Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

November 12, 2019

Via Hand Delivery and Electronic Mail

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
8 Grand Street, East Lyme, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains two (2) antennas and two (2) remote radio heads ("RRHs") at the 42.4-foot level on the existing 89-foot tower on the roof of the East Lyme Fire Department ("ELFD") building at 8 Grand Avenue in East Lyme, Connecticut (the "Property"). The tower and Property are owned by the Town of East Lyme ("Town"). The Siting Council approved Cellco's Eligible Facilities Request, to share the ELFD tower in 2015 (PE1133-VER-20150528). A copy of the Council's approval is included in Attachment 1. Cellco representatives did reach out to municipal officials who indicated that they could not locate any local permits or approvals for the ELFD tower.

Cellco now intends to modify its facility by removing its existing antennas and RRHs, and replacing them with two (2) new antennas and two (2) new RRHs. Included in Attachment 2 are project plans showing the proposed modifications and equipment specifications.

Please accept this letter as notification pursuant to R.C.S.A. § 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 East Lyme's First Selectman, Marc C. Nickerson and Gary Goeschel II, East Lyme's Director of Planning.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed at a centerline height of 42.4 feet on the 89-foot roof-top tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, 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 installation of two (2) new antennas and two (2) RRHs will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Far Field Approximation tables for each of Cellco's operating frequencies for the proposed (modified) facility are included in Attachment 3.

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

6. The roof-top tower and underlying structure with certain reinforcements, can support Cellco's proposed equipment modifications. (*See* Structural Analysis Report, reinforcement plans, and Structural Assessment Letter included in Attachment 4).

A copy of the parcel map and Property owner information is included in Attachment 5. A Certificate of Mailing verifying that this filing was sent to municipal officials is included in Attachment 6.

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Marc C. Nickerson, East Lyme First Selectman
Gary Goeschel, II East Lyme Director of Planning
Tim Parks

ATTACHMENT 1

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
www.ct.gov/csc

July 10, 2015

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **PE1133-VER-20150528** – Cellco Partnership d/b/a Verizon Wireless sub-petition for a declaratory ruling for approval of an eligible facility request for modifications to an existing telecommunications facility located at 8 Grand Street, East Lyme, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby approves your Eligible Facilities Request (EFR) to install antennas and associated equipment at the above-referenced facility pursuant to the Federal Communications Commission Wireless Infrastructure Report and Order, with the following conditions:

- Reinforcements shall be made in accordance with the structural analysis report prepared by CENTEK Engineering, Inc. dated April 29, 2015 and stamped by Timothy J. Lynn;
- Within 45 days following completion of the equipment installation, Cellco shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the structural analysis;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by the Petitioner shall be removed within 60 days of the date the antenna ceased to function;
- The validity of this action shall expire one year from the date of this letter; and
- The petitioner may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the EFR received on May 28, 2015.

Thank you for your attention and cooperation.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/MP

c: Honorable Mark C. Nickerson, First Selectman, Town of East Lyme
Gary Goeschel, Director of Planning, Town of East Lyme

ATTACHMENT 2

verizon

CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

LOCATION CODE:

469058

SITE NAME:

NIANTIC_CT

Digitally signed by Jiazhu Hu, Ph.D., P.E.
DN: cn=Jiazhu Hu, Ph.D., P.E., o=Nexius, ou=Engineering, email=Jiazhu.Hu@Nexius.com, c=US
Date: 2019.10.31 15:36:55 -04'00'

VICINITY MAP

PROJECT SUMMARY

SITE NAME:
NIANTIC_CT

SITE ADDRESS:
6&8 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

COORDINATES:
LATITUDE: 41° 19' 30.3708" N
LONGITUDE: 72° 11' 30.1092" W

LANDLORD:
TOWN OF EAST LYME
PO BOX 519
NIANTIC, CT 06357-0519

APPLICANT:
CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

SITE DESCRIPTION:
VERIZON WIRELESS TO REMOVE (2) REMOTE RADIO HEADS & (2) PANEL ANTENNA. INSTALL (2) REMOTE RADIO HEADS, (2) PANEL ANTENNA, & (4) DIPLEXERS. EXISTING (1) OVP BOX TO REMAIN & (1) 2x4 HYBRID CABLE TO REMAIN. INSTALL PANEL ANTENNAS @ 42.4'± A.G.L. ON THE EXISTING 89.0'± A.G.L. GUYED TOWER ON ROOF.

APPROVALS

OWNER:	DATE:
R.F. ENGINEER:	DATE:
CONSTRUCTION:	DATE:
LEASING & ZONING:	DATE:
VERIZON WIRELESS:	DATE:

THE ABOVE PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES OR MODIFICATIONS THEY MAY IMPOSE.

SHEET INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
A-1	COMPOUND PLAN & STRUCTURE ELEVATION
A-2	CONSTRUCTION DETAILS
S-1	STRUCTURAL REINFORCEMENT DETAILS

STRUCTURAL NOTES:

STRUCTURAL ANALYSIS PERFORMED BY NEXIUS DETERMINED THAT THE EXISTING STRUCTURE IS NOT ADEQUATE FOR THE PROPOSED INSTALLATIONS. STRUCTURAL REINFORCEMENT IS RECOMMENDED AS DETAILED IN THE DRAWINGS.

PREPARED BY:

nexius
TRANFORM YOUR BUSINESS...THROUGH WIRELESS

A&E OFFICE:
300 APOLLO DRIVE, SUITE 7
CHELMSFORD, MA 01824
1 (978) 923-7965

APPLICANT:

verizon

CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

PROFESSIONAL STAMP:

DRAWING SCALES ARE INTENDED FOR 22"x34" SIZE PRINTED MEDIA ONLY. 11"x17" IS DEEMED HALF SCALE, AND ALL OTHER PRINTED SIZES ARE DEEMED "NOT TO SCALE".

SUBMITTALS

REV	DATE	DESCRIPTION	BY
0	10/31/19	FOR CONSTRUCTION	NS

PROJECT INFORMATION:

SITE NAME:
NIANTIC_CT

SITE ADDRESS:
6&8 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

PROJECT NUMBER:
VZ11509

DRAWN BY:	DATE:
NS	10/31/19
CHECKED BY:	DATE:
KB/JH	10/31/19

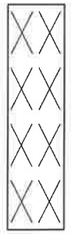
SHEET TITLE:
TITLE SHEET

SHEET NUMBER:

T-1

ANTENNA CONFIGURATION
SEE ANTENNA PLAN FOR ANTENNA LOCATIONS

700/850/AWS/PCS



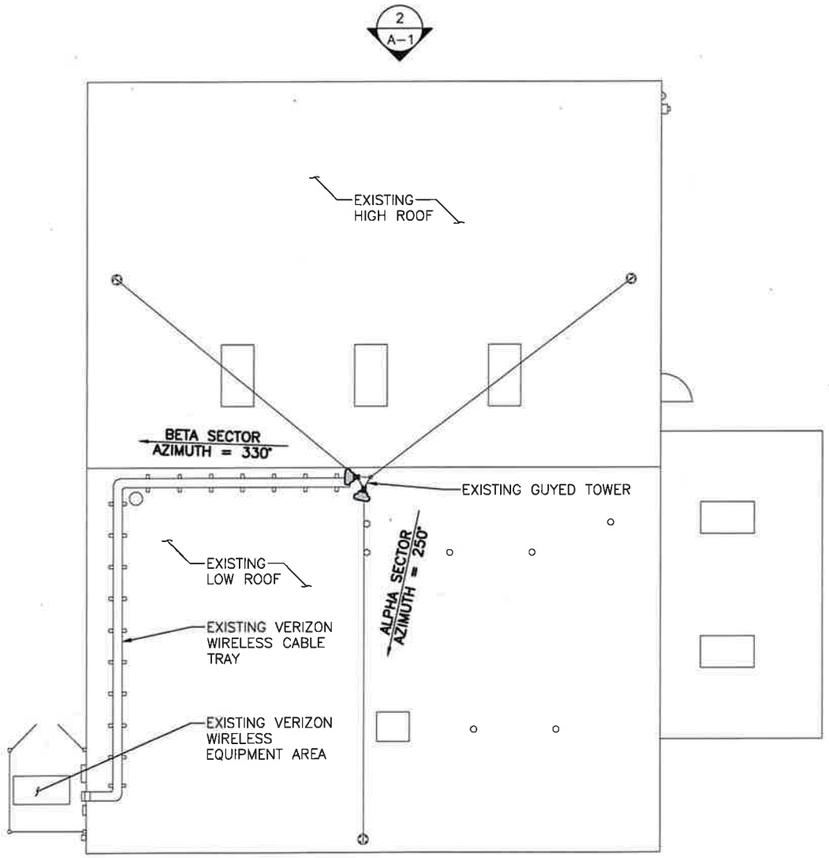
HYBRID CABLE SCHEDULE		
SECTOR	CABLE QUANTITY/ TYPE	LENGTH
ALPHA	EXISTING (1) 2x4 HYBRID	EXISTING
BETA		

THE DC AND FIBER HYBRID CABLES ARE PROVIDED BY VERIZON WIRELESS. THE SIZING AND OR DERATING OF HYBRID CABLE DC CONDUCTORS SHALL BE DONE BY OTHERS IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEC.

TOWER STRUCTURAL ASSESSMENT PREPARED BY NEXIUS
STRUCTURAL ANALYSIS, PREPARED BY NEXIUS, ENTITLED STRUCTURAL ANALYSIS REPORT, DATED OCTOBER 31, 2019, STATES THAT THE EXISTING STRUCTURE WILL BE OF SUFFICIENT CAPACITY FOR THE EXISTING AND PROPOSED LOADING INSTALLATIONS ON THE CONDITION OF INSTALLING THE PROPOSED MODIFICATIONS.

BUILDING STRUCTURAL ASSESSMENT LETTER PREPARED BY NEXIUS
STRUCTURAL ASSESSMENT, PREPARED BY NEXIUS, ENTITLED STRUCTURAL ASSESSMENT LETTER, DATED OCTOBER 31, 2019, STATES THAT THE EXISTING BUILDING STRUCTURE IS DETERMINED TO BE SUFFICIENT FOR THE PROPOSED LOADING INSTALLATIONS

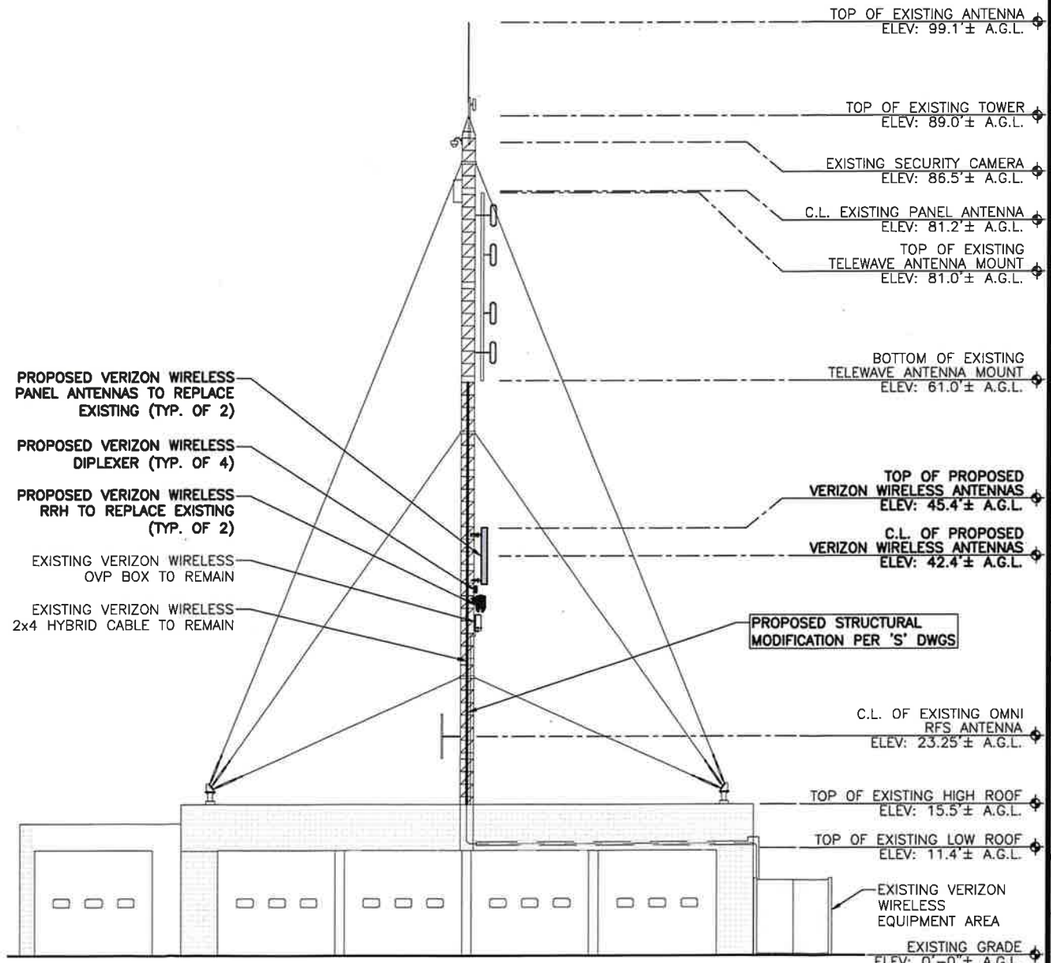
MOUNT STRUCTURAL ASSESSMENT PREPARED BY NEXIUS
STRUCTURAL ASSESSMENT PREPARED BY NEXIUS, ENTITLED MOUNT ASSESSMENT LETTER, DATED OCTOBER 31, 2019, STATES THAT THE EXISTING MOUNTING STRUCTURES ARE DETERMINED TO BE SUFFICIENT FOR THE PROPOSED LOADING INSTALLATIONS.



APPROX. NORTH

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

GRAPHIC SCALE: 1/8"=1'-0"



2 ELEVATION
SCALE: 1/8" = 1'-0"

GRAPHIC SCALE: 1/8"=1'-0"

PREPARED BY:
nexius
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A&E OFFICE:
300 APOLLO DRIVE, SUITE 7
CHELMSFORD, MA 01824
1 (978) 923-7965

APPLICANT:
verizon
CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

PROFESSIONAL STAMP:
STATE OF CONNECTICUT · JIAZHU HU · 31530 · LICENSED PROFESSIONAL ENGINEER

SUBMITTALS

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0	10/31/19	FOR CONSTRUCTION	NS

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6&8 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

PROJECT NUMBER:
VZ11509

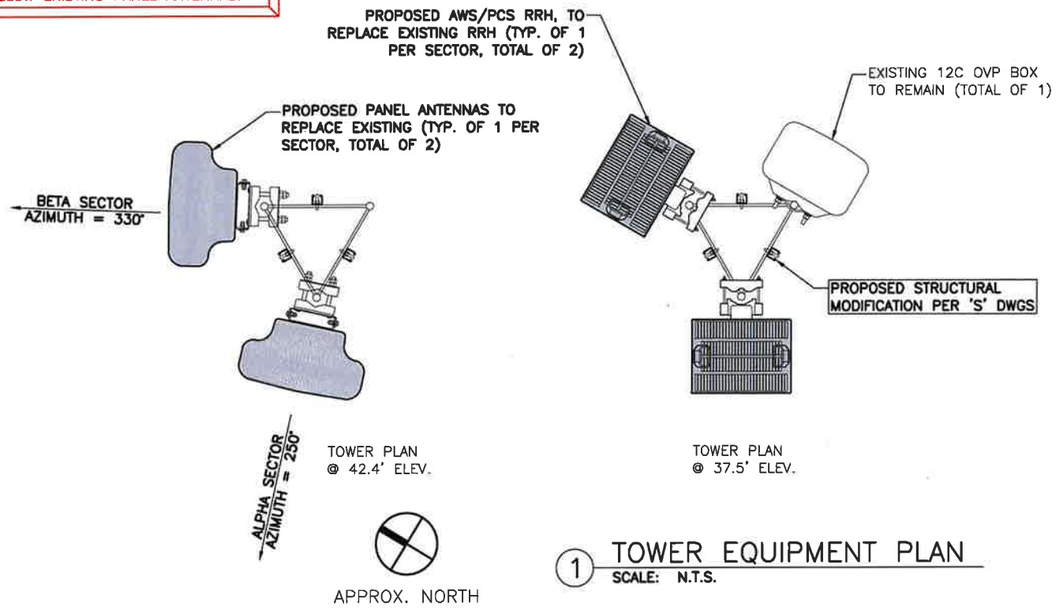
DRAWN BY:	DATE:
NS	10/31/19
CHECKED BY:	DATE:
KB/JH	10/31/19

SHEET TITLE:
COMPOUND PLAN & STRUCTURE ELEVATION

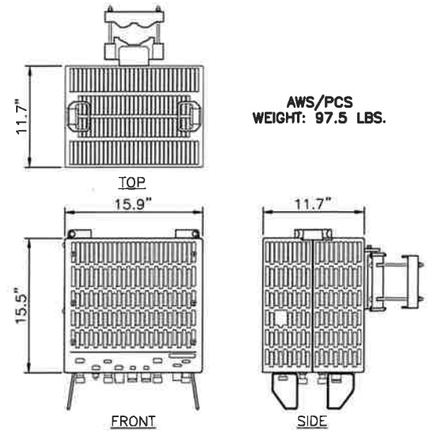
SHEET NUMBER:
A-1

NOTE:

ALL PROPOSED DIPLEXERS ARE TO BE MOUNTED BELOW EXISTING PANEL ANTENNAS.



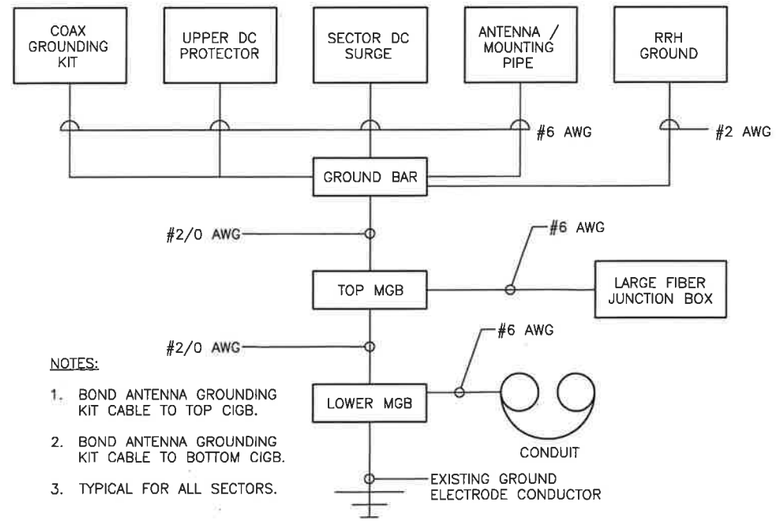
1 TOWER EQUIPMENT PLAN
SCALE: N.T.S.



2 RRH SPEC.
SCALE: N.T.S.

GENERAL NOTES:

1. INSTALL ALL EQUIPMENT, MOUNTING BRACKETS, AND HARDWARE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. GROUND DISTRIBUTION BOXES, MOUNTING PIPES, AND RRH'S IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. INSTALLED EQUIPMENT AND MOUNTING BRACKETS SHALL NOT INTERFERE WITH CLIMBING ACCESS NOR ANY INSTALLED SAFETY DEVICES.
4. EQUIPMENT TO BE INSTALLED AT VERIZON'S RAD CENTER IN ACCORDANCE WITH TOWER ANALYSIS/ROOFTOP STRUCTURAL ANALYSIS (ANALYSIS BY OTHERS).



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGB.
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGB.
3. TYPICAL FOR ALL SECTORS.

