:
Robert D. Barrett, E.I.
Structural Engineer II

Robert D. Barrett

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32595
LICENSED
PROFESSIONAL ENGINEER

Jan 5 2018 5:41 PM cosign

COA: PEC.0001553

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Table of Contents

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 150 ft guyed monopole to reflect the change in loading by Verizon Wireless.

Supporting Documents

Tower Drawings	SpectraSite Site #CT-0012, Rev 1, dated November 18, 2004
Foundation Drawing	Girard & Co. Engineers Job #38926, dated July 10, 1984

Analysis

The tower was analyzed using tnxTower version 7.0.8.5 tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	97 mph (3-Second Gust, V_{asd}) / 125 mph (3-Second Gust, V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft

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. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
154.0	154.0	3	CCI DTMABP7819VG12A	Platform w/ Handrails	(12) 1 1/4" Coax (6) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk	AT&T Mobility
		2	Raycap DC6-48-60-18-8F			
		3	ADC DD1900			
		3	Ericsson RRUS 32			
		3	Ericsson RRUS 32 B66			
		3	Ericsson RRUS 11 B5			
		3	Ericsson RRUS-32			
		3	Powerwave 7770.00			
		1	Quintel QS66512-3			
		1	CCI OPA-65R-LCUU-H6			
		2	CCI OPA-65R-LCUU-H8			
		2	CCI TPA-65R-LCUUUU-H8			
		6	CCI TPX-070821			
145.0	145.0	6	Allgon 7250.03 /XM-1900-65-18.5I-2-D	T-Arms	(12) 1 5/8" Coax	
129.0	129.0	3	Nokia B5 RRH4x40-850	Platform w/ Handrails	(1) 1 5/8" Hybriflex	Verizon Wireless
		3	Alcatel-Lucent RRH4x30W-B25			
		3	Alcatel-Lucent B13 RRH4x30-4R 700U			
		3	Alcatel-Lucent B66 RRH4x45			
		3	Antel BXA-80063-4CF-EDIN-X			
		4	Commscope JAHH-65B-R3B			
		2	Commscope JAHH-45B-R3B			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
129.0	129.0	1	RFS DB-T1-6Z-8AB-0Z	-	-	Verizon Wireless

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
129.0	129.0	6	RFS FD9R6004/2C-3L	Platform w/ Handrails	(1) 1 5/8" Hybriflex	Verizon Wireless
		1	Raycap RCMDC-6627-PF-48			

[1]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 outside the pole shaft. Stacking coax is not allowed.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	13%	Pass
Shaft	95%	Pass
Base Plate	8%	Pass
Flanges	70%	Pass
Guys	73%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Base Moment (Kips-Ft)	198.5	6%
Anchor Resultant (Kips)	34.7	68%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
129.0	RFS FD9R6004/2C-3L	Verizon Wireless	0.221	0.505
	Raycap RCMDC-6627-PF-48			

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

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Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

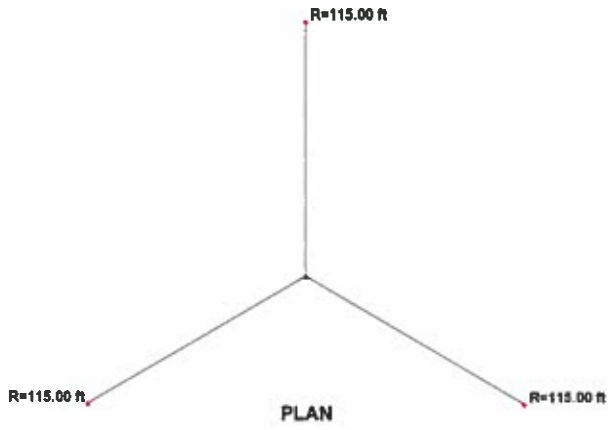
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

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 supplied herein.

Section	1	2	3	4
Length (ft)	40.00	40.00	42.00	35.67
Number of Sides	12	12	12	12
Thickness (in)	0.1875	0.2500	0.3125	0.3750
Socket Length (ft)		3.50	4.17	
Top Dia (in)	15.0000	21.2500	26.5535	31.8255
Bot Dia (in)	21.2500	27.6100	33.1000	37.3800
Grade	A572-65			
Weight (lb) 13384.0	1474.1	2849.4	4244.5	5016.1



DESIGNED APPURTENANCE LOADING

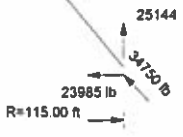
TYPE	ELEVATION	TYPE	ELEVATION
RRUS 32 B66	150	Flat Platform w/ Handrails	150
RRUS 32 B66	150	(2) 7250.03 /XM-1900-65-18.5I-2-D	145
RRUS 32 B66	150	(2) 7250.03 /XM-1900-65-18.5I-2-D	145
7770.00	150	(2) 7250.03 /XM-1900-65-18.5I-2-D	145
7770.00	150	Round T-Arm	145
7770.00	150	Round T-Arm	145
DC6-48-60-18-8F	150	Round T-Arm	145
DC6-48-60-18-8F	150	Flat Platform w/ Handrails	129
DTMABP7819VG12A	150	BXA-80063-4CF-EDIN-X	129
DTMABP7819VG12A	150	BXA-80063-4CF-EDIN-X	129
DTMABP7819VG12A	150	BXA-80063-4CF-EDIN-X	129
DD1900	150	B66 RRH4x45	129
DD1900	150	B66 RRH4x45	129
DD1900	150	B66 RRH4x45	129
RRUS-32	150	B5 RRH4x40-850	129
RRUS-32	150	B5 RRH4x40-850	129
RRUS-32	150	B5 RRH4x40-850	129
OPA-65R-LCUU-H6	150	RRH4x30W-B25	129
OPA-65R-LCUU-H8 (92.7")	150	RRH4x30W-B25	129
OPA-65R-LCUU-H8 (92.7")	150	RRH4x30W-B25	129
RRUS 32	150	B13 RRH4x30-4R 700U	129
RRUS 32	150	B13 RRH4x30-4R 700U	129
RRUS 32	150	B13 RRH4x30-4R 700U	129
RRUS 11 B5	150	(2) JAHH-65B-R3B	129
RRUS 11 B5	150	JAHH-65B-R3B	129
RRUS 11 B5	150	JAHH-65B-R3B	129
QS66512-3 (112 lbs.)	150	JAHH-45B-R3B	129
TPA-65R-LCUUUU-H8	150	JAHH-45B-R3B	129
TPA-65R-LCUUUU-H8	150	(2) FD9R6004/2C-3L (3.1 lbs)	129
(2) TPX-070821	150	(2) FD9R6004/2C-3L (3.1 lbs)	129
(2) TPX-070821	150	(2) FD9R6004/2C-3L (3.1 lbs)	129
(2) TPX-070821	150	RCMDC-6627-PF-48	129

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 94.7%



ALL REACTIONS ARE FACTORED

American Tower Engineering
3500 Regency Parkway, Suite 100
Cary, NC 27518
Phone: (919) 468-0112
FAX: (919) 466-5414
Tower Analysis

Job:	302476 - Wtbr - Waterbury, CT
Project:	OAA718489_C3_02
Client: Verizon Wireless	Drawn by: robert.barrett App'd:
Code: TIA-222-G	Date: 01/05/18 Scale: N
Path: C:\Users\robert.barrett\Desktop\302476\tnx\302476.eri	Dwg No.

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 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.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Safety factor used in guy design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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	150.00-110.00	40.00	0.00	12	15.0000	21.2500	0.1875	4.0000	A572-65 (65 ksi)
L2	110.00-70.00	40.00	3.50	12	21.2500	27.6100	0.2500	4.0000	A572-65 (65 ksi)

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
L3	70.00-31.50	42.00	4.17	12	26.5535	33.1000	0.3125	4.0000	A572-65 (65 ksi)
L4	31.50-0.00	35.67		12	31.8255	37.3800	0.3750	4.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.5291	8.9430	250.4541	5.3029	7.7700	32.2335	507.4880	4.4015	3.5175	18.76
	21.9996	12.7165	720.0669	7.5404	11.0075	65.4160	1459.0508	6.2587	5.1925	27.693
L2	21.9996	16.9050	951.5678	7.5180	11.0075	86.4472	1928.1342	8.3201	5.0250	20.1
	28.5840	22.0248	2104.4088	9.7949	14.3020	147.1411	4264.1028	10.8399	6.7295	26.918
L3	28.0550	26.4050	2320.7747	9.3943	13.7547	168.7258	4702.5188	12.9957	6.2788	20.092
	34.2676	32.9924	4527.0653	11.7379	17.1458	264.0335	9173.0615	16.2379	8.0333	25.707
L4	33.6200	37.9765	4794.6345	11.2593	16.4856	290.8376	9715.2293	18.6909	7.5242	20.065
	38.6986	44.6835	7810.0590	13.2478	19.3628	403.3530	15825.2970	21.9919	9.0128	24.034

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-110.00				1	1	1			
L2 110.00-70.00				1	1	1			
L3 70.00-31.50				1	1	1			
L4 31.50-0.00				1	1	1			

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
122	EHS	A	7/8	7970.00	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%
		B	7/8	7970.00	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%
		C	7/8	7970.00	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
122	Corner						

Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap	Pull-Off Grade	Pull-Off Type	Pull-Off Size
122.00	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	1 1/4

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
122	263.95	263.95	263.95		2.73 2.9 sec/pulse	2.73 2.9 sec/pulse	2.73 2.9 sec/pulse	

Guy Data (cont'd)

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
122	No	No			1	1	1	1

Guy Data (cont'd)

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
122	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
122	A	61.00	20	5	1.5950
	B	61.00	20	5	1.5950
	C	61.00	20	5	1.5950

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
0.78" (19.7 mm) 8 AWG 6	A	Surface Ar (CaAa)	150.00 - 7.00	2	2	-0.200 0.200	0.7800		0.59
0.39" (10mm) Fiber Trunk **	A	Surface Ar (CaAa)	150.00 - 7.00	1	1	0.200 0.250	0.3900		0.07
1 5/8" Hybriflex	C	Surface Ar (CaAa)	129.00 - 7.00	1	1	0.250 0.260	1.9800		1.30
1 5/8" Hybriflex ***	C	Surface Ar (CaAa)	129.00 - 7.00	1	1	0.250 0.260	1.9800		1.30

