Robinson+Cole

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June 12, 2017

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

Re: **Notice of Exempt Modification – Facility Modification**
467 South Quaker Lane, West Hartford, 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 119-foot tower at 467 South Quaker Lane in West Hartford, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 2001. Cellco now intends to replace six (6) of its existing antennas with three (3) model SBNHH-1DS65B, 1900 MHz antennas and three (3) model SBNHH-1DS65B, 2100 MHz antennas, all at the same 100-foot level on the tower. Cellco also intends to replace three (3) of its existing remote radio heads ("RRHs") and install six (6) new RRHs behind its antennas and two (2) HYBRIFLEX™ fiber optic antenna cables attached to the outside of the monopole. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Ronald Van Winkle, Town Manager for the Town of West Hartford; Todd Dumais, the Town Planner; Crown, the owner of the tower; and Church of the St. Mark the Evangelist, the owner of the Property.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRH's will be located at the 100-foot level on the 119-foot tower.

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

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

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

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

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

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

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Ronald Van Winkle, Town Manager
Todd Dumais, Town Planner
Church of the St. Mark the Evangelist
Crown Castle
Tim Parks, Verizon Wireless

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D65B

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

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

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

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

Array Layout

Product Specifications

SBNHH-1D65B

SBNHH 65

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		

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-1D65B

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	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Loading, lateral	197.0 N @ 150 km/h 44.3 lbf @ 150 km/h
Wind Loading, rear	728.0 N @ 150 km/h 163.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Depth	180.0 mm | 7.1 in
Net Weight, without mounting kit	18.4 kg | 40.6 lb

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

Length	2025.0 mm | 79.7 in
Width	390.0 mm | 15.4 in
Depth	296.0 mm | 11.7 in
Shipping Weight	31.0 kg | 68.3 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

Product Specifications

SBNHH-1D65B

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

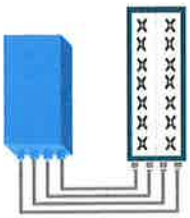
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

TECHNICAL SPECIFICATIONS

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

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.

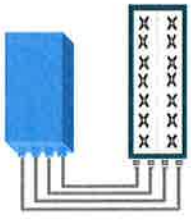
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the 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
WIRELESS PRODUCT DATASHEET
RRH2X60-AWS FOR BAND 4 APPLICATIONS

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

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

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

SUPERIOR RF PERFORMANCE

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

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

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

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

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

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

OPTIMIZED TCO

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

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

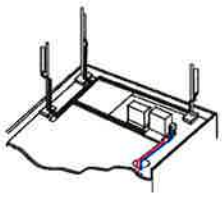
EASY INSTALLATION

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

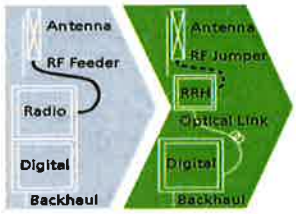
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

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

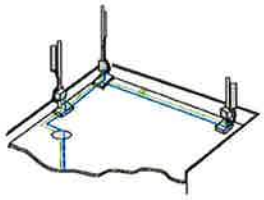
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

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

Dimensions and weights

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

Electrical Data

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

RF Characteristics

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

Connectivity

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

Environmental specifications

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

Safety and Regulatory Data

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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

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

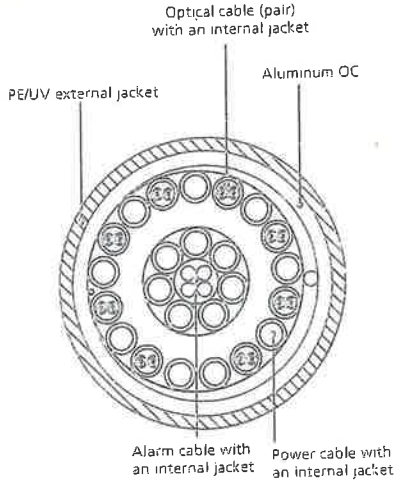


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: West Hartford 2								
Tower Height: 119Ft.								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*AT&T UMTS	2	414	110	850	0.0275	0.5667	0.49%	
*AT&T UMTS	2	656	110	1900	0.0436	1.0000	0.44%	
*AT&T GSM	2	1390	110	700	0.0924	0.4667	1.98%	
*AT&T GSM	2	1672	110	2300	0.1112	1.0000	1.11%	
*AT&T LTE	2	1423	110	1900	0.0946	1.0000	0.95%	
*Clearwire	2	153	80	2496	0.0201	1.0000	0.20%	
*Clearwire	1	211	80	11 GHz	0.0139	1.0000	0.14%	
*T-Mobile PCS/AWS	4	2334	120	1900/2100	0.2583	1.0000	2.58%	
*T-Mobile PCS/AWS	6	1667	120	19002100	0.2768	1.0000	2.77%	
*T-Mobile LTE	1	865	120	700	0.0239	0.4667	0.51%	
Verizon PCS	**11**	**459**	**100**	**0.1815**	**1970**	**1.0000**	**18.15%**	
Verizon Cellular	**9**	**416**	**100**	**0.1346**	**869**	**0.5793**	**23.24%**	
Verizon AWS	**1**	**3500**	**100**	**0.1258**	**2145**	**1.0000**	**12.58%**	
Verizon 700	**1**	**2100**	**100**	**0.0755**	**746**	**0.4973**	**15.18%**	
								80.32%
* Source: Siting Council								

ATTACHMENT 3

Date: **May 16, 2017**

Rebecca Klein
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6525

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	West Hartford 2
Crown Castle Designation:	**Crown Castle BU Number:**	829013
	Crown Castle Site Name:	West Hartford/I-84/X43
	Crown Castle JDE Job Number:	337922
	Crown Castle Work Order Number:	1401460
	Crown Castle Application Number:	300644 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	25680.119332
Site Data:	**467 South Quaker Lane (Church of St. Mar k)** **West Hartford, Hartford County, CT 06110** **Latitude *41° 44' 55.59"*, Longitude *-72° 43' 52.86"*** **119 Foot - Monopole Tower**	

Dear Rebecca Klein,

Tower Engineering Professionals 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 1037050, in accordance with application 300644, revision 1.

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 1609.3.1 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* 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.

Structural analysis prepared by: Ryan W. Tschetter, E.I. / RLM

Respectfully submitted by:

William H. Martin, P.E., S.E.

5/17/17

STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER

Electronic Copy

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 119-ft monopole tower designed by Pirod, Inc. in May of 2000. The tower was originally designed for a wind speed of 80 mph per EIA/TIA-222-F for the appurtenances listed in Table 3. The tower has been modified multiple times in the past to accommodate additional loading. TEP visited the site on July of 2014 to perform a Rebar Mapping. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the ANSI/TIA-222-G-2-2009 Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2 using a nominal 3-second gust wind speed of 97 mph with no ice, 40 mph with 1.0 inch ice thickness and 60 mph under service loads with the following design criteria:

Type of Analysis: **Rigorous Structural Analysis**
Classification of Structure: **Class II**
Exposure Category: **Exposure C**
Topographic Category: **Category 1**
Earthquake Category: **Not Considered**
Earthquake effects may be ignored per this standard for site locations where Ss does not exceed 1.0. (Hartford County Max Ss = 0.28).

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	100.0	6	Commscope	SBNHH-1D65B w/ Mount Pipe	2	1-5/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-AWS			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		3	Alcatel Lucent	RRH2x60-700			

Note:
1) See "Appendix B – Base Level Drawing" for assumed feed line configuration.

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
120.0	120.0	3	Commscope	LNX-6515DS-VTM w/ Mount Pipe	-	-	1
		3	Ericsson	RRUS 11 B12			
		1	RFS Celwave	APXV18-206517S-C w/ Mount Pipe			
		3	Ericsson	Air 21 B2A B4P w/ Mount Pipe	13	1-5/8	2
		3	Ericsson	Air 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	KRY 112 144/1			
		1	Tower Mounts	Platform Mount [LP 403-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
115.0	115.0	1	Andrew	VHLP2-18	1	1/2	2
		1	Tower Mounts	Side Arm Mount [SO 102-3]			
110.0	110.0	1	Andrew	SBNH-1D6565C w/ Mount Pipe	1 2 12	3/8 7/16 1-5/8	2
		2	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	Powerwave Technologies	7770.00 w/ Mount Pipe			
		1	Raycap	DC6-48-60-18-8F			
		6	Ericsson	RRUS 11			
		4	Powerwave Technologies	LGP21903			
		1	Tower Mounts	Platform Mount [LP 712-1]			
100.0	100.0	3	Antel	BXA-171063/8CF w/ Mount Pipe	-	-	3
		3	Antel	BXA-185063/8CF w/ Mount Pipe			
		3	Alcatel Lucent	RRH2X40-AWS			
		6	RFS Celwave	FD9R6004/2C-3L			
		3	Amphenol	BXA-80063-4BF-EDIN-X w/ Mount Pipe	12	1-5/8	2
		2	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		1	Antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		1	Tower Mounts	Platform Mount [LP 403-1]			
90.0	90.0	3	Kathrein	742 213 w/ Mount Pipe	6	1-5/8	2
80.0	83.0	1	Andrew	VHLP2-23	3 1 3 3	1/4 5/16 1/2 5/8	2
		1	Clearwire	CW Junction Box			
	81.0	3	Argus Technologies	LLPX310R w/ Mount Pipe			
		3	Samsung Telecom.	Wimax Dap Head			
	80.0	1	Tower Mounts	Side Arm Mount [SO 101-3]			

Notes:
1) Reserved equipment
2) Existing equipment
3) Existing equipment to be removed; not considered in this analysis

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)
120.0	120.0	12	Generic	1'x4' Panels	12	1-5/8
110.0	110.0	12	Generic	1'x4' Panels	12	1-5/8
100.0	100.0	12	Generic	1'x4' Panels	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Supplemental Geotechnical Report	Tower Engineering Professionals	3636697	CCISites
Tower Foundation Drawings	Pirod, Inc.	3636698	CCISites
Rebar Mapping	Tower Engineering Professionals	3636698	CCISites
Tower Manufacturer Drawings	Pirod, Inc.	3525378	CCISites
Tower Reinforcement Drawings	Natcomm Consulting Engineers, Inc.	3525386	CCISites
Post Modification Inspection	Natcomm Consulting Engineers, Inc.	3974228	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals	5650111	CCISites
Post-Modification Inspection	SGS Towers, Inc.	5852136	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.

RISA-3D, a commercially available analysis software package, was used to model and analyze the foundation. Selected output from the analysis is included in Appendix C.

