Robinson+Cole

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Also admitted in Massachusetts

June 10, 2019

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

Re: **Notice of Exempt Modification – Facility Modification**
60 Industrial Park Road, Vernon, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 153-foot level on an existing 175-foot tower at 60 Industrial Park Road in Vernon (the "Property"). The Property is owned by Industrial Park Road LLC. The tower is owned by Millenicom, LLC. Cellco's use of the tower was approved by the Council in 2000. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with six (6) model NHH-65B-R2B antennas, all at the same level on the tower. Cellco also intends to remove six (6) remote radio heads ("RRHs") and install six (6) new RRHs behind its antennas and install two (2) HYBRIFLEX™ antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Vernon Mayor, Daniel A. Champagne; Shaun Gately, Interim Director of Planning and Development; Millenicom, LLC; and Industrial Park Road LLC.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be located at the 153-foot level on the 175-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 facility with the new antennas and RRHs will not increase radio frequency (RF) emissions to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Attachment 2.

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

6. The tower and its foundation, with certain modifications, can support Cellco's proposed modifications. (*See* the June 4, 2019 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:
Daniel A. Champagne, Mayor
Shaun Gately, Interim Director of Planning and Development
Industrial Park Road LLC
Millenicom, LLC
Tim Parks

ATTACHMENT 1

NHH-65B-R2B

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

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

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.9	15.0	17.7	17.9	18.4	18.7
Beamwidth, Horizontal, degrees	65	60	71	69	64	57
Beamwidth, Vertical, degrees	12.4	11.2	5.7	5.2	4.9	4.6
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	13	14	18	18	19	18
Front-to-Back Ratio at 180°, dB	30	29	31	30	29	31
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	300	300	300	300	300	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

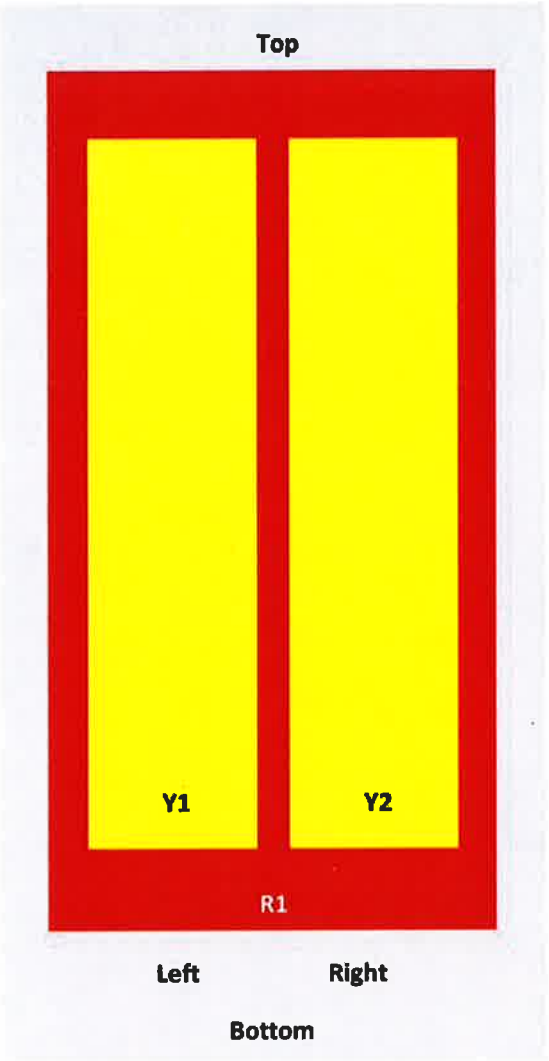
Electrical Specifications, BASTA*

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.5	14.5	17.3	17.7	18.1	18.5
Gain by all Beam Tilts Tolerance, dB	±0.6	±1.1	±0.4	±0.4	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.4 7 ° | 14.6 14 ° | 14.3	0 ° | 14.7 7 ° | 14.7 14 ° | 14.1	0 ° | 17.2 4 ° | 17.3 7 ° | 17.3	0 ° | 17.6 4 ° | 17.7 7 ° | 17.7	0 ° | 18.0 4 ° | 18.2 7 ° | 18.1	0 ° | 18.3 4 ° | 18.5 7 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2	±2.1	±3	±4.1	±6.5	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.7	±0.7	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	13	14	16	16	17	15
Front-to-Back Total Power at 180° ± 30°, dB	23	22	27	27	25	25
CPR at Boresight, dB	22	21	23	23	22	19
CPR at Sector, dB	10	7	16	13	11	4

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

Array Layout

NHH



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-896	1-2	1	ANxxxxxxxxxxxxxxx1
Y1	1695-2360	3-4	2	ANxxxxxxxxxxxxxxx2
Y2	1695-2360	5-6		

View from the front of the antenna

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

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Antenna Type	Sector

NHH-65B-R2B

Band	Multiband
Performance Note	Outdoor usage
Total Input Power, maximum	600 W @ 50 °C

Mechanical Specifications

RF Connector Quantity, total	6
RF Connector Quantity, low band	2
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female
Color	Light gray
Grounding Type	RF connector body grounded to reflector and mounting bracket
Radiator Material	Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	278.0 N @ 150 km/h 62.5 lbf @ 150 km/h
Wind Loading, lateral	230.0 N @ 150 km/h 51.7 lbf @ 150 km/h
Wind Loading, maximum	537.0 N @ 150 km/h 120.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1828.0 mm | 72.0 in
Width	301.0 mm | 11.9 in
Depth	180.0 mm | 7.1 in
Net Weight, without mounting kit	19.8 kg | 43.7 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 3
Internal RET	High band (1) | Low band (1)
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

NHH-65B-R2B

Length	1952.0 mm | 76.9 in
Width	409.0 mm | 16.1 in
Depth	299.0 mm | 11.8 in
Shipping Weight	32.3 kg | 71.2 lb

Regulatory Compliance/Certifications

Agency	**Classification**
RoHS 2011/65/EU	Compliant by Exemption
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
China RoHS SJ/T 11364-2014	Above Maximum Concentration Value (MCV)

Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

SAMSUNG

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

RFV01U-D2A

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

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

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

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

Features and Benefits

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

Key Technical Specifications

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

SAMSUNG

Dual-Band Radio Unit
AWS/PCS (B66/B2)
RFV01U-D1A

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

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

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

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

Features and Benefits

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

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)
B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)
Instantaneous Bandwidth:
70MHz(B66) + 60MHz(B2)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 255mm (36.8L)
Weight: 38.3kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

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.

