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ORIGINAL

Also admitted in Massachusetts

January 9, 2013

RECEIVED
JAN 10 2013

David Martin
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

CONNECTICUT
SITING COUNCIL

Re: **EM-VER-107-127025 – Cellco Partnership d/b/a Verizon Wireless**
617 South Orange Center Road, Orange, Connecticut

Dear Mr. Martin:

On August 28, 2012, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 617 South Orange Center Road in Orange, Connecticut. The modification involved the replacement of certain antennas and the installation of six (6) additional coax cables inside the tower.

During the installation of the new antennas, Cellco discovered that the six (6) additional antenna cables would not fit inside the tower and would need to be attached to the outside of the tower. Attached is a Revised Structural Analysis Report confirming that the tower and foundation can support Cellco's proposed facility modifications, including the attachment of the new coax cables on the outside of the tower. All construction associated with these modifications has now been completed.

If you have any questions please do not hesitate to contact me or Rachel Mayo.

Sincerely,



Kenneth C. Baldwin

Attachment

Copy to:

Sandy M. Carter
Brian Ragozzine
Mark Gauger



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

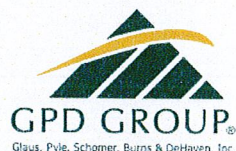
ALBANY

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AT&T Towers
5405 Windward Pkwy
Alpharetta, GA 30004
(770) 708-6100



Kevin Clements
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Atlanta, GA 30338
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GPD# 2012866.11 Rev 1
November 19, 2012

REVISED STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:
Site USID: 16326
Site FA: 10071197
Site Name: ORANGE TRANSFER STATION
AT&T Project: Verizon Tower-Only Modification 5-10-2012

ANALYSIS CRITERIA:
Codes: TIA/EIA-222-F, 2003 IBC, 2005 CTBC & ASCE 7-05
85 mph fastest mile with 0" ice
38 mph fastest mile with 3/4" ice

SITE DATA:
617 South Orange Center Rd, Orange, CT 06477, New Haven County
Latitude 41° 15' 19.979"N, Longitude 73° 0' 39.200"W
Market: New England
180' Rohn Monopole

Ms. Charlotte Malone,

GPD is pleased to submit this Revised Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

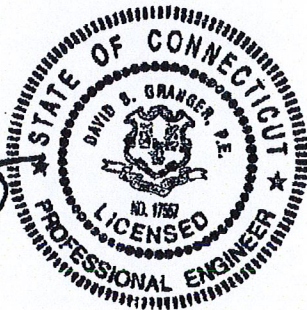
Analysis Results

Tower Stress Level with Proposed Equipment:	79.8%	Pass
Foundation Ratio with Proposed Equipment:	22.2%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T Mobility. If you have any questions please do not hesitate to call.

Respectfully submitted,

David B. Granger, P.E.
Connecticut#: 17557



SUMMARY & RESULTS

The purpose of this analysis was to verify that the existing structure is capable of carrying the proposed loading configuration as specified by Verizon to AT&T Mobility. This report was commissioned by Ms. Charlotte Malone of AT&T Mobility.

The proposed coax shall be banded flush to the outside of the pole in a single row in order for the analysis results to be valid.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	79.8%	Pass
Base Plate	47.6%	Pass
Anchor Bolts	78.3%	Pass
Foundation	22.2%	Pass

ANALYSIS METHOD

tnxTower (Version 6.0.4.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and being provided without the benefit of a detailed site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
Preliminary Tower Summary	Verizon Co-location Document	Siterra
Site Lease Application	Verizon Application, dated 09/17/2012	Siterra
Tower Design	Not Provided	N/A
Foundation Design	Not Provided	N/A
Previous Structural Analysis	GPD Job # 2012767.71, dated 06/28/2012	Siterra
Foundation Investigation	WEI Project # 2010-1056, dated 03/31/2010	Siterra
Geotechnical Report	WEI Project # 2010-1056, dated 03/31/2010	Siterra

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the monopole. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The monopole shaft sizes and shape are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations. If no data is available, the foundation system is not verified.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
8. All existing loading was obtained from the previous structural analysis by GPD Job # 2011147.02, dated 1/25/11, site photos, and the provided preliminary tower summary, and is assumed to be accurate.
9. No information was available for the structural reinforcement of the foundation. It has been assumed adequate based on the soil interaction of the foundation.
10. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
11. The existing AT&T loading as found in the preliminary tower summary differs slightly from the MOD-LTE Add 2-14-2011 project in Siterra. The existing AT&T loading is based on the final loading configuration within the MOD-LTE Add 2-14-2011 project in Siterra.
12. The generic AT&T future loading has been assumed since the preliminary tower summary lists no future loading.
13. The existing Verizon loading as found in the Site Lease Application, dated 5/9/12, differs from the previous analysis by GPD Job #: 2011147.02, dated 1/25/11, and site photos. The existing Verizon loading is based on the previous analysis and site photos.
14. The proposed (5) 1-5/8" coax shall be banded in a single row, flush to the monopole, in order for the analysis results to be valid.
15. A single 1/2" line was assumed for the GPS at 115'.
16. The proposed coax size has been assumed to match the existing coax for the purpose of this analysis.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

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

The engineering services rendered by GPD GROUP in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

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

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

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

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

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

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info	
Site Name	ORANGE TRANSFER STATION
Site Number	16326
FA Number	10071197
Date of Analysis	11/19/2012
Company Performing Analysis	GPD

Tower Info		Description	Date
Tower Type (G, SST, MP)	MP		
Tower Height (top of steel AGL)	180'		
Tower Manufacturer	Robn		
Tower Model	916		
Tower Design	916		
Foundation Design	916		
Golden Report	WEI Project # 2010-1056		3/31/2010
Tower Mapping	GPD Job # 2012/27.71		6/28/2012
Previous Structural Analysis	WEI Project # 2010-1056		3/31/2010

Steel Yield Strength (ksi)	
Pole	65
Base Plate	60
Anchor Rods	75

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Design Parameters	
Design Code Used	TIA/EIA-222-A, 2003 IBC
Location of Tower (County, State)	2005 CTBC & ASCE 7-05
Basic Wind Speed (mph)	New Haven, CT
Ice Thickness (in)	85 fastest mile
Structure Classification (I, II, III)	0.75
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)	
Existing/Reserved + Future + Proposed Condition	
Tower	79.8%
Base Plate	78.3%
Foundation	22.2%
Foundation Adequate?	Yes

Existing / Reserved Loading

Antenna				Mount				Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Type	Manufacturer	Attachment Internal/External
AT&T Mobility	177	177	6	Panel	Powerwave	7770.00	201/20/230	1	Unknown	13' LP Platform	Internal
AT&T Mobility	177	177	3	Panel	KMW	AM-X-CW-14-65-401-RET	201/20/230	1	Unknown	on same mount	Internal
AT&T Mobility	177	177	6	TMA	Powerwave	LGP21401		6	Unknown	behind the antennas	Internal
AT&T Mobility	176	178	6	RRH	Ericsson	RRUS 11 - Dual PA RRU RRHs				collar mount	Inside Conduit
AT&T Mobility	176	174	1	Fiber/Power	Raycap	DC6-48-50-18-8F				on same mount	
Unknown	165	165	3	Panel	Unknown	5' Panel				Pipe mounted	External
T-Mobile	148	148	6	Panel	RFS	APX16PV-16PVL		1	Unknown	13' LP Platform	Internal
T-Mobile	148	148	6	TMA	Powerwave	LGP 21401		1	Unknown	behind the antennas	Internal
Nextel	137	137	12	Panel	Decibel	844G45V1ZASX		1	Unknown	13' LP Platform	Internal
Sprint	125	127	6	Panel	Decibel	DB808N4572E-M		1	Unknown	13' Platform	Internal
Clewire	125	127	3	Panel	Argus	LPX210R	50/150/200	6	Unknown	on the existing mount	Internal
Clewire	125	127	3	RRH	Samsung	FDD R4 RRH		1	9207	5/16"	Internal
Clewire	125	127	2	Dish	Dragonwave	A-ANT-23G-2-C	50/150	2	Unknown	RET Cable	Internal
Clewire	125	127	2	Dish	Dragonwave	Horizon DUO		2	Unknown	1/2"	Internal
Verizon	115	117	4	Panel	Decibel	DB844G45ZAXY		1	Unknown	13' Platform	Internal
Verizon	115	117	6	Panel	Decibel	950F40T2E-M 2		1	Unknown	on the same mount	Internal
Verizon	115	117	3	Panel	Antel	BXA-70063/4CF		3		on the same mount	
Verizon	115	117	2	Panel	Antel	LPA-80063/4CF		1		on the same mount	
Verizon	115	115	1	GPS	Unknown	GPS		1	Unknown	1/2"	Internal
Sprint	50	50	1	GPS	Unknown	GPS Unit		1	Unknown	2' Standoff	Internal

Note: Prior to installation of the proposed loading, all Panel Antennas and (6) 1-5/8" coax at 117' shall be removed. The remaining equipment shall be reused.

Proposed Loading

Antenna				Mount				Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Type	Manufacturer	Attachment Internal/External
Verizon	115	117	3	Panel	Sweden	SLCP 2X3015	40/120/280	6		on the existing mount	Internal
Verizon	115	117	6	Panel	Sweden	SC-E 0114 REV2	40/120/280	1		on the existing mount	External
Verizon	115	117	3	Panel	Antel	BXA 171063/12BF	40/120/280	1		on the existing mount	Internal

Note: The proposed loading is in addition to the remaining loading at the same elevation.

Note: The proposed coax shall be banded flush to the outside of the pole in a single row in order for the analysis results to be valid.

Future Loading

Antenna				Mount				Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Type	Manufacturer	Attachment Internal/External
AT&T Mobility	177	177	3	Panel	Powerwave	7770.00	201/20/230	6		on the existing mount	Internal

Note: The future loading is in addition to the existing loading at the same elevation.

APPENDIX B

TNXTower Output File

tnxTower GPD Group 520 South Main St, Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Job	16326 Orange Transfer Station	Page	1 of 9
	Project	2012866.11 Rev 1	Date	11:02:34 11/19/12
	Client	AT&T Mobility	Designed by	bdaugherty

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 38 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		$C_d A_A$ ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	177.00 - 8.00	15	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
3" Flex Conduit	A	No	Inside Pole	177.00 - 8.00	1	No Ice	0.00	0.48
						1/2" Ice	0.00	0.48
						1" Ice	0.00	0.48
						2" Ice	0.00	0.48
						4" Ice	0.00	0.48
FIBER LINES	A	No	Inside Pole	177.00 - 8.00	6	No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
						1" Ice	0.00	0.04
						2" Ice	0.00	0.04
						4" Ice	0.00	0.04
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	165.00 - 8.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	165.00 - 8.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	148.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	137.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82

tnxTower GPD Group 520 South Main St, Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Job	16326 Orange Transfer Station	Page	2 of 9
	Project	2012866.11 Rev 1	Date	11:02:34 11/19/12
	Client	AT&T Mobility	Designed by	bdaugherty

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	125.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
9207 (5/16 FOEM)	C	No	Inside Pole	125.00 - 8.00	6	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
						2" Ice	0.00	1.00
						4" Ice	0.00	1.00
RET Cable	C	No	Inside Pole	125.00 - 8.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	125.00 - 8.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	115.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	115.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	115.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	50.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
Safety Line 3/8	C	No	CaAa (Out Of Face)	180.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
Climbing Pegs	C	No	CaAa (Out Of Face)	180.00 - 8.00	1	No Ice	0.01	0.31
						1/2" Ice	0.12	0.71
						1" Ice	0.22	1.71
						2" Ice	0.41	5.56
						4" Ice	0.82	20.59

tnxTower GPD Group 520 South Main St, Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Job	16326 Orange Transfer Station	Page	3 of 9
	Project	2012866.11 Rev 1	Date	11:02:34 11/19/12
	Client	AT&T Mobility	Designed by	bdaugherty