3.2) Assumptions

1) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and "Appendix B – Base Level Drawing".
4) All tower components are in sufficient condition to carry their full design capacity.
5) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
6) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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 (lb)	ϕP_{allow} (lb)	% Capacity	Pass / Fail
L1	119.083 - 101.083	Pole	TP26x22.13x0.25	1	-6858.42	1479480.00	18.0	Pass
L2	101.083 - 66.5	Pole	TP34.063x24.873x0.313	2	-16677.60	2387960.00	48.8	Pass
L3	66.5 - 32.8333	Pole	TP41.75x32.498x0.375	3	-25092.00	3492730.00	54.7	Pass
L4	32.8333 - 0	Pole	TP49.063x39.849x0.375	4	-36663.20	3984000.00	65.2	Pass
							Summary	
						Pole (L4)	65.2	Pass
						Rating =	**65.2**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	74.2	Pass
1	Base Plate	-	60.2	Pass
1	Base Foundation Soil Interaction	-	67.0	Pass
1	Base Foundation Structural	-	61.8	Pass
1	Rock Anchors	-	75.9	Pass

Structure Rating (max from all components) =	75.9%

Note:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

4.1) Recommendations

1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	18.00	18	0.250	2.92	22.130	26.000	A572-65	1157.5
2	37.50	18	0.313	3.83	24.873	34.063	A572-65	3690.1
3	37.50	18	0.375	4.67	32.498	41.750	A572-65	5581.5
4	37.50	18	0.375		39.849	49.063	A572-65	6695.0
								17124.1

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
2.4-in x 6-ft Mount Pipe	123	DC6-48-60-18-8F	110
LNX-6515DS-VTM w/ Mount Pipe	120	Platform Mount [LP 712-1]	110
LNX-6515DS-VTM w/ Mount Pipe	120	(2) 7770.00 w/ Mount Pipe	110
LNX-6515DS-VTM w/ Mount Pipe	120	LNX-6514DS-T4M w/ Mount Pipe	100
APXV18-206517S-C w/ Mount Pipe	120	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	100
RRUS 11 B12	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
RRUS 11 B12	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
RRUS 11 B12	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	DB-T1-6Z-8AB-0Z	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	(2) SBNHH-1D65B w/ Mount Pipe	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	(2) SBNHH-1D65B w/ Mount Pipe	100
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120	(2) SBNHH-1D65B w/ Mount Pipe	100
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120	RRH2x60-700	100
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120	RRH2x60-700	100
KRY 112 144/1	120	RRH2x60-700	100
KRY 112 144/1	120	RRH2x60-AWS	100
KRY 112 144/1	120	RRH2x60-AWS	100
2.4" Dia. x 6' Mount Pipe	120	RRH2x60-AWS	100
2.4" Dia. x 6' Mount Pipe	120	RRH2X60-PCS	100
Platform Mount [LP 403-1]	120	RRH2X60-PCS	100
Side Arm Mount [SO 102-3]	115	RRH2X60-PCS	100
2.4" Dia. x 6' Mount Pipe	115	DB-T1-6Z-8AB-0Z	100
VHLP2-18	115	Platform Mount [LP 403-1]	100
(2) 7770.00 w/ Mount Pipe	110	LNX-6514DS-T4M w/ Mount Pipe	100
(2) 7770.00 w/ Mount Pipe	110	2'x3' Ice Shield	97
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	2'x3' Ice Shield	95
SBNH-1D6565C w/ Mount Pipe	110	742 213 w/ Mount Pipe	90
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	742 213 w/ Mount Pipe	90
(2) RRUS 11	110	742 213 w/ Mount Pipe	90
(2) RRUS 11	110	LLPX310R w/ Mount Pipe	80
(2) RRUS 11	110	LLPX310R w/ Mount Pipe	80
(2) LGP21903	110	WIMAX DAP HEAD	80
(2) LGP21903	110	WIMAX DAP HEAD	80
2.4" Dia. x 6' Mount Pipe	110	WIMAX DAP HEAD	80
2.4" Dia. x 6' Mount Pipe	110	CW JUNCTION BOX	80
2.4" Dia. x 6' Mount Pipe	110	2.4" Dia. x 6' Mount Pipe	80
		2.4" Dia. x 6' Mount Pipe	80
		2.4" Dia. x 6' Mount Pipe	80
		Side Arm Mount [SO 101-3]	80
		LLPX310R w/ Mount Pipe	80
		VHLP2-23	80

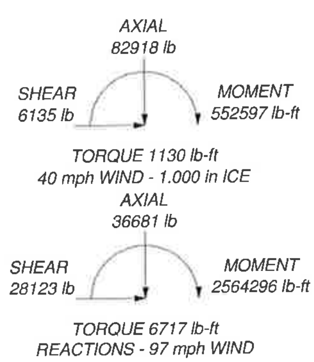
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 65.2%

ALL REACTIONS ARE FACTORED



Tower Engineering Professionals 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job: **West Hartford/I-84/X43 (BU 829013)**	
	Project: **TEP No. 25680.119332**	
	Client: Crown Castle	Drawn by: rwtschetter
	Code: TIA-222-G	Date: 05/16/17
	Path: C:\Work in Progress\25680.71241.119332 829013 WEST HARTFORD\ [illegible]	Dwg No. E-1

App'd: Scale: NTS

Tower Engineering Professionals

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

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				

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	119.08-101.08	18.00	2.917	18	22.130	26.000	0.250	1.000	A572-65 (65 ksi)
L2	101.08-66.50	37.50	3.833	18	24.873	34.063	0.313	1.250	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	66.50-32.83	37.50	4.667	18	32.498	41.750	0.375	1.500	A572-65 (65 ksi)
L4	32.83-0.00	37.50		18	39.849	49.063	0.375	1.500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.471	17.362	1050.090	7.767	11.242	93.407	2101.561	8.683	3.455	13.82
	26.401	20.433	1711.654	9.141	13.208	129.592	3425.561	10.218	4.136	16.544
L2	25.982	24.361	1856.528	8.719	12.635	146.930	3715.500	12.183	3.828	12.248
	34.588	33.476	4817.433	11.981	17.304	278.404	9641.206	16.741	5.445	17.424
L3	33.960	38.235	4984.583	11.404	16.509	301.930	9975.724	19.121	5.060	13.492
	42.394	49.247	10650.982	14.688	21.209	502.192	21315.979	24.628	6.688	17.835
L4	41.628	46.984	9249.061	14.013	20.243	456.899	18510.293	23.496	6.353	16.942
	49.819	57.950	17355.138	17.284	24.924	696.329	34733.112	28.981	7.975	21.267

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 119.08-101.08				1	1	1			
L2 101.08-66.50				1	1	1			
L3 66.50-32.83				1	1	1			
L4 32.83-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	Surface Ar (CaAa)	119.00 - 0.00	1	1	0.000 0.000	0.375		0.220
Rung 5/8" SR (12.5"w, 16"s)	C	Surface Ar (CaAa)	119.00 - 0.00	1	1	0.000 0.000	0.488		0.816
LDF7-50A(1-5/8")	B	Surface Ar (CaAa)	119.08 - 0.00	2	2	0.250 0.250	1.980		0.820
LDF7-50A(1-5/8")	C	Surface Ar (CaAa)	100.00 - 80.00	2	2	0.000 0.000	1.980		0.820
*** 90' ***									
LDF7-50A(1-5/8")	A	Surface Ar (CaAa)	90.00 - 0.00	6	6	0.500 0.500	1.980		0.820
2" Flexible Conduit	C	Surface Ar (CaAa)	80.00 - 0.00	2	2	0.000 0.000	2.000		0.340
FSJ4-50B(1/2")	C	Surface Ar (CaAa)	115.00 - 100.00	1	1	0.000 0.000	0.520		0.140
******									

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
*** 119' ***								
LDF7-50A(1-5/8")	B	No	Inside Pole	119.08 - 0.00	11	No Ice	0.00	0.820
						1/2" Ice	0.00	0.820
						1" Ice	0.00	0.820
*** 110' ***								
LDF7-50A(1-5/8")	A	No	Inside Pole	110.00 - 0.00	12	No Ice	0.00	0.820
						1/2" Ice	0.00	0.820
						1" Ice	0.00	0.820
WR-VG102ST-BRDA(7/16")	A	No	Inside Pole	110.00 - 0.00	2	No Ice	0.00	0.201
						1/2" Ice	0.00	0.201
						1" Ice	0.00	0.201
WR-VG122ST-BRDA(3/8)	A	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.200
						1/2" Ice	0.00	0.200
						1" Ice	0.00	0.200
3" Flexible Conduit	A	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	1.040
						1/2" Ice	0.00	1.040
						1" Ice	0.00	1.040
*** 100' ***								
LDF7-50A(1-5/8")	A	No	Inside Pole	100.00 - 0.00	12	No Ice	0.00	0.820
						1/2" Ice	0.00	0.820
						1" Ice	0.00	0.820
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	80.00 - 0.00	2	No Ice	0.00	0.820
						1/2" Ice	0.00	2.335
						1" Ice	0.00	4.461
*** 80' ***								
FSJ1-50A(1/4")	C	No	Inside Pole	80.00 - 0.00	3	No Ice	0.00	0.045
						1/2" Ice	0.00	0.045
						1" Ice	0.00	0.045
HJ4.5-50(5/8")	C	No	Inside Pole	80.00 - 0.00	3	No Ice	0.00	0.400
						1/2" Ice	0.00	0.400
						1" Ice	0.00	0.400
9207(5/16")	C	No	Inside Pole	80.00 - 0.00	1	No Ice	0.00	0.600
						1/2" Ice	0.00	0.600
						1" Ice	0.00	0.600
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	80.00 - 0.00	4	No Ice	0.00	0.140
						1/2" Ice	0.00	0.763
						1" Ice	0.00	1.997
*** 115' ***								
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	100.00 - 80.00	1	No Ice	0.00	0.140
						1/2" Ice	0.00	0.763
						1" Ice	0.00	1.997
******								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L1	119.08-101.08	A	0.000	0.000	0.000	0.000	102.38
		B	0.000	0.000	7.128	0.000	191.88
		C	0.000	0.000	2.270	0.000	20.51
L2	101.08-66.50	A	0.000	0.000	27.918	0.000	842.35

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
		B	0.000	0.000	13.695	0.000	368.66
		C	0.000	0.000	16.361	0.000	136.58
L3	66.50-32.83	A	0.000	0.000	39.996	0.000	883.48
		B	0.000	0.000	13.332	0.000	358.89
		C	0.000	0.000	16.372	0.000	196.98
L4	32.83-0.00	A	0.000	0.000	39.006	0.000	861.61
		B	0.000	0.000	13.002	0.000	350.00
		C	0.000	0.000	15.967	0.000	192.11

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L1	119.08-101.08	A	2.256	0.000	0.000	0.000	0.000	102.38
		B		0.000	0.000	19.060	0.000	470.39
		C		0.000	0.000	24.713	0.000	392.29
L2	101.08-66.50	A	2.194	0.000	0.000	48.149	0.000	1563.22
		B		0.000	0.000	36.620	0.000	903.75
		C		0.000	0.000	70.272	0.000	2112.82
L3	66.50-32.83	A	2.082	0.000	0.000	68.458	0.000	1883.81
		B		0.000	0.000	35.128	0.000	860.22
		C		0.000	0.000	67.743	0.000	2994.13
L4	32.83-0.00	A	1.864	0.000	0.000	65.848	0.000	1781.00
		B		0.000	0.000	33.343	0.000	805.30
		C		0.000	0.000	63.686	0.000	2656.03

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	119.08-101.08	0.504	0.152	0.610	0.748
L2	101.08-66.50	0.375	-0.351	0.442	0.223
L3	66.50-32.83	0.373	-0.664	0.468	-0.026
L4	32.83-0.00	0.396	-0.704	0.522	-0.049

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	101.08 - 119.00	1.0000	1.0000
L1	2	Rung 5/8" SR (12.5"w, 16"s)	101.08 - 119.00	1.0000	1.0000
L1	5	LDF7-50A(1-5/8")	101.08 - 119.08	1.0000	1.0000
L1	25	FSJ4-50B(1/2")	101.08 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	14	LDF7-50A(1-5/8")	115.00 101.08 - 100.00	1.0000	1.0000
L1	16	LDF7-50A(1-5/8")	101.08 - 90.00	1.0000	1.0000
L1	21	2" Flexible Conduit	101.08 - 80.00	1.0000	1.0000
L2	1	Safety Line 3/8	66.50 - 101.08	1.0000	1.0000
L2	2	Rung 5/8" SR (12.5"w, 16"s)	66.50 - 101.08	1.0000	1.0000
L2	5	LDF7-50A(1-5/8")	66.50 - 101.08	1.0000	1.0000
L2	16	LDF7-50A(1-5/8")	66.50 - 90.00	1.0000	1.0000
L2	21	2" Flexible Conduit	66.50 - 80.00	1.0000	1.0000
L3	1	Safety Line 3/8	32.83 - 66.50	1.0000	1.0000
L3	2	Rung 5/8" SR (12.5"w, 16"s)	32.83 - 66.50	1.0000	1.0000
L3	5	LDF7-50A(1-5/8")	32.83 - 66.50	1.0000	1.0000
L3	16	LDF7-50A(1-5/8")	32.83 - 66.50	1.0000	1.0000
L3	21	2" Flexible Conduit	32.83 - 66.50	1.0000	1.0000

