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

September 12, 2016

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

Re: **Notice of Exempt Modification – Facility Modification**
111 Upper Fish Rock Road, Southbury, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the top of the existing 99-foot tower at 111 Upper Fish Rock Road in Southbury, Connecticut (the "Property"). The tower is owned by American Tower Corporation ("ATC"). The Council approved Cellco's use of this tower in 2007 (Docket No. 325). Cellco now intends to modify its facility by replacing all of its antennas with six (6) model LPA-80080-CF, 850 MHz antennas; two (2) model SBNHH-1D65C, 700/1900 MHz antennas; one (1) model SBNHH-1D85C, 700/1900 MHz antenna; two (2) model SBNHH-1D65C, 2100 MHz antennas; and one (1) model SBNHH-1D85C, 2100 MHz antenna, all at the same level on the tower. Cellco also intends to install nine (9) 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 notice is being sent to Jeff Manville, First Selectman for the Town of Southbury. A copy of this notice is also being sent to Carl and Marilyn Ferencek, the Property owner and ATC, 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 structure. Cellco's new antennas and RRHs will be installed at a centerline height of 99 feet on the 99-foot 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 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 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 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:
Jeff Manville, Southbury First Selectman
Carl and Marilyn Ferencek
ATC
Tim Parks

ATTACHMENT 1

LPA-80080-8CF-EDIN-X

V-Pol | Log Periodic | 80° | 15.0 dBd

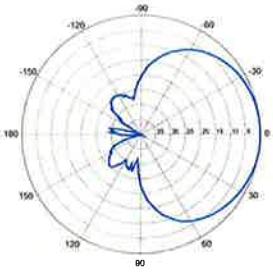
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics		
Frequency bands	806-960 MHz	
Polarization	Vertical	
Horizontal beamwidth	80°	
Vertical beamwidth	7°	
Gain	15.0 dBd (17.1 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 7	
Impedance	50Ω	
VSWR	≤1.4:1	
Upper sidelobe suppression (0°)	-23.4 dB	
Front-to-back ratio (+/-30°)	-42.6 dB	
Null fill	10% (-20.0 dB)	
Input power	500 W	
Lightning protection	Direct Ground	
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	2400 x 140 x 335 mm	94.5 x 5.5 x 10.9 in
Depth of antenna with z-bracket	375 mm	14.8 in
Weight without mounting brackets	10.9 kg	24.0 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.34 m² Side: 0.81 m²	Front: 3.6 ft² Side: 8.7 ft²
Wind load @ 161 km/hr (100 mph)	Front: 580 N Side:1204 N	Front: 130 lbf Side: 271 lbf

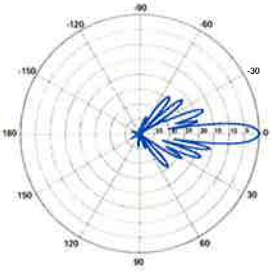
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit (0-17°)	21700000	50-102 mm 2.0-4.0 in	11 kg 25 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		

LPA-80080-8CF-EDIN-X



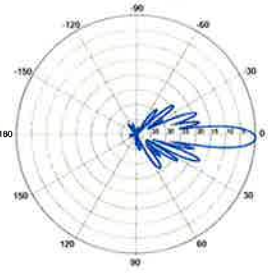
Horizontal

LPA-80080-8CF-EDIN-0



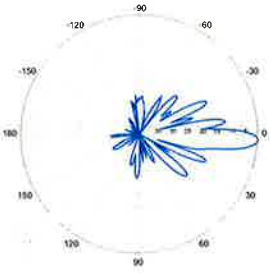
0° | Vertical

LPA-80080-8CF-EDIN-2



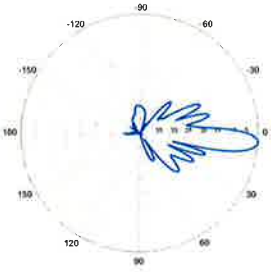
2° | Vertical

LPA-80080-8CF-EDIN-3



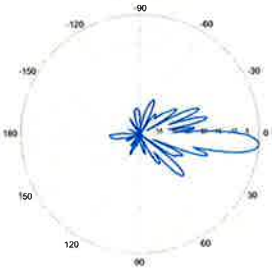
3° | Vertical

LPA-80080-8CF-EDIN-4



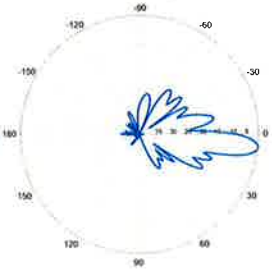
4° | Vertical

LPA-80080-8CF-EDIN-5



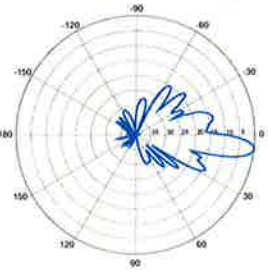
5° | Vertical

LPA-80080-8CF-EDIN-6



6° | Vertical

LPA-80080-8CF-EDIN-7



7° | Vertical

Product Specifications

COMMSCOPE®

SBNHH-1D65C

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	16.2	16.0	17.7	17.9	18.5	18.5
Beamwidth, Horizontal, degrees	66	64	70	65	63	58
Beamwidth, Vertical, degrees	8.9	7.8	5.7	5.2	5.0	4.4
Beam Tilt, degrees	0–11	0–11	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	11	12	15	15	15	14
Front-to-Back Ratio at 180°, dB	29	31	27	27	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	400	400	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	15.8	15.6	17.3	17.8	18.2	18.1
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.5	±0.3	±0.2	±0.5	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 16.0	0 ° | 15.8	0 ° | 17.3	0 ° | 17.7	0 ° | 18.0	0 ° | 17.9
	5 ° | 16.0	5 ° | 15.8	4 ° | 17.4	4 ° | 17.8	4 ° | 18.2	4 ° | 18.2
	11 ° | 15.5	11 ° | 15.2	7 ° | 17.3	7 ° | 17.7	7 ° | 18.1	7 ° | 18.2
Beamwidth, Horizontal Tolerance, degrees	±1.2	±1.9	±3.4	±3.8	±4.7	±3.7
Beamwidth, Vertical Tolerance, degrees	±0.6	±0.5	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	13	14	17	16	17	15
Front-to-Back Total Power at 180° ± 30°, dB	26	24	27	25	25	26
CPR at Boresight, dB	29	22	20	21	19	21
CPR at Sector, dB	14	11	13	11	9	5

* 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.

General Specifications

Antenna Type	Sector with internal RET
Band	Multiband
Brand	DualPol®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground

Product Specifications

SBNHH-1D65C

Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, frontal	879.0 N @ 150 km/h 197.6 lbf @ 150 km/h
Wind Loading, lateral	273.0 N @ 150 km/h 61.4 lbf @ 150 km/h
Wind Loading, rear	1033.0 N @ 150 km/h 232.2 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	180.0 mm | 7.1 in
Length	2453.0 mm | 96.6 in
Width	301.0 mm | 11.9 in
Net Weight, without mounting kit	22.5 kg | 49.6 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

Depth	296.0 mm | 11.7 in
Length	2628.0 mm | 103.5 in
Width	390.0 mm | 15.4 in
Shipping Weight	35.2 kg | 77.6 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

Product Specifications

SBNHH-1D65C

Included Products

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

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D85C

Andrew® Tri-band Antenna, 698–896 and 2x 1695–2360 MHz, 85° horizontal beamwidth, internal RETs.

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Three internal RETs for independent tilt on all three bands

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	15.6	15.6	17.0	17.6	17.9	17.8
Beamwidth, Horizontal, degrees	82	83	82	79	79	80
Beamwidth, Vertical, degrees	8.9	8.1	5.6	5.2	5.0	4.6
Beam Tilt, degrees	0–10	0–10	0–8	0–8	0–8	0–8
USLS (First Lobe), dB	16	17	14	14	14	15
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	25	25	25	25
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	300	300	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	15.4	15.4	16.6	17.3	17.6	17.6
Gain by all Beam Tilts Tolerance, dB	±0.2	±0.3	±0.6	±0.2	±0.4	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 15.2	0 ° | 15.1	0 ° | 16.6	0 ° | 17.3	0 ° | 17.6	0 ° | 17.5
	5 ° | 15.5	5 ° | 15.4	4 ° | 16.6	4 ° | 17.4	4 ° | 17.7	4 ° | 17.7
	10 ° | 15.5	10 ° | 15.5	8 ° | 16.4	8 ° | 17.2	8 ° | 17.5	8 ° | 17.3
Beamwidth, Horizontal Tolerance, degrees	±2.3	±1.4	±4.5	±2.4	±2.9	±2.6
Beamwidth, Vertical Tolerance, degrees	±0.5	±0.5	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	17	18	15	16	16	17
Front-to-Back Total Power at 180° ± 30°, dB	23	24	27	26	25	27
CPR at Boresight, dB	20	20	21	22	18	25
CPR at Sector, dB	14	16	13	12	11	6

* 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.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® multiband
Band	Multiband
Brand	DualPol®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray

Product Specifications

SBNHH-1D85C

Lightning Protection	dc Ground
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	875.0 N @ 150 km/h 196.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	180.0 mm | 7.1 in
Length	2438.0 mm | 96.0 in
Width	301.0 mm | 11.9 in
Net Weight	22.5 kg | 49.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
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
RET System	Teletilt®

Packed Dimensions

Depth	299.0 mm | 11.8 in
Length	2561.0 mm | 100.8 in
Width	409.0 mm | 16.1 in
Shipping Weight	35.0 kg | 77.2 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

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.

Product Specifications

SBNHH-1D85C

* 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.

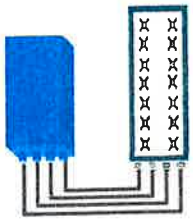
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

Alcatel·Lucent

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.) Volume in L Weight in kg (lb) (w/o mounting HW)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) 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

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
RRH2X60-1900A-4R FOR BAND 2/25 APPLICATIONS

The Alcatel-Lucent RRH2x60-1900A-4R is a high power, small form factor Remote Radio Head operating in the PCS 1900MHz frequency band for WCDMA and LTE technologies. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.

A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-1900A-4R is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-1900A-4R integrates all the latest technologies. This allows operators to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-1900A-4R is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

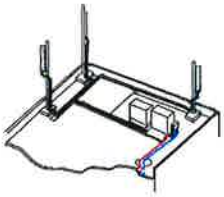
The Alcatel-Lucent RRH2x60-1900A-4R is a very cost-effective solution to deploy LTE MIMO.

EASY INSTALLATION

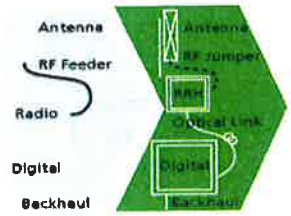
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-1900A-4R installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-1900A-4R is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

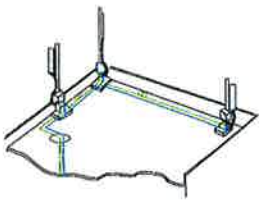
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-190A-4R is compact and weighs about 21 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-1900A-4R integrates two power amplifiers of 60W rating (at each antenna connector)
- RRH2x60-1900A-4R can operate WCDMA only, LTE only or a mix of WCDMA and LTE
- RRH2x60-1900A-4R offers the possibility for WCDMA (non MIMO) to operate the two radio chains independently (2 blocks of 20 MHz anywhere in the band)
- RRH2x60-1900A-4R is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO deployment and/or WCDMA and LTE simultaneous operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 500x285x208 mm (30l with solar shield)
- Weight : 21 kg (46 lbs) (with solar shield)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption: 460W typ. @2x60W (100%RF)

RF Characteristics

- Supported spectrum: DL 1930-1990 / UL 1850-1910
- Frequency band: 3GPP band 2/25
- Output power: 2x60W at antenna connectors
- Technology supported: W-CDMA and LTE
- Instantaneous bandwidth: 20 MHz (MIMO) or 2x20 MHz (non MIMO)
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -124.8dBm for WCDMA and -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 15km using SM fiber
- TMA/RETA: AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions: ETS300-019-1-4 class4.1E
- Ingress Protection: IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

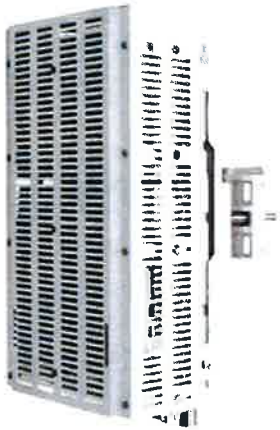
- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089
- Safety : IEC60950-1, EN 60825-1
- Regulatory: CE Mark-European Directive 2002/95/EC (RoHS), 2002/96/EC (WEEE), 1999/5/EC (R&TTE)
- Health : EN 50385

Alcatel·Lucent

B66A RRH 4X45 - PHYSICAL CHARACTERISTICS- TARGET 15.1

B4 RRH4x45-4R (AWS-Extension Band)	
Frequency Band	LR15.1 – B4 / LR16.1 B66 (AWS 1 and 3 only)
RF Output Power	2x90W/4x45W (SW configurable)
Operational range	2110-2180 MHz, DL/ 1710-1780 MHz UL
Instantaneous Bandwidth	70MHz
Configuration (HW readiness)	LTE: 2T2R, 2T4R, 4T4R
Carrier Bandwidths	5, 10, 15 and 20 MHz
Interfaces	2x CPRI Rate 7 Ports Antenna Connectors 4.3-10
AISG Support	AISG 2.0 for RET Internal Smart Bias T
Monitor Ports	NA (Spec An to replace ports)
Environmental	GR487 Compliance / GR3178 Compliance (with exceptions)
Mounting options	Pole/Wall
Connectors location	All bottom
External Alarms	4
Annual Return Rate (Target)	<2%
Operating Temperature	-40 C to +55 C (without solar load)

- Commercial Product Will include B66 support of AWS 1 and 3.
- Lower AWS 3 UL Not in 3GPP Band 66 Definition



Physical Dimensions – Not to Exceed		
	W/O Solar Shield	With Solar Shield
Dimensions HxWxD	H = 26in (H=660mm) W = 11.4in (W=290mm) D = 5.9in (D=150mm)	H = 26.6in (H=675mm) W = 12in (W=304mm) D = 6.8n (D=173mm)
Volume	29l	35.5l
Weight		64lbs / 29kg

Product Data Sheet HB158-1-08U8-S8J18

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.

