STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
A PETITION OF CELLCO PARTNERSHIP	:	SUB-PETITION NO. 1133
D/B/A VERIZON WIRELESS FOR A	:	1363 BOSTON POST ROAD
DECLARATORY RULING FOR	:	OLD SAYBROOK, CT
APPROVAL OF AN ELIGIBLE FACILITY	:	
REQUEST FOR MODIFICATIONS TO AN	:	
EXISTING TELECOMMUNICATIONS	:	
TOWER AT 1363 BOSTON POST ROAD,	:	
OLD SAYBROOK, CONNECTICUT	:	JUNE 10, 2015

SUB-PETITION FOR DECLARATORY RULING:
ELIGIBLE FACILITIES REQUEST FOR MODIFICATIONS
THAT WILL NOT SUBSTANTIALLY CHANGE THE
PHYSICAL DIMENSIONS OF AN EXISTING TOWER

I. Introduction

Pursuant to Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, codified at 47 U.S.C. § 1455(a) ("Section 6409(a)") and the October 21, 2014 Report and Order (FCC-14-533) issued by the Federal Communications Commission ("FCC") (the "FCC Order"), Cellco Partnership d/b/a Verizon Wireless ("Cellco") hereby petitions the Connecticut Siting Council (the "Council") for a declaratory ruling ("Sub-Petition") that the proposed modifications to an existing AT&T Wireless ("AT&T") tower at 1363 Boston Post Road in Old Saybrook, Connecticut constitutes an Eligible Facilities Request ("EFR") under the FCC Order. Cellco has designated this site as its "Old Saybrook 2 Facility".

II. Factual Background

AT&T maintains a 99-foot tall monopole tower in the northerly portion of a 7.53-acre parcel at 1363 Boston Post Road in Old Saybrook, Connecticut (the "Property"). *See* Attachment 1 – Site Vicinity Map and Site Schematic (Aerial Photograph). AT&T currently maintains

antennas at a centerline height of 97 feet above ground level ("AGL"). Equipment associated with AT&T's antennas is located in a shelter near the base of the tower. AT&T also maintains a pad-mounted back-up generator adjacent to its shelter.

III. Proposed Old Saybrook 2 Facility

Cellco plans to install twelve (12) antennas and nine (9) remote radio heads ("RRHs") on T-Arms at a height of 85 feet AGL.[1] Cellco's radio equipment and a propane fueled backup generator will be housed in a 12' x 26' shelter. Cellco's equipment shelter and 1000 gallon propane tank will be located within the existing fenced compound. Power and telephone service to Cellco's shelter will extend from the existing utility backboard at the site. Project Plans for the Old Saybrook 2 Facility are included in Attachment 2. Specifications for Cellco's antennas and RRHs are included in Attachment 3. A Structural Analysis confirming that the AT&T tower can accommodate Cellco's proposed modifications is included in Attachment 4.

IV. Discussion

A. The Proposed Modifications Will Not Cause a Substantial Change to the Physical Dimensions of the Existing Tower or Base Station

Section 6409(a) provides, in relevant part, that "a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station." Pursuant to the FCC Order, the proposed modification does not substantially change the physical dimensions of the tower or base station if the following criteria are satisfied.

1. *The proposed modified facility will not increase the height of the tower by more than ten (10) percent or by the height of one additional antenna array with separation from*

[1] The Council's approval in Docket No. 411 requires the use of T-Arm or flush-mounted antenna support structures.

the nearest existing antenna not to exceed twenty (20) feet, whichever is greater. Cellco proposes to install its antennas and RRHs at the 85-foot level on the existing 99-foot tower.

2. *The proposed facility will not protrude from the edge of the structure more than six (6) feet.* The proposed antennas and RRHs will be attached to T-Arms which protrude approximately 5'-7" from the face of the tower.

3. *The proposed facility does not involve installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets.* Cellco intends to install a single shelter to house its radio equipment and backup generator.

4. *The proposed facility does not entail any excavation or deployment outside the current site of the base station.* All of Cellco's site improvements will occur within the limits of the existing fenced compound area.

5. *The proposed facility does not defeat the existing concealment elements of the base station.* The existing antennas on the AT&T tower are not concealed in any fashion. Likewise, Cellco's antennas will not be concealed.

6. *The proposed facility complies with conditions associated with the prior approval of construction or modification of the base station.* Cellco's proposed installation complies with all of the Council's conditions of approval in Docket No. 411.

B. FCC Compliance

Operation of Cellco's small cell facility antennas will not increase the radio frequency ("RF") emissions at the Property to a level at or above the FCC Safety standard. Far field approximation tables for Cellco's proposed small cell antennas in each of its operating frequencies are included in Attachment 5.

C. Notice to the Town, Property Owner and Abutting Landowners

On June 10, 2015, a copy of this Sub-Petition was sent to the Old Saybrook First Selectman Carl P. Fortuna, Jr. and Wilcox Family LLC, the owners of the Property. *See* Attachment 6.

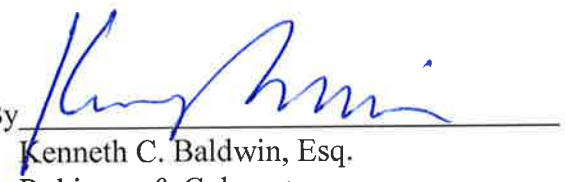
A copy of this Sub-Petition was also sent to each owner of land that abuts the Property. A sample abutter's cover letter and the list of those abutting landowners who were sent notice and a copy of the Sub-Petition is included in Attachment 7.

V. Conclusion

Based on the information provided above, Cellco respectfully submits that the proposed modification of the existing base station at the Property constitutes an "eligible facilities request" under Section 6409(a) and the FCC Order.

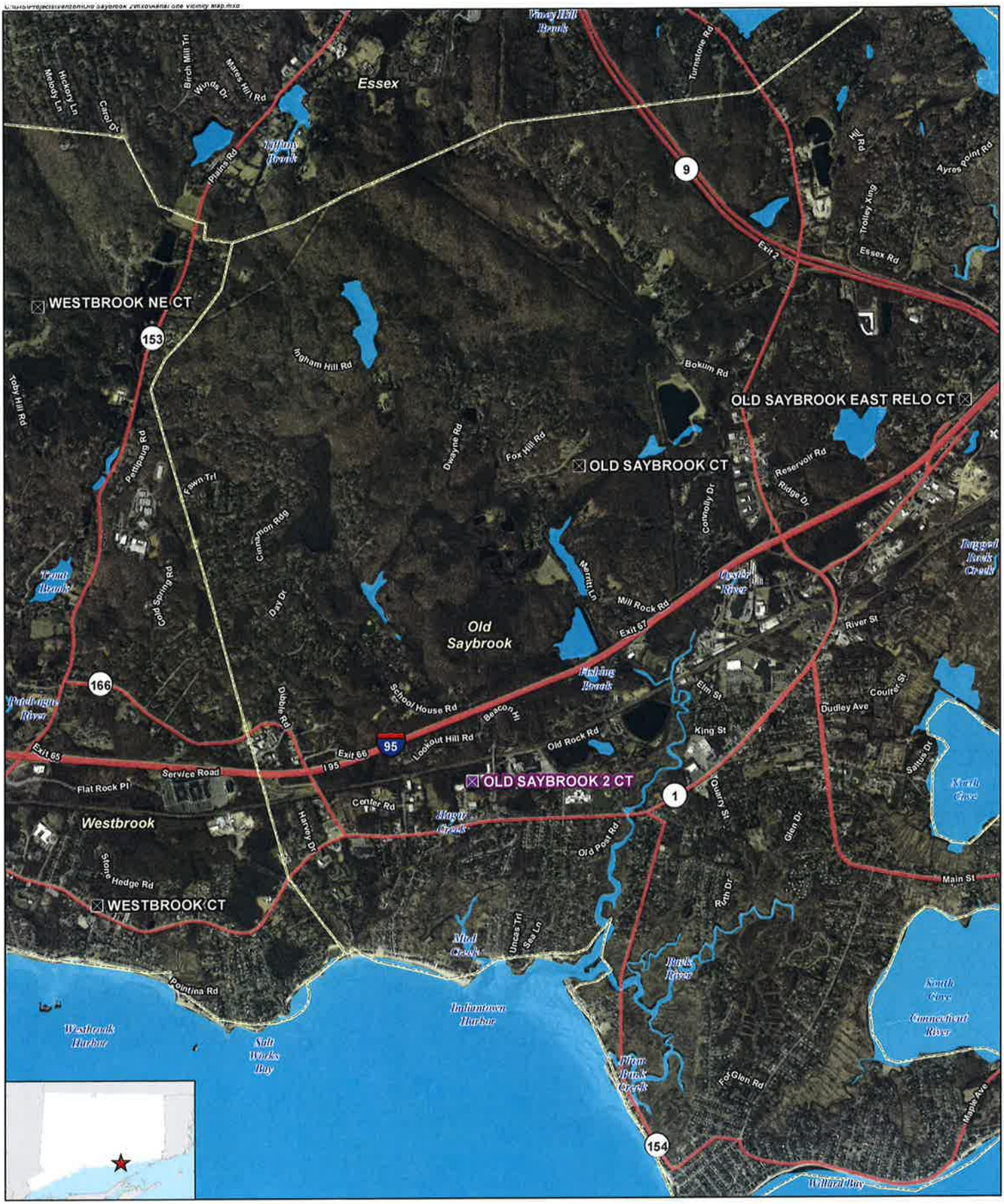
Respectfully submitted,

CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS

By 

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
(860) 275-8200
Its Attorneys

ATTACHMENT 1



Legend

- Proposed Verizon Wireless Facility
- Surrounding Verizon Wireless Facilities
- Municipal Boundary
- Waterbody

Site Vicinity Map

Proposed Wireless
Telecommunications Facility
Old Saybrook 2 CT
1363 Boston Post Road
Old Saybrook, Connecticut

verizon wireless

ALL-POINTS

3,000 1,500 0 3,000 Feet

Base Map Source: 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 3,000 feet
Map Date: April 2015

Legend

- Existing 99' Tall Monopole (others)
- Existing Fenced Compound
- Proposed Verizon Wireless Equipment
- Proposed Facility Layout
- Existing Access
- Approximate Subject Property
- Approximate Parcel Boundary (CTDEEP GIS Parcels)
- Watercourse (CTDEEP)

N W E S

200 100 0 200 Feet

Map Notes:
Base Map Source: 2014 Aerial Photograph (CTECO)
Map Scale: 1 inch = 200 feet
Map Date: April 2015

Site Schematic

Proposed Wireless
Telecommunications Facility
Old Saybrook 2 CT
1363 Boston Post Road
Old Saybrook, Connecticut

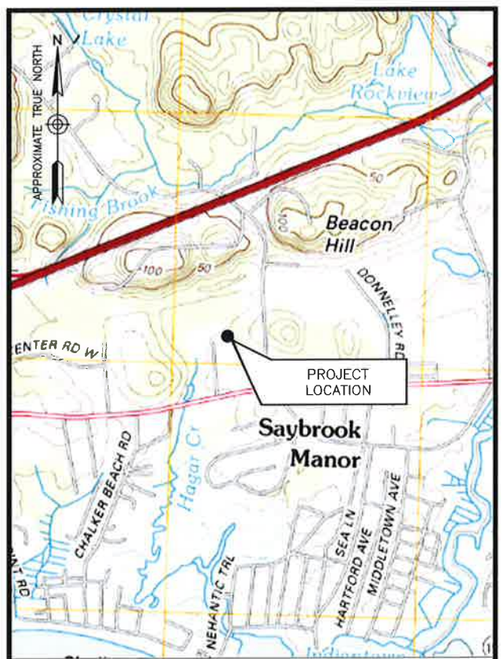
verizon wireless

ALL-POINTS

ATTACHMENT 2

CELLCO PARTNERSHIP d/b/a verizonwireless

PROPOSED WIRELESS FACILITY
SITE NAME: OLD SAYBROOK 2
1363 BOSTON POST ROAD,
OLD SAYBROOK, CT 06475



VICINITY MAP

N.T.S.

