Robinson+Cole

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Also admitted in Massachusetts

March 15, 2018

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

Re: **Notice of Exempt Modification – Facility Modification**
80 Lonetown Road, Redding, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 82-foot level of an existing 100-foot lattice tower at 80 Lonetown Road in Redding, Connecticut (the "Property"). The tower and Property are owned by Andrew C. and Elizabeth C. Mound. Cellco's use of the tower was approved by the Council in 1993. Cellco now intends to replace six (6) of its existing antennas with two (2) model SBNHH-1D45B, 700 MHz antennas; one (1) model SBNHH-1D65B, 700 MHz antenna; two (2) model SBNHH-1D45B, 2100 MHz antennas; and one (1) model SBNHH-1D65B, 2100 MHz antenna, all at the same level on the tower. Cellco also intends to install nine (9) remote radio heads ("RRHs") and install two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Redding First Selectman, Julia Pemberton; Jo-an Brooks, Redding's Land Use Coordinator; and Andrew C. and Elizabeth C. Mound, the owner of the Property and tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed at the same 82-foot level of the 100-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. Far Field Approximation tables at each of Cellco's operating frequencies, for the modified facility, are included in Attachment 2. These tables demonstrate that Cellco's modified facility will comply with the RF emissions standards established by the FCC.

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

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

A copy of the parcel map and owner information for the Property is included in Attachment 4. A Certificate of Mailing verifying that this filing was sent to municipal officials and the owner of the Property is included in Attachment 5.

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:
Julia Pemberton, Redding First Selectman
Jo-an Brooks, Redding Land Use Coordinator
Andrew C. and Elizabeth C. Mound
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D45B

6-port sector antenna, 2x 698–896 and 4x 1695–2360 MHz, 45° HPBW, 3x RET

- 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	16.9	17.6	19.6	20.1	20.5	21.0
Beamwidth, Horizontal, degrees	47	43	45	42	42	39
Beamwidth, Vertical, degrees	12.4	11.4	5.8	5.3	5.1	4.5
Beam Tilt, degrees	0–14	0–14	0–8	0–8	0–8	0–8
USLS (First Lobe), dB	16	16	18	17	17	16
Front-to-Back Ratio at 180°, dB	34	33	35	37	37	39
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	16.6	17.3	19.2	19.8	20.1	20.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.5	±0.4	±0.5	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 16.6	0 ° | 17.3	0 ° | 19.3	0 ° | 19.9	0 ° | 20.1	0 ° | 20.7
	7 ° | 16.7	7 ° | 17.4	4 ° | 19.3	4 ° | 19.9	4 ° | 20.2	4 ° | 20.9
	14 ° | 16.4	14 ° | 17.1	8 ° | 19.0	8 ° | 19.6	8 ° | 20.0	8 ° | 20.4
Beamwidth, Horizontal Tolerance, degrees	±1.5	±2.8	±2.1	±1.7	±1	±1.7
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6	±0.3	±0.2	±0.4	±0.1
USLS, beampeak to 20° above beampeak, dB	19	23	16	15	16	16
Front-to-Back Total Power at 180° ± 30°, dB	24	24	28	30	31	30
CPR at Boresight, dB	28	29	23	24	20	19
CPR at 10 dB Horizontal Beamwidth, dB	13	17	13	13	13	13

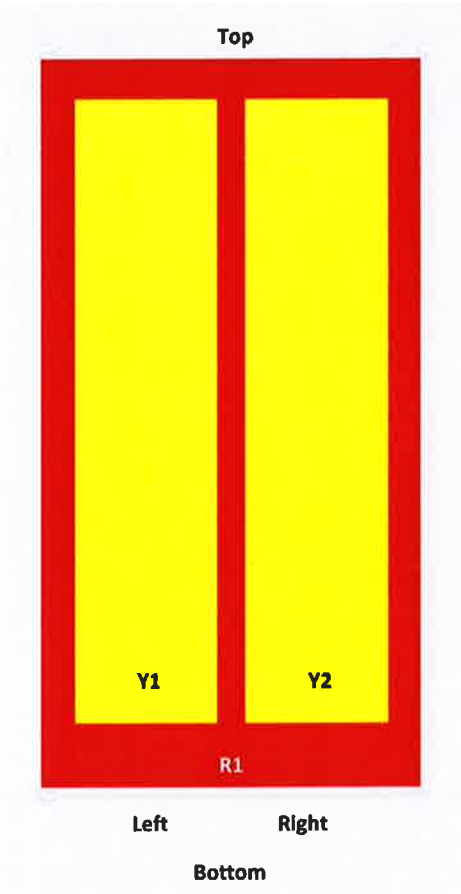
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

Product Specifications

SBNHH-1D45B

SBNHH 45 85



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

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

General Specifications

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

Mechanical Specifications

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

Product Specifications

COMMSCOPE®

SBNHH-1D45B

Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	1038.0 N @ 150 km/h 233.4 lbf @ 150 km/h
Wind Loading, lateral	234.0 N @ 150 km/h 52.6 lbf @ 150 km/h
Wind Loading, rear	1091.0 N @ 150 km/h 245.3 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1829.0 mm | 72.0 in
Width	457.0 mm | 18.0 in
Depth	178.0 mm | 7.0 in
Net Weight, without mounting kit	29.2 kg | 64.4 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal RET	High band (2) | Low band (1)
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Packed Dimensions

Length	1950.0 mm | 76.8 in
Width	567.0 mm | 22.3 in
Depth	311.0 mm | 12.2 in
Shipping Weight	42.5 kg | 93.7 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-1D45B

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®

SBNHH-1D65B

6-port sector antenna, 2x 698–896 and 4x 1695–2360 MHz, 65° HPBW, 2x RET. Both high bands share the same electrical tilt.

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

Electrical Specifications

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

Electrical Specifications, BASTA*

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

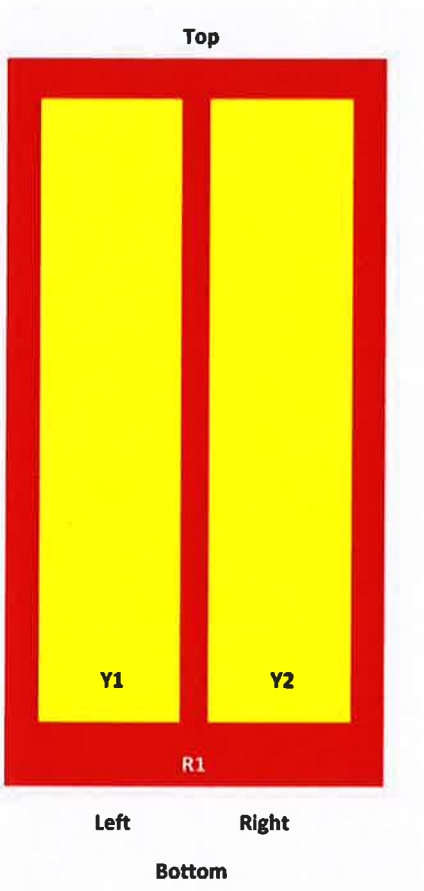
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

Product Specifications

SBNHH-1D65B

SBNHH 65



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

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

General Specifications

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

Mechanical Specifications

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

Product Specifications

SBNHH-1D65B

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

Dimensions

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

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

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

Regulatory Compliance/Certifications

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

Included Products

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

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

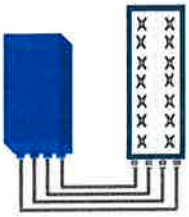
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.) 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 B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new 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 B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 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, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

The Alcatel-Lucent B25 RRH4x30 is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