Figure 1: HYBRIFLEX Series

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

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, 8.4mm² (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)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (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 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

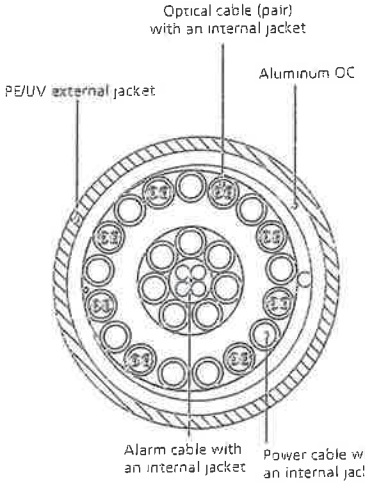


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Southbury								
Tower Height: 99'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T	2	500	90	880	0.0510	0.5867	0.87%	
*AT&T	1	500	90	1900	0.0255	1.0000	0.25%	
*AT&T	1	500	90	700	0.0255	0.4667	0.55%	
*AT&T	1	500	90	1900	0.0255	1.0000	0.25%	
*AT&T	1	500	90	2300	0.0255	1.0000	0.25%	
Verizon	**1**	**2104**	**99**	**0.0772**	**1970**	**1.0000**	**7.72%**	
Verizon	**9**	**492**	**99**	**0.1624**	**869**	**0.5793**	**28.04%**	
Verizon	**1**	**2488**	**99**	**0.0913**	**2145**	**1.0000**	**9.13%**	
Verizon	**1**	**1522**	**99**	**0.0558**	**698**	**0.4973**	**11.23%**	
								58.3%
* Source: Siting Council								

ATTACHMENT 3

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**99 ft Monopole**
ATC Site Name	:	**Southbury CT, CT**
ATC Site Number	:	**411188**
Engineering Number	:	**66444021**
Proposed Carrier	:	**Verizon**
Carrier Site Name	:	**Newtown NE**
Carrier Site Number	:	**N/A**
Site Location	:	**111 Upper Fishrock Road** **Southbury, CT 06488-4172** **41.438170,-73.237860**
County	:	**New Haven**
Date	:	**May 7, 2016**
Max Usage	:	**24%**
Result	:	**Pass**

Reviewed by:
Scott Wirgau, PE
Structural Team Leader

Prepared By:
Stephan M. Rawles, E.I.

May 9 2016 7:04 AM

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Eng. Number 66444021
May 6, 2016

Table of Contents

AMERICAN TOWER®
CORPORATION

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 99 ft monopole to reflect the change in loading by Verizon.

Supporting Documents

Tower Drawings	EEI Project #14859, dated August 29,2007
Foundation Drawing	EEI Project #14859, dated April 20, 2007
Geotechnical Report	Welti Geotechnical Engineering Site Location: III Upper Fishrock Rd, Southbury, CT, dated March 5, 2007

Analysis

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

Basic Wind Speed:	95 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2003 IBC w/ 2005 CT Supplement & 2009 CT Amendment
Structure Class:	II
Exposure Category:	C
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	$Ss = 0.20$, $S_1 = 0.06$
Site Class:	D - Stiff Soil

Conclusion

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

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

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
99.0	110.0	1	20' Omni	Flush	(1) 7/8" Coax	Town Of New Haven
99.0	99.0	1	VZW Unused Reserve: 12,083 sq in	Low Profile Platform	(16) 1 5/8" Coax	Verizon
90.0	90.0	3	RCU (Remote Control Unit)	Platform w/ Handrails	(3) 3/8" Coax (8) 0.78" 8 AWG 6 (2) 0.40" Fiber	AT&T Mobility
		6	Ericsson mRRU			
		4	Raycap DC6-48-60-18-8F (23.5" Height)			
		6	Ericsson RRUS A2 B2			
		3	Alcatel-Lucent IBC700-1			
		3	Ericsson RRUS 32 B30 (60 lbs)			
		6	Ericsson RRU11			
		6	Ericsson RRUS-12 B2			
		12	CCI HPA-65R-BUU-H8			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
99.0	99.0	3	48" x 12" x 7" Panel	-	(2) 1 5/8" Coax	Verizon
		6	72" x 12" Panel			
		3	60" x 6" Panel			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
99.0	99.0	3	Alcatel-Lucent RRH2X60-1900	Low Profile Platform	(2) 1 5/8" Fiber	Verizon
		3	Alcatel-Lucent RRH2x60 700			
		3	Alcatel-Lucent RRH4X45-B66 w/ Solar Shield			
		2	RFS DB-T1-6Z-8AB-0Z			
		2	Commscope SBNHH-1D85C			
		4	Commscope SBNHH-1D65C			
		6	Antel LPA-80080/8CF ___			

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

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	17%	Pass
Shaft	23%	Pass
Base Plate	17%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,370.4	24%
Axial (Kips)	49.4	10%
Shear (Kips)	30.3	16%

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

The foundation and anchorages for this tower have factors of safety exceeding 2.0 with respect to wind.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
99.0	Alcatel-Lucent RRH2X60-1900	Verizon	0.146	0.142
	Alcatel-Lucent RRH2x60 700			
	Alcatel-Lucent RRH4X45-B66 w/ Solar Shield			
	RFS DB-T1-6Z-8AB-0Z			
	Commscope SBNHH-1D85C			
	Commscope SBNHH-1D65C			
	Antel LPA-80080/8CF ___			

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

AMERICAN TOWER®
CORPORATION

Standard Conditions

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

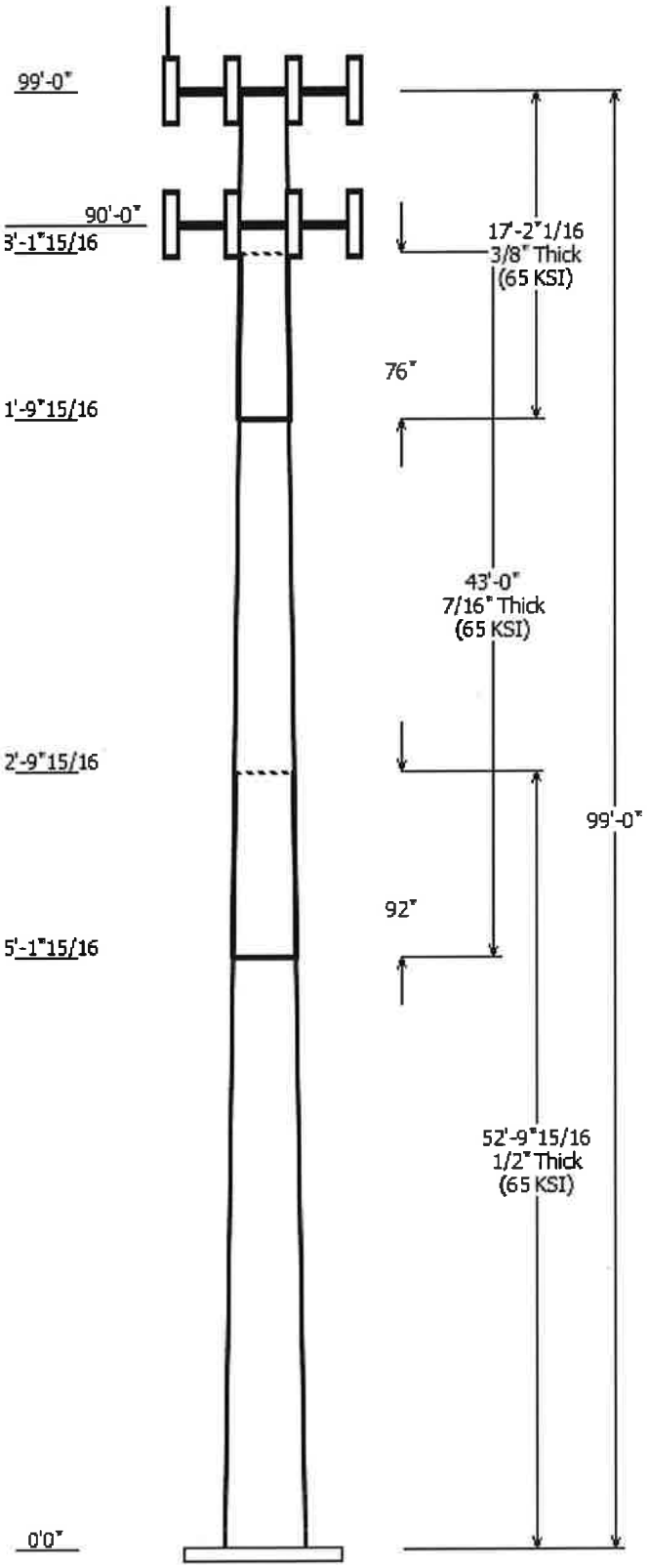
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

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

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

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



Job Information

Pole :	411188	Code:	ANSI/TIA-222-G
Description :			
Client :	VERIZON WIRELESS	Struct Class :	II
Location :	Southbury CT, CT		
Shape :	18 Sides	Exposure :	C
Height :	99.00 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.305900 (in/ft)		

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Across Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	52.830	53.83	70.00	0.500		0.000	0.305900	65
2	43.000	43.90	57.05	0.438	Slip Joint	92.000	0.305900	65
3	17.170	41.34	46.59	0.375	Slip Joint	76.000	0.305900	65

Discrete Appurtenance

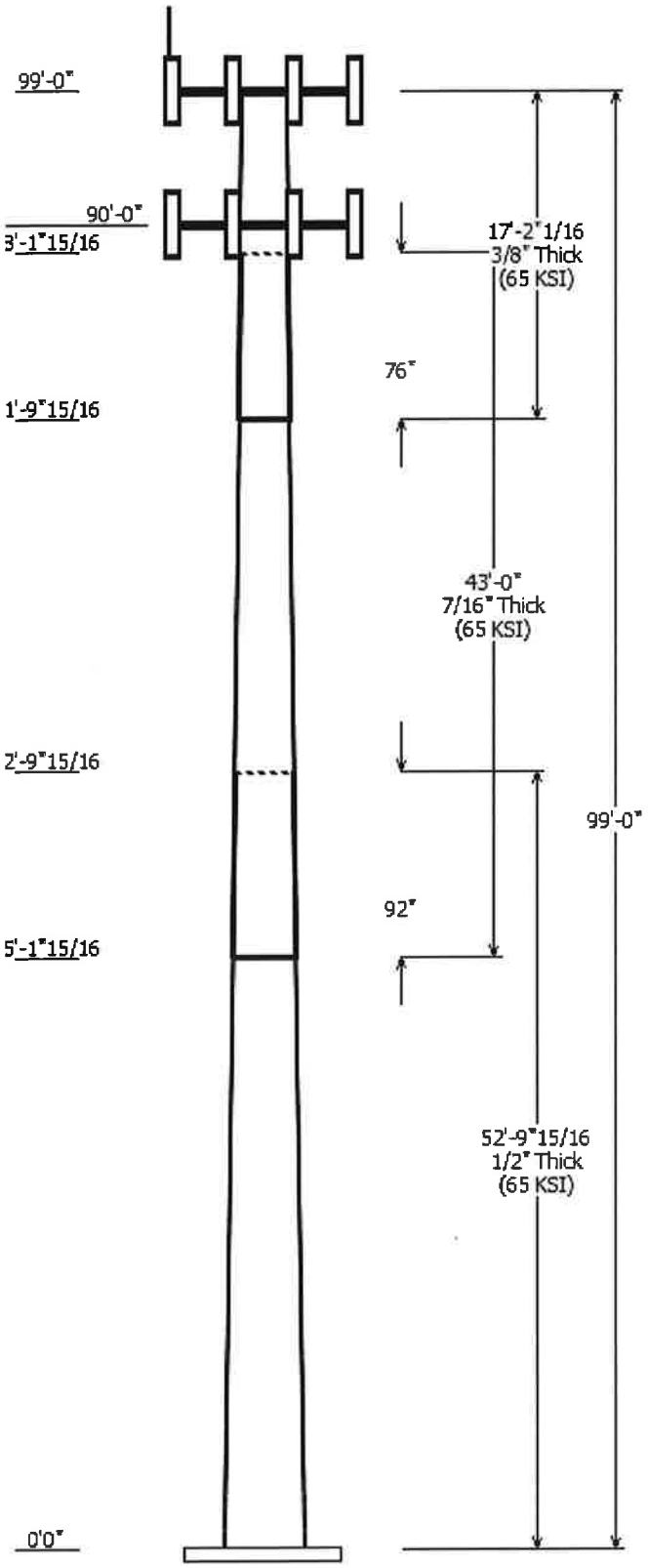
Attach Elev (ft)	Force Elev (ft)	Qty	Description
99.000	99.000	1	VZW Unused Reserve: 12,083
99.000	99.000	6	Antel LPA-80080/8CF ___
99.000	99.000	2	Commscope SBNHH-1D85C
99.000	99.000	4	Commscope SBNHH-1D65C
99.000	99.000	2	RFS DB-T1-6Z-8AB-0Z
99.000	99.000	3	Alcatel-Lucent RRH4X45-B66
99.000	99.000	3	Alcatel-Lucent RRH2x60 700
99.000	99.000	3	Alcatel-Lucent RRH2X60-1900
99.000	99.000	1	Flat Low Profile Platform
99.000	110.000	1	20' Omni
90.000	90.000	6	Ericsson RRUS-12 B2
90.000	90.000	6	Ericsson RRU11
90.000	90.000	3	Ericsson RRUS 32 B30 (60 lbs)
90.000	90.000	6	Ericsson RRUS A2 B2
90.000	90.000	6	Ericsson mRRU
90.000	90.000	3	RCU (Remote Control Unit)
90.000	90.000	1	Round Platform w/ Handrails
90.000	90.000	12	CCI HPA-65R-BUU-H8
90.000	90.000	3	Alcatel-Lucent IBC700-1
90.000	90.000	4	Raycap DC6-48-60-18-8F (23.5"

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	90.000	0.40" (10.3mm)	No
0.000	90.000	0.78" (19.7mm) 8	No
0.000	90.000	3/8" Coax	No
0.000	99.000	1 5/8" Coax	No
0.000	99.000	1 5/8" Fiber	No
0.000	99.000	7/8" Coax	No

Load Cases

1.2D + 1.6W	95 mph with No Ice
0.9D + 1.6W	95 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

