Robinson+Cole

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Also admitted in Massachusetts

June 6, 2017

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**
785 Park Avenue, Bloomfield, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 105-foot level of the existing 136-foot tower at 785 Park Avenue in Bloomfield, Connecticut (the "Property"). The tower is owned by Integrated Wireless Services LLC, ("Integrated Wireless"). The Council approved Cellco's use of this tower in 2002. Cellco now intends to replace six (6) of its existing antennas with three (3) model SBNHH-1D65A, 700/1900 MHz antennas and three (3) model SBNHH-1D65A, 2100 MHz antennas, all at the same 105-foot level on the tower. Cellco also intends to replace three (3) existing remote radio heads ("RRHs") with three (3) newer model RRHs and install three (3) additional RRHs, and two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Philip K. Schenk, Jr., Town Manager of the Town of Bloomfield; Jose Giner, Bloomfield's Planning Director; and Integrated Wireless, the tower owner. The Town of Bloomfield is the owner of the Property.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRH's will be located at the 105-foot level on the 136-foot tower.

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

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

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

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

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

A copy of the parcel map and property owner information is included in Attachment 4.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Philip K. Schenk, Jr., Bloomfield Town Manager
Jose Giner, Bloomfield Planning Director
Integrated Wireless Services LLC
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D65A

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

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

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	13.4	13.5	16.5	16.7	17.2	17.5
Beamwidth, Horizontal, degrees	66	61	70	65	62	61
Beamwidth, Vertical, degrees	17.6	15.9	7.1	6.6	6.2	5.5
Beam Tilt, degrees	0–18	0–18	0–10	0–10	0–10	0–10
USLS (First Lobe), dB	16	13	13	13	12	12
Front-to-Back Ratio at 180°, dB	25	27	28	28	27	29
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	13.1	13.1	16.1	16.5	16.7	17.2
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.5	±0.5	±0.3	±0.5	±0.4
	0 ° | 13.4	0 ° | 13.4	0 ° | 16.0	0 ° | 16.3	0 ° | 16.5	0 ° | 17.0
Gain by Beam Tilt, average, dBi	9 ° | 13.1	9 ° | 13.1	5 ° | 16.2	5 ° | 16.5	5 ° | 16.8	5 ° | 17.3
	18 ° | 12.7	18 ° | 12.7	10 ° | 16.1	10 ° | 16.5	10 ° | 16.6	10 ° | 16.9
Beamwidth, Horizontal Tolerance, degrees	±3.1	±5.4	±2.8	±4	±6.6	±4.6
Beamwidth, Vertical Tolerance, degrees	±1.8	±1.4	±0.3	±0.4	±0.5	±0.3
USLS, beampeak to 20° above beampeak, dB	15	14	15	15	15	14
Front-to-Back Total Power at 180° ± 30°, dB	22	21	26	26	24	25
CPR at Boresight, dB	22	16	22	25	21	22
CPR at Sector, dB	10	6	12	8	5	4

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

General Specifications

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

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground

Product Specifications

SBNHH-1D65A

Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, frontal	445.0 N @ 150 km/h 100.0 lbf @ 150 km/h
Wind Loading, lateral	145.0 N @ 150 km/h 32.6 lbf @ 150 km/h
Wind Loading, rear	523.0 N @ 150 km/h 117.6 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	180.0 mm | 7.1 in
Length	1413.0 mm | 55.6 in
Width	301.0 mm | 11.9 in
Net Weight, without mounting kit	15.2 kg | 33.5 lb

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

Depth	296.0 mm | 11.7 in
Length	1589.0 mm | 62.6 in
Width	390.0 mm | 15.4 in
Shipping Weight	26.1 kg | 57.5 lb

Regulatory Compliance/Certifications

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

Included Products

Product Specifications

SBNHH-1D65A

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.

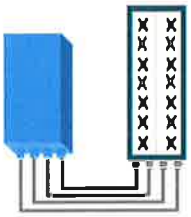
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

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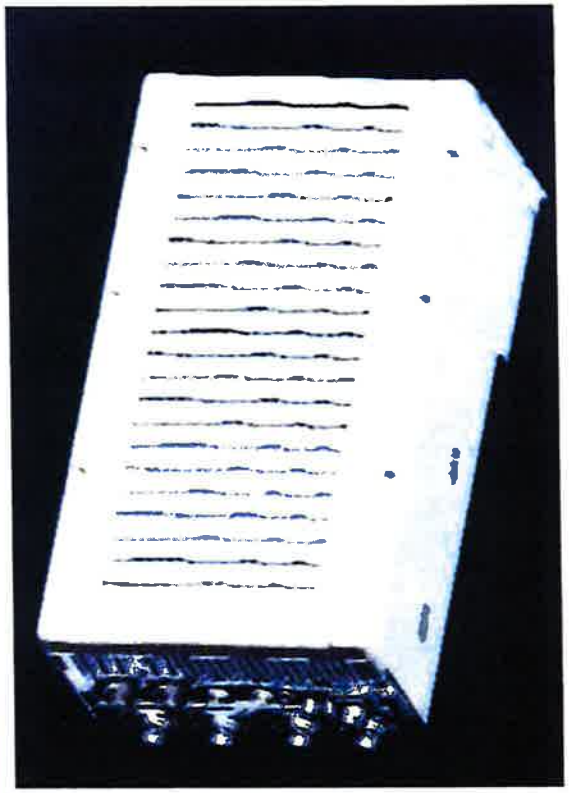
TECHNICAL SPECIFICATIONS

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

NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w)x 9.4" (d)**
Weight	55lb**



**- Includes solar shield but not mounting brackets (8 lbs.)

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The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.

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

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

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

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

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

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

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

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

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

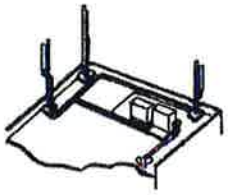
The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

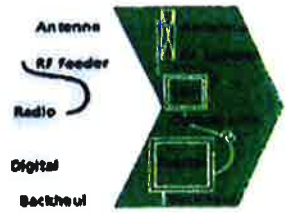
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

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

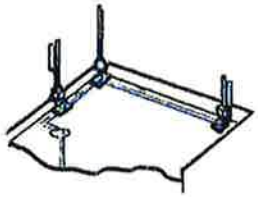
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control
- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

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

Dimensions and weights
- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data
- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics
- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity
- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications
- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data
- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm²(8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

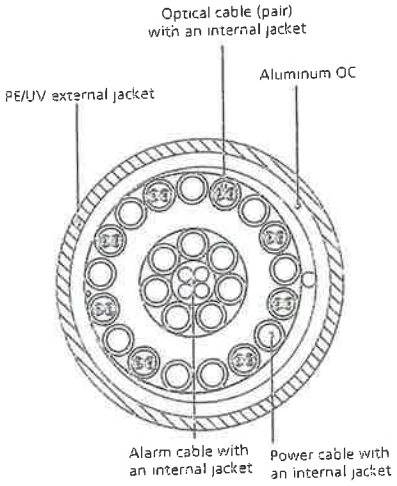


Figure 2: Construction Detail

- This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Bloomfield 3								
Tower Height: 136Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Police UHF	1.25	75	143.5	406	0.0018	0.2707	0.07%	
*Police Back up repeater	1	161	144	453.83	0.0030	0.3026	0.10%	
*Hartford Co. Fire	1	86	147.2	33.94	0.0016	0.2000	0.08%	
*State Police	1	89	72.8	45.86	0.0072	0.2000	0.36%	
*NPSAC	1	35	141.5	821.01	0.0007	0.5473	0.01%	
*RAFS	2	39	94	460.06	0.0036	0.3067	0.12%	
*Nextel	12	100	89	851	0.0626	0.5673	1.10%	
*Clearwire	2	153	115	2496	0.0093	1.0000	0.09%	
*Clearwire	1	211	115	11 GHz	0.0064	1.0000	0.06%	
*T-Mobile PCS/AWS	2	953	138	1900	0.0393	1.0000	0.39%	
*T-Mobile PCS/AWS	4	477	138	2100	0.0393	1.0000	0.39%	
*T-Mobile LTE	1	445	138	700	0.0092	0.4667	0.20%	
Verizon PCS	**3**	**454**	**105**	**0.0444**	**1970**	**1.0000**	**4.44%**	
Verizon Cellular	**8**	**412**	**105**	**0.1075**	**869**	**0.5793**	**18.55%**	
Verizon AWS	**1**	**3500**	**105**	**0.1141**	**2145**	**1.0000**	**11.41%**	
Verizon 700	**1**	**2100**	**105**	**0.0685**	**746**	**0.4973**	**13.77%**	
								51.16%
* Source: Siting Council								

ATTACHMENT 3

STRUCTURAL ANALYSIS REPORT

For

BLOOMFIELD 3 CT

785 PARK AVENUE
BLOOMFIELD, CT 06002

Antennas Mounted to the Monopole

Prepared for:

verizon

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

Dated: May 31, 2017

Prepared by:

Hudson Design Group LLC

1600 Osgood Street Bldg. 20N Suite 3090
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586
www.hudsondesigngroupllc.com

STATE OF CONNECTICUT
No. 22220
LICENSED
PROFESSIONAL ENGINEER

5/31/2017

Hudson Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the 136' monopole supporting the existing Verizon's antennas located at elevation 106' above the ground level.

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

Record drawings of the existing monopole were not available for our use. The previous structural analysis report prepared by Centek Engineering, dated July 14, 2015, was available for our use.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole **IS IN CONFORMANCE** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **68.5%** - (Pole section L1 from EL.88.25' to EL.137' Controlling).

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APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	20' Dipole	143'	Top of Monopole
	PTP 400	142'	Mount Pipe
	(6) Air 21 Antennas	138'	Steel Platform
	(3) LNX-6515DS Antennas	138'	Steel Platform
	(3) KRY 112 TMA	138'	Steel Platform
	(3) RRUS 11	138'	Steel Platform
	(2) LLPX310R Antennas	115'	Side Mount Standoff
	840 10054 Antenna	115'	Side Mount Standoff
	(6) RRH	115'	Side Mount Standoff
	GPS	115'	Side Mount Standoff
	(3) 6' Pipe	115'	Side Mount Standoff
	(3) VHLP1 Dish	115'	Side Mount Standoff
VERIZON	(6) SBNHH-1D65A Antennas	106'	Steel Platform
VERIZON	BXA-70063-6CF Antenna	106'	Steel Platform
VERIZON	(2) BXA-80063-4BF Antennas	106'	Steel Platform
VERIZON	(3) SLCP 2X6014 Antennas	106'	Steel Platform
VERIZON	(3) B13 RRH4X30-4R	106'	Steel Platform
VERIZON	(3) B4 RRH2X60-4R	106'	Steel Platform
VERIZON	(2) DB-T1-6Z-8AB-0Z	110'	Steel Platform
	Empty Steel Platform	95'	
	(3) PTP 400	83'	Mount Pipe

Proposed VERIZON Appurtenances shown in Bold.

VERIZON EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
VERIZON	(12) 1 5/8" Cables	106'	Inside Monopole
VERIZON	(2) Fiber Cables	106'	Outside Monopole

Proposed VERIZON Coax Cables shown in Bold.

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	**68.5 %**	88.25 – 137	PASS	**Controlling**
Pole Section-L2	55.3 %	47.25 – 88.25	PASS	
Pole Section-L3	55.6 %	1 – 47.25	PASS	

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DESIGN CRITERIA:

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

   County: Hartford
   Wind Load: 105 mph (3 second gust)
   Structural Class: II
   Exposure Category: B
   Topographic Category: 1
   Ice Thickness: 1.0 inch

2. Approximate height above grade to antennas: 106'

Calculations and referenced documents are attached

ASSUMPTIONS:

1. The monopole dimensions, member sizes and material strength are as indicated in the previous structural analysis report prepared by Centek Engineering, dated July 14, 2015.

2. The appurtenances configuration is as stated in the previous structural analysis report prepared by Centek Engineering, dated July 14, 2015. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.

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

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

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

6. The foundation of the tower was not checked due to lack of information. As-built foundation drawings and geotechnical report would be required to determine whether the foundation is capable of supporting the proposed loadings.

SUPPORT RECOMMENDATIONS:

HDG recommends that the existing antennas, RRHs and junction boxes be mounted on the existing steel platform supported by the monopole.

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Photo 1: Photo illustrating the Monopole with Appurtenances shown.

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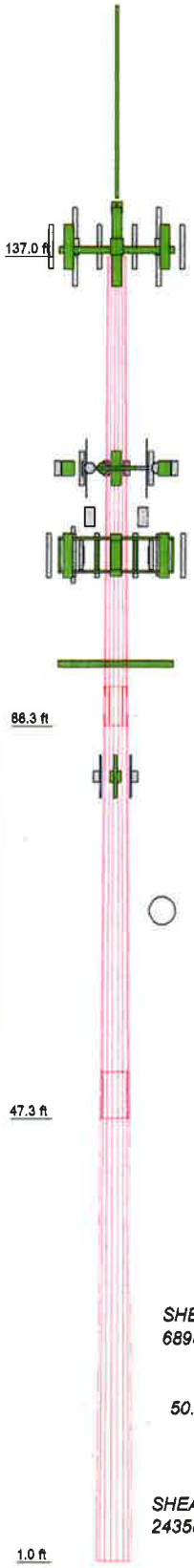
CALCULATIONS

Section	1	2	3
Length (ft)	48.75	45.00	51.00
Number of Sides	18	18	18
Thickness (in)	0.1875	0.3750	0.5000
Socket Length (ft)	4.00	4.75	
Top Dia (in)	23.0000	29.6932	35.3088
Bot Dia (in)	30.7000	36.8100	43.3600
Grade		A607-65	
Weight (lb)	2632.2	5992.0	10695.4