3 GROUNDING SCHEMATIC DIAGRAM
SCALE: N.T.S.

PREPARED BY:

nexius
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CHELMSFORD, MA 01824
1 (978) 923-7965

APPLICANT:

verizon

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99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

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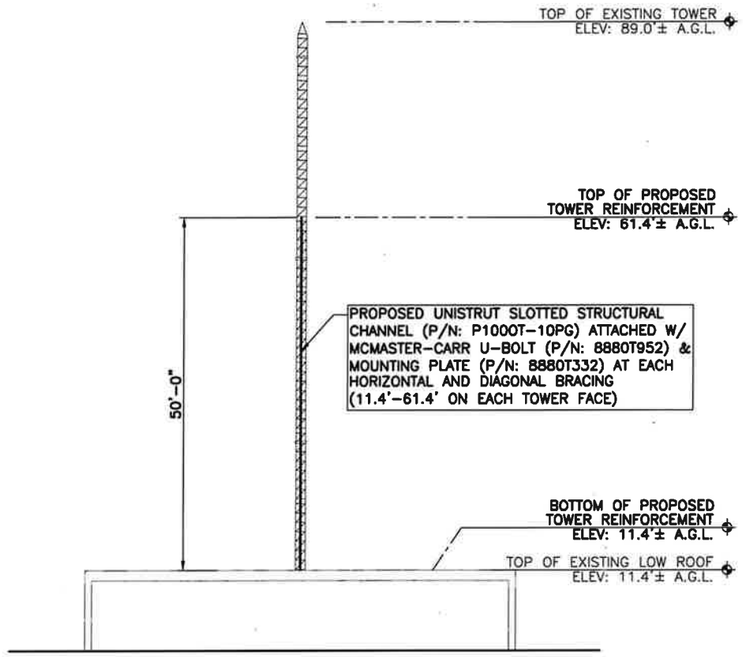
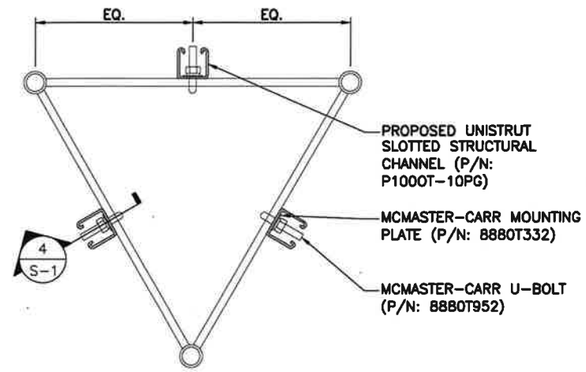
SHEET TITLE:
CONSTRUCTION DETAILS

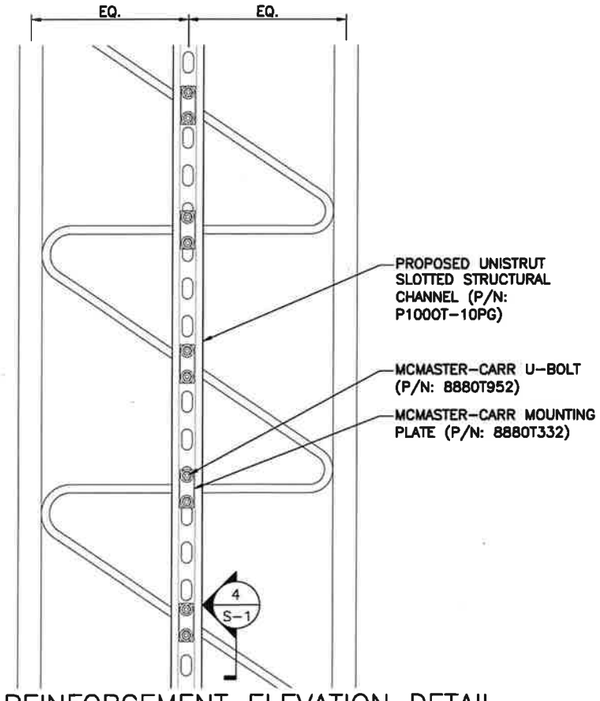
SHEET NUMBER:
A-2



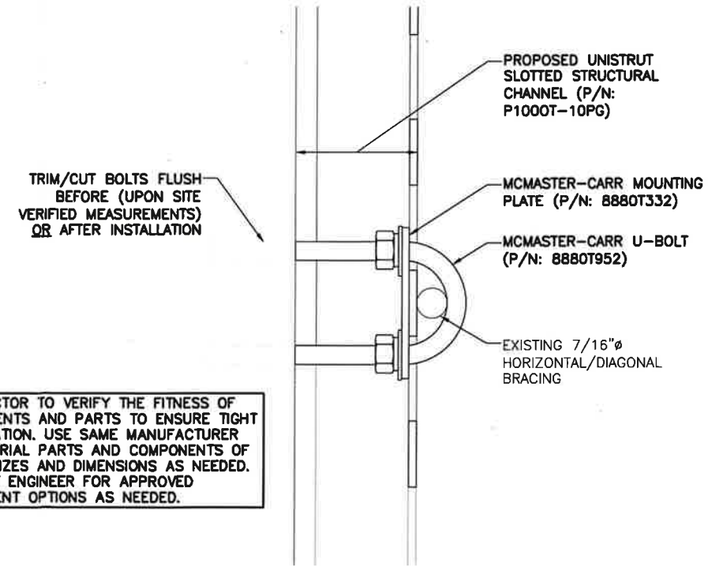
1 REINFORCEMENT ELEVATION
SCALE: N.T.S.



2 REINFORCEMENT PLAN
SCALE: 3" = 1'-0"



3 REINFORCEMENT ELEVATION DETAIL
SCALE: 3" = 1'-0"



4 REINFORCEMENT SECTION DETAIL
SCALE: 1'-0" = 1'-0"

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PROFESSIONAL STAMP:

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KB/JH	10/31/19

SHEET TITLE:
STRUCTURAL
REINFORCEMENT DETAILS

SHEET NUMBER:
S-1

Product Specifications

MX06FRO640-02

NWAV™ X-Pol Antenna | Hex-Port | 6 ft | 40°

JMA WIRELESS

X-Pol, Hex-Port 6 ft 40º Fast Roll-Off with Smart Bias-T

(2) 698–894 MHz & (4) 1695–2180 MHz

- Fast Roll-Off (FRO™) Azimuth beam pattern improves Intra- and Inter-cell SINR
- Excellent Passive Intermodulation (PIM) performance reduces harmful interference
- Fully integrated (iRETs) with *independent* RET control for low and high bands for ease of network optimization
- *SON-Ready* array spacing supports beamforming capabilities
- Suitable for LTE/CDMA/PCS/UMTS/GSM air interface technologies
- Integrated Smart BIAS-Ts reduces leasing costs

nwav technology

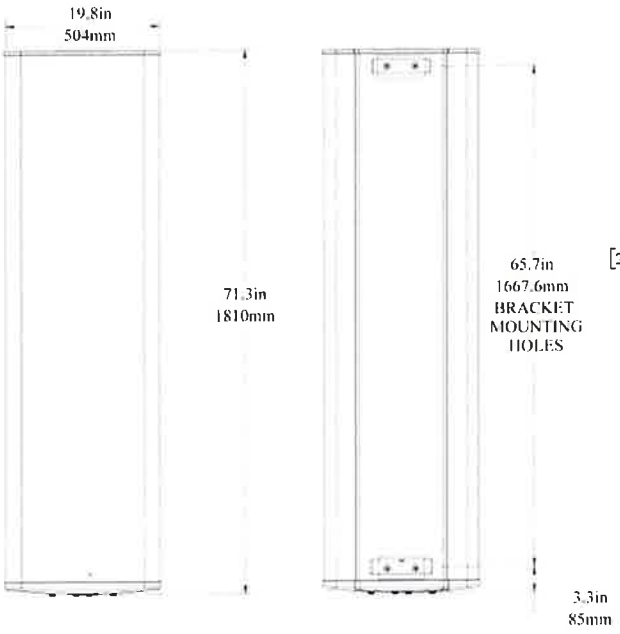
Electrical specification (minimum/ maximum)	**Ports 1,2**		**Ports 3,4,5,6**		
Frequency bands, MHz	698–798	824–894	1695–1880	1850–1990	1920–2180
Polarization	± 45°		± 45°		
Average gain over all tilts, dBi	16.3	17.2	19.3	20.1	20.4
Horizontal beamwidth (HBW), degrees[1]	42°	37°	40°	39°	37°
Front-to-back ratio, co-polar power @180° ± 30°, dB	>25.0	>25.0	>28.0	>28.0	>28.0
X-Pol discrimination (CPR) at boresight, dB	>18.0	>15.0	>18	>18	>15
Sector power ratio, percent	<4.5	<3.5	<3.7	<3.8	<3.6
Vertical beamwidth, (VBW), degrees[1]	13.1°	11.8°	6.0°	5.7°	5.3°
Electrical downtilt (EDT) range, degrees	2-14	2-14	0-9		
First upper side lobe (USLS) suppression, dB[1]	≤ -15.0	≤ -15.0	≤ -16.0	≤ -16.0	≤ -16.0
Minimum cross polar isolation, port-to-port, dB	25	25	25	25	25
Maximum VSWR/ return loss, dB	1.5/ -14.0	1.5/ -14.0	1.5/ -14.0	1.5/ -14.0	1.5/ -14.0
Maximum passive Intermodulation (PIM), 2x 20W carrier, dBc	-153	-153	-153		
Maximum input power per any port, watts	300		250		
Total composite power all ports, watts	1500				

[1] Typical value over frequency and tilt

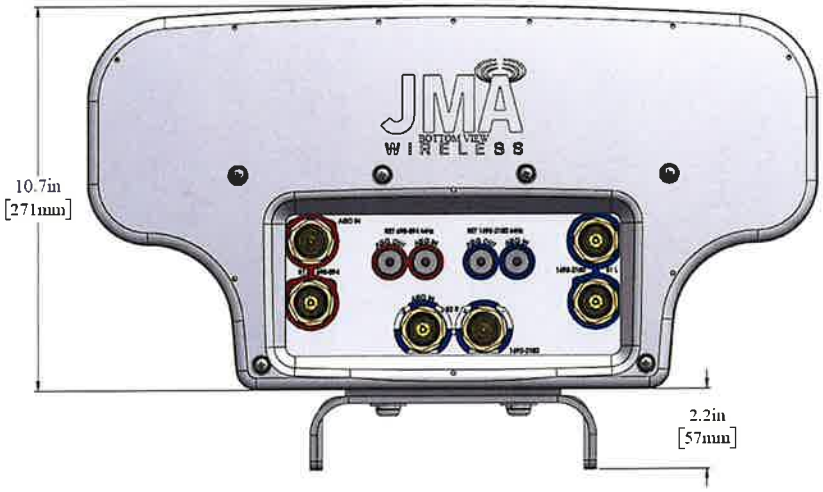
MX06FRO640-02

NWAV™ X-Pol Antenna | Hex-Port | 6 ft | 40°

Mechanical specifications	
Dimensions height/ width/ depth, inches (mm)	72/ 19.8/ 10.7 (1829/504/271)
Shipping dimensions length/ width/ height, inches (mm)	84/ 26/ 15 (2134/ 660/ 381)
No. of RF input ports, connector type & location	6 x 4.3-10 female, bottom
RF connector torque	96 lbf·in (10.85 N·m or 8 lbf·ft)
Net antenna weight, lb (kg)	70 (31.8)
Shipping weight, lb (kg)	100 (45.4)
Antenna mounting and downtilt kit included with antenna	91900318
Net weight of the mounting and downtilt kit, lb (kg)	18 (8.2)
Range of mechanical up/ down tilt	-2° to 14°
Rated wind survival speed, mph (km/h)	150 (241)
Frontal, lateral & rear wind loading @ 150 km/h, lbf (N)	263 (1170), 112 (498), 263 (1170)
Equivalent flat plate @100 mph and Cd=2, sq ft	6.03



Front view



Back view

Ordering information	
Antenna model	**Description**
MX06FRO640-02	6F X- Pol HEX FRO 40° 2-14°/ 0-9° RET, 4.3-10 & SBT
Optional accessories	
992100-CA030-SC	Optional AISG jumper cable, M/F, 3.0 meters
PCU-1000	Primary control unit, USB

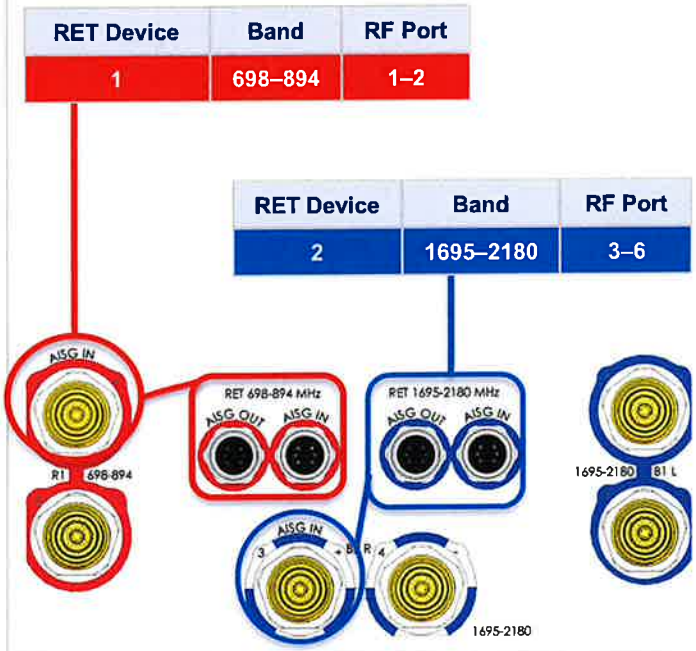
MX06FRO640-02

NWAV™ X-Pol Antenna | Hex-Port | 6 ft | 40°

Remote Electrical Tilt (RET 1000) information	
RET location	Integrated into antenna
RET interface connector type	8-pin AISG connector per IEC 60130-9
RET interface connector quantity	2 pairs of AISG male/ female connectors
RET interface connector location	Bottom of the antenna
Total No. of internal RETs low bands	1
Total No. of internal RETs high bands	1
RET input operating voltage, vdc	10–30
RET max. power consumption, idle state, W	≤ 2.0
RET max. power consumption, normal operating conditions, W	≤ 13.0
RET communication protocol	AISG 2.0/ 3GPP

RET & RF connector topology

Each RET device can be controlled either via the designated external AISG connector or RF port as shown below

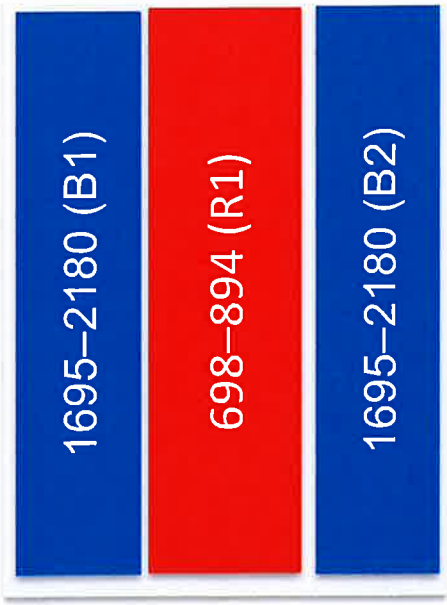


Array topology

3 sets of radiating arrays

R1: 698–894 MHz
B1: 1695–2180 MHz
B2: 1695–2180 MHz

Band	RF Port
1695–2180	3–4
698–894	1–2
1695–2180	5–6



SAMSUNG

Dual-Band Radio Unit
AWS/PCS (B66/B2)
RFV01U-D1A

Samsung's RFV01U-D1A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D1A RU targets dual-band support across Band 66 (AWS) and Band 2 (PCS), making it an ideal product for broad coverage footprints across multiple common mid-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation
- Built-in Broadcast Auxiliary Services (BAS) filter ensures compliant AWS operation without impacting footprint

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)
B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)
Instantaneous Bandwidth:
70MHz(B66) + 60MHz(B2)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 255mm (36.8L)
Weight: 38.3kg
Input Power: -48V DC
Operating Temp.: -40 ~ 55°(w/o solar load)
Cooling: Natural convection

ATTACHMENT 3

Far Field Approximation
with downtilt variation

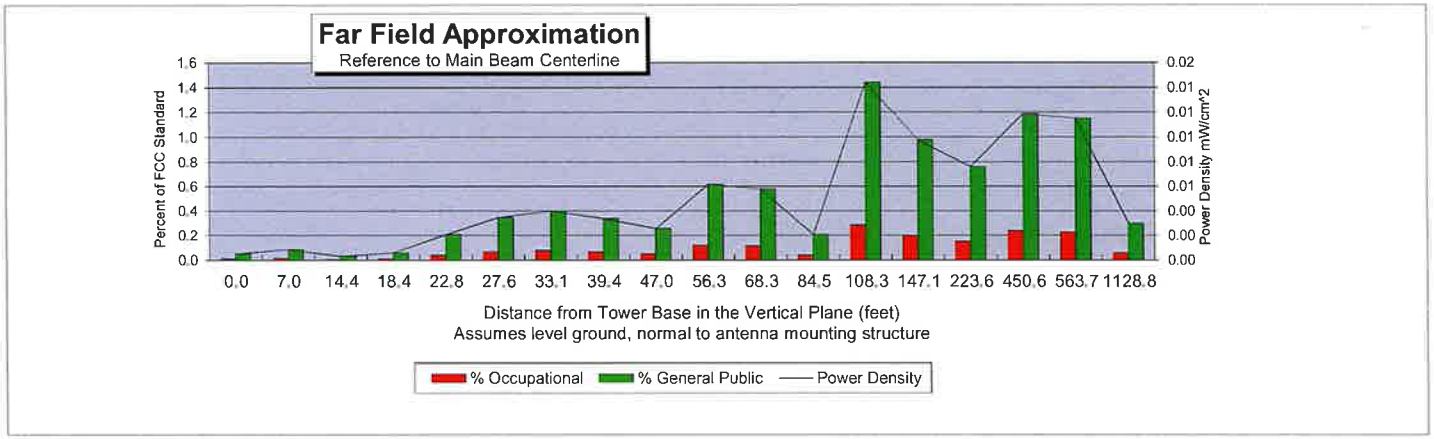
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Niantic, CT
Site #:	5008875
Date:	11/04/19
Name:	Wesley Stevens
File Name:	Niantic CT - FF Power AWS

Operating Freq. (MHz)	**2145.0**
Antenna Height (ft):	**42.4**
Antenna Gain (dBi):	**20.4**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**160.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	39.4	40.0	41.9	43.5	45.5	48.1	51.5	55.7	61.3	68.7	78.8	93.3	115.3	152.3	227.0	452.3	565.1	1129.5	
Distance from Antenna Structure Base in Horizontal plane	0.0	7.0	14.4	18.4	22.8	27.6	33.1	39.4	47.0	56.3	68.3	84.5	108.3	147.1	223.6	450.6	563.7	1128.8	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.2	0.2	0.2	0.2	0.1	
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.3	0.6	0.6	0.2	1.4	1.0	0.8	1.2	1.2	0.3	

Antenna Type MX06FRO640-02
Max% 1.44%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

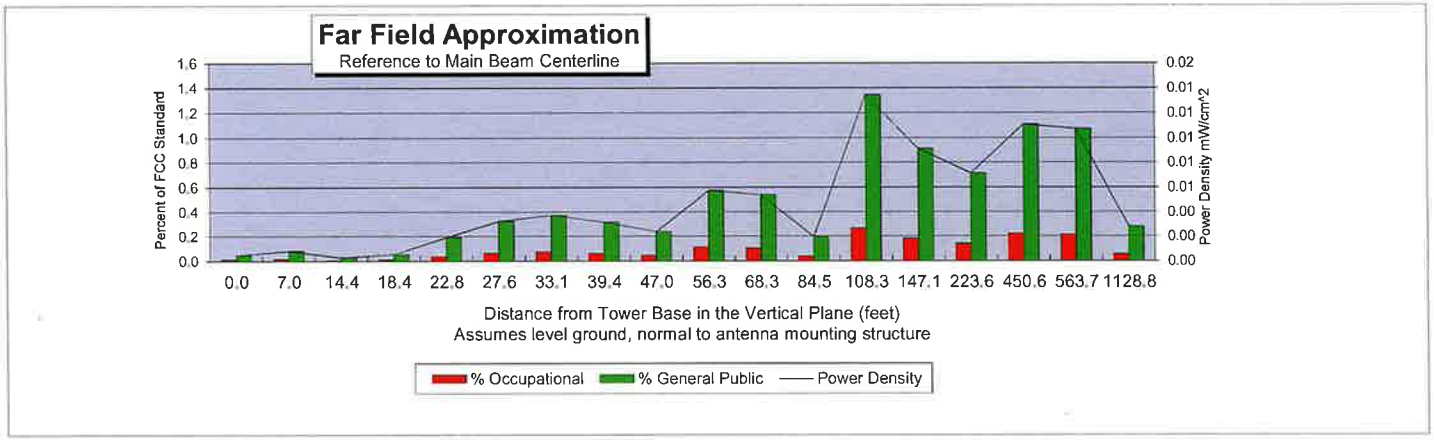
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Niantic, CT
Site #:	5008875
Date:	11/04/19
Name:	Wesley Stevens
File Name:	Niantic CT - FF Power PCS