DIRECTIONS FROM 99 EAST RIVER DRIVE, EAST HARTFORD, CT:

HEAD SOUTHWEST ON E RIVER DR TOWARD PITKIN ST. CONTINUE ONTO E RIVER DRIVE EXTENSION. TURN RIGHT ONTO THE U.S. 5 S/CONNECTICUT 15 S RAMP TO NEW HAVEN/INSTERSTATE 91 S. MERGE ONTO US-5 S. TAKE EXIT 22S ON THE LEFT TO MERGE ONTO CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK. TAKE THE EXIT ONTO I-95 S/U.S. 1 S TOWARD MIDDLETOWN/OLD SAYBROOK. TAKE EXIT ONTO I-95 S/U.S. 1 S TOWARD NEW HAVEN/N.Y. CITY. TAKE EXIT 67 TOWARD ELM ST. TURN LEFT ONTO ELM ST/INGHAM HILL RD. TURN RIGHT AT THE 1ST CROSS STREET ONTO INGHAM HILL RD. TURN RIGHT ONTO U.S. 1 S/BOSTON POST ROAD. TURN RIGHT ONTO TOMPKINS RD.

SITE COORDINATES:
LATITUDE: 41°-17'-22.89" N
LONGITUDE: 72°-24'-21.76" W
(BASED ON GOOGLE EARTH)

ELEVATION DATA
GRADE ELEVATION AT MONOPOLE = 47'± A.M.S.L.
(BASED ON GOOGLE EARTH)

ELEVATION (TO C.L. OF ANTENNAS)
ELEVATION = 85'± A.G.L., 132'± A.M.S.L.

PROJECT INFORMATION

THE SCOPE OF WORK SHALL INCLUDE:

1. THE INSTALLATION OF A PROPOSED CELLCO PARTNERSHIP EQUIPMENT SHELTER LOCATED IN AN EXISTING COMPOUND.
2. A TOTAL OF UP TO TWO (12) PROPOSED CELLCO PARTNERSHIP ANTENNAS AND ASSOCIATED APPURTENANCES ARE TO BE MOUNTED TO THE EXISTING MONOPOLE AT CENTERLINE ELEVATION OF 85'± A.G.L.
3. THE INSTALLATION OF A PROPOSED CELLCO PARTNERSHIP PROPANE TANK IN AN EXISTING COMPOUND.
4. THE INSTALLATION OF A PROPOSED BACKUP GENERATOR INSIDE THE PROPOSED CELLCO PARTNERSHIP EQUIPMENT SHELTER.
5. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.

SCOPE OF WORK

SITE NAME:
OLD SAYBROOK 2

SITE ADDRESS:
1363 BOSTON POST ROAD
OLD SAYBROOK, CT 06475
MIDDLESEX COUNTY

PROPERTY OWNER:
WILCOX FAMILY LLC
26 QUARRY STREET
OLD SAYBROOK, CT 06475

APPLICANT:
CELLCO PARTNERSHIP
d/b/a VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

SITE ACQUISITION CONTACT:
JAMES SMITH
STRUCTURE CONSULTING GROUP
(860) 608-0028

LEGAL/REGULATORY COUNSEL:
KENNETH C. BALDWIN, ESQ.
ROBINSON & COLE
(860) 275-8345

PROJECT INFORMATION

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
C-1	ABUTTERS MAP
C-2	PARTIAL SITE PLAN
C-3	ANTENNA MOUNTING CONFIGURATION & SOUTHWEST ELEVATION

SHEET INDEX

CELLCO PARTNERSHIP
d/b/a verizonwireless

OLD SAYBROOK 2

CSC DRAWINGS		
C	06/10/15	FOR SUBMITTAL
B	06/04/15	FOR SUBMITTAL
A	05/14/15	FOR COMMENT

Dewberry

Dewberry Engineers Inc.
800 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	JC
REVIEWED BY:	PD
CHECKED BY:	GHN
PROJECT NUMBER:	50067815
JOB NUMBER:	50067825

SITE ADDRESS

1363 BOSTON POST ROAD
OLD SAYBROOK, CT 06475

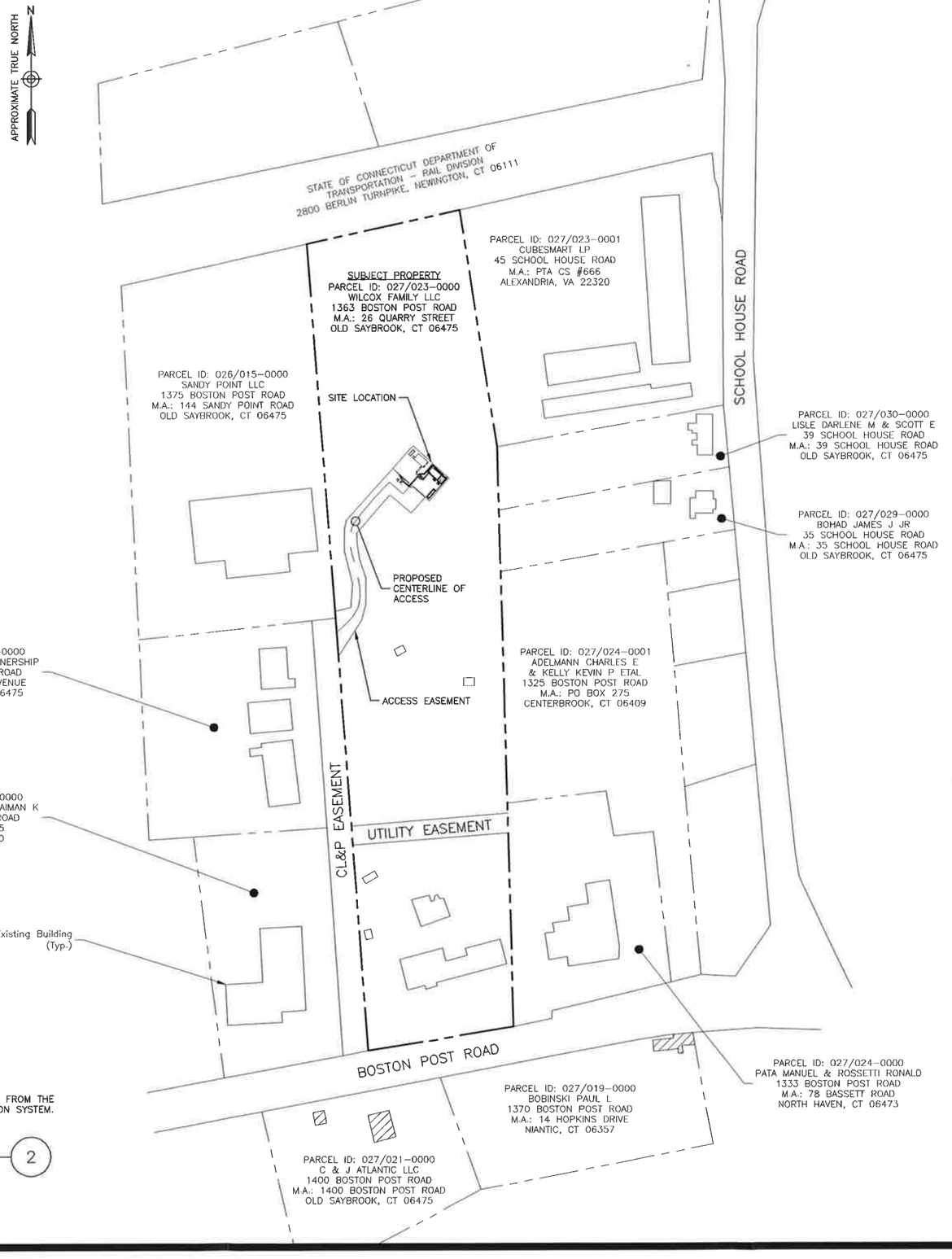
SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

MUNICIPALITY NOTIFICATION LIMIT MAP 1



NOTES:

1. ABUTTERS MAP BASED ON INFORMATION OBTAINED FROM THE TOWN OF OLD SAYBROOK GEOGRAPHIC INFORMATION SYSTEM.

ABUTTERS MAP 2

SCALE: 1"=200' FOR 11"x17"
1"=100' FOR 22"x34"

0' 100' 200'

CELLCO PARTNERSHIP
d/b/a verizonwireless

OLD SAYBROOK 2

CSC DRAWINGS		
C	06/10/15	FOR SUBMITTAL
B	06/04/15	FOR SUBMITTAL
A	05/14/15	FOR COMMENT

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

JIANG YU, P.E.
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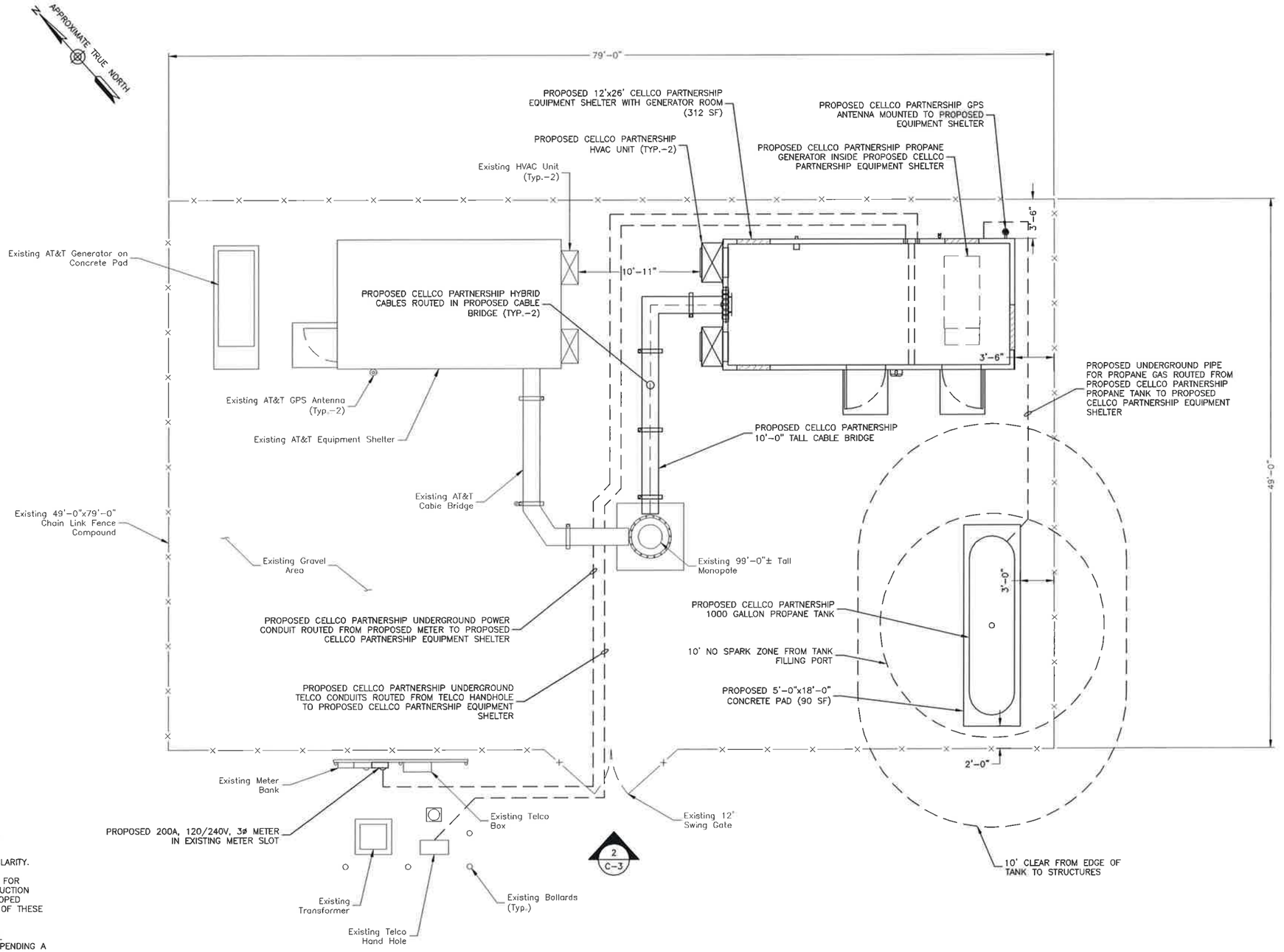
OLD SAYBROOK, CT 06475

SHEET TITLE

ABUTTERS MAP

SHEET NUMBER

C-1



NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. THESE DRAWINGS ARE PROVIDED FOR SITING COUNCIL REVIEW. CONSTRUCTION LEVEL DRAWINGS WILL BE DEVELOPED SUBSEQUENT TO THE APPROVAL OF THESE DRAWINGS.
4. LOCATION & ORIENTATION OF ALL ANTENNAS, COAX & EQUIPMENT PENDING A STRUCTURAL ANALYSIS BY OTHERS.
5. EXISTING GROUND RING WILL BE UTILIZED TO GROUND PROPOSED EQUIPMENT.
6. SITE PLAN & ELEVATION BASED ON SITE VISIT BY DEWBERRY ENGINEERS INC. ON 08/20/14.