Discrete Tower Loads

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 lb
2.4-in x 6-ft Mount Pipe	C	None		0.000	123.00	No Ice	1.44	1.44	22.00
						1/2" Ice	1.93	1.93	32.88
						1" Ice	2.30	2.30	47.87
*** 120' ***									
LNX-6515DS-VTM w/ Mount Pipe	A	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice	11.68	9.84	83.27
						1/2" Ice	12.40	11.37	172.93
						1" Ice	13.14	12.91	272.55
LNX-6515DS-VTM w/ Mount Pipe	B	From Centroid-Face	4.00 -3.750 0.000	30.000	120.00	No Ice	11.68	9.84	83.27
						1/2" Ice	12.40	11.37	172.93
						1" Ice	13.14	12.91	272.55
LNX-6515DS-VTM w/ Mount Pipe	C	From Centroid-Face	4.00 -3.750 0.000	30.000	120.00	No Ice	11.68	9.84	83.27
						1/2" Ice	12.40	11.37	172.93
						1" Ice	13.14	12.91	272.55
APXV18-206517S-C w/ Mount Pipe	B	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice	5.40	4.70	51.95
						1/2" Ice	5.96	5.86	97.04
						1" Ice	6.48	6.73	149.52
RRUS 11 B12	A	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice	2.79	1.19	50.70
						1/2" Ice	3.00	1.34	71.57
						1" Ice	3.21	1.50	95.48
RRUS 11 B12	B	From Centroid-Face	4.00 -3.750 0.000	30.000	120.00	No Ice	2.79	1.19	50.70
						1/2" Ice	3.00	1.34	71.57
						1" Ice	3.21	1.50	95.48
RRUS 11 B12	C	From Centroid-Face	4.00 -3.750 0.000	30.000	120.00	No Ice	2.79	1.19	50.70
						1/2" Ice	3.00	1.34	71.57
						1" Ice	3.21	1.50	95.48
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice	6.33	5.64	112.18
						1/2" Ice	6.78	6.43	169.02
						1" Ice	7.21	7.13	232.59
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Centroid-Face	4.00 -7.000	30.000	120.00	No Ice	6.33	5.64	112.18
						1/2" Ice	6.78	6.43	169.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
		ce	0.000			1" Ice	7.21	7.13	232.59
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	112.18 169.02 232.59
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Centroid-Face	4.00 3.750 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	112.18 169.02 232.59
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Centroid-Face	4.00 3.750 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	112.18 169.02 232.59
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	112.18 169.02 232.59
KRY 112 144/1	A	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	11.02 14.12 18.44
KRY 112 144/1	B	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	11.02 14.12 18.44
KRY 112 144/1	C	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	11.02 14.12 18.44
2.4" Dia. x 6' Mount Pipe	A	From Centroid-Face	4.00 0.000 0.000	0.000	120.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
2.4" Dia. x 6' Mount Pipe	C	From Centroid-Face	4.00 0.000 0.000	0.000	120.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
Platform Mount [LP 403-1]	C	None		0.000	120.00	No Ice 1/2" Ice 1" Ice	18.85 24.30 29.75	18.85 24.30 29.75	1500.00 1796.56 2093.12
*** 115' ***									
Side Arm Mount [SO 102-3]	C	None		0.000	115.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	81.00 111.00 141.00
2.4" Dia. x 6' Mount Pipe	C	From Leg	0.50 0.000 0.000	0.000	115.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
*** 110' ***									
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Face	4.00 -4.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55.38 102.81 156.64
(2) 7770.00 w/ Mount Pipe	B	From Centroid-Face	4.00 -4.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55.38 102.81 156.64
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Face	4.00 -4.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55.38 102.81 156.64
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	74.05 139.04 211.91
SBNH-1D6565C w/ Mount Pipe	B	From Centroid-Face	4.00 6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice	11.69 12.42 13.16	9.85 11.38 12.94	99.25 189.04 288.81
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	74.05 139.04 211.91

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) RRUS 11	A	From Centroid-Face	4.00 0.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	50.70 71.57 95.48
(2) RRUS 11	B	From Centroid-Face	4.00 0.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	50.70 71.57 95.48
(2) RRUS 11	C	From Centroid-Face	4.00 0.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	50.70 71.57 95.48
(2) LGP21903	A	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	11.02 13.44 16.93
(2) LGP21903	B	From Centroid-Face	4.00 6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	11.02 13.44 16.93
2.4" Dia. x 6' Mount Pipe	A	From Centroid-Face	4.00 -2.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
2.4" Dia. x 6' Mount Pipe	B	From Centroid-Face	4.00 -2.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
2.4" Dia. x 6' Mount Pipe	C	From Centroid-Face	4.00 -2.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
DC6-48-60-18-8F	B	From Centroid-Face	4.00 -6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	18.90 36.62 56.82
Platform Mount [LP 712-1]	C	None		0.000	110.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1335.00 1645.59 1956.18
*** 100' ***									
LNX-6514DS-T4M w/ Mount Pipe	A	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	8.44 8.98 9.51	7.42 8.45 9.34	79.33 151.64 232.88
LNX-6514DS-T4M w/ Mount Pipe	B	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	8.44 8.98 9.51	7.42 8.45 9.34	79.33 151.64 232.88
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	42.25 103.01 171.49
BXA-80063-4BF-EDIN-X w/ Mount Pipe	A	From Centroid-Face	4.00 7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	4.62 4.99 5.36	3.47 4.04 4.63	29.82 70.14 116.05
BXA-80063-4BF-EDIN-X w/ Mount Pipe	B	From Centroid-Face	4.00 7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	4.62 4.99 5.36	3.47 4.04 4.63	29.82 70.14 116.05
BXA-80063-4BF-EDIN-X w/ Mount Pipe	C	From Centroid-Face	4.00 7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	4.62 4.99 5.36	3.47 4.04 4.63	29.82 70.14 116.05
DB-T1-6Z-8AB-0Z	C	From Centroid-Face	4.00 3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	44.00 80.13 120.22
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	8.29 8.85 9.37	7.00 8.19 9.08	76.26 144.68 221.06
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Face	4.00 -3.000	0.000	100.00	No Ice 1/2" Ice	8.29 8.85	7.00 8.19	76.26 144.68

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
		ce	0.000			1" Ice	9.37	9.08	221.06
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	8.29 8.85 9.37	7.00 8.19 9.08	76.26 144.68 221.06
RRH2x60-700	A	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	60.00 82.72 109.06
RRH2x60-700	B	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	60.00 82.72 109.06
RRH2x60-700	C	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	60.00 82.72 109.06
RRH2x60-AWS	A	From Centroid-Face	4.00 3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	60.00 82.72 109.06
RRH2x60-AWS	B	From Centroid-Face	4.00 3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	60.00 82.72 109.06
RRH2x60-AWS	C	From Centroid-Face	4.00 3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	60.00 82.72 109.06
RRH2X60-PCS	A	From Centroid-Face	4.00 -7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	55.00 75.35 98.71
RRH2X60-PCS	B	From Centroid-Face	4.00 -7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	55.00 75.35 98.71
RRH2X60-PCS	C	From Centroid-Face	4.00 -7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	55.00 75.35 98.71
DB-T1-6Z-8AB-0Z	A	From Centroid-Face	4.00 -3.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	44.00 80.13 120.22
Platform Mount [LP 403-1]	C	None		0.000	100.00	No Ice 1/2" Ice 1" Ice	18.85 24.30 29.75	18.85 24.30 29.75	1500.00 1796.56 2093.12
*** 90' ***									
742 213 w/ Mount Pipe	A	From Leg	0.50 0.000 0.000	30.000	90.00	No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	48.92 93.54 145.83
742 213 w/ Mount Pipe	B	From Leg	0.50 0.000 0.000	0.000	90.00	No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	48.92 93.54 145.83
742 213 w/ Mount Pipe	C	From Leg	0.50 0.000 0.000	-10.000	90.00	No Ice 1/2" Ice 1" Ice	5.37 5.95 6.50	4.62 6.00 6.98	48.92 93.54 145.83
2'x3' Ice Shield	C	From Leg	0.50 0.000 0.000	-10.000	95.00	No Ice 1/2" Ice 1" Ice	0.72 0.99 1.26	1.18 1.61 2.04	72.00 132.00 192.00
2'x3' Ice Shield	C	From Leg	0.50 0.000 0.000	-10.000	97.00	No Ice 1/2" Ice 1" Ice	0.72 0.99 1.26	1.18 1.61 2.04	72.00 132.00 192.00
*** 80' ***									
LLPX310R w/ Mount Pipe	A	From Leg	1.00 -2.000 1.000	30.000	80.00	No Ice 1/2" Ice 1" Ice	4.45 4.79 5.13	2.87 3.40 3.94	43.87 80.95 123.32

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
LLPX310R w/ Mount Pipe	B	From Leg	1.00 -2.000 1.000	30.000	80.00	No Ice 1/2" Ice 1" Ice	4.45 4.79 5.13	2.87 3.40 3.94	43.87 80.95 123.32
LLPX310R w/ Mount Pipe	C	From Leg	1.00 -2.000 1.000	30.000	80.00	No Ice 1/2" Ice 1" Ice	4.45 4.79 5.13	2.87 3.40 3.94	43.87 80.95 123.32
WIMAX DAP HEAD	A	From Leg	1.00 2.000 1.000	30.000	80.00	No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	33.00 44.58 58.46
WIMAX DAP HEAD	B	From Leg	1.00 -2.000 1.000	30.000	80.00	No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	33.00 44.58 58.46
WIMAX DAP HEAD	C	From Leg	1.00 -2.000 1.000	30.000	80.00	No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	33.00 44.58 58.46
CW JUNCTION BOX	A	From Leg	1.00 2.000 3.000	30.000	80.00	No Ice 1/2" Ice 1" Ice	1.20 1.34 1.48	0.60 0.70 0.81	0.00 10.34 22.81
2.4" Dia. x 6' Mount Pipe	A	From Leg	1.00 2.000 0.000	0.000	80.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
2.4" Dia. x 6' Mount Pipe	B	From Leg	1.00 2.000 0.000	0.000	80.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
2.4" Dia. x 6' Mount Pipe	C	From Leg	1.00 2.000 0.000	0.000	80.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.32	1.43 1.93 2.32	22.00 37.81 55.56
Side Arm Mount [SO 101-3]	C	None		0.000	80.00	No Ice 1/2" Ice 1" Ice	7.50 8.90 10.30	7.50 8.90 10.30	252.00 333.00 414.00
******									

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 lb
*** 115' ***											
VHLP2-18	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.000 0.000	0.000		115.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	31.00 49.00 66.00
*** 80' ***											
VHLP2-23	A	Paraboloid w/Shroud (HP)	From Leg	1.00 2.000 3.000	-30.000		80.00	2.18	No Ice 1/2" Ice 1" Ice	3.73 4.02 4.31	30.00 50.00 70.00
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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
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 lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	119.083 - 101.083	Pole	Max Tension	26	0.00	0.10	-0.13
			Max. Compression	26	-21117.80	-6313.78	6007.39
			Max. Mx	8	-6857.16	-132740.13	2095.13
			Max. My	2	-6869.99	-2233.10	131774.68
			Max. Vy	8	11785.46	-132740.13	2095.13
			Max. Vx	2	-11704.60	-2233.10	131774.68
			Max. Torque	12			7289.27
L2	101.083 - 66.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47379.92	-3847.38	4508.57
			Max. Mx	8	-16677.56	-773003.25	3375.45
			Max. My	2	-16700.62	-5241.03	768991.47
			Max. Vy	8	22392.80	-773003.25	3375.45
			Max. Vx	14	22204.66	2298.44	-766691.00
			Max. Torque	12			7287.95
L3	66.5 - 32.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63077.89	-2439.96	3434.53
			Max. Mx	8	-25092.05	-1557951.53	2398.74
			Max. My	2	-25113.52	-7335.56	1542573.36
			Max. Vy	8	25383.75	-1557951.53	2398.74
			Max. Vx	14	24949.05	2411.03	-1541180.80
			Max. Torque	12			6734.24
L4	32.8333 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82918.13	-511.65	2054.75
			Max. Mx	8	-36663.21	-2564296.06	1209.20
			Max. My	2	-36663.80	-9547.03	2529485.90
			Max. Vy	8	28146.39	-2564296.06	1209.20
			Max. Vx	14	27632.39	2615.19	-2529070.33
			Max. Torque	12			6722.14

