Robinson+Cole

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August 22, 2018

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

Re: **Notice of Exempt Modification – Facility Modification**
890 Evergreen Avenue, Hamden, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 95-foot level of an existing 100-foot tower disguised as an agricultural silo at 890 Evergreen Avenue in Hamden, Connecticut (the "Property"). The tower/silo is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this facility in 1995 (Docket No. 195). Cellco now intends to replace six (6) of its existing antennas with six (6) new antennas (three (3) model JAHH-65B-R3B, 700/2100 MHz antennas and three (3) model JAHH-65B-R3B, 1900 MHz antennas) all at the same level on the tower/silo. Cellco also intends to replace three (3) remote radio heads ("RRHs") and install six (6) new RRHs, and one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Hamden Mayor, Curt B. Leng; Daniel W. Kops, Jr., Hamden's Town Planner; the Connecticut Agricultural Experiment Station, the owner of the Property; and Crown, the tower/silo owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower/silo. Cellco's new antennas and RRHs will be attached to its existing antenna platform at the 95-foot level and will be concealed inside the silo structure.

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 installation of Cellco's replacement antennas and new RRHs will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included 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/silo 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. A Certificate of Mailing verifying that this filing was sent to municipal officials and the owner of the Property is included in Attachment 5.

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Curt B. Leng, Mayor
Daniel W. Kops, Jr., Town Planner
Connecticut Agricultural Experiment Station
Crown Castle
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

JAHH-65B-R3B

8-port sector antenna, 2x 698–787, 2x 824-894 and 4x 1695–2360 MHz, 65° HPBW, 3x RET and low bands have diplexers. Internal SBT's on first LB(Port 1) and first HB (Port 5).

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band

Electrical Specifications

Frequency Band, MHz	698–787	824–894	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.5	15.8	18.0	18.4	18.5	18.8
Beamwidth, Horizontal, degrees	67	65	63	63	65	68
Beamwidth, Vertical, degrees	12.4	10.5	5.7	5.2	4.9	4.4
Beam Tilt, degrees	2–14	2–14	0–10	0–10	0–10	0–10
USLS (First Lobe), dB	18	18	20	20	21	23
Front-to-Back Ratio at 180°, dB	32	34	31	35	36	38
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	200	200	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–787	824–894	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.3	14.9	17.6	18.1	18.2	18.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.5	±0.6	±0.4	±0.5	±0.6
Gain by Beam Tilt, average, dBi	2 ° | 14.3	2 ° | 15.0	0 ° | 17.2	0 ° | 17.6	0 ° | 17.7	0 ° | 17.9
	8 ° | 14.3	8 ° | 14.9	5 ° | 17.6	5 ° | 18.2	5 ° | 18.3	5 ° | 18.7
	14 ° | 14.3	14 ° | 15.4	10 ° | 17.6	10 ° | 18.2	10 ° | 18.3	10 ° | 18.7
Beamwidth, Horizontal Tolerance, degrees	±1.2	±1.4	±4	±2.4	±2.9	±2.7
Beamwidth, Vertical Tolerance, degrees	±0.9	±0.5	±0.3	±0.2	±0.3	±0.1
USLS, beampeak to 20° above beampeak, dB	18	17	17	18	19	18
Front-to-Back Total Power at 180° ± 30°, dB	25	24	26	29	27	29
CPR at Boresight, dB	22	23	20	21	21	24
CPR at Sector, dB	11	12	11	11	11	8

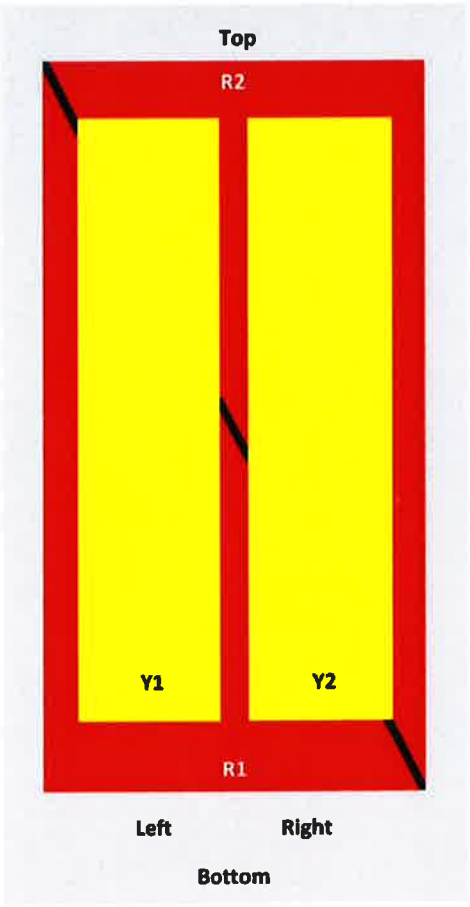
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Product Specifications

JAHH-65B-R3B

Array Layout

JAHH-65A-R3B JAHH-65B-R3B JAHH-65C-R3B



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

View from the front of the antenna

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

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 787 MHz | 824 – 894 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage

Mechanical Specifications

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

Product Specifications

JAHH-65B-R3B

Color	Light gray
Grounding Type	RF connector body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	301.0 N @ 150 km/h 67.7 lbf @ 150 km/h
Wind Loading, lateral	254.0 N @ 150 km/h 57.1 lbf @ 150 km/h
Wind Loading, maximum	638.0 N @ 150 km/h 143.4 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

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

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

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

Regulatory Compliance/Certifications

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

Product Specifications

JAHH-65B-R3B

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.

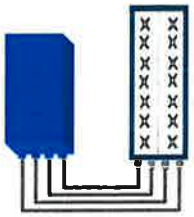
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

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
Size (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.

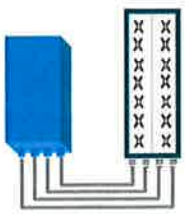
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

ALCATEL-LUCENT B66A RRH4X45

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

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

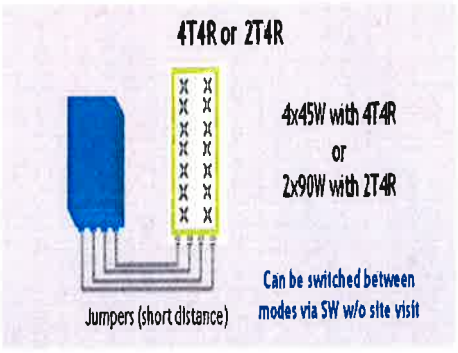
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

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

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

FEATURES

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



BENEFITS

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

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

Alcatel·Lucent

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)

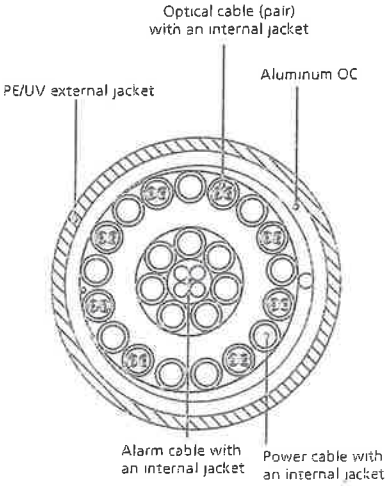


Figure 2: Construction Detail

This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Hamden North								
Tower Height: 100Ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T	1	500	85	880	0.0288	0.5867	0.49%	
*AT&T	2	500	85	1900	0.0576	1.0000	0.58%	
*AT&T	2	500	85	880	0.0576	0.5867	0.98%	
*AT&T	4	427	85	1900	0.0984	1.0000	0.98%	
*AT&T	1	500	85	740	0.0288	0.4933	0.58%	
*MetroPCS CDMA	3	727	65	2135	0.2253	1.0000	2.25%	
*MetroPCS LTE	1	1200	65	2130	0.1240	1.0000	1.24%	
*Clearwire	2	153	73	2130	0.0245	1.0000	0.25%	
*Clearwire	1	211	76	11 GHz	0.0155	1.0000	0.15%	
*Sprint	9	100	75	851	0.0680	0.5673	1.20%	
*Sprint	11	411	75	1962.5	0.3415	1.0000	3.41%	
*Sprint	3	562	75	2657	0.1274	1.0000	1.27%	
*T-Mobile	2	1229	104	2100	0.0920	1.0000	0.92%	
*T-Mobile	1	312	104	700	0.0117	0.4667	0.25%	
*T-Mobile	2	650	104	1900	0.0487	1.0000	0.49%	
*T-Mobile	2	644	104	2100	0.0483	1.0000	0.48%	
VZW PCS	**1**	**2254**	**95**	**0.0898**	**1970**	**1.0000**	**8.98%**	
VZW Cellular	**3**	**235**	**95**	**0.0281**	**876**	**0.5840**	**4.81%**	
VZW Cellular	**0**	**0**	**95**	**0.0000**	**869**	**0.5793**	**0.00%**	
VZW AWS	**1**	**3304**	**95**	**0.1316**	**2145**	**1.0000**	**13.16%**	
VZW 700	**1**	**945**	**95**	**0.0376**	**746**	**0.4973**	**7.57%**	
								50.06%
* Source: Siting Council								

ATTACHMENT 3

Date: **August 18, 2016**

GPD Engineering and Architecture
Professional Corporation
520 South Main Street Suite 2531
Akron, Ohio 44311
(216) 927-8663
dpalkovic@gpdgroup.com

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6607

Subject:	**Structural Analysis Report**	
Carrier Designation:	**Verizon Co-Locate**	
	Carrier Site Number:	469224
	Carrier Site Name:	Hamden North CT
Crown Castle Designation:	**Crown Castle BU Number:**	800529
	Crown Castle Site Name:	CT HAMDEN NORTH CAC
	Crown Castle JDE Job Number:	472574
	Crown Castle Work Order Number:	1507905
	Crown Castle Application Number:	416672 Rev. 2
Engineering Firm Designation:	**GPD Project Number:**	2018777.800529.06
Site Data:	**890 EVERGREEN AVENUE, Hamden, New Haven County, CT** **Latitude *41° 24' 23.9"*, Longitude *-72° 54' 16.32"*** **100 Foot - Self Support Tower**	

Dear Charles McGuirt,

GPD 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 1125105, in accordance with application 416672, Revision 2.

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor, Kzt, of 1 and Risk Category II were used in this analysis.

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

Respectfully submitted by:

Christopher J. Scheks
Connecticut # 0030026

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED
PROFESSIONAL ENGINEER

8/21/2018

TABLE OF CONTENTS

1) INTRODUCTION

The existing 100 ft self support tower has seven major sections with no taper and X bracing. The top 40' consists of 4 bays and a 4'10" face width, and the lower 60' consists of 3 bays and a 9'6-5/8" face width. The structure is galvanized.