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 1/4" Coax	A	No	Inside Pole	150.00 - 7.00	12	No Ice	0.00	0.63
						1/2" Ice	0.00	0.63
						1" Ice	0.00	0.63
0.39" (10mm) Fiber Trunk	A	No	Inside Pole	150.00 - 7.00	1	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
0.78" (19.7 mm) 8 AWG 6	A	No	Inside Pole	150.00 - 7.00	4	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
**								
1 5/8" Coax	B	No	Inside Pole	145.00 - 7.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
***								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-110.00	A	0.000	0.000	7.800	0.000	449.60
		B	0.000	0.000	0.000	0.000	344.40
		C	0.000	0.000	7.524	0.000	49.40
L2	110.00-70.00	A	0.000	0.000	7.800	0.000	449.60
		B	0.000	0.000	0.000	0.000	393.60
		C	0.000	0.000	15.840	0.000	104.00
L3	70.00-31.50	A	0.000	0.000	7.507	0.000	432.74
		B	0.000	0.000	0.000	0.000	378.84
		C	0.000	0.000	15.246	0.000	100.10
L4	31.50-0.00	A	0.000	0.000	4.777	0.000	275.38
		B	0.000	0.000	0.000	0.000	241.08
		C	0.000	0.000	9.702	0.000	63.70

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-110.00	A	1.719	0.000	0.000	40.305	0.000	880.52
		B		0.000	0.000	0.000	0.000	344.40
		C		0.000	0.000	20.590	0.000	344.65
L2	110.00-70.00	A	1.657	0.000	0.000	39.191	0.000	855.06
		B		0.000	0.000	0.000	0.000	393.60
		C		0.000	0.000	42.357	0.000	693.17
L3	70.00-31.50	A	1.566	0.000	0.000	37.722	0.000	822.99
		B		0.000	0.000	0.000	0.000	378.84
		C		0.000	0.000	40.768	0.000	667.18
L4	31.50-0.00	A	1.390	0.000	0.000	22.994	0.000	501.46
		B		0.000	0.000	0.000	0.000	241.08
		C		0.000	0.000	25.045	0.000	396.02

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-110.00	-1.2917	0.3700	-2.3171	-0.2595
L2	110.00-70.00	-1.7151	1.1531	-3.0074	0.8020
L3	70.00-31.50	-1.7702	1.1808	-3.3126	0.8635
L4	31.50-0.00	-1.4354	0.9534	-2.8960	0.7610

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev	K_a No Ice	K_a Ice
L1	4	0.78" (19.7 mm) 8 AWG 6	110.00 - 150.00	1.0000	1.0000
L1	5	0.39" (10mm) Fiber Trunk	110.00 - 150.00	1.0000	1.0000
L1	10	1 5/8" Hybriflex	110.00 - 129.00	1.0000	1.0000
L1	11	1 5/8" Hybriflex	110.00 - 129.00	1.0000	1.0000
L2	4	0.78" (19.7 mm) 8 AWG 6	70.00 - 110.00	1.0000	1.0000
L2	5	0.39" (10mm) Fiber Trunk	70.00 - 110.00	1.0000	1.0000
L2	10	1 5/8" Hybriflex	70.00 - 110.00	1.0000	1.0000
L2	11	1 5/8" Hybriflex	70.00 - 110.00	1.0000	1.0000
L3	4	0.78" (19.7 mm) 8 AWG 6	31.50 - 70.00	1.0000	1.0000
L3	5	0.39" (10mm) Fiber Trunk	31.50 - 70.00	1.0000	1.0000
L3	10	1 5/8" Hybriflex	31.50 - 70.00	1.0000	1.0000
L3	11	1 5/8" Hybriflex	31.50 - 70.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRUS 32 B66	A	From Leg	5.00		0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00				1/2" Ice	2.96	1.86	74.11
			4.00				1" Ice	3.19	2.05	98.42
RRUS 32 B66	B	From Leg	5.00		0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00				1/2" Ice	2.96	1.86	74.11
			4.00				1" Ice	3.19	2.05	98.42
RRUS 32 B66	C	From Leg	5.00		0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00				1/2" Ice	2.96	1.86	74.11
			4.00				1" Ice	3.19	2.05	98.42
7770.00	A	From Leg	5.00		0.0000	150.00	No Ice	5.51	2.93	35.00
			0.00				1/2" Ice	5.87	3.27	67.63
			4.00				1" Ice	6.23	3.63	105.06
7770.00	B	From Leg	5.00		0.0000	150.00	No Ice	5.51	2.93	35.00
			0.00				1/2" Ice	5.87	3.27	67.63
			4.00				1" Ice	6.23	3.63	105.06
7770.00	C	From Leg	5.00		0.0000	150.00	No Ice	5.51	2.93	35.00
			0.00				1/2" Ice	5.87	3.27	67.63
			4.00				1" Ice	6.23	3.63	105.06
DC6-48-60-18-8F	B	From Leg	5.00		0.0000	150.00	No Ice	1.11	1.47	31.80
			0.00				1/2" Ice	1.67	1.67	49.52
			4.00				1" Ice	1.88	1.88	69.72
DC6-48-60-18-8F	C	From Leg	5.00		0.0000	150.00	No Ice	1.11	1.47	31.80
			0.00				1/2" Ice	1.67	1.67	49.52
			4.00				1" Ice	1.88	1.88	69.72
DTMABP7819VG12A	A	From Leg	5.00		0.0000	150.00	No Ice	0.97	0.39	19.20
			0.00				1/2" Ice	0.00	0.49	26.49
			4.00				1" Ice	1.43	0.60	35.63
DTMABP7819VG12A	B	From Leg	5.00		0.0000	150.00	No Ice	0.97	0.39	19.20
			0.00				1/2" Ice	0.00	0.49	26.49
			4.00				1" Ice	1.43	0.60	35.63
DTMABP7819VG12A	C	From Leg	5.00		0.0000	150.00	No Ice	0.97	0.39	19.20
			0.00				1/2" Ice	0.00	0.49	26.49
			4.00				1" Ice	1.43	0.60	35.63
DD1900	A	From Leg	5.00		0.0000	150.00	No Ice	1.09	0.30	12.10
			0.00				1/2" Ice	1.43	0.40	19.21
			4.00				1" Ice	1.59	0.51	28.18
DD1900	B	From Leg	5.00		0.0000	150.00	No Ice	1.09	0.30	12.10
			0.00				1/2" Ice	1.43	0.40	19.21
			4.00				1" Ice	1.59	0.51	28.18
DD1900	C	From Leg	5.00		0.0000	150.00	No Ice	1.09	0.30	12.10
			0.00				1/2" Ice	1.43	0.40	19.21
			4.00				1" Ice	1.59	0.51	28.18
RRUS-32	A	From Leg	5.00		0.0000	150.00	No Ice	3.31	2.76	77.00
			0.00				1/2" Ice	4.15	3.02	104.93
			4.00				1" Ice	4.44	3.29	136.47
RRUS-32	B	From Leg	5.00		0.0000	150.00	No Ice	3.31	2.76	77.00
			0.00				1/2" Ice	4.15	3.02	104.93
			4.00				1" Ice	4.44	3.29	136.47
RRUS-32	C	From Leg	5.00		0.0000	150.00	No Ice	3.31	2.76	77.00
			0.00				1/2" Ice	4.15	3.02	104.93
			4.00				1" Ice	4.44	3.29	136.47