Operating Freq. (MHz)	**1970.0**
Antenna Height (ft):	**42.4**
Antenna Gain (dBi):	**20.1**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**160.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	39.4	40.0	41.9	43.5	45.5	48.1	51.5	55.7	61.3	68.7	78.8	93.3	115.3	152.3	227.0	452.3	565.1	1129.5	
Distance from Antenna Structure Base in Horizontal plane	0.0	7.0	14.4	18.4	22.8	27.6	33.1	39.4	47.0	56.3	68.3	84.5	108.3	147.1	223.6	450.6	563.7	1128.8	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.3	0.2	0.1	0.2	0.2	0.1	
Percent of General Population Standard	0.0	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.2	0.6	0.5	0.2	1.3	0.9	0.7	1.1	1.1	0.3	

Antenna Type MX06FRO640-02
Max% 1.35%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

ATTACHMENT 4

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Structural Analysis Report

Property Owner	Town of East Lyme
Structural Type	89 ft AGL GuyTowe r
Site Address	6&8 Grand Street Niantic, CT 06357
Site ID	N/A
Site Name	N/A
Latitude	41.325103
Longitude	-72.191697

Client	**Verizon Wireless** *118 Flanders Road, 3rd Floor* *Westborough, MA 01581*
Site Type	N/A
Site ID	N/A
Site Name	NIANTIC_CT
Location Code	469058

Prepared by	Nexius Solutions, Inc. *2595 North Dallas Parkway Suite 300* *Frisco, TX 75034*
Job/Task Number	VZW469058A01-NX062
Rev	0
Email	structurals@nexius.com
Phone	972-581-9888
Date	10/31/2019
Result	**CONDITIONAL PASS (94.6 %)**

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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 — **Conditional Pass (94.6 %)***

***On the condition of installing the proposed modifications**

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:

Abdul-Aziz Masood, EIT
Helder Lopez, P.E

Approved by:

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

Digitally signed by Jiazhu Hu, Ph.D., P.E.
DN: cn=Jiazhu Hu, Ph.D., P.E., o=Nexius, ou=Engineering, email=Jiazhu.Hu@Nexius.com, c=US
Date: 2019.11.01 15:04:26 -04'00'

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DOCUMENTS & REFERENCES

- RFDS, Location Code: 469058, Site Name: NIANTIC_CT , by Verizon Wireless, dated 10/10/2019.
- Construction Drawings (FOR CONSTRUCTION), Location Code: 469058, Verizon Site Name: NIANTIC_CT, by Nexius Dated 10/31/2019.
- Structural Analysis Report, CENTEK Project No. 14298, Verizon Site Ref: Niantic SC1, by CENTEK engineering, Inc., dated 04/29/2015

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	144 mph
Nominal Wind Speed	112 mph
Nominal Wind Speed with Ice	50 mph
Radial Ice Thickness	0.75 in
Exposure Category	C(1)
Structure Class	III
Topographic Category	1
Seismic Design Parameters*	
S_S	0.161
S_1	0.058

Note: (1) shoreline in hurricane prone region

RESULTS & RECOMMENDATIONS

Based on our analysis, it is determined that the existing tower structure would be **adequate** to support the existing and proposed loadings on the condition of installing the proposed modifications.

We recommend the following modifications:

- Install P1000T Unistrut member centered on the tower face for each side from tower base up to 50 ft above tower base, five (5) 10ft sections in total.

*See construction drawings for proposed modification design.

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 previous structural analysis report. 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.

LOADING

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
42.4	42.4	2	JMA	MX06FRO640-02	-	-	-
		2	Samsung	B2/B66A RRH-BR049			
		4	CommScope	CBC1923T-DS-43			

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
93.0	96.0	1	-	6ft x 3in Pipe mount	-	-	1
95.50	95.50	1	CommScope	DB586-Y	1	7/8	1
92.0	92.0	1	Motorola	PTP 49400	1	CAT5e	1
85.0	85.0	1	-	Camera	1	CAT5e	1
82.17	82.17	1	Motorola	5440AP	1	CAT5e	1
78.5	78.5	1	Motorola	PTP 49400	1	CAT5e	1
71.0	71.0	1	Telewave	ANT150D6	1	1/2	1
42.4	42.4	1	Raycap	RC2DC-1064-PF-48	1	1-5/8	1
		2	*Andrew*	*HBX-4517-DS1-VTM*	-	-	2
		2	*ALU*	*RRH2X60-AWS*			
33.0	33.0	1	Pulse Larsen	BSA150C	-	-	1
23.0	23.0	1	RFS	BA1012-1	1	1/2	1

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.

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RESULTS – MEMBER CAPACITIES (Failing)

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	90.5 - 89	Pole	Pipe 2" Sch. 40 (2.375" x 0.154")	1	-0.07	33.85	65.7	Pass
T1	89 - 87	Leg	ROHN TS1.25x14 ga	4	-1.57	10.60	60.0	Pass
T2	87 - 81	Leg	ROHN TS1.25x14 ga	11	-3.24	12.32	26.3	Pass
							33.1 (b)	
T3	81 - 71	Leg	ROHN TS1.25x14 ga	42	-4.28	12.23	35.0	Pass
							42.9 (b)	
T4	71 - 61	Leg	ROHN TS1.25x14 ga	90	-5.04	13.64	37.0	Pass
							49.4 (b)	
T5	61 - 51	Leg	ROHN TS1.25x14 ga	138	-7.07	12.23	57.8	Pass
							59.7 (b)	
T6	51 - 41	Leg	ROHN TS1.25x14 ga	186	-6.96	12.23	56.9	Pass
							67.4 (b)	
T7	41 - 31	Leg	ROHN TS1.25x14 ga	234	-9.25	13.64	67.8	Pass
							90.7 (b)	
T8	31 - 21	Leg	ROHN TS1.25x14 ga	282	-9.32	12.23	76.2	Pass
							87.9 (b)	
T9	21 - 11	Leg	ROHN TS1.25x14 ga	330	-8.57	12.23	70.1	Pass
T2	87 - 81	Diagonal	7/16	22	-0.71	1.83	38.6	Pass
T3	81 - 71	Diagonal	7/16	88	-0.67	1.78	37.5	Pass
T4	71 - 61	Diagonal	7/16	99	-0.91	1.78	51.3	Pass
T5	61 - 51	Diagonal	7/16	146	-1.73	1.78	97.3	Pass
T6	51 - 41	Diagonal	7/16	230	-1.69	1.78	95.3	Pass
T7	41 - 31	Diagonal	7/16	243	-3.15	1.78	177.3	Fail ✗
T8	31 - 21	Diagonal	7/16	327	-3.08	1.78	173.0	Fail ✗
T9	21 - 11	Diagonal	7/16	376	-2.67	1.78	150.4	Fail ✗
T2	87 - 81	Horizontal	7/16	23	-0.37	2.90	12.6	Pass
T3	81 - 71	Horizontal	7/16	85	0.40	4.87	8.2	Pass
T4	71 - 61	Horizontal	7/16	102	-0.41	2.90	14.1	Pass
T5	61 - 51	Horizontal	7/16	149	-0.86	2.90	29.7	Pass
T6	51 - 41	Horizontal	7/16	227	-0.79	2.90	27.2	Pass
T7	41 - 31	Horizontal	7/16	246	-1.22	2.90	42.2	Pass
T8	31 - 21	Horizontal	7/16	295	-1.38	2.90	47.4	Pass
T9	21 - 11	Horizontal	7/16	373	-1.31	2.90	45.1	Pass
T1	89 - 87	Top Girt	7/16	5	0.00	4.87	24.8	Pass
T2	87 - 81	Top Girt	7/16	14	0.16	4.87	3.3	Pass
T3	81 - 71	Top Girt	7/16	46	0.24	4.87	5.0	Pass
T4	71 - 61	Top Girt	7/16	94	0.25	4.87	5.1	Pass
T5	61 - 51	Top Girt	7/16	141	-0.26	2.90	9.1	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T6	51 - 41	Top Girt	7/16	188	-0.54	2.90	18.7	Pass
T7	41 - 31	Top Girt	7/16	238	-0.38	2.90	13.2	Pass
T8	31 - 21	Top Girt	7/16	285	-1.04	2.90	35.7	Pass
T9	21 - 11	Top Girt	7/16	334	-0.73	2.90	25.3	Pass
T1	89 - 87	Bottom Girt	7/16	8	-0.19	2.93	25.3	Pass
T2	87 - 81	Bottom Girt	7/16	17	-0.20	2.90	6.8	Pass
T3	81 - 71	Bottom Girt	7/16	49	0.15	4.87	3.0	Pass
T4	71 - 61	Bottom Girt	7/16	96	-0.27	2.90	9.4	Pass
T5	61 - 51	Bottom Girt	7/16	145	-0.48	2.90	16.6	Pass
T6	51 - 41	Bottom Girt	7/16	192	-0.32	2.90	11.0	Pass
T7	41 - 31	Bottom Girt	7/16	239	-1.03	2.90	35.4	Pass
T8	31 - 21	Bottom Girt	7/16	289	-0.81	2.90	28.0	Pass
T9	21 - 11	Bottom Girt	7/16	336	-0.45	2.90	15.6	Pass
T2	87 - 81	Guy A@84 (18 deg)	5/16	382	3.22	6.72	48.0	Pass
T5	61 - 51	Guy A@55.3229 (18 deg)	5/16	388	3.25	6.72	48.3	Pass
T8	31 - 21	Guy A@29.3854 (18 deg)	5/16	394	2.69	6.72	40.1	Pass
T2	87 - 81	Guy B@84 (18 deg)	5/16	381	3.22	6.72	47.9	Pass
T5	61 - 51	Guy B@55.3229 (18 deg)	5/16	387	3.21	6.72	47.7	Pass
T8	31 - 21	Guy B@29.3854 (18 deg)	5/16	393	2.71	6.72	40.3	Pass
T2	87 - 81	Guy C@84 (-18 deg)	5/16	377	3.69	6.72	55.0	Pass
T5	61 - 51	Guy C@55.3229 (-18 deg)	5/16	383	3.60	6.72	53.6	Pass
T8	31 - 21	Guy C@29.3854 (-18 deg)	5/16	389	3.05	6.72	45.4	Pass
T2	87 - 81	Top Guy Pull-Off@84	2X3/8	380	1.12	17.14	6.6	Pass
T5	61 - 51	Top Guy Pull-Off@55.3229	2X3/8	386	1.75	17.14	9.0 (b) 10.2 14.1 (b)	Pass
T8	31 - 21	Top Guy Pull-Off@29.3854	2X3/8	392	2.29	17.14	13.4 18.4 (b)	Pass

Summary

Pole (L1)	65.7	Pass
Leg (T7)	90.7	Pass
Diagonal (T7)	177.3	Fail ✗
Horizontal (T8)	47.4	Pass
Top Girt (T8)	35.7	Pass
Bottom Girt (T7)	35.4	Pass
Guy A (T5)	48.3	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						Guy B (T2)	47.9	Pass
						Guy C (T2)	55.0	Pass
						Top Guy Pull-Off (T8)	18.4	Pass
						Bolt Checks	90.7	Pass
						RATING =	**177.3**	**Fail X**

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RESULTS – MEMBER CAPACITIES (Passing)

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	90.5 - 89	Pole	Pipe 2" Sch. 40 (2.375" x 0.154")	1	-0.07	33.85	65.6	Pass
T1	89 - 87	Leg	ROHN TS1.25x14 ga	4	-1.58	10.60	60.9	Pass
T2	87 - 81	Leg	ROHN TS1.25x14 ga	11	-3.23	12.32	26.2	Pass
							33.1 (b)	
T3	81 - 71	Leg	ROHN TS1.25x14 ga	42	-4.27	12.23	34.9	Pass
							42.9 (b)	
T4	71 - 61	Leg	ROHN TS1.25x14 ga	90	-4.51	13.64	33.1	Pass
							44.2 (b)	
T5	61 - 51	Leg	ROHN TS1.25x14 ga	138	-6.60	12.23	53.9	Pass
							60.6 (b)	
T6	51 - 41	Leg	ROHN TS1.25x14 ga	186	-7.92	12.23	64.7	Pass
							76.3 (b)	
T7	41 - 31	Leg	ROHN TS1.25x14 ga	234	-9.64	13.64	70.7	Pass
							94.6 (b)	
T8	31 - 21	Leg	ROHN TS1.25x14 ga	282	-9.73	12.23	79.5	Pass
							92.7 (b)	
T9	21 - 11	Leg	ROHN TS1.25x14 ga	330	-9.15	12.23	74.8	Pass
T2	87 - 81	Diagonal	7/16	22	-0.71	1.83	39.0	Pass
T3	81 - 71	Diagonal	7/16	88	-0.67	1.78	37.9	Pass
T4	71 - 61	Diagonal	7/16	99	-0.88	1.78	49.6	Pass
T5	61 - 51	Diagonal	7/16	146	-1.88	3.79	49.7	Pass
T6	51 - 41	Diagonal	7/16	230	-1.83	3.79	48.2	Pass
T7	41 - 31	Diagonal	7/16	243	-3.39	3.79	89.6	Pass
T8	31 - 21	Diagonal	7/16	327	-3.33	3.79	87.9	Pass
T9	21 - 11	Diagonal	7/16	376	-2.87	3.79	75.7	Pass
T2	87 - 81	Horizontal	7/16	23	-0.36	2.90	12.3	Pass
T3	81 - 71	Horizontal	7/16	85	0.41	4.87	8.3	Pass
T4	71 - 61	Horizontal	7/16	102	-0.39	2.90	13.5	Pass
T5	61 - 51	Horizontal	7/16	149	-0.96	1.69	56.8	Pass
T6	51 - 41	Horizontal	7/16	227	-0.86	1.69	51.0	Pass
T7	41 - 31	Horizontal	7/16	246	-1.34	1.69	79.4	Pass
T8	31 - 21	Horizontal	7/16	295	-1.43	1.69	84.4	Pass
T9	21 - 11	Horizontal	7/16	373	-1.34	1.69	79.2	Pass
T1	89 - 87	Top Girt	7/16	5	-0.00	4.32	22.3	Pass
T2	87 - 81	Top Girt	7/16	14	0.17	4.87	3.4	Pass
T3	81 - 71	Top Girt	7/16	46	0.25	4.87	5.0	Pass
T4	71 - 61	Top Girt	7/16	94	0.25	4.87	5.0	Pass
T5	61 - 51	Top Girt	7/16	141	-0.25	1.69	14.9	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T6	51 - 41	Top Girt	7/16	188	-0.59	1.69	35.0	Pass
T7	41 - 31	Top Girt	7/16	238	-0.41	1.69	24.4	Pass
T8	31 - 21	Top Girt	7/16	285	-1.13	1.69	66.8	Pass
T9	21 - 11	Top Girt	7/16	334	-0.75	1.69	44.6	Pass
T1	89 - 87	Bottom Girt	7/16	8	-0.20	2.93	25.4	Pass
T2	87 - 81	Bottom Girt	7/16	17	-0.20	2.90	6.7	Pass
T3	81 - 71	Bottom Girt	7/16	49	0.15	4.87	3.1	Pass
T4	71 - 61	Bottom Girt	7/16	96	-0.26	2.90	9.1	Pass
T5	61 - 51	Bottom Girt	7/16	145	-0.53	1.69	31.1	Pass
T6	51 - 41	Bottom Girt	7/16	192	-0.35	1.69	20.6	Pass
T7	41 - 31	Bottom Girt	7/16	239	-1.11	1.69	65.4	Pass
T8	31 - 21	Bottom Girt	7/16	289	-0.84	1.69	49.5	Pass
T9	21 - 11	Bottom Girt	7/16	336	-0.50	1.69	29.4	Pass
T2	87 - 81	Guy A@84 (18 deg)	5/16	382	3.24	6.72	48.3	Pass
T5	61 - 51	Guy A@55.3229 (18 deg)	5/16	388	3.66	6.72	54.4	Pass
T8	31 - 21	Guy A@29.3854 (18 deg)	5/16	394	3.18	6.72	47.4	Pass
T2	87 - 81	Guy B@84 (18 deg)	5/16	381	3.24	6.72	48.2	Pass
T5	61 - 51	Guy B@55.3229 (18 deg)	5/16	387	3.61	6.72	53.8	Pass
T8	31 - 21	Guy B@29.3854 (18 deg)	5/16	393	3.20	6.72	47.6	Pass
T2	87 - 81	Guy C@84 (-18 deg)	5/16	377	3.73	6.72	55.5	Pass
T5	61 - 51	Guy C@55.3229 (-18 deg)	5/16	383	4.04	6.72	60.1	Pass
T8	31 - 21	Guy C@29.3854 (-18 deg)	5/16	389	3.38	6.72	50.3	Pass
T2	87 - 81	Top Guy Pull-Off@84	2X3/8	380	1.13	17.14	6.6	Pass
T5	61 - 51	Top Guy Pull-Off@55.3229	2X3/8	386	1.93	17.14	9.1 (b) 11.3	Pass
T8	31 - 21	Top Guy Pull-Off@29.3854	2X3/8	392	2.57	17.14	15.5 (b) 15.0	Pass
							20.7 (b)	
							Summary	
						Pole (L1)	65.6	Pass
						Leg (T7)	94.6	Pass
						Diagonal (T7)	89.6	Pass
						Horizontal (T8)	84.4	Pass
						Top Girt (T8)	66.8	Pass
						Bottom Girt (T7)	65.4	Pass
						Guy A (T5)	54.4	Pass
						Guy B (T5)	53.8	Pass
						Guy C (T5)	60.1	Pass
						Top Guy Pull-Off (T8)	20.7	Pass
						Bolt Checks	94.6	Pass
						RATING =	**94.6**	**Pass**

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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 A572-50
Solid Pipe	ASTM A36
Bolt	SAE Gr 5

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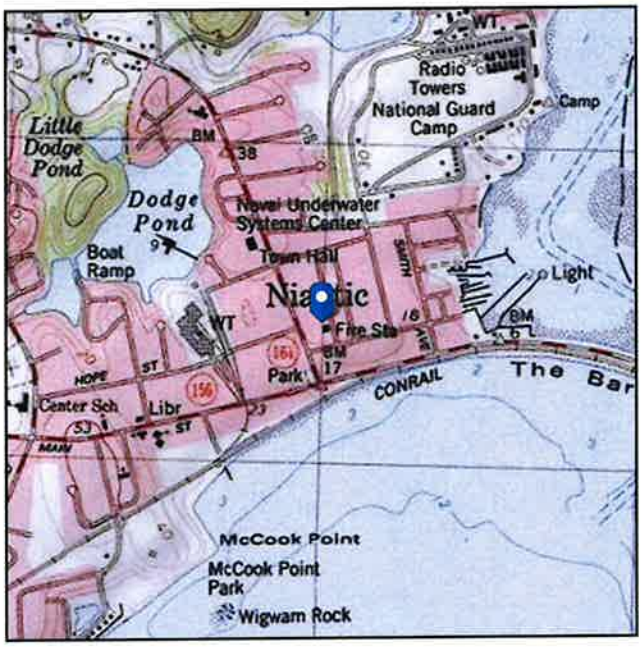
Appendix #1: Loading Parameters and Calculations

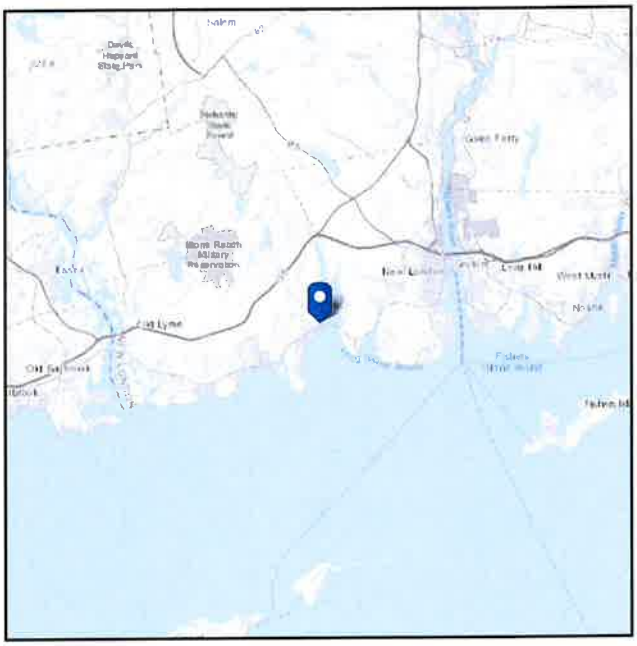
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 0 ft (NAVD 88)
Latitude: 41.325103
Longitude: -72.191697





Wind

Results:

Wind Speed:	144 Vmph
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	99 Vmph
100-year MRI	109 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1B and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Oct 28 2019

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 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings shall be protected against wind-borne debris as specified in Section 26.10.3.