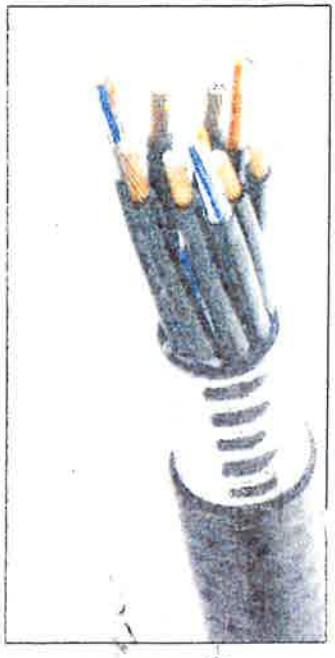


Figure 1: HYBRIFLEX Series

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
Mechanical Properties			
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)
Electrical Properties			
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)
Fiber Optic Properties			
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
DC Power Cable Properties			
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
Environmental			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

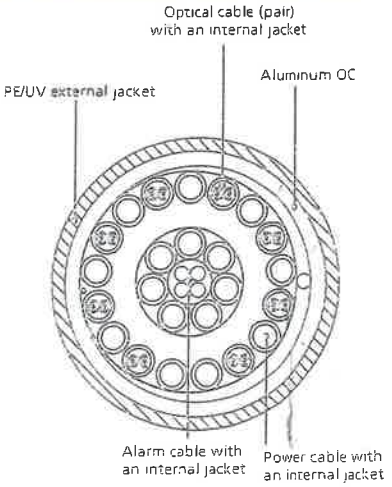


Figure 2: Construction Detail

This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Vernon 2								
Tower Height: 175ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Town Antennas	no RF information given							
*AT&T	2	419	168	850	0.0115	0.5667	0.20%	
*AT&T	2	730	168	700	0.0200	0.4667	0.43%	
*AT&T	4	1456	168	1900	0.0798	1.0000	0.80%	
*AT&T	2	940	168	700	0.0258	0.4667	0.55%	
*AT&T	2	2010	168	2300	0.0551	1.0000	0.55%	
*Nextel	9	100	145	851	0.0168	0.5673	0.30%	
*T-Mobile	6	1706	178.25	1900	0.1241	1.0000	1.24%	
*T-Mobile	1	865	178.25	700	0.0105	0.4667	0.22%	
VZW 700	**4**	**685**	**153**	**1970**	**0.0421**	**0.497333**	**8.47%**	
VZW Cellular CDMA	**2**	**352**	**153**	**869**	**0.0108**	**0.579333**	**1.87%**	
VZW Cellular LTE	**4**	**499**	**153**	**880**	**0.0307**	**0.586667**	**5.23%**	
VZW AWS	**4**	**1626**	**153**	**746**	**0.0999**	**1.0**	**9.99%**	
								29.85%
* Source: Siting Council								

ATTACHMENT 3

STRUCTURAL ANALYSIS REPORT

For

VERNON 2 CT

60 INDUSTRIAL PARK ROAD
VERNON, CT 06066

Antennas Mounted to the Monopole

Prepared for:

verizon

20 Alexander Drive
Wallingford, CT 06492

Dated: June 4, 2019

Prepared by:

HUDSON Design Group LLC

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

STATE OF CONNECTICUT
GI KAI WANG
No. 28220
LICENSED PROFESSIONAL ENGINEER
6/4/2019

HUDSON
Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the 175' monopole supporting the existing and proposed Verizon's antennas located at elevation 153' above the ground level.

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

Record drawings of the existing monopole prepared by Pirod Inc., dated January 28, 2000, were available for our use. The previous structural analysis report prepared by Vertical Solutions, Inc., dated August 25, 2015, was available for our use. The previous structural analysis report prepared by Maser Consulting, dated December 4, 2017, was also available and obtained for our use.

Hudson Design Group LLC performed a mount analysis on the existing Verizon antenna mount on April 1, 2019. The existing antenna mount is capable of supporting the proposed antenna installation with the following modifications:

- Install new platform reinforcement kit, SItePro1 P/N PRK-1245L (or approved equal).
- Install a new handrail kit, SitePro1 P/N HRK-14 (or approved equal).
- Reinforce existing L2-1 /2x1-1 /2x1 /4 steel angles with new L2-1 /2x1 -1 /2x1 /4 steel angles (typ. of 2 per sector, total of 6).

Mount analysis is under separate submission.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole and foundation **ARE IN CONFORMANCE** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **98.5%** - (Base Plate at EL.0' Controlling).

HUDSON
Design Group LLC

APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	(6) LNX-6514DS Antennas	178'	Steel Platform
	(3) APX16DWV-16DWVS-C Antennas	178'	Steel Platform
	(3) ATSBT-TOP-MF-4G	178'	Steel Platform
	(6) TMA	178'	Steel Platform
	(3) 800 10121 Antennas	168'	Steel Platform
	(3) Quintel QS66512-2 Antennas	168'	Steel Platform
	(3) OPA-65R-LCUU-H6 Antennas	168'	Steel Platform
	(6) RRUS-32	168'	Steel Platform
	(3) RRUS-11	168'	Steel Platform
	(3) B14 4478	168'	Steel Platform
	(6) TMA	168'	Steel Platform
	(2) DC6-48-60-18-8F	168'	Steel Platform
VERIZON	(6) LPA-80063-4CF Antennas	153'	Steel Platform ***w/Handrail***
VERIZON	***(6) NHH-65B-R2B Antennas***	153'	Steel Platform ***w/Handrail***
VERIZON	***(3) B5/B13 RRH-BR04C***	153'	Steel Platform ***w/Handrail***
VERIZON	***(3) B2/B66A RRH-BR049***	153'	Steel Platform ***w/Handrail***
VERIZON	***(1) DB-C1-12C-24AB-0Z***	153'	Steel Platform ***w/Handrail***
	(12) Mount Pipes	145'	Steel Platform

Proposed VERIZON Appurtenances shown in Bold.

VERIZON EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
VERIZON	(6) 1 5/8" Cables	153'	Inside Monopole
VERIZON	***(2) Fiber Cables***	153'	Inside Monopole

Proposed VERIZON Coax Cables shown in Bold.

