

# **STRUCTURAL ANALYSIS REPORT**

Prepared for ABC Tower and Tower Maintenance, Inc.

300' Guyed Antenna Tower  
N 37° 51.92' W 87° 32.15'  
Henderson, Henderson County, Kentucky

Report Date: 12 July, 2004



Prepared By:  
Hodge Design Associates, P.C.  
22 Chestnut Street  
Evansville, Indiana 47713-1022  
812.422.2558 812.422.3337 (FAX)  
[www.hodgedesign.com](http://www.hodgedesign.com)  
Project No. 04G-9999



12 July, 2004

Mr. John Smith  
ABC TOWER AND TOWER MAINTENANCE, INC.  
123 Main Street  
St, Louis, Missouri 99999

Re: Structural Analysis Report  
300' Guyed Antenna Tower  
Henderson, Henderson County, Kentucky  
HDA Project No. 04G-9999

Dear Mr. Smith,

Per your request, we have performed a structural analysis for the referenced antenna tower. The purpose of the analysis was to investigate the structural adequacy of the tower for the existing configuration (antennas, transmission lines and other appurtenances) under ice and wind loading conditions with the addition of two, 8' diameter high performance dish antennas with transmission lines at 200' AGL.

Our structural analysis of the antenna tower is based on data provided by ABC Tower and Tower Maintenance, Inc. and manufacturers' product data (please see Appendix A). We assume that the data is correct. Structural analysis computations were performed utilizing specialized computer software and the TIA-EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures. Please see Appendices B, C and D for structural calculations.

Our structural analysis of the antenna tower indicates that the antenna tower *is in conformance with the referenced design standard for the proposed configuration*. The antenna tower structural analysis may be summarized as follows:

HODGE DESIGN ASSOCIATES, P.C.

22 Chestnut Street • Evansville, Indiana 47713-1022 • tel: 812.422.2558 • fax: 812.422.3337 • www.hodgedesign.com

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 Mr. John Smith  
 ABC TOWER AND TOWER MAINTENANCE, INC.  
 123 Main Street  
 St, Louis, Missouri 99999  
 Re: Structural Analysis Report  
       300' Guyed Antenna Tower  
       Henderson, Henderson County, Kentucky  
       HDA Project No. 04G-9999

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Tower Owner: Tower Leasing Corporation of America, LLC  
 Tower Location: Henderson, Henderson County, Kentucky  
 Tower Height: 300'  
 Face Width: 36"  
 Panel Height: 40"  
 Tower Manufacturer: ABC Tower  
 Type: Self-Supporting  
 Number of Legs: 3  
 Design Standard: TIA/EIA-222-F  
 Loading: 70 mph wind, no ice  
           61 mph wind, 1/2" ice  
 Antenna Loading: See Appendices A and B  
 Materials: Legs: 50 ksi  
             Diagonals: 36 ksi  
             Horizontals: 36 ksi  
             Guys: EHS  
             Bolts: ASTM A325

<b>APPURTENANCE LIST</b>		
<i>Elevation (AGL)</i>	<i>Appurtenances</i>	<i>Transmission Lines</i>
<i>EXISTING</i>		
300'	FAA Beacon	2' Rigid Conduit
300'	6' Lightning Rod	
295'	(12) DB858 w/12' T Frames (3 Sections)	(12) 1 5/8
280'	(12) DB858 w/12' T Frames (3 Sections)	(12) 1 5/8
260'	(12) DB858 w/12' T Frames (3 Sections)	(12) 1 5/8
200'	Dual Obstruction Lights	
100'	Dual Obstruction Lights	
<i>PROPOSED</i>		
200'	(2) UHX8-59	(2) EW 63
<i>Please review the above appurtenance loading and contact us immediately if any discrepancies are noted. This listing represents our understanding of the appurtenance loading required.</i>		



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*foundation reactions exceed the design reactions. We recommend that the foundation be further investigated based on geotechnical information applicable for this site and the existing foundation configurations.*

This analysis report has been prepared without a site visit by Hodge Design Associates, P.C. personnel. All sections, connections hardware, anchor material, etc. have been assumed to be in good working order. Data provided by others is assumed to be correct. The opinions, conclusions and recommendations contained in this report pertain only to the computer analysis of the tower structure and the load carrying capacity of its members. It is the responsibility of the tower owner, property manager or other responsible party to ensure that the tower is in good working order and that the data provided by others is accurate and correct. The structural analysis does not consider the fabrication quality, including welded and bolted connections, except as specifically addressed in this report. If the structure has been altered or is different from the tower depicted herein, Hodge Design Associates, P.C. should be informed immediately. Hodge Design Associates, P.C. makes no warranties, expressed or implied in connection with this report and disclaims any liability arising from the original design, material, fabrication and erection deficiencies for this tower. The maximum liability of Hodge Design Associates, P.C. pursuant to this report shall be limited to the total fee received for the preparation of this report.

If you have any questions regarding this matter, please do not hesitate to contact me.

Sincerely,

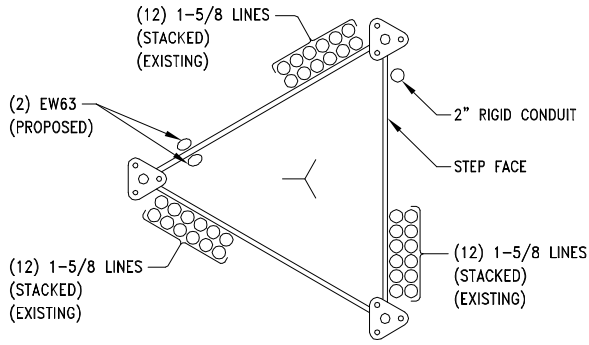
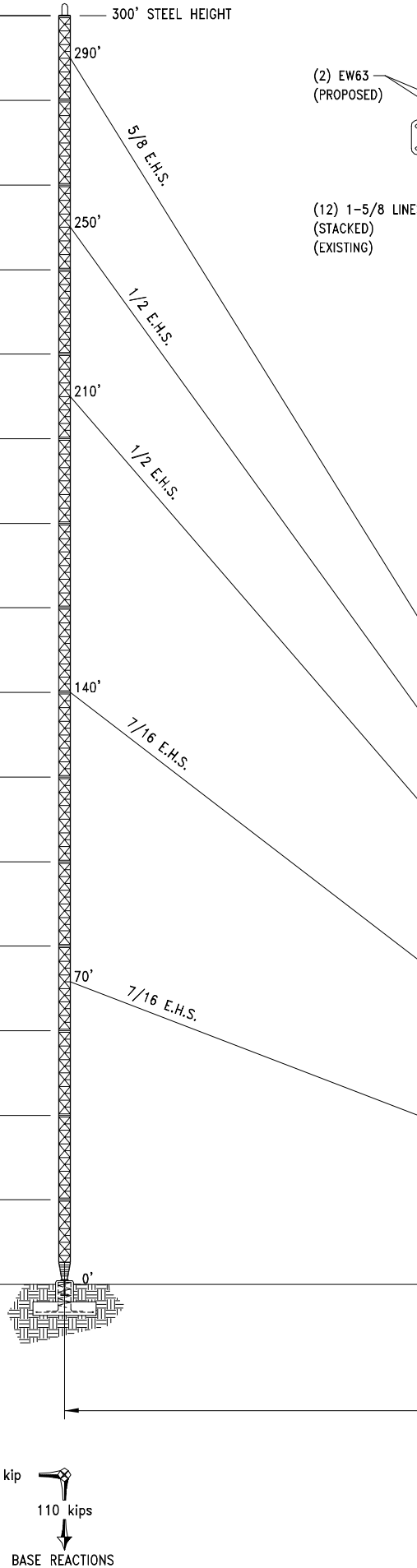
W. Gray Hodge, P.E., S.E.  
HODGE DESIGN ASSOCIATES, P.C.  
Consulting Engineers

**APPENDIX A**

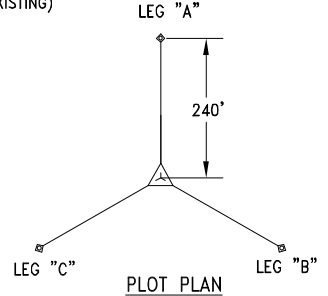
Data Supplied By Others  
Manufacturers' Data

DETAILED INFORMATION CHART

CONFIGURATION	1															2			3		
LEGS	SR 1 3/4"															SR 2"			SR 1 3/4"		
DIAGONALS	SR 5/8"															SR 5/8"			SR 3/4"		
GIRTS	SR 5/8"															SR 5/8"			SR 5/8"		
SECTION WEIGHT	700 lbs.															900 lbs.			800 lbs.		
SECTION #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15						



FEEDLINE DISTRIBUTION



ANTENNA INFORMATION

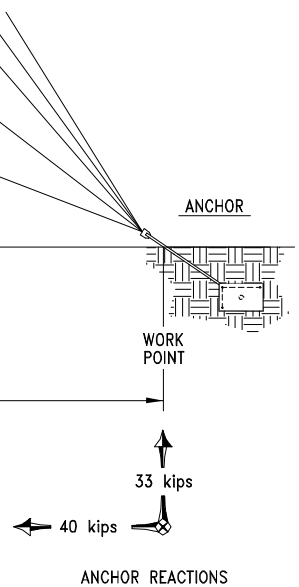
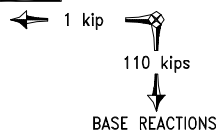
ANTENNA TYPE	ELEVATION	LINE
(12) DB858DDH65 * (EXISTING)	⊙ 295'	(12) 1-5/8
(12) DB858DDH65 * (EXISTING)	⊙ 280'	(12) 1-5/8
(12) DB858DDH65 * (EXISTING)	⊙ 260'	(12) 1-5/8
(2) 8' HP DISHES (PROPOSED)	⊙ 200'	(2) EW63

\* = (3) 12' T-SECTOR MOUNTS AT EACH LEVEL

THIS STRUCTURE IS DESIGNED TO MEET ANSI/EIA-222-F STANDARDS AND FOR A BASIC WIND SPEED OF 70 MPH WITH 1/2" ICE.

GUY & MEMBER CHART NOTES:

- 1) ALL MATERIAL IS MADE OF SOLID ROUND UNLESS NOTED OTHERWISE.
- 2) ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
- 3) ALL LEG & LEG FLANGE PL MATERIAL IS ASTM A-572 GRADE 50 (Fy ≥ 50 ksi). ALL OTHER MATERIAL IS ASTM A36 (Fy ≥ 36 ksi).
- 4) ALL STANDARD SECTIONS ARE 6-BAY X-BRACED (38-1/2" BAYS).
- 5) DIAGONALS ABOVE AND BELOW ALL GUY EARS ARE TO BE 1/8" LARGER IN DIAMETER THAN DIAGONALS LISTED IN CHART.
- 6) HORIZONTALS AT GUYEAR ELEVATIONS ARE TO BE LARGER IN DIAMETER THAN TYPICAL HORIZONTALS IN EACH GUYED SECTION.

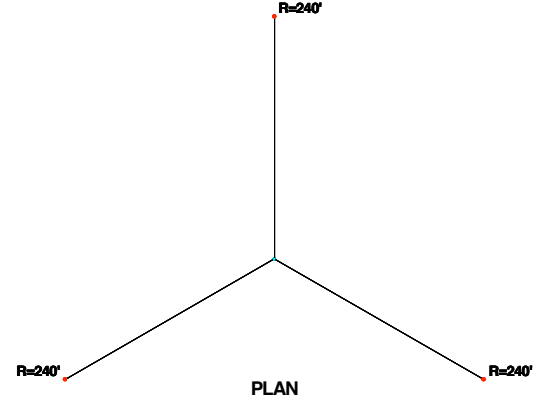
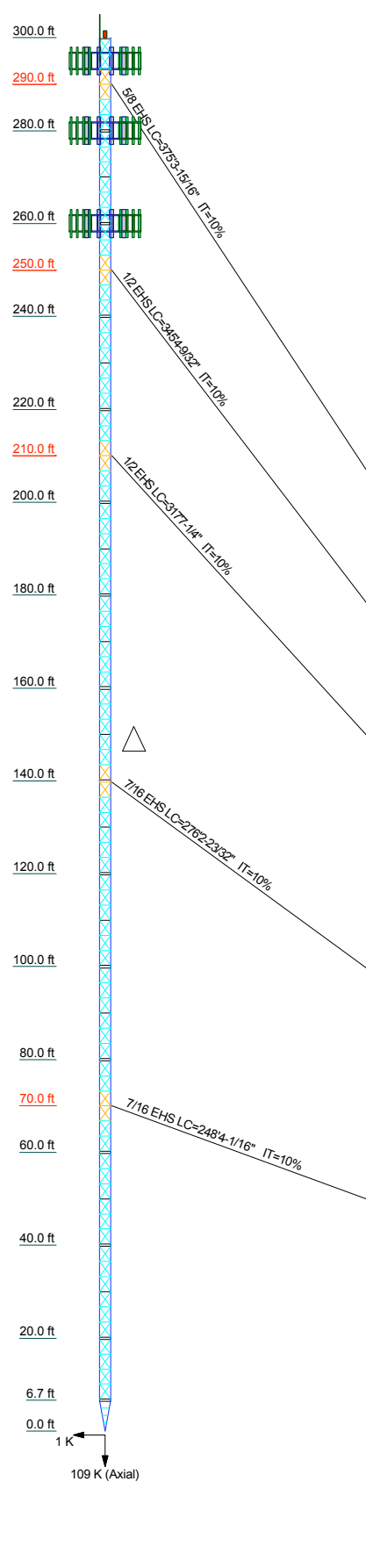


**APPENDIX B**  
Existing Antenna Tower

Graphical Computer Output  
Structural Analysis Report and Calculations



Section	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4	SR 1 3/4
Leg Grade	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Diagonals	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Diagonal Grade	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Top Girts	A	N.A.	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	SR 5/8	N.A.
Mid Girts	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Bottom Girts	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Horizontals	A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Top Guy Pull-Offs	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Guy Hi-Diagonals	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Guy Low-Diagonals	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Face Width (ft)	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833	B 4 @ 3.20833
# Panels @ (ft)	12.4	0.6	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8
Weight (K)																



**APPURTENANCES**

TYPE	ELEVATION	TYPE	ELEVATION
Lighting - Beacon	300	(4) DB858DDH65E-SX	280
Lighting Rod 6"	300	12' T-Frame Sector Mount	280
(4) DB858DDH65E-SX	295	(4) DB858DDH65E-SX	260
12' T-Frame Sector Mount	295	12' T-Frame Sector Mount	260
(4) DB858DDH65E-SX	295	(4) DB858DDH65E-SX	260
12' T-Frame Sector Mount	295	12' T-Frame Sector Mount	260
(4) DB858DDH65E-SX	295	(4) DB858DDH65E-SX	260
12' T-Frame Sector Mount	295	12' T-Frame Sector Mount	260
(4) DB858DDH65E-SX	280	Lighting - Dual Obstruction	200
12' T-Frame Sector Mount	280	Lighting - Dual Obstruction	100
(4) DB858DDH65E-SX	280	See E-7 for Feedlines and Linear Appurtenances	0
12' T-Frame Sector Mount	280		

**SYMBOL LIST**

MARK	SIZE	MARK	SIZE
A	C12x20.7	B	4 @ 1.54167

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

**TOWER DESIGN NOTES**

1. Tower is located in Henderson County, Kentucky.
2. Tower designed for a 70 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 61 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. See Sheet E-7 for Feedlines and Linear Appurtenances.
6. See Sheet E-8 for Code Check/Stress Distribution.
7. TOWER RATING: 87.7%

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 FAX: 812.422.3337

**Job: Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)**  
 Project: Henderson, Henderson County, KY --- Existing Tower Condition Analysis  
 Client: ABC Towers and Tower Maintenance  
 Code: TIA/EIA-222-F  
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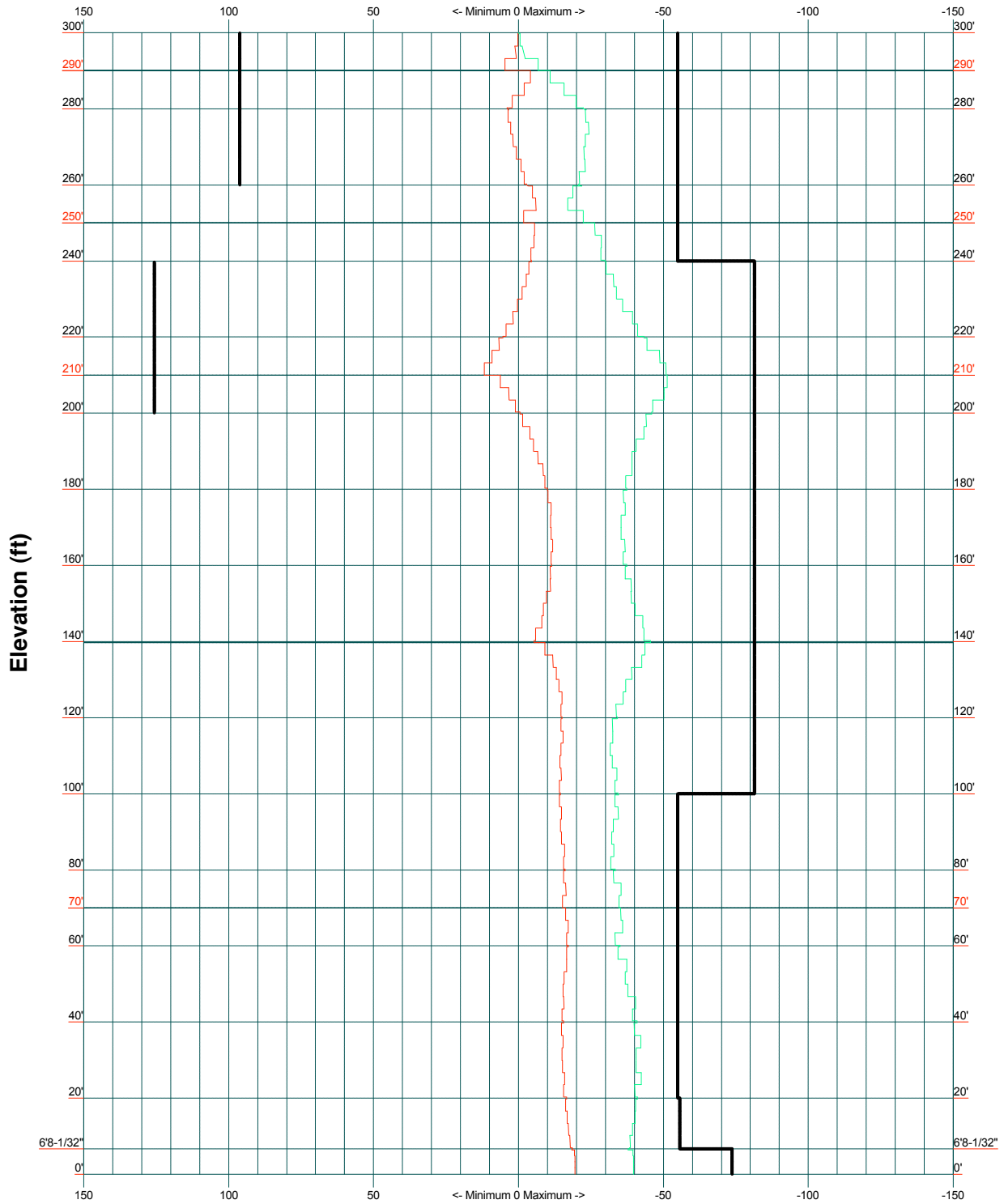
Drawn by: Gray Hodge  
 Date: 07/23/04  
 Dwg No. E-1

App'd:  
 Scale: NTS

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TIA/EIA-222-F - 70 mph/61 mph 0.5000 in Ice

Leg Capacity ——— Leg Compression (K)

