

February 14, 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  
289 Mountain Street, Hartford, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 80-foot level of the existing 110-foot tower at 289 Mountain Street in Hartford, Connecticut (the “Property”). The tower is owned by American Tower Corporation (“ATC”). The Council approved Cellco’s use of this tower in 2014. Cellco now intends to remove all of its existing antennas and install six (6) new antennas (three (3) model JAHH-65B-R3B, 700/850 MHz antennas and three (3) model JAHH-65B-R3B, 1900/2100 MHz antennas), at the same level (80 feet above grade) on the tower. Cellco also intends to remove six (6) existing remote radio heads (“RRHs”) and install twelve (12) new RRHs on Cellco’s antenna platform. Included in Attachment 1 are specifications for Cellco’s replacement antennas and RRHs.

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 Mayor Luke Bronin; Jamie Brätt, Hartford’s Director of Planning and Economic Development; The Metropolitan District Bureau of Public Works, the owner of the Property; and ATC, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco’s replacement antennas and RRH’s will remain at the 80-foot level of the 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 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 for each of Cellco's operating frequencies are included behind Attachment 2. The Far Field calculations demonstrate that Cellco's modified facility will operate well within 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:

Luke Bronin, Hartford Mayor  
Jamie Brätt, Hartford's Director of Planning and Economic Development  
The Metropolitan District Bureau of Public Works  
ATC  
Tim Parks

# **ATTACHMENT 1**



## 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, 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\*

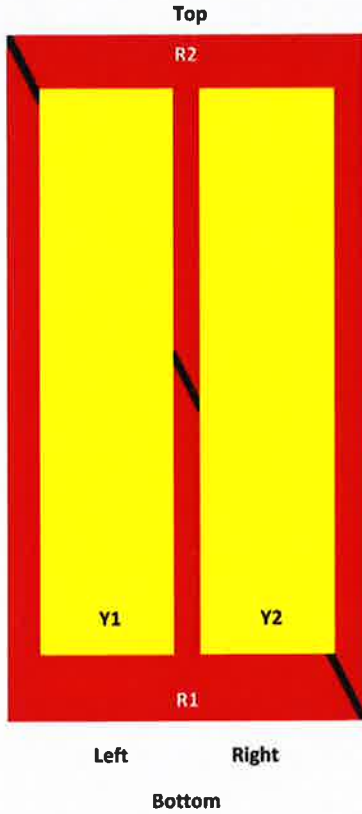
Frequency Band, MHz	698–787	824–894	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.3	14.9	17.6	18.1	18.2	18.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.5	±0.6	±0.4	±0.5	±0.6
	2°   14.3	2°   15.0	0°   17.2	0°   17.6	0°   17.7	0°   17.9
Gain by Beam Tilt, average, dBi	8°   14.3	8°   14.9	5°   17.6	5°   18.2	5°   18.3	5°   18.7
	14°   14.3	14°   15.4	10°   17.6	10°   18.2	10°   18.3	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	ANXXXXXXXXXXXXXXX1
R2	824-894	3-4	2	ANXXXXXXXXXXXXXXX2
Y1	1695-2360	5-6	3	ANXXXXXXXXXXXXXXX3
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
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage

## Mechanical Specifications

RF Connector Quantity, total	8
RF Connector Quantity, low band	4
RF Connector Quantity, high band	4
RF Connector Interface	4.3-10 Female

JAHH-65BR3B

Color	Light gray
Grounding Type	RF connector 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	746.0 N @ 150 km/h 167.7 lbf @ 150 km/h
Wind Loading, lateral	243.0 N @ 150 km/h 54.6 lbf @ 150 km/h
Wind Loading, rear	776.0 N @ 150 km/h 174.5 lbf @ 150 km/h
Wind Speed, maximum	241 km/h   150 mph

## Dimensions

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

## Remote Electrical Tilt (RET) Information

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

## Packed Dimensions

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

## Regulatory Compliance/Certifications

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



JAHH65BR3B

## 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.

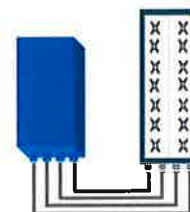


## FEATURES

- 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



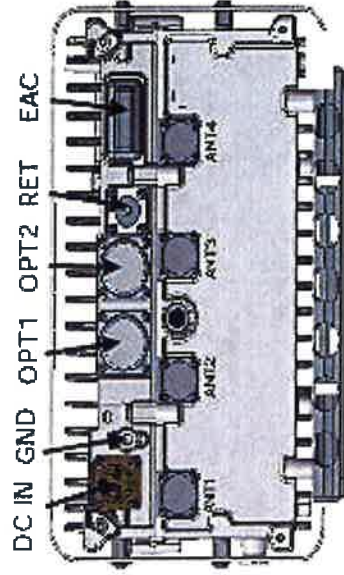
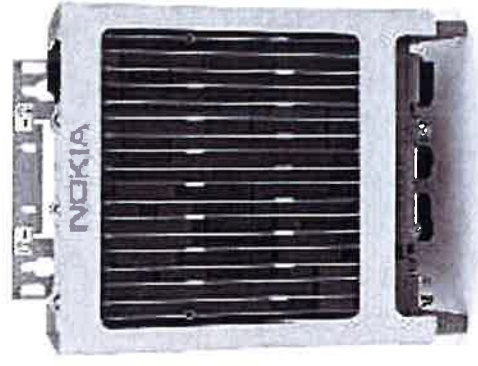
## TECHNICAL SPECIFICATIONS

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

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# AHCA AirScale RRH 4T4R B5 160W

Supported Frequency bands	3GPP band 5
Frequencies	DL 869-894MHz, UL 824-849MHz
Number of TX/RX paths/pipes	4TX/4RX
Instantaneous Bandwidth IBW	25MHz (Full Band)
Occupied Bandwidth OBW	25MHz (Full Band)
Output Power	4T4R @ 40W / 2T4R @ 60W
RF Sharing	LTE, WCDMA, LTE + NB-IOT supported
256 QAM Back Off	No backoff at 40W and 0.8dB at 60W.
Supply Voltage / Voltage Range	DC-48V / -36V to -60V
Typical Power Consumption	365W [50% ETSI Busy Hour Load at 4TX @ 40W] 529W [100% RF Load at 4 TX @ 40W] 574W [100% RF Load at 4 TX @ 40W with SBT and MISO ON]
Antenna Ports	4 Ports, 4.3-10+
Optical Ports	2x CPRI 9.8 Gbps
ALD Control Interfaces	MISO3.0 from ANT 1, 2, 3, 4 and RET (Power supply ANT1 and ANT3)
Other Interfaces	External Alarm MCR-26 Serial connector (4 inputs, 1 Output) DC Circular Power Connector



Operational Temperature Range	-40°C to 55°C (with solar cover)
Dimensions (mm)	337 x 295 x 165 (radio only)
Height x width x depth	13.3" x 11.7" x 6.5" 4.28 x 3.24 x 2.08 (with bracket and enclosure) 16.9" x 12.8" x 8.2"
Volume (liters)	16.5
Weight (kg)	16 / 35.3 lb - w/o bracket
Ingress protection class	IP65
Installation options	Pole or Wall, Vertical or Horizontal Book Mount
Surge protection	Class II 5kA

**NOKIA**

# 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.

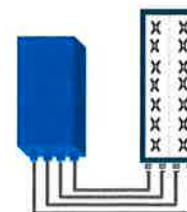


## FEATURES

- 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

## TECHNICAL SPECIFICATIONS

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

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# ALCATEL-LUCENT B66A RRH4X45

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

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

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



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

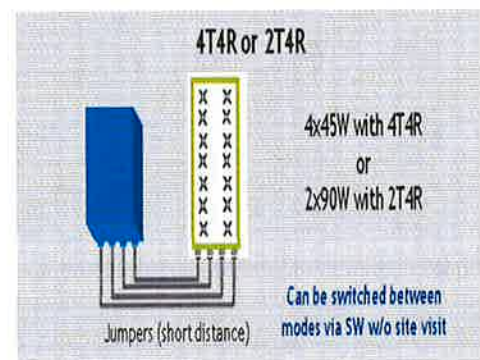
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

## FEATURES

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

## BENEFITS

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



## TECHNICAL SPECIFICATIONS

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

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

**Product Description**

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

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

**Features/Benefits**

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

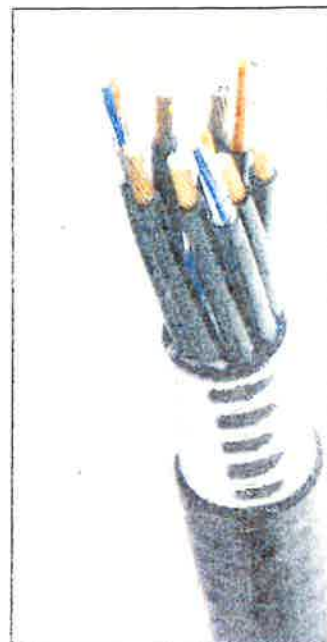


Figure 1: HYBRIFLEX Series

**Technical Specifications**

Outer Conductor Armor	Corrugated Aluminum	(mm (in))	46.5 (1.83)
Jacket	Polyethylene, PE	(mm (in))	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes

Weight, Approximate		(kg/m (lb/ft))	1.9 (1.30)
Minimum Bending Radius, Single Bending		(mm (in))	200 (8)
Minimum Bending Radius, Repeated Bending		(mm (in))	500 (20)
Recommended/Maximum Clamp Spacing		(m (ft))	1.0 / 1.2 (3.25 / 4.0)

DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	0.68 (0.205)
DC-Resistance Power Cable, 8.4mm <sup>2</sup> (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		

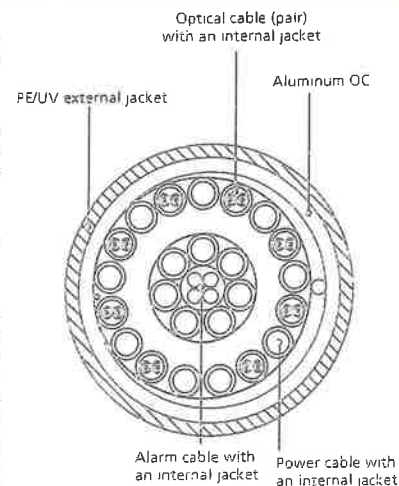


Figure 2: Construction Detail

Size (Power)	(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)		16 (8 pairs)
Size (Alarm)	(mm (AWG))	0.8 (18)
Quantity, Wire Count (Alarm)		4 (2 pairs)
Type		UV protected
Strands		19
Primary Jacket Diameter, Nominal	(mm (in))	6.8 (0.27)
Standards (Meets or exceeds)		NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant

Installation Temperature	(°C (°F))	-40 to +65 (-40 to 149)
Operation Temperature	(°C (°F))	-40 to +65 (-40 to 149)

\* This data is provisional and subject to change

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

# **ATTACHMENT 2**



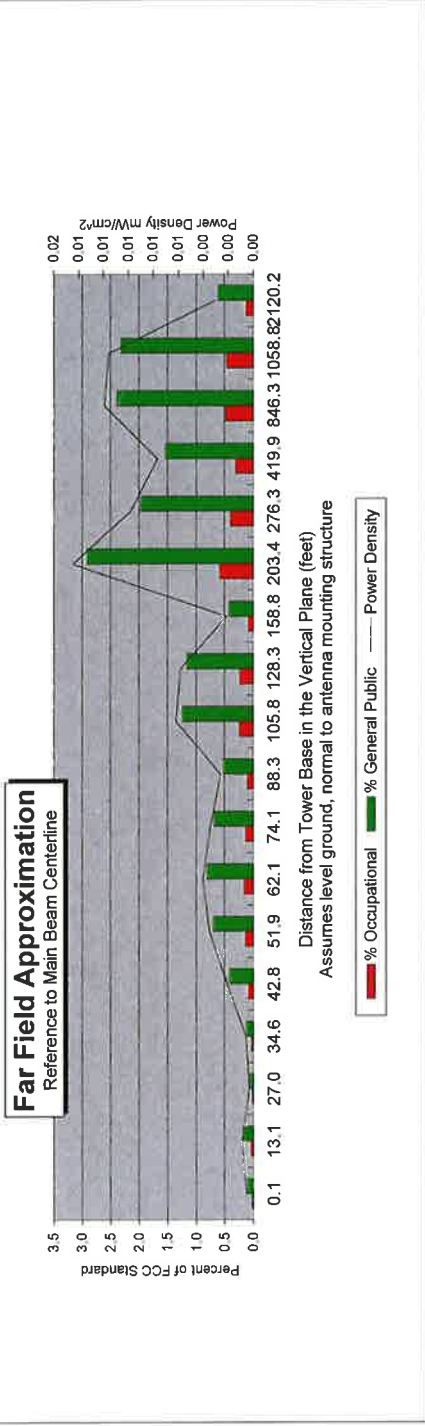
Far Field Approximation  
with downtilt variation

**Estimated Radiated Emission  
Single Emitter Far Field Model  
Dipole / Wire/ Yagi Antenna Types**



Location:	Hartford S 3, CT
Site #:	
Date:	01/19/18
Name:	Mark Brauer
File Name:	Hartford S 3, CT - FF Power

Operating Freq. (MHz)	746.0
Antenna Height (ft):	77.0
Antenna Gain (dBi):	14.5
Antenna Size (in.):	72.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	2200.0
Number of Channels	1



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	74.0	75.2	78.8	81.7	85.5	90.4	96.6	104.7	115.2	129.1	148.1	175.2	216.5	286.1	425.4	849.5	1061.4	2121.4
Distance from Antenna Structure Base in Horizontal plane	0.1	13.1	27.0	34.6	42.8	51.9	62.1	74.1	88.3	105.8	128.3	158.8	203.4	276.3	419.9	846.3	1058.8	2120.2
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)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.6	0.4	0.3	0.5	0.5	0.1
Percent of General Population Standard	0.1	0.2	0.1	0.1	0.4	0.7	0.8	0.7	0.5	1.2	1.2	0.4	2.9	2.0	1.5	2.4	2.3	0.6

Distance in feet below:

Antenna Type: J4HH-65B  
Max%: 2.91%

- Instructions:
- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be 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 Density (mW/cm²).
  - 4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
  - 5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
  - 6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
  - 7) An odd distance may be entered in the rightmost column of the lower table.

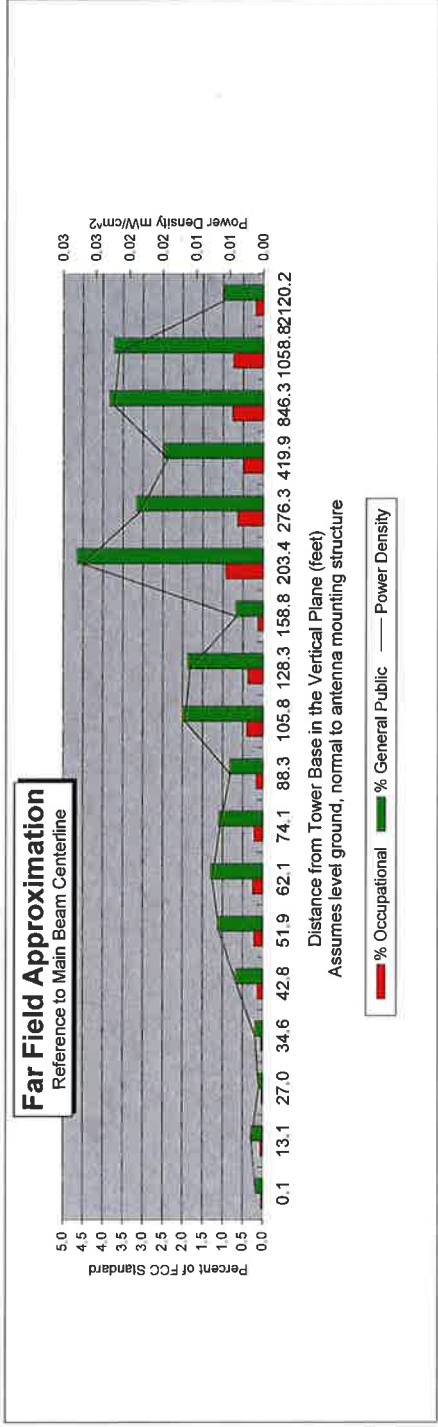
Far Field Approximation  
with downtilt variation

**Estimated Radiated Emission**  
**Single Emitter Far Field Model**  
**Dipole / Wire/ Yagi Antenna Types**



Location:	Hartford S 3. CT
Site #:	
Date:	01/19/18
Name:	Mark Brauer
File Name:	Hartford S 3. CT - FF Power

Operating Freq. (MHz)	869.0
Antenna Height (ft)	77.0
Antenna Gain (dBi)	15.8
Antenna Size (in.)	72.0
Downtilt (degrees)	0.0
Feedline Loss (dB)	0.0
Power @ J4 (w)	3050.0
Number of Channels	1



	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
Calc Angle	74.0	75.2	78.8	81.7	85.5	90.4	96.6	104.7	115.2	129.1	148.1	175.2	216.5	286.1	426.4	849.5	1061.4	2121.4
Solve for r, dx to antenna	0.1	13.1	27.0	34.6	42.8	51.9	62.1	74.1	88.3	105.8	128.3	158.8	203.4	276.3	419.9	846.3	1058.8	2120.2
Distance from Antenna Structure Base in Horizontal plane	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
Angle from Main Beam (reference to horizontal plane)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
dB down from centerline (referenced to centerline)	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
Reflection Coefficient (1 to 4, 2.56 typical)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.02	0.02	0.01
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.03	0.02	0.01	0.02	0.01
Percent of Occupational Standard	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.4	0.4	0.1	0.9	0.6	0.5	0.8	0.7	0.2
Percent of General Population Standard	0.2	0.3	0.1	0.2	0.7	1.1	1.3	1.1	0.8	2.0	1.9	0.7	4.7	3.2	2.5	3.8	3.7	1.0

Antenna Type: JAHH-65B  
Max%: 4.66%

Instructions:

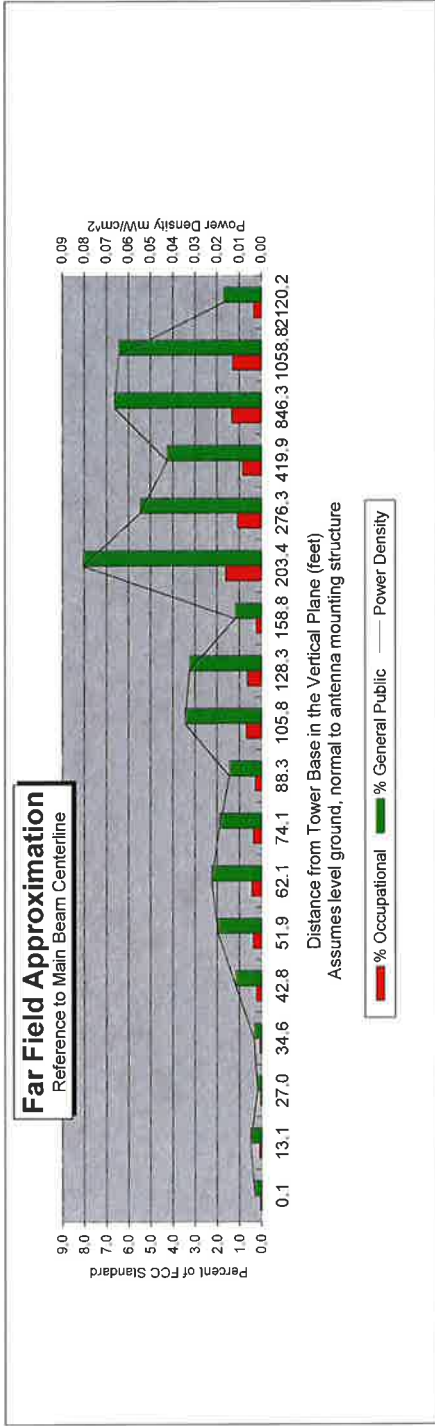
- 1) Fill in Site Location, Site number, Date, and enter File Name to be saved as.
- 2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
- 3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBi 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 Density (mW/cm²).
- 4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
- 5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
- 6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
- 7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation  
with downtilt variation

**Estimated Radiated Emission  
Single Emitter Far Field Model  
Dipole / Wire/Yagi Antenna Types**



Location:	Hartford S 3, CT
Site #:	
Date:	01/19/18
Name:	Mark Brauer
File Name:	Hartford S 3, CT - FF Power
Operating Freq. (MHz)	1970.0
Antenna Height (ft):	77.0
Antenna Gain (dBi):	18.4
Antenna Size (m.):	72.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	5000.0
Number of Channels	1



Distance in feet below:

Calc. Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0
Solve for r. dx to antenna	74.0	75.2	78.8	81.7	85.5	90.4	96.6	104.7	115.2	129.1	148.1	175.2	216.5	286.1	426.4	849.5	1061.4	2121.4
Distance from Antenna Structure Base in Horizontal plane	0.1	13.1	27.0	34.6	42.8	51.9	62.1	74.1	88.3	105.8	128.3	158.8	203.4	276.3	419.9	846.3	1058.8	2120.2
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)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.03	0.03	0.01	0.08	0.05	0.04	0.07	0.06	0.02
Percent of Occupational Standard	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.4	0.3	0.7	0.6	0.2	1.6	1.1	0.9	1.3	1.3	0.3
Percent of General Population Standard	0.3	0.5	0.2	0.3	1.2	1.9	2.2	1.9	1.4	3.4	3.2	1.2	8.1	5.5	4.3	6.6	6.4	1.7

Antenna Type: JAHH-65B  
Max%: 8.06%

Instructions:

- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Data, and enter File Name to be 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 dBi to obtain dB), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Power.
- 4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
- 5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
- 6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
- 7) An odd distance may be entered in the rightmost column of the lower table.