PARTIAL SITE PLAN

1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

0' 5' 10'

CELLCO PARTNERSHIP
d/b/a verizonwireless

OLD SAYBROOK 2

CSC DRAWINGS		
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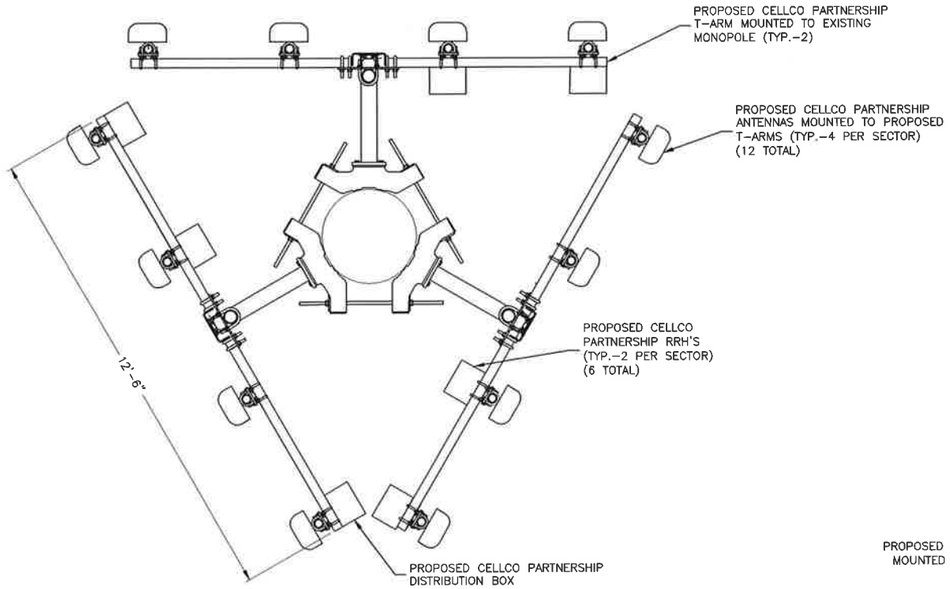
SHEET TITLE

PARTIAL SITE PLAN

SHEET NUMBER

C-2



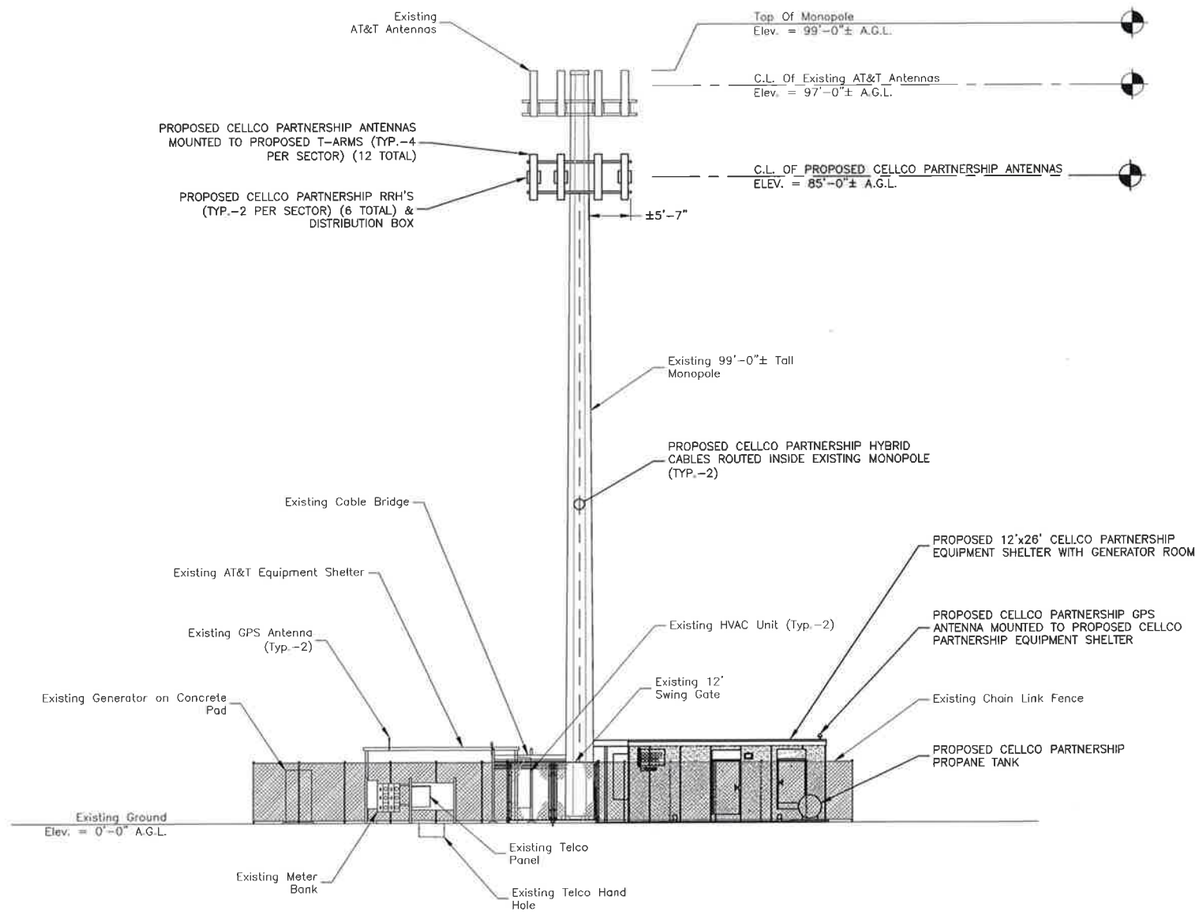
NOTE:

1. ANTENNA MOUNTING CONFIGURATION IS PROVIDED FOR SITING COUNCIL REVIEW. CONSTRUCTION LEVEL DRAWINGS WILL BE DEVELOPED SUBSEQUENT TO THE APPROVAL OF THESE DRAWINGS.

ANTENNA MOUNTING CONFIGURATION (1)

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 2' 4'



SOUTHWEST ELEVATION (2)

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. THESE DRAWINGS ARE PROVIDED FOR SITING COUNCIL REVIEW. CONSTRUCTION LEVEL DRAWINGS WILL BE DEVELOPED SUBSEQUENT TO THE APPROVAL OF THESE DRAWINGS.
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CELLCO PARTNERSHIP
d/b/a verizonwireless

OLD SAYBROOK 2

CSC DRAWINGS		
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SITE ADDRESS

1363 BOSTON POST ROAD
OLD SAYBROOK, CT 06475

SHEET TITLE

ANTENNA MOUNTING CONFIGURATION & SOUTHWEST ELEVATION

SHEET NUMBER

C-3

ATTACHMENT 3

Product Specifications

COMMSCOPE®

LNX-6515DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

POWERED BY ANDREW.

Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	16.7	17.6
Beamwidth, Horizontal, degrees	65	64
Beamwidth, Vertical, degrees	9.7	8.6
Beam Tilt, degrees	0–8	0–8
USLS, dB	17	17
Front-to-Back Ratio at 180°, dB	32	27
CPR at Boresight, dB	24	27
CPR at Sector, dB	15	13
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896
Gain by all Beam Tilts, average, dBi	16.6	16.9
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 16.6 4 ° | 16.6 8 ° | 16.4	0 ° | 17.0 4 ° | 17.0 8 ° | 16.8
Beamwidth, Horizontal Tolerance, degrees	±1	±0.9
Beamwidth, Vertical Tolerance, degrees	±0.6	±0.4
USLS, dB	18	18
Front-to-Back Total Power at 180° ± 30°, dB	25	23
CPR at Boresight, dB	24	27
CPR at Sector, dB	15	13

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

Mechanical Specifications

Color | Radome Material	Light gray | Fiberglass, UV resistant
Connector Interface | Location | Quantity	7-16 DIN Female | Bottom | 2
Wind Loading, maximum	878.0 N @ 150 km/h 197.4 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph
Antenna Dimensions, L x W x D	2438.0 mm x 301.0 mm x 181.0 mm | 96.0 in x 11.9 in x 7.1 in
Net Weight	19.8 kg | 43.7 lb
Model with factory installed AISG 2.0 RET	LNX-6515DS-A1M

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6517DS-VTM

Andrew® Quad Port Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.4 3 ° | 18.7 6 ° | 18.4	0 ° | 18.4 3 ° | 18.7 6 ° | 18.5	0 ° | 18.7 3 ° | 18.9 6 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

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

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz

Product Specifications

HBXX-6517DS-VTM

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1903.0 mm | 74.9 in
Width	305.0 mm | 12.0 in
Net Weight	19.5 kg | 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Regulatory Compliance/Certifications

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

Included Products

600899A-2 — 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.

Alcatel-Lucent RRH2x40-07-U

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-07-U is a high-power, small form-factor Remote Radio Head (RRH) operating in the North American Digital Dividend / 700MHz frequency band (3GPP Band 13). The Alcatel-Lucent RRH2x40-07-U is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.

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

The Alcatel-Lucent RRH2x40-07-U is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-07-U has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to two-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 10 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-07-U is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-07-U installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-07-U is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-07-U is compact and weights less than 23 kg (50 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

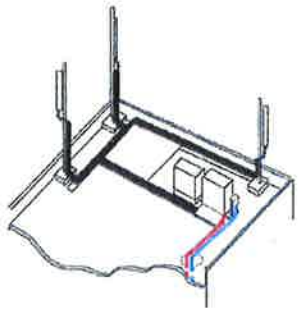
Because of its small size and weight, the Alcatel-Lucent RRH2x40-07-U can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-07-U where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-07-U provides more RF power while at the same time consuming less electricity.

