Robinson+Cole

KENNETH C. BALDWIN

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Also admitted in Massachusetts

February 28, 2018

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

Re: **Notice of Exempt Modification – Facility Modification**
311 Old Gate Lane, Milford, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 100-foot level of the existing 120-foot tower at 311 Old Gate Lane in Milford, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 2008. Cellco now intends to replace nine (9) of its existing antennas with three (3) model SBNHH-1D45A, 700 MHz antennas; three (3) model SBNHH-1D45A, 1900 MHz antennas; and three (3) model SBNHH-1D45A, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) existing remote radio heads ("RRHs") and install three (3) new RRHs behind its antennas and install one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Milford Mayor, Benjamin G. Blake; David B. Sulkis, Milford's City Planner; BVS JAI ALAI LLC, the owner of the Property; and Crown, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed at the 100-foot level of the 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 General Power Density table for Cellco's modified facility is included behind Attachment 2.

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

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural 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:
Benjamin G. Blake, Mayor
David B. Sulkis, City Planner
BVS JAI ALAI LLC
Crown Castle
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D45A

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

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Three internal RETs for independent tilt on all three bands

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	15.5	16.2	18.5	19.1	19.4	20.0
Beamwidth, Horizontal, degrees	48	43	44	43	44	39
Beamwidth, Vertical, degrees	18.5	16.8	7.9	7.3	6.9	6.0
Beam Tilt, degrees	2–18	2–18	1–9	1–9	1–9	1–9
USLS (First Lobe), dB	16	17	16	16	15	13
Front-to-Back Ratio at 180°, dB	33	34	37	36	38	39
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	25	25	25	25	25	25
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	15.1	15.9	18.1	18.8	19.1	19.7
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.4	±0.5	±0.4	±0.4	±0.3
	2 ° | 15.2	2 ° | 16.0	1 ° | 18.2	1 ° | 18.9	1 ° | 19.1	1 ° | 19.8
Gain by Beam Tilt, average, dBi	10 ° | 15.1	10 ° | 16.0	5 ° | 18.2	5 ° | 18.8	5 ° | 19.1	5 ° | 19.8
	18 ° | 14.9	18 ° | 15.5	9 ° | 18.0	9 ° | 18.6	9 ° | 18.9	9 ° | 19.4
Beamwidth, Horizontal Tolerance, degrees	±1.7	±3.1	±2.1	±1.4	±1.5	±1.6
Beamwidth, Vertical Tolerance, degrees	±1.1	±0.8	±0.3	±0.3	±0.5	±0.2
USLS, beampeak to 20° above beampeak, dB	17	21	14	14	15	13
Front-to-Back Total Power at 180° ± 30°, dB	24	25	28	29	30	30
CPR at Boresight, dB	26	30	20	24	18	20
CPR at 10 dB Horizontal Beamwidth, dB	13	15	10	10	11	13

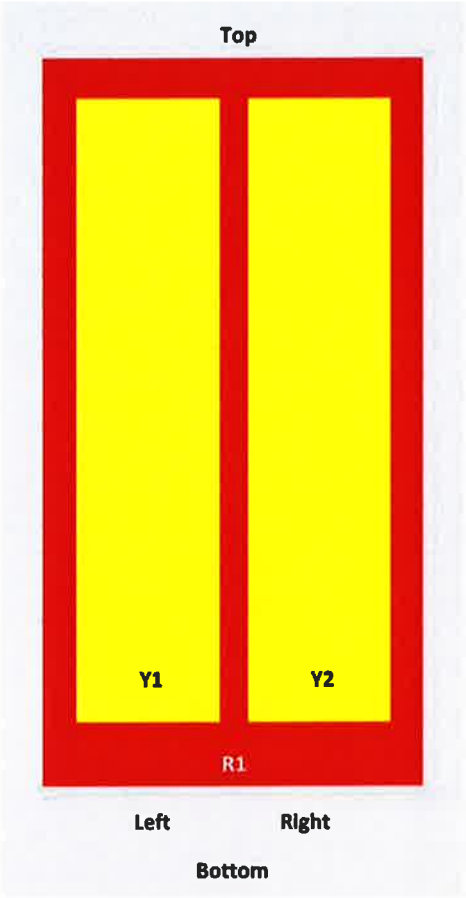
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

Product Specifications

SBNHH-1D45A

SBNHH 45 85



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

View from the front of the antenna

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

General Specifications

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

Mechanical Specifications

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

Product Specifications

SBNHH-1D45A

Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	693.0 N @ 150 km/h 155.8 lbf @ 150 km/h
Wind Loading, lateral	145.0 N @ 150 km/h 32.6 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1220.0 mm | 48.0 in
Width	457.0 mm | 18.0 in
Depth	178.0 mm | 7.0 in
Net Weight, without mounting kit	22.9 kg | 50.5 lb

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

Length	1342.0 mm | 52.8 in
Width	567.0 mm | 22.3 in
Depth	311.0 mm | 12.2 in
Shipping Weight	34.6 kg | 76.3 lb

Regulatory Compliance/Certifications

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

Included Products

Product Specifications

SBNHH-1D45A

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 B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

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

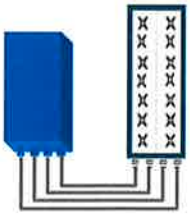
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

- Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options (Pole or Wall)



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2) RX Diversity scheme	2.0 dB typ. (<2.5 dB max) 2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in.) Volume (w/ solar shield) in L Weight (w/ solar shield) in kg (lb)	538 x 304 x 182 (21.2" x 12.0" x 7.2") 30 24 (53)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 580W typical @100% RF load
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) IP65 Frontal:<200N / Lateral :<150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 4 RF Tx & 4 RF Rx monitor ports 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

ALCATEL-LUCENT B66A RRH4X45

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

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

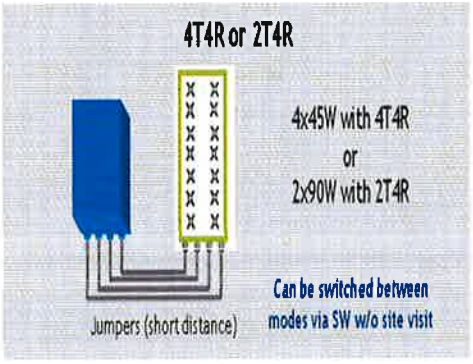
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

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

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

FEATURES

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



BENEFITS

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

TECHNICAL SPECIFICATIONS

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

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Structure			
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)		[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Environmental			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

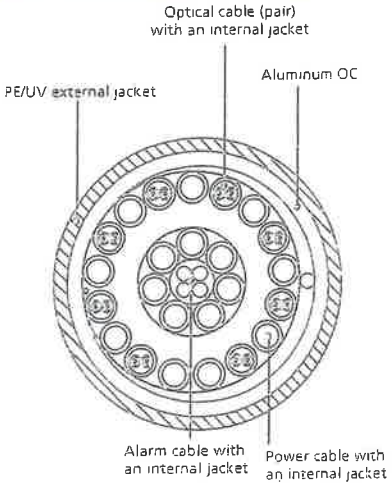


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Old Gate (Milford)								
Tower Height: 100'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint	1	438	121	850	0.0119	0.5667	0.21%	
*Sprint	2	438	121	850	0.0238	0.5667	0.42%	
*Sprint	5	622	121	1900	0.0846	1.0000	0.85%	
*Sprint	2	1556	121	1900	0.0846	1.0000	0.85%	
*Sprint	8	778	121	2500	0.1693	1.0000	1.69%	
*Clearwire	2	153	121	2496	0.0083	1.0000	0.08%	
*Clearwire	1	211	117	11 GHz	0.0062	1.0000	0.06%	
Verizon PCS	**1**	**4511**	**100**	**0.1622**	**0.1836**	**1.0000**	**16.22%**	
Verizon Cellular	**3**	**498**	**100**	**0.0537**	**0.0608**	**0.5793**	**9.27%**	
Verizon Cellular	**0**	**3709**	**100**	**0.0000**	**0.0000**	**0.5866**	**0.00%**	
Verizon AWS	**1**	**7251**	**100**	**0.2607**	**0.2951**	**1.0000**	**26.07%**	
Verizon 700	**1**	**2159**	**100**	**0.0776**	**0.0879**	**0.4973**	**15.61%**	
								71.3%
* Source: Siting Council								

ATTACHMENT 3

PJF PAUL J. FORD & COMPANY

Date: **April 24, 2017**

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
mscroggy@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	178084
	Carrier Site Name:	Old Gate, CT
Crown Castle Designation:	**Crown Castle BU Number:**	876309
	Crown Castle Site Name:	MILFORD JAI-ALAI
	Crown Castle JDE Job Number:	424261
	Crown Castle Work Order Number:	1394558
	Crown Castle Application Number:	378471 Rev. 5
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37517-0863.002.7805
Site Data:	**311 Old Gate Lane, Milford, New Haven County, CT**	
	Latitude *41° 14' 2.59"*, Longitude *-73° 1' 22.4"*	
	120 Foot - Monopole Tower	

Dear Sean Dempsey,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1028350, in accordance with application 378471, revision 5.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

We at *Paul J. Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Morgan Scroggy, E.I. RMK
Structural Designer

STATE OF CONNECTICUT JUSTIN T. MINE No. 30301 LICENSED PROFESSIONAL ENGINEER

4.24.17

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ROHN in December of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100.0	102.0	3	alcatel lucent	B25 RRH4X30	1	1-5/8	-
		3	alcatel lucent	B66A RRH4X45			
		9	commscope	SBNHH-1D45A w/ Mount Pipe			
		1	raycap	RXXDC-3315-PF-48			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	124.0	1	andrew	VHLP1-18	3	1/4	1
		1	dragonwave	HORIZON COMPACT	3	5/16	
	123.0	1	lucent	KS24019-L112A	3	1/2	
	121.0	1	andrew	VHLP1-18			
		1	dragonwave	HORIZON COMPACT			
	120.0	6	alcatel lucent	1900MHz RRH (65MHz)	4	1-1/4	2
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	TD-RRH8x20-25			
		9	rfs celwave	ACU-A20-N			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Pipe			
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	rfs celwave	IBC1900HB-2			
	117.0	3	argus tech	LLPX310R w/ Mount Pipe	-	-	1
		3	samsung telecom	FDD_R6_RRH			
		1	tower mounts	Platform Mount [LP 502-1]			
100.0	102.0	3	andrew	LNX-4514DS-A1M w/ Mount Pipe	-	-	3
		3	antel	BXA-171063-8BF-EDIN-0 w/ Pipe			
		3	antel	BXA-171063-8BF-EDIN-2 w/ Pipe			
		3	antel	BXA-70063-6BF-EDIN-0 w/ Pipe	12	1-5/8	1
		8	rfs celwave	FD9R6004/2C-3L			
	100.0	4	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 303-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed, Not Considered in this SA

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-	-	-	-	-	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 146G3C1600, 12/12/2014	2221322	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 34738SW, 12/16/1996	2068407	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, 34738SW, 12/16/1996	2068406	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions, 07574.04, 11/12/2007	2217525	CCISITES
4-POST-MODIFICATION INSPECTION	GPD, 2010111.29, 4/26/2010	2638363	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 41712-0006 MO R2, 4/20/2012	3158394	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 37512-0676 MO, 9/24/2012	3334396	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	ETS, 151931, 1/28/2016	3088811	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Monopole was fabricated and installed in accordance with the manufacturer's specifications.
2) Monopole has been properly maintained in accordance with manufacturer's specifications.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole was reinforced in conformance with the referenced modification drawings. Please note that our calculations indicate that the existing bridge stiffeners designed by Vertical solutions are not adequate. Therefore, we did not consider them in this analysis.
5) There is no PMI for reinforcement document #3088811. It is assumed that this modification was installed as designed.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 98.5	Pole	P24x0.25	1	-6.97	662.26	42.8	Pass
L2	98.5 - 90	Pole	RPS 24" x 0.38762"	2	-8.22	905.75	51.9	Pass
L3	90 - 79	Pole	P24x0.375	3	-9.88	1052.07	73.1	Pass
L4	79 - 75.17	Pole	Pipe 24" x 0.51722" Reinf	4	-10.62	1177.91	70.3	Pass
L5	75.17 - 60	Pole	RPS 24" x 0.66391"	5	-14.20	1491.58	83.5	Pass
L6	60 - 47.83	Pole	RPS 30" x 0.52963"	6	-21.31	1717.16	76.6	Pass
L7	47.83 - 43	Pole	RPS 30" x 0.6427"	7	-22.68	1841.03	77.1	Pass
L8	43 - 34.5	Pole	RPS 30" x 0.80546"	8	-25.58	1977.33	83.8	Pass
L9	34.5 - 30	Pole	RPS 30" x 0.6427"	9	-26.88	1839.43	96.5	Pass
L10	30 - 25.58	Pole	RPS 36" x 0.55016"	10	-33.63	2151.15	77.2	Pass
L11	25.58 - 20.75	Pole	RPS 36" x 0.64191"	11	-35.25	2233.24	76.8	Pass
L12	20.75 - 17.58	Pole	RPS 36" x 0.78214"	12	-36.50	2455.64	73.4	Pass
L13	17.58 - 13.5	Pole	RPS 36" x 0.68817"	13	-37.95	2171.87	87.8	Pass
L14	13.5 - 6.25	Pole	RPS 36" x 0.69662"	14	-40.57	2158.37	97.4	Pass
L15	6.25 - 0	Pole	RPS 36" x 0.8575"	15	-43.28	2722.26	84.0	Pass
							Summary	
						Pole (L14)	97.4	Pass
						RATING =	**97.4**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	35.5	Pass
1	Base Plate	0	36.3	Pass
1	Base Foundation – Rock Anchors	0	48.9	Pass
1	Base Foundation Soil Interaction	0	33.3	Pass
1	Flange Connection	30	45.8	Pass
1	Flange Connection	60	88.3	Pass
1	Flange Connection	90	47.5	Pass