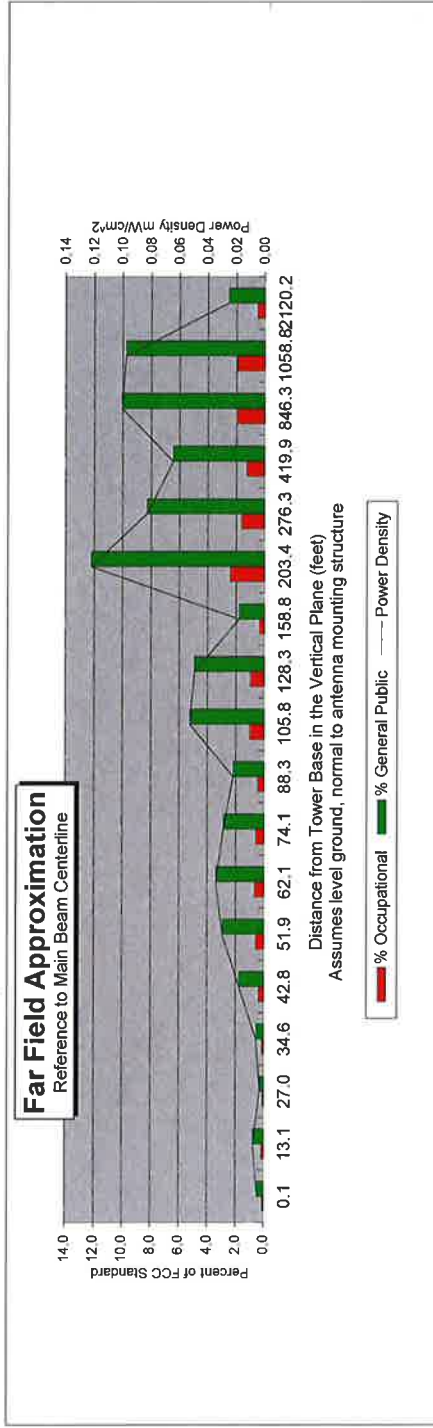
Far Field Approximation  
with downtilt variation

**Estimated Radiated Emission  
Single Emitter Far Field Model  
Dipole / Wire/ Yagi Antenna Types**



Location:	Hartford S.3, CT
Site #:	
Date:	01/19/18
Name:	Mark Brauer
File Name:	Hartford S.3, CT - FF Power

Operating Freq. (MHz)	2145.0
Antenna Height (ft):	77.0
Antenna Gain (dBi):	18.5
Antenna Size (in.):	72.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	7400.0
Number of Channels	1



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0
Solve for r. dx to antenna	74.0	75.2	78.8	81.7	85.5	90.4	96.6	104.7	115.2	129.1	148.1	175.2	216.5	286.1	426.4	849.5	1061.4	2121.4
Distance from Antenna Structure Base in Horizontal plane	0.1	13.1	27.0	34.6	42.8	51.9	62.1	74.1	88.3	105.8	128.3	158.8	203.4	276.3	419.9	846.3	1058.8	2120.2
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)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.01	0.00	0.01	0.02	0.03	0.03	0.03	0.03	0.05	0.05	0.02	0.12	0.08	0.06	0.10	0.10	0.03
Percent of Occupational Standard	0.1	0.1	0.1	0.1	0.3	0.6	0.7	0.6	0.4	1.0	1.0	0.4	2.4	1.7	1.3	2.0	1.9	0.5
Percent of General Population Standard	0.4	0.7	0.3	0.5	1.7	2.9	3.4	2.9	2.2	5.2	4.9	1.8	12.2	8.3	6.4	10.0	9.7	2.6

- Antenna Type: JAHH-65B  
Max%: 12.21%
- Instructions:
- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Data, and enter File Name to be 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 Density.
  - 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**



**AMERICAN TOWER®**  
CORPORATION

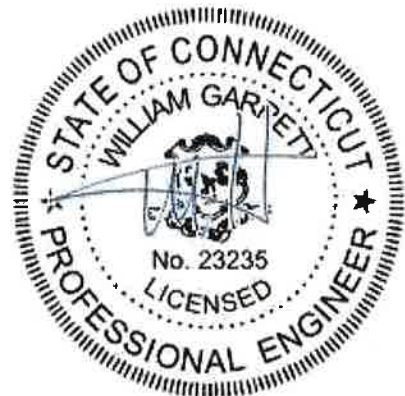
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## Structural Analysis Report

**Structure** : 110 ft Monopole  
**ATC Site Name** : Hrfr - South, CT  
**ATC Site Number** : 302481  
**Engineering Number** : OAA708587\_C3\_01  
**Proposed Carrier** : Verizon  
**Carrier Site Name** : Hartford South 3, CT  
**Carrier Site Number** : 467278  
**Site Location** : Mountain Road  
Hartford, CT 06106-4121  
41.726569,-72.708169  
**County** : Hartford  
**Date** : August 17, 2017  
**Max Usage** : 99%  
**Result** : Pass

Prepared By:  
Felix Buabeng  
Structural Engineer I

Reviewed By:



Aug 18 2017 1:02 PM **cosign**

**COA: PEC.0001553**



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Calculations .....	Attached



**Introduction**

The purpose of this report is to summarize results of a structural analysis performed on the 110 ft monopole to reflect the change in loading by Verizon.

**Supporting Documents**

<b>Tower Drawings</b>	Mapped by Smith Cullum Site #CT-0017(A), dated June 6, 2001
<b>Foundation Drawing</b>	Girard & Co Engineering Job #39902, dated April 29, 1988
<b>Geotechnical Report</b>	TEP Project #071162.01, dated July 23, 2007
<b>Modifications</b>	ATC Project #42719232, dated January 12, 2009 ATC Project #43595333, dated July 1, 2009 ATC Project #43930034, dated September 15, 2009 ATC Project #44662232, dated March 30, 2010

**Analysis**

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

<b>Basic Wind Speed:</b>	97 mph (3-Second Gust, $V_{asd}$ ) / 125 mph (3-Second Gust, $V_{ult}$ )
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
<b>Structure Class:</b>	II
<b>Exposure Category:</b>	B
<b>Topographic Category:</b>	4
<b>Crest Height:</b>	36 ft
<b>Spectral Response:</b>	$S_s = 0.18, S_1 = 0.06$
<b>Site Class:</b>	D - Stiff Soil

**Conclusion**

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

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



**Existing and Reserved Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
110.0	110.0	3	DragonWave Horizon Compact	Side Arms	(6) 5/16" Coax (3) 1/2" Coax (1) 2" Conduit	Clearwire
		1	12" x 12" Junction Box			
		1	DragonWave A-ANT-23G-1-C			
		3	NextNet BTS-2500			
		3	Argus LLPX310R			
		2	DragonWave A-ANT-11G-2.5-C			
100.0	105.0	1	10' Omni	Platform w/ Handrails	-	Other
	100.0	6	Powerwave 7020.00 Dual Band RET		(12) 1 5/8" Coax (4) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk (1) 3" Conduit	AT&T Mobility
		6	CCI TPX-070821			
		6	Powerwave LGP21401			
		2	Raycap DC6-48-60-18-8F			
		3	Ericsson RRUS-11			
		3	Ericsson RRUS 32 B2			
		3	Ericsson RRUS-32			
		3	Powerwave 7770.00			
		2	Quintel QS66512-2			
		2	CCI OPA-65R-LCUU-H6			
		1	CCI OPA-65R-LCUU-H8			
1	CCI TPA-65R-LCUUUU-H8					
87.0	87.0	3	Kathrein Smart Bias Tee	Low Profile Platform	(18) 1 5/8" Coax (1) 1.58" Hybrid	T-Mobile
		3	Ericsson KRY 112 144/1			
		3	Ericsson KRY 112 489/1			
		3	RFS APX16DWV-16DWV-S-E-ACU			
		3	Ericsson AIR32 B66Aa/B2a			
		3	Commscope LNX-6514DS-A1M			
80.0	-	-	-	Low Profile Platform	(12) 1 5/8" Coax (2) 1 5/8" Hybriflex	Verizon
75.0	75.0	1	Scala 840 10212	Stand Offs	(1) 7/8" Coax	Town of West Hartford
		1	TX RX Systems 421-86A-10-18-12-N			
70.0	70.0	3	72" x 6" Panel	Side Arms	(6) 1 5/8" Coax	Metro PCS
60.0	60.0	1	Radio/ODU	Stand Off	(1) 0.41" LMR-400 (1) 7/8" Coax	Town of West Hartford
		1	Scala 840 10212			
		1	Radio Waves SP2-4.7			

**Equipment to be Removed**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
80.0	80.0	6	Antel BXA-70063-6CF-EDIN-2	-	-	Verizon
		6	Antel BXA-171063-12CF-EDIN-5			
		1	RFS DB-T1-6Z-8AB-OZ			
		3	Alcatel-Lucent RRH2x60 700			
		3	Alcatel-Lucent RRH2X60-AWS			



**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
80.0	80.0	3	Nokia AirScale RRH 4T4R B5 160W AHCA	Low Profile Platform	-	Verizon
		3	Alcatel-Lucent B25 RRH4x30			
		3	Alcatel-Lucent B13 RRH4x30-4R			
		3	Alcatel-Lucent B66A RRH 4x45			
		1	Raycap RVZDC-6627-PF-48			
		6	Commscope JAHH-65B-R3B (63.3 lb)			

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

### Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	39%	Pass
Shaft	96%	Pass
Base Plate	71%	Pass
Flanges	21%	Pass
Reinforcement	99%	Pass

### Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	1,723.4	90%
Axial (Kips)	31.9	13%
Shear (Kips)	25.0	4%

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

### Deflection and Sway\*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
110.0	DragonWave A-ANT-23G-1-C	Clearwire	1.589	1.442
	DragonWave A-ANT-11G-2.5-C			
	DragonWave A-ANT-11G-2.5-C			
80.0	Nokia AirScale RRH 4T4R B5 160W AHCA	Verizon	0.885	1.105
	Alcatel-Lucent B25 RRH4x30			
	Alcatel-Lucent B13 RRH4x30-4R			
	Alcatel-Lucent B66A RRH 4x45			
	Raycap RVZDC-6627-PF-48			
Commscope JAHH-65B-R3B (63.3 lb)				
60.0	Radio Waves SP2-4.7	Town of West Hartfor	0.526	0.931

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



## **Standard Conditions**

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

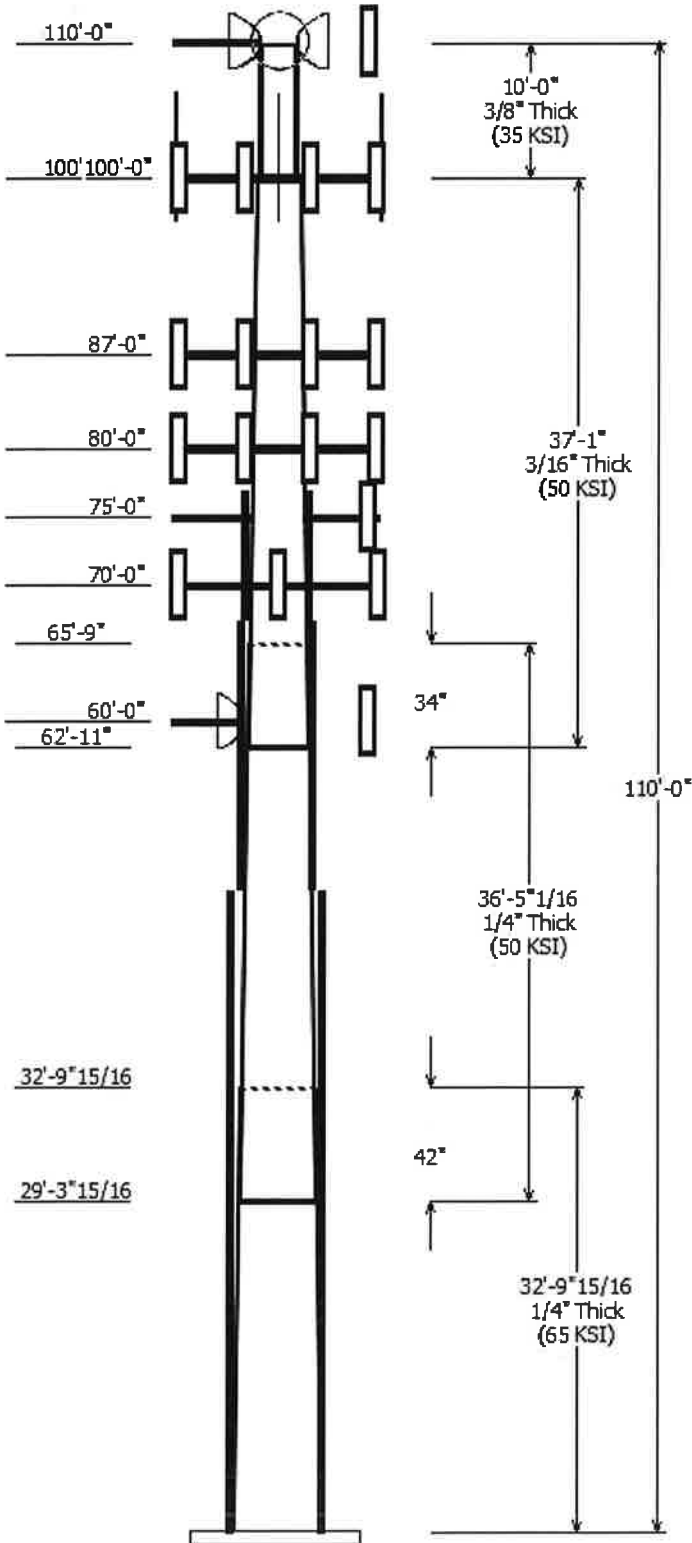
- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

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

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

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

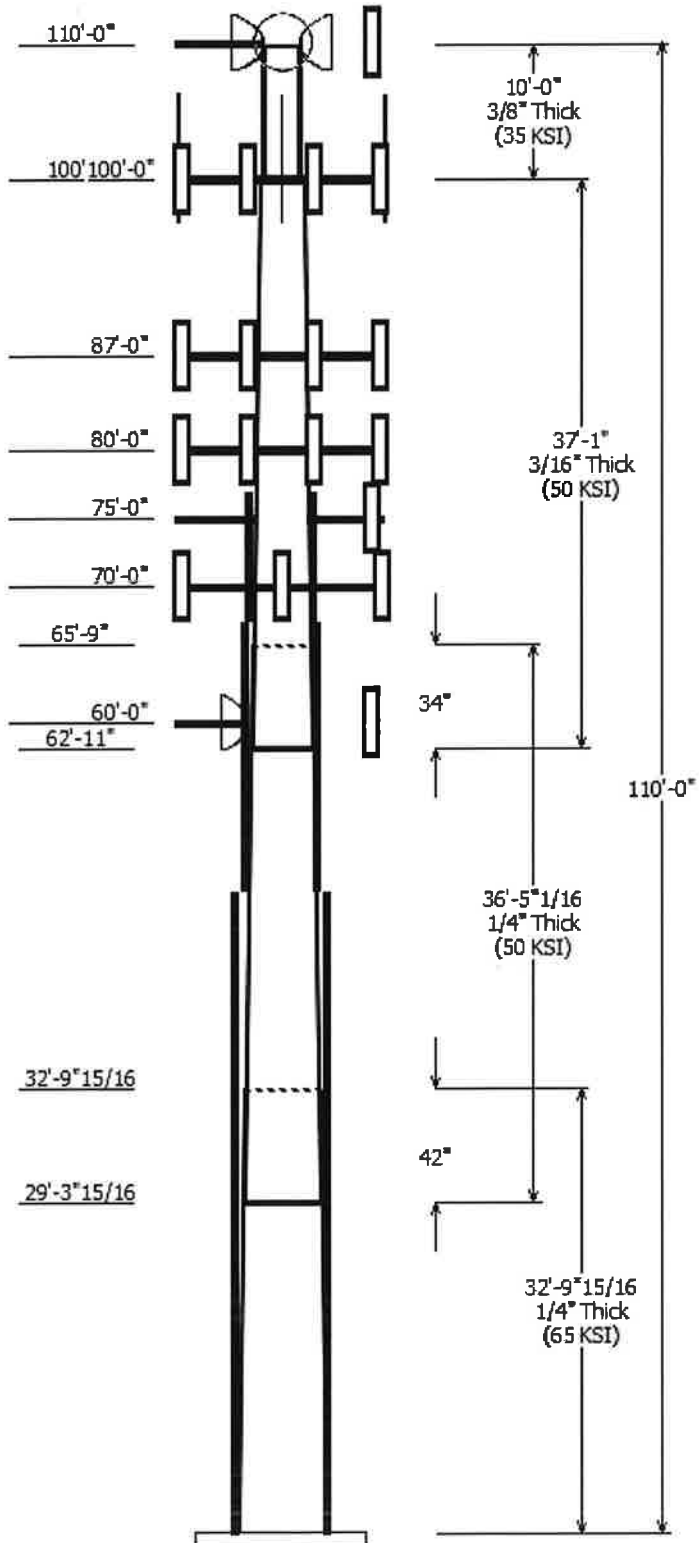
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Job Information	
Pole :	302481
Code:	ANSI/TIA-222-G
Description :	110 ft ITT Meyer Monopole
Client :	VERIZON WIRELESS
Struct Class :	II
Location :	Hrfr - South, CT
Shape :	12 Sides
Exposure :	B
Height :	110.00 (ft)
Topo :	4
Base Elev (ft):	0.00
Taper:	0.16400@in/ft

Sections Properties								
Shaft Section	Length (ft)	Diameter (in)		Thick Joint (in)	Type	Overlap Length (in)	Steel Taper (in/ft)	Steel Grade (ksi)
		Top	Bottom					
1	32.830	24.62	30.00	0.250		0.000	0.163700	65
2	36.420	19.73	25.69	0.250	Slip Joint	42.000	0.163700	50
3	37.083	14.50	20.57	0.188	Slip Joint	34.000	0.163700	50
4	10.000	12.75	12.75	0.375	Butt Joint	0.000	0.000000	35

