STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
A SUB-PETITION OF CELLCO	:	SUB-PETITION NO. 1133
PARTNERSHIP D/B/A VERIZON WIRELESS	:	355 NEW LONDON ROAD
FOR THE SHARED USE OF AN EXISTING	:	COLCHESTER, CT
WIRELESS TELECOMMUNICATIONS	:	
FACILITY AT 355 NEW LONDON ROAD,	:	
COLCHESTER, CONNECTICUT	:	JULY 12, 2016

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

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-14-153) 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 installation of a single canister antenna and related telecommunications equipment at the existing wireless telecommunications base station at 355 New London Road (Route 85) in Colchester, Connecticut (the "Property") constitutes an Eligible Facilities Request ("EFR") under the FCC Order. Cellco has designated this site as its "Colchester South 2 Facility".

II. Factual Background

The Property is a 36.1-acre parcel owned by M & J Auto Recycling Inc. The Property is zoned R-60 and is used for automobile recycling purposes and school bus parking/storage. The Property is surrounded by commercial and residential uses along New London Road and Dutton

Road. *See* Attachment 1 – Site Vicinity Map and Site Schematic (Aerial Photograph). American Tower Corporation ("ATC") owns and maintains a 180-foot monopole tower in the central portion of the Property. The tower is currently shared by Sprint, with antennas at the 180-foot level, and AT&T, with antennas at the 150-foot level. Equipment associated with the Sprint and AT&T antennas is located in a fenced compound area near the base of the tower, within a 100' x 100' leased parcel. According to limited information available in the Town records, building permits for the tower were issued in August of 1998. There is no record of any corresponding zoning approvals in the Town's files.

III. Proposed Colchester South 2 Facility

Cellco is licensed to provide wireless telecommunications services in the 850 MHz, 1900 MHz, 700 MHz and 2100 MHz frequency ranges in Colchester and throughout the State of Connecticut. The proposed Colchester South 2 Facility described in this filing will provide service and is designed to provide coverage and capacity relief to Cellco's existing wireless network in Colchester.

Cellco intends to install a total of twelve (12) antennas and six (6) remote radio heads ("RRHs") on a low profile antenna platform at the 161-foot level on the existing tower. Cellco will also install a 12' x 20' equipment platform and canopy structure near the base of the tower within the limits of the existing leased area.[1] The platform will support two (2) equipment cabinets and a 15 kW propane-fueled back-up generator. Cellco will also install a 1,000 gallon propane tank within the compound. Power and telephone service will extend from the existing utility backboard at the tower compound. Project Plans for the Colchester South 2 Facility are

[1] The existing compound fence will be extended to enclose the Cellco equipment platform. All of Cellco's improvements will remain within the limits of the ATC leased parcel.

included in Attachment 2. Specifications for Cellco's antennas and equipment are included in Attachment 3. A Structural Analysis Report confirming that the tower can support Cellco's antenna and related equipment modifications is included in Attachment 4.

IV. Discussion

A. The Proposed Modification Will Not Cause a Substantial Change to the Physical Dimensions of the Existing 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 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 of the height.* Cellco does not intend to increase the height of the existing tower. Cellco's antennas and RRHs will be located at the 161-foot level on the existing 180-foot tower.

2. *The proposed facility modification will not protrude from the edge of the structure more than six (6) feet.* Cellco's antennas and RRHs will not protrude more than six (6) feet 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 two equipment cabinets and a back-up generator on a steel platform and canopy structure.

4. *The proposed facility does not entail any excavation or deployment outside the current site of the base station.* Cellco's proposed modification will remain within the limits of the existing ATC leased parcel.

5. *The proposed facility does not defeat the existing concealment elements of the base station.* There are no concealment elements incorporated into Cellco's existing base station modification plan and none were required by the Town.

6. *The proposed facility complies with conditions associated with the prior approval of construction or modification of the base station.* The Town of Colchester issued its first building permit for this site on or about August 12, 1998. Cellco also searched local zoning files but found no evidence of a separate zoning approval for the parcel. Cellco's proposed installation does not violate any conditions of the Town's approval. A copy of the Town's building permit records is included in Attachment 5.

B. FCC Compliance

Included in Attachment 6 is a worst case General Power Density table for Cellco's proposed antennas confirming that the facility will operate within the FCC safety standards for radio frequency emissions.

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

On July 12, 2016, a copy of this Sub-Petition was sent to Colchester's First Selectman, Art Shilosky, to M & J Auto Recycling Inc. ("M & J"), the owner of the Property and to ATC, the owner of the tower. A copy of the cover letter sent to Mr. Shilosky, M & J and ATC is included in Attachment 7. A copy of this Sub-Petition was also sent to the owners 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 this filing is included in Attachment 8.

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.

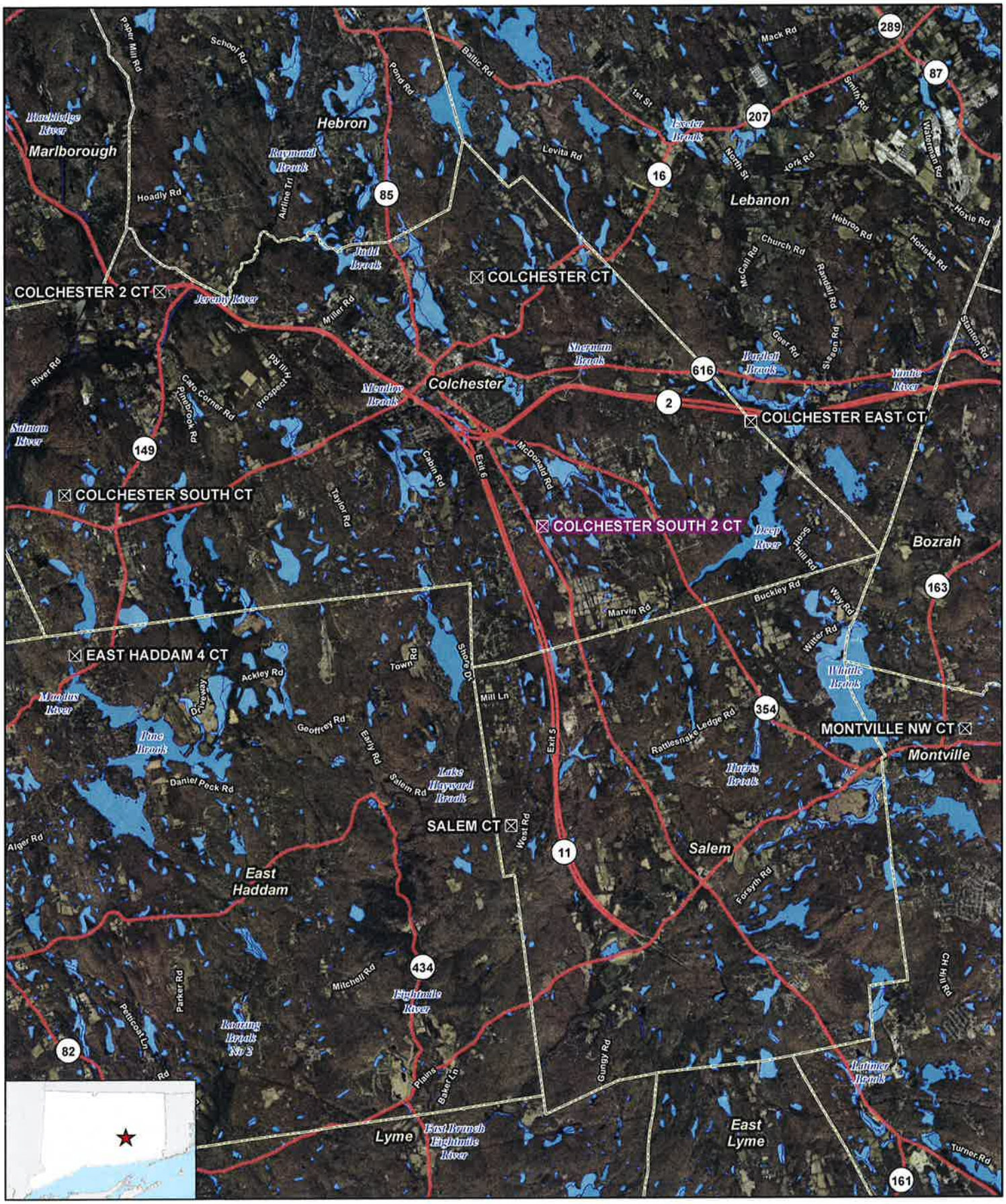
Respectfully submitted,

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
Colchester South 2 CT
355 New London Road (Route 85)
Colchester, Connecticut

verizon

6,000 3,000 0 6,000 Feet

Base Map Source: 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 9,000 feet
Map Date: June 2016

ALL-POINTS TECHNOLOGY CORPORATION

Legend

- Proposed Verizon Wireless Equipment Lease Areas
- Proposed Verizon Wireless Compound Expansion
- Approximate Parcel Boundary (CTDEEP GIS Parcels Last Updated 2010)
- Subject Property
- Existing Monopole Tower (By Others)
- Existing Compound Area (By Others)
- Existing Equipment (By Others)

N
W E
S

100 50 0 100
Feet

Site Schematic

Proposed Wireless
Telecommunications Facility
Colchester South 2 CT
355 New London Road (Route 85)
Colchester, Connecticut

verizon

ALL-POINTS TECHNOLOGY CORPORATION

Map Notes:
Base Map Source: 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 100 feet
Map Date: June 2016

ATTACHMENT 2

verizon

WIRELESS COMMUNICATIONS FACILITY

COLCHESTER SOUTH 2
355 NEW LONDON ROAD (RT. 85)
COLCHESTER, CT 06415

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE
EAST HARTFORD, CONNECTICUT

TO: 355 NEW LONDON ROAD (RT. 85)
NEW LONDON CT, CONNECTICUT

1.	Head East on E River Dr	253 ft
2.	Turn left onto the CT-2 E ramp to Norwich	0.2 mi
3.	Merge onto I-84 E	374 ft
4.	Take exit 55 to merge onto CT-2 toward Norwich/New London/I-84 E	23.8 mi
5.	Keep right to continue on CT-11 S, follow signs for Connecticut 11 S/New London	0.3 mi
6.	Take exit 6 for Lake Hayward Rd toward CT-85/CT-354	1.7 mi
7.	Turn left onto Lake Hayward Rd	0.3 mi
8.	Turn right onto CT-85 S, destination will be on the left	1.4 mi

GENERAL NOTES

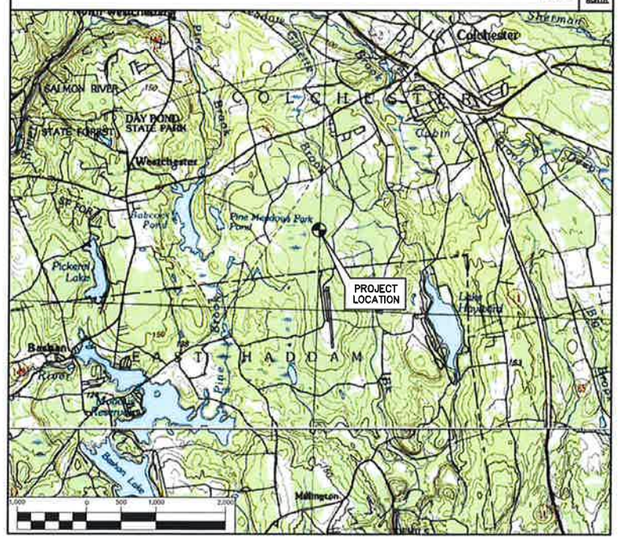
1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

PROJECT SCOPE

1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE EXPANSION OF THE EXISTING FENCED COMPOUND, INSTALLATION OF A 12'x20' RAISED EQUIPMENT PLATFORM ON CONCRETE PIERS WITH CANOPY ROOF AND THE INSTALLATION OF A 1000 GALLON PROPANE TANK ON A CONCRETE FOUNDATION, ALL OF WHICH ARE LOCATED WITHIN THE EXISTING WIRELESS COMMUNICATIONS LEASE AREA.
2. A TOTAL OF TWELVE (12) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED ON AN EXISTING 180' TALL MONOPOLE TOWER AT A CENTERLINE ELEVATION OF 161' ABOVE FINISHED GRADE.
3. ELECTRIC AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND TO THE PROPOSED EQUIPMENT SHELTER FROM AN EXISTING UTILITY BACKBOARD LOCATED ADJACENT TO FENCED COMPOUND.
4. FINAL DESIGN FOR TOWER AND ANTENNA MOUNTS SHALL BE INCLUDED IN THE D&M PLANS.
5. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.
6. THERE WILL NOT BE ANY LIGHTING UNLESS REQUIRED BY THE FCC OR THE FAA.
7. THERE WILL NOT BE ANY SIGNS OR ADVERTISING ON THE ANTENNAS OR EQUIPMENT.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

SITE NAME:	COLCHESTER SOUTH 2
SITE ADDRESS:	355 NEW LONDON ROAD COLCHESTER, CT 06415
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
VERIZON SITE ACQUISITION CONTACT:	JAMES SMITH CELLCO PARTNERSHIP (860) 608-0028
LEGAL/REGULATORY COUNSEL:	KENNETH C. BALDWIN, ESQ. ROBINSON & COLE LLP (860) 257-8345
TOWER COORDINATES:	LATITUDE: 41°-32'-41.8" LONGITUDE: 72°-18'-17.2" GROUND ELEVATION: 376'± A.M.S.L. COORDINATES & GROUND ELEVATION ARE BASED ON CONNECTICUT SITING COUNCIL DATABASE.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	2
C-1	ABUTTERS MAPS	2
C-2	COMPOUND PLAN AND ELEVATION	2

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	07/11/16	LGL	DMD	ISSUED FOR CSC
1	06/30/16	LGL	DMD	REVISED CSC - EQUIPMENT CHANGE FOR CLIENT REVIEW
0	06/12/14	CTP	DMD	CONNECTICUT SITING COUNCIL REVIEW

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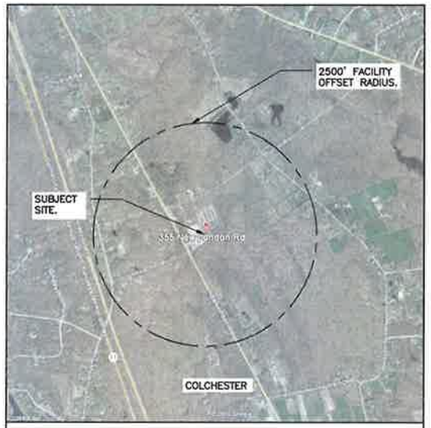
Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
COLCHESTER SOUTH 2
355 NEW LONDON ROAD (RT. 85)
COLCHESTER, CT 06415

DATE: 06/12/14
SCALE: AS NOTED
JOB NO. 13258.000

TITLE SHEET

T-1

Sheet No. 1 of 3



MUNICIPALITY NOTIFICATION LIMIT MAP

DUTTON RD

10 N/F
BAGSHAW CAROL A
MA: 10 DUTTON RD
COLCHESTER CT 06415

13 N/F
MAULUCCI JOSEH IV
MA: 13 DUTTON RD
COLCHESTER CT 06415

14 N/F
DIMOCK SCOTT & LYNETTE
MA: 14 DUTTON RD
COLCHESTER CT 06415

19 N/F
GERALD J & DIANE K PEARL
MA: 19 DUTTON RD
COLCHESTER CT 06415

29 N/F
MOROCH STANLEY & GINA
MA: 29 DUTTON RD
COLCHESTER CT 06415

43 N/F
WELLS A & MCCORMICK WELLS
KAREN K
MA: 43 DUTTON RD
COLCHESTER CT 06415

NEW LONDON RD

395 N/F
KENDZIOR DONALD J
MA: 383 NEW LONDON RD
COLCHESTER CT 06415

383 N/F
KENDZIOR DONALD
MA: 383 NEW LONDON RD
COLCHESTER CT 06415

338 N/F
RMD LAND DEVELOPMENT LLC
338 NEW LONDON RD
MA: 612 CHURCH ST
ASMSTON CT 06231

342 N/F
MILLER STEPHEN TY
MA: 342 NEW LONDON RD
COLCHESTER CT 06415

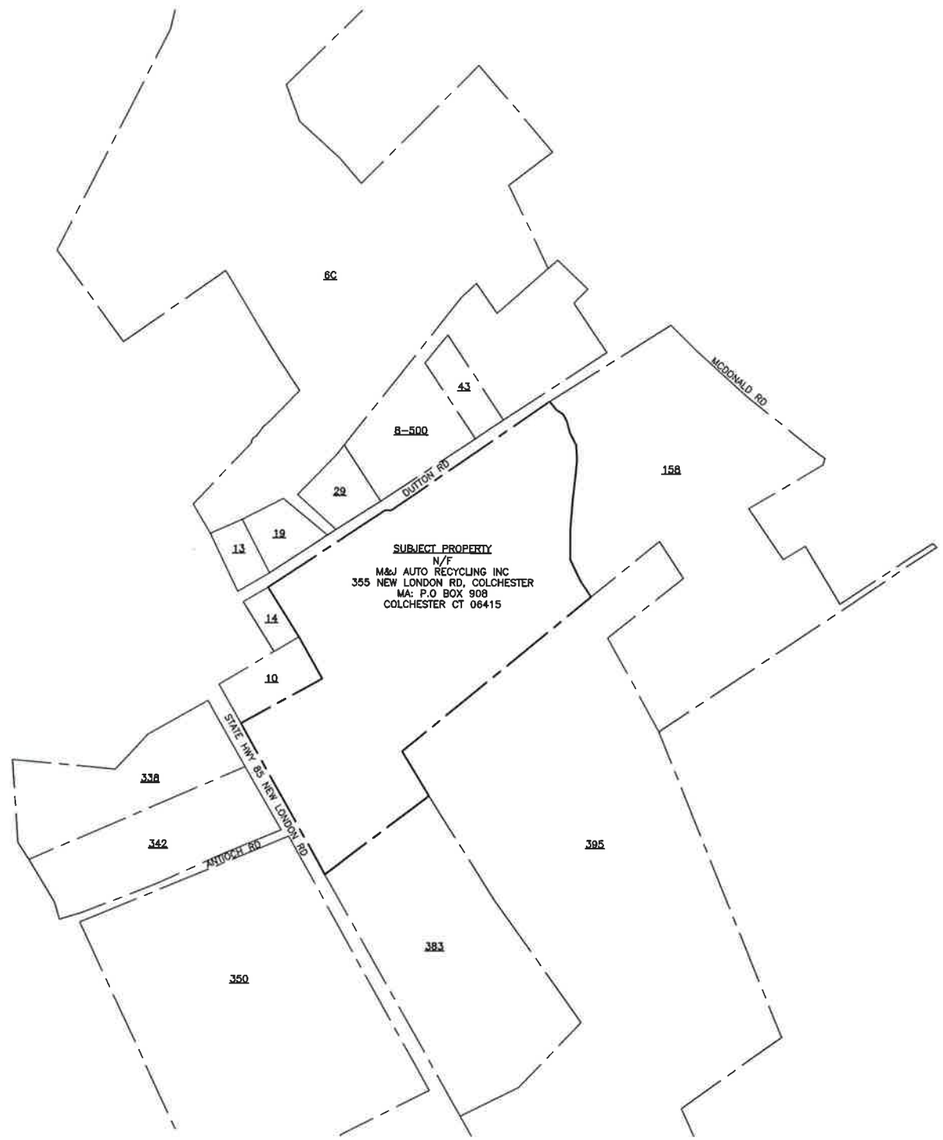
350 N/F
SCHOOLS JOSEPHINE EST OF
C/O SCHOOLS ROBERT P
350 NEW LONDON RD
MA: 184 WEST HIGH ST
EAST HAMPTON CT 06424

MCDONALD RD

6C N/F
COLCHESTER TOWN OF
86 MCDONALD RD
MA: 127 NORWICH AVE
COLCHESTER CT 06415

8-500 N/F
COLCHESTER TOWN OF
MCDONALD RD
MA: 127 NORWICH AVE
COLCHESTER CT 06415

158 N/F
BEGUN THEODORA S
MA: 158 MCDONALD RD
COLCHESTER CT 06415



1 / C-1 ABUTTERS MAP
SCALE: 1" = 300'

APPROXIMATE NORTH

GRAPHIC SCALE
300 0 150 300 600 1200
(IN FEET)
1 inch = 300 ft.