Features

- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless), noise-free, and heaterless unit
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



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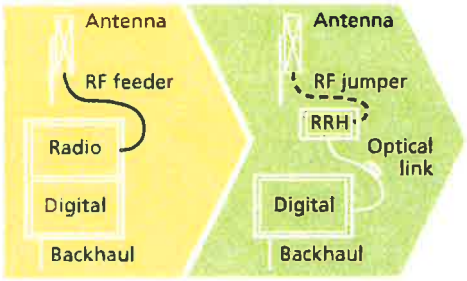
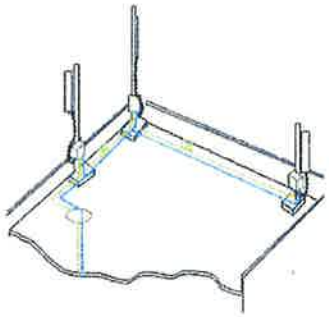


RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 390 mm (15.4 in.)
- Width: 380 mm (15 in.)
- Depth: 210 mm (8.2 in.)
- Weight (without mounting kit): less than 23 kg (50 lb)

Power

- Power supply: -48V

Operating environment

- Outdoor temperature range:
  - ¬ With solar load: -40°C to +50°C (-40°F to +122°F)
  - ¬ Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

RF characteristics

- Frequency band: 700 MHz; 3GPP Band 13
- Bandwidth: up to 10 MHz
- RF output power at antenna port:
  - ¬ 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way
- Noise figure: below 2.5 dB typical
- ALD features
  - ¬ TMA
  - ¬ Remote electrical tilt (RET) support (AISG v2.0)

Optical characteristics

Type/number of fibers

- Up to 3.12 Gb/s line bit rate
- Single-mode variant
  - ¬ One SM fiber (9/125 µm) per RRH2x, carrying UL and DL using CWDM (at 1550/1310 nm)
- Multi-mode variant
  - ¬ Two MM fibers (50/125 µm) per RRH2x: one carrying UL, the other carrying DL (at 850 nm)

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Alarms and ports

- Six external alarms
- Two optical ports to support daisy-chaining

Alcatel·Lucent

PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

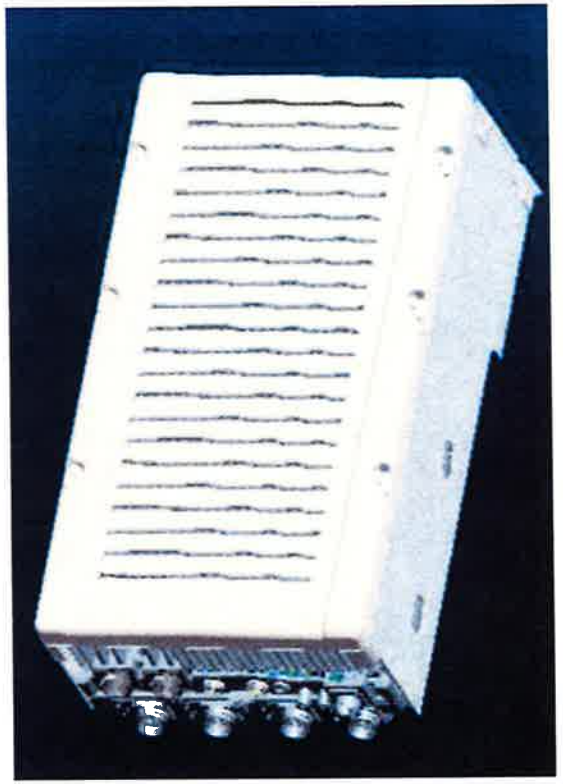
		RRH2x60
RF Output Power		2x60W
Instantaneous Bandwidth		20MHz
Transmitter		2 TX
Receiver	1900 HW version	2 Branch RX – LA6.0.1
	1900A HW version	4 Branch RX – LR13.3
Features		AISG 2.0 for RET/TMA
		Internal Smart Bias-T
Power		-48VDC
CPRI Ports		2 CPRI Rate 3 Ports
External Alarms		4 External User Alarms
Monitor Ports		TX
Environmental		GR487 Compliance
RF Connectors		7/16 DIN (top mounted)

** Not a Verizon Wireless deployed product

NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

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



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

Alcatel·Lucent

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
RRH2X60-AWS FOR BAND 4 APPLICATIONS

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

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

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

SUPERIOR RF PERFORMANCE

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

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

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

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

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

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

OPTIMIZED TCO

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

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

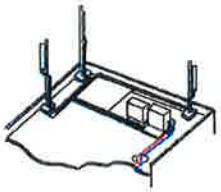
EASY INSTALLATION

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

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

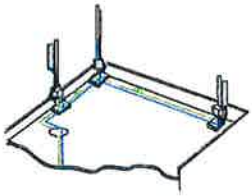
The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

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



Macro

RRH for space-constrained cell sites



Distributed

FEATURES

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

BENEFITS

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

TECHNICAL SPECIFICATIONS

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

Dimensions and weights

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

Electrical Data

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

RF Characteristics

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

Connectivity

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

Environmental specifications

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

Safety and Regulatory Data

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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

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

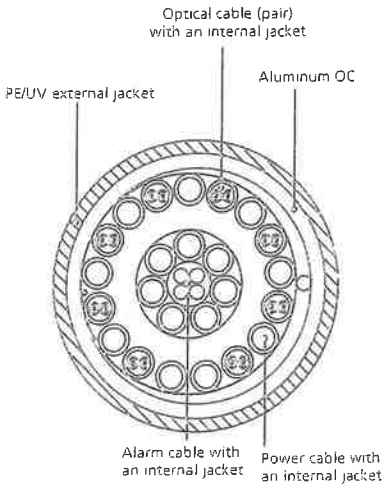


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 4

FDH Engineering, Inc., 6521 Meridien Drive, Raleigh, NC 27616, Ph. 919.755.1012, Fax 919.755.1031

Structural Analysis for AT&T Towers

99" Monopole Tower

Site Name: Old Saybrook Boston Post Rd
Site USID: 105130-A
Site FA#: 10133875
Carrier Project: Verizon Co-location 7-25-14

FDH Project Number 146DOJ1400 R1

Analysis Results

Tower Components	96.7%	Sufficient
Foundation	84.7%	Sufficient

Prepared By:

Chip DeVoto, EI
Project Engineer

Reviewed By:

Bradley R. Newman, PE
Senior Project Engineer
CT PE License No. 29630

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com

11/17/14

November 17, 2014

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut Building Code

TABLE OF CONTENTS

EXECUTIVE SUMMARY

At the request of AT&T Towers, FDH Engineering, Inc. performed a structural analysis of the existing self-supported tower located in Old Saybrook, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and the *2005 Connecticut Building Code (CBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, the member sizes, soil parameters and foundation dimensions was obtained from:

- Sabre Towers & Poles (Job No. 49722) Structural Design Report dated September 22, 2011
- Dr. Clarence Welti, P.E., P.C. (Site No. SR2597) Geotechnical Study dated June 1, 2011
- GPD Group (Project No. 2013723.13.105130.02 Rev. 1) Structural Analysis Report dated January 10, 2014
- All documents and photos acquired from AT&T Siterra
- AT&T Towers

The *basic design wind speed* per the *TIA/EIA-222-F* standards is 85 mph without ice and 37.6 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from Verizon in place at 85 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and the *2005 CBC* provided the **Recommendations** listed below are satisfied. Furthermore, given the existing foundation dimensions (see Sabre Towers & Poles Job No. 49722), and given soil parameters (see Dr. Clarence Welti, P.E., P.C. Site No. SR2597), the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and the *2005 CBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed feed line should be installed inside the pole's shaft
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 1 - Material Strength

Member Type	Yield Strength
Tower Shaft	65 ksi
Base Plate	50 ksi
Anchor Rods	75 ksi

Table 2 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 3** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 2 - Summary of Working Percentage of Structural Components

Section No.	Elevation (ft)	Component Type	Size	% Capacity*	Pass Fail
L1	99 – 48.5	Pole	TP34.15x22.14x0.25	84.9	Pass
L2	48.5 - 0	Pole	TP45.2x32.5203x0.3125	96.7	Pass
		Anchor Bolts	(12) 2.25" Ø on a 51.25" BC	81.1	Pass
		Base Plate	PL 49.75" Sq x 2.5" Thk	93.1	Pass

*Capacities include 1/3 allowable increase for wind per *TIA/EIA-222-F* standards.

Table 3 - Maximum Base Reactions

Load Type	Current Analysis* *(TIA/EIA-222-F)*
Axial	21 k
Shear	25 k
Moment	2,049 k

*Foundation adequate per independent analysis.
**There were two foundation types in the design document. Both types were analyzed and the controlling capacity is listed on the cover and first page of the report.

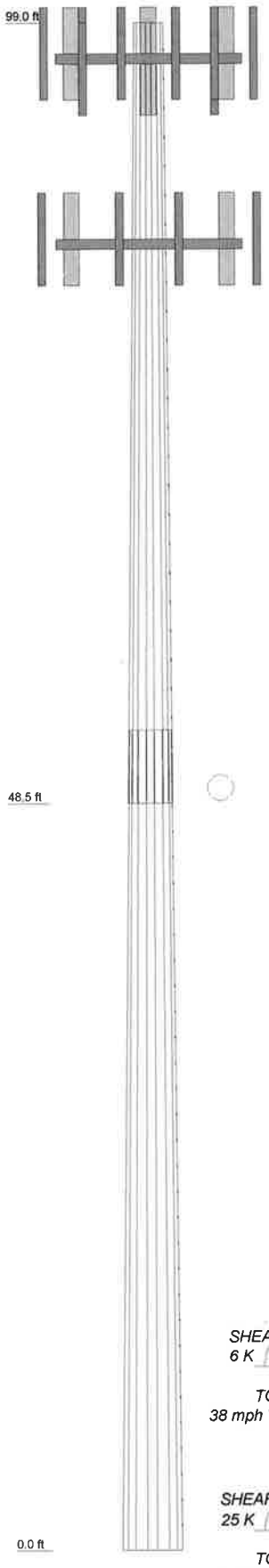
GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of AT&T Towers to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	50.50	18	0.2500	4.75	22.1400	34.1500	A572-65	3.8
2	53.25	18	0.3125		32.5203	45.2000		6.9

AXIAL
32 K

SHEAR
6 K

MOMENT
492 kip-ft

TORQUE 0 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
21 K

SHEAR
25 K

MOMENT
2049 kip-ft

TORQUE 1 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	99	(2) DTMABP7819VG12A TMA	97
AM-X-CD-16-65-00T-RET w/ Mount Pipe	97	(2) DTMABP7819VG12A TMA	97
AM-X-CD-16-65-00T-RET w/ Mount Pipe	97	(2) DTMABP7819VG12A TMA	97
AM-X-CD-16-65-00T-RET w/ Mount Pipe	97	(2) RRUS 11	97
(3) HPA-65R-BUU-H6 w/ Mount Pipe	97	(2) RRUS 11	97
(3) HPA-65R-BUU-H6 w/ Mount Pipe	97	(2) RRUS 11	97
(3) HPA-65R-BUU-H6 w/ Mount Pipe	97	DC6-48-60-18-8F	95
DTMABP7819VG12A TMA	97	DC6-48-60-18-8F	95
DTMABP7819VG12A TMA	97	DC6-48-60-18-8F	95
DTMABP7819VG12A TMA	97	Collar Mounts	95
(2) RRUS 11	97	(3) DC6-48-60-18-8F	95
(2) RRUS 11	97	RH_60W-PCS	85
(2) RRUS 11	97	RH_60W-PCS	85
(2) RRUS 12	97	RH_2x60-AWS	85
(2) RRUS 12	97	RH_2x60-AWS	85
(2) RRUS 12	97	RH_2x60-AWS	85
RRUS E2	97	DB-T1-6Z-8AB-0Z	85
RRUS E2	97	DB-T1-6Z-8AB-0Z	85
RRUS E2	97	Low Profile Platform Mount EEI P/N K10994A	85
RRUS-32	97	(2) HBXX-6517DS-VTM w/ Mount Pipe	85
RRUS-32	97	RH_2X40-700U	85
RRUS-32	97	RH_2X40-700U	85
(2) KRC 161 286/1 RRU A2 Module	97	RH_2X40-700U	85
(2) KRC 161 286/1 RRU A2 Module	97	(2) LNX-6515DS-VTM w/ Mount Pipe	85
(2) KRC 161 286/1 RRU A2 Module	97	(2) LNX-6515DS-VTM w/ Mount Pipe	85
(2) (6) 12.5' T-Arm Mounts	97	(2) LNX-6515DS-VTM w/ Mount Pipe	85
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	97	(2) HBXX-6517DS-VTM w/ Mount Pipe	85
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	97	(2) HBXX-6517DS-VTM w/ Mount Pipe	85
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	97	RH_60W-PCS	85

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 96.7%

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
Phone: (919) 755-1012
FAX: (919) 755-1031

Tower Analysis

Job: 105130-A Old Saybrook Boston Post			
Project: 146DOJ1400			
Client: AT&T Towers	Drawn by: Chip DeVoto, EI	App'd:	
Code: TIA/EIA-222-F	Date: 11/17/14	Scale: N	
Path:		Dwg No.	

Tower Analysis Summary Form

General Info

Site Name	Old Saybrook Boston Post Rd
Site Number	105130-A
FA Number	10133875
Date of Analysis	10/7/2014
Company Performing Analysis	FDH Engineering, inc.