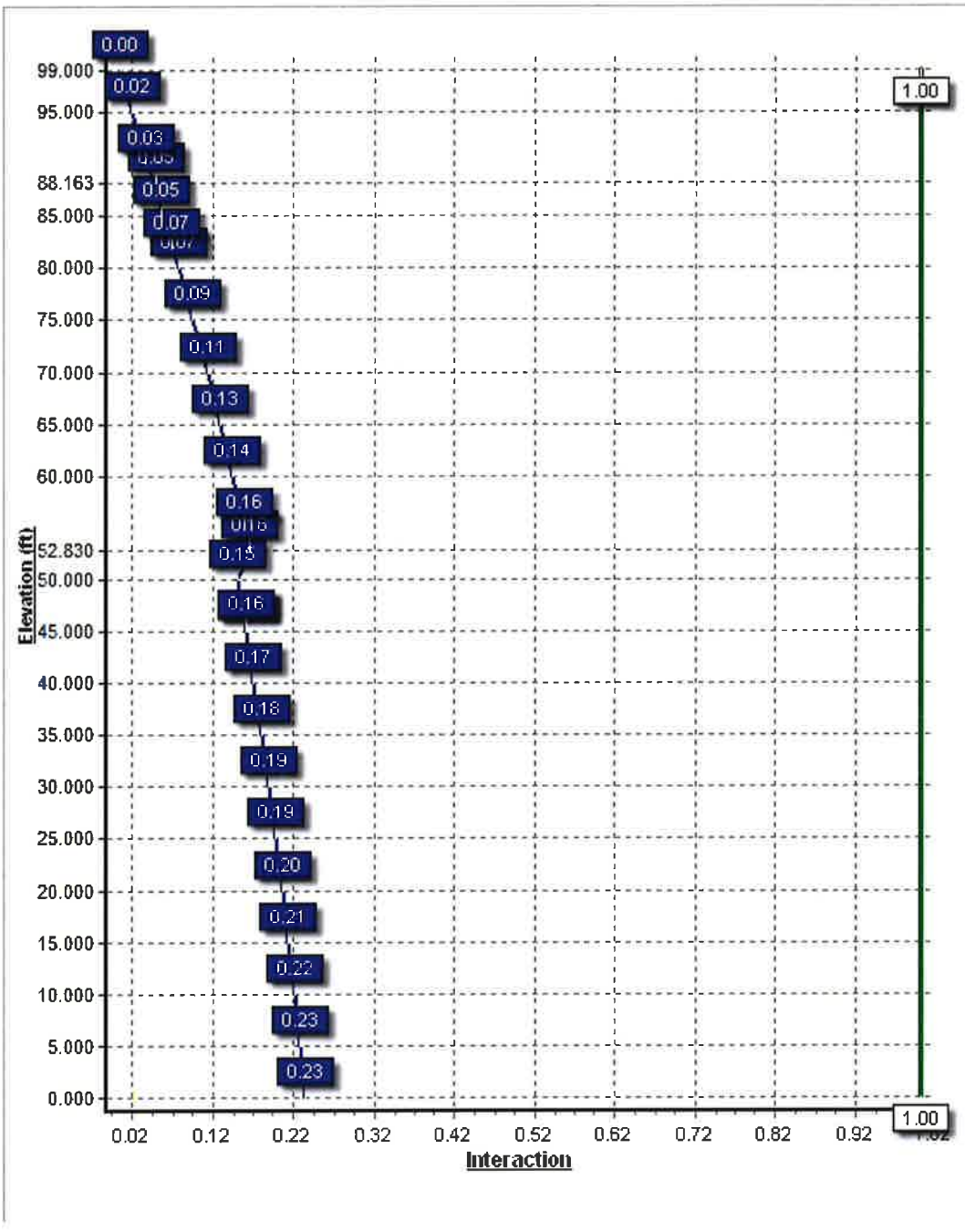


Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	2370.37	30.30	49.37
0.9D + 1.6W	2366.21	30.30	37.02
1.2D + 1.0Di + 1.0Wi	508.02	7.20	69.68
(1.2 + 0.2Sds) * DL + E ELFM	362.95	4.92	48.71
(1.2 + 0.2Sds) * DL + E EMAM	415.85	5.04	48.71
(0.9 - 0.2Sds) * DL + E ELFM	362.23	4.92	33.59
(0.9 - 0.2Sds) * DL + E EMAM	414.98	5.04	33.59
1.0D + 1.0W	590.28	7.55	41.15

Dish Deflections

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


0.00
0.02
0.03
0.05
0.07
0.09
0.11
0.13
0.14
0.16
0.16
0.17
0.18
0.19
0.19
0.20
0.21
0.22
0.23
0.23
1.00
1.00
99.000
95.000
88.163
85.000
80.000
75.000
70.000
65.000
60.000
52.830
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number:	**411188**	**Code: ANSI/TIA-222-G**	
Site Name:	**Southbury CT, CT**	**Engineering Number: 66444021**	**5/7/2016 9:26:25 AM**
Customer:	**VERIZON WIRELESS**		

Analysis Parameters

Location:	New Haven County, CT		
Code:	ANSI/TIA-222-G	**Height (ft):**	99
Shape:	18 Sides	**Base Diameter (in):**	70.00
Pole Type:	Taper	**Top Diameter (in):**	41.34
Pole Manfacturer:		**Taper (in/ft) :**	0.306

Ice & Wind Parameters

Structure Class:	II	**Design Wind Speed Without Ice:**	95 mph
Exposure Category:	C	**Design Wind Speed With Ice:**	50 mph
Topographic Category:	1	**Operational Wind Speed:**	60 mph
Crest Height:	0.0 ft	**Design Ice Thickness:**	0.75 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	0.75				
T_L (sec):	6	**p:**	1.3	**C_s:**	0.092
S_s:	0.201	**S_1:**	0.065	**C_s Max:**	0.092
F_a:	1.600	**F_v:**	2.400	**C_s Min:**	0.030
S_{ds}:	0.214	**S_{d1}:**	0.104		

Load Cases

1.2D + 1.6W	95 mph with No Ice
0.9D + 1.6W	95 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 411188 Code: ANSI/TIA-222-G

Site Name: Southbury CT, CT Engineering Number: 66444021 5/7/2016 9:26:25 AM

Customer: VERIZON WIRELESS

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-18	52.830	0.5000	65		0.00	17,522	70.00	0.00	110.29	67308.3	23.28	140.00	53.83	52.83	84.65	30426.0	17.58	107.68	0.305909
2-18	43.000	0.4375	65	Slip	92.00	10,168	57.05	45.16	78.62	31847.1	21.59	130.42	43.90	88.16	60.36	14408.5	16.28	100.35	0.305909
3-18	17.170	0.3750	65	Slip	76.00	3,031	46.59	81.83	55.01	14845.5	20.50	124.25	41.34	99.00	48.76	10337.5	18.03	110.24	0.305909
				Shaft Weight		30,721													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
99.00	20' Omni	1	55.00	6.000	1.00	199.23	12.793	1.00	0.000	11.000
99.00	Alcatel-Lucent RRH2x60 700	3	56.70	2.150	0.67	133.82	2.746	0.67	0.000	0.000
99.00	Alcatel-Lucent RRH2X60-	3	43.00	1.880	0.50	107.06	2.445	0.50	0.000	0.000
99.00	Alcatel-Lucent RRH4X45-B66	3	64.00	2.660	0.67	144.72	3.346	0.67	0.000	0.000
99.00	Antel LPA-80080/8CF___	6	24.00	12.170	0.76	265.54	7.683	0.76	0.000	0.000
99.00	Commscope SBNHH-1D65C	4	49.60	11.450	0.84	299.97	13.031	0.84	0.000	0.000
99.00	Commscope SBNHH-1D85C	2	44.10	11.390	0.84	293.59	12.974	0.84	0.000	0.000
99.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,121.53	44.415	1.00	0.000	0.000
99.00	RFS DB-T1-6Z-8AB-0Z	2	44.00	4.800	0.67	180.55	5.634	0.67	0.000	0.000
99.00	VZW Unused Reserve:	1	1490.30	83.980	1.00	1,686.84	5.173	1.00	0.000	0.000
90.00	Alcatel-Lucent IBC700-1	3	63.30	2.600	0.67	147.36	3.625	0.67	0.000	0.000
90.00	CCI HPA-65R-BUU-H8	12	68.00	12.980	0.79	312.40	16.386	0.79	0.000	0.000
90.00	Ericsson mRRU	6	22.00	1.350	0.50	96.00	2.105	0.50	0.000	0.000
90.00	Ericsson RRU11	6	63.90	2.950	0.67	168.70	3.631	0.67	0.000	0.000
90.00	Ericsson RRUS 32 B30 (60	3	60.00	2.690	0.67	140.11	3.378	0.67	0.000	0.000
90.00	Ericsson RRUS A2 B2	6	22.00	2.060	0.67	73.78	2.630	0.67	0.000	0.000
90.00	Ericsson RRUS-12 B2	6	58.00	3.150	0.67	134.94	4.254	0.67	0.000	0.000
90.00	Raycap DC6-48-60-18-8F	4	20.00	1.900	0.50	70.08	2.844	0.50	0.000	0.000
90.00	RCU (Remote Control Unit)	3	1.00	0.160	0.50	10.31	0.348	0.50	0.000	0.000
90.00	Round Platform w/ Handrails	1	2000.00	27.200	1.00	3,232.51	50.451	1.00	0.000	0.000
	Totals	76	8319.30			19,901.40			Number of Loadings :	20

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	99.00	16	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
0.00	99.00	2	1 5/8" Fiber	1.63	1.61	N	0.00	N	Verizon
0.00	99.00	1	7/8" Coax	1.09	0.33	N	0.00	N	Verizon
0.00	90.00	2	0.40" (10.3mm) Fiber	0.40	0.09	N	0.00	N	AT&T Mobility
0.00	90.00	8	0.78" (19.7mm) 8	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	90.00	3	3/8" Coax	0.44	0.08	N	0.00	N	AT&T Mobility

Segment Properties (Max Len : 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.5000	70.000	110.293	67,308.3	23.28	140.00	74.0	1893.	0.0	0.0
5.00		0.5000	68.470	107.865	62,961.5	22.74	136.94	74.7	1811.	0.0	1,855.9
10.00		0.5000	66.941	105.438	58,805.9	22.20	133.88	75.3	1730.	0.0	1,814.6
15.00		0.5000	65.411	103.011	54,837.4	21.66	130.82	75.9	1651.	0.0	1,773.3
20.00		0.5000	63.882	100.583	51,051.5	21.12	127.76	76.6	1574.	0.0	1,732.0
25.00		0.5000	62.352	98.156	47,444.0	20.58	124.70	77.2	1498.	0.0	1,690.7
30.00		0.5000	60.823	95.729	44,010.6	20.04	121.65	77.8	1425.	0.0	1,649.4
35.00		0.5000	59.293	93.301	40,747.0	19.50	118.59	78.5	1353.	0.0	1,608.1
40.00		0.5000	57.764	90.874	37,648.8	18.96	115.53	79.1	1283.	0.0	1,566.8
45.00		0.5000	56.234	88.447	34,711.8	18.42	112.47	79.7	1215.	0.0	1,525.5
45.16	Bot - Section 2	0.5000	56.184	88.368	34,618.5	18.40	112.37	79.8	1213.	0.0	49.1
50.00		0.5000	54.705	86.020	31,931.7	17.88	109.41	80.4	1149.	0.0	2,712.1
52.83	Top - Section 1	0.4375	54.714	75.367	28,051.3	20.64	125.06	77.1	1009.	0.0	1,553.3
55.00		0.4375	54.050	74.445	27,034.6	20.37	123.54	77.4	985.2	0.0	553.1
60.00		0.4375	52.520	72.321	24,786.2	19.76	120.05	78.2	929.5	0.0	1,248.5
65.00		0.4375	50.991	70.197	22,665.9	19.14	116.55	78.9	875.5	0.0	1,212.4
70.00		0.4375	49.461	68.073	20,670.2	18.52	113.05	79.6	823.1	0.0	1,176.3
75.00		0.4375	47.932	65.949	18,795.2	17.91	109.56	80.3	772.3	0.0	1,140.1
80.00		0.4375	46.402	63.826	17,037.2	17.29	106.06	81.1	723.2	0.0	1,104.0
81.83	Bot - Section 3	0.4375	45.842	63.048	16,422.2	17.07	104.78	81.3	705.6	0.0	395.0
85.00		0.4375	44.873	61.702	15,392.3	16.67	102.57	81.8	675.6	0.0	1,260.0
88.16	Top - Section 2	0.3750	44.655	52.702	13,055.7	19.59	119.08	78.4	575.9	0.0	1,230.4
90.00		0.3750	44.093	52.034	12,565.0	19.32	117.58	78.7	561.3	0.0	327.3
95.00		0.3750	42.564	50.213	11,291.8	18.60	113.50	79.5	522.5	0.0	869.8
99.00		0.3750	41.340	48.757	10,337.5	18.03	110.24	80.2	492.5	0.0	673.5
											30,721.0

Site Number: 411188 Code: ANSI/TIA-222-G

Site Name: Southbury CT, CT Engineering Number: 66444021 5/7/2016 9:26:25 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W 95 mph with No Ice 13 Iterations

Gust Response Factor : 1.10 Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		312.6	0.0					0.0	0.0	312.6	0.0	0.0	0.0
5.00		618.3	2,227.0					0.0	130.9	618.3	2,357.9	0.0	0.0
10.00		604.5	2,177.5					0.0	130.9	604.5	2,308.3	0.0	0.0
15.00		599.9	2,127.9					0.0	130.9	599.9	2,258.8	0.0	0.0
20.00		611.1	2,078.4					0.0	130.9	611.1	2,209.2	0.0	0.0
25.00		625.5	2,028.8					0.0	130.9	625.5	2,159.7	0.0	0.0
30.00		634.2	1,979.2					0.0	130.9	634.2	2,110.1	0.0	0.0
35.00		638.7	1,929.7					0.0	130.9	638.7	2,060.5	0.0	0.0
40.00		640.1	1,880.1					0.0	130.9	640.1	2,011.0	0.0	0.0
45.00		330.5	1,830.6					0.0	130.9	330.5	1,961.4	0.0	0.0
45.16	Bot - Section 2	323.7	59.0					0.0	4.3	323.7	63.2	0.0	0.0
50.00		495.7	3,254.5					0.0	126.6	495.7	3,381.1	0.0	0.0
52.83	Top - Section 1	321.7	1,864.0					0.0	74.1	321.7	1,938.0	0.0	0.0
55.00		458.1	663.7					0.0	56.8	458.1	720.5	0.0	0.0
60.00		634.0	1,498.2					0.0	130.9	634.0	1,629.1	0.0	0.0
65.00		626.0	1,454.9					0.0	130.9	626.0	1,585.7	0.0	0.0
70.00		616.8	1,411.5					0.0	130.9	616.8	1,542.4	0.0	0.0
75.00		606.5	1,368.1					0.0	130.9	606.5	1,499.0	0.0	0.0
80.00		409.1	1,324.8					0.0	130.9	409.1	1,455.6	0.0	0.0
81.83	Bot - Section 3	297.7	474.0					0.0	47.9	297.7	521.9	0.0	0.0
85.00		375.4	1,512.0					0.0	83.0	375.4	1,594.9	0.0	0.0
88.16	Top - Section 2	293.2	1,476.5					0.0	82.8	293.2	1,559.3	0.0	0.0
90.00	Appertunance(s)	393.5	392.7	7,561.6	0.0	0.0	5,117.2	0.0	48.1	7,955.1	5,558.0	0.0	0.0
95.00		510.7	1,043.8					0.0	100.0	510.7	1,143.8	0.0	0.0
99.00	Appertunance(s)	224.2	808.3	10,831.2	0.0	3,292.2	4,866.0	0.0	80.0	11,055.4	5,754.3	0.0	0.0
								Totals:		30,594.3	49,383.8	0.00	0.00