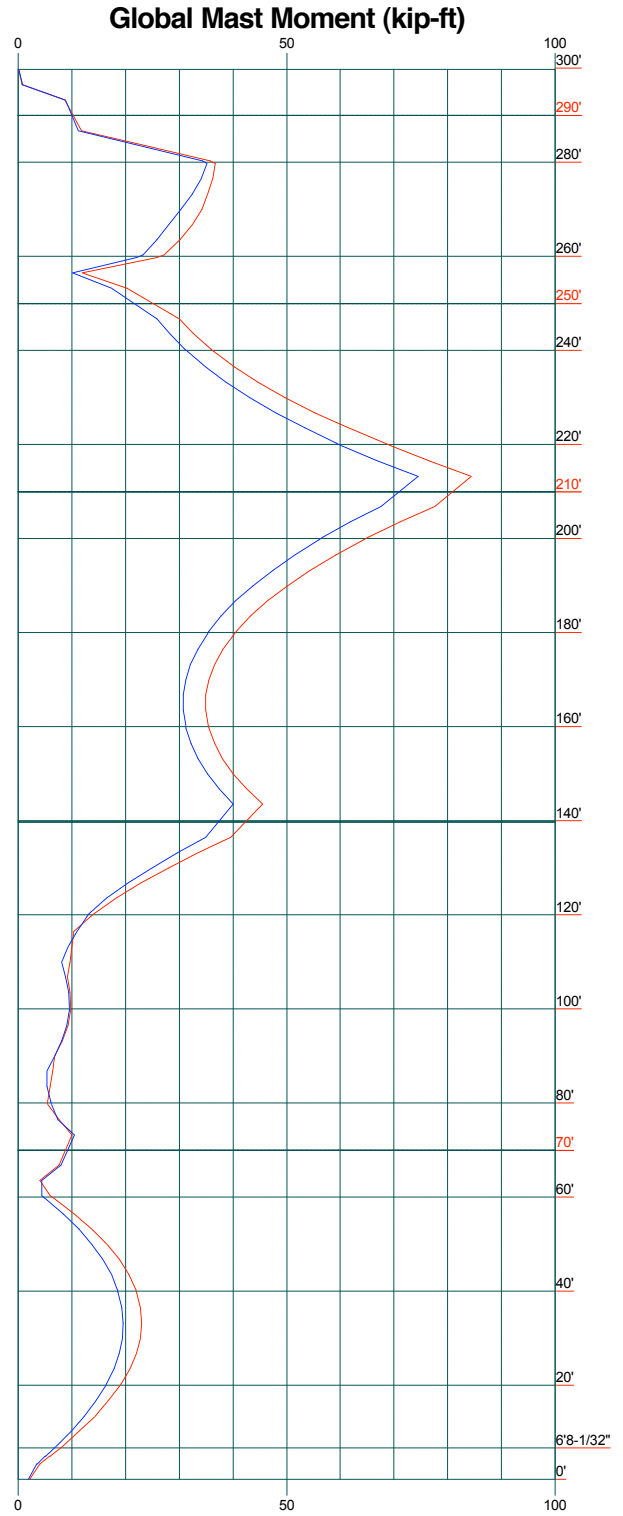
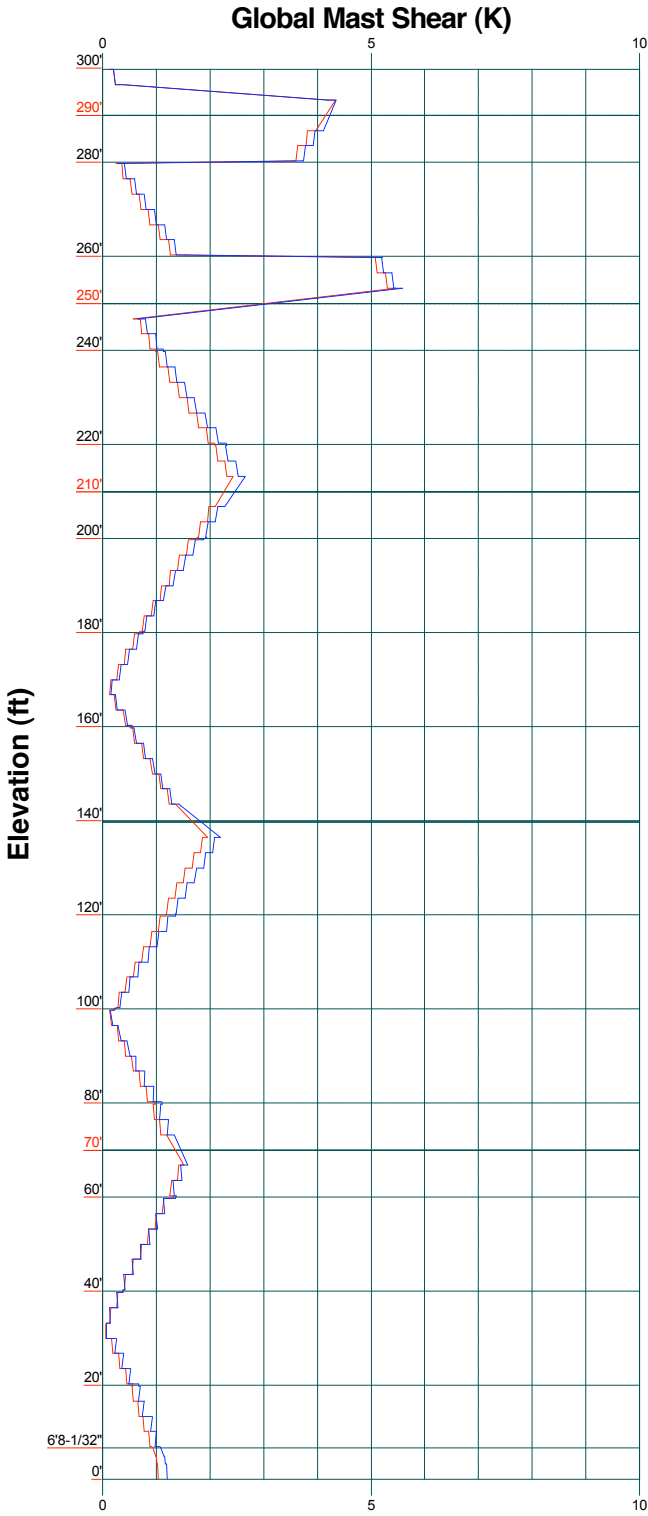


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<b>Project: Henderson, Henderson County, KY --- Existing Tower Condition Analysis</b>	
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge
Code: TIA/EIA-222-F	Date: 07/23/04
Path:	Scale: NTS
	Dwg No. E-3

Vx Vz

Mx Mz

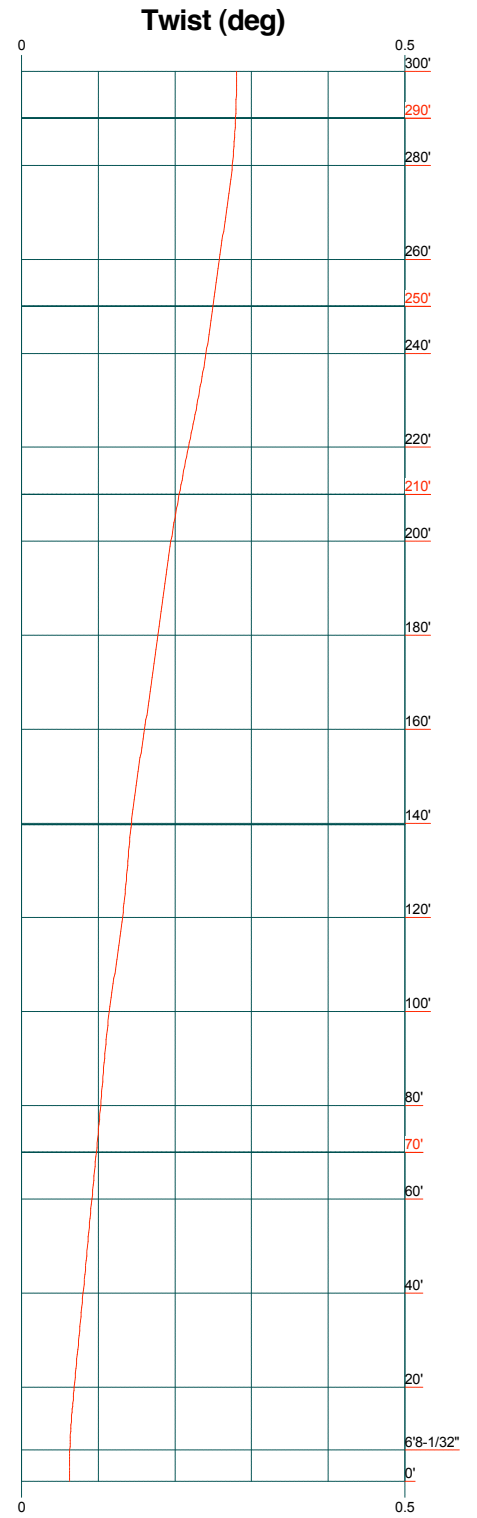
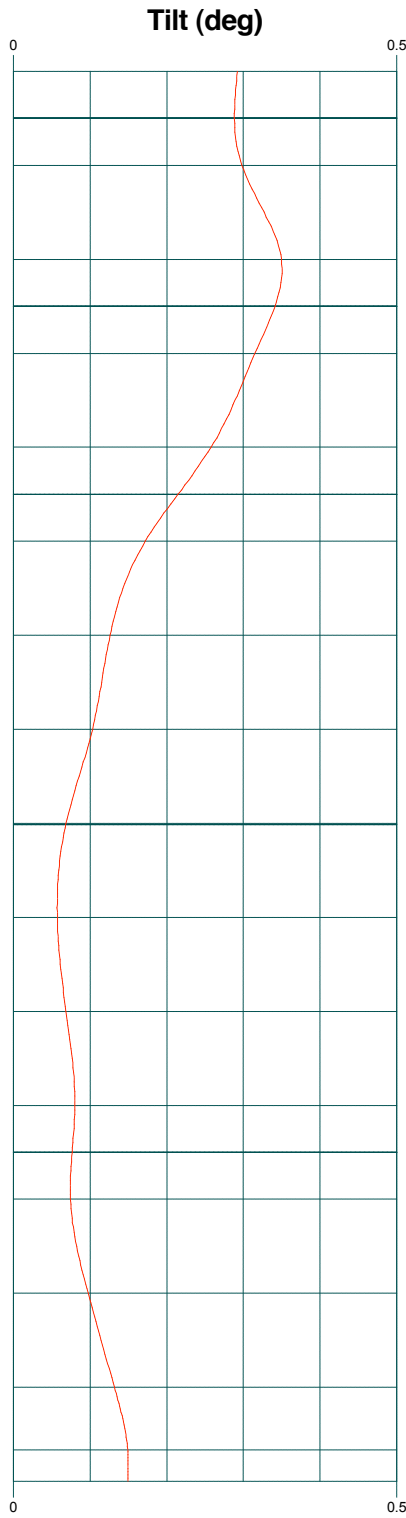
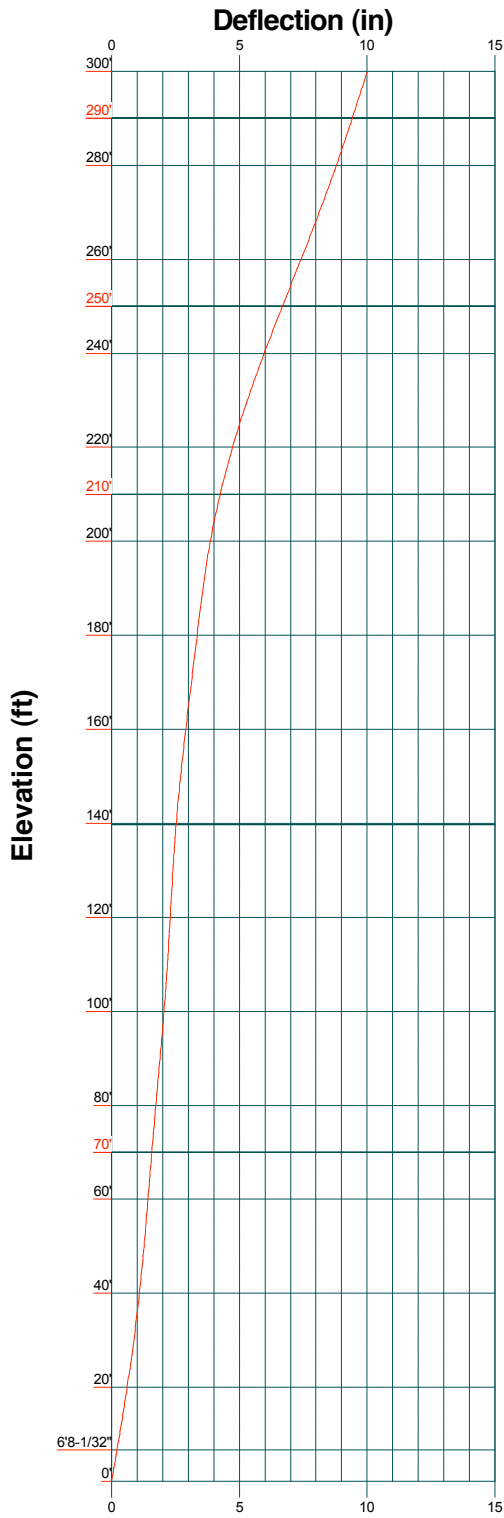



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Project: Henderson, Henderson County, KY -- Existing Tower Condition Analysis			
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS	
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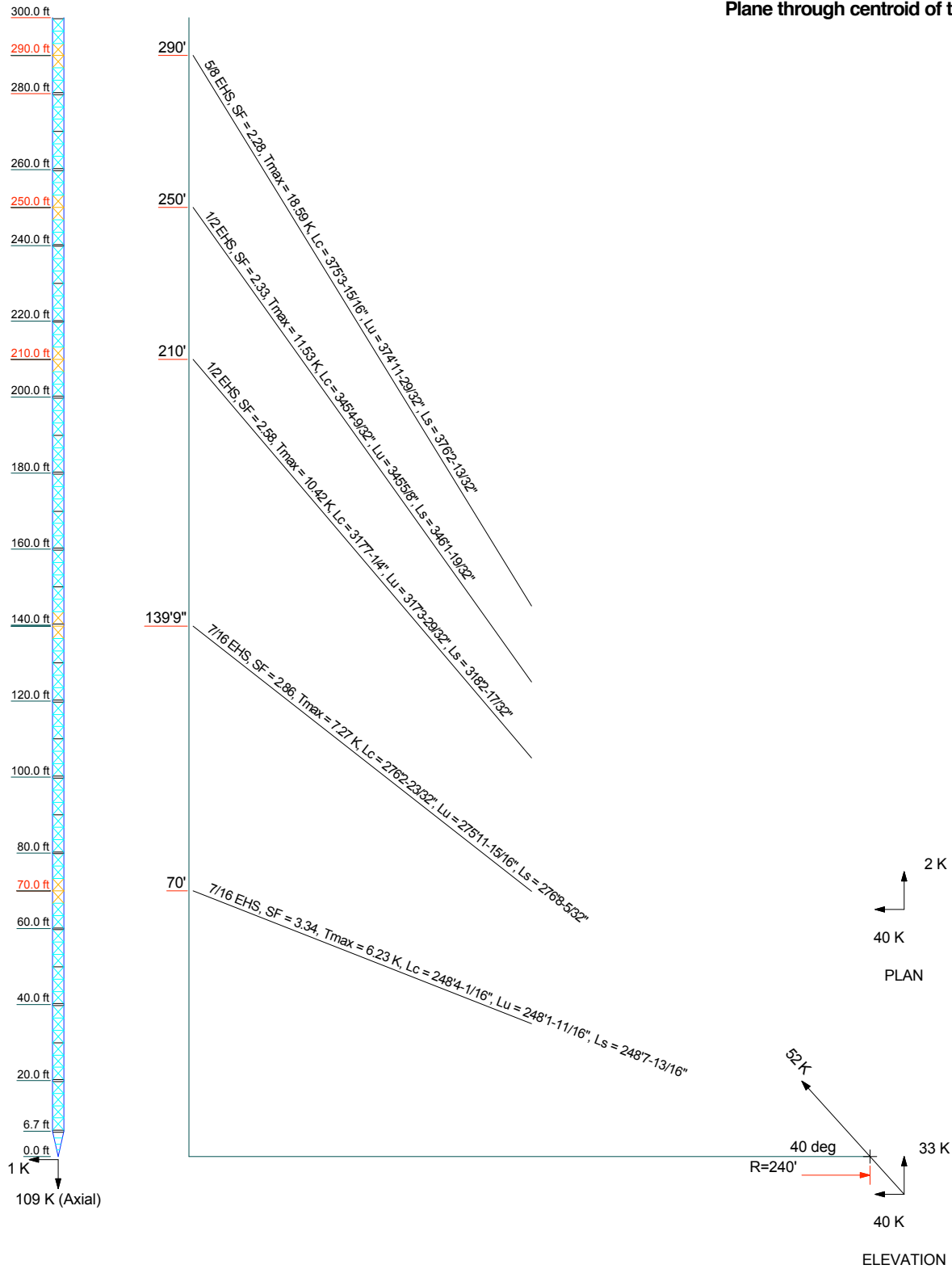



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	Job:		
	Project:		
	Client:		

# Guy Tensions and Tower Reactions

## TIA/EIA-222-F - 70 mph/61 mph 0.5000 in Ice

Maximum Values  
 Anchor 'A' @ 240 ft Azimuth 0 deg Elev 0 ft  
 Plane through centroid of tower

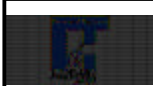
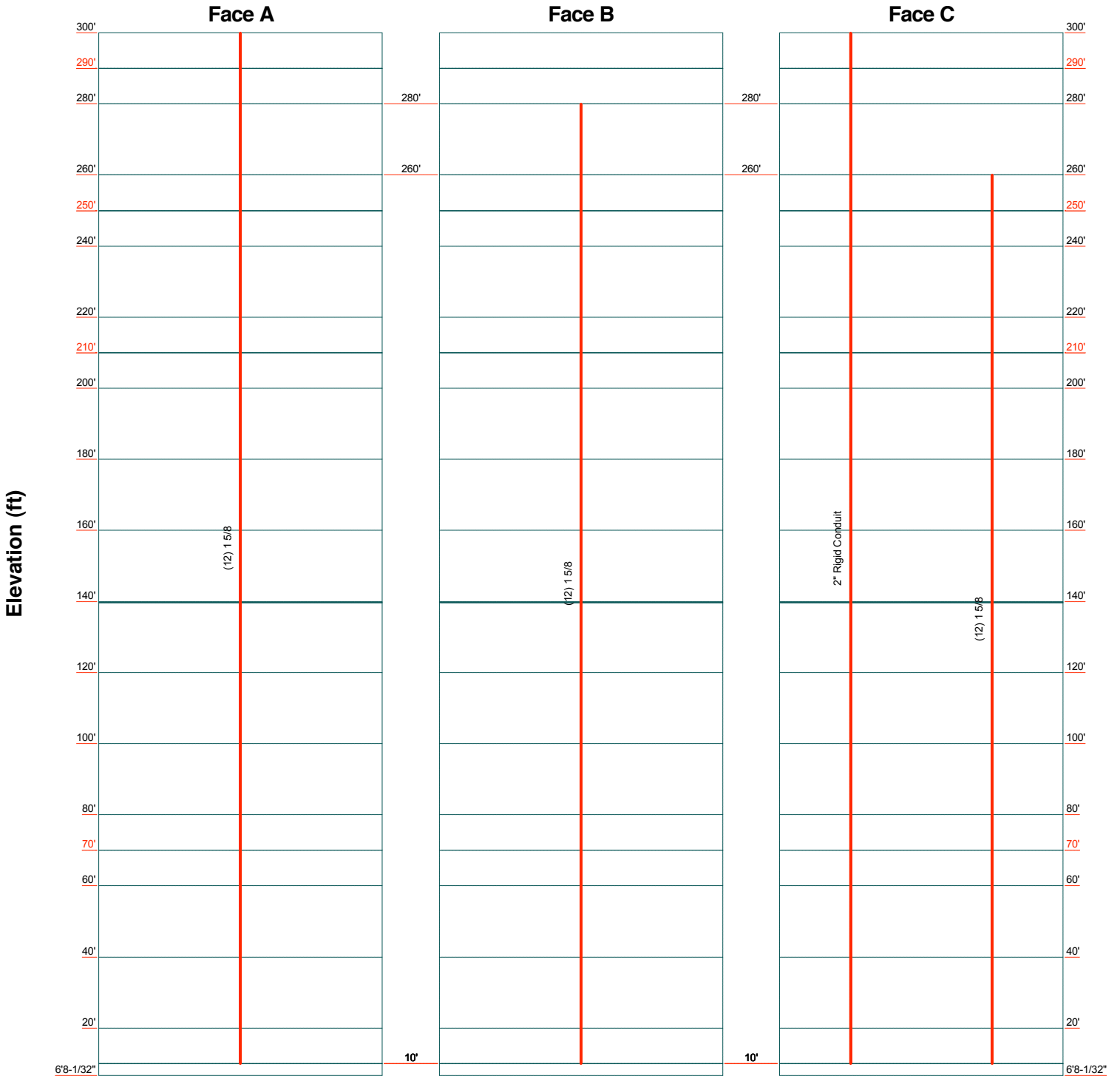