MAP REFERENCE NOTE:

PROPERTY LINES AND PROPERTY OWNER INFORMATION SHOWN HEREIN ARE REFERENCED FROM THE TOWN OF COLCHESTER ONLINE GIS SERVICES.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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0	06/12/14	CTP	DMD	CONNECTICUT SITING COUNCIL REVIEW

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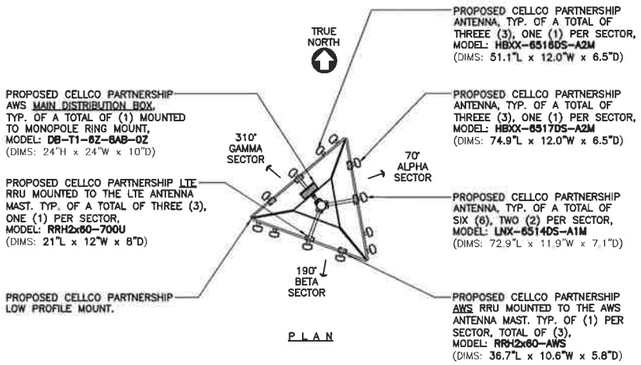
355 NEW LONDON ROAD (RT. 85)
COLCHESTER, CT 06415

DATE: 06/12/14
SCALE: AS NOTED
JOB NO. 13258.000

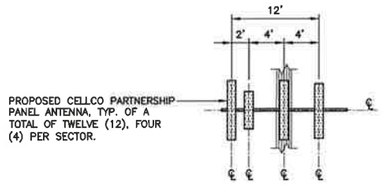
ABUTTERS MAP

C-1

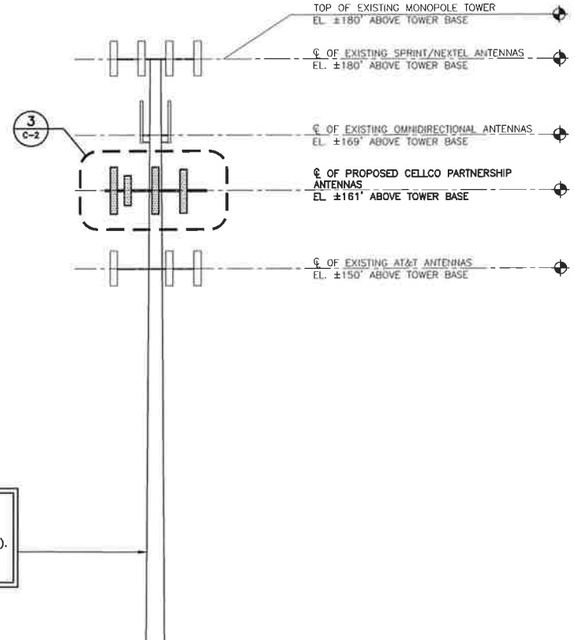
Sheet No. 2 of 3



PLAN



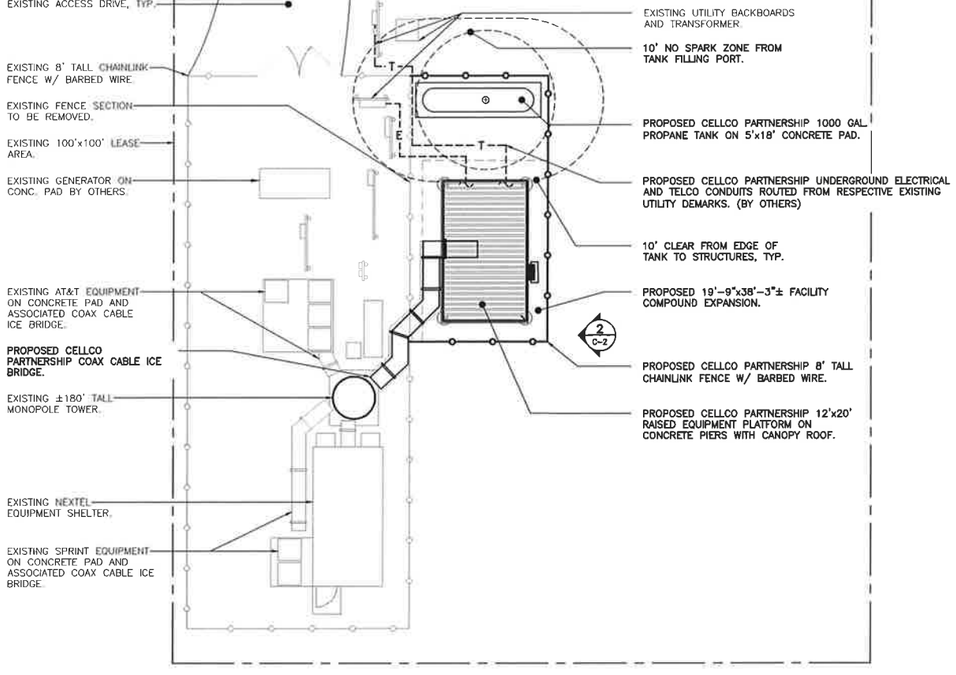
ELEVATION



3 / C-2 **ANTENNA MOUNTING CONFIGURATION**
NOT TO SCALE

TOWER STRUCTURAL ANALYSIS NOTE:

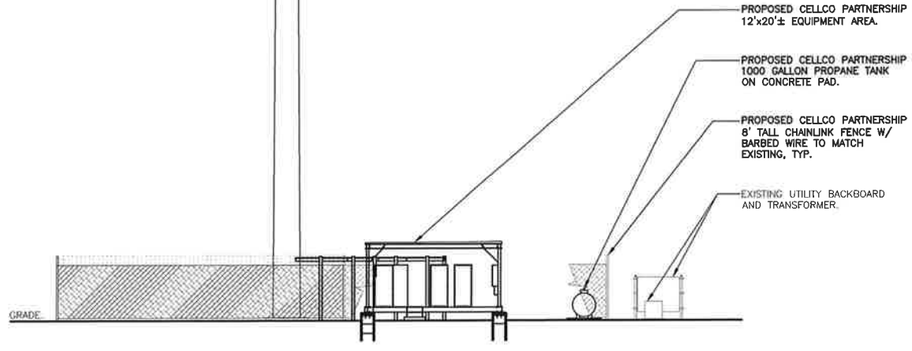
REFER TO TOWER STRUCTURAL ANALYSIS AND MODIFICATION DESIGN AS PREPARED BY AMERICAN TOWER CORPORATION (ATC). DATED DECEMBER 9, 2015. ATC SITE NUMBER: 302465, ATC ENGINEERING NUMBER: 542622210.



1 / C-2 **COMPOUND PLAN**
SCALE: 1" = 10'

APPROXIMATE NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



2 / C-2 **EAST ELEVATION**
SCALE: 1" = 10'

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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SCALE: AS NOTED
JOB NO. 13258.000

COMPOUND PLAN AND ELEVATION

C-2

Sheet No. 3 of 3

ATTACHMENT 3

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LNX-6514DS-VTM

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

- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Excellent solution for site sharing and maximizing capacity
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**
Gain, dBi	15.8	15.9
Beamwidth, Horizontal, degrees	65	64
Beamwidth, Vertical, degrees	12.4	11.2
Beam Tilt, degrees	0–10	0–10
USLS (First Lobe), dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	23	23
CPR at Sector, dB	12	10
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°
Impedance	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	**698–806**	**806–896**
Gain by all Beam Tilts, average, dBi	15.6	15.7
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.5
Gain by Beam Tilt, average, dBi	0 ° | 15.7 5 ° | 15.7 10 ° | 15.3	0 ° | 15.9 5 ° | 15.8 10 ° | 15.3
Beamwidth, Horizontal Tolerance, degrees	±0.9	±1.4
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6
USLS, beampeak to 20° above beampeak, dB	18	20
Front-to-Back Total Power at 180° ± 30°, dB	25	23
CPR at Boresight, dB	25	24
CPR at Sector, dB	15	12

* 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®
Band	Single band
Brand	DualPol® | Teletilt®

Product Specifications

LNX-6514DS-VTM

Operating Frequency Band	698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	180.5 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Net Weight	14.2 kg | 31.3 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	LNX-6514DS-A1M
RET System	Teletilt®

Packed Dimensions

Depth	284.0 mm | 11.2 in
Length	2163.0 mm | 85.2 in
Width	411.0 mm | 16.2 in
Shipping Weight	32.3 kg | 71.2 lb

Regulatory Compliance/Certifications

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

Included Products

DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

Product Specifications

LNX-6514DS-VTM

DB5083 — Downtilt Mounting Kit for 2.4"-4.5" (60 - 115 mm) OD round members. Includes a heavy-duty, galvanized steel downtilt mounting bracket assembly and associated hardware. This kit is compatible with the DB380 pipe mount kit for panel antennas that are equipped with two mounting brackets.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6516DS-VTM

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

- Each DualPol® array can be independently adjusted for greater flexibility
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Great solution to maximize network coverage and capacity

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	17.7	18.0	18.0
Beamwidth, Horizontal, degrees	67	66	64
Beamwidth, Vertical, degrees	7.5	7.0	6.6
Beam Tilt, degrees	0–10	0–10	0–10
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	22	22	21
CPR at Sector, dB	8	9	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	17.2	17.2	17.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.3	±0.5
Gain by Beam Tilt, average, dBi	0 ° | 17.0 5 ° | 17.3 10 ° | 17.0	0 ° | 17.1 5 ° | 17.4 10 ° | 17.0	0 ° | 17.4 5 ° | 17.7 10 ° | 17.2
Beamwidth, Horizontal Tolerance, degrees	±2.7	±2.3	±3.5
Beamwidth, Vertical Tolerance, degrees	±0.5	±0.4	±0.4
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	26	26	26
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	9	9	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-6516DS-VTM

Performance Note	Outdoor usage

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	419.0 N @ 150 km/h 94.2 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1297.0 mm | 51.1 in
Width	305.0 mm | 12.0 in
Net Weight	13.9 kg | 30.6 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6516DS-A2M
RET System	Teletilt®

Packed Dimensions

Depth	294.0 mm | 11.6 in
Length	1609.0 mm | 63.3 in
Width	409.0 mm | 16.1 in
Shipping Weight	25.1 kg | 55.3 lb

Regulatory Compliance/Certifications

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

Included Products

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.

Product Specifications

HBXX-6516DS-VTM

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

Product Specifications

COMMSCOPE®

HBXX-6517DS-VTM | HBXX-6517DS-A2M

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 (First Lobe), 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	0 ° | 18.4	0 ° | 18.7
	3 ° | 18.7	3 ° | 18.7	3 ° | 18.9
	6 ° | 18.4	6 ° | 18.5	6 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, beampeak to 20° above beampeak, 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®
Operating Frequency Band	1710 – 2180 MHz

Product Specifications

COMMSCOPE®

HBXX-6517DS-VTM | HBXX-6517DS-A2M

Performance Note	Outdoor usage

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, frontal	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Loading, lateral	175.0 N @ 150 km/h 39.3 lbf @ 150 km/h
Wind Loading, rear	777.0 N @ 150 km/h 174.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1906.0 mm | 75.0 in
Width	305.0 mm | 12.0 in
Net Weight, without mounting kit	18.5 kg | 40.8 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M

Packed Dimensions

Depth	292.0 mm | 11.5 in
Length	2036.0 mm | 80.2 in
Width	402.0 mm | 15.8 in
Shipping Weight	28.2 kg | 62.2 lb

Regulatory Compliance/Certifications

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

Included Products

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.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

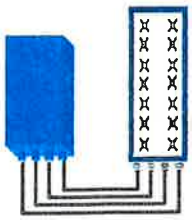
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

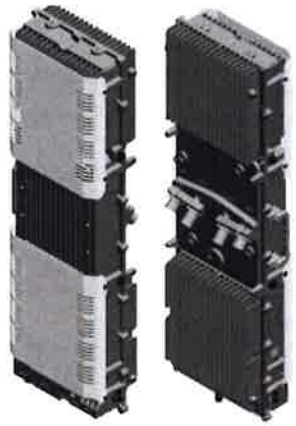
Can be switched between modes via SW w/o site visit

Alcatel·Lucent

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

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
B4 RRH2X60-4R FOR AWS BAND APPLICATIONS

The Alcatel-Lucent B4 RRH2x60-4R 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 B4 RRH2x60-4R 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 B4 RRH2x60-4R integrates all the latest technologies. This allows operators 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 B4 RRH2x60-4R 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 B4 RRH2x60-4R is a very cost-effective solution to deploy LTE MIMO.

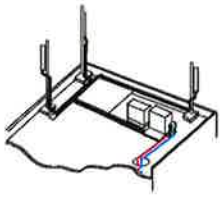
EASY INSTALLATION

The B4 RRH2x60-4R 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.

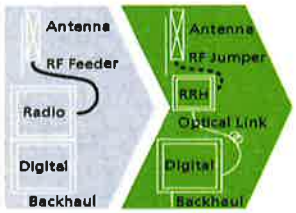
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent B4 RRH2x60-4R installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent B4 RRH2x60-4R is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

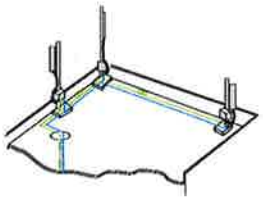
Installation can easily be done by a single person as the Alcatel–Lucent B4 RRH2x60-4R is compact and weighs about 25 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- B4 RRH2x60-4R integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- B4 RRH2x60-4R is optimized for LTE operation
- B4 RRH2x60-4R 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 : 930x270x146 mm (with solar shield)
- Weight : 25 kg (55 lbs) (with solar shield)

Electrical Data

- Power Supply : -48V DC (-38 to -57V)
- Power Consumption: 346W typ. @2x30W (100%RF), 560W typ. @2x60W (100%RF)

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 (3-6) 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 300m using MM fiber, up to 15km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Four 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
- Health : EN 50385

Alcatel·Lucent

8220-603 series

Reliability through Simplicity

POLAR POWER INC.

Back-up DC Generator Set

Founded in 1979 Polar Power specialized in solar photovoltaic systems, solar air conditioning and refrigeration. We developed and provided photovoltaic charging controls for telecommunications in the 1980s along with DC generators for the military. In 1994 we were first to provide DC generators with remote control and monitoring to the telecommunications industry.

Polar's success is based on engineering generators to meet the very specific needs of each application. Telecom site optimization is best met with the DC generator technology as the loads and batteries are DC. It makes no sense to install an AC generator and convert the output to DC. The AC generators are designed for a wide range of applications and they are not specifically produced for telecom applications so there are issues with reliability, space, and fuel efficiency.

Polar can save you considerable time and cost in permitting, installing, purchasing, and maintaining a backup generator. We reduce CAPEX and OPEX costs while improving backup reliability.

Intertek 4003706
Conforms to UL STD 2200
Certified to CSA STD C22.2 No. 100

Meets EPA Emission Regulations
CA/MA Emissions Compliant

Available Models:

- **8220-603-NG-12** Natural Gas 12 kW -48 VDC
- **8340-603-NG-15** Natural Gas 15 kW -48 VDC
- **8220-603-LP-12** LPG 12 kW -48 VDC
- **8340-603-LP-15** LPG 15 kW -48 VDC

Made in USA

2 year standard warranty, extended 5-10 year warranty available

The concepts and features behind Polar's backup generator for telecommunications include:

SMALL FOOTPRINT. Polar's DC generator is considerably smaller in size than an AC generator. You can now backup sites that could not accommodate an AC generator. Smaller also means less cost for space leasing.

LOW ACOUSTIC NOISE. <59 dBA @ 7 meters, and low vibration so as not to disturb the local residents or building landlords. Quieter than other generators with lower noise ratings.

LIGHTWEIGHT. Up to 1/3 the weight of a comparable AC generator. Facilitates roof top installations.

RODENT RESISTANT. Small animals can quickly destroy a generator set by gnawing on wires, fuel lines, radiator hoses, etc. Cooling air inlets and outlets have perforated aluminum screens to keep small rodents and large insects out. Stainless steel wire braid is placed over fuel and radiator lines for increased reliability and safety.