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
OPA-65R-LCUU-H6	A	From Leg	5.00		0.0000	150.00	No Ice	9.66	5.52	73.00
			0.00				1/2" Ice	10.13	5.97	131.43
			4.00				1" Ice	10.61	6.43	196.17
OPA-65R-LCUU-H8 (92.7")	B	From Leg	5.00		0.0000	150.00	No Ice	12.75	7.25	88.00
			0.00				1/2" Ice	13.33	7.82	159.29
			4.00				1" Ice	13.92	8.40	238.16
OPA-65R-LCUU-H8 (92.7")	C	From Leg	5.00		0.0000	150.00	No Ice	12.75	7.25	88.00
			0.00				1/2" Ice	13.33	7.82	159.29
			4.00				1" Ice	13.92	8.40	238.16
RRUS 32	A	From Leg	5.00		0.0000	150.00	No Ice	2.69	1.57	50.80
			0.00				1/2" Ice	2.91	1.76	71.20
			4.00				1" Ice	3.14	1.95	94.75
RRUS 32	B	From Leg	5.00		0.0000	150.00	No Ice	2.69	1.57	50.80
			0.00				1/2" Ice	2.91	1.76	71.20
			4.00				1" Ice	3.14	1.95	94.75
RRUS 32	C	From Leg	5.00		0.0000	150.00	No Ice	2.69	1.57	50.80
			0.00				1/2" Ice	2.91	1.76	71.20
			4.00				1" Ice	3.14	1.95	94.75
RRUS 11 B5	A	From Leg	5.00		0.0000	150.00	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			4.00				1" Ice	3.21	1.50	95.48
RRUS 11 B5	B	From Leg	5.00		0.0000	150.00	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			4.00				1" Ice	3.21	1.50	95.48
RRUS 11 B5	C	From Leg	5.00		0.0000	150.00	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			4.00				1" Ice	3.21	1.50	95.48
QS66512-3 (112 lbs.)	A	From Leg	5.00		0.0000	150.00	No Ice	8.13	6.80	112.00
			0.00				1/2" Ice	8.59	7.27	169.20
			4.00				1" Ice	9.05	7.72	232.66
TPA-65R-LCUUUU-H8	B	From Leg	5.00		0.0000	150.00	No Ice	13.30	8.82	82.10
			0.00				1/2" Ice	13.90	9.42	161.56
			4.00				1" Ice	14.50	10.03	248.92
TPA-65R-LCUUUU-H8	C	From Leg	5.00		0.0000	150.00	No Ice	13.30	8.82	82.10
			0.00				1/2" Ice	13.90	9.42	161.56
			4.00				1" Ice	14.50	10.03	248.92
(2) TPX-070821	A	From Leg	5.00		0.0000	150.00	No Ice	0.47	0.18	7.50
			0.00				1/2" Ice	0.56	0.25	10.98
			4.00				1" Ice	0.66	0.32	15.80
(2) TPX-070821	B	From Leg	5.00		0.0000	150.00	No Ice	0.47	0.18	7.50
			0.00				1/2" Ice	0.56	0.25	10.98
			4.00				1" Ice	0.66	0.32	15.80
(2) TPX-070821	C	From Leg	5.00		0.0000	150.00	No Ice	0.47	0.18	7.50
			0.00				1/2" Ice	0.56	0.25	10.98
			4.00				1" Ice	0.66	0.32	15.80
Flat Platform w/ Handrails	A	None			0.0000	150.00	No Ice	42.40	42.40	2000.00
							1/2" Ice	48.40	48.40	2450.00
							1" Ice	54.40	54.40	2900.00
***										
(2) 7250.03 /XM-1900-65-18.5I-2-D	A	From Leg	5.00		0.0000	145.00	No Ice	4.00	1.87	15.40
			0.00				1/2" Ice	4.39	2.33	35.03
			0.00				1" Ice	4.78	2.70	59.38
(2) 7250.03 /XM-1900-65-18.5I-2-D	B	From Leg	5.00		0.0000	145.00	No Ice	4.00	1.87	15.40
			0.00				1/2" Ice	4.39	2.33	35.03
			0.00				1" Ice	4.78	2.70	59.38
(2) 7250.03 /XM-1900-65-18.5I-2-D	C	From Leg	5.00		0.0000	145.00	No Ice	4.00	1.87	15.40
			0.00				1/2" Ice	4.39	2.33	35.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
				0.00			1" Ice	4.78	2.70	59.38
Round T-Arm	A	None			0.0000	145.00	No Ice	9.70	3.30	250.00
							1/2" Ice	12.10	5.20	314.00
							1" Ice	14.50	7.10	378.00
Round T-Arm	B	None			0.0000	145.00	No Ice	9.70	3.30	250.00
							1/2" Ice	12.10	5.20	314.00
							1" Ice	14.50	7.10	378.00
Round T-Arm	C	None			0.0000	145.00	No Ice	9.70	3.30	250.00
							1/2" Ice	12.10	5.20	314.00
							1" Ice	14.50	7.10	378.00
***										
Flat Platform w/ Handrails	B	None			0.0000	129.00	No Ice	42.40	42.40	2000.00
							1/2" Ice	48.40	48.40	2450.00
							1" Ice	54.40	54.40	2900.00
BXA-80063-4CF-EDIN-X	A	From Leg	5.00		0.0000	129.00	No Ice	4.71	2.25	9.90
			0.00				1/2" Ice	5.55	2.55	37.73
			0.00				1" Ice	5.94	2.85	69.84
BXA-80063-4CF-EDIN-X	B	From Leg	5.00		0.0000	129.00	No Ice	4.71	2.25	9.90
			0.00				1/2" Ice	5.55	2.55	37.73
			0.00				1" Ice	5.94	2.85	69.84
BXA-80063-4CF-EDIN-X	C	From Leg	5.00		0.0000	129.00	No Ice	4.71	2.25	9.90
			0.00				1/2" Ice	5.55	2.55	37.73
			0.00				1" Ice	5.94	2.85	69.84
B66 RRH4x45	A	From Leg	5.00		0.0000	129.00	No Ice	2.58	1.59	67.00
			0.00				1/2" Ice	2.88	1.77	87.35
			0.00				1" Ice	3.10	1.96	110.85
B66 RRH4x45	B	From Leg	5.00		0.0000	129.00	No Ice	2.58	1.59	67.00
			0.00				1/2" Ice	2.88	1.77	87.35
			0.00				1" Ice	3.10	1.96	110.85
B66 RRH4x45	C	From Leg	5.00		0.0000	129.00	No Ice	2.58	1.59	67.00
			0.00				1/2" Ice	2.88	1.77	87.35
			0.00				1" Ice	3.10	1.96	110.85
B5 RRH4x40-850	A	From Leg	5.00		0.0000	129.00	No Ice	1.32	0.75	48.50
			0.00				1/2" Ice	1.54	0.92	56.76
			0.00				1" Ice	1.76	1.09	65.02
B5 RRH4x40-850	B	From Leg	5.00		0.0000	129.00	No Ice	1.32	0.75	48.50
			0.00				1/2" Ice	1.54	0.92	56.76
			0.00				1" Ice	1.76	1.09	65.02
B5 RRH4x40-850	C	From Leg	5.00		0.0000	129.00	No Ice	1.32	0.75	48.50
			0.00				1/2" Ice	1.54	0.92	56.76
			0.00				1" Ice	1.76	1.09	65.02
RRH4x30W-B25	A	From Leg	5.00		0.0000	129.00	No Ice	1.97	1.12	55.10
			0.00				1/2" Ice	2.24	1.34	65.95
			0.00				1" Ice	2.51	1.56	76.80
RRH4x30W-B25	B	From Leg	5.00		0.0000	129.00	No Ice	1.97	1.12	55.10
			0.00				1/2" Ice	2.24	1.34	65.95
			0.00				1" Ice	2.51	1.56	76.80
RRH4x30W-B25	C	From Leg	5.00		0.0000	129.00	No Ice	1.97	1.12	55.10
			0.00				1/2" Ice	2.24	1.34	65.95
			0.00				1" Ice	2.51	1.56	76.80
B13 RRH4x30-4R 700U	A	From Leg	5.00		0.0000	129.00	No Ice	2.17	1.63	57.20
			0.00				1/2" Ice	2.36	1.80	76.88
			0.00				1" Ice	2.56	1.98	99.53
B13 RRH4x30-4R 700U	B	From Leg	5.00		0.0000	129.00	No Ice	2.17	1.63	57.20
			0.00				1/2" Ice	2.36	1.80	76.88
			0.00				1" Ice	2.56	1.98	99.53
B13 RRH4x30-4R 700U	C	From Leg	5.00		0.0000	129.00	No Ice	2.17	1.63	57.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	2.36	1.80	76.88
			0.00			1" Ice	2.56	1.98	99.53
(2) JAHH-65B-R3B	A	From Leg	5.00	0.0000	129.00	No Ice	9.11	5.98	60.60
			0.00			1/2" Ice	9.58	6.44	118.68
			0.00			1" Ice	10.05	6.91	183.05
JAHH-65B-R3B	B	From Leg	5.00	0.0000	129.00	No Ice	9.11	5.98	60.60
			0.00			1/2" Ice	9.58	6.44	118.68
			0.00			1" Ice	10.05	6.91	183.05
JAHH-65B-R3B	C	From Leg	5.00	0.0000	129.00	No Ice	9.11	5.98	60.60
			0.00			1/2" Ice	9.58	6.44	118.68
			0.00			1" Ice	10.05	6.91	183.05
JAHH-45B-R3B	B	From Leg	5.00	0.0000	129.00	No Ice	11.40	5.28	83.80
			0.00			1/2" Ice	12.13	5.97	120.87
			0.00			1" Ice	12.86	6.66	157.94
JAHH-45B-R3B	C	From Leg	5.00	0.0000	129.00	No Ice	11.40	5.28	83.80
			0.00			1/2" Ice	12.13	5.97	120.87
			0.00			1" Ice	12.86	6.66	157.94
(2) FD9R6004/2C-3L (3.1 lbs)	A	From Leg	5.00	0.0000	129.00	No Ice	0.31	0.08	3.10
			0.00			1/2" Ice	0.39	0.12	5.40
			0.00			1" Ice	0.47	0.17	8.79
(2) FD9R6004/2C-3L (3.1 lbs)	B	From Leg	5.00	0.0000	129.00	No Ice	0.31	0.08	3.10
			0.00			1/2" Ice	0.39	0.12	5.40
			0.00			1" Ice	0.47	0.17	8.79
(2) FD9R6004/2C-3L (3.1 lbs)	C	From Leg	5.00	0.0000	129.00	No Ice	0.31	0.08	3.10
			0.00			1/2" Ice	0.39	0.12	5.40
			0.00			1" Ice	0.47	0.17	8.79
RCMDC-6627-PF-48	B	From Leg	5.00	0.0000	129.00	No Ice	4.06	3.10	32.00
			0.00			1/2" Ice	4.45	3.46	68.49
			0.00			1" Ice	4.84	3.82	104.98

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.00-110.00	129.07	1.063	24	62.548	A	0.000	62.548	62.548	100.00	7.800	0.000
					B	0.000	62.548		100.00	0.000	0.000
					C	0.000	62.548		100.00	7.524	0.000
L2 110.00-70.00	89.45	0.957	22	84.306	A	0.000	84.306	84.306	100.00	7.800	0.000
					B	0.000	84.306		100.00	0.000	0.000
					C	0.000	84.306		100.00	15.840	0.000
L3 70.00-31.50	50.64	0.814	18	99.976	A	0.000	99.976	99.976	100.00	7.507	0.000
					B	0.000	99.976		100.00	0.000	0.000
					C	0.000	99.976		100.00	15.246	0.000
L4 31.50-0.00	15.38	0.7	16	94.918	A	0.000	94.918	94.918	100.00	4.777	0.000
					B	0.000	94.918		100.00	0.000	0.000
					C	0.000	94.918		100.00	9.702	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	129.07	1.063	6	1.7192	74.009	A	0.000	74.009	74.009	100.00	40.305	0.000
150.00-110.00						B	0.000	74.009		100.00	0.000	0.000
						C	0.000	74.009		100.00	20.590	0.000
L2 110.00-70.00	89.45	0.957	6	1.6573	95.355	A	0.000	95.355	95.355	100.00	39.191	0.000
						B	0.000	95.355		100.00	0.000	0.000
						C	0.000	95.355		100.00	42.357	0.000
L3 70.00-31.50	50.64	0.814	5	1.5656	110.610	A	0.000	110.610	110.610	100.00	37.722	0.000
						B	0.000	110.610		100.00	0.000	0.000
						C	0.000	110.610		100.00	40.768	0.000
L4 31.50-0.00	15.38	0.7	4	1.3898	103.138	A	0.000	103.138	103.138	100.00	22.994	0.000
						B	0.000	103.138		100.00	0.000	0.000
						C	0.000	103.138		100.00	25.045	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	129.07	1.063	8	62.548	A	0.000	62.548	62.548	100.00	7.800	0.000
150.00-110.00					B	0.000	62.548		100.00	0.000	0.000
					C	0.000	62.548		100.00	7.524	0.000
L2	89.45	0.957	7	84.306	A	0.000	84.306	84.306	100.00	7.800	0.000
110.00-70.00					B	0.000	84.306		100.00	0.000	0.000
					C	0.000	84.306		100.00	15.840	0.000
L3 70.00-31.50	50.64	0.814	6	99.976	A	0.000	99.976	99.976	100.00	7.507	0.000
					B	0.000	99.976		100.00	0.000	0.000
					C	0.000	99.976		100.00	15.246	0.000
L4 31.50-0.00	15.38	0.7	5	94.918	A	0.000	94.918	94.918	100.00	4.777	0.000
					B	0.000	94.918		100.00	0.000	0.000
					C	0.000	94.918		100.00	9.702	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy

