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

May 25, 2010

Kenneth C. Baldwin
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-078-100405-** Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 1725 Stafford Road, Mansfield, 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.

The proposed modifications are to be implemented as specified here and in your notice dated April 5, 2010, including the placement of all necessary equipment and shelters within the tower compound. 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable Elizabeth Patterson, Mayor, Town of Mansfield
Matthew W. Hart, Town Manager, Town of Mansfield
Gregory Padick, Town Planner, Town of Mansfield

G:\EM\BAM-VERIZON\Mansfield\dc052210StaffordRd.DOC

CONNECTICUT SITING COUNCIL

ROBINSON & COL

EM-VER-078-100405

KENNETH C. BALDWIN

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

ORIGINAL

April 5, 2010

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
1725 Stafford Road, Mansfield, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains wireless telecommunications antennas at the top of the existing 170-foot tower at the above-referenced address. The tower and underlying property are owned by the Town of Mansfield. The Council approved Cellco's shared use of the existing tower in 2004 in EM-VER-078-040310. Cellco now intends to modify its installation by replacing six (6) of its PCS antennas with three (3) model BXA-185063/12CF PCS antennas and three (3) model P65-16-XL-2 LTE antennas, all at the same 170-foot level on the tower. Attached behind Tab 1 are the specifications for the proposed 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 Matthew W. Hart, Town Manager for the Town of Mansfield.

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 any increase in the height of the existing tower. Cellco's antennas will be located at the same 170-foot level on the existing tower.

2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative 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 antennas modification. (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:
Matthew W. Hart, Mansfield Town Manager
Sandy M. Carter

Vertically Polarized, Log Periodic 63° / 18.5 dBi

LPA-185063/12CF ___

When ordering replace "___" with connector type.

Mechanical specifications

	Length	1806 mm	71.1 in
	Width	167 mm	6.6 in
	Depth	148 mm	5.8 in
	Depth with t-bracket	176 mm	6.9 in
4)	Weight	6.1 kg	13.5 lbs
	Wind Area		
	Fore/Aft	0.30 m^2	3.3 ft^2
	Side	0.27 m^2	2.9 ft^2
	Rated Wind Velocity (Safety factor 2.0)	>224 km/hr	>139 mph
	Wind Load @ 100 mph (161 km/hr)		
	Fore/Aft	479 N	107.6 lbs
	Side	434 N	97.6 lbs

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in).

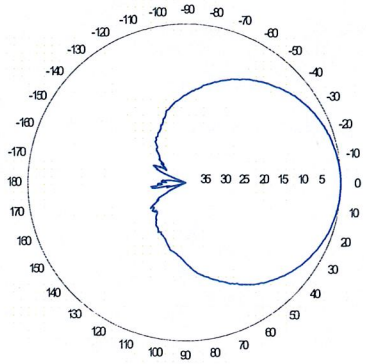
Mounting bracket kit #26799997
Downtilt bracket kit #26799999

The downtil bracket kit includes the mounting bracket kit.

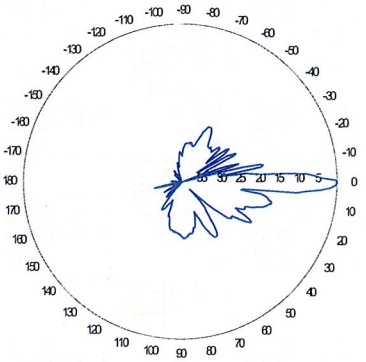
Electrical specifications

	Frequency Range	1850-1990 MHz
	Impedance	50Ω
3)	Connector(s)	NE or E-DIN 1 port / center
1)	VSWR	≤ 1.4:1
	Polarization	Vertical
1)	Gain	18.5 dBi
2)	Power Rating	250 W
1)	Half Power Angle	
	H-Plane	63°
	E-Plane	5°
1)	Electrical Downtilt	0°
1)	Null Fill	10%
	Lightning Protection	Direct Ground

Radiation pattern[1)]



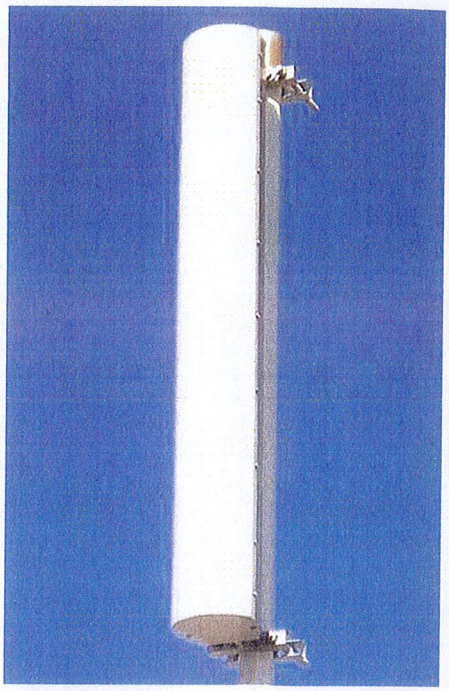
Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band-width and superior performance.
- Air as insulation for virtually no internal signal loss.

This Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with center-fed connector only.

1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector.
   E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

CF Denotes a Center-Fed Connector.