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	Scale: NTS		
	Dwg No. E-6		
	App'd:		

# Feedline Distribution Chart

## 6'8-1/32" - 300'

— Round   
 — Flat   
 — App In Face   
 — App Out Face   
 — Truss Leg



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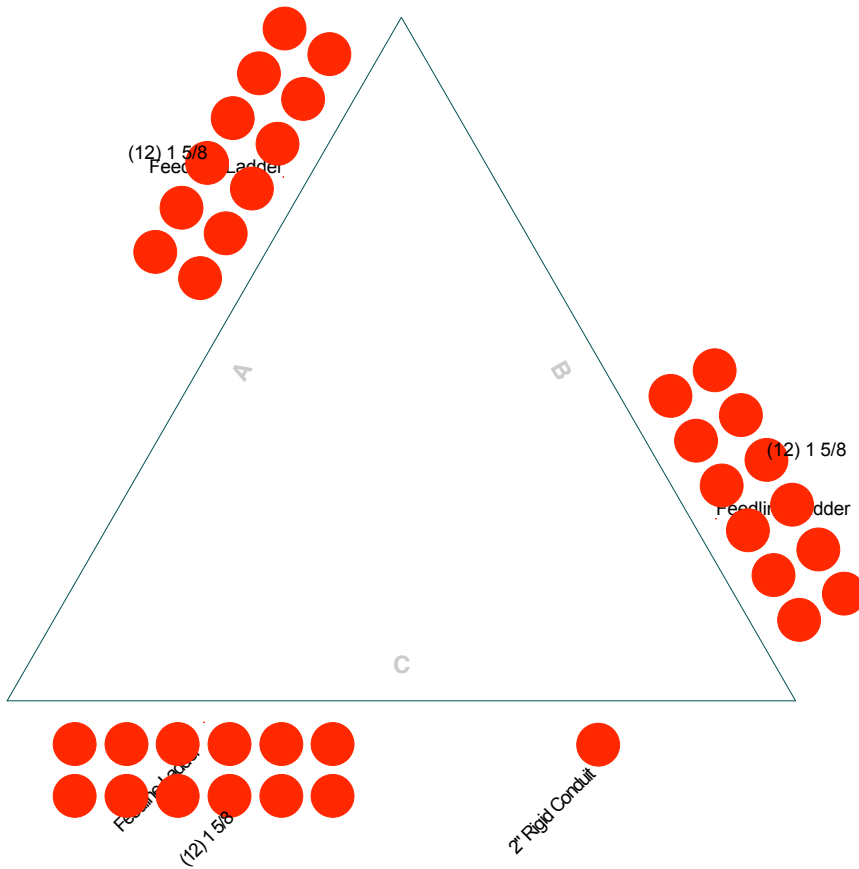
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<b>Job:</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	
<b>Project:</b> Henderson, Henderson County, KY --- Existing Tower Condition Analysis	
<b>Client:</b> ABC Towers and Tower Maintenance	<b>Drawn by:</b> Gray Hodge
<b>Code:</b> TIA/EIA-222-F	<b>Date:</b> 07/23/04
<b>Path:</b>	<b>Scale:</b> NTS
	<b>Dwg No.:</b> E-7

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# Feedline Plan

— Round   
 — Flat   
 — App In Face   
 — App Out Face



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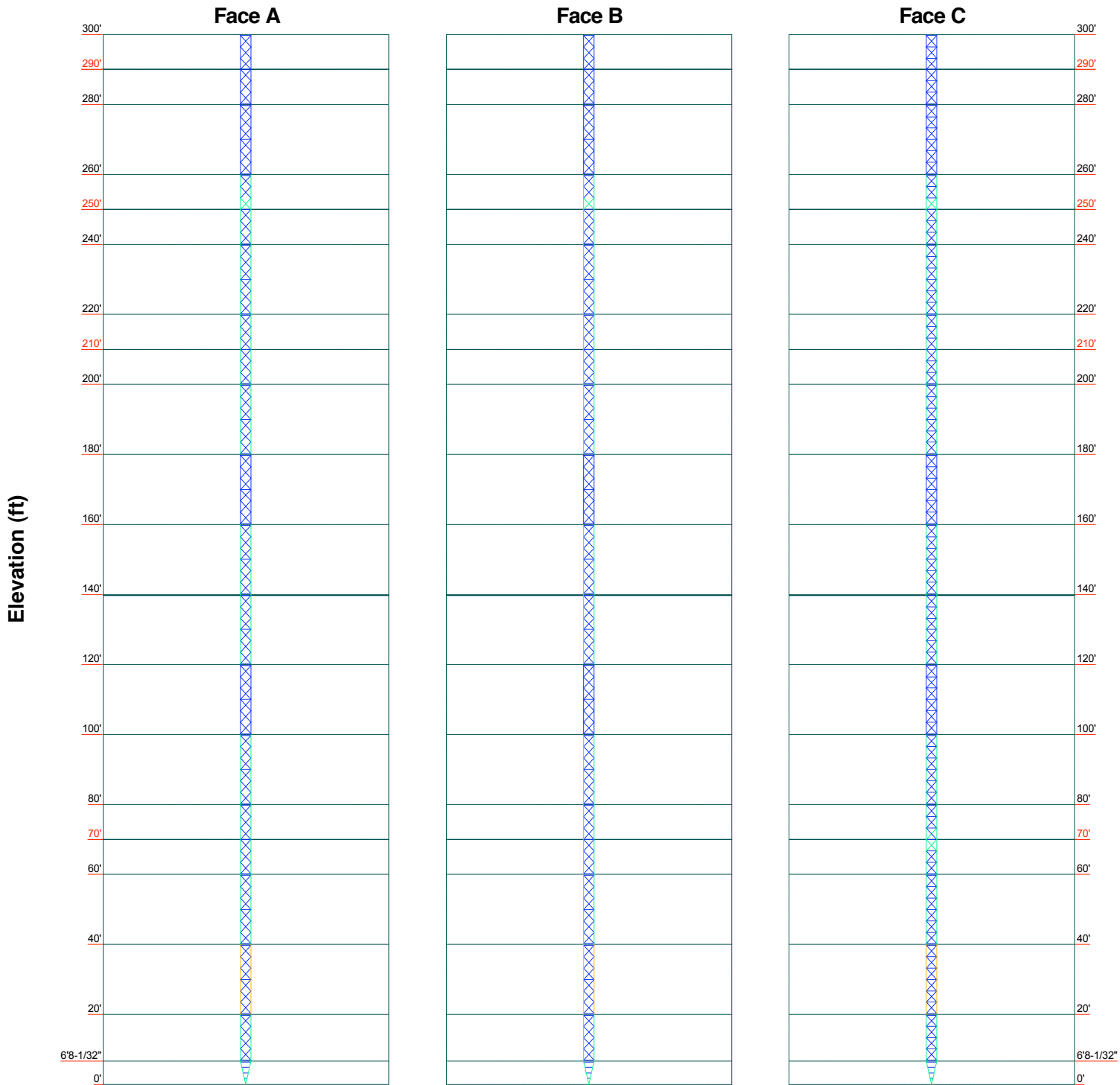
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Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS	
Path:		Dwg No. E-7	

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# Stress Distribution Chart 0' - 300'

■ > 100%  
 ■ 90%-100%  
 ■ 75%-90%  
 ■ 50%-75%  
 ■ < 50% Overstress



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Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
Path:		Dwg No. E-8

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<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 1 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b> 12:34:18 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

## Tower Input Data

The main tower is a 3x guyed tower with an overall height of 300' above the ground line.

The base of the tower is set at an elevation of 0' above the ground line.

The face width of the tower is 3' at the top and tapered at the base.

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

The following design criteria apply:

Tower is located in Henderson County, Kentucky.

Basic wind speed of 70 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 61 mph is used in combination with ice.

Temperature drop of 75 °F.

Deflections calculated using a wind speed of 50 mph.

See Sheet E-7 for Feedlines and Linear Appurtenances..

See Sheet E-8 for Code Check/Stress Distribution..

Pressures are calculated at each section.

Safety factor used in guy design is 2.

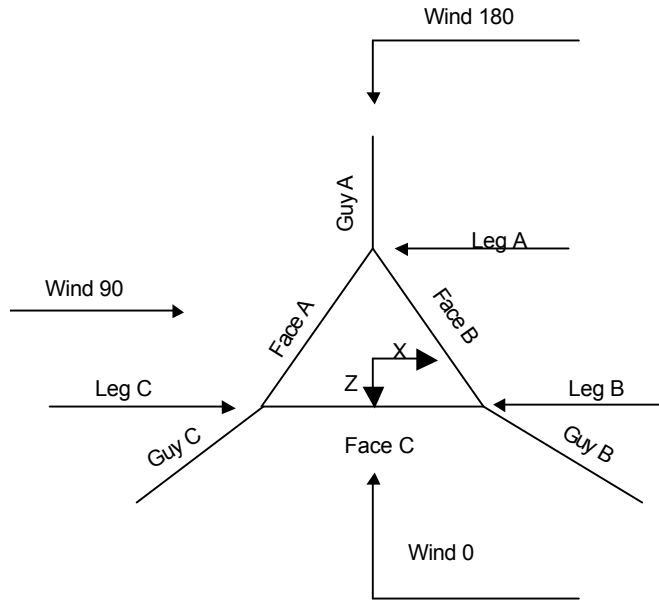
Stress ratio used in tower member design is 1.333.

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

## Options

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>v Use Code Stress Ratios</li> <li>v Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>v Include Bolts In Member Capacity</li> <li>v Leg Bolts Are At Top Of Section</li> <li>v Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>Add IBC .6D+W Combination</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>v Assume Rigid Index Plate</li> <li>v Use Clear Spans For Wind Area</li> <li>v Use Clear Spans For KL/r</li> <li>v Retension Guys To Initial Tension</li> <li>Bypass Mast Stability Checks</li> <li>v Use Azimuth Dish Coefficients</li> <li>v Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>v SR Members Have Cut Ends</li> <li>v Sort Capacity Reports By Component</li> <li>v Triangulate Diamond Inner Bracing</li> </ul> | <ul style="list-style-type: none"> <li>v Treat Feedline Bundles As Cylinder</li> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>v Calculate Redundant Bracing Forces</li> <li>v Ignore Redundant Members in FEA</li> <li>v SR Leg Bolts Resist Compression</li> <li>v All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>v Consider Feedline Torque</li> <li>v Include Angle Block Shear Check</li> <li style="text-align: center;">Poles</li> <li>v Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul> |
|--|--|---|

<p><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 2 of 34</p>
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**Corner & Starmount Guyed Tower**

**Tower Section Geometry**

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	300'-280'			3'	1	20'
T2	280'-260'			3'	1	20'
T3	260'-240'			3'	1	20'
T4	240'-220'			3'	1	20'
T5	220'-200'			3'	1	20'
T6	200'-180'			3'	1	20'
T7	180'-160'			3'	1	20'
T8	160'-140'			3'	1	20'
T9	140'-120'			3'	1	20'
T10	120'-100'			3'	1	20'
T11	100'-80'			3'	1	20'
T12	80'-60'			3'	1	20'
T13	60'-40'			3'	1	20'
T14	40'-20'			3'	1	20'
T15	20'-6'8-1/32"			3'	1	13'3-31/32"
T16	6'8-1/32"-0'			3'	1	6'8-1/32"

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 3 of 34</p>
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	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

### Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	300'-280'	3'3"	X Brace	No	Steps	3.0000	3.0000
T2	280'-260'	3'3"	X Brace	No	Steps	3.0000	3.0000
T3	260'-240'	3'3"	X Brace	No	Steps	3.0000	3.0000
T4	240'-220'	3'3"	X Brace	No	Steps	3.0000	3.0000
T5	220'-200'	3'3"	X Brace	No	Steps	3.0000	3.0000
T6	200'-180'	3'3"	X Brace	No	Steps	3.0000	3.0000
T7	180'-160'	3'3"	X Brace	No	Steps	3.0000	3.0000
T8	160'-140'	3'3"	X Brace	No	Steps	3.0000	3.0000
T9	140'-120'	3'3"	X Brace	No	Steps	3.0000	3.0000
T10	120'-100'	3'3"	X Brace	No	Steps	3.0000	3.0000
T11	100'-80'	3'3"	X Brace	No	Steps	3.0000	3.0000
T12	80'-60'	3'3"	X Brace	No	Steps	3.0000	3.0000
T13	60'-40'	3'3"	X Brace	No	Steps	3.0000	3.0000
T14	40'-20'	3'3"	X Brace	No	Steps	3.0000	3.0000
T15	20'-6'-8-1/32"	3'-2-17/32"	X Brace	No	Steps	3.0000	3.0000
T16	6'-8-1/32"-0'	1'-6-15/32"	X Brace	No	Yes	3.0000	3.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 300'-280'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 280'-260'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T3 260'-240'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T4 240'-220'	Solid Round	2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 220'-200'	Solid Round	2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 200'-180'	Solid Round	2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 180'-160'	Solid Round	2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 160'-140'	Solid Round	2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 140'-120'	Solid Round	2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 120'-100'	Solid Round	2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T11 100'-80'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T12 80'-60'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T13 60'-40'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T14 40'-20'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T15 20'-6'-8-1/32"	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T16 6'-8-1/32"-0'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 4 of 34
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Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(50 ksi)			(36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 300'-280'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 280'-260'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 260'-240'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 240'-220'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 220'-200'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 200'-180'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 180'-160'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 160'-140'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 140'-120'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 120'-100'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T11 100'-80'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T12 80'-60'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T13 60'-40'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T14 40'-20'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T15 20'-6'8-1/32"	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T16 6'8-1/32"-0'	Channel	C12x20.7	A36 (36 ksi)	Channel		A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 300'-280'	1	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 280'-260'	1	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 260'-240'	1	Solid Round	5/8	A36	Solid Round	5/8	A36

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 5 of 34</p>
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Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T4 240'-220'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T5 220'-200'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T6 200'-180'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T7 180'-160'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T8 160'-140'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T9 140'-120'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T10 120'-100'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T11 100'-80'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T12 80'-60'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T13 60'-40'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T14 40'-20'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T15 20'-6'8-1/32"	None	Solid Round		(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T16 6'8-1/32"-0'	None	Solid Round		(36 ksi) A36	Channel	C12x20.7	(36 ksi) A36

### Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 300'-280'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T2 280'-260'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T3 260'-240'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T4 240'-220'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T5 220'-200'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T6 200'-180'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T7 180'-160'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T8 160'-140'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T9 140'-120'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T10 120'-100'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 6 of 34
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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
ft	ft <sup>2</sup>	in						
T11 100'-80'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T12 80'-60'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T13 60'-40'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T14 40'-20'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T15 20'-6'8-1/32"	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T16 6'8-1/32"-0'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors <sup>1</sup>							
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
											X Y
T1 300'-280'	No	Yes	1	1	1	1	1	1	1	1	1
T2 280'-260'	No	Yes	1	1	1	1	1	1	1	1	1
T3 260'-240'	No	Yes	1	1	1	1	1	1	1	1	1
T4 240'-220'	No	Yes	1	1	1	1	1	1	1	1	1
T5 220'-200'	No	Yes	1	1	1	1	1	1	1	1	1
T6 200'-180'	No	Yes	1	1	1	1	1	1	1	1	1
T7 180'-160'	No	Yes	1	1	1	1	1	1	1	1	1
T8 160'-140'	No	Yes	1	1	1	1	1	1	1	1	1
T9 140'-120'	No	Yes	1	1	1	1	1	1	1	1	1
T10 120'-100'	No	Yes	1	1	1	1	1	1	1	1	1
T11 100'-80'	No	Yes	1	1	1	1	1	1	1	1	1
T12 80'-60'	No	Yes	1	1	1	1	1	1	1	1	1
T13 60'-40'	No	Yes	1	1	1	1	1	1	1	1	1
T14 40'-20'	No	Yes	1	1	1	1	1	1	1	1	1
T15 20'-6'8-1/32"	No	Yes	1	1	1	1	1	1	1	1	1
T16 6'8-1/32"-0'	No	No	1	1	1	1	1	1	1	1	1

<sup>1</sup>Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>7 of 34</p>
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	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

**Tower Section Geometry (cont'd)**

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 300'-280'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 280'-260'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 260'-240'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 240'-220'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 220'-200'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 200'-180'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 180'-160'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 160'-140'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 140'-120'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 120'-100'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 100'-80'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 80'-60'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 60'-40'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40'-20'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 20'-6'8-1/32"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 6'8-1/32"-0'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

**Guy Data**

Guy Elevation ft	Guy Grade	Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L <sub>u</sub> ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %	
290	EHS	A	5/8	4.24	10%	21000	0.813	375'3/8"	240'	0.0000	0'	100%
		B	5/8	4.24	10%	21000	0.813	375'3/8"	240'	0.0000	0'	100%
		C	5/8	4.24	10%	21000	0.813	375'3/8"	240'	0.0000	0'	100%
250	EHS	A	1/2	2.69	10%	21000	0.517	345'31/32"	240'	0.0000	0'	100%
		B	1/2	2.69	10%	21000	0.517	345'31/32"	240'	0.0000	0'	100%
		C	1/2	2.69	10%	21000	0.517	345'31/32"	240'	0.0000	0'	100%
210	EHS	A	1/2	2.69	10%	21000	0.517	317'4-3/16"	240'	0.0000	0'	100%
		B	1/2	2.69	10%	21000	0.517	317'4-3/16"	240'	0.0000	0'	100%
		C	1/2	2.69	10%	21000	0.517	317'4-3/16"	240'	0.0000	0'	100%
139.75	EHS	A	7/16	2.08	10%	21000	0.399	276'1/8"	240'	0.0000	0'	100%
		B	7/16	2.08	10%	21000	0.399	276'1/8"	240'	0.0000	0'	100%
		C	7/16	2.08	10%	21000	0.399	276'1/8"	240'	0.0000	0'	100%
70	EHS	A	7/16	2.08	10%	21000	0.399	248'1-11/16"	240'	0.0000	0'	100%
		B	7/16	2.08	10%	21000	0.399	248'1-11/16"	240'	0.0000	0'	100%
		C	7/16	2.08	10%	21000	0.399	248'1-11/16"	240'	0.0000	0'	100%

**Guy Data (cont'd)**





<b><i>ERITower</i></b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 9 of 34
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	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm		Pull Off		Diagonal	
			K <sub>x</sub>	K <sub>y</sub>	K <sub>x</sub>	K <sub>y</sub>	K <sub>x</sub>	K <sub>y</sub>
290	No	No			1	1	1	1
250	No	No			1	1	1	1
210	No	No			1	1	1	1
139.75	No	No			1	1	1	1
70	No	No			1	1	1	1

### Guy Data (cont'd)

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
290	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
250	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
210	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
139.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
70	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

### Guy Pressures

Guy Elevation ft	Guy Location	z ft	q <sub>z</sub> psf	q <sub>z</sub> Ice psf	Ice Thickness in
290	A	145'	19	14	0.5000
	B	145'	19	14	0.5000
	C	145'	19	14	0.5000
250	A	125'	18	14	0.5000
	B	125'	18	14	0.5000
	C	125'	18	14	0.5000
210	A	105'	17	13	0.5000
	B	105'	17	13	0.5000
	C	105'	17	13	0.5000
139.75	A	69'10-9/16"	16	12	0.5000
	B	69'10-9/16"	16	12	0.5000
	C	69'10-9/16"	16	12	0.5000
70	A	35'	13	10	0.5000
	B	35'	13	10	0.5000
	C	35'	13	10	0.5000

**Feed Line/Linear Appurtenances - Entered As Round Or Flat**

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>10 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Feedline Ladder	A	Yes	Ar (CfAe)	10' - 10'	1.0000	0.25	1	1	1.5000	0.0000		0.01
Feedline Ladder	B	Yes	Ar (CfAe)	10' - 10'	1.0000	0.25	1	1	1.5000	0.0000		0.01
Feedline Ladder	C	Yes	Ar (CfAe)	10' - 10'	1.0000	0.25	1	1	1.5000	0.0000		0.01
2" Rigid Conduit	C	Yes	Ar (CfAe)	300' - 10'	1.0000	-0.25	1	1	2.0000	2.0000		0.00
1 5/8	A	Yes	Ar (CfAe)	300' - 10'	1.0000	0.25	12	6	0.3750	1.9800		0.00
1 5/8	B	Yes	Ar (CfAe)	280' - 10'	1.0000	0.25	12	6	0.3750	1.9800		0.00
1 5/8	C	Yes	Ar (CfAe)	260' - 10'	1.0000	0.25	12	6	0.3750	1.9800		0.00