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
13' LP Platform	C	None		0.0000	177.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
(3) 7770.00 w/Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	20.0000	177.00	No Ice	5.88	4.10	61.54
						1/2" Ice	6.31	4.73	107.08
						1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
(3) 7770.00 w/Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	No Ice	5.88	4.10	61.54
						1/2" Ice	6.31	4.73	107.08
						1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
(3) 7770.00 w/Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	-10.0000	177.00	No Ice	5.88	4.10	61.54
						1/2" Ice	6.31	4.73	107.08
						1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
AM-X-CW-14-65-00T-RET w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	20.0000	177.00	No Ice	5.77	4.16	59.75
						1/2" Ice	6.22	4.77	105.75
						1" Ice	6.69	5.42	159.41
						2" Ice	7.65	6.82	288.60
						4" Ice	9.71	9.93	652.18
AM-X-CW-14-65-00T-RET w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	No Ice	5.77	4.16	59.75
						1/2" Ice	6.22	4.77	105.75
						1" Ice	6.69	5.42	159.41
						2" Ice	7.65	6.82	288.60
						4" Ice	9.71	9.93	652.18
AM-X-CW-14-65-00T-RET w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	-10.0000	177.00	No Ice	5.77	4.16	59.75
						1/2" Ice	6.22	4.77	105.75
						1" Ice	6.69	5.42	159.41
						2" Ice	7.65	6.82	288.60
						4" Ice	9.71	9.93	652.18
(2) RRUS 11 - Dual PA RRU	A	From Leg	0.50 0.00 2.00	0.0000	176.00	No Ice	2.94	1.25	55.00
						1/2" Ice	3.17	1.41	74.32
						1" Ice	3.41	1.59	96.56
						2" Ice	3.91	1.96	150.56
						4" Ice	5.02	2.82	302.12
(2) RRUS 11 - Dual PA RRU	B	From Leg	0.50 0.00 2.00	0.0000	176.00	No Ice	2.94	1.25	55.00
						1/2" Ice	3.17	1.41	74.32
						1" Ice	3.41	1.59	96.56
						2" Ice	3.91	1.96	150.56
						4" Ice	5.02	2.82	302.12
(2) RRUS 11 - Dual PA RRU	C	From Leg	0.50 0.00 2.00	0.0000	176.00	No Ice	2.94	1.25	55.00
						1/2" Ice	3.17	1.41	74.32
						1" Ice	3.41	1.59	96.56
						2" Ice	3.91	1.96	150.56
						4" Ice	5.02	2.82	302.12
6' x 2" Mount Pipe	A	From Leg	0.25 0.00 0.00	0.0000	176.00	No Ice	1.43	1.43	22.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
6' x 2" Mount Pipe	B	From Leg	0.25	0.0000	176.00	4" Ice	4.70	4.70	230.84
			0.00			No Ice	1.43	1.43	22.00
			0.00			1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
6' x 2" Mount Pipe	C	From Leg	0.25	0.0000	176.00	4" Ice	4.70	4.70	230.84
			0.00			No Ice	1.43	1.43	22.00
			0.00			1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
6' x 2" Mount Pipe	A	From Centroid-Le g	4.00	0.0000	177.00	4" Ice	4.70	4.70	230.84
			0.00			No Ice	1.43	1.43	22.00
			0.00			1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
6' x 2" Mount Pipe	B	From Centroid-Le g	4.00	0.0000	177.00	4" Ice	4.70	4.70	230.84
			0.00			No Ice	1.43	1.43	22.00
			0.00			1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
6' x 2" Mount Pipe	C	From Centroid-Le g	4.00	0.0000	177.00	4" Ice	4.70	4.70	230.84
			0.00			No Ice	1.43	1.43	22.00
			0.00			1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
DC6-48-60-18-8F Surge Suppression Unit	C	From Leg	0.50	0.0000	176.00	4" Ice	4.70	4.70	230.84
			0.00			No Ice	1.47	1.47	32.80
			-2.00			1/2" Ice	1.67	1.67	50.52
						1" Ice	1.88	1.88	70.72
						2" Ice	2.33	2.33	119.24
(2) LGP21401	A	From Centroid-Le g	4.00	0.0000	177.00	4" Ice	3.38	3.38	252.92
			0.00			No Ice	1.29	0.23	14.10
			0.00			1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
(2) LGP21401	B	From Centroid-Le g	4.00	0.0000	177.00	4" Ice	2.79	1.12	135.29
			0.00			No Ice	1.29	0.23	14.10
			0.00			1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
(2) LGP21401	C	From Centroid-Le g	4.00	0.0000	177.00	4" Ice	2.79	1.12	135.29
			0.00			No Ice	1.29	0.23	14.10
			0.00			1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
5 s.f. Panel Antenna w/Mount Pipe	A	From Leg	1.00	0.0000	165.00	4" Ice	2.79	1.12	135.29
			0.00			No Ice	5.24	4.20	61.90
			0.00			1/2" Ice	5.77	5.07	103.30
						1" Ice	6.29	5.81	154.72
						2" Ice	7.36	7.35	279.85
5 s.f. Panel Antenna w/Mount Pipe	B	From Leg	1.00	0.0000	165.00	4" Ice	9.62	10.63	650.04
			0.00			No Ice	5.24	4.20	61.90
			0.00			1/2" Ice	5.77	5.07	103.30
						1" Ice	6.29	5.81	154.72
						2" Ice	7.36	7.35	279.85
5 s.f. Panel Antenna w/Mount	C	From Leg	1.00	0.0000	165.00	4" Ice	9.62	10.63	650.04
						No Ice	5.24	4.20	61.90

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
Pipe			0.00 0.00			1/2" Ice 5.77 1" Ice 6.29 2" Ice 7.36 4" Ice 9.62	5.07 5.81 7.35 10.63	103.30 154.72 279.85 650.04
(2) APX16PV-16PVL w/mount pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 6.79 1/2" Ice 7.25 1" Ice 7.73 2" Ice 8.71 4" Ice 10.80	3.17 3.80 4.44 5.78 8.70	57.85 100.15 151.47 274.85 631.91
(2) APX16PV-16PVL w/mount pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 6.79 1/2" Ice 7.25 1" Ice 7.73 2" Ice 8.71 4" Ice 10.80	3.17 3.80 4.44 5.78 8.70	57.85 100.15 151.47 274.85 631.91
(2) APX16PV-16PVL w/mount pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 6.79 1/2" Ice 7.25 1" Ice 7.73 2" Ice 8.71 4" Ice 10.80	3.17 3.80 4.44 5.78 8.70	57.85 100.15 151.47 274.85 631.91
(2) LGP21401	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 1.97 4" Ice 2.79	0.23 0.31 0.40 0.61 1.12	10.00 21.26 30.32 54.89 135.29
(2) LGP21401	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 1.97 4" Ice 2.79	0.23 0.31 0.40 0.61 1.12	10.00 21.26 30.32 54.89 135.29
(2) LGP21401	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 1.97 4" Ice 2.79	0.23 0.31 0.40 0.61 1.12	10.00 21.26 30.32 54.89 135.29
6' x 2" Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1.43 1/2" Ice 1.92 1" Ice 2.29 2" Ice 3.06 4" Ice 4.70	1.43 1.92 2.29 3.06 4.70	22.00 32.83 47.71 90.28 230.84
6' x 2" Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1.43 1/2" Ice 1.92 1" Ice 2.29 2" Ice 3.06 4" Ice 4.70	1.43 1.92 2.29 3.06 4.70	22.00 32.83 47.71 90.28 230.84
6' x 2" Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1.43 1/2" Ice 1.92 1" Ice 2.29 2" Ice 3.06 4" Ice 4.70	1.43 1.92 2.29 3.06 4.70	22.00 32.83 47.71 90.28 230.84
13' LP Platform	C	None		0.0000	148.00	No Ice 14.66 1/2" Ice 18.87 1" Ice 23.08 2" Ice 31.50 4" Ice 48.34	14.66 18.87 23.08 31.50 48.34	1250.00 1481.33 1712.66 2175.32 3100.64
(4) 844G45VTZASX w/Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	137.00	No Ice 7.71 1/2" Ice 8.44 1" Ice 9.04	5.63 6.73 7.54	40.55 99.25 168.68

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
(4) 844G45VTZASX w/Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	137.00	2" Ice	10.29	9.21	330.45
						4" Ice	12.93	12.75	779.97
						No Ice	7.71	5.63	40.55
						1/2" Ice	8.44	6.73	99.25
						1" Ice	9.04	7.54	168.68
						2" Ice	10.29	9.21	330.45
(4) 844G45VTZASX w/Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	137.00	4" Ice	12.93	12.75	779.97
						No Ice	7.71	5.63	40.55
						1/2" Ice	8.44	6.73	99.25
						1" Ice	9.04	7.54	168.68
						2" Ice	10.29	9.21	330.45
						4" Ice	12.93	12.75	779.97
13' LP Platform	C	None		0.0000	137.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
						No Ice	4.27	3.86	34.05
(2) DB980H65T2E-M w/Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	30.0000	125.00	1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
						No Ice	4.27	3.86	34.05
						1/2" Ice	4.86	4.95	69.84
(2) DB980H65T2E-M w/Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	125.00	1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
						No Ice	4.27	3.86	34.05
						1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
(2) DB980H65T2E-M w/Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	-15.0000	125.00	2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
						No Ice	4.27	3.86	34.05
						1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
LLPX310R w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	50.0000	125.00	4" Ice	8.86	10.87	585.45
						No Ice	5.40	3.59	69.09
						1/2" Ice	5.86	4.19	115.51
						1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
LLPX310R w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	30.0000	125.00	No Ice	5.40	3.59	69.09
						1/2" Ice	5.86	4.19	115.51
						1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
						No Ice	5.40	3.59	69.09
LLPX310R w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	20.0000	125.00	1/2" Ice	5.86	4.19	115.51
						1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
						No Ice	5.40	3.59	69.09
						1/2" Ice	5.86	4.19	115.51
FDD R6 RRH	A	From Centroid-Le g	4.00 0.00 2.00	50.0000	125.00	1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
						No Ice	1.80	0.78	33.00
						1/2" Ice	1.99	0.92	44.58
						1" Ice	2.18	1.07	58.46
FDD R6 RRH	B	From Centroid-Le g	4.00 0.00 2.00	30.0000	125.00	2" Ice	2.59	1.39	93.93
						4" Ice	3.51	2.14	201.10
						No Ice	1.80	0.78	33.00
						1/2" Ice	1.99	0.92	44.58
						1" Ice	2.18	1.07	58.46
						2" Ice	2.59	1.39	93.93
FDD R6 RRH						4" Ice	3.51	2.14	201.10

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
FDD R6 RRH	C	From Centroid-Le g	4.00	20.0000	125.00	No Ice	1.80	0.78	33.00
			0.00			1/2" Ice	1.99	0.92	44.58
			2.00			1" Ice	2.18	1.07	58.46
						2" Ice	2.59	1.39	93.93
						4" Ice	3.51	2.14	201.10
Horizon DUO	A	From Centroid-Le g	4.00	50.0000	125.00	No Ice	0.55	0.34	7.00
			0.00			1/2" Ice	0.65	0.43	11.78
			2.00			1" Ice	0.76	0.52	18.03
						2" Ice	1.00	0.73	35.72
						4" Ice	1.60	1.25	97.31
Horizon DUO	B	From Centroid-Le g	4.00	30.0000	125.00	No Ice	0.55	0.34	7.00
			0.00			1/2" Ice	0.65	0.43	11.78
			2.00			1" Ice	0.76	0.52	18.03
						2" Ice	1.00	0.73	35.72
						4" Ice	1.60	1.25	97.31
Valmont 13' Platform w/o rails (GPD)	C	None		0.0000	125.00	No Ice	24.80	24.80	1500.00
						1/2" Ice	26.20	26.20	2500.00
						1" Ice	27.60	27.60	3500.00
						2" Ice	30.40	30.40	5500.00
						4" Ice	36.00	36.00	9500.00
SLCP 2X6015 w/ mount pipe	A	From Centroid-Le g	4.00	40.0000	115.00	No Ice	10.66	9.94	56.16
			0.00			1/2" Ice	11.33	11.26	142.91
			2.00			1" Ice	11.98	12.31	242.48
						2" Ice	13.31	14.40	470.62
						4" Ice	16.08	18.80	1077.74
SLCP 2X6015 w/ mount pipe	B	From Centroid-Le g	4.00	0.0000	115.00	No Ice	10.66	9.94	56.16
			0.00			1/2" Ice	11.33	11.26	142.91
			2.00			1" Ice	11.98	12.31	242.48
						2" Ice	13.31	14.40	470.62
						4" Ice	16.08	18.80	1077.74
SLCP 2X6015 w/ mount pipe	C	From Centroid-Le g	4.00	40.0000	115.00	No Ice	10.66	9.94	56.16
			0.00			1/2" Ice	11.33	11.26	142.91
			2.00			1" Ice	11.98	12.31	242.48
						2" Ice	13.31	14.40	470.62
						4" Ice	16.08	18.80	1077.74
(2) SC-E 6014 rev2 w/ Mount Pipe	A	From Centroid-Le g	4.00	40.0000	115.00	No Ice	4.13	4.77	36.90
			0.00			1/2" Ice	4.67	5.60	77.52
			2.00			1" Ice	5.16	6.32	127.31
						2" Ice	6.19	7.80	246.63
						4" Ice	8.39	10.97	595.06
(2) SC-E 6014 rev2 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.0000	115.00	No Ice	4.13	4.77	36.90
			0.00			1/2" Ice	4.67	5.60	77.52
			2.00			1" Ice	5.16	6.32	127.31
						2" Ice	6.19	7.80	246.63
						4" Ice	8.39	10.97	595.06
(2) SC-E 6014 rev2 w/ Mount Pipe	C	From Centroid-Le g	4.00	40.0000	115.00	No Ice	4.13	4.77	36.90
			0.00			1/2" Ice	4.67	5.60	77.52
			2.00			1" Ice	5.16	6.32	127.31
						2" Ice	6.19	7.80	246.63
						4" Ice	8.39	10.97	595.06
BXA-171063/12BF w/ 6' mount pipe	A	From Centroid-Le g	4.00	40.0000	115.00	No Ice	4.74	5.00	40.00
			0.00			1/2" Ice	5.19	5.93	77.56
			2.00			1" Ice	5.64	6.74	128.84
						2" Ice	6.57	8.42	255.51
						4" Ice	8.58	11.96	636.04
BXA-171063/12BF w/ 6' mount pipe	B	From Centroid-Le	4.00	0.0000	115.00	No Ice	4.74	5.00	40.00
			0.00			1/2" Ice	5.19	5.93	77.56

