

April 22, 2019

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  
520 Bailey Hill Road, Killingly, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains six (6) wireless telecommunications antennas at the top of the existing 149-foot tower at 520 Bailey Hill Road in Killingly, Connecticut (the “Property”). The tower is owned by Cellco. The Council approved the existing tower in 2016 in Docket No. 469. Cellco now intends to modify its facility by replacing its six (6) existing antennas with four (4) model JAHH-45B-R3B antennas and two (2) model JAHH-65B-R3B antennas, all at the same level on the tower. Cellco also now intends to remove three (3) remote radio heads (“RRHs”) and install six (6) new RRHs behind its antennas and one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cable.

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 Killingly Town Manager, Mary Calorio; Ann-Marie Aubrey, Killingly’s Director of Planning and Development; and Tri Lakes LLC, the owner of the Property.

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 located at the top of the 149-foot tower.

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2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

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

4. The operation of the facility with the new antennas and RRHs will not increase radio frequency (RF) emissions 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 behind Attachment 2.

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

6. The tower and its foundation can support Cellco's proposed modifications. (See Structural Opinion Letter and 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:

Mary Calorio, Killingly Town Manager  
Ann-Marie Aubrey, Director of Planning and Development  
Tri Lakes LLC  
Tim Parks

# **ATTACHMENT 1**



8-port sector antenna, 2x 698–798, 2x 824–894 and 4x 1695–2360 MHz, 45° HPBW, low bands each have a RET and the high bands share a RET. Two internal SBTs.

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band
- Narrow beamwidth capacity antenna for higher level of densification and enhanced data throughput

## Electrical Specifications

Frequency Band, MHz	698–798	824–894	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	16.5	17.2	19.4	20.2	20.5	21.1
Beamwidth, Horizontal, degrees	48	43	44	43	41	38
Beamwidth, Vertical, degrees	12.6	11.2	5.8	5.4	5.0	4.5
Beam Tilt, degrees	2–14	2–14	0–8	0–8	0–8	0–8
USLS (First Lobe), dB	16	21	18	18	18	18
Front-to-Back Ratio at 180°, dB	32	36	37	37	38	41
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	28	28	28	28
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	200	200	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

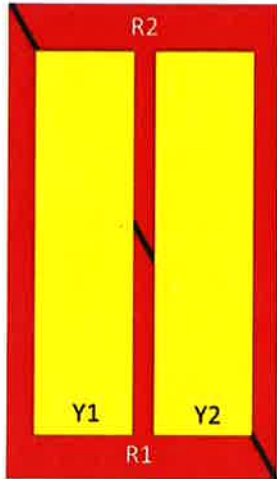
## Electrical Specifications, BASTA\*

Frequency Band, MHz	698–798	824–894	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	16.3	17.0	19.1	19.9	20.2	20.9
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.3	±0.5	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	2°   16.3 8°   16.3 14°   16.1	2°   17.1 8°   17.1 14°   16.7	0°   19.1 4°   19.2 8°   19.0	0°   19.8 4°   19.9 8°   19.8	0°   20.1 4°   20.2 8°   20.1	0°   20.7 4°   21.0 8°   20.7
Beamwidth, Horizontal Tolerance, degrees	±1.1	±2.4	±2	±2.7	±2.9	±1.5
Beamwidth, Vertical Tolerance, degrees	±0.7	±0.6	±0.3	±0.2	±0.3	±0.1
USLS, beampeak to 20° above beampeak, dB	16	21	17	17	17	17
Front-to-Back Total Power at 180° ± 30°, dB	23	24	29	31	33	34
CPR at Boresight, dB	25	26	20	21	20	20
CPR at Sector, dB	16	18	14	15	15	16

# JAHH-45B-R3B

\* 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



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

Left Right  
Bottom

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

## Port Configuration



## General Specifications

<b>Operating Frequency Band</b>	1695 – 2360 MHz   698 – 798 MHz   824 – 894 MHz
<b>Antenna Type</b>	Sector
<b>Band</b>	Multiband
<b>Performance Note</b>	Outdoor usage
<b>Total Input Power, maximum</b>	800 W @ 50 °C

## Mechanical Specifications

<b>RF Connector Quantity, total</b>	8
<b>RF Connector Quantity, low band</b>	4
<b>RF Connector Quantity, high band</b>	4
<b>RF Connector Interface</b>	4.3-10 Female
<b>Color</b>	Light gray
<b>Grounding Type</b>	RF connector body grounded to reflector and mounting bracket
<b>Radiator Material</b>	Aluminum   Low loss circuit board
<b>Radome Material</b>	Fiberglass, UV resistant
<b>Reflector Material</b>	Aluminum
<b>RF Connector Location</b>	Bottom
<b>Wind Loading, frontal</b>	1038.0 N @ 150 km/h 233.4 lbf @ 150 km/h
<b>Wind Loading, lateral</b>	234.0 N @ 150 km/h 52.6 lbf @ 150 km/h
<b>Wind Speed, maximum</b>	241 km/h   150 mph

## Dimensions

<b>Length</b>	1829.0 mm   72.0 in
<b>Width</b>	457.0 mm   18.0 in
<b>Depth</b>	178.0 mm   7.0 in
<b>Net Weight, without mounting kit</b>	41.5 kg   91.5 lb

## Remote Electrical Tilt (RET) Information

<b>Input Voltage</b>	10–30 Vdc
<b>Internal Bias Tee</b>	Port 1   Port 5
<b>Internal RET</b>	High band (1)   Low band (2)
<b>Power Consumption, idle state, maximum</b>	1 W
<b>Power Consumption, normal conditions, maximum</b>	8 W
<b>Protocol</b>	3GPP/AISG 2.0 (Single RET)
<b>RET Interface</b>	8-pin DIN Female   8-pin DIN Male

# JAHH-45B-R3B

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**RET Interface, quantity** 2 female | 2 male

## Packed Dimensions

**Length** 1970.0 mm | 77.6 in  
**Width** 608.0 mm | 23.9 in  
**Depth** 346.0 mm | 13.6 in  
**Shipping Weight** 71.5 kg | 157.6 lb

## Regulatory Compliance/Certifications

### Agency

RoHS 2011/65/EU

ISO 9001:2015

China RoHS SJ/T 11364-2014

### Classification

Compliant by Exemption

Designed, manufactured and/or distributed under this quality management system

Above Maximum Concentration Value (MCV)



## Included Products

BSAMNT-3 — 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.