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
T1	300'-280'	A	23.314	0.000	0.000	0.000	0.25
		B	0.000	0.000	0.000	0.000	0.00
		C	3.333	0.000	0.000	0.000	0.06
T2	280'-260'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	3.333	0.000	0.000	0.000	0.06
T3	260'-240'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T4	240'-220'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T5	220'-200'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T6	200'-180'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T7	180'-160'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T8	160'-140'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T9	140'-120'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T10	120'-100'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T11	100'-80'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T12	80'-60'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T13	60'-40'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T14	40'-20'	A	23.314	0.000	0.000	0.000	0.25

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>11 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
T15	20'-6"8-1/32"	B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
		A	11.657	0.000	0.000	0.000	0.12
T16	6'8-1/32"-0'	B	11.657	0.000	0.000	0.000	0.12
		C	13.323	0.000	0.000	0.000	0.15
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
T1	300'-280'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		0.000	0.000	0.000	0.000	0.00
		C		5.000	0.000	0.000	0.000	0.09
T2	280'-260'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		5.000	0.000	0.000	0.000	0.09
T3	260'-240'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T4	240'-220'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T5	220'-200'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T6	200'-180'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T7	180'-160'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T8	160'-140'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T9	140'-120'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T10	120'-100'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T11	100'-80'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T12	80'-60'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T13	60'-40'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T14	40'-20'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T15	20'-6"8-1/32"	A	0.500	2.483	10.007	0.000	0.000	0.28
		B		2.483	10.007	0.000	0.000	0.28

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>12 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ $ft^2$	$A_F$ $ft^2$	$C_{AA}$ In Face $ft^2$	$C_{AA}$ Out Face $ft^2$	Weight K
T16	6'8-1/32"-0'	C	0.500	4.983	10.007	0.000	0.000	0.32
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

### Feed Line Shielding

Section	Elevation ft	Face	$A_R$ $ft^2$	$A_R$ Ice $ft^2$	$A_F$ $ft^2$	$A_F$ Ice $ft^2$
T1	300'-280'	A	1.341	3.786	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.261	0.905	0.000	0.000
T2	280'-260'	A	1.249	3.672	0.000	0.000
		B	1.249	3.672	0.000	0.000
		C	0.245	0.882	0.000	0.000
T3	260'-240'	A	1.280	3.710	0.000	0.000
		B	1.280	3.710	0.000	0.000
		C	1.737	5.266	0.000	0.000
T4	240'-220'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T5	220'-200'	A	1.159	3.559	0.000	0.000
		B	1.159	3.559	0.000	0.000
		C	1.595	5.084	0.000	0.000
T6	200'-180'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T7	180'-160'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T8	160'-140'	A	1.097	3.483	0.000	0.000
		B	1.097	3.483	0.000	0.000
		C	1.523	4.993	0.000	0.000
T9	140'-120'	A	1.128	3.522	0.000	0.000
		B	1.128	3.522	0.000	0.000
		C	1.559	5.039	0.000	0.000
T10	120'-100'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T11	100'-80'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T12	80'-60'	A	1.159	3.559	0.000	0.000
		B	1.159	3.559	0.000	0.000
		C	1.595	5.084	0.000	0.000
T13	60'-40'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T14	40'-20'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T15	20'-6'8-1/32"	A	0.530	1.712	0.000	0.000
		B	0.530	1.712	0.000	0.000
		C	0.755	2.511	0.000	0.000
T16	6'8-1/32"-0'	A	0.000	0.000	0.000	0.000

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 13 of 34
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	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Section	Elevation	Face	$A_R$	$A_{R\ Ice}$	$A_F$	$A_{F\ Ice}$
	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

### Feed Line Center of Pressure

Section	Elevation	$CP_x$	$CP_z$	$CP_x\ Ice$	$CP_z\ Ice$
	ft	in	in	in	in
T1	300'-280'	-2.3388	-5.0183	-0.9667	-2.2255
T2	280'-260'	2.9186	-3.3640	1.7692	-1.6387
T3	260'-240'	0.2972	0.3555	0.3442	0.3355
T4	240'-220'	0.2966	0.3554	0.3444	0.3373
T5	220'-200'	0.2937	0.3516	0.3415	0.3338
T6	200'-180'	0.2966	0.3554	0.3444	0.3373
T7	180'-160'	0.2966	0.3554	0.3444	0.3373
T8	160'-140'	0.2957	0.3541	0.3434	0.3361
T9	140'-120'	0.2947	0.3529	0.3425	0.3349
T10	120'-100'	0.2966	0.3554	0.3444	0.3373
T11	100'-80'	0.3043	0.3646	0.3512	0.3439
T12	80'-60'	0.3012	0.3607	0.3482	0.3403
T13	60'-40'	0.3043	0.3646	0.3512	0.3439
T14	40'-20'	0.3043	0.3646	0.3512	0.3439
T15	20'-6'8-1/32"	0.2792	0.3286	0.3097	0.2899
T16	6'8-1/32"-0'	0.0000	0.0000	0.0000	0.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	$C_{AA\ Front}$	$C_{AA\ Side}$	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
See E-7 for Feedlines and Linear Appurtenances Lighting - Beacon	C	None			0.0000	0'	No Ice	0.00	0.00	0.00
							1/2" Ice	0.00	0.00	0.00
Lighting - Beacon	C	None			0.0000	300'	No Ice	2.70	2.70	0.05
							1/2" Ice	3.10	3.10	0.07
Lighting - Dual Obstruction	C	None			0.0000	200'	No Ice	2.70	2.70	0.05
							1/2" Ice	3.60	3.60	0.07
Lighting - Dual Obstruction	C	None			0.0000	100'	No Ice	2.70	2.70	0.05
							1/2" Ice	3.60	3.60	0.07
Lightning Rod 6'	C	From Leg	0.00	0'	0.0000	300'	No Ice	2.09	2.09	0.08
							1/2" Ice	2.46	2.46	0.09
(4) DB858DDH65E-SX	A	From Leg	3.50	0'	0.0000	295'	No Ice	11.54	6.14	0.04
							1/2" Ice	12.16	6.73	0.10
12' T-Frame Sector Mount	A	From Leg	3.50	0'	0.0000	295'	No Ice	13.60	13.60	0.47
							1/2" Ice	18.40	18.40	0.60
(4) DB858DDH65E-SX	B	From Leg	3.50	0'	0.0000	295'	No Ice	11.54	6.14	0.04

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 14 of 34</p>
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	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AAA</sub> Front	C <sub>AAA</sub> Side	Weight
			Horz	Vert	Lateral					
			0'				1/2" Ice	12.16	6.73	0.10
12' T-Frame Sector Mount	B	From Leg	3.50	0.0000	295'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	
(4) DB858DDH65E-SX	C	From Leg	3.50	0.0000	295'	No Ice	11.54	6.14	0.04	
			0'			1/2" Ice	12.16	6.73	0.10	
12' T-Frame Sector Mount	C	From Leg	3.50	0.0000	295'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	
(4) DB858DDH65E-SX	A	From Leg	3.50	0.0000	280'	No Ice	11.54	6.14	0.04	
			0'			1/2" Ice	12.16	6.73	0.10	
12' T-Frame Sector Mount	A	From Leg	3.50	0.0000	280'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	
(4) DB858DDH65E-SX	B	From Leg	3.50	0.0000	280'	No Ice	11.54	6.14	0.04	
			0'			1/2" Ice	12.16	6.73	0.10	
12' T-Frame Sector Mount	B	From Leg	3.50	0.0000	280'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	
(4) DB858DDH65E-SX	C	From Leg	3.50	0.0000	280'	No Ice	11.54	6.14	0.04	
			0'			1/2" Ice	12.16	6.73	0.10	
12' T-Frame Sector Mount	C	From Leg	3.50	0.0000	280'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	
(4) DB858DDH65E-SX	A	From Leg	3.50	0.0000	260'	No Ice	11.54	6.14	0.04	
			0'			1/2" Ice	12.16	6.73	0.10	
12' T-Frame Sector Mount	A	From Leg	3.50	0.0000	260'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	
(4) DB858DDH65E-SX	B	From Leg	3.50	0.0000	260'	No Ice	11.54	6.14	0.04	
			0'			1/2" Ice	12.16	6.73	0.10	
12' T-Frame Sector Mount	B	From Leg	3.50	0.0000	260'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	
(4) DB858DDH65E-SX	C	From Leg	3.50	0.0000	260'	No Ice	11.54	6.14	0.04	
			0'			1/2" Ice	12.16	6.73	0.10	
12' T-Frame Sector Mount	C	From Leg	3.50	0.0000	260'	No Ice	13.60	13.60	0.47	
			0'			1/2" Ice	18.40	18.40	0.60	

**Load Combinations**

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 15 of 34</p>
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	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

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

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K	
Mast	Max. Vert	15	109.02	0.00	0.64	
	Max. H <sub>x</sub>	11	78.44	0.61	0.05	
	Max. H <sub>z</sub>	15	109.02	0.00	0.64	
	Max. M <sub>x</sub>	1	0.00	0.00	0.02	
	Max. M <sub>z</sub>	1	0.00	0.00	0.02	
	Max. Torsion	22	0.32	0.33	-0.41	
	Min. Vert	1	56.98	0.00	0.02	
	Min. H <sub>x</sub>	5	78.45	-0.60	0.05	
	Min. H <sub>z</sub>	8	71.53	0.00	-0.64	
	Min. M <sub>x</sub>	1	0.00	0.00	0.02	
	Min. M <sub>z</sub>	1	0.00	0.00	0.02	
	Min. Torsion	16	-0.33	-0.21	0.52	
	Guy C @ 240 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.60	-0.93	0.54

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>16 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy B @ 240 ft Elev 0 ft Azimuth 120 deg	Max. H <sub>x</sub>	10	-0.60	-0.93	0.54
	Max. H <sub>z</sub>	17	-33.10	-34.58	19.97
	Min. Vert	17	-33.10	-34.58	19.97
	Min. H <sub>x</sub>	17	-33.10	-34.58	19.97
	Min. H <sub>z</sub>	10	-0.60	-0.93	0.54
	Max. Vert	6	-0.60	0.93	0.54
	Max. H <sub>x</sub>	25	-33.09	34.58	19.97
	Max. H <sub>z</sub>	25	-33.09	34.58	19.97
	Min. Vert	25	-33.09	34.58	19.97
	Min. H <sub>x</sub>	6	-0.60	0.93	0.54
Guy A @ 240 ft Elev 0 ft Azimuth 0 deg	Min. H <sub>z</sub>	6	-0.60	0.93	0.54
	Max. Vert	2	-0.60	0.00	-1.08
	Max. H <sub>x</sub>	24	-17.86	1.73	-21.72
	Max. H <sub>z</sub>	2	-0.60	0.00	-1.08
	Min. Vert	21	-33.09	-0.00	-39.96
	Min. H <sub>x</sub>	18	-17.87	-1.73	-21.72
	Min. H <sub>z</sub>	21	-33.09	-0.00	-39.96

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	56.98	-0.00	-0.02	-0.00	-0.00	-0.00
Dead+Wind 0 deg - No Ice+Guy	81.72	-0.00	-0.62	-0.00	-0.00	0.11
Dead+Wind 30 deg - No Ice+Guy	78.45	0.33	-0.53	-0.00	-0.00	0.16
Dead+Wind 60 deg - No Ice+Guy	71.53	0.57	-0.35	-0.00	-0.00	0.02
Dead+Wind 90 deg - No Ice+Guy	78.45	0.60	-0.05	-0.00	-0.00	-0.11
Dead+Wind 120 deg - No Ice+Guy	81.73	0.52	0.28	-0.00	-0.00	-0.08
Dead+Wind 150 deg - No Ice+Guy	78.45	0.27	0.52	-0.00	-0.00	-0.05
Dead+Wind 180 deg - No Ice+Guy	71.53	-0.00	0.64	-0.00	-0.00	-0.12
Dead+Wind 210 deg - No Ice+Guy	78.44	-0.27	0.52	-0.00	-0.00	-0.15
Dead+Wind 240 deg - No Ice+Guy	81.72	-0.53	0.28	-0.00	-0.00	-0.03
Dead+Wind 270 deg - No Ice+Guy	78.44	-0.61	-0.05	-0.00	-0.00	0.11
Dead+Wind 300 deg - No Ice+Guy	71.53	-0.57	-0.35	-0.00	-0.00	0.10
Dead+Wind 330 deg - No Ice+Guy	78.45	-0.33	-0.53	-0.00	-0.00	0.04
Dead+Ice+Temp+Guy	88.40	-0.00	-0.02	-0.00	-0.00	-0.00
Dead+Wind 0 deg+Ice+Temp+Guy	109.02	-0.00	-0.64	-0.00	-0.00	0.14
Dead+Wind 30 deg+Ice+Temp+Guy	108.33	0.21	-0.52	-0.00	-0.00	0.33



<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>17 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60	106.79	0.39	-0.25	-0.00	-0.00	0.11
deg+Ice+Temp+Guy						
Dead+Wind 90	108.31	0.53	0.04	-0.00	-0.00	-0.12
deg+Ice+Temp+Guy						
Dead+Wind 120	109.01	0.53	0.29	-0.00	-0.00	-0.02
deg+Ice+Temp+Guy						
Dead+Wind 150	108.32	0.32	0.41	-0.00	-0.00	0.09
deg+Ice+Temp+Guy						
Dead+Wind 180	106.79	-0.00	0.43	-0.00	-0.00	-0.13
deg+Ice+Temp+Guy						
Dead+Wind 210	108.31	-0.33	0.41	-0.00	-0.00	-0.32
deg+Ice+Temp+Guy						
Dead+Wind 240	109.00	-0.54	0.29	-0.00	-0.00	-0.13
deg+Ice+Temp+Guy						
Dead+Wind 270	108.30	-0.53	0.04	-0.00	-0.00	0.12
deg+Ice+Temp+Guy						
Dead+Wind 300	106.79	-0.39	-0.25	-0.00	-0.00	0.01
deg+Ice+Temp+Guy						
Dead+Wind 330	108.33	-0.21	-0.52	-0.00	-0.00	-0.10
deg+Ice+Temp+Guy						
Dead+Wind 0 deg - Service+Guy	60.67	-0.00	-0.42	-0.00	-0.00	0.07
Dead+Wind 30 deg - Service+Guy	60.70	0.18	-0.35	-0.00	-0.00	0.10
Dead+Wind 60 deg - Service+Guy	60.35	0.32	-0.20	-0.00	-0.00	-0.00
Dead+Wind 90 deg - Service+Guy	60.69	0.38	-0.01	-0.00	-0.00	-0.10
Dead+Wind 120 deg - Service+Guy	60.66	0.35	0.18	-0.00	-0.00	-0.07
Dead+Wind 150 deg - Service+Guy	60.69	0.20	0.31	-0.00	-0.00	-0.02
Dead+Wind 180 deg - Service+Guy	60.35	-0.00	0.35	-0.00	-0.00	-0.07
Dead+Wind 210 deg - Service+Guy	60.69	-0.20	0.31	-0.00	-0.00	-0.10
Dead+Wind 240 deg - Service+Guy	60.65	-0.35	0.18	-0.00	-0.00	0.00
Dead+Wind 270 deg - Service+Guy	60.68	-0.38	-0.01	-0.00	-0.00	0.10
Dead+Wind 300 deg - Service+Guy	60.35	-0.32	-0.20	-0.00	-0.00	0.07
Dead+Wind 330 deg - Service+Guy	60.70	-0.19	-0.35	-0.00	-0.00	0.02

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-31.78	0.00	-0.00	31.78	0.00	0.003%
2	0.00	-31.96	-28.37	0.00	31.96	28.36	0.014%
3	14.17	-31.78	-24.54	-14.17	31.78	24.53	0.010%
4	24.54	-31.60	-14.17	-24.54	31.60	14.17	0.010%
5	28.33	-31.78	0.00	-28.33	31.78	0.00	0.007%
6	24.57	-31.96	14.18	-24.56	31.96	-14.18	0.010%
7	14.17	-31.78	24.54	-14.16	31.78	-24.54	0.010%
8	0.00	-31.60	28.33	0.00	31.60	-28.34	0.010%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
9	-14.17	-31.78	24.54	14.16	31.78	-24.54	0.010%
10	-24.57	-31.96	14.18	24.56	31.96	-14.18	0.010%
11	-28.33	-31.78	0.00	28.33	31.78	0.00	0.007%
12	-24.54	-31.60	-14.17	24.54	31.60	14.17	0.010%
13	-14.17	-31.78	-24.54	14.17	31.78	24.53	0.010%
14	0.00	-54.72	0.00	0.00	54.72	0.00	0.005%
15	0.00	-55.12	-31.96	0.00	55.12	31.96	0.010%
16	15.36	-54.72	-26.61	-15.37	54.72	26.61	0.009%
17	26.28	-54.32	-15.17	-26.28	54.32	15.17	0.000%
18	30.73	-54.72	0.00	-30.72	54.72	0.00	0.009%
19	27.68	-55.12	15.98	-27.67	55.12	-15.98	0.010%
20	15.36	-54.72	26.61	-15.36	54.72	-26.61	0.009%
21	0.00	-54.32	30.35	0.00	54.32	-30.35	0.000%
22	-15.36	-54.72	26.61	15.36	54.72	-26.61	0.009%
23	-27.68	-55.12	15.98	27.67	55.12	-15.98	0.010%
24	-30.73	-54.72	0.00	30.72	54.72	0.00	0.009%
25	-26.28	-54.32	-15.17	26.28	54.32	15.17	0.001%
26	-15.36	-54.72	-26.61	15.37	54.72	26.61	0.009%
27	0.00	-31.87	-14.47	0.00	31.87	14.47	0.005%
28	7.23	-31.78	-12.52	-7.23	31.78	12.52	0.006%
29	12.52	-31.69	-7.23	-12.52	31.69	7.23	0.008%
30	14.46	-31.78	0.00	-14.45	31.78	0.00	0.006%
31	12.53	-31.87	7.24	-12.53	31.87	-7.24	0.005%
32	7.23	-31.78	12.52	-7.23	31.78	-12.52	0.006%
33	0.00	-31.69	14.46	0.00	31.69	-14.46	0.008%
34	-7.23	-31.78	12.52	7.23	31.78	-12.52	0.006%
35	-12.53	-31.87	7.24	12.53	31.87	-7.24	0.005%
36	-14.46	-31.78	0.00	14.45	31.78	0.00	0.006%
37	-12.52	-31.69	-7.23	12.52	31.69	7.23	0.008%
38	-7.23	-31.78	-12.52	7.23	31.78	12.52	0.006%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	7	0.00000001	0.00012188
2	Yes	30	0.00010828	0.00011274
3	Yes	30	0.00009354	0.00012638
4	Yes	17	0.00009765	0.00010876
5	Yes	31	0.00008363	0.00013831
6	Yes	31	0.00010002	0.00014409
7	Yes	30	0.00010197	0.00013350
8	Yes	17	0.00009575	0.00010547
9	Yes	30	0.00010181	0.00013333
10	Yes	31	0.00010076	0.00014501
11	Yes	31	0.00008362	0.00013824
12	Yes	17	0.00009813	0.00010908
13	Yes	30	0.00009222	0.00012753
14	Yes	7	0.00000001	0.00009824
15	Yes	30	0.00013195	0.00009596
16	Yes	28	0.00013962	0.00008549
17	Yes	32	0.00004690	0.00010284
18	Yes	28	0.00014890	0.00010195
19	Yes	30	0.00013630	0.00010460
20	Yes	28	0.00014398	0.00009418
21	Yes	35	0.00004524	0.00013702

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 19 of 34
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22	Yes	28	0.00014569	0.00009415
23	Yes	30	0.00013637	0.00010463
24	Yes	28	0.00014885	0.00010182
25	Yes	29	0.00006142	0.00013985
26	Yes	28	0.00013954	0.00008551
27	Yes	24	0.00010435	0.00003640
28	Yes	22	0.00011839	0.00004314
29	Yes	14	0.00011466	0.00009241
30	Yes	22	0.00011835	0.00004350
31	Yes	24	0.00010321	0.00003658
32	Yes	22	0.00011769	0.00004357
33	Yes	14	0.00011472	0.00009194
34	Yes	22	0.00011734	0.00004340
35	Yes	24	0.00010291	0.00003644
36	Yes	22	0.00011799	0.00004334
37	Yes	14	0.00011460	0.00009341
38	Yes	22	0.00011839	0.00004314