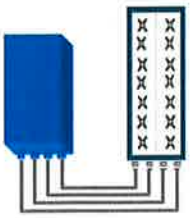
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 1.9 GHz band (PCS, 3GPP band 2 & 25)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- Ready for 3, 5, 10, 15 or 20MHz LTE carrier operation with 4Rx Diversity
- Ready to support up to 4 carriers anywhere in 65MHz instantaneous bandwidth
- Convection-cooled (fan-less)
- Supports AISG 2.0 devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx 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	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2) RX Diversity scheme	2.0 dB typ. (<2.5 dB max) 2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in.) Volume (w/ solar shield) in L Weight (w/ solar shield) in kg (lb)	538 x 304 x 182 (21.2" x 12.0" x 7.2") 30 24 (53)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 580W typical @100% RF load
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 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 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 B66A RRH4X45

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

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

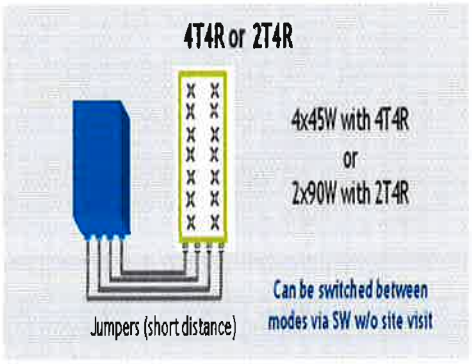
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

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

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

FEATURES

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



BENEFITS

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

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme Receiver Sensivity (FRC A1-3)	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.) Volume in Liters Weight in kg (lb) (w/o mounting HW)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield) 35.5 (with solar shield) 29.7 (without solar shield) 25.8kg (56.8lb) (with solar shield)
DC voltage range DC power consumption	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) UL50E Type 4 Enclosure 250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

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)

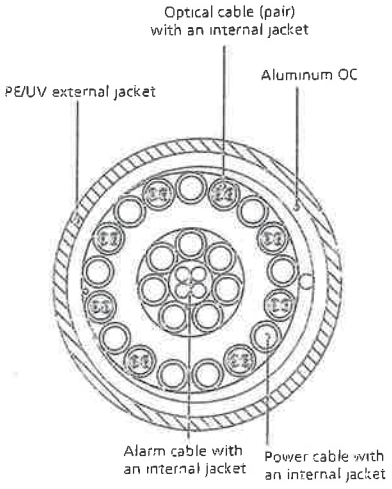


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

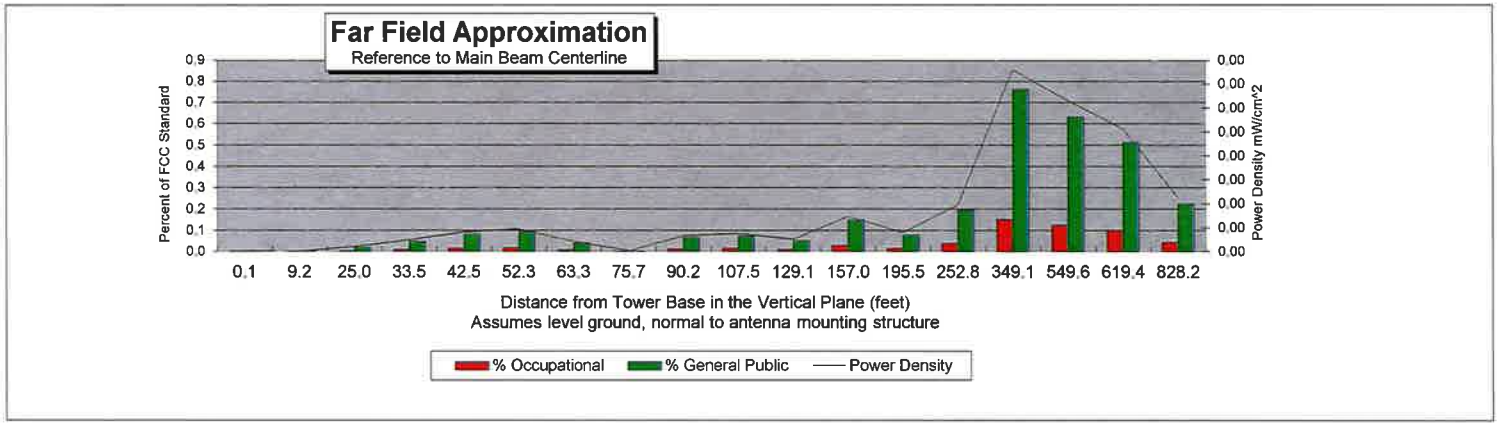
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Redding CT
Site #:	87
Date:	12/21/17
Name:	Maria Montrose
File Name:	Redding, CT - FF Power

Operating Freq. (MHz):	746.0
Antenna Height (ft):	82.0
Antenna Gain (dBi):	16.0
Antenna Size (in.):	72.0
Downtilt (degrees):	4.0
Feedline Loss (dB):	0.2
Power @ J4 (w):	120.0
Number of Channels	1



Distance in feet below:

Calc Angle	90.0	84.0	74.0	69.0	64.0	59.0	54.0	49.0	44.0	39.0	34.0	29.0	24.0	19.0	14.0	9.0	8.0	6.0	
Solve for r, dx to antenna	87.0	87.5	90.5	93.2	96.8	101.5	107.6	115.3	125.3	138.3	155.7	179.5	214.0	267.4	359.8	556.4	625.4	832.7	
Distance from Antenna Structure Base in Horizontal plane	0.1	9.2	25.0	33.5	42.5	52.3	63.3	75.7	90.2	107.5	129.1	157.0	195.5	252.8	349.1	549.6	619.4	828.2	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	40.72	50.94	30.82	26.79	24.18	23.16	26.18	37.76	22.83	21.46	22.06	16.28	17.44	11.55	3.09	0.11	0	1.09	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.8	0.6	0.5	0.2	

Antenna Type SBNHH-1D45B

Max% 0.76%

Instructions:

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

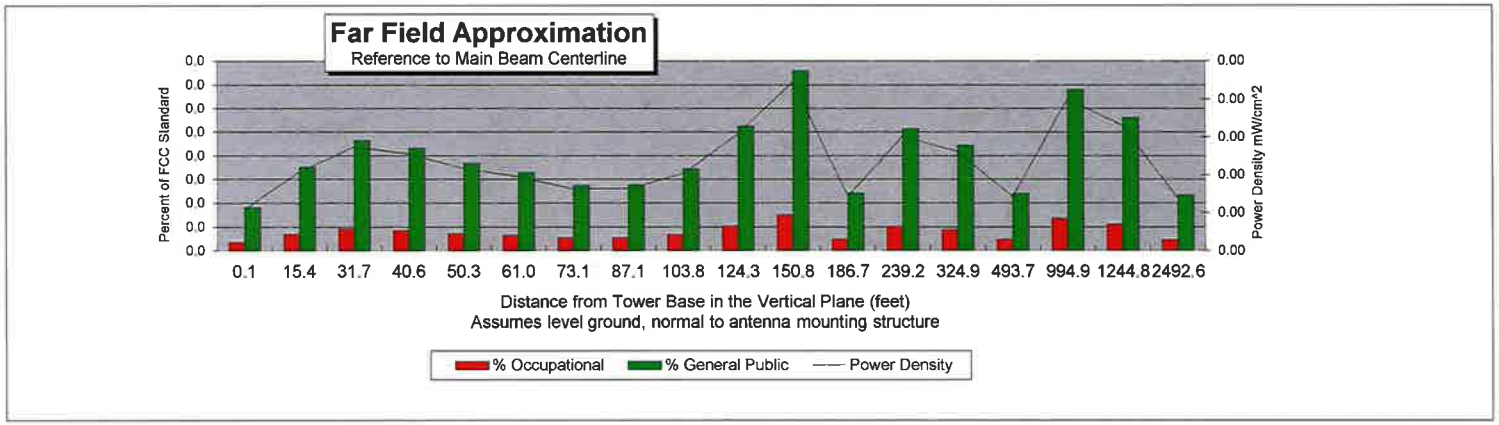
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Redding CT
Site #:	87
Date:	12/21/17
Name:	Maria Montrose
File Name:	Redding, CT - FF Power