Site Number: 411188 Code: ANSI/TIA-222-G

Site Name: Southbury CT, CT Engineering Number: 66444021 5/7/2016 9:26:26 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W 95 mph with No Ice 13 Iterations

Gust Response Factor : 1.10 Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-49.37	-30.30	0.00	-2,370.37	0.00	2,370.37	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.232
5.00	-46.99	-29.72	0.00	-2,218.86	0.00	2,218.86	7,247.84	3,623.92	20,252.7	10,141.4	0.03	-0.05	0.225
10.00	-44.66	-29.15	0.00	-2,070.24	0.00	2,070.24	7,144.94	3,572.47	19,512.6	9,770.83	0.10	-0.10	0.218
15.00	-42.37	-28.58	0.00	-1,924.48	0.00	1,924.48	7,039.27	3,519.64	18,778.2	9,403.06	0.23	-0.15	0.211
20.00	-40.14	-28.00	0.00	-1,781.56	0.00	1,781.56	6,930.83	3,465.42	18,049.9	9,038.38	0.41	-0.19	0.203
25.00	-37.96	-27.40	0.00	-1,641.55	0.00	1,641.55	6,819.62	3,409.81	17,328.3	8,677.06	0.64	-0.24	0.195
30.00	-35.83	-26.78	0.00	-1,504.56	0.00	1,504.56	6,705.64	3,352.82	16,614.0	8,319.35	0.92	-0.29	0.186
35.00	-33.76	-26.16	0.00	-1,370.65	0.00	1,370.65	6,588.88	3,294.44	15,907.3	7,965.52	1.25	-0.33	0.177
40.00	-31.73	-25.53	0.00	-1,239.84	0.00	1,239.84	6,469.35	3,234.68	15,209.0	7,615.83	1.62	-0.38	0.168
45.00	-29.76	-25.20	0.00	-1,112.18	0.00	1,112.18	6,347.05	3,173.53	14,519.5	7,270.55	2.05	-0.42	0.158
45.16	-29.69	-24.89	0.00	-1,108.06	0.00	1,108.06	6,343.01	3,171.51	14,497.1	7,259.35	2.06	-0.43	0.157
50.00	-26.30	-24.38	0.00	-987.69	0.00	987.69	6,221.98	3,110.99	13,839.3	6,929.95	2.51	-0.47	0.147
52.83	-24.35	-24.05	0.00	-918.69	0.00	918.69	5,231.28	2,615.64	11,664.6	5,840.97	2.80	-0.49	0.162
55.00	-23.63	-23.60	0.00	-866.50	0.00	866.50	5,188.38	2,594.19	11,426.3	5,721.65	3.03	-0.51	0.156
60.00	-21.99	-22.97	0.00	-748.50	0.00	748.50	5,087.55	2,543.78	10,882.0	5,449.10	3.59	-0.55	0.142
65.00	-20.39	-22.34	0.00	-633.67	0.00	633.67	4,983.95	2,491.97	10,344.7	5,180.06	4.19	-0.59	0.127
70.00	-18.84	-21.72	0.00	-521.98	0.00	521.98	4,877.57	2,438.79	9,815.02	4,914.80	4.83	-0.63	0.110
75.00	-17.34	-21.10	0.00	-413.40	0.00	413.40	4,768.43	2,384.21	9,293.36	4,653.59	5.50	-0.66	0.093
80.00	-15.88	-20.68	0.00	-307.89	0.00	307.89	4,656.51	2,328.26	8,780.31	4,396.68	6.21	-0.69	0.074
81.83	-15.36	-20.38	0.00	-270.04	0.00	270.04	4,614.86	2,307.43	8,594.79	4,303.78	6.48	-0.70	0.066
85.00	-13.77	-19.99	0.00	-205.44	0.00	205.44	4,541.82	2,270.91	8,276.38	4,144.34	6.95	-0.71	0.053
88.16	-12.21	-19.68	0.00	-142.21	0.00	142.21	3,716.95	1,858.48	6,758.81	3,384.43	7.42	-0.72	0.045
90.00	-6.75	-11.65	0.00	-106.07	0.00	106.07	3,684.34	1,842.17	6,613.79	3,311.81	7.70	-0.72	0.034
95.00	-5.61	-11.13	0.00	-47.81	0.00	47.81	3,593.66	1,796.83	6,223.40	3,116.33	8.46	-0.73	0.017
99.00	0.00	-11.06	0.00	-3.29	0.00	3.29	3,519.13	1,759.56	5,916.01	2,962.40	9.08	-0.74	0.001

Site Number: 411188 | Code: ANSI/TIA-222-G |

Site Name: Southbury CT, CT | Engineering Number: 66444021 | 5/7/2016 9:26:26 AM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W | 95 mph with No Ice (Reduced DL) | 13 Iterations

Gust Response Factor : 1.10 | Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		312.6	0.0					0.0	0.0	312.6	0.0	0.0	0.0
5.00		618.3	1,670.3					0.0	98.1	618.3	1,768.4	0.0	0.0
10.00		604.5	1,633.1					0.0	98.1	604.5	1,731.2	0.0	0.0
15.00		599.9	1,595.9					0.0	98.1	599.9	1,694.1	0.0	0.0
20.00		611.1	1,558.8					0.0	98.1	611.1	1,656.9	0.0	0.0
25.00		625.5	1,521.6					0.0	98.1	625.5	1,619.7	0.0	0.0
30.00		634.2	1,484.4					0.0	98.1	634.2	1,582.6	0.0	0.0
35.00		638.7	1,447.3					0.0	98.1	638.7	1,545.4	0.0	0.0
40.00		640.1	1,410.1					0.0	98.1	640.1	1,508.2	0.0	0.0
45.00		330.5	1,372.9					0.0	98.1	330.5	1,471.1	0.0	0.0
45.16	Bot - Section 2	323.7	44.2					0.0	3.2	323.7	47.4	0.0	0.0
50.00		495.7	2,440.9					0.0	94.9	495.7	2,535.8	0.0	0.0
52.83	Top - Section 1	321.7	1,398.0					0.0	55.6	321.7	1,453.5	0.0	0.0
55.00		458.1	497.8					0.0	42.6	458.1	540.4	0.0	0.0
60.00		634.0	1,123.7					0.0	98.1	634.0	1,221.8	0.0	0.0
65.00		626.0	1,091.2					0.0	98.1	626.0	1,189.3	0.0	0.0
70.00		616.8	1,058.6					0.0	98.1	616.8	1,156.8	0.0	0.0
75.00		606.5	1,026.1					0.0	98.1	606.5	1,124.3	0.0	0.0
80.00		409.1	993.6					0.0	98.1	409.1	1,091.7	0.0	0.0
81.83	Bot - Section 3	297.7	355.5					0.0	35.9	297.7	391.4	0.0	0.0
85.00		375.4	1,134.0					0.0	62.2	375.4	1,196.2	0.0	0.0
88.16	Top - Section 2	293.2	1,107.4					0.0	62.1	293.2	1,169.5	0.0	0.0
90.00	Appertunance(s)	393.5	294.6	7,561.6	0.0	0.0	3,837.9	0.0	36.1	7,955.1	4,168.5	0.0	0.0
95.00		510.7	782.8					0.0	75.0	510.7	857.8	0.0	0.0
99.00	Appertunance(s)	224.2	606.2	10,831.2	0.0	3,292.2	3,649.5	0.0	60.0	11,055.4	4,315.7	0.0	0.0
								Totals:		30,594.3	37,037.9	0.00	0.00

Site Number: 411188 Code: ANSI/TIA-222-G

Site Name: Southbury CT, CT Engineering Number: 66444021 5/7/2016 9:26:27 AM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W 95 mph with No Ice (Reduced DL) 13 Iterations

Gust Response Factor : 1.10 Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-37.02	-30.30	0.00	-2,366.21	0.00	2,366.21	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.230
5.00	-35.23	-29.71	0.00	-2,214.72	0.00	2,214.72	7,247.84	3,623.92	20,252.7	10,141.4	0.03	-0.05	0.223
10.00	-33.48	-29.13	0.00	-2,066.18	0.00	2,066.18	7,144.94	3,572.47	19,512.6	9,770.83	0.10	-0.10	0.216
15.00	-31.76	-28.55	0.00	-1,920.53	0.00	1,920.53	7,039.27	3,519.64	18,778.2	9,403.06	0.23	-0.14	0.209
20.00	-30.08	-27.96	0.00	-1,777.77	0.00	1,777.77	6,930.83	3,465.42	18,049.9	9,038.38	0.41	-0.19	0.201
25.00	-28.44	-27.35	0.00	-1,637.96	0.00	1,637.96	6,819.62	3,409.81	17,328.3	8,677.06	0.64	-0.24	0.193
30.00	-26.84	-26.73	0.00	-1,501.19	0.00	1,501.19	6,705.64	3,352.82	16,614.0	8,319.35	0.92	-0.29	0.185
35.00	-25.28	-26.11	0.00	-1,367.52	0.00	1,367.52	6,588.88	3,294.44	15,907.3	7,965.52	1.24	-0.33	0.176
40.00	-23.75	-25.48	0.00	-1,236.99	0.00	1,236.99	6,469.35	3,234.68	15,209.0	7,615.83	1.62	-0.38	0.166
45.00	-22.27	-25.14	0.00	-1,109.60	0.00	1,109.60	6,347.05	3,173.53	14,519.5	7,270.55	2.04	-0.42	0.156
45.16	-22.22	-24.83	0.00	-1,105.50	0.00	1,105.50	6,343.01	3,171.51	14,497.1	7,259.35	2.06	-0.43	0.156
50.00	-19.67	-24.32	0.00	-985.41	0.00	985.41	6,221.98	3,110.99	13,839.3	6,929.95	2.51	-0.47	0.145
52.83	-18.21	-24.00	0.00	-916.57	0.00	916.57	5,231.28	2,615.64	11,664.6	5,840.97	2.79	-0.49	0.160
55.00	-17.67	-23.54	0.00	-864.49	0.00	864.49	5,188.38	2,594.19	11,426.3	5,721.65	3.02	-0.51	0.155
60.00	-16.43	-22.91	0.00	-746.77	0.00	746.77	5,087.55	2,543.78	10,882.0	5,449.10	3.58	-0.55	0.140
65.00	-15.24	-22.28	0.00	-632.22	0.00	632.22	4,983.95	2,491.97	10,344.7	5,180.06	4.18	-0.59	0.125
70.00	-14.07	-21.66	0.00	-520.81	0.00	520.81	4,877.57	2,438.79	9,815.02	4,914.80	4.82	-0.63	0.109
75.00	-12.94	-21.05	0.00	-412.50	0.00	412.50	4,768.43	2,384.21	9,293.36	4,653.59	5.49	-0.66	0.091
80.00	-11.85	-20.63	0.00	-307.25	0.00	307.25	4,656.51	2,328.26	8,780.31	4,396.68	6.20	-0.69	0.073
81.83	-11.46	-20.33	0.00	-269.49	0.00	269.49	4,614.86	2,307.43	8,594.79	4,303.78	6.46	-0.70	0.065
85.00	-10.26	-19.94	0.00	-205.04	0.00	205.04	4,541.82	2,270.91	8,276.38	4,144.34	6.93	-0.71	0.052
88.16	-9.10	-19.64	0.00	-141.95	0.00	141.95	3,716.95	1,858.48	6,758.81	3,384.43	7.41	-0.72	0.045
90.00	-5.03	-11.63	0.00	-105.88	0.00	105.88	3,684.34	1,842.17	6,613.79	3,311.81	7.68	-0.72	0.033
95.00	-4.17	-11.11	0.00	-47.73	0.00	47.73	3,593.66	1,796.83	6,223.40	3,116.33	8.45	-0.73	0.017
99.00	0.00	-11.06	0.00	-3.29	0.00	3.29	3,519.13	1,759.56	5,916.01	2,962.40	9.06	-0.73	0.001

Site Number: 411188 | Code: ANSI/TIA-222-G |

Site Name: Southbury CT, CT | Engineering Number: 66444021 | 5/7/2016 9:26:27 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 13 Iterations

Gust Response Factor : 1.10 | Ice Dead Load Factor : 1.00 | Wind Importance Factor : 1.00

Dead Load Factor : 1.20 | Ice Importance Factor : 1.00

Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		103.2	0.0					0.0	0.0	103.2	0.0	0.0	0.0
5.00		204.6	2,732.6					0.0	130.9	204.6	2,863.4	0.0	0.0
10.00		200.8	2,730.4					0.0	130.9	200.8	2,861.2	0.0	0.0
15.00		199.7	2,697.3					0.0	130.9	199.7	2,828.2	0.0	0.0
20.00		203.9	2,654.2					0.0	130.9	203.9	2,785.0	0.0	0.0
25.00		209.1	2,605.7					0.0	130.9	209.1	2,736.6	0.0	0.0
30.00		212.5	2,554.0					0.0	130.9	212.5	2,684.9	0.0	0.0
35.00		214.4	2,500.0					0.0	130.9	214.4	2,630.9	0.0	0.0
40.00		215.3	2,444.3					0.0	130.9	215.3	2,575.2	0.0	0.0
45.00		111.2	2,387.3					0.0	130.9	111.2	2,518.2	0.0	0.0
45.16	Bot - Section 2	109.1	77.2					0.0	4.3	109.1	81.5	0.0	0.0
50.00		167.1	3,793.2					0.0	126.6	167.1	3,919.8	0.0	0.0
52.83	Top - Section 1	108.6	2,176.8					0.0	74.1	108.6	2,250.9	0.0	0.0
55.00		154.9	902.0					0.0	56.8	154.9	958.8	0.0	0.0
60.00		214.7	2,035.6					0.0	130.9	214.7	2,166.5	0.0	0.0
65.00		212.5	1,981.6					0.0	130.9	212.5	2,112.4	0.0	0.0
70.00		209.8	1,927.0					0.0	130.9	209.8	2,057.8	0.0	0.0
75.00		206.8	1,871.9					0.0	130.9	206.8	2,002.7	0.0	0.0
80.00		139.7	1,816.3					0.0	130.9	139.7	1,947.2	0.0	0.0
81.83	Bot - Section 3	101.8	652.6					0.0	47.9	101.8	700.5	0.0	0.0
85.00		128.5	1,820.9					0.0	83.0	128.5	1,903.8	0.0	0.0
88.16	Top - Section 2	100.5	1,779.6					0.0	82.8	100.5	1,862.4	0.0	0.0
90.00	Appertunance(s)	135.2	567.1	1,809.8	0.0	0.0	10,286.7	0.0	48.1	1,945.0	10,901.9	0.0	0.0
95.00		175.8	1,504.4					0.0	100.0	175.8	1,604.4	0.0	0.0
99.00	Appertunance(s)	77.3	1,168.3	1,368.7	0.0	1,215.3	9,473.8	0.0	80.0	1,446.0	10,722.1	0.0	0.0
								Totals:		7,295.76	69,676.4	0.00	0.00