This tower is a 100 ft Self Support tower designed by STEALTH NETWORK TECHNOLOGIES INC. in December of 2000. The tower was originally designed for a wind speed of 110 mph per ASCE 7-95.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor, Kzt, of 1 and Risk Category II were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
95.0	95.0	6	Commscope	JAHH-65B-R3B	1	1-1/4	
		3	Alcatel Lucent	AWS-3 RRH4X45			
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2X60-700			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			

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
100.0	104.0	3	Andrew	SBNHH-1D65A	18 1	1-5/8 1/2	
		1	Decibel	DB806-XC			
		6	Commscope	ATBT-Bottom-24V			
		3	RFS/Celwave	ATMAA1412D-1A20			
95.0	95.0	3	Alcatel Lucent	RRH2X40-AWS			1
		2	Antel	BXA-171063-12BF			
		1	Antel	BXA-171063-12CF-EDIN-2			
		6	RFS Celwave	FD9R6004/2C-3L			
		3	Rymsa Wireless	MG D3-800TV			
		3	Antel	BXA-80080/4CF	1 12	1-1/4 1-5/8	
		3	Amphenol	BXA-70063-6CF-EDIN-X			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
85.0	85.0	3	CCI	HPA-33R-BUU-H6			2
		3	Ericsson	RRUS 32 B2			
		6	CCI	DTMABP7819VG12A	12	7/8	

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	Ericsson	RRUS-11	2	3/4	
		3	Kathrein	800 10121	1	3/8	
		6	Kathrein	860 10025	2	2	
		3	KMW	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			
75.0	75.0	2	CSA Wireless	A-18A24N-U	11	1-1/4	
		10	Decibel	DB844H90E-XY			
65.0	65.0	3	Kathrein	742 213	6	1-5/8	

Notes:
1) Existing equipment to be removed prior to the installation of the proposed equipment listed in Table 1.
2) Reserved Equipment

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)
95.0	95.0	12	Allgon	7129.16.33		
85.0	85.0	12	Allgon	7120.16		
75.0	75.0	12	Decibel	844H90EXY		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	GPD Project #: 2016777.800529.04, dated 8/10/2016	6400183	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Stealth Job #: 00-065, dated 12/5/2000	671923	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Stealth Job #: 00-065, dated 12/5/2000	605026	CCISITES
4-TOWER STRUCTURAL ANALYSIS LETTER	GPD Project #: 2016777.800529.03, dated 6/17/2016	6316916	CCISITES
4-TOWER STRUCTURAL ANALYSIS	GPD Project #: 2016777.800529.05, dated 8/18/2016	6412453	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.7.0) and RISA 3D (Version 16.0.0), commercially available analysis software packages, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD 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)	SF*P_allow (lb)	% Capacity	Pass / Fail
L1	100 - 90	Leg	HSS6x6x1/4	M1	7.42	181.658	2.6%	Pass
		Diagonal	2L2x2x3/16x1/2	M10	4.851	29.85	16.3%	Pass
		Top Girt	C6x10.5	M5	1.759	59.887	1.3%	Pass
L2	90 - 80	Leg	HSS6x6x1/4	M18	17.324	181.658	8.3%	Pass
		Diagonal	2L2x2x3/16x1/2	M29	7.591	29.85	22.5%	Pass
		Top Girt	C6x10.5	M21	2.031	59.887	4.9%	Pass
L3	80 - 70	Leg	HSS6x6x1/4	M34	36.403	181.658	17.4%	Pass
		Diagonal	2L2x2x3/16x1/2	M43	11.331	29.85	33.4%	Pass
		Top Girt	C6x10.5	M38	3.628	59.887	5.7%	Pass
L4	70 - 60	Leg	HSS6x6x1/4	M50	68.277	181.658	34.9%	Pass
		Diagonal	2L2x2x3/16x1/2	M61	14.922	29.85	46.3%	Pass
		Top Girt	C6x10.5	M54	4.726	59.887	6.3%	Pass
T1	60 - 40	Leg	HSS8x8x1/4	M66	49.68	199.192	22.3%	Pass
		Diagonal	2L4x4x3/8x1/2	M74	28.474	112.46	23.0%	Pass
		Top Girt	W16x45	M69	10.748	426.018	66.9%	Pass
T2	40 - 20	Leg	HSS8x8x1/4	M82	87.504	199.192	39.4%	Pass
		Diagonal	2L4x4x3/8x1/2	M90	42.032	112.46	33.7%	Pass
		Top Girt	W6x12	M86	22.909	59.891	27.2%	Pass
T3	20 - 0	Leg	HSS8x8x1/4	M98	127.654	199.192	56.3%	Pass
		Diagonal	2L4x4x3/8x1/2	M106	61.074	112.46	48.6%	Pass
		Top Girt	W6x12	M102	38.056	59.891	46.9%	Pass
							Summary	
						Leg (T3)	56.3%	Pass
						Diagonal (T3)	48.6%	Pass
						Top Girt (T1)	66.9%	Pass
						Bolt Checks	67.5%	Pass
						Rating =	67.5%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0.0	75.6	Pass
1	Base Foundation	0.0	8.7	Pass
1	Base Foundation Soil Interaction	0.0	58.3	Pass

Structure Rating (max from all components) =	75.6%

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

4.1) Recommendations

The existing tower and its foundation are sufficient for the proposed loading and do not require modifications.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

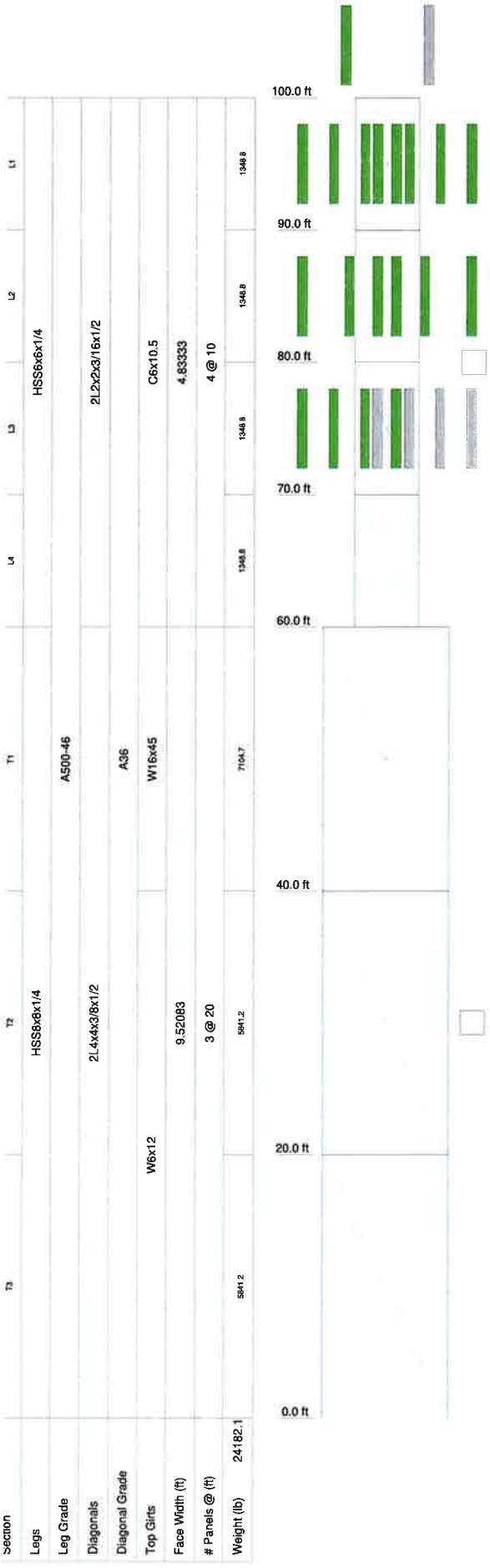
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

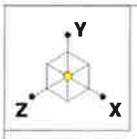
TYPE	ELEVATION	TYPE	ELEVATION
SBNHH-1D65A w/ Mount Pipe	100	800 10121 w/ Mount Pipe	85
DB806-XC	100	800 10121 w/ Mount Pipe	85
SBNHH-1D65A w/ Mount Pipe	100	AM-X-CD-16-65-00T-RET w/ Mount Pipe	85
SBNHH-1D65A w/ Mount Pipe	100		
(2) ATMAA1412D-1A20	100	AM-X-CD-16-65-00T-RET w/ Mount Pipe	85
(2) ATMAA1412D-1A20	100		
(2) ATMAA1412D-1A20	100	AM-X-CD-16-65-00T-RET w/ Mount Pipe	85
ATBT-BOTTOM-24V	100		
ATBT-BOTTOM-24V	100	HPA-33R-BUU-H6 w/ Mount Pipe	85
ATBT-BOTTOM-24V	100	HPA-33R-BUU-H6 w/ Mount Pipe	85
(2) JAHH-65B-R3B w/ Mount Pipe	95	HPA-33R-BUU-H6 w/ Mount Pipe	85
(2) JAHH-65B-R3B w/ Mount Pipe	95	(2) 860 10025	85
(2) JAHH-65B-R3B w/ Mount Pipe	95	(2) 860 10025	85
BXA-70063-6CF-EDIN-X w/ Mount Pipe	95	(2) 860 10025	85
		(2) DTMABP7819VG12A	85
BXA-70063-6CF-EDIN-X w/ Mount Pipe	95	(2) DTMABP7819VG12A	85
		(2) DTMABP7819VG12A	85
BXA-70063-6CF-EDIN-X w/ Mount Pipe	95	RRUS-11	85
		RRUS-11	85
AWS-3 RRH4X45	95	RRUS-11	85
AWS-3 RRH4X45	95	RRUS 32 B2	85
AWS-3 RRH4X45	95	RRUS 32 B2	85
BXA-80080/4CF w/Mount Pipe	95	RRUS 32 B2	85
BXA-80080/4CF w/Mount Pipe	95	DC6-48-60-18-8F Surge Suppression Unit	85
BXA-80080/4CF w/Mount Pipe	95		
RRH2x60-700	95	A-18A24N-U w/ mount pipe	75
RRH2x60-700	95	A-18A24N-U w/ mount pipe	75
RRH2x60-700	95	(3) DB844H90E-XY w/ Mount Pipe	75
RRH2X60-PCS	95	(4) DB844H90E-XY w/ Mount Pipe	75
RRH2X60-PCS	95	(3) DB844H90E-XY w/ Mount Pipe	75
RRH2X60-PCS	95	742 213 w/ Mount Pipe	65
DB-T1-6Z-8AB-0Z	95	742 213 w/ Mount Pipe	65
DB-T1-6Z-8AB-0Z	95	742 213 w/ Mount Pipe	65
800 10121 w/ Mount Pipe	85		

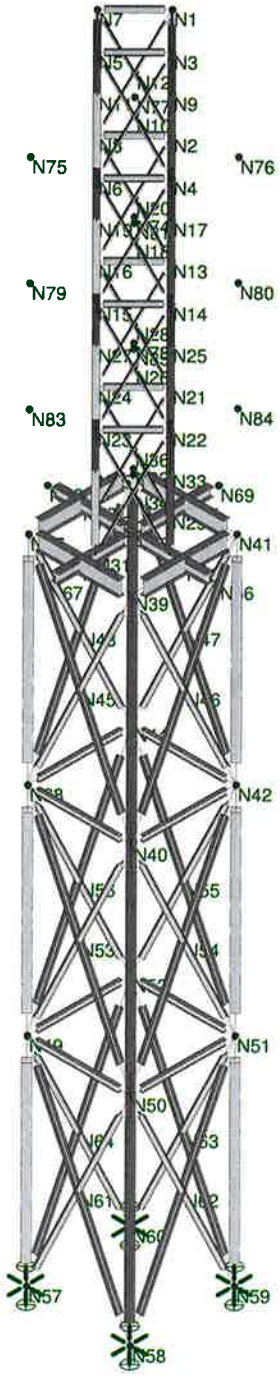
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2103

Job:	800529 CT HAMDEN NORTH CA		
Project:	2018777.800529.06		
Client:	Crown Castle	Drawn by: J. Stokes	App'd:
Code:	TIA-222-G	Date: 01/10/18	Scale: N
Path:	T:\Crown\800529\06\TNX\800529.eri		Dwg No.