Operating Freq. (MHz):	880.0
Antenna Height (ft):	82.0
Antenna Gain (dBi):	16.6
Antenna Size (in.):	72.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	1.4
Power @ J4 (w):	60.0
Number of Channels	3



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	87.0	88.4	92.6	96.0	100.5	106.2	113.6	123.1	135.4	151.7	174.1	206.0	254.5	336.3	501.3	998.7	1247.8	2494.1	
Distance from Antenna Structure Base in Horizontal plane	0.1	15.4	31.7	40.6	50.3	61.0	73.1	87.1	103.8	124.3	150.8	186.7	239.2	324.9	493.7	994.9	1244.8	2492.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	30.3	27.3	25.7	25.7	26	26	26.2	25.5	23.7	20.9	18.1	21.6	16.5	14.7	13.9	3.4	2.3	0.1	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Antenna Type BXA-80063/6CF - CDMA Service
Max% 0.04%

Instructions:

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

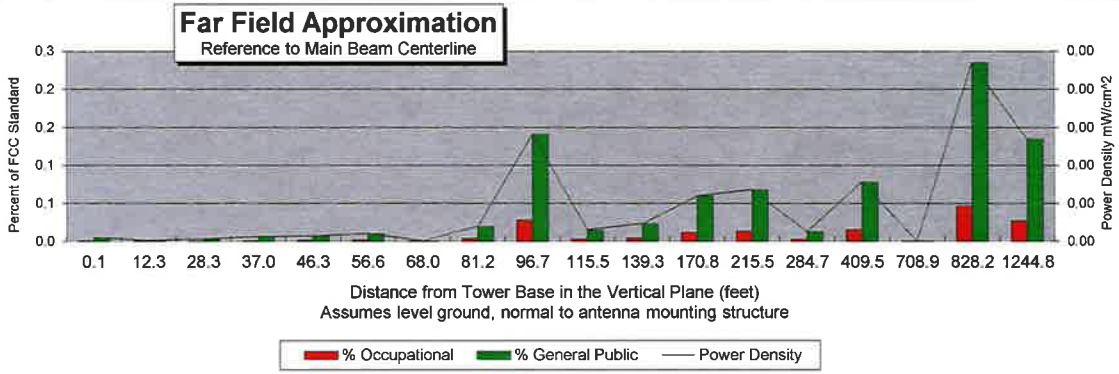
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Redding CT
Site #:	87
Date:	12/21/17
Name:	Maria Montrose
File Name:	Redding, CT - FF Power

Operating Freq. (MHz):	**2145.0**
Antenna Height (ft):	**82.0**
Antenna Gain (dBi):	**19.0**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.2**
Power @ J4 (w):	**180.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0	
Solve for r, dx to antenna	87.0	87.9	91.5	94.5	98.6	103.8	110.4	119.0	130.1	144.6	164.3	191.7	232.4	297.7	418.7	714.2	832.7	1247.8	
Distance from Antenna Structure Base in Horizontal plane	0.1	12.3	28.3	37.0	46.3	56.6	68.0	81.2	96.7	115.5	139.3	170.8	215.5	284.7	409.5	708.9	828.2	1244.8	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	39.14	46.6	41.16	37.55	36.59	34.42	50.22	30.33	20.98	29.77	26.78	21.33	19.12	24.22	13.39	60.2	2.64	1.54	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.2	0.1	

Antenna Type SBNHH-1D45B
Max% 0.24%

Instructions:

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

ATTACHMENT 3

STRUCTURAL ANALYSIS REPORT

For

REDDING CT

80 LONETOWN ROAD
REDDING, CT 06896

Antennas Mounted to the Tower

Prepared for:

verizon

99 East River Road, 9th Floor
East Hartford, CT 06108

Dated: March 7, 2018

STATE OF CONNECTICUT
GI RAI WANG
No. 32220
LICENSED PROFESSIONAL ENGINEER
3/7/2018

Prepared by:

HDG HUDSON Design Group LLC

45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586
www.hudsondesigngroupllc.com

HUDSON
Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by VERIZON to conduct a structural evaluation of the 100' self-supporting tower supporting the existing and proposed VERIZON's antennas located at elevation 82' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of VERIZON's existing and proposed antennas listed below.

Record drawings of the existing tower were not available for our use. The previous structural analysis report prepared by Centek Engineering, dated September 23, 2013, was available and obtained for our use.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing tower and foundation **are in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The tower structure is rated at **90.9%** - (Legs at Tower Section T4 from EL.20' to EL.40' Controlling).

HUDSON
Design Group LLC

APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
T-Mobile	(3) APXV18-206516-S-A20 Antennas	92'	T - Frame
T-Mobile	(3) LNX-6512DS-A1M Antennas	92'	T - Frame
T-Mobile	(6) RRUS-11	92'	T - Frame
VERIZON	(4) BXA-80063-6CF Antennas	82'	T - Frame
VERIZON	(2) BXA-80080-4CF Antennas	82'	T - Frame
VERIZON	(6) FD9R6004 Diplexers	82'	T - Frame
VERIZON	***(1) SBNHH-1D65B Antenna***	82'	T - Frame
VERIZON	***(2) SBNHH-1D45B Antennas***	82'	T - Frame
VERIZON	***(3) RRH2X60-700***	82'	T - Frame
VERIZON	***(3) RRH2X60-PCS***	82'	T - Frame
VERIZON	***DB-T1-6Z-8AB-0Z***	82'	T - Frame
VERIZON (FUTURE)	***(1) SBNHH-1D65B Antenna***	82'	T - Frame
VERIZON (FUTURE)	***(2) SBNHH-1D45B Antennas***	82'	T - Frame
VERIZON (FUTURE)	***(3) RRH4X45-AWS***	82'	T - Frame
VERIZON (FUTURE)	***DB-T1-6Z-8AB-0Z***	82'	T - Frame

Proposed VERIZON Appurtenances shown in Bold.

VERIZON EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
VERIZON	(12) 1 5/8" Cables	82'	Tower Face
VERIZON	***(2) Fiber Cables***	82'	Tower Face

Proposed VERIZON Coax Cables shown in Bold.

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Legs	**90.9 %**	20 – 40	PASS	**Controlling**
Diagonals	84.7 %	60 – 80	PASS	
Top Girts	22.8 %	0 – 20	PASS	

HUDSON
Design Group LLC

DESIGN CRITERIA:

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

   City/Town: Redding
   County: Fairfield
   Wind Load (Per Client's Request): 93 mph (3 second gust)
   Structural Class: II
   Exposure Category: B
   Topographic Category: 1
   Nominal Ice Thickness: 0.75 inch

1. Approximate height above grade to proposed antennas: 82'

***Calculations and referenced documents are attached.**

ASSUMPTIONS:

1. The tower dimensions, member sizes and material strength are as indicated in the previous structural analysis report prepared by Centek Engineering, dated September 23, 2013.

2. The existing appurtenances configuration is as stated in this report. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.

3. The tower and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.

4. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.

5. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas, RRHs and distribution boxes be mounted on the existing T-frame supported by the tower.