19319.7



ALL REACTIONS ARE FACTORED

AXIAL 79986 lb

SHEAR 6898 lb — *MOMENT 718771 lb-ft*

TORQUE 228 lb-ft

50.0 mph WIND - 1.0000 in ICE

AXIAL 38190 lb

SHEAR 24358 lb — *MOMENT 2434234 lb-ft*

TORQUE 618 lb-ft

REACTIONS - 105.0 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' Dipole	143	Andrew VHLP1	115
PTP 400	142	Andrew VHLP1	115
3"x4.5' pipe	140	Andrew VHLP1	115
(2) Air 21 antenna w/mount pipe	138	RFS DB-T1-6Z-8AB-0Z	110
(2) Air 21 antenna w/mount pipe	138	RFS DB-T1-6Z-8AB-0Z	110
(2) Air 21 antenna w/mount pipe	138	PiROD 13' Platform w/handrail (VERIZON - existing)	106
LNX-6515DS-VTM w/ Mount Pipe	138		
LNX-6515DS-VTM w/ Mount Pipe	138	(2) SBNHH-1D65A w/ Mount Pipe	106
LNX-6515DS-VTM w/ Mount Pipe	138	(2) SBNHH-1D65A w/ Mount Pipe	106
KRY 112 71/2	138	(2) SBNHH-1D65A w/ Mount Pipe	106
KRY 112 71/2	138	BXA-70063-6CF-EDIN w/mount pipe	106
KRY 112 71/2	138	BXA-80063-4BF w/mount pipe	106
RRUS 11	138	BXA-80063-4BF w/mount pipe	106
RRUS 11	138	SLCP 2x6014 w/Pipe Mount	106
RRUS 11	138	SLCP 2x6014 w/Pipe Mount	106
PIROD 13' Low Profile Platform	138	SLCP 2x6014 w/Pipe Mount	106
3"x6' pipe	115	B13 RRH4X30-4R	106
LLPX 310R w/ Mount Pipe	115	B13 RRH4X30-4R	106
LLPX 310R w/ Mount Pipe	115	B13 RRH4X30-4R	106
840-10054 w/mount pipe	115	B4 RRH2X60-4R	106
(2) RRH	115	B4 RRH2X60-4R	106
(2) RRH	115	B4 RRH2X60-4R	106
(2) RRH	115	PiROD 13' Low Profile Platform	95
GPS	115	PTP 400	83
Valmont Light Duty Tri-Bracket (1)	115	3"x4.5' pipe	83
Dual Standoff Mount	115	3"x4.5' pipe	83
Dual Standoff Mount	115	3"x4.5' pipe	83
Dual Standoff Mount	115	PTP 400	83
3"x6' pipe	115	PTP 400	83
3"x6' pipe	115		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 68.5%

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Job: **BLOOMFIELD 3 CT**		
Project: **136 ft Monopole**		
Client: VERIZON	Drawn by: kw	App'd:
Code: TIA-222-G	Date: 05/31/17	Scale: NTS
Path:		Dwg No. E-1

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VERIZON	kw

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 105.0 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56.0 pcf.
A wind speed of 50.0 mph is used in combination with ice.
Temperature drop of 50.0 °F.
Deflections calculated using a wind speed of 60.0 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	137.00-88.25	48.75	4.00	18	23.0000	30.7000	0.1875	0.7500	A607-65 (65 ksi)
L2	88.25-47.25	45.00	4.75	18	29.6932	36.8100	0.3750	1.5000	A607-65 (65 ksi)
L3	47.25-1.00	51.00		18	35.3088	43.3600	0.5000	2.0000	A607-65 (65 ksi)

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
1 5/8	A	Surface Ar (CaAa)	137.00 - 4.00	6	6	0.000 0.000	1.9800		1.04
1 5/8	C	Surface Ar (CaAa)	116.00 - 4.00	1	1	0.000 0.000	1.9800		1.04
1 5/8 Fiber Cable **********	A	Surface Ar (CaAa)	137.00 - 4.00	1	1	0.000 0.000	1.9800		1.04
1 5/8 Fiber Cable (VERIZON - existing)	B	Surface Ar (CaAa)	106.00 - 4.00	2	2	0.000 0.000	1.9800		1.04

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Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8	A	No	Inside Pole	137.00 - 4.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
**********								
1 5/8 (VERIZON - existing)	B	No	Inside Pole	106.00 - 4.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
**********								
CATEGORY 5e (1 WIRE)	C	No	Inside Pole	137.00 - 4.00	1	No Ice	0.00	0.21
						1/2" Ice	0.00	0.21
						1" Ice	0.00	0.21
CATEGORY 5e (1 WIRE)	A	No	Inside Pole	86.00 - 4.00	3	No Ice	0.00	0.21
						1/2" Ice	0.00	0.21
						1" Ice	0.00	0.21
1 5/8	B	No	Inside Pole	137.00 - 4.00	3	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
20' Dipole	C	From Face	1.00	0.0000	143.00	No Ice	7.00	7.00	60.00
			0.00			1/2" Ice	10.04	10.04	115.61
			10.00			1" Ice	12.10	12.10	184.01
PTP 400	C	From Face	1.00	0.0000	142.00	No Ice	1.75	0.48	12.10
			0.00			1/2" Ice	1.92	0.58	23.53
			0.00			1" Ice	2.09	0.69	37.28
3"x4.5' pipe	C	From Face	1.00	0.0000	140.00	No Ice	1.30	1.30	34.00
			0.00			1/2" Ice	1.57	1.57	45.51
			0.00			1" Ice	1.86	1.86	60.28
**********									
LLPX 310R w/ Mount Pipe	A	From Face	3.00	0.0000	115.00	No Ice	4.69	3.15	45.85
			0.00			1/2" Ice	5.07	3.73	85.18
			0.00			1" Ice	5.46	4.32	129.99
LLPX 310R w/ Mount Pipe	B	From Face	3.00	0.0000	115.00	No Ice	4.69	3.15	45.85
			0.00			1/2" Ice	5.07	3.73	85.18
			0.00			1" Ice	5.46	4.32	129.99
840-10054 w/mount pipe	C	From Face	3.00	0.0000	115.00	No Ice	4.81	2.39	46.43
			0.00			1/2" Ice	5.16	2.92	82.55
			0.00			1" Ice	5.53	3.47	123.97
(2) RRH	A	From Face	3.00	0.0000	115.00	No Ice	2.39	1.45	51.00
			0.00			1/2" Ice	2.58	1.61	72.75
			0.00			1" Ice	2.78	1.77	97.53
(2) RRH	B	From Face	3.00	0.0000	115.00	No Ice	2.39	1.45	51.00
			0.00			1/2" Ice	2.58	1.61	72.75
			0.00			1" Ice	2.78	1.77	97.53
(2) RRH	C	From Face	3.00	0.0000	115.00	No Ice	2.39	1.45	51.00

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VERIZON	kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	2.58	1.61	72.75
			0.00			1" Ice	2.78	1.77	97.53
GPS	A	From Face	3.00	0.0000	115.00	No Ice	0.21	0.21	5.00
			0.00			1/2" Ice	0.31	0.31	7.52
			0.00			1" Ice	0.42	0.42	11.31
Valmont Light Duty Tri-Bracket (1)	C	None		0.0000	115.00	No Ice	1.76	1.76	54.00
						1/2" Ice	2.08	2.08	70.00
						1" Ice	2.40	2.40	86.00
Dual Standoff Mount	A	From Face	1.50	0.0000	115.00	No Ice	1.40	0.95	130.00
			0.00			1/2" Ice	1.69	1.15	192.44
			0.00			1" Ice	1.99	1.36	260.52
Dual Standoff Mount	B	From Face	1.50	0.0000	115.00	No Ice	1.40	0.95	130.00
			0.00			1/2" Ice	1.69	1.15	192.44
			0.00			1" Ice	1.99	1.36	260.52
Dual Standoff Mount	C	From Face	1.50	0.0000	115.00	No Ice	1.40	0.95	130.00
			0.00			1/2" Ice	1.69	1.15	192.44
			0.00			1" Ice	1.99	1.36	260.52
3"x6' pipe	A	From Face	2.50	0.0000	115.00	No Ice	1.93	1.93	46.00
			0.00			1/2" Ice	2.29	2.29	61.18
			0.00			1" Ice	2.67	2.67	80.53
3"x6' pipe	B	From Face	2.50	0.0000	115.00	No Ice	1.93	1.93	46.00
			0.00			1/2" Ice	2.29	2.29	61.18
			0.00			1" Ice	2.67	2.67	80.53
3"x6' pipe	C	From Face	2.50	0.0000	115.00	No Ice	1.93	1.93	46.00
			0.00			1/2" Ice	2.29	2.29	61.18
			0.00			1" Ice	2.67	2.67	80.53
**********									
PiROD 13' Platform w/handrail (VERIZON - existing)	A	None		0.0000	106.00	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
(2) SBNHH-1D65A w/ Mount Pipe	A	From Face	4.00	0.0000	106.00	No Ice	6.28	5.34	55.90
			0.00			1/2" Ice	6.76	6.20	111.21
			0.00			1" Ice	7.22	6.93	173.23
(2) SBNHH-1D65A w/ Mount Pipe	B	From Face	4.00	0.0000	106.00	No Ice	6.28	5.34	55.90
			0.00			1/2" Ice	6.76	6.20	111.21
			0.00			1" Ice	7.22	6.93	173.23
(2) SBNHH-1D65A w/ Mount Pipe	C	From Face	4.00	0.0000	106.00	No Ice	6.28	5.34	55.90
			0.00			1/2" Ice	6.76	6.20	111.21
			0.00			1" Ice	7.22	6.93	173.23
BXA-70063-6CF-EDIN w/mount pipe	A	From Face	4.00	0.0000	106.00	No Ice	7.83	5.82	42.55
			0.00			1/2" Ice	8.39	6.99	103.53
			0.00			1" Ice	8.91	7.87	172.25
BXA-80063-4BF w/mount pipe	B	From Face	4.00	0.0000	106.00	No Ice	4.96	3.44	28.25
			0.00			1/2" Ice	5.34	4.04	69.36
			0.00			1" Ice	5.73	4.66	116.23
BXA-80063-4BF w/mount pipe	C	From Face	4.00	0.0000	106.00	No Ice	4.96	3.44	28.25
			0.00			1/2" Ice	5.34	4.04	69.36
			0.00			1" Ice	5.73	4.66	116.23
SLCP 2x6014 w/Pipe Mount	A	From Face	4.00	0.0000	106.00	No Ice	6.62	6.46	38.25
			0.00			1/2" Ice	7.02	7.12	102.02
			0.00			1" Ice	7.42	7.79	172.52
SLCP 2x6014 w/Pipe Mount	B	From Face	4.00	0.0000	106.00	No Ice	6.62	6.46	38.25
			0.00			1/2" Ice	7.02	7.12	102.02
			0.00			1" Ice	7.42	7.79	172.52
SLCP 2x6014 w/Pipe Mount	C	From Face	4.00	0.0000	106.00	No Ice	6.62	6.46	38.25
			0.00			1/2" Ice	7.02	7.12	102.02
			0.00			1" Ice	7.42	7.79	172.52

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VERIZON	kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
B13 RRH4X30-4R	A	From Face	3.00	0.0000	106.00	No Ice	2.16	1.62	57.20
			0.00			1/2" Ice	2.35	1.79	76.81
			0.00			1" Ice	2.55	1.97	99.38
B13 RRH4X30-4R	B	From Face	3.00	0.0000	106.00	No Ice	2.16	1.62	57.20
			0.00			1/2" Ice	2.35	1.79	76.81
			0.00			1" Ice	2.55	1.97	99.38
B13 RRH4X30-4R	C	From Face	3.00	0.0000	106.00	No Ice	2.16	1.62	57.20
			0.00			1/2" Ice	2.35	1.79	76.81
			0.00			1" Ice	2.55	1.97	99.38
B4 RRH2X60-4R	A	From Face	3.00	0.0000	106.00	No Ice	3.50	2.10	60.00
			0.00			1/2" Ice	3.76	2.34	84.31
			0.00			1" Ice	4.03	2.58	112.31
B4 RRH2X60-4R	B	From Face	3.00	0.0000	106.00	No Ice	3.50	2.10	60.00
			0.00			1/2" Ice	3.76	2.34	84.31
			0.00			1" Ice	4.03	2.58	112.31
B4 RRH2X60-4R	C	From Face	3.00	0.0000	106.00	No Ice	3.50	2.10	60.00
			0.00			1/2" Ice	3.76	2.34	84.31
			0.00			1" Ice	4.03	2.58	112.31
RFS DB-T1-6Z-8AB-0Z	A	From Face	2.00	0.0000	110.00	No Ice	4.80	2.00	44.00
			0.00			1/2" Ice	5.07	2.19	80.13
			0.00			1" Ice	5.35	2.39	120.22
RFS DB-T1-6Z-8AB-0Z	B	From Face	2.00	0.0000	110.00	No Ice	4.80	2.00	44.00
			0.00			1/2" Ice	5.07	2.19	80.13
			0.00			1" Ice	5.35	2.39	120.22
**********									
PiROD 13' Low Profile Platform	A	None		0.0000	95.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
**********									
PTP 400	A	From Face	1.00	0.0000	83.00	No Ice	1.75	0.48	12.10
			0.00			1/2" Ice	1.92	0.58	23.53
			0.00			1" Ice	2.09	0.69	37.28
PTP 400	B	From Face	1.00	0.0000	83.00	No Ice	1.75	0.48	12.10
			0.00			1/2" Ice	1.92	0.58	23.53
			0.00			1" Ice	2.09	0.69	37.28
PTP 400	C	From Face	1.00	0.0000	83.00	No Ice	1.75	0.48	12.10
			0.00			1/2" Ice	1.92	0.58	23.53
			0.00			1" Ice	2.09	0.69	37.28
3"x4.5' pipe	A	From Face	0.50	0.0000	83.00	No Ice	1.30	1.30	34.00
			0.00			1/2" Ice	1.57	1.57	45.51
			0.00			1" Ice	1.86	1.86	60.28
3"x4.5' pipe	B	From Face	0.50	0.0000	83.00	No Ice	1.30	1.30	34.00
			0.00			1/2" Ice	1.57	1.57	45.51
			0.00			1" Ice	1.86	1.86	60.28
3"x4.5' pipe	C	From Face	0.50	0.0000	83.00	No Ice	1.30	1.30	34.00
			0.00			1/2" Ice	1.57	1.57	45.51
			0.00			1" Ice	1.86	1.86	60.28
**********									
(2) Air 21 antenna w/mount pipe	A	From Face	4.00	0.0000	138.00	No Ice	6.23	5.58	101.90
			0.00			1/2" Ice	6.71	6.42	158.52
			0.00			1" Ice	7.17	7.13	221.83
(2) Air 21 antenna w/mount pipe	B	From Face	4.00	0.0000	138.00	No Ice	6.23	5.58	101.90
			0.00			1/2" Ice	6.71	6.42	158.52
			0.00			1" Ice	7.17	7.13	221.83
(2) Air 21 antenna w/mount pipe	C	From Face	4.00	0.0000	138.00	No Ice	6.23	5.58	101.90
			0.00			1/2" Ice	6.71	6.42	158.52
			0.00			1" Ice	7.17	7.13	221.83

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136 ft Monopole	15:35:19 05/31/17
Client	**Designed by**
VERIZON	kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
LNX-6515DS-VTM w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.67 12.39 13.12	9.83 11.35 12.90	83.15 172.72 272.25
LNX-6515DS-VTM w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.67 12.39 13.12	9.83 11.35 12.90	83.15 172.72 272.25
LNX-6515DS-VTM w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.67 12.39 13.12	9.83 11.35 12.90	83.15 172.72 272.25
KRY 112 71/2	A	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.45 0.54 0.64	13.20 18.69 25.81
KRY 112 71/2	B	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.45 0.54 0.64	13.20 18.69 25.81
KRY 112 71/2	C	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.45 0.54 0.64	13.20 18.69 25.81
RRUS 11	A	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	50.70 71.50 95.33
RRUS 11	B	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	50.70 71.50 95.33
RRUS 11	C	From Face	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	50.70 71.50 95.33
PiROD 13' Low Profile Platform	A	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice	15.70 20.10 24.50	15.70 20.10 24.50	1300.00 1765.00 2230.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
Andrew VHLP1	A	Paraboloid w/Radome	From Face	3.00 1.50 0.00	0.0000		115.00	1.25	No Ice 1/2" Ice 1" Ice	1.23 1.40 1.58	14.00 27.00 40.00
Andrew VHLP1	B	Paraboloid w/Radome	From Face	3.00 1.50 0.00	0.0000		115.00	1.25	No Ice 1/2" Ice 1" Ice	1.23 1.40 1.58	14.00 27.00 40.00
Andrew VHLP1	C	Paraboloid w/Radome	From Face	3.00 1.50 0.00	0.0000		115.00	1.25	No Ice 1/2" Ice 1" Ice	1.23 1.40 1.58	14.00 27.00 40.00