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
		g	2.00			1" Ice 5.64	6.74	128.84
						2" Ice 6.57	8.42	255.51
						4" Ice 8.58	11.96	636.04
BXA-171063/12BF w/ 6' mount pipe	C	From Centroid-Lc g	4.00 0.00 2.00	40.0000	115.00	No Ice 4.74	5.00	40.00
						1/2" Ice 5.19	5.93	77.56
						1" Ice 5.64	6.74	128.84
						2" Ice 6.57	8.42	255.51
						4" Ice 8.58	11.96	636.04
GPS	C	From Centroid-Lc g	4.00 0.00 0.00	0.0000	115.00	No Ice 0.17	0.17	0.87
						1/2" Ice 0.24	0.24	3.85
						1" Ice 0.32	0.32	7.85
						2" Ice 0.51	0.51	19.56
						4" Ice 1.02	1.02	62.07
Valmont 13' Platform w/o rails (GPD)	C	None		0.0000	115.00	No Ice 24.80	24.80	1500.00
						1/2" Ice 26.20	26.20	2500.00
						1" Ice 27.60	27.60	3500.00
						2" Ice 30.40	30.40	5500.00
						4" Ice 36.00	36.00	9500.00
GPS	C	From Face	2.00 0.00 0.00	0.0000	50.00	No Ice 0.17	0.17	0.87
						1/2" Ice 0.24	0.24	3.85
						1" Ice 0.32	0.32	7.85
						2" Ice 0.51	0.51	19.56
						4" Ice 1.02	1.02	62.07
2'-0" - STANDOFF	C	From Face	1.00 0.00 0.00	0.0000	50.00	No Ice 1.36	1.36	20.00
						1/2" Ice 2.45	2.45	40.00
						1" Ice 3.50	3.50	64.00
						2" Ice 5.74	5.74	103.00
						4" Ice 10.12	10.12	181.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Centroid -Leg	4.00 0.00 2.00	50.0000		125.00	2.17	No Ice 3.72	12.30
									1/2" Ice 4.01	20.56
									1" Ice 4.30	28.82
									2" Ice 4.88	45.35
									4" Ice 6.04	78.40
A-ANT-23G-2-C	B	Paraboloid w/o Radome	From Centroid -Leg	4.00 0.00 2.00	30.0000		125.00	2.17	No Ice 3.72	12.30
									1/2" Ice 4.01	20.56
									1" Ice 4.30	28.82
									2" Ice 4.88	45.35
									4" Ice 6.04	78.40

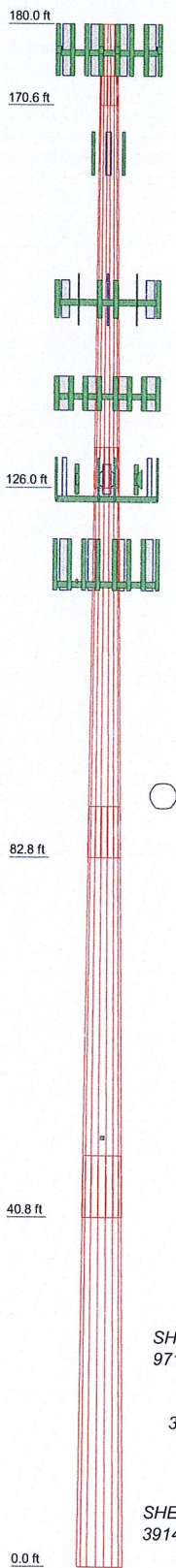
Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	13' LP Platform	28	34.335	1.6713	0.0032	36490

APPENDIX C

Tower Elevation Drawing

Section	1	2	3	4	5
Length (ft)	9.42	48.00	48.00	48.00	48.00
Number of Sides	18	18	18	18	18
Thickness (in)	0.1875	0.2500	0.3125	0.3750	0.4375
Socket Length (ft)	3.42	4.75	6.00	7.25	
Top Dia (in)	24.0000	25.0581	34.8903	44.2987	53.2831
Bot Dia (in)	26.2500	36.5250	46.3570	55.7650	64.7500
Grade			A572-65		
Weight (lb)	475.7	3958.4	6530.7	9653.7	13286.3



DESIGNED APPURTENANCE LOADING

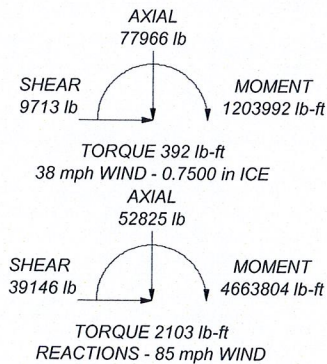
TYPE	ELEVATION	TYPE	ELEVATION
13' LP Platform	177	6' x 2" Mount Pipe	148
(3) 7770.00 w/Mount Pipe	177	6' x 2" Mount Pipe	148
(3) 7770.00 w/Mount Pipe	177	13' LP Platform	148
(3) 7770.00 w/Mount Pipe	177	(4) 844G45VTZASX w/Mount Pipe	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	(4) 844G45VTZASX w/Mount Pipe	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	(4) 844G45VTZASX w/Mount Pipe	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	13' LP Platform	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	(2) DB980H65T2E-M w/Mount Pipe	125
6' x 2" Mount Pipe	177	(2) DB980H65T2E-M w/Mount Pipe	125
6' x 2" Mount Pipe	177	(2) DB980H65T2E-M w/Mount Pipe	125
6' x 2" Mount Pipe	177	LLPX310R w/ Mount Pipe	125
(2) LGP21401	177	LLPX310R w/ Mount Pipe	125
(2) LGP21401	177	FDD R6 RRH	125
(2) LGP21401	177	FDD R6 RRH	125
(2) RRUS 11 - Dual PA RRU	176	FDD R6 RRH	125
(2) RRUS 11 - Dual PA RRU	176	Horizon DUO	125
(2) RRUS 11 - Dual PA RRU	176	Horizon DUO	125
DC6-48-60-18-8F Surge Suppression Unit	176	Valmont 13' Platform w/o rails (GPD)	125
6' x 2" Mount Pipe	176	A-ANT-23G-2-C	125
6' x 2" Mount Pipe	176	A-ANT-23G-2-C	125
6' x 2" Mount Pipe	176	SLCP 2X6015 w/ mount pipe	115
5 s.f. Panel Antenna w/Mount Pipe	165	(2) SC-E 6014 rev2 w/ Mount Pipe	115
5 s.f. Panel Antenna w/Mount Pipe	165	(2) SC-E 6014 rev2 w/ Mount Pipe	115
5 s.f. Panel Antenna w/Mount Pipe	165	(2) SC-E 6014 rev2 w/ Mount Pipe	115
(2) APX16PV-16PVL w/mount pipe	148	BXA-171063/12BF w/ 6' mount pipe	115
(2) APX16PV-16PVL w/mount pipe	148	BXA-171063/12BF w/ 6' mount pipe	115
(2) APX16PV-16PVL w/mount pipe	148	BXA-171063/12BF w/ 6' mount pipe	115
(2) LGP21401	148	GPS	115
(2) LGP21401	148	Valmont 13' Platform w/o rails (GPD)	115
(2) LGP21401	148	SLCP 2X6015 w/ mount pipe	115
(2) LGP21401	148	SLCP 2X6015 w/ mount pipe	115
6' x 2" Mount Pipe	148	GPS	50
		2'-0" - STANDOFF	50

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 79.8%



GPD Group
 520 South Main St, Suite 2531
 Akron, OH 44311
 Phone: (330) 572-2100
 FAX: (330) 572-2101

Job: **16326 Orange Transfer Station**

Project: **2012866.11 Rev 1**

Client: **AT&T Mobility**

Drawn by: **bdaugherty**

App'd:

Code: **TIA/EIA-222-F**

Date: **11/19/12**

Scale: **NTS**

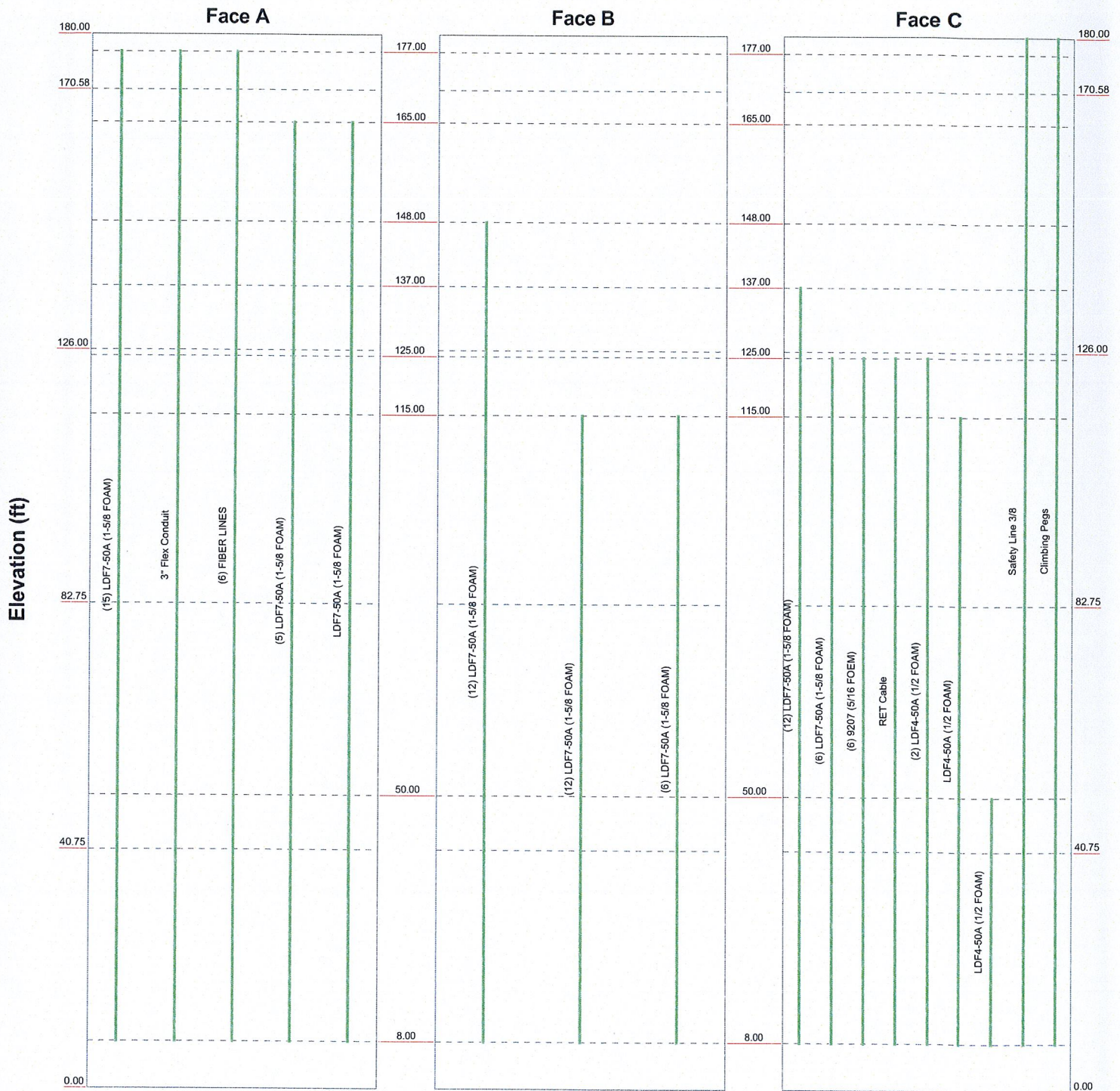
Path: **C:\Users\bdaugherty\Desktop\16326\11\Proposed\16326.dwg**

Dwg No. **E-1**

Feedline Distribution Chart

0' - 180'