BSAMNT-M — Middle Downtilt Mounting Kit for Long Antennas for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor bracket set.

## \* Footnotes

**Performance Note** Severe environmental conditions may degrade optimum performance



# JAHH-65B-R3B



8-port sector antenna, 2x 698–787, 2x 824–894 and 4x 1695–2360 MHz, 65° HPBW, 3x RET and low bands have diplexers. Internal SBT's on first LB (Port 1) and first HB(Port 5).

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band

## Electrical Specifications

Frequency Band, MHz	698–787	824–894	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.5	15.8	18.0	18.4	18.5	18.8
Beamwidth, Horizontal, degrees	67	65	63	63	65	68
Beamwidth, Vertical, degrees	12.4	10.5	5.7	5.2	4.9	4.4
Beam Tilt, degrees	2–14	2–14	0–10	0–10	0–10	0–10
USLS (First Lobe), dB	18	18	20	20	21	23
Front-to-Back Ratio at 180°, dB	32	34	31	35	36	38
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 at 50°C, maximum, watts	200	200	300	300	300	250
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	698–787	824–894	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.3	14.9	17.6	18.1	18.2	18.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.5	±0.6	±0.4	±0.5	±0.6
Gain by Beam Tilt, average, dBi	2 °   14.3 8 °   14.3 14 °   14.3	2 °   15.0 8 °   14.9 14 °   15.4	0 °   17.2 5 °   17.6 10 °   17.6	0 °   17.6 5 °   18.2 10 °   18.2	0 °   17.7 5 °   18.3 10 °   18.3	0 °   17.9 5 °   18.7 10 °   18.7
Beamwidth, Horizontal Tolerance, degrees	±1.2	±1.4	±4	±2.4	±2.9	±2.7
Beamwidth, Vertical Tolerance, degrees	±0.9	±0.5	±0.3	±0.2	±0.3	±0.1
USLS, beampeak to 20° above beampeak, dB	18	17	17	18	19	18
Front-to-Back Total Power at 180° ± 30°, dB	25	24	26	29	27	29
CPR at Boresight, dB	22	23	20	21	21	24
CPR at Sector, dB	11	12	11	11	11	8

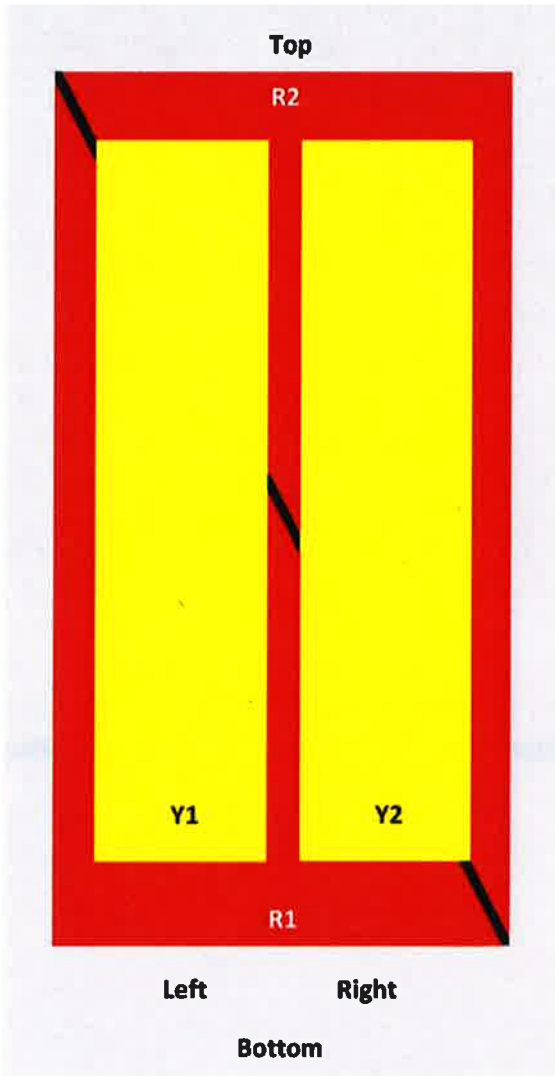
\* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, [download the whitepaper Time to Raise the Bar on BSAs.](#)



# JAHH-65B-R3B

## Array Layout

**JAHH-65A-R3B JAHH-65B-R3B JAHH-65C-R3B**



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANXXXXXXXXXXXXX1
R2	824-894	3-4	2	ANXXXXXXXXXXXXX2
Y1	1695-2360	5-6	3	ANXXXXXXXXXXXXX3
Y2	1695-2360	7-8		

**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 – 787 MHz | 824 – 894 MHz

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# JAHH-65B-R3B

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<b>Antenna Type</b>	Sector
<b>Band</b>	Multiband
<b>Performance Note</b>	Outdoor usage

## Mechanical Specifications

<b>RF Connector Quantity, total</b>	8
<b>RF Connector Quantity, low band</b>	4
<b>RF Connector Quantity, high band</b>	4
<b>RF Connector Interface</b>	4.3-10 Female
<b>Color</b>	Light gray
<b>Grounding Type</b>	RF connector body grounded to reflector and mounting bracket
<b>Radiator Material</b>	Aluminum   Low loss circuit board
<b>Radome Material</b>	Fiberglass, UV resistant
<b>Reflector Material</b>	Aluminum
<b>RF Connector Location</b>	Bottom
<b>Wind Loading, frontal</b>	301.0 N @ 150 km/h 67.7 lbf @ 150 km/h
<b>Wind Loading, lateral</b>	254.0 N @ 150 km/h 57.1 lbf @ 150 km/h
<b>Wind Loading, maximum</b>	638.0 N @ 150 km/h 143.4 lbf @ 150 km/h
<b>Wind Speed, maximum</b>	241 km/h   150 mph