CORROSION RESISTANT. All-aluminum enclosure with stainless hardware for low maintenance, and long service life.

SUPERCAPACITOR STARTER. Failure to start is the number one problem plaguing generator reliability. Polar's unique design has replaced the starting battery with a Super Capacitor. Capacitors are more reliable and last longer than batteries (10-15 year life).

LONG LIFE. Controls and wire harnesses are designed to exceed a 20 year life. Higher grade, longer life electrical wire (UL 3173), weather tight connectors, gold plated connector pins on signal circuits. Controls and wire harness are easily replaceable.

ADVANCED MONITORING. Remote diagnostics, control, and monitoring. Ethernet and RS232 standard, with optional SNMP.

SIMPLICITY. Transfer switch, rectifier, and starting battery are not required.

POLAR POWER INC.
application and engineering data

COMPARING THE COST OF AC vs DC

	AC	DC
Transfer switch required	Yes	No
Permitting costs	$$	$
Shipping to site and installation cost	$$	$
Site preparation/reinforcing structures	$$$	$
Ethernet/RS232 remote control and monitoring	Extra	Standard

PERMITTING IS FACILITATED

- Small engine horsepower
- DC generator is fully isolated from the utility grid
- No transfer switch
- Low acoustic noise
- Incorporates all requirements made by local Fire Marshals

8220 ALTERNATOR FEATURES

- No mechanical adjustments
- Very lightweight
- High quality electrical output
- Voltage and current regulation
- Up to 94% efficiency
- Class 220° C insulation
- Anodized type III process for aluminum parts
- Nickel plating for steel parts
- Stator is varnished

8220 ALTERNATOR SPECIFICATIONS

Type	Permanent Magnets, NdFeB
Weight (lb/kg)	46.5/21
Regulation Type	Variable engine speed
Stator	3 phase/32 poles
Overcurrent Protection (A)	12 kW - 250 15 kW - 350
Disconnect Means	Pull fuse block, sized for each generator kW
Voltage Range (VDC)	44 to 62
Alternator Exhaust Flow (cfm/cmm)	130 to 180 / 3.68 to 5.1
MTBF (hr)	100,000+

ENCLOSURE

Model	88-25-0603
Type	Weather Protective
Materials	Marine Grade Aluminum
Door Hardware	Three Point with Padlock Hasp, and Removable Side Panels
Mounting	Secure Mounting Tabs

STARTER SUPERCAPACITOR SPECIFICATIONS

Model	20-16-0001
Storage Rating (Farads)	500
Voltage (VDC)	13-14.4
Weight (lb/kg)	12.1/5.5
Operating Temperature (°C/°F)	-40 to 65 / -40 to 149
Service Life (year)	10 to 15

CHARGER SPECIFICATIONS

Model	00-10-0015
Input Voltage (VDC)	28.8 to 60
Output Voltage (VDC)	14 to 14.4
Recharge time from 0 VDC (min)	10
Recharge time from 8 VDC (min)	2
Weight (lb/kg)	2.2/1

SOUND EMISSIONS

Contact us for current sound data.

WEIGHTS AND DIMENSIONS

	Natural Gas	LPG
Dry Weight (lb/kg)	765/347	770/350
Dimensions (LxWxH) (in/cm)	32 x 50 x 72 / 81.3 x 127 x 183	

ENGINE SPECIFICATIONS: 12 - 15 KW NATURAL GAS and LPG

Engine Model	Natural Gas - Kubota DG972 LPG - Kubota WG972
Cylinders	3 In-line
Displacement (L)	0.962
Bore (in./mm)	2.93/74.5
Stroke (in./mm)	2.9/73.6
Intake Air System	Naturally Aspirated
Engine HP	18
Emissions Compliance	EPA and CARB Certified
Variable RPM	2300 to 3150

ENVIRONMENTAL

Operating Temperature (°C/°F)	-40 to 72 or -40 to 162
Operating Humidity %	100
Cold Start Aids	Glow Plugs

PROPANE ENGINE FUEL CONSUMPTION

	Output (kW)	gal/hr	L/hr
Kubota 972	4	0.97	3.67
	5	1.1	4.16
	6	1.26	4.77
	7	1.475	5.58
	8	1.69	6.4
	9	1.945	7.36
	10	2.2	8.33
	12	2.52	9.54
	15	3.55	13.44

ENGINE LUBRICATION SYSTEM

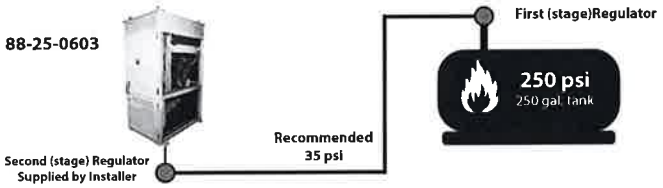
Oil Filter Type	Full flow spin-on canister
Oil Capacity	3.7 L - DG972/WG972
Oil Pressure Switch	Yes
Oil Pressure Transducer	Optional

ENGINE COOLING SYSTEM

Type	Pressurized Aluminum Radiator
Water Pump	Belt-driven, Pre-lubed, self-sealing
Fan Type	Electric Fans
Airflow CFM or M³/hr	1300 or 2200
Fan Mode	Pusher
Temperature Switch	Yes

FUEL SYSTEM

Type	Natural Gas or Propane
Fuel Tank/Line	Supplied By Customer
Max Fuel Flow Rate (BTU/hr)	12 kW - 241,000 15 kW - 340,000



Pressure Chart

Minimum	Recommended	Maximum
0.14 psi	0.39 psi	0.5 psi
4 in H2O	11 in H2O	13.9 in H2O
10 mbar	27.4 mbar	34.5 mbar

POWER ADJUSTMENT FOR AMBIENT CONDITIONS

Temperature Deration	1% derate for every 5.6 °C (10 °F) above 25 °C (77 °F)
Altitude Deration	3% derate for every 300 m (1000 ft) above 91 m (300 ft)

POLAR POWER INC.

operating data

ENGINE COOLING

	Natural Gas	LPG
System coolant capacity (gal/L)	2.2/8.3	
Maximum operation air temperature on radiator (°C/°F)	54/129	
Maximum ambient temperature (°C/°F)	49/120	

COMBUSTION REQUIREMENTS

	Natural Gas	LPG
Flow at rated power (cfm/cmm)	47/1.34	

EXHAUST

	Natural Gas	LPG
Exhaust flow at rated output (cfm/cmm)	90/2.55	
Exhaust temperature at rated output (°C/°F)	480/900	

CONTROLLER FEATURES

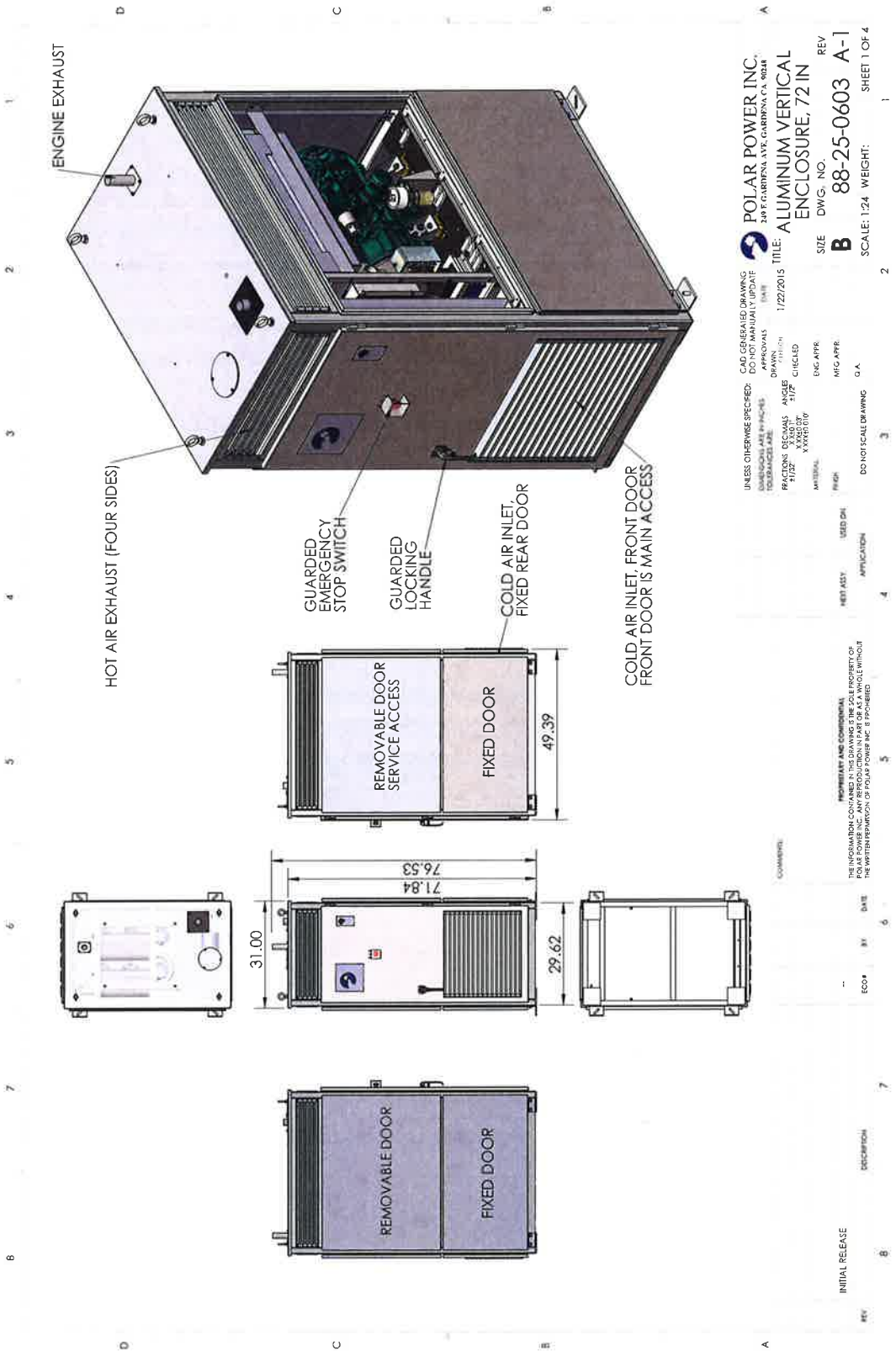
Controller Type.....Supra Model 250
4-Line Plain Text LCD Display.....Simple user interface for ease of operation
Engine Run Hours Indication.....Standard
Programmable Start Delay.....Standard
Run/Alarm/Maintenance Logs.....Standard
Engine Start Sequence.....Cyclic cranking: 5 sec on, 45 sec rest (3 attempts maximum)
Starter Supercapacitor Charger.....Standard
Automatic Voltage Regulation with Over and Under Voltage Protection.....Standard
Automatic Low Oil Pressure/High Oil Temperature Shutdown.....Standard
Overcrank/Overspeed.....Standard
Automatic High Engine Temperature Shutdown.....Standard
Field Upgradeable Firmware.....Standard
Glow Plug Delay.....Automatic With Temperature
Engine Start Delay.....Adjustable, Set at 60 sec
Return to Utility Delay.....Adjustable, Set at 60 sec
Engine Cooldown.....Adjustable, Set at 60 sec
Exerciser.....Programmable, weekly/bi-weekly

WARNING ALARMS

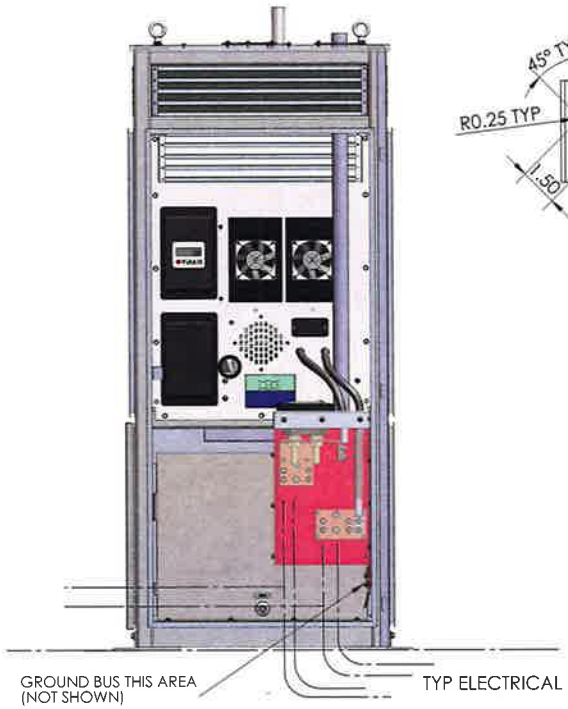
Low Diesel Fuel Level.....Standard
Diesel Fuel Tank Rapture Basin.....Standard
Low/High Supercapacitor Voltage.....Standard
High Water Temperature.....Standard
Low Oil Pressure.....Standard

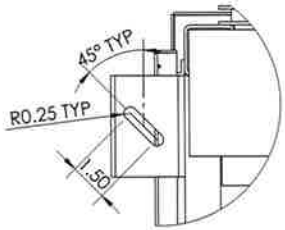
CONTACT CLOSURE FOR REMOTE INDICATION (PN 84-12-0640)

Shutdown Alarm.....Optional
Warning Alarm.....Optional
Engine Run.....Optional
Low Diesel Fuel Level.....Optional
Diesel Fuel Leak.....Optional
E-Stop Depressed.....Optional
Fuel Level Over 90%.....Optional


ENGINE EXHAUST
HOT AIR EXHAUST (FOUR SIDES)
GUARDED EMERGENCY STOP SWITCH
GUARDED LOCKING HANDLE
COLD AIR INLET, FIXED REAR DOOR
COLD AIR INLET, FRONT DOOR FRONT DOOR IS MAIN ACCESS
REMOVABLE DOOR SERVICE ACCESS
FIXED DOOR
49.39
76.53
71.84
31.00
29.62
REMOVABLE DOOR
FIXED DOOR
POLAR POWER INC.
ALUMINUM VERTICAL ENCLOSURE, 72 IN
SIZE B
DWG. NO. 88-25-0603
REV A-1
SCALE: 1:24 WEIGHT:
SHEET 1 OF 4
INITIAL RELEASE

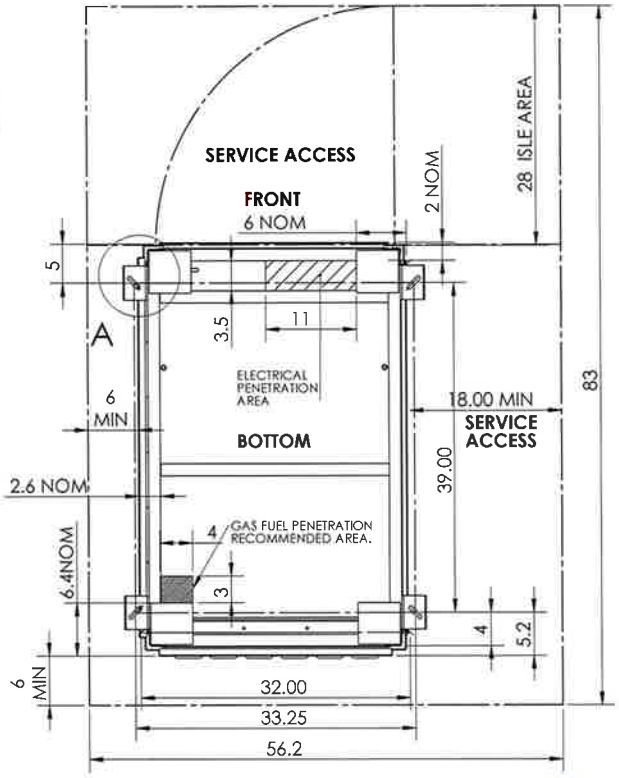
249 E. Gardena Blvd, Gardena CA, 90248 | 310.830.9153 | www.polarpower.com | info@polarpowerinc.com





DETAIL A
SCALE 1 : 4

INSTALLATION FOOTPRINT, BOTTOM VIEW



REV	DESCRIPTION	ECO#	BY	DATE
	INITIAL RELEASE			

COMMENTS:

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ±1/32" DECIMALS X X±0.1 X XX±0.05 X XXX±0.010 ANGLES ±1/2°
MATERIAL
FINISH
NEXT ASSY USED ON
APPLICATION
DO NOT SCALE DRAWING

CAD GENERATED DRAWING
DO NOT MANUALLY UPDATE
APPROVALS DATE
DRAWN 1/22/2015
CHECKED
ENG APPR.
MFG APPR.
Q.A.

POLAR POWER INC.
249 E GARDENA AVE. GARDENA CA. 90248

TITLE: ALUMINUM VERTICAL ENCLOSURE, 72 IN

SIZE	DWG. NO.	REV
B	88-25-0603	A-1

SCALE: 1:24 WEIGHT: SHEET 2 OF 4

POLAR POWER INC.
installation layout

ATTACHMENT 4

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

SEMAAN
ENGINEERING SOLUTIONS

Structural Analysis Report

Structure	:	**180 ft Monopole**
ATC Site Name	:	**Colchester CT 6, CT**
ATC Site Number	:	**302465**
Engineering Number	:	**542622210**
Proposed Carrier	:	**Verizon Wireless**
Carrier Site Name	:	**Colchester South 2 CT**
Carrier Site Number	:	**273484**
Site Location	:	**355 Route 85** **Colchester, CT** **41.54481944, -72.30489167**
County	:	**New London**
Date	:	**December 9, 2015**
Max Usage	:	**88%**
Result	:	**Pass**

Mitchell Gocke
SES Structural Engineer

STATE OF CONNECTICUT
THOMAS L. TAYLOR
28130
LICENSED
PROFESSIONAL ENGINEER

12.10.15

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

SEMAAN
ENGINEERING SOLUTIONS

Structural Analysis Report

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Mitchell Gocke
SES Structural Engineer

SEMAAN
ENGINEERING SOLUTIONS

Table of Contents

SEMAAN
ENGINEERING SOLUTIONS

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180 ft monopole to reflect the change in loading by Verizon Wireless.