Structure Rating (max from all components) =	**97.4%**

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in New Haven County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 97.00 mph.
4) Structure Class II.
5) Exposure Category C.
6) Topographic Category 1.
7) Crest Height 0.0000 ft.
8) Nominal ice thickness of 0.7500 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56.00 pcf.
11) A wind speed of 50.00 mph is used in combination with ice.
12) Temperature drop of 50.00 °F.
13) Deflections calculated using a wind speed of 60.00 mph.
14) A non-linear (P-delta) analysis was used.
15) Pressures are calculated at each section.
16) Stress ratio used in pole design is 1.
17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	120.0000-98.5000	21.5000	P24x0.25	A53-B-42 (42 ksi)	
L2	98.5000-90.0000	8.5000	RPS 24" x 0.38762"	Reinf 35.00 ksi (35 ksi)	
L3	90.0000-79.0000	11.0000	P24x0.375	A53-B-42 (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L4	79.0000-75.1700	3.8300	Pipe 24" x 0.51722" Reinf	Reinf 34.30 ksi (34 ksi)	
L5	75.1700-60.0000	15.1700	RPS 24" x 0.66391"	Reinf 34.05 ksi (34 ksi)	
L6	60.0000-47.8300	12.1700	RPS 30" x 0.52963"	Reinf 38.91 ksi (39 ksi)	
L7	47.8300-43.0000	4.8300	RPS 30" x 0.6427"	Reinf 34.51 ksi (35 ksi)	
L8	43.0000-34.5000	8.5000	RPS 30" x 0.80546"	Reinf 29.74 ksi (30 ksi)	
L9	34.5000-30.0000	4.5000	RPS 30" x 0.6427"	Reinf 34.48 ksi (34 ksi)	
L10	30.0000-25.5800	4.4200	RPS 36" x 0.55016"	Reinf 39.01 ksi (39 ksi)	
L11	25.5800-20.7500	4.8300	RPS 36" x 0.64191"	Reinf 34.80 ksi (35 ksi)	
L12	20.7500-17.5800	3.1700	RPS 36" x 0.78214"	Reinf 31.53 ksi (32 ksi)	
L13	17.5800-13.5000	4.0800	RPS 36" x 0.68817"	Reinf 31.61 ksi (32 ksi)	
L14	13.5000-6.2500	7.2500	RPS 36" x 0.69662"	Reinf 31.04 ksi (31 ksi)	
L15	6.2500-0.0000	6.2500	RPS 36" x 0.8575"	Reinf 31.95 ksi (32 ksi)	

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
7983A(1/2")	C	No	CaAa (Out Of Face)	117.0000 - 0.0000	2	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.74
						1" Ice	0.0000	2.01
9207(5/16")	C	No	Inside Pole	117.0000 - 0.0000	3	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
9248(1/4)	C	No	Inside Pole	117.0000 - 0.0000	3	No Ice	0.0000	0.03
						1/2" Ice	0.0000	0.03
						1" Ice	0.0000	0.03
2" (Nominal) Conduit	C	No	CaAa (Out Of Face)	117.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	2.48
						1" Ice	0.0000	4.84
2" (Nominal) Conduit	C	No	CaAa (Out Of Face)	117.0000 - 0.0000	1	No Ice	0.2375	0.72
						1/2" Ice	0.3375	2.48
						1" Ice	0.4375	4.84
*								
LDF4-50A(1/2")	C	No	Inside Pole	117.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	117.0000 - 0.0000	3	No Ice	0.0000	1.20
						1/2" Ice	0.0000	1.20
						1" Ice	0.0000	1.20
HB114-13U3M12-XXXF(1-1/4")	C	No	Inside Pole	117.0000 - 0.0000	1	No Ice	0.0000	0.99
						1/2" Ice	0.0000	0.99
						1" Ice	0.0000	0.99
***								
561(1-5/8")	C	No	Inside Pole	100.0000 - 0.0000	12	No Ice	0.0000	1.35
						1/2" Ice	0.0000	1.35
						1" Ice	0.0000	1.35
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	100.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	2.81
						1" Ice	0.0000	4.94
***								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	22.0000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
1 1/4" Flat	C	No	CaAa (Out Of	44.0000 - 30.0000	1	No Ice	0.2083	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Reinforcement			Face)			1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
***								
Aero MP3-05	C	No	CaAa (Out Of Face)	30.0000 - 0.0000	1	No Ice	0.3478	0.00
						1/2" Ice	0.4001	0.00
						1" Ice	0.6566	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	60.0000 - 30.0000	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
Aero MP3-03	C	No	CaAa (Out Of Face)	75.1700 - 60.0000	1	No Ice	0.2625	0.00
						1/2" Ice	0.3736	0.00
						1" Ice	0.4847	0.00
***								
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	100.2500 - 90.2500	1	No Ice	0.1250	0.00
						1/2" Ice	0.2361	0.00
						1" Ice	0.3472	0.00

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 K
LLPX310R w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	4.4582 4.7860 5.1221	2.8533 3.3731 3.9095	0.04 0.08 0.12
LLPX310R w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	4.4582 4.7860 5.1221	2.8533 3.3731 3.9095	0.04 0.08 0.12
LLPX310R w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	4.4582 4.7860 5.1221	2.8533 3.3731 3.9095	0.04 0.08 0.12
FDD_R6_RRH	A	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	1.5333 1.6898 1.8537	0.6840 0.7999 0.9228	0.03 0.04 0.06
FDD_R6_RRH	B	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	1.5333 1.6898 1.8537	0.6840 0.7999 0.9228	0.03 0.04 0.06
FDD_R6_RRH	C	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	1.5333 1.6898 1.8537	0.6840 0.7999 0.9228	0.03 0.04 0.06
HORIZON COMPACT	A	From Leg	4.0000 0.00 4.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.7208 0.8278 0.9422	0.3681 0.4499 0.5391	0.01 0.02 0.03
HORIZON COMPACT	B	From Leg	4.0000 0.00 7.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.7208 0.8278 0.9422	0.3681 0.4499 0.5391	0.01 0.02 0.03
*									
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	7.4708 8.6564 9.5559	0.09 0.16 0.24
(2) APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.9458 8.1266 9.0212	0.08 0.15 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	6.5799 7.0306 7.4733	4.9591 5.7544 6.4723	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	6.5799 7.0306 7.4733	4.9591 5.7544 6.4723	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	6.5799 7.0306 7.4733	4.9591 5.7544 6.4723	0.08 0.13 0.19
800MHZ RRH	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
800MHZ RRH	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
800MHZ RRH	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
(2) 1900MHz RRH (65MHz)	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2360 2.4385 2.6485	0.06 0.08 0.11
(2) 1900MHz RRH (65MHz)	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2360 2.4385 2.6485	0.06 0.08 0.11
(2) 1900MHz RRH (65MHz)	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2360 2.4385 2.6485	0.06 0.08 0.11
(3) ACU-A20-N	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
(3) ACU-A20-N	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
(3) ACU-A20-N	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
800 EXTERNAL NOTCH FILTER	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.6601 0.7627 0.8727	0.3211 0.3983 0.4830	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.6601 0.7627 0.8727	0.3211 0.3983 0.4830	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	0.6601 0.7627 0.8727	0.3211 0.3983 0.4830	0.01 0.02 0.02
IBC1900HB-2	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 1/2" Ice 1" Ice	1.1250 1.2704 1.4231	0.7125 0.8368 0.9682	0.04 0.05 0.06
IBC1900HB-2	B	From Leg	4.0000	0.0000	117.0000	No Ice	1.1250	0.7125	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2"	1.2704	0.8368	0.05
			3.00			Ice	1.4231	0.9682	0.06
						1" Ice			
IBC1900HB-2	C	From Leg	4.0000	0.0000	117.0000	No Ice	1.1250	0.7125	0.04
			0.00			1/2"	1.2704	0.8368	0.05
			3.00			Ice	1.4231	0.9682	0.06
						1" Ice			
TD-RRH8x20-25	A	From Leg	4.0000	0.0000	117.0000	No Ice	4.0455	1.5345	0.07
			0.00			1/2"	4.2975	1.7142	0.10
			3.00			Ice	4.5570	1.9008	0.13
						1" Ice			
TD-RRH8x20-25	B	From Leg	4.0000	0.0000	117.0000	No Ice	4.0455	1.5345	0.07
			0.00			1/2"	4.2975	1.7142	0.10
			3.00			Ice	4.5570	1.9008	0.13
						1" Ice			
TD-RRH8x20-25	C	From Leg	4.0000	0.0000	117.0000	No Ice	4.0455	1.5345	0.07
			0.00			1/2"	4.2975	1.7142	0.10
			3.00			Ice	4.5570	1.9008	0.13
						1" Ice			
KS24019-L112A	C	From Leg	4.0000	0.0000	117.0000	No Ice	0.1407	0.1407	0.01
			0.00			1/2"	0.1979	0.1979	0.01
			6.00			Ice	0.2621	0.2621	0.01
						1" Ice			
(2) 2.375" OD x 6' Mount Pipe	A	From Leg	4.0000	0.0000	117.0000	No Ice	1.4250	1.4250	0.03
			0.00			1/2"	1.9250	1.9250	0.04
			3.00			Ice	2.2939	2.2939	0.05
						1" Ice			
(2) 2.375" OD x 6' Mount Pipe	B	From Leg	4.0000	0.0000	117.0000	No Ice	1.4250	1.4250	0.03
			0.00			1/2"	1.9250	1.9250	0.04
			3.00			Ice	2.2939	2.2939	0.05
						1" Ice			
(2) 2.375" OD x 6' Mount Pipe	C	From Leg	4.0000	0.0000	117.0000	No Ice	1.4250	1.4250	0.03
			0.00			1/2"	1.9250	1.9250	0.04
			3.00			Ice	2.2939	2.2939	0.05
						1" Ice			
Platform Mount [LP 502-1]	C	None		0.0000	117.0000	No Ice	32.3472	32.3472	0.93
						1/2"	45.6677	45.6677	1.19
						Ice	58.9882	58.9882	1.46
						1" Ice			
***									
(3) SBNHH-1D45A w/ Mount Pipe	A	From Leg	4.0000	0.0000	100.0000	No Ice	8.6573	5.1455	0.07
			0.00			1/2"	9.1256	5.9157	0.14
			2.00			Ice	9.5886	6.6150	0.21
						1" Ice			
(3) SBNHH-1D45A w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	8.6573	5.1455	0.07
			0.00			1/2"	9.1256	5.9157	0.14
			2.00			Ice	9.5886	6.6150	0.21
						1" Ice			
(3) SBNHH-1D45A w/ Mount Pipe	C	From Leg	4.0000	0.0000	100.0000	No Ice	8.6573	5.1455	0.07
			0.00			1/2"	9.1256	5.9157	0.14
			2.00			Ice	9.5886	6.6150	0.21
						1" Ice			
B25 RRH4X30	A	From Leg	4.0000	0.0000	100.0000	No Ice	2.2000	1.7417	0.06
			0.00			1/2"	2.3926	1.9204	0.08
			2.00			Ice	2.5926	2.1065	0.10
						1" Ice			
B25 RRH4X30	B	From Leg	4.0000	0.0000	100.0000	No Ice	2.2000	1.7417	0.06
			0.00			1/2"	2.3926	1.9204	0.08
			2.00			Ice	2.5926	2.1065	0.10
						1" Ice			
B25 RRH4X30	C	From Leg	4.0000	0.0000	100.0000	No Ice	2.2000	1.7417	0.06
			0.00			1/2"	2.3926	1.9204	0.08
			2.00			Ice	2.5926	2.1065	0.10
						1" Ice			
B66A RRH4X45	A	From Leg	4.0000	0.0000	100.0000	No Ice	2.5800	1.6296	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.7937	1.8106	0.09
			2.00			1" Ice	3.0148	1.9986	0.11
B66A RRH4X45	B	From Leg	4.0000	0.0000	100.0000	No Ice	2.5800	1.6296	0.07
			0.00			1/2" Ice	2.7937	1.8106	0.09
			2.00			1" Ice	3.0148	1.9986	0.11
B66A RRH4X45	C	From Leg	4.0000	0.0000	100.0000	No Ice	2.5800	1.6296	0.07
			0.00			1/2" Ice	2.7937	1.8106	0.09
			2.00			1" Ice	3.0148	1.9986	0.11
RXXDC-3315-PF-48	A	From Leg	4.0000	0.0000	100.0000	No Ice	3.0123	1.9629	0.02
			0.00			1/2" Ice	3.2311	2.1512	0.05
			2.00			1" Ice	3.4572	2.3469	0.08
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.0000	0.0000	100.0000	No Ice	7.3296	5.4600	0.04
			0.00			1/2" Ice	7.7872	6.3840	0.10
			2.00			1" Ice	8.2456	7.1844	0.16
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	7.3296	5.4600	0.04
			0.00			1/2" Ice	7.7872	6.3840	0.10
			2.00			1" Ice	8.2456	7.1844	0.16
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.0000	0.0000	100.0000	No Ice	7.3296	5.4600	0.04
			0.00			1/2" Ice	7.7872	6.3840	0.10
			2.00			1" Ice	8.2456	7.1844	0.16
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.0000	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2" Ice	0.3862	0.1189	0.01
			0.00			1" Ice	0.4656	0.1685	0.01
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.0000	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2" Ice	0.3862	0.1189	0.01
			2.00			1" Ice	0.4656	0.1685	0.01
(4) FD9R6004/2C-3L	B	From Leg	4.0000	0.0000	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2" Ice	0.3862	0.1189	0.01
			2.00			1" Ice	0.4656	0.1685	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.0000	0.0000	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2" Ice	0.3862	0.1189	0.01
			0.00			1" Ice	0.4656	0.1685	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.0000	0.0000	100.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2" Ice	0.3862	0.1189	0.01
			2.00			1" Ice	0.4656	0.1685	0.01
Platform Mount [LP 303-1]	C	None		0.0000	100.0000	No Ice	14.6600	14.6600	1.25
						1/2" Ice	18.8700	18.8700	1.48
						1" Ice	23.0800	23.0800	1.71
***									
Bridge Stiffener (35" x 10.5" x 1.25")	A	None		0.0000	60.0000	No Ice	0.6076	3.1570	0.82
						1/2" Ice	0.8483	3.4043	0.84
						1" Ice	1.0660	3.6586	0.86
Bridge Stiffener (35" x 10.5" x 1.25")	B	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.82
						1/2" Ice	0.0000	0.0000	0.84
						1" Ice	0.0000	0.0000	0.86
Bridge Stiffener (35" x 10.5" x 1.25")	C	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.82
						1/2" Ice	0.0000	0.0000	0.84
						1" Ice	0.0000	0.0000	0.86
Bridge Stiffener (35" x	A	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.82