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
110.000	110.000	1	DragonWave A-ANT-11G-2.5-C
110.000	110.000	3	DragonWave Horizon Compact
110.000	110.000	1	Side Arms
110.000	110.000	1	DragonWave A-ANT-23G-1-C
110.000	110.000	3	Argus LLPX310R
110.000	110.000	3	NextNet BTS-2500
110.000	110.000	1	DragonWave A-ANT-11G-2.5-C
110.000	110.000	1	12" x 12" Junction Box
100.000	100.000	6	CCI TPX-070821
100.000	105.000	1	10' Omni
100.000	100.000	1	CCI TPA-65R-LCUUUU-H8
100.000	100.000	2	Quintel QS66512-2
100.000	100.000	3	Ericsson RRUS 32 B2
100.000	100.000	6	Powerwave Allgon 7020.00
100.000	100.000	3	Ericsson RRUS-11
100.000	100.000	1	CCI OPA-65R-LCUU-H8
100.000	100.000	2	CCI OPA-65R-LCUU-H6
100.000	100.000	3	Ericsson RRUS-32
100.000	100.000	2	Raycap DC6-48-60-18-8F
100.000	100.000	3	Powerwave Allgon 7770.00
100.000	100.000	1	Flat Platform w/ Handrails
100.000	100.000	6	Powerwave LGP21401
87.000	87.000	3	Kathrein Smart Bias Tee
87.000	87.000	1	Flat Low Profile Platform
87.000	87.000	3	Commscope LNX-6514DS-A1M
87.000	87.000	3	RFS APX16DWV-16DWV-S-E-
87.000	87.000	3	Ericsson KRY 112 489/1
87.000	87.000	3	Ericsson KRY 112 144/1
87.000	87.000	3	Ericsson AIR32 B66Aa/B2a
80.000	80.000	1	Raycap RVZDC-6627-PF-48
80.000	80.000	3	Nokia AirScale RRH 4T4R B5 160
80.000	80.000	6	Commscope JAHH-65B-R3B
80.000	80.000	3	Alcatel-Lucent B66A RRH 4x45
80.000	80.000	3	Alcatel-Lucent B13 RRH4x30-4R
80.000	80.000	3	Alcatel-Lucent B25 RRH4x30
80.000	80.000	1	Round Low Profile Platform
75.000	75.000	2	Stand Offs
75.000	75.000	1	TX RX Systems 421-86A-10-18-
75.000	75.000	1	Scala 840 10212
70.000	70.000	3	Round Side Arms
70.000	70.000	3	72" x 6" Panel
60.000	60.000	1	Radio Waves SP2-4.7
60.000	60.000	1	Radio/ODU
60.000	60.000	1	Stand Off



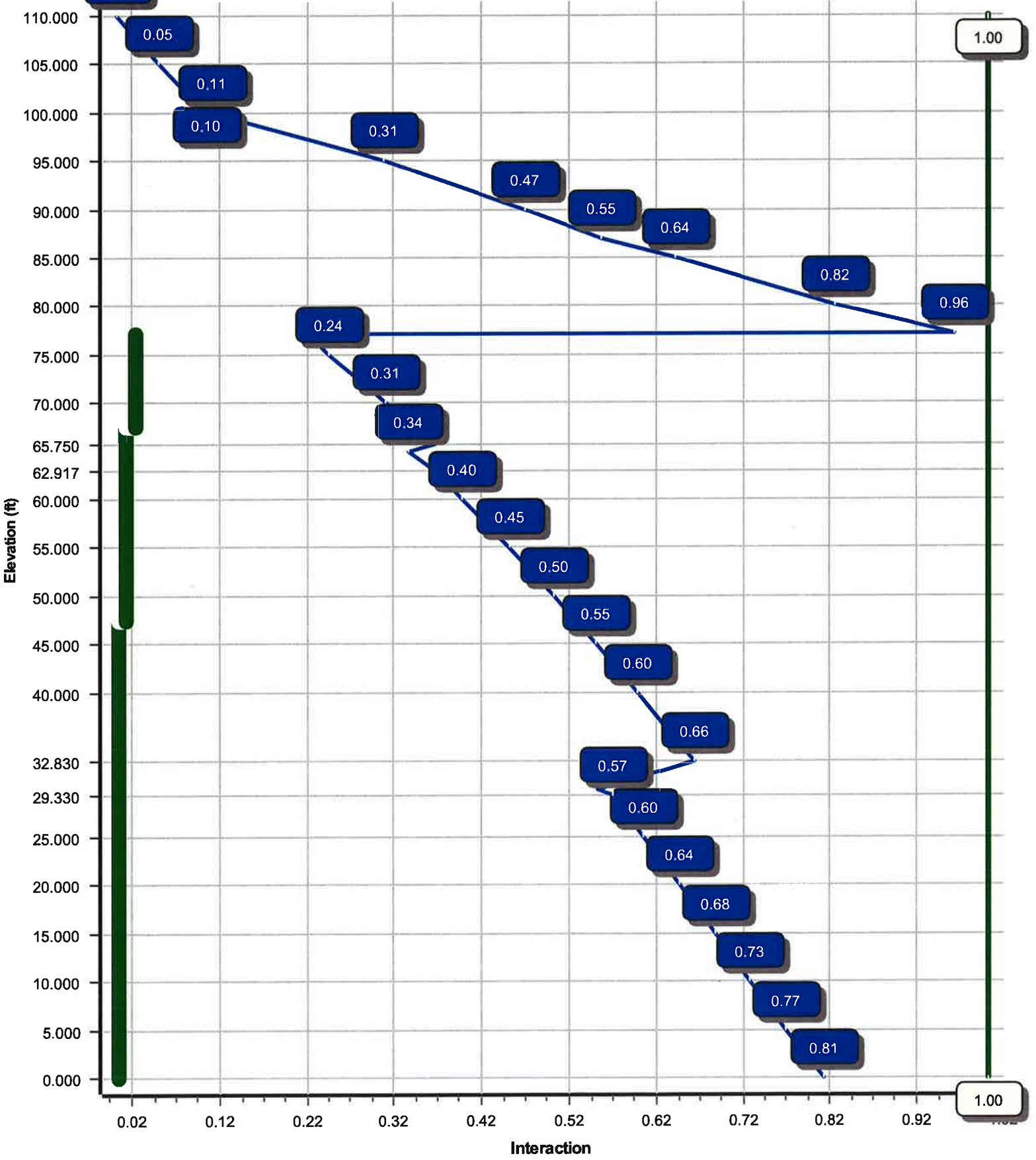
Linear Appurtenance			
Elev (ft)		Description	Exposed To Wind
From	To		
0.000	60.000	0.41" LMR-400	Yes
0.000	60.000	7/8" Coax	Yes
0.000	70.000	1 5/8" Coax	Yes
0.000	75.000	7/8" Coax	Yes
0.000	80.000	1 5/8" Coax	Yes
0.000	80.000	1 5/8" Hybriflex	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	87.000	1 5/8" Coax	Yes
0.000	87.000	1.58" Hybrid	Yes
0.000	100.0	0.39" Fiber Trunk	No
0.000	100.0	0.78" 8 AWG 6	No
0.000	100.0	1 5/8" Coax	No
0.000	100.0	1 5/8" Coax	Yes
0.000	100.0	3" Conduit	No
0.000	110.0	1/2" Coax	Yes
0.000	110.0	2" Conduit	Yes
0.000	110.0	5/16" Coax	No

Load Cases	
1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions			
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	1723.39	25.01	31.93
0.9D + 1.6W	1692.17	24.91	23.93
1.2D + 1.0Di + 1.0Wi	509.86	6.88	84.19
(1.2 + 0.2Sds) * DL + E ELFM	95.73	1.09	31.77
(1.2 + 0.2Sds) * DL + E EMAM	109.57	1.25	31.77
(0.9 - 0.2Sds) * DL + E ELFM	94.03	1.08	22.10
(0.9 - 0.2Sds) * DL + E EMAM	107.48	1.25	22.10
1.0D + 1.0W	407.30	5.98	26.68

Dish Deflections			
Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	60.00	6.315	0.931
1.0D + 1.0W	110.00	19.072	1.442
1.0D + 1.0W	110.00	19.072	1.442
1.0D + 1.0W	110.00	19.072	1.442

Load Case : 1.2D + 1.6W  
Max Ratio 96.14% at 77.0 ft



Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

Analysis Parameters

Location:	HARTFORD County, CT	Height (ft):	110
Code:	ANSI/TIA-222-G	Base Diameter (in):	30.00
Shape:	12 Sides. Sect 4: Round	Top Diameter (in):	12.75
Pole Type:	Custom	Taper (in/ft) :	0.164
Pole Manufacturer:	ITT Meyer	Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	97 mph
Exposure Category:	B	Design Wind Speed With Ice:	50 mph
Topographic Category:	4	Operational Wind Speed:	60 mph
Crest Height:	36.4 ft	Design Ice Thickness:	1.00 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	2.19		
T <sub>L</sub> (sec):	6	p:	1.3
S <sub>s</sub> :	0.181	S <sub>1</sub> :	0.064
F <sub>a</sub> :	1.600	F <sub>v</sub> :	2.400
S <sub>ds</sub> :	0.193	S <sub>d1</sub> :	0.102
		C <sub>s</sub> :	0.031
		C <sub>s</sub> Max:	0.031
		C <sub>s</sub> Min:	0.030

Load Cases

1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph



Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

**Shaft Section Properties**

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip		Weight (lb)	Bottom						Top						
				Joint Type	Joint Len (in)		Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)
1-12	32.830	0.2500	65		0.00	2,434	30.00	0.00	23.95	2705.5	29.47	120.00	24.62	32.83	19.62	1487.9	23.71	98.50	0.163750
2-12	36.420	0.2500	50	Slip	42.00	2,241	25.69	29.33	20.49	1693.2	24.86	102.79	19.73	65.75	15.68	759.9	18.47	78.93	0.163750
3-12	37.083	0.1875	50	Slip	34.00	1,322	20.57	62.92	12.31	652.8	26.72	109.72	14.50	100.00	8.64	225.9	18.04	77.33	0.163750
4-R	10.000	0.3750	35	Butt	0.00	496	12.75	100.00	14.58	279.3	0.00	34.00	12.75	110.00	14.58	279.3	0.00	34.00	0.000000
Shaft Weight						6,493													

**Discrete Appurtenance Properties**

Attach Elev (ft)	Description	Qty	No Ice			Ice			Distance From Face (ft)	Vert Ecc (ft)
			Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor		
110.00	12" x 12" Junction Box	1	10.00	1.400	0.50	83.53	1.828	0.50	0.000	0.000
110.00	Argus LLPX310R	3	28.60	4.290	0.63	178.50	5.481	0.63	0.000	0.000
110.00	DragonWave A-ANT-11G-2.5-	1	47.60	8.670	0.57	213.26	10.914	0.57	0.000	0.000
110.00	DragonWave A-ANT-11G-2.5-	1	47.60	8.670	0.99	213.26	10.914	0.99	0.000	0.000
110.00	DragonWave A-ANT-23G-1-C	1	15.00	1.610	0.64	60.90	2.594	0.64	0.000	0.000
110.00	DragonWave Horizon	3	10.60	0.430	0.50	54.59	0.772	0.50	0.000	0.000
110.00	NextNet BTS-2500	3	35.00	1.820	0.50	115.53	2.551	0.50	0.000	0.000
110.00	Side Arms	1	500.00	7.000	1.00	1,043.09	14.603	1.00	0.000	0.000
100.00	10' Omni	1	25.00	3.000	1.00	216.58	6.567	1.00	0.000	5.000
100.00	CCI OPA-65R-LCUU-H6	2	73.00	9.660	0.66	386.34	11.449	0.66	0.000	0.000
100.00	CCI OPA-65R-LCUU-H8	1	88.00	12.750	0.67	469.44	14.867	0.67	0.000	0.000
100.00	CCI TPA-65R-LCUUUU-H8	1	81.60	13.300	0.69	594.16	19.456	0.69	0.000	0.000
100.00	CCI TPX-070821	6	7.50	0.550	0.50	41.12	1.031	0.50	0.000	0.000
100.00	Ericsson RRUS 32 B2	3	53.00	2.740	0.50	174.38	3.704	0.50	0.000	0.000
100.00	Ericsson RRUS-11	3	50.00	2.570	0.50	162.11	3.424	0.50	0.000	0.000
100.00	Ericsson RRUS-32	3	77.00	3.310	0.50	202.47	4.964	0.50	0.000	0.000
100.00	Flat Platform w/ Handrails	1	2000.00	42.400	1.00	3,833.54	69.457	1.00	0.000	0.000
100.00	Powerwave Allgon 7020.00	6	2.20	0.400	0.50	5.77	0.625	0.50	0.000	0.000
100.00	Powerwave Allgon 7770.00	3	35.00	5.510	0.65	220.58	6.897	0.65	0.000	0.000
100.00	Powerwave LGP21401	6	14.10	1.100	0.50	62.42	1.718	0.50	0.000	0.000
100.00	Quintel QS66512-2	2	111.00	8.130	0.74	418.48	9.835	0.74	0.000	0.000
100.00	Raycap DC6-48-60-18-8F	2	32.80	1.280	0.75	160.37	2.146	0.75	0.000	0.000
87.00	Commscope LNX-6514DS-	3	38.80	8.170	0.69	312.69	9.871	0.69	0.000	0.000
87.00	Ericsson AIR32 B66Aa/B2a	3	132.20	6.510	0.71	378.54	7.975	0.71	0.000	0.000
87.00	Ericsson KRY 112 144/1	3	11.00	0.410	0.50	35.26	0.734	0.50	0.000	0.000
87.00	Ericsson KRY 112 489/1	3	15.40	0.650	0.50	51.14	1.026	0.50	0.000	0.000
87.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,329.49	50.543	1.00	0.000	0.000
87.00	Kathrein Smart Bias Tee	3	3.31	0.090	0.50	14.23	0.312	0.50	0.000	0.000
87.00	RFS APX16DWV-16DWV-S-E-	3	39.60	6.080	0.60	216.28	7.482	0.60	0.000	0.000
80.00	Alcatel-Lucent B13 RRH4x30-	3	57.80	2.140	0.67	167.23	2.952	0.67	0.000	0.000
80.00	Alcatel-Lucent B25 RRH4x30	3	53.00	2.120	0.67	152.78	2.937	0.67	0.000	0.000
80.00	Alcatel-Lucent B66A RRH	3	67.00	2.580	0.67	182.89	3.492	0.67	0.000	0.000
80.00	Commscope JAHH-65B-R3B	6	63.30	9.110	0.69	370.37	10.851	0.69	0.000	0.000
80.00	Nokia AirScale RRH 4T4R B5	3	35.30	1.290	0.50	103.74	1.921	0.50	0.000	0.000
80.00	Raycap RVZDC-6627-PF-48	1	32.00	3.780	0.67	201.37	4.843	0.67	0.000	0.000
80.00	Round Low Profile Platform	1	1500.00	21.700	1.00	2,325.80	46.171	1.00	0.000	0.000
75.00	Scala 840 10212	1	6.70	2.170	0.63	92.96	3.041	0.63	0.000	0.000
75.00	Stand Offs	2	75.00	2.500	1.00	121.47	3.739	1.00	0.000	0.000
75.00	TX RX Systems 421-86A-10-	1	15.00	2.220	0.67	85.93	3.016	0.67	0.000	0.000
70.00	72" x 6" Panel	3	40.00	4.700	0.69	870.04	20.015	0.69	0.000	0.000
70.00	Round Side Arms	3	100.00	4.000	0.67	161.86	6.651	0.67	0.000	0.000
60.00	Radio Waves SP2-4.7	1	22.00	5.230	1.00	131.07	6.152	1.00	0.000	0.000
60.00	Radio/ODU	1	30.00	1.600	0.50	114.82	2.294	0.50	0.000	0.000
60.00	Scala 840 10212	1	6.70	2.170	0.63	92.43	3.036	0.63	0.000	0.000
60.00	Stand Off	1	75.00	2.500	1.00	121.27	4.152	1.00	0.000	0.000

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

Totals 107 9756.23

28,538.90

Number of Loadings : 45

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Projected Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	110.00	3	1/2" Coax	0.63	0.15	N	0.00	Y	Clearwire
0.00	110.00	1	2" Conduit	2.38	3.65	N	2.38	Y	Clearwire
0.00	110.00	6	5/16" Coax	0.31	0.05	N	0.00	N	Clearwire
0.00	100.00	2	0.39" Fiber Trunk	0.39	0.06	N	0.00	N	AT&T Mobility
0.00	100.00	4	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	100.00	6	1 5/8" Coax	1.98	0.82	N	0.00	N	AT&T Mobility
0.00	100.00	6	1 5/8" Coax	1.98	0.82	N	3.96	Y	AT&T Mobility
0.00	100.00	1	3" Conduit	3.50	7.58	N	0.00	N	AT&T Mobility
0.00	87.00	18	1 5/8" Coax	1.98	0.82	N	1.12	Y	T-Mobile
0.00	87.00	1	1.58" Hybrid	1.58	1.61	N	0.00	Y	T-Mobile
0.00	81.00	4	#20 DYWIDAG	8.00	0.00	N	1.00	Y	--
0.00	80.00	12	1 5/8" Coax	1.98	0.82	N	0.00	Y	Verizon
0.00	80.00	2	1 5/8" Hybriflex	1.98	1.30	N	0.00	Y	Verizon
0.00	75.00	1	7/8" Coax	1.09	0.33	N	0.00	Y	Town of West Hartford
0.00	70.00	6	1 5/8" Coax	1.98	0.82	N	0.00	Y	Metro PCS
0.00	60.00	1	0.41" LMR-400	0.41	0.07	N	0.00	Y	Town of West Hartford
0.00	60.00	1	7/8" Coax	1.09	0.33	N	0.00	Y	Town of West Hartford

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Intermediate Connections		Connectors	Continuation?	
					Description	Spacing (in)	Len (in)			
0.00	47.50	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	39.0	3.31	5/8" A36 U-Bolt	Yes
47.50	67.50	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes
67.50	77.04	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

**Segment Properties** (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	F'y (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)	Additional Reinforcing		
												Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	Weight (lb)
0.00		0.2500	30.000	23.949	2,705.5	29.47	120.00	72.6	174.2	0.0	0.0	19.64	3,462	0.0
5.00		0.2500	29.181	23.290	2,488.2	28.60	116.72	73.5	164.7	0.0	401.9	19.64	3,308	334.0
10.00		0.2500	28.362	22.631	2,282.9	27.72	113.45	74.5	155.5	0.0	390.6	19.64	3,157	334.0
15.00		0.2500	27.544	21.971	2,089.2	26.84	110.18	75.4	146.5	0.0	379.4	19.64	3,010	334.0
20.00		0.2500	26.725	21.312	1,906.7	25.96	106.90	76.4	137.8	0.0	368.2	19.64	2,866	334.0
25.00		0.2500	25.906	20.653	1,735.2	25.09	103.63	77.4	129.4	0.0	357.0	19.64	2,726	334.0
29.33	Bot - Section 2	0.2500	25.197	20.083	1,595.3	24.33	100.79	78.2	122.3	0.0	300.1	19.64	2,607	289.2
30.00		0.2500	25.087	19.994	1,574.4	24.21	100.35	78.3	121.2	0.0	92.3	19.64	2,672	44.8
32.83	Top - Section 1	0.2500	25.124	20.024	1,581.3	24.25	100.50	62.7	121.6	0.0	385.4	19.64	2,595	189.0
35.00		0.2500	24.769	19.738	1,514.5	23.87	99.07	63.0	118.1	0.0	146.8	19.64	2,537	145.0
40.00		0.2500	23.950	19.078	1,367.8	22.99	95.80	63.0	110.3	0.0	330.2	19.64	2,405	334.0
45.00		0.2500	23.131	18.419	1,230.9	22.11	92.53	63.0	102.8	0.0	319.0	19.64	2,277	334.0
47.50	Reinf. Top Reinf	0.2500	22.722	18.090	1,166.0	21.67	90.89	63.0	99.1	0.0	155.3	19.64	2,214	167.0
50.00		0.2500	22.313	17.760	1,103.4	21.23	89.25	63.0	95.5	0.0	152.5	19.64	2,152	167.0
55.00		0.2500	21.494	17.101	985.1	20.36	85.97	63.0	88.5	0.0	296.6	19.64	2,031	334.0
60.00		0.2500	20.675	16.442	875.5	19.48	82.70	63.0	81.8	0.0	285.4	19.64	1,913	334.0
62.92	Bot - Section 3	0.2500	20.197	16.058	815.5	18.97	80.79	63.0	78.0	0.0	161.3	19.64	1,846	194.8
65.00		0.2500	19.856	15.783	774.4	18.60	79.43	63.0	75.3	0.0	199.4	19.64	1,850	139.2
65.75	Top - Section 2	0.1875	20.108	12.027	609.2	26.06	107.25	61.4	58.5	0.0	70.9	19.64	1,833	50.1
67.50	Reinf. Top Reinf	0.1875	19.822	11.854	583.3	25.65	105.72	61.7	56.8	0.0	71.1	19.64	1,794	116.9
70.00		0.1875	19.413	11.607	547.6	25.06	103.53	62.1	54.5	0.0	99.8	19.64	1,738	167.0
75.00		0.1875	18.594	11.113	480.6	23.89	99.17	63.0	49.9	0.0	193.3	19.64	1,629	334.0
77.04	Reinf. Top	0.1875	18.259	10.911	454.8	23.41	97.38	63.0	48.1	0.0	76.5	19.64	1,586	136.4
80.00		0.1875	17.775	10.618	419.2	22.72	94.80	63.0	45.6	0.0	108.4			
85.00		0.1875	16.956	10.124	363.4	21.55	90.43	63.0	41.4	0.0	176.5			
87.00		0.1875	16.629	9.926	342.5	21.08	88.69	63.0	39.8	0.0	68.2			
90.00		0.1875	16.138	9.630	312.7	20.38	86.07	63.0	37.4	0.0	99.8			
95.00		0.1875	15.319	9.135	267.0	19.21	81.70	63.0	33.7	0.0	159.6			
100.0	Top - Section 3	0.1875	14.500	8.641	225.9	18.04	77.33	63.0	30.1	0.0	151.2			
100.0	Bot - Section 4	0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4				
105.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	248.0			
110.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	248.0			
											6,492.7	5,146.3		