Supporting Documents

Tower Drawings	Valmont order # 17494-98, dated June 8, 1998
Foundation Drawing	Valmont drawing # 17494-S-01 dated July 10, 1998
Geotechnical Report	Tectonic Engineering Consultants W.O. 1170.C877 dated June 5, 1998

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/EIA-222.

Basic Wind Speed:	85 mph (Fastest Mile)
Basic Wind Speed w/ Ice:	74 mph (Fastest Mile)w/ 1/2" radial ice concurrent
Code:	ANSI/TIA/EIA-222-F / 2003 IBC , Sec. 1609.1.1, Exception (5) & Sec. 3108.4 w/ 2005 CT Supplement & 2013 CT Amendment

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

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Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
180.0	-	-	-	-	(15) 1 5/8" Coax	Sprint Nextel
177.0	177.0	9	Generic 48" x 12" Panel	T-Arms	-	
		3	Generic 72" x 12" x 7" Panel			
169.0	169.0	2	Diamond X50A	Standoff Mounts	(2) 1/2" Coax	Senet
150.0	152.0	6	LGP LGP21903	Low Profile Platform	(12) 1 1/4" Coax (2) 8 AWG 2C (1) 1.3" Hybrid	AT&T Mobility
	149.0	6	Ericsson RRUS-11 800MHz			
	152.0	6	Powerwave LGP21401			
	151.0	6	Powerwave 7770.00			
		1	KMW AM-X-CD-16-65-00T-RET			
		2	Powerwave P65-17-XLH-RR			
	150.0	1	Raycap DC6-48-60-18-8F			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
No loading considered as to be removed						

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
161.0	161.0	3	Alcatel-Lucent RRH2x60-AWS	Existing Low Profile Platform	(2) 1 5/8" Coax	Verizon
		3	Alcatel-Lucent RRH2x60 700			
		1	RFS DB-T1-6Z-8AB-0Z			
		3	Commscope HBXX-6517DS-VTM			
		3	Commscope HBXX-6516DS-VTM			
		6	Commscope LNX-6514DS-VTM			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.

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Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	77%	Pass
Shaft	88%	Pass
Base Plate	62%	Pass

Foundations

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Moment (Kips-Ft)	4,932.4	4,504.9	91%
Shear (Kips)	41.5	39.0	94%

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
161.0	RFS DB-T1-6Z-8AB-0Z	Verizon Wireless	2.708	2.067
	Alcatel-Lucent RRH2x60-AWS			
	Alcatel-Lucent RRH2x60 700			
	Commscope HBXX-6517DS-VTM			

***Deflection and Sway was evaluated considering a design wind speed of 50 mph (Fastest Mile) per ANSI/TIA/EIA-222-F.**

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Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

SEMAAN ENGINEERING SOLUTIONS, LLC
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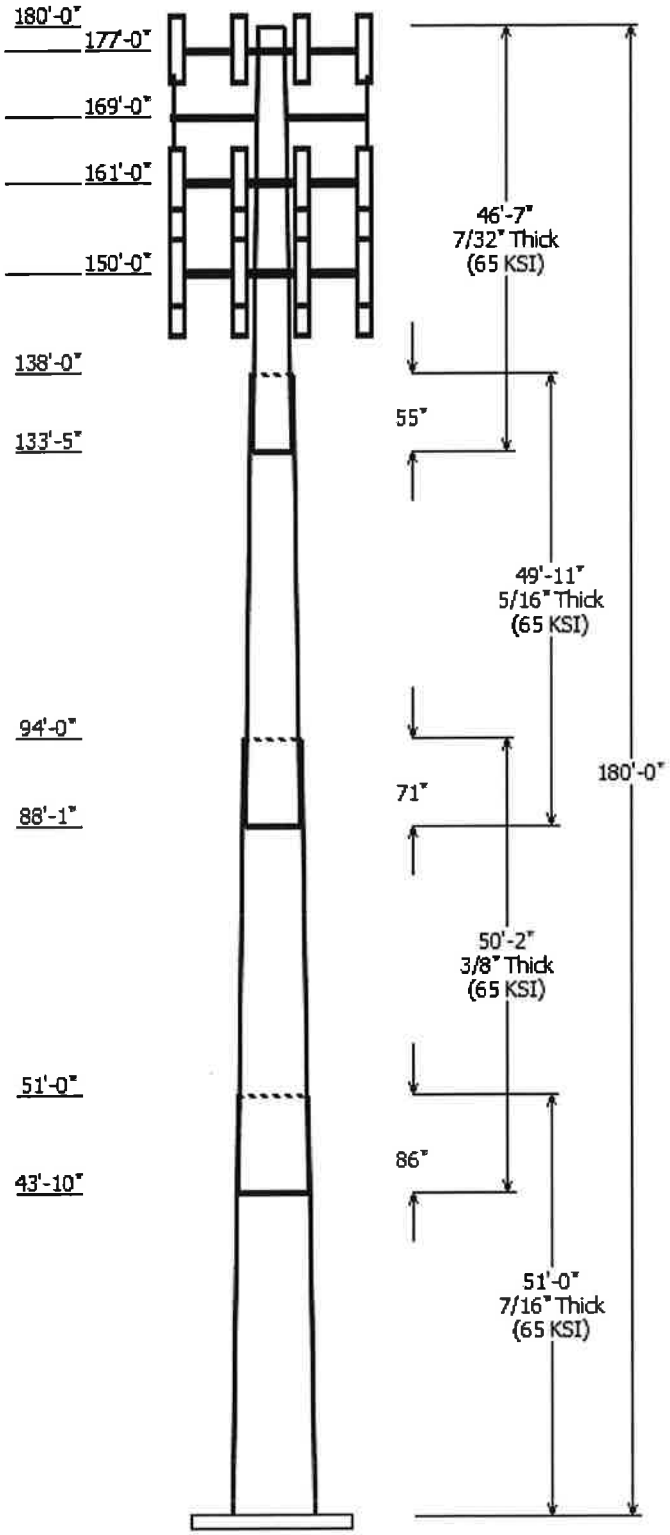
Elkhorn, NE 68022
Phone: 402-289-1888
Fax: 402-289-1861



Job Information

Pole :	302465 Code: TIA/EIA-222-F
Description :	180 ft Valmont Monopole verified 10-16-12 JK
Client :	VERIZON WIRELESS
Location :	Colchester CT 6, CT
Shape :	12 Sides
Height :	180.00 (ft)
Base Elev (ft):	0.00
Taper:	0.26080((in/ft)

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	51.000	50.69	64.00	0.438		0.000	0.260800	65
2	50.167	40.23	53.31	0.375	Slip Joint	86.000	0.260800	65
3	49.917	29.38	42.40	0.313	Slip Joint	71.000	0.260800	65
4	46.583	18.86	31.01	0.219	Slip Joint	55.000	0.260800	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
177.000	177.000	3	T-Arms
177.000	177.000	3	Generic 72" x 12" x 7" Panel
177.000	177.000	9	Generic 48" x 12" Panel
169.000	169.000	2	Standoff Mounts
169.000	169.000	2	Diamond X50A
161.000	161.000	6	Commscope LNX-6514DS-VTM
161.000	161.000	3	Commscope HBXX-6516DS-
161.000	161.000	3	Commscope HBXX-6517DS-
161.000	161.000	3	Alcatel-Lucent RRH2x60 700
161.000	161.000	3	Alcatel-Lucent RRH2x60-AWS
161.000	161.000	1	Low Profile Platform
161.000	161.000	1	RFS DB-T1-6Z-8AB-0Z
150.000	151.000	6	Powerwave 7770.00
150.000	151.000	1	KMW AM-X-CD-16-65-00T-RET
150.000	150.000	1	Low Profile Platform
150.000	151.000	2	Powerwave P65-17-XLH-RR
150.000	149.000	6	Ericsson RRUS-11 800 MHz
150.000	152.000	6	Powerwave LGP21401
150.000	150.000	1	Raycap DC6-48-60-18-8F
150.000	152.000	6	LGP Allgon LGP21903

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	150.0	1 1/4" Coax	No
0.000	150.0	1.3" Hybrid	No
0.000	150.0	8 AWG 2C	No
0.000	161.0	1 5/8" Coax	No
0.000	169.0	1/2" Coax	No
0.000	180.0	1 5/8" Coax	No

Load Cases

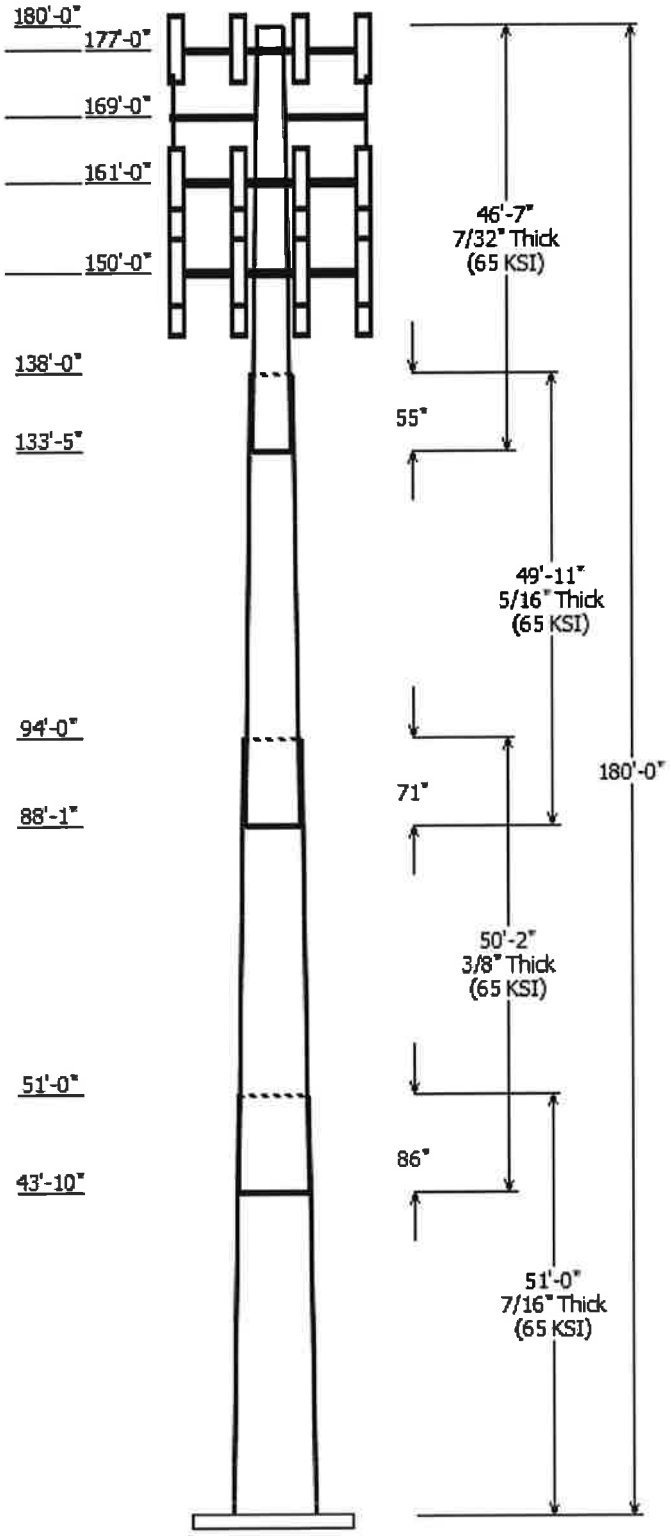
No Ice	85.00 mph Wind with No Ice
Ice	73.61 mph Wind with Ice
Twist/Sway	50.00 mph Wind with No Ice

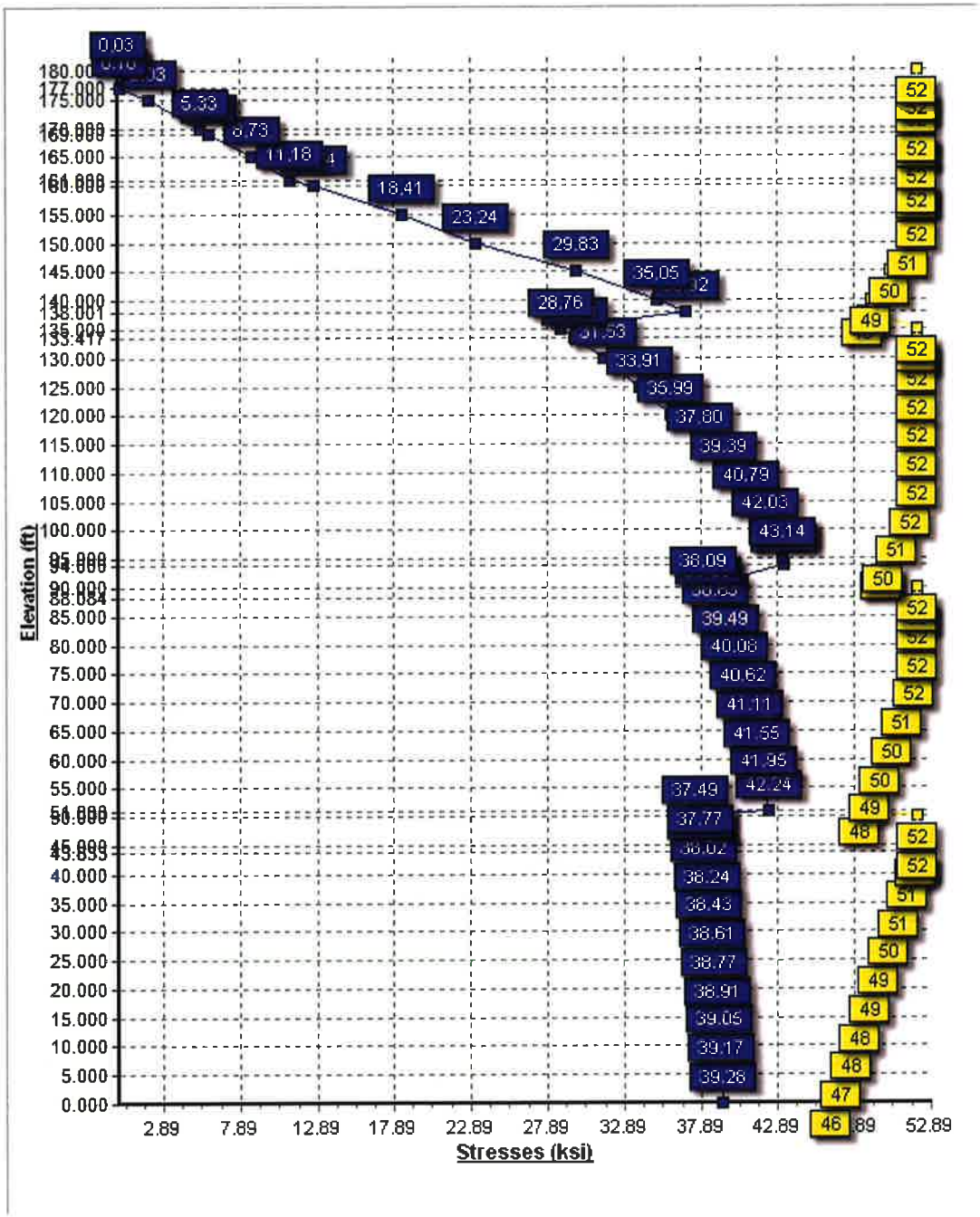
Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)

No Ice	4504.87	38.98	41.53
Ice	3652.27	30.91	48.38
Twist/Sway	1560.52	13.49	41.57

Dish Deflections			
Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000




Elevation (ft)
Stresses (ksi)
2.89
7.89
12.89
17.89
22.89
27.89
32.89
37.89
42.89
52.89
0.03
5.33
11.18
18.41
23.24
29.83
35.05
28.76
33.91
35.99
37.80
39.39
40.79
42.03
43.14
38.09
39.49
40.08
40.62
41.11
41.55
41.95
42.24
37.49
37.77
38.24
38.43
38.61
38.77
38.91
39.05
39.17
39.28
52
51
50
49
48
47
46

Site Number:	**302465**	**Code: TIA/EIA-222-F**	
Site Name:	**Colchester CT 6, CT**	**Engineering Number: 542622210**	**12/9/2015 3:38:58 PM**
Customer:	**VERIZON WIRELESS**		

Analysis Parameters

Location:	**New London County, CT**		
Code:	**TIA/EIA-222-F**	**Height (ft):**	**180**
Shape:	**12 Sides**	**Base Diameter (in):**	**64.00**
Pole Type:	**Taper**	**Top Diameter (in):**	**18.87**
Pole Manfacturer:	**Valmont**	**Taper (in/ft) :**	**0.261**

Load Cases

No Ice	**85.00 mph Wind with No Ice**
Ice	**73.61 mph Wind with Ice**
Twist/Sway	**50.00 mph Wind with No Ice**

Site Number: 302465 | Code: TIA/EIA-222-F |

Site Name: Colchester CT 6, CT | Engineering Number: 542622210 | 12/9/2015 3:38:58 PM