GPD		SK - 1
J. Stokes	800529 CT HAMDEN NORTH CAC	Jan 10, 2018 at 4:12 PM
2018777.800529.06		800529.rt3

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
Feedline Ladder (Af)	B	No	CaAa (Out Of Face)	100.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	100.00 - 8.00	0.0000	0	18	No Ice	0.00	0.82
								1/2" Ice	0.00	2.33
								1" Ice	0.00	4.46
Feedline Ladder (Af)	A	No	CaAa (Out Of Face)	95.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	95.00 - 8.00	0.0000	0	12	No Ice	0.00	0.82
								1/2" Ice	0.00	2.33
								1" Ice	0.00	4.46
HB114-1-0813U4-M5F (1-1/4")	A	No	CaAa (Out Of Face)	95.00 - 8.00	0.0000	0	2	No Ice	0.00	1.20
								1/2" Ice	0.00	2.45
								1" Ice	0.00	4.30
Feedline Ladder (Af)	C	No	CaAa (Out Of Face)	85.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF5-50A (7/8 FOAM)	C	No	CaAa (Out Of Face)	85.00 - 8.00	0.0000	0	12	No Ice	0.00	0.33
								1/2" Ice	0.00	1.30
								1" Ice	0.00	2.88
3/4" DC Power Line	C	No	CaAa (Out Of Face)	85.00 - 8.00	0.0000	0	2	No Ice	0.00	0.33
								1/2" Ice	0.00	1.09
								1" Ice	0.00	2.47
3/8" Fiber Cable	C	No	CaAa (Out Of Face)	85.00 - 8.00	0.0000	0	1	No Ice	0.00	0.10
								1/2" Ice	0.00	0.63
								1" Ice	0.00	1.78
2" Flex Conduit	C	No	CaAa (Out Of Face)	85.00 - 8.00	0.0000	0	2	No Ice	0.00	0.32
								1/2" Ice	0.00	1.85
								1" Ice	0.00	3.98
Feedline Ladder (Af)	D	No	CaAa (Out Of Face)	75.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF6-50A (1-1/4 FOAM)	D	No	CaAa (Out Of Face)	75.00 - 8.00	0.0000	0	11	No Ice	0.00	0.66
								1/2" Ice	0.00	1.91
								1" Ice	0.00	3.78
Feedline Ladder (Af)	D	No	CaAa (Out Of Face)	65.00 - 8.00	0.0000	0.45	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF7-50A (1-5/8 FOAM)	D	No	CaAa (Out Of Face)	65.00 - 8.00	0.0000	0.45	6	No Ice	0.00	0.82
								1/2" Ice	0.00	2.33
								1" Ice	0.00	4.46
Climbing Ladder (CCI)	B	No	CaAa (Out Of Face)	100.00 - 0.00	0.0000	0.45	1	No Ice	0.00	4.81
								1/2" Ice	0.00	6.97
								1" Ice	0.00	9.48
Safety Line (3/8")	B	No	CaAa (Out Of Face)	100.00 - 0.00	0.0000	0.45	1	No Ice	0.00	0.22
								1/2" Ice	0.00	0.75
								1" Ice	0.00	1.28
LDF4P-50A (1/2 FOAM)	C	No	CaAa (Out Of Face)	100.00 - 8.00	0.0000	0.3	1	No Ice	0.00	0.15
								1/2" Ice	0.00	0.84
								1" Ice	0.00	2.14

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
SBNHH-1D65A w/ Mount Pipe	A	From Leg	1.00	0.00	0.0000	100.00	No Ice	0.00	0.00	61.30
							1/2"	0.00	0.00	115.03

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
			4.00			Ice	0.00	0.00	175.35
						1" Ice			
DB806-XC	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	21.00
			0.00			1/2"	0.00	0.00	29.93
			4.00			Ice	0.00	0.00	42.71
						1" Ice			
SBNHH-1D65A w/ Mount Pipe	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	61.30
			0.00			1/2"	0.00	0.00	115.03
			4.00			Ice	0.00	0.00	175.35
						1" Ice			
SBNHH-1D65A w/ Mount Pipe	D	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	61.30
			0.00			1/2"	0.00	0.00	115.03
			4.00			Ice	0.00	0.00	175.35
						1" Ice			
(2) ATMAA1412D-1A20	A	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	13.00
			0.00			1/2"	0.00	0.00	20.62
			4.00			Ice	0.00	0.00	30.11
						1" Ice			
(2) ATMAA1412D-1A20	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	13.00
			0.00			1/2"	0.00	0.00	20.62
			4.00			Ice	0.00	0.00	30.11
						1" Ice			
(2) ATMAA1412D-1A20	D	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	13.00
			0.00			1/2"	0.00	0.00	20.62
			4.00			Ice	0.00	0.00	30.11
						1" Ice			
ATBT-BOTTOM-24V	A	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	2.87
			0.00			1/2"	0.00	0.00	4.02
			4.00			Ice	0.00	0.00	5.94
						1" Ice			
ATBT-BOTTOM-24V	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	2.87
			0.00			1/2"	0.00	0.00	4.02
			4.00			Ice	0.00	0.00	5.94
						1" Ice			
ATBT-BOTTOM-24V	D	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	2.87
			0.00			1/2"	0.00	0.00	4.02
			4.00			Ice	0.00	0.00	5.94
						1" Ice			
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Centroid-Leg	4.00	0.0000	95.00	No Ice	0.00	0.00	86.15
			0.00			1/2"	0.00	0.00	162.72
			0.00			Ice	0.00	0.00	247.46
						1" Ice			
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Centroid-Leg	4.00	0.0000	95.00	No Ice	0.00	0.00	86.15
			0.00			1/2"	0.00	0.00	162.72
			0.00			Ice	0.00	0.00	247.46
						1" Ice			
(2) JAHH-65B-R3B w/ Mount Pipe	D	From Centroid-Leg	4.00	0.0000	95.00	No Ice	0.00	0.00	86.15
			0.00			1/2"	0.00	0.00	162.72
			0.00			Ice	0.00	0.00	247.46
						1" Ice			
BXA-70063-6CF-EDIN-X w/ Mount Pipe	A	From Centroid-Leg	4.00	0.0000	95.00	No Ice	0.00	0.00	42.25
			0.00			1/2"	0.00	0.00	103.01
			0.00			Ice	0.00	0.00	171.49
						1" Ice			
BXA-70063-6CF-EDIN-X w/ Mount Pipe	C	From Centroid-Leg	4.00	0.0000	95.00	No Ice	0.00	0.00	42.25
			0.00			1/2"	0.00	0.00	103.01
			0.00			Ice	0.00	0.00	171.49
						1" Ice			
BXA-70063-6CF-EDIN-X w/ Mount Pipe	D	From Centroid-Leg	4.00	0.0000	95.00	No Ice	0.00	0.00	42.25
			0.00			1/2"	0.00	0.00	103.01
			0.00			Ice	0.00	0.00	171.49
						1" Ice			
AWS-3 RRH4X45	A	From Centroid-Leg	4.00	0.0000	95.00	No Ice	0.00	0.00	79.00
			0.00			1/2"	0.00	0.00	112.49
			0.00			Ice	0.00	0.00	149.87

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
AWS-3 RRH4X45	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	79.00 112.49 149.87
AWS-3 RRH4X45	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	79.00 112.49 149.87
BXA-80080/4CF w/Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	39.85 89.34 145.14
BXA-80080/4CF w/Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	39.85 89.34 145.14
BXA-80080/4CF w/Mount Pipe	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	39.85 89.34 145.14
RRH2x60-700	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	60.00 82.72 109.06
RRH2x60-700	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	60.00 82.72 109.06
RRH2x60-700	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	60.00 82.72 109.06
RRH2X60-PCS	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	55.00 72.91 93.69
RRH2X60-PCS	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	55.00 72.91 93.69
RRH2X60-PCS	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	55.00 72.91 93.69
DB-T1-6Z-8AB-0Z	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	44.00 80.13 120.22
DB-T1-6Z-8AB-0Z	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	44.00 80.13 120.22
800 10121 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	64.55 110.68 163.06
800 10121 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	64.55 110.68 163.06
800 10121 w/ Mount Pipe	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	64.55 110.68 163.06

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft²	*C_AA_A Side* ft²	*Weight* lb
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	89.03 157.32 234.42
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	89.03 157.32 234.42
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	89.03 157.32 234.42
HPA-33R-BUU-H6 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	104.95 209.02 321.92
HPA-33R-BUU-H6 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	104.95 209.02 321.92
HPA-33R-BUU-H6 w/ Mount Pipe	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	104.95 209.02 321.92
(2) 860 10025	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	1.16 2.65 5.06
(2) 860 10025	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	1.16 2.65 5.06
(2) 860 10025	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	1.16 2.65 5.06
(2) DTMABP7819VG12A	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	19.18 26.48 35.63
(2) DTMABP7819VG12A	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	19.18 26.48 35.63
(2) DTMABP7819VG12A	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	19.18 26.48 35.63
RRUS-11	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	47.62 68.42 92.25
RRUS-11	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	47.62 68.42 92.25
RRUS-11	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	47.62 68.42 92.25
RRUS 32 B2	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	52.90 73.96 98.21
RRUS 32 B2	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	52.90

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
		Centroid-Leg	0.00 0.00			1/2" Ice 1" Ice	0.00 0.00	0.00 0.00	73.96 98.21
RRUS 32 B2	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	52.90 73.96 98.21
DC6-48-60-18-8F Surge Suppression Unit	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	18.90 36.62 56.82
A-18A24N-U w/ mount pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	43.55 88.76 139.53
A-18A24N-U w/ mount pipe	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	43.55 88.76 139.53
(3) DB844H90E-XY w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	43.20 90.60 144.32
(4) DB844H90E-XY w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	43.20 90.60 144.32
(3) DB844H90E-XY w/ Mount Pipe	D	From Centroid-Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	43.20 90.60 144.32
742 213 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	65.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	51.20 97.45 151.50
742 213 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	65.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	51.20 97.45 151.50
742 213 w/ Mount Pipe	D	From Leg	1.00 0.00 0.00	0.0000	65.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	51.20 97.45 151.50

ASCE 7-10 Wind Loading
800529 800529 CT HAMDEN NORTH CAC
20187777.800529.06

Structure Information		
Structure Type:	Silo	
Structure Height:	108	ft
Gh (Mount Gust Effect Factor) =	0.85	
Risk Category:	II	