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

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

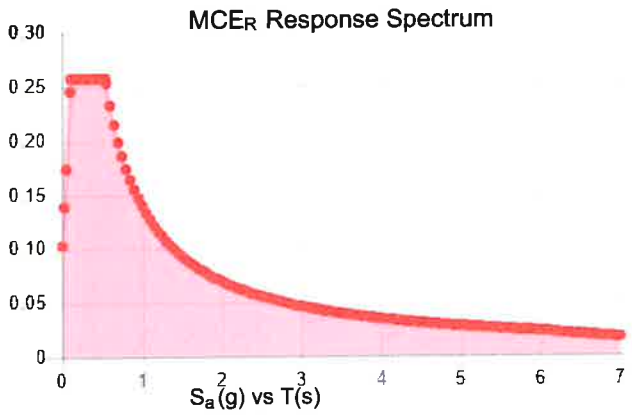
Seismic

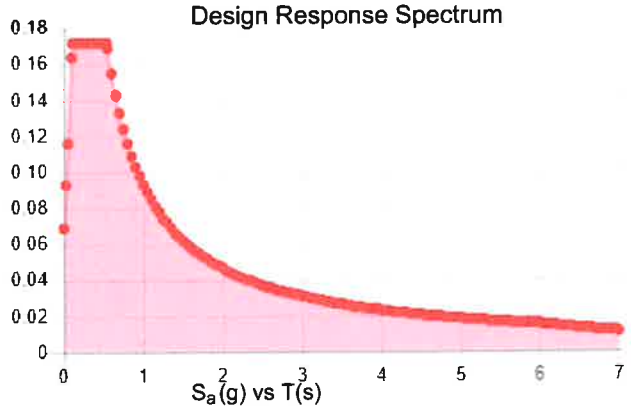
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.161	S_{DS} :	0.172
S_1 :	0.058	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.08
S_{MS} :	0.258	PGA_M :	0.128
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B





Data Accessed: Mon Oct 28 2019

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

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Oct 28 2019

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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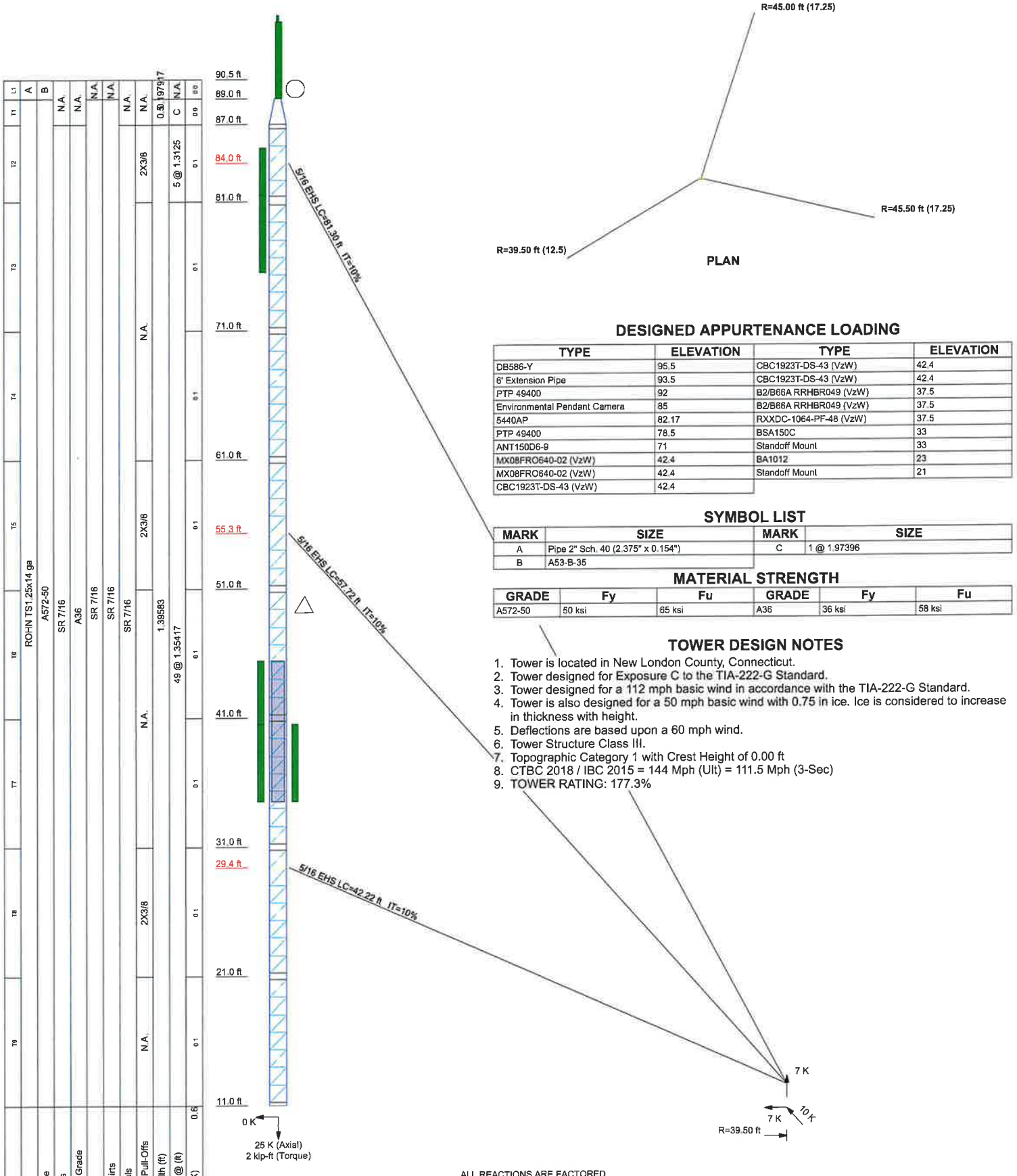
Appendix #2: tnxTower Output

Existing Guy Tower



PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB586-Y	95.5	CBC1923T-DS-43 (VzW)	42.4
6' Extension Pipe	93.5	CBC1923T-DS-43 (VzW)	42.4
PTP 49400	92	B2/B66A RRHBR049 (VzW)	37.5
Environmental Pendant Camera	85	B2/B66A RRHBR049 (VzW)	37.5
5440AP	82.17	RXXDC-1064-PF-48 (VzW)	37.5
PTP 49400	78.5	BSA150C	33
ANT150D6-9	71	Standoff Mount	33
MX08FRO640-02 (VzW)	42.4	BA1012	23
MX08FRO640-02 (VzW)	42.4	Standoff Mount	21
CBC1923T-DS-43 (VzW)	42.4		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pipe 2" Sch. 40 (2.375" x 0.154")	C	1 @ 1.97396
B	A53-B-35		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 112 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 III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. CTBC 2018 / IBC 2015 = 144 Mph (Ult) = 111.5 Mph (3-Sec)
9. TOWER RATING: 177.3%

ALL REACTIONS ARE FACTORED

Nexius
2595 North Dallas Parkway, Suite 300
Frisco, TX 75034
Phone: 972-581-9888
FAX:

Job: *VZW469058A01 (NX062)*			
Project: *NIANTIC_CT*			
Client: Verizon Wireless	Drawn by: HL	App'd:	
Code: TIA-222-G	Date: 11/01/19	Scale: NTS	
Path: D:\Structural Analysis\Nantic_CT\Tailing\VZW469058A01_NIANTIC_CT (NX062) Tailing.eri		Dwg No. E-1	

tnxTower	Job	Page
	VZW469058A01 (NX062)	1 of 15
Nexius 2595 North Dallas Parkway, Suite 300 Frisco, TX 75034 Phone: 972-581-9888 FAX:	Project NIANTIC_CT	Date 14:02:38 11/01/19
	Client Verizon Wireless	Designed by HL

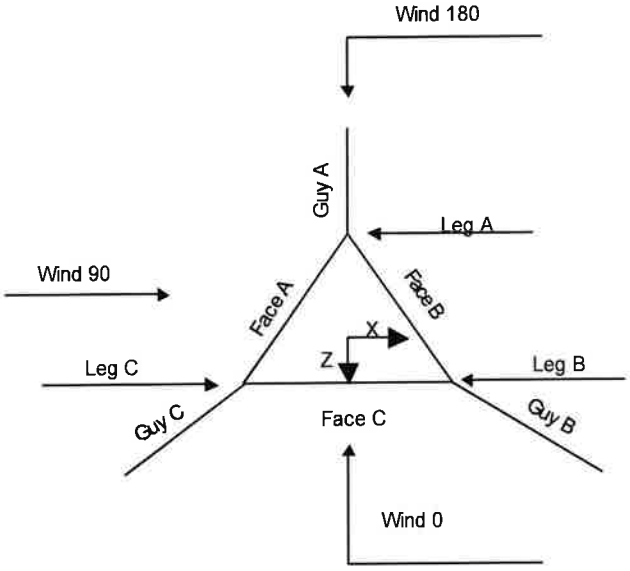
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 90.50 ft above the ground line.
The base of the tower is set at an elevation of 11.00 ft above the ground line.
The face width of the tower is 0.50 ft at the top and 1.40 ft at the base.
An index plate is provided at the 3x guyed -tower connection.
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 London County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 112 mph.
Structure Class III.
Exposure Category C.
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.
CTBC 2018 / IBC 2015 = 144 Mph (Ult) = 111.5 Mph (3-Sec).
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Safety factor used in guy design is 1.
Stress ratio used in tower member 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	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	90.50-89.00	1.50	Pipe 2" Sch. 40 (2.375" x 0.154")	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	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 90.50-89.00				1	1	1			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	89.00-87.00			0.50	1	2.00

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T2	87.00-81.00			1.40	1	6.00
T3	81.00-71.00			1.40	1	10.00
T4	71.00-61.00			1.40	1	10.00
T5	61.00-51.00			1.40	1	10.00
T6	51.00-41.00			1.40	1	10.00
T7	41.00-31.00			1.40	1	10.00
T8	31.00-21.00			1.40	1	10.00
T9	21.00-11.00			1.40	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	89.00-87.00	1.97	X Brace	No	Yes	0.0000	0.3125
T2	87.00-81.00	1.31	Z Brace	No	Yes	4.5000	4.5000
T3	81.00-71.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T4	71.00-61.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T5	61.00-51.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T6	51.00-41.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T7	41.00-31.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T8	31.00-21.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T9	21.00-11.00	1.35	Z Brace	No	Yes	3.1250	3.1250

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 89.00-87.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)
T2 87.00-81.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T3 81.00-71.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 71.00-61.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T5 61.00-51.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T6 51.00-41.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T7 41.00-31.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T8 31.00-21.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T9 21.00-11.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 89.00-87.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T2 87.00-81.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T3 81.00-71.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 71.00-61.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T5 61.00-51.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T6 51.00-41.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T7 41.00-31.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T8 31.00-21.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T9 21.00-11.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 89.00-87.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T2 87.00-81.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T3 81.00-71.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 71.00-61.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T5 61.00-51.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T6 51.00-41.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T7 41.00-31.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T8 31.00-21.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T9 21.00-11.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 89.00-87.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T2 87.00-81.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T3 81.00-71.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T4 71.00-61.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T5 61.00-51.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T6 51.00-41.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T7 41.00-31.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T8 31.00-21.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T9 21.00-11.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	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
T1 89.00-87.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 87.00-81.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 81.00-71.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 71.00-61.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 61.00-51.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 51.00-41.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 41.00-31.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 31.00-21.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 21.00-11.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 89.00-87.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 87.00-81.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 81.00-71.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 71.00-61.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 61.00-51.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 51.00-41.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 41.00-31.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 31.00-21.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 21.00-11.00	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 89.00-87.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 87.00-81.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 81.00-71.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 71.00-61.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 61.00-51.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 51.00-41.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 41.00-31.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 31.00-21.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 21.00-11.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 89.00-87.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T2 87.00-81.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T3 81.00-71.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T4 71.00-61.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T5 61.00-51.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T6 51.00-41.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T7 41.00-31.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T8 31.00-21.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T9 21.00-11.00	Sleeve DS	0.0000 SAEGR-5	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
84	EHS	A	5/16	1.12	10%	21000	0.205	80.00	45.00	18.0000	17.25	100%
		B	5/16	1.12	10%	21000	0.205	80.28	45.50	-18.0000	17.25	100%
		C	5/16	1.12	10%	21000	0.205	81.23	39.50	0.0000	12.50	100%
55.3229	EHS	A	5/16	1.12	10%	21000	0.205	58.31	45.00	18.0000	17.25	100%
		B	5/16	1.12	10%	21000	0.205	58.69	45.50	-18.0000	17.25	100%
		C	5/16	1.12	10%	21000	0.205	57.66	39.50	0.0000	12.50	100%
29.3854	EHS	A	5/16	1.12	10%	21000	0.205	45.83	45.00	18.0000	17.25	100%
		B	5/16	1.12	10%	21000	0.205	46.31	45.50	-18.0000	17.25	100%
		C	5/16	1.12	10%	21000	0.205	42.18	39.50	0.0000	12.50	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
84	Corner						
55.3229	Corner						
29.3854	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
84.00	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	2X3/8
55.32	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	2X3/8
29.39	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	2X3/8

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
84	0.02	0.02	0.02		0.58 1.3 sec/pulse	0.59 1.3 sec/pulse	0.60 1.3 sec/pulse	
55.3229	0.01	0.01	0.01		0.31 1.0 sec/pulse	0.31 1.0 sec/pulse	0.30 1.0 sec/pulse	
29.3854	0.01	0.01	0.01		0.19 0.8 sec/pulse	0.20 0.8 sec/pulse	0.16 0.7 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
84	No	No			1	1	1	1
55.3229	No	No			1	1	1	1
29.3854	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
84	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
55.3229	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
29.3854	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z ksf	q_z Ice ksf	Ice Thickness in
84	A	50.63	0	0	1.9570
	B	50.63	0	0	1.9570
	C	48.25	0	0	1.9476
55.3229	A	36.29	0	0	1.8929
	B	36.29	0	0	1.8929
	C	33.91	0	0	1.8801
29.3854	A	23.32	0	0	1.8110
	B	23.32	0	0	1.8110
	C	20.94	0	0	1.7916

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	87.00 - 11.00	0.0000	0.45	1	1	1.0900 0.0000	1.0900		0.00
Cat5e	B	No	No	Ar (CaAa)	87.00 - 11.00	0.0000	0.46	1	1	0.0000	0.3600		0.00
Cat5e	B	No	No	Ar (CaAa)	87.00 - 11.00	0.0000	0.47	1	1	0.0000	0.3600		0.00
Cat5e	B	No	No	Ar (CaAa)	81.00 - 11.00	0.0000	0.42	1	1	0.0000	0.3600		0.00
Cat5e	B	No	No	Ar (CaAa)	81.00 - 11.00	0.0000	0.42	1	1	0.0000	0.3600		0.00
LDF4P-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	71.00 - 11.00	0.0000	-0.45	1	1	0.0000	0.6300		0.00
LDF4P-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	71.00 - 11.00	0.0000	-0.46	1	1	0.0000	0.6300		0.00
Hybriflex 1-5/8" (VzW)	A	No	No	Ar (CaAa)	36.00 - 11.00	0.0000	0.44	1	1	1.9800 0.0000	1.9800		0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	90.50-89.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	89.00-87.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	87.00-81.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.086	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	81.00-71.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
T4	71.00-61.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.530	0.000	0.01

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	1.260	0.000	0.01
T5	61.00-51.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	1.260	0.000	0.01
T6	51.00-41.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	1.260	0.000	0.01
T7	41.00-31.00	A	0.000	0.000	0.990	0.000	0.01
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	1.260	0.000	0.01
T8	31.00-21.00	A	0.000	0.000	1.980	0.000	0.01
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	1.260	0.000	0.01
T9	21.00-11.00	A	0.000	0.000	1.980	0.000	0.01
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	1.260	0.000	0.01

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	90.50-89.00	A	2.072	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	89.00-87.00	A	2.068	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	87.00-81.00	A	2.059	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	8.497	0.000	0.12
		C		0.000	0.000	0.000	0.000	0.00
T3	81.00-71.00	A	2.038	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	22.911	0.000	0.32
		C		0.000	0.000	0.000	0.000	0.00
T4	71.00-61.00	A	2.010	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	22.626	0.000	0.31
		C		0.000	0.000	9.298	0.000	0.13
T5	61.00-51.00	A	1.977	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	22.298	0.000	0.31
		C		0.000	0.000	9.167	0.000	0.13
T6	51.00-41.00	A	1.938	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	21.913	0.000	0.30
		C		0.000	0.000	9.013	0.000	0.13
T7	41.00-31.00	A	1.891	0.000	0.000	2.881	0.000	0.05
		B		0.000	0.000	21.444	0.000	0.28
		C		0.000	0.000	8.826	0.000	0.12
T8	31.00-21.00	A	1.831	0.000	0.000	5.642	0.000	0.10
		B		0.000	0.000	20.838	0.000	0.27
		C		0.000	0.000	8.583	0.000	0.12
T9	21.00-11.00	A	1.744	0.000	0.000	5.468	0.000	0.09
		B		0.000	0.000	19.971	0.000	0.25
		C		0.000	0.000	8.236	0.000	0.11

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	90.50-89.00	0.0000	0.0000	0.0000	0.0000
T1	89.00-87.00	0.0000	0.0000	0.0000	0.0000
T2	87.00-81.00	1.4180	0.6944	0.0000	0.0000
T3	81.00-71.00	2.0861	0.9854	0.0529	0.0253
T4	71.00-61.00	2.7076	1.4531	0.1344	0.0717
T5	61.00-51.00	2.5111	1.3643	0.0000	0.0000
T6	51.00-41.00	2.7076	1.4531	0.2884	0.1539
T7	41.00-31.00	2.3779	0.5816	0.3824	0.1643
T8	31.00-21.00	1.9667	-0.1508	0.2567	0.0825
T9	21.00-11.00	2.0975	-0.1591	0.7013	0.2233

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	1	LDF5-50A (7/8 FOAM)	81.00 - 87.00	0.6000	0.0000
T2	2	Cat5e	81.00 - 87.00	0.6000	0.0000
T2	3	Cat5e	81.00 - 87.00	0.6000	0.0000
T3	1	LDF5-50A (7/8 FOAM)	71.00 - 81.00	0.6000	0.0108
T3	2	Cat5e	71.00 - 81.00	0.6000	0.0108
T3	3	Cat5e	71.00 - 81.00	0.6000	0.0108
T3	4	Cat5e	71.00 - 81.00	0.6000	0.0108
T3	5	Cat5e	71.00 - 81.00	0.6000	0.0108
T4	1	LDF5-50A (7/8 FOAM)	61.00 - 71.00	0.6000	0.0199
T4	2	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	3	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	4	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	5	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	6	LDF4P-50A (1/2 FOAM)	61.00 - 71.00	0.6000	0.0199
T4	7	LDF4P-50A (1/2 FOAM)	61.00 - 71.00	0.6000	0.0199
T5	1	LDF5-50A (7/8 FOAM)	51.00 - 61.00	0.6000	0.0000
T5	2	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	3	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	4	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	5	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	6	LDF4P-50A (1/2 FOAM)	51.00 - 61.00	0.6000	0.0000
T5	7	LDF4P-50A (1/2 FOAM)	51.00 - 61.00	0.6000	0.0000
T6	1	LDF5-50A (7/8 FOAM)	41.00 - 51.00	0.6000	0.0426
T6	2	Cat5e	41.00 - 51.00	0.6000	0.0426
T6	3	Cat5e	41.00 - 51.00	0.6000	0.0426
T6	4	Cat5e	41.00 - 51.00	0.6000	0.0426
T6	5	Cat5e	41.00 - 51.00	0.6000	0.0426
T6	6	LDF4P-50A (1/2 FOAM)	41.00 - 51.00	0.6000	0.0426
T6	7	LDF4P-50A (1/2 FOAM)	41.00 - 51.00	0.6000	0.0426
T7	1	LDF5-50A (7/8 FOAM)	31.00 - 41.00	0.6000	0.0578
T7	2	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	3	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	4	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	5	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	6	LDF4P-50A (1/2 FOAM)	31.00 - 41.00	0.6000	0.0578
T7	7	LDF4P-50A (1/2 FOAM)	31.00 - 41.00	0.6000	0.0578