1850-1990 MHz

Amphenol Antel, Inc. 1300 Capital Drive Rockford, Illinois 61109 USA Tel. (815) 399-0001
Toll-Free (888) 417-9562 Fax. (815) 399-0156 antel@antelinc.com www.antelinc.com

Amphenol Antel, Inc. The Antenna Technology Company

Revision Date: 712/07

P65-16-XL-2 Very Low Broadband Antennas

POLARIZATION: Dual linear ±45°
FREQUENCY (MHz): 698-894
HORIZONTAL BEAM WIDTH (°): 65
GAIN (dBi/dBd): 16.0/13.9
TILT: 2
LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)		698-894	
Frequency band (MHz)	698-806		806-894
Gain (dBi/dBd)	15.5/13.4		16.0/13.9
Polarization			
Nominal Impedance (Ω)			
VSWR			
Horizontal beam width, -3 dB (°)	68		65
Vertical beam width, -3 dB (°)	10.5		9.5
Electrical down tilt (°)			
Side lobe suppression, vertical 1st upper (dB)	> 15		> 15
Isolation between inputs (dB)	> 30		> 30
Tracking, horizontal plane ±60° (dB)	< 2		< 2
First null fill (dB)	-		-
Vertical beam squint (°)	< 0.5		< 0.5
Front to back ratio (dB)	> 30		> 30
Front to back ratio, total power (dB)	> 25		> 25
Cross polar discrimination (XPD) 0° (dB)	> 15	> 15	
Cross polar discrimination (XPD) ±60° (dB)	> 10		> 10
Far field coupling			
IM3, 2xTx@43dBm (dBc)	-153		
IM7, 2xTx@43dBm (dBc)			
Power handling, average per input (W)			
Power handling, average total (W)			

MECHANICAL SPECIFICATIONS*

Connector	2 X 7/16 DIN Female
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 5" (1829 x 305 x 125)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	44 (20)
Weight, without brackets, kg (lbs)	33 (15)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	125 (55)
Lightning protection	DC Ground
Radome material	PVC
Radome colour	Light Grey
Package size, HxWxD, mm (ft)	82" x 16" x 10" (2082 x 400 x 255)
Shipping weight, kg (lbs)	55 (25)
RET	N/A
Brackets	7256.00, 7454.00, 2210.00

*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit http://www.powerwave.com/rpa/.

	General	Power	Density					
Site Name: Mansfield North								
Tower Height: Verizon @ 170Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Town	1	200	170	0.0025	150	0.2	1.24%	
*Town	1	200	170	0.0025	138	0.2	1.24%	
*Town	1	200	170	0.0025	140	0.2	1.24%	
*T-Mobile	8	130	137	0.0199	1935	1.0000	1.99%	
*AT&T UMTS	1	500	150	0.0080	880	0.5867	1.36%	
*AT&T GSM	2	427	150	0.0136	1900	1.0000	1.36%	
*AT&T GSM	4	296	150	0.0189	880	0.5867	3.23%	
*Sprint	11	336.6	130	0.0788	1962.5	1.0000	7.88%	
Verizon	**3**	**547**	**170**	**0.0204**	**970**	**1.0000**	**2.04%**	
Verizon	**9**	**210**	**170**	**0.0235**	**869**	**0.5793**	**4.06%**	
Verizon	**1**	**649**	**170**	**0.0081**	**757**	**0.4973**	**1.62%**	
								27.28%
* Source: Siting Council								

GLOBAL TOWER Services

Structural Analysis Report

170 ft. Tapered Monopole

1725 Stafford Road, Mansfield, CT 06268
Tolland County
(CT-5031, Mansfield Center 2)

Verizon Wireless
Verizon Wireless Site Number: N/A
Verizon Wireless Site Name: Mansfield North, CT

Prepared by:
Global Tower Services, LLC
Michael T. De Boer, P.E.
Director of Structural Engineering

February 10, 2010

750 Park of Commerce Boulevard • Suite 300 • Boca Raton, FL 33487-3612
Phone 605.422.1548 • Fax 605.422.1550 • www.gtpsites.com

Global Tower Services, LLC
February 10, 2010
Mansfield Center 2
CT-5031

Table of Contents

Introduction.....3

Description of Structure.....3

Design Parameter.....3

Antenna Loading Information.....4

Analysis Results.....4 - 5

Analysis Summary and Conclusions.....5

Standard Conditions.....6

Disclaimer of Warranties.....7

Appendix A - Monopole Profile.....Attached

Appendix B - Calculations.....Attached

Global Tower Services, LLC
February 10, 2010
Mansfield Center 2
CT-5031

INTRODUCTION

We have completed the structural analysis for the existing 170 ft. tapered monopole located in Tolland County (1725 Stafford Road, Mansfield), CT. The objective of the analysis is to determine if the existing tapered monopole design is in conformance / compliance with the current codes and standards for the proposed equipment installation.

TSTower written by TowerSoft was utilized in performing the analysis. This program is a commercially available software program which was used to create a non-linear three-dimensional beam model and calculate member stresses for various loading conditions.

DESCRIPTION OF STRUCTURE

The existing structure is a 170 ft. tapered monopole. The original monopole manufacturer is Valmont / PennSummit, West Hazelton, PA. The existing monopole consists of four (4) sections with slip connections.

Original monopole drawings provided by Valmont / PennSummit were used to model the monopole steel. (Valmont / PennSummit Design Number 19122, December 6, 2002) The monopole shaft is manufactured from 65 ksi steel, the base plate is 55 ksi steel and the anchor bolts are A615 Grade 75 steel.

The monopole, for the purpose of analysis, is considered to be in good condition with no defects.