Code Specifications		
IBC Edition:	2003	
TIA/EIA Code:	G	
Nominal Wind Speed (No Ice) =	97	mph (3-s gust)
Nominal Wind Speed (With Ice) =	50	mph (3-s gust)
Ice Thickness	0.75	in
Exposure Category	C	

Topographic Inputs		Consider Temperature Effects if Ice?
Topographic Feature:	N/A	No

Section Sets									Height	No Ice	Ice Output	
Mount Components	Member Type	Length (in)	Side (Longest seeing wind) (in)	Other Side (in)	Calculated Dc, for Ice weight (in)	Dc, for Ice weight (in)	Area Type (Round or Flat)	K_a	User's Wind Multiplier	ft	Normal Wind Pressure (lb/ft^2)*	Normal Ice Wind Force (lb/ft^2)*	Ice Weight (lb/ft)*
Top Cap	Pipe	96.000	192	192		192.00	Round	1.00	1.00	103.4	24.79	5.36	397.88
Tower from 90'-100'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	95	24.35	5.18	394.50
Tower from 80'-90'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	85	23.79	5.06	390.10
Tower from 70'-80'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	75	23.17	4.93	385.20
Tower from 60'-70'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	65	22.48	4.78	379.69
Tower from 40'-60'	Pipe	240.000	192	192		192.00	Round	1.00	1.00	50	21.37	4.52	369.77
Tower from 20'-40'	Pipe	240.000	192	192		192.00	Round	1.00	1.00	30	19.11	4.06	351.22
Tower from 0'-20'	Pipe	240.000	192	192		192.00	Round	1.00	1.00	10	16.53	3.51	314.43

*All forces are unfactored.

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Standard Solver

Hot Rolled Steel Code	AISC 13th(360-05): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-10: ASD - Building AISC 14th(360-10): ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A500-46	29000	11200	.295	.65	.49	46	1.2	58	1.1
2	A36	29000	11200	.295	.65	.49	36	1.5	58	1.2
3	A992-50	29000	11200	.295	.65	.49	50	1.5	65	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	TWR_LEG_L1	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
2	TWR_TOP_GI...	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
3	TWR_DIAG_L1	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
4	TWR_LEG_L2	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
5	TWR_TOP_GI...	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
6	TWR_DIAG_L2	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
7	TWR_LEG_L3	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
8	TWR_TOP_GI...	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
9	TWR_DIAG_L3	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
10	TWR_LEG_L4	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
11	TWR_TOP_GI...	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
12	TWR_DIAG_L4	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
13	TWR_LEG_T1	HSS8x8x1/4	Column	Tube	A500-46	Typical	7.1	70.7	70.7	111
14	TWR_TOP_GI...	W16x45	Beam	Wide Fla...	A992-50	Typical	13.3	32.8	586	1.11
15	TWR_INNER_B...	W10x33	Beam	Wide Fla...	A992-50	Typical	9.71	36.6	171	.583
16	TWR_DIAG_T1	2L4x4x3/8x1/2	Column	None	A36	Typical	5.719	19.74	8.717	.268
17	TWR_LEG_T2	HSS8x8x1/4	Column	Tube	A500-46	Typical	7.1	70.7	70.7	111
18	TWR_TOP_GI...	W6x12	Beam	Wide Fla...	A992-50	Typical	3.55	2.99	22.1	.09
19	TWR_DIAG_T2	2L4x4x3/8x1/2	Column	None	A36	Typical	5.719	19.74	8.717	.268
20	TWR_LEG_T3	HSS8x8x1/4	Column	Tube	A500-46	Typical	7.1	70.7	70.7	111
21	TWR_TOP_GI...	W6x12	Beam	Wide Fla...	A992-50	Typical	3.55	2.99	22.1	.09
22	TWR_DIAG_T3	2L4x4x3/8x1/2	Column	None	A36	Typical	5.719	19.74	8.717	.268