HUDSON
Design Group LLC

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	20.9 %	160 – 175	PASS	
Pole Section-L2	49.3 %	140 – 160	PASS	
Pole Section-L3	70.7 %	120 – 140	PASS	
Pole Section-L4	83.2 %	100 – 120	PASS	
Pole Section-L5	89.5 %	80 – 100	PASS	
Pole Section-L6	92.7 %	60 – 80	PASS	
Pole Section-L7	94.2 %	40 – 60	PASS	
Pole Section-L8	83.2 %	20 – 40	PASS	
Pole Section-L9	76.8 %	0 – 20	PASS	
Base Plate & Anchor Bolts	**98.5 %**	0	PASS	**Controlling**

HUDSON
Design Group LLC

DESIGN CRITERIA:

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

2. 2018 Connecticut State Building Code

   County: Tolland
   City/Town: Vernon
   Wind Load: 97 mph (3 second gust)
   Structural Class: II
   Exposure Category: B
   Topographic Category: 1
   Ice Thickness: 1.0 inch

3. Approximate height above grade to proposed antennas: 153'

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 Maser Consulting, dated December 4, 2017.

2. The appurtenances configuration is as stated in the previous structural analysis reports. 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. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

SUPPORT RECOMMENDATIONS:

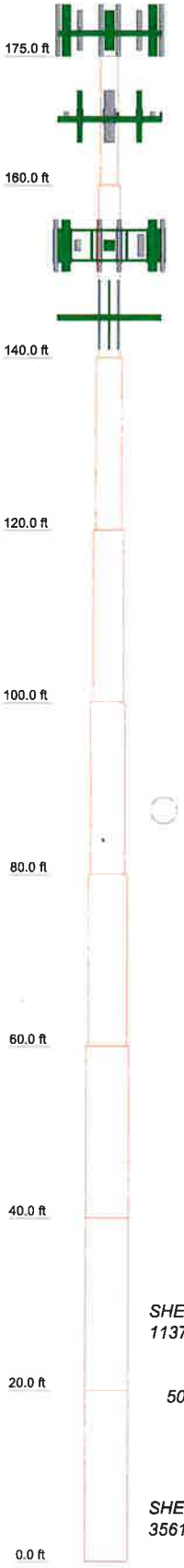
HDG recommends that the proposed antennas, RRHs and distribution box be mounted on the existing steel platform supported by the monopole.

HUDSON
Design Group LLC

Photo 1: Photo illustrating the Monopole with Appurtenances shown.

HUDSON
Design Group LLC

CALCULATIONS



Section	Size	Length (ft)	Grade	Weight (lb)
1	P24x3/8	15.00	A53-B-42	1420.6
2	P30x3/8	20.00		2375.2
3	P36x3/8	20.00		2856.3
4	P42x3/8	20.00		3337.3
5	P48x3/8	20.00		3818.4
6	P54x3/8	20.00		4299.5
7	P60x3/8	20.00		4780.5
8	P60x1/2	20.00		6360.7
9	P60x5/8	20.00		7934.1
				37182.6

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PiROD 15' Low Profile Platform	178	B14 4478	168
(2) LNX-6514DS-A1M w/ Mount Pipe	178	B14 4478	168
(2) LNX-6514DS-A1M w/ Mount Pipe	178	B14 4478	168
(2) LNX-6514DS-A1M w/ Mount Pipe	178	(2) Gen. TMA	168
APX16DWV-16DWVS-C w/mount pipe	178	(2) Gen. TMA	168
APX16DWV-16DWVS-C w/mount pipe	178	(2) Gen. TMA	168
APX16DWV-16DWVS-C w/mount pipe	178	DC6-48-60-18-8F	168
ATSBT-TOP-MF-4G	178	DC6-48-60-18-8F	168
ATSBT-TOP-MF-4G	178	PiROD 15' Platform with handrail (VERIZON - existing)	153
ATSBT-TOP-MF-4G	178		
(2) Ericsson KRY 112 71/2	178	(2) LPA-80063-4CF-EDIN w/mount pipe	153
(2) Ericsson KRY 112 71/2	178		
(2) Ericsson KRY 112 71/2	178	(2) LPA-80063-4CF-EDIN w/mount pipe	153
PiROD 15' Low Profile Platform (ATT)	168		
Kathrein 800 10121 w/mount pipe	168	(2) LPA-80063-4CF-EDIN w/mount pipe	153
Kathrein 800 10121 w/mount pipe	168		
Kathrein 800 10121 w/mount pipe	168	(2) NHH-65B-R2B w/ Mount Pipe (VERIZON - proposed)	153
Quintel QS66512-2 w/mpount pipe	168	(2) NHH-65B-R2B w/ Mount Pipe	153
Quintel QS66512-2 w/mpount pipe	168	(2) NHH-65B-R2B w/ Mount Pipe	153
Quintel QS66512-2 w/mpount pipe	168	B5/B13 RRH-BR04C	153
OPA-65R-LCUU-H6 w/mount pipe	168	B5/B13 RRH-BR04C	153
OPA-65R-LCUU-H6 w/mount pipe	168	B5/B13 RRH-BR04C	153
OPA-65R-LCUU-H6 w/mount pipe	168	B2/B66A RRH-BR049	153
Ericsson RRUS-32	168	B2/B66A RRH-BR049	153
Ericsson RRUS-32	168	B2/B66A RRH-BR049	153
Ericsson RRUS-32	168	DB-C1-12C-24AB-0Z	153
Ericsson RRUS-11	168	PiROD 15' Low Profile Platform	145
Ericsson RRUS-11	168	(4) 2"x8' pipe	145
Ericsson RRUS-11	168	(4) 2"x8' pipe	145
Ericsson RRUS-32	168	(4) 2"x8' pipe	145
Ericsson RRUS-32	168		
Ericsson RRUS-32	168		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97.0 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: 94.2%

ALL REACTIONS ARE FACTORED

AXIAL
115541 lb

SHEAR
11376 lb

MOMENT
1523918 lb-ft

TORQUE 1380 lb-ft
50.0 mph WIND - 1.0000 in ICE

AXIAL
62848 lb

SHEAR
35617 lb

MOMENT
4661693 lb-ft

TORQUE 2115 lb-ft
REACTIONS - 97.0 mph WIND

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

Job: ***VERNON 2 CT***
Project: ***81 ft Monopole***
Client: VERIZON Drawn by: kw App'd:
Code: TIA-222-G Date: 06/04/19 Scale: N
Path: Dwg No.