DESIGN PARAMETERS

- Standard:	ANSI/TIA-222-F-1996
- Basic Wind Speed:	85 mph (fastest mile) 105 mph (3-sec gust)
- Serviceability Wind Speed:	50 mph (fastest mile)
- Basic Wind Speed with Ice:	73.95 mph (fastest mile)
- Design Ice Thickness:	0.50 (inch)
- Allowable Stress Increase:	1/3 for wind loading conditions

Global Tower Services, LLC
February 10, 2010
Mansfield Center 2
CT-5031

ANTENNA LOADING INFORMATION

Existing and Reserved Loading Information

Antenna Type / Mount Type	Qty.	Elev. (ft)	Ex. Lines	Qty.	Customer
DB844H80 / Low Profile Platform **(New antenna config. listed below)**	12	170	1 5/8"	12	Verizon
Powerwave 7770 / Low Profile Platform	6	150	1 5/8"	12	ATT
Powerwave 21401 TMA's	6	150			ATT
Powerwave 21903 Diplexers	6	150			ATT
EMS RR-90-17-02 DPL2 / Low Profile Platform	6	140	1 5/8"	12	T-Mobile
DB980F90E-M / Low Profile Platform	9	130	1 5/8"	9	Sprint

Note: Existing lines are inside the monopole shaft.

Final Verizon Loading Configuration

Antenna Type / Mount Type	Qty.	Elev. (ft)	Lines	Qty.	Customer
DB844F90A-SX_0 /Low Profile Platform	6	170	1 5/8"	6	Verizon
Antel BXA-185063/12CF / Low Profile Platform	3	170	1 5/8"	3	Verizon
Powerwave P65-16-XL-2 / Low Profile Platform	3	170	1 5/8"	3	Verizon

Note: The existing lines can be re-used if they are in adequate condition. Existing mount to be re-used.

ANALYSIS RESULTS

Structure

The existing 170 ft. tapered monopole **is structurally capable** of supporting the proposed equipment. **(See table below)**

Monopole Members	% Capacity	Results
Monopole Shaft	51	Pass
Monopole Base Plate	28	Pass
Anchor Bolts	53	Pass

(105 percent is considered acceptable.)

Global Tower Services, LLC
February 10, 2010
Mansfield Center 2
CT-5031

ANALYSIS RESULTS

Foundation

The existing foundation has also been evaluated. The existing foundation was found to be **acceptable** with the proposed equipment installed. (See table below)

Overturning Moment	2899.3 Ft-Kips	5555.0 Ft-Kips	52	Pass
Shear	25.5 Kips	45.0 Kips	57	Pass

Monopole Rating: 57%

Summary and Conclusions

The existing 170 ft. tapered monopole located in Tolland County (1725 Stafford Road, Mansfield), CT **is structurally acceptable** based upon the EIA-222-F 1996 Standard and the local building code with the proposed equipment installed.

If any other changes are proposed, another structural analysis should be performed to assure the tower is in compliance / conformance with the applicable codes and standards.

Should any further questions arise, please contact the Global Tower Services, LLC Engineering Department at 605-422-1708.

Global Tower Services, LLC

Michael T. De Boer, P.E.
Director of Structural Engineering

STATE OF CONNECTICUT
MICHAEL T. DE BOER
No. 18022
LICENSED
PROFESSIONAL ENGINEER

2/10/10

Global Tower Services, LLC
February 10, 2010
Mansfield Center 2
CT-5031

Standard Conditions

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

- Information supplied by the client regarding the structure itself, the antenna and transmission line loading on the structure and it components, or relevant information.

- Information from drawings in possession of Global Tower Services, LLC, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Global Tower Services, LLC and used in the performance of our engineering services is correct and complete. In the absence of information contrary, we consider that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated; and we, therefore consider that their capacity has not significantly changed from the original design condition.

All services will be performed to the codes and standards specified by the client, and we do not imply to meet any other code and standard requirements unless explicitly agreed to in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes and standards, the client shall specify the exact requirements. In the absence of information to the contrary, all work will be performed in accordance with the revision of ANSI/TIA/EIA-222 requested.

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

Global Tower Services, LLC
February 10, 2010
Mansfield Center 2
CT-5031

Disclaimer of Warranties

The engineering services by **Global Tower Services, LLC** in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. **Global Tower Services, LLC** does not analyze the fabrication, including welding, except as included in this report.

The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines. Any mention of structural modifications are reasonable estimates and should not be used a precise construction document. Precise modification drawings are obtainable from **Global Tower Services, LLC** but are beyond the scope of this report.

Global Tower Services, LLC makes no warranties, expressed or implied, in connection with this report and disclaim any liability arising from material, fabrication and erection of this tower. **Global Tower Services, LLC** 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 **Global Tower Services, LLC** pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

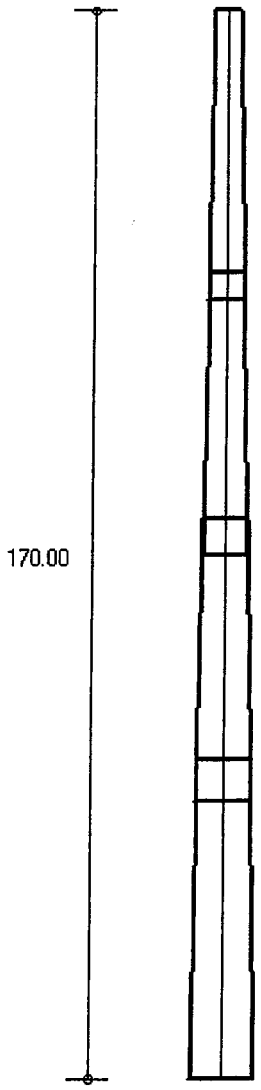
Monopole Profile

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract:
Revision: 1
Project: Structural Analysis for 170' Monopole
Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM
Engineer: Mike De Boer