Site Number: 411188 Code: ANSI/TIA-222-G

Site Name: Southbury CT, CT Engineering Number: 66444021 5/7/2016 9:26:28 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 13 Iterations

Gust Response Factor : 1.10 Ice Dead Load Factor : 1.00 Wind Importance Factor : 1.00

Dead Load Factor : 1.20 Ice Importance Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-69.68	-7.20	0.00	-508.02	0.00	508.02	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.058
5.00	-66.81	-7.01	0.00	-472.03	0.00	472.03	7,247.84	3,623.92	20,252.7	10,141.4	0.01	-0.01	0.056
10.00	-63.95	-6.82	0.00	-436.99	0.00	436.99	7,144.94	3,572.47	19,512.6	9,770.83	0.02	-0.02	0.054
15.00	-61.12	-6.63	0.00	-402.91	0.00	402.91	7,039.27	3,519.64	18,778.2	9,403.06	0.05	-0.03	0.052
20.00	-58.33	-6.43	0.00	-369.79	0.00	369.79	6,930.83	3,465.42	18,049.9	9,038.38	0.09	-0.04	0.049
25.00	-55.60	-6.23	0.00	-337.64	0.00	337.64	6,819.62	3,409.81	17,328.3	8,677.06	0.14	-0.05	0.047
30.00	-52.91	-6.02	0.00	-306.49	0.00	306.49	6,705.64	3,352.82	16,614.0	8,319.35	0.19	-0.06	0.045
35.00	-50.28	-5.81	0.00	-276.38	0.00	276.38	6,588.88	3,294.44	15,907.3	7,965.52	0.26	-0.07	0.042
40.00	-47.70	-5.60	0.00	-247.32	0.00	247.32	6,469.35	3,234.68	15,209.0	7,615.83	0.34	-0.08	0.040
45.00	-45.18	-5.49	0.00	-219.31	0.00	219.31	6,347.05	3,173.53	14,519.5	7,270.55	0.43	-0.09	0.037
45.16	-45.10	-5.38	0.00	-218.41	0.00	218.41	6,343.01	3,171.51	14,497.1	7,259.35	0.43	-0.09	0.037
50.00	-41.18	-5.22	0.00	-192.37	0.00	192.37	6,221.98	3,110.99	13,839.3	6,929.95	0.52	-0.10	0.034
52.83	-38.93	-5.11	0.00	-177.61	0.00	177.61	5,231.28	2,615.64	11,664.6	5,840.97	0.58	-0.10	0.038
55.00	-37.97	-4.95	0.00	-166.53	0.00	166.53	5,188.38	2,594.19	11,426.3	5,721.65	0.63	-0.10	0.036
60.00	-35.81	-4.74	0.00	-141.77	0.00	141.77	5,087.55	2,543.78	10,882.0	5,449.10	0.74	-0.11	0.033
65.00	-33.69	-4.53	0.00	-118.07	0.00	118.07	4,983.95	2,491.97	10,344.7	5,180.06	0.87	-0.12	0.030
70.00	-31.64	-4.32	0.00	-95.44	0.00	95.44	4,877.57	2,438.79	9,815.02	4,914.80	1.00	-0.13	0.026
75.00	-29.63	-4.11	0.00	-73.86	0.00	73.86	4,768.43	2,384.21	9,293.36	4,653.59	1.13	-0.13	0.022
80.00	-27.69	-3.96	0.00	-53.32	0.00	53.32	4,656.51	2,328.26	8,780.31	4,396.68	1.27	-0.14	0.018
81.83	-26.99	-3.86	0.00	-46.07	0.00	46.07	4,614.86	2,307.43	8,594.79	4,303.78	1.33	-0.14	0.017
85.00	-25.08	-3.73	0.00	-33.83	0.00	33.83	4,541.82	2,270.91	8,276.38	4,144.34	1.42	-0.14	0.014
88.16	-23.22	-3.62	0.00	-22.03	0.00	22.03	3,716.95	1,858.48	6,758.81	3,384.43	1.51	-0.14	0.013
90.00	-12.32	-1.65	0.00	-15.37	0.00	15.37	3,684.34	1,842.17	6,613.79	3,311.81	1.57	-0.14	0.008
95.00	-10.72	-1.47	0.00	-7.11	0.00	7.11	3,593.66	1,796.83	6,223.40	3,116.33	1.72	-0.14	0.005
99.00	0.00	-1.45	0.00	-1.22	0.00	1.22	3,519.13	1,759.56	5,916.01	2,962.40	1.84	-0.14	0.000

Site Number: 411188 | Code: ANSI/TIA-222-G |

Site Name: Southbury CT, CT | Engineering Number: 66444021 | 5/7/2016 9:26:28 AM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W | Serviceability 60 mph | 13 Iterations

Gust Response Factor : 1.10 | Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		77.9	0.0					0.0	0.0	77.9	0.0	0.0	0.0
5.00		154.1	1,855.9					0.0	109.0	154.1	1,964.9	0.0	0.0
10.00		150.7	1,814.6					0.0	109.0	150.7	1,923.6	0.0	0.0
15.00		149.6	1,773.3					0.0	109.0	149.6	1,882.3	0.0	0.0
20.00		152.3	1,732.0					0.0	109.0	152.3	1,841.0	0.0	0.0
25.00		155.9	1,690.7					0.0	109.0	155.9	1,799.7	0.0	0.0
30.00		158.1	1,649.4					0.0	109.0	158.1	1,758.4	0.0	0.0
35.00		159.2	1,608.1					0.0	109.0	159.2	1,717.1	0.0	0.0
40.00		159.6	1,566.8					0.0	109.0	159.6	1,675.8	0.0	0.0
45.00		82.4	1,525.5					0.0	109.0	82.4	1,634.5	0.0	0.0
45.16	Bot - Section 2	80.7	49.1					0.0	3.6	80.7	52.7	0.0	0.0
50.00		123.6	2,712.1					0.0	105.5	123.6	2,817.6	0.0	0.0
52.83	Top - Section 1	80.2	1,553.3					0.0	61.7	80.2	1,615.0	0.0	0.0
55.00		114.2	553.1					0.0	47.3	114.2	600.4	0.0	0.0
60.00		158.1	1,248.5					0.0	109.0	158.1	1,357.6	0.0	0.0
65.00		156.1	1,212.4					0.0	109.0	156.1	1,321.4	0.0	0.0
70.00		153.8	1,176.3					0.0	109.0	153.8	1,285.3	0.0	0.0
75.00		151.2	1,140.1					0.0	109.0	151.2	1,249.2	0.0	0.0
80.00		102.0	1,104.0					0.0	109.0	102.0	1,213.0	0.0	0.0
81.83	Bot - Section 3	74.2	395.0					0.0	39.9	74.2	434.9	0.0	0.0
85.00		93.6	1,260.0					0.0	69.1	93.6	1,329.1	0.0	0.0
88.16	Top - Section 2	73.1	1,230.4					0.0	69.0	73.1	1,299.4	0.0	0.0
90.00	Appertunance(s)	98.1	327.3	1,885.2	0.0	0.0	4,264.3	0.0	40.1	1,983.3	4,631.6	0.0	0.0
95.00		127.3	869.8					0.0	83.3	127.3	953.2	0.0	0.0
99.00	Appertunance(s)	55.9	673.5	2,700.3	0.0	820.8	4,055.0	0.0	66.7	2,756.2	4,795.2	0.0	0.0
								Totals:		7,627.39	41,153.2	0.00	0.00

Site Number: 411188 Code: ANSI/TIA-222-G

Site Name: Southbury CT, CT Engineering Number: 66444021 5/7/2016 9:26:29 AM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W Serviceability 60 mph 13 Iterations

Gust Response Factor : 1.10 Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.15	-7.55	0.00	-590.28	0.00	590.28	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.062
5.00	-39.19	-7.41	0.00	-552.51	0.00	552.51	7,247.84	3,623.92	20,252.7	10,141.4	0.01	-0.01	0.060
10.00	-37.26	-7.26	0.00	-515.47	0.00	515.47	7,144.94	3,572.47	19,512.6	9,770.83	0.03	-0.02	0.058
15.00	-35.38	-7.12	0.00	-479.15	0.00	479.15	7,039.27	3,519.64	18,778.2	9,403.06	0.06	-0.04	0.056
20.00	-33.53	-6.97	0.00	-443.54	0.00	443.54	6,930.83	3,465.42	18,049.9	9,038.38	0.10	-0.05	0.054
25.00	-31.73	-6.82	0.00	-408.67	0.00	408.67	6,819.62	3,409.81	17,328.3	8,677.06	0.16	-0.06	0.052
30.00	-29.97	-6.67	0.00	-374.55	0.00	374.55	6,705.64	3,352.82	16,614.0	8,319.35	0.23	-0.07	0.049
35.00	-28.26	-6.51	0.00	-341.21	0.00	341.21	6,588.88	3,294.44	15,907.3	7,965.52	0.31	-0.08	0.047
40.00	-26.58	-6.36	0.00	-308.64	0.00	308.64	6,469.35	3,234.68	15,209.0	7,615.83	0.40	-0.09	0.045
45.00	-24.94	-6.27	0.00	-276.86	0.00	276.86	6,347.05	3,173.53	14,519.5	7,270.55	0.51	-0.11	0.042
45.16	-24.89	-6.20	0.00	-275.84	0.00	275.84	6,343.01	3,171.51	14,497.1	7,259.35	0.51	-0.11	0.042
50.00	-22.07	-6.07	0.00	-245.87	0.00	245.87	6,221.98	3,110.99	13,839.3	6,929.95	0.63	-0.12	0.039
52.83	-20.46	-5.99	0.00	-228.70	0.00	228.70	5,231.28	2,615.64	11,664.6	5,840.97	0.70	-0.12	0.043
55.00	-19.86	-5.87	0.00	-215.70	0.00	215.70	5,188.38	2,594.19	11,426.3	5,721.65	0.75	-0.13	0.042
60.00	-18.50	-5.72	0.00	-186.33	0.00	186.33	5,087.55	2,543.78	10,882.0	5,449.10	0.89	-0.14	0.038
65.00	-17.18	-5.56	0.00	-157.75	0.00	157.75	4,983.95	2,491.97	10,344.7	5,180.06	1.04	-0.15	0.034
70.00	-15.89	-5.41	0.00	-129.95	0.00	129.95	4,877.57	2,438.79	9,815.02	4,914.80	1.20	-0.16	0.030
75.00	-14.64	-5.25	0.00	-102.92	0.00	102.92	4,768.43	2,384.21	9,293.36	4,653.59	1.37	-0.16	0.025
80.00	-13.43	-5.15	0.00	-76.66	0.00	76.66	4,656.51	2,328.26	8,780.31	4,396.68	1.55	-0.17	0.020
81.83	-12.99	-5.07	0.00	-67.24	0.00	67.24	4,614.86	2,307.43	8,594.79	4,303.78	1.61	-0.17	0.018
85.00	-11.66	-4.98	0.00	-51.15	0.00	51.15	4,541.82	2,270.91	8,276.38	4,144.34	1.73	-0.18	0.015
88.16	-10.36	-4.90	0.00	-35.41	0.00	35.41	3,716.95	1,858.48	6,758.81	3,384.43	1.85	-0.18	0.013
90.00	-5.74	-2.90	0.00	-26.42	0.00	26.42	3,684.34	1,842.17	6,613.79	3,311.81	1.92	-0.18	0.010
95.00	-4.79	-2.77	0.00	-11.91	0.00	11.91	3,593.66	1,796.83	6,223.40	3,116.33	2.11	-0.18	0.005
99.00	0.00	-2.76	0.00	-0.82	0.00	0.82	3,519.13	1,759.56	5,916.01	2,962.40	2.26	-0.18	0.000

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.20
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Long-Period Transition Period (T_L):	6
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coeffiecient F_v:	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.21
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Seismic Response Coefficient (C_s):	0.09
Upper Limit C_s	0.09
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	0.75
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.13
Total Unfactored Dead Load:	41.15 k
Seismic Base Shear (E):	4.93 k

Load Case (1.2 + 0.2Sds) * DL + E ELFM

Seismic Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
24	97.00	740	128	0.033	163	920
23	92.50	953	156	0.040	199	1,185
22	89.08	367	58	0.015	73	457
21	86.58	1,299	198	0.051	252	1,615
20	83.42	1,329	194	0.050	247	1,652
19	80.92	435	61	0.016	78	541
18	77.50	1,213	163	0.042	207	1,508
17	72.50	1,249	156	0.040	198	1,553
16	67.50	1,285	148	0.038	188	1,597
15	62.50	1,321	139	0.036	177	1,642
14	57.50	1,358	130	0.034	166	1,687
13	53.92	600	54	0.014	68	746
12	51.42	1,615	137	0.035	174	2,007
11	47.58	2,818	219	0.056	278	3,502
10	45.08	53	4	0.001	5	65
9	42.50	1,635	112	0.029	142	2,032
8	37.50	1,676	99	0.026	126	2,083
7	32.50	1,717	87	0.022	110	2,134
6	27.50	1,758	74	0.019	94	2,186
5	22.50	1,800	60	0.015	76	2,237
4	17.50	1,841	46	0.012	59	2,288
3	12.50	1,882	32	0.008	41	2,339
2	7.50	1,924	19	0.005	24	2,391

1	2.50	1,965	6	0.001	7	2,442
Alcatel-Lucent RRH2X	99.00	129	23	0.006	29	160
Alcatel-Lucent RRH2x	99.00	170	30	0.008	38	211
Alcatel-Lucent RRH4X	99.00	192	34	0.009	43	239
RFS DB-T1-6Z-8AB-0Z	99.00	88	16	0.004	20	109
20' Omni	99.00	55	10	0.003	12	68
Commscope SBNHH-1D85	99.00	88	16	0.004	20	110
Commscope SBNHH-1D65	99.00	198	35	0.009	45	247
Antel LPA-80080/8CF	99.00	144	25	0.007	32	179
Flat Low Profile Pla	99.00	1,500	266	0.069	338	1,864
VZW Unused Reserve:	99.00	1,490	264	0.068	335	1,852
RCU (Remote Control	90.00	3	0	0.000	1	4
Ericsson mRRU	90.00	132	21	0.005	27	164
Raycap DC6-48-60-18-	90.00	80	13	0.003	16	99
Ericsson RRUS A2 B2	90.00	132	21	0.005	27	164
Alcatel-Lucent IBC70	90.00	190	30	0.008	38	236
Ericsson RRUS 32 B30	90.00	180	29	0.007	36	224
Ericsson RRU11	90.00	383	61	0.016	78	477
Ericsson RRUS-12 B2	90.00	348	55	0.014	70	433
CCI HPA-65R-BUU-H8	90.00	816	130	0.033	165	1,014
Round Platform w/ Ha	90.00	2,000	318	0.082	404	2,486
		41,153	3,874	1.000	4,926	51,149