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:43:55 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W

97 mph with No Ice

23 Iterations

Gust Response Factor :1.10

Wind Importance Factor :1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		542.1	0.0					0.0	0.0	542.1	0.0	0.0	0.0
5.00		999.3	482.2					265.0	753.3	1,264.3	1,235.6	0.0	0.0
10.00		849.7	468.8					236.6	753.3	1,086.2	1,222.1	0.0	0.0
15.00		734.9	455.3					214.6	753.3	949.4	1,208.7	0.0	0.0
20.00		645.5	441.9					197.4	753.3	842.9	1,195.2	0.0	0.0
25.00		540.1	428.4					183.9	753.3	724.0	1,181.7	0.0	0.0
29.33	Bot - Section 2	272.6	360.1					150.6	652.4	423.2	1,012.5	0.0	0.0
30.00		182.8	110.8					22.7	101.0	205.5	211.7	0.0	0.0
32.83	Top - Section 1	257.5	462.4					94.9	426.4	352.4	888.8	0.0	0.0
35.00		355.9	176.2					72.2	327.0	428.1	503.1	0.0	0.0
40.00		480.6	396.2					164.8	753.3	645.4	1,149.6	0.0	0.0
45.00		348.9	382.8					163.2	753.3	512.0	1,136.1	0.0	0.0
47.50	Reinf. Top Reinf	225.5	186.3					81.2	376.7	306.6	563.0	0.0	0.0
50.00		328.3	183.0					81.0	376.7	409.3	559.7	0.0	0.0
55.00		425.3	355.9					161.7	753.3	587.0	1,109.2	0.0	0.0
60.00	Appertunance(s)	326.7	342.4	378.7	0.0	0.0	160.4	161.7	753.3	867.1	1,256.2	0.0	0.0
62.92	Bot - Section 3	202.5	193.5					94.5	438.0	297.0	631.6	0.0	0.0
65.00		114.5	239.3					67.6	312.9	182.1	552.2	0.0	0.0
65.75	Top - Section 2	99.6	85.1					24.4	112.6	124.0	197.7	0.0	0.0
67.50	Reinf. Top Reinf	167.4	85.3					56.9	262.8	224.3	348.2	0.0	0.0
70.00	Appertunance(s)	288.3	119.8	610.7	0.0	0.0	504.0	81.5	375.5	980.5	999.2	0.0	0.0
75.00	Appertunance(s)	266.2	231.9	305.2	0.0	0.0	206.0	163.8	721.4	735.1	1,159.4	0.0	0.0
77.04	Reinf. Top	183.5	91.8					67.2	293.8	250.8	385.6	0.0	0.0
80.00	Appertunance(s)	284.5	130.0	2,601.6	0.0	0.0	3,061.3	97.8	188.5	2,983.9	3,379.9	0.0	0.0
85.00		245.5	211.7					150.6	244.0	396.1	455.7	0.0	0.0
87.00	Appertunance(s)	169.9	81.9	2,412.1	0.0	0.0	2,665.1	59.0	97.6	2,641.0	2,844.6	0.0	0.0
90.00		264.1	119.8					75.6	87.5	339.7	207.3	0.0	0.0
95.00		319.1	191.6					126.9	145.8	446.0	337.4	0.0	0.0
100.00	Top - Section 3	238.1	181.5	3,906.4	0.0	461.8	4,099.2	128.0	145.8	4,272.5	4,426.5	0.0	0.0
105.00		164.9	297.7					0.0	26.4	164.9	324.1	0.0	0.0
110.00	Appertunance(s)	82.9	297.7	1,177.4	0.0	0.0	1,011.4	0.0	26.4	1,260.2	1,335.4	0.0	0.0
<b>Totals:</b>										25,443.4	32,017.8	0.00	0.00

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:43:57 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W

97 mph with No Ice

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-31.93	-25.01	0.00	-1,723.39	0.00	1,723.39	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.809
5.00	-30.54	-23.95	0.00	-1,598.34	0.00	1,598.34	1,541.15	770.57	1,839.28	908.35	0.21	-0.38	0.767
10.00	-29.18	-23.04	0.00	-1,478.61	0.00	1,478.61	1,517.03	758.51	1,758.81	868.61	0.81	-0.76	0.726
15.00	-27.85	-22.25	0.00	-1,363.42	0.00	1,363.42	1,491.77	745.88	1,678.72	829.06	1.81	-1.13	0.685
20.00	-26.54	-21.55	0.00	-1,252.18	0.00	1,252.18	1,465.38	732.69	1,599.10	789.74	3.19	-1.50	0.644
25.00	-25.26	-20.93	0.00	-1,144.45	0.00	1,144.45	1,437.85	718.93	1,520.09	750.71	4.96	-1.85	0.603
29.33	-24.20	-20.55	0.00	-1,053.82	0.00	1,053.82	1,413.10	706.55	1,452.23	717.20	6.78	-2.16	0.567
30.00	-23.95	-20.39	0.00	-1,040.05	0.00	1,040.05	1,409.19	704.59	1,441.78	712.04	7.09	-2.21	0.551
32.83	-23.02	-20.06	0.00	-982.36	0.00	982.36	1,130.07	565.03	1,157.93	571.86	8.45	-2.40	0.662
35.00	-22.45	-19.71	0.00	-938.82	0.00	938.82	1,119.12	559.56	1,130.17	558.15	9.58	-2.54	0.640
40.00	-21.23	-19.12	0.00	-840.29	0.00	840.29	1,081.75	540.88	1,055.58	521.31	12.41	-2.85	0.595
45.00	-20.05	-18.63	0.00	-744.69	0.00	744.69	1,044.38	522.19	983.54	485.73	15.56	-3.15	0.549
47.50	-19.46	-18.34	0.00	-698.12	0.00	698.12	1,025.69	512.85	948.47	468.42	17.25	-3.30	0.524
47.50	-19.46	-18.34	0.00	-698.12	0.00	698.12	1,025.69	512.85	948.47	468.42	17.25	-3.30	0.524
50.00	-18.86	-17.96	0.00	-652.28	0.00	652.28	1,007.01	503.50	914.04	451.41	19.02	-3.44	0.500
55.00	-17.72	-17.39	0.00	-562.45	0.00	562.45	969.64	484.82	847.10	418.35	22.76	-3.71	0.449
60.00	-16.47	-16.49	0.00	-475.51	0.00	475.51	932.27	466.13	782.69	386.54	26.78	-3.95	0.396
62.92	-15.83	-16.18	0.00	-427.41	0.00	427.41	910.47	455.23	746.30	368.57	29.24	-4.09	0.364
65.00	-15.27	-15.98	0.00	-393.69	0.00	393.69	894.90	447.45	720.84	355.99	31.04	-4.18	0.335
65.75	-15.07	-15.85	0.00	-381.71	0.00	381.71	664.38	332.19	545.54	269.42	31.70	-4.21	0.364
67.50	-14.72	-15.63	0.00	-353.96	0.00	353.96	658.03	329.02	532.49	262.98	33.25	-4.28	0.341
67.50	-14.72	-15.63	0.00	-353.96	0.00	353.96	658.03	329.02	532.49	262.98	33.25	-4.28	0.341
70.00	-13.76	-14.61	0.00	-314.89	0.00	314.89	648.81	324.41	513.97	253.83	35.52	-4.38	0.307
75.00	-12.63	-13.81	0.00	-241.86	0.00	241.86	629.79	314.90	477.45	235.80	40.20	-4.55	0.243
77.04	-12.25	-13.54	0.00	-213.66	0.00	213.66	618.65	309.32	460.40	227.38	42.16	-4.62	0.218
77.04	-12.25	-13.54	0.00	-213.66	0.00	213.66	618.65	309.32	460.40	227.38	42.16	-4.62	0.961
80.00	-9.07	-10.34	0.00	-173.59	0.00	173.59	602.07	301.03	435.93	215.29	45.05	-4.70	0.823
85.00	-8.59	-9.96	0.00	-121.88	0.00	121.88	574.04	287.02	396.08	195.61	50.24	-5.20	0.639
87.00	-5.98	-7.09	0.00	-101.96	0.00	101.96	562.83	281.41	380.68	188.00	52.45	-5.37	0.554
90.00	-5.77	-6.76	0.00	-80.70	0.00	80.70	546.01	273.01	358.14	176.87	55.90	-5.60	0.467
95.00	-5.46	-6.30	0.00	-46.91	0.00	46.91	517.98	258.99	322.12	159.08	61.92	-5.89	0.306
100.00	-1.50	-1.59	0.00	-14.94	0.00	14.94	489.95	244.98	288.00	142.23	68.18	-6.06	0.108
100.00	-1.50	-1.59	0.00	-14.94	0.00	14.94	459.24	229.62	229.69	150.79	68.18	-6.06	0.102
105.00	-1.19	-1.40	0.00	-6.98	0.00	6.98	459.24	229.62	229.69	150.79	74.55	-6.12	0.049
110.00	0.00	-1.26	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	80.97	-6.14	0.000

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:43:57 PM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W

97 mph with No Ice (Reduced DL)

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

### Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		542.1	0.0					0.0	0.0	542.1	0.0	0.0	0.0
5.00		999.3	361.7					265.0	565.0	1,264.3	926.7	0.0	0.0
10.00		849.7	351.6					236.6	565.0	1,086.2	916.6	0.0	0.0
15.00		734.9	341.5					214.6	565.0	949.4	906.5	0.0	0.0
20.00		645.5	331.4					197.4	565.0	842.9	896.4	0.0	0.0
25.00		540.1	321.3					183.9	565.0	724.0	886.3	0.0	0.0
29.33	Bot - Section 2	272.6	270.1					150.6	489.3	423.2	759.4	0.0	0.0
30.00		182.8	83.1					22.7	75.7	205.5	158.8	0.0	0.0
32.83	Top - Section 1	257.5	346.8					94.9	319.8	352.4	666.6	0.0	0.0
35.00		355.9	132.1					72.2	245.2	428.1	377.3	0.0	0.0
40.00		480.6	297.2					164.8	565.0	645.4	862.2	0.0	0.0
45.00		348.9	287.1					163.2	565.0	512.0	852.1	0.0	0.0
47.50	Reinf. Top Reinf	225.5	139.8					81.2	282.5	306.6	422.3	0.0	0.0
50.00		328.3	137.2					81.0	282.5	409.3	419.7	0.0	0.0
55.00		425.3	266.9					161.7	565.0	587.0	831.9	0.0	0.0
60.00	Appertunance(s)	326.7	256.8	378.7	0.0	0.0	120.3	161.7	565.0	867.1	942.2	0.0	0.0
62.92	Bot - Section 3	202.5	145.1					94.5	328.5	297.0	473.7	0.0	0.0
65.00		114.5	179.5					67.6	234.7	182.1	414.1	0.0	0.0
65.75	Top - Section 2	99.6	63.8					24.4	84.5	124.0	148.3	0.0	0.0
67.50	Reinf. Top Reinf	167.4	64.0					56.9	197.1	224.3	261.1	0.0	0.0
70.00	Appertunance(s)	288.3	89.8	610.7	0.0	0.0	378.0	81.5	281.6	980.5	749.4	0.0	0.0
75.00	Appertunance(s)	266.2	173.9	305.2	0.0	0.0	154.5	163.8	541.1	735.1	869.5	0.0	0.0
77.04	Reinf. Top	183.5	68.9					67.2	220.3	250.8	289.2	0.0	0.0
80.00	Appertunance(s)	284.5	97.5	2,601.6	0.0	0.0	2,296.0	97.8	141.4	2,983.9	2,534.9	0.0	0.0
85.00		245.5	158.8					150.6	183.0	396.1	341.8	0.0	0.0
87.00	Appertunance(s)	169.9	61.4	2,412.1	0.0	0.0	1,998.8	59.0	73.2	2,641.0	2,133.4	0.0	0.0
90.00		264.1	89.8					75.6	65.6	339.7	155.4	0.0	0.0
95.00		319.1	143.7					126.9	109.3	446.0	253.0	0.0	0.0
100.00	Top - Section 3	221.1	136.1	3,906.4	0.0	461.8	3,074.4	128.0	109.3	4,255.5	3,319.8	0.0	0.0
105.00		130.9	223.2					0.0	19.8	130.9	243.0	0.0	0.0
110.00	Appertunance(s)	65.8	223.2	1,177.4	0.0	0.0	758.5	0.0	19.8	1,243.1	1,001.6	0.0	0.0
Totals:										25,375.4	24,013.3	0.00	0.00

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:44:00 PM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W

97 mph with No Ice (Reduced DL)

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-23.93	-24.91	0.00	-1,692.17	0.00	1,692.17	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.792
5.00	-22.85	-23.80	0.00	-1,567.61	0.00	1,567.61	1,541.15	770.57	1,839.28	908.35	0.20	-0.38	0.750
10.00	-21.80	-22.84	0.00	-1,448.63	0.00	1,448.63	1,517.03	758.51	1,758.81	868.61	0.80	-0.75	0.708
15.00	-20.77	-22.01	0.00	-1,334.43	0.00	1,334.43	1,491.77	745.88	1,678.72	829.06	1.78	-1.11	0.668
20.00	-19.76	-21.27	0.00	-1,224.39	0.00	1,224.39	1,465.38	732.69	1,599.10	789.74	3.13	-1.47	0.627
25.00	-18.78	-20.62	0.00	-1,118.06	0.00	1,118.06	1,437.85	718.93	1,520.09	750.71	4.86	-1.82	0.587
29.33	-17.98	-20.23	0.00	-1,028.76	0.00	1,028.76	1,413.10	706.55	1,452.23	717.20	6.64	-2.11	0.552
30.00	-17.79	-20.05	0.00	-1,015.21	0.00	1,015.21	1,409.19	704.59	1,441.78	712.04	6.94	-2.16	0.536
32.83	-17.08	-19.72	0.00	-958.46	0.00	958.46	1,130.07	565.03	1,157.93	571.86	8.28	-2.35	0.643
35.00	-16.64	-19.35	0.00	-915.66	0.00	915.66	1,119.12	559.56	1,130.17	558.15	9.38	-2.49	0.622
40.00	-15.71	-18.74	0.00	-818.93	0.00	818.93	1,081.75	540.88	1,055.58	521.31	12.15	-2.79	0.578
45.00	-14.82	-18.24	0.00	-725.22	0.00	725.22	1,044.38	522.19	983.54	485.73	15.23	-3.08	0.532
47.50	-14.37	-17.95	0.00	-679.61	0.00	679.61	1,025.69	512.85	948.47	468.42	16.89	-3.23	0.508
47.50	-14.37	-17.95	0.00	-679.61	0.00	679.61	1,025.69	512.85	948.47	468.42	16.89	-3.23	0.508
50.00	-13.92	-17.57	0.00	-634.73	0.00	634.73	1,007.01	503.50	914.04	451.41	18.61	-3.36	0.484
55.00	-13.05	-16.99	0.00	-546.91	0.00	546.91	969.64	484.82	847.10	418.35	22.28	-3.62	0.434
60.00	-12.11	-16.10	0.00	-461.98	0.00	461.98	932.27	466.13	782.69	386.54	26.20	-3.86	0.382
62.92	-11.63	-15.79	0.00	-415.03	0.00	415.03	910.47	455.23	746.30	368.57	28.60	-3.99	0.352
65.00	-11.22	-15.59	0.00	-382.13	0.00	382.13	894.90	447.45	720.84	355.99	30.36	-4.08	0.323
65.75	-11.06	-15.47	0.00	-370.44	0.00	370.44	664.38	332.19	545.54	269.42	31.00	-4.11	0.351
67.50	-10.80	-15.24	0.00	-343.37	0.00	343.37	658.03	329.02	532.49	262.98	32.52	-4.18	0.329
67.50	-10.80	-15.24	0.00	-343.37	0.00	343.37	658.03	329.02	532.49	262.98	32.52	-4.18	0.329
70.00	-10.09	-14.23	0.00	-305.27	0.00	305.27	648.81	324.41	513.97	253.83	34.73	-4.28	0.296
75.00	-9.25	-13.45	0.00	-234.12	0.00	234.12	629.79	314.90	477.45	235.80	39.30	-4.44	0.233
77.04	-8.97	-13.19	0.00	-206.66	0.00	206.66	618.65	309.32	460.40	227.38	41.22	-4.50	0.210
77.04	-8.97	-13.19	0.00	-206.66	0.00	206.66	618.65	309.32	460.40	227.38	41.22	-4.50	0.925
80.00	-6.62	-10.05	0.00	-167.64	0.00	167.64	602.07	301.03	435.93	215.29	44.03	-4.58	0.791
85.00	-6.26	-9.66	0.00	-117.41	0.00	117.41	574.04	287.02	396.08	195.61	49.09	-5.06	0.612
87.00	-4.35	-6.85	0.00	-98.09	0.00	98.09	562.83	281.41	380.68	188.00	51.25	-5.23	0.530
90.00	-4.20	-6.52	0.00	-77.54	0.00	77.54	546.01	273.01	358.14	176.87	54.61	-5.45	0.447
95.00	-3.97	-6.06	0.00	-44.96	0.00	44.96	517.98	258.99	322.12	159.08	60.47	-5.73	0.291
100.00	-1.10	-1.50	0.00	-14.18	0.00	14.18	489.95	244.98	288.00	142.23	66.56	-5.89	0.102
100.00	-1.10	-1.50	0.00	-14.18	0.00	14.18	459.24	229.62	229.69	150.79	66.56	-5.89	0.096
105.00	-0.87	-1.34	0.00	-6.70	0.00	6.70	459.24	229.62	229.69	150.79	72.75	-5.95	0.046
110.00	0.00	-1.24	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	78.99	-5.97	0.000

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:44:00 PM

Customer: VERIZON WIRELESS

**Load Case:** 1.2D + 1.0Di + 1.0Wi

50 mph with 1.00 in Radial Ice

23 Iterations

Gust Response Factor : 1.10

Ice Dead Load Factor : 1.00

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Ice Importance Factor : 1.00