Round Flat App In Face App Out Face Truss Leg

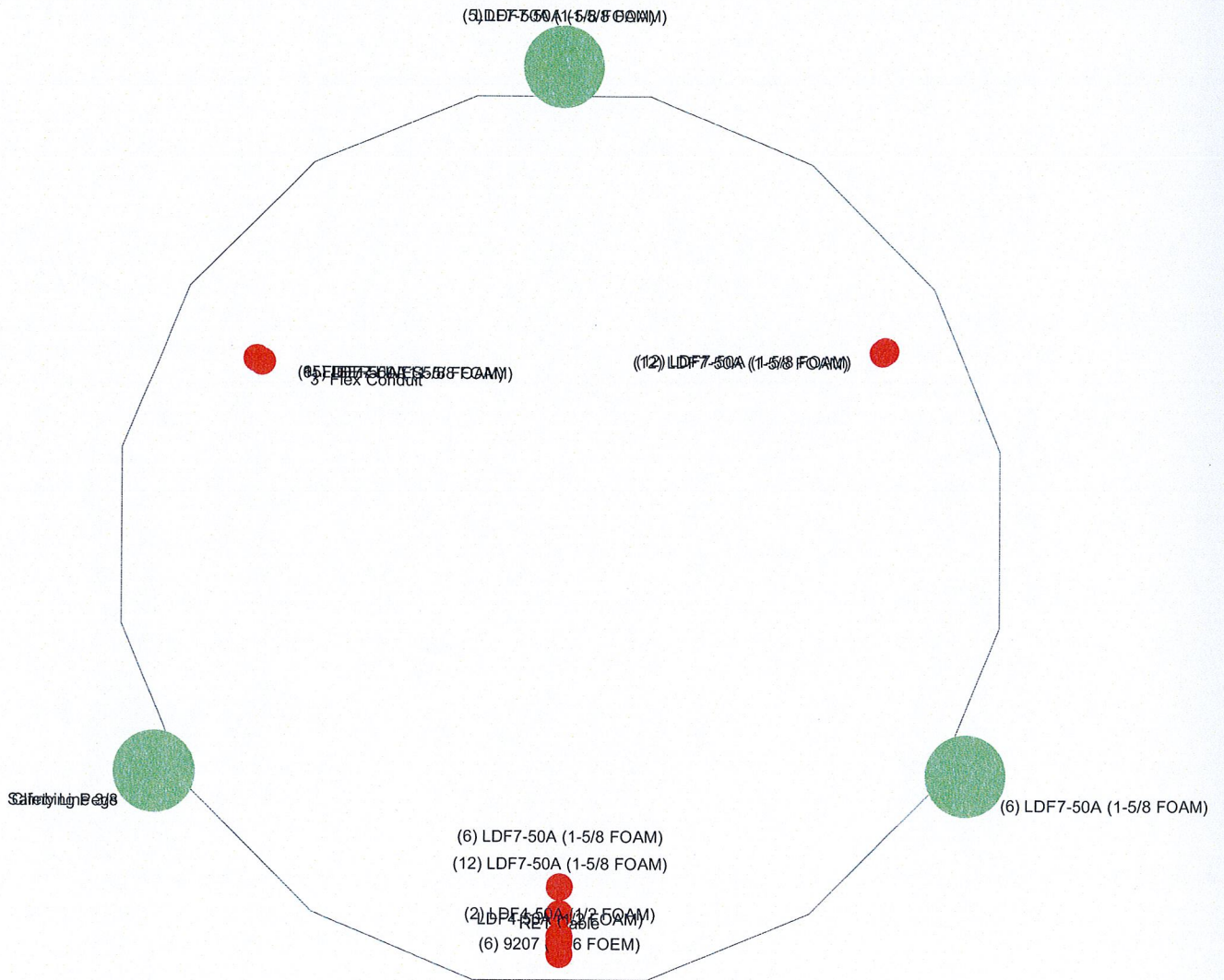


GPD Group
520 South Main St, Suite 2531
Akron, OH 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: 16326 Orange Transfer Station			
Project: 2012866.11 Rev 1			
Client: AT&T Mobility	Drawn by: bdaugherty	App'd:	
Code: TIA/EIA-222-F	Date: 11/19/12	Scale: NTS	
Path: C:\Users\bdaugherty\Desktop\16326\16326.dwg		Dwg No. E-7	

Feedline Plan

Round Flat App In Face App Out Face



GPD Group
 520 South Main St, Suite 2531
 Akron, OH 44311
 Phone: (330) 572-2100
 FAX: (330) 572-2101

Job: 16326 Orange Transfer Station
 Project: 2012866.11 Rev 1
 Client: AT&T Mobility
 Code: TIA/EIA-222-F
 Path: C:\Users\bdaugherty\Desktop\RISA\2012\866.11\Proposed\16326.11
 Drawn by: bdaugherty
 Date: 11/19/12
 App'd:
 Scale: NTS
 Dwg No. E-7

APPENDIX D

Anchor Rod and Base Plate Analysis



Anchor Rod and Base Plate Stresses
16326 ORANGE TRANSFER STATION
 2012866.11 Rev 1

Overturing Moment =	4663.80	k*ft
Axial Force =	52.83	k
Shear Force =	39.15	k

Acceptable Stress Ratio	
=	100.0%

Anchor Rods		
Number of Rods =	20	
Type =	Upset Rod	
Rod Yield Strength (F _y) =	75	ksi
ASIF =	1.333	
Rod Circle =	72	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in ²
Max Tension on Rod =	152.74	kips
Max Compression on Rod =	158.03	kips
Allow. Rod Force =	195.00	kips
Anchor Rod Capacity =	78.3%	OK

Stiffeners		
Configuration =	None	

Base Plate		
Location =	External	
Plate Strength (F _y) =	60	ksi
Outside Diameter =	77.25	in
Plate Thickness =	2.75	in
wcalc =	31.49	in
wmax =	49.75	in
w =	31.49	in
S =	39.69	in ³
f _b =	28.56	ksi
F _b =	60	ksi
BP Capacity =	47.6%	OK

Pole		
Pole Diameter =	64.75	in
Number of Sides =	18	
Thickness =	0.4375	in
Pole Yield Strength =	65	ksi

APPENDIX E

Foundation Analysis



Mat Foundation Analysis
16326 ORANGE TRANSFER STATION
2012866.11 Rev 1

General Info	
Code	TIA/EIA-222-F (ASD)
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Round
Reinforcing Known	No
Max Capacity	1

Tower Reactions	
Moment, M	4663.804 k-ft
Axial, P	52.825 k
Shear, V	39.146 k

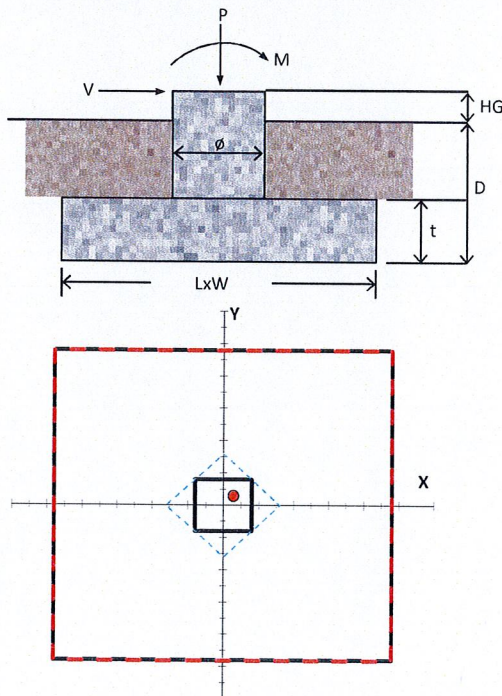
Pad & Pier Geometry	
Pier Diameter, ϕ	8 ft
Pad Length, L	48 ft
Pad Width, W	48 ft
Pad Thickness, t	6 ft
Depth, D	7 ft
Height Above Grade, HG	1 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete Fc'	3 ksi
Clear Cover	3 in
Reinforced Top & Bottom?	
Pad Reinforcing Size	
Pad Quantity Per Layer	
Pier Rebar Size	
Pier Quantity of Rebar	

Soil Properties	
Soil Type	Granular
Soil Unit Weight	120 pcf
Angle of Friction, ϕ	32 °
Bearing Type	Net
Ultimate Bearing	12 ksf
Water Table Depth	7 ft
Frost Depth	3.33 ft

Bearing Summary			Load Case
Qxmax	1.31	ksf	1D+1W
Qymax	1.31	ksf	1D+1W
Qmax @ 45°	1.42	ksf	1D+1W
Q _{(all) Gross}	6.42	ksf	
Controlling Capacity	22.2%	Pass	

Overturning Summary (Required FS=1.5)			Load Case
FS(ot)x	11.85	≥ 1.5	1D+1W
FS(ot)y	11.85	≥ 1.5	1D+1W
Controlling Capacity	12.7%	Pass	

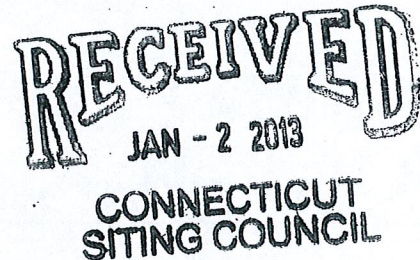


280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

December 28, 2012

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



Re: **EM-VER-064-120904 – 223 Brainard Road, Hartford, Connecticut**
EM-VER-049-120904 – Bright Meadow Boulevard, Enfield, Connecticut
EM-VER-089-120813 – 35 Wildwood Street, New Britain, Connecticut
EM-VER-107-120725 – 617 Orange Center Road, Orange, Connecticut
EM-VER-148-120702 – 90 North Plains Industrial Road, Wallingford, Connecticut
EM-VER-003-120906 – 20 Seles Road, Ashford, Connecticut

Completion of Construction Activity

Dear Ms. Roberts:

The purpose of this letter is to notify the Siting Council that construction activity associated with the above-referenced Celco Partnership d/b/a Verizon Wireless telecommunications facilities has been completed.

If you have any questions or need any additional information regarding this facility please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth C. Baldwin".

Kenneth C. Baldwin

Copy to:
Sandy M. Carter



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

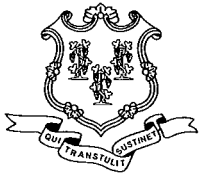
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STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

August 28, 2012

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-107-120725**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 617 South Orange Center Road, Orange, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated July 24, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

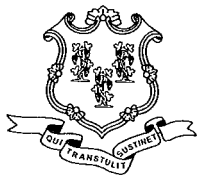
Very truly yours,

Linda Roberts
Executive Director

LR/CDM/jbw

c: The Honorable James M. Zeoli, First Selectman, Town of Orange
Paul Dinice, Zoning Enforcement Officer, Town of Orange
Christopher B. Fisher, Esq., AT&T





STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

July 26, 2012

The Honorable James M. Zeoli
First Selectman
Town of Orange
Town Hall
617 Orange Center Road
Orange, CT 06477-2423

RE: **EM-VER-107-120725-** Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 617 Orange Center Road, Orange, Connecticut.

Dear First Selectman Zeoli:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by August 9, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Paul Dinice, Zoning Enforcement Officer, Town of Orange

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

ORIGINAL

July 24, 2012

RECEIVED
JUL 25 2012
CONNECTICUT
SITING COUNCIL

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

Re: **Notice of Exempt Modification – Antenna Swap
617 Orange Center Road, Orange, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 117-foot level on an existing 180-foot tower at the above-referenced address. The tower is owned by AT&T. Cellco’s use of the tower was approved by the Council in 2002. Cellco now intends to replace all of its antennas with six (6) model SC-E 6014 rev 2 cellular antennas; (3) model BXA-171063-12BF PCS antennas; and three (3) model SLCP 2X6015 LTE antennas, all at the same 117-foot level. Cellco also intends to install six (6) additional coax cables inside the monopole tower. Attached behind Tab 1 are the specifications for the replacement antennas.

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 James Zeoli, First Selectman of the Town of Orange. The Town of Orange is the owner 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).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco’s replacement antennas will be located at the 117-foot level on the existing 180-foot tower.



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Linda Roberts
July 24, 2012
Page 2

2. The proposed modifications will 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 Tab 2.

Also attached is a Structural Analysis Report confirming that the tower and foundation can support Cellco's proposed modifications. (See Tab 3).

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:

James Zeoli, Orange First Selectman
Sandy M. Carter

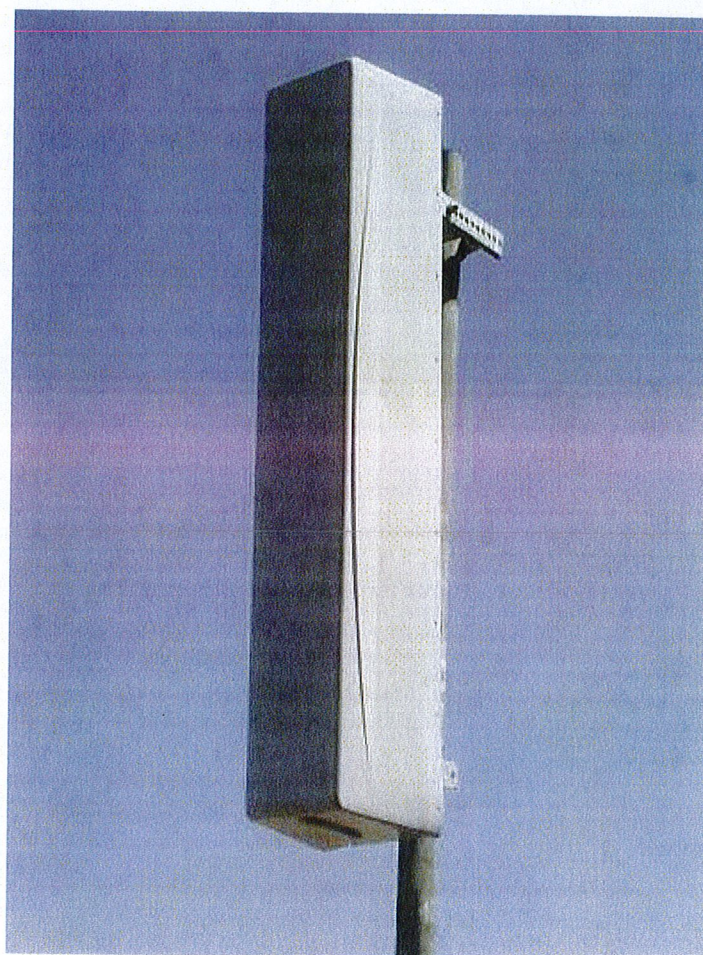


SC-E 6014 rev2

Enhanced 800 - 960 MHz log-periodic antenna

Features

- ☐ Small size
- ☐ Aesthetically pleasing
- ☐ Suitable for TDMA/CDMA/GSM/3G
- ☐ High return loss
- ☐ Low intermodulation
- ☐ High front-to-back ratio
- ☐ Outstanding performance over the entire band (800 - 960 MHz)
- ☐ Upper side-lobe suppression
- ☐ Rugged design
- ☐ Dramatically improved signal to interference performance



Electrical specifications

Frequency range:	800-960 MHz
Impedance:	50 ohm
Connector type:	7/16 Din
Return loss:	20 dB
Polarization:	Vertical
Gain:	14 dBd
Front-to-back ratio:	> 30 dB
Upper side-lobe suppression:	18 dB

Intermodulation (2x20W):	IM5	160 dB
	IM7/9	170 dB

Power rating:	500 W
H-plane (-3 dB point):	54 - 60°
V-plane (-3 dB point):	16 - 18°
Lightning protection:	DC grounded

Mechanical specifications

Overall height:	43 in	[1092 mm]
Width:	8.5 in	[216 mm]
Depth:	8 in	[203 mm]
Weight (excluding brackets):	15 lbs	[6.8 Kg]
Wind load measured up to:	150 mph	[240 Km/h]
Wind area (side of antenna):	2.54 sq. ft.	[0.24 sq.m]
Lateral thrust At 113 mph/ 180Km/h (worst case):	122 lbs	[577 N]

Materials

Radiating Elements:	Aluminum
Transformer (Power distribution)	Ceramic PCB
Chassis:	Aluminum
Radome:	Grey Fiberglass/PVC
Tilt-bracket:	Hot dip galvanized steel
Mounting bolts:	Stainless steel

The SC-E 6014 rev2 is made in the U.S.A.