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	
Tower Height (top of steel AGL)	99	
Tower Manufacturer	Sabre Towers & Poles	9/22/2011
Tower Model	-	
Tower Design	Sabre Towers & Poles	9/22/2011
Foundation Design	Sabre Towers & Poles	9/22/2011
Geotech Report	Dr. Clarence Welti, P.E., P.C.	6/1/2011
Tower Mapping	-	
Previous Structural Analysis	GPD Group	1/10/2014
Foundation Mapping	-	

Steel Yield Strength (ksi)

Pole	65
Tower Base	50
Anchor Rods	75

Design Parameters

Design Code Used	TIA/EIA-222-F 2005 Connecticut Building Code
Location of Tower (County, State)	Middlesex Co., CT
Basic Wind Speed (mph)	85
Ice Thickness (in)	0.75
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	96.7%
Base Plate (%)	93.1%
Foundation (%)	84.7%
Foundation Adequate?	Yes

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T Mobility	97	97	3	Panel	KMW	AM-X-CD-16-65-00T-RET	40/150/270	6	Site Pro	12.5' T-Arms	6	Unknown	1 5/8	Internal
AT&T Mobility	97	97	9	Panel	CCI	HPA-65R-BUU-H6	40/150/270			on same mount	6	DC Power	15.4 mm	Internal
AT&T Mobility	97	97	3	TMA	CCI	DTMABP7819VG12A				on same mount	1	Fiber	10 mm	Internal
AT&T Mobility	97	97	6	RRU	Ericsson	RRUS 11				on same mount				
AT&T Mobility	97	97	6	RRU	Ericsson	RRUS 12				on same mount				
AT&T Mobility	97	97	3	RRU	Ericsson	RRUS E2				on same mount				
AT&T Mobility	97	97	3	RRU	Ericsson	RRUS 32				on same mount				
AT&T Mobility	97	97	6	RRU	Ericsson	KRC 161 286-1 (A2 Module)				on same mount				
AT&T Mobility	95	95	3	Surge	Raycap	DC6-48-60-18-8F		1	Unknown	Collar Mount				

Note: Coax is installed inside the pole shaft

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
Verizon	85	85	6	Panel	Commscope	LNX-6515DS-VTM	30/150/270	1	EEI K10994A	Low Profile Platform	2		1 5/8	Internal
Verizon	85	85	6	Panel	Commscope	HBXX-6517DS-VTM	30/150/270			on same mount				
Verizon	85	85	3	RRH	ALU	RH_2x40-700U				on same mount				
Verizon	85	85	3	RRH	ALU	RH_60W-PCS				on same mount				
Verizon	85	85	3	RRH	ALU	RH_2x60-AWS				on same mount				
Verizon	85	85	2	Dist. Box	RFS	DB-T1-6Z-8AB-0Z				on same mount				

Note: Coax to be installed inside pole shaft

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T Mobility	97	96	9	Panel	KMW	AM-X-CD-16-65-00T-RET	40/150/270			on same mount	12	Unknown	1-5/8"	Internal
AT&T Mobility	97	96	6	TMA	CCI	DTMABP7819VG12A				on same mount	1	DC	15.4mm	Internal
AT&T Mobility	97	96	6	RRH	Ericsson	RRUS-11				on same mount	1	Fiber	10mm	
AT&T Mobility	95	95	3	Surge	Raycap	DC6-48-60-18-8F				Collar Mount				

NOTE: THIS FORM MUST BE SAVED AS EXCEL 97-2003 TO UPLOAD IN SITERRA

Tower Input Data

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

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	99.00-48.50	50.50	4.75	18	22.1400	34.1500	0.2500	1.0000	A572-65 (65 ksi)
L2	48.50-0.00	53.25		18	32.5203	45.2000	0.3125	1.2500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.4815	17.3697	1051.5300	7.7710	11.2471	93.4933	2104.4436	8.6865	3.4566	13.827
	34.6768	26.8996	3905.5615	12.0345	17.3482	225.1278	7816.2619	13.4524	5.5704	22.282
L2	34.1705	31.9462	4186.7736	11.4338	16.5203	253.4315	8379.0563	15.9761	5.1736	16.555
	45.8973	44.5228	11333.6722	15.9351	22.9616	493.5924	22682.2576	22.2656	7.4052	23.697

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 99.00-48.50				1	1	1		
L2 48.50-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	Surface Ar (CaAa)	99.00 - 0.00	1	1	0.000 0.000	0.3750		0.22

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
**								
LDF7-50A(1-5/8")	B	No	Inside Pole	97.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
15.4mm DC	B	No	Inside Pole	97.00 - 0.00	6	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
LDF2-50A(3/8")	B	No	Inside Pole	97.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
**								
HJ7-50A(1-5/8")	C	No	Inside Pole	85.00 - 0.00	2	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
						2" Ice	0.00	1.04
						4" Ice	0.00	1.04
**								
LDF7-50A(1-5/8")	B	No	Inside Pole	97.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
15.4mm DC	B	No	Inside Pole	97.00 - 0.00	1	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
LDF2-50A(3/8")	B	No	Inside Pole	97.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	99.00-48.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.77
		C	0.000	0.000	1.894	0.000	0.09
L2	48.50-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.77
		C	0.000	0.000	1.819	0.000	0.11

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	99.00-48.50	A	0.824	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.77
		C		0.000	0.000	10.220	0.000	0.15
L2	48.50-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.77
		C		0.000	0.000	9.815	0.000	0.17

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	99.00-48.50	0.0000	0.0561	0.0000	0.2687
L2	48.50-0.00	0.0000	0.0561	0.0000	0.2777

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod	A	From Leg	1.00 0.00 0.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.25 0.66 0.97 1.49 2.68	0.25 0.66 0.97 1.49 2.68	0.03 0.03 0.04 0.06 0.14
**									
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.09 7.71 8.28 9.45 11.92	5.68 6.69 7.51 9.18 12.75	0.06 0.12 0.18 0.34 0.77
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.09 7.71 8.28 9.45 11.92	5.68 6.69 7.51 9.18 12.75	0.06 0.12 0.18 0.34 0.77
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.09 7.71 8.28 9.45 11.92	5.68 6.69 7.51 9.18 12.75	0.06 0.12 0.18 0.34 0.77
(3) HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	8.11 9.30 10.21 12.17 16.35	0.08 0.16 0.25 0.46 1.02
(3) HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	8.11 9.30 10.21 12.17 16.35	0.08 0.16 0.25 0.46 1.02
(3) HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	8.11 9.30 10.21 12.17 16.35	0.08 0.16 0.25 0.46 1.02
DTMABP7819VG12A TMA	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
DTMABP7819VG12A TMA	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
DTMABP7819VG12A TMA	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
(2) RRUS 11	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) RRUS 11	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
(2) RRUS 11	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
(2) RRUS 12	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	0.06 0.08 0.11 0.17 0.34
(2) RRUS 12	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	0.06 0.08 0.11 0.17 0.34
(2) RRUS 12	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	0.06 0.08 0.11 0.17 0.34
RRUS E2	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.44 0.55 0.66 0.93 1.56	0.05 0.06 0.07 0.11 0.21
RRUS E2	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.44 0.55 0.66 0.93 1.56	0.05 0.06 0.07 0.11 0.21
RRUS E2	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.44 0.55 0.66 0.93 1.56	0.05 0.06 0.07 0.11 0.21
RRUS-32	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	0.08 0.10 0.14 0.21 0.41
RRUS-32	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	0.08 0.10 0.14 0.21 0.41
RRUS-32	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	0.08 0.10 0.14 0.21 0.41
(2) KRC 161 286/1 RRU A2 Module	A	From Leg	4.00 0.00	0.0000	97.00	No Ice 1/2" Ice	2.42 2.63	0.54 0.67	0.02 0.03

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 K
			0.00			1" Ice	2.85	0.82	0.05
						2" Ice	3.31	1.12	0.09
						4" Ice	4.34	1.85	0.20
(2) KRC 161 286/1 RRU A2 Module	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.42 2.63 2.85 3.31 4.34	0.54 0.67 0.82 1.12 1.85	0.02 0.03 0.05 0.09 0.20
(2) KRC 161 286/1 RRU A2 Module	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.42 2.63 2.85 3.31 4.34	0.54 0.67 0.82 1.12 1.85	0.02 0.03 0.05 0.09 0.20
(2) (6) 12.5' T-Arm Mounts	C	None		0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.59 15.44 19.29 26.99 42.39	11.59 15.44 19.29 26.99 42.39	0.77 0.99 1.21 1.64 2.50
**									
DC6-48-60-18-8F	A	From Leg	1.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40
DC6-48-60-18-8F	B	From Leg	1.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40
DC6-48-60-18-8F	C	From Leg	1.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40
Collar Mounts	C	None		0.0000	95.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
**									
(2) LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
(2) LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
(2) LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
(2) HBXX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	85.00	No Ice 1/2" Ice	8.98 9.65	6.96 8.18	0.07 0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	10.29	9.14	0.22
						2" Ice	11.59	11.02	0.40
						4" Ice	14.32	15.03	0.92
(2) HBXX-6517DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.98 9.65 10.29 11.59 14.32	6.96 8.18 9.14 11.02 15.03	0.07 0.14 0.22 0.40 0.92
(2) HBXX-6517DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.98 9.65 10.29 11.59 14.32	6.96 8.18 9.14 11.02 15.03	0.07 0.14 0.22 0.40 0.92
RH_2X40-700U	A	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.25 2.45 2.66 3.10 4.10	1.23 1.39 1.55 1.91 2.73	0.05 0.07 0.09 0.13 0.27
RH_2X40-700U	B	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.25 2.45 2.66 3.10 4.10	1.23 1.39 1.55 1.91 2.73	0.05 0.07 0.09 0.13 0.27
RH_2X40-700U	C	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.25 2.45 2.66 3.10 4.10	1.23 1.39 1.55 1.91 2.73	0.05 0.07 0.09 0.13 0.27
RH_60W-PCS	A	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.78 4.09 4.41 5.08 6.51	2.05 2.32 2.61 3.21 4.52	0.06 0.08 0.10 0.17 0.35
RH_60W-PCS	B	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.78 4.09 4.41 5.08 6.51	2.05 2.32 2.61 3.21 4.52	0.06 0.08 0.10 0.17 0.35
RH_60W-PCS	C	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.78 4.09 4.41 5.08 6.51	2.05 2.32 2.61 3.21 4.52	0.06 0.08 0.10 0.17 0.35
RH_2x60-AWS	A	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.35 2.56 2.79 3.26 4.31	1.53 1.72 1.92 2.34 3.29	0.04 0.06 0.08 0.13 0.27
RH_2x60-AWS	B	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.35 2.56 2.79 3.26 4.31	1.53 1.72 1.92 2.34 3.29	0.04 0.06 0.08 0.13 0.27
RH_2x60-AWS	C	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.35 2.56 2.79 3.26	1.53 1.72 1.92 2.34	0.04 0.06 0.08 0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.31	3.29	0.27
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
DB-T1-6Z-8AB-0Z	C	From Leg	4.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Low Profile Platform Mount EEI P/N K10994A	C	None		0.0000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.33 30.22 36.11 47.89 71.45	24.33 30.22 36.11 47.89 71.45	1.65 2.03 2.41 3.18 4.72
***									
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.09 7.71 8.28 9.45 11.92	5.68 6.69 7.51 9.18 12.75	0.06 0.12 0.18 0.34 0.77
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.09 7.71 8.28 9.45 11.92	5.68 6.69 7.51 9.18 12.75	0.06 0.12 0.18 0.34 0.77
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.09 7.71 8.28 9.45 11.92	5.68 6.69 7.51 9.18 12.75	0.06 0.12 0.18 0.34 0.77
(2) DTMABP7819VG12A TMA	A	From Leg	4.00 0.00 -1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
(2) DTMABP7819VG12A TMA	B	From Leg	4.00 0.00 -1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
(2) DTMABP7819VG12A TMA	C	From Leg	4.00 0.00 -1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
(2) RRUS 11	A	From Leg	4.00 0.00 -2.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
(2) RRUS 11	B	From Leg	4.00 0.00 -2.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) RRUS 11	C	From Leg	4.00 0.00 -2.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
(3) DC6-48-60-18-8F	A	From Leg	1.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40