Tower Input Data

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

Tower is located in Tolland County, Connecticut.
Basic wind speed of 97.0 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.

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	175.00-160.00	15.00	P24x3/8	A53-B-42 (42 ksi)	
L2	160.00-140.00	20.00	P30x3/8	A53-B-42 (42 ksi)	
L3	140.00-120.00	20.00	P36x3/8	A53-B-42 (42 ksi)	
L4	120.00-100.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L5	100.00-80.00	20.00	P48x3/8	A53-B-42 (42 ksi)	
L6	80.00-60.00	20.00	P54x3/8	A53-B-42 (42 ksi)	
L7	60.00-40.00	20.00	P60x3/8	A53-B-42 (42 ksi)	
L8	40.00-20.00	20.00	P60x1/2	A53-B-42 (42 ksi)	
L9	20.00-0.00	20.00	P60x5/8	A53-B-42 (42 ksi)	

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	175.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	124.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	No	CaAa (Out Of Face)	145.00 - 124.00	2	No Ice	0.20	0.82
							1/2" Ice	0.30	2.33
							1" Ice	0.40	4.46
LDF7-50A (1-5/8 FOAM)	C	No	No	CaAa (Out Of Face)	145.00 - 124.00	10	No Ice	0.20	0.82
							1/2" Ice	0.30	2.33
							1" Ice	0.40	4.46
1 5/8 Fiber Cable	C	No	No	Inside Pole	165.00 - 0.00	1	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	No	Inside Pole	153.00 - 0.00	6	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
********									
1 5/8 Fiber Cable (VERIZON - proposed)	B	No	No	Inside Pole	153.00 - 0.00	2	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 / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
PiROD 15' Low Profile Platform	A	None		0.0000	178.00	No Ice	17.30	17.30	1500.00
						1/2" Ice	22.10	22.10	2030.00
						1" Ice	26.90	26.90	2560.00
(2) LNX-6514DS-A1M w/ Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	8.42 8.98 9.50	7.09 8.27 9.17	56.85 125.98 203.14
(2) LNX-6514DS-A1M w/ Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	8.42 8.98 9.50	7.09 8.27 9.17	56.85 125.98 203.14
(2) LNX-6514DS-A1M w/ Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	8.42 8.98 9.50	7.09 8.27 9.17	56.85 125.98 203.14
APX16DWV-16DWVS-C w/mount pipe	A	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	6.91 7.39 7.86	3.60 4.44 5.15	62.60 112.14 168.24
APX16DWV-16DWVS-C w/mount pipe	B	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	6.91 7.39 7.86	3.60 4.44 5.15	62.60 112.14 168.24
APX16DWV-16DWVS-C w/mount pipe	C	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	6.91 7.39 7.86	3.60 4.44 5.15	62.60 112.14 168.24
ATSBT-TOP-MF-4G	A	From Face	3.00 0.00	0.0000	178.00	No Ice 1/2" Ice	0.17 0.23	0.09 0.14	2.00 3.67

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
			0.00			1" Ice	0.29	0.19	6.27
ATSBT-TOP-MF-4G	B	From Face	3.00	0.0000	178.00	No Ice	0.17	0.09	2.00
			0.00			1/2" Ice	0.23	0.14	3.67
			0.00			1" Ice	0.29	0.19	6.27
ATSBT-TOP-MF-4G	C	From Face	3.00	0.0000	178.00	No Ice	0.17	0.09	2.00
			0.00			1/2" Ice	0.23	0.14	3.67
			0.00			1" Ice	0.29	0.19	6.27
(2) Ericsson KRY 112 71/2	A	From Face	3.00	0.0000	178.00	No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
(2) Ericsson KRY 112 71/2	B	From Face	3.00	0.0000	178.00	No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
(2) Ericsson KRY 112 71/2	C	From Face	3.00	0.0000	178.00	No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
**********									
PiROD 15' Low Profile Platform (AT&T)	A	None		0.0000	168.00	No Ice	17.30	17.30	1500.00
						1/2" Ice	22.10	22.10	2030.00
						1" Ice	26.90	26.90	2560.00
Kathrein 800 10121 w/mount pipe	A	From Leg	3.00	0.0000	168.00	No Ice	5.40	4.77	64.55
			0.00			1/2" Ice	5.78	5.43	112.69
			0.00			1" Ice	6.17	6.10	167.17
Kathrein 800 10121 w/mount pipe	B	From Leg	3.00	0.0000	168.00	No Ice	5.40	4.77	64.55
			0.00			1/2" Ice	5.78	5.43	112.69
			0.00			1" Ice	6.17	6.10	167.17
Kathrein 800 10121 w/mount pipe	C	From Leg	3.00	0.0000	168.00	No Ice	5.40	4.77	64.55
			0.00			1/2" Ice	5.78	5.43	112.69
			0.00			1" Ice	6.17	6.10	167.17
Quintel QS66512-2 w/mpount pipe	A	From Leg	3.00	0.0000	168.00	No Ice	8.61	8.70	140.20
			0.00			1/2" Ice	9.27	9.99	218.50
			0.00			1" Ice	9.90	11.12	305.14
Quintel QS66512-2 w/mpount pipe	B	From Leg	3.00	0.0000	168.00	No Ice	8.61	8.70	140.20
			0.00			1/2" Ice	9.27	9.99	218.50
			0.00			1" Ice	9.90	11.12	305.14
Quintel QS66512-2 w/mpount pipe	C	From Leg	3.00	0.0000	168.00	No Ice	8.61	8.70	140.20
			0.00			1/2" Ice	9.27	9.99	218.50
			0.00			1" Ice	9.90	11.12	305.14
OPA-65R-LCUU-H6 w/mount pipe	A	From Leg	3.00	0.0000	168.00	No Ice	9.95	7.53	112.53
			0.00			1/2" Ice	10.50	8.56	192.76
			0.00			1" Ice	11.04	9.45	282.09
OPA-65R-LCUU-H6 w/mount pipe	B	From Leg	3.00	0.0000	168.00	No Ice	9.95	7.53	112.53
			0.00			1/2" Ice	10.50	8.56	192.76
			0.00			1" Ice	11.04	9.45	282.09
OPA-65R-LCUU-H6 w/mount pipe	C	From Leg	3.00	0.0000	168.00	No Ice	9.95	7.53	112.53
			0.00			1/2" Ice	10.50	8.56	192.76
			0.00			1" Ice	11.04	9.45	282.09
Ericsson RRUS-32	A	From Leg	3.00	0.0000	168.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
Ericsson RRUS-32	B	From Leg	3.00	0.0000	168.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
Ericsson RRUS-32	C	From Leg	3.00	0.0000	168.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
Ericsson RRUS-11	A	From Leg	3.00	0.0000	168.00	No Ice	2.79	1.19	50.70