Load Combinations

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

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	34	79986.08	3448.72	-5974.02
	Max. H_x	20	38189.73	23771.96	17.71

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. H_z	2	38189.73	9.94	23721.33
	Max. M_x	2	2369580.55	9.94	23721.33
	Max. M_z	8	2370739.32	-23771.96	-2.17
	Max. Torsion	24	617.92	11901.31	20556.15
	Min. Vert	13	28642.30	-11887.86	-20563.92
	Min. H_x	8	38189.73	-23771.96	-2.17
	Min. H_z	14	38189.73	-9.94	-23741.98
	Min. M_x	14	-2370360.68	-9.94	-23741.98
	Min. M_z	20	-2373289.38	23771.96	17.71
	Min. Torsion	12	-576.05	-11887.86	-20563.92

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	31824.78	0.00	0.00	-668.51	1019.12	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	38189.73	-9.94	-23721.33	-2369580.55	2356.94	-583.98
0.9 Dead+1.6 Wind 0 deg - No Ice	28642.30	-9.94	-23721.32	-2346318.16	2016.84	-584.15
1.2 Dead+1.6 Wind 30 deg - No Ice	38189.73	12195.10	-21084.89	-2108322.29	-1216746.47	-378.04
0.9 Dead+1.6 Wind 30 deg - No Ice	28642.30	12195.10	-21084.89	-2087621.21	-1205246.94	-381.86
1.2 Dead+1.6 Wind 60 deg - No Ice	38189.73	20588.23	-11862.38	-1185497.86	-2053133.21	-154.17
0.9 Dead+1.6 Wind 60 deg - No Ice	28642.30	20588.23	-11862.38	-1173752.90	-2033487.57	-160.58
1.2 Dead+1.6 Wind 90 deg - No Ice	38189.73	23771.96	2.17	-671.74	-2370739.32	75.96
0.9 Dead+1.6 Wind 90 deg - No Ice	28642.30	23771.95	2.17	-457.99	-2348010.27	68.42
1.2 Dead+1.6 Wind 120 deg - No Ice	38189.73	20580.29	11869.27	1184483.89	-2052101.56	372.43
0.9 Dead+1.6 Wind 120 deg - No Ice	28642.30	20580.29	11869.27	1173162.58	-2032466.04	365.81
1.2 Dead+1.6 Wind 150 deg - No Ice	38189.73	11887.86	20563.92	2052967.39	-1184874.75	576.05
0.9 Dead+1.6 Wind 150 deg - No Ice	28642.30	11887.86	20563.92	2033192.62	-1173671.56	572.30
1.2 Dead+1.6 Wind 180 deg - No Ice	38189.73	9.94	23741.98	2370360.68	193.12	524.66
0.9 Dead+1.6 Wind 180 deg - No Ice	28642.30	9.94	23741.97	2347501.27	-126.76	524.82
1.2 Dead+1.6 Wind 210 deg - No Ice	38189.73	-12181.65	21092.66	2107580.01	1217706.68	287.24
0.9 Dead+1.6 Wind 210 deg - No Ice	28642.30	-12181.65	21092.66	2087297.72	1205562.07	291.37
1.2 Dead+1.6 Wind 240 deg - No Ice	38189.73	-20570.35	11852.05	1182610.89	2053573.59	69.12
0.9 Dead+1.6 Wind 240 deg - No Ice	28642.30	-20570.35	11852.05	1171307.38	2033288.08	75.90
1.2 Dead+1.6 Wind 270 deg - No Ice	38189.73	-23771.96	-17.71	-2836.56	2373289.38	-143.50
0.9 Dead+1.6 Wind 270 deg -	28642.30	-23771.95	-17.71	-2602.32	2349900.48	-135.95

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
No Ice						
1.2 Dead+1.6 Wind 300 deg - No Ice	38189.73	-20598.17	-11879.60	-1187370.13	2056761.71	-408.98
0.9 Dead+1.6 Wind 300 deg - No Ice	28642.30	-20598.17	-11879.60	-1175607.67	2036446.17	-402.71
1.2 Dead+1.6 Wind 330 deg - No Ice	38189.73	-11901.31	-20556.15	-2053709.64	1189014.80	-617.92
0.9 Dead+1.6 Wind 330 deg - No Ice	28642.30	-11901.31	-20556.15	-2033516.17	1177136.78	-614.48
1.2 Dead+1.0 Ice+1.0 Temp	79986.08	-0.01	-0.01	-4470.04	7568.06	-0.79
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	79986.08	1.02	-6285.76	-660926.04	7556.01	-146.09
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	79986.08	3451.96	-5972.15	-626778.78	-351824.19	-19.98
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	79986.08	5450.51	-3146.25	-333150.63	-561217.25	86.64
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	79986.08	6291.42	-2.89	-4890.08	-648942.16	160.96
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	79986.08	5445.18	3142.00	323563.52	-560551.47	213.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	79986.08	3143.21	5446.90	564347.21	-320325.22	211.24
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	79986.08	-1.02	6290.74	652499.47	7793.12	129.79
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	79986.08	-3448.72	5974.02	617954.33	366761.22	0.99
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	79986.08	-5446.20	3143.76	323767.47	576017.27	-103.99
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	79986.08	-6291.42	-0.86	-4653.22	664288.77	-178.71
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	79986.08	-5449.49	-3144.49	-332944.35	576446.00	-228.19
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	79986.08	-3146.45	-5445.03	-573169.72	336084.88	-227.94
Dead+Wind 0 deg - Service	31824.78	-1.82	-4331.50	-430903.43	1255.77	-107.65
Dead+Wind 30 deg - Service	31824.78	2226.82	-3850.09	-383477.24	-220172.80	-68.13
Dead+Wind 60 deg - Service	31824.78	3759.40	-2166.06	-215849.04	-372063.32	-27.15
Dead+Wind 90 deg - Service	31824.78	4340.74	0.40	-661.33	-429747.87	13.26
Dead+Wind 120 deg - Service	31824.78	3757.95	2167.32	214585.86	-371875.24	66.16
Dead+Wind 150 deg - Service	31824.78	2170.72	3754.96	372320.05	-214369.85	103.94
Dead+Wind 180 deg - Service	31824.78	1.82	4335.27	429966.31	862.67	96.54
Dead+Wind 210 deg - Service	31824.78	-2224.36	3851.51	382262.95	222001.88	55.03
Dead+Wind 240 deg - Service	31824.78	-3756.13	2164.18	214245.41	373797.15	15.20
Dead+Wind 270 deg - Service	31824.78	-4340.74	-3.23	-1054.46	431866.32	-25.59
Dead+Wind 300 deg - Service	31824.78	-3761.21	-2169.21	-216189.48	374378.29	-76.53
Dead+Wind 330 deg - Service	31824.78	-2173.17	-3753.54	-373534.34	216777.65	-115.42

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-31824.78	0.00	0.00	31824.78	0.00	0.000%
2	-9.94	-38189.73	-23721.32	9.94	38189.73	23721.33	0.000%
3	-9.94	-28642.30	-23721.32	9.94	28642.30	23721.32	0.000%
4	12195.10	-38189.73	-21084.89	-12195.10	38189.73	21084.89	0.000%
5	12195.10	-28642.30	-21084.89	-12195.10	28642.30	21084.89	0.000%

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	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
6	20588.23	-38189.73	-11862.38	-20588.23	38189.73	11862.38	0.000%
7	20588.23	-28642.30	-11862.38	-20588.23	28642.30	11862.38	0.000%
8	23771.95	-38189.73	2.17	-23771.96	38189.73	-2.17	0.000%
9	23771.95	-28642.30	2.17	-23771.95	28642.30	-2.17	0.000%
10	20580.29	-38189.73	11869.27	-20580.29	38189.73	-11869.27	0.000%
11	20580.29	-28642.30	11869.27	-20580.29	28642.30	-11869.27	0.000%
12	11887.86	-38189.73	20563.92	-11887.86	38189.73	-20563.92	0.000%
13	11887.86	-28642.30	20563.92	-11887.86	28642.30	-20563.92	0.000%
14	9.94	-38189.73	23741.97	-9.94	38189.73	-23741.98	0.000%
15	9.94	-28642.30	23741.97	-9.94	28642.30	-23741.97	0.000%
16	-12181.65	-38189.73	21092.66	12181.65	38189.73	-21092.66	0.000%
17	-12181.65	-28642.30	21092.66	12181.65	28642.30	-21092.66	0.000%
18	-20570.35	-38189.73	11852.05	20570.35	38189.73	-11852.05	0.000%
19	-20570.35	-28642.30	11852.05	20570.35	28642.30	-11852.05	0.000%
20	-23771.95	-38189.73	-17.71	23771.96	38189.73	17.71	0.000%
21	-23771.95	-28642.30	-17.71	23771.95	28642.30	17.71	0.000%
22	-20598.17	-38189.73	-11879.60	20598.17	38189.73	11879.60	0.000%
23	-20598.17	-28642.30	-11879.60	20598.17	28642.30	11879.60	0.000%
24	-11901.31	-38189.73	-20556.15	11901.31	38189.73	20556.15	0.000%
25	-11901.31	-28642.30	-20556.15	11901.31	28642.30	20556.15	0.000%
26	0.00	-79986.08	0.00	0.01	79986.08	0.01	0.000%
27	1.02	-79986.08	-6285.65	-1.02	79986.08	6285.76	0.000%
28	3451.90	-79986.08	-5972.04	-3451.96	79986.08	5972.15	0.000%
29	5450.41	-79986.08	-3146.19	-5450.51	79986.08	3146.25	0.000%
30	6291.31	-79986.08	-2.89	-6291.42	79986.08	2.89	0.000%
31	5445.08	-79986.08	3141.94	-5445.18	79986.08	-3142.00	0.000%
32	3143.15	-79986.08	5446.80	-3143.21	79986.08	-5446.90	0.000%
33	-1.02	-79986.08	6290.62	1.02	79986.08	-6290.74	0.000%
34	-3448.65	-79986.08	5973.91	3448.72	79986.08	-5974.02	0.000%
35	-5446.10	-79986.08	3143.70	5446.20	79986.08	-3143.76	0.000%
36	-6291.31	-79986.08	-0.86	6291.42	79986.08	0.86	0.000%
37	-5449.39	-79986.08	-3144.43	5449.49	79986.08	3144.49	0.000%
38	-3146.39	-79986.08	-5444.93	3146.45	79986.08	5445.03	0.000%
39	-1.82	-31824.78	-4331.50	1.82	31824.78	4331.50	0.000%
40	2226.82	-31824.78	-3850.09	-2226.82	31824.78	3850.09	0.000%
41	3759.40	-31824.78	-2166.06	-3759.40	31824.78	2166.06	0.000%
42	4340.74	-31824.78	0.40	-4340.74	31824.78	-0.40	0.000%
43	3757.95	-31824.78	2167.32	-3757.95	31824.78	-2167.32	0.000%
44	2170.72	-31824.78	3754.96	-2170.72	31824.78	-3754.96	0.000%
45	1.82	-31824.78	4335.27	-1.82	31824.78	-4335.27	0.000%
46	-2224.36	-31824.78	3851.51	2224.36	31824.78	-3851.51	0.000%
47	-3756.13	-31824.78	2164.18	3756.13	31824.78	-2164.18	0.000%
48	-4340.74	-31824.78	-3.23	4340.74	31824.78	3.23	0.000%
49	-3761.21	-31824.78	-2169.21	3761.21	31824.78	2169.21	0.000%
50	-2173.17	-31824.78	-3753.54	2173.17	31824.78	3753.54	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	137 - 88.25	15.3095	46	0.9880	0.0017
L2	92.25 - 47.25	6.9555	40	0.7147	0.0004
L3	52 - 1	2.1750	40	0.3903	0.0002

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Critical Deflections and Radius of Curvature - Service Wind

Elevation *ft*	*Appurtenance*	*Gov. Load Comb.*	*Deflection* *in*	*Tilt* °	*Twist* °	*Radius of Curvature* *ft*
143.00	20' Dipole	46	15.3095	0.9880	0.0018	56421
142.00	PTP 400	46	15.3095	0.9880	0.0018	56421
140.00	3"x4.5' pipe	46	15.3095	0.9880	0.0018	56421
138.00	(2) Air 21 antenna w/mount pipe	46	15.3095	0.9880	0.0018	56421
115.00	Andrew VHLP1	46	10.9653	0.8632	0.0010	12822
110.00	RFS DB-T1-6Z-8AB-0Z	46	10.0249	0.8329	0.0009	10448
106.00	PiROD 13' Platform w/handrail	46	9.2930	0.8079	0.0008	9099
95.00	PiROD 13' Low Profile Platform	40	7.3976	0.7344	0.0005	6727
83.00	PTP 400	40	5.5740	0.6449	0.0004	6170

Section Capacity Table

Section No.	*Elevation* *ft*	*Component Type*	*Size*	*Critical Element*	*P* *lb*	*øP$_{allow}$* *lb*	*% Capacity*	*Pass Fail*
L1	137 - 88.25	Pole	TP30.7x23x0.1875	1	-12370.40	1124710.00	68.5	Pass
L2	88.25 - 47.25	Pole	TP36.81x29.6932x0.375	2	-21451.60	3155500.00	55.3	Pass
L3	47.25 - 1	Pole	TP43.36x35.3088x0.5	3	-38166.90	5053460.00	55.6	Pass
							Summary	
						Pole (L1)	68.5	Pass
						RATING =	**68.5**	**Pass**

Hudson Design Group LLC

May 9, 2017

verizon

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

RE: Site Name: Bloomfield 3 CT
Site Address: 785 Park Avenue
Bloomfield, CT 06002

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by VERIZON to perform a mount analysis on the existing VERIZON antenna mount to determine its capability of supporting the following equipment loading:

- **(6) SBNHH-1D65A Antennas (55"x11.9"x7.1" – Wt. = 41 lbs/each)**
- **(1) BXA-70063-6CF Antenna (71"x11.2"x5.2" – Wt. = 17 lbs)**
- **(2) BXA-80063-4BF Antennas (47.4"x11.2"x4.5" – Wt. = 10 lbs/each)**
- **(3) SLCP-2X6014 Antennas (53"x14"x11" – Wt. = 20 lbs/each)**
- **(3) B13 RRH4X30-4R RRH's (21.6"x12.0"x9.0" – Wt. = 57 lbs/each)**
- **(3) B4 RRH2X60-4R RRH's (37"x11"x6" – Wt. = 75 lbs/each)**
- **(2) DB-T1-6Z-8AB-0Z (23.0"x15.7"x10.3" – Wt. = 27 lbs/each) (separate mount)**

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing Verizon antenna mounts on May 4, 2017.

