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EM-VER-083-121011

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

October 10, 2012

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification – Antenna Swap 50 Fairchild Road, Middletown, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains three (3) wireless telecommunications antennas at the 110-foot level on an existing 130-foot tower at the above-referenced address. The tower is owned by SBA. Cellco's use of the tower was approved by the Council in 2008. Cellco now intends to replace its existing antennas with three (3) model BXD-636X638X-CF cellular antennas and add three (3) model BXA-70063-6CF LTE antennas, for a total of six (6) antennas, all at the same 110-foot level. Cellco also intends to install six (6) coax cable diplexers behind its antennas. Attached behind Tab 1 are the specifications for the replacement antennas and diplexers.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Daniel Drew, Mayor of the City of Middletown. A copy of this letter is also being sent to Stephen and Barbara Borelli, the owners of the property on which the tower is located.

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



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Linda Roberts October 10, 2012 Page 2

- 1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and diplexers will be located at the 110-foot level on the existing 130-foot tower.
- 2. The proposed modifications do not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.
- 3. The proposed modifications will not increase noise levels at the facility by six decibels or more.
- 4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind <u>Tab 2</u>.

Also attached is a Structural Analysis confirming that the tower and foundation, with certain modifications, can support Cellco's proposed modifications. (See <u>Tab 3</u>). The Modification Drawings for a 130-foot monopole, dated October 4, 2012, referenced on page 3 of the Structural Analysis will be forwarded to the Council as soon as they are available. We would ask that you condition the Council's approval on the receipt of this additional information.

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

Sincerely,

Kenneth C. Baldwin

Enclosures Copy to:

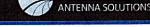
Daniel Drew, Middletown Mayor Stephen and Barbara Borelli Sandy M. Carter





BXD-636X638XCF-EDIN

XX-Pol | FET Dual Band Panel | 63°/63° | 16.6 / 18.0 dBi

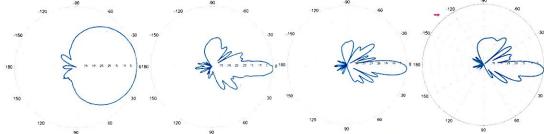


Replace "X" with desired electrical downtilt.

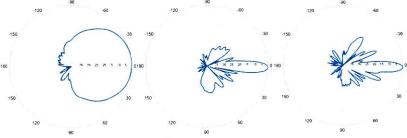
Antenna is available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Francisco de la constantina della constantina de	906	-900 MHz*		1850-1990 MHz
Frequency bands	806			
*Optional frequency band for iDEN			Hz (Specify when orde	
Polarization		±45°		±45°
Horizontal beamwidth		63°		63°
Vertical beamwidth		11°		7°
Gain	14.5 d	Bd (16.6 dBi)	15	5.9 dBd (18.0 dBi)
Electrical downtilt (X)		0, 4, 6		0, 2
Impedance			50Ω	
VSWR			≤1.4:1	,
Front-to-Back ratio (+/- 30°)		>30 dB		>30 dB
Null fill		5-15%	(-26.02 to -16.48 dB)	
Isolation between ports	< -25 dB			
Input power with EDIN connectors		500 W		250 W
Input power with NE connectors		300 W	N.	250 W
Lightning protection			Direct Ground	
Connector(s)		4 Ports / EDIN o	or NE / Female / Cente	er (Back)
Mechanical Characteristics		430/75/54		ta i Krtavija
Dimensions Length x Width x Depth	1804	x 427 x 107 mm	71.1	x 16.8 x 4.2 in
Weight without mounting brackets		12.7 kg		28.0 lbs
Survival wind speed		>201 km/hr		>125 mph
Wind area	Front: 0.77 m ²	Side: 0.19 m ²	Front: 8.3 ft ²	Side: 2.1 ft ²
Wind load @ 161 km/hr (100 mph)	Front: 1094 N	Side: 334 N	Front: 245.9 lbf	Side: 75.2 lbf
Mounting Options	Part Number	Fi	ts Pipe Diameter	Weight
3-Point mounting & downtilt bracket kit	36210008	40-1	15 mm 1.57-4.5 in	6.9 kg 15.2 lbs