Load Combinations

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

Comb. No.	Description
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	99 - 48.5	Pole	Max Tension	11	0.00	-0.00	-0.00
			Max. Compression	14	-21.11	0.47	0.44
			Max. Mx	11	-11.13	805.07	-1.70
			Max. My	2	-11.14	-1.72	804.11
			Max. Vy	11	-21.74	805.07	-1.70
			Max. Vx	2	-21.73	-1.72	804.11
			Max. Torque	4			0.75
L2	48.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.61	0.47	0.32
			Max. Mx	11	-20.50	2045.06	-4.84
			Max. My	2	-20.50	-4.85	2043.69
			Max. Vy	11	-24.84	2045.06	-4.84
			Max. Vx	2	-24.83	-4.85	2043.69
			Max. Torque	4			0.73

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	31.61	0.00	0.00
	Max. H_x	11	20.53	24.81	-0.06
	Max. H_z	2	20.53	-0.06	24.81
	Max. M_x	2	2043.69	-0.06	24.81
	Max. M_z	5	2044.69	-24.81	0.06
	Max. Torsion	4	0.72	-21.52	12.45
	Min. Vert	11	20.53	24.81	-0.06
	Min. H_x	5	20.53	-24.81	0.06
	Min. H_z	8	20.53	0.06	-24.81
	Min. M_x	8	-2043.30	0.06	-24.81
	Min. M_z	11	-2045.06	24.81	-0.06
	Min. Torsion	10	-0.72	21.52	-12.45

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	20.53	-0.00	-0.00	-0.19	0.18	0.00
Dead+Wind 0 deg - No Ice	20.53	0.06	-24.81	-2043.69	-4.85	-0.42
Dead+Wind 30 deg - No Ice	20.53	12.46	-21.51	-1772.46	-1026.64	-0.66
Dead+Wind 60 deg - No Ice	20.53	21.52	-12.45	-1026.32	-1773.29	-0.72
Dead+Wind 90 deg - No Ice	20.53	24.81	-0.06	-5.22	-2044.69	-0.59

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 120 deg - No Ice	20.53	21.46	12.35	1017.22	-1768.27	-0.30
Dead+Wind 150 deg - No Ice	20.53	12.36	21.45	1767.06	-1017.93	0.07
Dead+Wind 180 deg - No Ice	20.53	-0.06	24.81	2043.30	5.21	0.42
Dead+Wind 210 deg - No Ice	20.53	-12.46	21.51	1772.08	1027.00	0.66
Dead+Wind 240 deg - No Ice	20.53	-21.52	12.45	1025.93	1773.65	0.72
Dead+Wind 270 deg - No Ice	20.53	-24.81	0.06	4.84	2045.06	0.59
Dead+Wind 300 deg - No Ice	20.53	-21.46	-12.35	-1017.61	1768.63	0.30
Dead+Wind 330 deg - No Ice	20.53	-12.36	-21.45	-1767.45	1018.29	-0.07
Dead+Ice+Temp	31.61	-0.00	-0.00	-0.32	0.47	0.00
Dead+Wind 0 deg+Ice+Temp	31.61	0.01	-5.80	-491.04	-0.54	-0.10
Dead+Wind 30 deg+Ice+Temp	31.61	2.91	-5.03	-425.82	-245.89	-0.14
Dead+Wind 60 deg+Ice+Temp	31.61	5.03	-2.91	-246.60	-425.22	-0.15
Dead+Wind 90 deg+Ice+Temp	31.61	5.80	-0.01	-1.40	-490.47	-0.12
Dead+Wind 120 deg+Ice+Temp	31.61	5.01	2.89	244.08	-424.17	-0.05
Dead+Wind 150 deg+Ice+Temp	31.61	2.89	5.01	424.07	-244.07	0.03
Dead+Wind 180 deg+Ice+Temp	31.61	-0.01	5.80	490.34	1.56	0.10
Dead+Wind 210 deg+Ice+Temp	31.61	-2.91	5.03	425.12	246.91	0.14
Dead+Wind 240 deg+Ice+Temp	31.61	-5.03	2.91	245.90	426.23	0.15
Dead+Wind 270 deg+Ice+Temp	31.61	-5.80	0.01	0.70	491.49	0.12
Dead+Wind 300 deg+Ice+Temp	31.61	-5.01	-2.89	-244.78	425.18	0.05
Dead+Wind 330 deg+Ice+Temp	31.61	-2.89	-5.01	-424.77	245.09	-0.03
Dead+Wind 0 deg - Service	20.53	0.03	-12.36	-1019.30	-2.33	-0.21
Dead+Wind 30 deg - Service	20.53	6.21	-10.72	-884.02	-511.89	-0.33
Dead+Wind 60 deg - Service	20.53	10.72	-6.21	-511.93	-884.26	-0.36
Dead+Wind 90 deg - Service	20.53	12.36	-0.03	-2.70	-1019.61	-0.30
Dead+Wind 120 deg - Service	20.53	10.69	6.16	507.18	-881.73	-0.15
Dead+Wind 150 deg - Service	20.53	6.16	10.69	881.12	-507.54	0.03
Dead+Wind 180 deg - Service	20.53	-0.03	12.36	1018.91	2.69	0.21
Dead+Wind 210 deg - Service	20.53	-6.21	10.72	883.65	512.26	0.33
Dead+Wind 240 deg - Service	20.53	-10.72	6.21	511.53	884.60	0.36
Dead+Wind 270 deg - Service	20.53	-12.36	0.03	2.31	1019.97	0.30
Dead+Wind 300 deg - Service	20.53	-10.69	-6.16	-507.58	882.11	0.15
Dead+Wind 330 deg - Service	20.53	-6.16	-10.69	-881.53	507.92	-0.03

Solution Summary

Load Comb.	Sum of Applied Forces PX	PY	PZ	Sum of Reactions PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-20.53	0.00	0.00	20.53	0.00	0.000%
2	0.06	-20.53	-24.81	-0.06	20.53	24.81	0.002%
3	12.46	-20.53	-21.51	-12.46	20.53	21.51	0.000%
4	21.52	-20.53	-12.45	-21.52	20.53	12.45	0.000%
5	24.81	-20.53	-0.06	-24.81	20.53	0.06	0.002%
6	21.46	-20.53	12.35	-21.46	20.53	-12.35	0.000%
7	12.36	-20.53	21.45	-12.36	20.53	-21.45	0.000%
8	-0.06	-20.53	24.81	0.06	20.53	-24.81	0.002%
9	-12.46	-20.53	21.51	12.46	20.53	-21.51	0.000%
10	-21.52	-20.53	12.45	21.52	20.53	-12.45	0.000%
11	-24.81	-20.53	0.06	24.81	20.53	-0.06	0.002%
12	-21.46	-20.53	-12.35	21.46	20.53	12.35	0.000%
13	-12.36	-20.53	-21.45	12.36	20.53	21.45	0.000%
14	0.00	-31.61	0.00	0.00	31.61	0.00	0.000%
15	0.01	-31.61	-5.80	-0.01	31.61	5.80	0.001%
16	2.91	-31.61	-5.03	-2.91	31.61	5.03	0.001%
17	5.03	-31.61	-2.91	-5.03	31.61	2.91	0.001%
18	5.80	-31.61	-0.01	-5.80	31.61	0.01	0.001%
19	5.01	-31.61	2.89	-5.01	31.61	-2.89	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
20	2.89	-31.61	5.01	-2.89	31.61	-5.01	0.001%
21	-0.01	-31.61	5.80	0.01	31.61	-5.80	0.001%
22	-2.91	-31.61	5.03	2.91	31.61	-5.03	0.001%
23	-5.03	-31.61	2.91	5.03	31.61	-2.91	0.001%
24	-5.80	-31.61	0.01	5.80	31.61	-0.01	0.001%
25	-5.01	-31.61	-2.89	5.01	31.61	2.89	0.001%
26	-2.89	-31.61	-5.01	2.89	31.61	5.01	0.001%
27	0.03	-20.53	-12.36	-0.03	20.53	12.36	0.001%
28	6.21	-20.53	-10.72	-6.21	20.53	10.72	0.001%
29	10.72	-20.53	-6.21	-10.72	20.53	6.21	0.000%
30	12.36	-20.53	-0.03	-12.36	20.53	0.03	0.001%
31	10.69	-20.53	6.16	-10.69	20.53	-6.16	0.001%
32	6.16	-20.53	10.69	-6.16	20.53	-10.69	0.001%
33	-0.03	-20.53	12.36	0.03	20.53	-12.36	0.001%
34	-6.21	-20.53	10.72	6.21	20.53	-10.72	0.000%
35	-10.72	-20.53	6.21	10.72	20.53	-6.21	0.001%
36	-12.36	-20.53	0.03	12.36	20.53	-0.03	0.001%
37	-10.69	-20.53	-6.16	10.69	20.53	6.16	0.000%
38	-6.16	-20.53	-10.69	6.16	20.53	10.69	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	10	0.00000001	0.00007791
3	Yes	12	0.00000001	0.00005039
4	Yes	12	0.00000001	0.00005235
5	Yes	10	0.00000001	0.00008363
6	Yes	12	0.00000001	0.00005023
7	Yes	12	0.00000001	0.00005059
8	Yes	10	0.00000001	0.00008036
9	Yes	12	0.00000001	0.00005220
10	Yes	12	0.00000001	0.00005031
11	Yes	10	0.00000001	0.00008007
12	Yes	12	0.00000001	0.00005123
13	Yes	12	0.00000001	0.00005080
14	Yes	6	0.00000001	0.00000001
15	Yes	10	0.00000001	0.00008161
16	Yes	10	0.00000001	0.00010484
17	Yes	10	0.00000001	0.00010595
18	Yes	10	0.00000001	0.00008142
19	Yes	10	0.00000001	0.00010406
20	Yes	10	0.00000001	0.00010419
21	Yes	10	0.00000001	0.00008132
22	Yes	10	0.00000001	0.00010590
23	Yes	10	0.00000001	0.00010487
24	Yes	10	0.00000001	0.00008173
25	Yes	10	0.00000001	0.00010540
26	Yes	10	0.00000001	0.00010517
27	Yes	10	0.00000001	0.00005757
28	Yes	10	0.00000001	0.00014614
29	Yes	11	0.00000001	0.00004257
30	Yes	10	0.00000001	0.00005840
31	Yes	10	0.00000001	0.00014690
32	Yes	10	0.00000001	0.00014941

33	Yes	10	0.00000001	0.00005776
34	Yes	11	0.00000001	0.00004231
35	Yes	10	0.00000001	0.00014556
36	Yes	10	0.00000001	0.00005808
37	Yes	11	0.00000001	0.00004100
38	Yes	11	0.00000001	0.00004025

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	99 - 48.5	27.021	35	2.2993	0.0032
L2	53.25 - 0	8.003	35	1.3997	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
99.00	Lightning Rod	35	27.021	2.2993	0.0033	13684
97.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	35	26.068	2.2630	0.0031	13684
95.00	DC6-48-60-18-8F	35	25.115	2.2267	0.0030	13684
85.00	(2) LNX-6515DS-VTM w/ Mount Pipe	35	20.424	2.0434	0.0025	4887

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	99 - 48.5	54.107	10	4.6072	0.0064
L2	53.25 - 0	16.039	10	2.8056	0.0020

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
99.00	Lightning Rod	10	54.107	4.6072	0.0066	6889
97.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	10	52.198	4.5346	0.0063	6889
95.00	DC6-48-60-18-8F	10	50.292	4.4619	0.0061	6889
85.00	(2) LNX-6515DS-VTM w/ Mount Pipe	10	40.902	4.0949	0.0050	2459

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	99 - 48.5 (1)	TP34.15x22.14x0.25	50.50	0.00	0.0	39.000	26.0033	-11.13	1014.13	0.011
L2	48.5 - 0 (2)	TP45.2x32.5203x0.3125	53.25	0.00	0.0	39.000	44.5228	-20.50	1736.39	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	99 - 48.5 (1)	TP34.15x22.14x0.25	806.35	46.007	39.000	1.180	0.00	0.000	39.000	0.000
L2	48.5 - 0 (2)	TP45.2x32.5203x0.3125	2048.99	49.814	39.000	1.277	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	99 - 48.5 (1)	TP34.15x22.14x0.25	21.79	0.838	26.000	0.064	0.74	0.020	26.000	0.001
L2	48.5 - 0 (2)	TP45.2x32.5203x0.3125	24.89	0.559	26.000	0.043	0.72	0.009	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	99 - 48.5 (1)	0.011	1.180	0.000	0.064	0.001	1.192 ✔	1.333	H1-3+VT ✔
L2	48.5 - 0 (2)	0.012	1.277	0.000	0.043	0.000	1.290 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	99 - 48.5	Pole	TP34.15x22.14x0.25	1	-11.13	1351.84	89.4	Pass
L2	48.5 - 0	Pole	TP45.2x32.5203x0.3125	2	-20.50	2314.61	96.7	Pass
							Summary	
						Pole (L2)	96.7	Pass
						RATING =	**96.7**	**Pass**