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
10.5" x 1.25")						1/2" Ice	0.0000	0.0000	0.84
						1" Ice	0.0000	0.0000	0.86
Bridge Stiffener (35" x 10.5" x 1.25")	B	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.82
						1/2" Ice	0.0000	0.0000	0.84
						1" Ice	0.0000	0.0000	0.86
Bridge Stiffener (35" x 10.5" x 1.25")	C	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.82
						1/2" Ice	0.0000	0.0000	0.84
						1" Ice	0.0000	0.0000	0.86
***									
Bridge Stiffener (58" x 14" x 1.25")	A	None		0.0000	60.0000	No Ice	1.0069	7.1784	0.35
						1/2" Ice	1.5617	7.5687	0.38
						1" Ice	2.0568	7.9660	0.42
Bridge Stiffener (58" x 14" x 1.25")	B	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.38
						1" Ice	0.0000	0.0000	0.42
Bridge Stiffener (58" x 14" x 1.25")	C	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.38
						1" Ice	0.0000	0.0000	0.42
Bridge Stiffener (58" x 14" x 1.25")	A	None		0.0000	30.0000	No Ice	1.0069	7.1784	0.35
						1/2" Ice	1.5617	7.5687	0.38
						1" Ice	2.0568	7.9660	0.42
Bridge Stiffener (58" x 14" x 1.25")	B	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.38
						1" Ice	0.0000	0.0000	0.42
Bridge Stiffener (58" x 14" x 1.25")	C	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.38
						1" Ice	0.0000	0.0000	0.42
***									
Bridge Stiffener (93" x 16" x 1.25")	A	None		0.0000	30.0000	No Ice	1.6146	13.9213	0.35
						1/2" Ice	2.4934	14.5126	0.41
						1" Ice	3.3846	15.1108	0.47
Bridge Stiffener (93" x 16" x 1.25")	B	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.41
						1" Ice	0.0000	0.0000	0.47
Bridge Stiffener (93" x 16" x 1.25")	C	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.41
						1" Ice	0.0000	0.0000	0.47
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP1-18	A	Paraboloid w/o Radome	From Leg	4.0000 0.00 4.00	0.0000		117.0000	1.2750	No Ice	1.2800	0.01
									1/2" Ice	1.4500	0.02
									1" Ice	1.6200	0.03
VHLP1-18	B	Paraboloid w/o Radome	From Leg	4.0000 0.00	0.0000		117.0000	1.2750	No Ice	1.2800	0.01
									1/2" Ice	1.4500	0.02

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
				7.00					1" Ice	1.6200	0.03

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 120.0000-98.5000	109.2500	1.289	29.51	43.000	A	0.000	43.000	43.000	100.00	0.000	0.000
					B	0.000	43.000		100.00	0.000	0.000
					C	0.000	43.000		100.00	0.000	4.613
L2 98.5000-90.0000	94.2500	1.25	28.60	17.000	A	0.000	17.000	17.000	100.00	0.000	0.000
					B	0.000	17.000		100.00	0.000	0.000
					C	0.000	17.000		100.00	0.000	3.050
L3 90.0000-79.0000	84.5000	1.222	27.95	22.000	A	0.000	22.000	22.000	100.00	0.000	0.000
					B	0.000	22.000		100.00	0.000	0.000
					C	0.000	22.000		100.00	0.000	2.613
L4 79.0000-75.1700	77.0850	1.198	27.42	7.660	A	0.000	7.660	7.660	100.00	0.000	0.000
					B	0.000	7.660		100.00	0.000	0.000
					C	0.000	7.660		100.00	0.000	0.910
L5 75.1700-60.0000	67.5850	1.165	26.67	30.340	A	0.000	30.340	30.340	100.00	0.000	0.000
					B	0.000	30.340		100.00	0.000	0.000
					C	0.000	30.340		100.00	0.000	7.585
L6 60.0000-47.8300	53.9150	1.111	25.43	30.425	A	0.000	30.425	30.425	100.00	0.000	0.000
					B	0.000	30.425		100.00	0.000	0.000
					C	0.000	30.425		100.00	0.000	6.164
L7 47.8300-43.0000	45.4150	1.072	24.53	12.075	A	0.000	12.075	12.075	100.00	0.000	0.000
					B	0.000	12.075		100.00	0.000	0.000
					C	0.000	12.075		100.00	0.000	2.655
L8 43.0000-34.5000	38.7500	1.037	23.72	21.250	A	0.000	21.250	21.250	100.00	0.000	0.000
					B	0.000	21.250		100.00	0.000	0.000
					C	0.000	21.250		100.00	0.000	6.076
L9 34.5000-30.0000	32.2500	0.997	22.82	11.250	A	0.000	11.250	11.250	100.00	0.000	0.000
					B	0.000	11.250		100.00	0.000	0.000
					C	0.000	11.250		100.00	0.000	3.217
L10 30.0000-25.5800	27.7900	0.967	22.12	13.260	A	0.000	13.260	13.260	100.00	0.000	0.000
					B	0.000	13.260		100.00	0.000	0.000
					C	0.000	13.260		100.00	0.000	2.587
L11 25.5800-20.7500	23.1650	0.93	21.29	14.490	A	0.000	14.490	14.490	100.00	0.000	0.000
					B	0.000	14.490		100.00	0.000	0.000
					C	0.000	14.490		100.00	0.000	3.087
L12 20.7500-17.5800	19.1650	0.894	20.45	9.510	A	0.000	9.510	9.510	100.00	0.000	0.000
					B	0.000	9.510		100.00	0.000	0.000
					C	0.000	9.510		100.00	0.000	2.516
L13 17.5800-13.5000	15.5400	0.855	19.57	12.240	A	0.000	12.240	12.240	100.00	0.000	0.000
					B	0.000	12.240		100.00	0.000	0.000
					C	0.000	12.240		100.00	0.000	3.238
L14 13.5000-6.2500	9.8750	0.85	19.45	21.750	A	0.000	21.750	21.750	100.00	0.000	0.000
					B	0.000	21.750		100.00	0.000	0.000
					C	0.000	21.750		100.00	0.000	5.754
L15 6.2500-0.0000	3.1250	0.85	19.45	18.750	A	0.000	18.750	18.750	100.00	0.000	0.000
					B	0.000	18.750		100.00	0.000	0.000
					C	0.000	18.750		100.00	0.000	4.960

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.0000-98.5000	109.2500	1.289	7.84	1.6908	49.059	A	0.000	49.059	49.059	100.00	0.000	0.000
						B	0.000	49.059		100.00	0.000	0.000
						C	0.000	49.059		100.00	0.000	11.526
L2 98.5000-90.0000	94.2500	1.25	7.60	1.6660	19.360	A	0.000	19.360	19.360	100.00	0.000	0.000
						B	0.000	19.360		100.00	0.000	0.000
						C	0.000	19.360		100.00	0.000	8.936
L3 90.0000-79.0000	84.5000	1.222	7.43	1.6479	25.021	A	0.000	25.021	25.021	100.00	0.000	0.000
						B	0.000	25.021		100.00	0.000	0.000
						C	0.000	25.021		100.00	0.000	6.238
L4 79.0000-75.1700	77.0850	1.198	7.28	1.6328	8.702	A	0.000	8.702	8.702	100.00	0.000	0.000
						B	0.000	8.702		100.00	0.000	0.000
						C	0.000	8.702		100.00	0.000	2.160
L5 75.1700-60.0000	67.5850	1.165	7.09	1.6115	34.414	A	0.000	34.414	34.414	100.00	0.000	0.000
						B	0.000	34.414		100.00	0.000	0.000
						C	0.000	34.414		100.00	0.000	17.906
L6 60.0000-47.8300	53.9150	1.111	6.76	1.5755	33.621	A	0.000	33.621	33.621	100.00	0.000	0.000
						B	0.000	33.621		100.00	0.000	0.000
						C	0.000	33.621		100.00	0.000	14.260
L7 47.8300-43.0000	45.4150	1.072	6.52	1.5487	13.322	A	0.000	13.322	13.322	100.00	0.000	0.000
						B	0.000	13.322		100.00	0.000	0.000
						C	0.000	13.322		100.00	0.000	6.157
L8 43.0000-34.5000	38.7500	1.037	6.30	1.5243	23.409	A	0.000	23.409	23.409	100.00	0.000	0.000
						B	0.000	23.409		100.00	0.000	0.000
						C	0.000	23.409		100.00	0.000	14.426
L9 34.5000-30.0000	32.2500	0.997	6.06	1.4966	12.372	A	0.000	12.372	12.372	100.00	0.000	0.000
						B	0.000	12.372		100.00	0.000	0.000
						C	0.000	12.372		100.00	0.000	7.557
L10 30.0000-25.5800	27.7900	0.967	5.88	1.4744	14.346	A	0.000	14.346	14.346	100.00	0.000	0.000
						B	0.000	14.346		100.00	0.000	0.000
						C	0.000	14.346		100.00	0.000	5.721
L11 25.5800-20.7500	23.1650	0.93	5.66	1.4478	15.656	A	0.000	15.656	15.656	100.00	0.000	0.000
						B	0.000	15.656		100.00	0.000	0.000
						C	0.000	15.656		100.00	0.000	6.860
L12 20.7500-17.5800	19.1650	0.894	5.43	1.4207	10.261	A	0.000	10.261	10.261	100.00	0.000	0.000
						B	0.000	10.261		100.00	0.000	0.000
						C	0.000	10.261		100.00	0.000	5.692
L13 17.5800-13.5000	15.5400	0.855	5.20	1.3912	13.186	A	0.000	13.186	13.186	100.00	0.000	0.000
						B	0.000	13.186		100.00	0.000	0.000
						C	0.000	13.186		100.00	0.000	7.249
L14 13.5000-6.2500	9.8750	0.85	5.17	1.3295	23.356	A	0.000	23.356	23.356	100.00	0.000	0.000
						B	0.000	23.356		100.00	0.000	0.000
						C	0.000	23.356		100.00	0.000	12.593
L15 6.2500-0.0000	3.1250	0.85	5.17	1.1850	19.984	A	0.000	19.984	19.984	100.00	0.000	0.000
						B	0.000	19.984		100.00	0.000	0.000
						C	0.000	19.984		100.00	0.000	10.274