Based on our analysis, we have determined that the existing antenna mounts **ARE CAPABLE** of supporting the existing appurtenance loading with the following modifications:

- **Install a new platform reinforcement kit P/N PRK-1245L (or approved equal).**
- **Install a new handrail kit P/N HRK14 (or approved equal).**

This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the International Building Code 2012 with 2016 CTSBC Amendments.

Reference Documents:

- Mount mapping data prepared by ProVertic LLC dated May 4, 2017.
- Tower Structural Analysis prepared by Centek Engineering dated July 14, 2015.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mounts have been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to VERIZON's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting structure.

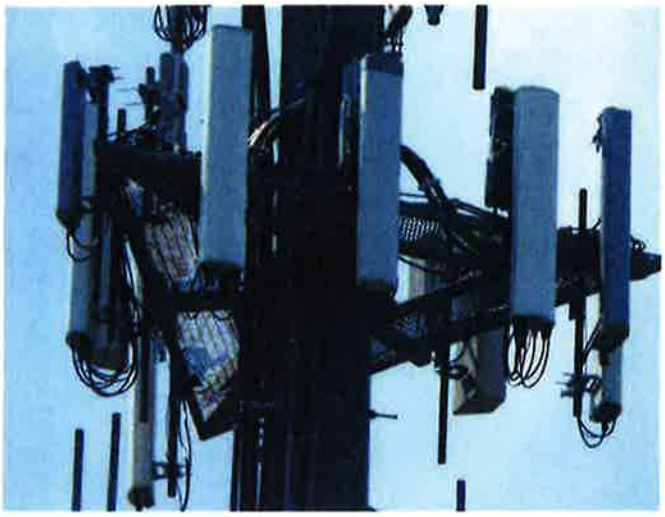
Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Structural Dept. Head

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:



Hudson Design Group LLC

Wind & Ice Calculations

p: 978.557.5553 f: 978.336.5586 a: 1600 Osgood Street, Building 20 North, Suite 3090, N. Andover, MA 01845
p: 413.588.8139 f: 413.517.0590 a: 116 Pleasant Street, Ste 302, Easthampton, MA 01027

Date: 05-09-2017
Project Name: Bloomfield 3 CT
Designed By: GH **Checked By:** MSC

Hudson Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z= 106 (ft)
z_g= 1200 (ft)
α= 7.0

K_z= 1.005

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_e K_t/K_h)]^2$ $K_h = e^{(f*z/H)}$

K_{zt}= #DIV/0!

(If Category 1 then K_{zt} =1.0)

Category= 1

K_h= #DIV/0!
K_e= 0 (from Table 2-4)
K_t= 0 (from Table 2-5)
f= 0 (from Table 2-5)
z= 106
H= 0 (Ht. of the crest above surrounding terrain)
K_{zt}= 1.00

Date: 05-09-2017
Project Name: Bloomfield 3 CT
Designed By: GH **Checked By:** MSC

Hudson Design Group LLC

2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h= 136 **Gh= 0.85**

2.6.7.2 Guyed Masts **Gh= 0.85**

2.6.7.3 Pole Structures **Gh= 1.1**

2.6.9 Appurtenances **Gh= 1.0**

2.6.7.4 Structures Supported on Other Structures
(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh= 1.35 **Gh= 1.00**

2.6.9.2 Design Wind Force on Appurtenances

$$F = q_z * G_h * (EPA)_A$$

$$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$$

K_z=	1.005
K_{zt}=	1.0
K_d=	0.95
V_{max}=	105
$V_{max\ (Ice)}$=	50
I=	1.00

q_z= 26.94
$q_{z\ (Ice)}$= 6.11

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

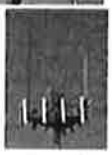
WIND LOADS

Angle = 60 (deg) **Ice Thickness =** 1 in.

WIND LOADS WITH NO ICE:

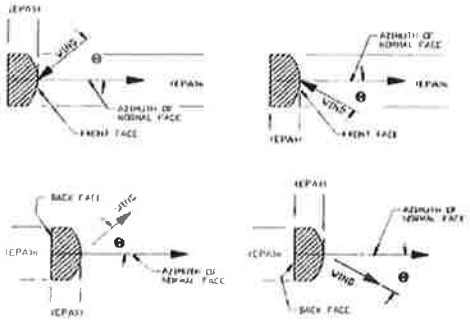
Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
SBNHH-1D65A	55.0	11.9	7.1	4.55	2.71	4.62	7.75	1.29	1.42	158	104	118
BXA-70063-6CF	71.0	11.2	5.2	5.52	2.56	6.34	13.65	1.37	1.62	204	112	135
BXA-80063-4BF	47.4	11.2	4.5	3.69	1.48	4.23	10.53	1.28	1.52	127	61	77
SLCP-2X6014	53.0	14.0	11.0	5.15	4.05	3.79	4.82	1.26	1.30	175	142	150
B13 RRH4X30-4R	21.6	12.0	9.0	1.80	1.35	1.80	2.40	1.20	1.20	58	44	47
B4 RRH2X60-4R	37.0	11.0	6.0	2.89	1.54	3.36	6.17	1.24	1.36	94	57	66
DB-T1-6Z-8AB-0Z	23.0	15.7	10.3	2.51	1.65	1.46	2.23	1.20	1.20	81	53	60
WIND LOADS WITH 1" ICE:												
SBNHH-1D65A	57.0	13.9	9.1	5.50	3.60	4.10	6.26	1.27	1.37	43	30	33
BXA-70063-6CF	73.0	13.2	7.2	6.69	3.65	5.53	10.14	1.33	1.50	55	34	39
BXA-80063-4BF	49.4	13.2	6.5	4.53	2.23	3.74	7.60	1.26	1.42	35	19	23
SLCP-2X6014	55.0	16.0	13.0	6.11	4.97	3.44	4.23	1.24	1.28	46	39	41
B13 RRH4X30-4R	23.6	14.0	11.0	2.29	1.80	1.69	2.15	1.20	1.20	17	13	14
B4 RRH2X60-4R	39.0	13.0	8.0	3.52	2.17	3.00	4.88	1.22	1.31	26	17	20
DB-T1-6Z-8AB-0Z	25.0	17.7	12.3	3.07	2.14	1.41	2.03	1.20	1.20	23	16	17

Antenna Loads



- Area calculations derived utilizing a standardized approach
- Less latitude for the designer.
- Must include antenna pipes – Depends on the direction under consideration
- Design Wind Force on Appurtenances
  - The design wind force on appurtenances (either discrete or linear but excluding microwave antennas), F_A, shall be determined from the equation:
  - $F_A = q_z G_h (EPA)_A$
  - Where $(EPA)_A = K_a[(EPA)_N \cos^2(\theta) + (EPA)_T \sin^2(\theta)]$
    - $(EPA)_N = \Sigma(C_a A_A)_N$
    - $(EPA)_T = \Sigma(C_a A_A)_T$
- Equivalent flat plate areas based on Revision C of this Standard shall be multiplied by a force coefficient, C_a, equal to 2.0 except when the appurtenance is made up of **round members only**, a force coefficient of 1.8 may be applied.

Appurtenances



ICE WEIGHT CALCULATIONS

Project: Bloomfield 3 CT

Thickness of ice:	1 in.
Density of ice:	56 pcf

SBNHH-1D65A Antenna

Weight of ice based on total radial SF area:

Depth (in):	7.1	
height (in):	55	
Width (in):	11.9	
Total weight of ice on object:		83 lbs
Weight of object:	41 lbs	
Combined weight of ice and object:		124 lbs

BXA-70063-6CF Antenna

Weight of ice based on total radial SF area:

Depth (in):	5.2	
height (in):	71	
Width (in):	11.2	
Total weight of ice on object:		91 lbs
Weight of object:	17 lbs	
Combined weight of ice and object:		108 lbs

BXA-80063-4BF Antenna

Weight of ice based on total radial SF area:

Depth (in):	4.5	
height (in):	47.4	
Width (in):	11.2	
Total weight of ice on object:		60 lbs
Weight of object:	10 lbs	
Combined weight of ice and object:		70 lbs

SLCP-2X6014 Antenna

Weight of ice based on total radial SF area:

Depth (in):	11	
height (in):	53	
Width (in):	14	
Total weight of ice on object:		106 lbs
Weight of object:	20 lbs	
Combined weight of ice and object:		126 lbs

2-3/8" Pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		3 plf

B13 RRH4X30-4R RRH

Weight of ice based on total radial SF area:

Depth (in):	9	
height (in):	21.6	
Width (in):	12	
Total weight of ice on object:		42 lbs
Weight of object:	57 lbs	
Combined weight of ice and object:		99 lbs

B4 RRH2X60-4R RRH

Weight of ice based on total radial SF area:

Depth (in):	6	
height (in):	37	
Width (in):	11	
Total weight of ice on object:		52 lbs
Weight of object:	75 lbs	
Combined weight of ice and object:		127 lbs

DB-T1-6Z-8AB-0Z

Weight of ice based on total radial SF area:

Depth (in):	10.3	
height (in):	23	
Width (in):	15.7	
Total weight of ice on object:		56 lbs
Weight of object:	27 lbs	
Combined weight of ice and object:		83 lbs

3x3x1/4 Angle

Weight of ice based on total radial SF area:

Depth (in):	0.25	
height (in):	12	
Width (in):	6	
Per foot weight of ice on object:		5 plf

4x4 HSS

Weight of ice based on total radial SF area:

Depth (in):	4	
height (in):	12	
Width (in):	4	
Per foot weight of ice on object:		6 plf

Hudson Design Group LLC

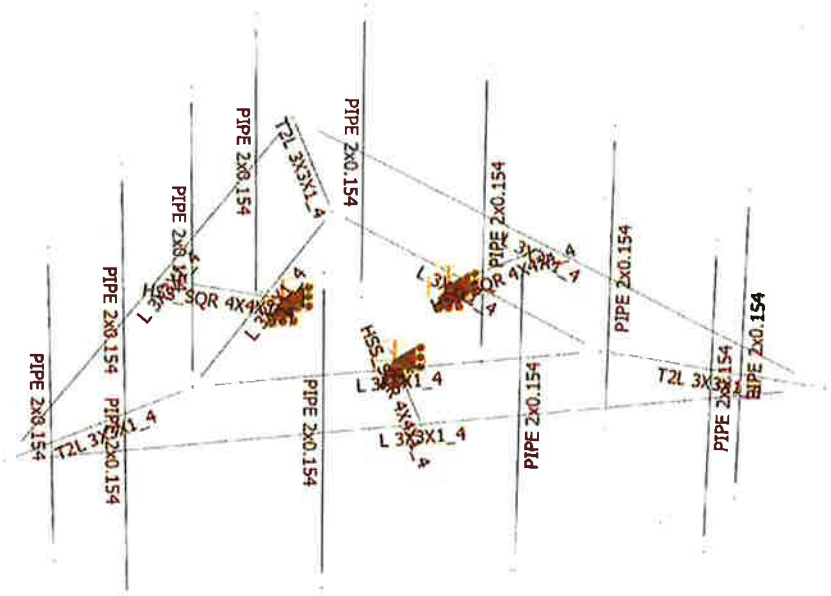
Antenna Mount Calculations
(EXISTING CONDITIONS)

p: 978.557.5553 f: 978.336.5586 a: 1600 Osgood Street, Building 20 North, Suite 3090, N. Andover, MA 01845
p: 413.588.8139 f: 413.517.0590 a: 116 Pleasant Street, Ste 302, Easthampton, MA 01027

Bentley

Current Date: 5/9/2017 3:01 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\VERIZON\CT\Bloomfield 3 CT\Bloomfield 3 CT.etz\

EXISTING MOUNT CONDITIONS



EXISTING MOUNT CONDITIONS

Bentley

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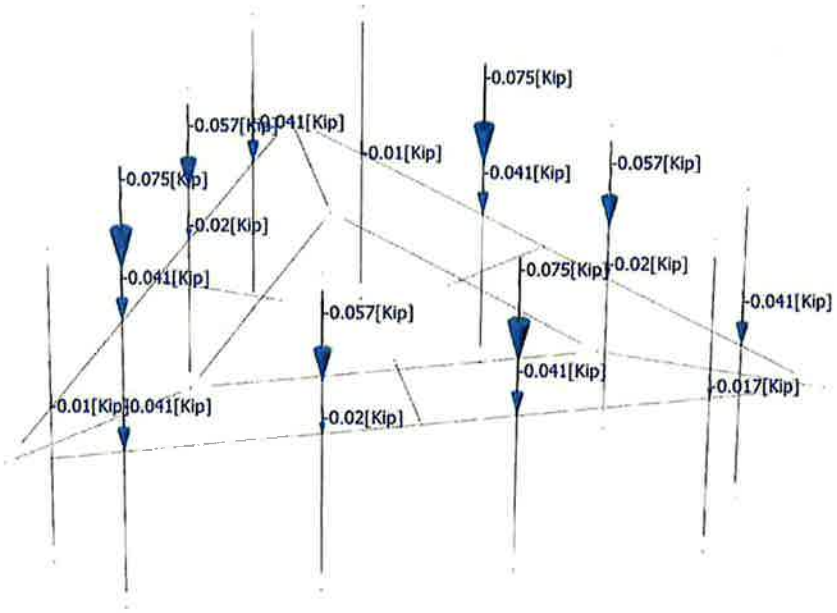
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\VERIZON\CT\Bloomfield 3 CT\Bloomfield 3 CT.etz\
Load condition: DL=Dead Load