DESIGN SPECIFICATION

Design Standard: TIA/EIA-222-F-1996
Basic Wind speed = 85.0 (mph)
Service Wind speed = 50.0 (mph)
Ice thickness = 0.50 (in)

Sct.	Length (ft)	Overlap (ft)	Top Dia. (in)	Bot Dia. (in)	Thick. (in)
1	51.00	6.75	51.52	64.12	0.4375
2	45.00	5.75	42.82	53.94	0.3750
3	45.00	4.50	33.75	44.87	0.3125
4	46.00	0.00	24.00	35.36	0.2500



MAXIMUM BASE REACTIONS

	Bare	Iced
Download (Kips)	45.1	52.9
Shear (Kips)	25.5	21.0
Moment (Kipsft)	2899.3	2468.9

APPENDIX B

Calculations

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: **Revision: 1**
Project: Structural Analysis for 170' Monopole **Site: CT-5031 (Mansfield Center 2)**
Date and Time: 2/10/2010 2:01:14 PM **Engineer: Mike De Boer**

Section A: PROJECT DATA

Project Title:	Structural Analysis for 170' Monopole
Customer Name:	Verizon Wireless
Site:	CT-5031 (Mansfield Center 2)
Contract No.:	
Revision:	1
Engineer:	Mike De Boer
Date:	Feb 10 2010
Time:	02:00:35 PM

Design Standard: TIA/EIA-222-F-1996

GENERAL DESIGN CONDITIONS

Start Wind direction:	0.00 (Deg)
End Wind direction:	330.00 (Deg)
Increment wind direction:	30.00 (Deg)
Elevation above ground:	0.00(ft)
Gust Response Factor Gh:	1.69
Material Density:	490.1(lbs/ft^3)
Young's Modulus:	29000.0(ksi)
Poisson Ratio:	0.3
Weight Multiplier:	1.00
Allowable Stress Incr. Factor:	1.333
Increase allowable stress:	Yes

WIND ONLY CONDITIONS:

Basic Wind Speed:	85.00(mph)

WIND AND ICE CONDITIONS:

Basic Wind Speed:	85.00(mph)
Ice Thickness:	0.50(in)
Ice density:	56.19(lbs/ft^3)
Wind pressure reduction for iced conditions:	0.75

WIND ONLY SERVICEABILITY CONDITIONS:

Operational Wind Speed:	50.00(mph)

Analysis performed using: TowerSoft Finite Element Analysis Program

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

Section B: STRUCTURE GEOMETRY

Total Height (ft)	Bottom Diameter (in)	Top Diameter (in)
170.00	64.12	24.00

Sect. No	Length (ft)	Overlap (ft)	Bot Dia. (in)	Top Dia. (in)	Thick. (in)	Sides	Joint Type	Yield Stress (ksi)	Mass (lbs)	Calculated Taper (in/ft)
1	51.00	6.75	64.12	51.52	0.4375	Circular	Flange	65.0	13676.6	0.24703
2	45.00	5.75	53.94	42.82	0.3750	Circular	Telescopic	65.0	8653.3	0.24703
3	45.00	4.50	44.87	33.75	0.3125	Circular	Telescopic	65.0	5857.9	0.24703
4	46.00	0.00	35.36	24.00	0.2500	Circular	Telescopic	65.0	3615.4	0.24703
Total Mass:									31803.3	

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

Section D: TRANSMISSION LINE DATA

Transmission Lines Position

No.	Bot El (ft)	Top El (ft)	Desc.	Radius (ft)	Az.	Orient.	No.	Shielded	Shielded Lines	Antenna
1	0.00	130.00	LDF7P-50A	0.00	0.00	0.00	9	Yes	9	
2	0.00	150.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
3	0.00	140.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
4	0.00	170.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	

Transmission Lines Details

No.	Desc.	Width (in)	Depth (in)	Unit Mass (lb/ft)
1	LDF7P-50A	2.01	2.01	0.92
2	LDF7P-50A	2.01	2.01	0.92
3	LDF7P-50A	2.01	2.01	0.92
4	LDF7P-50A	2.01	2.01	0.92

Utilization of the cross-section for TX Lines: 16.53%

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract:
Revision: 1
Project: Structural Analysis for 170' Monopole
Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM
Engineer: Mike De Boer