Horizontal | 806-900 MHz 0° | Vertical | 806-900 MHz 4° | Vertical | 806-900 MHz 6° | Vertical | 806-900 MHz 1850-1990 MHz



0° | Vertical | 1850-1990 MHz $\,$ 2° | Vertical | 1850-1990 MHz $\,$ Horizontal | 1850-1990 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

806-900 MHz



BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

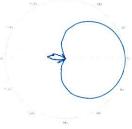
Electrical Characteristics 696-900 MHz Frequency bands 696-806 MHz 806-900 MHz Polarization ±45° Horizontal beamwidth 65° 63° 13° Vertical beamwidth 11° 14.0 dBd (16.1 dBi) 14.5 dBd (16.6 dBi) Electrical downtilt (X) 0, 2, 3, 4, 5, 6, 8, 10 Impedance 50Ω **VSWR** ≤1.35:1 -18.3 dB -18.2 dB Upper sidelobe suppression (0°) -36.3 dB Front-to-back ratio (+/-30°) -33.4 dB 5% (-26.02 dB) Null fill < -25 dB Isolation between ports 500 W Input power with EDIN connectors 300 W Input power with NE connectors Lightning protection Direct Ground Connector(s) 2 Ports / EDIN or NE / Female / Center (Back) **Mechanical Characteristics** Dimensions Length x Width x Depth 1804 x 285 x 132 mm 71.0 x 11.2 x 5.2 in Depth with z-brackets 172 mm 6.8 in Weight without mounting brackets 7.9 kg 17 lbs Survival wind speed > 201 km/hr > 125 mph Wind area Front: 0.51 m² Side: 0.24 m² Front: 5.5 ft² Side: 2.6 ft² Wind load @ 161 km/hr (100 mph) Front: 759 N Side: 391 N Front: 169 lbf Side: 89 lbf **Mounting Options** Part Number 3-Point Mounting & Downtilt Bracket Kit 36210008 40-115 mm 1.57-4.5 in 6.9 kg 15.2 lbs For concealment configurations, order BXA-70063-6CF-EDIN-X-FP Concealment Configurations

Replace "X" with desired electrical downtiit.

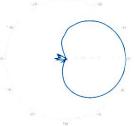
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.



BXA-70063-6CF-EDIN-X

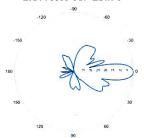


Horizontal | 750 MHz



Horizontal | 850 MHz

BXA-70063-6CF-EDIN-0

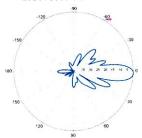


0° | Vertical | 750 MHz

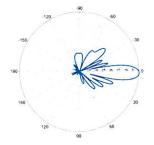


0° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-2



2° | Vertical | 750 MHz



2° | Vertical | 850 MHz

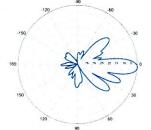
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.



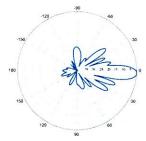
BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3