Wind Load Factor : 1.00

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		102.6	0.0					0.0	0.0	102.6	0.0	0.0	0.0
5.00		190.0	914.1					150.0	2,328.4	340.0	3,242.5	0.0	0.0
10.00		162.9	917.2					135.5	2,436.4	298.4	3,353.6	0.0	0.0
15.00		141.5	895.4					120.3	2,451.0	261.9	3,346.4	0.0	0.0
20.00		124.7	868.1					107.9	2,444.0	232.6	3,312.1	0.0	0.0
25.00		104.7	839.6					98.0	2,431.2	202.7	3,270.8	0.0	0.0
29.33	Bot - Section 2	52.9	704.7					78.6	2,094.8	131.5	2,799.5	0.0	0.0
30.00		35.5	164.7					11.7	323.4	47.2	488.1	0.0	0.0
32.83	Top - Section 1	50.1	685.7					49.0	1,363.5	99.1	2,049.2	0.0	0.0
35.00		69.4	344.7					37.2	1,043.4	106.7	1,388.1	0.0	0.0
40.00		94.1	771.4					84.8	2,397.9	178.8	3,169.2	0.0	0.0
45.00		68.5	744.8					83.7	2,391.5	152.3	3,136.3	0.0	0.0
47.50	Reinf. Top Reinf	44.5	364.1					41.6	1,194.2	86.1	1,558.3	0.0	0.0
50.00		65.0	357.6					41.5	1,193.5	106.5	1,551.1	0.0	0.0
55.00		84.6	693.2					82.8	2,385.8	167.4	3,079.0	0.0	0.0
60.00	Appertunance(s)	65.3	668.1	84.9	0.0	0.0	583.3	82.8	2,385.8	233.0	3,637.2	0.0	0.0
62.92	Bot - Section 3	40.6	379.6					48.4	1,348.4	89.0	1,728.1	0.0	0.0
65.00		23.0	372.5					34.6	963.7	57.6	1,336.2	0.0	0.0
65.75	Top - Section 2	20.1	132.8					12.5	347.0	32.6	479.8	0.0	0.0
67.50	Reinf. Top Reinf	33.8	195.3					29.2	810.0	63.0	1,005.3	0.0	0.0
70.00	Appertunance(s)	58.5	274.0	298.1	0.0	0.0	2,904.0	41.8	1,157.7	398.4	4,335.8	0.0	0.0
75.00	Appertunance(s)	54.2	529.3	73.6	0.0	0.0	606.2	84.1	2,146.7	212.0	3,282.2	0.0	0.0
77.04	Reinf. Top	37.7	211.5					34.6	860.5	72.2	1,072.0	0.0	0.0
80.00	Appertunance(s)	58.8	299.6	663.8	0.0	0.0	6,879.6	50.3	1,011.0	772.9	8,190.2	0.0	0.0
85.00		51.0	487.3					71.5	983.0	122.5	1,470.3	0.0	0.0
87.00	Appertunance(s)	35.6	190.5	617.0	0.0	0.0	5,598.1	27.4	360.7	679.9	6,149.3	0.0	0.0
90.00		55.7	278.7					30.2	234.1	86.0	512.8	0.0	0.0
95.00		68.0	445.3					50.9	391.0	118.8	836.3	0.0	0.0
100.00	Top - Section 3	62.7	424.3	951.4	0.0	167.9	9,715.9	51.5	392.1	1,065.6	10,532.3	0.0	0.0
105.00		58.9	504.2					0.0	128.8	58.9	633.0	0.0	0.0
110.00	Appertunance(s)	29.6	505.1	293.1	0.0	0.0	2,616.6	0.0	129.4	322.7	3,251.0	0.0	0.0
<b>Totals:</b>										<b>6,898.97</b>	<b>84,196.0</b>	<b>0.00</b>	<b>0.00</b>



Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:44:02 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 1.00 in Radial Ice

23 Iterations

Gust Response Factor : 1.10

Ice Dead Load Factor : 1.00

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Ice Importance Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-84.19	-6.88	0.00	-509.86	0.00	509.86	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.266
5.00	-80.93	-6.70	0.00	-475.46	0.00	475.46	1,541.15	770.57	1,839.28	908.35	0.06	-0.11	0.253
10.00	-77.57	-6.54	0.00	-441.96	0.00	441.96	1,517.03	758.51	1,758.81	868.61	0.24	-0.23	0.241
15.00	-74.21	-6.41	0.00	-409.26	0.00	409.26	1,491.77	745.88	1,678.72	829.06	0.54	-0.34	0.229
20.00	-70.89	-6.29	0.00	-377.23	0.00	377.23	1,465.38	732.69	1,599.10	789.74	0.95	-0.45	0.216
25.00	-67.61	-6.17	0.00	-345.80	0.00	345.80	1,437.85	718.93	1,520.09	750.71	1.48	-0.55	0.203
29.33	-64.81	-6.07	0.00	-319.08	0.00	319.08	1,413.10	706.55	1,452.23	717.20	2.02	-0.65	0.192
30.00	-64.31	-6.06	0.00	-315.01	0.00	315.01	1,409.19	704.59	1,441.78	712.04	2.12	-0.66	0.187
32.83	-62.26	-5.99	0.00	-297.87	0.00	297.87	1,130.07	565.03	1,157.93	571.86	2.53	-0.72	0.225
35.00	-60.87	-5.94	0.00	-284.87	0.00	284.87	1,119.12	559.56	1,130.17	558.15	2.86	-0.76	0.218
40.00	-57.69	-5.81	0.00	-255.17	0.00	255.17	1,081.75	540.88	1,055.58	521.31	3.71	-0.86	0.204
45.00	-54.55	-5.67	0.00	-226.13	0.00	226.13	1,044.38	522.19	983.54	485.73	4.66	-0.95	0.189
47.50	-52.99	-5.60	0.00	-211.95	0.00	211.95	1,025.69	512.85	948.47	468.42	5.17	-0.99	0.181
47.50	-52.99	-5.60	0.00	-211.95	0.00	211.95	1,025.69	512.85	948.47	468.42	5.17	-0.99	0.181
50.00	-51.44	-5.52	0.00	-197.95	0.00	197.95	1,007.01	503.50	914.04	451.41	5.70	-1.04	0.173
55.00	-48.35	-5.36	0.00	-170.34	0.00	170.34	969.64	484.82	847.10	418.35	6.83	-1.12	0.156
60.00	-44.72	-5.10	0.00	-143.54	0.00	143.54	932.27	466.13	782.69	386.54	8.04	-1.19	0.139
62.92	-42.99	-5.00	0.00	-128.67	0.00	128.67	910.47	455.23	746.30	368.57	8.78	-1.23	0.128
65.00	-41.65	-4.93	0.00	-118.25	0.00	118.25	894.90	447.45	720.84	355.99	9.33	-1.26	0.119
65.75	-41.17	-4.89	0.00	-114.56	0.00	114.56	664.38	332.19	545.54	269.42	9.53	-1.27	0.130
67.50	-40.17	-4.83	0.00	-105.99	0.00	105.99	658.03	329.02	532.49	262.98	10.00	-1.29	0.122
67.50	-40.17	-4.83	0.00	-105.99	0.00	105.99	658.03	329.02	532.49	262.98	10.00	-1.29	0.122
70.00	-35.84	-4.36	0.00	-93.93	0.00	93.93	648.81	324.41	513.97	253.83	10.68	-1.32	0.109
75.00	-32.56	-4.09	0.00	-72.15	0.00	72.15	629.79	314.90	477.45	235.80	12.09	-1.37	0.089
77.04	-31.49	-4.00	0.00	-63.81	0.00	63.81	618.65	309.32	460.40	227.38	12.68	-1.39	0.081
77.04	-31.49	-4.00	0.00	-63.81	0.00	63.81	618.65	309.32	460.40	227.38	12.68	-1.39	0.332
80.00	-23.31	-3.06	0.00	-51.98	0.00	51.98	602.07	301.03	435.93	215.29	13.55	-1.41	0.280
85.00	-21.84	-2.94	0.00	-36.67	0.00	36.67	574.04	287.02	396.08	195.61	15.12	-1.56	0.226
87.00	-15.71	-2.11	0.00	-30.79	0.00	30.79	562.83	281.41	380.68	188.00	15.78	-1.62	0.192
90.00	-15.20	-2.03	0.00	-24.47	0.00	24.47	546.01	273.01	358.14	176.87	16.82	-1.69	0.166
95.00	-14.36	-1.90	0.00	-14.33	0.00	14.33	517.98	258.99	322.12	159.08	18.64	-1.77	0.118
100.00	-3.87	-0.51	0.00	-4.67	0.00	4.67	489.95	244.98	288.00	142.23	20.53	-1.82	0.041
100.00	-3.87	-0.51	0.00	-4.67	0.00	4.67	459.24	229.62	229.69	150.79	20.53	-1.82	0.039
105.00	-3.24	-0.43	0.00	-2.14	0.00	2.14	459.24	229.62	229.69	150.79	22.45	-1.85	0.021
110.00	0.00	-0.32	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	24.39	-1.85	0.000

Load Case: 1.0D + 1.0W Serviceability 60 mph 22 Iterations  
 Gust Response Factor : 1.10 Wind Importance Factor : 1.00  
 Dead Load Factor : 1.00  
 Wind Load Factor : 1.00

### Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces			Sum of Forces			
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		129.6	0.0					0.0	0.0	129.6	0.0	0.0	0.0
5.00		239.0	401.9					71.6	627.8	310.6	1,029.6	0.0	0.0
10.00		203.2	390.6					62.1	627.8	265.3	1,018.4	0.0	0.0
15.00		175.7	379.4					54.9	627.8	230.6	1,007.2	0.0	0.0
20.00		154.4	368.2					49.3	627.8	203.7	996.0	0.0	0.0
25.00		129.2	357.0					45.0	627.8	174.2	984.8	0.0	0.0
29.33	Bot - Section 2	65.2	300.1					36.2	543.6	101.4	843.7	0.0	0.0
30.00		43.7	92.3					5.4	84.1	49.1	176.4	0.0	0.0
32.83	Top - Section 1	61.6	385.4					22.7	355.3	84.3	740.7	0.0	0.0
35.00		85.1	146.8					17.3	272.5	102.4	419.3	0.0	0.0
40.00		114.9	330.2					39.4	627.8	154.3	958.0	0.0	0.0
45.00		83.4	319.0					39.0	627.8	122.4	946.8	0.0	0.0
47.50	Reinf. Top Reinf	53.9	155.3					19.4	313.9	73.3	469.2	0.0	0.0
50.00		78.5	152.5					19.4	313.9	97.9	466.4	0.0	0.0
55.00		101.7	296.6					38.7	627.8	140.4	924.3	0.0	0.0
60.00	Appertunance(s)	78.1	285.4	90.5	0.0	0.0	133.7	38.7	627.8	207.3	1,046.8	0.0	0.0
62.92	Bot - Section 3	48.4	161.3					22.6	365.0	71.0	526.3	0.0	0.0
65.00		27.4	199.4					16.2	260.8	43.5	460.1	0.0	0.0
65.75	Top - Section 2	23.8	70.9					5.8	93.9	29.6	164.8	0.0	0.0
67.50	Reinf. Top Reinf	40.0	71.1					13.6	219.0	53.6	290.1	0.0	0.0
70.00	Appertunance(s)	68.9	99.8	146.0	0.0	0.0	420.0	19.5	312.9	234.5	832.7	0.0	0.0
75.00	Appertunance(s)	63.7	193.3	73.0	0.0	0.0	171.7	39.2	601.2	175.8	966.2	0.0	0.0
77.04	Reinf. Top	43.9	76.5					16.1	244.8	60.0	321.3	0.0	0.0
80.00	Appertunance(s)	68.0	108.4	622.1	0.0	0.0	2,551.1	23.4	157.1	713.5	2,816.6	0.0	0.0
85.00		58.7	176.5					36.0	203.3	94.7	379.8	0.0	0.0
87.00	Appertunance(s)	40.6	68.2	576.8	0.0	0.0	2,220.9	14.1	81.3	631.5	2,370.5	0.0	0.0
90.00		63.2	99.8					18.1	72.9	81.2	172.7	0.0	0.0
95.00		76.3	159.6					30.4	121.5	106.7	281.1	0.0	0.0
100.00	Top - Section 3	52.9	151.2	934.1	0.0	110.4	3,416.0	30.7	121.5	1,017.7	3,688.7	0.0	0.0
105.00		31.3	248.0					0.0	22.0	31.3	270.0	0.0	0.0
110.00	Appertunance(s)	15.7	248.0	281.6	0.0	0.0	842.8	0.0	22.0	297.3	1,112.8	0.0	0.0
<b>Totals:</b>										6,088.86	26,681.5	0.00	0.00

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W

Serviceability 60 mph

22 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-26.68	-5.98	0.00	-407.30	0.00	407.30	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.198
5.00	-25.64	-5.71	0.00	-377.40	0.00	377.40	1,541.15	770.57	1,839.28	908.35	0.05	-0.09	0.187
10.00	-24.61	-5.48	0.00	-348.86	0.00	348.86	1,517.03	758.51	1,758.81	868.61	0.19	-0.18	0.177
15.00	-23.60	-5.28	0.00	-321.46	0.00	321.46	1,491.77	745.88	1,678.72	829.06	0.43	-0.27	0.167
20.00	-22.60	-5.11	0.00	-295.06	0.00	295.06	1,465.38	732.69	1,599.10	789.74	0.75	-0.35	0.157
25.00	-21.61	-4.95	0.00	-269.53	0.00	269.53	1,437.85	718.93	1,520.09	750.71	1.17	-0.44	0.147
29.33	-20.76	-4.86	0.00	-248.08	0.00	248.08	1,413.10	706.55	1,452.23	717.20	1.60	-0.51	0.139
30.00	-20.58	-4.82	0.00	-244.83	0.00	244.83	1,409.19	704.59	1,441.78	712.04	1.67	-0.52	0.135
32.83	-19.84	-4.74	0.00	-231.19	0.00	231.19	1,130.07	565.03	1,157.93	571.86	1.99	-0.57	0.162
35.00	-19.41	-4.65	0.00	-220.90	0.00	220.90	1,119.12	559.56	1,130.17	558.15	2.26	-0.60	0.157
40.00	-18.45	-4.51	0.00	-197.63	0.00	197.63	1,081.75	540.88	1,055.58	521.31	2.93	-0.67	0.146
45.00	-17.50	-4.39	0.00	-175.07	0.00	175.07	1,044.38	522.19	983.54	485.73	3.67	-0.74	0.135
47.50	-17.03	-4.32	0.00	-164.09	0.00	164.09	1,025.69	512.85	948.47	468.42	4.07	-0.78	0.129
47.50	-17.03	-4.32	0.00	-164.09	0.00	164.09	1,025.69	512.85	948.47	468.42	4.07	-0.78	0.129
50.00	-16.56	-4.23	0.00	-153.28	0.00	153.28	1,007.01	503.50	914.04	451.41	4.49	-0.81	0.123
55.00	-15.64	-4.10	0.00	-132.11	0.00	132.11	969.64	484.82	847.10	418.35	5.37	-0.87	0.111
60.00	-14.59	-3.88	0.00	-111.63	0.00	111.63	932.27	466.13	782.69	386.54	6.32	-0.93	0.098
62.92	-14.06	-3.81	0.00	-100.31	0.00	100.31	910.47	455.23	746.30	368.57	6.89	-0.96	0.090
65.00	-13.60	-3.76	0.00	-92.37	0.00	92.37	894.90	447.45	720.84	355.99	7.32	-0.98	0.083
65.75	-13.44	-3.73	0.00	-89.55	0.00	89.55	664.38	332.19	545.54	269.42	7.47	-0.99	0.091
67.50	-13.15	-3.68	0.00	-83.02	0.00	83.02	658.03	329.02	532.49	262.98	7.84	-1.01	0.085
67.50	-13.15	-3.68	0.00	-83.02	0.00	83.02	658.03	329.02	532.49	262.98	7.84	-1.01	0.085
70.00	-12.32	-3.44	0.00	-73.82	0.00	73.82	648.81	324.41	513.97	253.83	8.38	-1.03	0.077
75.00	-11.35	-3.25	0.00	-56.64	0.00	56.64	629.79	314.90	477.45	235.80	9.48	-1.07	0.061
77.04	-11.03	-3.19	0.00	-50.01	0.00	50.01	618.65	309.32	460.40	227.38	9.94	-1.09	0.055
77.04	-11.03	-3.19	0.00	-50.01	0.00	50.01	618.65	309.32	460.40	227.38	9.94	-1.09	0.238
80.00	-8.23	-2.43	0.00	-40.58	0.00	40.58	602.07	301.03	435.93	215.29	10.62	-1.10	0.202
85.00	-7.85	-2.34	0.00	-28.44	0.00	28.44	574.04	287.02	396.08	195.61	11.84	-1.22	0.159
87.00	-5.49	-1.66	0.00	-23.77	0.00	23.77	562.83	281.41	380.68	188.00	12.36	-1.26	0.136
90.00	-5.32	-1.58	0.00	-18.79	0.00	18.79	546.01	273.01	358.14	176.87	13.17	-1.32	0.116
95.00	-5.04	-1.47	0.00	-10.90	0.00	10.90	517.98	258.99	322.12	159.08	14.59	-1.38	0.078
100.00	-1.37	-0.36	0.00	-3.44	0.00	3.44	489.95	244.98	288.00	142.23	16.07	-1.42	0.027
100.00	-1.37	-0.36	0.00	-3.44	0.00	3.44	459.24	229.62	229.69	150.79	16.07	-1.42	0.026
105.00	-1.11	-0.33	0.00	-1.63	0.00	1.63	459.24	229.62	229.69	150.79	17.56	-1.44	0.013
110.00	0.00	-0.30	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	19.07	-1.44	0.000

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

### Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period ( $S_g$ ):	0.18
Spectral Response Acceleration at 1.0 Second Period ( $S_{g1}$ ):	0.06
Long-Period Transition Period ( $T_L$ ):	6
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.60
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.19
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.10
Seismic Response Coefficient ( $C_s$ ):	0.03
Upper Limit $C_s$	0.03
Lower Limit $C_s$	0.03
Period based on Rayleigh Method (sec):	2.19
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.85
Total Unfactored Dead Load:	26.68 k
Seismic Base Shear (E):	1.08 k

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

Segment	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
30	107.50	270	1,517	0.024	26	334
29	102.50	270	1,389	0.022	23	334
28	97.50	273	1,279	0.020	22	338
27	92.50	281	1,197	0.019	20	348
26	88.50	173	678	0.011	11	214
25	86.00	150	556	0.009	9	185
24	82.50	380	1,309	0.020	22	470
23	78.52	265	835	0.013	14	329
22	76.02	321	952	0.015	16	398
21	72.50	794	2,157	0.034	36	984
20	68.75	413	1,016	0.016	17	511
19	66.62	290	674	0.011	11	359
18	65.37	165	370	0.006	6	204
17	63.96	460	991	0.015	17	570
16	61.46	526	1,053	0.016	18	652
15	57.50	913	1,616	0.025	27	1,131
14	52.50	924	1,383	0.022	23	1,145
13	48.75	466	609	0.010	10	578
12	46.25	469	556	0.009	9	581
11	42.50	947	959	0.015	16	1,173
10	37.50	958	770	0.012	13	1,187
9	33.91	419	280	0.004	5	519
8	31.41	741	430	0.007	7	917