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	8	Hybriflex 1-5/8"	31.00 - 36.00	0.6000	0.0578
T8	1	LDF5-50A (7/8 FOAM)	21.00 - 31.00	0.6000	0.0411
T8	2	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	3	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	4	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	5	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	6	LDF4P-50A (1/2 FOAM)	21.00 - 31.00	0.6000	0.0411
T8	7	LDF4P-50A (1/2 FOAM)	21.00 - 31.00	0.6000	0.0411
T8	8	Hybriflex 1-5/8"	21.00 - 31.00	0.6000	0.0411
T9	1	LDF5-50A (7/8 FOAM)	11.00 - 21.00	0.6000	0.1063
T9	2	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	3	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	4	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	5	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	6	LDF4P-50A (1/2 FOAM)	11.00 - 21.00	0.6000	0.1063
T9	7	LDF4P-50A (1/2 FOAM)	11.00 - 21.00	0.6000	0.1063
T9	8	Hybriflex 1-5/8"	11.00 - 21.00	0.6000	0.1063

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB586-Y	A	From Leg	0.00 0.00 0.00	8.5000	95.50	No Ice 1/2" Ice 1" Ice	0.74 1.23 1.53	0.74 1.23 1.53	0.01 0.01 0.02
6' Extension Pipe	A	None		0.0000	93.50	No Ice 1/2" Ice 1" Ice	1.64 2.29 2.67	1.64 2.29 2.67	0.04 0.06 0.07
PTP 49400	B	From Leg	0.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.75 1.92 2.09	0.48 0.58 0.69	0.01 0.02 0.04
Environmental Pendant Camera	B	From Leg	1.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.75 1.25 1.75	0.75 1.25 1.75	0.01 0.02 0.03
5440AP	C	From Leg	0.50 0.00 0.00	0.0000	82.17	No Ice 1/2" Ice 1" Ice	2.05 2.25 2.46	2.65 2.86 3.09	0.01 0.04 0.06
PTP 49400	C	From Leg	0.50 0.00 0.00	0.0000	78.50	No Ice 1/2" Ice 1" Ice	1.75 1.92 2.09	0.48 0.58 0.69	0.01 0.02 0.04
ANT150D6-9	A	From Leg	1.00 0.00 8.13	0.0000	71.00	No Ice 1/2" Ice 1" Ice	3.84 6.42 9.00	3.84 6.42 9.00	0.00 0.00 0.00
BSA150C	B	From Leg	3.00 0.00 0.00	0.0000	33.00	No Ice 1/2" Ice 1" Ice	7.36 10.76 11.23	7.36 10.76 11.23	0.00 0.15 0.31
Standoff Mount	B	From Leg	1.50 0.00 0.00	0.0000	33.00	No Ice 1/2" Ice 1" Ice	1.82 2.29 2.67	1.82 2.29 2.67	0.04 0.06 0.07
BA1012	A	From Leg	3.00	0.0000	23.00	No Ice	0.41	0.41	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.10	1.10	0.00
			0.00			1" Ice	1.79	1.79	0.01
Standoff Mount	A	From Leg	1.50	0.0000	21.00	No Ice	1.87	1.87	0.04
			0.00			1/2" Ice	2.29	2.29	0.06
			0.00			1" Ice	2.67	2.67	0.07
MX08FRO640-02 (VzW)	A	From Leg	0.75	0.0000	42.40	No Ice	9.98	7.42	0.05
			0.00			1/2" Ice	10.45	7.87	0.12
			0.00			1" Ice	10.93	8.32	0.20
MX08FRO640-02 (VzW)	C	From Leg	0.75	0.0000	42.40	No Ice	9.98	7.42	0.05
			0.00			1/2" Ice	10.45	7.87	0.12
			0.00			1" Ice	10.93	8.32	0.20
CBC1923T-DS-43 (VzW)	C	From Leg	0.75	0.0000	42.40	No Ice	1.74	1.41	0.01
			0.00			1/2" Ice	1.92	1.57	0.03
			0.00			1" Ice	2.10	1.74	0.05
CBC1923T-DS-43 (VzW)	B	From Leg	0.75	0.0000	42.40	No Ice	1.74	1.41	0.01
			0.00			1/2" Ice	1.92	1.57	0.03
			0.00			1" Ice	2.10	1.74	0.05
CBC1923T-DS-43 (VzW)	A	From Leg	0.75	0.0000	42.40	No Ice	1.74	1.41	0.01
			0.00			1/2" Ice	1.92	1.57	0.03
			0.00			1" Ice	2.10	1.74	0.05
B2/B66A RRHBR049 (VzW)	A	From Leg	0.75	0.0000	37.50	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
B2/B66A RRHBR049 (VzW)	C	From Leg	0.75	0.0000	37.50	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
RXXDC-1064-PF-48 (VzW)	B	From Leg	0.75	0.0000	37.50	No Ice	1.35	1.35	0.01
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.65	1.65	0.05

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	90.5 - 89	Pole	Pipe 2" Sch. 40 (2.375" x 0.154")	1	-0.07	33.85	65.7	Pass
T1	89 - 87	Leg	ROHN TS1.25x14 ga	4	-1.57	10.60	60.0	Pass
T2	87 - 81	Leg	ROHN TS1.25x14 ga	11	-3.24	12.32	26.3 33.1 (b)	Pass
T3	81 - 71	Leg	ROHN TS1.25x14 ga	42	-4.28	12.23	35.0 42.9 (b)	Pass
T4	71 - 61	Leg	ROHN TS1.25x14 ga	90	-5.04	13.64	37.0 49.4 (b)	Pass
T5	61 - 51	Leg	ROHN TS1.25x14 ga	138	-7.07	12.23	57.8 59.7 (b)	Pass
T6	51 - 41	Leg	ROHN TS1.25x14 ga	186	-6.96	12.23	56.9 67.4 (b)	Pass
T7	41 - 31	Leg	ROHN TS1.25x14 ga	234	-9.25	13.64	67.8 90.7 (b)	Pass
T8	31 - 21	Leg	ROHN TS1.25x14 ga	282	-9.32	12.23	76.2 87.9 (b)	Pass
T9	21 - 11	Leg	ROHN TS1.25x14 ga	330	-8.57	12.23	70.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T2	87 - 81	Diagonal	7/16	22	-0.71	1.83	38.6	Pass
T3	81 - 71	Diagonal	7/16	88	-0.67	1.78	37.5	Pass
T4	71 - 61	Diagonal	7/16	99	-0.91	1.78	51.3	Pass
T5	61 - 51	Diagonal	7/16	146	-1.73	1.78	97.3	Pass
T6	51 - 41	Diagonal	7/16	230	-1.69	1.78	95.3	Pass
T7	41 - 31	Diagonal	7/16	243	-3.15	1.78	177.3	Fail ✗
T8	31 - 21	Diagonal	7/16	327	-3.08	1.78	173.0	Fail ✗
T9	21 - 11	Diagonal	7/16	376	-2.67	1.78	150.4	Fail ✗
T2	87 - 81	Horizontal	7/16	23	-0.37	2.90	12.6	Pass
T3	81 - 71	Horizontal	7/16	85	0.40	4.87	8.2	Pass
T4	71 - 61	Horizontal	7/16	102	-0.41	2.90	14.1	Pass
T5	61 - 51	Horizontal	7/16	149	-0.86	2.90	29.7	Pass
T6	51 - 41	Horizontal	7/16	227	-0.79	2.90	27.2	Pass
T7	41 - 31	Horizontal	7/16	246	-1.22	2.90	42.2	Pass
T8	31 - 21	Horizontal	7/16	295	-1.38	2.90	47.4	Pass
T9	21 - 11	Horizontal	7/16	373	-1.31	2.90	45.1	Pass
T1	89 - 87	Top Girt	7/16	5	0.00	4.87	24.8	Pass
T2	87 - 81	Top Girt	7/16	14	0.16	4.87	3.3	Pass
T3	81 - 71	Top Girt	7/16	46	0.24	4.87	5.0	Pass
T4	71 - 61	Top Girt	7/16	94	0.25	4.87	5.1	Pass
T5	61 - 51	Top Girt	7/16	141	-0.26	2.90	9.1	Pass
T6	51 - 41	Top Girt	7/16	188	-0.54	2.90	18.7	Pass
T7	41 - 31	Top Girt	7/16	238	-0.38	2.90	13.2	Pass
T8	31 - 21	Top Girt	7/16	285	-1.04	2.90	35.7	Pass
T9	21 - 11	Top Girt	7/16	334	-0.73	2.90	25.3	Pass
T1	89 - 87	Bottom Girt	7/16	8	-0.19	2.93	25.3	Pass
T2	87 - 81	Bottom Girt	7/16	17	-0.20	2.90	6.8	Pass
T3	81 - 71	Bottom Girt	7/16	49	0.15	4.87	3.0	Pass
T4	71 - 61	Bottom Girt	7/16	96	-0.27	2.90	9.4	Pass
T5	61 - 51	Bottom Girt	7/16	145	-0.48	2.90	16.6	Pass
T6	51 - 41	Bottom Girt	7/16	192	-0.32	2.90	11.0	Pass
T7	41 - 31	Bottom Girt	7/16	239	-1.03	2.90	35.4	Pass
T8	31 - 21	Bottom Girt	7/16	289	-0.81	2.90	28.0	Pass
T9	21 - 11	Bottom Girt	7/16	336	-0.45	2.90	15.6	Pass
T2	87 - 81	Guy A@84 (18 deg)	5/16	382	3.22	6.72	48.0	Pass
T5	61 - 51	Guy A@55.3229 (18 deg)	5/16	388	3.25	6.72	48.3	Pass
T8	31 - 21	Guy A@29.3854 (18 deg)	5/16	394	2.69	6.72	40.1	Pass
T2	87 - 81	Guy B@84 (18 deg)	5/16	381	3.22	6.72	47.9	Pass
T5	61 - 51	Guy B@55.3229 (18 deg)	5/16	387	3.21	6.72	47.7	Pass
T8	31 - 21	Guy B@29.3854 (18 deg)	5/16	393	2.71	6.72	40.3	Pass
T2	87 - 81	Guy C@84 (-18 deg)	5/16	377	3.69	6.72	55.0	Pass
T5	61 - 51	Guy C@55.3229 (-18 deg)	5/16	383	3.60	6.72	53.6	Pass
T8	31 - 21	Guy C@29.3854 (-18 deg)	5/16	389	3.05	6.72	45.4	Pass
T2	87 - 81	Top Guy Pull-Off@84	2X3/8	380	1.12	17.14	6.6 9.0 (b)	Pass
T5	61 - 51	Top Guy Pull-Off@55.3229	2X3/8	386	1.75	17.14	10.2 14.1 (b)	Pass
T8	31 - 21	Top Guy Pull-Off@29.3854	2X3/8	392	2.29	17.14	13.4 18.4 (b)	Pass
							Summary	
						Pole (L1)	65.7	Pass
						Leg (T7)	90.7	Pass
						Diagonal (T7)	177.3	Fail ✗
						Horizontal	47.4	Pass

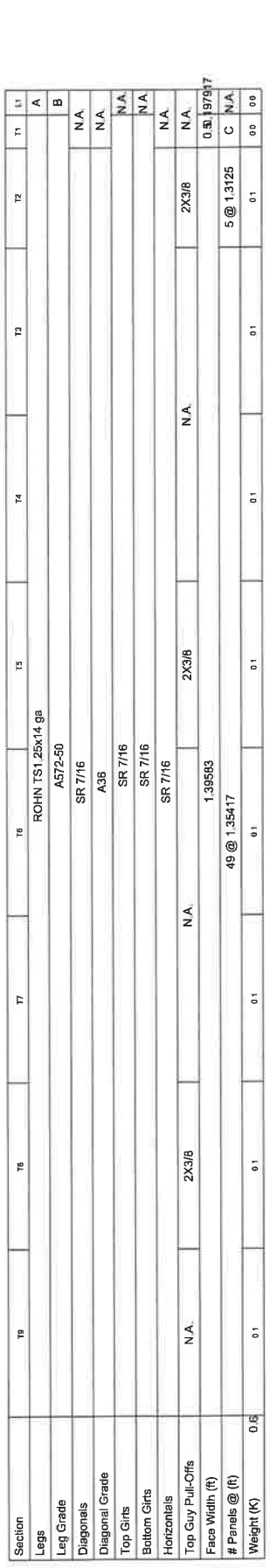
tnxTower	Job	Page
	VZW469058A01 (NX062)	15 of 15
Nexius 2595 North Dallas Parkway, Suite 300 Frisco, TX 75034 Phone: 972-581-9888 FAX:	Project NIANTIC_CT	Date 14:02:38 11/01/19
	Client Verizon Wireless	Designed by HL

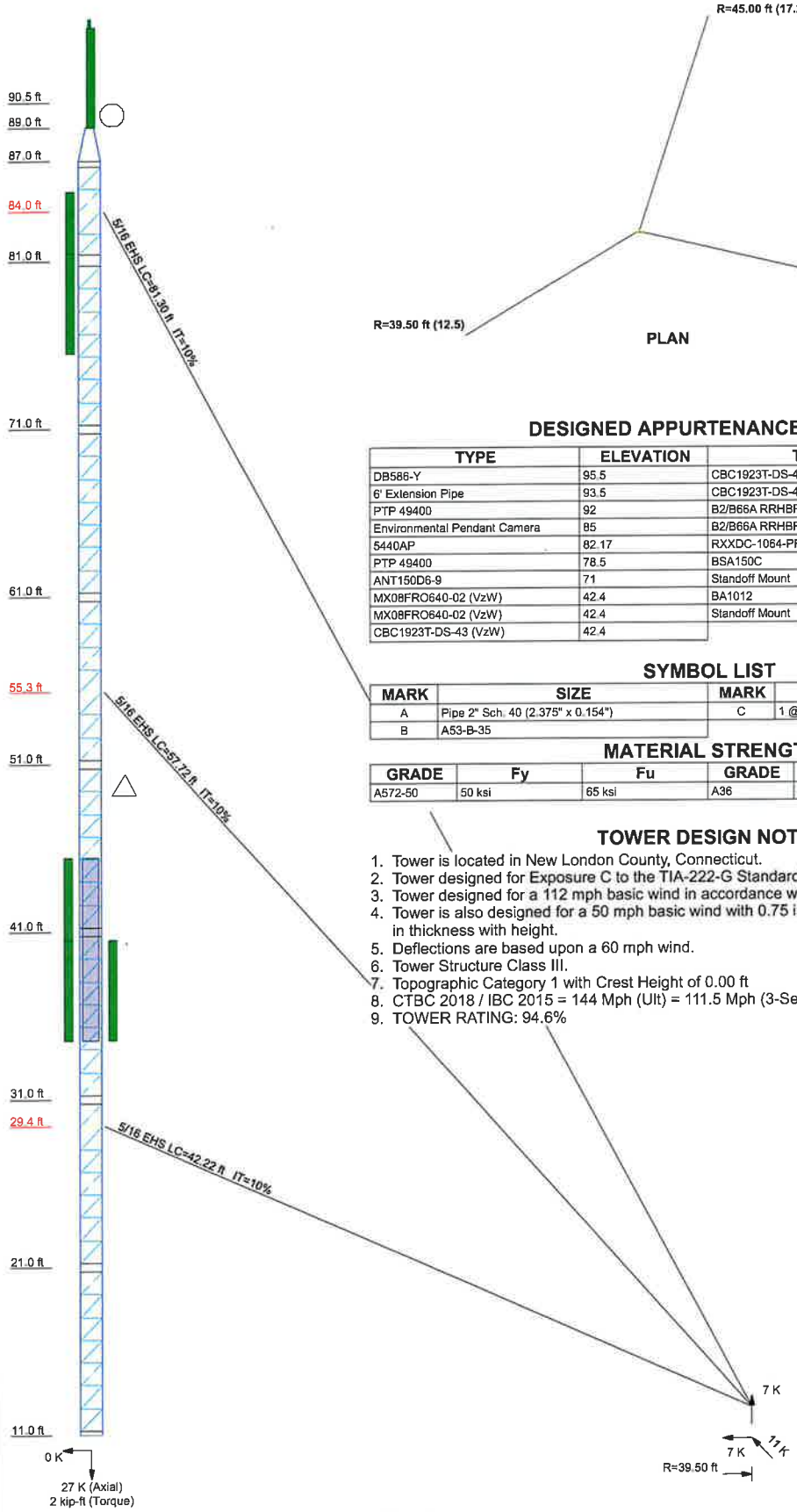
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						(T8) Top Girt	35.7	Pass
						(T8) Bottom Girt	35.4	Pass
						(T7) Guy A (T5)	48.3	Pass
						Guy B (T2)	47.9	Pass
						Guy C (T2)	55.0	Pass
						Top Guy Pull-Off (T8)	18.4	Pass
						Bolt Checks	90.7	Pass
						RATING =	**177.3**	**Fail** X

nexius

Appendix #3: tnxTower Output

Existing Guy Tower w/ Proposed Modifications





PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB586-Y	95.5	CBC1923T-DS-43 (VzW)	42.4
6' Extension Pipe	93.5	CBC1923T-DS-43 (VzW)	42.4
PTP 49400	92	B2/B66A RRHBR049 (VzW)	37.5
Environmental Pendant Camera	85	B2/B66A RRHBR049 (VzW)	37.5
5440AP	82.17	RXXDC-1064-PF-48 (VzW)	37.5
PTP 49400	78.5	BSA150C	33
ANT150D6-9	71	Standoff Mount	33
MX08FRO640-02 (VzW)	42.4	BA1012	23
MX08FRO640-02 (VzW)	42.4	Standoff Mount	21
CBC1923T-DS-43 (VzW)	42.4		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pipe 2" Sch. 40 (2.375" x 0.154")	C	1 @ 1.97396
B	A53-B-35		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 112 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 III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. CTBC 2018 / IBC 2015 = 144 Mph (Ult) = 111.5 Mph (3-Sec)
9. TOWER RATING: 94.6%

ALL REACTIONS ARE FACTORED

Nexius
2595 North Dallas Parkway, Suite 300
Frisco, TX 75034
Phone: 972-581-9888
FAX:

Job:	*VZW469058A01 (NX062) - MOD*
Project:	*NIANTIC_CT*
Client:	Verizon Wireless
Drawn by:	HL
App'd:	
Code:	TIA-222-G
Date:	11/01/19
Scale:	NTS
Path:	D:\Structural Analysis\Niantic_CT\Conditional Pass\VZW469058A01_NIANTIC_CT (NX062)_MOD.eri
Dwg No.	E-1

tnxTower	Job	Page
	VZW469058A01 (NX062) - MOD	1 of 15
Nexius 2595 North Dallas Parkway, Suite 300 Frisco, TX 75034 Phone: 972-581-9888 FAX:	Project NIANTIC_CT	Date 14:16:35 11/01/19
	Client Verizon Wireless	Designed by HL

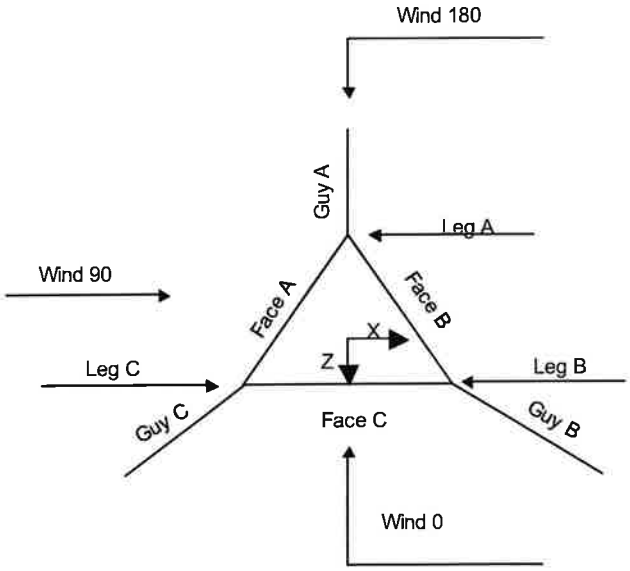
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 90.50 ft above the ground line.
The base of the tower is set at an elevation of 11.00 ft above the ground line.
The face width of the tower is 0.50 ft at the top and 1.40 ft at the base.
An index plate is provided at the 3x guyed -tower connection.
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 London County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 112 mph.
Structure Class III.
Exposure Category C.
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.
CTBC 2018 / IBC 2015 = 144 Mph (Ult) = 111.5 Mph (3-Sec).
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Safety factor used in guy design is 1.
Stress ratio used in tower member 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	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	90.50-89.00	1.50	Pipe 2" Sch. 40 (2.375" x 0.154")	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	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 90.50-89.00				1	1	1			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	89.00-87.00			0.50	1	2.00