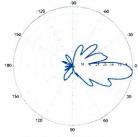


3° | Vertical | 750 MHz

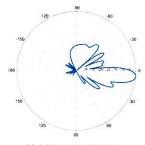


3° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6

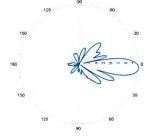


6° | Vertical | 750 MHz

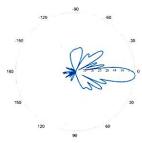


6° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-4

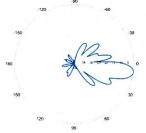


4° | Vertical | 750 MHz

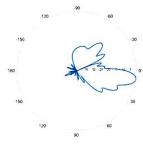


4° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-8

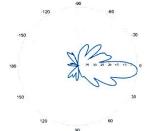


8° | Vertical | 750 MHz

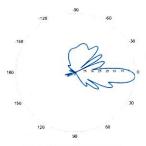


8° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-5

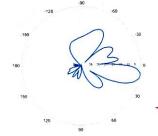


5° | Vertical | 750 MHz

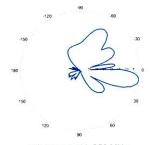


5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-10



10° | Vertical | 750 MHz



10° | Vertical | 850 MHz

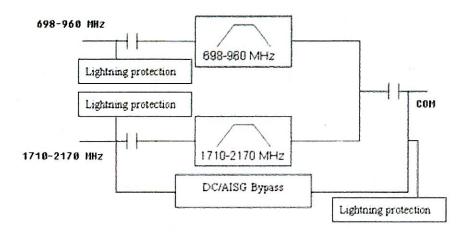
Product Specifications



an the go

CBC721-DF-7-DCB | E15V95P08

Block Diagram



General Specifications

Application Indoor | Outdoor Includes Mounting hardware

Mechanical Specifications

Color Gray

Connector Interface 7-16 DIN Female
Connector Interface Style Medium neck
Ground Screw Diameter 0.25 in

Environmental Specifications

Ingress Protection Test Method IEC 60529:2001, IP67

Operating Temperature -40 °C to +65 °C (-40 °F to +149 °F)

Relative Humidity 5%-100%

Dimensions

Depth 39.5 mm | 1.6 in Height 196.0 mm | 7.7 in

Volume 1.2

Width 153.0 mm | 6.0 in Weight, without mounting hardware 2.0 kg | 4.4 lb

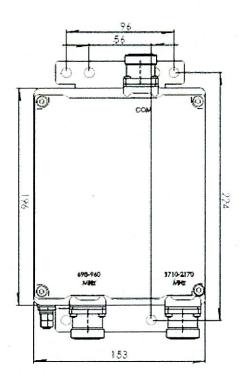
Product Specifications

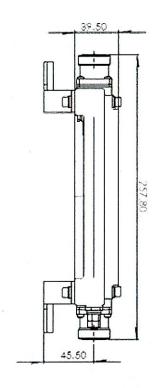


CBC721-DF-7-DCB | E15V95P08

on the go

Outline Drawing





Regulatory Compliance/Certifications

Agency

Classification

ISO 9001:2008

Designed, manufactured and/or distributed under this quality management system

	General	Power	Density					
Site Name: South Farms								
Tower Height: Verizon @ 110Ft.	10Ft.							
				CALC. POWER		MAX. PERMISS.	MAX. PRACTION	:
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	DENS	FREQ.	EXP.	MPE	Total
*Nextel	20	50	120	0.0250	851	0.5673	4.40%	
*AT&T GSM 850	8	296	130	0.0189	880	0.5867	3.22%	
*AT&T GSM 1900	1	427	130	0.0091	1960	1.0000	0.91%	
*AT&T UMTS 850	τ	500	130	9010'0	880	0.5867	1.81%	
*AT&T UMTS 1900	τ	200	130	9010'0	1960	1.0000	1.06%	
*AT&T LTE 700	τ	200	130	9010'0	740	0.4933	2.16%	
*Clearwire	2	153	06	0.0136	2496	1.0000	1.36%	
*Clearwire	1	211	06	0.0094	11 GHz	1.0000	0.94%	
*Pocket	£	631	100	0.0681	2130	1.0000	6.81%	
Verizon PCS	11	262	110	0.0856	1970	1.0000	8.56%	
Verizon Cellular	6	265	110	0.0709	869	0.5793	12.23%	:
Verizon AWS	1	636	110	0.0189	2145	1.0000	1.89%	
Verizon 700	ŀ	863	110	0.0256	869	0.4653	5.51%	:
								20.86%
* Source: Siting Council								



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

Structural Analysis for SBA Network Services, Inc.