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	10.006	27	0.2918	0.2791
T2	280 - 260	8.795	27	0.3006	0.2752
T3	260 - 240	7.413	31	0.3498	0.2593
T4	240 - 220	5.969	31	0.3166	0.2399
T5	220 - 200	4.733	31	0.2587	0.2162
T6	200 - 180	3.864	33	0.1713	0.1968
T7	180 - 160	3.344	33	0.1257	0.1775
T8	160 - 140	2.903	33	0.1024	0.1597
T9	140 - 120	2.527	33	0.0711	0.1442
T10	120 - 100	2.294	33	0.0559	0.1296
T11	100 - 80	2.052	33	0.0677	0.1154
T12	80 - 60	1.731	33	0.0819	0.1022
T13	60 - 40	1.422	35	0.0755	0.0907
T14	40 - 20	1.088	35	0.0967	0.0786
T15	20 - 6.66667	0.608	35	0.1312	0.0676
T16	6.66667 - 0	0.211	35	0.1465	0.0611

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
300'	Lighting - Beacon	27	10.006	0.2918	0.2791	76041
295'	(4) DB858DDH65E-SX	27	9.712	0.2901	0.2789	76041
290'	Guy	27	9.415	0.2900	0.2783	38020
280'	(4) DB858DDH65E-SX	27	8.795	0.3006	0.2752	20030
260'	(4) DB858DDH65E-SX	31	7.413	0.3498	0.2593	26246
250'	Guy	31	6.683	0.3416	0.2501	65773
210'	Guy	32	4.241	0.2146	0.2061	13437
200'	Lighting - Dual Obstruction	33	3.864	0.1713	0.1968	14039
139'9"	Guy	33	2.524	0.0707	0.1440	22814
100'	Lighting - Dual Obstruction	33	2.052	0.0677	0.1154	43655
70'	Guy	35	1.572	0.0784	0.0964	220644

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 20 of 34
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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.1465	0.0611	102547

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	32.884	2	0.9895	0.3669
T2	280 - 260	28.760	2	1.0070	0.3615
T3	260 - 240	24.304	2	1.1000	0.3353
T4	240 - 220	19.746	6	1.0213	0.3033
T5	220 - 200	15.690	6	0.8795	0.3048
T6	200 - 180	12.463	6	0.6645	0.3156
T7	180 - 160	10.043	6	0.5215	0.3232
T8	160 - 140	8.089	6	0.4190	0.3269
T9	140 - 120	6.743	21	0.3039	0.3269
T10	120 - 100	6.016	21	0.2222	0.3195
T11	100 - 80	5.272	21	0.2059	0.3079
T12	80 - 60	4.375	21	0.2203	0.2934
T13	60 - 40	3.502	21	0.2028	0.2741
T14	40 - 20	2.609	21	0.2458	0.2471
T15	20 - 6.66667	1.433	21	0.3142	0.2181
T16	6.66667 - 0	0.494	21	0.3454	0.1983

### Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
300'	Lighting - Beacon	2	32.884	0.9895	0.3669	39031
295'	(4) DB858DDH65E-SX	2	31.870	0.9864	0.3668	39031
290'	Guy	2	30.850	0.9863	0.3662	19515
280'	(4) DB858DDH65E-SX	2	28.760	1.0070	0.3615	10290
260'	(4) DB858DDH65E-SX	2	24.304	1.1000	0.3353	12252
250'	Guy	6	22.001	1.0788	0.3198	24759
210'	Guy	6	13.966	0.7728	0.3109	5421
200'	Lighting - Dual Obstruction	6	12.463	0.6645	0.3156	5480
139'9"	Guy	21	6.733	0.3026	0.3268	7702
100'	Lighting - Dual Obstruction	21	5.272	0.2059	0.3079	22299
70'	Guy	21	3.931	0.2093	0.2838	45478
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.1465	0.0611	46067

### Guy Design Data

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 21 of 34</p>
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Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable $T_a$ K	Required S.F.	Actual S.F.
T1	290' (A) (782)	5/8 EHS	4.24	42.40	18.55	21.20	2.000	2.286 ✓
	290' (B) (781)	5/8 EHS	4.24	42.40	18.59	21.20	2.000	2.281 ✓
	290' (C) (780)	5/8 EHS	4.24	42.40	18.59	21.20	2.000	2.280 ✓
T3	250' (A) (785)	1/2 EHS	2.69	26.90	11.53	13.45	2.000	2.333 ✓
	250' (B) (784)	1/2 EHS	2.69	26.90	11.52	13.45	2.000	2.336 ✓
	250' (C) (783)	1/2 EHS	2.69	26.90	11.52	13.45	2.000	2.335 ✓
T5	210' (A) (788)	1/2 EHS	2.69	26.90	10.42	13.45	2.000	2.581 ✓
	210' (B) (787)	1/2 EHS	2.69	26.90	10.40	13.45	2.000	2.587 ✓
	210' (C) (786)	1/2 EHS	2.69	26.90	10.40	13.45	2.000	2.587 ✓
T9	139'9" (A) (791)	7/16 EHS	2.08	20.80	7.27	10.40	2.000	2.862 ✓
	139'9" (B) (790)	7/16 EHS	2.08	20.80	7.26	10.40	2.000	2.867 ✓
	139'9" (C) (789)	7/16 EHS	2.08	20.80	7.26	10.40	2.000	2.867 ✓
T12	70' (A) (794)	7/16 EHS	2.08	20.80	6.23	10.40	2.000	3.341 ✓
	70' (B) (793)	7/16 EHS	2.08	20.80	6.21	10.40	2.000	3.351 ✓
	70' (C) (792)	7/16 EHS	2.08	20.80	6.21	10.40	2.000	3.352 ✓

**Compression Checks**

**Leg Design Data (Compression)**

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$Kl/r$	Mast Stability Index	$F_a$ ksi	A $in^2$	Actual P K	Allow. $P_a$ K	Ratio $\frac{P}{P_a}$
T1	300 - 280	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-22.43	41.18	0.545 ✓
T2	280 - 260	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-24.27	41.18	0.589 ✓
T3	260 - 240	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-29.82	41.18	0.724 ✓
T4	240 - 220	2	20'	3'3"	78.0 K=1.00	1.00	19.409	3.1416	-43.25	60.98	0.709 ✓
T5	220 - 200	2	20'	3'3"	78.0 K=1.00	1.00	19.409	3.1416	-51.40	60.98	0.843 ✓
T6	200 - 180	2	20'	3'3"	78.0 K=1.00	1.00	19.409	3.1416	-45.97	60.98	0.754 ✓
T7	180 - 160	2	20'	3'3"	78.0 K=1.00	1.00	19.409	3.1416	-37.40	60.98	0.613 ✓
T8	160 - 140	2	20'	3'3"	78.0 K=1.00	1.00	19.409	3.1416	-45.64	60.98	0.749 ✓
T9	140 - 120	2	20'	3'3"	78.0 K=1.00	1.00	19.409	3.1416	-45.65	60.98	0.749 ✓
T10	120 - 100	2	20'	3'3"	78.0	1.00	19.409	3.1416	-34.40	60.98	0.564 ✓

<b><i>ERITower</i></b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 22 of 34
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Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	Mast Stability Index	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T11	100 - 80	1 3/4	20'	3'3"	K=1.00 89.1	1.00	17.122	2.4053	-34.43	41.18	0.836 ✓
T12	80 - 60	1 3/4	20'	3'3"	K=1.00 89.1	1.00	17.122	2.4053	-35.39	41.18	0.859 ✓
T13	60 - 40	1 3/4	20'	3'3"	K=1.00 89.1	1.00	17.122	2.4053	-40.86	41.18	0.992 ✓
T14	40 - 20	1 3/4	20'	3'3"	K=1.00 89.1	1.00	17.122	2.4053	-42.42	41.18	1.030 ✓
T15	20 - 6.66667	1 3/4	13'3- 31/32"	3'2- 17/32"	K=1.00 88.0	1.00	17.365	2.4053	-41.07	41.77	0.983 ✓
T16	6.66667 - 0	1 3/4	6'10- 11/16"	1'10- 3/16"	K=1.00 50.8	0.95	22.953	2.4053	-30.46	55.21	0.552* ✓

\* DL controls

### Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	4'5-1/32"	2'1-3/16"	101.0 K=0.75	12.852	0.4418	-2.40	5.68	0.423 ✓
T2	280 - 260	3/4	4'5-1/32"	2'1-3/16"	101.0 K=0.75	12.852	0.4418	-1.30	5.68	0.229 ✓
T3	260 - 240	3/4	4'5-1/32"	2'1-3/16"	101.0 K=0.75	12.852	0.4418	-3.11	5.68	0.549 ✓
T4	240 - 220	5/8	4'5-1/32"	2'1-3/32"	120.3 K=0.75	10.239	0.3068	-1.80	3.14	0.574 ✓
T5	220 - 200	5/8	4'5-1/32"	2'1-3/32"	120.3 K=0.75	10.239	0.3068	-1.93	3.14	0.616 ✓
T6	200 - 180	5/8	4'5-1/32"	2'1-3/32"	120.3 K=0.75	10.239	0.3068	-1.79	3.14	0.570 ✓
T7	180 - 160	5/8	4'5-1/32"	2'1-3/32"	120.3 K=0.75	10.239	0.3068	-1.25	3.14	0.398 ✓
T8	160 - 140	5/8	4'5-1/32"	2'1-3/32"	120.3 K=0.75	10.239	0.3068	-1.43	3.14	0.456 ✓
T9	140 - 120	5/8	4'5-1/32"	2'1-3/32"	120.3 K=0.75	10.239	0.3068	-1.89	3.14	0.602 ✓
T10	120 - 100	5/8	4'5-1/32"	2'1-3/32"	120.3 K=0.75	10.239	0.3068	-1.55	3.14	0.492 ✓
T11	100 - 80	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.14	3.10	0.367* ✓
T12	80 - 60	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.68	3.10	0.542 ✓
T13	60 - 40	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.26	3.10	0.407* ✓

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 23 of 34
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Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T14	40 - 20	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.30	3.10	0.418*
T15	20 - 6.66667	5/8	4'4-11/16"	2'1-3/32"	120.4 K=0.75	10.232	0.3068	-1.30	3.14	0.414*

\* DL controls

### Guy Lower Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-3/16"	115.4 K=1.00	10.930	0.6013	-2.30	6.57	0.349
T3	260 - 240	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-1.21	3.64	0.332
T5	220 - 200	3/4	4'5-1/32"	2'1-3/32"	133.7 K=1.00	8.357	0.4418	-2.37	3.69	0.641
T9	140 - 120	3/4	4'5-1/32"	2'1-3/32"	133.7 K=1.00	8.357	0.4418	-2.46	3.69	0.665
T12	80 - 60	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-2.73	3.64	0.750

### Guy Upper Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-3/16"	115.4 K=1.00	10.930	0.6013	-2.26	6.57	0.344
T3	260 - 240	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-3.02	3.64	0.830
T5	220 - 200	3/4	4'5-1/32"	2'1-3/32"	133.7 K=1.00	8.357	0.4418	-2.27	3.69	0.615
T8	160 - 140	3/4	4'5-1/32"	2'1-3/32"	133.7 K=1.00	8.357	0.4418	-2.05	3.69	0.555
T12	80 - 60	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-2.44	3.64	0.671

### Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
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<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 24 of 34</p>
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Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.26	1.95	0.134
T5	220 - 200	5/8	3'	2'9-31/32"	152.3 K=0.70	6.436	0.3068	-0.15	1.97	0.078
T16	6.66667 - 0	C12x20.7	9-23/32"	7-29/32"	22.4 K=1.00	20.448	6.0900	-0.04	124.53	0.000

### Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.33	1.95	0.170
T2	280 - 260	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.06	1.95	0.029
T3	260 - 240	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.66	1.95	0.341
T6	200 - 180	5/8	3'	2'9-31/32"	152.3 K=0.70	6.436	0.3068	-0.15	1.97	0.077

### Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.59	1.95	0.303
T3	260 - 240	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.05	1.95	0.023
T4	240 - 220	5/8	3'	2'9-31/32"	152.3 K=0.70	6.436	0.3068	-0.26	1.97	0.132

### Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T2	280 - 260	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.02	1.95	0.008



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### Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/lr	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	1	3'	2'10- 3/16"	137.0 K=1.00	21.600	0.7854	0.00	6.25	0.000*
T3	260 - 240	1	3'	2'10- 3/16"	137.0 K=1.00	21.600	0.7854	0.00	6.25	0.000*
T5	220 - 200	1	3'	2'9- 31/32"	136.0 K=1.00	21.600	0.7854	0.00	6.34	0.000*
T9	140 - 120	1	3'	2'9- 31/32"	136.0 K=1.00	21.600	0.7854	0.00	6.34	0.000*
T12	80 - 60	1	3'	2'10- 3/16"	137.0 K=1.00	21.600	0.7854	0.00	6.25	0.000*

\* DL controls

### Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> F <sub>by</sub>
T1	300 - 280	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T3	260 - 240	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T5	220 - 200	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T9	140 - 120	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T12	80 - 60	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000

### Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio P P <sub>a</sub>	Ratio f <sub>bx</sub> F <sub>bx</sub>	Ratio f <sub>by</sub> F <sub>by</sub>	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	300 - 280	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T3	260 - 240	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T5	220 - 200	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T9	140 - 120	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T12	80 - 60	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓

\* DL controls

### Tension Checks

### Leg Design Data (Tension)

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>26 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	1 3/4	20'	3'3"	89.1	30.000	2.4053	4.67	72.16	0.065
T2	280 - 260	1 3/4	20'	3'3"	89.1	30.000	2.4053	3.97	72.16	0.055
T4	240 - 220	2	20'	3'3"	78.0	30.000	3.1416	5.30	94.25	0.056
T5	220 - 200	2	20'	3'3"	78.0	30.000	3.1416	11.86	94.25	0.126

**Diagonal Design Data (Tension)**

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	1.99	9.54	0.208
T2	280 - 260	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	0.83	9.54	0.087
T3	260 - 240	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	2.88	9.54	0.301
T4	240 - 220	5/8	4'5-1/32"	2'1-3/32"	160.4	21.600	0.3068	1.17	6.63	0.176
T5	220 - 200	5/8	4'5-1/32"	2'1-3/32"	160.4	21.600	0.3068	1.48	6.63	0.224
T6	200 - 180	5/8	4'5-1/32"	2'1-3/32"	160.4	21.600	0.3068	1.01	6.63	0.152
T7	180 - 160	5/8	4'5-1/32"	2'1-3/32"	160.4	21.600	0.3068	0.54	6.63	0.081
T8	160 - 140	5/8	4'5-1/32"	2'1-3/32"	160.4	21.600	0.3068	1.02	6.63	0.154
T9	140 - 120	5/8	4'5-1/32"	2'1-3/32"	160.4	21.600	0.3068	1.37	6.63	0.207
T10	120 - 100	5/8	4'5-1/32"	2'1-3/32"	160.4	21.600	0.3068	0.88	6.63	0.133
T11	100 - 80	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	0.93	6.63	0.141
T12	80 - 60	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	1.39	6.63	0.210
T13	60 - 40	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	1.17	6.63	0.177
T14	40 - 20	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	0.89	6.63	0.134
T15	20 - 6.66667	5/8	4'-11/16"	2'1-3/32"	160.5	21.600	0.3068	0.47	6.63	0.071

**Guy Lower Diagonal Design Data (Tension)**

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 27 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b> 12:34:18 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-3/16"	115.4	21.600	0.6013	1.96	12.99	0.151
T3	260 - 240	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	0.08	9.54	0.008
T5	220 - 200	3/4	4'5-1/32"	2'1-3/32"	133.7	21.600	0.4418	0.87	9.54	0.091
T9	140 - 120	3/4	4'5-1/32"	2'1-3/32"	133.7	21.600	0.4418	0.52	9.54	0.055
T12	80 - 60	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	0.24	9.54	0.025

**Guy Upper Diagonal Design Data (Tension)**

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-3/16"	115.4	21.600	0.6013	2.62	12.99	0.201
T3	260 - 240	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	2.59	9.54	0.271
T5	220 - 200	3/4	4'5-1/32"	2'1-3/32"	133.7	21.600	0.4418	1.08	9.54	0.113
T8	160 - 140	3/4	4'5-1/32"	2'1-3/32"	133.7	21.600	0.4418	0.44	9.54	0.046
T12	80 - 60	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	0.22	9.54	0.023

**Horizontal Design Data (Tension)**

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.96	6.63	0.145
T2	280 - 260	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.25	6.63	0.189
T3	260 - 240	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.47	6.63	0.222
T4	240 - 220	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.07	6.63	0.161
T5	220 - 200	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.57	6.63	0.237
T6	200 - 180	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.23	6.63	0.186
T7	180 - 160	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.23	6.63	0.186

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 28 of 34
	<b>Project</b> Henderson, Henderson County, KY --- Existing Tower Condition Analysis	<b>Date</b> 12:34:18 07/23/04
	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T8	160 - 140	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.59	6.63	0.240
T9	140 - 120	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.75	6.63	0.263
T10	120 - 100	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.09	6.63	0.164*
T11	100 - 80	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.47	6.63	0.221*
T12	80 - 60	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.71	6.63	0.258*
T13	60 - 40	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.63	6.63	0.246*
T14	40 - 20	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.68	6.63	0.253*
T15	20 - 6.66667	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.70	6.63	0.256*
T16	6.66667 - 0	C12x20.7	9-23/32"	7-29/32"	9.9	21.600	6.0900	0.09	131.54	0.001

\* DL controls

### Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.20	6.63	0.030
T2	280 - 260	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.73	6.63	0.110
T3	260 - 240	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.22	6.63	0.184
T4	240 - 220	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.47	6.63	0.071
T5	220 - 200	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.46	6.63	0.070
T6	200 - 180	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.83	6.63	0.125
T7	180 - 160	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.69	6.63	0.104
T8	160 - 140	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.63	6.63	0.095
T10	120 - 100	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.80	6.63	0.121
T11	100 - 80	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.72	6.63	0.109*
T12	80 - 60	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.77	6.63	0.116*
T13	60 - 40	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.83	6.63	0.125*

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>29 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T14	40 - 20	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.86	6.63	0.129*
T15	20 - 6.66667	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.85	6.63	0.128*
T16	6.66667 - 0	C12x20.7	2'10-11/16"	2'8-7/8"	41.2	21.600	6.0900	3.51	131.54	0.027*

\* DL controls

### Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.09	6.63	0.164
T2	280 - 260	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.48	6.63	0.073
T3	260 - 240	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.83	6.63	0.125
T4	240 - 220	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.81	6.63	0.122
T5	220 - 200	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.59	6.63	0.089
T6	200 - 180	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.61	6.63	0.093
T7	180 - 160	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.71	6.63	0.107
T8	160 - 140	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.09	6.63	0.165
T9	140 - 120	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.80	6.63	0.120
T10	120 - 100	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.59	6.63	0.089*
T11	100 - 80	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.77	6.63	0.116*
T12	80 - 60	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.83	6.63	0.125*
T13	60 - 40	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.85	6.63	0.128*
T14	40 - 20	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.89	6.63	0.135*
T15	20 - 6.66667	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.63	6.63	0.246*

\* DL controls

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 30 of 34
	<b>Project</b> Henderson, Henderson County, KY --- Existing Tower Condition Analysis	<b>Date</b> 12:34:18 07/23/04
	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

### Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/lr	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T2	280 - 260	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.12	6.63	0.169
T4	240 - 220	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	0.95	6.63	0.143
T6	200 - 180	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.18	6.63	0.177
T7	180 - 160	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.17	6.63	0.176
T8	160 - 140	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.25	6.63	0.189
T9	140 - 120	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.32	6.63	0.200
T10	120 - 100	5/8	3'	2'9-31/32"	217.6	21.600	0.3068	1.00	6.63	0.150*
T11	100 - 80	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.35	6.63	0.203*
T13	60 - 40	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.50	6.63	0.227*
T14	40 - 20	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.55	6.63	0.234*

\* DL controls

### Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/lr	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	1	3'	2'10-3/16"	137.0	21.600	0.7854	5.38	16.96	0.317
T3	260 - 240	1	3'	2'10-3/16"	137.0	21.600	0.7854	4.25	16.96	0.250
T5	220 - 200	1	3'	2'9-31/32"	136.0	21.600	0.7854	3.66	16.96	0.216
T9	140 - 120	1	3'	2'9-31/32"	136.0	21.600	0.7854	3.51	16.96	0.207
T12	80 - 60	1	3'	2'10-3/16"	137.0	21.600	0.7854	5.18	16.96	0.305

### Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> F <sub>by</sub>
T1	300 - 280	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000
T3	260 - 240	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 31 of 34
	<b>Project</b> Henderson, Henderson County, KY --- Existing Tower Condition Analysis	<b>Date</b> 12:34:18 07/23/04
	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
T5	220 - 200	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000
T9	140 - 120	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000
T12	80 - 60	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000

### Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $P$ $P_a$	Ratio $f_{bx}$ $F_{bx}$	Ratio $f_{by}$ $F_{by}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	300 - 280	1	0.317	0.018	0.000	0.335 ✓	1.333	H2-1 ✓
T3	260 - 240	1	0.250	0.018	0.000	0.269 ✓	1.333	H2-1 ✓
T5	220 - 200	1	0.216	0.018	0.000	0.234 ✓	1.333	H2-1 ✓
T9	140 - 120	1	0.207	0.018	0.000	0.226 ✓	1.333	H2-1 ✓
T12	80 - 60	1	0.305	0.018	0.000	0.324 ✓	1.333	H2-1 ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* $P_{allow}$ K	% Capacity	Pass Fail
T1	300 - 280	Leg	1 3/4	3	-22.43	54.90	40.9	Pass
T2	280 - 260	Leg	1 3/4	55	-24.27	54.90	44.2	Pass
T3	260 - 240	Leg	1 3/4	107	-29.82	54.90	54.3	Pass
T4	240 - 220	Leg	2	159	-43.25	81.28	53.2	Pass
T5	220 - 200	Leg	2	211	-51.40	81.28	63.2	Pass
T6	200 - 180	Leg	2	262	-45.97	81.28	56.6	Pass
T7	180 - 160	Leg	2	314	-37.40	81.28	46.0	Pass
T8	160 - 140	Leg	2	366	-45.64	81.28	56.2	Pass
T9	140 - 120	Leg	2	418	-45.65	81.28	56.2	Pass
T10	120 - 100	Leg	2	469	-34.40	81.28	42.3	Pass
T11	100 - 80	Leg	1 3/4	523	-34.43	54.90	62.7	Pass
T12	80 - 60	Leg	1 3/4	575	-35.39	54.90	64.5	Pass
T13	60 - 40	Leg	1 3/4	626	-40.86	54.90	74.4	Pass
T14	40 - 20	Leg	1 3/4	679	-42.42	54.90	77.3	Pass
T15	20 - 6.66667	Leg	1 3/4	730	-41.07	55.68	73.8	Pass
T16	6.66667 - 0	Leg	1 3/4	766	-30.46	55.21	55.2	Pass
T1	300 - 280	Diagonal	3/4	13	-2.40	7.57	31.7	Pass
T2	280 - 260	Diagonal	3/4	65	-1.30	7.57	17.2	Pass
T3	260 - 240	Diagonal	3/4	151	-3.11	7.57	41.2	Pass
T4	240 - 220	Diagonal	5/8	170	-1.80	4.19	43.1	Pass
T5	220 - 200	Diagonal	5/8	256	-1.93	4.19	46.2	Pass
T6	200 - 180	Diagonal	5/8	307	-1.79	4.19	42.8	Pass
T7	180 - 160	Diagonal	5/8	359	-1.25	4.19	29.9	Pass
T8	160 - 140	Diagonal	5/8	384	-1.43	4.19	34.2	Pass
T9	140 - 120	Diagonal	5/8	456	-1.89	4.19	45.2	Pass
T10	120 - 100	Diagonal	5/8	515	-1.55	4.19	36.9	Pass
T11	100 - 80	Diagonal	5/8	533	-1.14	3.10	36.7	Pass
T12	80 - 60	Diagonal	5/8	585	-1.68	4.14	40.6	Pass
T13	60 - 40	Diagonal	5/8	637	-1.26	3.10	40.7	Pass
T14	40 - 20	Diagonal	5/8	689	-1.30	3.10	41.8	Pass
T15	20 - 6.66667	Diagonal	5/8	759	-1.30	3.14	41.4	Pass

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<b>Job</b>	<b>Page</b>
	Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	32 of 34
	<b>Project</b>	<b>Date</b>
Henderson, Henderson County, KY --- Existing Tower Condition Analysis	12:34:18 07/23/04	
<b>Client</b>	<b>Designed by</b>	
ABC Towers and Tower Maintenance	Gray Hodge	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
T1	300 - 280	Guy Lower Diagonal@290	7/8	27	-2.30	8.76	26.2	Pass
T3	260 - 240	Guy Lower Diagonal@250	3/4	132	-1.21	4.85	24.9	Pass
T5	220 - 200	Guy Lower Diagonal@210	3/4	236	-2.37	4.92	48.1	Pass
T9	140 - 120	Guy Lower Diagonal@139.75	3/4	463	-2.46	4.92	49.9	Pass
T12	80 - 60	Guy Lower Diagonal@70	3/4	599	-2.73	4.85	56.3	Pass
T1	300 - 280	Guy Upper Diagonal@290	7/8	38	-2.26	8.76	25.8	Pass
T3	260 - 240	Guy Upper Diagonal@250	3/4	142	-3.02	4.85	62.2	Pass
T5	220 - 200	Guy Upper Diagonal@210	3/4	242	-2.27	4.92	46.1	Pass
T8	160 - 140	Guy Upper Diagonal@139.75	3/4	377	-2.05	4.92	41.6	Pass
T12	80 - 60	Guy Upper Diagonal@70	3/4	605	-2.44	4.85	50.3	Pass
T1	300 - 280	Horizontal	5/8	19	0.96	8.83	10.9	Pass
T2	280 - 260	Horizontal	5/8	98	1.25	8.83	14.1	Pass
T3	260 - 240	Horizontal	5/8	123	1.47	8.83	16.7	Pass
T4	240 - 220	Horizontal	5/8	175	1.07	8.83	12.1	Pass
T5	220 - 200	Horizontal	5/8	234	1.57	8.83	17.8	Pass
T6	200 - 180	Horizontal	5/8	279	1.23	8.83	14.0	Pass
T7	180 - 160	Horizontal	5/8	331	1.23	8.83	14.0	Pass
T8	160 - 140	Horizontal	5/8	383	1.59	8.83	18.0	Pass
T9	140 - 120	Horizontal	5/8	462	1.75	8.83	19.8	Pass
T10	120 - 100	Horizontal	5/8	487	1.09	6.63	16.4	Pass
T11	100 - 80	Horizontal	5/8	539	1.47	6.63	22.1	Pass
T12	80 - 60	Horizontal	5/8	598	1.71	6.63	25.8	Pass
T13	60 - 40	Horizontal	5/8	643	1.63	6.63	24.6	Pass
T14	40 - 20	Horizontal	5/8	695	1.68	6.63	25.3	Pass
T15	20 - 6.66667	Horizontal	5/8	758	1.70	6.63	25.6	Pass
T16	6.66667 - 0	Horizontal	C12x20.7	772	0.09	175.35	0.8	Pass
T1	300 - 280	Top Girt	5/8	5	-0.33	2.59	12.8	Pass
T2	280 - 260	Top Girt	5/8	56	0.73	8.83	8.3	Pass
T3	260 - 240	Top Girt	5/8	109	-0.66	2.59	25.6	Pass
T4	240 - 220	Top Girt	5/8	160	0.47	8.83	5.3	Pass
T5	220 - 200	Top Girt	5/8	212	0.46	8.83	5.3	Pass
T6	200 - 180	Top Girt	5/8	264	0.83	8.83	9.4	Pass
T7	180 - 160	Top Girt	5/8	316	0.69	8.83	7.8	Pass
T8	160 - 140	Top Girt	5/8	368	0.63	8.83	7.1	Pass
T10	120 - 100	Top Girt	5/8	472	0.80	8.83	9.1	Pass
T11	100 - 80	Top Girt	5/8	524	0.72	6.63	10.9	Pass
T12	80 - 60	Top Girt	5/8	576	0.77	6.63	11.6	Pass
T13	60 - 40	Top Girt	5/8	628	0.83	6.63	12.5	Pass
T14	40 - 20	Top Girt	5/8	680	0.86	6.63	12.9	Pass
T15	20 - 6.66667	Top Girt	5/8	732	0.85	6.63	12.8	Pass
T16	6.66667 - 0	Top Girt	C12x20.7	768	3.51	131.54	2.7	Pass
T1	300 - 280	Bottom Girt	5/8	8	-0.59	2.59	22.7	Pass
T2	280 - 260	Bottom Girt	5/8	59	0.48	8.83	5.5	Pass
T3	260 - 240	Bottom Girt	5/8	111	0.83	8.83	9.4	Pass
T4	240 - 220	Bottom Girt	5/8	164	-0.26	2.63	9.9	Pass
T5	220 - 200	Bottom Girt	5/8	215	0.59	8.83	6.7	Pass
T6	200 - 180	Bottom Girt	5/8	267	0.61	8.83	7.0	Pass
T7	180 - 160	Bottom Girt	5/8	319	0.71	8.83	8.0	Pass
T8	160 - 140	Bottom Girt	5/8	371	1.09	8.83	12.4	Pass
T9	140 - 120	Bottom Girt	5/8	423	0.80	8.83	9.0	Pass
T10	120 - 100	Bottom Girt	5/8	475	0.59	6.63	8.9	Pass



<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>33 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b></p> <p>12:34:18 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
T11	100 - 80	Bottom Girt	5/8	527	0.77	6.63	11.6	Pass
T12	80 - 60	Bottom Girt	5/8	579	0.83	6.63	12.5	Pass
T13	60 - 40	Bottom Girt	5/8	631	0.85	6.63	12.8	Pass
T14	40 - 20	Bottom Girt	5/8	683	0.89	6.63	13.5	Pass
T15	20 - 6.66667	Bottom Girt	5/8	735	1.63	6.63	24.6	Pass
T2	280 - 260	Mid Girt	5/8	62	1.12	8.83	12.7	Pass
T4	240 - 220	Mid Girt	5/8	166	0.95	8.83	10.7	Pass
T6	200 - 180	Mid Girt	5/8	270	1.18	8.83	13.3	Pass
T7	180 - 160	Mid Girt	5/8	322	1.17	8.83	13.2	Pass
T8	160 - 140	Mid Girt	5/8	374	1.25	8.83	14.2	Pass
T9	140 - 120	Mid Girt	5/8	426	1.32	8.83	15.0	Pass
T10	120 - 100	Mid Girt	5/8	478	1.00	6.63	15.0	Pass
T11	100 - 80	Mid Girt	5/8	530	1.35	6.63	20.3	Pass
T13	60 - 40	Mid Girt	5/8	634	1.50	6.63	22.7	Pass
T14	40 - 20	Mid Girt	5/8	686	1.55	6.63	23.4	Pass
T1	300 - 280	Guy A@290	5/8	782	18.55	21.20	87.5	Pass
T3	260 - 240	Guy A@250	1/2	785	11.53	13.45	85.7	Pass
T5	220 - 200	Guy A@210	1/2	788	10.42	13.45	77.5	Pass
T9	140 - 120	Guy A@139.75	7/16	791	7.27	10.40	69.9	Pass
T12	80 - 60	Guy A@70	7/16	794	6.23	10.40	59.9	Pass
T1	300 - 280	Guy B@290	5/8	781	18.59	21.20	87.7	Pass
T3	260 - 240	Guy B@250	1/2	784	11.52	13.45	85.6	Pass
T5	220 - 200	Guy B@210	1/2	787	10.40	13.45	77.3	Pass
T9	140 - 120	Guy B@139.75	7/16	790	7.26	10.40	69.8	Pass
T12	80 - 60	Guy B@70	7/16	793	6.21	10.40	59.7	Pass
T1	300 - 280	Guy C@290	5/8	780	18.59	21.20	87.7	Pass
T3	260 - 240	Guy C@250	1/2	783	11.52	13.45	85.7	Pass
T5	220 - 200	Guy C@210	1/2	786	10.40	13.45	77.3	Pass
T9	140 - 120	Guy C@139.75	7/16	789	7.26	10.40	69.8	Pass
T12	80 - 60	Guy C@70	7/16	792	6.21	10.40	59.7	Pass
T1	300 - 280	Top Guy Pull-Off@290	1	12	5.38	22.61	25.2	Pass
T3	260 - 240	Top Guy Pull-Off@250	1	114	4.25	22.61	20.2	Pass
T5	220 - 200	Top Guy Pull-Off@210	1	218	3.66	22.61	17.6	Pass
T9	140 - 120	Top Guy Pull-Off@139.75	1	420	3.51	22.61	16.9	Pass
T12	80 - 60	Top Guy Pull-Off@70	1	582	5.18	22.61	24.3	Pass

Summary

Leg (T14)	77.3	Pass
Diagonal (T5)	46.2	Pass
Guy Lower Diagonal (T12)	56.3	Pass
Guy Upper Diagonal (T3)	62.2	Pass
Horizontal (T12)	25.8	Pass
Top Girt (T3)	25.6	Pass
Bottom Girt (T15)	24.6	Pass
Mid Girt (T14)	23.4	Pass
Guy A (T1)	87.5	Pass
Guy B (T1)	87.7	Pass
Guy C (T1)	87.7	Pass

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 34 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p><b>Date</b> 12:34:18 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

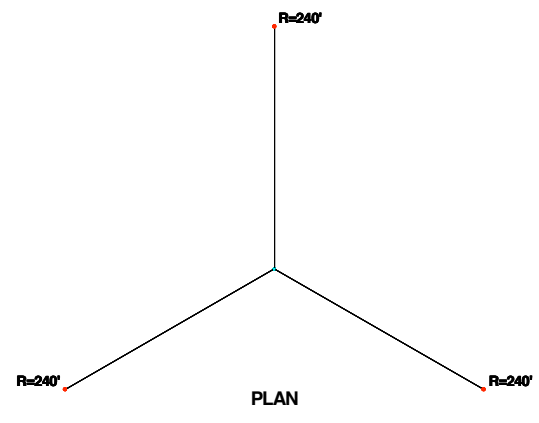
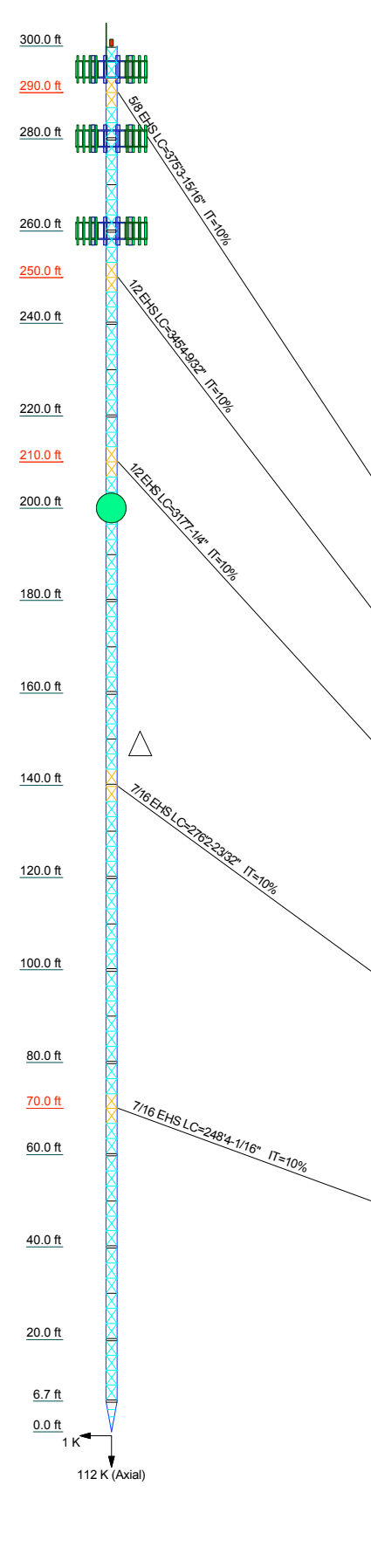
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
						Top Guy Pull-Off (T1)	25.2	Pass
						<b>RATING =</b>	<b>87.7</b>	<b>Pass</b>

**APPENDIX C**

Antenna Tower With Proposed Additional Antennas

Graphical Computer Output  
Structural Analysis Report and Calculations

Section	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs															SR 1 1/2	
Leg Grade															SR 3/4	
Diagonals	N.A.														SR 3/4	
Diagonal Grade	N.A.														SR 3/4	
Top Girts	A														SR 3/4	
Mid Girts	N.A.														SR 3/4	
Bottom Girts	N.A.														SR 3/4	
Horizontals	A														SR 3/4	
Top Guy Pull-Offs															N.A.	SR 1
Guy Hi-Diagonals	N.A.														N.A.	SR 3/4
Guy Low-Diagonals	N.A.														N.A.	SR 3/4
Face Width (ft)																SR 7/8
# Panels @ (ft)																SR 7/8
Weight (K)	10.6	0.6	0.6	0.6	0.6	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
																84 @ 3.25



**APPURTENANCES**

TYPE	ELEVATION	TYPE	ELEVATION
Lighting - Beacon	300	12' T-Frame Sector Mount	280
Lighting Rod 6"	300	(4) DB858DDH65E-SX	260
(4) DB858DDH65E-SX	295	12' T-Frame Sector Mount	260
12' T-Frame Sector Mount	295	(4) DB858DDH65E-SX	260
(4) DB858DDH65E-SX	295	12' T-Frame Sector Mount	260
12' T-Frame Sector Mount	295	(4) DB858DDH65E-SX	260
(4) DB858DDH65E-SX	295	12' T-Frame Sector Mount	260
12' T-Frame Sector Mount	295	Lighting - Dual Obstruction	200
(4) DB858DDH65E-SX	280	UHX8-59 (Proposed)	200
12' T-Frame Sector Mount	280	UHX8-59 (Proposed)	200
(4) DB858DDH65E-SX	280	Lighting - Dual Obstruction	100
12' T-Frame Sector Mount	280	See E-7 for Feedlines and Linear Appurtenances	0
(4) DB858DDH65E-SX	280		

**SYMBOL LIST**

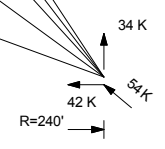
MARK	SIZE	MARK	SIZE
A	C12x20.7	B	4 @ 1.60417

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

**TOWER DESIGN NOTES**

1. Tower is located in Henderson County, Kentucky.
2. Tower designed for a 70 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 61 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. See Sheet E-7 for Feedlines and Linear Appurtenances.
6. See Sheet E-8 for Code Check/Stress Distribution.
7. TOWER RATING: 97.3%

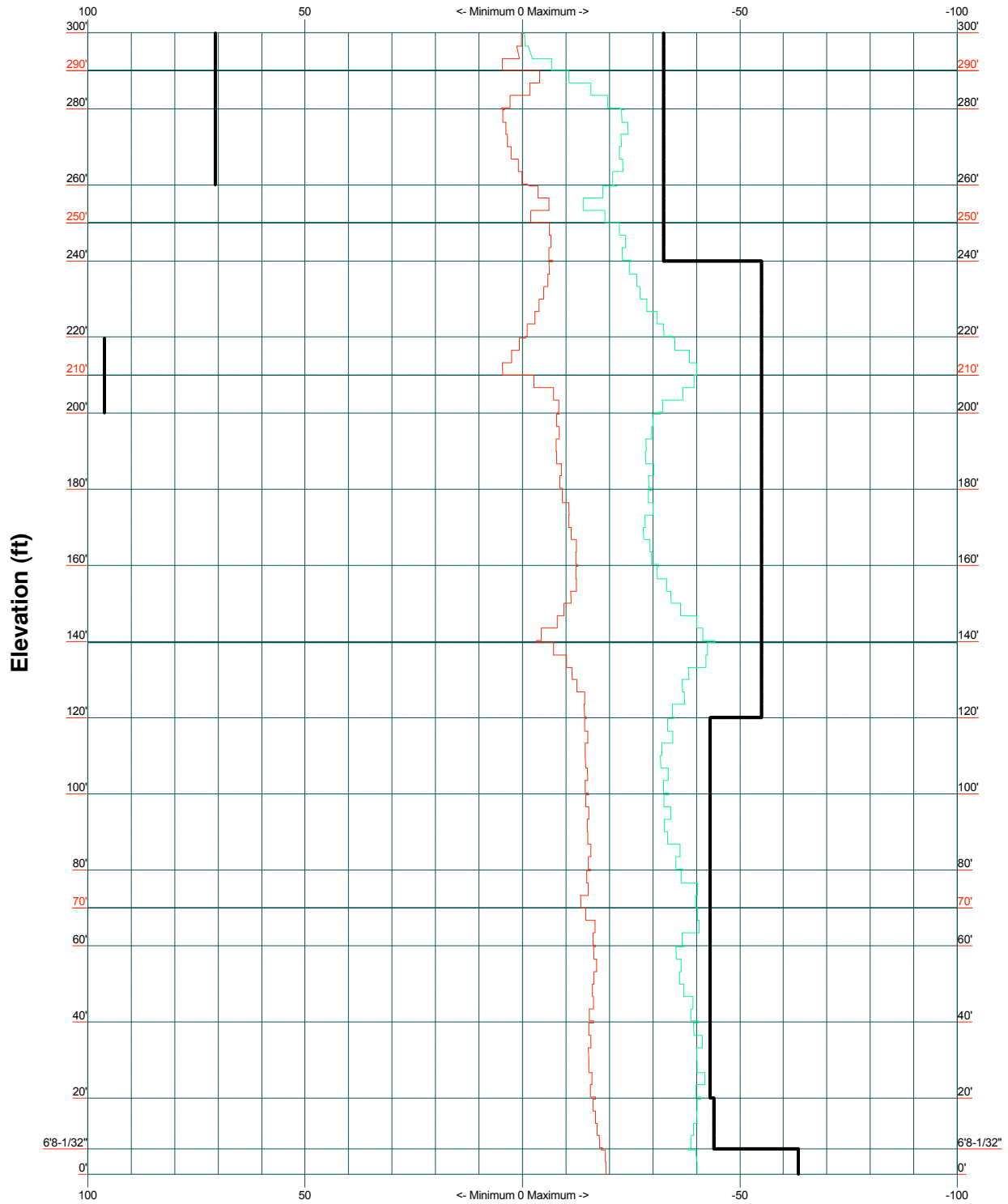



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Job: **Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)**  
 Project: **Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas**  
 Client: **ABC Towers and Tower Maintenance** Drawn by: **Gray Hodge** App'd:  
 Code: **TIA/EIA-222-F** Date: **07/23/04** Scale: **NTS**  
 Path: **C:\Documents and Settings\hodge\My Documents\ERTower Project Data Files\Sample Reports\Sample-CT-42.rvt** Dwg No. **E-1**