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
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
Ericsson RRUS-11	B	From Leg	3.00	0.0000	168.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
Ericsson RRUS-11	C	From Leg	3.00	0.0000	168.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
Ericsson RRUS-32	A	From Leg	3.00	0.0000	168.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
Ericsson RRUS-32	B	From Leg	3.00	0.0000	168.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
Ericsson RRUS-32	C	From Leg	3.00	0.0000	168.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
B14 4478	A	From Leg	3.00	0.0000	168.00	No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
			0.00			1" Ice	1.98	1.19	91.23
B14 4478	B	From Leg	3.00	0.0000	168.00	No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
			0.00			1" Ice	1.98	1.19	91.23
B14 4478	C	From Leg	3.00	0.0000	168.00	No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
			0.00			1" Ice	1.98	1.19	91.23
(2) Gen. TMA	A	From Leg	3.00	0.0000	168.00	No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
(2) Gen. TMA	B	From Leg	3.00	0.0000	168.00	No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
(2) Gen. TMA	B	From Leg	3.00	0.0000	168.00	No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
DC6-48-60-18-8F	A	From Leg	3.00	0.0000	168.00	No Ice	0.79	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.00			1" Ice	1.45	1.45	52.57
DC6-48-60-18-8F	B	From Leg	3.00	0.0000	168.00	No Ice	0.79	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.00			1" Ice	1.45	1.45	52.57
**********									
PiROD 15' Platform with handrail (VERIZON - existing)	A	None		0.0000	153.00	No Ice	33.80	33.80	2043.00
						1/2" Ice	43.60	43.60	2748.00
						1" Ice	53.40	53.40	3453.00
(2) LPA-80063-4CF-EDIN w/mount pipe	A	From Face	3.00	0.0000	153.00	No Ice	6.39	6.58	38.25
			0.00			1/2" Ice	6.79	7.21	103.94
			0.00			1" Ice	7.21	7.86	176.21
(2) LPA-80063-4CF-EDIN w/mount pipe	B	From Face	3.00	0.0000	153.00	No Ice	6.39	6.58	38.25
			0.00			1/2" Ice	6.79	7.21	103.94
			0.00			1" Ice	7.21	7.86	176.21
(2) LPA-80063-4CF-EDIN w/mount pipe	C	From Face	3.00	0.0000	153.00	No Ice	6.39	6.58	38.25
			0.00			1/2" Ice	6.79	7.21	103.94
			0.00			1" Ice	7.21	7.86	176.21
**********									
(2) NHH-65B-R2B w/ Mount Pipe	A	From Face	3.00	0.0000	153.00	No Ice	8.32	7.00	69.25
			0.00			1/2" Ice	8.88	8.19	137.80

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
(VERIZON - proposed)			0.00			1" Ice	9.40	9.08	214.31
(2) NHH-65B-R2B w/ Mount Pipe	B	From Face	3.00	0.0000	153.00	No Ice	8.32	7.00	69.25
			0.00			1/2" Ice	8.88	8.19	137.80
			0.00			1" Ice	9.40	9.08	214.31
(2) NHH-65B-R2B w/ Mount Pipe	C	From Face	3.00	0.0000	153.00	No Ice	8.32	7.00	69.25
			0.00			1/2" Ice	8.88	8.19	137.80
			0.00			1" Ice	9.40	9.08	214.31
B5/B13 RRH-BR04C	A	From Face	3.00	0.0000	153.00	No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B5/B13 RRH-BR04C	B	From Face	3.00	0.0000	153.00	No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B5/B13 RRH-BR04C	C	From Face	3.00	0.0000	153.00	No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B2/B66A RRH-BR049	A	From Face	3.00	0.0000	153.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH-BR049	B	From Face	3.00	0.0000	153.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH-BR049	C	From Face	3.00	0.0000	153.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
DB-C1-12C-24AB-0Z	B	From Face	3.00	0.0000	153.00	No Ice	4.06	3.10	32.00
			0.00			1/2" Ice	4.32	3.34	68.49
			0.00			1" Ice	4.58	3.58	108.97
**********									
PiROD 15' Low Profile Platform	A	None		0.0000	145.00	No Ice	17.30	17.30	1500.00
						1/2" Ice	22.10	22.10	2030.00
						1" Ice	26.90	26.90	2560.00
(4) 2"x8' pipe	A	From Face	0.00	0.0000	145.00	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.37
			0.00			1" Ice	3.40	3.40	64.01
(4) 2"x8' pipe	B	From Face	0.00	0.0000	145.00	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.37
			0.00			1" Ice	3.40	3.40	64.01
(4) 2"x8' pipe	C	From Face	0.00	0.0000	145.00	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.37
			0.00			1" Ice	3.40	3.40	64.01
**********									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice

Comb. No.	Description
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	26	115541.29	0.00	0.00
	Max. H_x	21	47136.37	35617.18	-3.84
	Max. H_z	2	62848.49	-3.84	35595.62
	Max. M_x	2	4658085.08	-3.84	35595.62
	Max. M_z	8	4661692.57	-35617.17	3.84
	Max. Torsion	25	2114.04	17805.26	30824.80
	Min. Vert	13	47136.37	-17805.26	-30824.80
	Min. H_x	9	47136.37	-35617.18	3.84

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_z	14	62848.49	3.84	-35595.62
	Min. M_x	14	-4658186.47	3.84	-35595.62
	Min. M_z	20	-4661398.78	35617.17	-3.84
	Min. Torsion	13	-2114.64	-17805.26	-30824.80