Comb. No.	Description
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	5.902	30	0.9604	0.0116
L2	110 - 70	0.658	37	0.1960	0.0042
L3	73.5 - 31.5	0.138	37	0.0133	0.0016
L4	35.667 - 0	0.056	37	0.0108	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	RRUS 32 B66	30	5.902	0.9604	0.0116	20121
145.00	(2) 7250.03 /XM-1900-65-18.5I-2-D	30	5.083	0.8474	0.0105	20121
129.00	Flat Platform w/ Handrails	31	2.651	0.5052	0.0073	4790
122.00	Guy	31	1.770	0.3747	0.0060	3593

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	39.489	6	5.1968	0.0693
L2	110 - 70	9.224	6	1.5426	0.0198
L3	73.5 - 31.5	2.968	6	0.4050	0.0075
L4	35.667 - 0	0.733	6	0.1771	0.0024

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	RRUS 32 B66	6	39.489	5.1968	0.0693	4106
145.00	(2) 7250.03 /XM-1900-65-18.5I-2-D	6	34.940	4.6676	0.0620	4106
129.00	Flat Platform w/ Handrails	6	21.231	3.0544	0.0398	976
122.00	Guy	6	16.080	2.4286	0.0314	731

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
L1	122.00 (A) (7)	7/8 EHS	7970.00	79699.84	34567.50	47820.00	1.000	1.383
	122.00 (B) (6)	7/8 EHS	7970.00	79699.84	34940.90	47820.00	1.000	1.369
	122.00 (C) (5)	7/8 EHS	7970.00	79699.84	34937.90	47820.00	1.000	1.369

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 110 (1)	TP21.25x15x0.1875	40.00	28.00	48.9	11.5845	-55382.50	615724.00	0.090
L2	110 - 70 (2)	TP27.61x21.25x0.25	40.00	122.00	194.7	16.9050	-55501.10	100711.00	0.551
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	42.00	122.00	152.7	26.9540	-60127.30	261264.00	0.230
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	35.67	122.00	127.4	38.7601	-67112.50	539514.00	0.124

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 110 (1)	TP21.25x15x0.1875	257038.33	315006.67	0.816	0.00	315006.67	0.000
L2	110 - 70 (2)	TP27.61x21.25x0.25	210348.33	531001.67	0.396	0.00	531001.67	0.000
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	84940.83	1080200.00	0.079	0.00	1080200.00	0.000
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	81079.08	1861400.00	0.044	0.00	1861400.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 110 (1)	TP21.25x15x0.1875	4109.99	403664.00	0.010	703.83	638735.00	0.001
L2	110 - 70 (2)	TP27.61x21.25x0.25	4051.59	623034.00	0.007	1181.88	1076708.33	0.001
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	1877.25	993388.00	0.002	1180.51	2190300.00	0.001
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	1839.26	1439990.00	0.001	701.01	3774333.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 110 (1)	0.090	0.816	0.000	0.010	0.001	0.906	1.000	4.8.2
L2	110 - 70 (2)	0.551	0.396	0.000	0.007	0.001	0.947	1.000	4.8.2
L3	70 - 31.5 (3)	0.230	0.079	0.000	0.002	0.001	0.309	1.000	4.8.2
L4	31.5 - 0 (4)	0.124	0.044	0.000	0.001	0.000	0.168	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	150 - 110	Pole	TP21.25x15x0.1875	1	-55382.50	615724.00	90.6	Pass
		Guy A@122	7/8	7	34567.50	47820.00	72.3	Pass
		Guy B@122	7/8	6	34940.90	47820.00	73.1	Pass
		Guy C@122	7/8	5	34937.90	47820.00	73.1	Pass
L2	110 - 70	Pole	TP27.61x21.25x0.25	2	-55501.10	100711.00	94.7	Pass
L3	70 - 31.5	Pole	TP33.1x26.5535x0.3125	3	-60127.30	261264.00	30.9	Pass
L4	31.5 - 0	Pole	TP37.38x31.8255x0.375	4	-67112.50	539514.00	16.8	Pass
							Summary	
						Pole (L2)	94.7	Pass
						Guy A (L1)	72.3	Pass
						Guy B (L1)	73.1	Pass
						Guy C (L1)	73.1	Pass
						RATING =	**94.7**	**Pass**

Program Version 7.0.8.5 - 9/29/2017 File:C:/Users/robert.barrett/Desktop/302476/tnx/302476.eri

Base/Flange Plate	Plate Type	*Baseplate*	
	Pole Diameter	37.38	in
	Pole Thickness	0.375	in
	Plate Length	44	in
	Plate Thickness	2.5	in
	Plate Fy	60	ksi
	Weld Length	0.3125	in
	ϕ_s Resistance	1382.37	k-in
	Applied	105.81	k-in
Stiffeners	#	*0*	

Bolts	#	*8*	
	Bolt Circle	44	in
	(R)adial / (S)quare	S	
	Bolt Gap	6	in
	Diameter	2.25	in
	Hole Diameter	2.75	in
	Type	A615-75	
	Fy	75	ksi
	Fu	100	ksi
	ϕ_s Resistance	259.82	k
	Applied	32.61	k
Reinforcement ●	#	*0*	
Extra Bolts O	#	*0*	

Code Rev.	*G*	Date	1/5/2018
		Engineer	RDB
		Site #	302476
Moment	173.3 k-ft	Carrier	Verizon Wireless
Axial	73.8 k		

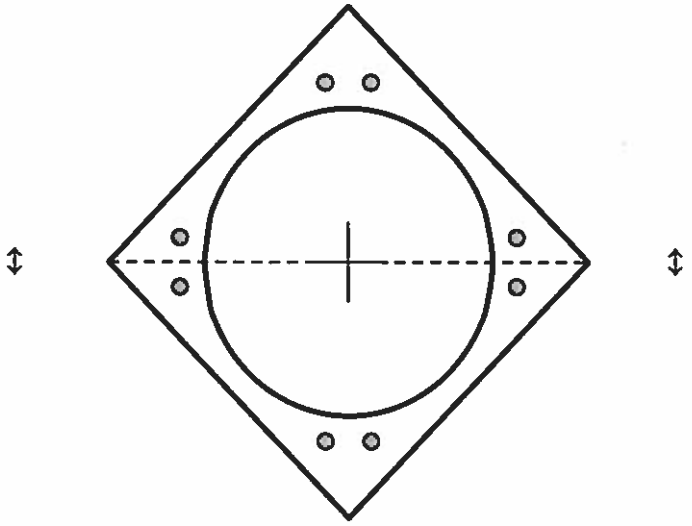


Plate Stress Ratio:
0.08 (Pass)

Bolt Stress Ratio:
0.13 (Pass)

Base/Flange Plate	Plate Type	*Flange @ 110.0 ft*
	Pole Diameter	21.25 in
	Pole Thickness	0.1875 in
	Plate Diameter	28.5 in
	Plate Thickness	1 in
	Plate Fy	60 ksi
	Weld Length	0.1875 in
	ϕ_s Resistance	75.10 k-in
	Applied	52.93 k-in
Stiffeners	#	*0*

Bolts	#	*12*
	Bolt Circle	25.75 in
	(R)adial / (S)quare	R
	Diameter	1 in
	Hole Diameter	1.125 in
	Type	A325
	Fy	92 ksi
	Fu	120 ksi
	ϕ_s Resistance	54.52 k
	Applied	35.29 k
Reinforcement ●	#	*0*
Extra Bolts O	#	*0*

Code Rev. *G*

Moment 257.0 k-ft
Axial 55.4 k

Date	1/5/2018
Engineer	RDB
Site #	302476
Carrier	Verizon Wireless

Required Flange Thickness:
0.84 in OK

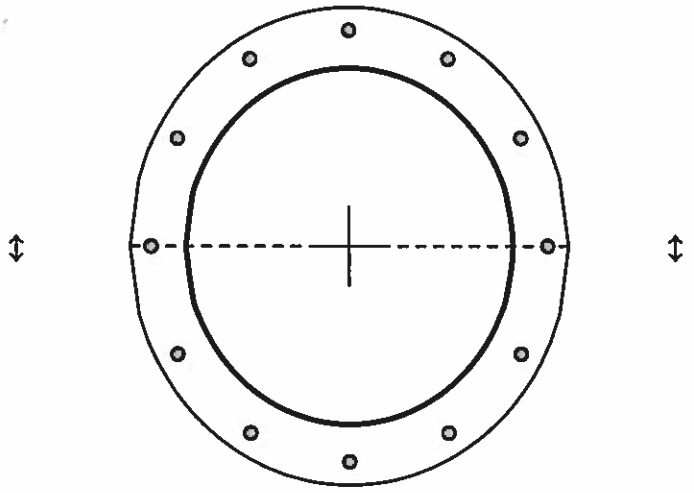
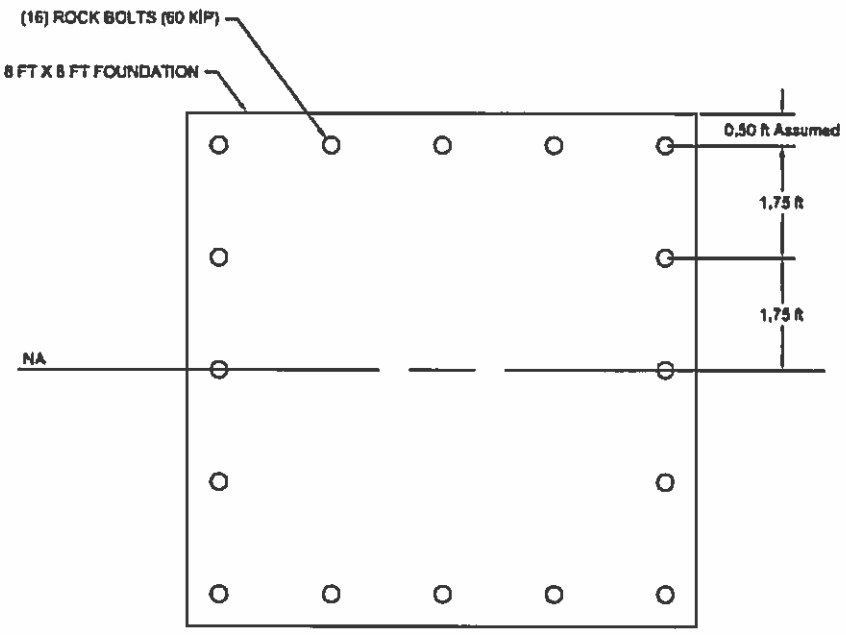