BXA-171063-12BF-EDIN-X

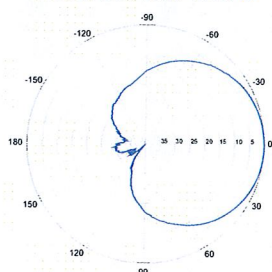
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 19.0 dBi



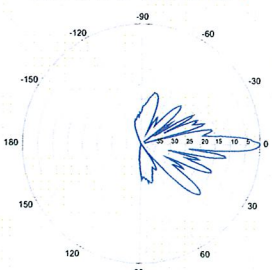
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1820 x 154 x 105 mm 71.7 x 6.1 x 4.1 in		
Depth with z-brackets	133 mm 5.2 in		
Weight without mounting brackets	6.8 kg 15 lbs		
Survival wind speed	> 201 km/hr > 125 mph		
Wind area	Front: 0.28 m² Side: 0.19 m² Front: 3.1 ft² Side: 2.1 ft²		
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N Front: 103 lbf Side: 68 lbf		
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12BF-EDIN-X-FP		

BXA-171063-12BF-EDIN-X



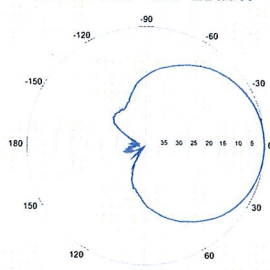
Horizontal | 1710-1880 MHz

BXA-171063-12BF-EDIN-0



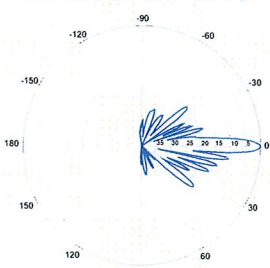
0° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-X



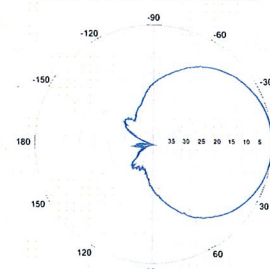
Horizontal | 1850-1990 MHz

BXA-171063-12BF-EDIN-0



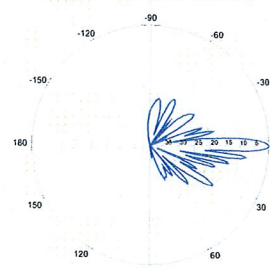
0° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-X



Horizontal | 1920-2170 MHz

BXA-171063-12BF-EDIN-0



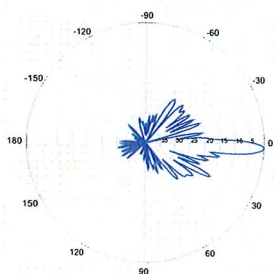
0° | Vertical | 1920-2170 MHz

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-171063-12BF-EDIN-X

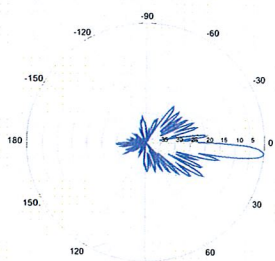
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12BF-EDIN-2



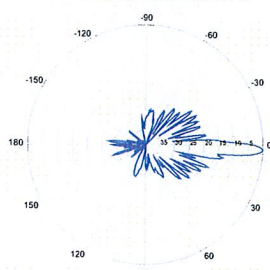
2° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-5



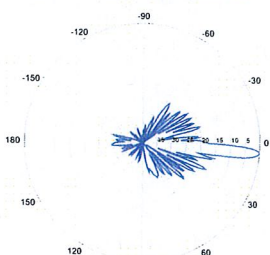
5° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-2



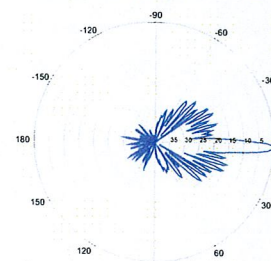
2° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-5



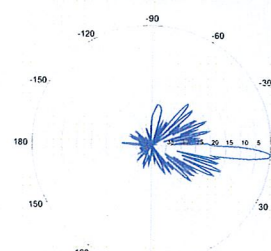
5° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-2



2° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-5



5° | Vertical | 1920-2170 MHz

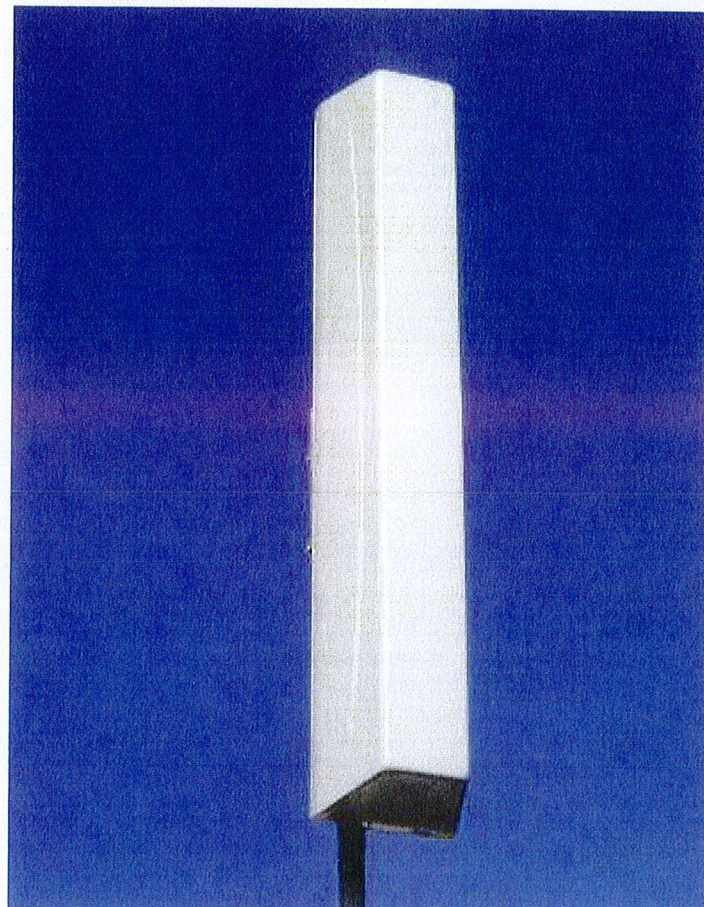
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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

SLCP 2x6015

Dual (2x) Circularly Polarized log-periodic antenna

Features

- ☐ **Transmit Diversity Gain**
- ☐ **Can be configured to combine space & polarization diversity**
- ☐ **Outstanding performance over the entire band (700 - 800 MHz)**
- ☐ **Excellent Axial Ratio**
- ☐ **Optimized for 4G & 3G systems**
- ☐ **Low intermodulation**
- ☐ **Improved Side-to-side rejection**
- ☐ **Fading reduction**
- ☐ **Excellent isolation between ports**



Electrical specifications

Frequency range:	700-800 MHz
Impedance:	50 ohm
Connector type:	7/16 Din
Return loss:	18 dB
Polarization:	Circular
Gain ea. port [Circular]:	2x15 dBdC
Gain ea. port [Linear]:	2x12 dBdL
Axial Ratio:	2 dB
Isolation between ports (TX band):	30 dB
Front-to-back ratio:	30 dB
Intermodulation (2x20W):	IM3 150 dB
	IM5 160 dB
	IM7/9 170 dB
Power rating:	2x 500 W
H-plane (-3 dB point):	2x 55°
V-plane (-3 dB point):	2x 11°
Lightning protection:	DC grounded

Mechanical specifications

Overall height:	77 in	[1956 mm]
Width:	14 in	[356 mm]
Depth:	11 in	[279 mm]
Weight (excluding brackets):	30 lbs	[13.6 Kg]
Wind load measured up to:	150 mph	[240 Km/h]
Wind area (side of antenna):	7.49 sq. ft.	[0.70 sq.m]
Lateral thrust at 113 mph/ 180 Km/h (worst case):	382 lbs	[1701 N]

Materials

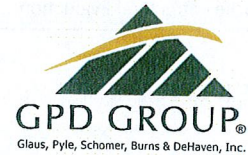
Radiating Elements:	Aluminum
Transformer (Power distribution)	Ceramic PCB
Chassis:	Aluminum
Radome:	Grey Fiberglass/PVC
Mounting bolts:	Stainless steel

The SLCP 2x6015 is made in the U.S.A.

	General	Power	Density				
Site Name: Orange 4							
Tower Height: Verizon @ 117Ft.							
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	PERMISS. EXP.	FRACTION MPE
*Sprint	11	122	127	0.0299	1962.5	1.0000	2.99%
*Clearwire	2	153	127	0.0068	2496	1.0000	0.68%
*Clearwire	1	211	127	0.0047	11 GHz	1.0000	0.47%
*Pocket	3	631	165	0.0250	2130	1.0000	2.50%
*AT&T UMTS	1	500	177	0.0057	1900	1.0000	0.57%
*AT&T GSM	6	296	177	0.0204	880	0.5867	3.47%
*AT&T GSM	3	427	177	0.0147	1900	1.0000	1.47%
*AT&T LTE	1	500	177	0.0057	740	0.4933	1.16%
*Nextel	12	100	137	0.0230	851	0.5673	4.05%
*T-Mobile UMTS (AWS)	2	12.0815	150	0.0004	2100	1.0000	0.04%
*T-Mobile GSM/UMTS	2	12.0815	150	0.0004	1950	1.0000	0.04%
*T-Mobile LTE	2	24.16301	150	0.0008	2100	1.0000	0.08%
Verizon PCS	7	362	117	0.0666	1970	1.0000	6.66%
Verizon Cellular	9	315	117	0.0745	869	0.5793	12.85%
Verizon AWS	1	904	117	0.0237	2145	1.0000	2.37%
Verizon 700	1	928	117	0.0244	698	0.4653	5.24%
							44.66%
* Source: Siting Council							



AT&T Towers
5405 Windward Pkwy
Alpharetta, GA 30004
(770) 708-6100



Kevin Clements
1117 Perimeter Center West, Suite W303
Atlanta, GA 30338
(678) 781-5061
kclements@gpdgroup.com

GPD# 2012767.71
June 28, 2012

STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:
Site USID: 16326
Site FA: 10071197
Site Name: ORANGE TRANSFER STATION
AT&T Project: Verizon Tower-Only Modification 5-10-2012

ANALYSIS CRITERIA:
Codes: TIA/EIA-222-F, 2003 IBC & 2005 CTBC
85 mph fastest mile with 0" ice
38 mph fastest mile with 3/4" ice

SITE DATA:
617 South Orange Center Rd, Orange, CT 06477, New Haven County
Latitude 41° 15' 19.979"N, Longitude 73° 0' 39.200"W
Market: New England
180' Rohn Monopole

Ms. Charlotte Malone,

GPD is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

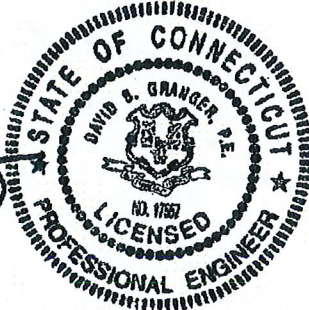
Analysis Results

Tower Stress Level with Proposed Equipment:	79.8%	Pass
Foundation Ratio with Proposed Equipment:	22.2%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T. If you have any questions please do not hesitate to call.

Respectfully submitted,

David B. Granger, P.E.
Connecticut#: 17557



SUMMARY & RESULTS

The purpose of this analysis was to verify that the existing structure is capable of carrying the proposed loading configuration as specified by Verizon to AT&T. This report was commissioned by Ms. Charlotte Malone of AT&T.