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Type	Design List	Material	Design Rul...
1	M9	N2	N3			TWR_DIAG_L1	Column	None	A36	Typical
2	M10	N4	N1			TWR_DIAG_L1	Column	None	A36	Typical
3	M11	N4	N5			TWR_DIAG_L1	Column	None	A36	Typical
4	M12	N6	N3			TWR_DIAG_L1	Column	None	A36	Typical
5	M13	N6	N7			TWR_DIAG_L1	Column	None	A36	Typical
6	M14	N8	N5			TWR_DIAG_L1	Column	None	A36	Typical
7	M15	N8	N1			TWR_DIAG_L1	Column	None	A36	Typical
8	M16	N2	N7			TWR_DIAG_L1	Column	None	A36	Typical
9	M25	N13	N4			TWR_DIAG_L2	Column	None	A36	Typical
10	M26	N14	N2			TWR_DIAG_L2	Column	None	A36	Typical
11	M27	N14	N6			TWR_DIAG_L2	Column	None	A36	Typical
12	M28	N15	N4			TWR_DIAG_L2	Column	None	A36	Typical
13	M29	N15	N8			TWR_DIAG_L2	Column	None	A36	Typical
14	M30	N16	N6			TWR_DIAG_L2	Column	None	A36	Typical
15	M31	N16	N2			TWR_DIAG_L2	Column	None	A36	Typical
16	M32	N13	N8			TWR_DIAG_L2	Column	None	A36	Typical
17	M41	N21	N14			TWR_DIAG_L3	Column	None	A36	Typical
18	M42	N22	N13			TWR_DIAG_L3	Column	None	A36	Typical
19	M43	N22	N15			TWR_DIAG_L3	Column	None	A36	Typical
20	M44	N23	N14			TWR_DIAG_L3	Column	None	A36	Typical
21	M45	N23	N16			TWR_DIAG_L3	Column	None	A36	Typical
22	M46	N24	N15			TWR_DIAG_L3	Column	None	A36	Typical
23	M47	N24	N13			TWR_DIAG_L3	Column	None	A36	Typical
24	M48	N21	N16			TWR_DIAG_L3	Column	None	A36	Typical
25	M57	N29	N22			TWR_DIAG_L4	Column	None	A36	Typical
26	M58	N30	N21			TWR_DIAG_L4	Column	None	A36	Typical
27	M59	N30	N23			TWR_DIAG_L4	Column	None	A36	Typical
28	M60	N31	N22			TWR_DIAG_L4	Column	None	A36	Typical
29	M61	N31	N24			TWR_DIAG_L4	Column	None	A36	Typical
30	M62	N32	N23			TWR_DIAG_L4	Column	None	A36	Typical
31	M63	N32	N21			TWR_DIAG_L4	Column	None	A36	Typical
32	M64	N29	N24			TWR_DIAG_L4	Column	None	A36	Typical
33	M73	N38	N39			TWR_DIAG_T1	Column	None	A36	Typical
34	M74	N40	N37			TWR_DIAG_T1	Column	None	A36	Typical
35	M75	N40	N41			TWR_DIAG_T1	Column	None	A36	Typical
36	M76	N42	N39			TWR_DIAG_T1	Column	None	A36	Typical
37	M77	N42	N43			TWR_DIAG_T1	Column	None	A36	Typical
38	M78	N44	N41			TWR_DIAG_T1	Column	None	A36	Typical
39	M79	N44	N37			TWR_DIAG_T1	Column	None	A36	Typical
40	M80	N38	N43			TWR_DIAG_T1	Column	None	A36	Typical
41	M89	N49	N40			TWR_DIAG_T2	Column	None	A36	Typical
42	M90	N50	N38		360	TWR_DIAG_T2	Column	None	A36	Typical
43	M91	N50	N42			TWR_DIAG_T2	Column	None	A36	Typical
44	M92	N51	N40		360	TWR_DIAG_T2	Column	None	A36	Typical
45	M93	N51	N44			TWR_DIAG_T2	Column	None	A36	Typical
46	M94	N52	N42		360	TWR_DIAG_T2	Column	None	A36	Typical
47	M95	N52	N38			TWR_DIAG_T2	Column	None	A36	Typical
48	M96	N49	N44		360	TWR_DIAG_T2	Column	None	A36	Typical
49	M105	N57	N50			TWR_DIAG_T3	Column	None	A36	Typical
50	M106	N58	N49			TWR_DIAG_T3	Column	None	A36	Typical
51	M107	N58	N51			TWR_DIAG_T3	Column	None	A36	Typical
52	M108	N59	N50			TWR_DIAG_T3	Column	None	A36	Typical
53	M109	N59	N52			TWR_DIAG_T3	Column	None	A36	Typical
54	M110	N60	N51			TWR_DIAG_T3	Column	None	A36	Typical
55	M111	N60	N49			TWR_DIAG_T3	Column	None	A36	Typical
56	M112	N57	N52			TWR_DIAG_T3	Column	None	A36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Type	Design List	Material	Design Rul...
57	M1	N2	N1		45	TWR_LEG_L1	Column	Tube	A500-46	Typical
58	M2	N4	N3		135	TWR_LEG_L1	Column	Tube	A500-46	Typical
59	M3	N6	N5		225	TWR_LEG_L1	Column	Tube	A500-46	Typical
60	M4	N8	N7		315	TWR_LEG_L1	Column	Tube	A500-46	Typical
61	M17	N13	N2		45	TWR_LEG_L2	Column	Tube	A500-46	Typical
62	M18	N14	N4		135	TWR_LEG_L2	Column	Tube	A500-46	Typical
63	M19	N15	N6		225	TWR_LEG_L2	Column	Tube	A500-46	Typical
64	M20	N16	N8		315	TWR_LEG_L2	Column	Tube	A500-46	Typical
65	M33	N21	N13		45	TWR_LEG_L3	Column	Tube	A500-46	Typical
66	M34	N22	N14		135	TWR_LEG_L3	Column	Tube	A500-46	Typical
67	M35	N23	N15		225	TWR_LEG_L3	Column	Tube	A500-46	Typical
68	M36	N24	N16		315	TWR_LEG_L3	Column	Tube	A500-46	Typical
69	M49	N29	N21		45	TWR_LEG_L4	Column	Tube	A500-46	Typical
70	M50	N30	N22		135	TWR_LEG_L4	Column	Tube	A500-46	Typical
71	M51	N31	N23		225	TWR_LEG_L4	Column	Tube	A500-46	Typical
72	M52	N32	N24		315	TWR_LEG_L4	Column	Tube	A500-46	Typical
73	M65	N38	N37		45	TWR_LEG_T1	Column	Tube	A500-46	Typical
74	M66	N40	N39		135	TWR_LEG_T1	Column	Tube	A500-46	Typical
75	M67	N42	N41		225	TWR_LEG_T1	Column	Tube	A500-46	Typical
76	M68	N44	N43		315	TWR_LEG_T1	Column	Tube	A500-46	Typical
77	M81	N49	N38		45	TWR_LEG_T2	Column	Tube	A500-46	Typical
78	M82	N50	N40		135	TWR_LEG_T2	Column	Tube	A500-46	Typical
79	M83	N51	N42		225	TWR_LEG_T2	Column	Tube	A500-46	Typical
80	M84	N52	N44		315	TWR_LEG_T2	Column	Tube	A500-46	Typical
81	M97	N57	N49		45	TWR_LEG_T3	Column	Tube	A500-46	Typical
82	M98	N58	N50		135	TWR_LEG_T3	Column	Tube	A500-46	Typical
83	M99	N59	N51		225	TWR_LEG_T3	Column	Tube	A500-46	Typical
84	M100	N60	N52		315	TWR_LEG_T3	Column	Tube	A500-46	Typical
85	M5	N1	N3		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
86	M6	N3	N5		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
87	M7	N5	N7		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
88	M8	N7	N1		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
89	M21	N2	N4		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
90	M22	N4	N6		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
91	M23	N6	N8		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
92	M24	N8	N2		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
93	M37	N13	N14		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
94	M38	N14	N15		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
95	M39	N15	N16		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
96	M40	N16	N13		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
97	M53	N21	N22		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
98	M54	N22	N23		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
99	M55	N23	N24		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
100	M56	N24	N21		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
101	M69	N37	N39			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
102	M70	N39	N41			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
103	M71	N41	N43			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
104	M72	N43	N37			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
105	M85	N38	N40		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
106	M86	N40	N42		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
107	M87	N42	N44		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
108	M88	N44	N38		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
109	M101	N49	N50			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
110	M102	N50	N51			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
111	M103	N51	N52			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
112	M104	N52	N49			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
113	M113	N67	N65			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Type	Design List	Material	Design Rul...
114	M114	N65	N69			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical
115	M115	N66	N65			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical
116	M116	N65	N68			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis Offset[in]	Inactive	Seismic Desig...
1	M9	BenPIN	BenPIN				Yes			None
2	M10	BenPIN	BenPIN				Yes			None
3	M11	BenPIN	BenPIN				Yes			None
4	M12	BenPIN	BenPIN				Yes			None
5	M13	BenPIN	BenPIN				Yes			None
6	M14	BenPIN	BenPIN				Yes			None
7	M15	BenPIN	BenPIN				Yes			None
8	M16	BenPIN	BenPIN				Yes			None
9	M25	BenPIN	BenPIN				Yes			None
10	M26	BenPIN	BenPIN				Yes			None
11	M27	BenPIN	BenPIN				Yes			None
12	M28	BenPIN	BenPIN				Yes			None
13	M29	BenPIN	BenPIN				Yes			None
14	M30	BenPIN	BenPIN				Yes			None
15	M31	BenPIN	BenPIN				Yes			None
16	M32	BenPIN	BenPIN				Yes			None
17	M41	BenPIN	BenPIN				Yes			None
18	M42	BenPIN	BenPIN				Yes			None
19	M43	BenPIN	BenPIN				Yes			None
20	M44	BenPIN	BenPIN				Yes			None
21	M45	BenPIN	BenPIN				Yes			None
22	M46	BenPIN	BenPIN				Yes			None
23	M47	BenPIN	BenPIN				Yes			None
24	M48	BenPIN	BenPIN				Yes			None
25	M57	BenPIN	BenPIN				Yes			None
26	M58	BenPIN	BenPIN				Yes			None
27	M59	BenPIN	BenPIN				Yes			None
28	M60	BenPIN	BenPIN				Yes			None
29	M61	BenPIN	BenPIN				Yes			None
30	M62	BenPIN	BenPIN				Yes			None
31	M63	BenPIN	BenPIN				Yes			None
32	M64	BenPIN	BenPIN				Yes			None
33	M73	BenPIN	BenPIN				Yes			None
34	M74	BenPIN	BenPIN				Yes			None
35	M75	BenPIN	BenPIN				Yes			None
36	M76	BenPIN	BenPIN				Yes			None
37	M77	BenPIN	BenPIN				Yes			None
38	M78	BenPIN	BenPIN				Yes			None
39	M79	BenPIN	BenPIN				Yes			None
40	M80	BenPIN	BenPIN				Yes			None
41	M89	BenPIN	BenPIN				Yes			None
42	M90	BenPIN	BenPIN				Yes			None
43	M91	BenPIN	BenPIN				Yes			None
44	M92	BenPIN	BenPIN				Yes			None
45	M93	BenPIN	BenPIN				Yes			None
46	M94	BenPIN	BenPIN				Yes			None
47	M95	BenPIN	BenPIN				Yes			None
48	M96	BenPIN	BenPIN				Yes			None
49	M105	BenPIN	BenPIN				Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis Offset[in]	Inactive	Seismic Desig...
50	M106	BenPIN	BenPIN				Yes			None
51	M107	BenPIN	BenPIN				Yes			None
52	M108	BenPIN	BenPIN				Yes			None
53	M109	BenPIN	BenPIN				Yes			None
54	M110	BenPIN	BenPIN				Yes			None
55	M111	BenPIN	BenPIN				Yes			None
56	M112	BenPIN	BenPIN				Yes			None
57	M1						Yes			None
58	M2						Yes			None
59	M3						Yes			None
60	M4						Yes			None
61	M17						Yes			None
62	M18						Yes			None
63	M19						Yes			None
64	M20						Yes			None
65	M33						Yes			None
66	M34						Yes			None
67	M35						Yes			None
68	M36						Yes			None
69	M49	BenPIN					Yes			None
70	M50	BenPIN					Yes			None
71	M51	BenPIN					Yes			None
72	M52	BenPIN					Yes			None
73	M65						Yes			None
74	M66						Yes			None
75	M67						Yes			None
76	M68						Yes			None
77	M81						Yes			None
78	M82						Yes			None
79	M83						Yes			None
80	M84						Yes			None
81	M97						Yes			None
82	M98						Yes			None
83	M99						Yes			None
84	M100						Yes			None
85	M5	BenPIN	BenPIN				Yes			None
86	M6	BenPIN	BenPIN				Yes			None
87	M7	BenPIN	BenPIN				Yes			None
88	M8	BenPIN	BenPIN				Yes			None
89	M21	BenPIN	BenPIN				Yes			None
90	M22	BenPIN	BenPIN				Yes			None
91	M23	BenPIN	BenPIN				Yes			None
92	M24	BenPIN	BenPIN				Yes			None
93	M37	BenPIN	BenPIN				Yes			None
94	M38	BenPIN	BenPIN				Yes			None
95	M39	BenPIN	BenPIN				Yes			None
96	M40	BenPIN	BenPIN				Yes			None
97	M53	BenPIN	BenPIN				Yes			None
98	M54	BenPIN	BenPIN				Yes			None
99	M55	BenPIN	BenPIN				Yes			None
100	M56	BenPIN	BenPIN				Yes			None
101	M69	BenPIN	BenPIN				Yes			None
102	M70	BenPIN	BenPIN				Yes			None
103	M71	BenPIN	BenPIN				Yes			None
104	M72	BenPIN	BenPIN				Yes			None
105	M85	BenPIN	BenPIN				Yes			None
106	M86	BenPIN	BenPIN				Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis Offset[in]	Inactive	Seismic Desig...
107	M87	BenPIN	BenPIN				Yes			None
108	M88	BenPIN	BenPIN				Yes			None
109	M101	BenPIN	BenPIN				Yes			None
110	M102	BenPIN	BenPIN				Yes			None
111	M103	BenPIN	BenPIN				Yes			None
112	M104	BenPIN	BenPIN				Yes			None
113	M113	BenPIN					Yes			None
114	M114		BenPIN				Yes			None
115	M115	BenPIN					Yes			None
116	M116		BenPIN				Yes			None

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot[ft]	L-tor...	Kyy	Kzz	Cb	Function
1	M9	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
2	M10	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
3	M11	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
4	M12	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
5	M13	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
6	M14	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
7	M15	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
8	M16	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
9	M25	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
10	M26	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
11	M27	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
12	M28	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
13	M29	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
14	M30	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
15	M31	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
16	M32	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
17	M41	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
18	M42	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
19	M43	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
20	M44	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
21	M45	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
22	M46	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
23	M47	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
24	M48	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
25	M57	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
26	M58	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
27	M59	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
28	M60	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
29	M61	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
30	M62	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
31	M63	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
32	M64	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
33	M73	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
34	M74	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
35	M75	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
36	M76	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
37	M77	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
38	M78	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
39	M79	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
40	M80	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
41	M89	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
42	M90	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot[ft]	L-tor...	Kyy	Kzz	Cb	Function
43	M91	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
44	M92	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
45	M93	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
46	M94	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
47	M95	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
48	M96	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
49	M105	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
50	M106	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
51	M107	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
52	M108	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
53	M109	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
54	M110	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
55	M111	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
56	M112	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
57	M1	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
58	M2	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
59	M3	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
60	M4	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
61	M17	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
62	M18	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
63	M19	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
64	M20	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
65	M33	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
66	M34	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
67	M35	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
68	M36	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
69	M49	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
70	M50	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
71	M51	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
72	M52	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
73	M65	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
74	M66	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
75	M67	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
76	M68	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
77	M81	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
78	M82	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
79	M83	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
80	M84	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
81	M97	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
82	M98	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
83	M99	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
84	M100	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
85	M5	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
86	M6	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
87	M7	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
88	M8	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
89	M21	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
90	M22	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
91	M23	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
92	M24	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
93	M37	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
94	M38	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
95	M39	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
96	M40	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
97	M53	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
98	M54	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
99	M55	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot[ft]	L-tor...	Kyy	Kzz	Cb	Function
100	M56	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
101	M69	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
102	M70	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
103	M71	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
104	M72	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
105	M85	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
106	M86	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
107	M87	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
108	M88	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
109	M101	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
110	M102	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
111	M103	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
112	M104	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
113	M113	TWR_INNER_BRACE_...	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral
114	M114	TWR_INNER_BRACE_...	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral
115	M115	TWR_INNER_BRACE_...	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral
116	M116	TWR_INNER_BRACE_...	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead	None		-1		56	248	60	4	
2	No Ice Wind 0 deg	None				64				
3	No Ice Wind 45 deg	None				128				
4	No Ice Wind 90 deg	None								
5	Ice	None				56	260	172		
6	Temperature Drop	None						117		
7	Ice Wind 0 deg	None				64				
8	Ice Wind 45 deg	None				128				
9	Ice Wind 90 deg	None								
10	Service Wind 0 deg	None								
11	Service Wind 45 deg	None								
12	Service Wind 90 deg	None								
13	Live Load	None							4	
15	BLC 1 Transient Area Loads	None						96		
16	BLC 13 Transient Area Loads	None						96		