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	30	82918.13	-6135.07	-17.23
	Max. H_x	20	36681.17	28071.62	6.10
	Max. H_z	2	36681.17	-57.71	27573.04
	Max. M_x	2	2529485.90	-57.71	27573.04
	Max. M_z	8	2564296.06	-28122.99	-37.07
	Max. Torsion	12	6717.36	-13730.29	-23912.60
	Min. Vert	19	27510.87	23798.91	-13772.06
	Min. H_x	8	36681.17	-28122.99	-37.07
	Min. H_z	14	36681.17	4.53	-27609.31
	Min. M_x	14	-2529070.33	4.53	-27609.31
	Min. M_z	20	-2557415.87	28071.62	6.10
	Min. Torsion	24	-6584.77	13739.02	23855.61

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	30567.64	0.00	-0.00	-1273.66	-445.12	-0.01
1.2 Dead+1.6 Wind 0 deg - No Ice	36681.17	57.71	-27573.04	-2529485.90	-9546.05	5165.87
0.9 Dead+1.6 Wind 0 deg - No Ice	27510.87	57.71	-27573.03	-2508566.40	-9313.28	5142.73
1.2 Dead+1.6 Wind 30 deg - No Ice	36681.17	13758.85	-23913.09	-2194686.37	-1265113.86	2290.46
0.9 Dead+1.6 Wind 30 deg - No Ice	27510.87	13758.85	-23913.09	-2176478.33	-1254690.53	2283.00
1.2 Dead+1.6 Wind 60 deg - No Ice	36681.17	23814.04	-13826.97	-1270774.62	-2185956.39	-1298.61
0.9 Dead+1.6 Wind 60 deg - No Ice	27510.87	23814.04	-13826.97	-1260058.75	-2168063.83	-1288.32
1.2 Dead+1.6 Wind 90 deg - No Ice	36681.17	28122.99	37.07	-1208.30	-2564296.06	-4685.27
0.9 Dead+1.6 Wind 90 deg - No Ice	27510.87	28122.99	37.07	-781.18	-2543419.02	-4659.71
1.2 Dead+1.6 Wind 120 deg - No Ice	36681.17	23845.30	13771.38	1257548.86	-2187559.14	-6586.77
0.9 Dead+1.6 Wind 120 deg - No Ice	27510.87	23845.30	13771.38	1247763.26	-2169667.84	-6553.21
1.2 Dead+1.6 Wind 150 deg - No Ice	36681.17	13730.29	23912.60	2189742.33	-1257736.25	-6717.36
0.9 Dead+1.6 Wind 150 deg - No Ice	27510.87	13730.29	23912.60	2172385.50	-1247405.47	-6684.50
1.2 Dead+1.6 Wind 180 deg - No Ice	36681.17	-4.53	27609.31	2529070.33	2616.20	-5280.32
0.9 Dead+1.6 Wind 180 deg - No Ice	27510.87	-4.53	27609.31	2508963.05	2713.03	-5257.10
1.2 Dead+1.6 Wind 210 deg - No Ice	36681.17	-13694.88	23914.48	2190617.84	1257503.00	-2450.83
0.9 Dead+1.6 Wind 210 deg - No Ice	27510.87	-13694.88	23914.48	2173255.82	1247420.04	-2443.44
1.2 Dead+1.6 Wind 240 deg - No Ice	36681.17	-23798.91	13772.06	1262229.53	2182358.45	1417.27
0.9 Dead+1.6 Wind 240 deg - No Ice	27510.87	-23798.91	13772.06	1252382.90	2164786.92	1406.88
1.2 Dead+1.6 Wind 270 deg - No Ice	36681.17	-28071.62	-6.10	276.53	2557415.87	4607.07
0.9 Dead+1.6 Wind 270 deg - No Ice	27510.87	-28071.62	-6.10	654.59	2536882.98	4581.47
1.2 Dead+1.6 Wind 300 deg - No Ice	36681.17	-23785.15	-13765.89	-1261212.80	2180410.12	6432.54
0.9 Dead+1.6 Wind 300 deg - No Ice	27510.87	-23785.15	-13765.89	-1250601.89	2162853.31	6398.93
1.2 Dead+1.6 Wind 330 deg - No Ice	36681.17	-13739.02	-23855.61	-2187436.47	1258472.60	6584.77
0.9 Dead+1.6 Wind 330 deg - No Ice	27510.87	-13739.02	-23855.61	-2169302.03	1248399.78	6551.93
1.2 Dead+1.0 Ice+1.0 Temp	82918.13	0.00	-0.01	-2054.75	-511.65	0.51
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	82918.13	-3.52	-5309.65	-502867.02	-686.23	852.92
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	82918.13	2633.97	-4597.15	-435721.53	-249068.06	353.52
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	82918.13	4571.60	-2650.19	-252187.59	-431497.61	-254.94
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	82918.13	6135.07	17.23	-844.72	-552596.67	-822.73

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	82918.13	4588.22	2662.85	248527.10	-433049.98	-1124.36
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	82918.13	2650.55	4609.15	432409.66	-250160.79	-1130.15
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	82918.13	11.29	5314.79	498932.10	-1374.25	-867.29
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	82918.13	-2624.70	4597.21	431222.35	246913.50	-375.44
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	82918.13	-4569.28	2642.25	247025.20	429941.84	272.43
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	82918.13	-6127.54	-12.86	-3172.94	550544.11	811.65
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	82918.13	-4579.51	-2662.20	-252968.51	430967.34	1102.77
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	82918.13	-2651.94	-4600.93	-435916.14	249306.89	1112.87
Dead+Wind 0 deg - Service	30567.64	12.35	-5899.55	-539747.51	-2380.79	1110.47
Dead+Wind 30 deg - Service	30567.64	2943.86	-5116.47	-468437.82	-269807.43	492.55
Dead+Wind 60 deg - Service	30567.64	5095.27	-2958.43	-271650.09	-465938.97	-278.77
Dead+Wind 90 deg - Service	30567.64	6017.22	7.93	-1241.54	-546541.06	-1006.36
Dead+Wind 120 deg - Service	30567.64	5101.96	2946.54	266864.08	-466281.81	-1414.58
Dead+Wind 150 deg - Service	30567.64	2937.74	5116.36	465416.18	-268239.92	-1442.08
Dead+Wind 180 deg - Service	30567.64	-0.97	5907.31	537695.59	206.12	-1133.85
Dead+Wind 210 deg - Service	30567.64	-2930.17	5116.76	465608.03	267491.92	-526.92
Dead+Wind 240 deg - Service	30567.64	-5092.04	2946.68	267862.91	464482.94	303.54
Dead+Wind 270 deg - Service	30567.64	-6006.23	-1.31	-928.63	544384.33	988.72
Dead+Wind 300 deg - Service	30567.64	-5089.09	-2945.36	-269617.33	464062.99	1381.13
Dead+Wind 330 deg - Service	30567.64	-2939.61	-5104.17	-466894.44	267696.21	1414.46

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-30567.64	0.00	-0.00	30567.64	0.00	0.000%
2	57.71	-36681.17	-27573.03	-57.71	36681.17	27573.04	0.000%
3	57.71	-27510.87	-27573.03	-57.71	27510.87	27573.03	0.000%
4	13758.85	-36681.17	-23913.09	-13758.85	36681.17	23913.09	0.000%
5	13758.85	-27510.87	-23913.09	-13758.85	27510.87	23913.09	0.000%
6	23814.04	-36681.17	-13826.97	-23814.04	36681.17	13826.97	0.000%
7	23814.04	-27510.87	-13826.97	-23814.04	27510.87	13826.97	0.000%
8	28122.99	-36681.17	37.07	-28122.99	36681.17	-37.07	0.000%
9	28122.99	-27510.87	37.07	-28122.99	27510.87	-37.07	0.000%
10	23845.30	-36681.17	13771.38	-23845.30	36681.17	-13771.38	0.000%
11	23845.30	-27510.87	13771.38	-23845.30	27510.87	-13771.38	0.000%
12	13730.29	-36681.17	23912.60	-13730.29	36681.17	-23912.60	0.000%
13	13730.29	-27510.87	23912.60	-13730.29	27510.87	-23912.60	0.000%
14	-4.53	-36681.17	27609.31	4.53	36681.17	-27609.31	0.000%
15	-4.53	-27510.87	27609.31	4.53	27510.87	-27609.31	0.000%
16	-13694.88	-36681.17	23914.48	13694.88	36681.17	-23914.48	0.000%
17	-13694.88	-27510.87	23914.48	13694.88	27510.87	-23914.48	0.000%
18	-23798.91	-36681.17	13772.06	23798.91	36681.17	-13772.06	0.000%
19	-23798.91	-27510.87	13772.06	23798.91	27510.87	-13772.06	0.000%
20	-28071.62	-36681.17	-6.10	28071.62	36681.17	6.10	0.000%
21	-28071.62	-27510.87	-6.10	28071.62	27510.87	6.10	0.000%
22	-23785.15	-36681.17	-13765.89	23785.15	36681.17	13765.89	0.000%
23	-23785.15	-27510.87	-13765.89	23785.15	27510.87	13765.89	0.000%
24	-13739.02	-36681.17	-23855.61	13739.02	36681.17	23855.61	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
25	-13739.02	-27510.87	-23855.61	13739.02	27510.87	23855.61	0.000%
26	0.00	-82918.13	0.00	-0.00	82918.13	0.01	0.000%
27	-3.52	-82918.13	-5309.59	3.52	82918.13	5309.65	0.000%
28	2633.95	-82918.13	-4597.10	-2633.97	82918.13	4597.15	0.000%
29	4571.55	-82918.13	-2650.16	-4571.60	82918.13	2650.19	0.000%
30	6135.00	-82918.13	17.23	-6135.07	82918.13	-17.23	0.000%
31	4588.17	-82918.13	2662.82	-4588.22	82918.13	-2662.85	0.000%
32	2650.52	-82918.13	4609.10	-2650.55	82918.13	-4609.15	0.000%
33	11.29	-82918.13	5314.73	-11.29	82918.13	-5314.79	0.000%
34	-2624.67	-82918.13	4597.16	2624.70	82918.13	-4597.21	0.000%
35	-4569.23	-82918.13	2642.22	4569.28	82918.13	-2642.25	0.000%
36	-6127.48	-82918.13	-12.86	6127.54	82918.13	12.86	0.000%
37	-4579.46	-82918.13	-2662.17	4579.51	82918.13	2662.20	0.000%
38	-2651.91	-82918.13	-4600.88	2651.94	82918.13	4600.93	0.000%
39	12.35	-30567.64	-5899.55	-12.35	30567.64	5899.55	0.000%
40	2943.85	-30567.64	-5116.47	-2943.86	30567.64	5116.47	0.000%
41	5095.27	-30567.64	-2958.43	-5095.27	30567.64	2958.43	0.000%
42	6017.22	-30567.64	7.93	-6017.22	30567.64	-7.93	0.000%
43	5101.96	-30567.64	2946.54	-5101.96	30567.64	-2946.54	0.000%
44	2937.74	-30567.64	5116.36	-2937.74	30567.64	-5116.36	0.000%
45	-0.97	-30567.64	5907.31	0.97	30567.64	-5907.31	0.000%
46	-2930.17	-30567.64	5116.76	2930.17	30567.64	-5116.76	0.000%
47	-5092.04	-30567.64	2946.68	5092.04	30567.64	-2946.68	0.000%
48	-6006.23	-30567.64	-1.31	6006.23	30567.64	1.31	0.000%
49	-5089.09	-30567.64	-2945.36	5089.09	30567.64	2945.36	0.000%
50	-2939.61	-30567.64	-5104.17	2939.61	30567.64	5104.17	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00017139
3	Yes	5	0.00000001	0.00007813
4	Yes	5	0.00000001	0.00057405
5	Yes	5	0.00000001	0.00025093
6	Yes	5	0.00000001	0.00055603
7	Yes	5	0.00000001	0.00024239
8	Yes	5	0.00000001	0.00015067
9	Yes	5	0.00000001	0.00006833
10	Yes	5	0.00000001	0.00045222
11	Yes	5	0.00000001	0.00019536
12	Yes	5	0.00000001	0.00066819
13	Yes	5	0.00000001	0.00029674
14	Yes	5	0.00000001	0.00016354
15	Yes	5	0.00000001	0.00007465
16	Yes	5	0.00000001	0.00048864
17	Yes	5	0.00000001	0.00021145
18	Yes	5	0.00000001	0.00050175
19	Yes	5	0.00000001	0.00021777
20	Yes	5	0.00000001	0.00014579
21	Yes	5	0.00000001	0.00006619
22	Yes	5	0.00000001	0.00066290
23	Yes	5	0.00000001	0.00029419
24	Yes	5	0.00000001	0.00045480
25	Yes	5	0.00000001	0.00019633