Loads

Concentrated - Members



EXISTING MOUNT CONDITIONS

Bentley

Current Date: 5/9/2017 3:01 PM
Units system: English
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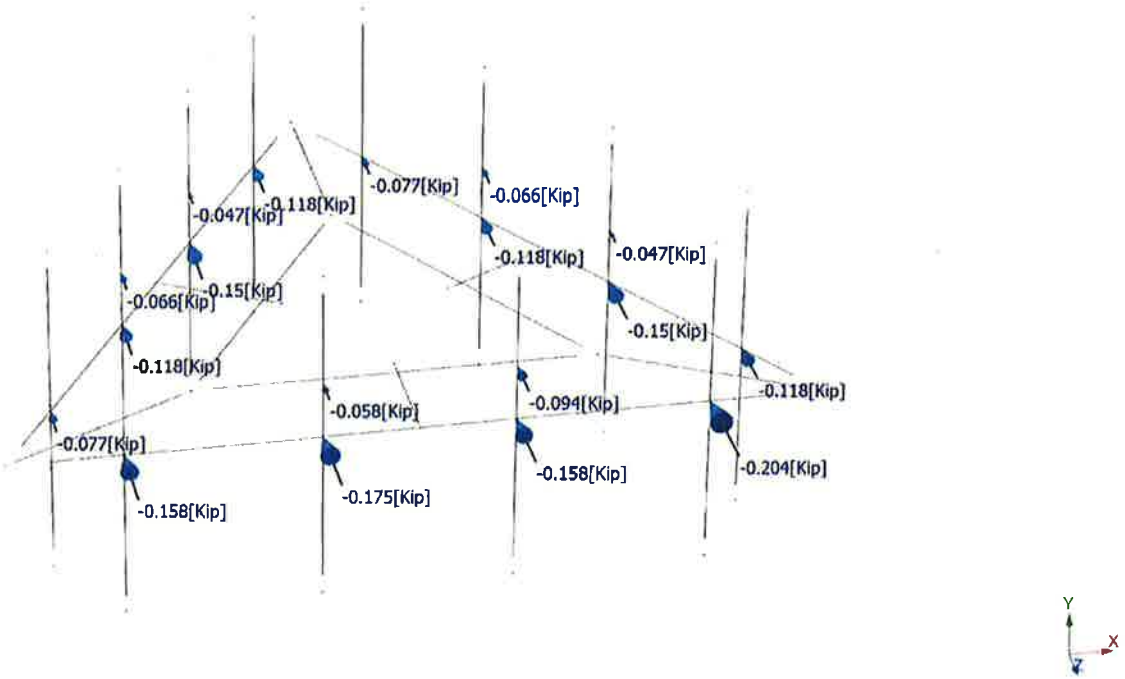
Load condition: Wo=Wind Load (No Ice)



EXISTING MOUNT CONDITIONS

Bentley

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Units system: English
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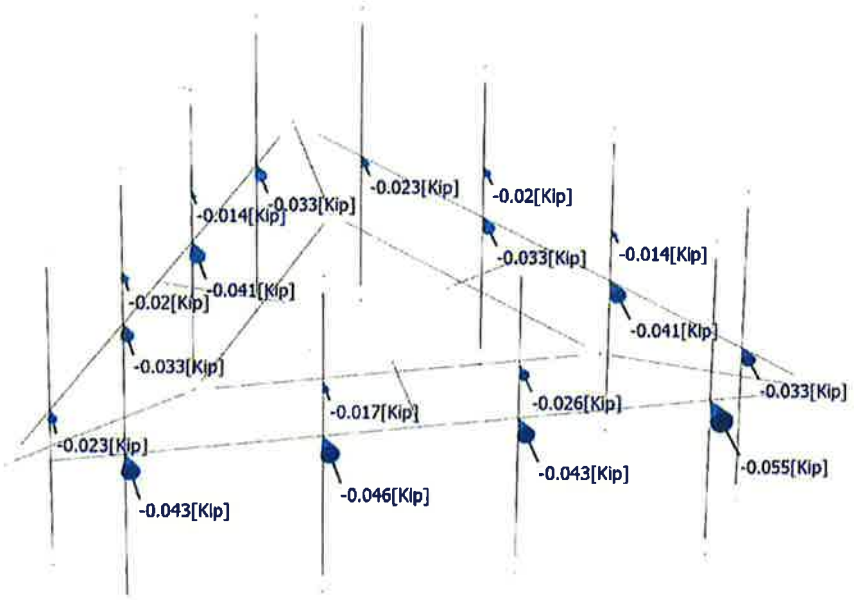
Load condition: Wi=Wind Load (With Ice)

Loads

Concentrated - Members



EXISTING MOUNT CONDITIONS

Bentley

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Units system: English
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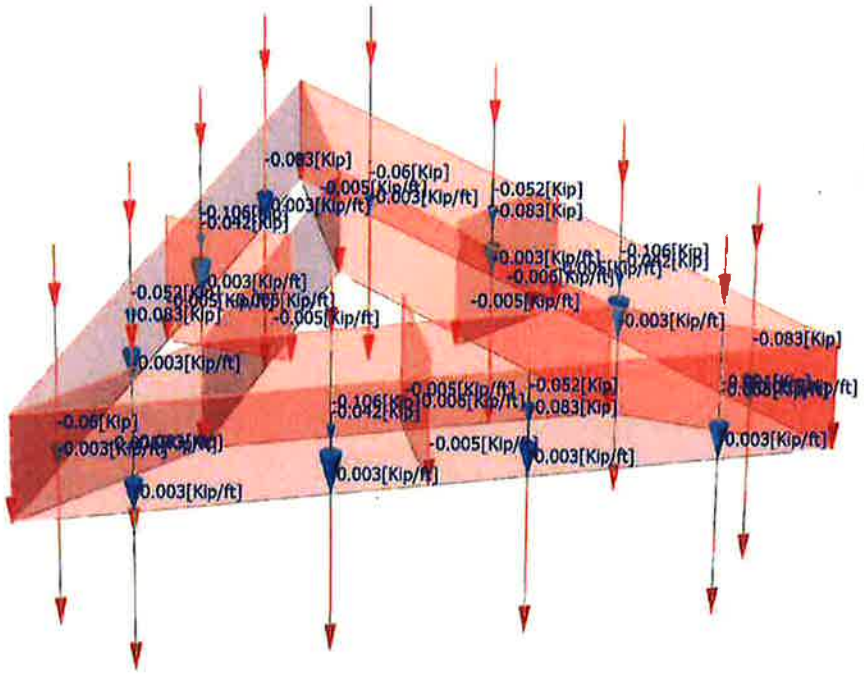
Load condition: Di=Ice Load

Loads

- Global distributed - Members
- Local distributed - Members
- Concentrated - Members



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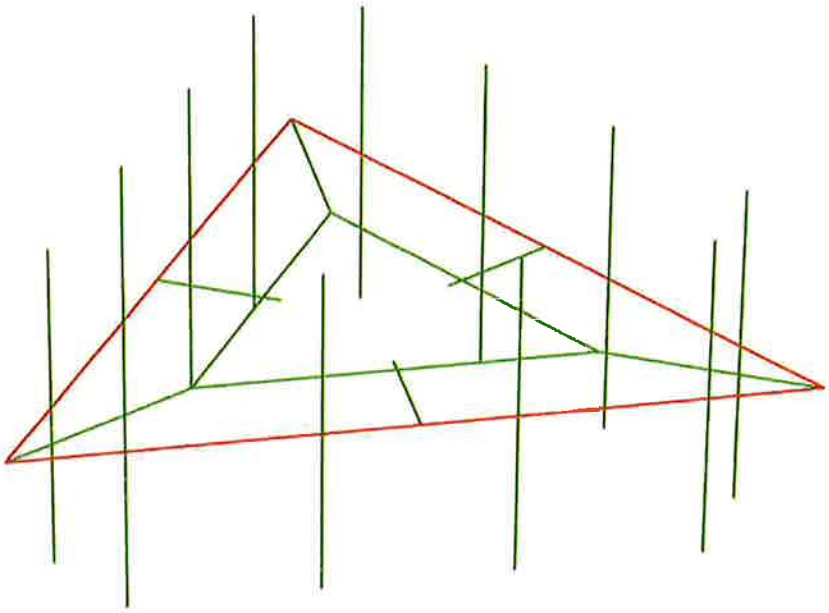
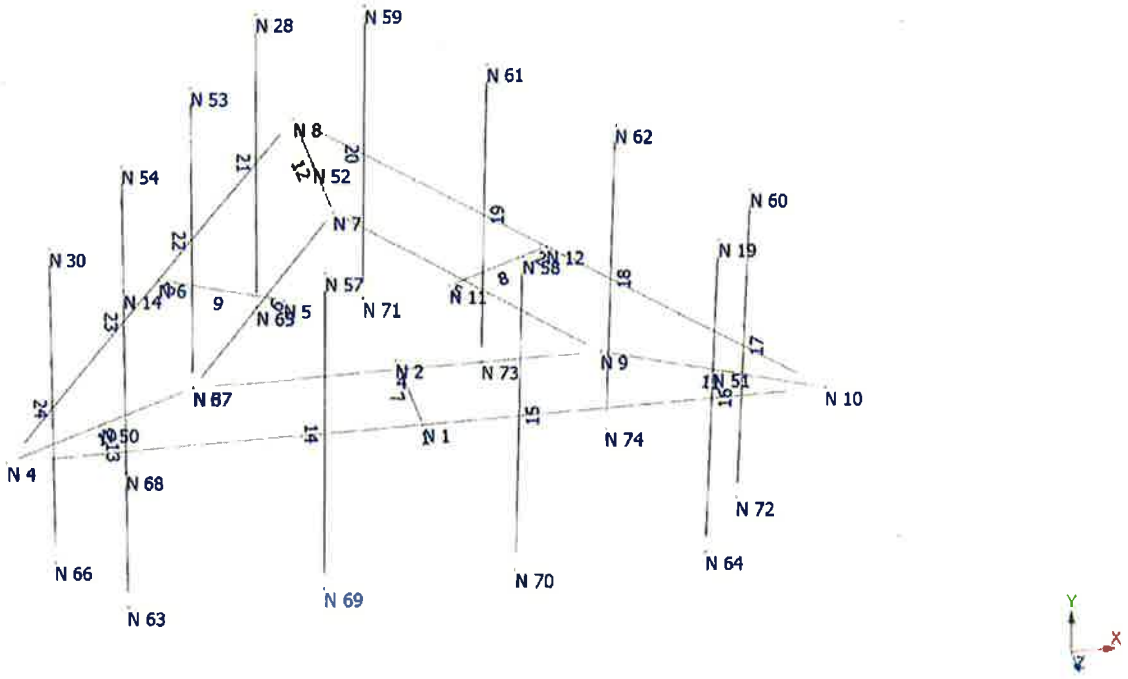
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\VERIZON\CT\Bloomfield 3 CT\Bloomfield 3 CT.etz\

Design status

- Not designed
- Error on design
- Design O.K.
- With warnings



EXISTING MOUNT CONDITIONS



EXISTING MOUNT CONDITIONS

Bentley

Current Date: 5/9/2017 3:01 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\VERIZON\CT\Bloomfield 3 CT\Bloomfield 3 CT.et

Steel Code Check

Report: Summary - For all selected load conditions

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Wi+Di
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X1_4	**7**	LC1 at 0.00%	0.10	OK	Eq. H1-1b
			LC2 at 0.00%	0.07	OK	Eq. H1-1b
			LC3 at 0.00%	**0.21**	**OK**	Eq. H1-1b
			LC4 at 0.00%	0.10	OK	Eq. H1-1b
			LC5 at 0.00%	0.08	OK	Eq. H1-1b
		8	LC1 at 0.00%	0.16	OK	Eq. H1-1b
			LC2 at 0.00%	0.14	OK	Eq. H1-1b
			LC3 at 0.00%	**0.22**	**OK**	Eq. H1-1b
			LC4 at 0.00%	0.10	OK	Eq. H1-1b
			LC5 at 0.00%	0.08	OK	Eq. H1-1b
		9	LC1 at 0.00%	0.14	OK	Eq. H1-1b
			LC2 at 0.00%	0.12	OK	Eq. H1-1b
			LC3 at 0.00%	**0.21**	**OK**	Eq. H1-1b
			LC4 at 0.00%	0.10	OK	Eq. H1-1b
			LC5 at 0.00%	0.08	OK	Eq. H1-1b
	L 3X3X1_4	**1**	LC1 at 50.00%	**1.13**	N.G.	Eq. H1-1b
			LC2 at 50.00%	**1.02**	N.G.	Eq. H3-8
			LC3 at 50.00%	**1.47**	**N.G.**	Eq. H1-1b
			LC4 at 50.00%	0.67	OK	Eq. H1-1b
			LC5 at 50.00%	0.51	OK	Eq. H1-1b
		2	LC1 at 50.00%	0.61	With warnings	Eq. H1-1b
			LC2 at 50.00%	0.49	With warnings	Eq. H1-1b
			LC3 at 50.00%	**1.30**	**N.G.**	Eq. H1-1b
			LC4 at 50.00%	0.66	With warnings	Eq. H1-1b
			LC5 at 50.00%	0.49	With warnings	Eq. H1-1b
		3	LC1 at 50.00%	0.58	With warnings	Eq. H1-1b
			LC2 at 50.00%	0.46	With warnings	Eq. H1-1b
			LC3 at 50.00%	**1.29**	**N.G.**	Eq. H1-1b
			LC4 at 50.00%	0.65	With warnings	Eq. H1-1b
			LC5 at 50.00%	0.49	With warnings	Eq. H1-1b
		4	LC1 at 50.00%	0.40	OK	Eq. H1-1b
			LC2 at 50.00%	0.30	OK	Eq. H1-1b
			LC3 at 50.00%	**0.84**	**OK**	Eq. H1-1b
			LC4 at 50.00%	0.41	OK	Eq. H1-1b
			LC5 at 50.00%	0.31	OK	Eq. H1-1b
		5	LC1 at 50.00%	0.49	OK	Eq. H1-1b
			LC2 at 50.00%	0.39	OK	Eq. H1-1b

		LC3 at 46.88%	**0.81**	**OK**	Eq. H1-1b
		LC4 at 50.00%	0.40	OK	Eq. H1-1b
		LC5 at 50.00%	0.30	OK	Eq. H1-1b
	6	LC1 at 50.00%	0.47	OK	Eq. H1-1b
		LC2 at 50.00%	0.37	OK	Eq. H1-1b
		LC3 at 50.00%	**0.79**	**OK**	Eq. H1-1b
		LC4 at 50.00%	0.40	OK	Eq. H1-1b
		LC5 at 50.00%	0.30	OK	Eq. H1-1b
PIPE 2x0.154	**13**	LC1 at 46.88%	**0.00**	**OK**	Sec. E1
		LC2 at 46.88%	0.00	OK	Sec. E1
		LC3 at 46.88%	0.00	OK	Sec. E1
		LC4 at 46.88%	0.00	OK	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
	14	LC1 at 46.88%	**0.06**	**OK**	Eq. H1-1b
		LC2 at 46.88%	0.06	OK	Eq. H1-1b
		LC3 at 46.88%	0.02	OK	Eq. H1-1b
		LC4 at 46.88%	0.01	OK	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
	15	LC1 at 46.88%	**0.10**	**OK**	Eq. H1-1b
		LC2 at 46.88%	0.10	OK	Eq. H1-1b
		LC3 at 46.88%	0.02	OK	Eq. H1-1b
		LC4 at 46.88%	0.01	OK	Sec. E1
		LC5 at 46.88%	0.01	OK	Sec. E1
	16	LC1 at 46.88%	**0.00**	**OK**	Sec. E1
		LC2 at 46.88%	0.00	OK	Sec. E1
		LC3 at 46.88%	0.00	OK	Sec. E1
		LC4 at 46.88%	0.00	OK	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
	17	LC1 at 46.88%	0.00	OK	Sec. E1
		LC2 at 46.88%	0.00	OK	Sec. E1
		LC3 at 46.88%	0.00	OK	Sec. E1
		LC4 at 46.88%	**0.00**	**OK**	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
	18	LC1 at 46.88%	**0.05**	**OK**	Eq. H1-1b
		LC2 at 46.88%	0.05	OK	Eq. H1-1b
		LC3 at 46.88%	0.01	OK	Eq. H1-1b
		LC4 at 46.88%	0.01	OK	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
	19	LC1 at 46.88%	**0.07**	**OK**	Eq. H1-1b
		LC2 at 46.88%	0.07	OK	Eq. H1-1b
		LC3 at 46.88%	0.02	OK	Eq. H1-1b
		LC4 at 46.88%	0.01	OK	Sec. E1
		LC5 at 46.88%	0.01	OK	Sec. E1
	20	LC1 at 46.88%	**0.00**	**OK**	Sec. E1
		LC2 at 46.88%	0.00	OK	Sec. E1
		LC3 at 46.88%	0.00	OK	Sec. E1
		LC4 at 46.88%	0.00	OK	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
	21	LC1 at 46.88%	0.00	OK	Sec. E1
		LC2 at 46.88%	0.00	OK	Sec. E1
		LC3 at 46.88%	0.00	OK	Sec. E1
		LC4 at 46.88%	**0.00**	**OK**	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1

