

January 11, 2017

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

Re: **Notice of Exempt Modification – Facility Modification
1050 Buckley Highway, Union, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 150-foot level of the existing 168-foot tower at 1050 Buckley Highway in Union, Connecticut (the “Property”). The tower is owned by Navigator Properties, a/k/a Mariner Tower. The Council approved Cellco’s use of this tower in 1997. Cellco now intends to replace six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/2100 MHz antennas and three (3) model SBNHH-1D65B, 1900 MHz antennas, all at the same 150-foot level on the tower. Cellco also intends to install (6) remote radio heads (“RRHs”) and two (2) HYBRIFLEX™ antenna cables. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cables.

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 Albert L. Goodhall, Jr., First Selectman of the Town of Union. A copy of this letter is also being sent to Kathy Lee and Wayne Kemp, the owners of the Property and Navigator Properties, the tower owner.

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 RRH’s will be located at the 150-foot level on the 168-foot tower.

15990725-v1

Robinson+Cole

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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 operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case General Power Density table for Cellco's modified facility is included in Attachment 2.

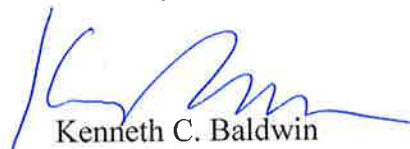
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (See Structural Analysis Report included in Attachment 3).

A copy of the Town Assessor's Parcel Map and property owner information is included in Attachment 4

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:

Albert L. Goodhall, Jr., Union First Selectman
Kathy Lee and Wayne Kemp
Navigator Properties
Tim Parks

ATTACHMENT 1



SBNHH-1D65B

Multiband Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR Return Loss, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

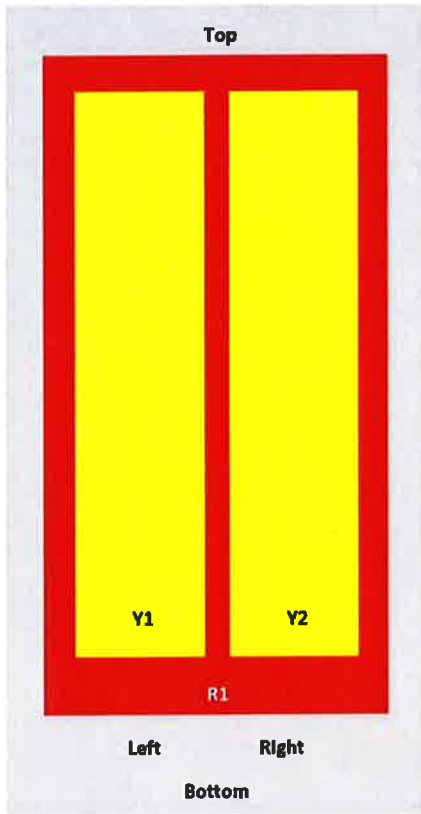
Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0° 14.6	0° 14.5	0° 17.4	0° 17.8	0° 18.1	0° 18.2
	7° 14.6	7° 14.4	3° 17.5	3° 17.9	3° 18.3	3° 18.4
	14° 14.2	14° 13.6	7° 17.4	7° 17.9	7° 18.2	7° 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, [download the whitepaper Time to Raise the Bar on BSAs.](#)

Array Layout

SBNHH-1D65B

SBNHH 65



Array	Freq (MHz)	Combs	RET (MRET)	AISG RET UID
R1	698-896	1-2	1	ARxxxxxxxxxxxxxxxxx.1
Y1	1695-2360	3-4	2	ARxxxxxxxxxxxxxxxxx.2
Y2	1695-2360	5-6		

View from the front of the antenna
(Sizes of colored boxes are not true depictions of array sizes)

General Specifications

Operating Frequency Band	1695 – 2360 MHz 698 – 896 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	6
RF Connector Quantity, low band	2
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female
Color	Light gray

SBNHH-1D65B

Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Loading, lateral	197.0 N @ 150 km/h 44.3 lbf @ 150 km/h
Wind Loading, rear	728.0 N @ 150 km/h 163.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Length	1851.0 mm 72.9 in
Width	301.0 mm 11.9 in
Depth	180.0 mm 7.1 in
Net Weight, without mounting kit	18.4 kg 40.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal RET	High band (1) Low band (1)
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	1 female 1 male

Packed Dimensions

Length	2025.0 mm 79.7 in
Width	390.0 mm 15.4 in
Depth	296.0 mm 11.7 in
Shipping Weight	31.0 kg 68.3 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



Included Products

SBNHH-1D65B

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.



The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

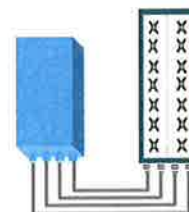
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

Can be switched between modes via SW w/o site visit

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield)
Volume in L	38 (with solar shield)
Weight in kg (lb) (w/o mounting HW)	26 (57.2) (with solar shield)
DC voltage range	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	550W typical @100% RF load (In 2Tx or 4TX mode)
Environmental conditions	-40°C (-40°F) / +55°C (+131°F)
Wind load (@150km/h or 93mph)	IP65 Frontal: <200N / Lateral : <150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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ALCATEL-LUCENT B66A RRH4X45

The Alcatel-Lucent B66a Remote Radio Head 4x45 is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.



The Alcatel-Lucent B66a RRH4x45 is a compact (near zero-footprint) solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

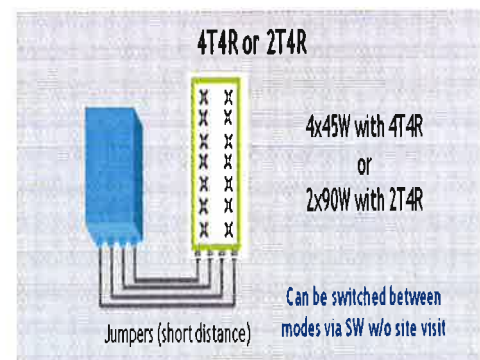
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 2110 - 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



TECHNICAL SPECIFICATIONS

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity
Receiver Sensivity (FRC A1-3)	-104.3 dBm maximum
Sizes (HxWxD) in mm (in.)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield)
Volume in Liters	35.5 (with solar shield) 29.7 (without solar shield)
Weight in kg (lb) (w/o mounting HW)	25.8kg (56.8lb) (with solar shield)
DC voltage range	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) UL50E Type 4 Enclosure
Wind load (@150km/h or 93mph)	250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

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HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics - minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding - Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design - Decreases tower loading
- Robust cabling - Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH - Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable - Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket - Ensures long-lasting cable protection



Figure 1: HYBRIFLEX Series

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	(mm (in.))	46.5 (1.83)
Jacket	Polyethylene, PE	(mm (in.))	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		(kg/m (lb/ft))	1.9 (1.30)
Minimum Bending Radius, Single Bending		(mm (in.))	200 (8)
Minimum Bending Radius, Repeated Bending		(mm (in.))	500 (20)
Recommended/Maximum Clamp Spacing		(m (ft))	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	068 (0.205)
DC-Resistance Power Cable, 8.4mm ² (8AWG)		(Ω/km (Ω/1000ft))	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		(μm)	50/125
Primary Coating (Acrylate)		(μm)	245
Buffer Diameter, Nominal		(μm)	900
Secondary Protection, Jacket, Nominal		(mm (in.))	2.0 (0.08)
Minimum Bending Radius		(mm (in.))	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		(mm (AWG))	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		(mm (in.))	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		(°C (°F))	-40 to +65 (-40 to 149)
Operation Temperature		(°C (°F))	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

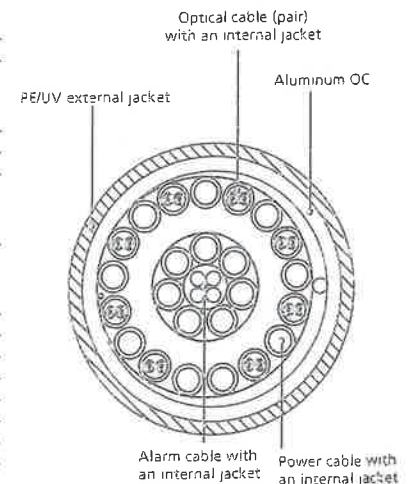


Figure 2: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering.