130' Monopole Tower

SBA Site Name: Middletown 2 SBA Site ID: CT13064-A Verizon Site ID: South Farms, CT

FDH Project Number 12-08192E S2

Analysis Results

Tower Components	97.1%	Sufficient
Foundation	93.4%	Sufficient

Prepared By:

Tyler Hall, El Project Engineer Reviewed By:

Christopher H. Murphy

Christopher M Murphy, PE President CT PE License No. 25842

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



October 8, 2012

Prepared pursuant to ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas and 2005 Connecticut Building Code (CBC)

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Middletown, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standard for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G* and *2005 Connecticut Building Code (CBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, and member sizes was obtained from:

Radian Communication Services (File No. 060-3494) original design drawings dated December 15, 2006
FDH, Inc. (Job No. 11-08072TC1) TIA Inspection Report dated December 27, 2011
Gemini Geotechnical Associates, Inc. (Site No. 999-0049) Geotechnical Engineering Report dated November
30, 2006
FDH Engineering, Inc.(Project No. 11-01248E S1) Modification & 10' Extension Drawings for a 120' Monopole
dated September 21, 2011
FDH Engineering, Inc. (Project No. 11-01248E S1) Post Construction Inspection Report dated December 14,
2011
FDH Engineering, Inc. (Job No. 12-08192E S2) Modification Drawings for a 130' Monopole dated October 4,
2012
SBA Network Services, Inc.

The basic design wind speed per the ANSI/TIA-222-G standard and 2005 CBC is 110 mph without ice and 50 mph with 3/4" radial ice. Ice is considered to increase in thickness with height. Furthermore, this structure was analyzed as a Class II structure in Exposure Category C with a topographical factor of 1.

Conclusions

With the existing and proposed antennas from Verizon in place at 110 ft, the tower meets the requirements of the *ANSI/TIA-222-G* standards and *2005 CBC* provided the **Recommendations** below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Radian File No. 060-3494), the foundation should have the necessary capacity to support both the proposed and existing loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

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

Recommendations

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

- 1. The proposed loading will be utilizing the existing coax installed inside the pole shaft.
- 2. Modifications must be installed per FDH Engineering, Inc. (Job No. 12-08192E S2) Modification Drawings for a 130' Monopole dated October 4, 2012 for this analysis to be valid.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
130	(9) Powerwave P65-16-XLH-RR W/ Mount Pipe (6) TT19-08BP111-001 TMAs (6) RRUS-11 RRH RRUs	(18) 1 5/8 (1) 1/2	AT&T	130	(1) Low-Profile Platform
120	(6) RFS APXV86-906515 W/ Mount Pipe	(12) 1 5/8	Nextel	120	(6) Pipe Mounts
110	(3) Jaybeam X65-13-04	(12) 1 5/8	Verizon	110	(3) Pipe Mounts
100	(3) APXV18-206517S W/Mount Pipe	(6) 1 5/8	Pocket	100	(3) Pipe Mounts
94	(1) 1'4" x 6.5" x 6" Surge Protector	(3) 5/16 (2) 1/2	Classics	94	Direct Mount
90	(3) Kathrein 840 10054 w/ Mount Pipe (3) Samsung RASSPI-2213-RRH (1) Andrew VHLP2-18-DW1 (1) VHLP800-11-DW1	(3) 5/8 (3) 1/4	Clearwire	90	(3) Standoff Mounts

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
110	(3) Antel BXA-70063-6CF-2 w/ Mount Pipe (3) Antel BXD-63606380CF W/ Mount Pipe (6) Andrew CBC721-DF	(12) 1 5/8	Verizon	110	(3) Pipe Mounts

RESULTS

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

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	50 ksi
Anchor Bolts	105 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. *Note: Capacities up to 100% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

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

See the Appendix for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	130 - 120.5	Pole	TP18x18x0.25	22.6	Pass
	120.5	Flange Bolts	(6) 1" Φ w/ BC=28.25	29.9	Pass
	120.5	Flange Plate	31.5" Φ x 1" Thk	69.0	Pass
L2	120.5 - 120	Pole	TP21.74x18x0.25	22.6	Pass
L3	120 - 87.42	Pole	TP29.89x21.74x0.1875	67.6	Pass
L4	87.42 - 43.3367	Pole	TP36.31x28.5352x0.25	96.7	Pass
	43.3367 - 8.0833	Pole	TP42.5x35.0541x0.312	97.1	Pass
L5	8.0833 - 0	Modified Pole	TP42.5x35.0541x0.3125 + Flat Plate	88.6	Pass
l ce		Anchor Bolts	(14) 1.5" Ø w/ BC=47.25" + (4) 2.25" Ø w/ BC = 56.75"	65.3	Pass
		Base Plate	51.75" Ø PL x 1.5" Thk	58.7	Pass

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* (ANSI/TIA-222-G)	Original Design (ANSI/TIA-222-G)
Axial	27 k	39 k
Shear	26 k	20 k
Moment	2,476 k-ft	1,864 k-ft

*Foundation determined adequate based on independent evaluation.