26	Yes	4	0.00000001	0.00005644
27	Yes	5	0.00000001	0.00027295
28	Yes	5	0.00000001	0.00031097
29	Yes	5	0.00000001	0.00030926
30	Yes	5	0.00000001	0.00029173
31	Yes	5	0.00000001	0.00030031
32	Yes	5	0.00000001	0.00031209
33	Yes	5	0.00000001	0.00026361
34	Yes	5	0.00000001	0.00028736
35	Yes	5	0.00000001	0.00028672
36	Yes	5	0.00000001	0.00028404
37	Yes	5	0.00000001	0.00031315
38	Yes	5	0.00000001	0.00030305
39	Yes	4	0.00000001	0.00025166
40	Yes	4	0.00000001	0.00026800
41	Yes	4	0.00000001	0.00023656
42	Yes	4	0.00000001	0.00022742
43	Yes	4	0.00000001	0.00028095
44	Yes	4	0.00000001	0.00044066
45	Yes	4	0.00000001	0.00024815
46	Yes	4	0.00000001	0.00017357
47	Yes	4	0.00000001	0.00017259
48	Yes	4	0.00000001	0.00022258
49	Yes	4	0.00000001	0.00043204
50	Yes	4	0.00000001	0.00028582

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119.083 - 101.083	13.320	42	0.947	0.016
L2	104 - 66.5	10.374	42	0.906	0.009
L3	70.3333 - 32.8333	4.782	42	0.639	0.004
L4	37.5 - 0	1.374	42	0.336	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.00	2.4-in x 6-ft Mount Pipe	42	13.320	0.947	0.016	31415
120.00	LNX-6515DS-VTM w/ Mount Pipe	42	13.320	0.947	0.016	31415
115.00	VHLP2-18	42	12.512	0.939	0.014	31415
110.00	(2) 7770.00 w/ Mount Pipe	42	11.530	0.927	0.012	17293
100.00	LNX-6514DS-T4M w/ Mount Pipe	42	9.625	0.886	0.008	9641
97.00	2'x3' Ice Shield	42	9.076	0.868	0.007	9129
95.00	2'x3' Ice Shield	42	8.716	0.855	0.007	8818
90.00	742 213 w/ Mount Pipe	42	7.841	0.817	0.006	8127
83.00	VHLP2-23	42	6.678	0.758	0.005	7323
80.00	LLPX310R w/ Mount Pipe	42	6.204	0.730	0.005	7025

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119.083 - 101.083	62.465	8	4.435	0.073
L2	104 - 66.5	48.671	8	4.252	0.043
L3	70.3333 - 32.8333	22.443	8	2.998	0.017
L4	37.5 - 0	6.450	8	1.579	0.007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.00	2.4-in x 6-ft Mount Pipe	8	62.465	4.435	0.073	6977
120.00	LNX-6515DS-VTM w/ Mount Pipe	8	62.465	4.435	0.073	6977
115.00	VHLP2-18	8	58.682	4.401	0.064	6977
110.00	(2) 7770.00 w/ Mount Pipe	8	54.083	4.348	0.054	3840
100.00	LNX-6514DS-T4M w/ Mount Pipe	8	45.161	4.159	0.038	2128
97.00	2'x3' Ice Shield	8	42.587	4.075	0.034	2007
95.00	2'x3' Ice Shield	8	40.901	4.013	0.032	1934
90.00	742 213 w/ Mount Pipe	8	36.797	3.838	0.027	1773
83.00	VHLP2-23	8	31.341	3.557	0.023	1586
80.00	LLPX310R w/ Mount Pipe	8	29.115	3.428	0.021	1518

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	119.083 - 101.083 (1)	TP26x22.13x0.25	18.00	0.00	0.0	19.935	-6858.42	1479480.00	0.005
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	37.50	0.00	0.0	32.544	-16677.60	2387960.00	0.007
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	37.50	0.00	0.0	47.876	-25092.00	3492730.00	0.007
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	37.50	0.00	0.0	57.950	-36663.20	3984000.00	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	119.083 - 101.083 (1)	TP26x22.13x0.25	133554.17	762729.17	0.175	0.00	762729.17	0.000

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	773010.83	1608483.33	0.481	0.00	1608483.33	0.000
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	1557950.00	2884758.33	0.540	0.00	2884758.33	0.000
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	2564300.00	3989300.00	0.643	0.00	3989300.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	119.083 - 101.083 (1)	TP26x22.13x0.25	11843.20	739739.00	0.016	1077.02	1527325.00	0.001
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	22392.80	1193980.00	0.019	4698.43	3220900.00	0.001
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	25383.80	1746370.00	0.015	4689.54	5776566.67	0.001
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	28146.40	1992000.00	0.014	4685.26	7988358.00	0.001

Pole Interaction Design Data

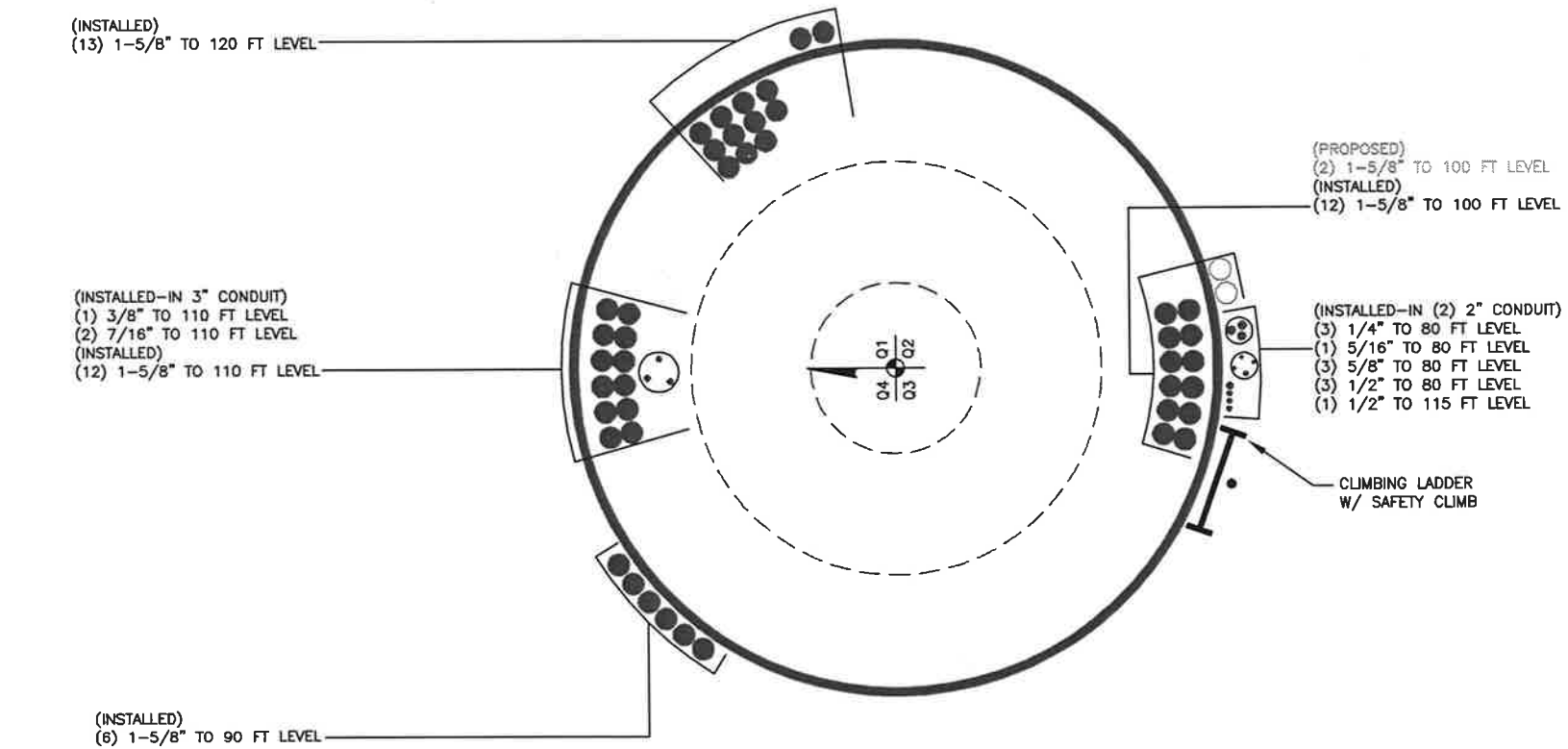
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	119.083 - 101.083 (1)	0.005	0.175	0.000	0.016	0.001	0.180	1.000	4.8.2
L2	101.083 - 66.5 (2)	0.007	0.481	0.000	0.019	0.001	0.488	1.000	4.8.2
L3	66.5 - 32.8333 (3)	0.007	0.540	0.000	0.015	0.001	0.547	1.000	4.8.2
L4	32.8333 - 0 (4)	0.009	0.643	0.000	0.014	0.001	0.652	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	119.083 - 101.083	Pole	TP26x22.13x0.25	1	-6858.42	1479480.00	18.0	Pass
L2	101.083 - 66.5	Pole	TP34.063x24.873x0.313	2	-16677.60	2387960.00	48.8	Pass
L3	66.5 - 32.8333	Pole	TP41.75x32.498x0.375	3	-25092.00	3492730.00	54.7	Pass
L4	32.8333 - 0	Pole	TP49.063x39.849x0.375	4	-36663.20	3984000.00	65.2	Pass
							Summary	
						Pole (L4)	65.2	Pass
						Rating =	**65.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 829013 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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#: *829013*
Site Name: *West Hartford/I-84/X43*
App #: *300644 Rev. 1*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	33	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	105	ksi
Bolt Circle:	54	in

Plate Data		
Diam:	58	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	4.74	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.25	in
Width:	4	in
Height:	12	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	49.0625	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	15	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	2564.30	ft-kips
Axial, Pu:	36.68	kips
Shear, Vu:	28.12	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ń):	71.9 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	96.9 Kips	φ*Tn
Anchor Rod Stress Ratio:	74.2%	