Site Number: 302481

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Site Name: Hrfr - South, CT

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Customer: VERIZON WIRELESS

7	29.66	176	92	0.001	2	219
6	27.16	844	374	0.006	6	1,045
5	22.50	985	308	0.005	5	1,220
4	17.50	996	196	0.003	3	1,234
3	12.50	1,007	107	0.002	2	1,248
2	7.50	1,018	42	0.001	1	1,261
1	2.50	1,030	6	0.000	0	1,275
DragonWave Horizon C	110.00	32	186	0.003	3	39
12" x 12" Junction B	110.00	10	59	0.001	1	12
DragonWave A-ANT-23G	110.00	15	88	0.001	1	19
NextNet BTS-2500	110.00	105	615	0.010	10	130
Argus LLPX310R	110.00	86	503	0.008	8	106
Side Arms	110.00	500	2,930	0.046	49	619
DragonWave A-ANT-11G	110.00	48	279	0.004	5	59
DragonWave A-ANT-11G	110.00	48	279	0.004	5	59
Powerwave Allgon 702	100.00	13	65	0.001	1	16
CCI TPX-070821	100.00	45	221	0.003	4	56
Powerwave LGP21401	100.00	85	416	0.006	7	105
Raycap DC6-48-60-18-	100.00	66	322	0.005	5	81
Ericsson RRUS-11	100.00	150	737	0.012	12	186
Ericsson RRUS 32 B2	100.00	159	782	0.012	13	197
10' Omni	100.00	25	123	0.002	2	31
Ericsson RRUS-32	100.00	231	1,135	0.018	19	286
Powerwave Allgon 777	100.00	105	516	0.008	9	130
Quintel QS66512-2	100.00	222	1,091	0.017	18	275
CCI OPA-65R-LCUU-H6	100.00	146	718	0.011	12	181
CCI OPA-65R-LCUU-H8	100.00	88	433	0.007	7	109
CCI TPA-65R-LCUUUU-H	100.00	82	401	0.006	7	101
Flat Platform w/ Han	100.00	2,000	9,830	0.154	166	2,477
Kathrein Smart Bias	87.00	10	38	0.001	1	12
Ericsson KRY 112 144	87.00	33	125	0.002	2	41
Ericsson KRY 112 489	87.00	46	176	0.003	3	57
RFS APX16DWV-16DWV-S	87.00	119	452	0.007	8	147
Ericsson AIR32 B66Aa	87.00	397	1,508	0.024	25	491
Commscope LNX-6514DS	87.00	116	442	0.007	7	144
Flat Low Profile Pla	87.00	1,500	5,702	0.089	96	1,858
Nokia AirScale RRH 4	80.00	106	345	0.005	6	131
Alcatel-Lucent B25 R	80.00	159	518	0.008	9	197
Alcatel-Lucent B13 R	80.00	173	565	0.009	10	215
Alcatel-Lucent B66A	80.00	201	654	0.010	11	249
Raycap RVZDC-6627-PF	80.00	32	104	0.002	2	40
Commscope JAHH-65B-R	80.00	380	1,237	0.019	21	470
Round Low Profile PI	80.00	1,500	4,884	0.076	82	1,858
Scala 840 10212	75.00	7	19	0.000	0	8
TX RX Systems 421-86	75.00	15	43	0.001	1	19
Stand Offs	75.00	150	434	0.007	7	186
Round Side Arms	70.00	300	763	0.012	13	372
72" x 6" Panel	70.00	120	305	0.005	5	149
Radio/ODU	60.00	30	57	0.001	1	37
Scala 840 10212	60.00	7	13	0.000	0	8
Stand Off	60.00	75	144	0.002	2	93
Radio Waves SP2-4.7	60.00	22	42	0.001	1	27
		26,682	63,999	1.000	1,080	33,048

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

Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
30	107.50	270	1,517	0.024	26	233
29	102.50	270	1,389	0.022	23	233

Site Number: 302481

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Site Name: Hrfr - South, CT

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Customer: VERIZON WIRELESS

28	97.50	273	1,279	0.020	22	235
27	92.50	281	1,197	0.019	20	242
26	88.50	173	678	0.011	11	149
25	86.00	150	556	0.009	9	129
24	82.50	380	1,309	0.020	22	327
23	78.52	265	835	0.013	14	229
22	76.02	321	952	0.015	16	277
21	72.50	794	2,157	0.034	36	684
20	68.75	413	1,016	0.016	17	355
19	66.62	290	674	0.011	11	250
18	65.37	165	370	0.006	6	142
17	63.96	460	991	0.015	17	396
16	61.46	526	1,053	0.016	18	453
15	57.50	913	1,616	0.025	27	787
14	52.50	924	1,383	0.022	23	796
13	48.75	466	609	0.010	10	402
12	46.25	469	556	0.009	9	404
11	42.50	947	959	0.015	16	816
10	37.50	958	770	0.012	13	825
9	33.91	419	280	0.004	5	361
8	31.41	741	430	0.007	7	638
7	29.66	176	92	0.001	2	152
6	27.16	844	374	0.006	6	727
5	22.50	985	308	0.005	5	848
4	17.50	996	196	0.003	3	858
3	12.50	1,007	107	0.002	2	868
2	7.50	1,018	42	0.001	1	877
1	2.50	1,030	6	0.000	0	887
DragonWave Horizon C	110.00	32	186	0.003	3	27
12" x 12" Junction B	110.00	10	59	0.001	1	9
DragonWave A-ANT-23G	110.00	15	88	0.001	1	13
NextNet BTS-2500	110.00	105	615	0.010	10	90
Argus LLPX310R	110.00	86	503	0.008	8	74
Side Arms	110.00	500	2,930	0.046	49	431
DragonWave A-ANT-11G	110.00	48	279	0.004	5	41
DragonWave A-ANT-11G	110.00	48	279	0.004	5	41
Powerwave Allgon 702	100.00	13	65	0.001	1	11
CCI TPX-070821	100.00	45	221	0.003	4	39
Powerwave LGP21401	100.00	85	416	0.006	7	73
Raycap DC6-48-60-18-	100.00	66	322	0.005	5	57
Ericsson RRUS-11	100.00	150	737	0.012	12	129
Ericsson RRUS 32 B2	100.00	159	782	0.012	13	137
10' Omni	100.00	25	123	0.002	2	22
Ericsson RRUS-32	100.00	231	1,135	0.018	19	199
Powerwave Allgon 777	100.00	105	516	0.008	9	90
Quintel QS66512-2	100.00	222	1,091	0.017	18	191
CCI OPA-65R-LCUU-H6	100.00	146	718	0.011	12	126
CCI OPA-65R-LCUU-H8	100.00	88	433	0.007	7	76
CCI TPA-65R-LCUUUU-H	100.00	82	401	0.006	7	70
Flat Platform w/ Han	100.00	2,000	9,830	0.154	166	1,723
Kathrein Smart Bias	87.00	10	38	0.001	1	9
Ericsson KRY 112 144	87.00	33	125	0.002	2	28
Ericsson KRY 112 489	87.00	46	176	0.003	3	40
RFS APX16DWV-16DWV-S	87.00	119	452	0.007	8	102
Ericsson AIR32 B66Aa	87.00	397	1,508	0.024	25	342
Commscope LNX-6514DS	87.00	116	442	0.007	7	100
Flat Low Profile Pla	87.00	1,500	5,702	0.089	96	1,292
Nokia AirScale RRH 4	80.00	106	345	0.005	6	91
Alcatel-Lucent B25 R	80.00	159	518	0.008	9	137
Alcatel-Lucent B13 R	80.00	173	565	0.009	10	149
Alcatel-Lucent B66A	80.00	201	654	0.010	11	173
Raycap RVZDC-6627-PF	80.00	32	104	0.002	2	28
Commscope JAHH-65B-R	80.00	380	1,237	0.019	21	327
Round Low Profile PI	80.00	1,500	4,884	0.076	82	1,292

Site Number: 302481

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Site Name: Hrfr - South, CT

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Customer: VERIZON WIRELESS

Scala 840 10212	75.00	7	19	0.000	0	6
TX RX Systems 421-86	75.00	15	43	0.001	1	13
Stand Offs	75.00	150	434	0.007	7	129
Round Side Arms	70.00	300	763	0.012	13	258
72" x 6" Panel	70.00	120	305	0.005	5	103
Radio/ODU	60.00	30	57	0.001	1	26
Scala 840 10212	60.00	7	13	0.000	0	6
Stand Off	60.00	75	144	0.002	2	65
Radio Waves SP2-4.7	60.00	22	42	0.001	1	19
		26,682	63,999	1.000	1,080	22,983

Site Number: 302481

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Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-31.77	-1.09	0.00	-95.73	0.00	95.73	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.055
5.00	-30.51	-1.10	0.00	-90.30	0.00	90.30	1,541.15	770.57	1,839.28	908.35	0.01	-0.02	0.053
10.00	-29.26	-1.10	0.00	-84.81	0.00	84.81	1,517.03	758.51	1,758.81	868.61	0.05	-0.04	0.051
15.00	-28.03	-1.11	0.00	-79.29	0.00	79.29	1,491.77	745.88	1,678.72	829.06	0.10	-0.06	0.049
20.00	-26.81	-1.11	0.00	-73.74	0.00	73.74	1,465.38	732.69	1,599.10	789.74	0.18	-0.09	0.047
25.00	-25.76	-1.11	0.00	-68.17	0.00	68.17	1,437.85	718.93	1,520.09	750.71	0.28	-0.11	0.045
29.33	-25.54	-1.12	0.00	-63.34	0.00	63.34	1,413.10	706.55	1,452.23	717.20	0.39	-0.13	0.043
30.00	-24.63	-1.11	0.00	-62.59	0.00	62.59	1,409.19	704.59	1,441.78	712.04	0.41	-0.13	0.041
32.83	-24.11	-1.11	0.00	-59.45	0.00	59.45	1,130.07	565.03	1,157.93	571.86	0.48	-0.14	0.050
35.00	-22.92	-1.10	0.00	-57.04	0.00	57.04	1,119.12	559.56	1,130.17	558.15	0.55	-0.15	0.048
40.00	-21.75	-1.09	0.00	-51.54	0.00	51.54	1,081.75	540.88	1,055.58	521.31	0.72	-0.17	0.046
45.00	-21.17	-1.08	0.00	-46.11	0.00	46.11	1,044.38	522.19	983.54	485.73	0.90	-0.19	0.043
47.50	-20.59	-1.07	0.00	-43.40	0.00	43.40	1,025.69	512.85	948.47	468.42	1.00	-0.19	0.042
47.50	-20.59	-1.07	0.00	-43.40	0.00	43.40	1,025.69	512.85	948.47	468.42	1.00	-0.19	0.042
50.00	-19.44	-1.05	0.00	-40.73	0.00	40.73	1,007.01	503.50	914.04	451.41	1.11	-0.20	0.040
55.00	-18.31	-1.02	0.00	-35.48	0.00	35.48	969.64	484.82	847.10	418.35	1.33	-0.22	0.036
60.00	-17.49	-1.00	0.00	-30.37	0.00	30.37	932.27	466.13	782.69	386.54	1.57	-0.24	0.033
62.92	-16.92	-0.98	0.00	-27.45	0.00	27.45	910.47	455.23	746.30	368.57	1.71	-0.24	0.031
65.00	-16.72	-0.98	0.00	-25.40	0.00	25.40	894.90	447.45	720.84	355.99	1.82	-0.25	0.029
65.75	-16.36	-0.97	0.00	-24.67	0.00	24.67	664.38	332.19	545.54	269.42	1.86	-0.25	0.032
67.50	-15.85	-0.95	0.00	-22.97	0.00	22.97	658.03	329.02	532.49	262.98	1.96	-0.26	0.031
67.50	-15.85	-0.95	0.00	-22.97	0.00	22.97	658.03	329.02	532.49	262.98	1.96	-0.26	0.031
70.00	-14.35	-0.89	0.00	-20.60	0.00	20.60	648.81	324.41	513.97	253.83	2.09	-0.26	0.028
75.00	-13.74	-0.86	0.00	-16.16	0.00	16.16	629.79	314.90	477.45	235.80	2.37	-0.27	0.023
77.04	-13.41	-0.85	0.00	-14.40	0.00	14.40	618.65	309.32	460.40	227.38	2.49	-0.28	0.022
77.04	-13.41	-0.85	0.00	-14.40	0.00	14.40	618.65	309.32	460.40	227.38	2.49	-0.28	0.085
80.00	-9.78	-0.67	0.00	-11.88	0.00	11.88	602.07	301.03	435.93	215.29	2.67	-0.28	0.071
85.00	-9.59	-0.67	0.00	-8.52	0.00	8.52	574.04	287.02	396.08	195.61	2.98	-0.32	0.060
87.00	-6.63	-0.50	0.00	-7.19	0.00	7.19	562.83	281.41	380.68	188.00	3.12	-0.33	0.050
90.00	-6.28	-0.48	0.00	-5.70	0.00	5.70	546.01	273.01	358.14	176.87	3.33	-0.35	0.044
95.00	-5.94	-0.45	0.00	-3.32	0.00	3.32	517.98	258.99	322.12	159.08	3.71	-0.37	0.032
100.00	-1.38	-0.12	0.00	-1.04	0.00	1.04	489.95	244.98	288.00	142.23	4.10	-0.38	0.010
100.00	-1.38	-0.12	0.00	-1.04	0.00	1.04	459.24	229.62	229.69	150.79	4.10	-0.38	0.010
105.00	-1.04	-0.09	0.00	-0.45	0.00	0.45	459.24	229.62	229.69	150.79	4.50	-0.38	0.005
110.00	0.00	-0.08	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	4.91	-0.39	0.000



Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

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

Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-22.10	-1.08	0.00	-94.03	0.00	94.03	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.051
5.00	-21.22	-1.09	0.00	-88.61	0.00	88.61	1,541.15	770.57	1,839.28	908.35	0.01	-0.02	0.049
10.00	-20.35	-1.10	0.00	-83.16	0.00	83.16	1,517.03	758.51	1,758.81	868.61	0.04	-0.04	0.047
15.00	-19.49	-1.10	0.00	-77.68	0.00	77.68	1,491.77	745.88	1,678.72	829.06	0.10	-0.06	0.045
20.00	-18.64	-1.10	0.00	-72.18	0.00	72.18	1,465.38	732.69	1,599.10	789.74	0.18	-0.08	0.043
25.00	-17.92	-1.10	0.00	-66.68	0.00	66.68	1,437.85	718.93	1,520.09	750.71	0.28	-0.10	0.041
29.33	-17.76	-1.10	0.00	-61.93	0.00	61.93	1,413.10	706.55	1,452.23	717.20	0.38	-0.12	0.039
30.00	-17.13	-1.09	0.00	-61.19	0.00	61.19	1,409.19	704.59	1,441.78	712.04	0.40	-0.13	0.038
32.83	-16.76	-1.09	0.00	-58.10	0.00	58.10	1,130.07	565.03	1,157.93	571.86	0.48	-0.14	0.046
35.00	-15.94	-1.08	0.00	-55.73	0.00	55.73	1,119.12	559.56	1,130.17	558.15	0.54	-0.15	0.044
40.00	-15.12	-1.07	0.00	-50.34	0.00	50.34	1,081.75	540.88	1,055.58	521.31	0.70	-0.16	0.042
45.00	-14.72	-1.06	0.00	-45.01	0.00	45.01	1,044.38	522.19	983.54	485.73	0.88	-0.18	0.039
47.50	-14.32	-1.05	0.00	-42.36	0.00	42.36	1,025.69	512.85	948.47	468.42	0.98	-0.19	0.038
47.50	-14.32	-1.05	0.00	-42.36	0.00	42.36	1,025.69	512.85	948.47	468.42	0.98	-0.19	0.038
50.00	-13.52	-1.03	0.00	-39.74	0.00	39.74	1,007.01	503.50	914.04	451.41	1.08	-0.20	0.036
55.00	-12.73	-1.00	0.00	-34.61	0.00	34.61	969.64	484.82	847.10	418.35	1.30	-0.22	0.033
60.00	-12.17	-0.98	0.00	-29.62	0.00	29.62	932.27	466.13	782.69	386.54	1.53	-0.23	0.030
62.92	-11.77	-0.96	0.00	-26.76	0.00	26.76	910.47	455.23	746.30	368.57	1.68	-0.24	0.028
65.00	-11.63	-0.95	0.00	-24.76	0.00	24.76	894.90	447.45	720.84	355.99	1.78	-0.24	0.026
65.75	-11.38	-0.94	0.00	-24.05	0.00	24.05	664.38	332.19	545.54	269.42	1.82	-0.25	0.029
67.50	-11.02	-0.93	0.00	-22.40	0.00	22.40	658.03	329.02	532.49	262.98	1.91	-0.25	0.027
67.50	-11.02	-0.93	0.00	-22.40	0.00	22.40	658.03	329.02	532.49	262.98	1.91	-0.25	0.027
70.00	-9.98	-0.87	0.00	-20.08	0.00	20.08	648.81	324.41	513.97	253.83	2.05	-0.26	0.025
75.00	-9.55	-0.84	0.00	-15.75	0.00	15.75	629.79	314.90	477.45	235.80	2.32	-0.27	0.021
77.04	-9.32	-0.83	0.00	-14.03	0.00	14.03	618.65	309.32	460.40	227.38	2.44	-0.27	0.019
77.04	-9.32	-0.83	0.00	-14.03	0.00	14.03	618.65	309.32	460.40	227.38	2.44	-0.27	0.077
80.00	-6.80	-0.66	0.00	-11.58	0.00	11.58	602.07	301.03	435.93	215.29	2.61	-0.28	0.065
85.00	-6.67	-0.65	0.00	-8.30	0.00	8.30	574.04	287.02	396.08	195.61	2.92	-0.31	0.054
87.00	-4.61	-0.48	0.00	-7.00	0.00	7.00	562.83	281.41	380.68	188.00	3.05	-0.32	0.045
90.00	-4.37	-0.46	0.00	-5.55	0.00	5.55	546.01	273.01	358.14	176.87	3.26	-0.34	0.039
95.00	-4.13	-0.44	0.00	-3.23	0.00	3.23	517.98	258.99	322.12	159.08	3.63	-0.36	0.028
100.00	-0.96	-0.12	0.00	-1.02	0.00	1.02	489.95	244.98	288.00	142.23	4.01	-0.37	0.009
100.00	-0.96	-0.12	0.00	-1.02	0.00	1.02	459.24	229.62	229.69	150.79	4.01	-0.37	0.009
105.00	-0.73	-0.09	0.00	-0.44	0.00	0.44	459.24	229.62	229.69	150.79	4.40	-0.38	0.005
110.00	0.00	-0.08	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	4.80	-0.38	0.000



Site Number: 302481

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

Argus LLPX310R	110.00	86	1.890	1.980	1.140	0.369	27	106
Side Arms	110.00	500	1.890	1.980	1.140	0.369	160	619
DragonWave A-ANT-11G	110.00	48	1.890	1.980	1.140	0.369	15	59
DragonWave A-ANT-11G	110.00	48	1.890	1.980	1.140	0.369	15	59
Powerwave Allgon 702	100.00	13	1.562	0.666	0.620	0.177	2	16
CCI TPX-070821	100.00	45	1.562	0.666	0.620	0.177	7	56
Powerwave LGP21401	100.00	85	1.562	0.666	0.620	0.177	13	105
Raycap DC6-48-60-18-	100.00	66	1.562	0.666	0.620	0.177	10	81
Ericsson RRUS-11	100.00	150	1.562	0.666	0.620	0.177	23	186
Ericsson RRUS 32 B2	100.00	159	1.562	0.666	0.620	0.177	24	197
10' Omni	100.00	25	1.562	0.666	0.620	0.177	4	31
Ericsson RRUS-32	100.00	231	1.562	0.666	0.620	0.177	36	286
Powerwave Allgon 777	100.00	105	1.562	0.666	0.620	0.177	16	130
Quintel QS66512-2	100.00	222	1.562	0.666	0.620	0.177	34	275
CCI OPA-65R-LCUU-H6	100.00	146	1.562	0.666	0.620	0.177	22	181
CCI OPA-65R-LCUU-H8	100.00	88	1.562	0.666	0.620	0.177	14	109
CCI TPA-65R-LCUUUU-H	100.00	82	1.562	0.666	0.620	0.177	13	101
Flat Platform w/ Han	100.00	2,000	1.562	0.666	0.620	0.177	308	2,477
Kathrein Smart Bias	87.00	10	1.182	-0.011	0.242	0.020	0	12
Ericsson KRY 112 144	87.00	33	1.182	-0.011	0.242	0.020	1	41
Ericsson KRY 112 489	87.00	46	1.182	-0.011	0.242	0.020	1	57
RFS APX16DWV-16DWV-	87.00	119	1.182	-0.011	0.242	0.020	2	147
Ericsson AIR32 B66Aa	87.00	397	1.182	-0.011	0.242	0.020	7	491
Commscope LNX-	87.00	116	1.182	-0.011	0.242	0.020	2	144
Flat Low Profile Pla	87.00	1,500	1.182	-0.011	0.242	0.020	27	1,858
Nokia AirScale RRH 4	80.00	106	1.000	-0.110	0.131	-0.023	-2	131
Alcatel-Lucent B25 R	80.00	159	1.000	-0.110	0.131	-0.023	-3	197
Alcatel-Lucent B13 R	80.00	173	1.000	-0.110	0.131	-0.023	-3	215
Alcatel-Lucent B66A	80.00	201	1.000	-0.110	0.131	-0.023	-4	249
Raycap RVZDC-6627-PF	80.00	32	1.000	-0.110	0.131	-0.023	-1	40
Commscope JAHH-65B-	80.00	380	1.000	-0.110	0.131	-0.023	-8	470
Round Low Profile PI	80.00	1,500	1.000	-0.110	0.131	-0.023	-30	1,858
Scala 840 10212	75.00	7	0.879	-0.121	0.079	-0.036	0	8
TX RX Systems 421-86	75.00	15	0.879	-0.121	0.079	-0.036	0	19
Stand Offs	75.00	150	0.879	-0.121	0.079	-0.036	-5	186
Round Side Arms	70.00	300	0.765	-0.105	0.044	-0.036	-9	372
72" x 6" Panel	70.00	120	0.765	-0.105	0.044	-0.036	-4	149
Radio/ODU	60.00	30	0.562	-0.039	0.011	-0.005	0	37
Scala 840 10212	60.00	7	0.562	-0.039	0.011	-0.005	0	8
Stand Off	60.00	75	0.562	-0.039	0.011	-0.005	0	93
Radio Waves SP2-4.7	60.00	22	0.562	-0.039	0.011	-0.005	0	27
		26,682	77.303	26.583	24.782	6.373	1,257	33,048