ATTACHMENT 2

Site Name: Union W Tower Height: 168'		General		Power		Density							
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*Sprint	11	250	130	1962.5	0.0643	1.0000	0.64%						
*AT&T	2	565	120	880	0.0313	0.5867	0.53%						
*AT&T	2	875	120	1900	0.0484	1.0000	0.48%						
*AT&T	1	283	120	880	0.0078	0.5867	0.13%						
*AT&T	4	525	120	1900	0.0581	1.0000	0.58%						
*AT&T	1	1615	120	734	0.0447	0.4893	0.91%						
*Nextel	9	100	160	851	0.0136	0.5673	0.24%						
*Pagenet			172	940	0.0182	0.6267	0.29%						
*T-Mobile	6	1102	140	1900	0.1324	1.0000	1.32%						
*T-Mobile	1	865	140	700	0.0173	0.4667	0.37%						
Verizon	11	400	150	0.0703	1970	1.0000	7.03%						
Verizon	9	289	150	0.0416	869	0.5793	7.18%						
Verizon	1	6907	150	0.1104	2145	1.0000	11.04%						
Verizon	1	1645	150	0.0263	698	0.4973	5.29%						
													36.0%
* Source: Siting Council													

ATTACHMENT 3



**STRUCTURAL ANALYSIS REPORT
168' SELF-SUPPORTING TOWER
UNION, CONNECTICUT**

Prepared for
Mariner Tower

Site: Union

October 5, 2016



APT Project #CT231261

STRUCTURAL ANALYSIS REPORT
168' SELF-SUPPORTING TOWER
UNION, CONNECTICUT
prepared for
Mariner Tower

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a condition assessment and structural analysis of this 168-foot self-supporting tower. The analysis was performed for Verizon's proposed replacement of twelve panel antennas at 150' and installation of six remote radio heads (RRHs) and two Raycap power/fiber distribution boxes (D-boxes). The antennas will be fed by the existing twelve 1-5/8" and two additional 1-1/4" hybrid lines.

Our analysis indicates the tower meets the requirements of the Connecticut State Building Code with the proposed equipment changes. Missing U-bolts at 64' & 84' should be replaced.

Evaluation of the existing base foundations was performed from a URS Corporation foundation evaluation and reinforcement provided to APT. The foundations were found to be adequately sized for the proposed equipment changes.

INTRODUCTION:

A condition assessment and structural analysis was performed on the above-mentioned communications tower by APT for Mariner Tower. The tower is located at 1050 West Buckley Highway in Union, Connecticut. APT climbed the structure in its entirety on September 29, 2016 to record information regarding physical and dimensional properties of the structure and its appurtenances.

The tower is a 168' self-supporting tower manufactured by ROHN Industries. This analysis also relied on ROHN tower drawings, Eng. File #34876PH dated November 5, 1996 for Litchfield Tower, a structural analyses by Paul J. Ford and Company dated June 4, 2002, a structural analysis and reinforcement design by URS Corporation dated April 18, 2003, a foundation investigation by URS Corporation dated July 9, 2003, a structural analyses by URS dated November 15, 2007, and site information provided by Mariner Tower.

The tower has been reinforced on at least two previous occasions. Tower reinforcing consists of split pipe leg reinforcing from 100' to 128' and added horizontal bracing in five bracing bays between 60' and 105'. Foundation reinforcing consists of two Williams rock anchors installed through each foundation pier and extended into bedrock.

All-Points Technology Corporation

116 Grandview Road
Conway, NH 03818
(603) 496-5853

3 Saddlebrook Drive
Killingworth, CT 06419
(860) 663-1697

The analysis was performed in accordance with the Connecticut State Building Code and TIA-222 G using the following antenna inventory:

Antenna	Elev.	Mount	Coax.
8' omnidirectional whip, 6' 4-bay dipole, 20' 4-bay dipole, 6' yagi	168'	(2) 2' x 2-3/8", 10' x 2-3/8" pipe on leg	(2) 7/8", 1-1/4", 1-5/8"
Vacant mounts	152'	(3) 3' sidearms	N.A.
(6) SBNHH-1D65B, (4) WPA-80063-4CF, (2) WPA-80080-4CF/12 panels, (3) B13 RRH4x40 RRHs, (3) B66A RRH4x45 RRHs, (2) Raycap RC3DC-3315-PF-48 D-boxes ¹	148'	(3) 16' sector mounts	(12) 1-5/8", (2) 1-1/4" hybrid
(3) LNX-6515DS, (3) RR90-17-DP panels, (3) TMAs	140'	(3) 4' sidearms	(12) 1-1/4"
(6) DB980 panel antennas	131'	(3) 10' sector mounts	(6) 1-5/8"
(2) P65-17-XL-R, (1) AM-X-CD-16-65, (3) 7770.00 panels, (3) RETs, (6) TMAs, (3) RRUS-11 RRHs, DC6-48 surge suppressor	120'	(3) 10' sector mounts	(6) 1-1/4", (2) 3/4" power, 5/16" fiber, 1/4"
2' dipole	91'	Leg	1/2"
Vacant mount	86'	3' sidearm	N.A.
GPS	82'	Leg	1/2"
13' dipole	71'	6' standoff	3/8"
10" x 8" flood light	68'	Leg	1/2"
10" x 8" flood light	62'	Leg	1/2"
Camera	23'	Leg	1/4"

¹ Six APL868013-42T0, three LNX-6514DS, and three BXA-185063 fed by twelve 1-5/8" coax currently installed.

CONDITION ASSESSMENT:

- **General Observations:** The tower, a 3-legged galvanized steel self-supporting tower, appeared to be in sound condition. No signs of movement or overstress of the tower were observed. Galvanizing appeared to be in good condition.
- **Leg Members:** Tower legs consist of pipe members; all appeared to be in good condition.
- **Lattice Bracing:** All braces appeared to be in good condition. Bracing connections were visually observed to the maximum extent practicable. No loose or missing bracing bolts were observed. U-bolts were missing at 64' and 84' from angle steel horizontal brace attachments on the southwest leg; these should be replaced.

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- **Splice Connections:** Connections were checked by hand for tightness at climbing leg splice connections. No loose or missing splice bolts were observed.
- **Antenna, Cable and Ground Connections:** Antenna mounting hardware appeared to be in good condition. Visible grounding system components were observed to be securely fastened and in good condition.

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with the Connecticut State Building Code and TIA-222, Revision G (TIA), Structural Standard for Antenna Supporting Structures and Antennas.

The analysis was conducted using a 3-second gust wind speed of 90 miles per hour with no ice and 40-mph with 3/4" radial ice in accordance with the TIA-222-G standard for Tolland County, Connecticut. The following additional design criteria were used:

Structure Class: II
Topographic Category: 1
Exposure Category: B

Analysis Results:

Analysis of the tower was conducted in accordance with the criteria outlined herein with antenna changes as previously described.

The following table summarizes the results of the analysis based on stresses of individual leg and bracing members:

Elevation	Legs	Bracing
160'-168'	3%	6%
140'-160'	28%	38%
120'-140'	65%	74%
100'-120'	73%	74%
80'-100'	94%	73%
60'-80'	99%	81%
40'-60'	92%	63%
20'-40'	99%	67%
0'-20'	94%	82%

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Bracing, Splice and Anchor Bolts:

Connection bolts were evaluated under the existing loading. All bolts were found to be adequately sized to support the existing loads.

Base Foundation:

Evaluation of the base foundations was performed from a foundation evaluation by URS Corporation. Reactions imposed by the existing equipment are within the design capacity of the foundation. Factored base reactions imposed with the existing equipment were calculated as follows:

Compression:	292.6 kips
Uplift:	261.2 kips
Shear:	30.8 kips
Overturning Moment:	4582 ft-kips

CONCLUSIONS AND RECOMMENDATIONS:

Our structural analysis indicates that the 168-foot self-supporting tower and foundations located at 1050 Buckley Highway in Union, Connecticut meets the requirements of the Connecticut State Building Code with Verizon Wireless's proposed changes.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in an undeteriorated condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower is in plumb condition.
6. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

All-Points Technology Corporation, P.C. (APT) is not responsible for modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Adding or relocating torque arms or guys.
4. Installing antenna mounting gates or side arms.

APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which is contrary to that which is contained herein, or you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

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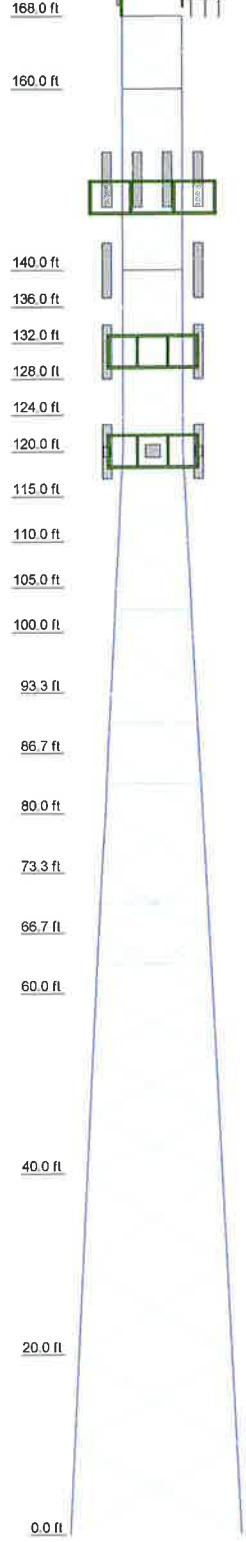
116 Grandview Road
Conway, NH 03818
(603) 496-5853

3 Saddlebrook Drive
Killingworth, CT 06419
(860) 663-1697

Appendix A

Tower Schematic

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20
Legs	ROHN 2.5 STD																			
Leg Grade	A572-50																			
Diagonals	L1 3/4x1 3/4x3/16																			
Diagonal Grade	A572-50																			
Top Girts	L2x2x1/8																			
Horizontals	N.A.																			
Face Width (ft)	18.85	12.77	12.06	11.42	10.74	10.07	9.39	8.72	8.21	7.7	7.2	6.86								
# Panels @ (ft)	4 @ 10	2 @ 3.332 @ 3.3351 @ 3.332 @ 3.3351 @ 6.672 @ 2.5	3 @ 3.332 @ 3.3351 @ 6.672 @ 2.5	3 @ 5	3 @ 5	3 @ 5	3 @ 5	3 @ 5	3 @ 5	3 @ 5	3 @ 5	12 @ 4								
Weight (lb)	15635.8	3130.2	2864.2	2600.0	2336.6	2060.0	1798.8	1541.9	1285.0	1028.1	771.3	514.0	257.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6' 4-bay dipole	168	4' sidearm	140
2'x2-3/8" Pipe Mount	168	4' sidearm	140
8' x 2' omni whip	168	4' sidearm	140
2'x2-3/8" Pipe Mount	168	(2) DB980H90E-M	131
6' Yagi	168	(2) DB980H90E-M	131
20' 4-Bay Dipole	168	(2) DB980H90E-M	131
10'x2 3/8" Pipe Mount	165	10' sector mount	131
3' sidearm	152	10' sector mount	131
3' sidearm	152	10' sector mount	131
3' sidearm	152	7770.00	120
(2) SBNHH-1D65B	150	7770.00	120
(2) SBNHH-1D65B	150	7770.00	120
(2) SBNHH-1D65B	150	P65-17-XL-R panel	120
WPA-80063/4CF	150	P65-17-XL-R panel	120
WPA-80063/4CF	150	AM-X-CD-16-65	120
(2) WPA-80063/4CF	150	7020.00 RET-RCU	120
WPA-80080/4CF	150	7020.00 RET-RCU	120
WPA-80080/4CF	150	7020.00 RET-RCU	120
ALU B66a RRH4x45w/bracket	149	(2) LGP2140X TMA	120
ALU B66a RRH4x45w/bracket	149	(2) LGP2140X TMA	120
ALU B66a RRH4x45w/bracket	149	(2) LGP2140X TMA	120
ALU B13 RRH4x30 w/bracket	149	Ericsson RRUS-11	120
ALU B13 RRH4x30 w/bracket	149	Ericsson RRUS-11	120
ALU B13 RRH4x30 w/bracket	149	Ericsson RRUS-11	120
Raycap RDC-3315-PF-48 J-box	149	Raycap DC6-48-60-18-8F surge suppressor	120
Raycap RDC-3315-PF-48 J-box	149	Raycap DC6-48-60-18-8F surge suppressor	120
16' sector mount	148	10' sector mount	120
16' sector mount	148	10' sector mount	120
16' sector mount	148	10' sector mount	120
LNx-6515DS-T4M	140	2' dipole	91
LNx-6515DS-T4M	140	3' sidearm	86
LNx-6515DS-T4M	140	GPS on 3' standoff	82
RR90-17-DP	140	13' dipole	71
RR90-17-DP	140	6'x2 3/8" Pipe Mount	71
RR90-17-DP	140	Flood light	68
LGP2140X TMA	140	Flood light	62
LGP2140X TMA	140	Camera	23
LGP2140X TMA	140		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2.5" Std with 3" Std split pipe	D	L3x3x3/16
B	3" Std with 3.5" Std split pipe	E	L2x2x3/16
C	L1 3/4x1 3/4x3/16		

MATERIAL STRENGTH

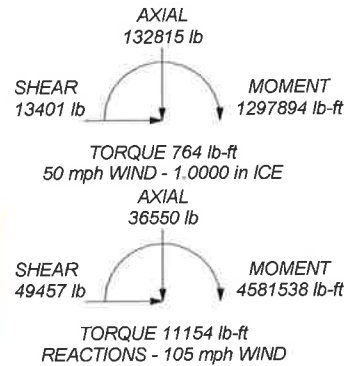
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

ALL REACTION FACTORS ARE FACTOR

MAX. CORNER REACTIONS AT BASE:

DOWN: 292630 lb
SHEAR: 30753 lb

UPLIFT: -261233 lb
SHEAR: 27706 lb



All-Points Technology Corporation

116 Grandview Road
Conway, NH 03818
Phone: (603) 496-5853
FAX: (603) 447-2124

Job: **168' Self-Supporting Tower**

Project: **CT231261 Union**

Client: Mariner Tower	Drawn by: Rob Adair	App'd:
Code: TIA-222-G	Date: 10/05/16	Scale: N
Path: Z:\Shared\NH Office\Jobs\CT231260 Union\CT231261 Union		Dwg No.:

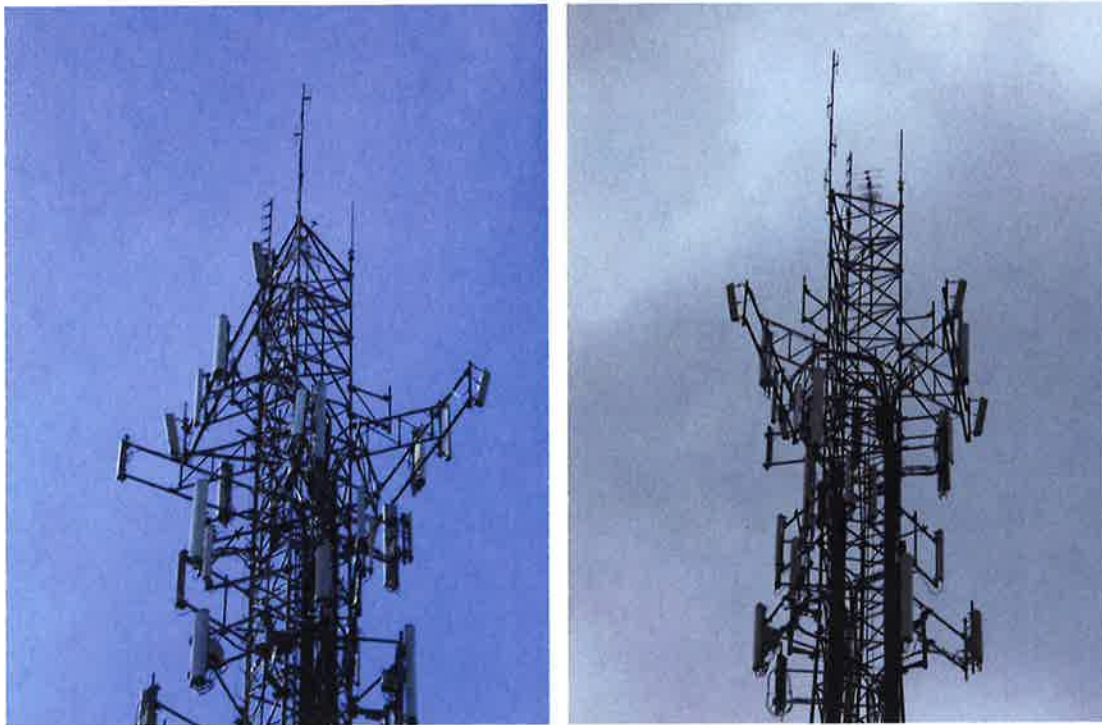
Appendix B

Photographs

MARINER TOWER
180' SELF-SUPPORTING TOWER
UNION, CONNECTICUT
SITE: UNION



Overview photos of 180' self-supporting tower.



Photos showing existing antennas on upper tower.

Photos taken by All-Points Technology Corporation, P.C. on September 29, 2016.

MARINER TOWER
180' SELF-SUPPORTING TOWER
UNION, CONNECTICUT
SITE: UNION



Photos of Verizon's existing waveguide cables.



Photo of Verizon's existing panel antennas.

Photos taken by All-Points Technology Corporation, P.C. on September 29, 2016.

MARINER TOWER
180' SELF-SUPPORTING TOWER
UNION, CONNECTICUT
SITE: UNION



Photos of Verizon's existing panel antennas.



MARINER TOWER
180' SELF-SUPPORTING TOWER
UNION, CONNECTICUT
SITE: UNION



Photo of typical foundation pier.