## Dimensions

<b>Length</b>	1828.0 mm   72.0 in
<b>Width</b>	350.0 mm   13.8 in
<b>Depth</b>	208.0 mm   8.2 in
<b>Net Weight, without mounting kit</b>	28.7 kg   63.3 lb

## Remote Electrical Tilt (RET) Information

<b>Input Voltage</b>	10–30 Vdc
<b>Internal Bias Tee</b>	Port 1   Port 5
<b>Internal RET</b>	High band (1)   Low band (2)
<b>Power Consumption, idle state, maximum</b>	2 W
<b>Power Consumption, normal conditions, maximum</b>	13 W
<b>Protocol</b>	3GPP/AISG 2.0 (Single RET)
<b>RET Interface</b>	8-pin DIN Female   8-pin DIN Male
<b>RET Interface, quantity</b>	2 female   2 male

# JAHH-65B-R3B

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## Packed Dimensions

<b>Length</b>	1975.0 mm   77.8 in
<b>Width</b>	456.0 mm   18.0 in
<b>Depth</b>	357.0 mm   14.1 in
<b>Shipping Weight</b>	42.0 kg   92.6 lb

## Regulatory Compliance/Certifications

### Agency

RoHS 2011/65/EU

ISO 9001:2015

China RoHS SJ/T 11364-2014

### Classification

Compliant by Exemption

Designed, manufactured and/or distributed under this quality management system

Above Maximum Concentration Value (MCV)



## Included Products

BSAMNT-3 — 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

# SAMSUNG

## Dual-Band Radio Unit 700/850MHz (B13/B5) RFV01U-D2A

Samsung's RFV01U-D2A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.



The RFV01U-D2A RU targets dual-band support across Band 13 (700MHz) and Band 5 (850MHz), making it an ideal product for broad coverage footprints across multiple common low-end, long-range frequencies.

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

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

### Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation

### Key Technical Specifications

Duplex Type: FDD  
Operating Frequencies:  
B13: DL(746-756MHz)/UL(777-787MHz)  
B5: DL(869-894MHz)/UL(824-849MHz)  
Instantaneous Bandwidth: 10MHz(B13) + 25MHz(B5)  
RF Chain: 4T4R/2T4R/2T2R  
Output Power: Total 320W  
DU-RU Interface: CPRI (10Gbps)  
Dimensions: 380 x 380 x 207mm (29.9L)  
Weight: 31.9kg  
Input Power: -48V DC  
Operating Temp.: -40 - 55°(w/o solar load)  
Cooling: Natural convection

# SAMSUNG

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

RFV01U-D1A

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



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

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

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

### Features and Benefits

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

### Key Technical Specifications

Duplex Type: FDD

Operating Frequencies:

B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)

B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)

Instantaneous Bandwidth:

70MHz(B66) + 60MHz(B2)

RF Chain: 4T4R/2T4R/2T2R

Output Power: Total 320W

DU-RU Interface: CPRI (10Gbps)

Dimensions: 380 x 380 x 255mm (36.8L)

Weight: 38.3kg

Input Power: -48V DC

Operating Temp.: -40 - 55°(w/o solar load)

Cooling: Natural convection





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

**Product Description**

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

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

**Features/Benefits**

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



Figure 1: HYBRIFLEX Series

**Technical Specifications**

Outer Conductor Armor	Corrugated Aluminum	(mm (in))	46.5 (1.83)
Jacket	Polyethylene, PE	(mm (in))	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
<b>Mechanical Properties</b>			
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)
<b>Electrical Properties</b>			
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	0.68 (0.205)
DC-Resistance Power Cable, 8.4mm (18AWG)		(Ω/km (Ω/1000ft))	2.1 (0.307)
<b>Fiber Cable Properties</b>			
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
<b>DC Power Cable Properties</b>			
Size (Power)		(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		(mm (AWG))	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		(mm (in))	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
<b>Operating Range</b>			
Installation Temperature		(°C (°F))	-40 to +65 (-40 to 149)
Operation Temperature		(°C (°F))	-40 to +65 (-40 to 149)

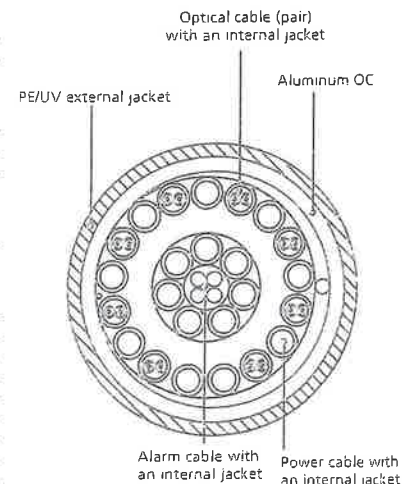


Figure 3: Construction Detail

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

# **ATTACHMENT 2**



General Power Density

Site Name: Dayville, CT  
 Cumulative Power Density

Operator	Operating Frequency (MHz)	Number of Trans.	ERP Per Trans. (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm <sup>2</sup> )	Maximum Permissible Exposure* (mW/cm <sup>2</sup> )	Fraction of MPE (%)
VZW PCS	1970	1	8621	8621	150	0.1378	1.0	13.78%
VZW Cellular LTE	869	1	1971	1971	150	0.0315	0.5793333333	5.44%
VZW AWS	2145	1	10101	10101	150	0.1614	1.0	16.14%
VZW 700	746	1	3983	3983	150	0.0637	0.4973333333	12.80%

**Total Percentage of Maximum Permissible Exposure**

48.16%

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

MHz = Megahertz  
 mW/cm<sup>2</sup> = milliwatts per square centimeter  
 ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:

1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.