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Site ID: *105130-A*
Site Name: *Old Saybrook Boston Post*
Job No. *146DOJ1400*

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	51.25	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	49.75	in
Thick:	2.5	in
Grade:	50	ksi
Clip Distance:	8	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	45.2	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2049	ft-kips
Unfactored Axial, P:	21	kips
Unfactored Shear, V:	25	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	158.2 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	81.1% Pass

Base Plate Results Flexural Check

Base Plate Stress:	46.5 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	93.1% Pass

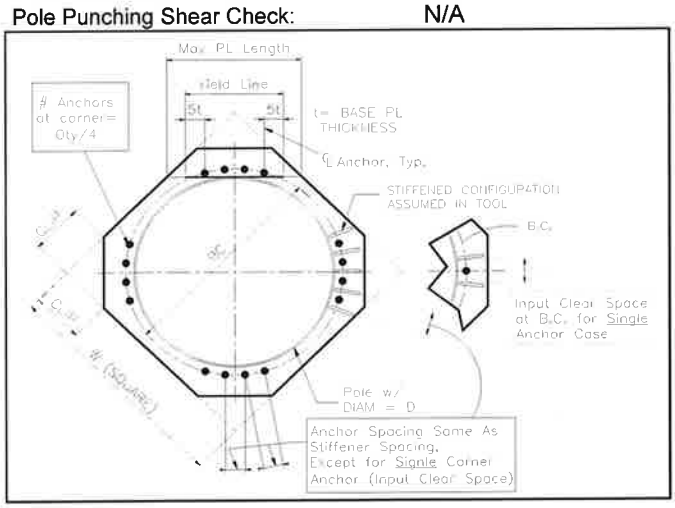
PL Ref. Data	
Yield Line (in):	25.16
Max PL Length:	25.16

N/A - Unstiffened
Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

Site ID: *105130-A*
Site Name: *Old Saybrook Boston Post Rd*
Job No.: *146DOJ1400*

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	6	ft
Pad Thickness, T:	1.5	ft
Pad Width=Length, L:	20.5	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	6	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	28.27	ft^2
Pier Height:	5.00	ft
Soil (above pad) Height:	4.50	ft

Soil Parameters		
Unit Weight, γ:	125.0	pcf
Ultimate Bearing Capacity, qn:	8.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	34.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	6.00	ksf
Passive Pres. Coeff., Kp	3.54	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	33.8	kips
Pad Force Location Above D:	0.71	ft
ϕ(Passive Pressure Moment):	24.11	ft-kips
Factored O.T. M(WL), "1.6W":	2994.0	ft-kips
Factored OT (MW-Msoil), M1	2969.86	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	3.04	ft
Sum of Soil Wedges Wt:	46.27	kips
Soil Wedges ecc, K1:	6.66	ft
Ftg+Soil above Pad wt:	336.2	kips
Unfactored (Total ftg-soil Wt):	382.52	kips
1.2D. **No Soil Wedges.**	428.70	kips
0.9D. **With Soil Wedges**	363.17	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	21	kips
Unfactored WL Axial, PW:		kips
Unfactored WL Shear, V:	25	kips
Unfactored WL Moment, M:	2049	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	25.2	kips
0.90	0.9D+1.6W, Pu:	18.9	kips
1.35	Vu:	33.75	kips
	Mu:	2766.15	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	428.70	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	2969.86	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	6.93	ft
Orthogonal qu=	3.15	ksf
qu/ϕ*qn Ratio=	**52.45%**	Pass

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	4.90	ft
Diagonal qu=	3.74	ksf
qu/ϕ*qn Ratio=	**62.36%**	Pass

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	363.17	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	2692.45	ft-kips