Photos of missing U-bolts at 64' and 84'.

Photos taken by All-Points Technology Corporation, P.C. on September 29, 2016.

MARINER TOWER
180' SELF-SUPPORTING TOWER
UNION, CONNECTICUT
SITE: UNION



Photos of compound and access driveway from tower.



Appendix C

Calculations

tnxTower All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	Job 168' Self-Supporting Tower	Page 2 of 9
	Project CT231261 Union	Date 15:12:24 10/05/16
	Client Mariner Tower	Designed by Rob Adair

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	lb	
6' 4-bay dipole	A	From Leg	0.00	0.00	0.0000	168.00	No Ice	2.20	2.20	65.00
			0.00	0.00			1/2" Ice	2.61	2.61	84.10
			5.00	0.00			1" Ice	2.97	2.97	107.47
2'x2-3/8" Pipe Mount	A	From Leg	0.00	0.00	0.0000	168.00	No Ice	0.34	0.34	7.50
			0.00	0.00			1/2" Ice	0.47	0.47	11.30
			1.00	0.00			1" Ice	0.61	0.61	16.72
8' x 2" omni whip	B	From Leg	0.00	0.00	0.0000	168.00	No Ice	1.60	1.60	50.00
			0.00	0.00			1/2" Ice	2.42	2.42	62.45
			6.00	0.00			1" Ice	3.24	3.24	80.14
2'x2-3/8" Pipe Mount	B	From Leg	0.00	0.00	0.0000	168.00	No Ice	0.34	0.34	7.50
			0.00	0.00			1/2" Ice	0.47	0.47	11.30
			1.00	0.00			1" Ice	0.61	0.61	16.72
6' Yagi	B	From Leg	0.00	0.00	0.0000	168.00	No Ice	0.00	0.00	0.00
			0.00	0.00			1/2" Ice	0.00	0.00	0.00
			2.00	0.00			1" Ice	0.00	0.00	0.00
10'x2 3/8" Pipe Mount	B	None			0.0000	165.00	No Ice	2.38	2.38	36.50
							1/2" Ice	3.40	3.40	54.35
							1" Ice	4.45	4.45	78.71
20' 4-Bay Dipole	C	From Leg	0.00	0.00	0.0000	168.00	No Ice	4.00	4.00	55.00
			0.00	0.00			1/2" Ice	6.00	6.00	100.00
			10.00	0.00			1" Ice	8.00	8.00	145.00
3' sidearm	A	None			0.0000	152.00	No Ice	1.43	0.72	30.00
							1/2" Ice	2.18	1.09	65.00
							1" Ice	2.93	1.47	105.00
3' sidearm	B	None			0.0000	152.00	No Ice	1.43	0.72	30.00
							1/2" Ice	2.18	1.09	65.00
							1" Ice	2.93	1.47	105.00
3' sidearm	C	None			0.0000	152.00	No Ice	1.43	0.72	30.00
							1/2" Ice	2.18	1.09	65.00
							1" Ice	2.93	1.47	105.00
(2) SBNHH-1D65B	A	From Leg	4.00	0.00	0.0000	150.00	No Ice	8.08	5.34	50.00
			0.00	0.00			1/2" Ice	8.53	5.79	100.05
			0.00	0.00			1" Ice	9.00	6.26	156.20
(2) SBNHH-1D65B	B	From Leg	4.00	0.00	0.0000	150.00	No Ice	8.08	5.34	50.00
			0.00	0.00			1/2" Ice	8.53	5.79	100.05
			0.00	0.00			1" Ice	9.00	6.26	156.20
(2) SBNHH-1D65B	C	From Leg	4.00	0.00	0.0000	150.00	No Ice	8.08	5.34	50.00
			0.00	0.00			1/2" Ice	8.53	5.79	100.05
			0.00	0.00			1" Ice	9.00	6.26	156.20
WPA-80063/4CF	A	From Leg	4.00	0.00	0.0000	150.00	No Ice	4.92	2.02	20.00
			0.00	0.00			1/2" Ice	5.24	2.31	47.69
			0.00	0.00			1" Ice	5.57	2.62	79.66
WPA-80063/4CF	B	From Leg	4.00	0.00	0.0000	150.00	No Ice	4.92	2.02	20.00
			0.00	0.00			1/2" Ice	5.24	2.31	47.69
			0.00	0.00			1" Ice	5.57	2.62	79.66
(2) WPA-80063/4CF	C	From Leg	4.00	0.00	0.0000	150.00	No Ice	4.92	2.02	20.00
			0.00	0.00			1/2" Ice	5.24	2.31	47.69
			0.00	0.00			1" Ice	5.57	2.62	79.66
WPA-80080/4CF	A	From Leg	4.00	0.00	0.0000	150.00	No Ice	4.71	2.25	20.00
			0.00	0.00			1/2" Ice	5.03	2.55	47.83
			0.00	0.00			1" Ice	5.35	2.85	79.94
WPA-80080/4CF	B	From Leg	4.00	0.00	0.0000	150.00	No Ice	4.71	2.25	20.00
			0.00	0.00			1/2" Ice	5.03	2.55	47.83
			0.00	0.00			1" Ice	5.35	2.85	79.94
ALU B66a RRH4x45w/bracket	A	From Leg	3.50	0.00	0.0000	149.00	No Ice	2.58	1.63	80.00
			0.00	0.00			1/2" Ice	2.79	1.81	100.47

tnxTower All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	Job	168' Self-Supporting Tower	Page	3 of 9
	Project	CT231261 Union	Date	15:12:24 10/05/16
	Client	Mariner Tower	Designed by	Rob Adair

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	lb
			0.00			1" Ice	3.01	2.00	124.06
ALU B66a	B	From Leg	3.50		0.0000	No Ice	2.58	1.63	80.00
RRH4x45w/bracket			0.00			1/2" Ice	2.79	1.81	100.47
			0.00			1" Ice	3.01	2.00	124.06
ALU B66a	C	From Leg	3.50		0.0000	No Ice	2.58	1.63	80.00
RRH4x45w/bracket			0.00			1/2" Ice	2.79	1.81	100.47
			0.00			1" Ice	3.01	2.00	124.06
ALU B13 RRH4x30	A	From Leg	3.50		0.0000	No Ice	2.16	1.80	60.00
w/bracket			0.00			1/2" Ice	2.35	1.98	80.73
			0.00			1" Ice	2.55	2.17	104.49
ALU B13 RRH4x30	B	From Leg	3.50		0.0000	No Ice	2.16	1.80	60.00
w/bracket			0.00			1/2" Ice	2.35	1.98	80.73
			0.00			1" Ice	2.55	2.17	104.49
ALU B13 RRH4x30	C	From Leg	3.50		0.0000	No Ice	2.16	1.80	60.00
w/bracket			0.00			1/2" Ice	2.35	1.98	80.73
			0.00			1" Ice	2.55	2.17	104.49
Raycap RDC-3315-PF-48	A	From Leg	3.50		0.0000	No Ice	2.51	1.64	30.00
J-box			0.00			1/2" Ice	2.71	1.81	52.86
			0.00			1" Ice	2.91	1.98	78.84
Raycap RDC-3315-PF-48	A	From Leg	3.50		0.0000	No Ice	2.51	1.64	30.00
J-box			0.00			1/2" Ice	2.71	1.81	52.86
			0.00			1" Ice	2.91	1.98	78.84
16' sector mount	A	None			0.0000	No Ice	11.25	5.63	500.00
						1/2" Ice	15.45	7.72	650.00
						1" Ice	19.65	9.82	800.00
16' sector mount	B	None			0.0000	No Ice	11.25	5.63	500.00
						1/2" Ice	15.45	7.72	650.00
						1" Ice	19.65	9.82	800.00
16' sector mount	C	None			0.0000	No Ice	11.25	5.63	500.00
						1/2" Ice	15.45	7.72	650.00
						1" Ice	19.65	9.82	800.00
LNx-6515DS-T4M	A	From Leg	4.00		0.0000	No Ice	11.39	7.66	50.00
			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
LNx-6515DS-T4M	B	From Leg	4.00		0.0000	No Ice	11.39	7.66	50.00
			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
LNx-6515DS-T4M	C	From Leg	4.00		0.0000	No Ice	11.39	7.66	50.00
			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
RR90-17-DP	A	From Leg	4.00		0.0000	No Ice	4.36	1.97	18.00
			0.00			1/2" Ice	4.70	2.31	40.42
			0.00			1" Ice	5.06	2.66	67.36
RR90-17-DP	B	From Leg	4.00		0.0000	No Ice	4.36	1.97	18.00
			0.00			1/2" Ice	4.70	2.31	40.42
			0.00			1" Ice	5.06	2.66	67.36
RR90-17-DP	C	From Leg	4.00		0.0000	No Ice	4.36	1.97	18.00
			0.00			1/2" Ice	4.70	2.31	40.42
			0.00			1" Ice	5.06	2.66	67.36
LGP2140X TMA	A	From Leg	3.50		0.0000	No Ice	1.08	0.36	20.00
			0.00			1/2" Ice	1.21	0.45	27.13
			0.00			1" Ice	1.35	0.56	36.14
LGP2140X TMA	B	From Leg	3.50		0.0000	No Ice	1.08	0.36	20.00
			0.00			1/2" Ice	1.21	0.45	27.13
			0.00			1" Ice	1.35	0.56	36.14
LGP2140X TMA	C	From Leg	3.50		0.0000	No Ice	1.08	0.36	20.00
			0.00			1/2" Ice	1.21	0.45	27.13
			0.00			1" Ice	1.35	0.56	36.14
4' sidearm	A	None			0.0000	No Ice	2.43	1.22	50.00

tnxTower All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	Job	168' Self-Supporting Tower	Page	4 of 9
	Project	CT231261 Union	Date	15:12:24 10/05/16
	Client	Mariner Tower	Designed by	Rob Adair