Section F: POINT LOAD DATA

Structure Azimuth from North:0.00

POINT LOADS

No.	Description	Elev. (ft)	Radius (ft)	Azim. (Deg)	Orient. (Deg)	Vertical Offset (ft)	Tx Line	Comments
1	(9) DB980F90E-M	130.00	0.00	0.0	0.0	0.00	(9)LDF7P-50A	Sprint (0.80)
2	Low Profile Platform	130.00	0.00	0.0	0.0	0.00		Sprint
3	Low Profile Platform	150.00	0.00	0.0	0.0	0.00	(12)LDF7P-50A	ATT
4	(6) Powerwave 21401 TMA's	150.00	0.00	0.0	0.0	0.00		ATT (0.85)
5	(6) RR-90-17-02DPL2	140.00	0.00	0.0	0.0	0.00		T-Mobile (0.85)
6	Low Profile Platform	140.00	0.00	0.0	0.0	0.00	(12)LDF7P-50A	T-Mobile
7	(6) DB844F90A-SX_0	170.00	0.00	0.0	0.0	0.00		Verizon (0.85)
8	Low Profile Platform	170.00	0.00	0.0	0.0	0.00	(12)LDF7P-50A	Verizon
9	(6) Powerwave 7770	150.00	0.00	0.0	0.0	0.00		ATT (0.85)
10	(6) Powerwave 21903 Dipl.	150.00	0.00	0.0	0.0	0.00		ATT
11	(3) BXA-185063/12CF	170.00	0.00	0.0	0.0	0.00		Verizon (1.0)
12	(3) P65-16-XL-2	170.00	0.00	0.0	0.0	0.00		Verizon (0.85)

POINT LOADS WIND AREAS AND WEIGHTS

No.	Description	Frontal Bare Area (ft^2)	Lateral Bare Area (ft^2)	Frontal Iced Area (ft^2)	Lateral Iced Area (ft^2)	Weight Bare (Kips)	Weight Iced (Kips)
1	(9) DB980F90E-M	25.20	25.20	29.88	29.88	0.27	0.45
2	Low Profile Platform	24.00	24.00	30.00	30.00	1.50	2.00
3	Low Profile Platform	24.00	24.00	30.00	30.00	1.50	2.00
4	(6) Powerwave 21401 TMA's	7.64	7.64	8.93	8.93	0.17	0.43
5	(6) RR-90-17-02DPL2	22.24	22.24	25.45	25.45	0.08	0.22
6	Low Profile Platform	21.00	21.00	27.00	27.00	1.50	2.00
7	(6) DB844F90A-SX_0	19.04	19.04	21.87	21.87	0.07	0.20
8	Low Profile Platform	21.00	21.00	27.00	27.00	1.50	2.00
9	(6) Powerwave 7770	30.00	30.00	33.32	33.32	0.21	0.53
10	(6) Powerwave 21903 Dipl.	5.00	5.00	7.00	7.00	0.06	0.12
11	(3) BXA-185063/12CF	12.88	12.88	15.20	15.20	0.05	0.12
12	(3) P65-16-XL-2	21.42	21.42	23.52	23.52	0.06	0.12

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

Section H: STRUCTURE DISPLACEMENT DATA

Load Combination Max Envelope

Wind Direction Maximum displacements

Elev. (ft)	N-S Disp (in)	W-E Disp (in)	Vert.Disp (in)	N-S Rot (deg)	W-E Rot (deg)	Twist Rot (deg)
170.00	66.6	-66.4	-1.4	-3.48	-3.49	0.00
161.70	60.6	-60.4	-1.2	-3.45	-3.47	0.00
153.40	54.6	-54.4	-1.0	-3.39	-3.40	0.00
145.10	48.8	-48.6	-0.9	-3.28	-3.30	0.00
136.80	43.2	-43.0	-0.7	-3.14	-3.16	0.00
128.50	37.8	-37.7	-0.6	-2.97	-2.98	0.00
124.00	35.1	-34.9	-0.5	-2.85	-2.87	0.00
117.05	31.0	-30.9	-0.4	-2.70	-2.71	0.00
110.10	27.2	-27.1	-0.4	-2.53	-2.54	0.00
103.15	23.6	-23.5	-0.3	-2.35	-2.35	0.00
96.20	20.3	-20.3	-0.2	-2.16	-2.17	0.00
89.25	17.3	-17.3	-0.2	-1.97	-1.98	0.00
83.50	15.0	-15.0	-0.2	-1.81	-1.82	0.00
77.00	12.7	-12.6	-0.1	-1.65	-1.66	0.00
70.50	10.5	-10.5	-0.1	-1.50	-1.50	0.00
64.00	8.6	-8.5	-0.1	-1.34	-1.34	0.00
57.50	6.9	-6.8	-0.1	-1.18	-1.19	0.00
51.00	5.3	-5.3	0.0	-1.03	-1.03	0.00
44.25	4.0	-4.0	0.0	-0.87	-0.88	0.00
36.88	2.8	-2.7	0.0	-0.72	-0.72	0.00
29.50	1.7	-1.7	0.0	-0.57	-0.57	0.00
22.13	1.0	-1.0	0.0	-0.42	-0.42	0.00
14.75	0.4	-0.4	0.0	-0.28	-0.28	0.00
7.38	0.1	-0.1	0.0	-0.14	-0.14	0.00
0.00	0.0	0.0	0.0	0.00	0.00	0.00