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T2	87.00-81.00			1.40	1	6.00
T3	81.00-71.00			1.40	1	10.00
T4	71.00-61.00			1.40	1	10.00
T5	61.00-51.00			1.40	1	10.00
T6	51.00-41.00			1.40	1	10.00
T7	41.00-31.00			1.40	1	10.00
T8	31.00-21.00			1.40	1	10.00
T9	21.00-11.00			1.40	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	89.00-87.00	1.97	X Brace	No	Yes	0.0000	0.3125
T2	87.00-81.00	1.31	Z Brace	No	Yes	4.5000	4.5000
T3	81.00-71.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T4	71.00-61.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T5	61.00-51.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T6	51.00-41.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T7	41.00-31.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T8	31.00-21.00	1.35	Z Brace	No	Yes	3.1250	3.1250
T9	21.00-11.00	1.35	Z Brace	No	Yes	3.1250	3.1250

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 89.00-87.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)
T2 87.00-81.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T3 81.00-71.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 71.00-61.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T5 61.00-51.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T6 51.00-41.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T7 41.00-31.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T8 31.00-21.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T9 21.00-11.00	Pipe	ROHN TS1.25x14 ga	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 89.00-87.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T2 87.00-81.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T3 81.00-71.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 71.00-61.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T5 61.00-51.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T6 51.00-41.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T7 41.00-31.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T8 31.00-21.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T9 21.00-11.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 89.00-87.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T2 87.00-81.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T3 81.00-71.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 71.00-61.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T5 61.00-51.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T6 51.00-41.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T7 41.00-31.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T8 31.00-21.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T9 21.00-11.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
ft						
T1 89.00-87.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T2 87.00-81.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T3 81.00-71.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T4 71.00-61.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T5 61.00-51.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T6 51.00-41.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T7 41.00-31.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T8 31.00-21.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T9 21.00-11.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 89.00-87.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 87.00-81.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 81.00-71.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 71.00-61.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 61.00-51.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 51.00-41.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 41.00-31.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 31.00-21.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 21.00-11.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	Yes	1	1	1	1	1	1	1	1
89.00-87.00				1	1	1	1	1	1	1
T2	No	Yes	1	1	1	1	1	1	1	1
87.00-81.00				1	1	1	1	1	1	1
T3	No	Yes	1	1	1	1	1	1	1	1
81.00-71.00				1	1	1	1	1	1	1
T4	No	Yes	1	1	1	1	1	1	1	1
71.00-61.00				1	1	1	1	1	1	1
T5	No	No	1	1	1	0.35	1	1	1	1
61.00-51.00				1	1	0.35	1	1	1	1
T6	No	No	1	1	1	0.35	1	1	1	1
51.00-41.00				1	1	0.35	1	1	1	1
T7	No	No	1	1	1	0.35	1	1	1	1
41.00-31.00				1	1	0.35	1	1	1	1
T8	No	No	1	1	1	0.35	1	1	1	1
31.00-21.00				1	1	0.35	1	1	1	1
T9	No	No	1	1	1	0.35	1	1	1	1
21.00-11.00				1	1	0.35	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 89.00-87.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 87.00-81.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 81.00-71.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 71.00-61.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 61.00-51.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 51.00-41.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 41.00-31.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 31.00-21.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 21.00-11.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 89.00-87.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T2 87.00-81.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T3 81.00-71.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T4 71.00-61.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T5 61.00-51.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T6 51.00-41.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T7 41.00-31.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T8 31.00-21.00	Sleeve DS	0.3125 SAEGR-5	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T9 21.00-11.00	Sleeve DS	0.0000 SAEGR-5	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
84	EHS	A	5/16	1.12	10%	21000	0.205	80.00	45.00	18.0000	17.25	100%
		B	5/16	1.12	10%	21000	0.205	80.28	45.50	-18.0000	17.25	100%
		C	5/16	1.12	10%	21000	0.205	81.23	39.50	0.0000	12.50	100%
55.3229	EHS	A	5/16	1.12	10%	21000	0.205	58.31	45.00	18.0000	17.25	100%
		B	5/16	1.12	10%	21000	0.205	58.69	45.50	-18.0000	17.25	100%
		C	5/16	1.12	10%	21000	0.205	57.66	39.50	0.0000	12.50	100%
29.3854	EHS	A	5/16	1.12	10%	21000	0.205	45.83	45.00	18.0000	17.25	100%
		B	5/16	1.12	10%	21000	0.205	46.31	45.50	-18.0000	17.25	100%
		C	5/16	1.12	10%	21000	0.205	42.18	39.50	0.0000	12.50	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
84	Corner						
55.3229	Corner						
29.3854	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
84.00	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	2X3/8
55.32	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	2X3/8
29.39	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	2X3/8

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
84	0.02	0.02	0.02		0.58 1.3 sec/pulse	0.59 1.3 sec/pulse	0.60 1.3 sec/pulse	
55.3229	0.01	0.01	0.01		0.31 1.0 sec/pulse	0.31 1.0 sec/pulse	0.30 1.0 sec/pulse	
29.3854	0.01	0.01	0.01		0.19 0.8 sec/pulse	0.20 0.8 sec/pulse	0.16 0.7 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
84	No	No			1	1	1	1
55.3229	No	No			1	1	1	1
29.3854	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
84	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
55.3229	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
29.3854	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z ksf	q_z Ice ksf	Ice Thickness in
84	A	50.63	0	0	1.9570
	B	50.63	0	0	1.9570
	C	48.25	0	0	1.9476
55.3229	A	36.29	0	0	1.8929
	B	36.29	0	0	1.8929
	C	33.91	0	0	1.8801
29.3854	A	23.32	0	0	1.8110
	B	23.32	0	0	1.8110
	C	20.94	0	0	1.7916

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	87.00 - 11.00	0.0000	0.45	1	1	1.0900 0.0000	1.0900		0.00
Cat5c	B	No	No	Ar (CaAa)	87.00 - 11.00	0.0000	0.46	1	1	0.0000	0.3600		0.00
Cat5c	B	No	No	Ar (CaAa)	87.00 - 11.00	0.0000	0.47	1	1	0.0000	0.3600		0.00
Cat5c	B	No	No	Ar (CaAa)	81.00 - 11.00	0.0000	0.42	1	1	0.0000	0.3600		0.00
Cat5c	B	No	No	Ar (CaAa)	81.00 - 11.00	0.0000	0.42	1	1	0.0000	0.3600		0.00
LDF4P-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	71.00 - 11.00	0.0000	-0.45	1	1	0.0000	0.6300		0.00
LDF4P-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	71.00 - 11.00	0.0000	-0.46	1	1	0.0000	0.6300		0.00
Hybriflex 1-5/8" (VzW)	A	No	No	Ar (CaAa)	36.00 - 11.00	0.0000	0.44	1	1	1.9800 0.0000	1.9800		0.00
Mods (Mods)	A	No	No	Af (CaAa)	61.00 - 11.00	0.0000	0	1	1	0.0000	1.6250		0.00
Mods (Mods)	B	No	No	Af (CaAa)	61.00 - 11.00	0.0000	0	1	1	0.0000	1.6250		0.00
Mods (Mods)	C	No	No	Af (CaAa)	61.00 - 11.00	0.0000	0	1	1	0.0000	1.6250		0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	90.50-89.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	89.00-87.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	87.00-81.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.086	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.00
T3	81.00-71.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
T4	71.00-61.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.530	0.000	0.01
		C	0.000	0.000	1.260	0.000	0.01
T5	61.00-51.00	A	0.000	0.000	2.708	0.000	0.02
		B	0.000	0.000	5.238	0.000	0.03
		C	0.000	0.000	3.968	0.000	0.03
T6	51.00-41.00	A	0.000	0.000	2.708	0.000	0.02
		B	0.000	0.000	5.238	0.000	0.03
		C	0.000	0.000	3.968	0.000	0.03
T7	41.00-31.00	A	0.000	0.000	3.698	0.000	0.03
		B	0.000	0.000	5.238	0.000	0.03
		C	0.000	0.000	3.968	0.000	0.03
T8	31.00-21.00	A	0.000	0.000	4.688	0.000	0.03
		B	0.000	0.000	5.238	0.000	0.03
		C	0.000	0.000	3.968	0.000	0.03
T9	21.00-11.00	A	0.000	0.000	4.688	0.000	0.03
		B	0.000	0.000	5.238	0.000	0.03
		C	0.000	0.000	3.968	0.000	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	90.50-89.00	A	2.072	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	89.00-87.00	A	2.068	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	87.00-81.00	A	2.059	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	8.497	0.000	0.12
		C		0.000	0.000	0.000	0.000	0.00
T3	81.00-71.00	A	2.038	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	22.911	0.000	0.32
		C		0.000	0.000	0.000	0.000	0.00
T4	71.00-61.00	A	2.010	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	22.626	0.000	0.31
		C		0.000	0.000	9.298	0.000	0.13
T5	61.00-51.00	A	1.977	0.000	0.000	6.662	0.000	0.12
		B		0.000	0.000	28.960	0.000	0.43
		C		0.000	0.000	15.829	0.000	0.25
T6	51.00-41.00	A	1.938	0.000	0.000	6.585	0.000	0.12
		B		0.000	0.000	28.498	0.000	0.42
		C		0.000	0.000	15.598	0.000	0.25
T7	41.00-31.00	A	1.891	0.000	0.000	9.372	0.000	0.17
		B		0.000	0.000	27.935	0.000	0.40
		C		0.000	0.000	15.317	0.000	0.24
T8	31.00-21.00	A	1.831	0.000	0.000	12.012	0.000	0.21
		B		0.000	0.000	27.208	0.000	0.38
		C		0.000	0.000	14.953	0.000	0.23
T9	21.00-11.00	A	1.744	0.000	0.000	11.665	0.000	0.20
		B		0.000	0.000	26.167	0.000	0.35
		C		0.000	0.000	14.433	0.000	0.21

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	90.50-89.00	0.0000	0.0000	0.0000	0.0000
T1	89.00-87.00	0.0000	0.0000	0.0000	0.0000
T2	87.00-81.00	1.4180	0.6944	0.0000	0.0000
T3	81.00-71.00	2.0861	0.9854	0.0529	0.0253
T4	71.00-61.00	2.7076	1.4531	0.1344	0.0717
T5	61.00-51.00	1.7141	0.8540	0.0000	0.0000
T6	51.00-41.00	1.8035	0.8911	0.2819	0.1503
T7	41.00-31.00	1.6279	0.3256	0.3708	0.1590
T8	31.00-21.00	1.4052	-0.1736	0.2512	0.0803
T9	21.00-11.00	1.4708	-0.1803	0.6618	0.2088

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	1	LDF5-50A (7/8 FOAM)	81.00 - 87.00	0.6000	0.0000
T2	2	Cat5e	81.00 - 87.00	0.6000	0.0000
T2	3	Cat5e	81.00 - 87.00	0.6000	0.0000
T3	1	LDF5-50A (7/8 FOAM)	71.00 - 81.00	0.6000	0.0108
T3	2	Cat5e	71.00 - 81.00	0.6000	0.0108
T3	3	Cat5e	71.00 - 81.00	0.6000	0.0108
T3	4	Cat5e	71.00 - 81.00	0.6000	0.0108
T3	5	Cat5e	71.00 - 81.00	0.6000	0.0108
T4	1	LDF5-50A (7/8 FOAM)	61.00 - 71.00	0.6000	0.0199
T4	2	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	3	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	4	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	5	Cat5e	61.00 - 71.00	0.6000	0.0199
T4	6	LDF4P-50A (1/2 FOAM)	61.00 - 71.00	0.6000	0.0199
T4	7	LDF4P-50A (1/2 FOAM)	61.00 - 71.00	0.6000	0.0199
T5	1	LDF5-50A (7/8 FOAM)	51.00 - 61.00	0.6000	0.0000
T5	2	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	3	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	4	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	5	Cat5e	51.00 - 61.00	0.6000	0.0000
T5	6	LDF4P-50A (1/2 FOAM)	51.00 - 61.00	0.6000	0.0000
T5	7	LDF4P-50A (1/2 FOAM)	51.00 - 61.00	0.6000	0.0000
T5	9	Mods	51.00 - 61.00	0.6000	0.0000
T5	10	Mods	51.00 - 61.00	0.6000	0.0000
T5	11	Mods	51.00 - 61.00	0.6000	0.0000
T6	1	LDF5-50A (7/8 FOAM)	41.00 - 51.00	0.6000	0.0426
T6	2	Cat5e	41.00 - 51.00	0.6000	0.0426
T6	3	Cat5e	41.00 - 51.00	0.6000	0.0426
T6	4	Cat5e	41.00 - 51.00	0.6000	0.0426
T6	5	Cat5e	41.00 - 51.00	0.6000	0.0426

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	6	LDF4P-50A (1/2 FOAM)	41.00 - 51.00	0.6000	0.0426
T6	7	LDF4P-50A (1/2 FOAM)	41.00 - 51.00	0.6000	0.0426
T6	9	Mods	41.00 - 51.00	0.6000	0.0426
T6	10	Mods	41.00 - 51.00	0.6000	0.0426
T6	11	Mods	41.00 - 51.00	0.6000	0.0426
T7	1	LDF5-50A (7/8 FOAM)	31.00 - 41.00	0.6000	0.0578
T7	2	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	3	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	4	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	5	Cat5e	31.00 - 41.00	0.6000	0.0578
T7	6	LDF4P-50A (1/2 FOAM)	31.00 - 41.00	0.6000	0.0578
T7	7	LDF4P-50A (1/2 FOAM)	31.00 - 41.00	0.6000	0.0578
T7	8	Hybriflex 1-5/8"	31.00 - 36.00	0.6000	0.0578
T7	9	Mods	31.00 - 41.00	0.6000	0.0578
T7	10	Mods	31.00 - 41.00	0.6000	0.0578
T7	11	Mods	31.00 - 41.00	0.6000	0.0578
T8	1	LDF5-50A (7/8 FOAM)	21.00 - 31.00	0.6000	0.0411
T8	2	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	3	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	4	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	5	Cat5e	21.00 - 31.00	0.6000	0.0411
T8	6	LDF4P-50A (1/2 FOAM)	21.00 - 31.00	0.6000	0.0411
T8	7	LDF4P-50A (1/2 FOAM)	21.00 - 31.00	0.6000	0.0411
T8	8	Hybriflex 1-5/8"	21.00 - 31.00	0.6000	0.0411
T8	9	Mods	21.00 - 31.00	0.6000	0.0411
T8	10	Mods	21.00 - 31.00	0.6000	0.0411
T8	11	Mods	21.00 - 31.00	0.6000	0.0411
T9	1	LDF5-50A (7/8 FOAM)	11.00 - 21.00	0.6000	0.1063
T9	2	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	3	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	4	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	5	Cat5e	11.00 - 21.00	0.6000	0.1063
T9	6	LDF4P-50A (1/2 FOAM)	11.00 - 21.00	0.6000	0.1063
T9	7	LDF4P-50A (1/2 FOAM)	11.00 - 21.00	0.6000	0.1063
T9	8	Hybriflex 1-5/8"	11.00 - 21.00	0.6000	0.1063
T9	9	Mods	11.00 - 21.00	0.6000	0.1063
T9	10	Mods	11.00 - 21.00	0.6000	0.1063
T9	11	Mods	11.00 - 21.00	0.6000	0.1063

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB586-Y	A	From Leg	0.00	0.00	8.5000	95.50	No Ice	0.74	0.74	0.01
							1/2" Ice	1.23	1.23	0.01
							1" Ice	1.53	1.53	0.02
6' Extension Pipe	A	None		0.00	0.0000	93.50	No Ice	1.64	1.64	0.04
							1/2" Ice	2.29	2.29	0.06
							1" Ice	2.67	2.67	0.07
PTP 49400	B	From Leg	0.00	0.00	0.0000	92.00	No Ice	1.75	0.48	0.01

tnxTower	Job	Page
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Nexius 2595 North Dallas Parkway, Suite 300 Frisco, TX 75034 Phone: 972-581-9888 FAX:	**Project** NIANTIC_CT	**Date** 14:16:35 11/01/19
	Client Verizon Wireless	**Designed by** HL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.69	0.04
Environmental Pendant Camera	B	From Leg	1.00	0.0000	85.00	No Ice	0.75	0.75	0.01
			0.00			1/2" Ice	1.25	1.25	0.02
			0.00			1" Ice	1.75	1.75	0.03
5440AP	C	From Leg	0.50	0.0000	82.17	No Ice	2.05	2.65	0.01
			0.00			1/2" Ice	2.25	2.86	0.04
			0.00			1" Ice	2.46	3.09	0.06
PTP 49400	C	From Leg	0.50	0.0000	78.50	No Ice	1.75	0.48	0.01
			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.69	0.04
ANT150D6-9	A	From Leg	1.00	0.0000	71.00	No Ice	3.84	3.84	0.00
			0.00			1/2" Ice	6.42	6.42	0.00
			8.13			1" Ice	9.00	9.00	0.00
BSA150C	B	From Leg	3.00	0.0000	33.00	No Ice	7.36	7.36	0.00
			0.00			1/2" Ice	10.76	10.76	0.15
			0.00			1" Ice	11.23	11.23	0.31
Standoff Mount	B	From Leg	1.50	0.0000	33.00	No Ice	1.82	1.82	0.04
			0.00			1/2" Ice	2.29	2.29	0.06
			0.00			1" Ice	2.67	2.67	0.07
BA1012	A	From Leg	3.00	0.0000	23.00	No Ice	0.41	0.41	0.00
			0.00			1/2" Ice	1.10	1.10	0.00
			0.00			1" Ice	1.79	1.79	0.01
Standoff Mount	A	From Leg	1.50	0.0000	21.00	No Ice	1.87	1.87	0.04
			0.00			1/2" Ice	2.29	2.29	0.06
			0.00			1" Ice	2.67	2.67	0.07
MX08FRO640-02 (VzW)	A	From Leg	0.75	0.0000	42.40	No Ice	9.98	7.42	0.05
			0.00			1/2" Ice	10.45	7.87	0.12
			0.00			1" Ice	10.93	8.32	0.20
MX08FRO640-02 (VzW)	C	From Leg	0.75	0.0000	42.40	No Ice	9.98	7.42	0.05
			0.00			1/2" Ice	10.45	7.87	0.12
			0.00			1" Ice	10.93	8.32	0.20
CBC1923T-DS-43 (VzW)	C	From Leg	0.75	0.0000	42.40	No Ice	1.74	1.41	0.01
			0.00			1/2" Ice	1.92	1.57	0.03
			0.00			1" Ice	2.10	1.74	0.05
CBC1923T-DS-43 (VzW)	B	From Leg	0.75	0.0000	42.40	No Ice	1.74	1.41	0.01
			0.00			1/2" Ice	1.92	1.57	0.03
			0.00			1" Ice	2.10	1.74	0.05
CBC1923T-DS-43 (VzW)	A	From Leg	0.75	0.0000	42.40	No Ice	1.74	1.41	0.01
			0.00			1/2" Ice	1.92	1.57	0.03
			0.00			1" Ice	2.10	1.74	0.05
B2/B66A RRHBR049 (VzW)	A	From Leg	0.75	0.0000	37.50	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
B2/B66A RRHBR049 (VzW)	C	From Leg	0.75	0.0000	37.50	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
RXXDC-1064-PF-48 (VzW)	B	From Leg	0.75	0.0000	37.50	No Ice	1.35	1.35	0.01
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.65	1.65	0.05

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	Client: Verizon Wireless	Designed by: HL