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft		C _{AA}	C _{AA}	Weight
							Front ft ²	Side ft ²	lb
						1/2" Ice	3.50	1.75	100.00
						1" Ice	4.50	2.25	175.00
4' sidearm	B	None		0.0000	140.00	No Ice	2.43	1.22	50.00
						1/2" Ice	3.50	1.75	100.00
						1" Ice	4.50	2.25	175.00
4' sidearm	C	None		0.0000	140.00	No Ice	2.43	1.22	50.00
						1/2" Ice	3.50	1.75	100.00
						1" Ice	4.50	2.25	175.00
(2) DB980H90E-M	A	From Leg	3.00 0.00 0.00	0.0000	131.00	No Ice	3.80	2.19	8.50
						1/2" Ice	4.18	2.56	28.62
						1" Ice	4.56	2.92	53.41
(2) DB980H90E-M	B	From Leg	3.00 0.00 0.00	0.0000	131.00	No Ice	3.80	2.19	8.50
						1/2" Ice	4.18	2.56	28.62
						1" Ice	4.56	2.92	53.41
(2) DB980H90E-M	C	From Leg	3.00 0.00 0.00	0.0000	131.00	No Ice	3.80	2.19	8.50
						1/2" Ice	4.18	2.56	28.62
						1" Ice	4.56	2.92	53.41
10' sector mount	A	None		0.0000	131.00	No Ice	7.58	3.79	300.00
						1/2" Ice	10.73	5.36	350.00
						1" Ice	13.88	6.94	425.00
10' sector mount	B	None		0.0000	131.00	No Ice	7.58	3.79	300.00
						1/2" Ice	10.73	5.36	350.00
						1" Ice	13.88	6.94	425.00
10' sector mount	C	None		0.0000	131.00	No Ice	7.58	3.79	300.00
						1/2" Ice	10.73	5.36	350.00
						1" Ice	13.88	6.94	425.00
7770.00	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	5.51	2.93	35.00
						1/2" Ice	5.87	3.27	67.63
						1" Ice	6.23	3.63	105.06
7770.00	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	5.51	2.93	35.00
						1/2" Ice	5.87	3.27	67.63
						1" Ice	6.23	3.63	105.06
7770.00	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	5.51	2.93	35.00
						1/2" Ice	5.87	3.27	67.63
						1" Ice	6.23	3.63	105.06
P65-17-XL-R panel	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	11.47	6.80	60.00
						1/2" Ice	12.08	7.38	122.06
						1" Ice	12.71	7.98	191.70
P65-17-XL-R panel	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	11.47	6.80	60.00
						1/2" Ice	12.08	7.38	122.06
						1" Ice	12.71	7.98	191.70
AM-X-CD-16-65	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	6.04	4.11	35.00
						1/2" Ice	6.41	4.45	76.48
						1" Ice	6.77	4.80	122.98
7020.00 RET-RCU	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	0.34	0.10	5.00
						1/2" Ice	0.42	0.14	7.94
						1" Ice	0.51	0.20	12.09
7020.00 RET-RCU	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	0.34	0.10	5.00
						1/2" Ice	0.42	0.14	7.94
						1" Ice	0.51	0.20	12.09
7020.00 RET-RCU	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	0.34	0.10	5.00
						1/2" Ice	0.42	0.14	7.94
						1" Ice	0.51	0.20	12.09
(2) LGP2140X TMA	A	From Leg	2.50 0.00 0.00	0.0000	120.00	No Ice	1.08	0.36	20.00
						1/2" Ice	1.21	0.45	27.13
						1" Ice	1.35	0.56	36.14
(2) LGP2140X TMA	B	From Leg	2.50 0.00 0.00	0.0000	120.00	No Ice	1.08	0.36	20.00
						1/2" Ice	1.21	0.45	27.13
						1" Ice	1.35	0.56	36.14

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	Client	Mariner Tower	Designed by	Rob Adair

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz Lateral	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	lb
(2) LGP2140X TMA	C	From Leg	2.50	0.0000	120.00	No Ice	1.08	0.36	20.00
			0.00			1/2" Ice	1.21	0.45	27.13
			0.00			1" Ice	1.35	0.56	36.14
Ericsson RRUS-11	A	From Leg	2.50	0.0000	120.00	No Ice	2.79	1.02	55.00
			0.00			1/2" Ice	3.00	1.16	75.86
			0.00			1" Ice	3.21	1.30	99.77
Ericsson RRUS-11	B	From Leg	2.50	0.0000	120.00	No Ice	2.79	1.02	55.00
			0.00			1/2" Ice	3.00	1.16	75.86
			0.00			1" Ice	3.21	1.30	99.77
Ericsson RRUS-11	C	From Leg	2.50	0.0000	120.00	No Ice	2.79	1.02	55.00
			0.00			1/2" Ice	3.00	1.16	75.86
			0.00			1" Ice	3.21	1.30	99.77
Raycap DC6-48-60-18-8F surge suppressor	C	None	0.0000	120.00	No Ice	0.74	0.74	30.00	
					1/2" Ice	1.20	1.20	44.34	
					1" Ice	1.37	1.37	60.93	
10' sector mount	A	None	0.0000	120.00	No Ice	7.58	3.79	300.00	
					1/2" Ice	10.73	5.36	350.00	
					1" Ice	13.88	6.94	425.00	
10' sector mount	B	None	0.0000	120.00	No Ice	7.58	3.79	300.00	
					1/2" Ice	10.73	5.36	350.00	
					1" Ice	13.88	6.94	425.00	
10' sector mount	C	None	0.0000	120.00	No Ice	7.58	3.79	300.00	
					1/2" Ice	10.73	5.36	350.00	
					1" Ice	13.88	6.94	425.00	
2' dipole	C	None	0.0000	91.00	No Ice	0.30	0.30	10.00	
					1/2" Ice	0.43	0.43	13.28	
					1" Ice	0.56	0.56	18.14	
3' sidearm	C	None	0.0000	86.00	No Ice	1.43	0.72	30.00	
					1/2" Ice	2.18	1.09	65.00	
					1" Ice	2.93	1.47	105.00	
GPS on 3' standoff	C	None	0.0000	82.00	No Ice	0.60	0.60	50.00	
					1/2" Ice	0.79	0.79	55.81	
					1" Ice	0.99	0.99	63.86	
13' dipole	C	From Leg	6.00	0.0000	71.00	No Ice	2.80	2.80	75.00
			0.00			1/2" Ice	4.22	4.22	96.61
			0.00			1" Ice	5.67	5.67	127.13
6'x2 3/8" Pipe Mount	C	None	0.0000	71.00	No Ice	1.43	1.43	21.90	
					1/2" Ice	1.92	1.92	32.73	
					1" Ice	2.29	2.29	47.61	
Flood light	C	None	0.0000	68.00	No Ice	0.18	0.18	8.00	
					1/2" Ice	0.25	0.25	10.47	
					1" Ice	0.33	0.33	13.91	
Flood light	B	None	0.0000	62.00	No Ice	0.18	0.18	8.00	
					1/2" Ice	0.25	0.25	10.47	
					1" Ice	0.33	0.33	13.91	
Camera	B	None	0.0000	23.00	No Ice	0.93	0.62	75.00	
					1/2" Ice	1.07	0.73	84.24	
					1" Ice	1.21	0.85	95.48	