# **ATTACHMENT 3**

# STRUCTURAL ANALYSIS REPORT

For

## DAYVILLE CT

520 BAILEY HILL ROAD  
DAYVILLE, CT 06241

### Antennas Mounted to the Monopole



Prepared for:

**verizon**✓

20 Alexander Drive  
Wallingford, CT 06492

Dated: March 22, 2019

Prepared by:

**HDG** | **HUDSON**  
Design Group LLC

45 Beechwood Drive  
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*John Wang 3/22/2019*



**HUDSON**  
Design Group LLC

### **SCOPE OF WORK:**

Hudson Design Group LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the 149' monopole supporting the existing and proposed Verizon's antennas located at elevation 150' 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 monopole prepared by Engineered Endeavors Inc., dated January 26, 2017, were available and obtained for our use.

### **CONCLUSION SUMMARY:**

Based on our evaluation, we have determined that the existing monopole and foundation **ARE IN CONFORMANCE** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **32.4%** - (Base Plate at EL.1' Controlling).



**APPURTENANCES CONFIGURATION: (VERIZON RFDS 3/13/2019)**

Tenant	Appurtenances	Elev.	Mount
<b>VERIZON</b>	<b>(4) JAHH-45B-R3B Antennas</b>	150'	Steel Platform
<b>VERIZON</b>	<b>(2) JAHH-65B-R3B Antennas</b>	150'	Steel Platform
<b>VERIZON</b>	<b>(3) B5/B13 RRH-BR04C</b>	150'	Steel Platform
<b>VERIZON</b>	<b>(3) B2/B66A RRH-BR049</b>	150'	Steel Platform
<b>VERIZON</b>	<b>(3) CBC78T-DS-43-2X</b>	150'	Steel Platform
<b>VERIZON</b>	<b>(1) DB-C1-12C-24AB-0Z</b>	150'	Steel Platform

*\*Proposed VERIZON Appurtenances shown in Bold.*

**VERIZON EXISTING/PROPOSED COAX CABLES:**

Tenant	Coax Cables	Elev.	Mount
<b>VERIZON</b>	<b>(1) Fiber Cable</b>	150'	Inside Monopole
<b>VERIZON</b>	<b>(1) Fiber Cable</b>	150'	Inside Monopole

*\*Proposed VERIZON Coax Cables shown in Bold.*

**ANALYSIS RESULTS SUMMARY:**

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
<b>Pole Section-L1</b>	16.5 %	96.08 – 150	PASS	
<b>Pole Section-L2</b>	20.3 %	47.87 – 96.08	PASS	
<b>Pole Section-L3</b>	24.8 %	1 – 47.87	PASS	
<b>Base Plate &amp; Anchor Bolts</b>	<b>32.4 %</b>	1	PASS	<b>Controlling</b>

**FOUNDATION ANALYSIS RESULTS SUMMARY:**

	Design Reactions	Proposed Reactions	Pass/Fail	Comments
<b>AXIAL</b>	<b>83.6 k</b>	55.2 k	PASS	
<b>SHEAR</b>	<b>82.1 k</b>	29.0 k	PASS	
<b>MOMENT</b>	<b>10643 ft-k</b>	2632 ft-k	PASS	



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#### **DESIGN CRITERIA:**

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures  
County: Windham  
City/Town: Killingly  
Wind Load: 110 mph (3 second gust)  
Structural Class: II  
Exposure Category: C  
Topographic Category: 1  
Ice Thickness: 1.0 inch
2. Approximate height above grade to proposed antennas: 150'

**\*Calculations and referenced documents are attached\***

#### **ASSUMPTIONS:**

1. The monopole dimensions, member sizes and material strength are as indicated in the record drawings of the existing monopole prepared by Engineered Endeavors Inc., dated January 26, 2017.
2. The 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 monopole 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, diplexers and distribution box be mounted on the existing steel platform supported by the monopole.



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**Photo 1:** Photo illustrating the Monopole with Appurtenances shown.





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## **CALCULATIONS**

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
	53.92	18	0.3750	5.85	29.0000	42.8000	A572-65	7758.1
	54.06	18	0.5000	7.28	40.5528	54.2000	A572-65	13684.9
	54.15	18	0.5625	51.3622	65.0000		A572-65	18955.1
								40398.2



### DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Andrew 12'-6" Platform (VERIZON - existing)	150	B5/B13 RRH-BR04C	150
(2) JAHH-45B-R3B w/ Mount Pipe (VERIZON - proposed)	150	B2/B66A RRH-BR049	150
(2) JAHH-45B-R3B w/ Mount Pipe	150	B2/B66A RRH-BR049	150
(2) JAHH-65B-R3B w/ Mount Pipe	150	CBC78T-DS-43-2X	150
B5/B13 RRH-BR04C	150	CBC78T-DS-43-2X	150
B5/B13 RRH-BR04C	150	DB-C1-12C-24AB-0Z	150

### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

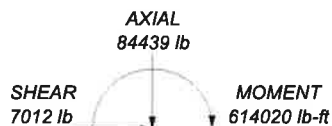
1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 110.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 32.4%

96.1 ft

47.9 ft

1.0 ft

ALL REACTIONS  
ARE FACTORED



TORQUE 220 lb-ft  
50.0 mph WIND - 1.0000 in ICE



TORQUE 1193 lb-ft  
REACTIONS - 110.0 mph WIND

**Hudson Design Group LLC**

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

Job: **DAYVILLE CT**

Project: **150 ft Monopole**

Client: VERIZON

Drawn by: kw

App'd:

Code: TIA-222-G

Date: 03/22/19

Scale: N

Path:

Dwg No.