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.0000-98.5000	109.2500	1.289	10.10	43.000	A	0.000	43.000	43.000	100.00	0.000	0.000
					B	0.000	43.000		100.00	0.000	0.000
					C	0.000	43.000		100.00	0.000	4.613
L2 98.5000-90.0000	94.2500	1.25	9.79	17.000	A	0.000	17.000	17.000	100.00	0.000	0.000
					B	0.000	17.000		100.00	0.000	0.000
					C	0.000	17.000		100.00	0.000	3.050
L3 90.0000-79.0000	84.5000	1.222	9.57	22.000	A	0.000	22.000	22.000	100.00	0.000	0.000
					B	0.000	22.000		100.00	0.000	0.000
					C	0.000	22.000		100.00	0.000	2.613
L4 79.0000-75.1700	77.0850	1.198	9.39	7.660	A	0.000	7.660	7.660	100.00	0.000	0.000
					B	0.000	7.660		100.00	0.000	0.000
					C	0.000	7.660		100.00	0.000	0.910

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L5 75.1700-60.0000	67.5850	1.165	9.13	30.340	A	0.000	30.340	30.340	100.00	0.000	0.000
					B	0.000	30.340		100.00	0.000	0.000
					C	0.000	30.340		100.00	0.000	7.585
L6 60.0000-47.8300	53.9150	1.111	8.71	30.425	A	0.000	30.425	30.425	100.00	0.000	0.000
					B	0.000	30.425		100.00	0.000	0.000
					C	0.000	30.425		100.00	0.000	6.164
L7 47.8300-43.0000	45.4150	1.072	8.40	12.075	A	0.000	12.075	12.075	100.00	0.000	0.000
					B	0.000	12.075		100.00	0.000	0.000
					C	0.000	12.075		100.00	0.000	2.655
L8 43.0000-34.5000	38.7500	1.037	8.12	21.250	A	0.000	21.250	21.250	100.00	0.000	0.000
					B	0.000	21.250		100.00	0.000	0.000
					C	0.000	21.250		100.00	0.000	6.076
L9 34.5000-30.0000	32.2500	0.997	7.81	11.250	A	0.000	11.250	11.250	100.00	0.000	0.000
					B	0.000	11.250		100.00	0.000	0.000
					C	0.000	11.250		100.00	0.000	3.217
L10 30.0000-25.5800	27.7900	0.967	7.57	13.260	A	0.000	13.260	13.260	100.00	0.000	0.000
					B	0.000	13.260		100.00	0.000	0.000
					C	0.000	13.260		100.00	0.000	2.587
L11 25.5800-20.7500	23.1650	0.93	7.29	14.490	A	0.000	14.490	14.490	100.00	0.000	0.000
					B	0.000	14.490		100.00	0.000	0.000
					C	0.000	14.490		100.00	0.000	3.087
L12 20.7500-17.5800	19.1650	0.894	7.00	9.510	A	0.000	9.510	9.510	100.00	0.000	0.000
					B	0.000	9.510		100.00	0.000	0.000
					C	0.000	9.510		100.00	0.000	2.516
L13 17.5800-13.5000	15.5400	0.855	6.70	12.240	A	0.000	12.240	12.240	100.00	0.000	0.000
					B	0.000	12.240		100.00	0.000	0.000
					C	0.000	12.240		100.00	0.000	3.238
L14 13.5000-6.2500	9.8750	0.85	6.66	21.750	A	0.000	21.750	21.750	100.00	0.000	0.000
					B	0.000	21.750		100.00	0.000	0.000
					C	0.000	21.750		100.00	0.000	5.754
L15 6.2500-0.0000	3.1250	0.85	6.66	18.750	A	0.000	18.750	18.750	100.00	0.000	0.000
					B	0.000	18.750		100.00	0.000	0.000
					C	0.000	18.750		100.00	0.000	4.960

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
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 Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 98.5	Pole	Max Tension	8	0.00	0.00	-0.00
			Max. Compression	26	-19.04	-3.32	0.61
			Max. Mx	8	-6.99	-162.75	-1.02
			Max. My	2	-6.97	2.69	163.30
			Max. Vy	20	-13.65	161.75	2.74
			Max. Vx	14	13.73	-2.18	-162.94
			Max. Torque	14			2.86
L2	98.5 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.02	-3.07	0.45
			Max. Mx	8	-8.23	-281.88	-1.49
			Max. My	2	-8.22	3.91	283.31
			Max. Vy	20	-14.45	281.20	3.68
			Max. Vx	14	14.53	-2.75	-283.03
			Max. Torque	14			2.68
L3	90 - 79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.53	-2.74	0.24
			Max. Mx	8	-9.89	-444.82	-2.11
			Max. My	2	-9.88	5.51	447.40
			Max. Vy	20	-15.24	444.56	4.88
			Max. Vx	14	15.32	-3.45	-447.22
			Max. Torque	14			2.55
L4	79 - 75.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.57	-2.62	0.17
			Max. Mx	8	-10.64	-503.57	-2.32
			Max. My	2	-10.63	6.07	506.55
			Max. Vy	20	-15.52	503.45	5.30
			Max. Vx	14	15.59	-3.69	-506.41
			Max. Torque	14			2.43
L5	75.17 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.28	-2.11	-0.11
			Max. Mx	20	-14.21	754.67	6.96
			Max. My	14	-14.20	-4.65	-758.79
			Max. Vy	20	-17.59	754.67	6.96
			Max. Vx	14	17.66	-4.65	-758.79
			Max. Torque	14			2.39
L6	60 - 47.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.97	-1.63	-0.37
			Max. Mx	20	-21.32	983.98	8.29
			Max. My	14	-21.31	-5.41	-989.03
			Max. Vy	20	-19.43	983.98	8.29

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	19.51	-5.41	-989.03
			Max. Torque	14			2.08
L7	47.83 - 43	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.71	-1.44	-0.48
			Max. Mx	20	-22.68	1078.91	8.81
			Max. My	14	-22.68	-5.71	-1084.33
			Max. Vy	20	-19.89	1078.91	8.81
			Max. Vx	14	19.97	-5.71	-1084.33
			Max. Torque	14			1.78
L8	43 - 34.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.28	-1.11	-0.66
			Max. Mx	20	-25.59	1253.28	9.73
			Max. My	14	-25.58	-6.23	-1259.35
			Max. Vy	20	-21.14	1253.28	9.73
			Max. Vx	14	21.22	-6.23	-1259.35
			Max. Torque	14			1.66
L9	34.5 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.89	-0.94	-0.75
			Max. Mx	20	-26.88	1349.69	10.22
			Max. My	14	-26.88	-6.50	-1356.10
			Max. Vy	20	-21.73	1349.69	10.22
			Max. Vx	14	21.80	-6.50	-1356.10
			Max. Torque	14			1.39
L10	30 - 25.58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.11	-0.74	-0.86
			Max. Mx	20	-33.64	1450.71	10.69
			Max. My	14	-33.63	-6.76	-1457.46
			Max. Vy	20	-23.06	1450.71	10.69
			Max. Vx	14	23.14	-6.76	-1457.46
			Max. Torque	14			1.25
L11	25.58 - 20.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.12	-0.53	-0.97
			Max. Mx	20	-35.25	1563.09	11.20
			Max. My	14	-35.25	-7.05	-1570.20
			Max. Vy	20	-23.49	1563.09	11.20
			Max. Vx	14	23.57	-7.05	-1570.20
			Max. Torque	16			1.16
L12	20.75 - 17.58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.62	-0.40	-1.05
			Max. Mx	20	-36.50	1638.23	11.54
			Max. My	14	-36.50	-7.24	-1645.58
			Max. Vy	20	-23.94	1638.23	11.54
			Max. Vx	14	24.01	-7.24	-1645.58
			Max. Torque	16			1.07
L13	17.58 - 13.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.38	-0.23	-1.14
			Max. Mx	20	-37.95	1736.94	11.97
			Max. My	14	-37.95	-7.47	-1744.60
			Max. Vy	20	-24.47	1736.94	11.97
			Max. Vx	14	24.54	-7.47	-1744.60
			Max. Torque	16			1.00
L14	13.5 - 6.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.50	0.05	-1.29
			Max. Mx	20	-40.58	1917.51	12.73
			Max. My	14	-40.58	-7.89	-1925.71
			Max. Vy	20	-25.36	1917.51	12.73
			Max. Vx	14	25.44	-7.89	-1925.71
			Max. Torque	16			0.92
L15	6.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.56	0.26	-1.41
			Max. Mx	20	-43.28	2078.36	13.37
			Max. My	14	-43.28	-8.24	-2087.02
			Max. Vy	20	-26.13	2078.36	13.37
			Max. Vx	14	26.20	-8.24	-2087.02
			Max. Torque	8			-0.91

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 98.5	14.220	43	1.0295	0.0082
L2	98.5 - 90	9.682	44	0.9605	0.0051
L3	90 - 79	8.020	44	0.9023	0.0042
L4	79 - 75.17	6.077	44	0.7759	0.0029
L5	75.17 - 60	5.471	44	0.7336	0.0026
L6	60 - 47.83	3.400	44	0.5582	0.0016
L7	47.83 - 43	2.125	44	0.4369	0.0011
L8	43 - 34.5	1.707	44	0.3893	0.0009
L9	34.5 - 30	1.081	44	0.3125	0.0007
L10	30 - 25.58	0.812	44	0.2566	0.0006
L11	25.58 - 20.75	0.593	44	0.2174	0.0005
L12	20.75 - 17.58	0.393	44	0.1775	0.0004
L13	17.58 - 13.5	0.282	44	0.1545	0.0003
L14	13.5 - 6.25	0.165	44	0.1192	0.0002
L15	6.25 - 0	0.035	44	0.0521	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.0000	VHLP1-18	43	14.220	1.0295	0.0084	39796
121.0000	VHLP1-18	43	14.220	1.0295	0.0084	39796
117.0000	LLPX310R w/ Mount Pipe	43	13.573	1.0226	0.0080	39796
100.0000	(3) SBNHH-1D45A w/ Mount Pipe	44	9.986	0.9677	0.0054	9942
60.0000	Bridge Stiffener (35" x 10.5" x 1.25")	44	3.400	0.5582	0.0017	5042
30.0000	Bridge Stiffener (35" x 10.5" x 1.25")	44	0.812	0.2566	0.0006	5403

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 98.5	66.646	12	4.8178	0.0313
L2	98.5 - 90	45.421	12	4.5043	0.0174
L3	90 - 79	37.635	12	4.2339	0.0134
L4	79 - 75.17	28.523	12	3.6434	0.0084
L5	75.17 - 60	25.681	12	3.4450	0.0071
L6	60 - 47.83	15.965	12	2.6216	0.0035
L7	47.83 - 43	9.980	12	2.0521	0.0019
L8	43 - 34.5	8.016	12	1.8284	0.0015
L9	34.5 - 30	5.075	12	1.4678	0.0010
L10	30 - 25.58	3.814	12	1.2050	0.0007
L11	25.58 - 20.75	2.783	12	1.0207	0.0006
L12	20.75 - 17.58	1.844	12	0.8336	0.0005
L13	17.58 - 13.5	1.326	12	0.7253	0.0004
L14	13.5 - 6.25	0.777	12	0.5596	0.0003
L15	6.25 - 0	0.162	12	0.2445	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.0000	VHLP1-18	12	66.646	4.8178	0.0319	8788
121.0000	VHLP1-18	12	66.646	4.8178	0.0319	8788

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
117.0000	LLPX310R w/ Mount Pipe	12	63.622	4.7868	0.0297	8788
100.0000	(3) SBNHH-1D45A w/ Mount Pipe	12	46.845	4.5379	0.0186	2191
60.0000	Bridge Stiffener (35" x 10.5" x 1.25")	12	15.965	2.6216	0.0037	1080
30.0000	Bridge Stiffener (35" x 10.5" x 1.25")	12	3.814	1.2050	0.0009	1151