All proposed coax is assumed to be internal to the monopole.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	79.8%	Pass
Base Plate	47.6%	Pass
Anchor Bolts	78.3%	Pass
Foundation	22.2%	Pass

ANALYSIS METHOD

tnxTower (Version 6.0.4.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and being provided without the benefit of a detailed site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
Preliminary Tower Summary	Verizon Co-location Document	Siterra
Site Lease Application	Verizon Application, dated 5/9/12	Siterra
Tower Design	Not Provided	N/A
Foundation Design	Not Provided	N/A
Previous Structural Analysis	GPD Job # 2011147.02, dated 1/25/11	Siterra
Foundation Investigation	WEI Project # 2010-1056, dated 3/31/10	Siterra
Geotechnical Report	WEI Project # 2010-1056, dated 3/31/10	Siterra

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the monopole. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The monopole shaft sizes and shape are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations. If no data is available, the foundation system is not verified.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
8. All existing loading was obtained from the previous structural analysis by GPD Job # 2011147.02, dated 1/25/11, site photos, and the provided preliminary tower summary, and is assumed to be accurate.
9. All proposed coax is assumed to be internal to the monopole.
10. No information was available for the structural reinforcement of the foundation. It has been assumed adequate based on the soil interaction of the foundation.
11. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
12. The existing AT&T loading as found in the preliminary tower summary differs slightly from the MOD-LTE Add 2-14-2011 project in Siterra. The existing AT&T loading is based on the final loading configuration within the MOD-LTE Add 2-14-2011 project in Siterra.
13. The generic AT&T future loading has been assumed since the preliminary tower summary lists no future loading.
14. The existing Verizon loading as found in the Site Lease Application, dated 5/9/12, differs from the previous analysis by GPD Job #: 2011147.02, dated 1/25/11, and site photos. The existing Verizon loading is based on the previous analysis and site photos.
15. A single 1/2" line was assumed for the GPS at 115'.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

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

The engineering services rendered by GPD GROUP in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

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

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

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

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

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

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info	ORANGE TRANSFER STATION
Site Name	15326
FA Number	10071197
Date of Analysis	8/28/2012
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	
Tower Height (top of steel AGL)	180'	
Tower Manufacturer	Robt	
Tower Model	n/a	
Tower Design	n/a	
Foundation Design	n/a	
Geotech Report	WEI Project # 2010-1056	3/31/2010
Tower Mapping	n/a	
Previous Structural Analysis	GPD Job # 2011147.02	1/05/2011
Foundation Mapping	WEI Project # 2010-1056	3/31/2010

Steel Yield Strength (ksi)	65
Base Plate	60
Anchor Rods	75

Design Parameters

Design Code Used	TIA/EIA-222-F
Location of Tower (County, State)	2003 IBC & 2005 CTBC New Haven, CT
Basic Wind Speed (mph)	85 fastest mile
Ice Thickness (in)	0.75
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)

Tower	Existing/Reserved + Future + Proposed Condition
Base Plate	79.5%
Foundation	79.5%
Foundation Adequacy?	Yes

Existing / Reserved Loading

Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Antenna			Mount			Transmission Line		
			Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Attachment Internal/External
AT&T Mobility	177	177	6	Panel	Powerwave	7770.00	201/20/230	1	Unknown	13" LP Platform	Internal
AT&T Mobility	177	177	3	Panel	KLMW	Alt-X-CIV-14-65-001-RET	201/20/230	1	Unknown	3" Conduit	Internal
AT&T Mobility	177	177	6	TMA	Powerwave	LGP21401		6	Unknown	Fiber Lines	Inside Conduit
AT&T Mobility	176	174	6	RRH	Ericsson	RRUS T1 - Dual PA RRU RRHs				collar mount	
AT&T Mobility	176	174	1	Fiber/Power	Raycap	DC5-48-60-18-8F				on same mount	
Unknown	165	165	3	Panel	Unknown	5' Panel		6	Unknown	1-5/8"	External
T-Mobile	148	148	6	Panel	RFS	APX16PV-16PV/L		1	Unknown	13" LP Platform	Internal
T-Mobile	148	148	6	TMA	Powerwave	LGP 21401				Behind the antennas	
Nexel	137	137	12	Panel	Decibel	944G45VTZASX		1	Unknown	13" LP Platform	Internal
Sprint	125	127	6	Panel	Decibel	D990046872E-M		1	Unknown	1-5/8"	Internal
Clewire	125	127	3	Panel	Argus	LLPX310R	50/150/260	6	Unknown	1-5/8"	Internal
Clewire	125	127	3	RRH	Samsung	FDD R6 RRH		6	9207	5/16"	Internal
Clewire	125	127	2	Dish	Dragonwave	A-ANT-235-2-C	50/150	1	Unknown	RET Cable	Internal
Clewire	125	127	2	DUO	Dragonwave	Horizon DUO		2	Unknown	1/2"	Internal
Verizon	115	117	4	Panel	Decibel	D8944G45ZAXY		1	Unknown	13" Platform	Internal
Verizon	115	117	6	Panel	Decibel	959F4072E-M 2				on the same mount	
Verizon	115	117	3	Panel	Antel	BXA-70053/4CF				on the same mount	
Verizon	115	117	2	Panel	Antel	LPA-80053/4CF				on the same mount	
Verizon	115	115	1	GPS	Unknown	GPS		1	Unknown	1/2"	Internal
Sprint	60	60	1	GPS	Unknown	GPS Unit		1	Unknown	2' Standoff	Internal

Note: Prior to installation of the proposed loading, all Panel Antennas at 117 shall be removed. The remaining equipment shall be reused.

Proposed Loading

Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Antenna			Mount			Transmission Line		
			Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Attachment Internal/External
Verizon	115	117	3	Panel	Swedcom	SLC2 2X6015	40/120/260			on the existing mount	
Verizon	115	117	6	Panel	Swedcom	SC-E 6014 REV2	40/120/260			on the existing mount	
Verizon	115	117	3	Panel	Antel	BXA-171053/125F	40/120/260			on the existing mount	

Note: The proposed loading is in addition to the remaining loading at the same elevation.

Future Loading

Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Antenna			Mount			Transmission Line		
			Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Attachment Internal/External
AT&T Mobility	177	177	3	Panel	powerwave	7770.00	201/20/230	6	Unknown	13" LP Platform	Internal

Note: The future loading is in addition to the existing loading at the same elevation.

APPENDIX B

TNXTower Output File

tnxTower GPD Group 520 South Main Street, Suite 2531 Akron, OH Phone: (330) 572.2100 FAX: (330) 572.2101	Job	16326 Orange Transfer Station	Page	1 of 9
	Project	2012767.71	Date	10:18:32 06/28/12
	Client	AT&T Mobility	Designed by	mmoeller

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 38 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	177.00 - 8.00	15	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	165.00 - 8.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	165.00 - 8.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	148.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	137.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	125.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
9207 (5/16 FOEM)	C	No	Inside Pole	125.00 - 8.00	6	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00

tnxTower GPD Group 520 South Main Street, Suite 2531 Akron, OH Phone: (330) 572.2100 FAX: (330) 572.2101	Job	16326 Orange Transfer Station	Page	2 of 9
	Project	2012767.71	Date	10:18:32 06/28/12
	Client	AT&T Mobility	Designed by	mmoeller

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		CAAA ft ² /ft	Weight plf
RET Cable	C	No	Inside Pole	125.00 - 8.00	1	2" Ice	0.00	1.00
						4" Ice	0.00	1.00
						No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	125.00 - 8.00	2	2" Ice	0.00	0.08
						4" Ice	0.00	0.08
						No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	117.00 - 8.00	18	2" Ice	0.00	0.15
						4" Ice	0.00	0.15
						No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	50.00 - 8.00	1	2" Ice	0.00	0.82
						4" Ice	0.00	0.82
						No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
3" Flex Conduit	A	No	Inside Pole	177.00 - 8.00	1	2" Ice	0.00	0.15
						4" Ice	0.00	0.15
						No Ice	0.00	0.48
						1/2" Ice	0.00	0.48
						1" Ice	0.00	0.48
FIBER LINES	A	No	Inside Pole	177.00 - 8.00	6	2" Ice	0.00	0.48
						4" Ice	0.00	0.48
						No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
						1" Ice	0.00	0.04
Safety Line 3/8	C	No	CaAa (Out Of Face)	180.00 - 8.00	1	2" Ice	0.00	0.04
						4" Ice	0.00	0.04
						No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
Climbing Pegs	C	No	CaAa (Out Of Face)	180.00 - 8.00	1	2" Ice	0.44	2.34
						4" Ice	0.84	4.46
						No Ice	0.01	0.31
						1/2" Ice	0.12	0.71
						1" Ice	0.22	1.71
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	115.00 - 8.00	1	2" Ice	0.41	5.56
						4" Ice	0.82	20.59
						No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15

tnxTower GPD Group 520 South Main Street, Suite 2531 Akron, OH Phone: (330) 572.2100 FAX: (330) 572.2101	Job	16326 Orange Transfer Station	Page	3 of 9
	Project	2012767.71	Date	10:18:32 06/28/12
	Client	AT&T Mobility	Designed by	mmoeller

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
13' LP Platform	C	None		0.0000	177.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
(3) 7770.00 w/Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	20.0000	177.00	No Ice	5.88	4.10	60.00
						1/2" Ice	6.31	4.73	107.08
						1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
(3) 7770.00 w/Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	No Ice	5.88	4.10	60.00
						1/2" Ice	6.31	4.73	107.08
						1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
(3) 7770.00 w/Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	-10.0000	177.00	No Ice	5.88	4.10	60.00
						1/2" Ice	6.31	4.73	107.08
						1" Ice	6.75	5.37	160.39
						2" Ice	7.66	6.70	289.46
						4" Ice	9.58	9.87	654.29
AM-X-CW-14-65-00T-RET w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	20.0000	177.00	No Ice	5.77	4.16	60.00
						1/2" Ice	6.22	4.77	105.75
						1" Ice	6.69	5.42	159.41
						2" Ice	7.65	6.82	288.60
						4" Ice	9.71	9.93	652.18
AM-X-CW-14-65-00T-RET w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	No Ice	5.77	4.16	60.00
						1/2" Ice	6.22	4.77	105.75
						1" Ice	6.69	5.42	159.41
						2" Ice	7.65	6.82	288.60
						4" Ice	9.71	9.93	652.18
AM-X-CW-14-65-00T-RET w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	-10.0000	177.00	No Ice	5.77	4.16	60.00
						1/2" Ice	6.22	4.77	105.75
						1" Ice	6.69	5.42	159.41
						2" Ice	7.65	6.82	288.60
						4" Ice	9.71	9.93	652.18
(2) RRUS 11 - Dual PA RRU	A	From Leg	0.50 0.00 2.00	0.0000	176.00	No Ice	2.94	1.25	60.00
						1/2" Ice	3.17	1.41	74.32
						1" Ice	3.41	1.59	96.56
						2" Ice	3.91	1.96	150.56
						4" Ice	5.02	2.82	302.12
(2) RRUS 11 - Dual PA RRU	B	From Leg	0.50 0.00 2.00	0.0000	176.00	No Ice	2.94	1.25	60.00
						1/2" Ice	3.17	1.41	74.32
						1" Ice	3.41	1.59	96.56
						2" Ice	3.91	1.96	150.56
						4" Ice	5.02	2.82	302.12
(2) RRUS 11 - Dual PA RRU	C	From Leg	0.50 0.00 2.00	0.0000	176.00	No Ice	2.94	1.25	60.00
						1/2" Ice	3.17	1.41	74.32
						1" Ice	3.41	1.59	96.56
						2" Ice	3.91	1.96	150.56
						4" Ice	5.02	2.82	302.12
6' x 2" Mount Pipe	A	From Leg	0.25 0.00 0.00	0.0000	176.00	No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
6' x 2" Mount Pipe	B	From Leg	0.25 0.00 0.00	0.0000	176.00	4" Ice	4.70	4.70	230.84
						No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
6' x 2" Mount Pipe	C	From Leg	0.25 0.00 0.00	0.0000	176.00	No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
						No Ice	1.43	1.43	20.00
6' x 2" Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
						No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
6' x 2" Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
						No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
6' x 2" Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
						No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
DC6-48-60-18-8F Surge Suppression Unit	C	From Leg	0.50 0.00 -2.00	0.0000	176.00	4" Ice	4.70	4.70	230.84
						No Ice	1.47	1.47	30.00
						1/2" Ice	1.67	1.67	50.52
						1" Ice	1.88	1.88	70.72
						2" Ice	2.33	2.33	119.24
						4" Ice	3.38	3.38	252.91
(2) LGP21401	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	No Ice	1.29	0.23	10.00
						1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
						No Ice	1.29	0.23	10.00
(2) LGP21401	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
						No Ice	1.29	0.23	10.00
						1/2" Ice	1.45	0.31	21.26
(2) LGP21401	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	177.00	1" Ice	1.61	0.40	30.32
						2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
						No Ice	1.29	0.23	10.00
						1/2" Ice	1.45	0.31	21.26
						1" Ice	1.61	0.40	30.32
5 s.f. Panel Antenna w/Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	165.00	2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
						No Ice	5.24	4.20	60.00
						1/2" Ice	5.77	5.07	103.30
						1" Ice	6.29	5.81	154.72
						2" Ice	7.36	7.35	279.85
5 s.f. Panel Antenna w/Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	165.00	4" Ice	9.62	10.63	650.04
						No Ice	5.24	4.20	60.00
						1/2" Ice	5.77	5.07	103.30
						1" Ice	6.29	5.81	154.72
						2" Ice	7.36	7.35	279.85
						4" Ice	9.62	10.63	650.04
5 s.f. Panel Antenna w/Mount	C	From Leg	1.00	0.0000	165.00	No Ice	5.24	4.20	60.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
Pipe			0.00 0.00			1/2" Ice	5.77	5.07	103.30
						1" Ice	6.29	5.81	154.72
						2" Ice	7.36	7.35	279.85
						4" Ice	9.62	10.63	650.04
(2) APX16PV-16PVL w/mount pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	6.79	3.17	60.00
						1/2" Ice	7.25	3.80	100.15
						1" Ice	7.73	4.44	151.47
						2" Ice	8.71	5.78	274.85
						4" Ice	10.80	8.70	631.91
(2) APX16PV-16PVL w/mount pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	6.79	3.17	60.00
						1/2" Ice	7.25	3.80	100.15
						1" Ice	7.73	4.44	151.47
						2" Ice	8.71	5.78	274.85
						4" Ice	10.80	8.70	631.91
(2) APX16PV-16PVL w/mount pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	6.79	3.17	60.00
						1/2" Ice	7.25	3.80	100.15
						1" Ice	7.73	4.44	151.47
						2" Ice	8.71	5.78	274.85
						4" Ice	10.80	8.70	631.91
(2) LGP21401	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	0.00	0.23	10.00
						1/2" Ice	0.00	0.31	21.26
						1" Ice	0.00	0.40	30.32
						2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
(2) LGP21401	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	0.00	0.23	10.00
						1/2" Ice	0.00	0.31	21.26
						1" Ice	0.00	0.40	30.32
						2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
(2) LGP21401	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	0.00	0.23	10.00
						1/2" Ice	0.00	0.31	21.26
						1" Ice	0.00	0.40	30.32
						2" Ice	1.97	0.61	54.89
						4" Ice	2.79	1.12	135.29
6' x 2" Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
6' x 2" Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
6' x 2" Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice	1.43	1.43	20.00
						1/2" Ice	1.92	1.92	32.83
						1" Ice	2.29	2.29	47.71
						2" Ice	3.06	3.06	90.28
						4" Ice	4.70	4.70	230.84
13' LP Platform	C	None		0.0000	148.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
(4) 844G45VTZASX w/Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	137.00	No Ice	7.71	5.63	40.00
						1/2" Ice	8.44	6.73	99.25
						1" Ice	9.04	7.54	168.68