C:\Users\jgordon\Documents\TIA222\PROJECTS\HDP\DAYVILLE CT - MF\Project - 3\DAYVILLE CT.DWG

<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b> DAYVILLE CT	<b>Page</b> 1 of 8
	<b>Project</b> 150 ft Monopole	<b>Date</b> 10:30:51 03/22/19
	<b>Client</b> VERIZON	<b>Designed by</b> kw

## Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Windham County, Connecticut.

Basic wind speed of 110.0 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56.0 pcf.

A wind speed of 50.0 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 60.0 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-96.08	53.92	5.85	18	29.0000	42.8000	0.3750	1.5000	A572-65 (65 ksi)
L2	96.08-47.87	54.06	7.28	18	40.5528	54.2000	0.5000	2.0000	A572-65 (65 ksi)
L3	47.87-1.00	54.15		18	51.3622	65.0000	0.5625	2.2500	A572-65 (65 ksi)

## Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	29.3895	34.0709	3527.0541	10.1619	14.7320	239.4145	7058.7493	17.0387	4.4440	11.851
	43.4024	50.4964	11482.6253	15.0609	21.7424	528.1213	22980.3597	25.2530	6.8728	18.327
L2	42.6008	63.5638	12882.8645	14.2187	20.6008	625.3571	25782.6805	31.7879	6.2573	12.515
	54.9590	85.2219	31048.2577	19.0635	27.5336	1127.6498	62137.3695	42.6190	8.6592	17.318
L3	53.9295	90.6965	29569.9244	18.0339	26.0920	1133.2949	59178.7576	45.3569	8.0497	14.311
	65.9160	115.0451	60350.7883	22.8753	33.0200	1827.7041	120780.987	57.5335	10.4500	18.578

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	<b>Client</b>	VERIZON	<b>Designed by</b>	kw

### Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	30
Embedment length	60.0000 in
$f_c$	4.0 ksi
Grout space	2.0000 in
Base plate grade	A572-50
Base plate thickness	3.0000 in
Bolt circle diameter	72.5000 in
Outer diameter	78.5000 in
Inner diameter	55.0000 in
Base plate type	Plain Plate

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub>		Weight plf
							ft <sup>2</sup> /ft		
1 5/8 Fiber Cable (VERIZON - existing) *****	B	No	No	Inside Pole	150.00 - 8.00	1	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
1 5/8 Fiber Cable (VERIZON - proposed)	B	No	No	Inside Pole	150.00 - 8.00	1	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub>		Weight lb	
			Horz Lateral ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>		
Andrew 12'-6" Platform (VERIZON - existing)  *****	A	None			0.0000	150.00	No Ice	22.50	22.50	4000.00
							1/2" Ice	23.44	23.44	4914.50
							1" Ice	24.38	24.38	5849.81
(2) JAHH-45B-R3B w/ Mount Pipe (VERIZON - proposed)	A	From Face	5.00		0.0000	150.00	No Ice	11.64	6.95	117.05
			0.00				1/2" Ice	12.23	8.13	201.14
			0.00				1" Ice	12.78	9.02	293.58
(2) JAHH-45B-R3B w/ Mount Pipe	B	From Face	5.00		0.0000	150.00	No Ice	11.64	6.95	117.05
			0.00				1/2" Ice	12.23	8.13	201.14
			0.00				1" Ice	12.78	9.02	293.58
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Face	5.00		0.0000	150.00	No Ice	9.35	7.65	88.85
			0.00				1/2" Ice	9.92	8.83	165.42
			0.00				1" Ice	10.46	9.73	250.16

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	<b>Client</b>	VERIZON	<b>Designed by</b>	kw

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
B5/B13 RRH-BR04C	A	From Face	5.00	0.0000	150.00	No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B5/B13 RRH-BR04C	B	From Face	5.00	0.0000	150.00	No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B5/B13 RRH-BR04C	C	From Face	5.00	0.0000	150.00	No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B2/B66A RRH-BR049	A	From Face	5.00	0.0000	150.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH-BR049	B	From Face	5.00	0.0000	150.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH-BR049	C	From Face	5.00	0.0000	150.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
CBC78T-DS-43-2X	A	From Face	5.00	0.0000	150.00	No Ice	0.37	0.51	22.00
			0.00			1/2" Ice	0.45	0.60	28.34
			0.00			1" Ice	0.53	0.70	36.37
CBC78T-DS-43-2X	B	From Face	5.00	0.0000	150.00	No Ice	0.37	0.51	22.00
			0.00			1/2" Ice	0.45	0.60	28.34
			0.00			1" Ice	0.53	0.70	36.37
CBC78T-DS-43-2X	C	From Face	5.00	0.0000	150.00	No Ice	0.37	0.51	22.00
			0.00			1/2" Ice	0.45	0.60	28.34
			0.00			1" Ice	0.53	0.70	36.37
DB-C1-12C-24AB-0Z	B	From Face	5.00	0.0000	150.00	No Ice	4.06	3.10	32.00
			0.00			1/2" Ice	4.32	3.34	68.49
			0.00			1" Ice	4.58	3.58	108.97

## 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

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

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	84438.61	-0.00	0.00
	Max. H <sub>x</sub>	20	55171.11	29030.92	-29.64
	Max. H <sub>z</sub>	2	55171.11	-29.64	28570.27
	Max. M <sub>x</sub>	2	2562702.80	-29.64	28570.27
	Max. M <sub>z</sub>	8	2632301.84	-29030.92	29.64
	Max. Torsion	14	1193.24	29.64	-28570.27
	Min. Vert	13	41378.33	-14489.79	-24727.76
	Min. H <sub>x</sub>	8	55171.11	-29030.92	29.64
	Min. H <sub>z</sub>	14	55171.11	29.64	-28570.27
	Min. M <sub>x</sub>	14	-2561589.01	29.64	-28570.27
	Min. M <sub>z</sub>	20	-2631875.53	29030.92	-29.64
	Min. Torsion	2	-1193.25	-29.64	28570.27