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	120 - 98.5 (1)	P24x0.25	21.5000	0.0000	0.0	18.6532	-6.97	662.26	0.011
L2	98.5 - 90 (2)	RPS 24" x 0.38762"	8.5000	0.0000	0.0	28.7538	-8.22	905.75	0.009
L3	90 - 79 (3)	P24x0.375	11.0000	0.0000	0.0	27.8325	-9.88	1052.07	0.009
L4	79 - 75.17 (4)	Pipe 24" x 0.51722" Reinf	3.8300	0.0000	0.0	38.1570	-10.62	1177.91	0.009
L5	75.17 - 60 (5)	RPS 24" x 0.66391"	15.1700	0.0000	0.0	48.6729	-14.20	1491.58	0.010
L6	60 - 47.83 (6)	RPS 30" x 0.52963"	12.1700	0.0000	0.0	49.0352	-21.31	1717.16	0.012
L7	47.83 - 43 (7)	RPS 30" x 0.6427"	4.8300	0.0000	0.0	59.2754	-22.68	1841.03	0.012
L8	43 - 34.5 (8)	RPS 30" x 0.80546"	8.5000	0.0000	0.0	73.8747	-25.58	1977.33	0.013
L9	34.5 - 30 (9)	RPS 30" x 0.6427"	4.5000	0.0000	0.0	59.2754	-26.88	1839.43	0.015
L10	30 - 25.58 (10)	RPS 36" x 0.55016"	4.4200	0.0000	0.0	61.2707	-33.63	2151.15	0.016
L11	25.58 - 20.75 (11)	RPS 36" x 0.64191"	4.8300	0.0000	0.0	71.3038	-35.25	2233.24	0.016
L12	20.75 - 17.58 (12)	RPS 36" x 0.78214"	3.1700	0.0000	0.0	86.5361	-36.50	2455.64	0.015
L13	17.58 - 13.5 (13)	RPS 36" x 0.68817"	4.0800	0.0000	0.0	76.3424	-37.95	2171.87	0.017
L14	13.5 - 6.25 (14)	RPS 36" x 0.69662"	7.2500	0.0000	0.0	77.2613	-40.57	2158.37	0.019
L15	6.25 - 0 (15)	RPS 36" x 0.8575"	6.2500	0.0000	0.0	94.6709	-43.28	2722.26	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	120 - 98.5 (1)	P24x0.25	164.90	396.68	0.416	0.00	396.68	0.000
L2	98.5 - 90 (2)	RPS 24" x 0.38762"	285.05	559.94	0.509	0.00	559.94	0.000
L3	90 - 79 (3)	P24x0.375	449.49	623.72	0.721	0.00	623.72	0.000
L4	79 - 75.17 (4)	Pipe 24" x 0.51722" Reinf	508.82	733.84	0.693	0.00	733.84	0.000
L5	75.17 - 60 (5)	RPS 24" x 0.66391"	761.73	923.55	0.825	0.00	923.55	0.000
L6	60 - 47.83 (6)	RPS 30" x 0.52963"	992.39	1318.18	0.753	0.00	1318.18	0.000
L7	47.83 - 43 (7)	RPS 30" x 0.6427"	1087.87	1433.89	0.759	0.00	1433.89	0.000
L8	43 - 34.5 (8)	RPS 30" x 0.80546"	1263.18	1531.65	0.825	0.00	1531.65	0.000
L9	34.5 - 30 (9)	RPS 30" x 0.6427"	1360.08	1432.64	0.949	0.00	1432.64	0.000
L10	30 - 25.58 (10)	RPS 36" x 0.55016"	1461.60	1932.80	0.756	0.00	1932.80	0.000
L11	25.58 - 20.75	RPS 36" x 0.64191"	1574.50	2094.78	0.752	0.00	2094.78	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L12	20.75 - 17.58 (11)	RPS 36" x 0.78214"	1649.98	2294.39	0.719	0.00	2294.39	0.000
L13	17.58 - 13.5 (12)	RPS 36" x 0.68817"	1749.14	2034.59	0.860	0.00	2034.59	0.000
L14	13.5 - 6.25 (13)	RPS 36" x 0.69662"	1930.48	2021.47	0.955	0.00	2021.47	0.000
L15	6.25 - 0 (14)	RPS 36" x 0.8575"	2092.00	2538.15	0.824	0.00	2538.15	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 98.5 (1)	P24x0.25	13.74	331.13	0.041	1.78	648.61	0.003
L2	98.5 - 90 (2)	RPS 24" x 0.38762"	14.54	452.87	0.032	1.65	876.96	0.002
L3	90 - 79 (3)	P24x0.375	15.36	526.03	0.029	2.28	1019.71	0.002
L4	79 - 75.17 (4)	Pipe 24" x 0.51722" Reinf	15.63	588.95	0.027	2.24	1128.23	0.002
L5	75.17 - 60 (5)	RPS 24" x 0.66391"	17.70	745.79	0.024	1.89	1411.34	0.001
L6	60 - 47.83 (6)	RPS 30" x 0.52963"	19.54	858.58	0.023	1.55	2072.01	0.001
L7	47.83 - 43 (7)	RPS 30" x 0.6427"	20.01	920.52	0.022	1.41	2204.80	0.001
L8	43 - 34.5 (8)	RPS 30" x 0.80546"	21.25	988.66	0.021	1.10	2342.50	0.000
L9	34.5 - 30 (9)	RPS 30" x 0.6427"	21.84	919.72	0.024	0.94	2202.88	0.000
L10	30 - 25.58 (10)	RPS 36" x 0.55016"	23.17	1075.58	0.022	0.79	3129.62	0.000
L11	25.58 - 20.75 (11)	RPS 36" x 0.64191"	23.60	1116.62	0.021	0.62	3232.53	0.000
L12	20.75 - 17.58 (12)	RPS 36" x 0.78214"	24.05	1227.82	0.020	0.48	3526.88	0.000
L13	17.58 - 13.5 (13)	RPS 36" x 0.68817"	24.58	1085.93	0.023	0.31	3135.63	0.000
L14	13.5 - 6.25 (14)	RPS 36" x 0.69662"	25.47	1079.19	0.024	0.02	3114.68	0.000
L15	6.25 - 0 (15)	RPS 36" x 0.8575"	26.24	1361.13	0.019	0.28	3893.50	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 98.5 (1)	0.011	0.416	0.000	0.041	0.003	0.428 ✔	1.000	4.8.2 ✔
L2	98.5 - 90 (2)	0.009	0.509	0.000	0.032	0.002	0.519 ✔	1.000	4.8.2 ✔
L3	90 - 79 (3)	0.009	0.721	0.000	0.029	0.002	0.731 ✔	1.000	4.8.2 ✔
L4	79 - 75.17 (4)	0.009	0.693	0.000	0.027	0.002	0.703 ✔	1.000	4.8.2 ✔
L5	75.17 - 60 (5)	0.010	0.825	0.000	0.024	0.001	0.835 ✔	1.000	4.8.2 ✔
L6	60 - 47.83 (6)	0.012	0.753	0.000	0.023	0.001	0.766 ✔	1.000	4.8.2 ✔
L7	47.83 - 43 (7)	0.012	0.759	0.000	0.022	0.001	0.771 ✔	1.000	4.8.2 ✔
L8	43 - 34.5 (8)	0.013	0.825	0.000	0.021	0.000	0.838 ✔	1.000	4.8.2 ✔
L9	34.5 - 30 (9)	0.015	0.949	0.000	0.024	0.000	0.965 ✔	1.000	4.8.2 ✔
L10	30 - 25.58 (10)	0.016	0.756	0.000	0.022	0.000	0.772 ✔	1.000	4.8.2 ✔

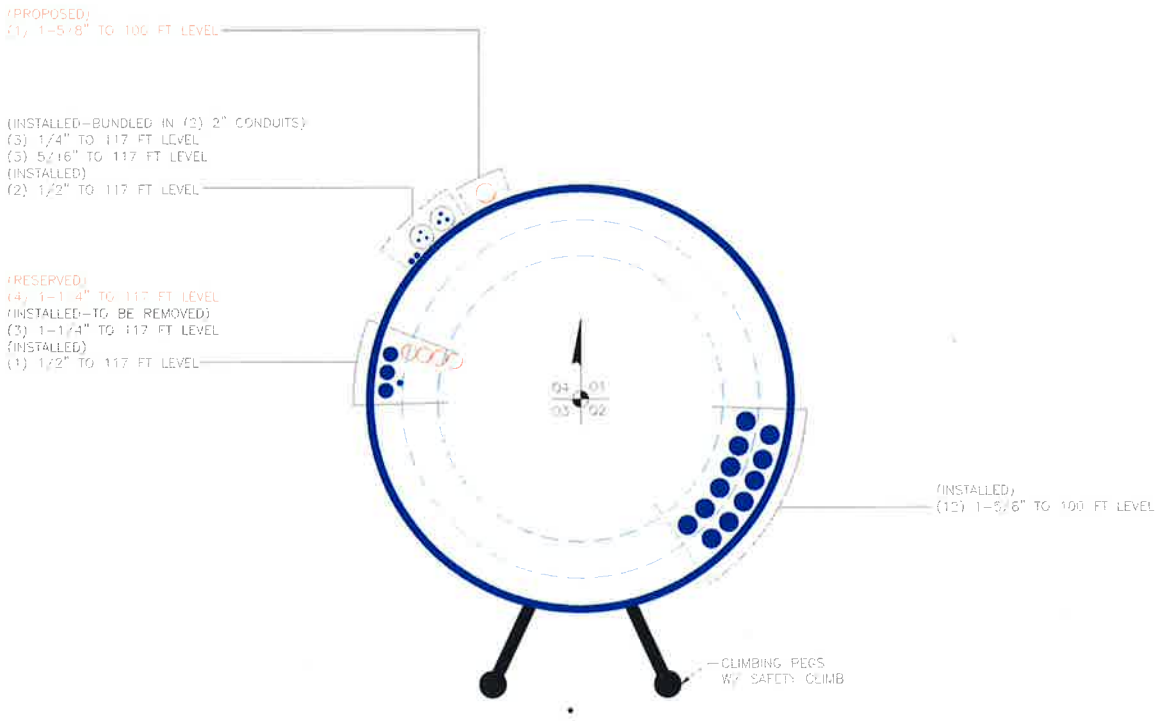
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L11	25.58 - 20.75 (11)	0.016	0.752	0.000	0.021	0.000	0.768 ✔	1.000	4.8.2 ✔
L12	20.75 - 17.58 (12)	0.015	0.719	0.000	0.020	0.000	0.734 ✔	1.000	4.8.2 ✔
L13	17.58 - 13.5 (13)	0.017	0.860	0.000	0.023	0.000	0.878 ✔	1.000	4.8.2 ✔
L14	13.5 - 6.25 (14)	0.019	0.955	0.000	0.024	0.000	0.974 ✔	1.000	4.8.2 ✔
L15	6.25 - 0 (15)	0.016	0.824	0.000	0.019	0.000	0.840 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	120 - 98.5	Pole	P24x0.25	1	-6.97	662.26	42.8	Pass
L2	98.5 - 90	Pole	RPS 24" x 0.38762"	2	-8.22	905.75	51.9	Pass
L3	90 - 79	Pole	P24x0.375	3	-9.88	1052.07	73.1	Pass
L4	79 - 75.17	Pole	Pipe 24" x 0.51722" Reinf	4	-10.62	1177.91	70.3	Pass
L5	75.17 - 60	Pole	RPS 24" x 0.66391"	5	-14.20	1491.58	83.5	Pass
L6	60 - 47.83	Pole	RPS 30" x 0.52963"	6	-21.31	1717.16	76.6	Pass
L7	47.83 - 43	Pole	RPS 30" x 0.6427"	7	-22.68	1841.03	77.1	Pass
L8	43 - 34.5	Pole	RPS 30" x 0.80546"	8	-25.58	1977.33	83.8	Pass
L9	34.5 - 30	Pole	RPS 30" x 0.6427"	9	-26.88	1839.43	96.5	Pass
L10	30 - 25.58	Pole	RPS 36" x 0.55016"	10	-33.63	2151.15	77.2	Pass
L11	25.58 - 20.75	Pole	RPS 36" x 0.64191"	11	-35.25	2233.24	76.8	Pass
L12	20.75 - 17.58	Pole	RPS 36" x 0.78214"	12	-36.50	2455.64	73.4	Pass
L13	17.58 - 13.5	Pole	RPS 36" x 0.68817"	13	-37.95	2171.87	87.8	Pass
L14	13.5 - 6.25	Pole	RPS 36" x 0.69662"	14	-40.57	2158.37	97.4	Pass
L15	6.25 - 0	Pole	RPS 36" x 0.8575"	15	-43.28	2722.26	84.0	Pass
							Summary	
						Pole (L14)	97.4	Pass
						RATING =	**97.4**	**Pass**