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

Section K: POLE OUTPUT LOAD DATA

Load Combination Max Envelope
Wind Direction Maximum Loads

Elev. (ft)	Axial Ld. (kips)	Shear Ld. (kips)	Torque (kipsft)	Bend Mom. (kipsft)
170.00	2.72	4.08	0.00	0.07
161.70	2.72	4.08	0.50	33.84
161.70	3.51	4.64	0.50	33.98
153.40	3.51	4.64	1.06	72.37
153.40	6.15	7.19	1.04	72.54
145.10	6.15	7.19	1.89	132.03
145.10	9.21	9.99	1.84	132.29
136.80	9.21	9.99	2.97	214.95
136.80	12.10	12.38	2.86	215.29
128.50	12.10	12.38	4.19	317.64
128.50	15.02	14.82	4.09	317.94
124.00	15.02	14.82	4.92	384.32
124.00	16.27	15.30	4.74	384.60
117.05	16.27	15.30	5.99	490.65
117.05	17.83	15.89	5.75	490.98
110.10	17.83	15.89	6.97	601.11
110.10	19.18	16.48	6.64	601.42
103.15	19.18	16.48	7.83	715.62
103.15	20.58	17.07	7.42	715.91
96.20	20.58	17.07	8.56	834.22
96.20	22.02	17.67	8.06	834.50
89.25	22.02	17.67	9.14	956.97
89.25	23.38	18.22	8.64	957.20
83.50	23.38	18.22	9.48	1061.46
83.50	25.34	18.77	8.94	1061.67
77.00	25.34	18.77	9.84	1183.20
77.00	27.51	19.35	9.25	1183.41
70.50	27.51	19.35	10.10	1308.72
70.50	29.21	19.92	9.45	1308.91
64.00	29.21	19.92	10.23	1437.91
64.00	30.97	20.48	9.52	1438.08
57.50	30.97	20.48	10.23	1570.75
57.50	32.77	21.03	9.46	1570.90
51.00	32.77	21.03	10.11	1707.89
51.00	34.66	21.59	9.26	1708.03
44.25	34.66	21.59	9.85	1852.91
44.25	37.69	22.18	8.93	1853.04
36.88	37.69	22.18	9.48	2016.46
36.88	41.00	22.78	8.51	2016.58
29.50	41.00	22.78	8.97	2184.46
29.50	43.53	23.36	7.94	2184.54
22.13	43.53	23.36	8.30	2356.74
22.13	46.14	23.94	7.21	2356.82
14.75	46.14	23.94	7.47	2532.60
14.75	48.82	24.54	6.32	2532.65
7.38	48.82	24.54	6.48	2713.69
7.38	51.56	25.15	5.27	2713.71
0.00	51.56	25.15	5.32	2899.30
Base	52.94	25.50	5.32	2899.30

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

Section L: STRENGTH ASSESSMENT DATA

Load Combination Max Envelope
Wind Direction Maximum

Elev. (ft)	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Total Stress (ksi)	Allowable Stress (ksi)	Assess.
170.00	0.01	0.10	0.22	0.39	52.00	0.008
161.70	3.13	0.09	0.20	3.24	52.00	0.062
161.70	3.15	0.12	0.23	3.29	52.00	0.063
153.40	5.75	0.11	0.21	5.87	52.00	0.113
153.40	5.77	0.19	0.33	5.98	52.00	0.115
145.10	9.10	0.18	0.31	9.29	52.00	0.179
145.10	9.12	0.27	0.43	9.41	52.00	0.181
136.80	12.97	0.25	0.40	13.23	52.00	0.255
136.80	12.99	0.33	0.49	13.35	52.00	0.257
128.50	16.91	0.31	0.46	17.25	52.00	0.332
128.50	16.93	0.40	0.56	17.35	52.00	0.334
124.00	15.89	0.34	0.45	16.26	52.00	0.313
117.05	18.39	0.33	0.43	18.74	52.00	0.360
117.05	18.41	0.37	0.45	18.79	52.00	0.361
110.10	20.54	0.35	0.43	20.90	52.00	0.402
110.10	20.55	0.38	0.44	20.94	52.00	0.403
103.15	22.37	0.37	0.42	22.75	52.00	0.438
103.15	22.38	0.40	0.44	22.79	52.00	0.438
96.20	23.95	0.38	0.42	24.35	52.00	0.468
96.20	23.96	0.41	0.43	24.39	52.00	0.469
89.25	25.33	0.40	0.42	25.73	52.00	0.495
89.25	25.33	0.43	0.43	25.77	52.00	0.496
83.50	22.67	0.38	0.36	23.06	52.00	0.443
77.00	23.50	0.37	0.35	23.88	52.00	0.459
77.00	23.51	0.41	0.36	23.92	52.00	0.460
70.50	24.25	0.39	0.35	24.65	52.00	0.474
70.50	24.25	0.42	0.36	24.68	52.00	0.475
64.00	24.91	0.41	0.35	25.32	52.00	0.487
64.00	24.91	0.44	0.36	25.35	52.00	0.488
57.50	25.49	0.42	0.35	25.92	52.00	0.498
57.50	25.49	0.45	0.36	25.95	52.00	0.499
51.00	26.02	0.43	0.34	26.46	52.00	0.509
51.00	26.02	0.46	0.35	26.49	52.00	0.510
44.25	23.45	0.43	0.31	23.88	52.00	0.459
36.88	23.83	0.41	0.30	24.25	52.00	0.466
36.88	23.83	0.46	0.30	24.30	52.00	0.467
29.50	24.17	0.44	0.29	24.62	52.00	0.473
29.50	24.17	0.47	0.30	24.65	52.00	0.474
22.13	24.47	0.46	0.29	24.93	52.00	0.479
22.13	24.47	0.49	0.30	24.96	52.00	0.480
14.75	24.71	0.47	0.29	25.19	52.00	0.484
14.75	24.71	0.50	0.30	25.22	52.00	0.485
7.38	24.94	0.49	0.29	25.43	52.00	0.489
7.38	24.94	0.52	0.30	25.46	52.00	0.490
0.00	25.14	0.50	0.29	25.64	52.00	0.493