### Tower Mast Reaction Summary

<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	DAYVILLE CT	<b>Page</b>	5 of 8
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<i>Load Combination</i>	<i>Vertical</i>	<i>Shear<sub>x</sub></i>	<i>Shear<sub>z</sub></i>	<i>Overturning Moment, M<sub>x</sub></i>	<i>Overturning Moment, M<sub>z</sub></i>	<i>Torque</i>
	<i>lb</i>	<i>lb</i>	<i>lb</i>	<i>lb-ft</i>	<i>lb-ft</i>	<i>lb-ft</i>
Dead Only	45975.92	0.00	0.00	-449.48	-172.05	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	55171.11	29.64	-28570.27	-2562702.80	-4713.18	1193.25
0.9 Dead+1.6 Wind 0 deg - No Ice	41378.33	29.64	-28570.27	-2552590.68	-4637.11	1191.90
1.2 Dead+1.6 Wind 30 deg - No Ice	55171.11	14541.13	-24757.39	-2221686.66	-1320161.24	993.14
0.9 Dead+1.6 Wind 30 deg - No Ice	41378.33	14541.13	-24757.39	-2212899.25	-1314934.09	993.84
1.2 Dead+1.6 Wind 60 deg - No Ice	55171.11	25156.34	-14310.80	-1285521.26	-2281922.19	526.87
0.9 Dead+1.6 Wind 60 deg - No Ice	41378.33	25156.34	-14310.80	-1280375.00	-2272930.08	529.43
1.2 Dead+1.6 Wind 90 deg - No Ice	55171.11	29030.92	-29.64	-5058.20	-2632301.84	-80.57
0.9 Dead+1.6 Wind 90 deg - No Ice	41378.33	29030.92	-29.64	-4893.76	-2621939.61	-76.83
1.2 Dead+1.6 Wind 120 deg - No Ice	55171.11	25126.70	14259.47	1276612.02	-2277423.09	-666.42
0.9 Dead+1.6 Wind 120 deg - No Ice	41378.33	25126.70	14259.47	1271788.77	-2268452.66	-662.51
1.2 Dead+1.6 Wind 150 deg - No Ice	55171.11	14489.79	24727.76	2216073.38	-1312366.27	-1073.71
0.9 Dead+1.6 Wind 150 deg - No Ice	41378.33	14489.79	24727.76	2207592.97	-1307176.77	-1070.66
1.2 Dead+1.6 Wind 180 deg - No Ice	55171.11	-29.64	28570.27	2561589.01	4289.14	-1193.24
0.9 Dead+1.6 Wind 180 deg - No Ice	41378.33	-29.64	28570.27	2551762.12	4321.65	-1191.88
1.2 Dead+1.6 Wind 210 deg - No Ice	55171.11	-14541.13	24757.39	2220571.74	1319736.82	-993.01
0.9 Dead+1.6 Wind 210 deg - No Ice	41378.33	-14541.13	24757.39	2212069.86	1314618.35	-993.71
1.2 Dead+1.6 Wind 240 deg - No Ice	55171.11	-25156.34	14310.80	1284406.16	2281496.64	-526.77
0.9 Dead+1.6 Wind 240 deg - No Ice	41378.33	-25156.34	14310.80	1279545.47	2272613.50	-529.32
1.2 Dead+1.6 Wind 270 deg - No Ice	55171.11	-29030.92	29.64	3944.02	2631875.53	80.55
0.9 Dead+1.6 Wind 270 deg - No Ice	41378.33	-29030.92	29.64	4064.91	2621622.48	76.81
1.2 Dead+1.6 Wind 300 deg - No Ice	55171.11	-25126.70	-14259.47	-1277725.08	2276997.16	666.30
0.9 Dead+1.6 Wind 300 deg - No Ice	41378.33	-25126.70	-14259.47	-1272616.78	2268135.81	662.38
1.2 Dead+1.6 Wind 330 deg - No Ice	55171.11	-14489.79	-24727.76	-2217186.24	1311941.47	1073.59
0.9 Dead+1.6 Wind 330 deg - No Ice	41378.33	-14489.79	-24727.76	-2208420.84	1306860.75	1070.55
1.2 Dead+1.0 Ice+1.0 Temp	84438.61	0.00	-0.00	-1660.63	-1346.91	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	84438.61	4.23	-6950.15	-604766.20	-2077.49	219.62
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	84438.61	3509.76	-6021.12	-524304.73	-308285.32	165.06
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	84438.61	6074.85	-3478.74	-303826.81	-532269.99	66.26
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	84438.61	7012.20	-4.23	-2409.35	-614015.02	-50.28
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	84438.61	6070.63	3471.41	299183.12	-531616.93	-153.36
1.2 Dead+1.0 Wind 150	84438.61	3502.44	6016.89	520139.17	-307154.15	-215.34





<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	DAYVILLE CT	<b>Page</b>	7 of 8
	<b>Project</b>	150 ft Monopole	<b>Date</b>	10:30:51 03/22/19
	<b>Client</b>	VERIZON	<b>Designed by</b>	kw

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
in		in	lb	lb	ksi	ksi		
3.0000	30	2.2500	56167.59	59612.83	14.596		Plate	0.32
			223654.40	371266.30	45.000			✓
			0.25	0.16	0.32			

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	150 - 96.08 (1)	TP42.8x29x0.375	53.92	0.00	0.0	48.7143	-14311.00	3536830.00	0.004
L2	96.08 - 47.87 (2)	TP54.2x40.5528x0.5	54.06	0.00	0.0	82.3053	-29584.90	6058710.00	0.005
L3	47.87 - 1 (3)	TP65x51.3622x0.5625	54.15	0.00	0.0	115.045	-55163.30	8236630.00	0.007
						0			