HUDSON
Design Group LLC

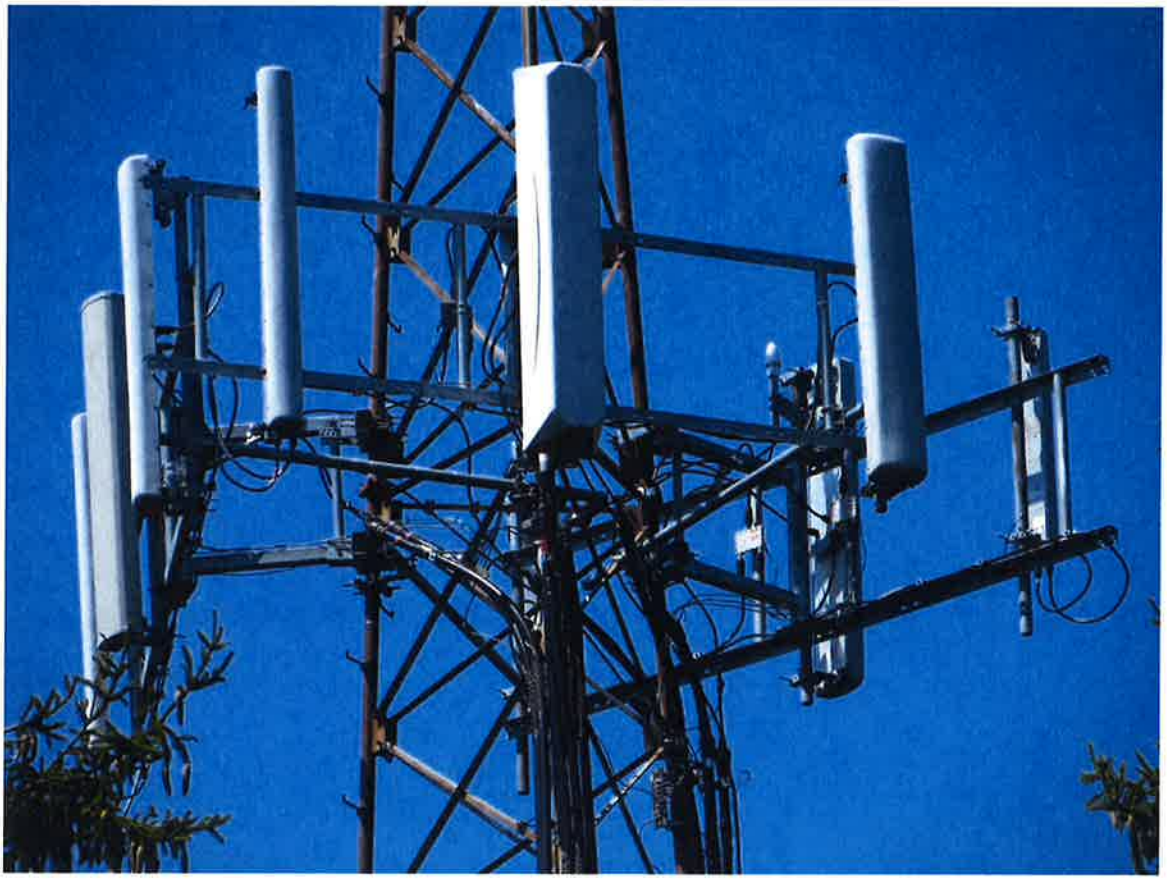
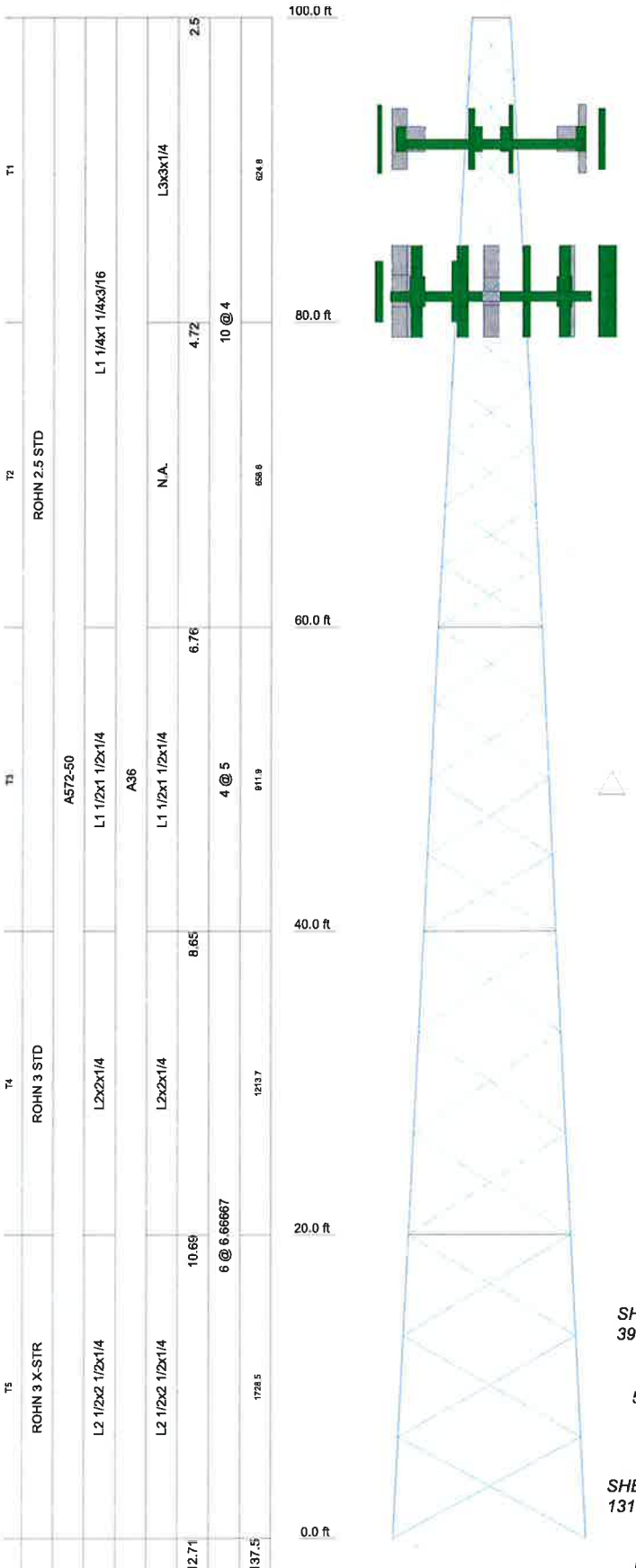


Photo 1: Photo illustrating the Tower with Appurtenances shown.

HUDSON
Design Group LLC

CALCULATIONS



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PIROD 12' T-Frame (T-Mobile - Proposed)	92	SBNHH-1D65B w/ Mount Pipe (Verizon - future)	82
PIROD 12' T-Frame	92	SBNHH-1D45B w/ Mount Pipe	82
PIROD 12' T-Frame	92	SBNHH-1D45B w/ Mount Pipe	82
APXV18-206516S-C-A20 w/mount pipe	92	RRH4X45-19	82
		RRH4X45-19	82
APXV18-206516S-C-A20 w/mount pipe	92	RRH4X45-19	82
		RFS DB-T1-6Z-8AB-0Z	82
APXV18-206516S-C-A20 w/mount pipe	92	PiROD 12' Lightweight T-Frame (Verizon - existing)	82
LNX-6512DS-VTM w/ Mount Pipe	92	PiROD 12' Lightweight T-Frame	82
LNX-6512DS-VTM w/ Mount Pipe	92	PiROD 12' Lightweight T-Frame	82
LNX-6512DS-VTM w/ Mount Pipe	92	(2) BXA-80063/6CF w/mount pipe	82
(2) RRUS 11	92	(2) BXA-80063/6CF w/mount pipe	82
(2) RRUS 11	92	(2) BXA-80080/4CF w/mount pipe	82
(2) RRUS 11	92	(2) FD9R6004 Diplexer	82
RRH2x60-700	82	(2) FD9R6004 Diplexer	82
RRH2x60-700	82	(2) FD9R6004 Diplexer	82
RRH2x60-700	82	SBNHH-1D65B w/ Mount Pipe (Verizon - proposed)	82
RRH2x60 PCS	82	SBNHH-1D45B w/ Mount Pipe	82
RRH2x60 PCS	82	SBNHH-1D45B w/ Mount Pipe	82
RRH2x60 PCS	82		
RFS DB-T1-6Z-8AB-0Z	82		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 90.9%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 79944 lb
SHEAR: 8683 lb