	22	LC1 at 46.88%	**0.05**	**OK**	Eq. H1-1b
		LC2 at 46.88%	0.05	OK	Eq. H1-1b
		LC3 at 46.88%	0.01	OK	Eq. H1-1b
		LC4 at 46.88%	0.01	OK	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
	23	LC1 at 46.88%	**0.07**	**OK**	Eq. H1-1b
		LC2 at 46.88%	0.07	OK	Eq. H1-1b
		LC3 at 46.88%	0.02	OK	Eq. H1-1b
		LC4 at 46.88%	0.01	OK	Sec. E1
		LC5 at 46.88%	0.01	OK	Sec. E1
	24	LC1 at 46.88%	0.00	OK	Sec. E1
		LC2 at 46.88%	0.00	OK	Sec. E1
		LC3 at 46.88%	**0.00**	**OK**	Sec. E1
		LC4 at 46.88%	0.00	OK	Sec. E1
		LC5 at 46.88%	0.00	OK	Sec. E1
T2L 3X3X1_4	**10**	LC1 at 100.00%	0.10	OK	Eq. H1-1b
		LC2 at 100.00%	0.10	OK	Eq. H1-1b
		LC3 at 0.00%	**0.13**	**OK**	Eq. H1-1b
		LC4 at 0.00%	0.06	OK	Eq. H1-1b
		LC5 at 0.00%	0.05	OK	Eq. H1-1b
	11	LC1 at 100.00%	0.13	OK	Eq. H1-1b
		LC2 at 100.00%	0.13	OK	Eq. H1-1b
		LC3 at 0.00%	**0.15**	**OK**	Eq. H1-1b
		LC4 at 0.00%	0.07	OK	Eq. H1-1b
		LC5 at 0.00%	0.05	OK	Eq. H1-1b
	12	LC1 at 0.00%	0.09	OK	Eq. H1-1b
		LC2 at 0.00%	0.07	OK	Eq. H1-1b
		LC3 at 0.00%	**0.14**	**OK**	Eq. H1-1b
		LC4 at 0.00%	0.06	OK	Eq. H1-1b
		LC5 at 0.00%	0.05	OK	Eq. H1-1b

Bentley

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	0.00	0.00	-2.3333	0
3	-3.5359	0.00	-2.00	0
4	-7.00	0.00	0.00	0
5	-1.4793	0.00	-4.8955	0
6	-3.50	0.00	-6.0622	0
7	0.00	0.00	-8.1244	0
8	0.00	0.00	-12.1244	0
9	3.5359	0.00	-2.00	0
10	7.00	0.00	0.00	0
11	1.4793	0.00	-4.8955	0
12	3.50	0.00	-6.0622	0
14	-5.00	3.00	0.00	0
19	5.00	3.00	0.00	0
28	-1.00	3.00	-10.3923	0
30	-6.00	3.00	-1.7321	0
50	-5.2679	0.00	-1.00	0
51	5.2679	0.00	-1.00	0
52	0.00	0.00	-10.1244	0
53	-2.6667	3.00	-7.5056	0
54	-4.3333	3.00	-4.6188	0
57	-1.6667	3.00	0.00	0

58	1.6667	3.00	0.00	0
59	1.00	3.00	-10.3923	0
60	6.00	3.00	-1.7321	0
61	2.6667	3.00	-7.5056	0
62	4.3333	3.00	-4.6188	0
63	-5.00	-3.00	0.00	0
64	5.00	-3.00	0.00	0
65	-1.00	-3.00	-10.3923	0
66	-6.00	-3.00	-1.7321	0
67	-2.6667	-3.00	-7.5056	0
68	-4.3333	-3.00	-4.6188	0
69	-1.6667	-3.00	0.00	0
70	1.6667	-3.00	0.00	0
71	1.00	-3.00	-10.3923	0
72	6.00	-3.00	-1.7321	0
73	2.6667	-3.00	-7.5056	0
74	4.3333	-3.00	-4.6188	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
2	1	1	1	1	1	1
5	1	1	1	1	1	1
11	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	4	10		L 3X3X1_4	A36	0.00	0.00	0.00
2	10	8		L 3X3X1_4	A36	0.00	0.00	0.00
3	8	4		L 3X3X1_4	A36	0.00	0.00	0.00
4	3	9		L 3X3X1_4	A36	0.00	0.00	0.00
5	9	7		L 3X3X1_4	A36	0.00	0.00	0.00
6	7	3		L 3X3X1_4	A36	0.00	0.00	0.00
7	2	1		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
8	11	12		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
9	5	6		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
10	3	4		T2L 3X3X1_4	A36	0.00	0.00	0.00
11	9	10		T2L 3X3X1_4	A36	0.00	0.00	0.00
12	7	8		T2L 3X3X1_4	A36	0.00	0.00	0.00
13	14	63		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
14	57	69		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
15	58	70		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
16	19	64		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
17	60	72		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
18	62	74		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
19	61	73		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
20	59	71		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
21	28	65		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	53	67		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

23	54	68		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	30	66		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	270.00	0	0.00	0.00	0.00
2	270.00	0	0.00	0.00	0.00
3	270.00	0	0.00	0.00	0.00
7	90.00	0	0.00	0.00	0.00
8	90.00	0	0.00	0.00	0.00
9	90.00	0	0.00	0.00	0.00
10	180.00	0	0.00	0.00	0.00
11	180.00	0	0.00	0.00	0.00
12	180.00	0	0.00	0.00	0.00

Hudson Design Group LLC

Antenna Mount Calculations
(WITH MODIFICATIONS)

p: 978.557.5553 f: 978.336.5586 a: 1600 Osgood Street, Building 20 North, Suite 3090, N. Andover, MA 01845
p: 413.588.8139 f: 413.517.0590 a: 116 Pleasant Street, Ste 302, Easthampton, MA 01027

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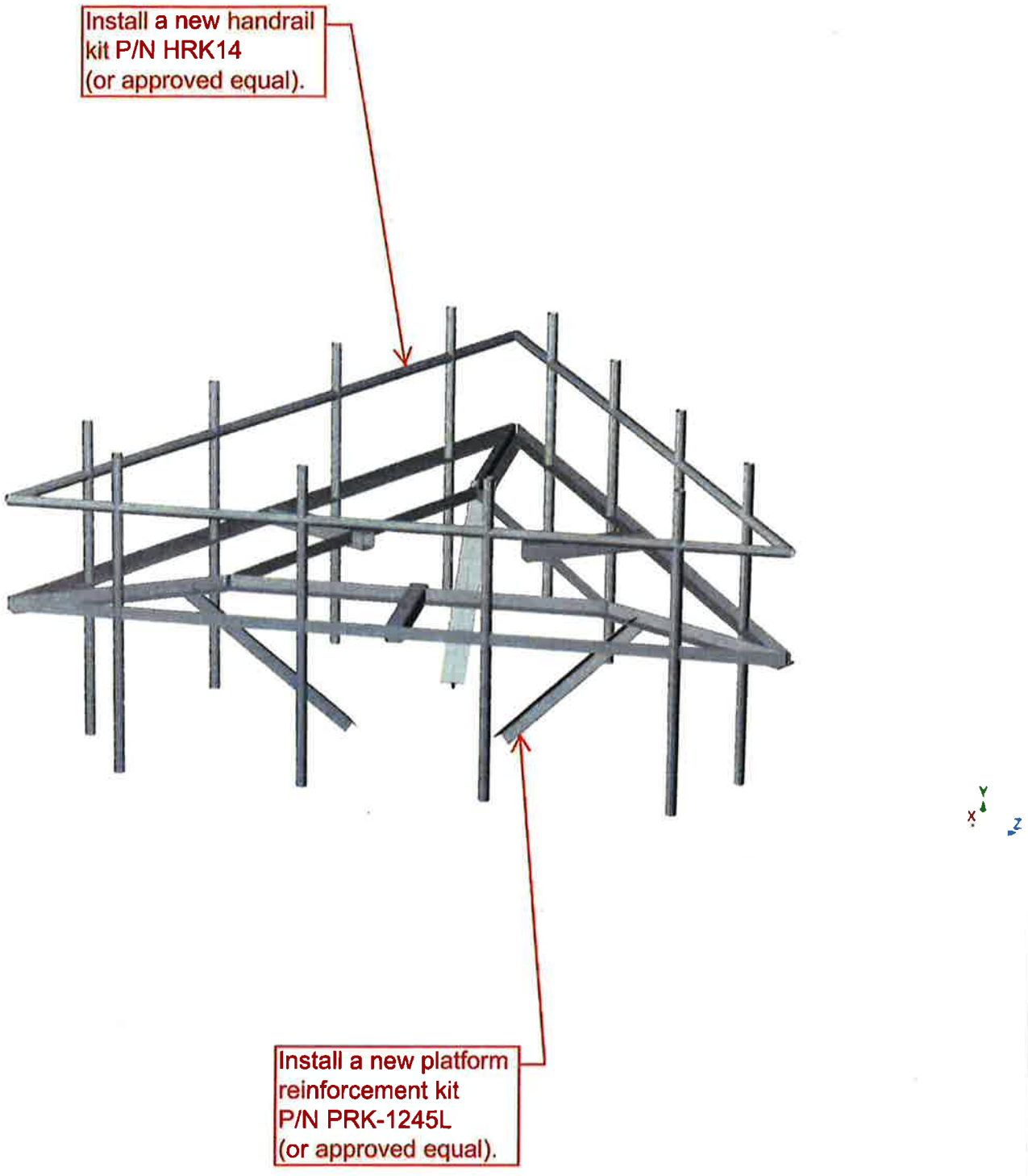

WITH MODIFICATIONS

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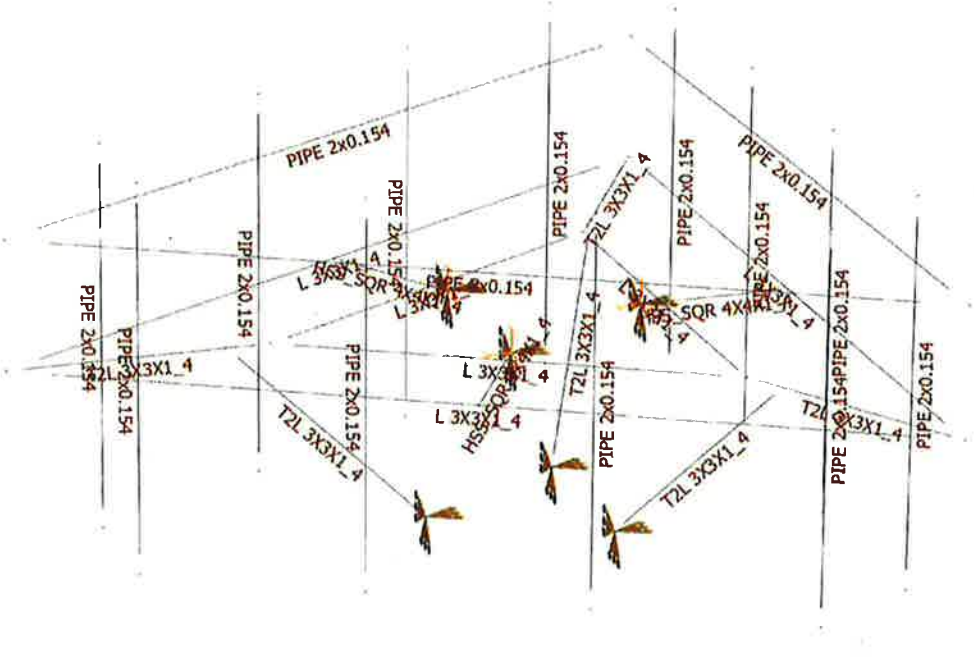

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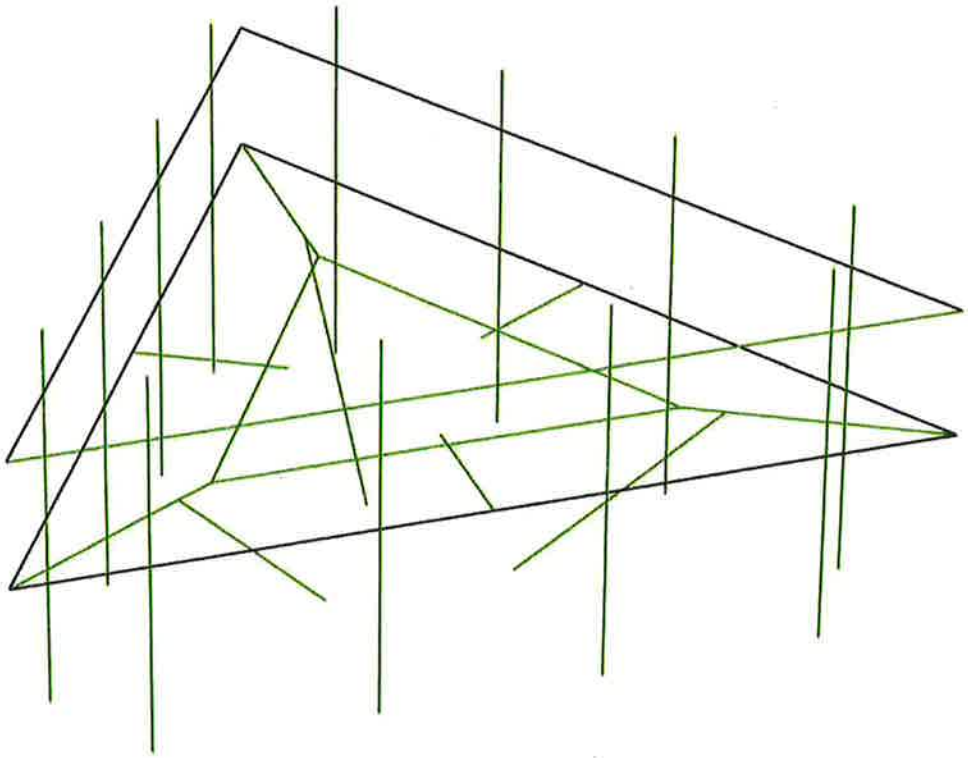
Design status