Load Combinations

	Description	S...	P...	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	Dead Only	Yes	Y		1	1.4	13	1	14	1	0		0		0		0		0	0	0			
2	Dead+Wind 0 deg - No Ice	Yes	Y		1	1.2	2	1.6							0		0		0	0	0			
3	Dead+Wind 45 deg - No Ice	Yes	Y		1	1.2	3	1.6	13	1	14	1	0		0		0		0	0	0			
4	Dead+Wind 90 deg - No Ice		Y		1	1	4	1	13	1	14	1	0		0		0		0	0	0			
5	Dead+Ice+Temp	Yes	Y		1	1	5	1	6	1	13	1	14	1	0		0		0	0	0			
6	Dead+Wind 0 deg+Ice+Temp	Yes	Y		1	1.2	7	1.6	5	1	6	1	13	1	14	1	0		0	0	0			
7	Dead+Wind 45 deg+Ice+Temp	Yes	Y		1	1.2	8	1.6	5	1	6	1	13	1	14	1	0		0	0	0			
8	Dead+Wind 90 deg+Ice+Temp		Y		1	1	9	1	5	1	6	1	13	1	14	1	0		0	0	0			
9	Dead+Wind 0 deg - Service		Y		1	1	10	1	13	1	14	1	0		0		0		0	0	0			
10	Dead+Wind 45 deg - Service		Y		1	1	11	1	13	1	14	1	0		0		0		0	0	0			
11	Dead+Wind 90 deg - Service		Y		1	1	12	1	13	1	14	1	0		0		0		0	0	0			

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N57	max	7.444	3	26.275	7	17.465	2	0	1	0	5	0	1
2		min	-9.883	2	-122.045	2	-2.153	1	0	1	0	3	0	1
3	N58	max	-1.638	5	205.553	3	-1.554	5	0	1	0	5	0	1
4		min	-23.037	3	16.728	1	-22.967	3	0	1	0	2	0	1
5	N59	max	3.632	3	147.668	2	20.541	2	0	1	0	3	0	1
6		min	-12.646	2	15.238	3	1.554	5	0	1	0	5	0	1
7	N60	max	2.076	1	24.521	5	2.153	1	0	1	0	2	0	1
8		min	-19.891	3	-176.521	3	-19.827	3	0	1	0	3	0	1
9	Totals:	max	0	5	102.848	7	0	2						
10		min	-45.046	2	51.247	2	-31.852	3						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*M...	phi*M...	Cb	Eqn
1	M9	2L2x2x3/16x1/2	.134	0	5	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
2	M10	2L2x2x3/16x1/2	.163	0	7	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
3	M11	2L2x2x3/16x1/2	.096	0	2	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
4	M12	2L2x2x3/16x1/2	.037	5.553	6	.005	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
5	M13	2L2x2x3/16x1/2	.116	0	3	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
6	M14	2L2x2x3/16x1/2	.046	5.553	3	.004	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
7	M15	2L2x2x3/16x1/2	.140	0	5	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
8	M16	2L2x2x3/16x1/2	.151	0	6	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
9	M25	2L2x2x3/16x1/2	.079	5.553	3	.005	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
10	M26	2L2x2x3/16x1/2	.223	2.545	3	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
11	M27	2L2x2x3/16x1/2	.207	5.553	2	.005	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
12	M28	2L2x2x3/16x1/2	.081	0	3	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
13	M29	2L2x2x3/16x1/2	.225	2.545	3	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
14	M30	2L2x2x3/16x1/2	.078	5.553	3	.004	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
15	M31	2L2x2x3/16x1/2	.074	5.553	2	.004	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
16	M32	2L2x2x3/16x1/2	.111	0	2	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
17	M41	2L2x2x3/16x1/2	.114	5.553	3	.005	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
18	M42	2L2x2x3/16x1/2	.334	3.124	2	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
19	M43	2L2x2x3/16x1/2	.334	3.124	2	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
20	M44	2L2x2x3/16x1/2	.169	0	3	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
21	M45	2L2x2x3/16x1/2	.327	3.239	3	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
22	M46	2L2x2x3/16x1/2	.118	5.553	2	.004	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
23	M47	2L2x2x3/16x1/2	.118	5.553	2	.004	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
24	M48	2L2x2x3/16x1/2	.125	0	2	.004	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
25	M57	2L2x2x3/16x1/2	.272	5.553	3	.006	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
26	M58	2L2x2x3/16x1/2	.459	5.553	3	.004	0	y	2	29.85	46.322	2.888	1.645	1	H1-...
27	M59	2L2x2x3/16x1/2	.418	5.553	2	.007	0	y	3	29.85	46.322	2.888	1.645	1	H1-...
28	M60	2L2x2x3/16x1/2	.150	0	3	.007	0	y	3	29.85	46.322	2.888	1.645	1	H1-...
29	M61	2L2x2x3/16x1/2	.463	5.553	3	.005	5.553	y	2	29.85	46.322	2.888	1.645	1	H1-...
30	M62	2L2x2x3/16x1/2	.275	5.553	2	.004	5.553	y	2	29.85	46.322	2.888	1.028	1	H1-...
31	M63	2L2x2x3/16x1/2	.275	5.553	2	.006	5.553	y	3	29.85	46.322	2.888	1.028	1	H1-...
32	M64	2L2x2x3/16x1/2	.239	5.438	2	.006	5.553	y	3	29.85	46.322	2.888	1.028	1	H1-...
33	M73	2L4x4x3/8x1/2	.072	11.075	2	.002	11.075	y	6	112.46	185.287	20.065	8.225	1	H1-...
34	M74	2L4x4x3/8x1/2	.230	5.307	3	.002	11.075	y	7	112.46	185.287	20.065	13.16	1	H1-...
35	M75	2L4x4x3/8x1/2	.229	5.307	3	.002	11.075	y	6	112.46	185.287	20.065	13.16	1	H1-...
36	M76	2L4x4x3/8x1/2	.156	0	2	.002	11.075	y	7	112.46	185.287	20.065	13.16	1	H1-...
37	M77	2L4x4x3/8x1/2	.157	0	2	.002	11.075	y	7	112.46	185.287	20.065	13.16	1	H1-...
38	M78	2L4x4x3/8x1/2	.086	11.075	3	.002	11.075	y	6	112.46	185.287	20.065	8.225	1	H1-...
39	M79	2L4x4x3/8x1/2	.085	11.075	3	.002	11.075	y	7	112.46	185.287	20.065	8.225	1	H1-...
40	M80	2L4x4x3/8x1/2	.060	11.075	2	.002	11.075	y	6	112.46	185.287	20.065	8.225	1	H1-...
41	M89	2L4x4x3/8x1/2	.096	11.075	2	.002	11.075	y	3	112.46	185.287	20.065	8.225	1	H1-...

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*M...	phi*M...	Cb	Eqn
42	M90	2L4x4x3/8x1/2	.337	6.23	3	.002	11.075	y	7	112.46	185.287	20.065	13.16	1	H1-...
43	M91	2L4x4x3/8x1/2	.336	6.23	3	.002	11.075	y	6	112.46	185.287	20.065	13.16	1	H1-...
44	M92	2L4x4x3/8x1/2	.282	11.075	2	.002	11.075	y	3	112.46	185.287	20.065	8.225	1	H1-...
45	M93	2L4x4x3/8x1/2	.218	6.23	2	.002	11.075	y	7	112.46	185.287	20.065	13.16	1	H1-...
46	M94	2L4x4x3/8x1/2	.126	11.075	3	.002	11.075	y	3	112.46	185.287	20.065	8.225	1	H1-...
47	M95	2L4x4x3/8x1/2	.126	11.075	3	.002	11.075	y	3	112.46	185.287	20.065	8.225	1	H1-...
48	M96	2L4x4x3/8x1/2	.093	11.075	2	.002	11.075	y	2	112.46	185.287	20.065	8.225	1	H1-...
49	M105	2L4x4x3/8x1/2	.166	0	3	.002	11.075	y	3	112.46	185.287	20.065	13.16	1	H1-...
50	M106	2L4x4x3/8x1/2	.486	6.922	3	.002	11.075	y	7	112.46	185.287	20.065	13.16	1	H1-...
51	M107	2L4x4x3/8x1/2	.484	6.922	3	.002	11.075	y	6	112.46	185.287	20.065	13.16	1	H1-...
52	M108	2L4x4x3/8x1/2	.454	11.075	2	.002	11.075	y	3	112.46	185.287	20.065	8.225	1	H1-...
53	M109	2L4x4x3/8x1/2	.270	7.614	2	.002	11.075	y	7	112.46	185.287	20.065	13.16	1	H1-...
54	M110	2L4x4x3/8x1/2	.291	11.075	3	.002	11.075	y	2	112.46	185.287	20.065	8.225	1	H1-...
55	M111	2L4x4x3/8x1/2	.291	11.075	3	.002	11.075	y	3	112.46	185.287	20.065	8.225	1	H1-...
56	M112	2L4x4x3/8x1/2	.243	11.075	2	.002	11.075	y	6	112.46	185.287	20.065	8.225	1	H1-...
57	M1	HSS6x6x1/4	.026	0	7	.000	0	z	6	181.658	216.936	38.64	38.64	1	H1-...
58	M2	HSS6x6x1/4	.025	0	2	.000	0	y	7	181.658	216.936	38.64	38.64	1	H1-...
59	M3	HSS6x6x1/4	.020	0	7	.000	0	z	2	181.658	216.936	38.64	38.64	1	H1-...
60	M4	HSS6x6x1/4	.009	0	6	.000	0	z	7	181.658	216.936	38.64	38.64	1	H1-...
61	M17	HSS6x6x1/4	.030	0	6	.001	0	z	6	181.658	216.936	38.64	38.64	1	H1-...
62	M18	HSS6x6x1/4	.083	0	2	.001	0	y	7	181.658	216.936	38.64	38.64	1	H1-...
63	M19	HSS6x6x1/4	.065	0	3	.000	0	z	2	181.658	216.936	38.64	38.64	1	H1-...
64	M20	HSS6x6x1/4	.032	0	5	.001	0	z	7	181.658	216.936	38.64	38.64	1	H1-...
65	M33	HSS6x6x1/4	.061	0	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-...
66	M34	HSS6x6x1/4	.174	0	2	.001	0	y	2	181.658	216.936	38.64	38.64	1	H1-...
67	M35	HSS6x6x1/4	.134	0	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-...
68	M36	HSS6x6x1/4	.089	0	2	.001	0	y	2	181.658	216.936	38.64	38.64	1	H1-...
69	M49	HSS6x6x1/4	.103	10	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-...
70	M50	HSS6x6x1/4	.349	10	2	.001	0	y	3	181.658	216.936	38.64	38.64	1	H1-...
71	M51	HSS6x6x1/4	.262	10	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-...
72	M52	HSS6x6x1/4	.269	10	2	.001	0	y	3	181.658	216.936	38.64	38.64	1	H1-...
73	M65	HSS8x8x1/4	.051	0	7	.000	0	z	3	199.192	293.94	66.288	66.288	1	H1-...
74	M66	HSS8x8x1/4	.223	0	3	.000	0	y	3	199.192	293.94	66.288	66.288	1	H1-...
75	M67	HSS8x8x1/4	.154	0	2	.000	0	z	3	199.192	293.94	66.288	66.288	1	H1-...
76	M68	HSS8x8x1/4	.064	0	3	.000	0	y	3	199.192	293.94	66.288	66.288	1	H1-...
77	M81	HSS8x8x1/4	.099	0	2	.000	0	z	3	199.192	293.94	66.288	66.288	1	H1-...
78	M82	HSS8x8x1/4	.394	0	3	.000	0	z	2	199.192	293.94	66.288	66.288	1	H1-...
79	M83	HSS8x8x1/4	.292	0	2	.000	0	z	3	199.192	293.94	66.288	66.288	1	H1-...
80	M84	HSS8x8x1/4	.228	0	3	.000	0	y	3	199.192	293.94	66.288	66.288	1	H1-...
81	M97	HSS8x8x1/4	.251	20	2	.001	0	z	3	199.192	293.94	66.288	66.288	1	H1-...
82	M98	HSS8x8x1/4	.563	20	3	.001	0	y	3	199.192	293.94	66.288	66.288	1	H1-...
83	M99	HSS8x8x1/4	.414	20	2	.001	0	z	3	199.192	293.94	66.288	66.288	1	H1-...
84	M100	HSS8x8x1/4	.344	20	3	.001	0	y	3	199.192	293.94	66.288	66.288	1	H1-...
85	M5	C6x10.5	.013	2.417	6	.003	0	y	6	59.887	99.468	2.428	15.224	1	H1-...
86	M6	C6x10.5	.005	2.417	6	.003	4.833	y	6	59.887	99.468	2.428	15.224	1	H1-...
87	M7	C6x10.5	.006	2.417	6	.003	4.833	y	6	59.887	99.468	2.428	15.224	1	H1-...
88	M8	C6x10.5	.013	2.417	6	.003	0	y	6	59.887	99.468	2.428	15.224	1	H1-...
89	M21	C6x10.5	.049	2.417	6	.013	4.833	y	6	59.887	99.468	2.428	15.224	1	H1-...
90	M22	C6x10.5	.046	2.417	3	.014	4.833	y	6	59.887	99.468	2.428	15.224	1	H1-...
91	M23	C6x10.5	.047	2.417	1	.015	4.833	y	6	59.887	99.468	2.428	15.224	1	H1-...
92	M24	C6x10.5	.049	2.467	6	.013	4.833	y	7	59.887	99.468	2.428	15.224	1	H1-...
93	M37	C6x10.5	.043	2.417	6	.013	4.833	y	1	59.887	99.468	2.428	15.224	1	H1-...
94	M38	C6x10.5	.055	2.417	3	.013	4.833	y	1	59.887	99.468	2.428	15.224	1	H1-...
95	M39	C6x10.5	.048	2.417	1	.015	4.833	y	1	59.887	99.468	2.428	15.224	1	H1-...
96	M40	C6x10.5	.057	2.467	3	.013	4.833	y	1	59.887	99.468	2.428	15.224	1	H1-...
97	M53	C6x10.5	.045	2.417	6	.013	4.833	y	3	59.887	99.468	2.428	15.224	1	H1-...
98	M54	C6x10.5	.060	2.417	3	.013	4.833	y	1	59.887	99.468	2.428	15.224	1	H1-...