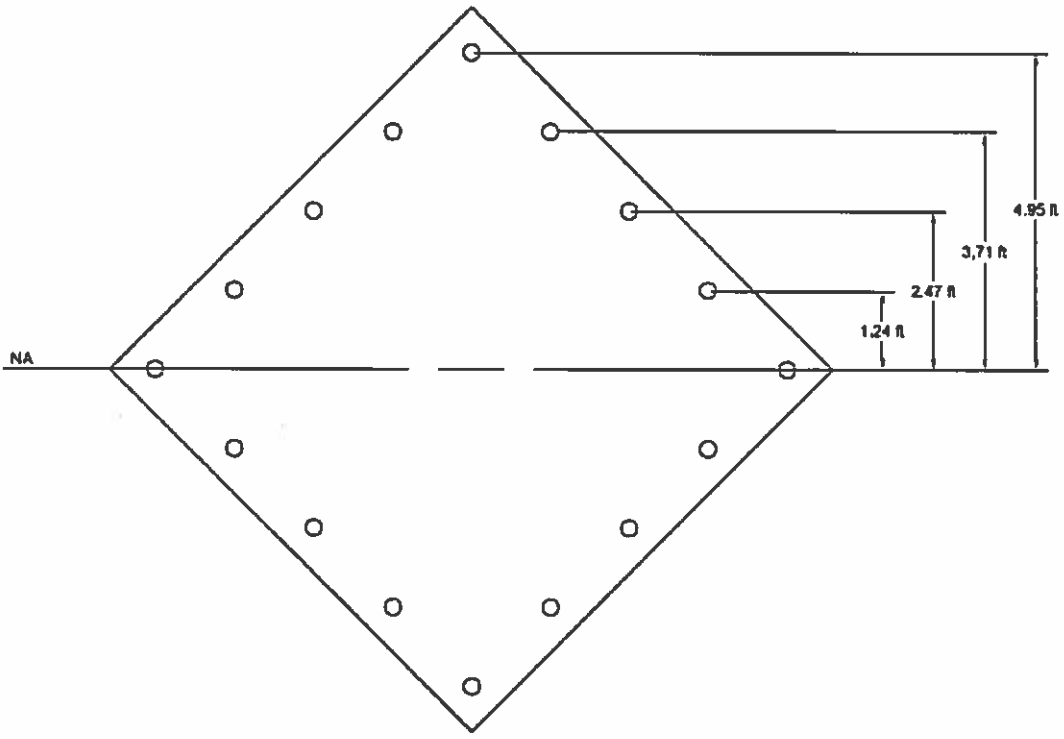
Plate Stress Ratio:
0.70 (Pass)

Bolt Stress Ratio:
0.65 (Pass)

REF TIA-G 4.9.6.4



$$I_0 = \sum d^2$$
$$I_0 = 4 * 1.75^2 + 10 * 3.5^2 = \mathbf{134.8}$$



$$I_0 = \sum d^2$$
$$I_0 = 4 * 1.24^2 + 4 * 2.47^2 + 4 * 3.71^2 + 2 * 4.95^2 = \mathbf{134.6}$$

AMERICAN TOWER CORPORATION

CONTROLLING USAGE

$$M_{Overturning} = M + V * D = 173.3 + 4.2 * 6 = \mathbf{198.5k - ft}$$

$$T_{U-Rock-Bolt} = \frac{M_{Overturning} * L_{Max}}{I_0} - \frac{P}{\#Rock\ Bolts}$$

$$T_{U-Rock-Bolt} = \frac{198.5 * 4.95}{134.6} - \frac{73.8}{16} = \mathbf{2.7k}$$

$$\frac{Tub}{\emptyset Rnt} = \frac{2.7k}{0.75(60k)} = \mathbf{0.06\ OK}$$

GUY ANCHOR ROD CHECK

Uplift = 25.1k
Shear = 24.0k } Guy Anchor Reactions

Tub = Tapplied $= \sqrt{(25.1k)^2 + (24.0k)^2} = 34.7k$

1.5" Diameter Anchor Rod
A36 Grade Assumed Ag = $1.77\ in^2$

$$\frac{Tub}{\emptyset Rnt} = \frac{34.7k}{0.8(36ksi * 1.77in^2)} = \mathbf{0.68\ OK}$$

Site Name: WATERBURY CT

Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	1	7487	7487	127.9	0.1646	1.0	16.46%
VZW Cellular	869	3	427	1281	127.9	0.0282	0.579333333	4.86%
VZW Cellular	880	1	5120	5120	127.9	0.1126	0.586666667	19.19%
VZW AWS	2145	1	13817	13817	127.9	0.3038	1.0	30.38%
VZW 700	746	1	3268	3268	127.9	0.0718	0.497333333	14.45%
Total Percentage of Maximum Permissible Exposure								85.33%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.13101 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:
1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.

Location: FARMDALE DR **Owner:** SPRINGWICH CELLULAR TOWER HOLDINGS LLC

Property Information:

Map Block Lot:	0167-0559-0024	**Acres:**	4.75
Primary Use:	Res Vac Land (5-1)	**Zone:**	RL
Neighborhood:	14100-Long Hill	**Vol/Page:**	5156
Mailing Address:	SPRINGWICH CELLULAR TOWER HOLDINGS LLC 909 CHESTNUT RM 36-M-1 ST LOUIS MO 63101		

Property Values:

	Appraised Value	**Assessed Value (70%)**
Building	0	0
Land	321578	225100
OutBuilding	0	0
Total	321578	225100

Sales Information:

Sale Date	**Sale Price**	**Sale Type**	**Valid sale**
8/23/1984	20000		No
10/29/2004	0	Quit Claim	No

Outbuilding Information:

Type	**Area (sq.ft)**	**Year Built**	**Condition**

Special Features:

Permit Information:

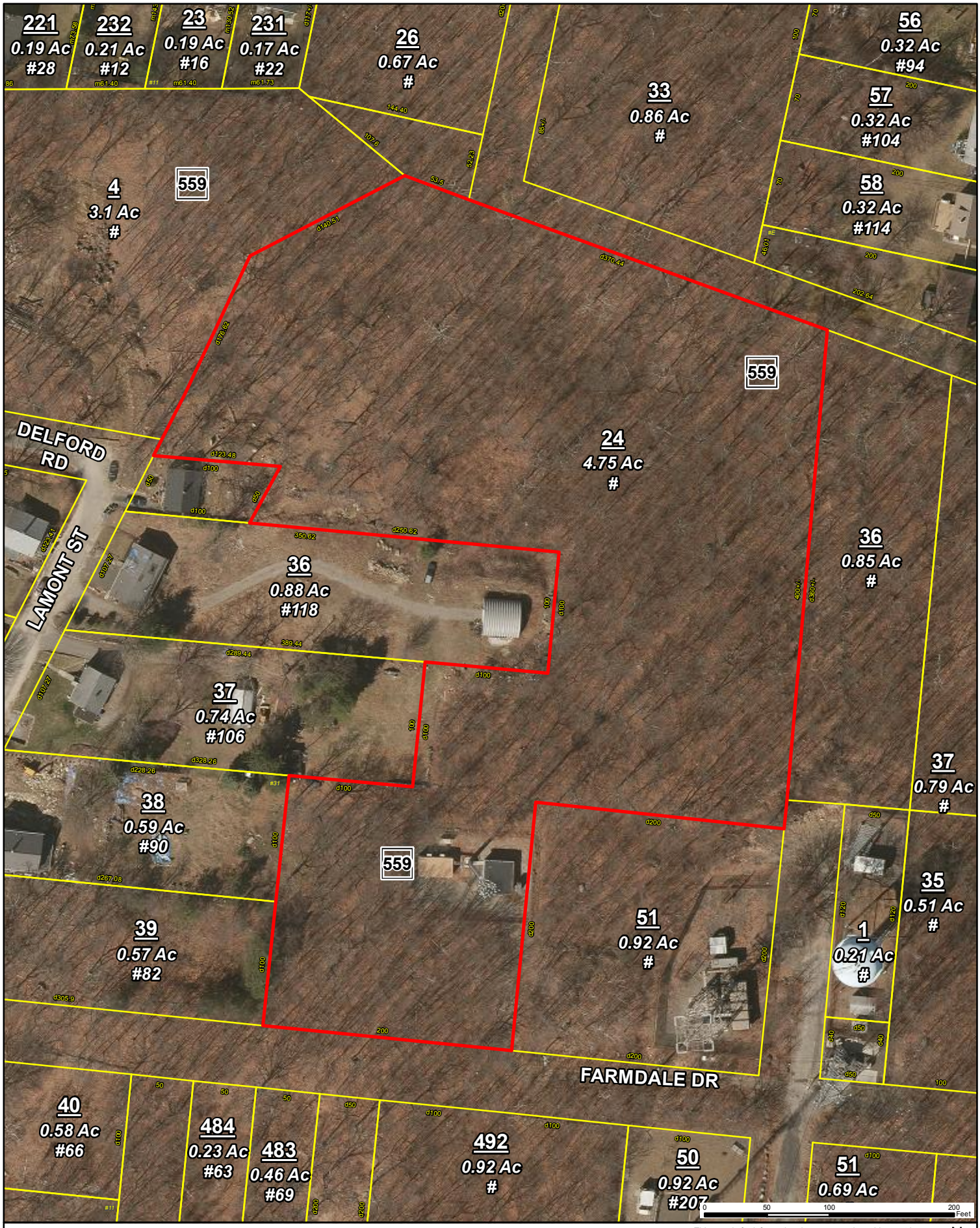
Permit Date	**Permit Number**	**Permit Type**	**Click for Details**
08/28/2015	PR20150002331	BD - Electrical	Details
08/09/2013	PR20130002198	BD - Electrical	Details
06/20/2014	PR20140001587	BD - Building	Details
05/26/2016	PR20160001522	BD - Electrical	Details
04/28/2015	PR20150000950	BD - Electrical	Details
02/03/2014	PR20140000177	BD - Electrical	Details