APPENDIX B

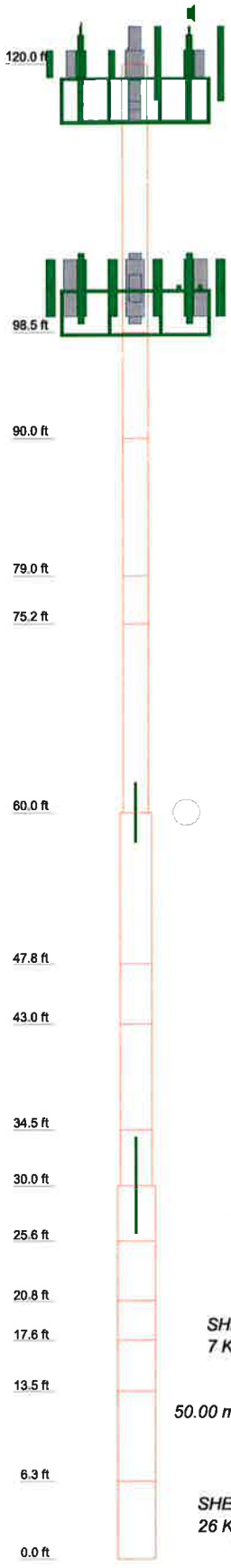
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 7.0.5.1 - 2/1/2016 File:G:/TOWER/375_Crown_Castle/2017/37517-0863_876309_Milford Jai-alai/37517-0863.002.7805_SA_1394558/37517-0863.002.7805_Reinforced.eri



Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	21.5000	A53-B-42	1.4
2	RPS 24" x 0.38762"	8.5000	Reinf 35.00 ksi	0.8
3	P24x0.375	11.0000	A53-B-42	1.0
4	RPS 24" x 0.51722" Re	3.8300	Reinf 34.30 ksi	0.5
5	RPS 24" x 0.6639"Pipe	15.1700	Reinf 34.05 ksi	2.5
6	RPS 30" x 0.52963"	12.1700	Reinf 38.91 ksi	2.0
7	30" x 0.6427	4.8300	Reinf 34.51 ksi	1.0
8	30" x 0.8	8.5000	Reinf 29.74 ksi	2.1
9		4.5000	Reinf 34.48 ksi	0.9
10		4.4200	Reinf 39.01 ksi	0.9
11		4.8300	Reinf 34.80 ksi	1.2
12		3.1700	Reinf 31.53 ksi	0.9
13		4.0800	Reinf 31.61 ksi	1.1
14	36" x 0.8	7.2500	Reinf 31.04 ksi	1.9
15	RPS 36" x 0.87	6.2500	Reinf 31.95 ksi	2.0
				20.3

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe	117	(3) SBNHH-1D45A w/ Mount Pipe	100
LLPX310R w/ Mount Pipe	117	B25 RRH4X30	100
LLPX310R w/ Mount Pipe	117	B25 RRH4X30	100
FDD_R6_RRH	117	B25 RRH4X30	100
FDD_R6_RRH	117	B66A RRH4X45	100
FDD_R6_RRH	117	B66A RRH4X45	100
HORIZON COMPACT	117	B66A RRH4X45	100
HORIZON COMPACT	117	RXXDC-3315-PF-48	100
APXV9ERR18-C-A20 w/ Mount Pipe	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
(2) APXVSPP18-C-A20 w/ Mount Pipe	117		
APXVTM14-C-120 w/ Mount Pipe	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
APXVTM14-C-120 w/ Mount Pipe	117		
APXVTM14-C-120 w/ Mount Pipe	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
800MHZ RRH	117	(2) FD9R6004/2C-3L	100
800MHZ RRH	117	(2) FD9R6004/2C-3L	100
800MHZ RRH	117	(4) FD9R6004/2C-3L	100
(2) 1900MHz RRH (65MHz)	117	(2) FD9R6004/2C-3L	100
(2) 1900MHz RRH (65MHz)	117	(2) FD9R6004/2C-3L	100
(2) 1900MHz RRH (65MHz)	117	Platform Mount [LP 303-1]	100
(3) ACU-A20-N	117	(3) SBNHH-1D45A w/ Mount Pipe	100
(3) ACU-A20-N	117	(3) SBNHH-1D45A w/ Mount Pipe	100
(3) ACU-A20-N	117	Bridge Stiffener (35" x 10.5" x 1.25")	60
800 EXTERNAL NOTCH FILTER	117	Bridge Stiffener (58" x 14" x 1.25")	60
800 EXTERNAL NOTCH FILTER	117	Bridge Stiffener (58" x 14" x 1.25")	60
800 EXTERNAL NOTCH FILTER	117	Bridge Stiffener (58" x 14" x 1.25")	60
IBC1900HB-2	117	Bridge Stiffener (35" x 10.5" x 1.25")	60
IBC1900HB-2	117	Bridge Stiffener (35" x 10.5" x 1.25")	60
IBC1900HB-2	117	Bridge Stiffener (35" x 10.5" x 1.25")	30
TD-RRH8x20-25	117	Bridge Stiffener (58" x 14" x 1.25")	30
TD-RRH8x20-25	117	Bridge Stiffener (58" x 14" x 1.25")	30
TD-RRH8x20-25	117	Bridge Stiffener (58" x 14" x 1.25")	30
KS24019-L112A	117	Bridge Stiffener (93" x 16" x 1.25")	30
(2) 2.375" OD x 6' Mount Pipe	117	Bridge Stiffener (93" x 16" x 1.25")	30
(2) 2.375" OD x 6' Mount Pipe	117	Bridge Stiffener (93" x 16" x 1.25")	30
(2) 2.375" OD x 6' Mount Pipe	117	Bridge Stiffener (35" x 10.5" x 1.25")	30
Platform Mount [LP 502-1]	117	Bridge Stiffener (35" x 10.5" x 1.25")	30
VHLP1-18	117		
VHLP1-18	117		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	Reinf 34.48 ksi	34 ksi	44 ksi
Reinf 35.00 ksi	35 ksi	44 ksi	Reinf 39.01 ksi	39 ksi	49 ksi
Reinf 34.30 ksi	34 ksi	43 ksi	Reinf 34.80 ksi	35 ksi	44 ksi
Reinf 34.05 ksi	34 ksi	43 ksi	Reinf 31.53 ksi	32 ksi	40 ksi
Reinf 38.91 ksi	39 ksi	49 ksi	Reinf 31.61 ksi	32 ksi	40 ksi
Reinf 34.51 ksi	35 ksi	44 ksi	Reinf 31.04 ksi	31 ksi	39 ksi
Reinf 29.74 ksi	30 ksi	38 ksi	Reinf 31.95 ksi	32 ksi	40 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97.00 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.00 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 97.4%

ALL REACTIONS ARE FACTORED

AXIAL 65 K

SHEAR 7 K

MOMENT 599 kip-ft

TORQUE 1 kip-ft

50.00 mph WIND - 0.7500 in ICE

AXIAL 43 K

SHEAR 26 K

MOMENT 2092 kip-ft

TORQUE 1 kip-ft

REACTIONS - 97.00 mph WIND

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
Phone: mscroggy@pjfweb.com
FAX: 614.448.4105

Job: 120 ft Monopole / Jai-Alai			
Project: PJF 37513-2057 / BU 876309			
Client: CCI	Drawn by: Morgan Scroggy	App'd:	
Code: TIA-222-G	Date: 04/24/17	Scale: N	
Path:		Dwg No.	

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com
Effective Date: 3/21/2016 Verison 1.3

DATE:	4/24/2017
PROJECT NO:	A37517-0863.002.7805
SITE NAME:	MILFORD JAI-ALAI
SITE NUMBER/BUN:	876309.00
DESCRIPTION:	90' Flange
OWNER:	CCI
ENGINEER:	MLS

BOLTED FLANGE JUMP ANALYSIS PER TIA-222-G & AISC 13TH ED. (BLACK)

General Parameters & Loading

Flange Elevation:	90.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	1.00	
Moment, Muf:	285.10	k-ft
Axial, Puf:	8.20	kips
Shear, Vf:	14.50	kips

Pole Parameters

	Upper Pole	Lower Pole	
Number of Sides	Round	Round	
Pole Diameter, Dp:	24.00	24.00	in
Pole Thickness, tp:	0.2500	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	32.00	32.00	in
Flange Thickness, tf:	1.50	1.50	in

Flange Parameters

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	20		
Bolt Diameter:	1.00		in
Bolt Circle:	29.00		in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0.00		degrees
Bolt Area, Ag:	0.7854	0.0000	in^2

	Bolt Circle 1	Bolt Circle 2	
Max. Tension:	13.63	0.00	kips
Max. Net Tension:	13.37	0.00	kips
Max. Net Compression:	13.89	0.00	kips
Moment to Bolt Circle:	164.73	0.00	k-ft
Axial to Bolt Circle:	5.21	0.00	kips
Shear to Bolt Circle:	14.50	0.00	kips
Equivalent Bolt Circle:	29.00	0.00	in

	Thickness	Width	Height
Top Flange Stiffener Parameters			
Bot. Flange Stiffener Parameters			

Shaft Reinforcing Parameters

	Generation 1	Generation 2	Generation 3	Generation 4	
Top Condition					
Top Shaft Reinf. Designation					
Top Shaft Reinf. Thickness					in
Top Shaft Reinf. Width					in
Top Shaft Reinf. Term. Bolts					
Top Shaft Reinf. Bolt Spacing					in
Top Shaft Reinf. End Spacing					in
Bottom Condition					
Bottom Shaft Reinf. Designation					
Bottom Shaft Reinf. Thickness					in
Bottom Shaft Reinf. Width					in
Bottom Shaft Reinf. Term. Bolts					
Bottom Shaft Reinf. Bolt Spacing					in
Bottom Shaft Reinf. End Spacing					in

Bridge Stiffener Parameters

	Generation 1	Generation 2	Generation 3	Generation 4	
Reference Document					
Analysis, Design, New, Ignore	Analysis				
Jump Plate Designation	CCI-040075				
Jump Plate Width Override					in
Jump Plate Thickness Override					in
Clear Distance from Flange	0.00				in
Jump Plate Fy	65				ksi
Jump Plate Fu	80				ksi
Bolt Type	APPROVED BLIND BOLT				
Bolt Tension Method	Case 2				
Top Bolt Quantity	8				
Top Bolt Spacing	3.00				in
Top Bolt Edge Distance	3.00				in
Bottom Bolt Quantity	8				
Bottom Bolt Spacing	3.00				in
Bottom Bolt Edge Distance	3.00				in
Unbraced Length	18.00	18.00			in
Unbraced Length Override	16.00				in
K	0.80				
Stiffener Circle	32.75				in
Clearance Check	OK				
Qty. Jump Plates	3				in
Location 1	90				deg
Location 2	210				deg
Location 3	330				deg
Location 4					deg
Location 5					deg
Location 6					deg

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com
Effective Date: 3/21/2016 Verison 1.3

DATE:	4/24/2017
PROJECT NO:	A37517-0863.002.7805
SITE NAME:	MILFORD JAI-ALAI
SITE NUMBER/BUN:	876309.00
DESCRIPTION:	90' Flange
OWNER:	CCI
ENGINEER:	MLS

BOLTED FLANGE JUMP ANALYSIS PER TIA-222-G & AISC 13TH ED. (BLACK)

Jump Plate Analysis

	Generation 1	Generation 2	Generation 3	Generation 4	
Applied Axial Load (Pu)	59.80				kips
Hole Diameter	1.19				in
Gross Area (Ag)	3.00				in^2
Net Area (An)	2.11				in^2
b/t Ratio	5.33				
Radius of Gyration (r)	0.22				in
K L / r	59.12				
Q (Where Qa = 1.0)	1.00				
ASIF Value	1.00				
Critical Stress (Fa or Fcr)	46.63				ksi
Nominal Compressive Capacity	125.89				kips
Nominal Tensile Capacity	126.56				kips
Controlling Stress Ratio	47.5%				

Bolt Analysis

	Generation 1	Generation 2	Generation 3	Generation 4	
Top Bolt Shear Load (Vu)	7.475				kips
Top Bolt Tension Load (Tu)	5.451				kips
Top Eccentricity (e)	4.375				in
Top Bolt Bearing Capacity (Rn)	31.721				kips
Top Bolt Shear Capacity (Vn)	37.000				kips
Top Bolt Tension Capacity (Tn)	9.450				kips
Top Connection Length Reduction	N/a				
Top Bolt Combined Stress Ratio	38.8%				

Bottom Bolt Shear Load (Vu)	7.475				kips
Bottom Bolt Tension Load (Tu)	5.451				kips
Bottom Eccentricity (e)	4.375				in
Bottom Bolt Bearing Capacity (Rn)	47.581				kips
Bottom Bolt Shear Capacity (Vn)	37.000				kips
Bottom Bolt Tension Capacity (Tn)	14.175				kips
Bottom Connection Length Reduction	N/a				
Bottom Bolt Combined Stress Ratio	18.9%				

Analysis Summary

	Generation 1	Generation 2	Generation 3	Generation 4
JUMP PLATE COMBINED STRESS RATIO	47.5%			
TOP BOLT COMBINED STRESS RATIO	38.8%			
BOTTOM BOLT COMBINED STRESS RATIO	18.9%			

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876309*
Site Name: *Milford Jai-Alai*
App #:

Reactions		
Mu	167.73	ft-kips
Axial, Pu:	5.21	kips
Shear, Vu:	14.54	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	29		