TIA/EIA-222-F - 70 mph/61 mph 0.5000 in Ice

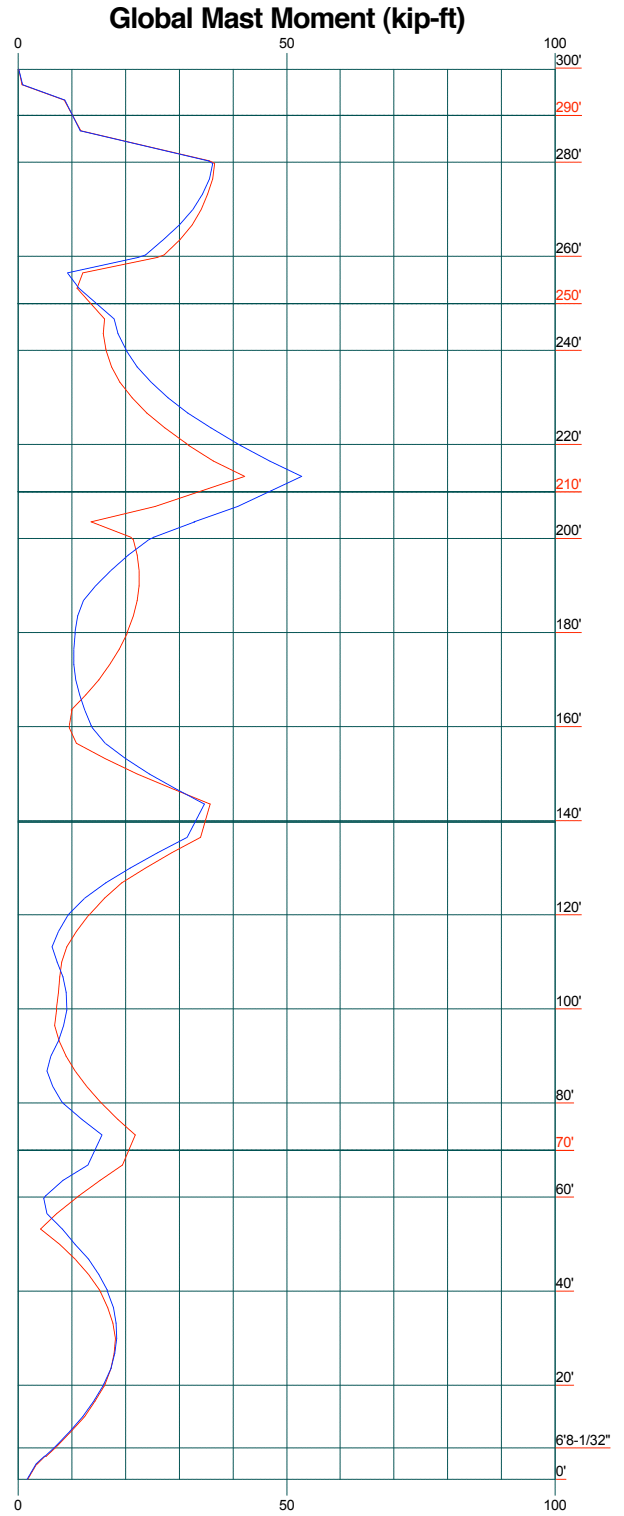
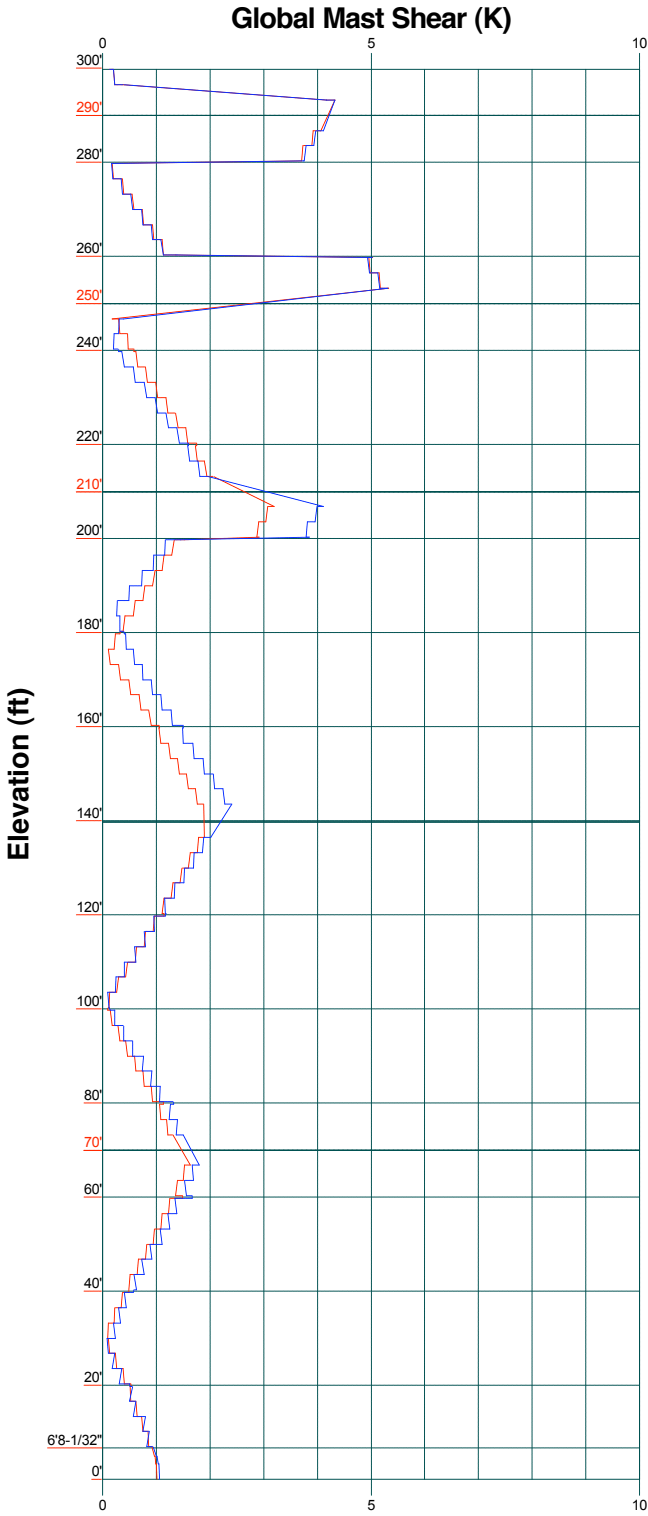
Leg Capacity ——— Leg Compression (K)



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	App'd:		Dwg No. E-3
	App'd:		Dwg No. E-3

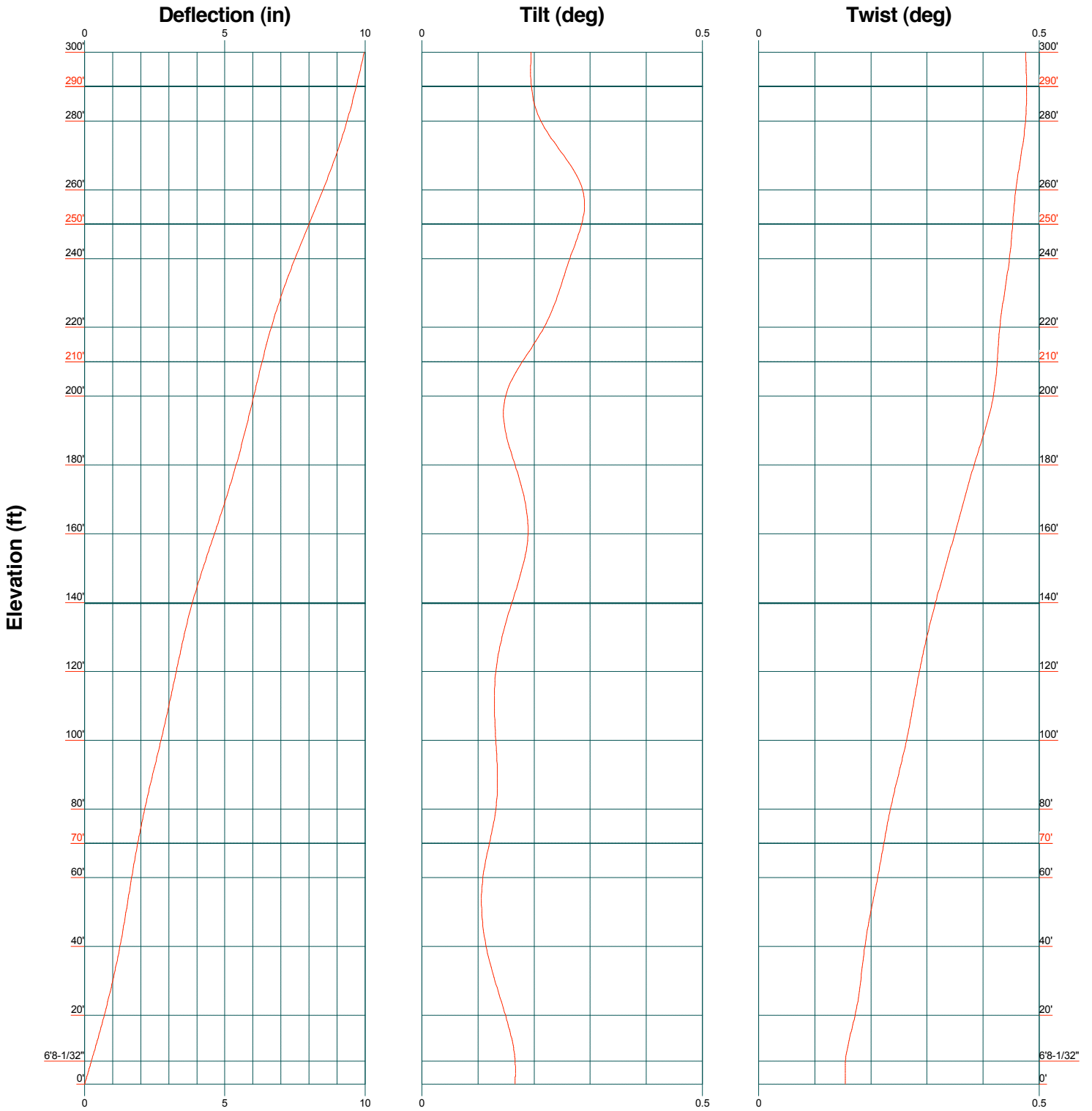
Vx Vz

Mx Mz



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Path:		Dwg No. E-4	



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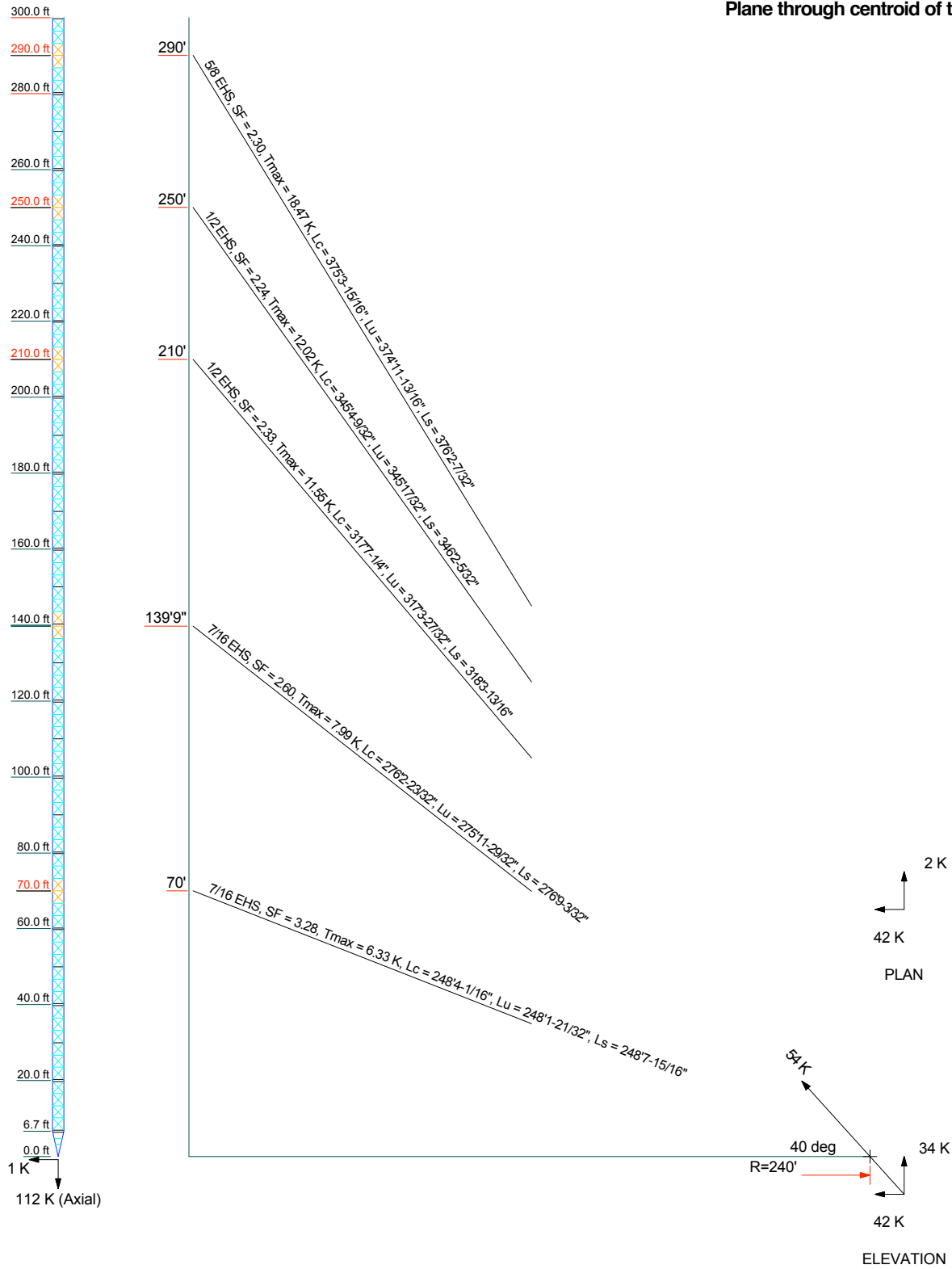
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Project: <b>Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas</b>		
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
Path:		Dwg No. E-5

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# Guy Tensions and Tower Reactions

## TIA/EIA-222-F - 70 mph/61 mph 0.5000 in Ice

**Maximum Values**  
**Anchor 'A' @ 240 ft Azimuth 0 deg Elev 0 ft**  
**Plane through centroid of tower**



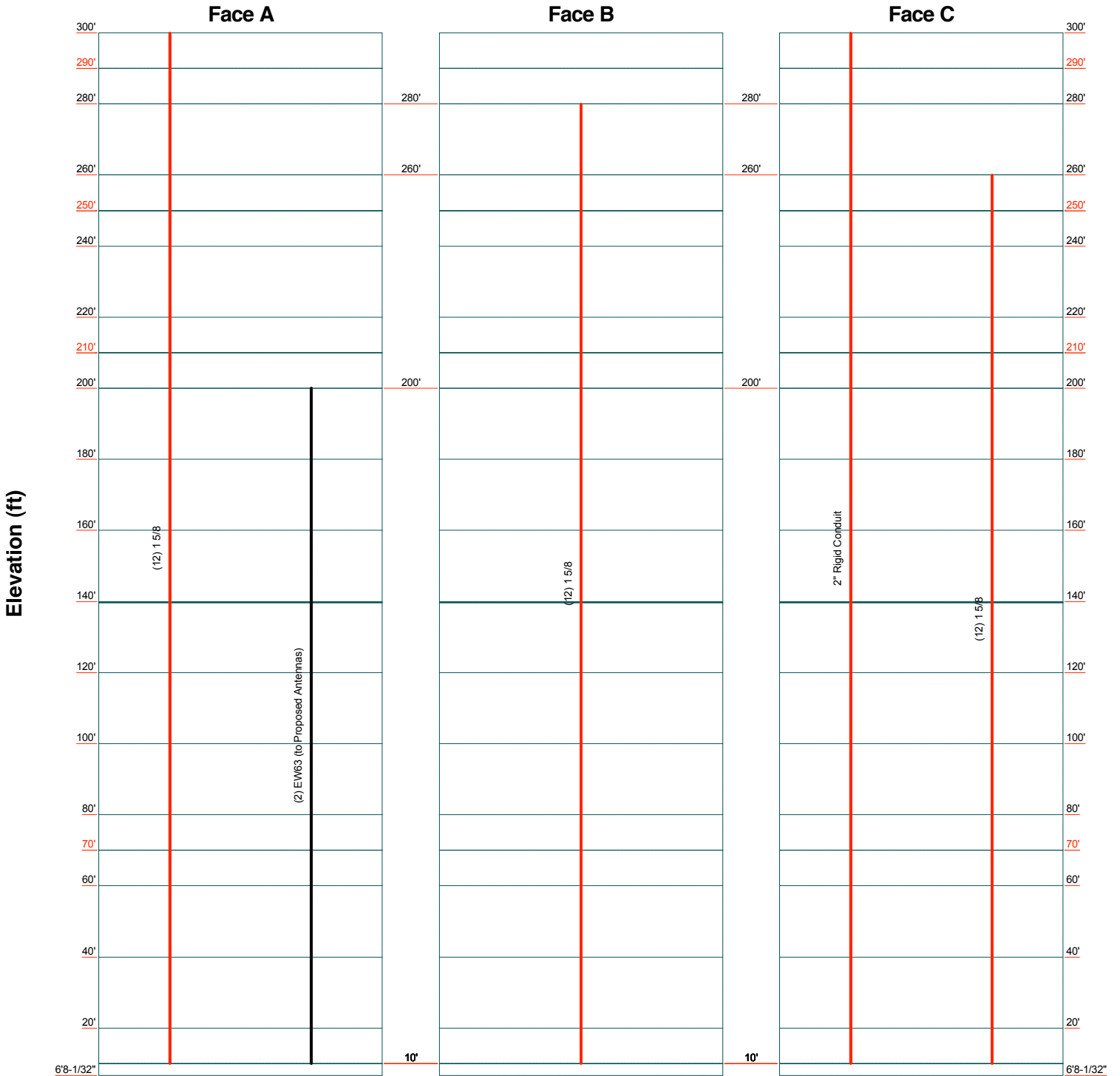
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	22 Chestnut Street	Project: <b>Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas</b>		
	Evansville, Indiana 47713-1022	Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
	Phone: 812.422.2558	Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
	FAX: 812.422.3337	Path:		Dwg No. E-6