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> lb-ft	φM <sub>nx</sub> lb-ft	Ratio M <sub>ux</sub> / φM <sub>nx</sub>	M <sub>uy</sub> lb-ft	φM <sub>ny</sub> lb-ft	Ratio M <sub>uy</sub> / φM <sub>ny</sub>
L1	150 - 96.08 (1)	TP42.8x29x0.375	479267.50	2972791.67	0.161	0.00	2972791.67	0.000
L2	96.08 - 47.87 (2)	TP54.2x40.5528x0.5	1275608.33	6449958.00	0.198	0.00	6449958.00	0.000
L3	47.87 - 1 (3)	TP65x51.3622x0.5625	2632308.33	10904500.00	0.241	0.00	10904500.00	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> lb	φV <sub>n</sub> lb	Ratio V <sub>u</sub> / φV <sub>n</sub>	Actual T <sub>u</sub> lb-ft	φT <sub>n</sub> lb-ft	Ratio T <sub>u</sub> / φT <sub>n</sub>
L1	150 - 96.08 (1)	TP42.8x29x0.375	13347.60	1768420.00	0.008	80.59	5961074.67	0.000
L2	96.08 - 47.87 (2)	TP54.2x40.5528x0.5	20787.70	3029360.00	0.007	80.57	12934416.00	0.000
L3	47.87 - 1 (3)	TP65x51.3622x0.5625	29045.80	4118320.00	0.007	80.56	21864416.00	0.000

<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	DAYVILLE CT	<b>Page</b>	8 of 8
	<b>Project</b>	150 ft Monopole	<b>Date</b>	10:30:51 03/22/19
	<b>Client</b>	VERIZON	<b>Designed by</b>	kw

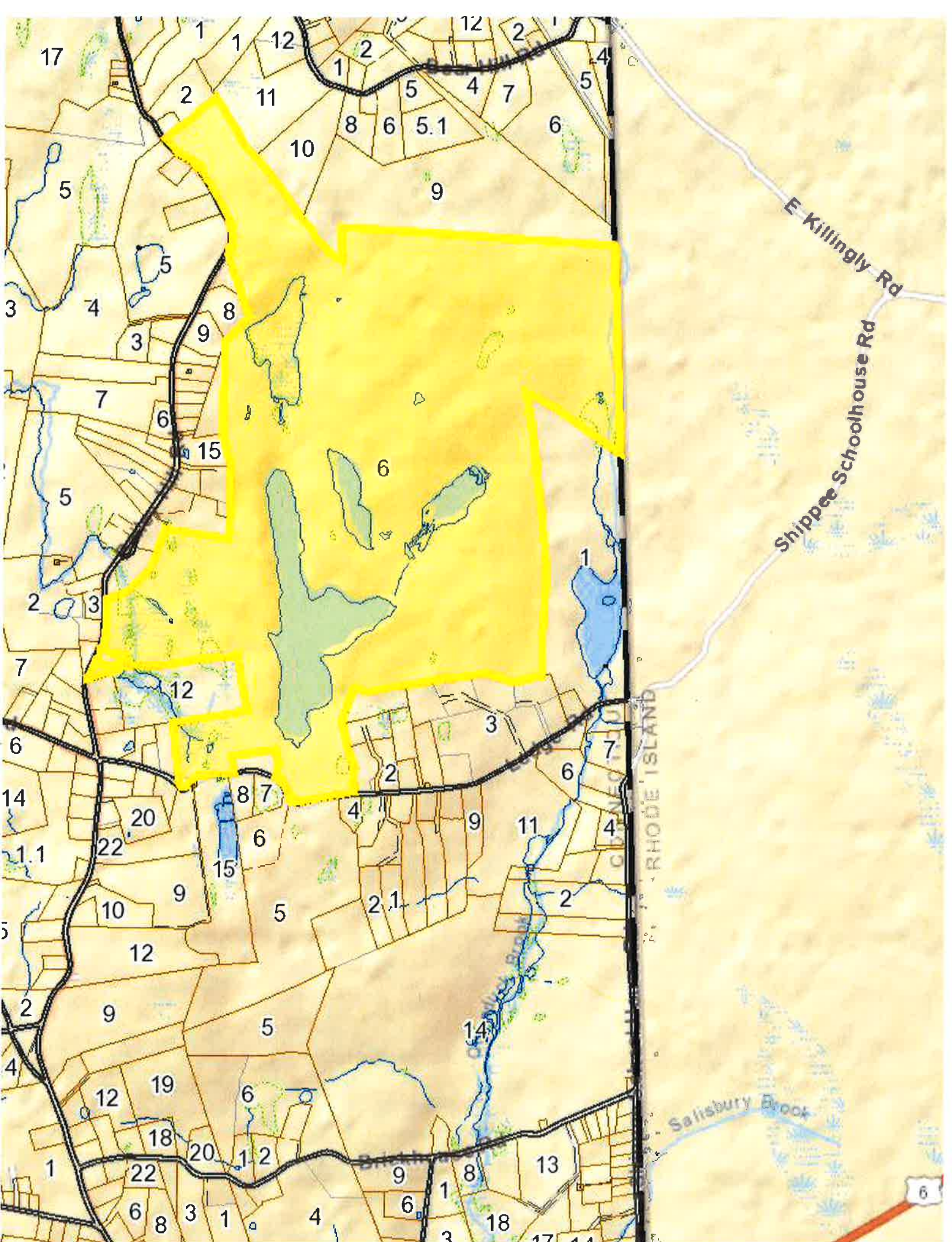
**Pole Interaction Design Data**

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_u$	$M_{ux}$	$M_{uy}$	$V_u$	$T_u$			
L1	150 - 96.08 (1)	0.004	0.161	0.000	0.008	0.000	0.165	1.000	4.8.2 ✓
L2	96.08 - 47.87 (2)	0.005	0.198	0.000	0.007	0.000	0.203	1.000	4.8.2 ✓
L3	47.87 - 1 (3)	0.007	0.241	0.000	0.007	0.000	0.248	1.000	4.8.2 ✓