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Solution Summary

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	168 - 160	5.167	12	0.2674	0.0031
T2	160 - 140	4.718	12	0.2670	0.0031
T3	140 - 136	3.601	12	0.2574	0.0039
T4	136 - 132	3.382	12	0.2518	0.0041
T5	132 - 128	3.168	12	0.2442	0.0044
T6	128 - 124	2.961	12	0.2347	0.0046
T7	124 - 120	2.760	12	0.2273	0.0047
T8	120 - 115	2.567	12	0.2186	0.0048
T9	115 - 110	2.334	12	0.2089	0.0049
T10	110 - 105	2.115	12	0.1986	0.0049
T11	105 - 100	1.905	12	0.1877	0.0048
T12	100 - 93.33	1.706	12	0.1763	0.0046
T13	93.33 - 86.66	1.462	12	0.1608	0.0044
T14	86.66 - 80	1.240	12	0.1449	0.0041
T15	80 - 73.33	1.040	12	0.1285	0.0038
T16	73.33 - 66.66	0.863	12	0.1144	0.0035
T17	66.66 - 60	0.705	12	0.1002	0.0031
T18	60 - 40	0.568	12	0.0857	0.0027
T19	40 - 20	0.252	12	0.0537	0.0017
T20	20 - 0	0.070	12	0.0239	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	6' 4-bay dipole	12	5.167	0.2674	0.0031	Inf
165.00	10'x2 3/8" Pipe Mount	12	4.998	0.2673	0.0031	Inf
152.00	3' sidearm	12	4.269	0.2657	0.0032	348334
150.00	(2) SBNHH-1D65B	12	4.157	0.2650	0.0033	255828
149.00	ALU B66a RRH4x45w/bracket	12	4.101	0.2645	0.0033	225841
148.00	16' sector mount	12	4.045	0.2640	0.0034	202146
140.00	LNX-6515DS-T4M	12	3.601	0.2574	0.0039	74123
131.00	(2) DB980H90E-M	12	3.116	0.2419	0.0044	32367
120.00	7770.00	12	2.567	0.2186	0.0048	30176
91.00	2' dipole	12	1.382	0.1554	0.0043	24575
86.00	3' sidearm	12	1.219	0.1433	0.0041	25802
82.00	GPS on 3' standoff	12	1.097	0.1332	0.0039	21713
71.00	13' dipole	12	0.806	0.1096	0.0034	29708
68.00	Flood light	12	0.736	0.1031	0.0032	26449
62.00	Flood light	12	0.607	0.0899	0.0029	29212
23.00	Camera	12	0.089	0.0281	0.0010	35787

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Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria
T1	168	Leg	A325N	0.6250	4	234.99	20708.70	0.011	1	Bolt Tension
		Diagonal	A325N	0.6250	1	457.51	8775.00	0.052	1	Member Bearing
		Top Girt	A325N	0.6250	1	89.26	12425.20	0.007	1	Bolt Shear
T2	160	Leg	A325N	0.6250	4	3404.59	20708.70	0.164	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3038.63	8775.00	0.346	1	Member Bearing
		Top Girt	A325N	0.6250	1	46.47	5220.00	0.009	1	Member Bearing
T3	140	Diagonal	A325N	0.6250	1	3976.43	8775.00	0.453	1	Member Bearing
		Top Girt	A325N	0.6250	1	252.07	5220.00	0.048	1	Member Bearing
T4	136	Diagonal	A325N	0.6250	1	4365.23	8775.00	0.497	1	Member Bearing
T5	132	Diagonal	A325N	0.6250	1	5127.59	8775.00	0.584	1	Member Bearing
T6	128	Diagonal	A325N	0.6250	1	5732.32	8775.00	0.653	1	Member Bearing
T7	124	Leg	A325N	0.7500	4	13702.80	29820.60	0.460	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5989.68	8775.00	0.683	1	Member Bearing
T8	120	Diagonal	A325N	0.6250	1	5228.04	8775.00	0.596	1	Member Bearing
T9	115	Diagonal	A325N	0.6250	1	5508.95	8775.00	0.628	1	Member Bearing
T10	110	Diagonal	A325N	0.6250	1	5408.00	8775.00	0.616	1	Member Bearing
T11	105	Leg	A325N	0.8750	4	23931.80	40589.10	0.590	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5601.07	8775.00	0.638	1	Member Bearing
		Horizontal	A325N	0.7500	1	1861.69	10603.10	0.176	1	Member Bearing
T12	100	Diagonal	A325N	0.6250	1	6264.02	8775.00	0.714	1	Member Bearing
T13	93.33	Diagonal	A325N	0.6250	1	6486.98	8775.00	0.739	1	Member Bearing
		Horizontal	A325N	0.7500	1	2289.54	10603.10	0.216	1	Member Bearing
T14	86.66	Leg	A325N	0.8750	4	32560.60	40589.10	0.802	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6599.14	8775.00	0.752	1	Member Bearing
		Horizontal	A325N	0.7500	1	2508.86	10603.10	0.237	1	Member Bearing
T15	80	Diagonal	A325N	0.6250	1	6816.54	11700.00	0.583	1	Member Bearing
T16	73.33	Diagonal	A325N	0.6250	1	7271.44	11700.00	0.621	1	Member Bearing
		Horizontal	A325N	0.7500	1	2948.07	10603.10	0.278	1	Member Bearing
T17	66.66	Leg	A325N	1.0000	4	41092.20	53014.40	0.775	1	Bolt Tension
		Diagonal	A325N	0.6250	1	7304.70	11700.00	0.624	1	Member Bearing
		Horizontal	A325N	0.6250	2	1581.25	11700.00	0.135	1	Member Bearing
T18	60	Leg	A325N	1.0000	6	32865.90	53014.40	0.620	1	Bolt Tension
		Diagonal	A325N	0.6250	1	7920.12	11700.00	0.677	1	Member Bearing
T19	40	Leg	A325N	1.0000	6	37548.70	53014.40	0.708	1	Bolt Tension
		Diagonal	A325N	0.6250	1	9221.60	11700.00	0.788	1	Member Bearing
T20	20	Leg	A325N	1.0000	6	42348.50	53014.40	0.799	1	Bolt Tension
		Diagonal	A325N	0.7500	1	9467.57	14137.50	0.670	1	Member Bearing

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	Client Mariner Tower	Designed by Rob Adair

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	168 - 160	Leg	ROHN 2.5 STD	3	-1875.11	63560.30	3.0	Pass
		Diagonal	L1 3/4x1 3/4x3/16	11	-493.87	8139.64	6.1	Pass
		Top Girt	L1 3/4x1 3/4x3/16	4	-89.26	2762.38	3.2	Pass
T2	160 - 140	Leg	ROHN 2.5 STD	21	-17782.50	63560.30	28.0	Pass
		Diagonal	L1 3/4x1 3/4x3/16	26	-3063.62	8139.64	37.6	Pass
		Top Girt	L2x2x1/8	22	41.84	12744.10	1.1	Pass
T3	140 - 136	Leg	ROHN 2.5 STD	57	-24503.20	63560.30	38.6	Pass
		Diagonal	L1 3/4x1 3/4x3/16	62	-4067.57	8139.64	50.0	Pass
		Top Girt	L2x2x1/8	58	-88.39	2886.36	3.1	Pass
						4.8 (b)		
T4	136 - 132	Leg	ROHN 2.5 STD	69	-32776.00	63560.30	51.6	Pass
		Diagonal	L1 3/4x1 3/4x3/16	71	-4279.71	8139.64	52.6	Pass
T5	132 - 128	Leg	ROHN 2.5 STD	78	-41550.50	63560.30	65.4	Pass
		Diagonal	L1 3/4x1 3/4x3/16	80	-5224.92	8139.64	64.2	Pass
T6	128 - 124	Leg	2.5" Std with 3" Std split pipe	87	-52404.20	105167.00	49.8	Pass
		Diagonal	L1 3/4x1 3/4x3/16	89	-5629.91	8139.64	69.2	Pass
T7	124 - 120	Leg	2.5" Std with 3" Std split pipe	96	-62497.30	105167.00	59.4	Pass
		Diagonal	L1 3/4x1 3/4x3/16	98	-6116.30	8272.70	73.9	Pass
T8	120 - 115	Leg	3" Std with 3.5" Std split pipe	105	-74274.10	131869.00	56.3	Pass
		Diagonal	L2x2x3/16	109	-5413.01	9726.21	55.7	Pass
							59.6 (b)	
T9	115 - 110	Leg	3" Std with 3.5" Std split pipe	114	-86453.90	131873.00	65.6	Pass
		Diagonal	L2x2x3/16	116	-5406.12	8846.62	61.1	Pass
							62.8 (b)	
T10	110 - 105	Leg	3" Std with 3.5" Std split pipe	123	-96447.00	131869.00	73.1	Pass
		Diagonal	L2x2x3/16	125	-5522.07	8045.37	68.6	Pass
T11	105 - 100	Leg	3" Std with 3.5" Std split pipe	132	-107345.00	152785.00	70.3	Pass
		Diagonal	L2x2x3/16	135	-5507.51	7450.84	73.9	Pass
		Horizontal	L3x3x3/16	136	-1861.69	27285.90	6.8	Pass
							17.6 (b)	
T12	100 - 93.33	Leg	ROHN 3.5 EH	150	-118618.00	125695.00	94.4	Pass
		Diagonal	L2 1/2x2 1/2x3/16	152	-6335.11	10958.00	57.8	Pass
							71.4 (b)	
T13	93.33 - 86.66	Leg	ROHN 3.5 EH	159	-132016.00	154519.00	85.4	Pass
		Diagonal	L2 1/2x2 1/2x3/16	162	-6567.11	10165.70	64.6	Pass
							73.9 (b)	
		Horizontal	L2x2x3/16	166	-2289.54	7888.39	29.0	Pass
T14	86.66 - 80	Leg	ROHN 3.5 EH	177	-144666.00	154552.00	93.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	180	-6738.78	9247.40	72.9	Pass
							75.2 (b)	
		Horizontal	L2x2x3/16	181	-2508.86	6866.46	36.5	Pass
T15	80 - 73.33	Leg	ROHN 4 EH	195	-157756.00	159875.00	98.7	Pass
		Diagonal	L2 1/2x2 1/2x1/4	197	-6830.69	10829.60	63.1	Pass
T16	73.33 - 66.66	Leg	ROHN 4 EH	204	-169993.00	187930.00	90.5	Pass
		Diagonal	L2 1/2x2 1/2x1/4	207	-7428.01	10054.80	73.9	Pass
		Horizontal	L3x3x3/16	208	-2948.07	18397.30	16.0	Pass
							27.8 (b)	
T17	66.66 - 60	Leg	ROHN 4 EH	222	-182349.00	187959.00	97.0	Pass
		Diagonal	L2 1/2x2 1/2x1/4	225	-7486.78	9210.51	81.3	Pass
		Horizontal	L2x2x3/16	226	-3162.49	4792.93	66.0	Pass
T18	60 - 40	Leg	ROHN 5 EH	240	-219242.00	239385.00	91.6	Pass
		Diagonal	L3x3x1/4	242	-7941.46	12706.00	62.5	Pass
							67.7 (b)	
T19	40 - 20	Leg	ROHN 6 EHS	261	-241374.00	244059.00	98.9	Pass
		Diagonal	L3 1/2x3 1/2x1/4	263	-9340.09	14026.70	66.6	Pass
							78.8 (b)	
T20	20 - 0	Leg	ROHN 6 EH	276	-284295.00	303741.00	93.6	Pass
		Diagonal	L3 1/2x3 1/2x1/4	278	-9643.81	11758.10	82.0	Pass