Planning Application:

Application Date	**Application Number**	**Application Type**	**Click for Details**

Code Enforcement:			
Case Date	**Case Number**	**Case Type**	**Click for Details**

Close

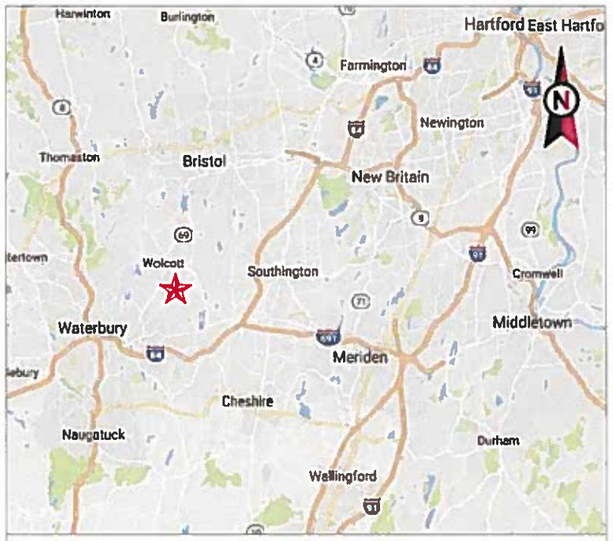


City of Waterbury
Public Works Department

MBL: **0167-0559-0024**

ADDRESS: FARMDALE DR

N



VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: WTBR - WATERBURY
ATC SITE NUMBER: 302476
VERIZON SITE NAME: WATERBURY CT
SITE ADDRESS: 1 FARMDALE DRIVE
WATERBURY, CT 06704

LOCATION MAP

VERIZON WIRELESS
ANTENNA AMENDMENT DRAWINGS

COMPLIANCE CODE

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

1. INTERNATIONAL BUILDING CODE (IBC)
2. NATIONAL ELECTRIC CODE (NEC)
3. LOCAL BUILDING CODE
4. CITY/COUNTY ORDINANCES

UTILITY COMPANIES

POWER COMPANY: EVERSOURCE
PHONE: (877) 659 6326

TELEPHONE COMPANY: FRONTIER COMMUNICATIONS
PHONE: (800) 376 6843

811
Know what's **below.**
Call before you dig.

PROJECT SUMMARY

SITE ADDRESS:

1 FARMDALE DRIVE
WATERBURY, CT 06704
COUNTY: NEW HAVEN

GEOGRAPHIC COORDINATES:

LATITUDE: 41.57066
LONGITUDE: -73.0176
GROUND ELEVATION: 826' AMSL

PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

ENGINEER:

ATC TOWER SERVICES, LLC
3500 REGENCY PKWY STE 100
CARY, NC 27518

PROPERTY OWNER:

AMERICAN TOWER
116 HUNTINGTON AVE
BOSTON, MA 02116

APPLICANT:

VERIZON WIRELESS
99 EAST RIVER DRIVE, 9TH FLOOR
EAST HARTFORD, CT 06108

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

REMOVE (9) PANELS, (3) RRUs, (1) OVP, (15) 1-5/8" COAX CABLES.

INSTALL (6) NEW PANELS, (9) RRUs, (1) 1-1/4" HYBRID CABLE

EXISTING (3) PANELS, (3) RRUs, (1) 1-1/4" HYBRID CABLE TO REMAIN

PROJECT NOTES

1. THE FACILITY IS UNMANNED.
2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE.
3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE.
4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED.
5. HANDICAP ACCESS IS NOT REQUIRED.

PROJECT LOCATION DIRECTIONS

FROM HARTFORD, CT:

TAKE I-84 WEST TO EXIT 23. FOLLOW RT 69 NORTH TO WOLCOTT RD AND TURN LEFT. AT FIRST LIGHT TURN RIGHT ONTO LONG HILL RD. GO UP HILL, THROUGH THE STOP SIGN AND TAKE THE FIRST RIGHT ONTO WARNER RD. GO UP HILL AND TAKE FIRST RIGHT ONTO GARDEN CIRCLE. FOLLOW TO END TO ACCESS ROAD FOR THE 5 TOWERS. PAST THE FIRST TOWER ON LEFT THERE IS AN ACCESS ROAD ON THE LEFT. FOLLOW THAT TO THE TOWER.

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	COVER SHEET	1	12/22/17	AMM
G-002	GENERAL NOTES	0	12/05/17	AMM
C-101	DETAILED SITE PLAN AND TOWER ELEVATION	0	12/05/17	AMM
C-501	RF SCHEDULE AND ANTENNA INSTALLATION	1	12/22/17	AMM
C-502	CONSTRUCTION DETAILS	0	12/05/17	AMM

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	AMM	12/05/17
1	REV COAX COUNT	AMM	12/22/17

ATC SITE NUMBER:
302476

ATC SITE NAME:
WTBR - WATERBURY

SITE ADDRESS:
1 FARMDALE DRIVE
WATERBURY, CT 06704

SEAL:

Dec 22 2017 5:30 PM cosign

verizon

DRAWN BY:	AMM
APPROVED BY:	KRF
DATE DRAWN:	12/05/17
ATC JOB NO:	12168231
CUSTOMER ID:	WATERBURY CT

COVER SHEET

SHEET NUMBER:	REVISION:
G-001	1

GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC MASTER SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE VERIZON WIRELESS REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE VERIZON WIRELESS REP PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE VERIZON WIRELESS REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE VERIZON WIRELESS REP IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
17. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
18. CONTRACTOR SHALL FURNISH VERIZON WIRELESS WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
19. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH VERIZON WIRELESS REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
20. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH VERIZON WIRELESS REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY VERIZON WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
21. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH VERIZON WIRELESS SPECIFICATIONS AND REQUIREMENTS.
22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO VERIZON WIRELESS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO VERIZON WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
24. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
25. CONTRACTOR SHALL NOTIFY VERIZON WIRELESS REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
26. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.
27. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
28. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE VERIZON WIRELESS REP. ANY WORK FOUND BY THE VERIZON WIRELESS REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
29. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
   - A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
   - B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
   - C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
   - D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
   - E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
   - A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
   - B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
   - C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
   - D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
   - E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
   - F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
   - G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING ½" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	AMM	12/05/17

ATC SITE NUMBER:
302476

ATC SITE NAME:
WTBR - WATERBURY

SITE ADDRESS:
1 FARMDALE DRIVE
WATERBURY, CT 06704

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verizon

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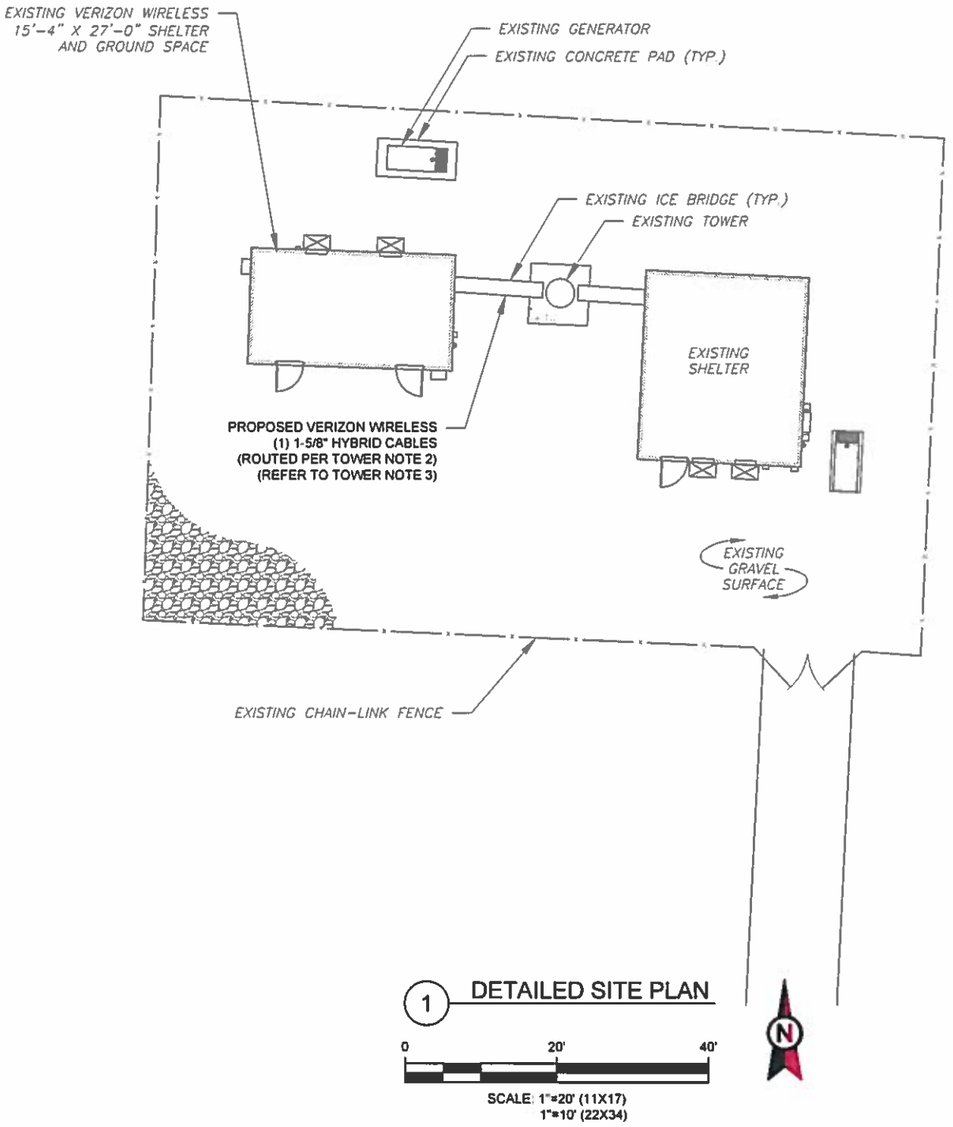
CUSTOMER ID:	WATERBURY CT

GENERAL NOTES

SHEET NUMBER:	REVISION:
G-002	0

SITE PLAN NOTES:

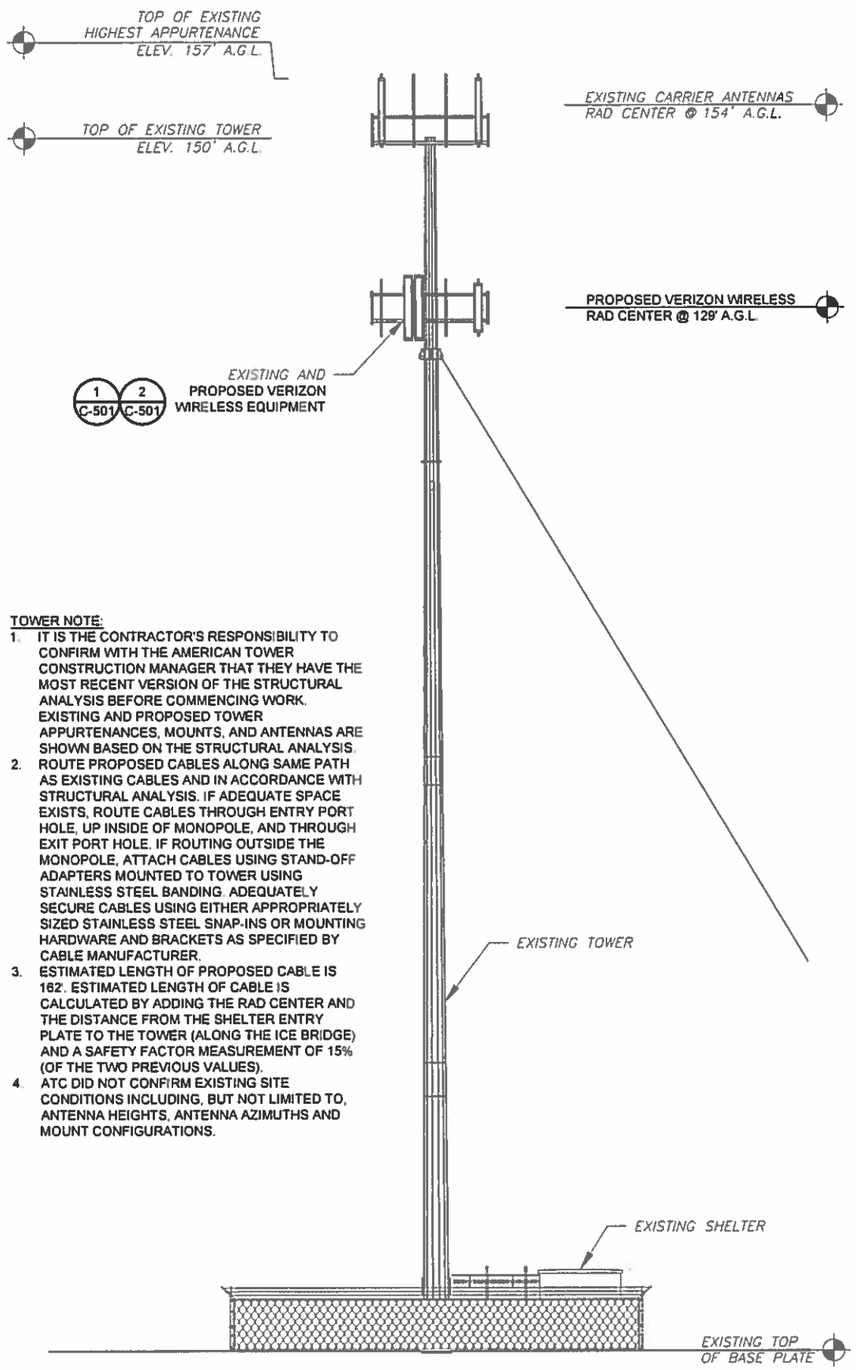
1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.
2. ICE BRIDGE, CABLE LADDER, COAX PORT, CABLE SUPPORTS, AND CABLES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE INSTALLING NEW CABLE SUPPORT STRUCTURES, COAX PORTS, OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ATC CONSTRUCTION MANAGER AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.



1 DETAILED SITE PLAN

0 20' 40'

SCALE: 1"=20' (11X17)
1"=10' (22X34)



TOWER NOTE:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE AMERICAN TOWER CONSTRUCTION MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
2. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.
3. ESTIMATED LENGTH OF PROPOSED CABLE IS 162'. ESTIMATED LENGTH OF CABLE IS CALCULATED BY ADDING THE RAD CENTER AND THE DISTANCE FROM THE SHELTER ENTRY PLATE TO THE TOWER (ALONG THE ICE BRIDGE) AND A SAFETY FACTOR MEASUREMENT OF 15% (OF THE TWO PREVIOUS VALUES).
4. ATC DID NOT CONFIRM EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, ANTENNA HEIGHTS, ANTENNA AZIMUTHS AND MOUNT CONFIGURATIONS.

2 TOWER ELEVATION

SCALE: NOT TO SCALE

AMERICAN TOWER®
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SUITE 100
CARY, NC 27518
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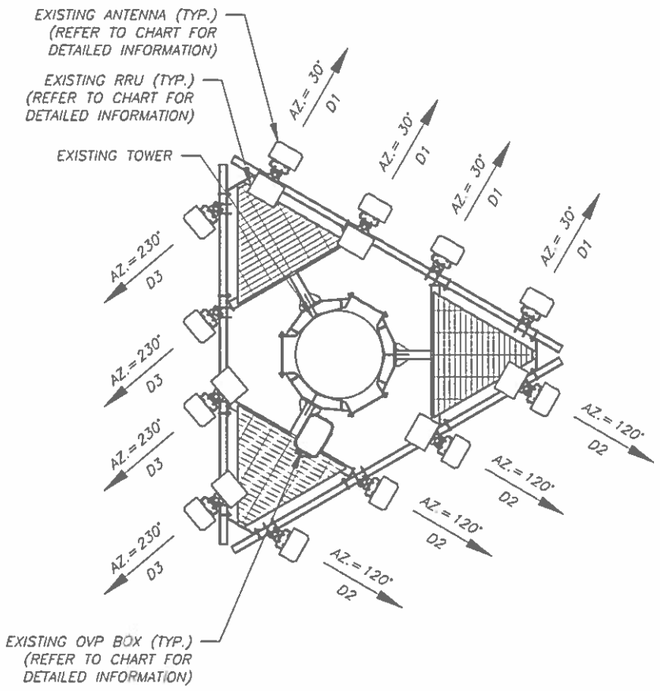
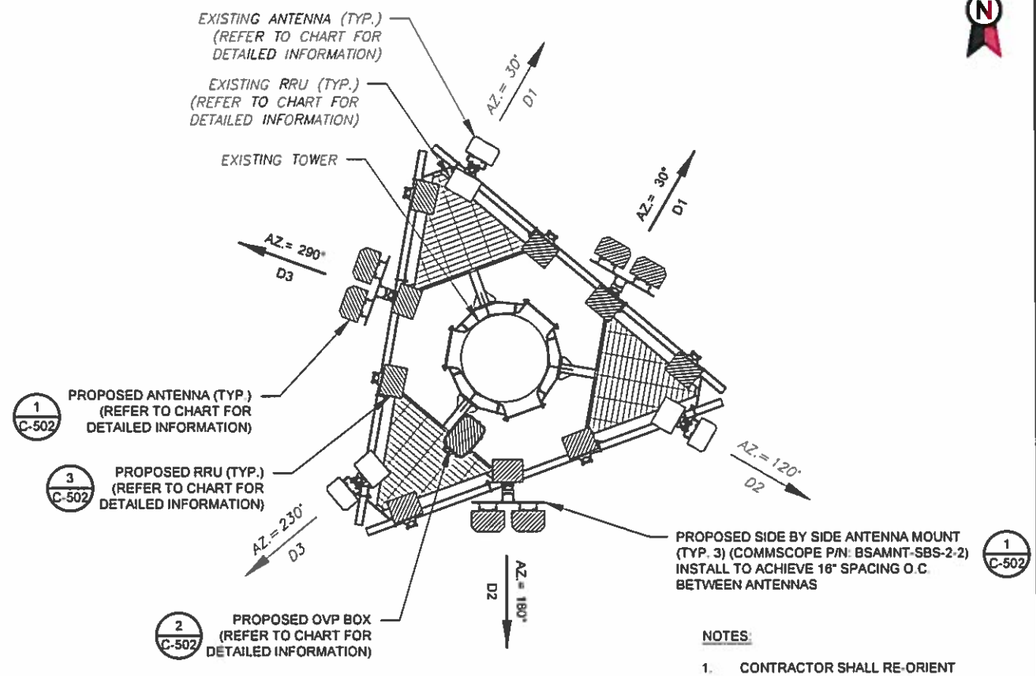
CUSTOMER ID:	WATERBURY CT

DETAILED SITE PLAN AND TOWER ELEVATION

SHEET NUMBER:	REVISION:
C-101	0



1 CURRENT ANTENNA PLAN



NOTES:

1. CONTRACTOR SHALL RE-ORIENT T-ARMS AS NECESSARY TO ACHEIVE PROPOSED ANTENNA AZIMUTHS.

2 PROPOSED ANTENNA PLAN

CURRENT ANTENNA AND RF EQUIPMENT SCHEDULE

LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY		
SECTOR	RAD	AZ	POS	BAND	MODEL NUMBER	STATUS	POS	MODEL NUMBER	STATUS
D1	129'	30°	1	850 CDMA	BXA-80063-4CF-EDIN-X	RMN	1	B66 RRH4X45	RMN
			2	700 LTE	LNX-6514DS-A1M	RMV	2	RRH2X60-1900	RMV
			3	-	DB948F85E-M	RMV	3	-	-
			4	700 LTE	LNX-4514DS-A1M	RMV	4	-	-
			-	-	-	-	-	-	-
D2	129'	120°	1	850 CDMA	BXA-80063-4CF-EDIN-X	RMN	1	B66 RRH4X45	RMN
			2	700 LTE	LNX-6514DS-A1M	RMV	2	RRH2X60-1900	RMV
			3	-	DB948F85E-M	RMV	3	-	-
			4	-	SBNHH-1D45B	RMV	4	-	-
			-	-	-	-	-	-	-
D3	129'	230°	1	850 CDMA	BXA-80063-4CF-EDIN-X	RMN	1	B66 RRH4X45	RMN
			2	-	SBNHH-1D65B	RMV	2	RRH2X60-1900	RMV
			3	-	DB948F85E-M	RMV	3	-	-
			4	-	SBNHH-1D45B	RMV	4	-	-
			-	-	-	-	-	-	-