Customer: VERIZON WIRELESS

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	51.000	0.4375	65		0.00	13,914	64.00	0.00	89.54	46176.7	37.05	146.29	50.69	51.00	70.81	22831.3	28.91	115.88	0.260800
2-12	50.167	0.3750	65	Slip	86.00	9,565	53.31	43.83	63.93	22872.0	35.95	142.18	40.23	94.00	48.13	9760.5	26.61	107.29	0.260800
3-12	49.917	0.3125	65	Slip	71.00	6,081	42.40	88.08	42.35	9577.1	34.21	135.69	29.38	138.00	29.25	3155.8	23.05	94.03	0.260800
4-12	46.583	0.2188	65	Slip	55.00	2,761	31.01	133.42	21.70	2627.1	35.84	141.76	18.86	180.00	13.14	583.3	20.96	86.24	0.260800
				Shaft Weight		32,321													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
177.00	Generic 48" x 12" Panel	9	30.00	5.600	0.75	63.00	6.190	0.75	0.000	0.000
177.00	Generic 72" x 12" x 7" Panel	3	45.00	8.400	0.75	87.00	9.230	0.75	0.000	0.000
177.00	T-Arms	3	250.00	9.700	0.75	314.00	12.100	0.75	0.000	0.000
169.00	Diamond X50A	2	2.30	1.120	1.00	57.20	1.630	1.00	0.000	0.000
169.00	Standoff Mounts	2	150.00	5.200	1.00	175.00	5.900	1.00	0.000	0.000
161.00	Alcatel-Lucent RRH2x60 700	3	56.70	2.510	0.67	67.60	2.550	0.67	0.000	0.000
161.00	Alcatel-Lucent RRH2x60-AWS	3	44.00	2.190	0.67	61.40	2.870	0.67	0.000	0.000
161.00	Commscope HBXX-6516DS-	3	30.60	5.930	0.81	41.00	6.670	0.81	0.000	0.000
161.00	Commscope HBXX-6517DS-	3	43.00	8.730	0.81	41.00	6.670	0.81	0.000	0.000
161.00	Commscope LNX-6514DS-	6	38.80	8.410	0.71	71.30	8.310	0.71	0.000	0.000
161.00	Low Profile Platform	1	1500.00	26.100	1.00	1,700.00	31.600	1.00	0.000	0.000
161.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	5.600	1.00	144.50	6.080	1.00	0.000	0.000
150.00	Ericsson RRUS-11 800 MHz	6	54.00	2.940	0.67	75.64	3.290	0.67	0.000	-1.000
150.00	KMW AM-X-CD-16-65-00T-	1	33.00	6.620	1.00	95.00	9.080	1.00	0.000	1.000
150.00	LGP Allgon LGP21903	6	5.50	0.270	0.50	7.90	0.380	0.50	0.000	2.000
150.00	Low Profile Platform	1	1500.00	21.700	1.00	1,700.00	27.200	1.00	0.000	0.000
150.00	Powerwave 7770.00	6	35.00	5.880	0.75	67.63	6.530	0.75	0.000	1.000
150.00	Powerwave LGP21401	6	14.10	1.290	0.50	21.26	1.530	0.50	0.000	2.000
150.00	Powerwave P65-17-XLH-RR	2	59.00	11.460	0.80	121.00	12.390	0.80	0.000	1.000
150.00	Raycap DC6-48-60-18-8F	1	20.00	1.260	1.00	35.10	1.460	1.00	0.000	0.000
	Totals	68	6081.90			8,246.38			Number of Loadings :	20

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	No Ice Weight (lb/ft)	No Ice CaAa (sf/ft)	Ice Weight (lb/ft)	Ice CaAa (sf/ft)	Exposed To Wind
0.00	180.00	15	1 5/8" Coax	15.00	0.00	0.00	0.00	N
0.00	169.00	2	1/2" Coax	0.30	0.00	0.00	0.00	N
0.00	161.00	2	1 5/8" Coax	0.82	0.00	0.00	0.00	N
0.00	150.00	12	1 1/4" Coax	0.63	0.00	0.00	0.00	N
0.00	150.00	1	1.3" Hybrid	1.00	0.00	0.00	0.00	N
0.00	150.00	2	8 AWG 2C	0.31	0.00	0.00	0.00	N
			Total Weight	3,173.72 (lb)		0.00 (lb)		

Segment Properties (Max Len : 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Fa (ksi)	Weight (lb)
0.00		0.4375	64.000	89.544	46,176.7	37.05	146.29	65	46	0	0.0
5.00		0.4375	62.696	87.707	43,392.6	36.25	143.31	65	47	0	1,507.9
10.00		0.4375	61.392	85.870	40,722.8	35.46	140.32	65	48	0	1,476.6
15.00		0.4375	60.088	84.033	38,164.7	34.66	137.34	65	48	0	1,445.3
20.00		0.4375	58.784	82.196	35,716.1	33.86	134.36	65	49	0	1,414.1
25.00		0.4375	57.480	80.359	33,374.6	33.06	131.38	65	49	0	1,382.8
30.00		0.4375	56.176	78.522	31,137.6	32.26	128.40	65	50	0	1,351.6
35.00		0.4375	54.872	76.685	29,003.0	31.46	125.42	65	51	0	1,320.3
40.00		0.4375	53.568	74.848	26,968.2	30.66	122.44	65	51	0	1,289.1
43.83	Bot - Section 2	0.4375	52.568	73.439	25,474.3	30.05	120.16	65	52	0	967.1
45.00		0.4375	52.264	73.011	25,030.8	29.87	119.46	65	52	0	543.8
50.00		0.4375	50.960	71.174	23,188.6	29.07	116.48	65	52	0	2,294.6
51.00	Top - Section 1	0.3750	51.449	61.672	20,534.2	34.62	137.20	65	48	0	452.0
55.00		0.3750	50.406	60.412	19,301.5	33.87	134.42	65	49	0	830.9
60.00		0.3750	49.102	58.838	17,831.3	32.94	130.94	65	50	0	1,014.5
65.00		0.3750	47.798	57.263	16,437.7	32.01	127.46	65	50	0	987.7
70.00		0.3750	46.494	55.689	15,118.6	31.08	123.98	65	51	0	960.9
75.00		0.3750	45.190	54.114	13,872.1	30.15	120.51	65	52	0	934.1
80.00		0.3750	43.886	52.540	12,696.1	29.21	117.03	65	52	0	907.3
85.00		0.3750	42.582	50.965	11,588.5	28.28	113.55	65	52	0	880.5
88.08	Bot - Section 3	0.3750	41.778	49.994	10,938.6	27.71	111.41	65	52	0	529.7
90.00		0.3750	41.278	49.390	10,547.2	27.35	110.07	65	52	0	598.6
94.00	Top - Section 2	0.3125	40.860	40.801	8,562.0	32.89	130.75	65	50	0	1,226.3
95.00		0.3125	40.599	40.538	8,397.9	32.67	129.92	65	50	0	138.3
100.0		0.3125	39.295	39.226	7,608.5	31.55	125.74	65	51	0	678.6
105.0		0.3125	37.991	37.914	6,870.3	30.43	121.57	65	52	0	656.2
110.0		0.3125	36.687	36.602	6,181.3	29.31	117.40	65	52	0	633.9
115.0		0.3125	35.383	35.290	5,540.1	28.20	113.23	65	52	0	611.6
120.0		0.3125	34.079	33.978	4,944.8	27.08	109.05	65	52	0	589.3
125.0		0.3125	32.775	32.665	4,393.8	25.96	104.88	65	52	0	566.9
130.0		0.3125	31.471	31.353	3,885.3	24.84	100.71	65	52	0	544.6
133.4	Bot - Section 4	0.3125	30.580	30.456	3,561.3	24.08	97.86	65	52	0	359.4
135.0		0.3125	30.167	30.041	3,417.6	23.72	96.53	65	52	0	279.0
138.0	Top - Section 3	0.2188	29.822	20.857	2,333.0	34.38	136.30	65	48	0	518.5
140.0		0.2188	29.301	20.489	2,211.8	33.74	133.92	65	49	0	140.6
145.0		0.2188	27.997	19.570	1,927.4	32.14	127.96	65	50	0	340.8
150.0		0.2188	26.693	18.652	1,668.5	30.54	122.00	65	51	0	325.2
155.0		0.2188	25.389	17.733	1,433.9	28.95	116.04	65	52	0	309.5
160.0		0.2188	24.085	16.814	1,222.4	27.35	110.08	65	52	0	293.9
161.0		0.2188	23.824	16.631	1,182.8	27.03	108.88	65	52	0	56.9
165.0		0.2188	22.781	15.896	1,032.8	25.75	104.12	65	52	0	221.4
169.0		0.2188	21.737	15.161	896.0	24.48	99.35	65	52	0	211.4
170.0		0.2188	21.477	14.977	863.9	24.16	98.16	65	52	0	51.3
175.0		0.2188	20.173	14.058	714.4	22.56	92.20	65	52	0	247.0
177.0		0.2188	19.651	13.691	659.9	21.92	89.81	65	52	0	94.4
180.0		0.2188	18.869	13.139	583.3	20.96	86.24	65	52	0	136.9
											32,320.9

Site Number: 302465 | Code: TIA/EIA-222-F |

Site Name: Colchester CT 6, CT | Engineering Number: 542622210 | 12/9/2015 3:38:58 PM

Customer: VERIZON WIRELESS

Load Case: No Ice | 85.00 mph Wind with No Ice | 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		424.9	0.0					0.0	0.0	424.9	0.0	0.0	0.0
5.00		841.1	1,507.9					0.0	90.3	841.1	1,598.2	0.0	0.0
10.00		823.6	1,476.6					0.0	90.3	823.6	1,566.9	0.0	0.0
15.00		806.1	1,445.3					0.0	90.3	806.1	1,535.6	0.0	0.0
20.00		788.6	1,414.1					0.0	90.3	788.6	1,504.4	0.0	0.0
25.00		771.1	1,382.8					0.0	90.3	771.1	1,473.1	0.0	0.0
30.00		753.6	1,351.6					0.0	90.3	753.6	1,441.9	0.0	0.0
35.00		749.6	1,320.3					0.0	90.3	749.6	1,410.6	0.0	0.0
40.00		669.4	1,289.1					0.0	90.3	669.4	1,379.4	0.0	0.0
43.83	Bot - Section 2	382.8	967.1					0.0	69.2	382.8	1,036.4	0.0	0.0
45.00		480.3	543.8					0.0	21.1	480.3	564.8	0.0	0.0
50.00		467.9	2,294.6					0.0	90.3	467.9	2,384.9	0.0	0.0
51.00	Top - Section 1	391.0	452.0					0.0	18.1	391.0	470.0	0.0	0.0
55.00		704.0	830.9					0.0	72.2	704.0	903.1	0.0	0.0
60.00		781.1	1,014.5					0.0	90.3	781.1	1,104.8	0.0	0.0
65.00		778.0	987.7					0.0	90.3	778.0	1,078.0	0.0	0.0
70.00		773.0	960.9					0.0	90.3	773.0	1,051.2	0.0	0.0
75.00		766.3	934.1					0.0	90.3	766.3	1,024.4	0.0	0.0
80.00		758.0	907.3					0.0	90.3	758.0	997.6	0.0	0.0
85.00		606.6	880.5					0.0	90.3	606.6	970.8	0.0	0.0
88.08	Bot - Section 3	373.7	529.7					0.0	55.7	373.7	585.4	0.0	0.0
90.00		441.6	598.6					0.0	34.6	441.6	633.2	0.0	0.0
94.00	Top - Section 2	371.4	1,226.3					0.0	72.2	371.4	1,298.5	0.0	0.0
95.00		438.9	138.3					0.0	18.1	438.9	156.4	0.0	0.0
100.00		723.5	678.6					0.0	90.3	723.5	768.9	0.0	0.0
105.00		709.3	656.2					0.0	90.3	709.3	746.5	0.0	0.0
110.00		694.1	633.9					0.0	90.3	694.1	724.2	0.0	0.0
115.00		678.0	611.6					0.0	90.3	678.0	701.9	0.0	0.0
120.00		661.0	589.3					0.0	90.3	661.0	679.6	0.0	0.0
125.00		643.2	566.9					0.0	90.3	643.2	657.2	0.0	0.0
130.00		528.2	544.6					0.0	90.3	528.2	634.9	0.0	0.0
133.42	Bot - Section 4	308.9	359.4					0.0	61.7	308.9	421.1	0.0	0.0
135.00		280.1	279.0					0.0	28.6	280.1	307.6	0.0	0.0
138.00	Top - Section 3	302.0	518.5					0.0	54.2	302.0	572.7	0.0	0.0
140.00		411.4	140.6					0.0	36.1	411.4	176.8	0.0	0.0
145.00		573.2	340.8					0.0	90.3	573.2	431.1	0.0	0.0
150.00	Appertunance(s)	551.8	325.2	4,382.6	0.0	2,366.1	2,322.6	0.0	90.3	4,934.4	2,738.1	0.0	0.0
155.00		529.8	309.5					0.0	80.6	529.8	390.1	0.0	0.0
160.00		309.8	293.9					0.0	80.6	309.8	374.5	0.0	0.0
161.00	Appertunance(s)	247.8	56.9	5,535.5	0.0	0.0	2,299.7	0.0	16.1	5,783.3	2,372.7	0.0	0.0
165.00		387.2	221.4					0.0	61.2	387.2	282.6	0.0	0.0
169.00	Appertunance(s)	236.1	211.4	630.1	0.0	0.0	304.6	0.0	61.2	866.2	577.2	0.0	0.0
170.00		270.3	51.3					0.0	15.0	270.3	66.3	0.0	0.0
175.00		310.2	247.0					0.0	75.0	310.2	322.0	0.0	0.0
177.00	Appertunance(s)	211.7	94.4	3,966.3	0.0	0.0	1,155.0	0.0	30.0	4,178.1	1,279.4	0.0	0.0
180.00		125.6	136.9					0.0	45.0	125.6	181.9	0.0	0.0

Site Number:	302465	Code: TIA/EIA-222-F	
Site Name:	Colchester CT 6, CT	Engineering Number: 542622210	12/9/2015 3:38:59 PM
Customer:	VERIZON WIRELESS		

Load Case: No Ice — 85.00 mph Wind with No Ice — 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Totals:	39,350.4	41,576.5	0.00	0.00

Site Number: 302465 | Code: TIA/EIA-222-F |

Site Name: Colchester CT 6, CT | Engineering Number: 542622210 | 12/9/2015 3:38:59 PM

Customer: VERIZON WIRELESS

Load Case: No Ice | 85.00 mph Wind with No Ice | 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Shaft Forces and Deflections

Seg Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	X Deflect (in)	Z Deflect (in)	Total Deflect (in)	Rotation (deg)
0.00	-38.975	-41.529	0.000	0.000	0.000	-4,504.875	0.000	0.000	0.000	0.000
5.00	-38.228	-39.840	0.000	0.000	0.000	-4,310.002	-0.073	0.000	0.073	-0.136
10.00	-37.491	-38.185	0.000	0.000	0.000	-4,118.867	-0.290	0.000	0.290	-0.274
15.00	-36.767	-36.564	0.000	0.000	0.000	-3,931.413	-0.653	0.000	0.653	-0.415
20.00	-36.054	-34.975	0.000	0.000	0.000	-3,747.583	-1.165	0.000	1.165	-0.558
25.00	-35.352	-33.420	0.000	0.000	0.000	-3,567.318	-1.827	0.000	1.827	-0.703
30.00	-34.662	-31.898	0.000	0.000	0.000	-3,390.560	-2.644	0.000	2.644	-0.852
35.00	-33.971	-30.410	0.000	0.000	0.000	-3,217.251	-3.617	0.000	3.617	-1.003
40.00	-33.345	-28.964	0.000	0.000	0.000	-3,047.398	-4.750	0.000	4.750	-1.156
43.83	-32.979	-27.890	0.000	0.000	0.000	-2,919.578	-5.728	0.000	5.728	-1.277
45.00	-32.533	-27.280	0.000	0.000	0.000	-2,881.104	-6.045	0.000	6.045	-1.315
50.00	-32.048	-24.854	0.000	0.000	0.000	-2,718.441	-7.508	0.000	7.508	-1.474
51.00	-31.680	-24.349	0.000	0.000	0.000	-2,686.394	-7.820	0.000	7.820	-1.507
55.00	-31.016	-23.380	0.000	0.000	0.000	-2,559.674	-9.139	0.000	9.139	-1.638
60.00	-30.274	-22.202	0.000	0.000	0.000	-2,404.595	-10.953	0.000	10.953	-1.821
65.00	-29.529	-21.055	0.000	0.000	0.000	-2,253.228	-12.959	0.000	12.959	-2.006
70.00	-28.784	-19.937	0.000	0.000	0.000	-2,105.585	-15.162	0.000	15.162	-2.195
75.00	-28.041	-18.850	0.000	0.000	0.000	-1,961.666	-17.563	0.000	17.563	-2.386
80.00	-27.301	-17.793	0.000	0.000	0.000	-1,821.462	-20.166	0.000	20.166	-2.580
85.00	-26.697	-16.778	0.000	0.000	0.000	-1,684.957	-22.973	0.000	22.973	-2.777
88.08	-26.323	-16.165	0.000	0.000	0.000	-1,602.633	-24.808	0.000	24.808	-2.901
90.00	-25.883	-15.501	0.000	0.000	0.000	-1,552.190	-25.988	0.000	25.988	-2.980
94.00	-25.467	-14.179	0.000	0.000	0.000	-1,448.652	-28.554	0.000	28.554	-3.142
95.00	-25.054	-13.987	0.000	0.000	0.000	-1,423.194	-29.216	0.000	29.216	-3.184
100.0	-24.341	-13.163	0.000	0.000	0.000	-1,297.924	-32.673	0.000	32.673	-3.414
105.0	-23.637	-12.366	0.000	0.000	0.000	-1,176.220	-36.372	0.000	36.372	-3.645
110.0	-22.944	-11.597	0.000	0.000	0.000	-1,058.036	-40.312	0.000	40.312	-3.877
115.0	-22.262	-10.855	0.000	0.000	0.000	-943.317	-44.493	0.000	44.493	-4.107
120.0	-21.593	-10.141	0.000	0.000	0.000	-832.006	-48.915	0.000	48.915	-4.335
125.0	-20.938	-9.455	0.000	0.000	0.000	-724.041	-53.572	0.000	53.572	-4.559
130.0	-20.387	-8.801	0.000	0.000	0.000	-619.353	-58.459	0.000	58.459	-4.776
133.4	-20.060	-8.370	0.000	0.000	0.000	-549.683	-61.929	0.000	61.929	-4.922
135.0	-19.767	-8.055	0.000	0.000	0.000	-517.936	-63.571	0.000	63.571	-4.990
138.0	-19.429	-7.477	0.000	0.000	0.000	-458.622	-66.743	0.000	66.743	-5.112
140.0	-19.025	-7.284	0.000	0.000	0.000	-419.777	-68.899	0.000	68.899	-5.191
145.0	-18.441	-6.836	0.000	0.000	0.000	-324.655	-74.461	0.000	74.461	-5.430
150.0	-13.280	-4.544	0.000	0.000	0.000	-230.087	-80.256	0.000	80.256	-5.636
155.0	-12.725	-4.176	0.000	0.000	0.000	-163.689	-86.244	0.000	86.244	-5.804
160.0	-12.383	-3.819	0.000	0.000	0.000	-100.067	-92.388	0.000	92.388	-5.935
161.0	-6.387	-2.053	0.000	0.000	0.000	-87.684	-93.631	0.000	93.631	-5.956
165.0	-5.974	-1.806	0.000	0.000	0.000	-62.138	-98.645	0.000	98.645	-6.029
169.0	-5.053	-1.321	0.000	0.000	0.000	-38.242	-103.712	0.000	103.712	-6.084
170.0	-4.777	-1.282	0.000	0.000	0.000	-33.190	-104.986	0.000	104.986	-6.095
175.0	-4.435	-0.993	0.000	0.000	0.000	-9.303	-111.380	0.000	111.380	-6.130
177.0	-0.144	-0.167	0.000	0.000	0.000	-0.433	-113.944	0.000	113.944	-6.134
180.0	-0.125	0.000	0.000	0.000	0.000	0.000	-117.791	0.000	117.791	-6.134