Plate Data		
Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.53	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	13.62	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.488	in	
Min PL "treq" for actual **T w/ Pry:**	0.567	in	
Min PL "t1" for actual **T w/o Pry:**	0.744	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	13.62	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	25.0%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	9.6	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	29.7%	**Pass**	Comp. Y.L. Length:
No Prying			16.28
Tension Side Stress Ratio, (treq/t)^2:	14.3%	**Pass**	

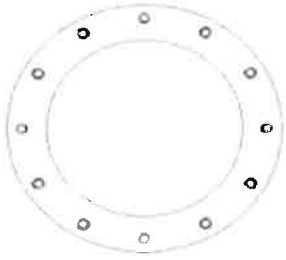
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876309*
Site Name: *Milford Jai-Alai*
App #:

Reactions		
Mu	167.73	ft-kips
Axial, Pu:	5.21	kips
Shear, Vu:	14.54	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G

<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	29		

Plate Data		
Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.53	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	13.62	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.488	in	
Min PL "treq" for actual **T w/ Pry:**	0.567	in	
Min PL "t1" for actual **T w/o Pry:**	0.744	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	13.62	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	25.0%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	9.6	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	29.7%	**Pass**	Comp. Y.L. Length:
No Prying			16.28
Tension Side Stress Ratio, (treq/t)^2:	14.3%	**Pass**	

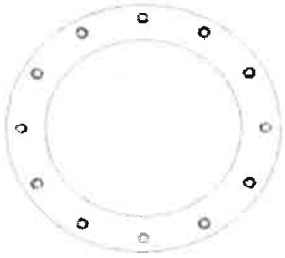
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 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

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Phone 614.221.6679 www.pauljford.com

v2.0, Effective Date: 1-12-12

Date: 4/24/2017
Project No: 37517-0863.002.7805
Site Name: Milford Jai-Alai
Site Number/BUN: 876309
Description:
Owner:
Engineer:

Welded Bridge Stiffener Analysis per TIA-222-G & AISC 13th Ed. (Black)

General Parameters and Loading:

Flange Elevation:	60.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	N/A	
Moment, Muf:	761.7	k-ft
Axial, Puf:	14.2	kips
Shear, Vf:	17.7	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	24.00	30.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	41.00	41.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	3	
Upper Weld Length, L1:	25.00	47.25	in
Lower Weld Length, L2:	22.00	44.13	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E70	E80	
Effective Stiffener Width, Ws:	6.68	7.00	in
Stiffener Thickness, ts:	1.34	1.25	in
Notch, n:	1.00	0.50	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	11.75	4.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	75	degrees
Stiffener Circle:	49.68	49.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.84	12.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.84	9.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	35.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Tables 8-4 & 8-3:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	6	Num. of Sixteenths in Weld
a:	0.5136	0.2646	= e1 / L1
k:	0	0	
C:	2.2506	3.2460	Tabulated Cofficient
C1:	1.0000	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	128.2	123.7	kips
Axial Capacity, ΦPn:	253.2	710.9	kips = Φ C C1 D L
Ratio:	50.7%	17.4%	
Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.4473	0.2153	= e2 / L2
k:	0	0	
C:	2.4851	3.4488	Tabulated Cofficient
C1:	1.0000	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	128.2	123.7	kips
Axial Capacity, ΦPn:	246.0	705.3	kips = Φ C C1 D L
Ratio:	52.1%	17.5%	

Pole Analysis per AISC Table J2.5 & Sect. J4.2:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, Pu:	128.2	123.7	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	2.6	1.3	kips/in= Pu / (2 L1)
Section Modulus, S:	208.3	744.2	in^2 = $L1^2$ / 3
Bending Stress, fub:	7.9	2.1	kips/in = Pu e1 / S
Combined Stress, fu:	8.3	2.5	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	87.9%	26.0%	
Lower Pole			
Stiffener Axial, Pu:	128.2	123.7	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	2.9	1.4	ksi = Pu / (2 L2)
Section Modulus, S:	161.3	649.0	in^2 = $L2^2$ / 3
Bending Stress, fub:	7.8	1.8	ksi = Pu e2 / S
Combined Stress, fu:	8.3	2.3	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	88.3%	24.2%	

Stiffener 1 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 1	
Gross Area, Ag:	8.9512	in^2
Effective Net Area, Aen:	7.1854	in^2 = Ag U, where U = 0.803
Stiffener Axial, Pu:	128.2	kips
Stiffener Stress, fu:	14.3	ksi = Pu / Ag
b:	16.1800	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.0746	in
Q, Where Qa = 1.0:	0.9055	= Qa 1.34 - 0.76 (b / ts) $(Fy / E)^{1/2}$
r:	0.3868	in^3
K L / r:	24.3004	
Φ:	0.9000	
Axial Capacity, ΦFcr:	50.35	ksi = Φ Q $[0.658^{Q\,Fy/Fe}]$ Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	48.16	ksi = Φ Fu (Aen / Ag)
Ratio:	29.7%	

Stiffener 2 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 2	
Gross Area, Ag:	8.7500	in^2
Effective Net Area, Aen:	7.9568	in^3 = Ag U, where U = 0.909
Stiffener Axial, Pu:	123.7	kips
Stiffener Stress, fu:	14.1	ksi = Pu / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8794	= Qa 1.34 - 0.76 (b / ts) $(Fy / E)^{1/2}$
r:	0.3608	in^3
K L / r:	10.2537	
Φ:	0.9000	
Axial Capacity, ΦFcr:	51.00	ksi = Φ Q $[0.658^{Q\,Fy/Fe}]$ Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	54.56	ksi = Φ Fu (Aen / Ag)
Ratio:	27.7%	

Analysis Summary:

Bridge Stiffener Type 1
Weld Analysis Ratio: 52.1% PASS
Pole Analysis Ratio: 88.3% PASS
Stiffener Analysis Ratio: 29.7% PASS

Bridge Stiffener Type 2
Weld Analysis Ratio: 17.5% PASS
Pole Analysis Ratio: 26.0% PASS
Stiffener Analysis Ratio: 27.7% PASS

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v2.0, Effective Date: 1-12-12

Date: 4/24/2017
Project No: 37517-0863.002.7805
Site Name: Milford Jai-Alai
Site Number/BUN: 876309
Description:
Owner:
Engineer:

Welded Bridge Stiffener Analysis per TIA-222-G & AISC 13th Ed. (Black)

General Parameters and Loading:

Flange Elevation:	30.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	N/A	
Moment, Muf:	1360.1	k-ft
Axial, Puf:	26.9	kips
Shear, Vf:	21.8	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	30.00	36.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	47.00	47.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	3	
Upper Weld Length, L1:	45.25	47.25	in
Lower Weld Length, L2:	42.25	44.13	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E70	E80	
Effective Stiffener Width, Ws:	7.00	7.00	in
Stiffener Thickness, ts:	1.25	1.25	in
Notch, n:	0.50	0.50	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	5.63	4.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	22.5	75	degrees
Stiffener Circle:	55.00	55.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.50	12.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.50	9.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	41.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Tables 8-4 & 8-3:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	6	Num. of Sixteenths in Weld
a:	0.2762	0.2646	= e1 / L1
k:	0	0	
C:	3.1945	3.2460	Tabulated Cofficient
C1:	1.0000	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	202.4	202.4	kips
Axial Capacity, ΦPn:	650.5	710.9	kips = Φ C C1 D L
Ratio:	31.1%	28.5%	
Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.2249	0.2153	= e2 / L2
k:	0	0	
C:	3.4106	3.4488	Tabulated Cofficient
C1:	1.0000	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	202.4	202.4	kips
Axial Capacity, ΦPn:	648.4	705.3	kips = Φ C C1 D L
Ratio:	31.2%	28.7%	

Pole Analysis per AISC Table J2.5 & Sect. J4.2:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, Pu:	202.4	202.4	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	2.2	2.1	kips/in= Pu / (2 L1)
Section Modulus, S:	682.5	744.2	$in^2 = L1^2 / 3$
Bending Stress, fub:	3.7	3.4	kips/in = Pu e1 / S
Combined Stress, fu:	4.3	4.0	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	45.8%	42.5%	
Lower Pole			
Stiffener Axial, Pu:	202.4	202.4	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	2.4	2.3	ksi = Pu / (2 L2)
Section Modulus, S:	595.0	649.0	$in^2 = L2^2 / 3$
Bending Stress, fub:	3.2	3.0	ksi = Pu e2 / S
Combined Stress, fu:	4.0	3.7	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	42.6%	39.6%	

Stiffener 1 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 1	
Gross Area, Ag:	8.7500	in^2
Effective Net Area, Aen:	7.9216	in^2 = Ag U, where U = 0.905
Stiffener Axial, Pu:	202.4	kips
Stiffener Stress, fu:	23.1	ksi = Pu / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8794	= Qa 1.34 - 0.76 (b / ts) $(Fy / E)^{1/2}$
r:	0.3608	in^3
K L / r:	12.4708	
Φ:	0.9000	
Axial Capacity, ΦFcr:	50.78	ksi = Φ Q $[0.658^{Q\,Fy/Fe}]$ Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	54.32	ksi = Φ Fu (Aen / Ag)
Ratio:	45.6%	

Stiffener 2 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 2	
Gross Area, Ag:	8.7500	in^2
Effective Net Area, Aen:	7.9568	in^2 = Ag U, where U = 0.909
Stiffener Axial, Pu:	202.4	kips
Stiffener Stress, fu:	23.1	ksi = Pu / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8794	= Qa 1.34 - 0.76 (b / ts) $(Fy / E)^{1/2}$
r:	0.3608	in^3
K L / r:	10.2537	
Φ:	0.9000	
Axial Capacity, ΦFcr:	51.00	ksi = Φ Q $[0.658^{Q\,Fy/Fe}]$ Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	54.56	ksi = Φ Fu (Aen / Ag)
Ratio:	45.4%	

Analysis Summary:

Bridge Stiffener Type 1
Weld Analysis Ratio: 31.2% PASS
Pole Analysis Ratio: 45.8% PASS
Stiffener Analysis Ratio: 45.6% PASS

Bridge Stiffener Type 2
Weld Analysis Ratio: 28.7% PASS
Pole Analysis Ratio: 42.5% PASS
Stiffener Analysis Ratio: 45.4% PASS

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STRUCTURAL ENGINEERS
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Date: 4/24/2017
PJF Project: 37517-0863.002.7805
Client Ref. # 876309
Site Name: Milford Jai-Alai
Description: 120' Pole
Owner: CCI
Engineer: MLS

v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment =	2092	k-ft	TIA Ref.	G	Location =	Base Plate	
Axial =	43.0	kips	ASIF =	1.0000	η =	0.50	for BP, Rev. G Sect. 4.9.9
Shear =	26.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	23						

** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. **

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	41.00	0.00	1.77	39.86	36.78	41.73	0.00	141.00	29.6%
2	1.500	A354 Gr BC	109	125	22.5	41.00	0.00	1.77	39.30	36.21	41.16	0.00	141.00	29.2%
3	1.500	A354 Gr BC	109	125	45.0	41.00	0.00	1.77	40.38	37.29	42.24	0.00	141.00	30.0%
4	1.500	A354 Gr BC	109	125	67.5	41.00	0.00	1.77	42.87	39.79	44.74	0.00	141.00	31.7%
5	1.500	A354 Gr BC	109	125	90.0	41.00	0.00	1.77	45.63	42.55	47.50	0.00	141.00	33.7%
6	1.500	A354 Gr BC	109	125	112.5	41.00	0.00	1.77	47.39	44.31	49.26	0.00	141.00	34.9%
7	1.500	A354 Gr BC	109	125	135.0	41.00	0.00	1.77	47.39	44.31	49.26	0.00	141.00	34.9%
8	1.500	A354 Gr BC	109	125	157.5	41.00	0.00	1.77	45.57	42.49	47.44	0.00	141.00	33.6%
9	1.500	A354 Gr BC	109	125	180.0	41.00	0.00	1.77	42.62	39.54	44.49	0.00	141.00	31.6%
10	1.500	A354 Gr BC	109	125	202.5	41.00	0.00	1.77	39.81	36.72	41.67	0.00	141.00	29.6%
11	1.500	A354 Gr BC	109	125	225.0	41.00	0.00	1.77	38.43	35.34	40.29	0.00	141.00	28.6%
12	1.500	A354 Gr BC	109	125	247.5	41.00	0.00	1.77	38.91	35.83	40.78	0.00	141.00	28.9%
13	1.500	A354 Gr BC	109	125	270.0	41.00	0.00	1.77	40.47	37.39	42.34	0.00	141.00	30.0%
14	1.500	A354 Gr BC	109	125	292.5	41.00	0.00	1.77	41.83	38.74	43.69	0.00	141.00	31.0%
15	1.500	A354 Gr BC	109	125	315.0	41.00	0.00	1.77	42.10	39.01	43.96	0.00	141.00	31.2%
16	1.500	A354 Gr BC	109	125	337.5	41.00	0.00	1.77	41.19	38.11	43.06	0.00	141.00	30.5%
17	1.750	Dywidag (150 ksi)	127.7	150	101.3	47.00	0.00	2.71	81.20	76.47	84.06	241.00	241.00	34.9%
18	1.750	Dywidag (150 ksi)	127.7	150	221.3	47.00	0.00	2.71	67.56	62.83	70.42	241.00	241.00	29.2%
19	0.000	Dywidag (150 ksi)	0	0	341.3	47.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
20	2.000	A193 Gr B7	105	125	326.3	47.00	0.00	3.14	85.34	79.85	88.65	0.00	250.00	35.5%
21	2.250	Williams R71	127.7	150	56.3	96.00	0.00	4.14	217.95	210.71	222.32	0.00	489.60	45.4%
22	2.250	Williams R71	127.7	150	191.3	96.00	0.00	4.14	217.79	210.56	222.17	0.00	489.60	45.4%
23	2.250	Williams R71	127.7	150	303.8	96.00	0.00	4.14	235.10	227.87	239.48	0.00	489.60	48.9%
								49.27						