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	Client	Mariner Tower	Designed by	Rob Adair

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\emptyset P_{allow}$ lb	% Capacity	Pass Fail	
							Summary		
							Leg (T19)	98.9	Pass
							Diagonal (T20)	82.0	Pass
							Horizontal (T17)	66.0	Pass
							Top Girt (T3)	4.8	Pass
							Bolt Checks	80.2	Pass
							RATING =	98.9	Pass

All-Points Technology Corp., P.C.

116 Grandview Road
Conway, NH 03818
(603) 496-5853

Client: **Mariner Tower**
Job: **Union, CT**
Calculated By: **R. Adair**

Site: **Union**
Job No.: **CT231261**
Date: **5-Oct-16**

References: TIA-222, Structural Standards for Towers
Wang & Salmon, Reinforced Concrete Design, Chapter 20

TOWER PIER/FOOTING DESIGN

Program assumes:

Footing is square in plan view.
Pier above footing is cylindrical in shape.
Unit weight of concrete = 150 pcf
Submerged unit wt of concrete = 87.6 pcf
Unit weight of soil = 100 pcf
Submerged unit weight of soil = 37.6 pcf
Concrete strength = 3000 psi
Reinforcing strength = 60000 psi

Information to be provided:

C = Compression force to be resisted	C = 292.6 kips
T = Uplift force to be resisted	T = 261.2 kips
H = Height from ground surface to bottom of footing	H = 7.7 feet
w = depth from ground surface to water table	w = 7.7 feet
y = Height of footing	y = 2.0 feet
x = Width of footing	x = 6.25 feet
d = Diameter of pier	d = 3.00 feet
S.F. = Safety factor	S.F. = 1.0

Input satisfactory

OUTPUT:

Depth of footing =	d =	20 in.
Net Allowable Soil Pressure =		6.13 ksf
Factored Live & Dead Loads =		312.45 kips
Total Uplift Resistance =		67.29 kips
Supplemental Uplift Resist. Req'd =		193.91 kips
Concrete Quantity =		4.4 c.y. per foundation
Tension Reinf. Req'd =		7.26 in⁴

All-Points Technology Corp., P.C.

116 Grandview Road
Conway, NH 03818
(603) 496-5853

Client: Mariner Tower
Job: Union, CT
Calculated By: R. Adair

Site: Union
Job No.: CT231261
Date: 10/5/2016

FOOTING REINFORCEMENT DESIGN:

Shear Reinforcement - Two Way

Ultimate shear = $V_U = 255.91$ kips
 $v_n = 67.20$ psi
 $v_c = 219.09$ psi **No shear reinf. needed**

Shear Reinforcement - One Way

Ultimate shear = $V_U = -2.08$ kips
 $v_n = -1.63$ psi
 $v_c = 109.54$ psi **No shear reinf. needed**

Transfer of Load at Base of Column

Compressive design strength = 1816.91 kips **No dowels needed**
Area of Dowels Req'd = **None Required**

Calculate Required Footing Steel

Ultimate moment = $M_U = 66$ ft-kips
 $R_U = 49$ psi
Reinforcement ratio = $p = 0.00082$
Area of Steel Req'd : $A_S = 1.23$ in² or 0.20 in²/ft of width

$C/a = 191$ kips/in.
 $T = 74$ kips
 $a = 0.39$ in.
 $M_n = 110$ ft-kips **O.K.**

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Job No.: CT231261
Date: 10/5/16

References: 1. Navy Design Manual DM 7.2, page 7.2-170
2. ASCE - Rock Foundations, Equation 9-3
3. Post-Tensioning Institute: Post-Tensioning Manual, Chapter 4

Program assumes:

Uplift resisted by cone of rock at 30° from vertical
Unit weight of rock = 160 pcf

Information to be provided:

R _v = Vertical force to be resisted	R _v =	193.9 kips
S.F. = Factor of Safety	S.F. =	1.0
T _w = Ultimate bond stress	T _w =	60 psi
d = Drill hole diameter	d =	3.5 inches
F _y = Yield stress of anchor rod	F _y =	127.7 ksi
N = Number of bars	N =	2
D _b = Diameter of bars	D _b =	1.75

SIZE OF ROD REQUIRED:

Resultant force x Factor of Safety =	193.9 kips
Allowable Stress on Bars =	368.6 kips
Usage of bars =	53%
Rod Length Required =	15.1 feet
Area of Rod Required =	1.27 square inches
	1.27 in. diameter

ATTACHMENT 4



necog

ashford brooklyn canterbury chaplin eastford hampton killing
pomfret putnam scotland sterling thompson union voluntown

Search...

CT-145-13-18-000020

Description



[Parcel Report](#) [Abutters Report](#)