Load Case: No Ice — 85.00 mph Wind with No Ice — 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Stresses

Seg Elev (ft)	Applied Stresses Axial (Y) (ksi)	Shear (X) (ksi)	Shear (Z) (ksi)	Torsion (ksi)	Bending (X) (ksi)	Bending (Z) (ksi)	Combined (ksi)	Allowable Stress (Fb) (ksi)	Allowable Stress (Fa) (ksi)	Stress Ratio
0.00	0.46	0.88	0.00	0.00	0.00	38.78	39.28	46.3	0.0	0.848
5.00	0.45	0.89	0.00	0.00	0.00	38.68	39.17	47.0	0.0	0.834
10.00	0.44	0.89	0.00	0.00	0.00	38.57	39.05	47.6	0.0	0.820
15.00	0.44	0.89	0.00	0.00	0.00	38.45	38.91	48.2	0.0	0.807
20.00	0.43	0.89	0.00	0.00	0.00	38.31	38.77	48.8	0.0	0.794
25.00	0.42	0.89	0.00	0.00	0.00	38.16	38.61	49.5	0.0	0.780
30.00	0.41	0.90	0.00	0.00	0.00	38.00	38.43	50.1	0.0	0.767
35.00	0.40	0.90	0.00	0.00	0.00	37.81	38.24	50.7	0.0	0.754
40.00	0.39	0.91	0.00	0.00	0.00	37.60	38.02	51.4	0.0	0.740
43.83	0.38	0.91	0.00	0.00	0.00	37.42	37.84	51.8	0.0	0.730
45.00	0.37	0.91	0.00	0.00	0.00	37.37	37.77	52.0	0.0	0.727
50.00	0.35	0.91	0.00	0.00	0.00	37.11	37.49	52.0	0.0	0.721
51.00	0.39	1.04	0.00	0.00	0.00	41.81	42.24	48.3	0.0	0.875
55.00	0.39	1.04	0.00	0.00	0.00	41.52	41.95	48.8	0.0	0.859
60.00	0.38	1.05	0.00	0.00	0.00	41.13	41.55	49.6	0.0	0.838
65.00	0.37	1.05	0.00	0.00	0.00	40.70	41.11	50.3	0.0	0.817
70.00	0.36	1.05	0.00	0.00	0.00	40.22	40.62	51.0	0.0	0.796
75.00	0.35	1.05	0.00	0.00	0.00	39.69	40.08	51.8	0.0	0.774
80.00	0.34	1.06	0.00	0.00	0.00	39.11	39.49	52.0	0.0	0.759
85.00	0.33	1.06	0.00	0.00	0.00	38.46	38.83	52.0	0.0	0.747
88.08	0.32	1.07	0.00	0.00	0.00	38.02	38.39	52.0	0.0	0.738
90.00	0.31	1.06	0.00	0.00	0.00	37.73	38.09	52.0	0.0	0.733
94.00	0.35	1.27	0.00	0.00	0.00	42.94	43.35	49.6	0.0	0.874
95.00	0.35	1.26	0.00	0.00	0.00	42.74	43.14	49.8	0.0	0.867
100.00	0.34	1.26	0.00	0.00	0.00	41.64	42.03	50.7	0.0	0.830
105.00	0.33	1.27	0.00	0.00	0.00	40.40	40.79	51.5	0.0	0.791
110.00	0.32	1.27	0.00	0.00	0.00	39.01	39.39	52.0	0.0	0.757
115.00	0.31	1.28	0.00	0.00	0.00	37.42	37.80	52.0	0.0	0.727
120.00	0.30	1.29	0.00	0.00	0.00	35.62	35.99	52.0	0.0	0.692
125.00	0.29	1.30	0.00	0.00	0.00	33.55	33.91	52.0	0.0	0.652
130.00	0.28	1.32	0.00	0.00	0.00	31.16	31.53	52.0	0.0	0.606
133.42	0.27	1.34	0.00	0.00	0.00	29.32	29.68	52.0	0.0	0.571
135.00	0.27	1.34	0.00	0.00	0.00	28.40	28.76	52.0	0.0	0.553
138.00	0.36	1.89	0.00	0.00	0.00	36.42	36.92	48.4	0.0	0.762
140.00	0.36	1.89	0.00	0.00	0.00	34.54	35.05	48.9	0.0	0.716
145.00	0.35	1.91	0.00	0.00	0.00	29.29	29.83	50.2	0.0	0.594
150.00	0.24	1.45	0.00	0.00	0.00	22.86	23.24	51.4	0.0	0.452
155.00	0.24	1.46	0.00	0.00	0.00	18.00	18.41	52.0	0.0	0.354
160.00	0.23	1.50	0.00	0.00	0.00	12.25	12.74	52.0	0.0	0.245
161.00	0.12	0.78	0.00	0.00	0.00	10.97	11.18	52.0	0.0	0.215
165.00	0.11	0.76	0.00	0.00	0.00	8.51	8.73	52.0	0.0	0.168
169.00	0.09	0.68	0.00	0.00	0.00	5.76	5.97	52.0	0.0	0.115
170.00	0.09	0.65	0.00	0.00	0.00	5.13	5.33	52.0	0.0	0.103
175.00	0.07	0.64	0.00	0.00	0.00	1.63	2.03	52.0	0.0	0.039
177.00	0.01	0.02	0.00	0.00	0.00	0.08	0.10	52.0	0.0	0.002
180.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	52.0	0.0	0.001

Site Number: 302465 | Code: TIA/EIA-222-F |

Site Name: Colchester CT 6, CT | Engineering Number: 542622210 | 12/9/2015 3:38:59 PM

Customer: VERIZON WIRELESS

Load Case: Ice | 73.61 mph Wind with Ice | 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		323.7	0.0					0.0	0.0	323.7	0.0	0.0	0.0
5.00		640.8	1,705.7					0.0	90.3	640.8	1,796.0	0.0	0.0
10.00		627.7	1,670.4					0.0	90.3	627.7	1,760.7	0.0	0.0
15.00		614.6	1,635.0					0.0	90.3	614.6	1,725.3	0.0	0.0
20.00		601.5	1,599.7					0.0	90.3	601.5	1,690.0	0.0	0.0
25.00		588.3	1,564.3					0.0	90.3	588.3	1,654.6	0.0	0.0
30.00		575.2	1,529.0					0.0	90.3	575.2	1,619.3	0.0	0.0
35.00		572.4	1,493.7					0.0	90.3	572.4	1,584.0	0.0	0.0
40.00		511.4	1,458.3					0.0	90.3	511.4	1,548.6	0.0	0.0
43.83	Bot - Section 2	292.5	1,094.5					0.0	69.2	292.5	1,163.7	0.0	0.0
45.00		367.1	582.8					0.0	21.1	367.1	603.9	0.0	0.0
50.00		357.6	2,458.0					0.0	90.3	357.6	2,548.3	0.0	0.0
51.00	Top - Section 1	299.0	484.5					0.0	18.1	299.0	502.5	0.0	0.0
55.00		538.5	958.3					0.0	72.2	538.5	1,030.6	0.0	0.0
60.00		597.7	1,169.7					0.0	90.3	597.7	1,260.0	0.0	0.0
65.00		595.7	1,138.9					0.0	90.3	595.7	1,229.2	0.0	0.0
70.00		592.2	1,108.0					0.0	90.3	592.2	1,198.3	0.0	0.0
75.00		587.4	1,077.1					0.0	90.3	587.4	1,167.4	0.0	0.0
80.00		581.5	1,046.2					0.0	90.3	581.5	1,136.5	0.0	0.0
85.00		465.5	1,015.4					0.0	90.3	465.5	1,105.7	0.0	0.0
88.08	Bot - Section 3	286.9	611.3					0.0	55.7	286.9	667.0	0.0	0.0
90.00		339.1	649.5					0.0	34.6	339.1	684.1	0.0	0.0
94.00	Top - Section 2	285.3	1,329.9					0.0	72.2	285.3	1,402.1	0.0	0.0
95.00		337.4	164.1					0.0	18.1	337.4	182.1	0.0	0.0
100.00		556.4	803.1					0.0	90.3	556.4	893.4	0.0	0.0
105.00		545.9	776.7					0.0	90.3	545.9	867.0	0.0	0.0
110.00		534.7	750.3					0.0	90.3	534.7	840.6	0.0	0.0
115.00		522.8	723.9					0.0	90.3	522.8	814.2	0.0	0.0
120.00		510.3	697.5					0.0	90.3	510.3	787.8	0.0	0.0
125.00		497.1	671.1					0.0	90.3	497.1	761.4	0.0	0.0
130.00		408.7	644.7					0.0	90.3	408.7	735.0	0.0	0.0
133.42	Bot - Section 4	239.1	425.9					0.0	61.7	239.1	487.6	0.0	0.0
135.00		217.0	309.8					0.0	28.6	217.0	338.4	0.0	0.0
138.00	Top - Section 3	234.1	575.5					0.0	54.2	234.1	629.7	0.0	0.0
140.00		319.2	177.9					0.0	36.1	319.2	214.1	0.0	0.0
145.00		445.2	430.0					0.0	90.3	445.2	520.3	0.0	0.0
150.00	Appertunance(s)	429.3	410.3	3,830.3	0.0	2,048.7	3,106.7	0.0	90.3	4,259.7	3,607.3	0.0	0.0
155.00		413.0	390.6					0.0	80.6	413.0	471.2	0.0	0.0
160.00		241.8	370.9					0.0	80.6	241.8	451.5	0.0	0.0
161.00	Appertunance(s)	193.8	72.1	4,291.2	0.0	0.0	2,905.3	0.0	16.1	4,485.0	2,993.6	0.0	0.0
165.00		303.1	279.7					0.0	61.2	303.1	340.9	0.0	0.0
169.00	Appertunance(s)	185.1	267.0	563.0	0.0	0.0	464.4	0.0	61.2	748.1	792.6	0.0	0.0
170.00		212.4	65.0					0.0	15.0	212.4	80.0	0.0	0.0
175.00		244.0	311.7					0.0	75.0	244.0	386.7	0.0	0.0
177.00	Appertunance(s)	166.9	119.7	3,400.7	0.0	0.0	1,770.0	0.0	30.0	3,567.7	1,919.7	0.0	0.0
180.00		99.0	173.3					0.0	45.0	99.0	218.3	0.0	0.0

Load Case: Ice — 73.61 mph Wind with Ice — 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Totals:	31,183.2	48,411.2	0.00	0.00

Site Number: 302465 | Code: TIA/EIA-222-F |

Site Name: Colchester CT 6, CT | Engineering Number: 542622210 | 12/9/2015 3:39:00 PM

Customer: VERIZON WIRELESS

Load Case: Ice | 73.61 mph Wind with Ice | 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Shaft Forces and Deflections

Seg Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	X Deflect (in)	Z Deflect (in)	Total Deflect (in)	Rotation (deg)
0.00	-30.907	-48.381	0.000	0.000	0.000	-3,652.269	0.000	0.000	0.000	0.000
5.00	-30.354	-46.526	0.000	0.000	0.000	-3,497.739	-0.060	0.000	0.060	-0.110
10.00	-29.810	-44.709	0.000	0.000	0.000	-3,345.970	-0.235	0.000	0.235	-0.222
15.00	-29.273	-42.928	0.000	0.000	0.000	-3,196.923	-0.530	0.000	0.530	-0.337
20.00	-28.745	-41.183	0.000	0.000	0.000	-3,050.558	-0.945	0.000	0.945	-0.453
25.00	-28.224	-39.475	0.000	0.000	0.000	-2,906.837	-1.484	0.000	1.484	-0.572
30.00	-27.712	-37.803	0.000	0.000	0.000	-2,765.718	-2.148	0.000	2.148	-0.693
35.00	-27.197	-36.168	0.000	0.000	0.000	-2,627.162	-2.939	0.000	2.939	-0.816
40.00	-26.730	-34.575	0.000	0.000	0.000	-2,491.179	-3.861	0.000	3.861	-0.941
43.83	-26.455	-33.387	0.000	0.000	0.000	-2,388.718	-4.658	0.000	4.658	-1.040
45.00	-26.123	-32.753	0.000	0.000	0.000	-2,357.854	-4.916	0.000	4.916	-1.071
50.00	-25.756	-30.177	0.000	0.000	0.000	-2,227.242	-6.108	0.000	6.108	-1.201
51.00	-25.481	-29.651	0.000	0.000	0.000	-2,201.487	-6.362	0.000	6.362	-1.228
55.00	-24.984	-28.576	0.000	0.000	0.000	-2,099.564	-7.438	0.000	7.438	-1.335
60.00	-24.428	-27.267	0.000	0.000	0.000	-1,974.644	-8.917	0.000	8.917	-1.486
65.00	-23.869	-25.990	0.000	0.000	0.000	-1,852.507	-10.555	0.000	10.555	-1.638
70.00	-23.309	-24.747	0.000	0.000	0.000	-1,733.165	-12.355	0.000	12.355	-1.793
75.00	-22.749	-23.536	0.000	0.000	0.000	-1,616.624	-14.317	0.000	14.317	-1.951
80.00	-22.190	-22.359	0.000	0.000	0.000	-1,502.883	-16.447	0.000	16.447	-2.111
85.00	-21.732	-21.222	0.000	0.000	0.000	-1,391.934	-18.744	0.000	18.744	-2.273
88.08	-21.448	-20.536	0.000	0.000	0.000	-1,324.921	-20.247	0.000	20.247	-2.376
90.00	-21.115	-19.830	0.000	0.000	0.000	-1,283.821	-21.214	0.000	21.214	-2.441
94.00	-20.795	-18.411	0.000	0.000	0.000	-1,199.355	-23.316	0.000	23.316	-2.575
95.00	-20.487	-18.203	0.000	0.000	0.000	-1,178.567	-23.859	0.000	23.859	-2.610
100.0	-19.946	-17.271	0.000	0.000	0.000	-1,076.136	-26.694	0.000	26.694	-2.801
105.0	-19.412	-16.367	0.000	0.000	0.000	-976.406	-29.730	0.000	29.730	-2.992
110.0	-18.885	-15.494	0.000	0.000	0.000	-879.345	-32.967	0.000	32.967	-3.185
115.0	-18.365	-14.650	0.000	0.000	0.000	-784.921	-36.404	0.000	36.404	-3.376
120.0	-17.854	-13.836	0.000	0.000	0.000	-693.096	-40.041	0.000	40.041	-3.566
125.0	-17.351	-13.052	0.000	0.000	0.000	-603.828	-43.874	0.000	43.874	-3.752
130.0	-16.927	-12.301	0.000	0.000	0.000	-517.073	-47.900	0.000	47.900	-3.934
133.4	-16.672	-11.806	0.000	0.000	0.000	-459.229	-50.759	0.000	50.759	-4.056
135.0	-16.448	-11.461	0.000	0.000	0.000	-432.843	-52.113	0.000	52.113	-4.112
138.0	-16.184	-10.826	0.000	0.000	0.000	-383.489	-54.729	0.000	54.729	-4.214
140.0	-15.876	-10.598	0.000	0.000	0.000	-351.132	-56.507	0.000	56.507	-4.281
145.0	-15.425	-10.064	0.000	0.000	0.000	-271.754	-61.098	0.000	61.098	-4.481
150.0	-10.910	-6.778	0.000	0.000	0.000	-192.582	-65.883	0.000	65.883	-4.653
155.0	-10.473	-6.319	0.000	0.000	0.000	-138.035	-70.830	0.000	70.830	-4.794
160.0	-10.200	-5.879	0.000	0.000	0.000	-85.669	-75.909	0.000	75.909	-4.905
161.0	-5.478	-3.277	0.000	0.000	0.000	-75.469	-76.938	0.000	76.938	-4.924
165.0	-5.149	-2.959	0.000	0.000	0.000	-53.559	-81.086	0.000	81.086	-4.986
169.0	-4.336	-2.233	0.000	0.000	0.000	-32.962	-85.280	0.000	85.280	-5.033
170.0	-4.118	-2.170	0.000	0.000	0.000	-28.627	-86.334	0.000	86.334	-5.043
175.0	-3.841	-1.805	0.000	0.000	0.000	-8.037	-91.628	0.000	91.628	-5.073
177.0	-0.118	-0.209	0.000	0.000	0.000	-0.354	-93.752	0.000	93.752	-5.077
180.0	-0.099	0.000	0.000	0.000	0.000	0.000	-96.937	0.000	96.937	-5.077

Site Number: 302465 | Code: TIA/EIA-222-F |

Site Name: Colchester CT 6, CT | Engineering Number: 542622210 | 12/9/2015 3:39:00 PM

Customer: VERIZON WIRELESS

Load Case: Ice | 73.61 mph Wind with Ice | 25 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Stresses