GENERAL COMMENTS

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

LIMITATIONS

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

APPENDIX

18.0000 18.0000 18,0000 0.2500 9.50 0.5 21.7400 120.5 ft 0.0 21.7400 3.92 18 1.7 48.00 0.2500 18 4.2 A572-65 43.3 ft ALL REACTIONS ARE FACTORED AXIAL 45 K 48.00 42.5000 0.3125 35.0541 18 6.2 SHEAR 6K TORQUE 0 kip-ft 50 mph WIND - 0.7500 in ICE AXIAL 27 K SHEAR 26 K 0.0 ft TORQUE 0 kip-ft 12.6 Number of Sides REACTIONS - 110 mph WIND Socket Length Top Dia (in) Length (ft) Weight (K) Bot Dia (in)

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	130	BXD-63606380CF W/ Mount Pipe	110
(3) P65-16-XLH-RR W/ Mount Pipe	130	(Verizon)	
(ATI)		BXD-63606380CF W/ Mount Pipe	110
(3) P65-16-XLH-RR W/ Mount Pipe	130	(Verizon)	140
(ATI)	100	BXD-63606380CF W/ Mount Pipe (Verizon)	110
(3) P65-16-XLH-RR W/ Mount Pipe (ATI)	130	(2) CBC721-DF (Verizon)	110
(2) TT19-08BP111-001 TMA (ATI)	130	(2) CBC721-DF (Verizon)	110
(2) TT19-08BP111-001 TMA (ATI)	130	(2) CBC721-DF (Verizon)	110
(2) TT19-08BP111-001 TMA (ATI)	130	(3) Pipe Mounts (PM 502-3)	110
(2) RRUS-11 RRH (ATI)	130	APXV18-206517S W/Mount Pipe	100
(2) RRUS-11 RRH (ATI)	130	(Pocket)	
(2) RRUS-11 RRH (ATT)	130	APXV18-206517S W/Mount Pipe	100
Low-Profile Platform (ATI)	130	(Pocket)	100
(2) APXV86-906515 W/ Mount Pipe (Nextel)	120	APXV18-206517S W/Mount Pipe (Pocket)	100
(2) APXV86-906515 W/ Mount Pipe (Nextel)	120	1'4" x 6.5" x 6" Surge Protector (Clearwire)	94
(2) APXV86-906515 W/ Mount Pipe	120	VHLP2.5-11 (Clearwire)	90.0001
(Nextel)	120	840 10054 w/ Mount Pipe (Clearwire)	90
BXA-70063-6CF-2 w/ Mount Pipe	110	RASSPI-2213-RRH (Clearwire)	90
(Verizon)		RASSPI-2213-RRH (Clearwire)	90
BXA-70063-6CF-2 w/ Mount Pipe	110	RASSPI-2213-RRH (Clearwire)	90
(Verizon)		840 10054 w/ Mount Pipe (Clearwire)	90
BXA-70063-6CF-2 w/ Mount Pipe	110	VHLP2-11 (Clearwire)	90
(Verizon)		840 10054 w/ Mount Pipe (Clearwire)	90

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

- 1. Tower is located in Middlesex County, Connecticut.
- 2. Tower designed for Exposure C to the TIA-222-G Standard.
- 3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
- 4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
- 5. Deflections are based upon a 60 mph wind.
- Tower Structure Class II.
- 7. Topographic Category 1 with Crest Height of 0.00 ft

MOMENT 563 kip-ft

MOMENT 2476 kip-ft