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
(4) 844G45VTZASX w/Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	137.00	2" Ice	10.29	9.21	330.45
						4" Ice	12.93	12.75	779.97
						No Ice	7.71	5.63	40.00
						1/2" Ice	8.44	6.73	99.25
						1" Ice	9.04	7.54	168.68
						2" Ice	10.29	9.21	330.45
(4) 844G45VTZASX w/Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	137.00	4" Ice	12.93	12.75	779.97
						No Ice	7.71	5.63	40.00
						1/2" Ice	8.44	6.73	99.25
						1" Ice	9.04	7.54	168.68
						2" Ice	10.29	9.21	330.45
						4" Ice	12.93	12.75	779.97
13' LP Platform	C	None		0.0000	137.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
						No Ice	4.27	3.86	30.00
(2) DB980H65T2E-M w/Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	30.0000	125.00	1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
						No Ice	4.27	3.86	30.00
						1/2" Ice	4.86	4.95	69.84
(2) DB980H65T2E-M w/Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	125.00	1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
						No Ice	4.27	3.86	30.00
						1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
(2) DB980H65T2E-M w/Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	-15.0000	125.00	2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
						No Ice	4.27	3.86	30.00
						1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
LLPX310R w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	50.0000	125.00	4" Ice	8.86	10.87	585.45
						No Ice	5.40	3.59	70.00
						1/2" Ice	5.86	4.19	115.51
						1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
LLPX310R w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	30.0000	125.00	No Ice	5.40	3.59	70.00
						1/2" Ice	5.86	4.19	115.51
						1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
						No Ice	5.40	3.59	70.00
LLPX310R w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	20.0000	125.00	1/2" Ice	5.86	4.19	115.51
						1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
						No Ice	5.40	3.59	70.00
						1/2" Ice	5.86	4.19	115.51
FDD R6 RRH	A	From Centroid-Le g	4.00 0.00 2.00	50.0000	125.00	1" Ice	6.34	4.80	166.01
						2" Ice	7.33	6.13	290.23
						4" Ice	9.48	9.15	636.88
						No Ice	1.80	0.78	30.00
						1/2" Ice	1.99	0.92	44.58
						1" Ice	2.18	1.07	58.46
FDD R6 RRH	B	From Centroid-Le g	4.00 0.00 2.00	30.0000	125.00	2" Ice	2.59	1.39	93.93
						4" Ice	3.51	2.14	201.10
						No Ice	1.80	0.78	30.00
						1/2" Ice	1.99	0.92	44.58
						1" Ice	2.18	1.07	58.46
						2" Ice	2.59	1.39	93.93
FDD R6 RRH						4" Ice	3.51	2.14	201.10

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
FDD R6 RRH	C	From Centroid-Le g	4.00 0.00 2.00	20.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	30.00 44.58 58.46 93.93 201.10
Horizon DUO	A	From Centroid-Le g	4.00 0.00 2.00	50.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60	0.34 0.43 0.52 0.73 1.25	7.00 11.78 18.03 35.72 97.31
Horizon DUO	B	From Centroid-Le g	4.00 0.00 2.00	30.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60	0.34 0.43 0.52 0.73 1.25	7.00 11.78 18.03 35.72 97.31
Valmont 13' Platform w/o rails (GPD)	C	None		0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.80 26.20 27.60 30.40 36.00	24.80 26.20 27.60 30.40 36.00	1500.00 2500.00 3500.00 5500.00 9500.00
SLCP 2X6015 w/ mount pipe	A	From Centroid-Le g	4.00 0.00 2.00	40.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.66 11.33 11.98 13.31 16.08	9.94 11.26 12.31 14.40 18.80	60.00 142.91 242.48 470.62 1077.74
SLCP 2X6015 w/ mount pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.66 11.33 11.98 13.31 16.08	9.94 11.26 12.31 14.40 18.80	60.00 142.91 242.48 470.62 1077.74
SLCP 2X6015 w/ mount pipe	C	From Centroid-Le g	4.00 0.00 2.00	40.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.66 11.33 11.98 13.31 16.08	9.94 11.26 12.31 14.40 18.80	60.00 142.91 242.48 470.62 1077.74
(2) SC-E 6014 rev2 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	40.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.13 4.67 5.16 6.19 8.39	4.77 5.60 6.32 7.80 10.97	40.00 77.52 127.31 246.63 595.06
(2) SC-E 6014 rev2 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.13 4.67 5.16 6.19 8.39	4.77 5.60 6.32 7.80 10.97	40.00 77.52 127.31 246.63 595.06
(2) SC-E 6014 rev2 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	40.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.13 4.67 5.16 6.19 8.39	4.77 5.60 6.32 7.80 10.97	40.00 77.52 127.31 246.63 595.06
BXA-171063/12BF w/ 6' mount pipe	A	From Centroid-Le g	4.00 0.00 2.00	40.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.74 5.19 5.64 6.57 8.58	5.00 5.93 6.74 8.42 11.96	40.00 77.56 128.84 255.51 636.04
BXA-171063/12BF w/ 6' mount pipe	B	From Centroid-Le	4.00 0.00	0.0000	115.00	No Ice 1/2" Ice	4.74 5.19	5.00 5.93	40.00 77.56

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	Client	AT&T Mobility	Designed by	rmmoeller

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
		g	2.00					
BXA-171063/12BF w/ 6' mount pipe	C	From Centroid-Le g	4.00	40.0000	115.00	1" Ice	5.64	128.84
			0.00			2" Ice	6.57	255.51
			2.00			4" Ice	8.58	636.04
			0.00			No Ice	4.74	40.00
			0.00			1/2" Ice	5.19	77.56
			0.00			1" Ice	5.64	128.84
			0.00			2" Ice	6.57	255.51
			0.00			4" Ice	8.58	636.04
GPS	C	From Centroid-Le g	4.00	0.0000	115.00	No Ice	0.17	0.87
			0.00			1/2" Ice	0.24	3.85
			0.00			1" Ice	0.32	7.85
			0.00			2" Ice	0.51	19.56
			0.00			4" Ice	1.02	62.07
			0.00			No Ice	24.80	1500.00
			0.00			1/2" Ice	26.20	2500.00
			0.00			1" Ice	27.60	3500.00
Valmont 13' Platform w/o rails (GPD)	C	None	4.00	0.0000	115.00	2" Ice	30.40	5500.00
			0.00			4" Ice	36.00	9500.00
			0.00			No Ice	0.17	0.87
			0.00			1/2" Ice	0.24	3.85
			0.00			1" Ice	0.32	7.85
			0.00			2" Ice	0.51	19.56
			0.00			4" Ice	1.02	62.07
			0.00			No Ice	1.36	20.00
GPS	C	From Face	2.00	0.0000	50.00	1/2" Ice	2.45	40.00
			0.00			1" Ice	3.50	64.00
			0.00			2" Ice	5.74	103.00
			0.00			4" Ice	10.12	181.00
			0.00			No Ice	1.36	20.00
			0.00			1/2" Ice	2.45	40.00
			0.00			1" Ice	3.50	64.00
			0.00			2" Ice	5.74	103.00
2'-0" - STANDOFF	C	From Face	1.00	0.0000	50.00	4" Ice	10.12	181.00
			0.00			No Ice	1.36	20.00
			0.00			1/2" Ice	2.45	40.00
			0.00			1" Ice	3.50	64.00
			0.00			2" Ice	5.74	103.00
			0.00			4" Ice	10.12	181.00
			0.00			No Ice	1.36	20.00
			0.00			1/2" Ice	2.45	40.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb	
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Centroid -Leg	4.00	50.0000		125.00	2.17	No Ice	3.72	10.00
				0.00					1/2" Ice	4.01	20.00
				2.00					1" Ice	4.30	30.00
									2" Ice	4.88	50.00
									4" Ice	6.04	80.00
A-ANT-23G-2-C	B	Paraboloid w/o Radome	From Centroid -Leg	4.00	30.0000		125.00	2.17	No Ice	3.72	10.00
				0.00					1/2" Ice	4.01	20.00
				2.00					1" Ice	4.30	30.00
									2" Ice	4.88	50.00
									4" Ice	6.04	80.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	13' LP Platform	28	34.331	1.6711	0.0032	36518

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Date	10:18:32 06/28/12
Designed by	mmoeller

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>		<i>Comb.</i>	<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
176.00	(2) RRUS 11 - Dual PA RRU	28	33.981	1.6707	0.0032	36518
165.00	5 s.f. Panel Antenna w/Mount Pipe	28	30.162	1.6486	0.0028	16082
148.00	(2) APX16PV-16PVL w/mount pipe	28	24.454	1.5544	0.0026	8681
137.00	(4) 844G45VTZASX w/Mount Pipe	28	20.962	1.4638	0.0024	6686
127.00	A-ANT-23G-2-C	28	17.975	1.3675	0.0021	5803
125.00	(2) DB980H65T2E-M w/Mount Pipe	28	17.402	1.3470	0.0021	5744
115.00	SLCP 2X6015 w/ mount pipe	28	14.664	1.2396	0.0018	5472
50.00	GPS	28	2.646	0.4862	0.0004	4383

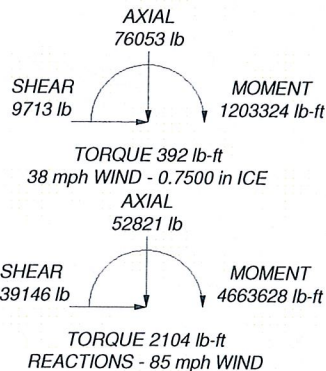
Section Capacity Table

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Size</i>	<i>Critical Element</i>	<i>P lb</i>	<i>SF*P_{allow} lb</i>	<i>% Capacity</i>	<i>Pass Fail</i>
L1	180 - 170.58	Pole	TP26.25x24x0.1875	1	-2407.66	781068.65	4.7	Pass
L2	170.58 - 126	Pole	TP36.525x25.0581x0.25	2	-10002.20	1449597.45	44.2	Pass
L3	126 - 82.75	Pole	TP46.357x34.8903x0.3125	3	-22335.30	2300358.00	74.8	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.2987x0.375	4	-34530.50	3320236.26	79.8	Pass
L5	40.75 - 0	Pole	TP64.75x53.2831x0.4375	5	-52800.30	4642745.50	77.0	Pass
Summary								
Pole (L4)							79.8	Pass
RATING =							79.8	Pass

APPENDIX C

Tower Elevation Drawing

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	9.42	18	0.1875	3.42	24.0000	26.2500		475.7
2	48.00	18	0.2500	4.75	25.0581	36.5250		3958.4
3	48.00	18	0.3125	6.00	34.8903	46.3570	A572-65	6530.7
4	48.00	18	0.3750	7.25	44.2987	55.7650		9653.7
5	48.00	18	0.4375	53.2831	64.7500			13286.3
								33904.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
13' LP Platform	177	6' x 2" Mount Pipe	148
(3) 7770.00 w/Mount Pipe	177	6' x 2" Mount Pipe	148
(3) 7770.00 w/Mount Pipe	177	13' LP Platform	148
(3) 7770.00 w/Mount Pipe	177	(4) 844G45VTZASX w/Mount Pipe	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	(4) 844G45VTZASX w/Mount Pipe	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	(4) 844G45VTZASX w/Mount Pipe	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	13' LP Platform	137
AM-X-CW-14-65-00T-RET w/ Mount Pipe	177	(2) DB980H65T2E-M w/Mount Pipe	125
6' x 2" Mount Pipe	177	(2) DB980H65T2E-M w/Mount Pipe	125
6' x 2" Mount Pipe	177	(2) DB980H65T2E-M w/Mount Pipe	125
6' x 2" Mount Pipe	177	LLPX310R w/ Mount Pipe	125
(2) LGP21401	177	LLPX310R w/ Mount Pipe	125
(2) LGP21401	177	LLPX310R w/ Mount Pipe	125
(2) LGP21401	177	FDD R6 RRH	125
(2) RRUS 11 - Dual PA RRU	176	FDD R6 RRH	125
(2) RRUS 11 - Dual PA RRU	176	FDD R6 RRH	125
(2) RRUS 11 - Dual PA RRU	176	Horizon DUO	125
DC6-48-60-18-8F Surge Suppression Unit	176	Horizon DUO	125
6' x 2" Mount Pipe	176	Valmont 13' Platform w/o rails (GPD)	125
6' x 2" Mount Pipe	176	A-ANT-23G-2-C	125
6' x 2" Mount Pipe	176	A-ANT-23G-2-C	125
5 s.f. Panel Antenna w/Mount Pipe	165	SLCP 2X6015 w/ mount pipe	115
5 s.f. Panel Antenna w/Mount Pipe	165	(2) SC-E 6014 rev2 w/ Mount Pipe	115
5 s.f. Panel Antenna w/Mount Pipe	165	(2) SC-E 6014 rev2 w/ Mount Pipe	115
(2) APX16PV-16PVL w/mount pipe	148	(2) SC-E 6014 rev2 w/ Mount Pipe	115
(2) APX16PV-16PVL w/mount pipe	148	BXA-171063/12BF w/ 6' mount pipe	115
(2) APX16PV-16PVL w/mount pipe	148	BXA-171063/12BF w/ 6' mount pipe	115
(2) LGP21401	148	BXA-171063/12BF w/ 6' mount pipe	115
(2) LGP21401	148	GPS	115
(2) LGP21401	148	Valmont 13' Platform w/o rails (GPD)	115
(2) LGP21401	148	SLCP 2X6015 w/ mount pipe	115
6' x 2" Mount Pipe	148	SLCP 2X6015 w/ mount pipe	115
		GPS	50
		2'-0" - STANDOFF	50