Seg Elev (ft)	Applied Stresses							Allowable Stress (Fb) (ksi)	Allowable Stress (Fa) (ksi)	Stress Ratio
	Axial (Y) (ksi)	Shear (X) (ksi)	Shear (Z) (ksi)	Torsion (ksi)	Bending (X) (ksi)	Bending (Z) (ksi)	Combined (ksi)			
0.00	0.54	0.70	0.00	0.00	0.00	31.44	32.01	46.3	0.0	0.691
5.00	0.53	0.70	0.00	0.00	0.00	31.39	31.95	47.0	0.0	0.680
10.00	0.52	0.71	0.00	0.00	0.00	31.33	31.88	47.6	0.0	0.670
15.00	0.51	0.71	0.00	0.00	0.00	31.27	31.80	48.2	0.0	0.659
20.00	0.50	0.71	0.00	0.00	0.00	31.19	31.71	48.8	0.0	0.649
25.00	0.49	0.71	0.00	0.00	0.00	31.10	31.61	49.5	0.0	0.639
30.00	0.48	0.72	0.00	0.00	0.00	30.99	31.50	50.1	0.0	0.629
35.00	0.47	0.72	0.00	0.00	0.00	30.87	31.37	50.7	0.0	0.618
40.00	0.46	0.73	0.00	0.00	0.00	30.74	31.22	51.4	0.0	0.608
43.83	0.45	0.73	0.00	0.00	0.00	30.62	31.10	51.8	0.0	0.600
45.00	0.45	0.73	0.00	0.00	0.00	30.58	31.06	52.0	0.0	0.597
50.00	0.42	0.74	0.00	0.00	0.00	30.40	30.85	52.0	0.0	0.593
51.00	0.48	0.84	0.00	0.00	0.00	34.26	34.77	48.3	0.0	0.721
55.00	0.47	0.84	0.00	0.00	0.00	34.06	34.56	48.8	0.0	0.708
60.00	0.46	0.84	0.00	0.00	0.00	33.78	34.27	49.6	0.0	0.691
65.00	0.45	0.85	0.00	0.00	0.00	33.46	33.95	50.3	0.0	0.675
70.00	0.44	0.85	0.00	0.00	0.00	33.11	33.58	51.0	0.0	0.658
75.00	0.43	0.85	0.00	0.00	0.00	32.71	33.18	51.8	0.0	0.641
80.00	0.43	0.86	0.00	0.00	0.00	32.27	32.73	52.0	0.0	0.629
85.00	0.42	0.87	0.00	0.00	0.00	31.77	32.22	52.0	0.0	0.620
88.08	0.41	0.87	0.00	0.00	0.00	31.43	31.88	52.0	0.0	0.613
90.00	0.40	0.87	0.00	0.00	0.00	31.21	31.65	52.0	0.0	0.609
94.00	0.45	1.04	0.00	0.00	0.00	35.55	36.05	49.6	0.0	0.727
95.00	0.45	1.03	0.00	0.00	0.00	35.39	35.89	49.8	0.0	0.721
100.00	0.44	1.03	0.00	0.00	0.00	34.52	35.01	50.7	0.0	0.691
105.00	0.43	1.04	0.00	0.00	0.00	33.54	34.02	51.5	0.0	0.660
110.00	0.42	1.05	0.00	0.00	0.00	32.42	32.89	52.0	0.0	0.633
115.00	0.42	1.06	0.00	0.00	0.00	31.14	31.61	52.0	0.0	0.608
120.00	0.41	1.07	0.00	0.00	0.00	29.67	30.14	52.0	0.0	0.580
125.00	0.40	1.08	0.00	0.00	0.00	27.98	28.44	52.0	0.0	0.547
130.00	0.39	1.10	0.00	0.00	0.00	26.02	26.48	52.0	0.0	0.509
133.42	0.39	1.11	0.00	0.00	0.00	24.49	24.96	52.0	0.0	0.480
135.00	0.38	1.11	0.00	0.00	0.00	23.73	24.19	52.0	0.0	0.465
138.00	0.52	1.58	0.00	0.00	0.00	30.45	31.09	48.4	0.0	0.642
140.00	0.52	1.57	0.00	0.00	0.00	28.89	29.54	48.9	0.0	0.604
145.00	0.51	1.60	0.00	0.00	0.00	24.52	25.19	50.2	0.0	0.502
150.00	0.36	1.19	0.00	0.00	0.00	19.14	19.61	51.4	0.0	0.381
155.00	0.36	1.20	0.00	0.00	0.00	15.18	15.68	52.0	0.0	0.301
160.00	0.35	1.23	0.00	0.00	0.00	10.48	11.04	52.0	0.0	0.212
161.00	0.20	0.67	0.00	0.00	0.00	9.44	9.71	52.0	0.0	0.187
165.00	0.19	0.66	0.00	0.00	0.00	7.34	7.61	52.0	0.0	0.146
169.00	0.15	0.58	0.00	0.00	0.00	4.97	5.21	52.0	0.0	0.100
170.00	0.14	0.56	0.00	0.00	0.00	4.42	4.67	52.0	0.0	0.090
175.00	0.13	0.56	0.00	0.00	0.00	1.41	1.81	52.0	0.0	0.035
177.00	0.02	0.02	0.00	0.00	0.00	0.07	0.09	52.0	0.0	0.002
180.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	52.0	0.0	0.001

Site Number: 302465 | Code: TIA/EIA-222-F |

Site Name: Colchester CT 6, CT | Engineering Number: 542622210 | 12/9/2015 3:39:00 PM

Customer: VERIZON WIRELESS

Load Case: Twist/Sway | 50.00 mph Wind with No Ice | 24 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		147.0	0.0					0.0	0.0	147.0	0.0	0.0	0.0
5.00		291.0	1,507.9					0.0	90.3	291.0	1,598.2	0.0	0.0
10.00		285.0	1,476.6					0.0	90.3	285.0	1,566.9	0.0	0.0
15.00		278.9	1,445.3					0.0	90.3	278.9	1,535.6	0.0	0.0
20.00		272.9	1,414.1					0.0	90.3	272.9	1,504.4	0.0	0.0
25.00		266.8	1,382.8					0.0	90.3	266.8	1,473.1	0.0	0.0
30.00		260.8	1,351.6					0.0	90.3	260.8	1,441.9	0.0	0.0
35.00		259.4	1,320.3					0.0	90.3	259.4	1,410.6	0.0	0.0
40.00		231.6	1,289.1					0.0	90.3	231.6	1,379.4	0.0	0.0
43.83	Bot - Section 2	132.4	967.1					0.0	69.2	132.4	1,036.4	0.0	0.0
45.00		166.2	543.8					0.0	21.1	166.2	564.8	0.0	0.0
50.00		161.9	2,294.6					0.0	90.3	161.9	2,384.9	0.0	0.0
51.00	Top - Section 1	135.3	452.0					0.0	18.1	135.3	470.0	0.0	0.0
55.00		243.6	830.9					0.0	72.2	243.6	903.1	0.0	0.0
60.00		270.3	1,014.5					0.0	90.3	270.3	1,104.8	0.0	0.0
65.00		269.2	987.7					0.0	90.3	269.2	1,078.0	0.0	0.0
70.00		267.5	960.9					0.0	90.3	267.5	1,051.2	0.0	0.0
75.00		265.2	934.1					0.0	90.3	265.2	1,024.4	0.0	0.0
80.00		262.3	907.3					0.0	90.3	262.3	997.6	0.0	0.0
85.00		209.9	880.5					0.0	90.3	209.9	970.8	0.0	0.0
88.08	Bot - Section 3	129.3	529.7					0.0	55.7	129.3	585.4	0.0	0.0
90.00		152.8	598.6					0.0	34.6	152.8	633.2	0.0	0.0
94.00	Top - Section 2	128.5	1,226.3					0.0	72.2	128.5	1,298.5	0.0	0.0
95.00		151.9	138.3					0.0	18.1	151.9	156.4	0.0	0.0
100.00		250.3	678.6					0.0	90.3	250.3	768.9	0.0	0.0
105.00		245.4	656.2					0.0	90.3	245.4	746.5	0.0	0.0
110.00		240.2	633.9					0.0	90.3	240.2	724.2	0.0	0.0
115.00		234.6	611.6					0.0	90.3	234.6	701.9	0.0	0.0
120.00		228.7	589.3					0.0	90.3	228.7	679.6	0.0	0.0
125.00		222.5	566.9					0.0	90.3	222.5	657.2	0.0	0.0
130.00		182.8	544.6					0.0	90.3	182.8	634.9	0.0	0.0
133.42	Bot - Section 4	106.9	359.4					0.0	61.7	106.9	421.1	0.0	0.0
135.00		96.9	279.0					0.0	28.6	96.9	307.6	0.0	0.0
138.00	Top - Section 3	104.5	518.5					0.0	54.2	104.5	572.7	0.0	0.0
140.00		142.4	140.6					0.0	36.1	142.4	176.8	0.0	0.0
145.00		198.3	340.8					0.0	90.3	198.3	431.1	0.0	0.0
150.00	Appertunance(s)	190.9	325.2	1,516.5	0.0	818.7	2,322.6	0.0	90.3	1,707.4	2,738.1	0.0	0.0
155.00		183.3	309.5					0.0	80.6	183.3	390.1	0.0	0.0
160.00		107.2	293.9					0.0	80.6	107.2	374.5	0.0	0.0
161.00	Appertunance(s)	85.8	56.9	1,915.4	0.0	0.0	2,299.7	0.0	16.1	2,001.1	2,372.7	0.0	0.0
165.00		134.0	221.4					0.0	61.2	134.0	282.6	0.0	0.0
169.00	Appertunance(s)	81.7	211.4	218.0	0.0	0.0	304.6	0.0	61.2	299.7	577.2	0.0	0.0
170.00		93.5	51.3					0.0	15.0	93.5	66.3	0.0	0.0
175.00		107.4	247.0					0.0	75.0	107.4	322.0	0.0	0.0
177.00	Appertunance(s)	73.3	94.4	1,372.4	0.0	0.0	1,155.0	0.0	30.0	1,445.7	1,279.4	0.0	0.0
180.00		43.4	136.9					0.0	45.0	43.4	181.9	0.0	0.0

Load Case: Twist/Sway — 50.00 mph Wind with No Ice — 24 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Totals:	13,616.0	41,576.5	0.00	0.00

Load Case: Twist/Sway — 50.00 mph Wind with No Ice — 24 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Shaft Forces and Deflections

Seg Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	X Deflect (in)	Z Deflect (in)	Total Deflect (in)	Rotation (deg)
0.00	-13.485	-41.571	0.000	0.000	0.000	-1,560.522	0.000	0.000	0.000	0.000
5.00	-13.227	-39.962	0.000	0.000	0.000	-1,493.096	-0.025	0.000	0.025	-0.047
10.00	-12.972	-38.384	0.000	0.000	0.000	-1,426.963	-0.101	0.000	0.101	-0.095
15.00	-12.722	-36.838	0.000	0.000	0.000	-1,362.103	-0.226	0.000	0.226	-0.144
20.00	-12.475	-35.324	0.000	0.000	0.000	-1,298.496	-0.403	0.000	0.403	-0.193
25.00	-12.233	-33.841	0.000	0.000	0.000	-1,236.121	-0.633	0.000	0.633	-0.244
30.00	-11.995	-32.390	0.000	0.000	0.000	-1,174.957	-0.916	0.000	0.916	-0.295
35.00	-11.756	-30.970	0.000	0.000	0.000	-1,114.985	-1.253	0.000	1.253	-0.347
40.00	-11.540	-29.582	0.000	0.000	0.000	-1,056.206	-1.646	0.000	1.646	-0.401
43.83	-11.413	-28.541	0.000	0.000	0.000	-1,011.971	-1.985	0.000	1.985	-0.442
45.00	-11.259	-27.971	0.000	0.000	0.000	-998.656	-2.095	0.000	2.095	-0.456
50.00	-11.092	-25.581	0.000	0.000	0.000	-942.360	-2.601	0.000	2.601	-0.511
51.00	-10.965	-25.107	0.000	0.000	0.000	-931.268	-2.710	0.000	2.710	-0.522
55.00	-10.736	-24.196	0.000	0.000	0.000	-887.408	-3.167	0.000	3.167	-0.567
60.00	-10.480	-23.083	0.000	0.000	0.000	-833.728	-3.795	0.000	3.795	-0.631
65.00	-10.223	-21.996	0.000	0.000	0.000	-781.329	-4.491	0.000	4.491	-0.695
70.00	-9.967	-20.937	0.000	0.000	0.000	-730.214	-5.254	0.000	5.254	-0.761
75.00	-9.710	-19.905	0.000	0.000	0.000	-680.382	-6.087	0.000	6.087	-0.827
80.00	-9.456	-18.900	0.000	0.000	0.000	-631.831	-6.989	0.000	6.989	-0.894
85.00	-9.247	-17.924	0.000	0.000	0.000	-584.554	-7.963	0.000	7.963	-0.963
88.08	-9.119	-17.336	0.000	0.000	0.000	-556.039	-8.599	0.000	8.599	-1.006
90.00	-8.967	-16.699	0.000	0.000	0.000	-538.565	-9.008	0.000	9.008	-1.033
94.00	-8.824	-15.397	0.000	0.000	0.000	-502.695	-9.898	0.000	9.898	-1.089
95.00	-8.682	-15.237	0.000	0.000	0.000	-493.875	-10.128	0.000	10.128	-1.104
100.0	-8.436	-14.461	0.000	0.000	0.000	-450.468	-11.327	0.000	11.327	-1.184
105.0	-8.194	-13.709	0.000	0.000	0.000	-408.288	-12.610	0.000	12.610	-1.264
110.0	-7.956	-12.979	0.000	0.000	0.000	-367.318	-13.977	0.000	13.977	-1.344
115.0	-7.721	-12.272	0.000	0.000	0.000	-327.540	-15.428	0.000	15.428	-1.424
120.0	-7.491	-11.588	0.000	0.000	0.000	-288.935	-16.963	0.000	16.963	-1.503
125.0	-7.266	-10.928	0.000	0.000	0.000	-251.480	-18.579	0.000	18.579	-1.581
130.0	-7.076	-10.290	0.000	0.000	0.000	-215.152	-20.276	0.000	20.276	-1.657
133.4	-6.963	-9.868	0.000	0.000	0.000	-190.970	-21.481	0.000	21.481	-1.707
135.0	-6.863	-9.560	0.000	0.000	0.000	-179.950	-22.051	0.000	22.051	-1.731
138.0	-6.746	-8.986	0.000	0.000	0.000	-159.357	-23.153	0.000	23.153	-1.773
140.0	-6.607	-8.808	0.000	0.000	0.000	-145.869	-23.901	0.000	23.901	-1.801
145.0	-6.407	-8.374	0.000	0.000	0.000	-112.832	-25.833	0.000	25.833	-1.884
150.0	-4.615	-5.690	0.000	0.000	0.000	-79.980	-27.847	0.000	27.847	-1.955
155.0	-4.423	-5.303	0.000	0.000	0.000	-56.906	-29.927	0.000	29.927	-2.014
160.0	-4.305	-4.930	0.000	0.000	0.000	-34.791	-32.062	0.000	32.062	-2.059
161.0	-2.220	-2.630	0.000	0.000	0.000	-30.487	-32.495	0.000	32.495	-2.067
165.0	-2.077	-2.352	0.000	0.000	0.000	-21.606	-34.237	0.000	34.237	-2.092
169.0	-1.757	-1.786	0.000	0.000	0.000	-13.298	-35.998	0.000	35.998	-2.111
170.0	-1.661	-1.723	0.000	0.000	0.000	-11.541	-36.441	0.000	36.441	-2.115
175.0	-1.542	-1.405	0.000	0.000	0.000	-3.235	-38.663	0.000	38.663	-2.127
177.0	-0.050	-0.180	0.000	0.000	0.000	-0.150	-39.555	0.000	39.555	-2.129
180.0	-0.043	0.000	0.000	0.000	0.000	0.000	-40.892	0.000	40.892	-2.129

Load Case: Twist/Sway — 50.00 mph Wind with No Ice — 24 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Stresses

Seg Elev (ft)	Applied Stresses Axial (Y) (ksi)	Shear (X) (ksi)	Shear (Z) (ksi)	Torsion (ksi)	Bending (X) (ksi)	Bending (Z) (ksi)	Combined (ksi)	Allowable Stress (Fb) (ksi)	Allowable Stress (Fa) (ksi)	Stress Ratio
0.00	0.46	0.31	0.00	0.00	0.00	13.43	13.91	46.3	0.0	0.300
5.00	0.46	0.31	0.00	0.00	0.00	13.40	13.87	47.0	0.0	0.295
10.00	0.45	0.31	0.00	0.00	0.00	13.36	13.82	47.6	0.0	0.290
15.00	0.44	0.31	0.00	0.00	0.00	13.32	13.77	48.2	0.0	0.286
20.00	0.43	0.31	0.00	0.00	0.00	13.28	13.72	48.8	0.0	0.281
25.00	0.42	0.31	0.00	0.00	0.00	13.22	13.66	49.5	0.0	0.276
30.00	0.41	0.31	0.00	0.00	0.00	13.17	13.59	50.1	0.0	0.271
35.00	0.40	0.31	0.00	0.00	0.00	13.10	13.52	50.7	0.0	0.266
40.00	0.40	0.31	0.00	0.00	0.00	13.03	13.44	51.4	0.0	0.262
43.83	0.39	0.32	0.00	0.00	0.00	12.97	13.37	51.8	0.0	0.258
45.00	0.38	0.31	0.00	0.00	0.00	12.95	13.35	52.0	0.0	0.257
50.00	0.36	0.32	0.00	0.00	0.00	12.86	13.23	52.0	0.0	0.255
51.00	0.41	0.36	0.00	0.00	0.00	14.49	14.91	48.3	0.0	0.309
55.00	0.40	0.36	0.00	0.00	0.00	14.40	14.81	48.8	0.0	0.303
60.00	0.39	0.36	0.00	0.00	0.00	14.26	14.67	49.6	0.0	0.296
65.00	0.38	0.36	0.00	0.00	0.00	14.11	14.51	50.3	0.0	0.288
70.00	0.38	0.36	0.00	0.00	0.00	13.95	14.34	51.0	0.0	0.281
75.00	0.37	0.36	0.00	0.00	0.00	13.77	14.15	51.8	0.0	0.273
80.00	0.36	0.37	0.00	0.00	0.00	13.57	13.94	52.0	0.0	0.268
85.00	0.35	0.37	0.00	0.00	0.00	13.34	13.71	52.0	0.0	0.264
88.08	0.35	0.37	0.00	0.00	0.00	13.19	13.55	52.0	0.0	0.261
90.00	0.34	0.37	0.00	0.00	0.00	13.09	13.45	52.0	0.0	0.259
94.00	0.38	0.44	0.00	0.00	0.00	14.90	15.30	49.6	0.0	0.308
95.00	0.38	0.44	0.00	0.00	0.00	14.83	15.23	49.8	0.0	0.306
100.00	0.37	0.44	0.00	0.00	0.00	14.45	14.84	50.7	0.0	0.293
105.00	0.36	0.44	0.00	0.00	0.00	14.02	14.41	51.5	0.0	0.280
110.00	0.35	0.44	0.00	0.00	0.00	13.54	13.92	52.0	0.0	0.268
115.00	0.35	0.44	0.00	0.00	0.00	12.99	13.36	52.0	0.0	0.257
120.00	0.34	0.45	0.00	0.00	0.00	12.37	12.73	52.0	0.0	0.245
125.00	0.33	0.45	0.00	0.00	0.00	11.65	12.01	52.0	0.0	0.231
130.00	0.33	0.46	0.00	0.00	0.00	10.83	11.18	52.0	0.0	0.215
133.42	0.32	0.46	0.00	0.00	0.00	10.19	10.54	52.0	0.0	0.203
135.00	0.32	0.46	0.00	0.00	0.00	9.87	10.22	52.0	0.0	0.196
138.00	0.43	0.66	0.00	0.00	0.00	12.65	13.13	48.4	0.0	0.271
140.00	0.43	0.66	0.00	0.00	0.00	12.00	12.48	48.9	0.0	0.255
145.00	0.43	0.67	0.00	0.00	0.00	10.18	10.67	50.2	0.0	0.213
150.00	0.31	0.50	0.00	0.00	0.00	7.95	8.30	51.4	0.0	0.161
155.00	0.30	0.51	0.00	0.00	0.00	6.26	6.62	52.0	0.0	0.127
160.00	0.29	0.52	0.00	0.00	0.00	4.26	4.64	52.0	0.0	0.089
161.00	0.16	0.27	0.00	0.00	0.00	3.81	4.00	52.0	0.0	0.077
165.00	0.15	0.27	0.00	0.00	0.00	2.96	3.14	52.0	0.0	0.060
169.00	0.12	0.24	0.00	0.00	0.00	2.00	2.16	52.0	0.0	0.042
170.00	0.12	0.23	0.00	0.00	0.00	1.78	1.94	52.0	0.0	0.037
175.00	0.10	0.22	0.00	0.00	0.00	0.57	0.77	52.0	0.0	0.015
177.00	0.01	0.01	0.00	0.00	0.00	0.03	0.04	52.0	0.0	0.001
180.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	52.0	0.0	0.000