UPLIFT: -70473 lb
SHEAR: 7593 lb

AXIAL
35612 lb

SHEAR
3982 lb

MOMENT
267212 lb-ft

TORQUE 449 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL
12112 lb

SHEAR
13135 lb

MOMENT
842916 lb-ft

TORQUE 2618 lb-ft
REACTIONS - 93 mph WIND

Hudson Design Group LLC
45 Beechwood Drive
North Andover, MA 01845
Phone: (978) 557-5553
FAX: (978) 336-5586

Job:	REDDING CT		
Project:	100 ft Self Supporting Tower		
Client: VERIZON	Drawn by: kw	App'd:	
Code: TIA-222-G	Date: 03/07/18	Scale: N	
Path:		Dwg No.	

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 100.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 2.50 ft at the top and 12.71 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 93 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	100.00-80.00			2.50	1	20.00
T2	80.00-60.00			4.72	1	20.00
T3	60.00-40.00			6.76	1	20.00
T4	40.00-20.00			8.65	1	20.00
T5	20.00-0.00			10.69	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	100.00-80.00	4.00	X Brace	No	No	0.0000	0.0000
T2	80.00-60.00	4.00	X Brace	No	No	0.0000	0.0000
T3	60.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T4	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T5	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 100.00-80.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T2 80.00-60.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T3 60.00-40.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/4	A36 (36 ksi)
T4 40.00-20.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T5 20.00-0.00	Pipe	ROHN 3 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 60.00-40.00	Equal Angle	L1 1/2x1 1/2x1/4	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T4 40.00-20.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T5 20.00-0.00	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon - existing)	B	No	Ar (CaAa)	82.00 - 3.00	6	6	0.0000	1.9800		1.04
1 5/8 ********	C	No	Ar (CaAa)	82.00 - 3.00	6	6	0.0000	1.9800		1.04
1 1/4 Fiber Cable (Verizon - proposed) **********	C	No	Ar (CaAa)	82.00 - 3.00	2	2	1.5500	1.5500		0.66
1 5/8 Fiber Cable (T-Mobile - proposed)	A	No	Ar (CaAa)	92.00 - 3.00	1	1	0.0000	1.9800		1.04

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
PiROD 12' Lightweight	A	From Leg	1.50 ft	0.0000	82.00	No Ice	10.20	10.20	253.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
T-Frame			0.00			1/2" Ice	16.20	16.20	355.00
(Verizon - existing)			0.00			1" Ice	22.20	22.20	457.00
PiROD 12' Lightweight	B	From Leg	1.50	0.0000	82.00	No Ice	10.20	10.20	253.00
T-Frame			0.00			1/2" Ice	16.20	16.20	355.00
			0.00			1" Ice	22.20	22.20	457.00
PiROD 12' Lightweight	C	From Leg	1.50	0.0000	82.00	No Ice	10.20	10.20	253.00
T-Frame			0.00			1/2" Ice	16.20	16.20	355.00
			0.00			1" Ice	22.20	22.20	457.00
(2) BXA-80063/6CF	A	From Leg	3.00	0.0000	82.00	No Ice	8.07	5.95	44.10
w/mount pipe			0.00			1/2" Ice	8.74	7.22	107.20
			0.00			1" Ice	9.37	8.33	178.24
(2) BXA-80063/6CF	B	From Leg	3.00	0.0000	82.00	No Ice	8.07	5.95	44.10
w/mount pipe			0.00			1/2" Ice	8.74	7.22	107.20
			0.00			1" Ice	9.37	8.33	178.24
(2) BXA-80080/4CF	C	From Leg	3.00	0.0000	82.00	No Ice	5.03	4.03	32.55
w/mount pipe			0.00			1/2" Ice	5.42	4.65	76.83
			0.00			1" Ice	5.81	5.27	127.02
(2) FD9R6004 Diplexer	A	From Leg	3.00	0.0000	82.00	No Ice	0.31	0.08	2.60
			0.00			1/2" Ice	0.39	0.12	4.90
			0.00			1" Ice	0.47	0.17	8.29
(2) FD9R6004 Diplexer	B	From Leg	3.00	0.0000	82.00	No Ice	0.31	0.08	2.60
			0.00			1/2" Ice	0.39	0.12	4.90
			0.00			1" Ice	0.47	0.17	8.29
(2) FD9R6004 Diplexer	C	From Leg	3.00	0.0000	82.00	No Ice	0.31	0.08	2.60
			0.00			1/2" Ice	0.39	0.12	4.90
			0.00			1" Ice	0.47	0.17	8.29
**********									
SBNHH-1D65B w/ Mount	A	From Leg	3.00	0.0000	82.00	No Ice	8.42	7.09	66.55
Pipe			0.00			1/2" Ice	8.98	8.27	135.68
(Verizon - proposed)			0.00			1" Ice	9.50	9.17	212.84
SBNHH-1D45B w/ Mount	B	From Leg	3.00	0.0000	82.00	No Ice	11.64	6.95	89.95
Pipe			0.00			1/2" Ice	12.23	8.13	174.04
			0.00			1" Ice	12.78	9.02	266.48
SBNHH-1D45B w/ Mount	C	From Leg	3.00	0.0000	82.00	No Ice	11.64	6.95	89.95
Pipe			0.00			1/2" Ice	12.23	8.13	174.04
			0.00			1" Ice	12.78	9.02	266.48
RRH2x60-700	A	From Leg	3.00	0.0000	82.00	No Ice	3.50	1.82	60.00
			0.00			1/2" Ice	3.76	2.05	82.72
			0.00			1" Ice	4.03	2.29	109.06
RRH2x60-700	B	From Leg	3.00	0.0000	82.00	No Ice	3.50	1.82	60.00
			0.00			1/2" Ice	3.76	2.05	82.72
			0.00			1" Ice	4.03	2.29	109.06
RRH2x60-700	C	From Leg	3.00	0.0000	82.00	No Ice	3.50	1.82	60.00
			0.00			1/2" Ice	3.76	2.05	82.72
			0.00			1" Ice	4.03	2.29	109.06
RRH2x60 PCS	A	From Leg	3.00	0.0000	82.00	No Ice	2.15	1.35	55.00
			0.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RRH2x60 PCS	B	From Leg	3.00	0.0000	82.00	No Ice	2.15	1.35	55.00
			0.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RRH2x60 PCS	C	From Leg	3.00	0.0000	82.00	No Ice	2.15	1.35	55.00
			0.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RFS DB-T1-6Z-8AB-0Z	C	From Leg	3.00	0.0000	82.00	No Ice	4.80	2.00	44.00
			0.00			1/2" Ice	5.07	2.19	80.13
			0.00			1" Ice	5.35	2.39	120.22