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	52373.74	0.00	0.00	40.83	-112.18	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	62848.49	3.84	-35595.62	-4658085.08	-527.82	-1755.82
0.9 Dead+1.6 Wind 0 deg - No Ice	47136.37	3.84	-35595.62	-4617037.76	-484.45	-1764.78
1.2 Dead+1.6 Wind 30 deg - No Ice	62848.49	17811.91	-30828.63	-4034194.59	-2331248.21	-936.28
0.9 Dead+1.6 Wind 30 deg - No Ice	47136.37	17811.91	-30828.63	-3998647.98	-2310660.18	-942.67
1.2 Dead+1.6 Wind 60 deg - No Ice	62848.49	30847.29	-17801.13	-2329336.26	-4037350.67	134.32
0.9 Dead+1.6 Wind 60 deg - No Ice	47136.37	30847.29	-17801.13	-2308817.64	-4001723.74	132.18
1.2 Dead+1.6 Wind 90 deg - No Ice	62848.49	35617.17	-3.84	-326.31	-4661692.57	1169.16
0.9 Dead+1.6 Wind 90 deg - No Ice	47136.37	35617.18	-3.84	-336.20	-4620558.05	1171.87
1.2 Dead+1.6 Wind 120 deg - No Ice	62848.49	30843.45	17794.49	2328786.24	-4036985.92	1890.76
0.9 Dead+1.6 Wind 120 deg - No Ice	47136.37	30843.45	17794.49	2308246.58	-4001358.95	1897.58
1.2 Dead+1.6 Wind 150 deg - No Ice	62848.49	17805.26	30824.80	4033922.35	-2330612.17	2105.54
0.9 Dead+1.6 Wind 150 deg - No Ice	47136.37	17805.26	30824.80	3998351.90	-2310025.17	2114.64
1.2 Dead+1.6 Wind 180 deg - No Ice	62848.49	-3.84	35595.62	4658186.47	213.19	1755.93
0.9 Dead+1.6 Wind 180 deg - No Ice	47136.37	-3.84	35595.62	4617112.98	253.65	1764.88
1.2 Dead+1.6 Wind 210 deg - No Ice	62848.49	-17811.91	30828.63	4034301.76	2330944.40	935.76
0.9 Dead+1.6 Wind 210 deg - No Ice	47136.37	-17811.91	30828.63	3998727.45	2310437.33	942.18
1.2 Dead+1.6 Wind 240 deg - No Ice	62848.49	-30847.29	17801.13	2329436.94	4037057.30	-134.95
0.9 Dead+1.6 Wind 240 deg - No Ice	47136.37	-30847.29	17801.13	2308892.34	4001508.54	-132.82
1.2 Dead+1.6 Wind 270 deg - No Ice	62848.49	-35617.17	3.84	414.70	4661398.78	-1169.27
0.9 Dead+1.6 Wind 270 deg - No Ice	47136.37	-35617.18	3.84	401.91	4620342.55	-1171.98
1.2 Dead+1.6 Wind 300 deg - No Ice	62848.49	-30843.45	-17794.49	-2328703.63	4036681.28	-1890.24
0.9 Dead+1.6 Wind 300 deg - No Ice	47136.37	-30843.45	-17794.49	-2308185.13	4001135.50	-1897.05
1.2 Dead+1.6 Wind 330 deg -	62848.49	-17805.26	-30824.80	-4033833.24	2330297.11	-2104.93

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 0.9 Dead+1.6 Wind 330 deg - No Ice	47136.37	-17805.26	-30824.80	-3998285.69	2309794.07	-2114.04
1.2 Dead+1.0 Ice+1.0 Temp	115541.29	0.00	0.00	1705.03	2140.24	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	115541.29	0.14	-11372.29	-1518336.94	2493.32	-1166.53
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	115541.29	5688.24	-9848.76	-1314632.47	-758003.18	-640.11
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	115541.29	9852.18	-5686.26	-758143.44	-1314734.22	57.81
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	115541.29	11376.24	-0.14	2020.50	-1518526.18	740.24
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	115541.29	9852.04	5686.02	762176.34	-1314773.20	1224.30
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	115541.29	5688.00	9848.62	1318642.12	-758068.68	1380.27
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	115541.29	-0.14	11372.29	1522312.05	2420.91	1166.36
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	115541.29	-5688.24	9848.76	1318610.59	762922.90	639.90
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	115541.29	-9852.18	5686.26	762118.30	1319659.29	-58.04
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	115541.29	-11376.24	0.14	1948.10	1523451.10	-740.43
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	115541.29	-9852.04	-5686.02	-758210.75	1319692.64	-1224.45
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	115541.29	-5688.00	-9848.62	-1314673.27	762982.78	-1380.41
Dead+Wind 0 deg - Service	52373.74	0.82	-7616.07	-991544.34	-200.16	-379.01
Dead+Wind 30 deg - Service	52373.74	3811.05	-6596.12	-858736.32	-496346.22	-202.26
Dead+Wind 60 deg - Service	52373.74	6600.12	-3808.75	-495819.45	-859529.08	28.69
Dead+Wind 90 deg - Service	52373.74	7620.68	-0.82	-36.95	-992434.37	251.96
Dead+Wind 120 deg - Service	52373.74	6599.30	3807.33	495766.85	-859450.25	407.72
Dead+Wind 150 deg - Service	52373.74	3809.63	6595.30	858741.83	-496209.52	454.23
Dead+Wind 180 deg - Service	52373.74	-0.82	7616.07	991629.01	-42.07	379.01
Dead+Wind 210 deg - Service	52373.74	-3811.05	6596.12	858821.21	496104.39	202.24
Dead+Wind 240 deg - Service	52373.74	-6600.12	3808.75	495904.10	859287.65	-28.72
Dead+Wind 270 deg - Service	52373.74	-7620.68	0.82	121.14	992192.92	-251.97
Dead+Wind 300 deg - Service	52373.74	-6599.30	-3807.33	-495682.88	859208.39	-407.70
Dead+Wind 330 deg - Service	52373.74	-3809.63	-6595.30	-858657.61	495967.27	-454.20

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	175 - 160	18.4909	42	0.9513	0.0008
L2	160 - 140	15.5302	42	0.9245	0.0010
L3	140 - 120	11.7991	42	0.8395	0.0011
L4	120 - 100	8.5127	42	0.7155	0.0009
L5	100 - 80	5.7789	42	0.5797	0.0006
L6	80 - 60	3.6137	42	0.4469	0.0004
L7	60 - 40	1.9914	42	0.3224	0.0003
L8	40 - 20	0.8728	42	0.2075	0.0001
L9	20 - 0	0.2185	42	0.1016	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.00	PiROD 15' Low Profile Platform	42	18.4909	0.9513	0.0008	60446
168.00	PiROD 15' Low Profile Platform	42	17.1011	0.9413	0.0009	43175
153.00	PiROD 15' Platform with handrail	42	14.1856	0.9013	0.0010	15112
145.00	PiROD 15' Low Profile Platform	42	12.6972	0.8657	0.0011	11754