Analysis Summary

	Reactions						Max Stresses			
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Combined Stress (ksi)	Allowable Stress (ksi)	Elev (ft)	Stress Ratio
No Ice	39.0	0.00	41.53	0.00	0.00	4504.87	42.24	48.3	51.00	0.875
Ice	30.9	0.00	48.38	0.00	0.00	3652.27	36.05	49.6	94.00	0.727
Twist/Sway	13.5	0.00	41.57	0.00	0.00	1560.52	14.91	48.3	51.00	0.309

Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
4,932.40	45.02	41.52	4,504.87	48.38	38.98	91.33

Base Plate

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Moment (kip-in)	Allow Stress (ksi)	Applied Stress (ksi)	Stress Ratio
60.0	2.500	78.760	Polygon	12	0.00	44.450	1732.97	60.00	37.43	0.62

Anchor Bolts

								Start	Compression			Tension		
Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Angle (deg)	Force (kip)	Allow (kip)	Ratio	Force (kip)	Allow (kip)	Ratio
72.76	20	2.25" 18J	2.25	75.00	100.00	Radial	0.00	0.0	151.01	195.00	0.77	146.17	195.00	0.75

ATTACHMENT 5

355 NEW LONDON RD.
NO. STREET ADDRESS

M & J AUTO (NEXTEL COM.) 860.537.5002 2-80 , 3
PROPERTY OWNER PHONE TAX MAP LOT

CONTRACTOR PHONE

BUILDING PERMIT

NO._____ DATE_____

Other Permits/Dates

( ) Wetlands _____
( ) Zoning _____
( ) Driveway _____

Inspections/Dates

( ) Temp Electrical _____
( ) Footings _____
( ) Rough Framing _____
( ) Rough Elec. _____
( ) Rough Plumb. _____
( ) Perm. Elec. _____

( ) CERTIFICATE OF OCCUPANCY

_____

Activity	Date	
1. Testing application		
2. Testing fee		
3. Final plan review		
4. Septic permit application	10/30/00	
5. Septic permit fee	10/25/00	
6. Strip inspection	5/7/01	
7. Final septic inspection	6/5/01 pumpvalve	
8. Soil pipe inspection	5/9/01	
9. As-built approved		
10. Permit to discharge		
11. Well permit issued	10/92 - RG.	
12. Well completion report	10/92	
13. Water supply approved		
14. C.O. approved		
Comments:		
* Strip - depth ok. bottom to be re-scarified prior to fill placement.		
5/9/01 - System Ok, need to verify Pump, once in		

ADDITIONAL PERMITS

NO.	DATE	USE
98-7406	8/12/98	MANGRLE
00-8823	10/24/00	INSTALL TRAILER
10/24 - Bus Terminal per USA#2000 247		
00-8919	12/28/00	ANTENNA
02-10163	9/13/02.	ANTENNA
07-13278	1/29/07.	Replace Antennat Equip
08-14511	9/16/08.	Cold STORAGE

TECTONIC ENGINEERING CONSULTANTS P.C.

☒ P.O. Box 447, 615 Route 32, Highland Mills, N.Y. 10930
Phone: (914)928-6531 Fax: (914)928-9211
☐ 2 Northway Lane, Latham, N.Y. 12110
Phone: (513)783-1630 Fax: (513)783-1544
☐ 714B Southbridge St., Auburn, M.A. 01501
Phone: (508)832-7146 Fax: (508)832-0775
☐ 7370 Kingsgate, Suite H, West Chester, OH 45069
Phone: (513)759-9500

LETTER OF TRANSMITTAL

DATE: 8/5/98	**JOB NO.:** 1170.C877
ATTENTION: Timothy York	
RE: Colchester South	

TO Timothy York
Town of Colchester Bldg. Dept.
127 Norwich Avenue
Colchester, CT 06415

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via **overnight** the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION	REVISION:
1			**Monopole Review**	
1	**7/24/98**	**13592**	**Check for $965.00 for Building Permit**	
1	**7/93**	**5948001**	**Safeco Performance Bond (2 pages) Signed & Sealed.**	
1	**8/18/97**	**9501**	**Safeco Power of Attorney**	
1	**8/5/98**		**Letter - Design Review**	

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit_____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit_____copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return_____ corrected prints
☐ For review and comment ☐ _____
☐ For BIDS DUE_____19_____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please send a receipt for the check. Thank you.

COPY TO:

SIGNED: **Tammy Rossie/cmp**

TOWN OF COLCHESTER
INSPECTION REQUEST

LOCATION: Dutton Rd./ M & J Auto Monopole REQUESTED BY: Contractor

REC'D ON: AT: DATE NEEDED: 9/15/98 10 AM

TYPE OF INSPECTION (RESIDENTIAL)

BUILDING		PLUMBING		MECHANICAL		ELECTRICAL		SEPTIC	
Footing	✓	Sewer/Water Lns.		Rough in		Temp Service		Stripped	
Backfill		Rough In		Final		New Service		Final	
Rough In		Slab		Wood Stove		Service Change		Test Pit	
Insulation		Air or Water Test		Smoke Chamber		Rough In		E & S Controls	
Final		Final		Pools		Final		Septic Repair	

TYPE OF INSPECTION (COMMERCIAL)

Footings		Supply Duct		Vent Systems		Panel Location		Other	
Concrete Slab		Return Air		Waste Lines		Disconnect			
Foundation		Comb. Air		Supply Lines		Service			
Framing		Supply Tank		Pressure Test		GFIC			
Fire Separation		Furnace Location							
Insulation		Fire Dampers							
Alarms		Duct Insulation							
Sprinklers		Seismic							

COMMENTS: Grade Beams set 9/14/98 visual inspection 9/15/98 Beams OK

INSPECTOR'S SIGNATURE:

TOWN OF COLCHESTER
INSPECTION REQUEST

LOCATION: NEXTEL TOWER REQUESTED BY: CONTRACTOR

REC'D ON: AT: DATE NEEDED: 9-30-98 3:30 PM

TYPE OF INSPECTION (RESIDENTIAL)

BUILDING		PLUMBING		MECHANICAL		ELECTRICAL		SEPTIC	
Footing		Sewer/Water Lns.		Rough in		Temp Service		Stripped	
Backfill		Rough In		Final		New Service	X	Final	
Rough In		Slab		Wood Stove		Service Change		Test Pit	
Insulation		Air or Water Test		Smoke Chamber		Rough In		E & S Controls	
Final		Final		Pools		Final		Septic Repair	

TYPE OF INSPECTION (COMMERCIAL)

Footings		Supply Duct		Vent Systems		Panel Location		Other	
Concrete Slab		Return Air		Waste Lines		Disconnect			
Foundation		Comb. Air		Supply Lines		Service			
Framing		Supply Tank		Pressure Test		GFIC			
Fire Separation		Furnace Location							
Insulation		Fire Dampers							
Alarms		Duct Insulation							
Sprinklers		Seismic							

COMMENTS: Trench ok to Back Fill, Ground Rod installed
2nd Ground Rod with continuous ground wire
Service ok will be

INSPECTOR'S SIGNATURE:

OFFICE USE ONLY
Street 355 New London Rd
Map _____ Lot _____
Date 12/28/00
PERMIT Nº 8919

TOWN OF COLCHESTER

BUILDING PERMIT

FEES PAID					
	Structural 80	Plumbing _____	Misc. (Ltr Fee)	2
	Septic _____	Heating _____	Misc. (St Fee)	10
	Electrical _____	Well _____	Total Fee Paid	92

PERMISSION IS HEREBY GRANTED TO M & T Auto Recycling
to: erect ✓, alter _____, enlarge _____, repair _____, move _____, demolish _____, a Antenna
located at 355 New London Rd on land
owned by Same
Said: erection _____, alteration _____, enlargement _____, repairs _____, removal _____, demolition _____, to be occupied as _____
as described in Application No. _____ and to conform with plans and specifications filed with application, all provisions of the Connecticut Building Code and to comply with all other laws and rules relating to this subject. If no work is performed within six months from the time of issuance, this permit shall expire by limitation as provided by law.

REMARKS Antenna & Cssoc. equipment

Receipt No. #1154

Approved by Timothy E. York
Timothy E. York
Building Inspector

Please refer to notice on reverse side of this permit

WHITE: Applicant CANARY: Assessor PINK: Gen. File GOLDENROD: Street File

TOWN OF COLCHESTER
APPLICATION FOR BUILDING PERMIT

DATE OF APPLICATION 12-21-00 ASSESSOR'S TAX MAP & LOT # /

Notice: Please refer to rules and requirements on reverse side.

The undersigned hereby applies for a permit to: ERECT ( ), ALTER ( ), ENLARGE ( ), REPAIR ( ), REMOVE ( ), DEMOLISH ( ), a building or structure herein described and in accordance with plans and specifications submitted.

LOCATION (Street & No.) 355 Route 85 PROPERTY OWNER M & J Auto Recycling

OWNER'S ADDRESS same PHONE

BUILDER Douglas Manson PHONE 203 268 6666

BUILDER'S ADDRESS 1229 Daniels Farm Rd Trumbull 06611 LICENSE # 122377

USE GROUP _____ TYPE OF CONSTRUCTION pad mount control box SIZE OF BUILDING 3' X 8'

GARAGE SIZE _____ x _____ ATTACHED _____ TOTAL FLOOR AREA _____ NUMBER OF STORIES _____

NUMBER OF BATHS _____ NUMBER OF BEDROOMS _____ JACUZZI/HOT-TUBS _____ GAL.

HEATING TYPE _____ SIDING _____ SEPTIC _____ WELL _____ CITY WATER _____

CITY SEWER _____ GARBAGE DISPOSAL _____ ACCESSORY BUILDING SIZE _____

IS PROPERTY WITHIN 100 YEAR FLOOD PLAIN? _____ EST. CONSTRUCTION VALUE $ 8,000.00

The applicant agrees to comply with all the provisions of the building code and with the provisions of all other laws and rules governing building construction.

Signed (Owner or (Agent)) Douglas Manson Print Name Douglas Manson

APPROVED (Building Official) Timothy E Lyon

DESCRIPTION OF PROPOSED WORK UNDER THIS APPLICATION: A 6 Meter Electric SVC 5 of which are for future & 1 of which will be used for the 100 Amp 1 Ø 120/208 panel for antenna equipment control box

SUBCONTRACTORS		OFFICIAL USE ONLY	
Electrician Name Signature	Address Lic.#	Electrical	___
Plumber Name Signature	Address Lic.#	Plumbing	___
Heating Contractor Name Signature	Address Lic.#	Heating	___
Remodeler Name Signature	Address Lic.#	Sed/Erosion	___
Sprinkler Contractor Name Signature	Address Lic.#	Septic	___
		Well	___
		Driveway	___
		Building	80
		Education Fee	2
		State Fee	10
		Total Fee	92

WHITE: File PINK: Assessor CANARY: Applicant

ATTACHMENT 6

Site Name: Colchester S 2, CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	11	400	4396.354	161	0.0610	1.0	6.10%
VZW Cellular	869	9	342	3078.432	161	0.0427	0.579333333	7.37%
VZW AWS	2145	1	1750	1750	161	0.0243	1.0	2.43%
VZW 700	746	1	1050	1050	161	0.0146	0.497333333	2.93%

Total Percentage of Maximum Permissible Exposure 18.83%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used.

ATTACHMENT 7

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

July 12, 2016

Via Certificate of Mailing

Art Shilosky, First Selectman
Town of Colchester
127 Norwich Avenue
Colchester, CT 06415

Re: **Proposed Modifications to a Telecommunications Facility at 355 New London Road in Colchester, Connecticut**

Dear Mr. Shilosky:

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 install antennas and related equipment on the existing 180-foot monopole tower at 355 New London Road in Colchester, Connecticut (the "Property"). Cellco intends to install twelve (12) antennas and six (6) remote radio heads at the 161-foot level on the tower. Equipment associated with Cellco's antennas and an emergency back-up generator will be installed on a new equipment platform with canopy roof.

As presented in the Sub-Petition, the proposed facility modifications 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-14-153). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

15008556-v1

Robinson+Cole

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

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

July 12, 2016

Via Certificate of Mailing

M & J Auto Recycling Inc.
P.O. Box 908
Colchester, CT 06415

Re: **Proposed Modifications to a Telecommunications Facility at 355 New London Road in Colchester, Connecticut**

Dear Sir or 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 install antennas and related equipment on the existing 180-foot monopole tower at 355 New London Road in Colchester, Connecticut (the "Property"). Cellco intends to install twelve (12) antennas and six (6) remote radio heads at the 161-foot level on the tower. Equipment associated with Cellco's antennas and an emergency back-up generator will be installed on a new equipment platform with canopy roof.

As presented in the Sub-Petition, the proposed facility modifications 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-14-153). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

15008575-v1

Robinson+Cole

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

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

July 12, 2016

Via Certificate of Mailing

Heather Douglas Wilkins
Territory Manager-Business Development
Northeast (New England/NY)
American Tower Corporation
10 Presidential Way
Woburn, MA 01801

Re: **Proposed Modifications to a Telecommunications Facility at 355 New London Road in Colchester, Connecticut**

Dear Ms. Wilkins:

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 install antennas and related equipment on the existing 180-foot monopole tower at 355 New London Road in Colchester, Connecticut (the "Property"). Cellco intends to install twelve (12) antennas and six (6) remote radio heads at the 161-foot level on the tower. Equipment associated with Cellco's antennas and an emergency back-up generator will be installed on a new equipment platform with canopy roof.

As presented in the Sub-Petition, the proposed facility modifications 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-14-153). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

15008587-v1

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

ATTACHMENT 8

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

July 12, 2016

Via Certificate of Mailing

«Name_and_Address»

Re: **Proposed Telecommunications Facility at 355 New London Road in Colchester, 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 install antennas and related equipment on the existing 180-foot monopole tower at 355 New London Road in Colchester, Connecticut (the "Property"). Cellco intends to install twelve (12) antennas and six (6) remote radio heads at the 161-foot level on the tower. Equipment associated with Cellco's antennas and an emergency back-up generator will be installed on a new equipment platform with canopy roof.

As presented in the Sub-Petition, the proposed 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-14-153). 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

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS

ABUTTING PROPERTY OWNERS

355 NEW LONDON ROAD/ROUTE 85
COLCHESTER, CONNECTICUT

	Property Address	Owner's and Mailing Address
1.	10 Dutton Road	Carol A. Bagshaw 10 Dutton Road Colchester, CT 06415
2.	14 Dutton Road	Scott and Lynette Dimock 14 Dutton Road Colchester, CT 06415
3.	13 Dutton Road	Joseph Maulucci 13 Dutton Road Colchester, CT 06415
4.	19 Dutton Road	Gerald and Diane Pearl 19 Dutton Road Colchester, CT 06415
5.	86 McDonald Road	Town of Colchester 127 Norwich Road Colchester, CT 06415
6.	29 Dutton Road	Stanley and Gina Moroch 29 Dutton Road Colchester, CT 06415
7.	McDonald Road	Town of Colchester 127 Norwich Road Colchester, CT 06415
8.	43 Dutton Road	William A. and Karen McCormick Wells 43 Dutton Road Colchester, CT 06415
9.	158 McDonald Road	Theodora C. Begun 158 McDonald Road Colchester, CT 06415
10.	395 New London Road	Donald J. Kendzior 383 New London Road Colchester, CT 06415

	Property Address	Owner's and Mailing Address
11.	383 New London Road	Donald J. Kendzior 383 New London Road Colchester, CT 06415
12.	350 New London Road	Estate of Josephine Schools c/o Robert P. Schools 184 West High Street East Hampton, CT 06424
13.	342 New London Road	Stephen Ty Miller 342 New London Road Colchester, CT 06415
14.	338 New London Road	RMD Land Development LLC 612 Church Street Amston, CT 06231