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
**********									
SBNHH-1D65B w/ Mount Pipe	A	From Leg	3.00	0.0000	82.00	No Ice	8.42	7.09	66.55
			-6.00			1/2" Ice	8.98	8.27	135.68
(Verizon - future)			0.00			1" Ice	9.50	9.17	212.84
SBNHH-1D45B w/ Mount Pipe	B	From Leg	3.00	0.0000	82.00	No Ice	11.64	6.95	89.95
			-6.00			1/2" Ice	12.23	8.13	174.04
			0.00			1" Ice	12.78	9.02	266.48
SBNHH-1D45B w/ Mount Pipe	C	From Leg	3.00	0.0000	82.00	No Ice	11.64	6.95	89.95
			-6.00			1/2" Ice	12.23	8.13	174.04
			0.00			1" Ice	12.78	9.02	266.48
RRH4X45-19	A	From Leg	3.00	0.0000	82.00	No Ice	2.31	2.38	59.50
			-6.00			1/2" Ice	2.52	2.58	83.40
			0.00			1" Ice	2.73	2.79	110.58
RRH4X45-19	B	From Leg	3.00	0.0000	82.00	No Ice	2.31	2.38	59.50
			-6.00			1/2" Ice	2.52	2.58	83.40
			0.00			1" Ice	2.73	2.79	110.58
RRH4X45-19	C	From Leg	3.00	0.0000	82.00	No Ice	2.31	2.38	59.50
			-6.00			1/2" Ice	2.52	2.58	83.40
			0.00			1" Ice	2.73	2.79	110.58
RFS DB-T1-6Z-8AB-0Z	B	From Leg	3.00	0.0000	82.00	No Ice	4.80	2.00	44.00
			0.00			1/2" Ice	5.07	2.19	80.13
			0.00			1" Ice	5.35	2.39	120.22
**********									
PiROD 12' T-Frame	A	From Leg	1.50	0.0000	92.00	No Ice	12.20	12.20	360.00
(T-Mobile - Proposed)			0.00			1/2" Ice	17.60	17.60	490.00
			0.00			1" Ice	23.00	23.00	620.00
PiROD 12' T-Frame	B	From Leg	1.50	0.0000	92.00	No Ice	12.20	12.20	360.00
			0.00			1/2" Ice	17.60	17.60	490.00
			0.00			1" Ice	23.00	23.00	620.00
PiROD 12' T-Frame	C	From Leg	1.50	0.0000	92.00	No Ice	12.20	12.20	360.00
			0.00			1/2" Ice	17.60	17.60	490.00
			0.00			1" Ice	23.00	23.00	620.00
APXV18-206516S-C-A20 w/mount pipe	A	From Leg	3.00	0.0000	92.00	No Ice	4.00	3.45	41.50
			6.00			1/2" Ice	4.47	4.28	77.56
			0.00			1" Ice	4.91	4.98	119.60
APXV18-206516S-C-A20 w/mount pipe	B	From Leg	3.00	0.0000	92.00	No Ice	4.00	3.45	41.50
			6.00			1/2" Ice	4.47	4.28	77.56
			0.00			1" Ice	4.91	4.98	119.60
APXV18-206516S-C-A20 w/mount pipe	C	From Leg	3.00	0.0000	92.00	No Ice	4.00	3.45	41.50
			6.00			1/2" Ice	4.47	4.28	77.56
			0.00			1" Ice	4.91	4.98	119.60
LNX-6512DS-VTM w/ Mount Pipe	A	From Leg	3.00	0.0000	92.00	No Ice	5.32	4.52	47.25
			-6.00			1/2" Ice	5.70	5.13	95.35
			0.00			1" Ice	6.10	5.75	149.50
LNX-6512DS-VTM w/ Mount Pipe	B	From Leg	3.00	0.0000	92.00	No Ice	5.32	4.52	47.25
			-6.00			1/2" Ice	5.70	5.13	95.35
			0.00			1" Ice	6.10	5.75	149.50
LNX-6512DS-VTM w/ Mount Pipe	C	From Leg	3.00	0.0000	92.00	No Ice	5.32	4.52	47.25
			-6.00			1/2" Ice	5.70	5.13	95.35
			0.00			1" Ice	6.10	5.75	149.50
(2) RRUS 11	A	From Leg	2.00	0.0000	92.00	No Ice	2.83	1.18	51.00
			0.00			1/2" Ice	3.04	1.33	71.87
			0.00			1" Ice	3.26	1.48	95.79
(2) RRUS 11	B	From Leg	2.00	0.0000	92.00	No Ice	2.83	1.18	51.00
			0.00			1/2" Ice	3.04	1.33	71.87
			0.00			1" Ice	3.26	1.48	95.79
(2) RRUS 11	C	From Leg	2.00	0.0000	92.00	No Ice	2.83	1.18	51.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	3.04	1.33	71.87
			0.00			1" Ice	3.26	1.48	95.79

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service

Comb. No.	Description
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	10093.02	-0.00	-0.00	1216.58	-1138.89	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	12111.63	0.00	-13010.70	-832126.84	-1383.00	1940.04
0.9 Dead+1.6 Wind 0 deg - No Ice	9083.72	0.00	-13010.70	-831537.76	-1038.03	1937.70
1.2 Dead+1.6 Wind 30 deg - No Ice	12111.65	6567.56	-11375.34	-726814.20	-421864.62	2617.80
0.9 Dead+1.6 Wind 30 deg - No Ice	9083.72	6567.54	-11375.31	-726348.50	-421037.09	2614.60
1.2 Dead+1.6 Wind 60 deg - No Ice	12111.63	10745.68	-6204.02	-402960.05	-701888.18	2462.15
0.9 Dead+1.6 Wind 60 deg - No Ice	9083.72	10745.68	-6204.02	-402860.80	-700732.35	2458.79
1.2 Dead+1.6 Wind 90 deg - No Ice	12111.63	13135.07	-0.00	1475.26	-842330.85	1735.11
0.9 Dead+1.6 Wind 90 deg - No Ice	9083.72	13135.07	-0.00	1106.77	-841021.98	1731.89
1.2 Dead+1.6 Wind 120 deg - No Ice	12111.63	11267.60	6505.35	418268.77	-723287.65	590.53
0.9 Dead+1.6 Wind 120 deg - No Ice	9083.72	11267.60	6505.35	417420.92	-722113.14	589.22
1.2 Dead+1.6 Wind 150 deg - No Ice	12111.63	6567.54	11375.31	729757.61	-421853.71	-731.56
0.9 Dead+1.6 Wind 150 deg - No Ice	9083.72	6567.54	11375.31	728553.72	-421027.25	-730.57
1.2 Dead+1.6 Wind 180 deg - No Ice	12111.63	-0.00	12408.05	810345.94	-1382.27	-1872.60
0.9 Dead+1.6 Wind 180 deg - No Ice	9083.72	0.00	12408.05	809040.76	-1037.46	-1870.46
1.2 Dead+1.6 Wind 210 deg - No Ice	12111.65	-6567.55	11375.34	729765.60	419092.82	-2617.81
0.9 Dead+1.6 Wind 210 deg - No Ice	9083.72	-6567.54	11375.31	728561.48	418956.10	-2614.61
1.2 Dead+1.6 Wind 240 deg - No Ice	12111.63	-11267.60	6505.35	418276.78	720535.65	-2551.04
0.9 Dead+1.6 Wind 240 deg - No Ice	9083.72	-11267.60	6505.35	417428.82	720050.81	-2547.40
1.2 Dead+1.6 Wind 270 deg - No Ice	12111.63	-13135.07	-0.00	1475.53	839583.07	-1735.14
0.9 Dead+1.6 Wind 270 deg - No Ice	9083.72	-13135.07	-0.00	1106.97	838963.91	-1731.91
1.2 Dead+1.6 Wind 300 deg - No Ice	12111.63	-10745.68	-6204.02	-402967.27	699135.81	-570.07
0.9 Dead+1.6 Wind 300 deg - No Ice	9083.72	-10745.68	-6204.02	-402868.08	698669.77	-568.83
1.2 Dead+1.6 Wind 330 deg - No Ice	12111.63	-6567.54	-11375.31	-726821.91	419102.78	731.60
0.9 Dead+1.6 Wind 330 deg -	9083.72	-6567.54	-11375.31	-726356.20	418965.33	730.59