MATERIAL STRENGTH

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

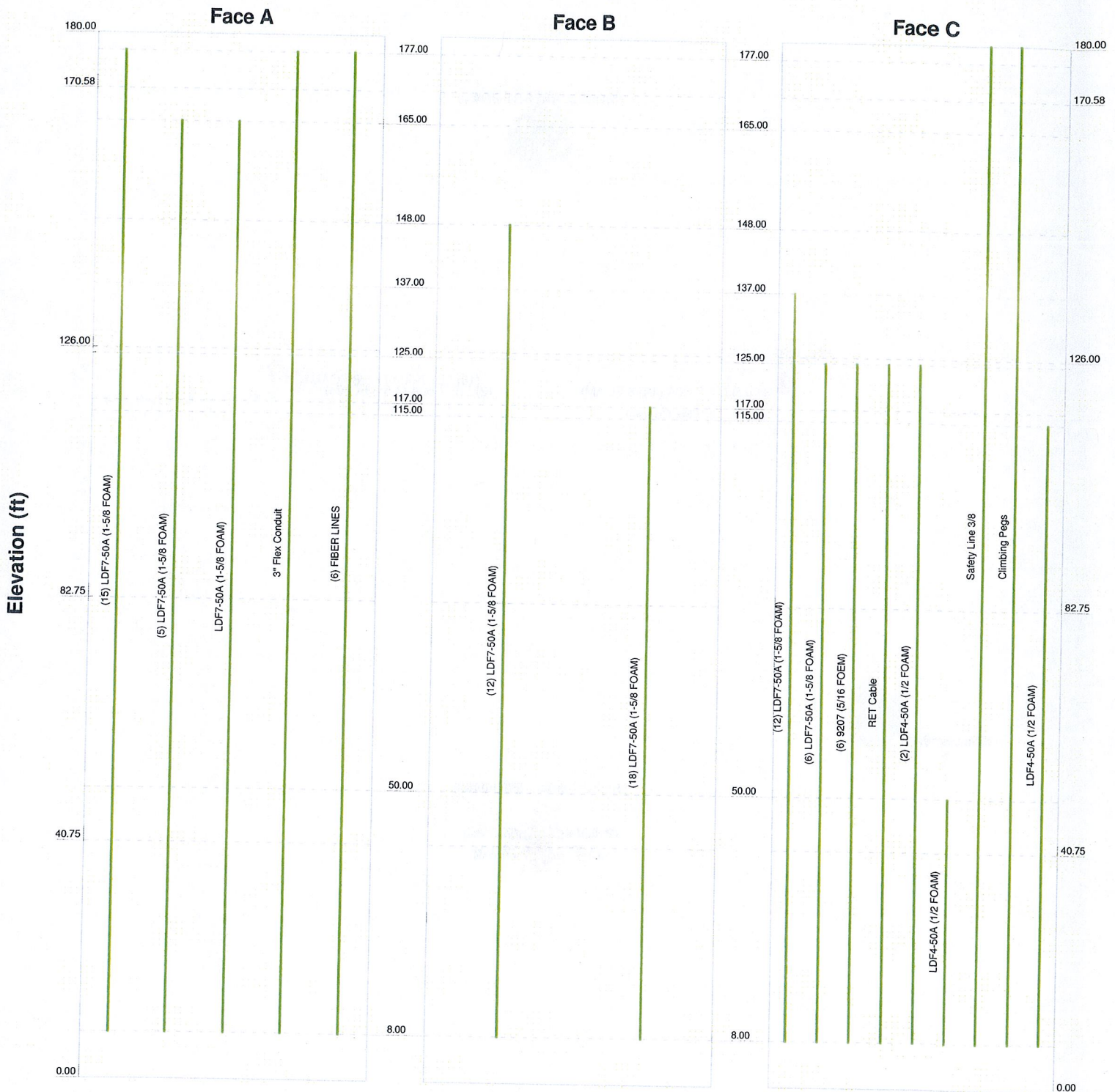
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 79.8%

 GPD Group Consulting Engineers		520 South Main Street, Suite 2531 Akron, OH Phone: (330) 572.2100 FAX: (330) 572.2101	
		Job: 16326 Orange Transfer Station Project: 2012767.71 Client: AT&T Mobility Code: TIA/EIA-222-F Path: O:\2012\2012767.71\16326.eri	
		Drawn by: mmoeller Date: 06/28/12 Scale: NTS Dwg No. E-1	App'd:

Feedline Distribution Chart 0° - 180°

Round Flat App In Face App Out Face Truss Leg



 GPD GROUP Consulting Engineers	GPD Group 520 South Main Street, Suite 2531 Akron, OH Phone: (330) 572.2100 FAX: (330) 572.2101		Job: 16326 Orange Transfer Station	
	Project: 2012767.71		Client: AT&T Mobility	Drawn by: mmoeller
	Code: TIA/EIA-222-F		Date: 06/28/12	App'd: NTS
	Path: 0:\2012\2012767\71\mxd\16326.dwg		Dwg No. E-7	

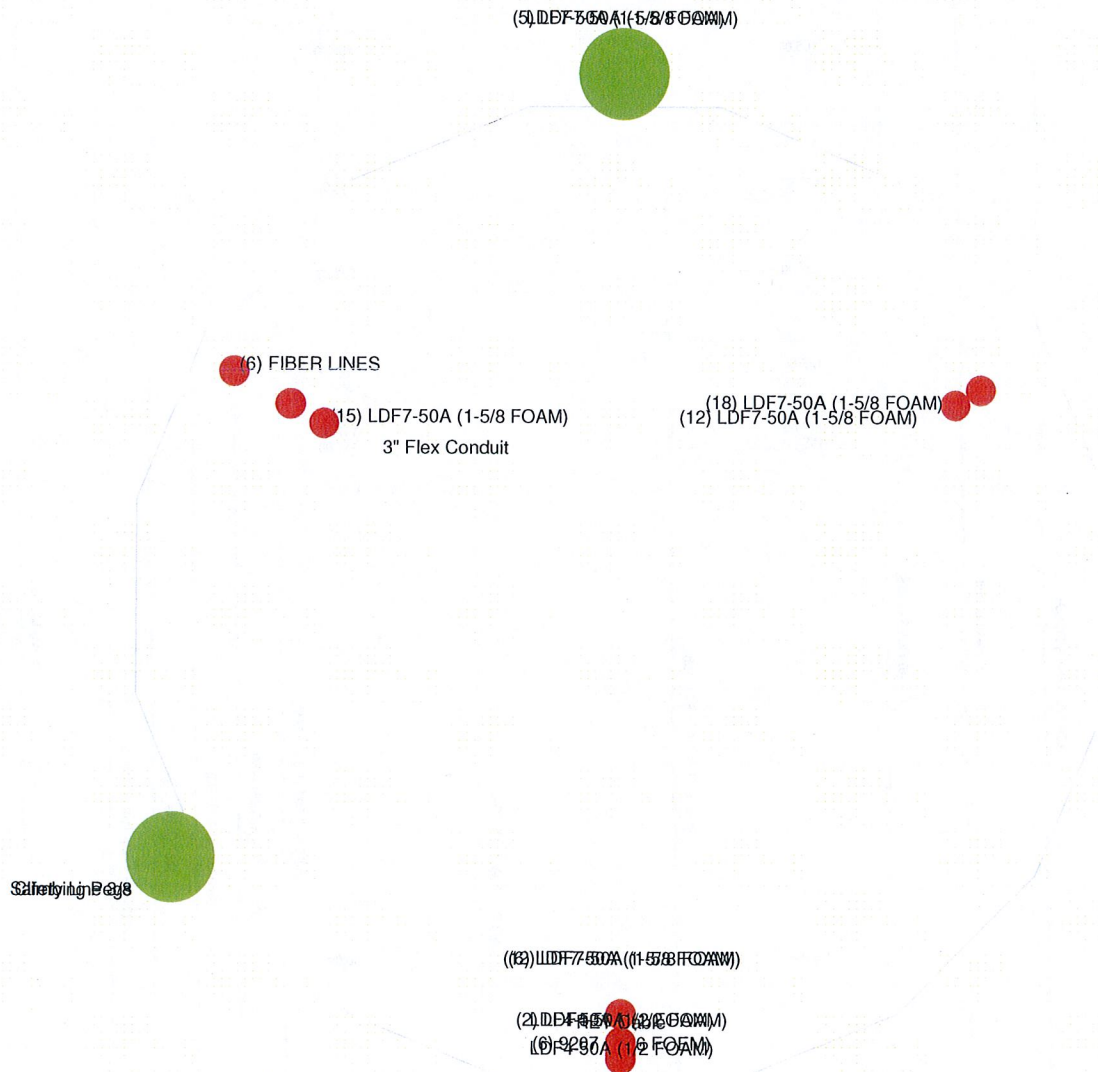
Feedline Plan

Round

Flat

App In Face

App Out Face



GPD Group
520 South Main Street, Suite 2531
Akron, OH
Phone: (330) 572.2100
FAX: (330) 572.2101

Job: 16326 Orange Transfer Station		
Project: 2012767.71		
Client: AT&T Mobility	Drawn by: mmoeller	App'd:
Code: TIA/EIA-222-F	Date: 06/28/12	Scale: NTS
Path: C:\2012\201276771\mxd\16326.eri	Dwg No. E-7	

APPENDIX D

Anchor Rod and Base Plate Analysis



Anchor Rod and Base Plate Stresses **16326 ORANGE TRANSFER STATION** **2012767.71**

Overturning Moment =	4663.63	k*ft
Axial Force =	52.82	k
Shear Force =	39.15	k

Acceptable Stress Ratio	=	100.0%
-------------------------	---	--------

Anchor Rods		
Number of Rods =	20	
Type =	Upset Rod	
Rod Yield Strength (F _y) =	75	ksi
ASIF =	1.333	
Rod Circle =	72	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in ²
Max Tension on Rod =	152.74	kips
Max Compression on Rod =	158.02	kips
Allow. Rod Force =	195.00	kips
Anchor Rod Capacity =	78.3%	OK

Stiffeners		
Configuration =	None	

Base Plate		
Location =	External	
Plate Strength (F _y) =	60	ksi
Outside Diameter =	77.25	in
Plate Thickness =	2.75	in
w _{calc} =	31.49	in
w _{max} =	49.75	in
w =	31.49	in
S =	39.69	in ³
f _b =	28.56	ksi
F _b =	60	ksi
BP Capacity =	47.6%	OK

Pole		
Pole Diameter =	64.75	in
Number of Sides =	18	
Thickness =	0.4375	in
Pole Yield Strength =	65	ksi

APPENDIX E

Foundation Analysis



Mat Foundation Analysis **16326 ORANGE TRANSFER STATION** **2012767.71**

General Info	
Code	TIA/EIA-222-F (ASD)
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Round
Reinforcing Known	No
Max Capacity	1

Tower Reactions	
Moment, M	4663.628 k-ft
Axial, P	52.821 k
Shear, V	39.146 k

Pad & Pier Geometry	
Pier Diameter, ϕ	8 ft
Pad Length, L	48 ft
Pad Width, W	48 ft
Pad Thickness, t	6 ft
Depth, D	7 ft
Height Above Grade, HG	1 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete Fc'	3 ksi
Clear Cover	3 in
Reinforced Top & Bottom?	
Pad Reinforcing Size	
Pad Quantity Per Layer	
Pier Rebar Size	
Pier Quantity of Rebar	

Soil Properties	
Soil Type	Granular
Soil Unit Weight	120 pcf
Angle of Friction, ϕ	32 °
Bearing Type	Net
Ultimate Bearing	12 ksf
Water Table Depth	7 ft
Frost Depth	3.33 ft

Bearing Summary			Load Case
Q _{xmax}	1.31	ksf	1D+1W
Q _{ymax}	1.31	ksf	1D+1W
Q _{max @ 45°}	1.42	ksf	1D+1W
Q _{(all) Gross}	6.42	ksf	
Controlling Capacity	22.2%	Pass	

Overturning Summary (Required FS=1.5)			Load Case
FS(ot)x	11.85	≥1.5	1D+1W
FS(ot)y	11.85	≥1.5	1D+1W
Controlling Capacity	12.7%	Pass	