Base Plate Results Flexural Check

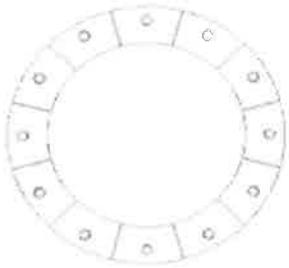
		Stiffened
Base Plate Stress:	24.0 ksi	AISC LRFD
Allowable Plate Stress:	45.0 ksi	φ*Fy
Base Plate Stress Ratio:	53.2%	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	60.2%
Vertical Weld:	40.1%
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	16.0%
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	59.3%
Plate Comp. (AISC Bracket):	58.9%

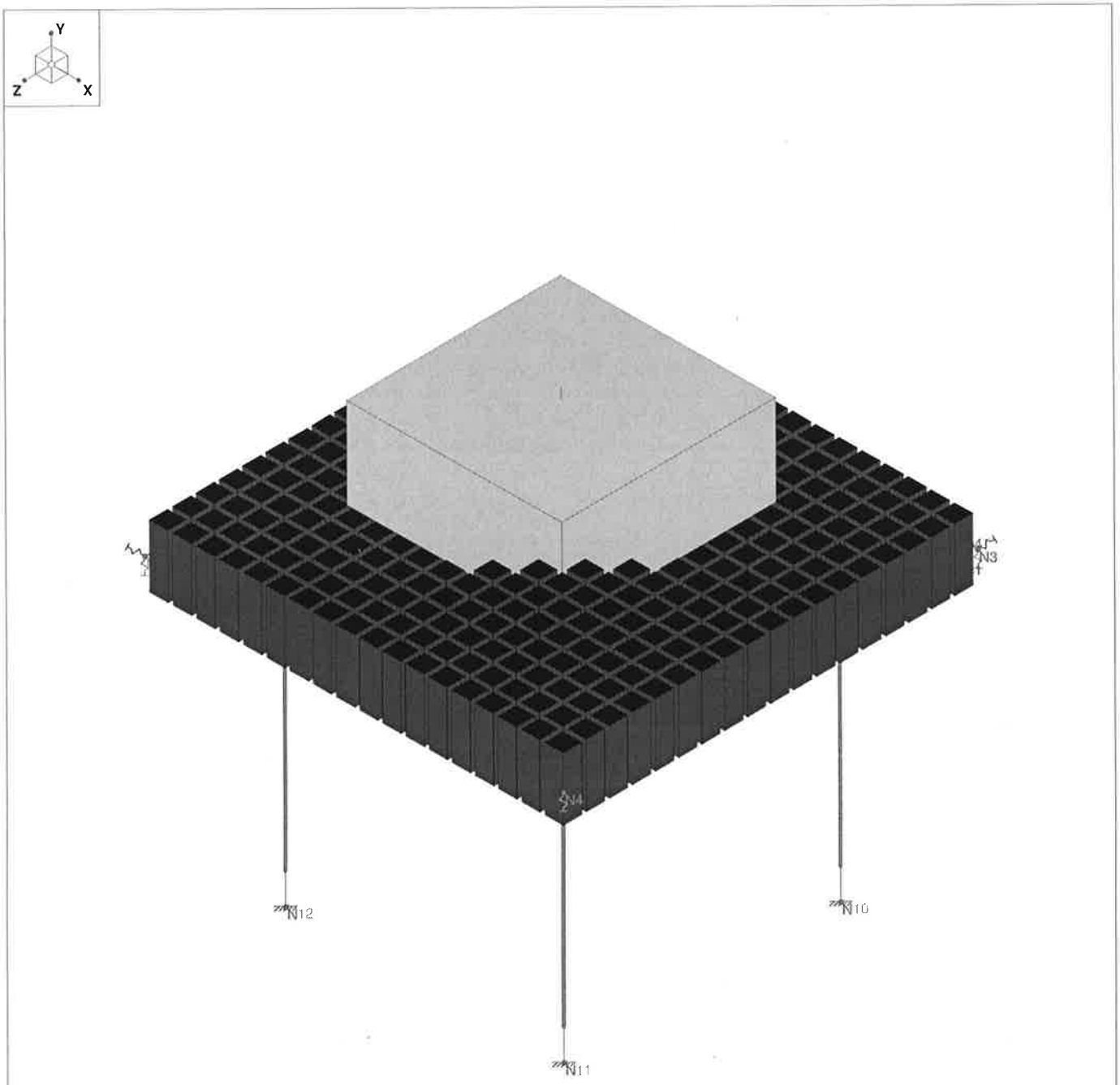
Pole Results

Pole Punching Shear Check:	8.0%



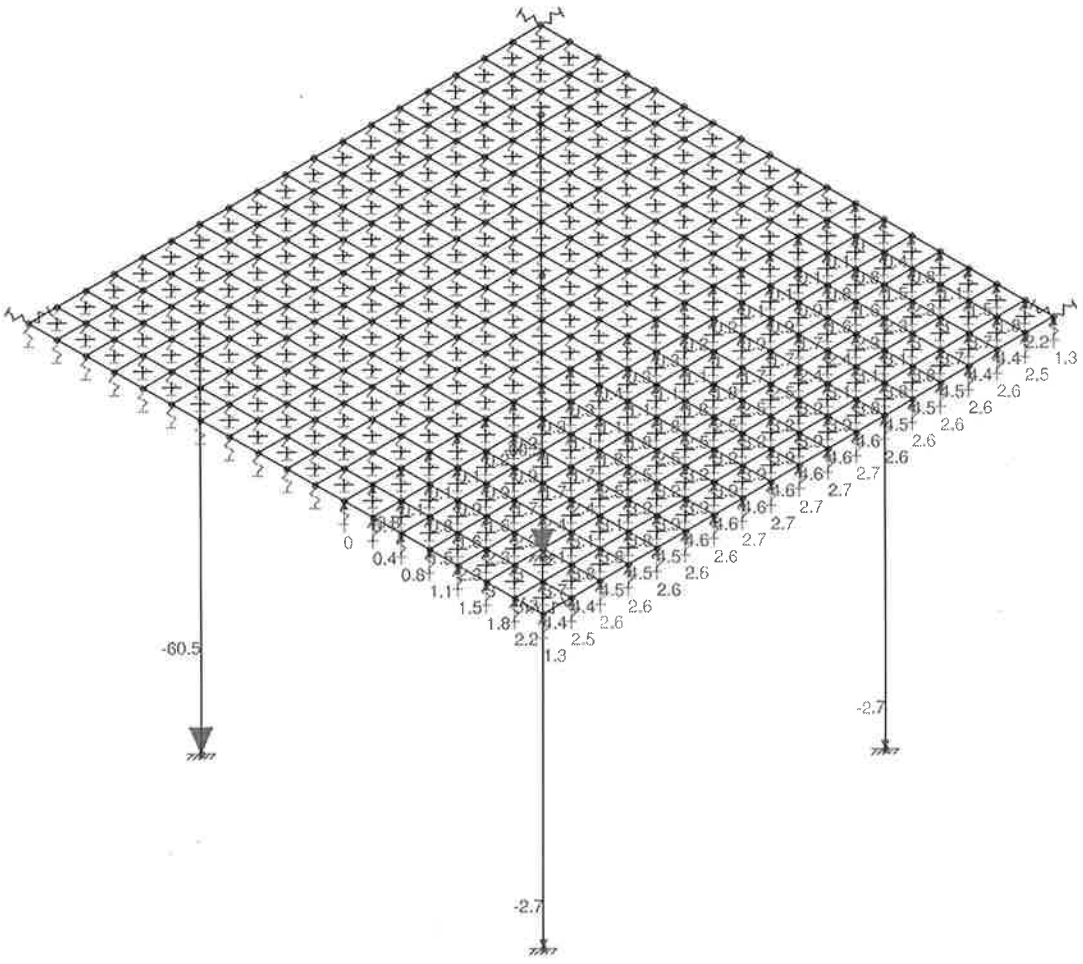
* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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



Envelope Only Solution

Crown Castle	West Hartford/I-84/X43 (BU 829013)	SK - 1
RWT		May 16, 2017 at 1:04 PM
TEP No. 25680.119332		829013.02S_Foundation.r3d



Y-direction Reaction Units are k and k-ft

Crown Castle	West Hartford/I-84/X43 (BU 829013)	SK - 2
RWT		May 16, 2017 at 1:05 PM
TEP No. 25680.119332		829013.02S_Foundation.r3d

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[lb/f...	f'c[ksi]	Lambda	Flex Steel[...	Shear Stee...
1	Conc3000NW	3156	1372	.15	.6	145	3	1	60	60
2	Conc3500NW	3409	1482	.15	.6	145	3.5	1	60	60
3	Conc4000NW	3644	1584	.15	.6	145	4	1	60	60
4	Conc3000LW	2085	907	.15	.6	109.999	3	.75	60	60
5	Conc3500LW	2252	979	.15	.6	109.999	3.5	.75	60	60
6	Conc4000LW	2408	1047	.15	.6	109.999	4	.75	60	60

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N8	N12			1" WF Rock	Column	None	A722	Typical
2	M2	N7	N11			1" WF Rock	Column	None	A722	Typical
3	M3	N6	N10			1" WF Rock	Column	None	A722	Typical
4	M4	N5	N9			1" WF Rock	Column	None	A722	Typical
5	M5	TL1	N367			CRECT102X1...	Column	Rectangular	Conc3000...	Typical
6	M6	N367	TOWER			6' rigid offset	Column	None	RIGID	Typical

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	Y	-30.6

Joint Loads and Enforced Displacements (BLC 2 : Wind 0)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	X	17.6
2	TL1	L	Mz	-1602.7

Joint Loads and Enforced Displacements (BLC 3 : Wind 90)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	Z	17.6
2	TL1	L	Mx	1602.7

Joint Loads and Enforced Displacements (BLC 4 : Wind 45)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	X	12.4
2	TL1	L	Mz	-1133.3
3	TL1	L	Z	12.4
4	TL1	L	Mx	1133.3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	DL		-1		1				260
2	Wind 0	WL				2				
3	Wind 90	WL				2				
4	Wind 45	WL				4				
5	Prestress	None						4		

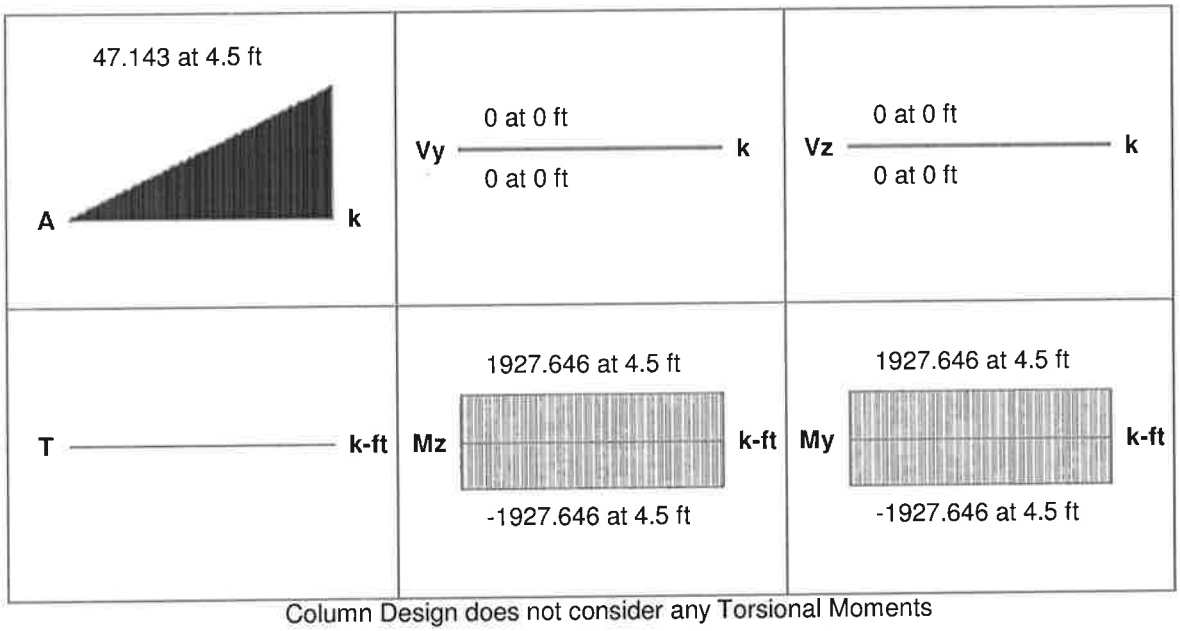
Load Combinations

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.2D+1.6...	Yes	Y		1	1.2	2	1.6	5	1																
2	1.2D+1.6...	Yes	Y		1	1.2	3	1.6	5	1																
3	1.2D+1.6...	Yes	Y		1	1.2	4	1.6	5	1																
4	0.9D+1.6...	Yes	Y		1	.9	2	1.6	5	1																
5	0.9D+1.6...	Yes	Y		1	.9	3	1.6	5	1																
6	0.9D+1.6...	Yes	Y		1	.9	4	1.6	5	1																
7	Prestress	Yes	Y		5	1																				