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	35611.80	-0.00	-0.00	5752.62	-4606.86	-0.17
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	35611.80	-0.00	-3982.35	-254556.67	-4613.54	337.90
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	35611.80	1976.18	-3422.85	-218814.99	-134275.57	449.31
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	35611.80	3372.27	-1946.98	-122641.30	-227022.13	433.84
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	35611.80	3952.36	-0.00	5763.94	-263936.23	304.55
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	35611.80	3448.82	1991.18	135924.63	-230057.61	100.38
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	35611.80	1976.18	3422.85	230344.58	-134274.11	-132.52
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	35611.80	-0.00	3893.96	262579.17	-4614.39	-334.14
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	35611.80	-1976.18	3422.85	230345.12	125047.66	-448.57
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	35611.80	-3448.82	1991.18	135925.14	220831.62	-439.79
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	35611.80	-3952.36	-0.00	5764.27	254709.77	-303.91
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	35611.80	-3372.27	-1946.98	-122641.94	217794.59	-98.28
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	35611.80	-1976.18	-3422.85	-218815.41	125048.53	131.88
Dead+Wind 0 deg - Service	10093.02	-0.00	-3384.68	-215479.37	-1144.79	504.40
Dead+Wind 30 deg - Service	10093.02	1708.52	-2959.24	-188096.25	-110448.14	680.13
Dead+Wind 60 deg - Service	10093.02	2795.44	-1613.95	-103910.30	-183241.66	640.03
Dead+Wind 90 deg - Service	10093.02	3417.03	-0.00	1223.56	-219751.52	451.18
Dead+Wind 120 deg - Service	10093.02	2931.22	1692.34	109574.19	-188813.64	153.56
Dead+Wind 150 deg - Service	10093.02	1708.52	2959.24	190542.15	-110448.05	-190.49
Dead+Wind 180 deg - Service	10093.02	-0.00	3227.90	211490.53	-1144.57	-486.86
Dead+Wind 210 deg - Service	10093.02	-1708.52	2959.24	190542.49	108159.19	-680.13
Dead+Wind 240 deg - Service	10093.02	-2931.22	1692.34	109574.84	186525.26	-663.16
Dead+Wind 270 deg - Service	10093.02	-3417.03	-0.00	1223.62	217463.56	-451.19
Dead+Wind 300 deg - Service	10093.02	-2795.44	-1613.95	-103910.81	180953.32	-147.97
Dead+Wind 330 deg - Service	10093.02	-1708.52	-2959.24	-188096.93	108159.31	190.49

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	100 - 80	2.305	44	0.1848	0.0120
T2	80 - 60	1.529	44	0.1789	0.0112
T3	60 - 40	0.827	44	0.1400	0.0047
T4	40 - 20	0.342	44	0.0829	0.0022
T5	20 - 0	0.083	44	0.0354	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	PiROD 12' T-Frame	44	1.992	0.1849	0.0123	255198
82.00	PiROD 12' Lightweight T-Frame	44	1.605	0.1807	0.0116	109588

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	100 - 80	Leg	ROHN 2.5 STD	2	-9045.98	63511.40	14.2	Pass
T2	80 - 60	Leg	ROHN 2.5 STD	38	-33532.90	63519.00	52.8	Pass
T3	60 - 40	Leg	ROHN 2.5 STD	71	-51175.40	57142.40	89.6	Pass
T4	40 - 20	Leg	ROHN 3 STD	101	-64405.30	70891.50	90.9	Pass
T5	20 - 0	Leg	ROHN 3 X-STR	125	-77465.30	94343.00	82.1	Pass
T1	100 - 80	Diagonal	L1 1/4x1 1/4x3/16	7	-2084.87	4490.61	46.4	Pass
T2	80 - 60	Diagonal	L1 1/4x1 1/4x3/16	40	-2345.10	2767.70	84.7	Pass
T3	60 - 40	Diagonal	L1 1/2x1 1/2x1/4	76	-2436.30	3842.72	63.4	Pass
T4	40 - 20	Diagonal	L2x2x1/4	106	-2718.83	5880.68	46.2	Pass
T5	20 - 0	Diagonal	L2 1/2x2 1/2x1/4	130	-2846.98	9045.76	31.5	Pass
T1	100 - 80	Top Girt	L3x3x1/4	4	-135.22	32489.70	0.4	Pass
T3	60 - 40	Top Girt	L1 1/2x1 1/2x1/4	75	-454.26	3488.88	13.0	Pass
T4	40 - 20	Top Girt	L2x2x1/4	105	-986.23	5045.13	19.5	Pass
T5	20 - 0	Top Girt	L2 1/2x2 1/2x1/4	129	-1497.01	6556.44	22.8	Pass
						Summary		
						Leg (T4)	90.9	Pass
						Diagonal (T2)	84.7	Pass
						Top Girt (T5)	22.8	Pass
						RATING =	**90.9**	**Pass**

Unit Base Foundation

Checks capacity of square mat foundation with raised piers for a self-supporting tower

BU#: REDDING CT
Site Name:
App Number:
TIA-222 Revision: G

Design Reactions		
Shear, **S**:	13.1	kips
Moment, **M**:	842.9	ft-kips
Compression/leg, **Ca**:	79.9	kips
Uplift/leg, **Ua**:	70.5	kips
Tower Weight, **Wt**:	12.1	kips
Tower Height, **H**:	100	ft
Base Face Width, **w'**:	12.7	ft

Pad Properties		
Depth, **D**:	4.0	ft
Pad Width, **W**:	15.5	ft
Pad Thickness, **T**:	4.5	ft
Ext. Above Grade, **E**:	0.5	ft
Neglected Depth, **N**:	0.0	ft
Pad Rebar Size, **Sp**:		
Pad Rebar Quantity, **mp**:		#N/A

Pier Properties		
Pier Shape:	Square	
Pier Width, **di**:	2.0	ft
Pier Rebar Size, **Sc**:		
Pier Rebar Quantity, **mc**:		#N/A
Pier Tie Size, **St**:		
Tie Quantity, **mt**:		#N/A