**Section Capacity Table**

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail	
L1	150 - 96.08	Pole	TP42.8x29x0.375	1	-14311.00	3536830.00	16.5	Pass	
L2	96.08 - 47.87	Pole	TP54.2x40.5528x0.5	2	-29584.90	6058710.00	20.3	Pass	
L3	47.87 - 1	Pole	TP65x51.3622x0.5625	3	-55163.30	8236630.00	24.8	Pass	
							Summary		
							Pole (L3)	24.8	Pass
							Base Plate	32.4	Pass
							<b>RATING =</b>	<b>32.4</b>	<b>Pass</b>

# **ATTACHMENT 4**





Situs : 520 BAILEY HILL RD

Map ID: 005294

Class: PA 490 FOREST

Card: 1 of 1

Printed: February 7, 2019

**CURRENT OWNER**

TRI LAKES LLC  
% MGRE CO LLC  
PO BOX 28  
WATERTOWN CT 06795-0028

**GENERAL INFORMATION**

Living Units  
Neighborhood 115  
Alternate Id 143-6  
Vol / Pg 753/204  
District 4  
Zoning RURAL DEVELOPMENT  
Class 600



**Property Notes**

FOUNDATION ONLY 2013  
1323/185 TRANSFERRED LOT 2 - 1ACRE  
AVALON SUBDIVISION ON FILE  
WILL SPLIT WHEN DEVELOPED IN 490

**Land Information**

Type	Size	Influence Factors	Influence %	Value
Primary	AC 1.8400			46,470
Excess	AC 58.1600			101,780
Excess	AC 233.3500			408,360
Rear	AC 288.8500			288,850
Waste	AC 64.8000			16,200

Total Acres: 647  
Spot:

Location:

**Assessment Information**

Assessed	Appraised	Cost	Income
Land 202,390	861,700	861,700	0
Building 7,000	10,000	10,000	0
<b>Total 209,390</b>	<b>871,700</b>	<b>871,700</b>	<b>0</b>

Value Flag COST APPROACH  
FOUNDATION 10000  
Manual Override Reason  
Base Date of Value 10/01/2018  
Effective Date of Value 01/31/2019

**Entrance Information**

Date	ID	Entry Code	Source
09/23/13	SS	Permit/Field Check	Other

**Permit Information**

Date Issued	Number	Price	Purpose	% Complete
05/05/17	25260	324,400	51 BLDG Construct 150' Monopole W/100x1	
10/31/12	22076	7,000	25 FOUN Foundation For 2800 Sf Dwell	100

**Sales/Ownership History**

Transfer Date	Price	Type	Validity
07/17/96		Land & Bldg	Sale Of No Consideration
12/16/87		Land & Bldg	Sale Of No Consideration
08/13/87		Land & Bldg	Sale Of No Consideration
03/06/74		Land & Bldg	Sale Of No Consideration
03/01/71		Land & Bldg	Sale Of No Consideration
09/17/62		Land & Bldg	Sale Of No Consideration

**Deed Reference Deed Type**

660/23	
413/31	
401/203	
203/444	
186/511	
147/529	

**Grantee**

685 PARKER ST INC %DIME SAVINGS BANK

Situs : 520 BAILEY HILL RD

Parcel Id: 005294

Class: PA 490 FOREST

Card: 1 of 1

Printed: February 7, 2019

**Dwelling Information**

Style Year Built  
 Story height Eff Year Built  
 Attic Year Remodeled  
 Exterior Walls Amenities  
 Masonry Trim x  
 Color In-law Apt No

**Basement**

Basement # Car Bsmt Gar  
 FBLA Size x FBLA Type  
 Rec Rm Size x Rec Rm Type

**Heating & Cooling**

Heat Type Fireplaces  
 Fuel Type Stacks  
 System Type Openings  
 Pre-Fab

**Room Detail**

Bedrooms Full Baths  
 Family Rooms Half Baths  
 Kitchens Extra Fixtures  
 Total Rooms Bath Type  
 Kitchen Type Bath Remod  
 Kitchen Remod

**Adjustments**

Int vs Ext Unfinished Area  
 Cathedral Ceiling x Unheated Area

**Grade & Depreciation**

Grade Market Adj  
 Condition Functional  
 CDU Economic  
 Cost & Design 0 % Good Ovr  
 % Complete

**Dwelling Computations**

Base Price % Good  
 Plumbing % Good Override  
 Basement Functional  
 Heating Economic  
 Attic % Complete  
 Other Features 0 C&D Factor  
 Subtotal Adj Factor  
 Additions

Ground Floor Area Dwelling Value  
 Total Living Area

**Building Notes**

**Outbuilding Data**

Type	Size 1	Size 2	Area	Qty	Yr Blt	Grade	Condition	Value

**Condominium / Mobile Home Information**

Complex Name  
 Condo Model  
 Unit Number  
 Unit Level  
 Unit Parking  
 Model (MH)  
 Unit Location  
 Unit View  
 Model Make (MH)

**Addition Details**

Line #	Low	1st	2nd	3rd	Value



# **ATTACHMENT 5**



**Certificate of Mailing — Firm**

Name and Address of Sender  
Kenneth C. Baldwin, Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103



TOTAL NO. of Pieces Listed by Sender  
**3**

TOTAL NO. of Pieces Received at Post Office™  
**3**

Postmaster, per (name of receiving employee)  
*SAC*

Affix Stamp Here  
Postmark with Date of Receipt.

neopost®  
04/22/2019  
**US POSTAGE \$002.79**  
ZIP 06103  
041L12208937

USPS® Tracking Number Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Mary Calorio, Town Manager Town of Killingly 172 Main Street Killingly, CT 06239				
2.	Ann-Marie Aubrey, Director of Planning and Development Town of Killingly 172 Main Street Killingly, CT 06239				
3.	Tri Lakes LLC c/o MGRE Co. LLC P.O. Box 28 Watertown, CT 06795-0028				
4.					
5.					
6.					