Column: ***M5***

Shape:	**CRECT102X102**	Concrete Stress Block:	**Rectangular**
Material:	**Conc3000NW**	Cracked Sections Used:	**Yes**
Length:	**4.5 ft**	Cracked 'I' Factor:	**.70**
I Joint:	**TL1**	Effective 'I':	**6.31419e+6 in^4**
J Joint:	**N367**	Biaxial Bending Solution:	**PCA Load Contour**

Code Check: **0.496 (LC 1)**
Report Based On 97 Sections



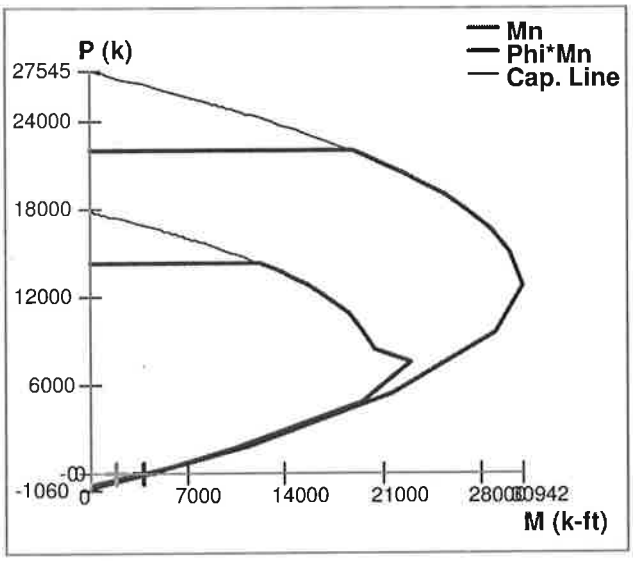
Column Design does not consider any Torsional Moments

Warning: Exact Integration selected but PCA method used
Custom rebar layout does not meet min steel (As,min) per Global Parameters

ACI 318-11 Code Check

		Bending Check	**0.496**	Shear Check	**0.000 (y)**
Gov LC	**7**	Location	**4.5 ft**	Location	**0 ft**
Gov Pu	**0 k**	Gov Muy	**1927.646 k-ft**	Gov Vuy	**0 k**
phi*Pn		Gov Muz	**0 k-ft**	Gov Vuz	**0 k**
Phi eff.	**.9**	phi*Mnoy	**-.9 k-ft**	phi*Vny	**1111.305 k**
		phi*Mnoz		phi*Vnz	**1111.305 k**
Tension Bar Fy	**60 ksi**	Concrete Weight	**145 lb/ft^3**		
Shear Bar Fy	**60 ksi**	λ	**1**	Sway yy	**No**
F'c	**3 ksi**	E_Concrete	**3156 ksi**	Sway zz	**No**
Flex. Rebar Set	**ASTM A615**	Shear Rebar Set	**ASTM A615**	Thres. Torsion	**917.543k-ft(LC:1)**
Flex. Bars	**9 #6 , 9 #6 , 11 #6 , 11 #6**				
Shear Bars	**#4 @6in**				

Column Interaction Diagram



Span Information

Span	Span Length (ft)	I-Face Dist. (in)	J-Face Dist. (in)
1	0 - 4.5	0	0

Column Steel

Span	Main Bars	UC Max	Gov LC	Loc (ft)	Pu (k)	Muy (k-ft)	Muz (k-ft)
1	40 #6	0.496	7	4.5 ft	0	1927.646	0

Axial Span Results

Span	Phi_eff	Pn (k)	Po (k)	Rho Gross	As Prvd (in^2)
1	.9		27545.425	.0017	17.671

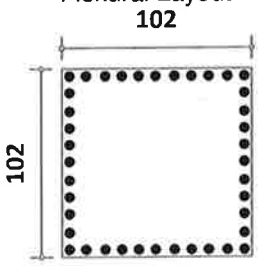
Bending Span Results

Span	ecc. y (ft)	ecc. z (ft)	NA y-y (ft)	NA z-z (ft)	Mny (k-ft)	Mnz (k-ft)	Mnoy (k-ft)	Mnoz (k-ft)
1	0	0		3.949	4319.59			

Rebar Detailing

Span	Region(ft)	Shear Steel
1	4.5 - 0 -	9 #4 @6in

Flexural Layout



Total No. of Bars - Top : 4.5 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Total No. of Bars - Middle : 2.25 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Total No. of Bars - Bottom : 0 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Monopole on Mat Foundation with Rock Anchors - TIA-222-G

Site Data

Site Name:	West Hartford/I-84/X43
CCI Number:	BU 829013
TEP Job Number:	25680.119332

Factored Reactions from TNX		
Axial	36.681	k
Shear	28.123	k
Moment	2564.296	k-ft

Mat and Pier Properties		
Mat Width	16.5	ft
Mat Length	16.5	ft
Mat Thickness	2.5	ft
Pier Type	Square	
Pier Width/Diam.	8.5	ft
Pier Height	4.5	ft

Soil Properties		
q_{allow}	10.8	ksf
FS	2.0	
Subgrade Mod.	390	kcf
Rock Weight	160	pcf
Rock Cone Angle	30	deg

Rock Anchor Properties		
Type of Bar	WilliamsForm150	
Bar Size	1.00	in
Net Area	0.85	in^2
Ultimate Stress, Fu	150.0	ksi
Yield Stress, Fy	120.0	ksi
Bar Diameter	1.000	in
Steel/Grout Bond[1]	190	psi
Grout/Rock Allow Bond	50	psi
FS	2	
Drilled Shaft Diam.	3.75	in

[1] Ultimate Bond Values

Mat Foundation Results

Bearing Stress	10.9	ksf
Bearing Capacity, ϕq_{allow}	16.3	ksf
% Capacity	67.0%	Pass

Mat and Pier Structural Results

Bending Moment	711.3	kft
Flexural Capacity, ϕMn	1151.3	kft
% Capacity	61.8%	Pass

Rock Anchor Steel Results

Max Tension Force	69.71	k
Anchor Capacity, ϕPn	91.8	k
% Capacity	75.9%	Pass

Rock Anchor Pullout Results

Req. Bond Length, ld	13.0	ft
Req. Cone Height, h	12.2	ft
Total Req. Embedment	20.8	ft
Pullout Capacity, phiTn	92.3	k
% Capacity	75.5%	Pass

Drilled Caisson Tool - Pier

	PASS	PASS
Results Summary:	LC1	LC2
Soil Interaction:	N/A	N/A
Foundation Structural:	30.1%	6.3%

West Hartford/I-84/X43 (BU 829013)

TEP #:	25680.119332	
Analysis:	RWT	5/16/2017
Check:	RLM	5/16/2017

Code Revisions: TIA-222-G ACI 318-11

Tower Type: Monopole

	LC1	LC2	
Moment:	763.21	164.80	kip-ft
Axial (download):	36.68	82.92	kip
Shear:	28.12	6.14	kip
Axial (uplift):			kip

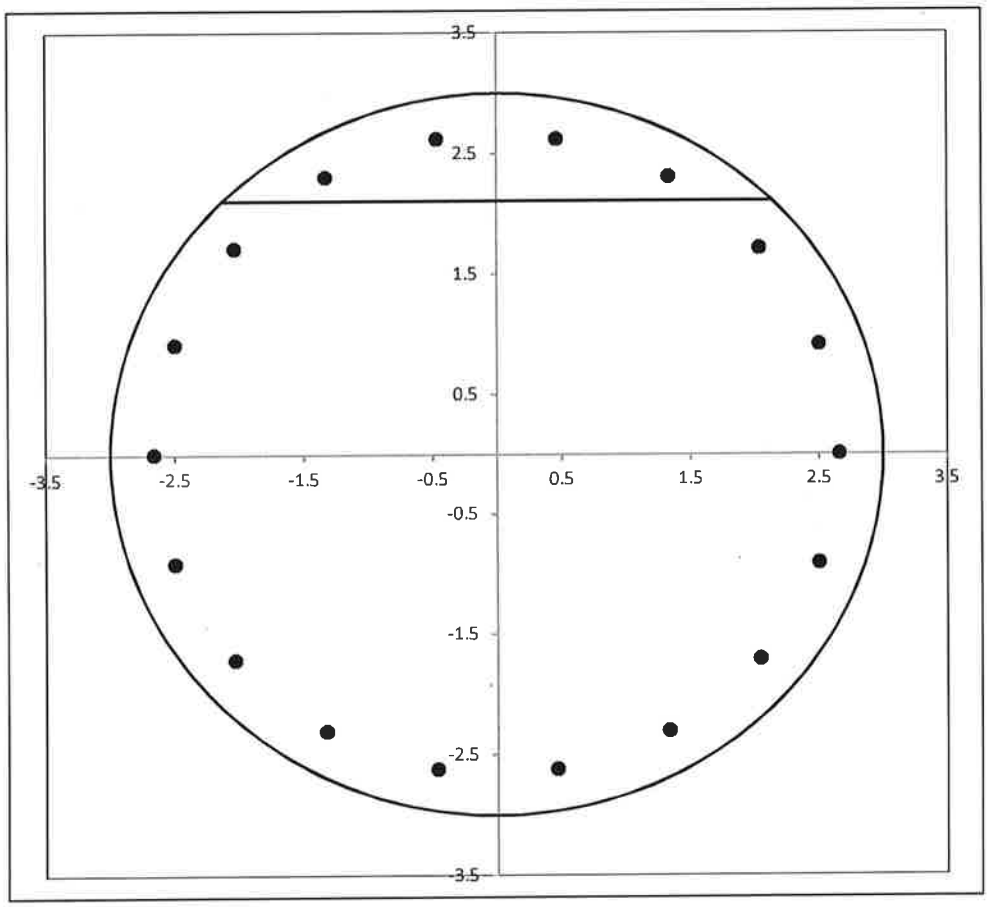
Shaft Information

Diameter:	6.00	ft
Projection:	0.50	ft
Caisson Length:	4.50	ft
f'c:	3.000	ksi
Max εc:	0.003	in/in

Cage 1 Reinforcement

Tie Bar Size:	4	*(fy = 60.0 ksi)*
Clear Cover to Tie:	3.00	*in (Cage Ø = 63.87in)*
Tie Bar Spacing:	6.00	in
Vertical Bar Size:	9	
Vertical Bar Quantity:	18	*(ρ =0.442%)*
fy:	60.0	ksi
E:	29,000	ksi