CURRENT FIBER DISTRIBUTION / OVP BOX

LOCATION	POS	BAND	MODEL NUMBER	STATUS
-	-	-	DB-T1-6Z-8AB-0Z	RMV
-	-	-	-	-

CURRENT CABLING SUMMARY

COAX	HYBRID	STATUS
(15) 1-5/8"	-	RMV
-	(1) 1-5/8"	RMN

NOTES

1. BASED ON APPROVED ATC APPLICATION OAA717077 , DATED 11-29-17 CONFIRM WITH VERIZON WIRELESS REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS.
2. ATC HAS NOT YET VERIFIED ANY EXISTING ANTENNA CONFIGURATION OR MOUNT CONFIGURATION. CONTRACTOR TO VERIFY MOUNT CONFIGURATION HAS SUFFICIENT SPACE FOR PROPOSED LESSEE EQUIPMENT (I.E. CLEARANCES, MOUNT PIPE OR SUFFICIENT LENGTH, ETC.) ATC DID NOT ANALYZE ANTENNA MOUNT TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR ANY LESSEE LOADING.
3. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS ON FILE WITH THE ATC CM.
4. CONFIRM SPACING OF PROPOSED EQUIPMENT DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.
5. POSITIONS START WITH FIRST PIPE ON THE LEFT SIDE (AS VIEWED FROM BEHIND THE MOUNT).
6. CABLE LENGTHS SHOWN ESTIMATE MAXIMUM TYPICAL RUN AND INCORPORATE A 15% SAFETY FACTOR.

PROPOSED ANTENNA AND RF EQUIPMENT SCHEDULE

LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY		
SECTOR	RAD	AZ	POS	BAND	MODEL NUMBER	STATUS	POS	MODEL NUMBER	STATUS
D1	129'	30°	1	850 CDMA	BXA-80063-4CF-EDIN-X	RMN	1	B66 RRH4X45	RMN
			2	-	-	-	2	B25 RRH4X30-4R	ADD
			3	-	(2) JAHH-65B-R3B	ADD	3	B5RRH4X40-850	ADD
							4	B13 RRH4X30-4R	ADD
			-	-	-	-	-	-	-
D2	129'	120°	1	850 CDMA	BXA-80063-4CF-EDIN-X	RMN	1	B66 RRH4X45	RMN
			2	-	-	-	2	B25 RRH4X30-4R	ADD
			3	-	(2) JAHH-65B-R3B	ADD	3	B5RRH4X40-850	ADD
							4	B13 RRH4X30-4R	ADD
			-	-	-	-	-	-	-
D3	129'	230°	1	850 CDMA	BXA-80063-4CF-EDIN-X	RMN	1	B66 RRH4X45	RMN
			2	-	-	-	2	B25 RRH4X30-4R	ADD
			3	-	(2) JAHH-45B-R3B	ADD	3	B5RRH4X40-850	ADD
							4	B13 RRH4X30-4R	ADD
			-	-	-	-	-	-	-

PROPOSED FIBER DISTRIBUTION / OVP BOX

LOCATION	POS	BAND	MODEL NUMBER	STATUS
-	-	-	RCMDC-6627-PF-48	ADD
-	-	-	-	-

PROPOSED CABLING SUMMARY

COAX	HYBRID	STATUS
-	(1) 1-5/8"	ADD
-	-	-

STATUS ABBREVIATIONS
RMV: TO BE REMOVED
RMN: TO REMAIN
REL: TO BE RELOCATED
DSC: TO BE DISCONNECTED AND TO REMAIN

CABLE LENGTHS FOR FOR FIBER AND DC JUMPERS
FROM FIBER DISTRIBUTION / OVP BOX TO RRU: 15' JUMPERS
FROM RRU TO COMBINER: 15' JUMPERS
FROM COMBINER TO ANTENNA: 15' JUMPERS

3 ANTENNA AND RF EQUIPMENT SCHEDULES

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	AMM	12/05/17
1	REV COAX COUNT	AMM	12/22/17

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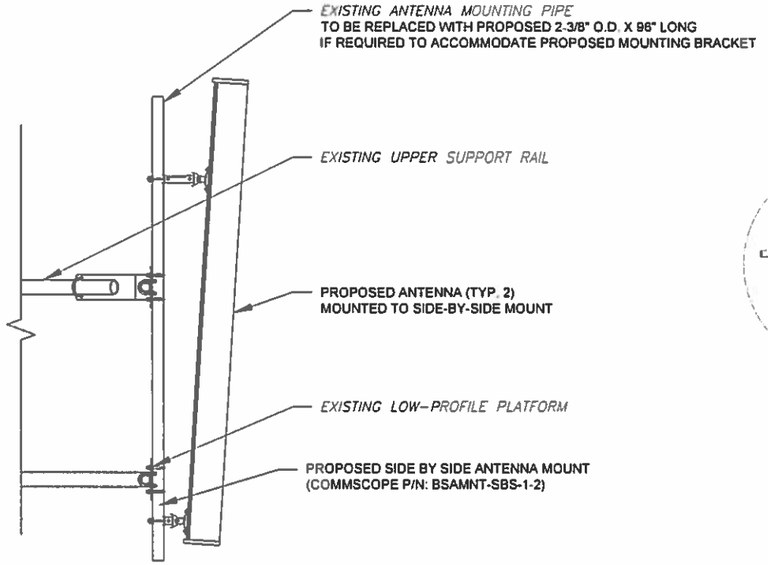
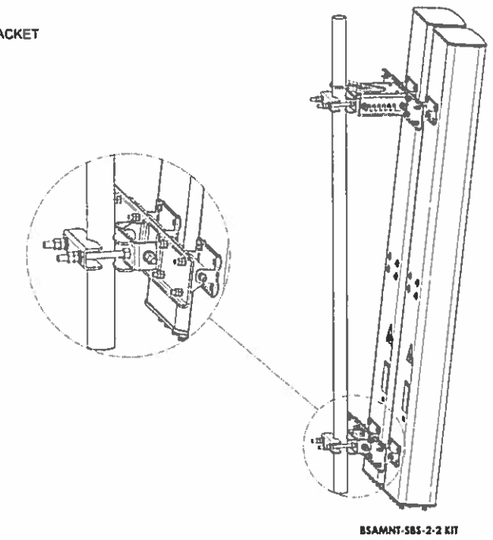
CUSTOMER ID:	WATERBURY CT

RF SCHEDULE AND ANTENNA INSTALLATION

SHEET NUMBER:	REVISION:
C-501	1



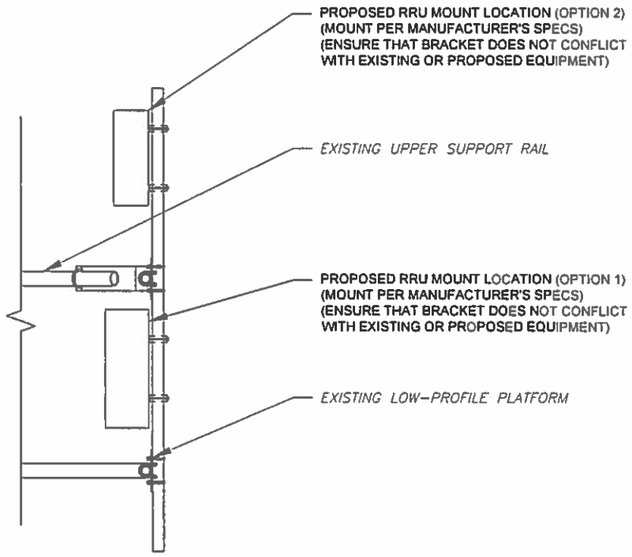
PROFILE VIEW



ISOMETRIC VIEW (BY MANUFACTURER)

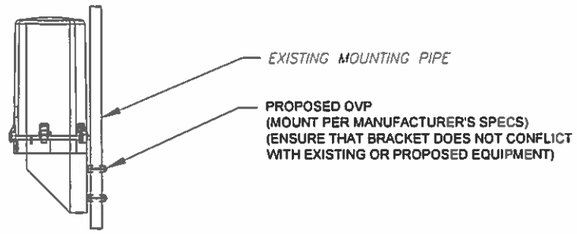
1 PROPOSED SIDE-BY-SIDE MOUNT

SCALE: NOT TO SCALE



2 PROPOSED RRU MOUNTING DETAIL - TYPICAL

SCALE: NOT TO SCALE

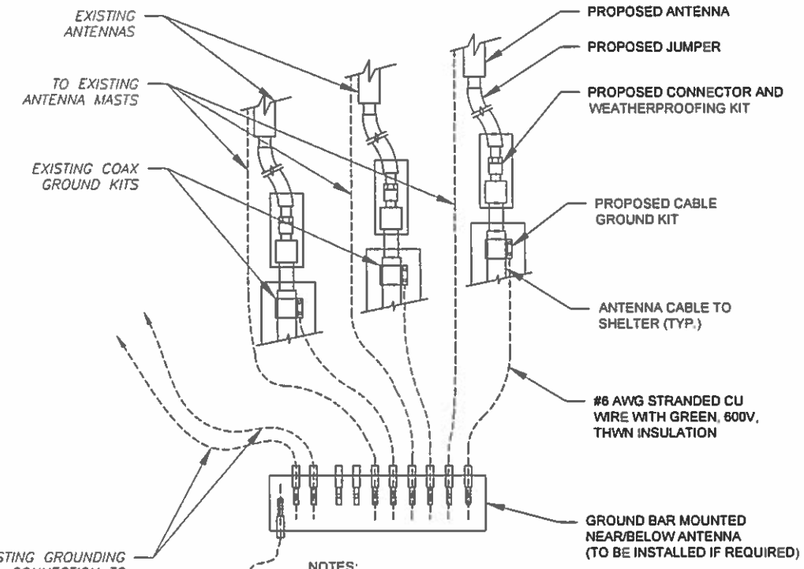


2 PROPOSED OVP MOUNTING

SCALE: NOT TO SCALE

2 PROPOSED ANTENNA MOUNTING DETAIL - TYPICAL

SCALE: NOT TO SCALE



NOTES:

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH VERIZON WIRELESS GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH VERIZON WIRELESS GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

3 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: NOT TO SCALE

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

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0	FOR CONSTRUCTION	AMM	12/05/17

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CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-502	0