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract:
Revision: 1
Project: Structural Analysis for 170' Monopole
Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM
Engineer: Mike De Boer

Section M: SECTION PROPERTIES DATA

Elev. (ft)	Diam. (in)	Width (in)	Thick. (in)	W/t	Area (in^2)	S (in^3)
170.0	24.0	24.0	0.250	96.0	18.7	109.61
161.7	26.1	26.1	0.250	104.2	20.3	129.46
161.7	26.1	26.1	0.250	104.2	20.3	129.46
153.4	28.1	28.1	0.250	112.4	21.9	150.96
153.4	28.1	28.1	0.250	112.4	21.9	150.96
145.1	30.2	30.2	0.250	120.6	23.5	174.11
145.1	30.2	30.2	0.250	120.6	23.5	174.11
136.8	32.2	32.2	0.250	128.8	25.1	198.91
136.8	32.2	32.2	0.250	128.8	25.1	198.91
128.5	34.3	34.3	0.250	137.0	26.7	225.36
128.5	34.3	34.3	0.250	137.0	26.7	225.36
124.0	35.4	35.4	0.250	141.5	27.6	240.39
124.0	34.9	34.9	0.313	111.6	33.9	290.39
117.1	36.6	36.6	0.313	117.1	35.6	320.10
117.1	36.6	36.6	0.313	117.1	35.6	320.10
110.1	38.3	38.3	0.313	122.6	37.3	351.26
110.1	38.3	38.3	0.313	122.6	37.3	351.26
103.2	40.0	40.0	0.313	128.0	39.0	383.86
103.2	40.0	40.0	0.313	128.0	39.0	383.86
96.2	41.7	41.7	0.313	133.5	40.7	417.91
96.2	41.7	41.7	0.313	133.5	40.7	417.91
89.3	43.4	43.4	0.313	139.0	42.3	453.41
89.3	43.4	43.4	0.313	139.0	42.3	453.41
83.5	44.9	44.9	0.313	143.6	43.7	483.87
83.5	44.2	44.2	0.375	118.0	51.7	562.02
77.0	45.8	45.8	0.375	122.3	53.6	604.10
77.0	45.8	45.8	0.375	122.3	53.6	604.10
70.5	47.5	47.5	0.375	126.5	55.5	647.69
70.5	47.5	47.5	0.375	126.5	55.5	647.69
64.0	49.1	49.1	0.375	130.8	57.4	692.80
64.0	49.1	49.1	0.375	130.8	57.4	692.80
57.5	50.7	50.7	0.375	135.1	59.2	739.43
57.5	50.7	50.7	0.375	135.1	59.2	739.43
51.0	52.3	52.3	0.375	139.4	61.1	787.58
51.0	52.3	52.3	0.375	139.4	61.1	787.58
44.3	53.9	53.9	0.375	143.8	63.1	839.18
44.3	53.2	53.2	0.438	121.6	72.5	948.37
36.9	55.0	55.0	0.438	125.7	75.0	1015.29
36.9	55.0	55.0	0.438	125.7	75.0	1015.29
29.5	56.8	56.8	0.438	129.9	77.5	1084.48
29.5	56.8	56.8	0.438	129.9	77.5	1084.48
22.1	58.7	58.7	0.438	134.1	80.0	1155.95
22.1	58.7	58.7	0.438	134.1	80.0	1155.95
14.8	60.5	60.5	0.438	138.2	82.5	1229.71
14.8	60.5	60.5	0.438	138.2	82.5	1229.71
7.4	62.3	62.3	0.438	142.4	85.0	1305.74
7.4	62.3	62.3	0.438	142.4	85.0	1305.74
0.0	64.1	64.1	0.438	146.6	87.5	1384.06

Note: w/t values marked with * (asterisk) indicate width to thickness exceeding maximum allowable values by standards.

File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

BASE PLATE DETAILS

Maximum base reactions

Axial Load(Kips)	=	45.07
Shear Load(Kips)	=	25.50
Bending Moment(Kipsft)	=	2899.30
Torque(Kipsft)	=	5.32

Anchor Rod Data

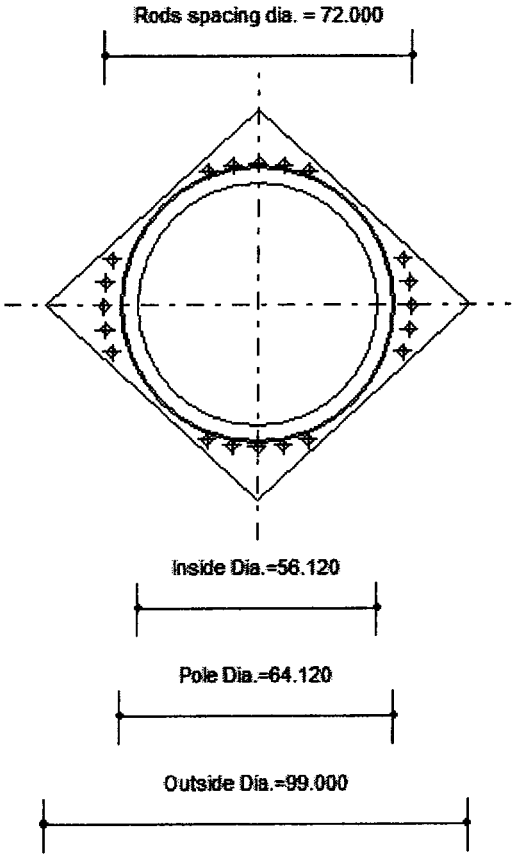
No of rods	=	20
Grade	=	A615 Gr.75
Size	=	2 1/4 in
Rods Spacing(in)	=	6.000
Lar * (in)	=	2.000
Shear Load(Kips)	=	1.36
Axial Load(Kips)	=	98.90
Shear Cap.(Kips)	=	90.12
Axial Cap.(Kips)	=	194.85
Assessment Ratio	=	0.53
Allow. Stress Increase	=	1.33