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	175 - 160	Pole	P24x3/8	1	-7671.47	1052070.00	20.9	Pass
L2	160 - 140	Pole	P30x3/8	2	-16476.70	1311060.00	49.3	Pass
L3	140 - 120	Pole	P36x3/8	3	-20529.60	1490100.00	70.7	Pass
L4	120 - 100	Pole	P42x3/8	4	-25432.60	1668870.00	83.2	Pass
L5	100 - 80	Pole	P48x3/8	5	-30941.10	1847490.00	89.5	Pass
L6	80 - 60	Pole	P54x3/8	6	-37044.20	2026000.00	92.7	Pass
L7	60 - 40	Pole	P60x3/8	7	-43737.00	2204430.00	94.2	Pass
L8	40 - 20	Pole	P60x1/2	8	-52338.00	3125690.00	83.2	Pass
L9	20 - 0	Pole	P60x5/8	9	-62840.50	4139150.00	76.8	Pass
							Summary	
						Pole (L7)	94.2	Pass
						RATING =	**94.2**	**Pass**

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *0*
Site Name: *VERNON 2 CT*
App #: *0*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	67	in

Plate Data		
Diam:	73	in
Thick:	1.5	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6.5	in
Thick:	0.375	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	60	in
Thick:	0.625	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	4662	ft-kips
Axial, Pu:	63	kips
Shear, Vu:	36	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ή):	66.8 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	77.5 Kips	φ*Tn
Anchor Rod Stress Ratio:	86.2% **Pass**	

Base Plate Results — Shear Check Only

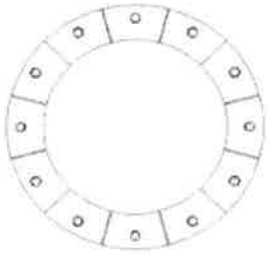
		Stiffened
Base Plate Stress:	7.3 ksi	AISC LRFD
Allowable Plate Stress:	19.4 ksi	φ*Fy
Base Plate Stress Ratio:	37.4% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	69.0% **Pass**
Vertical Weld:	33.3% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	48.7% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	97.4% **Pass**
Plate Comp. (AISC Bracket):	98.5% **Pass**

Pole Results

Pole Punching Shear Check:	9.8% **Pass**



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Monopole Pier and Pad Foundation

BU # :
Site Name: VERNON 2 CT
App. Number:
TIA-222 Revision: G

Design Reactions		
Shear, **S**:	35.6	kips
Moment, **M**:	4662	ft-kips
Tower Height, **H**:	175	ft
Tower Weight, **Wt**:	62.8	kips
Base Diameter, **BD**:	5.00	ft

Foundation Dimensions		
Depth, **D**:	10	ft
Pad Width, **W**:	20	ft
Neglected Depth, **N**:	0	ft
Thickness, **T**:	3.00	ft
Pier Diameter, **Pd**:	7.00	ft
Ext. Above Grade, **E**:	0.50	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

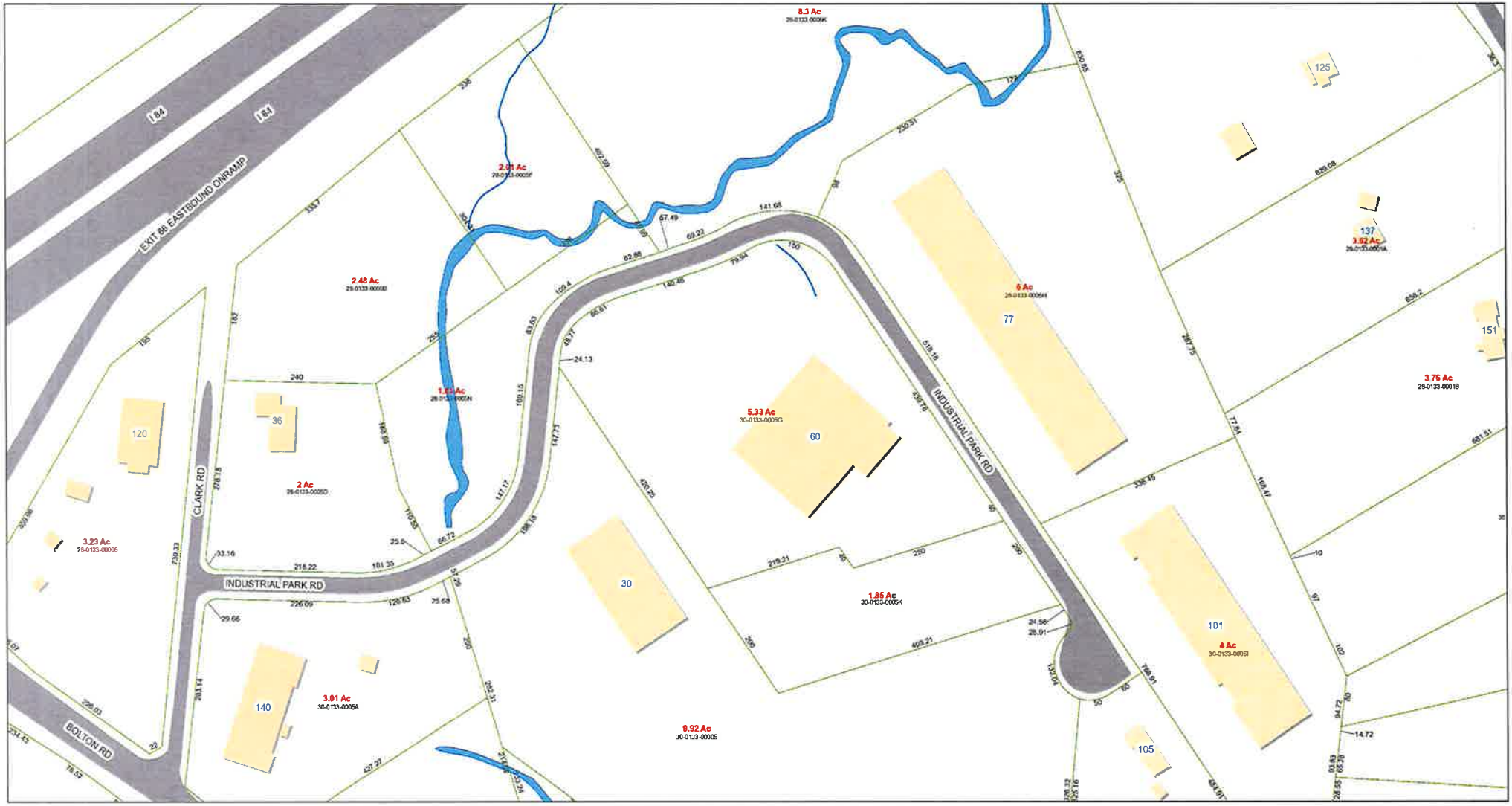
Soil Properties		
Soil Unit Weight, **γ**:	0.120	kcf
Ult. Bearing Capacity, Bc:	10.0	ksf
Angle of Friction, **Φ**:	34	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	ksf
Base Friction, **μ**:	0.30	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:		