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

Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
24	97.00	740	128	0.033	163	634
23	92.50	953	156	0.040	199	817
22	89.08	367	58	0.015	73	315
21	86.58	1,299	198	0.051	252	1,114
20	83.42	1,329	194	0.050	247	1,139
19	80.92	435	61	0.016	78	373
18	77.50	1,213	163	0.042	207	1,040
17	72.50	1,249	156	0.040	198	1,071
16	67.50	1,285	148	0.038	188	1,102
15	62.50	1,321	139	0.036	177	1,133
14	57.50	1,358	130	0.034	166	1,164
13	53.92	600	54	0.014	68	515
12	51.42	1,615	137	0.035	174	1,384
11	47.58	2,818	219	0.056	278	2,415
10	45.08	53	4	0.001	5	45
9	42.50	1,635	112	0.029	142	1,401
8	37.50	1,676	99	0.026	126	1,436
7	32.50	1,717	87	0.022	110	1,472
6	27.50	1,758	74	0.019	94	1,507
5	22.50	1,800	60	0.015	76	1,543
4	17.50	1,841	46	0.012	59	1,578
3	12.50	1,882	32	0.008	41	1,613
2	7.50	1,924	19	0.005	24	1,649
1	2.50	1,965	6	0.001	7	1,684
Alcatel-Lucent RRH2X	99.00	129	23	0.006	29	111
Alcatel-Lucent RRH2x	99.00	170	30	0.008	38	146
Alcatel-Lucent RRH4X	99.00	192	34	0.009	43	165
RFS DB-T1-6Z-8AB-0Z	99.00	88	16	0.004	20	75
20' Omni	99.00	55	10	0.003	12	47
Commscope SBNHH-1D85	99.00	88	16	0.004	20	76
Commscope SBNHH-1D65	99.00	198	35	0.009	45	170
Antel LPA-80080/8CF	99.00	144	25	0.007	32	123
Flat Low Profile Pla	99.00	1,500	266	0.069	338	1,286

VZW Unused Reserve:	99.00	1,490	264	0.068	335	1,277
RCU (Remote Control	90.00	3	0	0.000	1	3
Ericsson mRRU	90.00	132	21	0.005	27	113
Raycap DC6-48-60-18-	90.00	80	13	0.003	16	69
Ericsson RRUS A2 B2	90.00	132	21	0.005	27	113
Alcatel-Lucent IBC70	90.00	190	30	0.008	38	163
Ericsson RRUS 32 B30	90.00	180	29	0.007	36	154
Ericsson RRU11	90.00	383	61	0.016	78	329
Ericsson RRUS-12 B2	90.00	348	55	0.014	70	298
CCI HPA-65R-BUU-H8	90.00	816	130	0.033	165	699
Round Platform w/ Ha	90.00	2,000	318	0.082	404	1,714
		41,153	3,874	1.000	4,926	35,273

Load Case (1.2 + 0.2Sds) * DL + E ELFM — Seismic Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-48.71	-4.92	0.00	-362.95	0.00	362.95	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.041
5.00	-46.31	-4.90	0.00	-338.34	0.00	338.34	7,247.84	3,623.92	20,252.7	10,141.4	0.00	-0.01	0.040
10.00	-43.97	-4.87	0.00	-313.83	0.00	313.83	7,144.94	3,572.47	19,512.6	9,770.83	0.02	-0.01	0.038
15.00	-41.69	-4.81	0.00	-289.49	0.00	289.49	7,039.27	3,519.64	18,778.2	9,403.06	0.04	-0.02	0.037
20.00	-39.45	-4.74	0.00	-265.42	0.00	265.42	6,930.83	3,465.42	18,049.9	9,038.38	0.06	-0.03	0.035
25.00	-37.26	-4.65	0.00	-241.72	0.00	241.72	6,819.62	3,409.81	17,328.3	8,677.06	0.10	-0.04	0.033
30.00	-35.13	-4.54	0.00	-218.46	0.00	218.46	6,705.64	3,352.82	16,614.0	8,319.35	0.14	-0.04	0.032
35.00	-33.04	-4.42	0.00	-195.75	0.00	195.75	6,588.88	3,294.44	15,907.3	7,965.52	0.19	-0.05	0.030
40.00	-31.01	-4.28	0.00	-173.65	0.00	173.65	6,469.35	3,234.68	15,209.0	7,615.83	0.24	-0.06	0.028
45.00	-30.95	-4.28	0.00	-152.26	0.00	152.26	6,347.05	3,173.53	14,519.5	7,270.55	0.31	-0.06	0.026
45.16	-27.45	-4.00	0.00	-151.56	0.00	151.56	6,343.01	3,171.51	14,497.1	7,259.35	0.31	-0.06	0.025
50.00	-25.44	-3.82	0.00	-132.24	0.00	132.24	6,221.98	3,110.99	13,839.3	6,929.95	0.38	-0.07	0.023
52.83	-24.69	-3.75	0.00	-121.43	0.00	121.43	5,231.28	2,615.64	11,664.6	5,840.97	0.42	-0.07	0.026
55.00	-23.00	-3.59	0.00	-113.28	0.00	113.28	5,188.38	2,594.19	11,426.3	5,721.65	0.45	-0.07	0.024
60.00	-21.36	-3.41	0.00	-95.35	0.00	95.35	5,087.55	2,543.78	10,882.0	5,449.10	0.53	-0.08	0.022
65.00	-19.76	-3.22	0.00	-78.30	0.00	78.30	4,983.95	2,491.97	10,344.7	5,180.06	0.62	-0.08	0.019
70.00	-18.21	-3.02	0.00	-62.20	0.00	62.20	4,877.57	2,438.79	9,815.02	4,914.80	0.71	-0.09	0.016
75.00	-16.70	-2.81	0.00	-47.09	0.00	47.09	4,768.43	2,384.21	9,293.36	4,653.59	0.80	-0.09	0.014
80.00	-16.16	-2.73	0.00	-33.02	0.00	33.02	4,656.51	2,328.26	8,780.31	4,396.68	0.90	-0.10	0.011
81.83	-14.51	-2.49	0.00	-28.02	0.00	28.02	4,614.86	2,307.43	8,594.79	4,303.78	0.94	-0.10	0.010
85.00	-12.90	-2.23	0.00	-20.14	0.00	20.14	4,541.82	2,270.91	8,276.38	4,144.34	1.00	-0.10	0.008
88.16	-12.44	-2.16	0.00	-13.08	0.00	13.08	3,716.95	1,858.48	6,758.81	3,384.43	1.07	-0.10	0.007
90.00	-5.96	-1.09	0.00	-9.12	0.00	9.12	3,684.34	1,842.17	6,613.79	3,311.81	1.11	-0.10	0.004
95.00	-5.04	-0.92	0.00	-3.69	0.00	3.69	3,593.66	1,796.83	6,223.40	3,116.33	1.21	-0.10	0.003
99.00	0.00	-0.91	0.00	0.00	0.00	0.00	3,519.13	1,759.56	5,916.01	2,962.40	1.30	-0.10	0.000

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

Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-33.59	-4.92	0.00	-362.23	0.00	362.23	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.039
5.00	-31.94	-4.90	0.00	-337.63	0.00	337.63	7,247.84	3,623.92	20,252.7	10,141.4	0.00	-0.01	0.038
10.00	-30.33	-4.86	0.00	-313.13	0.00	313.13	7,144.94	3,572.47	19,512.6	9,770.83	0.02	-0.01	0.036
15.00	-28.75	-4.81	0.00	-288.81	0.00	288.81	7,039.27	3,519.64	18,778.2	9,403.06	0.04	-0.02	0.035
20.00	-27.20	-4.73	0.00	-264.77	0.00	264.77	6,930.83	3,465.42	18,049.9	9,038.38	0.06	-0.03	0.033
25.00	-25.70	-4.64	0.00	-241.10	0.00	241.10	6,819.62	3,409.81	17,328.3	8,677.06	0.10	-0.04	0.032
30.00	-24.22	-4.53	0.00	-217.89	0.00	217.89	6,705.64	3,352.82	16,614.0	8,319.35	0.14	-0.04	0.030
35.00	-22.79	-4.41	0.00	-195.22	0.00	195.22	6,588.88	3,294.44	15,907.3	7,965.52	0.19	-0.05	0.028
40.00	-21.39	-4.27	0.00	-173.17	0.00	173.17	6,469.35	3,234.68	15,209.0	7,615.83	0.24	-0.06	0.026
45.00	-21.34	-4.26	0.00	-151.83	0.00	151.83	6,347.05	3,173.53	14,519.5	7,270.55	0.31	-0.06	0.024
45.16	-18.93	-3.99	0.00	-151.14	0.00	151.14	6,343.01	3,171.51	14,497.1	7,259.35	0.31	-0.06	0.024
50.00	-17.54	-3.81	0.00	-131.86	0.00	131.86	6,221.98	3,110.99	13,839.3	6,929.95	0.37	-0.07	0.022
52.83	-17.03	-3.74	0.00	-121.07	0.00	121.07	5,231.28	2,615.64	11,664.6	5,840.97	0.42	-0.07	0.024
55.00	-15.86	-3.58	0.00	-112.95	0.00	112.95	5,188.38	2,594.19	11,426.3	5,721.65	0.45	-0.07	0.023
60.00	-14.73	-3.40	0.00	-95.07	0.00	95.07	5,087.55	2,543.78	10,882.0	5,449.10	0.53	-0.08	0.020
65.00	-13.63	-3.21	0.00	-78.07	0.00	78.07	4,983.95	2,491.97	10,344.7	5,180.06	0.62	-0.08	0.018
70.00	-12.56	-3.01	0.00	-62.01	0.00	62.01	4,877.57	2,438.79	9,815.02	4,914.80	0.71	-0.09	0.015
75.00	-11.52	-2.80	0.00	-46.95	0.00	46.95	4,768.43	2,384.21	9,293.36	4,653.59	0.80	-0.09	0.013
80.00	-11.15	-2.73	0.00	-32.92	0.00	32.92	4,656.51	2,328.26	8,780.31	4,396.68	0.90	-0.10	0.010
81.83	-10.01	-2.48	0.00	-27.93	0.00	27.93	4,614.86	2,307.43	8,594.79	4,303.78	0.94	-0.10	0.009
85.00	-8.89	-2.22	0.00	-20.08	0.00	20.08	4,541.82	2,270.91	8,276.38	4,144.34	1.00	-0.10	0.007
88.16	-8.58	-2.15	0.00	-13.04	0.00	13.04	3,716.95	1,858.48	6,758.81	3,384.43	1.07	-0.10	0.006
90.00	-4.11	-1.08	0.00	-9.09	0.00	9.09	3,684.34	1,842.17	6,613.79	3,311.81	1.10	-0.10	0.004
95.00	-3.47	-0.92	0.00	-3.68	0.00	3.68	3,593.66	1,796.83	6,223.40	3,116.33	1.21	-0.10	0.002
99.00	0.00	-0.91	0.00	0.00	0.00	0.00	3,519.13	1,759.56	5,916.01	2,962.40	1.29	-0.10	0.000

Equivalent Modal Forces Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.20
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.21
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	0.75
Redundancy Factor (p):	1.30

Load Case (1.2 + 0.2Sds) * DL + E EMAM — **Seismic Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
24	97.00	740	1.814	1.605	1.002	0.425	272	920
23	92.50	953	1.650	0.942	0.740	0.324	268	1,185
22	89.08	367	1.530	0.578	0.580	0.261	83	457
21	86.58	1,299	1.446	0.376	0.480	0.221	249	1,615
20	83.42	1,329	1.342	0.183	0.374	0.178	206	1,652
19	80.92	435	1.263	0.072	0.304	0.151	57	541
18	77.50	1,213	1.158	-0.031	0.225	0.120	127	1,508
17	72.50	1,249	1.014	-0.106	0.138	0.091	98	1,553
16	67.50	1,285	0.879	-0.121	0.079	0.074	83	1,597
15	62.50	1,321	0.753	-0.102	0.041	0.067	77	1,642
14	57.50	1,358	0.638	-0.066	0.019	0.064	76	1,687
13	53.92	600	0.561	-0.038	0.011	0.064	33	746
12	51.42	1,615	0.510	-0.020	0.007	0.063	89	2,007
11	47.58	2,818	0.437	0.006	0.006	0.062	151	3,502
10	45.08	53	0.392	0.021	0.007	0.060	3	65
9	42.50	1,635	0.348	0.033	0.009	0.059	83	2,032
8	37.50	1,676	0.271	0.051	0.015	0.054	78	2,083
7	32.50	1,717	0.204	0.062	0.023	0.048	71	2,134
6	27.50	1,758	0.146	0.068	0.031	0.041	63	2,186
5	22.50	1,800	0.098	0.071	0.037	0.036	55	2,237
4	17.50	1,841	0.059	0.072	0.041	0.030	49	2,288
3	12.50	1,882	0.030	0.068	0.041	0.026	42	2,339
2	7.50	1,924	0.011	0.056	0.033	0.019	32	2,391
1	2.50	1,965	0.001	0.026	0.014	0.009	15	2,442
Alcatel-Lucent RRH2X	99.00	129	1.890	1.980	1.140	0.475	53	160
Alcatel-Lucent RRH2x	99.00	170	1.890	1.980	1.140	0.475	70	211
Alcatel-Lucent RRH4X	99.00	192	1.890	1.980	1.140	0.475	79	239
RFS DB-T1-6Z-8AB-0Z	99.00	88	1.890	1.980	1.140	0.475	36	109
20' Omni	99.00	55	1.890	1.980	1.140	0.475	23	68
Commscope SBNHH-	99.00	88	1.890	1.980	1.140	0.475	36	110
Commscope SBNHH-	99.00	198	1.890	1.980	1.140	0.475	82	247
Antel LPA-80080/8CF	99.00	144	1.890	1.980	1.140	0.475	59	179
Flat Low Profile Pla	99.00	1,500	1.890	1.980	1.140	0.475	618	1,864
VZW Unused Reserve:	99.00	1,490	1.890	1.980	1.140	0.475	614	1,852