- Not designed
- Error on design
- Design O.K.
- With warnings



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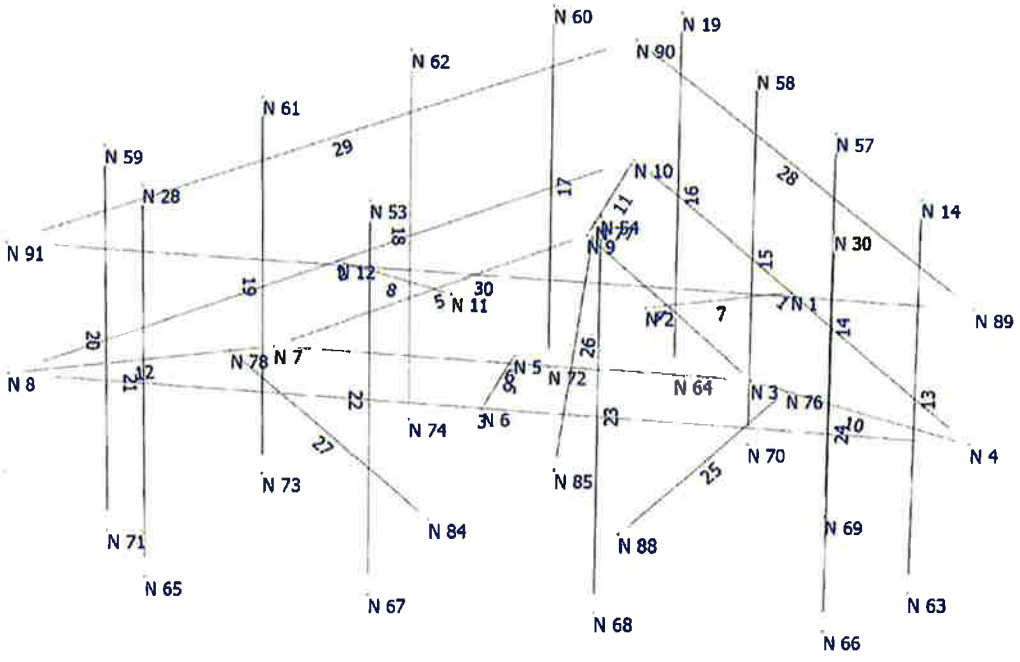

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Steel Code Check

Report: Summary - For all selected load conditions

Load conditions to be included in design :

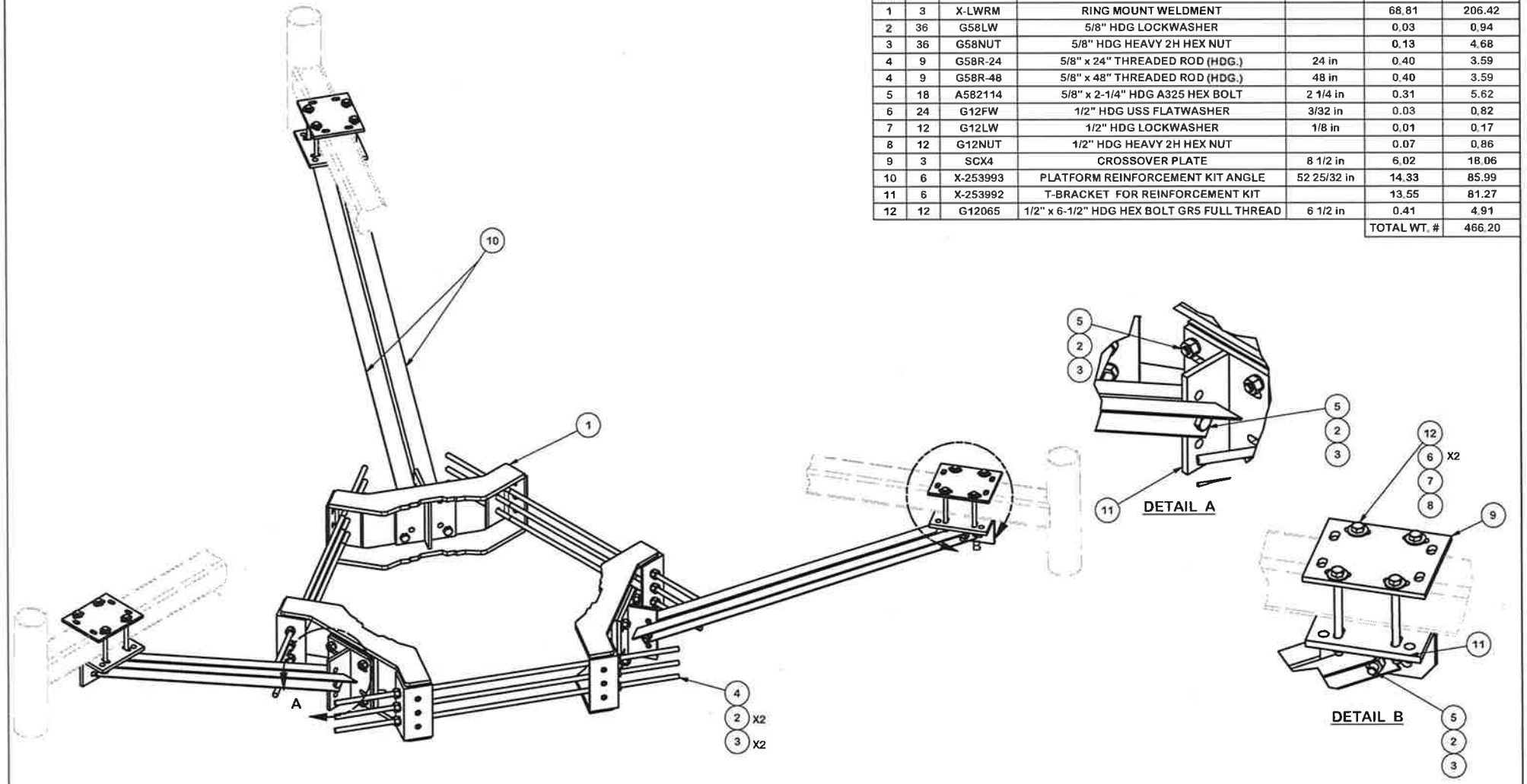
LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Wi+Di
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X1_4	**7**	LC1 at 0.00%	0.10	OK	Eq. H1-1b
			LC2 at 0.00%	0.08	OK	Eq. H1-1b
			LC3 at 0.00%	**0.17**	**OK**	Eq. H1-1b
			LC4 at 0.00%	0.09	OK	Eq. H1-1b
			LC5 at 0.00%	0.06	OK	Eq. H1-1b
		8	LC1 at 0.00%	0.14	OK	Eq. H1-1b
			LC2 at 0.00%	0.12	OK	Eq. H1-1b
			LC3 at 0.00%	**0.18**	**OK**	Eq. H1-1b
			LC4 at 0.00%	0.09	OK	Eq. H1-1b
			LC5 at 0.00%	0.06	OK	Eq. H1-1b
		9	LC1 at 0.00%	0.12	OK	Eq. H1-1b
			LC2 at 0.00%	0.10	OK	Eq. H1-1b
			LC3 at 0.00%	**0.17**	**OK**	Eq. H1-1b
			LC4 at 0.00%	0.09	OK	Eq. H1-1b
			LC5 at 0.00%	0.06	OK	Eq. H1-1b
	L 3X3X1_4	**1**	LC1 at 50.00%	**0.70**	**With warnings**	Eq. H1-1b
			LC2 at 50.00%	0.65	With warnings	Eq. H1-1b
			LC3 at 50.00%	0.47	With warnings	Eq. H1-1b
			LC4 at 50.00%	0.21	With warnings	Eq. H1-1b
			LC5 at 50.00%	0.15	With warnings	Eq. H1-1b
		2	LC1 at 100.00%	0.37	With warnings	Eq. H1-1a
			LC2 at 100.00%	0.36	With warnings	Eq. H1-1a
			LC3 at 50.00%	**0.41**	**With warnings**	Eq. H1-1b
			LC4 at 50.00%	0.20	With warnings	Eq. H1-1b
			LC5 at 50.00%	0.15	With warnings	Eq. H1-1b
		3	LC1 at 0.00%	**0.41**	**With warnings**	Eq. H1-1a
			LC2 at 0.00%	0.40	With warnings	Eq. H1-1a
			LC3 at 50.00%	0.40	With warnings	Eq. H1-1b
			LC4 at 50.00%	0.19	With warnings	Eq. H1-1b
			LC5 at 50.00%	0.14	With warnings	Eq. H1-1b
		4	LC1 at 100.00%	0.06	OK	Eq. H1-1b
			LC2 at 100.00%	0.06	OK	Eq. H1-1b
			LC3 at 100.00%	**0.19**	**OK**	Eq. H1-1b
			LC4 at 100.00%	0.09	OK	Eq. H1-1b
			LC5 at 100.00%	0.07	OK	Eq. H1-1b
		5	LC1 at 0.00%	0.14	OK	Eq. H1-1b

		LC2 at 0.00%	0.12	OK	Eq. H1-1b
		LC3 at 0.00%	**0.20**	**OK**	Eq. H1-1b
		LC4 at 0.00%	0.09	OK	Eq. H1-1b
		LC5 at 0.00%	0.07	OK	Eq. H1-1b
	6	LC1 at 0.00%	0.14	OK	Eq. H1-1b
		LC2 at 0.00%	0.12	OK	Eq. H1-1b
		LC3 at 0.00%	**0.19**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.09	OK	Eq. H1-1b
		LC5 at 100.00%	0.07	OK	Eq. H1-1b
PIPE 2x0.154	**13**	LC1 at 16.67%	0.05	OK	Eq. H1-1b
		LC2 at 16.67%	0.05	OK	Eq. H1-1b
		LC3 at 16.67%	**0.05**	**OK**	Eq. H1-1b
		LC4 at 16.67%	0.03	OK	Eq. H1-1b
		LC5 at 16.67%	0.02	OK	Eq. H1-1b
	14	LC1 at 16.67%	0.06	OK	
		LC2 at 16.67%	0.07	OK	
		LC3 at 47.92%	**0.14**	**OK**	Eq. H1-1b
		LC4 at 47.92%	0.07	OK	Eq. H1-1b
		LC5 at 47.92%	0.06	OK	Eq. H1-1b
	15	LC1 at 33.33%	0.09	OK	Eq. H1-1b
		LC2 at 33.33%	0.09	OK	Eq. H1-1b
		LC3 at 47.92%	**0.14**	**OK**	Eq. H1-1b
		LC4 at 47.92%	0.08	OK	Eq. H1-1b
		LC5 at 47.92%	0.06	OK	Eq. H1-1b
	16	LC1 at 16.67%	**0.06**	**OK**	Eq. H1-1b
		LC2 at 47.92%	0.05	OK	Eq. H1-1b
		LC3 at 16.67%	0.05	OK	Eq. H1-1b
		LC4 at 16.67%	0.03	OK	Eq. H1-1b
		LC5 at 16.67%	0.02	OK	Eq. H1-1b
	17	LC1 at 16.67%	0.05	OK	Eq. H1-1b
		LC2 at 16.67%	0.04	OK	Eq. H1-1b
		LC3 at 16.67%	**0.07**	**OK**	Eq. H1-1b
		LC4 at 16.67%	0.03	OK	Eq. H1-1b
		LC5 at 16.67%	0.03	OK	Eq. H1-1b
	18	LC1 at 47.92%	0.19	OK	Eq. H1-1b
		LC2 at 47.92%	0.17	OK	Eq. H1-1b
		LC3 at 47.92%	**0.22**	**OK**	Eq. H1-1b
		LC4 at 47.92%	0.10	OK	Eq. H1-1b
		LC5 at 47.92%	0.08	OK	Eq. H1-1b
	19	LC1 at 47.92%	0.07	OK	Eq. H1-1b
		LC2 at 33.33%	0.06	OK	Eq. H1-1b
		LC3 at 47.92%	**0.20**	**OK**	Eq. H1-1b
		LC4 at 47.92%	0.10	OK	Eq. H1-1b
		LC5 at 47.92%	0.08	OK	Eq. H1-1b
	20	LC1 at 47.92%	0.05	OK	Eq. H1-1b
		LC2 at 47.92%	0.06	OK	Eq. H1-1b
		LC3 at 16.67%	**0.06**	**OK**	Eq. H1-1b
		LC4 at 16.67%	0.03	OK	Eq. H1-1b
		LC5 at 16.67%	0.02	OK	Eq. H1-1b
	21	LC1 at 47.92%	0.05	OK	Eq. H1-1b
		LC2 at 47.92%	**0.05**	**OK**	Eq. H1-1b
		LC3 at 16.67%	0.04	OK	Eq. H1-1b
		LC4 at 16.67%	0.03	OK	Eq. H1-1b

		LC5 at 16.67%	0.02	OK	Eq. H1-1b
	22	LC1 at 47.92%	0.08	OK	Eq. H1-1b
		LC2 at 47.92%	0.05	OK	Eq. H1-1b
		LC3 at 47.92%	**0.20**	**OK**	Eq. H1-1b
		LC4 at 47.92%	0.10	OK	Eq. H1-1b
		LC5 at 47.92%	0.07	OK	Eq. H1-1b
	23	LC1 at 47.92%	0.19	OK	Eq. H1-1b
		LC2 at 47.92%	0.17	OK	Eq. H1-1b
		LC3 at 47.92%	**0.21**	**OK**	Eq. H1-1b
		LC4 at 47.92%	0.10	OK	Eq. H1-1b
		LC5 at 47.92%	0.08	OK	Eq. H1-1b
	24	LC1 at 16.67%	0.05	OK	Eq. H1-1b
		LC2 at 16.67%	0.04	OK	Eq. H1-1b
		LC3 at 16.67%	**0.07**	**OK**	Eq. H1-1b
		LC4 at 16.67%	0.03	OK	Eq. H1-1b
		LC5 at 16.67%	0.02	OK	Eq. H1-1b
	28	LC1 at 62.50%	**0.10**	**OK**	Eq. H1-1b
		LC2 at 62.50%	0.10	OK	Eq. H1-1b
		LC3 at 37.50%	0.07	OK	Eq. H1-1b
		LC4 at 37.50%	0.04	OK	Eq. H1-1b
		LC5 at 37.50%	0.03	OK	Eq. H1-1b
	29	LC1 at 37.50%	**0.10**	**With warnings**	Eq. H1-1b
		LC2 at 37.50%	0.09	With warnings	Eq. H1-1b
		LC3 at 37.50%	0.09	With warnings	Eq. H1-1b
		LC4 at 37.50%	0.04	With warnings	Eq. H1-1b
		LC5 at 37.50%	0.03	With warnings	Eq. H1-1b
	30	LC1 at 62.50%	**0.08**	**With warnings**	Eq. H1-1b
		LC2 at 62.50%	0.08	With warnings	Eq. H1-1b
		LC3 at 37.50%	0.08	With warnings	Eq. H1-1b
		LC4 at 37.50%	0.04	With warnings	Eq. H1-1b
		LC5 at 37.50%	0.03	With warnings	Eq. H1-1b
T2L 3X3X1_4	10	LC1 at 100.00%	0.17	OK	Eq. H1-1b
		LC2 at 100.00%	0.15	OK	Eq. H1-1b
		LC3 at 100.00%	**0.23**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.11	OK	Eq. H1-1b
		LC5 at 100.00%	0.08	OK	Eq. H1-1b
	11	LC1 at 100.00%	0.20	OK	Eq. H1-1b
		LC2 at 100.00%	0.18	OK	Eq. H1-1b
		LC3 at 100.00%	**0.26**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.11	OK	Eq. H1-1b
		LC5 at 100.00%	0.09	OK	Eq. H1-1b
	12	LC1 at 100.00%	0.15	OK	Eq. H1-1b
		LC2 at 100.00%	0.12	OK	Eq. H1-1b
		LC3 at 100.00%	**0.23**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.11	OK	Eq. H1-1b
		LC5 at 100.00%	0.08	OK	Eq. H1-1b
	25	LC1 at 0.00%	0.06	OK	Eq. H1-1b
		LC2 at 0.00%	0.04	OK	Eq. H1-1b
		LC3 at 0.00%	**0.14**	**OK**	Eq. H1-1b
		LC4 at 0.00%	0.08	OK	Eq. H1-1b
		LC5 at 0.00%	0.06	OK	Eq. H1-1b
	26	LC1 at 0.00%	0.07	OK	Eq. H1-1b