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

Seismic (Reduced DL) Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
30	107.50	270	1.805	1.562	0.986	0.315	74	233
29	102.50	270	1.641	0.911	0.727	0.219	51	233
28	97.50	273	1.485	0.464	0.525	0.139	33	235
27	92.50	281	1.336	0.174	0.369	0.075	18	242
26	88.50	173	1.223	0.028	0.273	0.033	5	149
25	86.00	150	1.155	-0.033	0.223	0.012	2	129
24	82.50	380	1.063	-0.088	0.165	-0.011	-4	327
23	78.52	265	0.963	-0.117	0.114	-0.028	-7	229
22	76.02	321	0.903	-0.122	0.088	-0.035	-10	277
21	72.50	794	0.821	-0.115	0.060	-0.038	-26	684
20	68.75	413	0.738	-0.098	0.038	-0.034	-12	355
19	66.62	290	0.693	-0.085	0.029	-0.029	-7	250

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

18	65.37	165	0.668	-0.077	0.024	-0.025	-4	142
17	63.96	460	0.639	-0.067	0.020	-0.020	-8	396
16	61.46	526	0.590	-0.049	0.013	-0.011	-5	453
15	57.50	913	0.516	-0.022	0.008	0.006	5	787
14	52.50	924	0.431	0.008	0.006	0.025	20	796
13	48.75	466	0.371	0.027	0.008	0.036	15	402
12	46.25	469	0.334	0.037	0.010	0.042	17	404
11	42.50	947	0.282	0.049	0.014	0.047	39	816
10	37.50	958	0.220	0.060	0.021	0.050	42	825
9	33.91	419	0.180	0.065	0.026	0.050	18	361
8	31.41	741	0.154	0.068	0.030	0.050	32	638
7	29.66	176	0.137	0.069	0.032	0.049	8	152
6	27.16	844	0.115	0.070	0.035	0.049	36	727
5	22.50	985	0.079	0.072	0.040	0.047	40	848
4	17.50	996	0.048	0.071	0.042	0.045	39	858
3	12.50	1,007	0.024	0.066	0.039	0.042	36	868
2	7.50	1,018	0.009	0.053	0.031	0.035	31	877
1	2.50	1,030	0.001	0.024	0.013	0.017	15	887
DragonWave Horizon C	110.00	32	1.890	1.980	1.140	0.369	10	27
12" x 12" Junction B	110.00	10	1.890	1.980	1.140	0.369	3	9
DragonWave A-ANT-23G	110.00	15	1.890	1.980	1.140	0.369	5	13
NextNet BTS-2500	110.00	105	1.890	1.980	1.140	0.369	34	90
Argus LLPX310R	110.00	86	1.890	1.980	1.140	0.369	27	74
Side Arms	110.00	500	1.890	1.980	1.140	0.369	160	431
DragonWave A-ANT-11G	110.00	48	1.890	1.980	1.140	0.369	15	41
DragonWave A-ANT-11G	110.00	48	1.890	1.980	1.140	0.369	15	41
Powerwave Allgon 702	100.00	13	1.562	0.666	0.620	0.177	2	11
CCI TPX-070821	100.00	45	1.562	0.666	0.620	0.177	7	39
Powerwave LGP21401	100.00	85	1.562	0.666	0.620	0.177	13	73
Raycap DC6-48-60-18-	100.00	66	1.562	0.666	0.620	0.177	10	57
Ericsson RRUS-11	100.00	150	1.562	0.666	0.620	0.177	23	129
Ericsson RRUS 32 B2	100.00	159	1.562	0.666	0.620	0.177	24	137
10' Omni	100.00	25	1.562	0.666	0.620	0.177	4	22
Ericsson RRUS-32	100.00	231	1.562	0.666	0.620	0.177	36	199
Powerwave Allgon 777	100.00	105	1.562	0.666	0.620	0.177	16	90
Quintel QS66512-2	100.00	222	1.562	0.666	0.620	0.177	34	191
CCI OPA-65R-LCUU-H6	100.00	146	1.562	0.666	0.620	0.177	22	126
CCI OPA-65R-LCUU-H8	100.00	88	1.562	0.666	0.620	0.177	14	76
CCI TPA-65R-LCUUUU-H	100.00	82	1.562	0.666	0.620	0.177	13	70
Flat Platform w/ Han	100.00	2,000	1.562	0.666	0.620	0.177	308	1,723
Kathrein Smart Bias	87.00	10	1.182	-0.011	0.242	0.020	0	9
Ericsson KRY 112 144	87.00	33	1.182	-0.011	0.242	0.020	1	28
Ericsson KRY 112 489	87.00	46	1.182	-0.011	0.242	0.020	1	40
RFS APX16DWV-16DWV-	87.00	119	1.182	-0.011	0.242	0.020	2	102
Ericsson AIR32 B66Aa	87.00	397	1.182	-0.011	0.242	0.020	7	342
Commscope LNX-	87.00	116	1.182	-0.011	0.242	0.020	2	100
Flat Low Profile Pla	87.00	1,500	1.182	-0.011	0.242	0.020	27	1,292
Nokia AirScale RRH 4	80.00	106	1.000	-0.110	0.131	-0.023	-2	91
Alcatel-Lucent B25 R	80.00	159	1.000	-0.110	0.131	-0.023	-3	137
Alcatel-Lucent B13 R	80.00	173	1.000	-0.110	0.131	-0.023	-3	149
Alcatel-Lucent B66A	80.00	201	1.000	-0.110	0.131	-0.023	-4	173
Raycap RVZDC-6627-PF	80.00	32	1.000	-0.110	0.131	-0.023	-1	28
Commscope JAHH-65B-	80.00	380	1.000	-0.110	0.131	-0.023	-8	327
Round Low Profile PI	80.00	1,500	1.000	-0.110	0.131	-0.023	-30	1,292
Scala 840 10212	75.00	7	0.879	-0.121	0.079	-0.036	0	6
TX RX Systems 421-86	75.00	15	0.879	-0.121	0.079	-0.036	0	13
Stand Offs	75.00	150	0.879	-0.121	0.079	-0.036	-5	129
Round Side Arms	70.00	300	0.765	-0.105	0.044	-0.036	-9	258
72" x 6" Panel	70.00	120	0.765	-0.105	0.044	-0.036	-4	103
Radio/ODU	60.00	30	0.562	-0.039	0.011	-0.005	0	26
Scala 840 10212	60.00	7	0.562	-0.039	0.011	-0.005	0	6
Stand Off	60.00	75	0.562	-0.039	0.011	-0.005	0	65
Radio Waves SP2-4.7	60.00	22	0.562	-0.039	0.011	-0.005	0	19

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Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

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26,682

77.303

26.583

24.782

6.373

1,257

22,983

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:44:05 PM

Customer: VERIZON WIRELESS

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

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-31.77	-1.25	0.00	-109.57	0.00	109.57	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.062
5.00	-30.51	-1.23	0.00	-103.33	0.00	103.33	1,541.15	770.57	1,839.28	908.35	0.01	-0.02	0.060
10.00	-29.26	-1.21	0.00	-97.18	0.00	97.18	1,517.03	758.51	1,758.81	868.61	0.05	-0.05	0.057
15.00	-28.03	-1.18	0.00	-91.15	0.00	91.15	1,491.77	745.88	1,678.72	829.06	0.12	-0.07	0.055
20.00	-26.81	-1.15	0.00	-85.26	0.00	85.26	1,465.38	732.69	1,599.10	789.74	0.21	-0.10	0.053
25.00	-25.76	-1.12	0.00	-79.52	0.00	79.52	1,437.85	718.93	1,520.09	750.71	0.32	-0.12	0.050
29.33	-25.54	-1.12	0.00	-74.67	0.00	74.67	1,413.10	706.55	1,452.23	717.20	0.45	-0.14	0.049
30.00	-24.63	-1.09	0.00	-73.92	0.00	73.92	1,409.19	704.59	1,441.78	712.04	0.47	-0.15	0.047
32.83	-24.11	-1.07	0.00	-70.85	0.00	70.85	1,130.07	565.03	1,157.93	571.86	0.56	-0.16	0.058
35.00	-22.92	-1.03	0.00	-68.52	0.00	68.52	1,119.12	559.56	1,130.17	558.15	0.63	-0.17	0.056
40.00	-21.75	-1.00	0.00	-63.35	0.00	63.35	1,081.75	540.88	1,055.58	521.31	0.83	-0.20	0.054
45.00	-21.17	-0.99	0.00	-58.35	0.00	58.35	1,044.38	522.19	983.54	485.73	1.04	-0.22	0.052
47.50	-20.59	-0.97	0.00	-55.88	0.00	55.88	1,025.69	512.85	948.47	468.42	1.16	-0.23	0.051
47.50	-20.59	-0.97	0.00	-55.88	0.00	55.88	1,025.69	512.85	948.47	468.42	1.16	-0.23	0.051
50.00	-19.44	-0.96	0.00	-53.44	0.00	53.44	1,007.01	503.50	914.04	451.41	1.28	-0.24	0.049
55.00	-18.31	-0.95	0.00	-48.66	0.00	48.66	969.64	484.82	847.10	418.35	1.55	-0.26	0.047
60.00	-17.49	-0.96	0.00	-43.90	0.00	43.90	932.27	466.13	782.69	386.54	1.83	-0.29	0.044
62.92	-16.92	-0.97	0.00	-41.10	0.00	41.10	910.47	455.23	746.30	368.57	2.01	-0.30	0.043
65.00	-16.72	-0.97	0.00	-39.08	0.00	39.08	894.90	447.45	720.84	355.99	2.15	-0.31	0.041
65.75	-16.36	-0.98	0.00	-38.35	0.00	38.35	664.38	332.19	545.54	269.42	2.19	-0.31	0.045
67.50	-15.85	-0.99	0.00	-36.64	0.00	36.64	658.03	329.02	532.49	262.98	2.31	-0.32	0.043
67.50	-15.85	-0.99	0.00	-36.64	0.00	36.64	658.03	329.02	532.49	262.98	2.31	-0.32	0.043
70.00	-14.34	-1.03	0.00	-34.16	0.00	34.16	648.81	324.41	513.97	253.83	2.48	-0.33	0.040
75.00	-13.73	-1.04	0.00	-29.03	0.00	29.03	629.79	314.90	477.45	235.80	2.83	-0.35	0.036
77.04	-13.40	-1.05	0.00	-26.91	0.00	26.91	618.65	309.32	460.40	227.38	2.98	-0.36	0.034
77.04	-13.40	-1.05	0.00	-26.91	0.00	26.91	618.65	309.32	460.40	227.38	2.98	-0.36	0.140
80.00	-9.77	-1.09	0.00	-23.81	0.00	23.81	602.07	301.03	435.93	215.29	3.21	-0.37	0.127
85.00	-9.59	-1.09	0.00	-18.39	0.00	18.39	574.04	287.02	396.08	195.61	3.63	-0.44	0.111
87.00	-6.62	-1.03	0.00	-16.21	0.00	16.21	562.83	281.41	380.68	188.00	3.82	-0.46	0.098
90.00	-6.27	-1.01	0.00	-13.13	0.00	13.13	546.01	273.01	358.14	176.87	4.12	-0.50	0.086
95.00	-5.93	-0.98	0.00	-8.08	0.00	8.08	517.98	258.99	322.12	159.08	4.67	-0.55	0.062
100.00	-1.37	-0.36	0.00	-3.19	0.00	3.19	489.95	244.98	288.00	142.23	5.27	-0.58	0.025
100.00	-1.37	-0.36	0.00	-3.19	0.00	3.19	459.24	229.62	229.69	150.79	5.27	-0.58	0.024
105.00	-1.04	-0.28	0.00	-1.40	0.00	1.40	459.24	229.62	229.69	150.79	5.88	-0.59	0.012
110.00	0.00	-0.27	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	6.50	-0.60	0.000

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hrfr - South, CT

Engineering Number: OAA708587\_C3\_01

8/17/2017 3:44:05 PM

Customer: VERIZON WIRELESS

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-22.10	-1.25	0.00	-107.48	0.00	107.48	1,564.13	782.07	1,919.99	948.21	0.00	0.00	0.057
5.00	-21.22	-1.22	0.00	-101.25	0.00	101.25	1,541.15	770.57	1,839.28	908.35	0.01	-0.02	0.055
10.00	-20.35	-1.20	0.00	-95.13	0.00	95.13	1,517.03	758.51	1,758.81	868.61	0.05	-0.05	0.053
15.00	-19.49	-1.16	0.00	-89.15	0.00	89.15	1,491.77	745.88	1,678.72	829.06	0.11	-0.07	0.051
20.00	-18.64	-1.13	0.00	-83.33	0.00	83.33	1,465.38	732.69	1,599.10	789.74	0.20	-0.10	0.049
25.00	-17.92	-1.10	0.00	-77.67	0.00	77.67	1,437.85	718.93	1,520.09	750.71	0.32	-0.12	0.047
29.33	-17.76	-1.10	0.00	-72.90	0.00	72.90	1,413.10	706.55	1,452.23	717.20	0.44	-0.14	0.045
30.00	-17.13	-1.07	0.00	-72.17	0.00	72.17	1,409.19	704.59	1,441.78	712.04	0.46	-0.14	0.044
32.83	-16.76	-1.05	0.00	-69.15	0.00	69.15	1,130.07	565.03	1,157.93	571.86	0.55	-0.16	0.053
35.00	-15.94	-1.01	0.00	-66.87	0.00	66.87	1,119.12	559.56	1,130.17	558.15	0.62	-0.17	0.052
40.00	-15.12	-0.98	0.00	-61.82	0.00	61.82	1,081.75	540.88	1,055.58	521.31	0.81	-0.19	0.050
45.00	-14.72	-0.96	0.00	-56.94	0.00	56.94	1,044.38	522.19	983.54	485.73	1.02	-0.21	0.048
47.50	-14.32	-0.95	0.00	-54.54	0.00	54.54	1,025.69	512.85	948.47	468.42	1.13	-0.22	0.047
47.50	-14.32	-0.95	0.00	-54.54	0.00	54.54	1,025.69	512.85	948.47	468.42	1.13	-0.22	0.047
50.00	-13.52	-0.93	0.00	-52.17	0.00	52.17	1,007.01	503.50	914.04	451.41	1.25	-0.24	0.046
55.00	-12.73	-0.92	0.00	-47.53	0.00	47.53	969.64	484.82	847.10	418.35	1.51	-0.26	0.043
60.00	-12.16	-0.93	0.00	-42.91	0.00	42.91	932.27	466.13	782.69	386.54	1.79	-0.28	0.041
62.92	-11.77	-0.94	0.00	-40.19	0.00	40.19	910.47	455.23	746.30	368.57	1.97	-0.29	0.039
65.00	-11.63	-0.94	0.00	-38.23	0.00	38.23	894.90	447.45	720.84	355.99	2.10	-0.30	0.037
65.75	-11.38	-0.95	0.00	-37.53	0.00	37.53	664.38	332.19	545.54	269.42	2.14	-0.30	0.041
67.50	-11.02	-0.96	0.00	-35.86	0.00	35.86	658.03	329.02	532.49	262.98	2.26	-0.31	0.040
67.50	-11.02	-0.96	0.00	-35.86	0.00	35.86	658.03	329.02	532.49	262.98	2.26	-0.31	0.040
70.00	-9.97	-1.00	0.00	-33.46	0.00	33.46	648.81	324.41	513.97	253.83	2.42	-0.32	0.037
75.00	-9.55	-1.01	0.00	-28.46	0.00	28.46	629.79	314.90	477.45	235.80	2.77	-0.34	0.033
77.04	-9.32	-1.02	0.00	-26.39	0.00	26.39	618.65	309.32	460.40	227.38	2.92	-0.35	0.031
77.04	-9.32	-1.02	0.00	-26.39	0.00	26.39	618.65	309.32	460.40	227.38	2.92	-0.35	0.131
80.00	-6.79	-1.06	0.00	-23.38	0.00	23.38	602.07	301.03	435.93	215.29	3.13	-0.36	0.120
85.00	-6.66	-1.07	0.00	-18.06	0.00	18.06	574.04	287.02	396.08	195.61	3.55	-0.43	0.104
87.00	-4.60	-1.01	0.00	-15.93	0.00	15.93	562.83	281.41	380.68	188.00	3.73	-0.45	0.093
90.00	-4.36	-0.99	0.00	-12.90	0.00	12.90	546.01	273.01	358.14	176.87	4.03	-0.49	0.081
95.00	-4.12	-0.96	0.00	-7.94	0.00	7.94	517.98	258.99	322.12	159.08	4.57	-0.54	0.058
100.00	-0.96	-0.35	0.00	-3.15	0.00	3.15	489.95	244.98	288.00	142.23	5.15	-0.57	0.024
100.00	-0.96	-0.35	0.00	-3.15	0.00	3.15	459.24	229.62	229.69	150.79	5.15	-0.57	0.023
105.00	-0.72	-0.28	0.00	-1.38	0.00	1.38	459.24	229.62	229.69	150.79	5.75	-0.58	0.011
110.00	0.00	-0.27	0.00	0.00	0.00	0.00	459.24	229.62	229.69	150.79	6.36	-0.58	0.000

Site Number: 302481

Code: ANSI/TIA-222-G

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Site Name: Hfr - South, CT

Engineering Number: OAA708587\_C3\_01

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Customer: VERIZON WIRELESS

Analysis Summary

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	25.01	0.00	31.93	0.00	0.00	1723.39	77.04	0.96
0.9D + 1.6W	24.91	0.00	23.93	0.00	0.00	1692.17	77.04	0.93
1.2D + 1.0Di + 1.0Wi	6.88	0.00	84.19	0.00	0.00	509.86	77.04	0.33
(1.2 + 0.2Sds) * DL + E ELFM	1.09	0.00	31.77	0.00	0.00	95.73	77.04	0.08
(1.2 + 0.2Sds) * DL + E EMAM	1.25	0.00	31.77	0.00	0.00	109.57	77.04	0.14
(0.9 - 0.2Sds) * DL + E ELFM	1.08	0.00	22.10	0.00	0.00	94.03	77.04	0.08
(0.9 - 0.2Sds) * DL + E EMAM	1.25	0.00	22.10	0.00	0.00	107.48	77.04	0.13
1.0D + 1.0W	5.98	0.00	26.68	0.00	0.00	407.30	77.04	0.24

Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors			Upper Termination Connectors				Lower Termination Connectors				Max Member		
			VQ/I (lb/in)	Shear Applied (kips)	Shear phiVn (kips)	MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Pu (kip)	phiPn (kip)	Ratio
0.00	47.5	(4) SOL-#20 All Thre	399.3	15.6	16.8	0.0	12.0	0	0	0.0	12.0	0	0	312.4	315.5	0.990
47.5	67.5	(4) SOL-#20 All Thre	435.3	13.1	16.8	0.0	12.0	0	0	0.0	12.0	0	0	184.9	330.5	0.560
67.5	77.0	(4) SOL-#20 All Thre	435.3	13.1	16.8	78.2	12.0	7	7	0.0	12.0	0	0	120.6	330.5	0.365



<b>Base/Flange Plate</b>	Plate Type	<b>Baseplate</b>
	Pole Diameter	30 in
	Pole Thickness	0.25 in
	Plate Length	44 in
	Plate Thickness	2 in
	Plate Fy	60 ksi
	Weld Length	0.1875 in
	$\phi_s$ Resistance	1598.36 k-in
	Applied	1127.20 k-in
	#	<b>0</b>
<b>Stiffeners</b>	#	<b>0</b>

Code Rev. **G**

Date **8/17/2017**  
 Engineer **Felix.Buabeng**  
 Site # **302481**  
 Carrier **VERIZON WIRELESS**

Moment **1723.4 k-ft**  
 Axial **31.9 k**

<b>Bolts</b>	#	<b>8</b>
	Bolt Circle	44 in
	(R)adial / (S)quare	S
	Bolt Gap	6 in
	Diameter	2.25 in
	Hole Diameter	2.375 in
	Type	A615-75
	Fy	75 ksi
	Fu	100 ksi
	$\phi_s$ Resistance	259.82 k
Applied	100.20 k	
<b>Reinforcement</b>	#	<b>4</b>
	DYW. Circle	38.6 in
	Offset Angle	0°
	Type	#20
	Diameter	2.5 in
Fu	100 ksi	
<b>Extra Bolts</b>	#	<b>0</b>

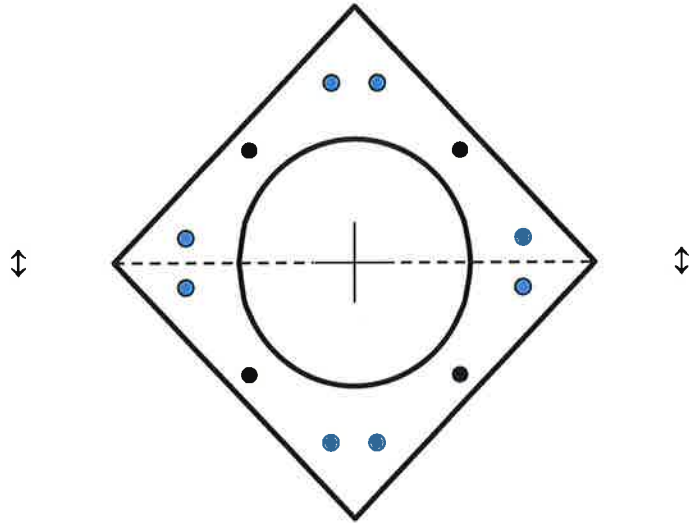


Plate Stress Ratio:  
**0.71** (Pass)

Bolt Stress Ratio:  
**0.39** (Pass)

<b>Base/Flange Plate</b>	Plate Type	<b>Flange @ 100.0 ft</b>
	Pole Diameter	12.75 in
	Pole Thickness	0.375 in
	Plate Diameter	28.5 in
	Plate Thickness	1.5 in
	Plate Fy	36 ksi
	Weld Length	0.25 in
	$\phi_s$ Resistance	60.83 k-in
	Applied	12.69 k-in
	<b>Stiffeners</b>	#

Code Rev. **G**

Date **8/17/2017**  
 Engineer **Felix.Buabeng**  
 Site # **302481**  
 Carrier **VERIZON WIRELESS**

Moment **14.9 k-ft**  
 Axial **1.5 k**

Required Flange Thickness:

**0.69 in** OK

<b>Bolts</b>	#	<b>12</b>
	Bolt Circle	26 in
	(R)adial / (S)quare	R
	Diameter	1 in
	Hole Diameter	1.0625 in
	Type	A325
	Fy	92 ksi
	Fu	120 ksi
	$\phi_s$ Resistance	54.52 k
	Applied	2.17 k
<b>Reinforcement</b>	#	0
<b>Extra Bolts</b>	#	0

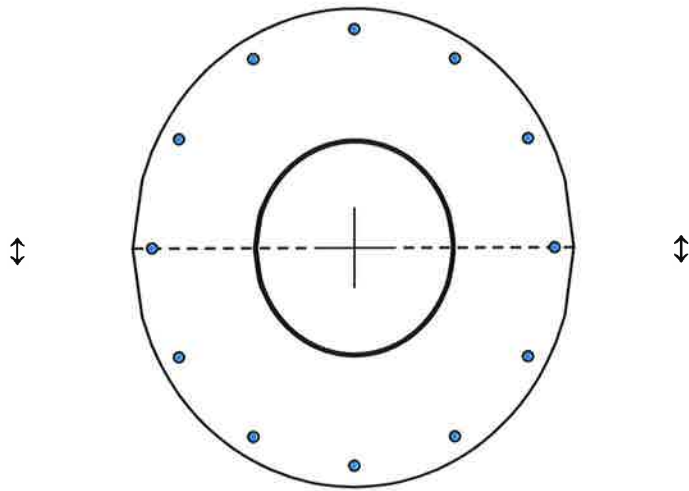


Plate Stress Ratio:  
**0.21** (Pass)

Bolt Stress Ratio:  
**0.04** (Pass)

Site Name: Hrfr-South, CT  
 Site Number: 302481  
 Engineering Number: OAA708587  
 Engineer: Felix.Buabeng  
 Date: 8/17/2017

**Design Base Loads (Factored) - Design per TIA-222-G Standard**

Moment (Overturning) ( $M_u$ ): 1723.4 k-ft  
 Shear ( $V_u$ ): 25.0 k  
 Axial ( $P_u$ ): 31.9 k  
 k

Tower Type (GT / SST / MP):

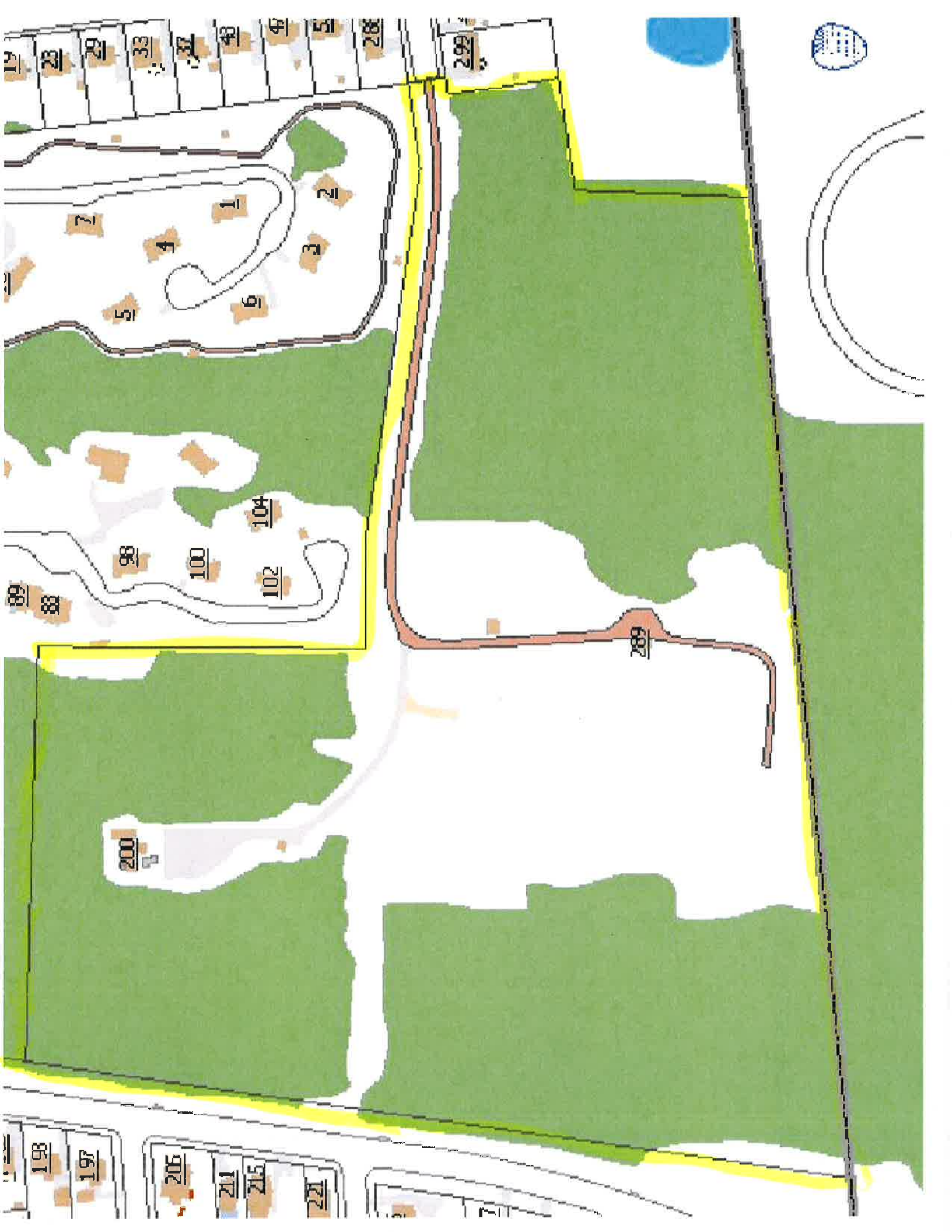
MP

Length / Width of Block:	6.0	9.0 ft
Thickness of Block:	6.0	ft
Block Height Above Ground:	0.5	ft
Depth Below Ground Surface to Water Table (w):	99.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil:	125.0	pcf
Unit Weight of Water:	62.4	pcf
Ultimate Compressive Bearing Pressure:	10000	psf
Capacity Increase (Due to Transient Loads):	1.00	
Pullout Angle:	30.0	degrees
Rod Diameter:	1.00	in
Rod Ultimate Strength:	105	ksi
Original Rod Net Area:	0.76	in <sup>2</sup>
New Rod Net Area:	0.78	in <sup>2</sup>
Number of Rods:	18	
Diameter of Cored Hole:	2.00	in
Ultimate Grout / Rock Interface Bond Strength:	200	psi
Ultimate Grout / Rock Anchor Interface Bond Strength:	600	psi
Overall Rod Embedment Length:	72	in
Rod Exposure Above Lock Off Nut in Foundation:	60	in
Rod Embedment Circle:	96	in
Free Stress Length:	0	in
Soil / Concrete Friction Coefficient:	0.44	
Rock Anchor Design Plastic or Elastic:	Elastic	
Ignore Pullout Weight Resistance (Y/N):	Y	
Volume of Concrete:	324.0	ft <sup>3</sup>
Compressive Bearing Resistance:	424.1	k
Soil Strength Reduction Factor ( $\phi_s$ ):	0.75	
Factored Nominal Moment Capacity per Leg ( $\phi_s M_n$ ):	2090.4	k
Factored Nominal Uplift Capacity per Leg ( $\phi_s T_n$ ):	1145.0	k
Factored Nominal Compressive Capacity per Leg ( $\phi_s P_n$ ):	318.1	k
Factored Nominal Shear Capacity per Leg ( $\phi_s V_n$ ):	660.0	k
$M_u$ :	1873.5	k-ft
$T_u$ :	0.0	k
$P_u$ :	40.8	k
$V_u$ :	25.0	k
$T_u / \phi_s T_n + M_u / \phi_s M_n$ :	<b>0.90 Result: OK</b>	
$P_u / \phi_s P_n$ :	<b>0.13 Result: OK</b>	
$V_u / \phi_s V_n$ :	<b>0.04 Result: OK</b>	

## Caisson Strength Capacity

Concrete Compressive Strength ( $f'_c$ ):	3000 psi
Vertical Steel Rebar Size #:	11
Vertical Steel Rebar Area:	1.56 in <sup>2</sup>
# of Vertical Steel Rebars:	78 Minimum # of vertical rebar met
Vertical Steel Rebar Yield Strength ( $F_y$ ):	60 ksi
Horizontal Tie / Stirrup Size #:	5
Horizontal Tie / Stirrup Area:	0.31 in <sup>2</sup>
Horizontal Tie / Stirrup Spacing:	11.0 in
Horizontal Tie / Stirrup Steel Yield Strength ( $F_y$ ):	60 ksi
Rod Bearing Plate Diameter:	8.0 in
Rod Bearing Plate Thickness:	1.0 in
Anchor Bearing Plate Yield Strength:	36 ksi
Anchor Rod Nut Diameter:	2.02 in
Rebar Cage Diameter:	82.0 in
Strength Bending/Tension Reduction Factor ( $\phi_B$ ):	0.90 ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor ( $\phi_V$ ):	0.75 ACI318-05 - 9.3.2.3
Strength Compression/Bearing Reduction Factor ( $\phi_{P/B}$ ):	0.65 ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000 ksi
Design Moment ( $M_u$ ):	1873.5 k-ft
Factored Nominal Moment Capacity ( $\phi_B M_n$ ):	21953.2 k-ft - ACI318-05 - 10.2
$M_u / \phi_B M_n$ :	<b>0.09 Result: OK</b>
Design Shear ( $V_u$ ):	467.9 k
Factored Nominal Shear Capacity ( $\phi_V V_n$ ):	502.8 k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u / \phi_V V_n$ :	<b>0.93 Result: OK</b>
Design Tension ( $T_u$ ):	0.0 k
Factored Nominal Tension Capacity ( $\phi_T T_n$ ):	6570.7 k - ACI318-05 - 10.2
$T_u / \phi_T T_n$ :	<b>0.00 Result: OK</b>
Design Compression ( $P_u$ ):	31.9 k
Factored Nominal Compression Capacity ( $\phi_P P_n$ ):	6161.7 k - ACI318-05 - 10.3.6.2
$P_u / \phi_P P_n$ :	<b>0.01 Result: OK</b>

# **ATTACHMENT 4**



## Unofficial Property Record Card - City of Hartford, CT

### General Property Data

Parcel Identification 144-714-128	Property Location 0289 MOUNTAIN ST HARTFORD
Property Owner METROPOLITAN DISTRICT BUREAU OF PUBLIC WORKS	Property Use WATER SUPPLY
Mailing Address 555 MAIN ST	Most Recent Sale Date 5/1/1990
City HARTFORD	Legal Reference 03061 0053
Mailing State CT Zip 06103-2915	Grantor PRACHNIAKEDWARD J.
ParcelZoning CAMP	Sale Price 250
	Land Area 22.470 acres

### Current Property Assessment

Fiscal Year 2016	Total Value 2,626,260
Land Value 2,616,180	Building Value 5,110

### Building Description

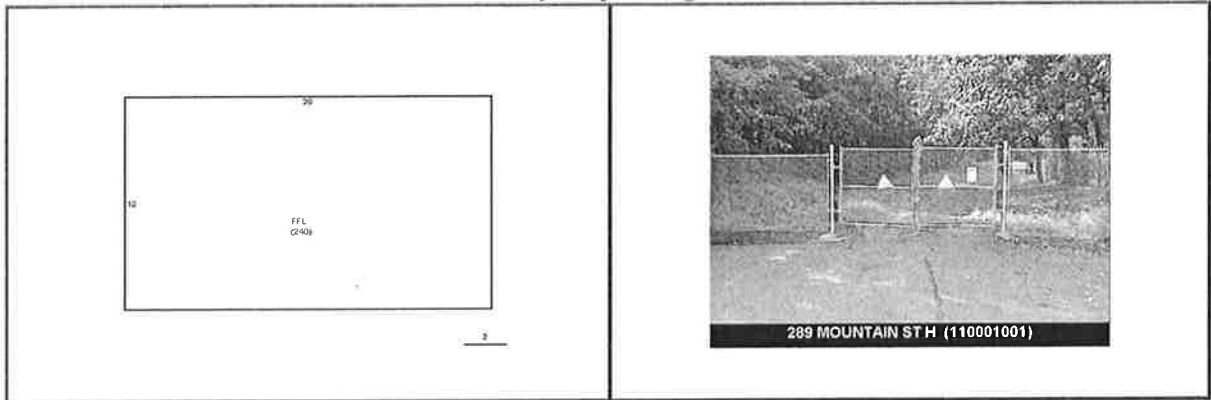
Building Style MFG/PROCESS	Foundation Type Concrete	Flooring Type CONCRETE
# of Living Units 0	Frame Type Wood Frame	Basement Floor N/A
Year Built 1960	Roof Structure GABLE/HIP	Heating Type None
Building Grade Good	Roof Cover Asphalt	Heating Fuel None
Building Condition Average	Siding Brick	Air Conditioning 0%
Finished Area (SF) 240	Interior Walls AVERAGE	# of Bsmt Garages 0
Number Rooms 0	Number Beds 0	# of Full Baths 0
# of 3/4 Baths 0	# of 1/2 Baths 0	# of Other Fixtures 0

### Legal Description

#### Narrative Description of Property

This property contains 22.470 acres of land mainly classified as WATER SUPPLY with a(n) MFG/PROCESS style building, built about 1960 , having Brick exterior and Asphalt roof cover, with 0 unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

### Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranted.

# **ATTACHMENT 5**





**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.	Fee	Special Handling	Parcel Airlift																												
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3 Postmaster, per (name of receiving employee)																																	
USPS® Tracking Number Firm-specific Identifier	<table border="1"> <thead> <tr> <th data-bbox="592 210 673 451">Address (Name, Street, City, State, and ZIP Code™)</th> <th data-bbox="592 451 673 661">Fee</th> <th data-bbox="592 661 673 871">Special Handling</th> <th data-bbox="592 871 673 2068">Parcel Airlift</th> </tr> </thead> <tbody> <tr> <td data-bbox="673 210 803 451">           Luke Bronin, Mayor            City of Hartford            550 Main Street            Hartford, CT 06103         </td> <td data-bbox="673 451 803 661"></td> <td data-bbox="673 661 803 871"></td> <td data-bbox="673 871 803 2068"></td> </tr> <tr> <td data-bbox="803 210 950 451">           Jamie Bratt, Director of Planning and Economic            Development            City of Hartford            250 Constitution Plaza            Hartford, CT 06103         </td> <td data-bbox="803 451 950 661"></td> <td data-bbox="803 661 950 871"></td> <td data-bbox="803 871 950 2068"></td> </tr> <tr> <td data-bbox="950 210 1096 451">           Metropolitan District Commission            565 Main Street            P.O. Box 800            Hartford, CT 06142-0800         </td> <td data-bbox="950 451 1096 661"></td> <td data-bbox="950 661 1096 871"></td> <td data-bbox="950 871 1096 2068"></td> </tr> <tr> <td data-bbox="1096 210 1242 451"></td> <td data-bbox="1096 451 1242 661"></td> <td data-bbox="1096 661 1242 871"></td> <td data-bbox="1096 871 1242 2068"></td> </tr> <tr> <td data-bbox="1242 210 1388 451"></td> <td data-bbox="1242 451 1388 661"></td> <td data-bbox="1242 661 1388 871"></td> <td data-bbox="1242 871 1388 2068"></td> </tr> <tr> <td data-bbox="1388 210 1534 451"></td> <td data-bbox="1388 451 1534 661"></td> <td data-bbox="1388 661 1534 871"></td> <td data-bbox="1388 871 1534 2068"></td> </tr> </tbody> </table>						Address (Name, Street, City, State, and ZIP Code™)	Fee	Special Handling	Parcel Airlift	Luke Bronin, Mayor City of Hartford 550 Main Street Hartford, CT 06103				Jamie Bratt, Director of Planning and Economic Development City of Hartford 250 Constitution Plaza Hartford, CT 06103				Metropolitan District Commission 565 Main Street P.O. Box 800 Hartford, CT 06142-0800															
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