RCU (Remote Control	90.00	3	1.562	0.666	0.620	0.277	1	4
Ericsson mRRU	90.00	132	1.562	0.666	0.620	0.277	32	164
Raycap DC6-48-60-18-	90.00	80	1.562	0.666	0.620	0.277	19	99
Ericsson RRUS A2 B2	90.00	132	1.562	0.666	0.620	0.277	32	164
Alcatel-Lucent IBC70	90.00	190	1.562	0.666	0.620	0.277	46	236
Ericsson RRUS 32 B30	90.00	180	1.562	0.666	0.620	0.277	43	224
Ericsson RRU11	90.00	383	1.562	0.666	0.620	0.277	92	477
Ericsson RRUS-12 B2	90.00	348	1.562	0.666	0.620	0.277	84	433
CCI HPA-65R-BUU-H8	90.00	816	1.562	0.666	0.620	0.277	196	1,014
Round Platform w/ Ha	90.00	2,000	1.562	0.666	0.620	0.277	480	2,486
		41,153	51.072	30.260	21.855	10.069	5,052	51,149

Load Case (0.9 - 0.2Sds) * DL + E EMAM **Seismic (Reduced DL) Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
24	97.00	740	1.814	1.605	1.002	0.425	272	634
23	92.50	953	1.650	0.942	0.740	0.324	268	817
22	89.08	367	1.530	0.578	0.580	0.261	83	315
21	86.58	1,299	1.446	0.376	0.480	0.221	249	1,114
20	83.42	1,329	1.342	0.183	0.374	0.178	206	1,139
19	80.92	435	1.263	0.072	0.304	0.151	57	373
18	77.50	1,213	1.158	-0.031	0.225	0.120	127	1,040
17	72.50	1,249	1.014	-0.106	0.138	0.091	98	1,071
16	67.50	1,285	0.879	-0.121	0.079	0.074	83	1,102
15	62.50	1,321	0.753	-0.102	0.041	0.067	77	1,133
14	57.50	1,358	0.638	-0.066	0.019	0.064	76	1,164
13	53.92	600	0.561	-0.038	0.011	0.064	33	515
12	51.42	1,615	0.510	-0.020	0.007	0.063	89	1,384
11	47.58	2,818	0.437	0.006	0.006	0.062	151	2,415
10	45.08	53	0.392	0.021	0.007	0.060	3	45
9	42.50	1,635	0.348	0.033	0.009	0.059	83	1,401
8	37.50	1,676	0.271	0.051	0.015	0.054	78	1,436
7	32.50	1,717	0.204	0.062	0.023	0.048	71	1,472
6	27.50	1,758	0.146	0.068	0.031	0.041	63	1,507
5	22.50	1,800	0.098	0.071	0.037	0.036	55	1,543
4	17.50	1,841	0.059	0.072	0.041	0.030	49	1,578
3	12.50	1,882	0.030	0.068	0.041	0.026	42	1,613
2	7.50	1,924	0.011	0.056	0.033	0.019	32	1,649
1	2.50	1,965	0.001	0.026	0.014	0.009	15	1,684
Alcatel-Lucent RRH2X	99.00	129	1.890	1.980	1.140	0.475	53	111
Alcatel-Lucent RRH2x	99.00	170	1.890	1.980	1.140	0.475	70	146
Alcatel-Lucent RRH4X	99.00	192	1.890	1.980	1.140	0.475	79	165
RFS DB-T1-6Z-8AB-0Z	99.00	88	1.890	1.980	1.140	0.475	36	75
20' Omni	99.00	55	1.890	1.980	1.140	0.475	23	47
Commscope SBNHH-	99.00	88	1.890	1.980	1.140	0.475	36	76
Commscope SBNHH-	99.00	198	1.890	1.980	1.140	0.475	82	170
Antel LPA-80080/8CF	99.00	144	1.890	1.980	1.140	0.475	59	123
Flat Low Profile Pla	99.00	1,500	1.890	1.980	1.140	0.475	618	1,286
VZW Unused Reserve:	99.00	1,490	1.890	1.980	1.140	0.475	614	1,277
RCU (Remote Control	90.00	3	1.562	0.666	0.620	0.277	1	3
Ericsson mRRU	90.00	132	1.562	0.666	0.620	0.277	32	113
Raycap DC6-48-60-18-	90.00	80	1.562	0.666	0.620	0.277	19	69
Ericsson RRUS A2 B2	90.00	132	1.562	0.666	0.620	0.277	32	113
Alcatel-Lucent IBC70	90.00	190	1.562	0.666	0.620	0.277	46	163
Ericsson RRUS 32 B30	90.00	180	1.562	0.666	0.620	0.277	43	154
Ericsson RRU11	90.00	383	1.562	0.666	0.620	0.277	92	329
Ericsson RRUS-12 B2	90.00	348	1.562	0.666	0.620	0.277	84	298
CCI HPA-65R-BUU-H8	90.00	816	1.562	0.666	0.620	0.277	196	699

Round Platform w/ Ha	90.00	2,000	1.562	0.666	0.620	0.277	480	1,714
		41,153	51.072	30.260	21.855	10.069	5,052	35,273

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-48.71	-5.04	0.00	-415.85	0.00	415.85	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.046
5.00	-46.31	-5.01	0.00	-390.66	0.00	390.66	7,247.84	3,623.92	20,252.7	10,141.4	0.00	-0.01	0.045
10.00	-43.97	-4.98	0.00	-365.58	0.00	365.58	7,144.94	3,572.47	19,512.6	9,770.83	0.02	-0.02	0.044
15.00	-41.69	-4.94	0.00	-340.69	0.00	340.69	7,039.27	3,519.64	18,778.2	9,403.06	0.04	-0.03	0.042
20.00	-39.45	-4.88	0.00	-316.02	0.00	316.02	6,930.83	3,465.42	18,049.9	9,038.38	0.07	-0.03	0.041
25.00	-37.26	-4.83	0.00	-291.60	0.00	291.60	6,819.62	3,409.81	17,328.3	8,677.06	0.11	-0.04	0.039
30.00	-35.13	-4.76	0.00	-267.47	0.00	267.47	6,705.64	3,352.82	16,614.0	8,319.35	0.16	-0.05	0.037
35.00	-33.04	-4.68	0.00	-243.68	0.00	243.68	6,588.88	3,294.44	15,907.3	7,965.52	0.22	-0.06	0.036
40.00	-31.01	-4.60	0.00	-220.27	0.00	220.27	6,469.35	3,234.68	15,209.0	7,615.83	0.29	-0.07	0.034
45.00	-30.95	-4.60	0.00	-197.26	0.00	197.26	6,347.05	3,173.53	14,519.5	7,270.55	0.36	-0.08	0.032
45.16	-27.44	-4.45	0.00	-196.51	0.00	196.51	6,343.01	3,171.51	14,497.1	7,259.35	0.36	-0.08	0.031
50.00	-25.44	-4.36	0.00	-175.00	0.00	175.00	6,221.98	3,110.99	13,839.3	6,929.95	0.44	-0.08	0.029
52.83	-24.69	-4.33	0.00	-162.66	0.00	162.66	5,231.28	2,615.64	11,664.6	5,840.97	0.50	-0.09	0.033
55.00	-23.00	-4.25	0.00	-153.27	0.00	153.27	5,188.38	2,594.19	11,426.3	5,721.65	0.54	-0.09	0.031
60.00	-21.36	-4.17	0.00	-132.03	0.00	132.03	5,087.55	2,543.78	10,882.0	5,449.10	0.63	-0.10	0.028
65.00	-19.76	-4.09	0.00	-111.16	0.00	111.16	4,983.95	2,491.97	10,344.7	5,180.06	0.74	-0.10	0.025
70.00	-18.21	-3.99	0.00	-90.71	0.00	90.71	4,877.57	2,438.79	9,815.02	4,914.80	0.85	-0.11	0.022
75.00	-16.70	-3.86	0.00	-70.76	0.00	70.76	4,768.43	2,384.21	9,293.36	4,653.59	0.97	-0.12	0.019
80.00	-16.16	-3.81	0.00	-51.44	0.00	51.44	4,656.51	2,328.26	8,780.31	4,396.68	1.10	-0.12	0.015
81.83	-14.51	-3.60	0.00	-44.48	0.00	44.48	4,614.86	2,307.43	8,594.79	4,303.78	1.15	-0.12	0.013
85.00	-12.89	-3.35	0.00	-33.08	0.00	33.08	4,541.82	2,270.91	8,276.38	4,144.34	1.23	-0.12	0.011
88.16	-12.44	-3.26	0.00	-22.50	0.00	22.50	3,716.95	1,858.48	6,758.81	3,384.43	1.31	-0.13	0.010
90.00	-5.96	-1.96	0.00	-16.51	0.00	16.51	3,684.34	1,842.17	6,613.79	3,311.81	1.36	-0.13	0.007
95.00	-5.04	-1.68	0.00	-6.73	0.00	6.73	3,593.66	1,796.83	6,223.40	3,116.33	1.49	-0.13	0.004
99.00	0.00	-1.67	0.00	0.00	0.00	0.00	3,519.13	1,759.56	5,916.01	2,962.40	1.60	-0.13	0.000

Load Case (0.9 - 0.2Sds) * DL + E EMAM **Seismic (Reduced DL) Equivalent Modal Analysis Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-33.59	-5.04	0.00	-414.98	0.00	414.98	7,347.96	3,673.98	20,997.9	10,514.5	0.00	0.00	0.044
5.00	-31.94	-5.01	0.00	-389.79	0.00	389.79	7,247.84	3,623.92	20,252.7	10,141.4	0.00	-0.01	0.043
10.00	-30.33	-4.97	0.00	-364.73	0.00	364.73	7,144.94	3,572.47	19,512.6	9,770.83	0.02	-0.02	0.042
15.00	-28.75	-4.93	0.00	-339.86	0.00	339.86	7,039.27	3,519.64	18,778.2	9,403.06	0.04	-0.03	0.040
20.00	-27.20	-4.88	0.00	-315.22	0.00	315.22	6,930.83	3,465.42	18,049.9	9,038.38	0.07	-0.03	0.039
25.00	-25.70	-4.82	0.00	-290.84	0.00	290.84	6,819.62	3,409.81	17,328.3	8,677.06	0.11	-0.04	0.037
30.00	-24.22	-4.75	0.00	-266.76	0.00	266.76	6,705.64	3,352.82	16,614.0	8,319.35	0.16	-0.05	0.036
35.00	-22.79	-4.67	0.00	-243.03	0.00	243.03	6,588.88	3,294.44	15,907.3	7,965.52	0.22	-0.06	0.034
40.00	-21.38	-4.59	0.00	-219.67	0.00	219.67	6,469.35	3,234.68	15,209.0	7,615.83	0.29	-0.07	0.032
45.00	-21.34	-4.59	0.00	-196.72	0.00	196.72	6,347.05	3,173.53	14,519.5	7,270.55	0.36	-0.08	0.030
45.16	-18.92	-4.44	0.00	-195.97	0.00	195.97	6,343.01	3,171.51	14,497.1	7,259.35	0.36	-0.08	0.030
50.00	-17.54	-4.35	0.00	-174.52	0.00	174.52	6,221.98	3,110.99	13,839.3	6,929.95	0.44	-0.08	0.028
52.83	-17.02	-4.31	0.00	-162.22	0.00	162.22	5,231.28	2,615.64	11,664.6	5,840.97	0.49	-0.09	0.031
55.00	-15.86	-4.24	0.00	-152.86	0.00	152.86	5,188.38	2,594.19	11,426.3	5,721.65	0.53	-0.09	0.030
60.00	-14.73	-4.16	0.00	-131.67	0.00	131.67	5,087.55	2,543.78	10,882.0	5,449.10	0.63	-0.10	0.027
65.00	-13.63	-4.08	0.00	-110.86	0.00	110.86	4,983.95	2,491.97	10,344.7	5,180.06	0.74	-0.10	0.024
70.00	-12.55	-3.98	0.00	-90.47	0.00	90.47	4,877.57	2,438.79	9,815.02	4,914.80	0.85	-0.11	0.021
75.00	-11.51	-3.85	0.00	-70.57	0.00	70.57	4,768.43	2,384.21	9,293.36	4,653.59	0.97	-0.12	0.018
80.00	-11.14	-3.79	0.00	-51.31	0.00	51.31	4,656.51	2,328.26	8,780.31	4,396.68	1.10	-0.12	0.014
81.83	-10.00	-3.59	0.00	-44.37	0.00	44.37	4,614.86	2,307.43	8,594.79	4,303.78	1.14	-0.12	0.012
85.00	-8.89	-3.34	0.00	-33.00	0.00	33.00	4,541.82	2,270.91	8,276.38	4,144.34	1.23	-0.12	0.010
88.16	-8.57	-3.25	0.00	-22.44	0.00	22.44	3,716.95	1,858.48	6,758.81	3,384.43	1.31	-0.13	0.009
90.00	-4.11	-1.95	0.00	-16.47	0.00	16.47	3,684.34	1,842.17	6,613.79	3,311.81	1.36	-0.13	0.006
95.00	-3.47	-1.68	0.00	-6.71	0.00	6.71	3,593.66	1,796.83	6,223.40	3,116.33	1.49	-0.13	0.003
99.00	0.00	-1.67	0.00	0.00	0.00	0.00	3,519.13	1,759.56	5,916.01	2,962.40	1.60	-0.13	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	30.30	0.00	49.37	0.00	0.00	2370.37	0.00	0.23
0.9D + 1.6W	30.30	0.00	37.02	0.00	0.00	2366.21	0.00	0.23
1.2D + 1.0Di + 1.0Wi	7.20	0.00	69.68	0.00	0.00	508.02	0.00	0.06
(1.2 + 0.2Sds) * DL + E ELFM	4.92	0.00	48.71	0.00	0.00	362.95	0.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	5.04	0.00	48.71	0.00	0.00	415.85	0.00	0.05
(0.9 - 0.2Sds) * DL + E ELFM	4.92	0.00	33.59	0.00	0.00	362.23	0.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	5.04	0.00	33.59	0.00	0.00	414.98	0.00	0.04
1.0D + 1.0W	7.55	0.00	41.15	0.00	0.00	590.28	0.00	0.06

Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
5,777.70	45.40	55.36	2,370.37	69.68	30.30	41.03

Base Plate

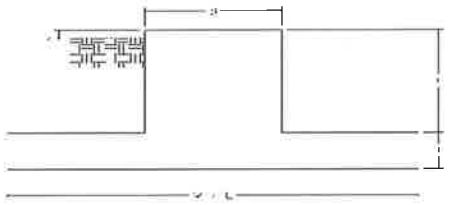
Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
60.0	3.500	84.000	Round	0	0.00	6.171	169.82	1020.60	0.17

Anchor Bolts

								Start	Compression			Tension		
Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Angle (deg)	Force (kip)	Allow (kip)	Ratio	Force (kip)	Allow (kip)	Ratio
78.00	36	2.25" 18J	2.25	75.00	100.00	Radial	0.00	0.0	42.45	260.00	0.17	38.58	260.00	0.15

Site Name:	Southbury CT, CT
Site Number:	411188
Engineering Number:	66444021
Engineer:	S. Rawles
Date:	05/07/16
Tower Type:	MP