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	90.5 - 89	Pole	Pipe 2" Sch. 40 (2.375" x 0.154")	1	-0.07	33.85	65.6	Pass
T1	89 - 87	Leg	ROHN TS1.25x14 ga	4	-1.58	10.60	60.9	Pass
T2	87 - 81	Leg	ROHN TS1.25x14 ga	11	-3.23	12.32	26.2 33.1 (b)	Pass
T3	81 - 71	Leg	ROHN TS1.25x14 ga	42	-4.27	12.23	34.9 42.9 (b)	Pass
T4	71 - 61	Leg	ROHN TS1.25x14 ga	90	-4.51	13.64	33.1 44.2 (b)	Pass
T5	61 - 51	Leg	ROHN TS1.25x14 ga	138	-6.60	12.23	53.9 60.6 (b)	Pass
T6	51 - 41	Leg	ROHN TS1.25x14 ga	186	-7.92	12.23	64.7 76.3 (b)	Pass
T7	41 - 31	Leg	ROHN TS1.25x14 ga	234	-9.64	13.64	70.7 94.6 (b)	Pass
T8	31 - 21	Leg	ROHN TS1.25x14 ga	282	-9.73	12.23	79.5 92.7 (b)	Pass
T9	21 - 11	Leg	ROHN TS1.25x14 ga	330	-9.15	12.23	74.8	Pass
T2	87 - 81	Diagonal	7/16	22	-0.71	1.83	39.0	Pass
T3	81 - 71	Diagonal	7/16	88	-0.67	1.78	37.9	Pass
T4	71 - 61	Diagonal	7/16	99	-0.88	1.78	49.6	Pass
T5	61 - 51	Diagonal	7/16	146	-1.88	3.79	49.7	Pass
T6	51 - 41	Diagonal	7/16	230	-1.83	3.79	48.2	Pass
T7	41 - 31	Diagonal	7/16	243	-3.39	3.79	89.6	Pass
T8	31 - 21	Diagonal	7/16	327	-3.33	3.79	87.9	Pass
T9	21 - 11	Diagonal	7/16	376	-2.87	3.79	75.7	Pass
T2	87 - 81	Horizontal	7/16	23	-0.36	2.90	12.3	Pass
T3	81 - 71	Horizontal	7/16	85	0.41	4.87	8.3	Pass
T4	71 - 61	Horizontal	7/16	102	-0.39	2.90	13.5	Pass
T5	61 - 51	Horizontal	7/16	149	-0.96	1.69	56.8	Pass
T6	51 - 41	Horizontal	7/16	227	-0.86	1.69	51.0	Pass
T7	41 - 31	Horizontal	7/16	246	-1.34	1.69	79.4	Pass
T8	31 - 21	Horizontal	7/16	295	-1.43	1.69	84.4	Pass
T9	21 - 11	Horizontal	7/16	373	-1.34	1.69	79.2	Pass
T1	89 - 87	Top Girt	7/16	5	0.00	4.87	22.3	Pass
T2	87 - 81	Top Girt	7/16	14	0.17	4.87	3.4	Pass
T3	81 - 71	Top Girt	7/16	46	0.25	4.87	5.0	Pass
T4	71 - 61	Top Girt	7/16	94	0.25	4.87	5.0	Pass
T5	61 - 51	Top Girt	7/16	141	-0.25	1.69	14.9	Pass
T6	51 - 41	Top Girt	7/16	188	-0.59	1.69	35.0	Pass
T7	41 - 31	Top Girt	7/16	238	-0.41	1.69	24.4	Pass
T8	31 - 21	Top Girt	7/16	285	-1.13	1.69	66.8	Pass
T9	21 - 11	Top Girt	7/16	334	-0.75	1.69	44.6	Pass
T1	89 - 87	Bottom Girt	7/16	8	-0.20	2.93	25.4	Pass
T2	87 - 81	Bottom Girt	7/16	17	-0.20	2.90	6.7	Pass
T3	81 - 71	Bottom Girt	7/16	49	0.15	4.87	3.1	Pass
T4	71 - 61	Bottom Girt	7/16	96	-0.26	2.90	9.1	Pass
T5	61 - 51	Bottom Girt	7/16	145	-0.53	1.69	31.1	Pass
T6	51 - 41	Bottom Girt	7/16	192	-0.35	1.69	20.6	Pass
T7	41 - 31	Bottom Girt	7/16	239	-1.11	1.69	65.4	Pass
T8	31 - 21	Bottom Girt	7/16	289	-0.84	1.69	49.5	Pass
T9	21 - 11	Bottom Girt	7/16	336	-0.50	1.69	29.4	Pass
T2	87 - 81	Guy A@84 (18 deg)	5/16	382	3.24	6.72	48.3	Pass
T5	61 - 51	Guy A@55.3229 (18 deg)	5/16	388	3.66	6.72	54.4	Pass
T8	31 - 21	Guy A@29.3854 (18 deg)	5/16	394	3.18	6.72	47.4	Pass
T2	87 - 81	Guy B@84 (18 deg)	5/16	381	3.24	6.72	48.2	Pass
T5	61 - 51	Guy B@55.3229 (18	5/16	387	3.61	6.72	53.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		deg)						
T8	31 - 21	Guy B@29.3854 (18 deg)	5/16	393	3.20	6.72	47.6	Pass
T2	87 - 81	Guy C@84 (-18 deg)	5/16	377	3.73	6.72	55.5	Pass
T5	61 - 51	Guy C@55.3229 (-18 deg)	5/16	383	4.04	6.72	60.1	Pass
T8	31 - 21	Guy C@29.3854 (-18 deg)	5/16	389	3.38	6.72	50.3	Pass
T2	87 - 81	Top Guy Pull-Off@84	2X3/8	380	1.13	17.14	6.6 9.1 (b)	Pass
T5	61 - 51	Top Guy Pull-Off@55.3229	2X3/8	386	1.93	17.14	11.3 15.5 (b)	Pass
T8	31 - 21	Top Guy Pull-Off@29.3854	2X3/8	392	2.57	17.14	15.0 20.7 (b)	Pass
							Summary	
							Pole (L1) 65.6	Pass
							Leg (T7) 94.6	Pass
							Diagonal (T7) 89.6	Pass
							Horizontal (T8) 84.4	Pass
							Top Girt (T8) 66.8	Pass
							Bottom Girt (T7) 65.4	Pass
							Guy A (T5) 54.4	Pass
							Guy B (T5) 53.8	Pass
							Guy C (T5) 60.1	Pass
							Top Guy Pull-Off (T8) 20.7	Pass
							Bolt Checks 94.6	Pass
							RATING = 94.6	**Pass**

nexius

Appendix #4: Guy Anchor / Support Check

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Location Code *469058*
Site Name: *Niantic_CT*
Calc. Name: *Guy Ach Pt Top Conntc.*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	4	
Diam:	0.75	in
Rod Material:	Other	
Yield, Fy:	92	ksi
Strength, Fu:	120	ksi
Bolt Circle:	10	in

Plate Data		
W=Side:	13	in
Thick:	0.75	in
Grade:	36	ksi
Clip Distance:	0	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:	Fillet	**
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi
Clear Space between Stiffeners at B.C.		in

Pole Data		
Diam:	5.563	in
Thick:	0.349	in
Grade:	53	ksi
# of Sides:	0	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	0	ft-kips
Factored Axial, Pu:	7	kips
Factored Shear, Vu:	7	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	5.3 Kips
Axial Design Strength, Φ*Fu*Anet:	32.1 Kips
Anchor Rod Stress Ratio:	16.4% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	3.3 ksi
PL Design Bending Strength, Φ*Fy:	32.4 ksi
Base Plate Stress Ratio:	10.3% **Pass**

PL Ref. Data
Yield Line (in): 8.31
Max PL Length: 12.82

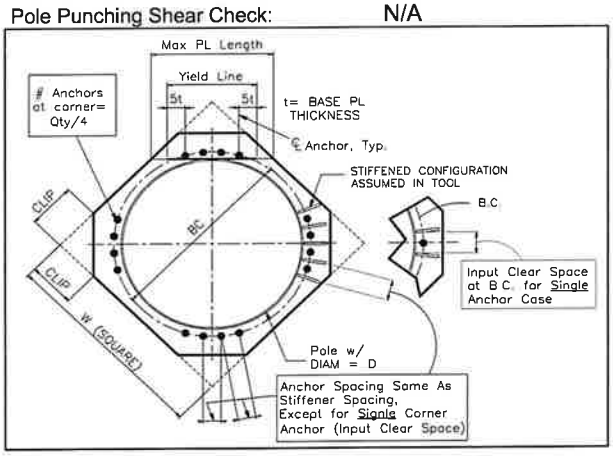
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Location Code *469058*
Site Name: *Niantic_CT*
Calc. Name: *Guy Ach Pt Bt Conntc.*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	4	
Diam:	0.75	in
Rod Material:	Other	
Yield, Fy:	92	ksi
Strength, Fu:	120	ksi
Bolt Circle:	10	in

Plate Data		
W=Side:	12	in
Thick:	1	in
Grade:	36	ksi
Clip Distance:	0	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:	Fillet	**
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi
Clear Space between Stiffeners at B.C.		in

Pole Data		
Diam:	5.563	in
Thick:	0.349	in
Grade:	53	ksi
# of Sides:	0	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	10.5	ft-kips
Factored Axial, Pu:	7	kips
Factored Shear, Vu:	7	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	17.9 Kips
Axial Design Strength, Φ*Fu*Anet:	32.1 Kips
Anchor Rod Stress Ratio:	55.7% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	15.3 ksi
PL Design Bending Strength, Φ*Fy:	32.4 ksi
Base Plate Stress Ratio:	47.3% **Pass**

PL Ref. Data
Yield Line (in): 8.31
Max PL Length: 11.41

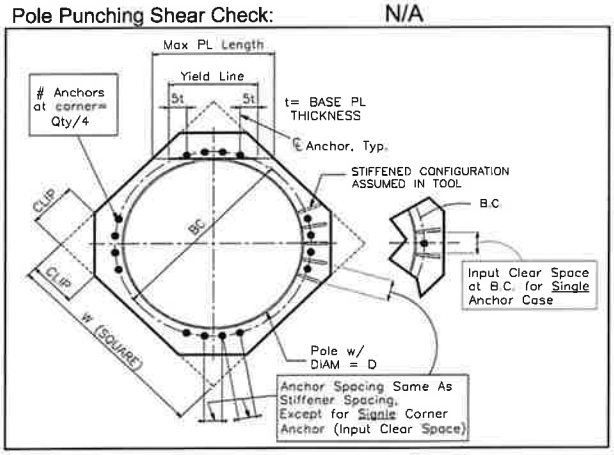
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

Weld Strength - Guy Anchor Plate

Loading

Vertical, $Vs := 7 \cdot kip$

Horizontal, $Hs := 7 \cdot kip$

Resultant, $Rs := 11 \cdot kip$

$Method := \text{“LRFD”}$

Weld Property:

Weld thickness: $t := \frac{1}{4}\ in$

Weld length: $l := 10 \cdot in$

Weld Strength Properties: $E_{xx} := 70 \cdot ksi$

Design Weld Strength, $F_w := 0.75 \cdot (0.6 \cdot E_{xx}) \cdot \left(\frac{1}{\sqrt{2}} \cdot l \cdot t \cdot 2\right) = 111.369\ kip$

Weld Strength: $\frac{Rs}{F_w} = 0.099$ Adequate

nexius

Client: ___Verizon_____ **Prepared by:** Akshay Doddamani_____
Project: ___NIANTIC_CT **Date:** _____11/01/2019
Calc. ID: _____ **Checked by:** _Jaizhu Hu_____
Calc. Title: _Post Weldment Check___ **Date:** _____11/01/2019

Loading

$Method := \text{“LRFD”}$

$P_x := 7\ kip$ $P_y := 0\ kip$ Major/minor (x/y) axis shear load

$P_z := 7\ kip$ Axial (z) axis load (+/tension -/ compression)

$M_x := 10.5\ kip \cdot ft$ $M_y := 0\ kip \cdot ft$ Moment about x/y axis

$T_z := 0\ kip \cdot in$ Torque about z axis

Section Geometry Properties

$d := 5.563\ in$ Diameter of circular weld

$r := \frac{d}{2} = 2.782\ in$ Radius of circular weld

Weld Strength Properties $E_{xx} := 70\ ksi$

$$F_w := 0.75 \cdot (0.6 \cdot E_{xx}) \cdot \left(\frac{1}{\sqrt{2}}\right) = 1.392\ \frac{kip}{in \cdot \frac{in}{16}}$$

Weld strength (kip/(1/16")

$ASIF := 1.0$ Allowable stress increase factor

$ASIF_{use} := \text{“N”}$

$SR_{allow} := 0.95$ Allowable stress ratio

$c_x := r = 2.782\ in$ $c_y := r = 2.782\ in$ Distance from y/x-axis to Edge of Weld.

$L_x := \pi \cdot r = 8.738\ in$ $L_y := \pi \cdot r = 8.738\ in$ Total length of weld in x/y-direction.

$L_w := L_x + L_y = 17.477\ in$ Total length of weld

$S_x := \pi \cdot r^2 = 24.306\ in^2$ $S_y := \pi \cdot r^2 = 24.306\ in^2$ Section modulus of weld about x/y-axis

$I_z := 2\ \pi \cdot r^3 = 135.213\ in^3$ Polar Moment of Intertia (PMI) about z-axis

Calculated stresses

$f_x := f_{vx} + f_{tx} = 0.801 \ \frac{kip}{in}$ $f_y := f_{vy} + f_{ty} = 0 \ \frac{kip}{in}$ Total (shear) stress along x/ y-axis of weld

$f_z := f_a + f_{bx} + f_{by} = 5.585 \ \frac{kip}{in}$ Total (normal) stress along z-axis of weld.

$f_r := \sqrt{f_x^{\ 2} + f_y^{\ 2} + f_z^{\ 2}} = 5.642 \ \frac{kip}{in}$ Resultant stress in weld.

$F_{weld} := F_w = 1.392 \ \frac{kip}{in \cdot \frac{in}{16}}$ (Since, $ASIF_{use} =$ "N")

$t_{min} := \frac{3}{8} \ in$ - Minimum Weld Size Required

$SR := \frac{f_r}{F_{weld} \cdot t_{min}} = 0.675$

verizon

CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

LOCATION CODE:
469058

SITE NAME:
NIANTIC_CT

Digitally signed by Jiazhu Hu, Ph.D., P.E.
DN: cn=Jiazhu Hu, Ph.D., P.E., o=Nexius, ou=Engineering, email=Jiazhu.Hu@Nexius.com, c=US
Date: 2019.10.31 15:36:55 -04'00'

VICINITY MAP

PROJECT SUMMARY

SITE NAME:
NIANTIC_CT

SITE ADDRESS:
6&8 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

COORDINATES:
LATITUDE: 41° 19' 30.3708" N
LONGITUDE: 72° 11' 30.1092" W

LANDLORD:
TOWN OF EAST LYME
PO BOX 519
NIANTIC, CT 06357-0519

APPLICANT:
CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

SITE DESCRIPTION:
VERIZON WIRELESS TO REMOVE (2) REMOTE RADIO HEADS & (2) PANEL ANTENNA. INSTALL (2) REMOTE RADIO HEADS, (2) PANEL ANTENNA, & (4) DIPLEXERS. EXISTING (1) OVP BOX TO REMAIN & (1) 2x4 HYBRID CABLE TO REMAIN. INSTALL PANEL ANTENNAS @ 42.4'± A.G.L. ON THE EXISTING 89.0'± A.G.L. GUYED TOWER ON ROOF.

APPROVALS

OWNER:	DATE:
R.F. ENGINEER:	DATE:
CONSTRUCTION:	DATE:
LEASING & ZONING:	DATE:
VERIZON WIRELESS:	DATE:

THE ABOVE PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES OR MODIFICATIONS THEY MAY IMPOSE.

SHEET INDEX

STRUCTURAL NOTES:

STRUCTURAL ANALYSIS PERFORMED BY NEXIUS DETERMINED THAT THE EXISTING STRUCTURE IS NOT ADEQUATE FOR THE PROPOSED INSTALLATIONS. STRUCTURAL REINFORCEMENT IS RECOMMENDED AS DETAILED IN THE DRAWINGS.

PREPARED BY:
nexius
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CHELMSFORD, MA 01824
1 (978) 923-7965

APPLICANT:
verizon
CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

PROFESSIONAL STAMP:
STATE OF CONNECTICUT · JIAZHU HU · 31530 · LICENSED PROFESSIONAL ENGINEER

SUBMITTALS

REV	DATE	DESCRIPTION	BY
0	10/31/19	FOR CONSTRUCTION	NS

PROJECT INFORMATION:
SITE NAME:
NIANTIC_CT
SITE ADDRESS:
6&8 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

PROJECT NUMBER:
VZ11509

DRAWN BY:	DATE:
NS	10/31/19
CHECKED BY:	DATE:
KB/JH	10/31/19

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

ANTENNA CONFIGURATION
SEE ANTENNA PLAN FOR ANTENNA LOCATIONS

700/850/AWS/PCS

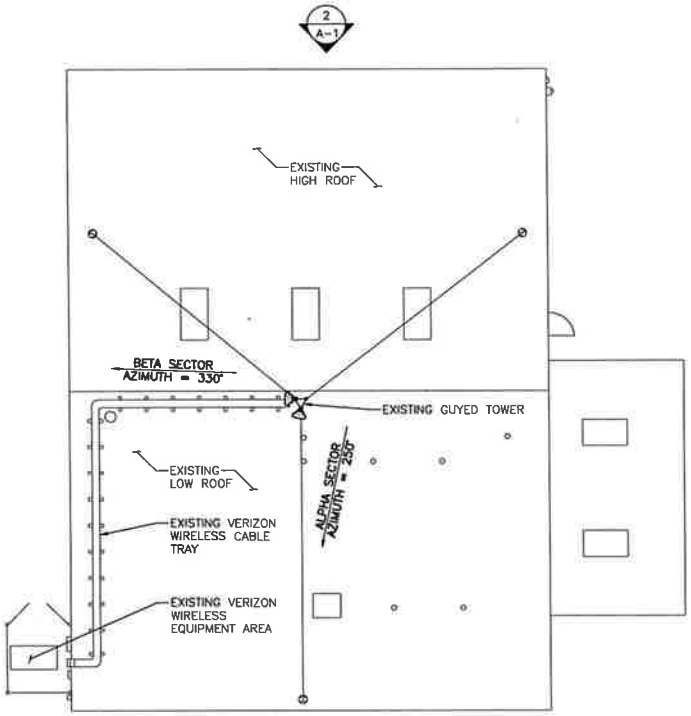
HYBRID CABLE SCHEDULE		
SECTOR	CABLE QUANTITY/ TYPE	LENGTH
ALPHA	EXISTING (1) 2x4 HYBRID	EXISTING
BETA		

THE DC AND FIBER HYBRID CABLES ARE PROVIDED BY VERIZON WIRELESS. THE SIZING AND OR DERATING OF HYBRID CABLE DC CONDUCTORS SHALL BE DONE BY OTHERS IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEC.

TOWER STRUCTURAL ASSESSMENT PREPARED BY NEXIUS
STRUCTURAL ANALYSIS, PREPARED BY NEXIUS, ENTITLED STRUCTURAL ANALYSIS REPORT, DATED OCTOBER 31, 2019, STATES THAT THE EXISTING STRUCTURE WILL BE OF SUFFICIENT CAPACITY FOR THE EXISTING AND PROPOSED LOADING INSTALLATIONS ON THE CONDITION OF INSTALLING THE PROPOSED MODIFICATIONS.