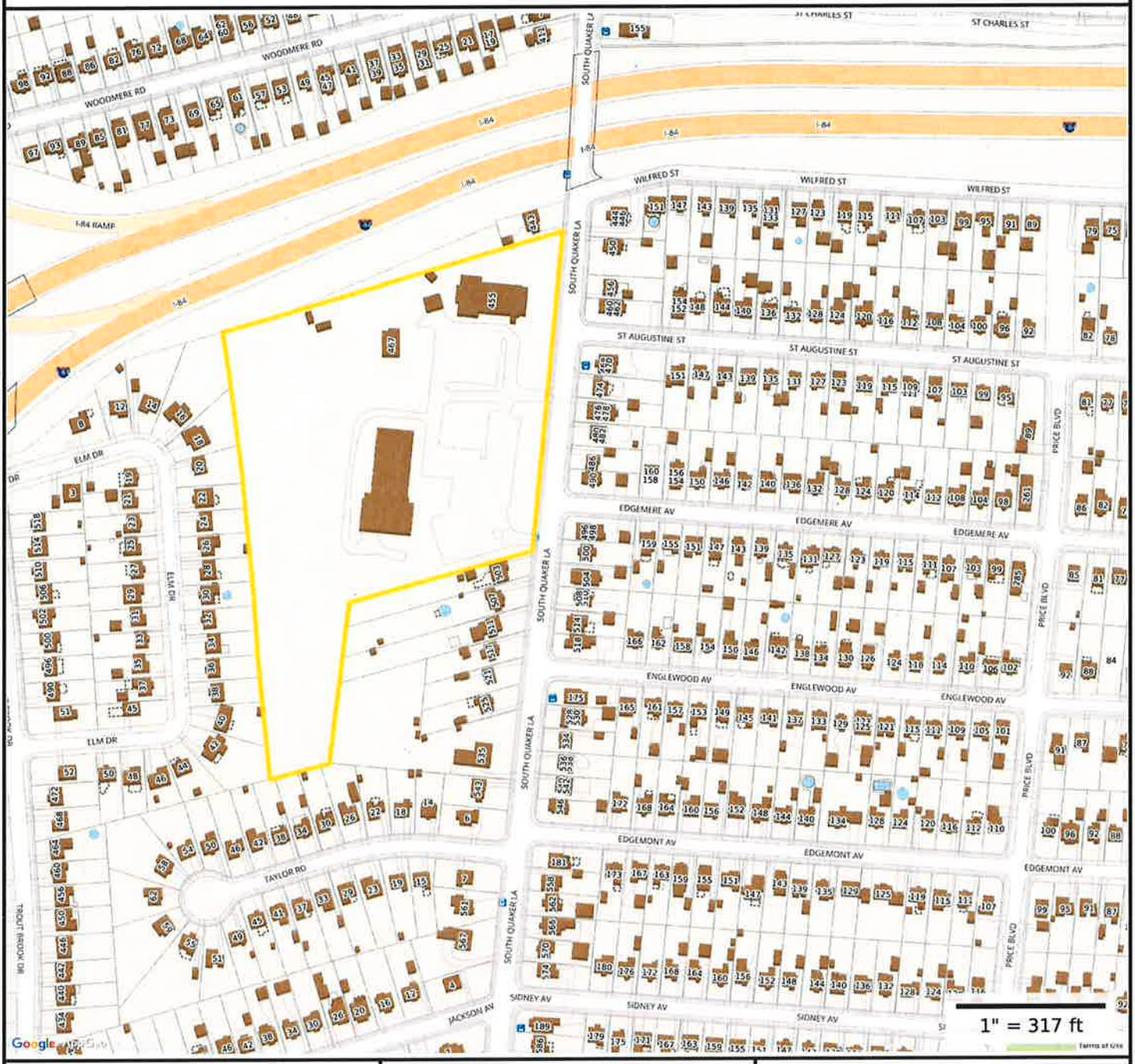
Reinforcement Capacity



		LC1	LC2	
	Vu =	28.1	6.1	kip
	Vc =	448.0	450.6	kip
fy,tie = 60.0	Vs =	269.8	269.8	kip
	ϕVn =	538.4	540.3	kip
	Capacity =	5.2%	1.1%	
		PASS	PASS	

		LC1	LC2	
	Mu =	763.2	164.8	kip-ft
	ϕMn =	2535.7	2636.8	kip-ft
	Capacity =	30.1%	6.3%	
		PASS	PASS	

ATTACHMENT 4



Property Information

Property ID	5096 1 471 0001
Location	471 SOUTH QUAKER LANE
Owner	CHURCH OF ST MARK THE EVANGELIST CORP

TOWN OF WEST HARTFORD

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of West Hartford, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 5/1/2016
Properties updated Daily

471 SOUTH QUAKER LANE

Location	471 SOUTH QUAKER LANE	**Mblu**	G11/ 5096/ 471/ /
Parcel ID	5096 1 471 0001	**Owner**	CHURCH OF ST MARK THE EVANGELIST CORP
Assessment	$4,434,850	**Appraisal**	$6,335,500
Vision Id #	18998	**Building Count**	3

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$4,499,800	$1,835,700	$6,335,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$3,149,860	$1,284,990	$4,434,850

Owner of Record

Owner	CHURCH OF ST MARK THE EVANGELIST CORP	**Sale Price**	$0
Co-Owner		**Certificate**	1
Address	455 QUAKER LANE SOUTH WEST HARTFORD, CT 06110	**Book & Page**	215/ 42
		Sale Date	
		Instrument	U

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
CHURCH OF ST MARK THE EVANGELIST CORP	$0	1	215/ 42	U	

Building Information

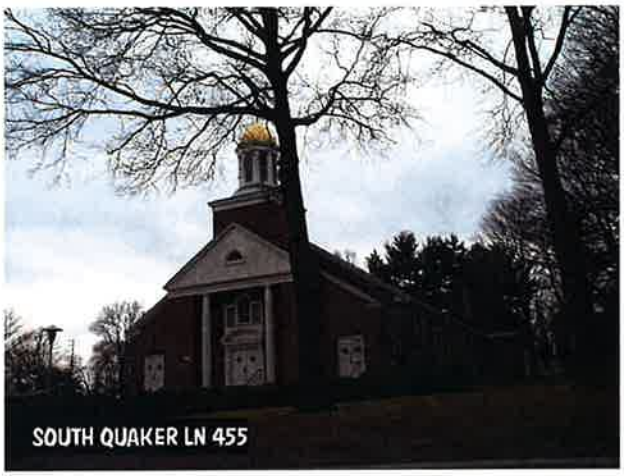
Building 1 : Section 1

Year Built:	1945
Living Area:	3,580
Replacement Cost:	$592,451
Building Percent Good:	55
Replacement Cost Less Depreciation:	$325,800

Building Attributes

Field	Description
Style	Colonial
Model	Residential
Stories	2.0
Occupancy	1
Exterior Wall 1	Brick
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Typical
Interior Wall 2	
Interior Flr 1	Typical
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Forced Air
AC Type:	Yes
# of Bedrooms	3
Full Bthrms:	4
Half Baths:	0
Extra Fixtures	0
Total Rooms:	12
Bath Style:	Typical
Kitchen Style:	Typical
Extra Kitchens	
Fireplaces	1
Prefab Fpl(s)	
Bsmt Egress	
Foundation	Conc Per Piers
Bsmt Garage(s)	None
Fin Bsmt/RRm	
Bsmt Rec Rm	
FBLA	
Attic Access	03
Dormer LF	

Building Photo



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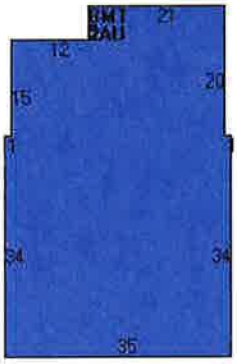
Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
2AU	2 STORY U UNFIN ATT	1,790	3,580
BMT	BSMT UNFIN RES	1,790	0
		3,580	3,580

Building 2 : Section 1

Year Built:	1945
Living Area:	18,254
Replacement Cost:	$4,041,758
Building Percent Good:	56

Replacement Cost Less Depreciation: $2,263,400

Building Attributes : Bldg 2 of 3	
Field	**Description**
STYLE	Church
MODEL	Comm/Ind
Grade	B 0.90
Stories:	2
Occupancy	
Exterior Wall 1	Precast Panel
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Comp - Shingle
Interior Wall 1	Typical
Interior Wall 2	
Floor Type	Wood
Floor Cover	Carpet
Heating Fuel	Typical
Heating Type	Steam Boiler
AC Type	Central - Zone
As Built Use	CHUR
Bldg Use	Exempt Commercial
# of Bedrooms	
Total Baths	
Type	01
Wet Sprinkler	
Dry Sprinkler	
1st Floor Use:	
Class	Class B
Frame Type	Rigid Steel
Plumbing	LIGHT
Ceiling	Drywall
Group	CTA
Wall Height	17
Adjustment	

Building Photo

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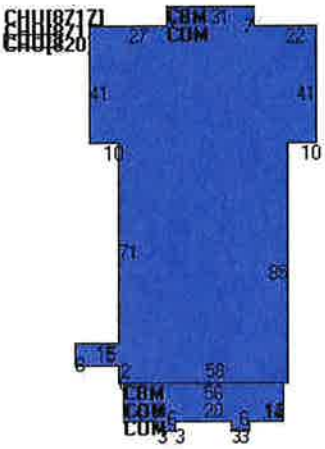
Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
CHU	CHURCH	18,254	18,254
CBM	BSMT COMM - NV	9,537	0
COM	COMMERCIAL - NV	10,357	0
		38,148	18,254

Building 3 : Section 1

Year Built: 1970
Living Area: 16,556
Replacement Cost: $2,952,864
Building Percent Good: 64

Replacement Cost
Less Depreciation: $1,889,800

Building Attributes : Bldg 3 of 3	
Field	**Description**
STYLE	Classroom
MODEL	Comm/Ind
Grade	C 1.10
Stories:	1
Occupancy	
Exterior Wall 1	Precast Panel
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Comp - Shingle
Interior Wall 1	Typical
Interior Wall 2	
Floor Type	Concrete Slab
Floor Cover	None
Heating Fuel	Typical
Heating Type	None
AC Type	None
As Built Use	RCLS
Bldg Use	Exempt Commercial
# of Bedrooms	
Total Baths	
Type	01
Wet Sprinkler	
Dry Sprinkler	
1st Floor Use:	
Class	Class C
Frame Type	Masonry
Plumbing	LIGHT
Ceiling	Not Applicable
Group	CTA
Wall Height	10
Adjustment	

Building Photo

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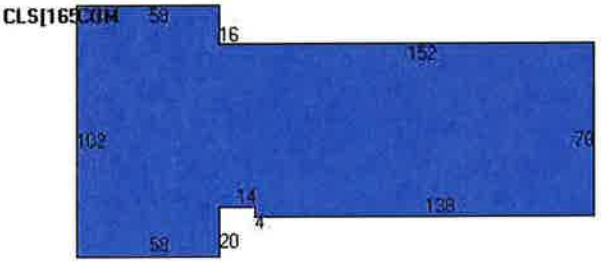
Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
CLS	CLASS ROOM BLDG	16,556	16,556
COM	COMMERCIAL - NV	16,500	0
		33,056	16,556

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
RP0	Stoop	30 sf	$0	1

Land

Land Use

Use Code	901
Description	Exempt Res
Zone	R-6
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	8.16
Frontage	
Depth	
Assessed Value	$1,284,990
Appraised Value	$1,835,700

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
CCP9	Canopy-wood			56 SF	$300	1
CRG4	Garage - 1.0 Story Det			918 SF	$14,700	1
CRG4	Garage - 1.0 Story Det			247 SF	$5,800	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$4,499,800	$1,835,700	$6,335,500
2015	$4,067,700	$1,835,700	$5,903,400
2014	$4,067,700	$1,835,700	$5,903,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$3,149,860	$1,284,990	$4,434,850
2015	$2,847,390	$1,284,990	$4,132,380
2014	$2,847,390	$1,284,990	$4,132,380