Orthogonal ecc3 = M2/P2 =	7.41	ft
Ortho Non Bearing Length,NBL=	14.83	ft
Orthogonal qu=	3.12	ksf
Diagonal qu=	3.62	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	2049.00		
M Orthogonal:	2418.99	**84.70%**	Pass
M Diagonal:	2418.99	**84.70%**	Pass

```
*************************************************************************************************
*                                                                                               *
* CAISSON - Pier Foundations Analysis and Design -  Copyright Power Line Systems, Inc. 1993-2010 *
*                                                                                               *
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```

Project Title: 105130-A Old Saybrook Boston Post
Project Notes: 146DOJ1400

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
6.00	0.50	4.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.00	0.00	125.0			
2	Sand	2.00	3.00	125.0		3.537	34.00
3	Sand	25.00	5.00	65.0		3.537	34.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure	
2049.0	21.0	25.00	5.52	SOIL CAPACITY = 2.00/5.52 = 36.2%

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
30.500	129.355	742.7	4575.0	5317.7

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	3.00	125.0			0.00	2.00
Sand	3.50	2.00	125.0		3.537	63.67	4.58
Sand	5.50	16.14	65.0		3.537	1181.44	14.80
Sand	21.64	8.86	65.0		3.537	-1106.55	26.29

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)	
0.00	138.6	11313.0	25.1	2049.5	
3.05	138.6	11735.6	25.1	2126.0	
6.10	50.3	12054.3	9.1	2183.8	MAX
9.15	-97.9	11991.5	-17.7	2172.4	
12.20	-284.6	11417.9	-51.6	2068.5	
15.25	-509.8	10216.3	-92.3	1850.8	
18.30	-773.4	8269.2	-140.1	1498.0	
21.35	-1075.6	5459.2	-194.9	989.0	
24.40	-796.8	2508.6	-144.4	454.5	
27.45	-417.7	646.7	-75.7	117.2	
30.50	0.0	0.0	0.0	0.0	

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *105130-A*
Site Name: *Old Saybrook Boston Post*
App #:

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	2183.8	ft-kips (* Note)
Max. Service Shaft P:	21	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.30	Mu:	2838.94	ft-kips
1.30	Pu:	27.3	kips

Pier Properties

Concrete:

Pier Diameter =	6.0	ft
Concrete Area =	4071.5	in^2

Reinforcement:

Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	4	
Vert. Cage Diameter =	5.31	ft
Vert. Cage Diameter =	63.73	in
Vertical Bar Size =	10	
Bar Diameter =	1.27	in
Bar Area =	1.27	in^2
Number of Bars =	34	
As Total=	43.18	in^2
A s/ Aconc, Rho:	0.0106	1.06%

Material Properties		
Concrete Comp. strength, f'c =	4000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2005	
Seismic Properties		
Seismic Design Category =	B	
Seismic Risk =	**Low**	

Solve (Run) <-- Press Upon Completing All Input

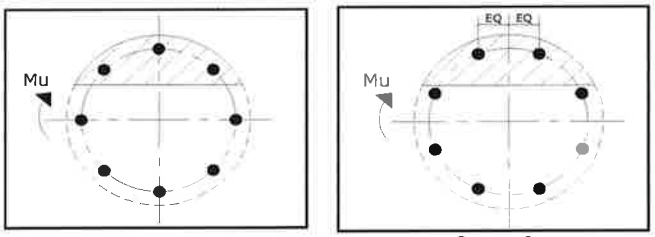
ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0032
200 / Fy:	0.0033

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis:	**13.50**	in
Extreme Steel Strain, εt:	**0.0121**	
	εt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	1.06%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8469.29	kips
at Mu=(ϕ=0.65)Mn=	4391.09	ft-kips
Max Tu, (φ=0.9) Tn =	2331.72	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	27.30	kips
Drilled Shaft Moment Capacity, φMn:	**5625.12**	ft-kips
Drilled Shaft Superimposed Mu:	**2838.94**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**50.5%**

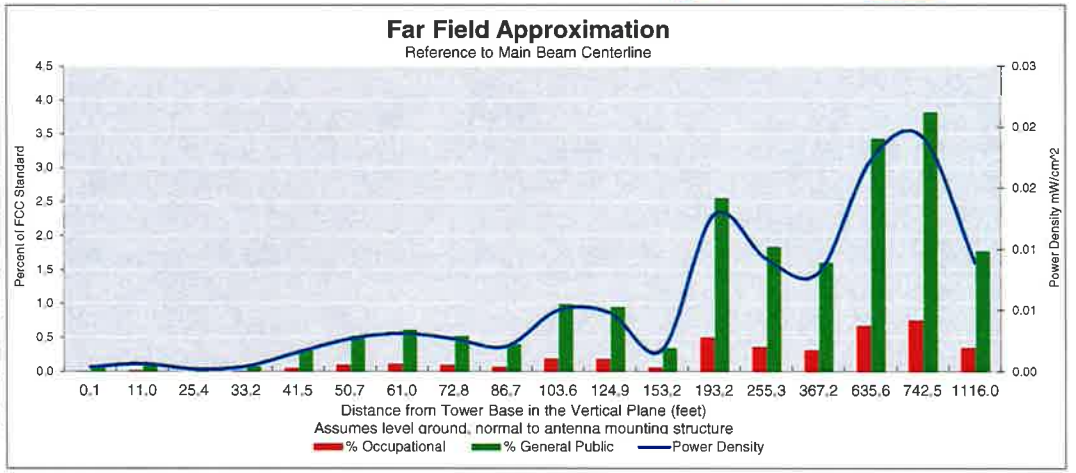
ATTACHMENT 5

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole/Wire/Yagi Antenna Types

verizonwireless

Location:	**OLD SAYBROOK 2 CT**
Site #:	2-0525
Date:	10/01/14
Name:	Jaime Laredo
File Name:	OLD SAYBROOK 2 CT - FF POWER (LTE-700).xlsx

Operating Freq. (MHz):	**751.0**
Antenna Height (ft):	**81.0**
Antenna Gain (dBi):	**16.7**
Antenna Size (in.):	**96.3**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
ERP (w):	**1086.9**
Number of Channels:	**1**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	78.0	78.8	82.0	84.8	88.4	93.0	99.0	106.7	116.6	129.7	147.3	171.9	208.3	266.9	375.3	640.4	746.6	1118.7
Distance from Antenna Structure Base in Horizontal plane	0.1	11.0	25.4	33.2	41.5	50.7	61.0	72.8	86.7	103.6	124.9	153.2	193.2	255.3	367.2	635.6	742.5	1116.0
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.01
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.5	0.4	0.3	0.7	0.8	0.4
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.3	0.5	0.6	0.5	0.4	1.0	1.0	0.4	2.6	1.8	1.6	3.4	3.8	1.8

Antenna Type: **LNX-6515DS-A1M_2DT_750MHZ**

Max%: **3.83%**

Instructions:

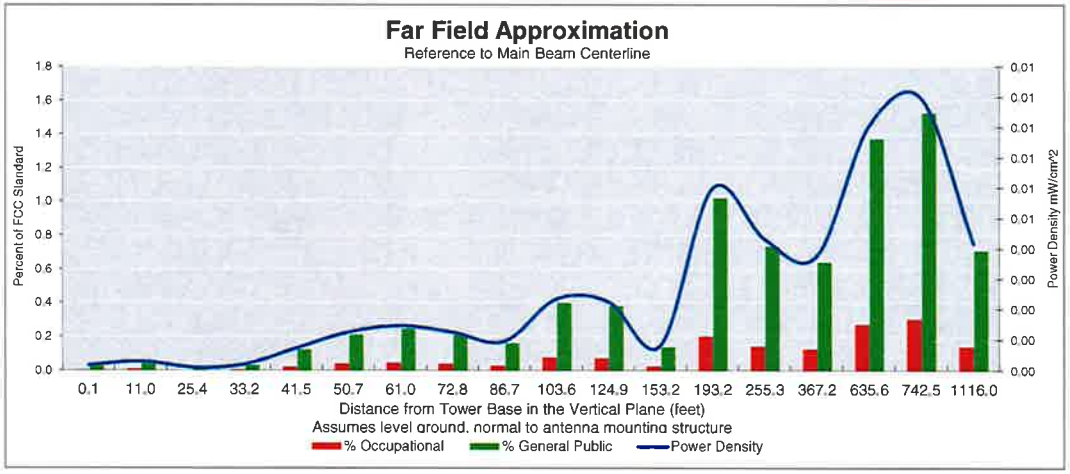
1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Power (in watts).
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole/Wire/Yagi Antenna Types

verizonwireless

Location:	**OLD SAYBROOK 2 CT**
Site #:	2-0525
Date:	10/01/14
Name:	Jaime Laredo
File Name:	OLD SAYBROOK 2 CT - FF POWER (Cellular).xlsx

Operating Freq. (MHz):	**878.5**
Antenna Height (ft):	**81.0**
Antenna Gain (dBi):	**17.1**
Antenna Size (in.):	**96.3**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
ERP (w):	**466.9**
Number of Channels:	**9**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	78.0	78.8	82.0	84.8	88.4	93.0	99.0	106.7	116.6	129.7	147.3	171.9	208.3	266.9	375.3	640.4	746.6	1118.7
Distance from Antenna Structure Base in Horizontal plane	0.1	11.0	25.4	33.2	41.5	50.7	61.0	72.8	86.7	103.6	124.9	153.2	193.2	255.3	367.2	635.6	742.5	1116.0
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.3	0.3	0.1
Percent of General Population Standard	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.4	0.4	0.1	1.0	0.7	0.6	1.4	1.5	0.7

Antenna Type: **LNX-6515DS-A1M_2DT_850MHZ**

Max%: **1.53%**

Instructions:

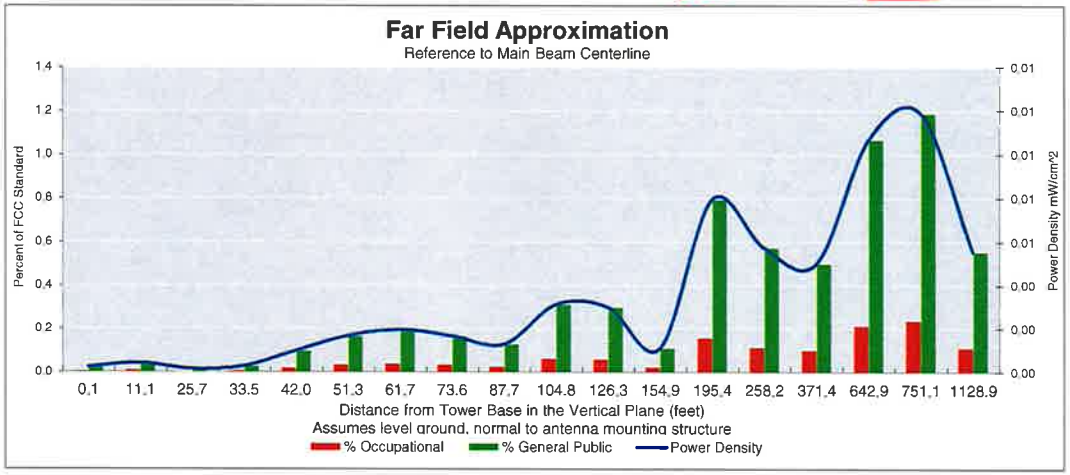
1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Power (in watts).
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole/Wire/Yagi Antenna Types

verizonwireless

Location:	**OLD SAYBROOK 2 CT**
Site #:	2-0525
Date:	10/01/14
Name:	Jaime Laredo
File Name:	OLD SAYBROOK 2 CT - FF POWER (PCS).xlsx

Operating Freq. (MHz):	**1973.8**
Antenna Height (ft):	**81.9**
Antenna Gain (dBi):	**18.5**
Antenna Size (in.):	**74.9**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
ERP (w):	**457.5**
Number of Channels:	**11**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	78.9	79.7	83.0	85.7	89.4	94.1	100.2	107.9	118.0	131.2	149.0	173.9	210.7	270.0	379.7	647.7	755.2	1131.7
Distance from Antenna Structure Base in Horizontal plane	0.1	11.1	25.7	33.5	42.0	51.3	61.7	73.6	87.7	104.8	126.3	154.9	195.4	258.2	371.4	642.9	751.1	1128.9
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.1
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.8	0.6	0.5	1.1	1.2	0.6

Antenna Type: **HBXX-6517DS-A2M_PORT 3 - +45_02DT_1920**

Max%: **1.19%**

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Power (in watts).
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

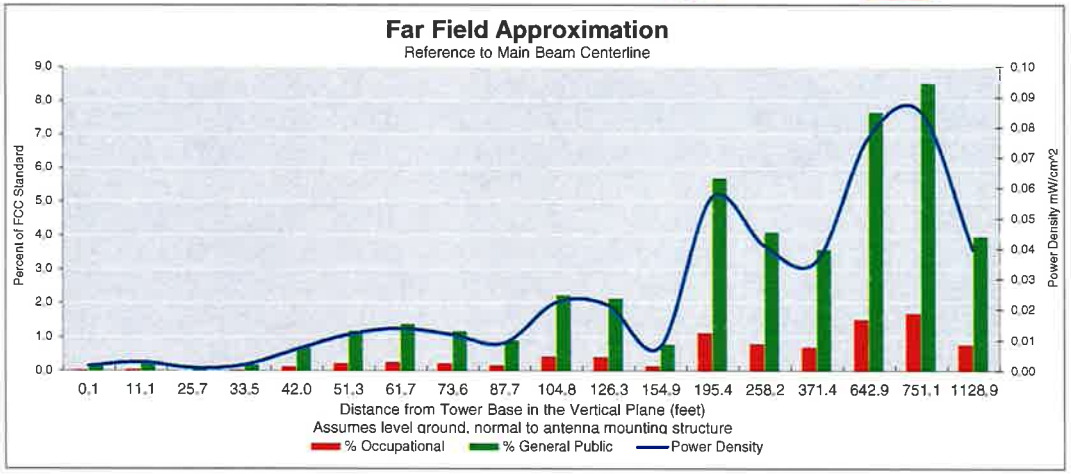
Far Field Approximation
with downtilt variation

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole/Wire/Yagi Antenna Types

verizonwireless

Location:	**OLD SAYBROOK 2 CT**
Site #:	2-0525
Date:	10/01/14
Name:	Jaime Laredo
File Name:	OLD SAYBROOK 2 CT - FF POWER (LTE-AWS).xlsx

Operating Freq. (MHz):	**2120.0**
Antenna Height (ft):	**81.9**
Antenna Gain (dBi):	**19.2**
Antenna Size (in.):	**74.9**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
ERP (w):	**2811.6**
Number of Channels:	**1**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	78.9	79.7	83.0	85.7	89.4	94.1	100.2	107.9	118.0	131.2	149.0	173.9	210.7	270.0	379.7	647.7	755.2	1131.7
Distance from Antenna Structure Base in Horizontal plane	0.1	11.1	25.7	33.5	42.0	51.3	61.7	73.6	87.7	104.8	126.3	154.9	195.4	258.2	371.4	642.9	751.1	1128.9
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dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.06	0.04	0.04	0.08	0.09	0.04
Percent of Occupational Standard	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.4	0.4	0.2	1.1	0.8	0.7	1.5	1.7	0.8
Percent of General Population Standard	0.2	0.3	0.1	0.2	0.7	1.2	1.4	1.2	0.9	2.2	2.1	0.8	5.7	4.1	3.6	7.7	8.5	4.0

Antenna Type: **HBXX-6517DS-A2M_PORT 3 - +45_02DT_2110**

Max%: **8.53%**

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Power (in watts).
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5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

ATTACHMENT 6

Robinson + Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

June 10, 2015

Via Certificate of Mailing

Carl P. Fortuna, Jr., First Selectman
Town of Old Saybrook
302 Main Street
Old Saybrook, CT 06475

Re: **Proposed Installation of a Small Cell Telecommunications Facility at 1363 Boston Post Road, Old Saybrook, Connecticut**

Dear Mr. Fortuna:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to share the wireless telecommunications facility at 1363 Boston Post Road in Old Saybrook (the "Property"). Cellco will install a total of twelve (12) antennas and nine (9) remote radio heads attached at the 85-foot level of the existing 99-foot tower at the Property. Equipment associated with Cellco's antennas will be housed in a 12' x 26' shelter located within the existing tower compound. Cellco will also install a 1,000 gallon propane tank within the tower compound to fuel its generator.

As presented in the Sub-Petition, the proposed Cellco facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent a copy of this Sub-Petition.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment
Copy to:
Tim Parks

Robinson + Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

June 10, 2015

Via Certificate of Mailing

Wilcox Family LLC
26 Quarry Street
Old Saybrook, CT 06475

Re: **Proposed Installation of a Small Cell Telecommunications Facility at 1363 Boston Post Road, Old Saybrook, Connecticut**

Dear Sir of Madam:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to share the wireless telecommunications facility at 1363 Boston Post Road in Old Saybrook (the "Property"). Cellco will install a total of twelve (12) antennas and nine (9) remote radio heads attached at the 85-foot level of the existing 99-foot tower at the Property. Equipment associated with Cellco's antennas will be housed in a 12' x 26' shelter located within the existing tower compound. Cellco will also install a 1,000 gallon propane tank within the tower compound to fuel its generator.

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Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment
Copy to:
Tim Parks

ATTACHMENT 7

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

June 10, 2015

Via Certificate of Mailing

«Name_and_Address»

Re: **Proposed Installation of a Small Cell Telecommunications Facility at 1363 Boston Post Road, Old Saybrook, Connecticut**

Dear «Salutation»:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to share the wireless telecommunications facility at 1363 Boston Post Road in Old Saybrook (the "Property"). Cellco will install a total of twelve (12) antennas and nine (9) remote radio heads attached at the 85-foot level of the existing 99-foot tower at the Property. Equipment associated with Cellco's antennas will be housed in a 12' x 26' shelter located within the existing tower compound. Cellco will also install a 1,000 gallon propane tank within the tower compound to fuel its generator.

The facility improvements constitute a eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation Act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the Sub-Petition.

This notice is being sent to you because you are listed as an owner of land that abuts the Property. If you have any questions regarding the Sub-Petition, the Council's process for reviewing the Sub-Petition or the details of the filing itself, please feel free to contact me at the number listed above. You may also contact the Council directly at 860-827-2935.

Sincerely,

Kenneth C. Baldwin

Attachment
Copy to:
Tim Parks

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS

ABUTTERS LIST

MAP 27/LOT 23

1363 BOSTON POST ROAD
OLD SAYBROOK, CONNECTICUT

	Map/Lot	Property Address	Owner and Mailing Address
1.		Railroad	State of Connecticut Department of Transportation Rail Division 2800 Berlin Turnpike Newington, CT 06111
2.	26/15	1375 Boston Post Road	Sandy Point LC 144 Sandy Point Road Old Saybrook, CT 06475
3.	26/14	1379 Boston Post Road	Hollyhead Limited Partnership 31 Pettipaug Avenue Old Saybrook, CT 06475
4.	26/12	1381 Boston Post Road	Vandana K. and Khiman K. Pursnani P.O. Box 3115 Milford, CT 06460
5.	27/21	1400 Boston Post Road	C&J Atlantic LLC 1400 Boston Post Road Old Saybrook, CT 06475
6.	27/19	1370 Boston Post Road	Paul L. Bobinski 14 Hopkins Drive Niantic, CT 06357
7.	27/24	1333 Boston Post Road	Manvel Pata and Ronald Rossetti 78 Bassett Road North Haven, CT 06473
8.	27/24-1	1325 Boston Post Road	Charles E. Adelmann and Kevin P. Kelly, Et Al P.O. Box 275 Centerbrook, CT 06409
9.	27/29	35 Schoolhouse Road	James J. Bohan 35 Schoolhouse Road Old Saybrook, CT 06475

	Map/Lot	Property Address	Owner and Mailing Address
10.	27/30	39 Schoolhouse Road	Scott E. and Darlene M. Lisle 39 Schoolhouse Road Old Saybrook, CT 06475
11.	27/23-1	45 Schoolhouse Road	Cubesmart LP PTA CS# 666 P.O. Box 320099 Alexandria, VA 22320