BUILDING STRUCTURAL ASSESSMENT LETTER PREPARED BY NEXIUS
STRUCTURAL ASSESSMENT, PREPARED BY NEXIUS, ENTITLED STRUCTURAL ASSESSMENT LETTER, DATED OCTOBER 31, 2019, STATES THAT THE EXISTING BUILDING STRUCTURE IS DETERMINED TO BE SUFFICIENT FOR THE PROPOSED LOADING INSTALLATIONS

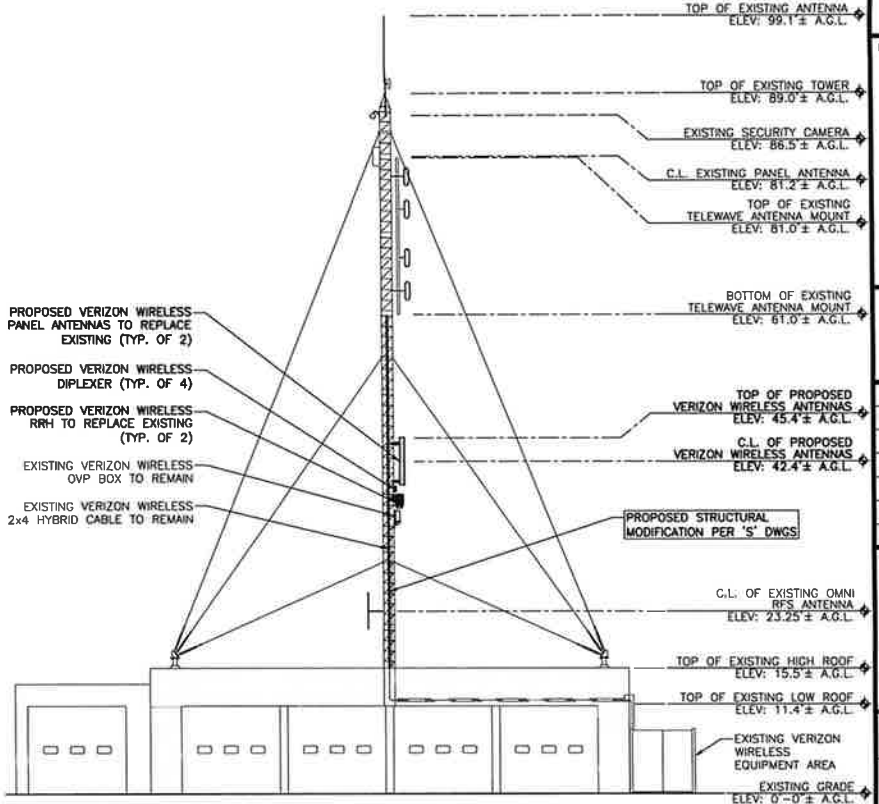
MOUNT STRUCTURAL ASSESSMENT PREPARED BY NEXIUS
STRUCTURAL ASSESSMENT PREPARED BY NEXIUS, ENTITLED MOUNT ASSESSMENT LETTER, DATED OCTOBER 31, 2019, STATES THAT THE EXISTING MOUNTING STRUCTURES ARE DETERMINED TO BE SUFFICIENT FOR THE PROPOSED LOADING INSTALLATIONS.



APPROX. NORTH

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

GRAPHIC SCALE: 1/8"=1'-0"



2 ELEVATION
SCALE: 1/8" = 1'-0"

GRAPHIC SCALE: 1/8"=1'-0"

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1 (978) 923-7965

APPLICANT:
verizon
CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS
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EAST HARTFORD, CT 06108

PROFESSIONAL STAMP:
STATE OF CONNECTICUT · JIAZHU HU · 31530 · LICENSED PROFESSIONAL ENGINEER

SUBMITTALS

REV	DATE	DESCRIPTION	BY
0	10/31/19	FOR CONSTRUCTION	NS

PROJECT INFORMATION:

SITE NAME:
NIANTIC_CT

SITE ADDRESS:
6&8 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

PROJECT NUMBER
VZ11509

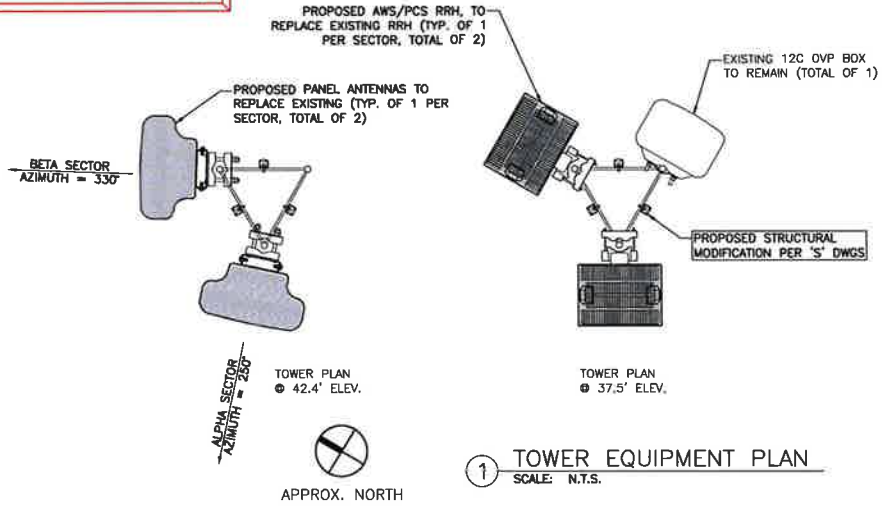
DRAWN BY:	DATE:
NS	10/31/19
CHECKED BY:	DATE:
KB/JH	10/31/19

SHEET TITLE:
COMPOUND PLAN & STRUCTURE ELEVATION

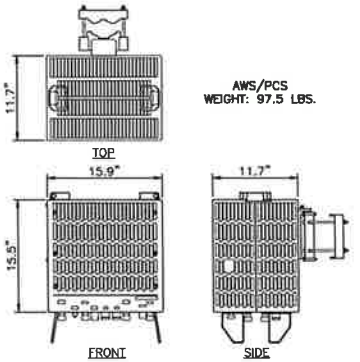
SHEET NUMBER:
A-1

NOTE:

ALL PROPOSED DIPLEXERS ARE TO BE MOUNTED BELOW EXISTING PANEL ANTENNAS.



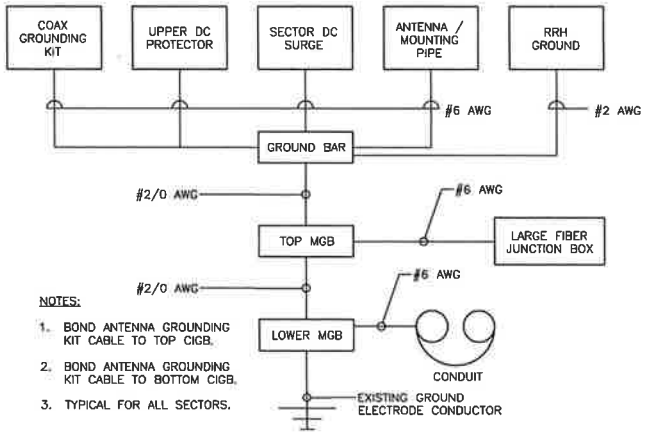
1 TOWER EQUIPMENT PLAN
SCALE: N.T.S.



2 RRH SPEC.
SCALE: N.T.S.

GENERAL NOTES:

1. INSTALL ALL EQUIPMENT, MOUNTING BRACKETS, AND HARDWARE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. GROUND DISTRIBUTION BOXES, MOUNTING PIPES, AND RRH'S IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. INSTALLED EQUIPMENT AND MOUNTING BRACKETS SHALL NOT INTERFERE WITH CLIMBING ACCESS NOR ANY INSTALLED SAFETY DEVICES.
4. EQUIPMENT TO BE INSTALLED AT VERIZON'S RAD CENTER IN ACCORDANCE WITH TOWER ANALYSIS/ROOFTOP STRUCTURAL ANALYSIS (ANALYSIS BY OTHERS).



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGB.
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGB.
3. TYPICAL FOR ALL SECTORS.

3 GROUNDING SCHEMATIC DIAGRAM
SCALE: N.T.S.

PREPARED BY:

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APPLICANT:

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EAST HARTFORD, CT 06108

PROFESSIONAL STAMP:

SUBMITTALS

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0	10/31/19	FOR CONSTRUCTION	NS

PROJECT INFORMATION

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NIANTIC_CT

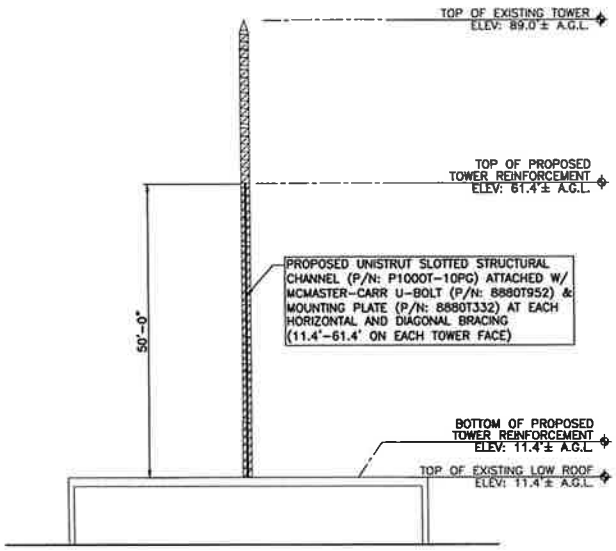
SITE ADDRESS:
6&8 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

PROJECT NUMBER:
VZ11509

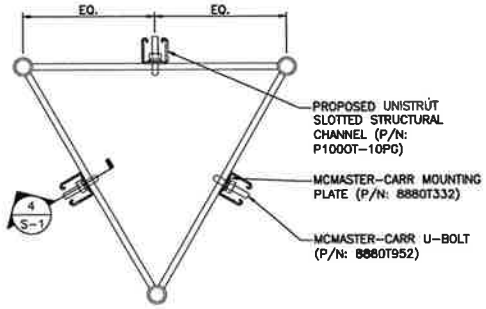
DRAWN BY:	DATE:
NS	10/31/19
CHECKED BY:	DATE:
KB/JH	10/31/19

SHEET TITLE:
CONSTRUCTION DETAILS

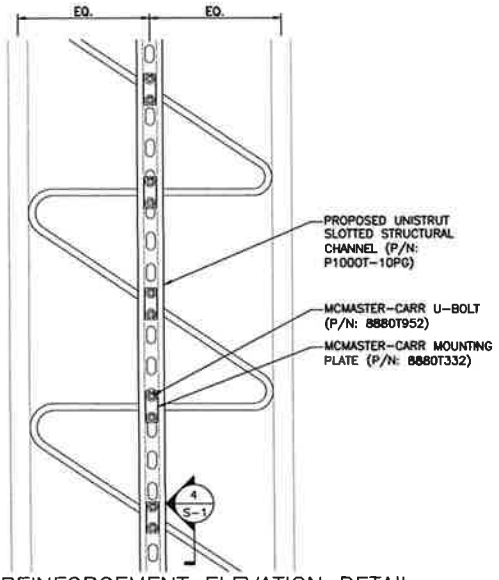
SHEET NUMBER:
A-2



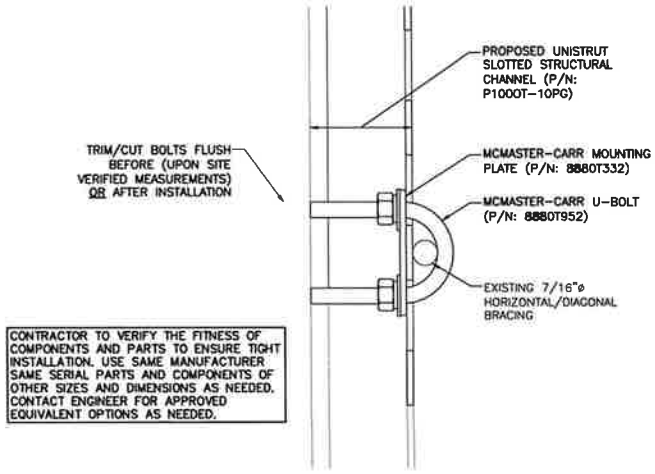
1 REINFORCEMENT ELEVATION
SCALE: N.T.S.



2 REINFORCEMENT PLAN
SCALE: 3" = 1'-0"



3 REINFORCEMENT ELEVATION DETAIL
SCALE: 3" = 1'-0"



4 REINFORCEMENT SECTION DETAIL
SCALE: 1'-0" = 1'-0"

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PROFESSIONAL STAMP:
STATE OF CONNECTICUT
JIAZHU HU
31530
LICENSED
PROFESSIONAL ENGINEER

SUBMITTALS

REV	DATE	DESCRIPTION	BY
0	10/31/19	FOR CONSTRUCTION	NS

PROJECT INFORMATION:
SITE NAME:
NIANTIC_CT
SITE ADDRESS:
688 GRAND STREET
NIANTIC, CT 06357
NEW LONDON COUNTY

PROJECT NUMBER:
VZ11509

DRAWN BY:	DATE:
NS	10/31/19
CHECKED BY:	DATE:
KB/JH	10/31/19

SHEET TITLE:
STRUCTURAL
REINFORCEMENT DETAILS

SHEET NUMBER
S-1

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Accelerating Network and Business Transformation

STRUCTURAL ASSESSMENT LETTER

October 31, 2019

VERIZON WIRELESS
118 FLANDERS ROAD, 3RDFLOOR
WESTBOROUGH, MA 01581

Location Code:	469058
RFDS Project ID:	1371367
Site Name:	NIANTIC_CT
Site Address:	6&8 GRAND ST, NIANTIC, CT 06357
Structural Type:	**15.5 ft ONE-STORY BUILDING SUPPORTING 89 FT GUYED TOWER**

To Whom It May Concern:

Nexius is pleased to submit this "Letter" to determine the structural integrity of the above-mentioned structure for supporting the proposed and existing loading changes. The existing and proposed loading is detailed in the following loading **Table 1** (next page).

The tower structural analysis completed by Nexius, dated October 31, 2019, stated that **the existing tower structure is sufficient for the proposed installation**. Changes in the tower support reactions onto the building are minimal compared to existing condition and the structure's overall capacity. Assuming the structure is sufficient for the existing installation and has been maintained as required according to original design, **the above-mentioned existing building structure is determined to be sufficient for the proposed installation**according to the 2018 Connecticut State Building Code (IBC 2015 w/ State Amendments) and ANSI/TIA-222-G w/ Addendums, Structural Standard for Antenna Supporting Structures and Antennas.

All structural components and connections should be checked for tightness and good condition prior to installing the proposed loading. All proposed equipment must be installed and supported in accordance with manufacturers' recommendations and specifications. Should you have any questions, comments or require additional information, please do not hesitate to contact us.

Sincerely Yours,

Analysis prepared by:

Akshay Doddamani
Structural Engineer

Approved by:

Digitally signed by Jiazhu Hu, Ph.D., P.E.
DN: cn=Jiazhu Hu, Ph.D., P.E., o=Nexius, ou=Engineering, email=Jiazhu.Hu@Nexius.com, c=US
Date: 2019.11.05 10:31:10 -05'00'

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

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Accelerating Network and Business Transformation

TABLE 1 LOADING

Mount Elev. ft	Ant. Ctr. Elev. ft	Qty	Description	Carrier	Status
42.4	42.4	**2**	**JMA MX06FRO640-02**	VERIZON WIRELESS	**Proposed**
		2	**Samsung B2/B66A RRH BR049**		
		4	**CBC1923T-DS-43**		
		1	Raycap RC2DC-1064-PF-48		Existing to Remain
		2	*Andrew HBX-4517DS1-VTM*		*Existing to be Removed*
		2	*ALU RRH2X60-AWS*		

ATTACHMENT 5

6

11/5/2019 6:16:22 AM

Scale: 1"=100'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

6 & 8 GRAND ST

Location	6 & 8 GRAND ST	**Mblu**	12.1/ 18/ / /
Acct#	007607	**Owner**	EAST LYME TOWN OF
Assessment	$456,610	**Appraisal**	$652,300
PID	3079	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$528,200	$124,100	$652,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$369,740	$86,870	$456,610

Owner of Record

Owner	EAST LYME TOWN OF
Co-Owner	NIANTIC FIRE/GARAGE
Address	PO BOX 519 NIANTIC, CT 06357-0519

Sale Price	$0
Certificate	
Book & Page	72/ 596
Sale Date	11/28/1956
Instrument	15

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
EAST LYME TOWN OF	$0		56/ 347	15	02/02/1950
EAST LYME TOWN OF	$0		22/ 530	15	05/23/1925

Building Information

Building 1 : Section 1

Year Built:	1923
Living Area:	1,482
Replacement Cost:	$249,047
Building Percent Good:	57
Replacement Cost Less Depreciation:	$142,000

Building Attributes

Field	Description
STYLE	Commercial
MODEL	Commercial
Grade	Average
Stories:	2
Occupancy	3
Exterior Wall 1	Stucco/Masonry
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	Carpet
Heating Fuel	Oil
Heating Type	Forced Air-Duc
AC Type	None
Bldg Use	MUN FIRE
Total Rooms	
Total Bedrms	04
Total Baths	2
1st Floor Use:	
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL & WL
Rooms/Prtns	AVERAGE
Wall Height	12
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos2/EastLymeCTPhotos//\01\00\92/

Building Layout

(http://images.vgsi.com/photos2/EastLymeCTPhotos//Sketches/3

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
FUS	Upper Story, Finished	1,560	1,482
FGR	Garage	1,560	0
FST	Utility, Finished	210	0
UBM	Basement, Unfinished	1,560	0
		4,890	1,482

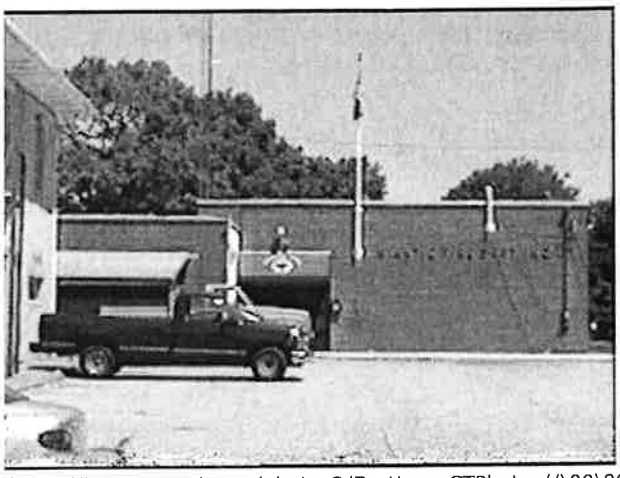
Building 2 : Section 1

Year Built: 1957
Living Area: 5,183
Replacement Cost: $647,201
Building Percent Good: 57
Replacement Cost Less Depreciation: $368,900

Building Attributes : Bldg 2 of 2	
Field	Description

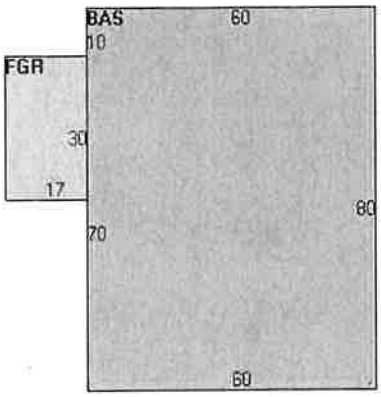
STYLE	Fire Station
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall/Sheet
Interior Floor 1	Concr-Finished
Interior Floor 2	Vinyl/Asphalt
Heating Fuel	Oil
Heating Type	Hot Water
AC Type	None
Bldg Use	MUN FIRE
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	9032
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	16
% Comn Wall	0

Building Photo



(http://images.vgsi.com/photos2/EastLymeCTPhotos//\00\00\10/

Building Layout



(http://images.vgsi.com/photos2/EastLymeCTPhotos//Sketches/3

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	4,800	4,800
FGR	Garage	510	383
		5,310	5,183

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 9032
Description MUN FIRE

Land Line Valuation

Size (Acres) 0.51
Frontage 0

Zone	CB	**Depth**	0
Neighborhood	0050	**Assessed Value**	$86,870
Alt Land Appr	No	**Appraised Value**	$124,100
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			8000 S.F.	$12,000	1
SHD1	SHED FRAME			162 S.F.	$600	2
PAV2	PAVING-CONC			2100 S.F.	$4,700	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$528,200	$124,100	$652,300
2017	$528,200	$124,100	$652,300
2016	$528,200	$124,100	$652,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$369,740	$86,870	$456,610
2017	$369,740	$86,870	$456,610
2016	$369,740	$86,870	$456,610

ATTACHMENT 6

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	2	2	neopost 11/12/2019 US POSTAGE $002.79⁰ ZIP 06103 041L12203937
	Postmaster, per *(name of receiving employee)*		OLD STATE HOUSE STATION 06103 NOV 12 2019 USPS

USPS® Tracking Number Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Marc C. Nickerson, First Selectman Town of East Lyme 108 Pennsylvania Avenue Niantic, CT 06357				
2.	Gary Goeschel II, Director of Planning Town of East Lyme 108 Pennsylvania Avenue Niantic, CT 06357				
3.					
4.					
5.					
6.					