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*M...	phi*M...	Cb	Eqn
99	M55	C6x10.5	.049	2.417	1	.015	4.833	y	3	59.887	99.468	2.428	15.224	1	H1-...
100	M56	C6x10.5	.063	2.467	3	.013	4.833	y	1	59.887	99.468	2.428	15.224	1	H1-...
101	M69	W16x45	.589	4.76	3	.149	0	y	3	426.018	598.5	54.375	273.12	1	H1-...
102	M70	W16x45	.669	4.76	2	.187	9.521	y	2	426.018	598.5	54.375	273.12	1	H1-...
103	M71	W16x45	.451	4.76	3	.097	4.76	y	3	426.018	598.5	54.375	273.12	1	H1-...
104	M72	W16x45	.575	4.76	2	.146	4.76	y	2	426.018	598.5	54.375	273.12	1	H1-...
105	M85	W6x12	.055	4.76	3	.003	9.521	y	6	59.891	159.75	8.7	22.79	1	H1-...
106	M86	W6x12	.069	4.76	2	.003	9.521	y	7	59.891	159.75	8.7	22.79	1	H1-...
107	M87	W6x12	.171	0	3	.003	9.521	y	6	59.891	159.75	8.7	22.79	1	H1-...
108	M88	W6x12	.272	4.76	2	.003	9.521	y	7	59.891	159.75	8.7	22.79	1	H1-...
109	M101	W6x12	.084	4.76	3	.003	9.521	y	6	59.891	159.75	8.7	22.79	1	H1-...
110	M102	W6x12	.212	4.76	2	.003	9.521	y	7	59.891	159.75	8.7	22.79	1	H1-...
111	M103	W6x12	.315	4.76	3	.003	9.521	y	6	59.891	159.75	8.7	22.79	1	H1-...
112	M104	W6x12	.469	4.76	2	.003	9.521	y	7	59.891	159.75	8.7	22.79	1	H1-...
113	M113	W10x33	.451	4.395	3	.550	3.092	y	3	205.996	436.95	52.5	142.0...	1	H1-...
114	M114	W10x33	.308	3.418	3	.382	3.418	y	3	205.996	436.95	52.5	142.0...	1	H1-...
115	M115	W10x33	.558	4.395	2	.696	3.092	y	2	205.996	436.95	52.5	142.0...	1	H1-...
116	M116	W10x33	.466	3.418	2	.577	3.418	y	2	205.996	436.95	52.5	142.0...	1	H1-...

Project #: 2018777.800529.06

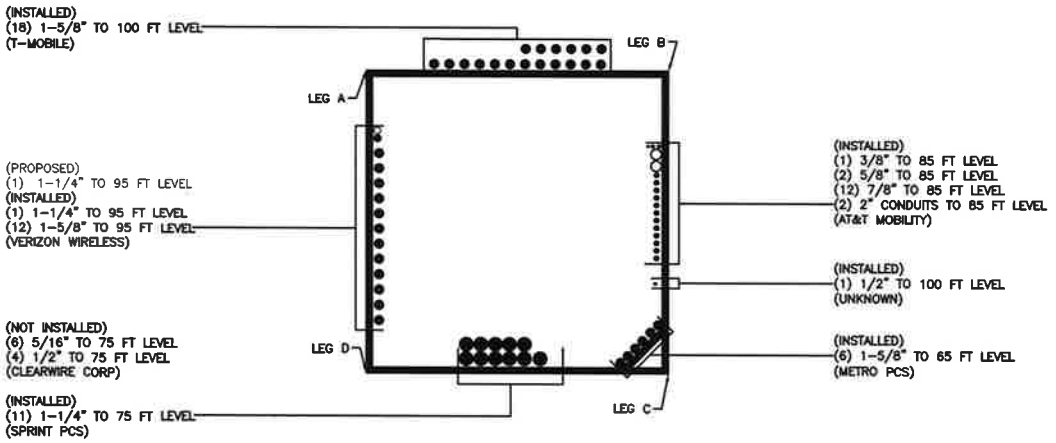
Bolt Checks

Date: 1/10/2018

Section #	Elevation	Component Type	Bolt Grade	Bolt Size (in)	# of Bolts	Maximum Load (k)	Maximum Load per Bolt (k)	Allowable Load per Bolt (k)	Ratio	Allowable Ratio	% Capacity	Criteria
L1	100	Diagonal	A325N	0.875	2	4.875	2.438	15.588	0.156	1.000	15.6%	Member Block Shear
L2	90	Diagonal	A325N	0.875	2	6.571	3.286	15.588	0.211	1.000	21.1%	Member Block Shear
L3	80	Diagonal	A325N	0.875	2	9.783	4.892	15.588	0.314	1.000	31.4%	Member Block Shear
L4	70	Leg	A325N	0.875	4	58.865	14.716	40.589	0.363	1.000	36.3%	Bolt Tension
		Diagonal	A325N	0.875	2	12.89	6.445	15.588	0.413	1.000	41.3%	Member Block Shear
T1	60	Diagonal	A325N	0.875	2	24.77	12.385	41.372	0.299	1.000	29.9%	Member Block Shear
T2	40	Top Girt	A325N	0.875	2	19.876	9.938	24.354	0.408	1.000	40.8%	
		Diagonal	A325N	0.875	2	36.434	18.217	41.372	0.440	1.000	44.0%	Member Block Shear
T3	20	Top Girt	A325N	0.875	2	32.885	16.442	24.354	0.675	1.000	67.5%	
		Diagonal	A325N	0.875	2	52.838	26.419	41.372	0.639	1.000	63.9%	Member Block Shear
										Maximum Capacity	67.5%	

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 800529 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING

SCALE N.T.S.	1

CT DATE: 7/26/2016 FILE NAME: 800529 BASELEVEL.dwg

CROWN REGION ADDRESS

USA

31/08/12	APPLICATION ADDED PER WORK ORDER # 300506	WJM
23/10/12	APPLICATION ADDED PER WORK ORDER # 343888	HAH
31/10/12	APPLICATION ADDED PER WORK ORDER # 344287	AM
02/11/12	AS-BUILT INFORMATION ADDED PER WORK ORDER # 370882	MS
08/03/13	UPDATED PER WORK ORDER 700851	EDJ
28/7/2015	UPDATED PER WORK ORDER 1127105	ADE
25/5/2016	UPDATED PER WORK ORDER 1231535	SKT
14/06/16	UPDATED PER WORK ORDER 1307987	AAM
02/01/16		BMJ

DRAWN BY: AAM
CHECKED BY:
DRAWING DATE: 19/05/06

SITE NUMBER:
SITE NAME:

SITE NAME

CT HAMDEN NORTH CAC

BUSINESS UNIT NUMBER

800529

SITE ADDRESS

890 EVERGREEN AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9 Rev. 6.1

Site Data	
Site ID:	800529
Site Name:	CT HAMDEN NORTH CAC
Job #:	2018777.800529.06

Anchor Rod Data		
Qty:	8	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	58	ksi
Yield (Fy):	36	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

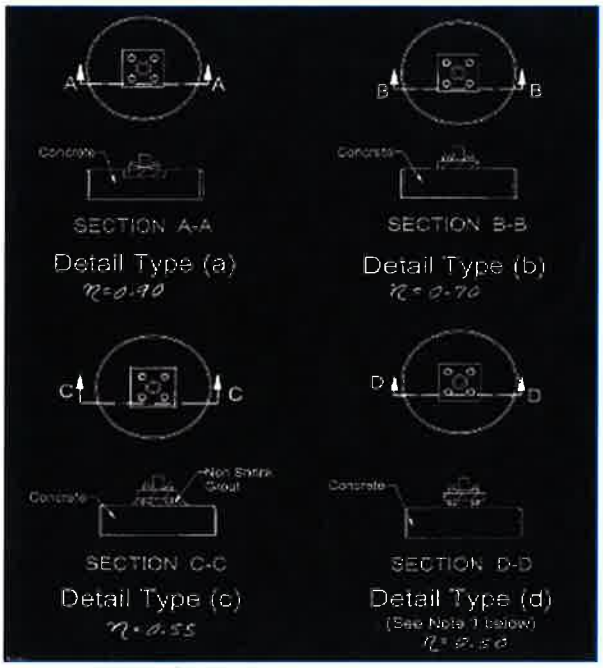


Figure 4-4 of TIA-222-G

Reactions		
Eta Factor, η	0.5	Detail Type
Down load, Pu:	206	kips
Shear, Vu:	33	kips

l_{ar}:		in
$Mu = 0.65*l_{ar}*V_u$		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ή):	34.0	Kips
Design Axial, Φ*Fu*Anet:	45.0	Kips
Anchor Rod Stress Ratio:	75.6%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