Rebar Properties		
Pier Rebar Size, **Sp**:	9	
Pier Rebar Quanity, **mp**:	34	28
Pad Rebar Size, **Spad**:	8	
Pad Rebar Quanity, **mpad**:	23	14
Pier Tie Size, **St**:	4	3
Tie Quanity, **mt**:	12	7

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	7	7	**OK**
Overturning (ft-kips)	5082.10	4662.00	**91.7%**
Shear Capacity (kips)	174.01	35.60	**20.5%**
Bearing (ksf)	7.50	7.18	**95.7%**
Pad Shear - 1-way (kips)	640.84	458.87	**71.6%**
Pad Shear - 2-way (kips)	1954.52	123.41	**6.3%**
Pad Moment Capacity (k-ft)	2584.54	1725.21	**66.8%**
Pier Moment Capacity (k-ft)	9815.92	4929.00	**50.2%**

ATTACHMENT 4



June 6, 2019

1:1,813

0 0.0225 0.045 0.09 mi

0 0.035 0.07 0.14 km

Town of Vernon

INDUSTRIAL PARK ROAD LLC
75 GERBER ROAD EAST
SOUTH WINDSOR, CT 06074
CENSUS TRACT: 530600

ighborhood Number
12100
ighborhood Name
General Commercial
XING DISTRICT INFORMATION
Jurisdiction Name Town of Vernon
Area 146
Routing Number 5044

Transfer of Ownership

Owner	Consideration	Transfer Date	Deed Book	Page	Deed Type
DJV REAL ESTATE LLC	0	03/22/2018	2546	253	W
LILYMAXJACK LLC	700000	10/30/2017	2529	193	W
BEAUREGARD GEORGE W	0	07/05/2005	1744	267	Q
BEAUREGARD GEORGE W & KAREN S	0	07/05/2005	1744	264	Q
BEAUREGARD KAREN S & GEORGE W	0	03/07/2000	1244	40	Q
BEAUREGARD GEORGE W	0	04/13/1999	1200	11	Q

te Description
Topography

Public Utilities
Water, Sewer, Gas, Electric
Street or Road
Paved
Neighborhood

Zoning:
Industrial
Legal Acres:
5.1000

Valuation Record

Assessment Year		2011	2016	2017	2018			
Reason for Change		2011 REVAL	2016 Reval	BAA	2018 ASMT			
Market	L	313380	245720	245720	245720			
	I	668250	1449820	754280	574280			
	T	981630	1695540	1000000	820000			
70% Assessed/Use	L	219370	172000	172000	172000			
	I	467770	1014880	528000	401990			
	T	687140	1186880	700000	573990			

Land Size

Land Type	Rating, Soil ID - or - Actual Frontage	Acreage - or - Effective Frontage	Square Feet - or - Effective Depth	Influence Facto

ıysical Characteristics

OFING

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sulation

LLS

	B	1	2	U
ame		Yes		
ard	Yes	Yes	Yes	Yes

AMING

	B	1	2	U
Res	0	34908	0	4000

NISH

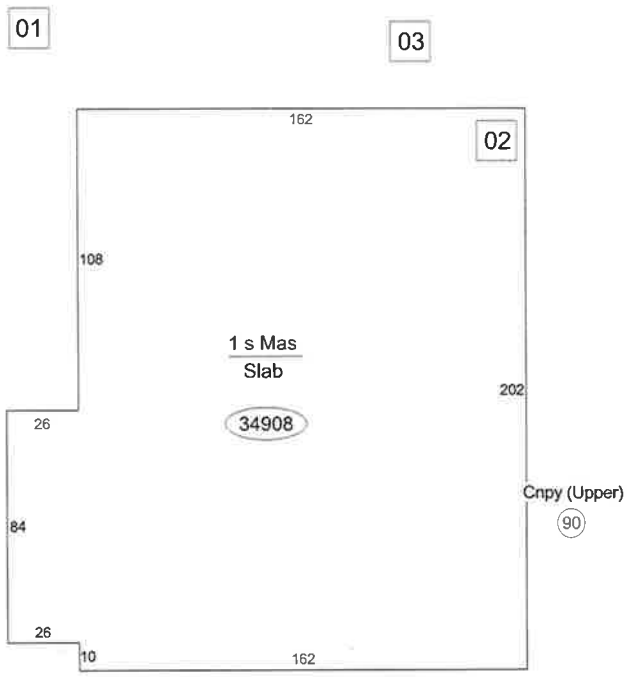
	UF	SF	FO	FD
	34908	0	0	0
	4000	0	0	0
tal	38908	0	0	0

ATING AND AIR CONDITIONING

	B	1	2	U
at	0	34908	0	4000
rink	0	34908	0	4000

UMBING

	Residential		Commercial	
	#	TF	#	TF
ll Baths				
lf Baths			3	6
tra Fixtures				
TAL		0		6



Special Features

Description

Summary of Improvements

ID	USE	Story Height	Const Type	Grade	Year Cons	Eff Year	Cond
C	LMFG	0.00		Fair	1968	1970	FR
01	PAVING	0.00	85	Avg	1968	1968	AV
02	MEZZSF	1.00		Fair	1968	1968	AV
03	TOWERMON	0.00		Avg	2000	2000	AV

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3	3	neopost 06/10/2019 US POSTAGE $002.79⁰ ZIP 06103 041L12203837
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Daniel A. Champagne, Mayor Town of Vernon 14 Park Place Vernon, CT 06066	1			
2.	Shaun Gately, Interim Director of Planning and Development Town of Vernon 14 Park Place Vernon, CT 06066		OLD STATE HOUSE STATION 06103 JUN 10 2019 USPS		
3.	Industrial Park Road LLC 75 Gerber Road East South Windsor, CT 06474				
4.					
5.					
6.					