	LC2 at 0.00%	0.05	OK	Eq. H1-1b
	LC3 at 0.00%	**0.16**	**OK**	Eq. H1-1b
	LC4 at 0.00%	0.08	OK	Eq. H1-1b
	LC5 at 0.00%	0.06	OK	Eq. H1-1b
27	LC1 at 0.00%	0.11	OK	Eq. H1-1b
	LC2 at 0.00%	0.09	OK	Eq. H1-1b
	LC3 at 0.00%	**0.15**	**OK**	Eq. H1-1b
	LC4 at 0.00%	0.08	OK	Eq. H1-1b
	LC5 at 0.00%	0.06	OK	Eq. H1-1b



PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	36	G58LW	5/8" HDG LOCKWASHER		0.03	0.94
3	36	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	4.68
4	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	0.40	3.59
4	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	0.40	3.59
5	18	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	5.62
6	24	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	0.82
7	12	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.17
8	12	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.86
9	3	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	18.06
10	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
11	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
12	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
					TOTAL WT. #	466.20

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED ALL 5/8" BOLTS TO A582114	4488	CEK	10/1/2015

REVISION HISTORY

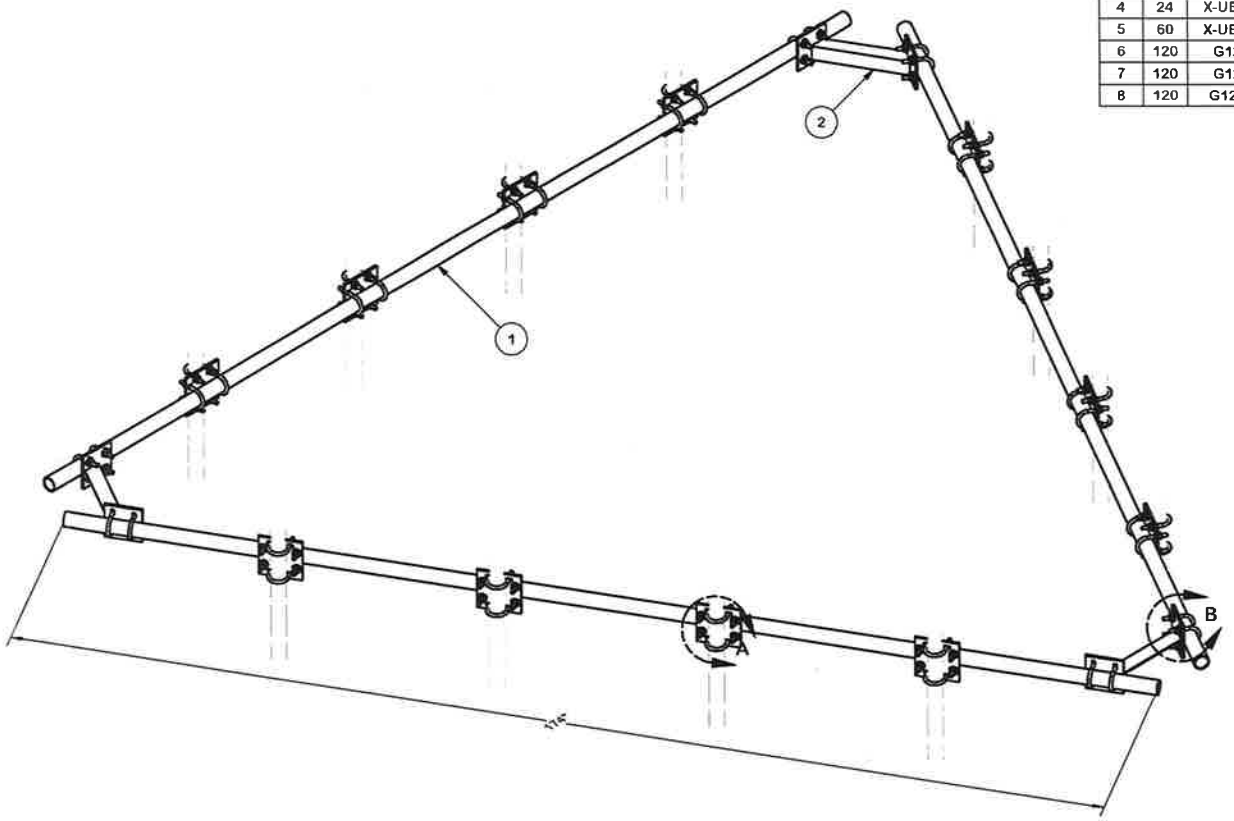
DESCRIPTION
PLATFORM RENIFORCEMENT
ON A 12" TO 45" POLE
4' 6" ANGLE

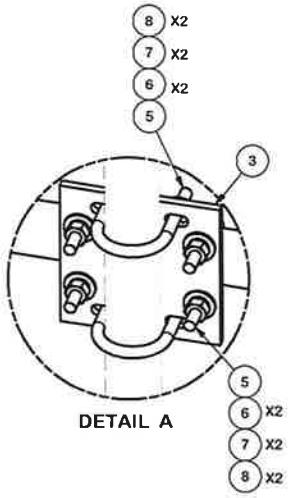
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
4488	CEK 4/11/2014		PRK-1245

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 1/18/2016	PRK-1245

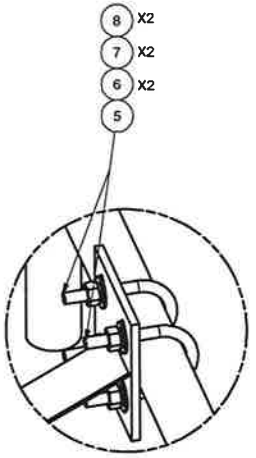
SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2174	2-3/8" OD X 174" SCH 40 GALVANIZED PIPE	174 in	55.75	167.24
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
4	24	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.73	17.56
5	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	43.90
6	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.09
7	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
8	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60





DETAIL A



DETAIL B

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
UNIVERSAL HANDRAIL KIT
FOR 14' PLATFORM
2-3/8" & 2-7/8" ANTENNA PIPES

SITE PRO 1 — A valmont COMPANY

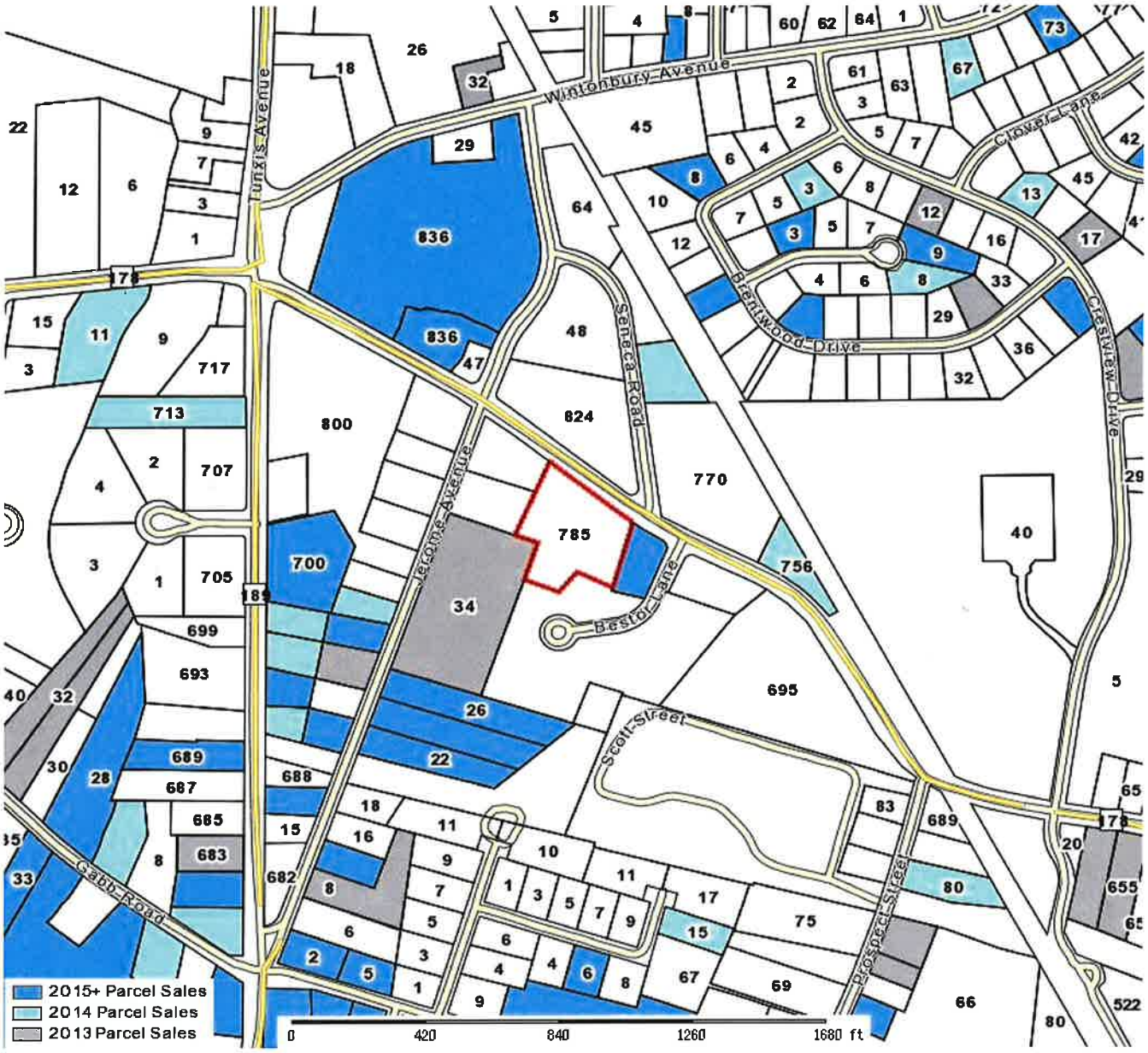
Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 3/10/2015		HRK14-U	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 3/10/2015	HRK14-U

ATTACHMENT 4



Town of Bloomfield			
Parcel: 7721 Acres: 2.25			
Name:	BLOOMFIELD TOWN OF	Land Value	560000
Site:	785 PARK AVE	Building Value	2511900
Sale:	0 on 0000-00-00 Reason=U Qual=34	Misc Value	0
Mail:	800 BLOOMFIELD AVE. BLOOMFIELD, CT 06002	Just Value	3071900
		Assessed Value	0
		Exempt Value	0
		Taxable Value	0

Date printed: 06/02/17 : 12:03:35

The town of Bloomfield Assessor

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Owner and Parcel Information

Owner Name	BLOOMFIELD TOWN OF POLICE STATION	**Today's Date**	June 2, 2017
Mailing Address	800 BLOOMFIELD AVE.	**Parcel ID**	7721 (Account #: R90068)
	BLOOMFIELD, CT 06002	**Fire District**	C
Location Address	785 PARK AVE	**Census Tract**	4713
Map / Lot	177-3 / 6	**Acreage**	2.25
Use Class / Description	922 Mun Bldg Com	**Parcel Map**	Show Parcel Map / Owner List By Radius
Assessing Neighborhood	0001A	**Utilities**	

Current Appraised Value Information

Building Value	XF Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
$ 2,511,900	$ 0	$ 0	$ 560,000		$ 3,071,900	$ 3,071,900	$ 2,150,330

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
Current	$ 1,758,330	0	$ 392,000	$ 2,150,330
2016	$ 1,758,330	0	$ 392,000	$ 2,150,330
2013	$ 1,414,840	0	$ 273,420	$ 1,688,260

Land Information

Use	Class	Zoning	Area	Value
Mun Bldg Com	E	BCD	2.25 AC	$ 360,000
Com Cell Site	C	BCD	1 BL	$ 200,000

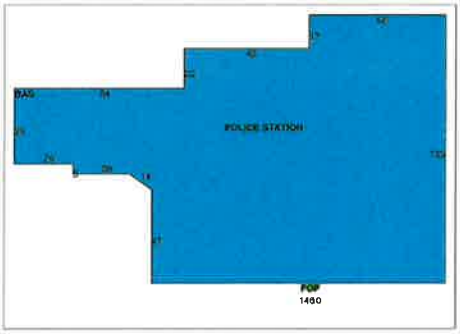
Commercial Building Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
City/Town Hall	1991	1994	20,917	1	B	Concrete	Drywall	16	1
Roof Cover	**Roof Structure**	**Floor Type**	**Heat Type**	**Heat Fuel**	**AC Type**	**Sprinkler**	**Construction**	**Plumbing**	**Comm Walls**
Asphalt Shingl	Gable	Carpet	Gas	Forced Air	None 100%	100%	Masonry	Average	0%

Building Sub Areas

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	20,887	20,887	
FOP	Finished Open Porch	0	30	
	Totals	**20,887**	**20,917**	**20,893**

Building Sketch Enlarge



Building Photo Enlarge

Out Buildings / Extra Features

Description	Sub Description	Area	Year Built	Value
No Out Building/Misc Information available for this parcel.				

Sale Information

Sale Date	Sale Price	Deed Book/Page	Sale Qualification	Reason	Vacant or Improved	Owner
00/00/0000		33/ 70	Unqualified	Old sale- Validity unknown	Vacant	BLOOMFIELD TOWN OF POLICE STATION

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
B-13-4321	07/30/2013	CM	Commercial	$ 14,500		0	10/01/2013	ADD 6 ANTENNAS
B21971	02/20/2003			$ 50,000		100		WIRELESS COM FACILITY W/EQUIPMENT;

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