Plate Data

Thickness(in)	=	3.250
Grade	=	A572 gr.52
Max. Stress(ksi)	=	14.4
Allow. Stress(ksi)	=	52.0
Assessment Ratio	=	0.28
Allow. Stress Increase	=	1.33

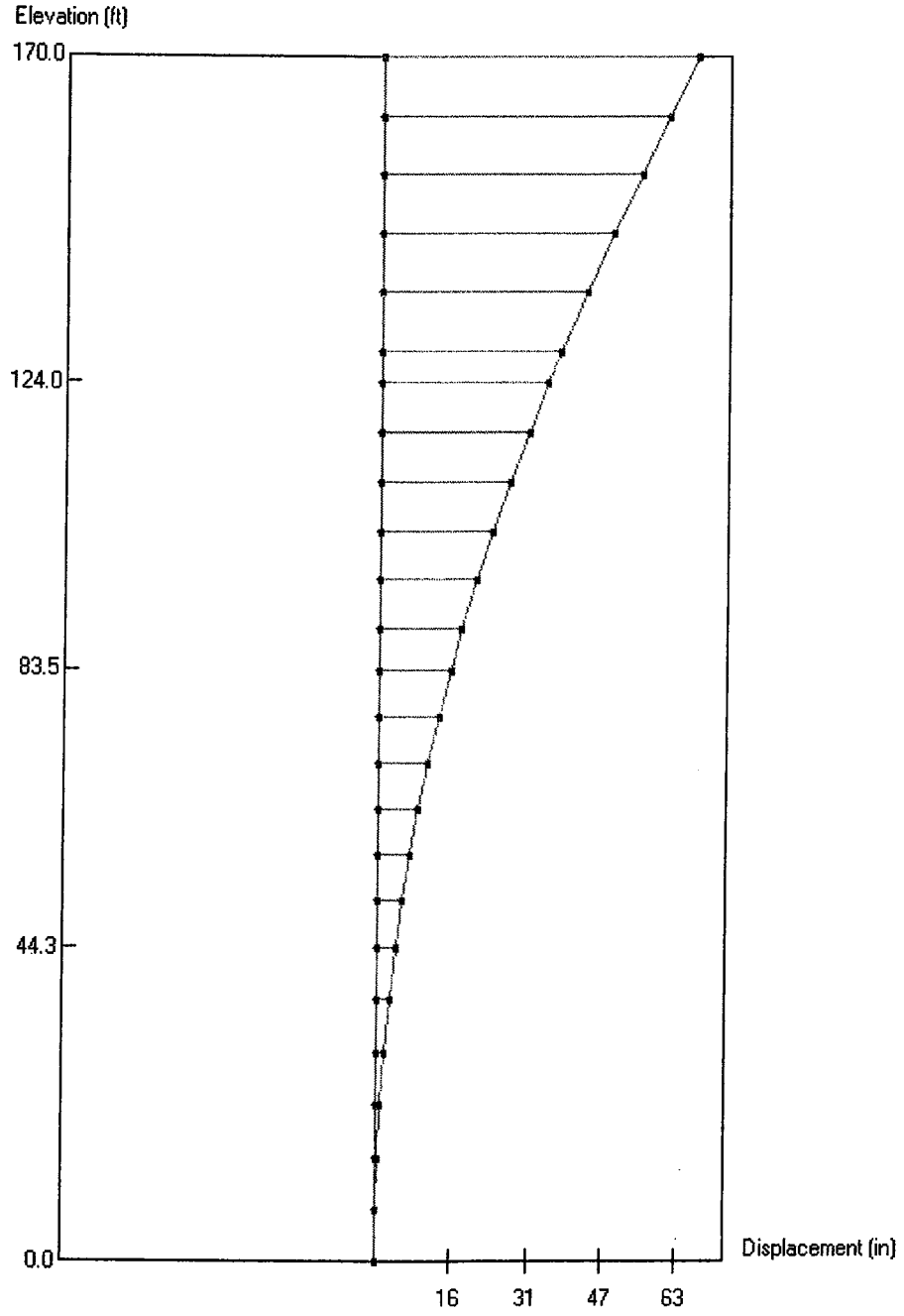
Plate Bottom above Concrete

* Lar = Length from top of concrete to bottom of anchor rod leveling nut.



File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

Horizontal Displacement Diagram
Max. Envelope (All Loading Cases)



File: C:\Program Files\TSTower\TSTOWER Input\CT-5031_021010_Verizon.out
Contract: Revision: 1
Project: Structural Analysis for 170' Monopole Site: CT-5031 (Mansfield Center 2)
Date and Time: 2/10/2010 2:01:14 PM Engineer: Mike De Boer

Bending Moment Diagram
Max. Envelope (All Loading Cases)