Maximum Acceptable Ratio: 105 %

Governing Stress Ratio: 75.6% Pass

Mat Foundation Analysis
800529 CT HAMDEN NORTH CAC
2018777.800529.06

General Info	
Foundation Criteria	Crown Castle
TIA Code	TIA-222-G
Soil Code	AASHTO 2012
Concrete Code	ACI 318-11
Seismic Design Category	B
Tower Height	100 ft
Bearing On	Soil
Foundation Type	Monopole Pad
Pier Type	Round
Reinforcing Known	Yes

Tower Reactions	
Moment, M	2638 k-ft
Axial, P	60 k
Shear, V	45 k

Pad & Pier Geometry	
Pier Diameter, ø	16 ft
Pad Length, L [y]	24 ft
Pad Width, W [x]	24 ft
Pad Thickness, t	3 ft
Depth, D	4.625 ft
Height Above Grade, HG	0.375 ft
Tower Centroid, X	12 ft
Tower Centroid, Y	12 ft
Tower Eccentricity	0.0000 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete F'c	3 ksi
Pier Reinforcing Clear Cover	3 in
Shear Rebar Type	Tie
Shear Rebar Size	
Pad Reinforcing Clear Cover	3 in
Reinforced Top & Bottom?	Yes
Pad Reinforcing Size	# 8
Pad Quantity Per Layer	32
Pier Rebar Size	
Pier Quantity of Rebar	

Soil Properties	
Soil Type	Granular
Soil Unit Weight	115 pcf
Angle of Friction, ø	30
Base Friction Coeff. Provided in Geo?	No
Bearing Type	Gross
Ultimate Bearing	9 ksf
Water Table Depth	99 ft
Frost Depth	3.5 ft

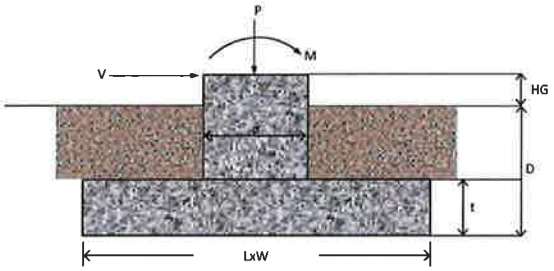
GPD Mat Foundation Analysis - V3.2

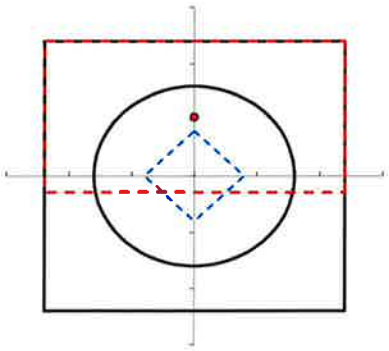
Bearing Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*	*Eccentricity*	*Load Case*
Qxmax	2.18 ksf	6.75 ksf	OK, <= 110%	L/4.6	1.2D+1.6W
Qymax	2.18 ksf	6.75 ksf	OK, <= 110%	W/4.6	1.2D+1.6W
Qmax @ 45°	1.95 ksf	6.75 ksf	OK, <= 110%	W/4.9	0.9D+1.6W
Controlling Capacity		**32.4%**	**Pass**		

Overturning Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Ovtx	2768.2 k-ft	4747.5 k-ft	58.3%	OK	0.9D+1.6W
Ovty	2768.2 k-ft	4747.5 k-ft	58.3%	OK	0.9D+1.6W
Ovtxy	1933.3 k-ft	4747.5 k-ft	40.7%	OK	0.9D+1.6W
Controlling Capacity		**58.3%**	**Pass**		

Sliding Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Slidingx	45.0 k	125.0 k	36.0%	OK	0.9D+1.6W
Slidingy	45.0 k	125.0 k	36.0%	OK	0.9D+1.6W
Controlling Capacity		**36.0%**	**Pass**		

Reinforcement Summary					
Component	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Pad Flexural Bending	12.1 k-ft	144.4 k-ft	8.4%	OK	0.9D+1.6W
One-Way Shear in Pad	53.2 k	745.3 k	7.1%	OK	0.9D+1.6W
Two-Way Shear in Pad	322.9 k	3718.0 k	8.7%	OK	0.9D+1.6W
Compression on Pier	132.4 k	#N/A	#N/A	#N/A	1.2D+1.6W
Moment on Pier	2728.0 k-ft	#N/A	#N/A	#N/A	1.2D+1.6W
As Min Pad Met?	2.11 sq. in.	0.07 sq. in.	Yes		
As Min Pier Met?	#N/A	144.76 sq. in.	#N/A		
Controlling Capacity		**#N/A**	**#N/A**		

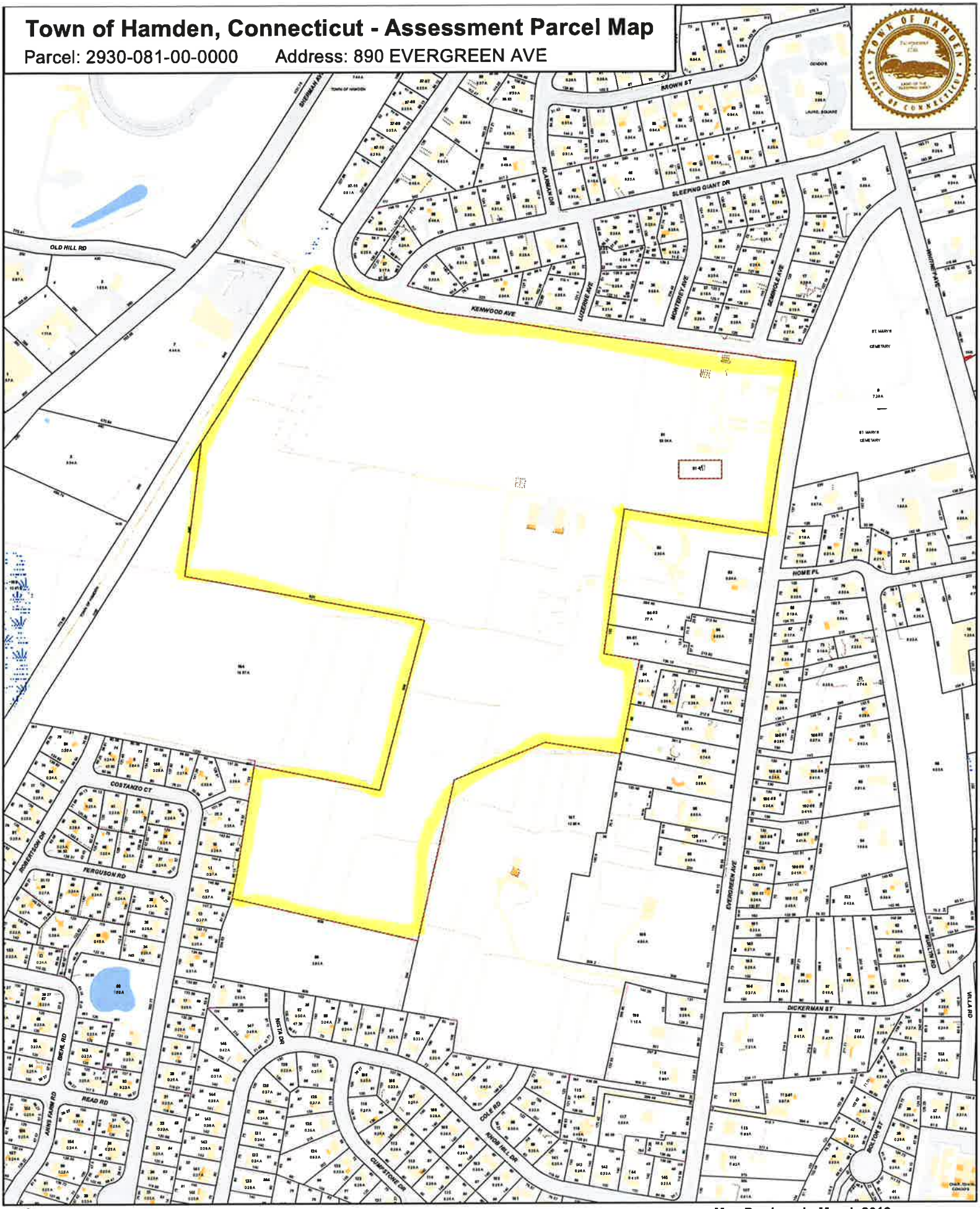




ATTACHMENT 4

Town of Hamden, Connecticut - Assessment Parcel Map

Parcel: 2930-081-00-0000 Address: 890 EVERGREEN AVE



Approximate Scale: 1 inch = 400 feet

0 200 400 600 800 Feet

Map Produced: March 2018

Town of Hamden, CT

Property Listing Report | Map Block Lot 2930-081-01-0000 | Account

Property Information

Property Location	890 EVERGREEN AVE
Owner	CONN AGRICULURAL EXPT STATION
Co-Owner	
Mailing Address	890 EVERGREEN AVE HAMDEN CT 06518
Land Use	4310 TEL REL TW M96
Land Class	I
Zoning Code	R4
Census Tract	4
Sub Lot	
Neighborhood	110
Acreage	0
Lot Setting/Desc	Suburban Above Street
Survey Map	
Utilities	All Public
Additional Info	

Photo

Sketch

No Photo Available

Primary Construction Details

Year Built	0
Stories	
Building Style	
Building Use	
Building Condition	
Floors	Concr-Finished
Total Rooms	

Bedrooms	
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Gable/Hip
Roof Cover	Asphalt

Exterior Walls	Concr/Cinder
Interior Walls	Minim/Masonry
Heating Type	Hot Air-no Duc
Heating Fuel	Oil
AC Type	None
Gross Bldg Area	3000
Total Living Area	1473

Report Created On 7/3/2018

Town of Hamden, CT

Property Listing Report | Map Block Lot 2930-081-01-0000 | Account

Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	125600	87920
Extras	0	0
Outbuildings	0	0
Land	165000	105000
Total	290600	192920

Outbuilding and Extra Items

Type	Description

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	1473	1473
Slab	1527	0
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CONN AGRICULURAL EXPT STATION	64/ 135	1/4/1911	

Report Created On 7/3/2018

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3		neopost 08/22/2018 US POSTAGE $002.38⁰ ZIP 06103 041L12203380
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Curt B. Leng, Mayor Town of Hamden Government Center 2750 Dixwell Avenue Hamden, CT 06518				
2.	Daniel W. Kops, Jr., Town Planner Town of Hamden Government Center 2750 Dixwell Avenue Hamden, CT 06518				
3.	Connecticut Agricultural Experiment Station 890 Evergreen Avenue Hamden, CT 06518				
4.					
5.					
6.					

OLD STATE HOUSE STATION 06103
AUG 22 2018
USPS