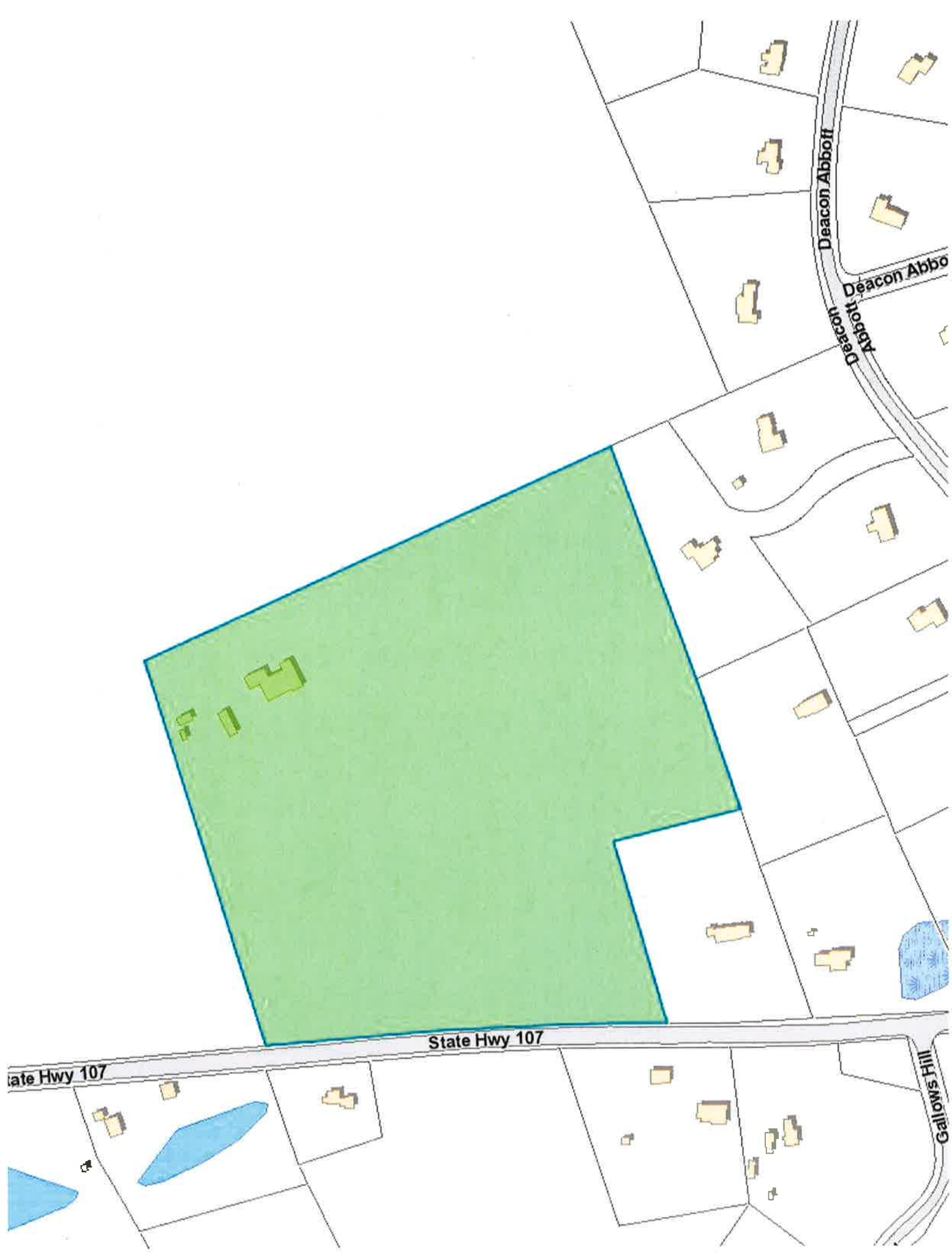
Material Properties		
Rebar Tensile, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3500	psi
Concrete Density, δ**c**:	150	pcf
Clear Cover, **cc**:	3	in

Soil Properties		
Soil Unit Weight, γ:	120	pcf
Ultimate Bearing: **Bc**:	6.000	ksf
Cohesion, **Co**:	0.000	ksf
Friction Angle, φ:	30	degrees
Base Sliding, **μ**:	0.35	

Design Checks	*Capacity/ Availability*	*Demand/ Limits*	*Check*
Base Sliding (kips):	192.29	13.10	**6.8%**
Overturning (k-ft):	989.88	842.90	**85.2%**
Bearing (ksf):	4.50	2.31	**51.3%**
1-way Shear (kips):	#N/A	#N/A	**#N/A**
2-way Shear (kips):	#N/A	79.90	**#N/A**
Pier concrete stress (ksf):	1048.32	79.90	**7.6%**
Pier moment capacity (k-ft):	117.40	0.00	**0.0%**
Pad moment capacity(k-ft):	#N/A	303.97	**#N/A**

☐ Tower centroid is offset from foundation

ATTACHMENT 4


Deacon Abbott
Deacon Abbo
State Hwy 107
ate Hwy 107
Gallows Hill

80 LONETOWN RD

Location	80 LONETOWN RD	**Mblu**	14/ / 21/ /
Acct#	00133800	**Owner**	MOUND ANDREW C & ELIZABETH C
Assessment	$399,190	**Appraisal**	$782,500
PID	1333	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$251,600	$530,900	$782,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$176,100	$223,090	$399,190

Owner of Record

Owner	MOUND ANDREW C & ELIZABETH C
Co-Owner	
Address	80 LONETOWN RD REDDING, CT 06896-1415

Sale Price	$967,500
Certificate	1
Book & Page	229/ 721
Sale Date	05/04/1999
Instrument	XX

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
MOUND ANDREW C & ELIZABETH C	$967,500	1	229/ 721	XX	05/04/1999
GIANNINOTO JAMES H GORDON J &	$0	2	162/ 187	XX	07/01/1991
GIANNINOTO FRANK A EST OF	$0	3	146/ 796	XX	06/28/1988
GIANNINOTO FRANK A	$0	4	43/ 13	XX	12/29/1944

Building Information

Building 1 : Section 1

Year Built:	1950
Living Area:	2,774
Replacement Cost:	$379,233
Building Percent Good:	63
Replacement Cost Less Depreciation:	$238,900

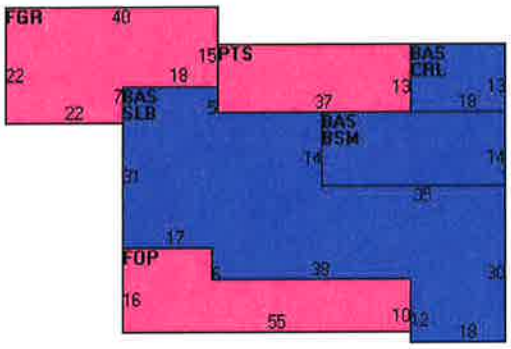
Building Attributes

Field	Description
Style	Ranch
Model	Residential
Grade:	B+
Stories	1 Story
Occupancy	1
Exterior Wall 1	Concrete
Exterior Wall 2	Stucco
Roof Structure	Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Forced Air
AC Type:	Central
Total Bedrooms	4 Bedrooms
Full Bathrooms	3
Half Bathrooms	1
Total Xtra Fixtrs	4
Total Rooms	9
Bath Style:	Above Average
Kitchen Style:	Above Average
Fireplaces	2
Whirlpool Tubs	1
Fin Bsmt Area	
Fin Bsmt Qual	
Bsmt Garages	

Building Photo

(http://images.vgsi.com/photos/ReddingCTPhotos//\00\00\86/2

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	2,774	2,774
BSM	Basement Area	490	0
CRL	Crawl Space	234	0
FGR	Garage	754	0
FOP	Framed Open Porch	652	0
PTS	Patio - Stone	481	0
SLB	Slab	2,050	0
		7,435	2,774

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	101	**Size (Acres)**	22.56
Description	Single Family Res	**Frontage**	
Zone	R-2	**Depth**	
Neighborhood	130	**Assessed Value**	$223,090
Alt Land Appr	No	**Appraised Value**	$530,900
Category			

Special Land			
Land Use Code	**Land Use Description**	**Units**	**Unit Type**
800	Open Space	14	AC

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
GRN1	Res Green Hse			936 S.F.	$9,800	1
SHD1	Shed	FR	Frame	432 S.F.	$1,700	1
SHD1	Shed	CB	CindBk/Frame	160 S.F.	$1,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$219,800	$628,800	$848,600
2015	$219,800	$628,800	$848,600
2014	$219,800	$628,800	$848,600

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$153,900	$277,290	$431,190
2015	$153,900	$277,290	$431,190
2014	$153,900	$277,290	$431,190

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3	3	neopost 03/15/2018 US POSTAGE $002.38⁰ ZIP 06103 041L12200380
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Julia Pemberton, First Selectman Town of Redding 100 Hill Road Redding, CT 06875				
2.	Jo-an Brooks, Land Use Coordinator Town of Redding 100 Hill Road Redding, CT 06875				
3.	Andrew C. and Elizabeth C. Mound 80 Lonetown Road Redding, CT 06875				
4.		OLD STATE HOUSE STA 06103 MAR 15 2018 USPS			
5.					
6.					

PS Form **3665**, January 2017 (Page ___ of ___) PSN 7530-17-000-5549

See Reverse for Instructions