Owner: KEMP WAYNE & KATHY LEE

Address: 1050 BUCKLEY HIGHWAY

Town: Union

Details

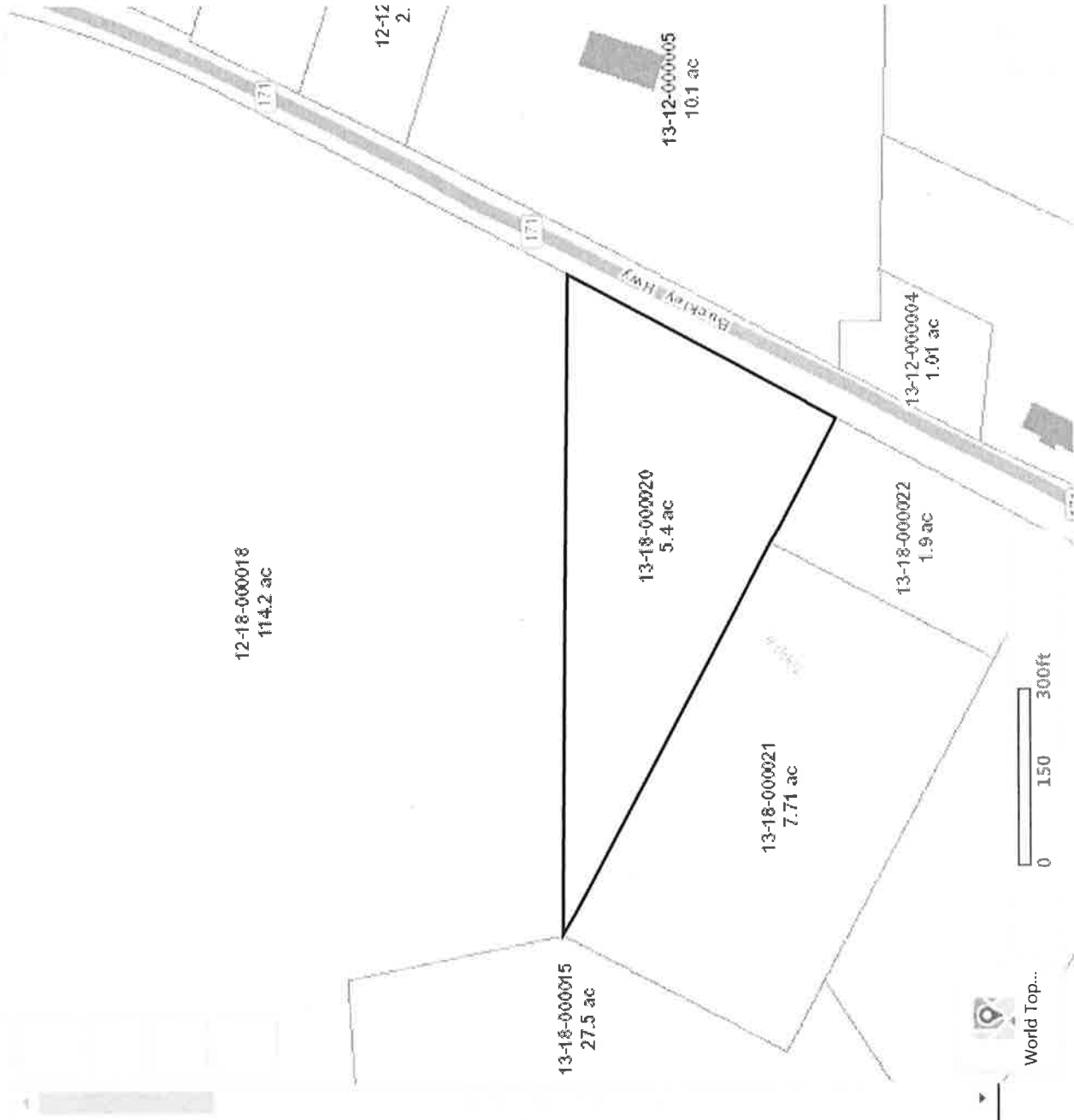
Owner Name
KEMP WAYNE & KATHY LEE

Street Address
1050 BUCKLEY HIGHWAY

Town
N/A

Gis ID
CT-145-13-18-000020

I want to...



World Top...

1050 BUCKLEY HIGHWAY

Location 1050 BUCKLEY HIGHWAY

Assessment \$407,340

Mblu 13/ 18/ 020/ /

Appraisal \$581,910

Acct# 00023000

PID 186

Owner KEMP WAYNE & KATHY LEE

Building Count 3

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2014	\$334,280	\$247,630	\$581,910
Assessment			
Valuation Year	Improvements	Land	Total
2014	\$234,000	\$173,340	\$407,340

Owner of Record

Owner KEMP WAYNE & KATHY LEE

Sale Price \$135,000

Co-Owner

Certificate

Address 1050 BUCKLEY HWY
UNION, CT 06076

Book & Page 39/384

Sale Date 11/14/1996

Instrument Q

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
KEMP WAYNE & KATHY LEE	\$135,000		39/384	Q	11/14/1996

Building Information

Building 1 : Section 1

Year Built: 1959

Living Area: 1720

Replacement Cost: \$206,928

Building Percent 66

Good:

Replacement Cost

Less Depreciation: \$136,570

Building Attributes	
Field	Description
Style	Ranch

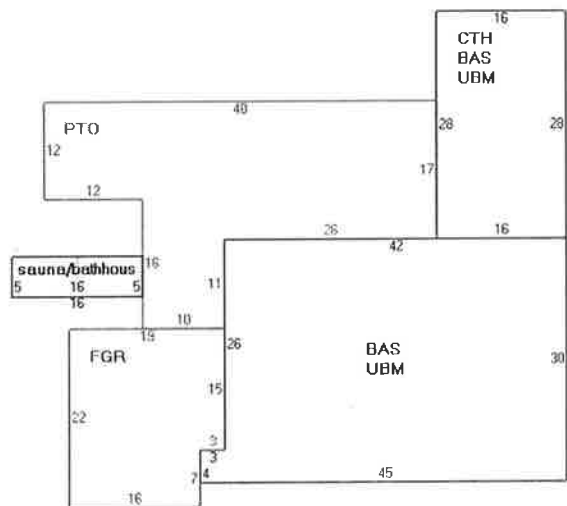
Model	Residential
Grade:	C+
Stories:	1 Story
Occupancy	1
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure:	Gable or Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	Quarry Tile
Heat Fuel	Oil
Heat Type:	Forced Air
AC Type:	Central
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	5 Rooms
Bath Style:	Modern
Kitchen Style:	Average

Building Photo



(<http://images.vgsi.com/photos/UnionCTPhotos//\00\00\01\12>).

Building Layout



Building Sub-Areas			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	1720	1720	
CTH	Cathedral Ceiling	448	0	
FGR	Garage	397	0	
PTO	Patio	866	0	
UBM	Unfinished Basement	1720	0	
		5151	1720	

Building 2 : Section 1

Year Built:	1999
Living Area:	2200
Replacement Cost:	\$129,404
Building Percent Good:	89

Replacement Cost
Less Depreciation: \$115,170

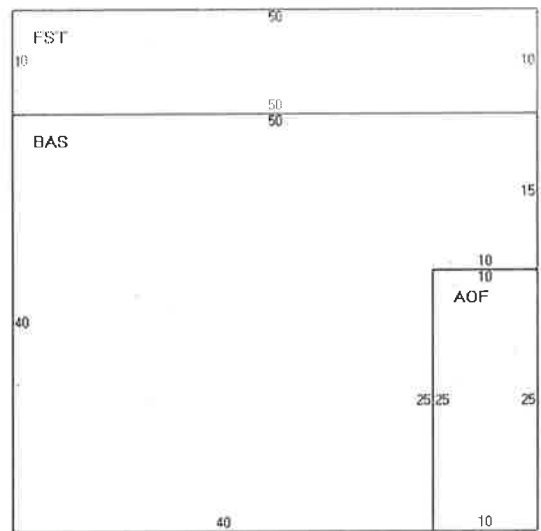
Building Attributes : Bldg 2 of 3	
Field	Description
STYLE	Garage/Office
MODEL	Commercial
Grade	Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable or Hip
Roof Cover	Asphalt
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Gravity Air
AC Type	None/Partial
Bldg Use	STORE/SHOP
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	None
Frame Type	Wood Frame
Baths/Plumbing	Light
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	Light
Wall Height	13.00
% Corn Wall	0.00

Building Photo



(<http://images.vgsi.com/photos/UnionCTPhotos//\00\00\04\19>)

Building Layout



Building Sub-Areas		Legend	
Code	Description	Gross Area	Living Area
BAS	First Floor	1750	1750
AOF	Office	250	250
FST	Finished Utility/Storage	500	200
		2500	2200

Building 3 : Section 1

Year Built:
Living Area: 0
Replacement Cost: \$0
Building Percent Good:
Replacement Cost
Less Depreciation: \$0

Building Attributes : Bldg 3 of 3
--

Field	Description
Style	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	

Building Photo



(<http://images.vgsi.com/photos/UnionCTPhotos//default.jpg>)

Building Layout

Building Layout

Building Sub-Areas	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
WHL	WHIRLPOOL	1.00 UNITS	\$2,310	1
FPL1	FIREPLACE 1 ST	1.00 UNITS	\$1,450	1
SNA	SAUNA	192.00 S.F.	\$9,220	1

Land

Land Use

Use Code	1010
Description	Single Fam MDL-01
Zone	CI
Neighborhood	12
Alt Land Appr Category	No

Land Line Valuation

Size (Acres)	5.40
Frontage	0
Depth	0
Assessed Value	\$173,340
Appraised Value	\$247,630

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FGR2	GARAGE-GOOD			2400.00 S.F.	\$67,200	3
PAV1	PAVING-ASPHALT			3500.00 S.F.	\$2,360	2

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2012	\$350,030	\$266,410	\$616,440
2011	\$350,030	\$266,410	\$616,440
2010	\$350,030	\$266,410	\$616,440

Assessment			
Valuation Year	Improvements	Land	Total
2012	\$245,030	\$186,490	\$431,520
2011	\$245,030	\$186,490	\$431,520
2010	\$245,030	\$186,490	\$431,520

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