Program Last Updated: *5/13/2014*



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

Design / Analysis / Mapping:	Analysis				
Compression/Leg:	49.4	k	Concrete Strength (f'_c):	4000	psi
Uplift/Leg:	0.0	k	Pad Tension Steel Depth:	32.00	in
Total Shear:	30.3	k	ϕ_{Shear}:	0.75	
Moment:	2370.4	k-ft	$\phi_{Flexure\ /\ Tension}$:	0.90	
Tower + Appurtenance Weight:	49.4	k	$\phi_{Compression:}$	0.65	
Depth to Base of Foundation (l + t - h):	5.00	ft	β:	0.85	
Diameter of Pier (d):	9.00	ft	Bottom Pad Rebar Size #:	11	
Height of Pier above Ground (h):	1.00		# of Bottom Pad Rebar:	37	
Width of Pad (W):	32.00	ft	Pad Bottom Steel Area:	57.72	in^2
Length of Pad (L):	32.00	ft	Pad Steel F_y:	60000	psi
Thickness of Pad (t):	3.00	ft	Top Pad Rebar Size #:	11	
Tower Leg Center to Center:	0.00	ft	# of Top Pad Rebar:	19	
Number of Tower Legs:	1.0	(1 if MP or GT)	Pad Top Steel Area:	29.64	in^2
Tower Center from Mat Center:	0.00	ft	Pier Rebar Size #:	11	
Depth Below Ground Surface to Water Table:	99.00	ft	Pier Steel Area (Single Bar):	1.56	in^2
Unit Weight of Concrete:	150.0	pcf	# of Pier Rebar:	30	
Unit Weight of Soil Above Water Table:	100.0	pcf	Pier Steel F_y:	60000	psi
Unit Weight of Water:	62.4	pcf	Pier Cage Diameter:	100.0	in
Unit Weight of Soil Below Water Table:	50.0	pcf	Rebar Strain Limit:	0.008	
Friction Angle of Uplift:	15.0	Degrees	Steel Elastic Modulus:	29000	ksi
Ultimate Coefficient of Shear Friction:	0.35		Tie Rebar Size #:	4	
Ultimate Compressive Bearing Pressure:	12000.0	psf	Tie Steel Area (Single Bar):	0.20	in^2
Ultimate Passive Pressure on Pad Face:	0.0	psf	Tie Spacing:	6	in
$\phi_{Soil\ and\ Concrete\ Weight}$:	0.9		Tie Steel F_y:	60000	psi
ϕ_{Soil}:	0.75				

Overturning Moment Usage

Design OTM:	2552.2	k-ft
OTM Resistance:	10719.4	k-ft
Design OTM / OTM Resistance:	0.24	Result: OK

Soil Bearing Pressure Usage

Net Bearing Pressure:	939	psf
Factored Nominal Bearing Pressure:	9000	psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.10	Result: OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge	

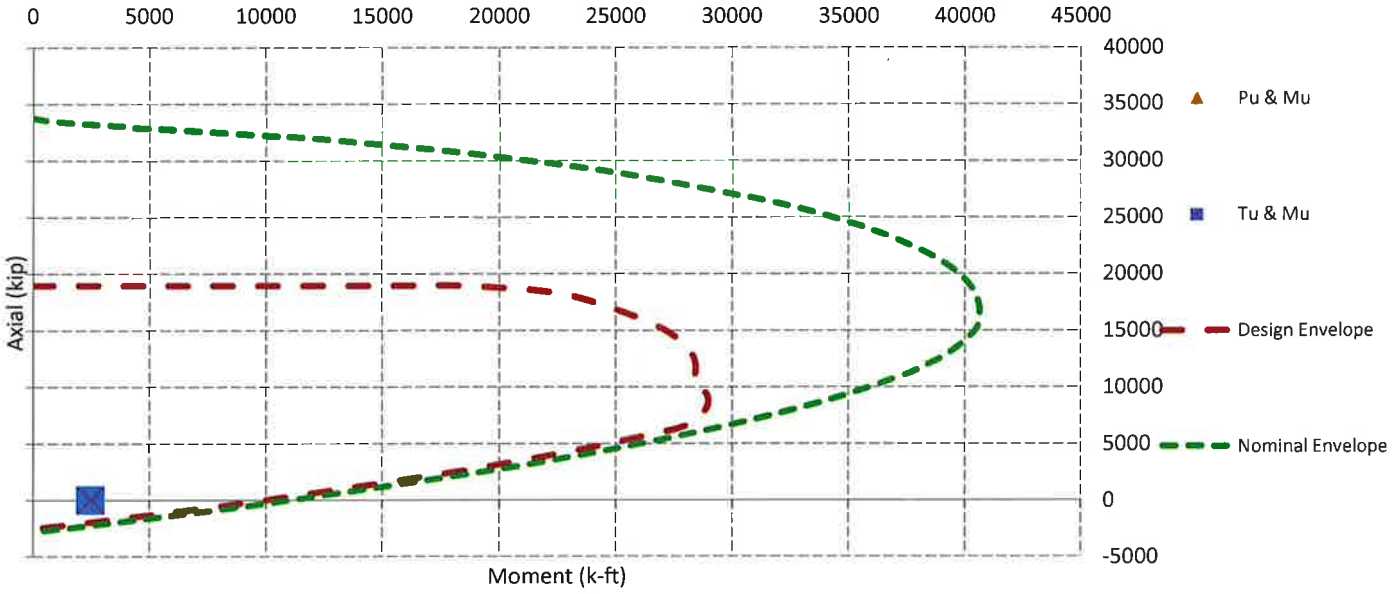
Sliding Factor of Safety

Total Factored Sliding Resistance:	189.7	k
Sliding Design / Sliding Resistance:	0.16	Result: OK

One Way Shear, Flexual Capacity, and Punching Shear

Factored One Way Shear (V_u):	183.2	k
One Way Shear Capacity (ϕV_c):	1165.7	k - ACI11.3.1.1
$V_u / \phi V_c$:	0.16	Result: OK
Load Direction Controling Shear Capacity:	Parallel to Pad Edge	
Lower Steel Pad Factored Moment (M_u):	1405.1	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	8018.9	k-ft - ACI10.3
$M_u / \phi M_n$:	0.18	Result: OK
Load Direction Controling Flexural Capacity:	Parallel to Pad Edge	
Upper Steel Pad Factored Moment (M_u):	519.9	k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	4190.9	k-ft
$M_u / \phi M_n$:	0.12	Result: OK
Lower Pad Flexural Reinforcement Ratio:	0.0047	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Upper Pad Flexural Reinforcement Ratio:	0.0024	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Lower Pad Reinforcement Spacing:	10	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Factored Punching Shear (V_u):	0.0	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	2670.4	k - ACI11.12.2.1
$V_u / \phi V_c$:	0.00	Result: OK
Factored Moment in Pier (M_u):	2461.3	k-ft
Pier Moment Capacity (ϕM_n):	10306.2	k-ft
$M_u / \phi M_n$:	0.24	Result: OK
Factored Shear in Pier (V_u):	30.3	k
Pier Shear Capacity (ϕV_n):	871.4	k
$V_u / \phi V_c$:	0.03	Result: OK
Pier Shear Reinforcement Ratio:	0.0002	No Ties Necessary for Shear - ACI11.5.6.1
Factored Tension in Pier (T_u):	0.0	k
Pier Tension Capacity (ϕT_n):	2527.2	k
$T_u / \phi T_n$:	0.00	Result: OK
Factored Compression in Pier (P_u):	49.4	k
Pier Compression Capacity (ϕP_n):	16113.7	k - ACI10.3.6.2
$P_u / \phi P_n$:	0.00	Result: OK
Pier Compression Reinforcement Ratio:	0.005	OK - Reinforcement Ratio Met - ACI10.9.1 & 10.8.4
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.24	Result: OK

Nominal and Design Moment Capacity and Factored Design Loads

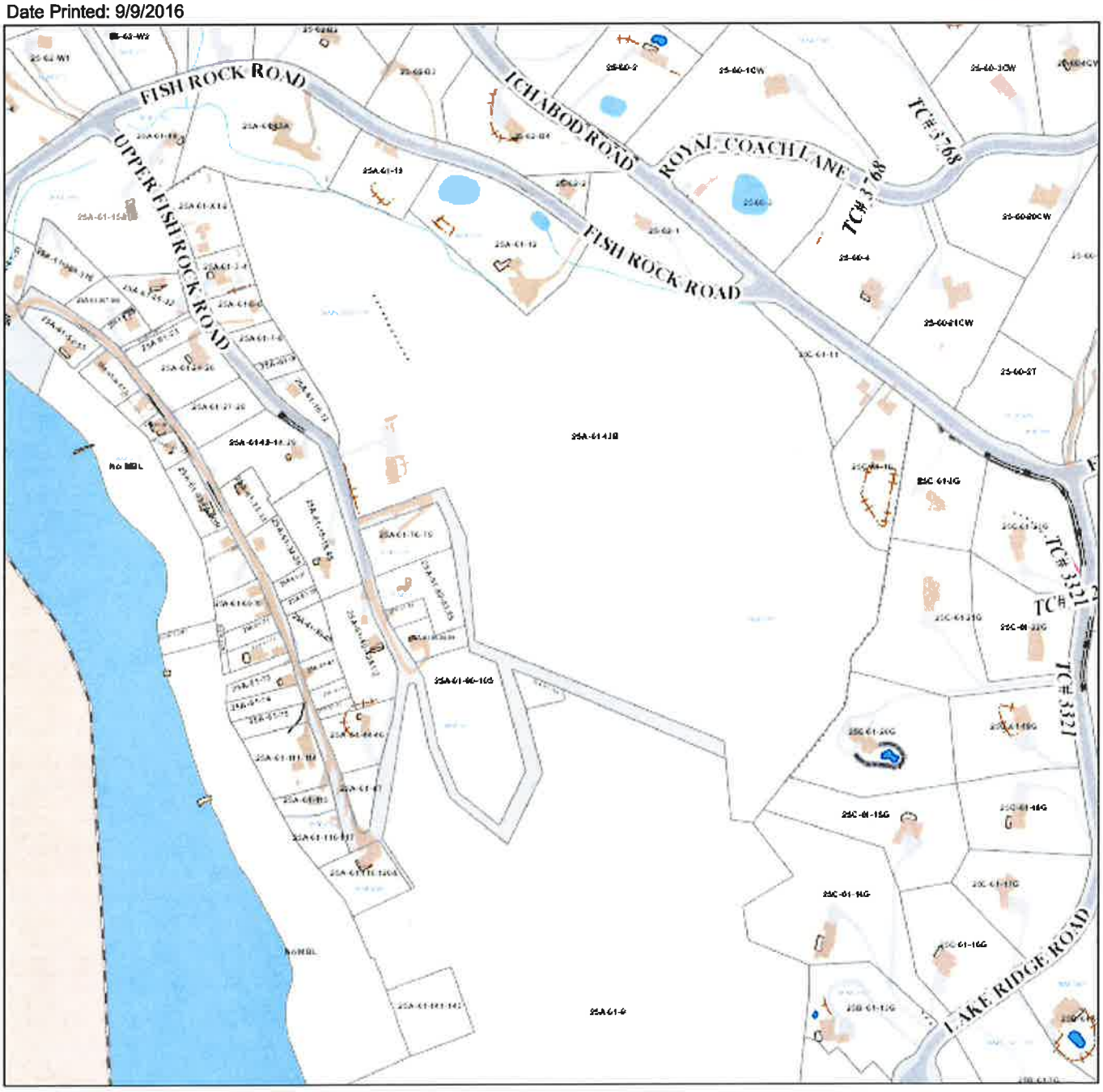


ATTACHMENT 4

Town of Southbury

Geographic Information System (GIS)

Date Printed: 9/9/2016



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for informational purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Southbury and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 400 feet

0 400 Feet

N W E S

111 UPPER FISH ROCK ROAD

Location	111 UPPER FISH ROCK ROAD	**Mblu**	25A/ 61/ 13B/ /
Acct#	00224000	**Owner**	FERENCEK CARL M & MARILYN T (SV)
Assessment	$178,080	**Appraisal**	$521,290
PID	2447	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$146,390	$374,900	$521,290

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$102,480	$75,600	$178,080

Owner of Record

Owner	FERENCEK CARL M & MARILYN T (SV)	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	111 UPPER FISH ROCK ROAD SOUTHBURY, CT 06488	**Book & Page**	553/ 282
		Sale Date	12/11/2008
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
FERENCEK CARL M & MARILYN T (SV)	$0		553/ 282	25	12/11/2008
FERENCEK CARL M & MARILYN T	$0		181/ 206	25	07/08/1985

Building Information

Building 1 : Section 1

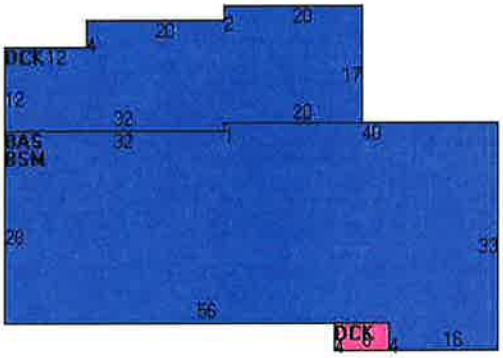
Year Built:	1974
Living Area:	2120
Replacement Cost:	$201,109
Building Percent Good:	71
Replacement Cost Less Depreciation:	$142,790

Building Attributes	
Field	**Description**
Style	Ranch
Model	Residential
Grade:	C
Stories	1
Occupancy	1
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Arch Shingles
Interior Wall 1	Panel
Interior Wall 2	
Interior Flr 1	Carpet
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Forced Hot Air
AC Percent	100
Total Bedrooms:	5 Bedrooms
Full Bthrms:	2
Half Baths:	0
Extra Fixtures	0
Total Rooms:	10
Bath Style:	Average
Kitchen Style:	Average
Num Kitchens	2
Pln FPL:	1
Det FPL:	1
Gas Fireplace(s)	0
% Attic Fin	0
LF Dormer	0
Foundation	Conc Block
Bsmt Gar(s)	2
Bsmt %	100
SF FBM	400
Fin Bsmt Qual	Better Quality
Bsmt Access	Walkout

Building Photo

(http://images.vgsi.com/photos/SouthburyCTPhotos//\00\00\12

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	2120	2120
BSM	Basement	2120	0
DCK	Deck	836	0
		5076	2120

Extra Features

Extra Features	Legend

No Data for Extra Features

Land

Land Use

Use Code	101
Description	Res Dwelling
Zone	R-20
Neighborhood	34
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	31.55
Frontage	0
Depth	0
Assessed Value	$75,600
Appraised Value	$374,900

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	Shed	MT	Metal	120 S.F.	$1,350	1
SHD1	Shed	MT	Metal	200 S.F.	$2,250	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2011	$174,590	$163,610	$338,200

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2011	$122,210	$114,530	$236,740