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#:	
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Mu:	626.7	ft-kips
Axial, Pu:	24.7	kips
Shear, Vu:	14.9	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Reactions adjusted to account for post installed anchors and rock anchors

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

Anchor Rod Data		
Qty:	16	
Diam:	1.5	in
Rod Material:	A615-J	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	41	in

Plate Data		
Diam:	47	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.07	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Groove	
Groove Depth:	0.4375	in **
Groove Angle:	45	degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:	0.25	in
Width:	5.5	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ή):	49.3 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	141.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	34.9% **Pass**	

Base Plate Results Flexural Check

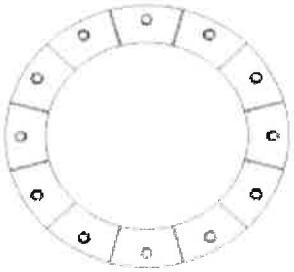
		Stiffened
Base Plate Stress:	10.0 ksi	AISC LRFD
Allowable Plate Stress:	32.4 ksi	φ*Fy
Base Plate Stress Ratio:	30.9% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	36.3% **Pass**
Vertical Weld:	19.1% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	2.6% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	15.8% **Pass**
Plate Comp. (AISC Bracket):	16.0% **Pass**

Pole Results

Pole Punching Shear Check:	5.6% **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

foundation loads

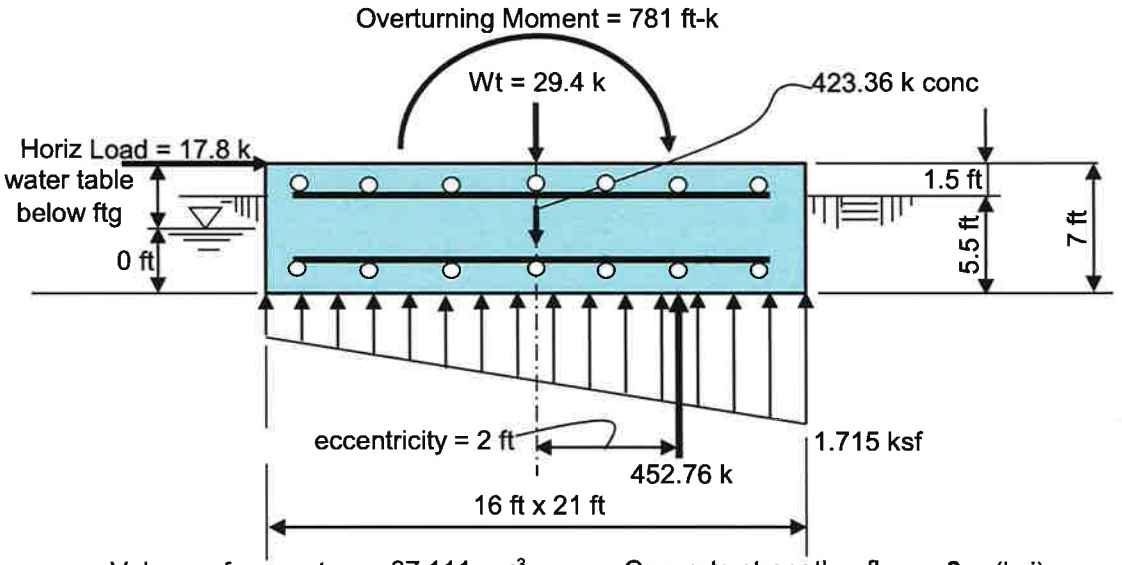
Limit states Tower or Pole Weight =	**29.4**	kips
limit states total horizontal force =	**17.8**	kips
limit states overturning moment =	**781**	ft-kips

soil properties

Safety factor against overturning =	**1**	
Soil Density =	**130**	pcf
Ultimate soil bearing =	**20**	ksf
Depth to water table =	**6.7**	ft

mat dimensions

depth to bottom of footing =	**5.5**	ft
Footing thickness =	**7**	ft
Footing Width =	**16**	ft
Footing Length =	**21**	ft
Tower/Pole Center Offset =	**0**	ft



Volume of concrete = 87.111 yd^3 Concrete strength = f'_c = **3** (ksi)

Rebar = (34) #8 x 15.5 ft long plus (34) #8 x 20.5 ft long

reinforcing steel = **(17) #8 by 15.5 long @ 15.38 in o.c. top and bot short bars**

reinforcing steel = **(17) #8 by 20.5 long @ 11.63 in o.c. top and bot long bars**

Summary of analysis results

Overturning Moment: (Stress Ratio = 0.333) **< CONTROLLING CRITERIA**

Calculated Ultimate Overturning Moment = 905.6 ft-kips

Resisting Moment = 2716.6 ft-kips

Factor of Safety against overturning = 3.000 **> 1 okay**

Rebar strength = F_y = **60** (ksi)

minimum cover over rebar = **3** inches

Soil Bearing (Stress Ratio = 0.114)

Limit States Maximum Net Soil Bearing = 15 ksf

Calculated limit states Soil Bearing Pressure = 1.715 **ksf < 15 ksf okay**

Bending Moment (Stress Ratio = 0.095)

Ultimate Bending Moment Resistance = 4755 ft-kips

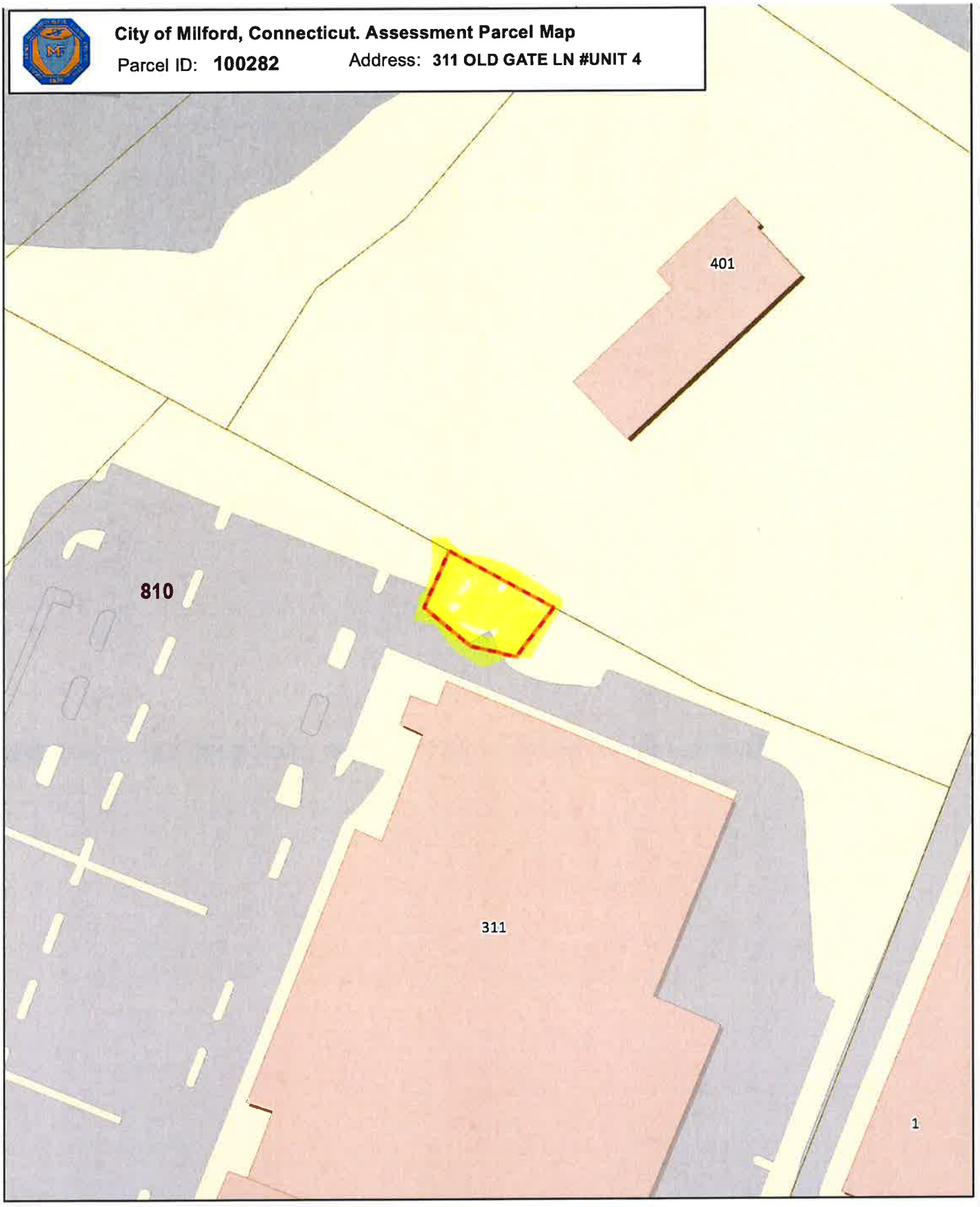
Calculated Ultimate Bending Moment = 453 **ft-kips < 4755 ft-kips okay**

Bending Shear (Stress Ratio = 0.046)

Ultimate Bending Shear Resistance = 1421 kips

Calculated Ultimate Bending Shear = 65 **kips < 1421 kips okay**

ATTACHMENT 4



1 inch = 100 feet

0 50 100 150 200 Feet

Disclaimer: This map is for informational purposes only All information is subject to verification by any user. The City of Milford and its mapping contractors assume no legal responsibility for the information contained herein.

Map Produced: July 2016

311 OLD GATE LN #UNIT 4

Location	311 OLD GATE LN #UNIT 4	**Mblu**	79/ 810/ 13/G1 /
Acct#	023045	**Owner**	BVS JAI ALAI LLC
Assessment	$329,180	**Appraisal**	$470,250
PID	100282	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$450,000	$20,250	$470,250
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$315,000	$14,180	$329,180

Owner of Record

Owner BVS JAI ALAI LLC
Other
Address 1720 POST RD
FAIRFIELD, CT 06824

Sale Price $14,000,000
Certificate
Book & Page 03138/0001
Sale Date 12/19/2006
Instrument 15

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
BVS JAI ALAI LLC	$14,000,000		03138/0001	15	12/19/2006
CITY OF MILFORD (TAXABLE)	$0		02955/0591		01/20/2005
JAI ALAI ASSOCIATES LLC	$0		02407/0500		05/22/2000
JAI ALAI ASSOCIATES LIMITED	$0		01191/0215		02/08/1983

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:

Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Description:	
Kitchen Descrip:	
Int Condition:	
Solar Panels	
House Generator	

Building Photo

(http://images.vgsi.com/photos/MilfordCTPhotos//default.jpg)

Building Layout

Building Layout

(http://images.vgsi.com/photos/MilfordCTPhotos//Sketches/100

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 434V
Description CELL TOWER MDL-00

Land Line Valuation

Size (Acres) 0.09
Frontage

Zone	ID	**Depth**	
Neighborhood	F	**Assessed Value**	$14,180
Alt Land Appr	No	**Appraised Value**	$20,250
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
CEL1	CEL TWR SITE			1 UNITS	$450,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$450,000	$20,250	$470,250
2013	$450,000	$20,250	$470,250
2012	$450,000	$20,250	$470,250

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$315,000	$14,180	$329,180
2013	$315,000	$14,180	$329,180
2012	$315,000	$14,180	$329,180

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 02/28/2018 US POSTAGE $002.38 ZIP 06103 041L122033
	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.	Benjamin G. Blake, Mayor City of Milford 110 River Street Milford, CT 06460				
2.	David B. Sulkis, City Planner City of Milford 70 West River Street Milford, CT 06460				
3.	BVS JAI ALAI LLC 1720 Post Road Fairfield, CT 06824				
4.					
5.					
6.					

OLD STATE HOUSE STA 06103