# Feedline Distribution Chart

## 6'8-1/32" - 300'

— Round   
 — Flat   
 — App In Face   
 — App Out Face   
 — Truss Leg

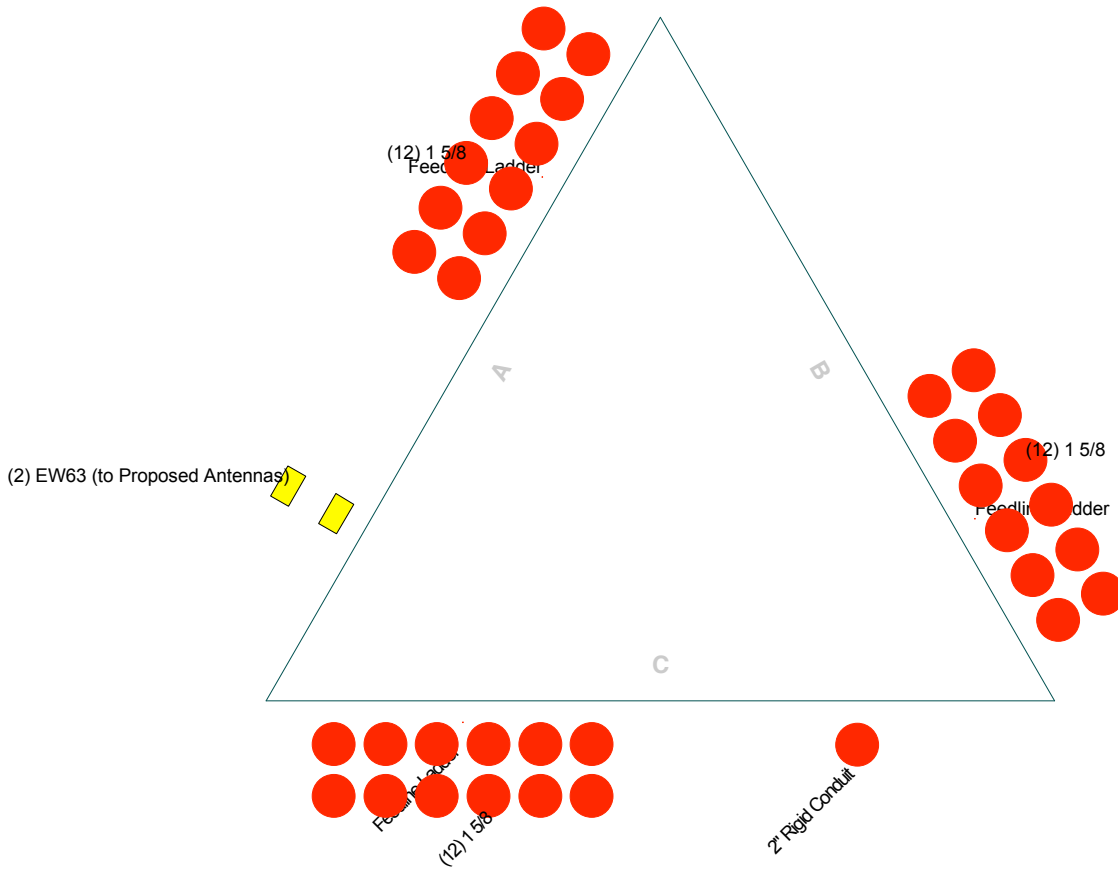


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Project: <b>Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas</b>			
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS	
Path:		Dwg No. E-7	

# Feedline Plan

— Round   
 — Flat   
 — App In Face   
 — App Out Face



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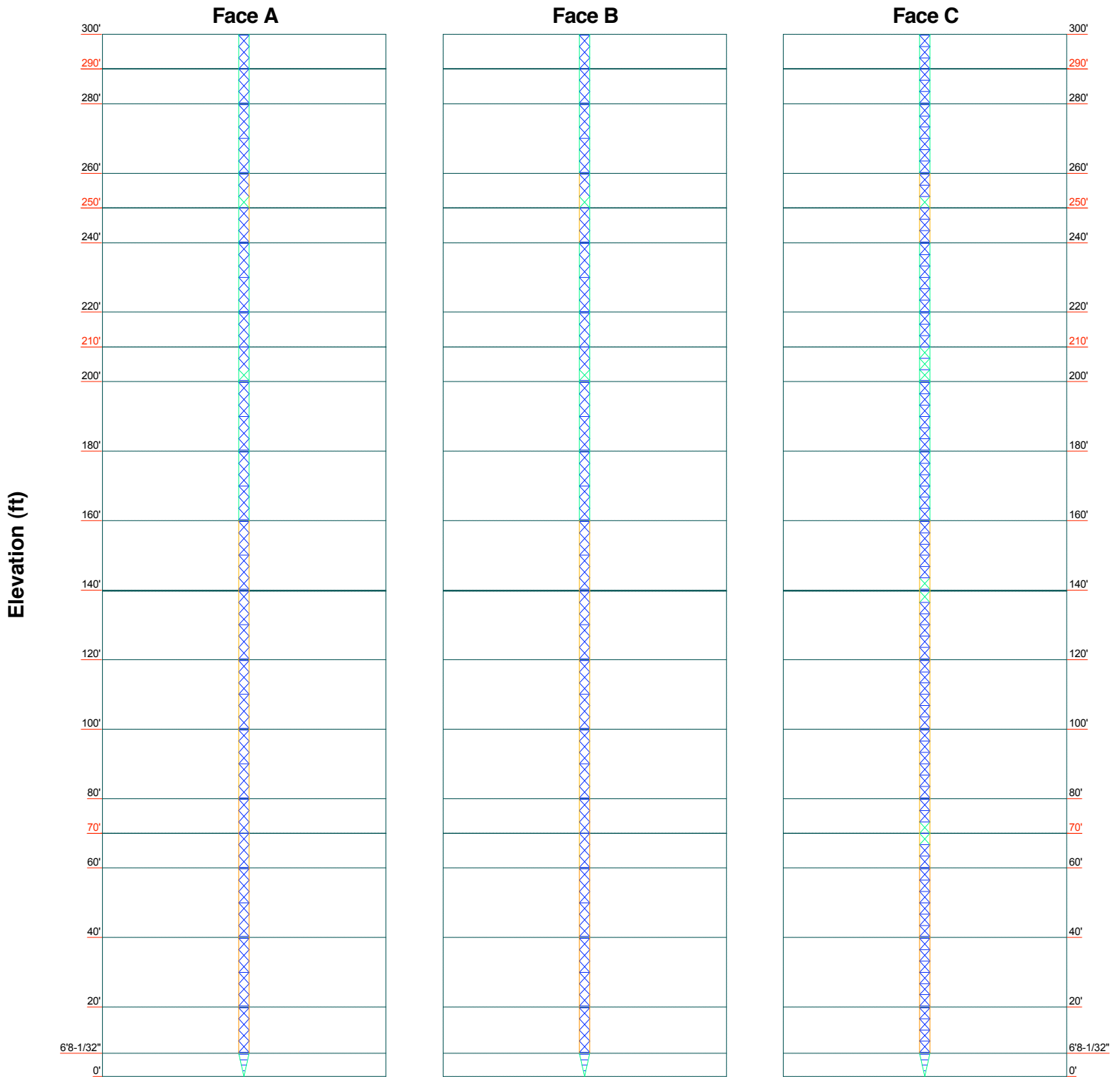
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<b>Job: Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</b>			
Project: <b>Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas</b>			
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS	
Path:	Dwg No. E-7		

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# Stress Distribution Chart 0' - 300'

■ > 100%  
 ■ 90%-100%  
 ■ 75%-90%  
 ■ 50%-75%  
 ■ < 50% Overstress



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<b>Job: Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</b>		
Project: <b>Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas</b>		
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
Path:		Dwg No. E-8

C:\Documents and Settings\grayhodge\HODGEDESIGN\000\My Documents\ERTower Project Data Files\Sample Reports\Sample-CT-R2.rvt

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 1 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b> 12:43:27 07/23/04</p>
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## Tower Input Data

The main tower is a 3x guyed tower with an overall height of 300' above the ground line.

The base of the tower is set at an elevation of 0' above the ground line.

The face width of the tower is 3' at the top and tapered at the base.

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

The following design criteria apply:

Tower is located in Henderson County, Kentucky.

Basic wind speed of 70 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 61 mph is used in combination with ice.

Temperature drop of 75 °F.

Deflections calculated using a wind speed of 50 mph.

See Sheet E-7 for Feedlines and Linear Appurtenances..

See Sheet E-8 for Code Check/Stress Distribution..

Pressures are calculated at each section.

Safety factor used in guy design is 2.

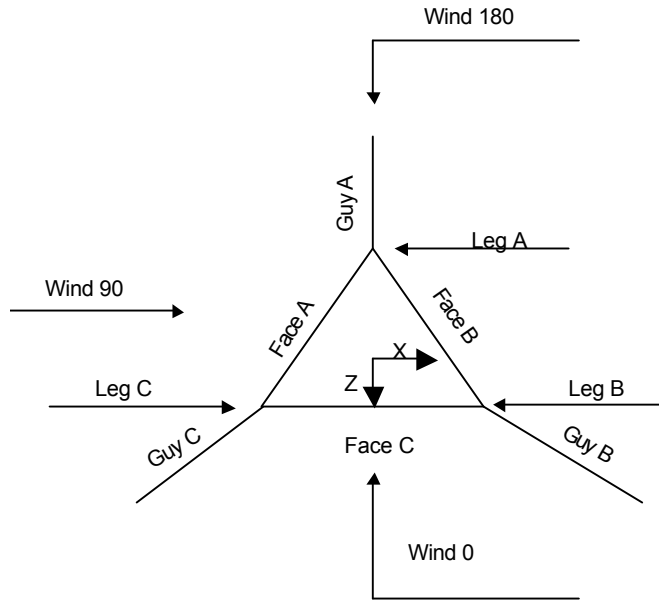
Stress ratio used in tower member design is 1.333.

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

## Options

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>v Use Code Stress Ratios</li> <li>v Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>v Include Bolts In Member Capacity</li> <li>v Leg Bolts Are At Top Of Section</li> <li>v Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>Add IBC .6D+W Combination</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>v Assume Rigid Index Plate</li> <li>v Use Clear Spans For Wind Area</li> <li>v Use Clear Spans For KL/r</li> <li>v Retension Guys To Initial Tension</li> <li>Bypass Mast Stability Checks</li> <li>v Use Azimuth Dish Coefficients</li> <li>v Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>v SR Members Have Cut Ends</li> <li>v Sort Capacity Reports By Component</li> <li>v Triangulate Diamond Inner Bracing</li> </ul> | <ul style="list-style-type: none"> <li>v Treat Feedline Bundles As Cylinder</li> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>v Calculate Redundant Bracing Forces</li> <li>v Ignore Redundant Members in FEA</li> <li>v SR Leg Bolts Resist Compression</li> <li>v All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>v Consider Feedline Torque</li> <li>v Include Angle Block Shear Check</li> <li style="text-align: center;">Poles</li> <li>v Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul> |
|--|--|---|

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**Corner & Starmount Guyed Tower**

**Tower Section Geometry**

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	300'-280'			3'	1	20'
T2	280'-260'			3'	1	20'
T3	260'-240'			3'	1	20'
T4	240'-220'			3'	1	20'
T5	220'-200'			3'	1	20'
T6	200'-180'			3'	1	20'
T7	180'-160'			3'	1	20'
T8	160'-140'			3'	1	20'
T9	140'-120'			3'	1	20'
T10	120'-100'			3'	1	20'
T11	100'-80'			3'	1	20'
T12	80'-60'			3'	1	20'
T13	60'-40'			3'	1	20'
T14	40'-20'			3'	1	20'
T15	20'-6'8-1/32"			3'	1	13'3-31/32"
T16	6'8-1/32"-0'			3'	1	6'8-1/32"

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>3 of 34</p>
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	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

### Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	300'-280'	3'3"	X Brace	No	Steps	3.0000	3.0000
T2	280'-260'	3'3"	X Brace	No	Steps	3.0000	3.0000
T3	260'-240'	3'3"	X Brace	No	Steps	3.0000	3.0000
T4	240'-220'	3'3"	X Brace	No	Steps	3.0000	3.0000
T5	220'-200'	3'3"	X Brace	No	Steps	3.0000	3.0000
T6	200'-180'	3'3"	X Brace	No	Steps	3.0000	3.0000
T7	180'-160'	3'3"	X Brace	No	Steps	3.0000	3.0000
T8	160'-140'	3'3"	X Brace	No	Steps	3.0000	3.0000
T9	140'-120'	3'3"	X Brace	No	Steps	3.0000	3.0000
T10	120'-100'	3'3"	X Brace	No	Steps	3.0000	3.0000
T11	100'-80'	3'3"	X Brace	No	Steps	3.0000	3.0000
T12	80'-60'	3'3"	X Brace	No	Steps	3.0000	3.0000
T13	60'-40'	3'3"	X Brace	No	Steps	3.0000	3.0000
T14	40'-20'	3'3"	X Brace	No	Steps	3.0000	3.0000
T15	20'-6'-8-1/32"	3'-2-17/32"	X Brace	No	Steps	3.0000	3.0000
T16	6'-8-1/32"-0'	1'-7-3/16"	X Brace	No	Yes	3.0000	0.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 300'-280'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 280'-260'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T3 260'-240'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T4 240'-220'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 220'-200'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 200'-180'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 180'-160'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 160'-140'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 140'-120'	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 120'-100'	Solid Round	1 5/8	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T11 100'-80'	Solid Round	1 5/8	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T12 80'-60'	Solid Round	1 5/8	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T13 60'-40'	Solid Round	1 5/8	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T14 40'-20'	Solid Round	1 5/8	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T15 20'-6'-8-1/32"	Solid Round	1 5/8	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T16 6'-8-1/32"-0'	Solid Round	1 5/8	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 4 of 34</p>
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Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(50 ksi)			(36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 300'-280'	Solid Round	3/4	A36 (36 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 280'-260'	Solid Round	3/4	A36 (36 ksi)	Solid Round	3/4	A36 (36 ksi)
T3 260'-240'	Solid Round	3/4	A36 (36 ksi)	Solid Round	3/4	A36 (36 ksi)
T4 240'-220'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 220'-200'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 200'-180'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 180'-160'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 160'-140'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 140'-120'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 120'-100'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T11 100'-80'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T12 80'-60'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T13 60'-40'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T14 40'-20'	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T15 20'-6'8-1/32"	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T16 6'8-1/32"-0'	Channel	C12x20.7	A36 (36 ksi)	Solid Round		A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 300'-280'	1	Solid Round	3/4	A36 (36 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 280'-260'	1	Solid Round	3/4	A36 (36 ksi)	Solid Round	3/4	A36 (36 ksi)
T3 260'-240'	1	Solid Round	3/4	A36	Solid Round	3/4	A36

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Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T4 240'-220'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T5 220'-200'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T6 200'-180'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T7 180'-160'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T8 160'-140'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T9 140'-120'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T10 120'-100'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T11 100'-80'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T12 80'-60'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T13 60'-40'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T14 40'-20'	1	Solid Round	5/8	(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T15 20'-6'8-1/32"	None	Solid Round		(36 ksi) A36	Solid Round	5/8	(36 ksi) A36
T16 6'8-1/32"-0'	None	Solid Round		(36 ksi) A36	Channel	C12x20.7	(36 ksi) A36

### Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 300'-280'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T2 280'-260'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T3 260'-240'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T4 240'-220'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T5 220'-200'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T6 200'-180'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T7 180'-160'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T8 160'-140'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T9 140'-120'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T10 120'-100'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000



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	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
ft	ft <sup>2</sup>	in						
T11 100'-80'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T12 80'-60'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T13 60'-40'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T14 40'-20'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T15 20'-6'8-1/32"	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000
T16 6'8-1/32"-0'	0.00	0.0000	A36 (36 ksi)	1.01	1.05	1.01	36.0000	36.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors <sup>1</sup>							
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
											X
ft			X	X	X	X	X	X	X	X	
T1 300'-280'	No	Yes	1	1	1	1	1	1	1	1	1
T2 280'-260'	No	Yes	1	1	1	1	1	1	1	1	1
T3 260'-240'	No	Yes	1	1	1	1	1	1	1	1	1
T4 240'-220'	No	Yes	1	1	1	1	1	1	1	1	1
T5 220'-200'	No	Yes	1	1	1	1	1	1	1	1	1
T6 200'-180'	No	Yes	1	1	1	1	1	1	1	1	1
T7 180'-160'	No	Yes	1	1	1	1	1	1	1	1	1
T8 160'-140'	No	Yes	1	1	1	1	1	1	1	1	1
T9 140'-120'	No	Yes	1	1	1	1	1	1	1	1	1
T10 120'-100'	No	Yes	1	1	1	1	1	1	1	1	1
T11 100'-80'	No	Yes	1	1	1	1	1	1	1	1	1
T12 80'-60'	No	Yes	1	1	1	1	1	1	1	1	1
T13 60'-40'	No	Yes	1	1	1	1	1	1	1	1	1
T14 40'-20'	No	Yes	1	1	1	1	1	1	1	1	1
T15 20'-6'8-1/32"	No	Yes	1	1	1	1	1	1	1	1	1
T16 6'8-1/32"-0'	No	No	1	1	1	1	1	1	1	1	1

<sup>1</sup>Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

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**Tower Section Geometry (cont'd)**

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 300'-280'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 280'-260'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 260'-240'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 240'-220'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 220'-200'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 200'-180'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 180'-160'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 160'-140'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 140'-120'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 120'-100'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 100'-80'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 80'-60'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 60'-40'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40'-20'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 20'-6'-8-1/32"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 6'-8-1/32"-0'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

**Guy Data**

Guy Elevation ft	Guy Grade	Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L <sub>u</sub> ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %	
290	EHS	A	5/8	4.24	10%	21000	0.813	375'3/8"	240'	0.0000	0'	100%
		B	5/8	4.24	10%	21000	0.813	375'3/8"	240'	0.0000	0'	100%
		C	5/8	4.24	10%	21000	0.813	375'3/8"	240'	0.0000	0'	100%
250	EHS	A	1/2	2.69	10%	21000	0.517	345'31/32"	240'	0.0000	0'	100%
		B	1/2	2.69	10%	21000	0.517	345'31/32"	240'	0.0000	0'	100%
		C	1/2	2.69	10%	21000	0.517	345'31/32"	240'	0.0000	0'	100%
210	EHS	A	1/2	2.69	10%	21000	0.517	317'4-3/16"	240'	0.0000	0'	100%
		B	1/2	2.69	10%	21000	0.517	317'4-3/16"	240'	0.0000	0'	100%
		C	1/2	2.69	10%	21000	0.517	317'4-3/16"	240'	0.0000	0'	100%
139.75	EHS	A	7/16	2.08	10%	21000	0.399	276'1/8"	240'	0.0000	0'	100%
		B	7/16	2.08	10%	21000	0.399	276'1/8"	240'	0.0000	0'	100%
		C	7/16	2.08	10%	21000	0.399	276'1/8"	240'	0.0000	0'	100%
70	EHS	A	7/16	2.08	10%	21000	0.399	248'1-11/16"	240'	0.0000	0'	100%
		B	7/16	2.08	10%	21000	0.399	248'1-11/16"	240'	0.0000	0'	100%
		C	7/16	2.08	10%	21000	0.399	248'1-11/16"	240'	0.0000	0'	100%

**Guy Data (cont'd)**



<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 9 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b> 12:43:27 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm		Pull Off		Diagonal	
			K <sub>x</sub>	K <sub>y</sub>	K <sub>x</sub>	K <sub>y</sub>	K <sub>x</sub>	K <sub>y</sub>
290	No	No			1	1	1	1
250	No	No			1	1	1	1
210	No	No			1	1	1	1
139.75	No	No			1	1	1	1
70	No	No			1	1	1	1

**Guy Data (cont'd)**

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
290	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
250	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
210	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
139.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
70	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

**Guy Pressures**

Guy Elevation ft	Guy Location	z ft	q <sub>z</sub> psf	q <sub>z</sub> Ice psf	Ice Thickness in
290	A	145'	19	14	0.5000
	B	145'	19	14	0.5000
	C	145'	19	14	0.5000
250	A	125'	18	14	0.5000
	B	125'	18	14	0.5000
	C	125'	18	14	0.5000
210	A	105'	17	13	0.5000
	B	105'	17	13	0.5000
	C	105'	17	13	0.5000
139.75	A	69'10-9/16"	16	12	0.5000
	B	69'10-9/16"	16	12	0.5000
	C	69'10-9/16"	16	12	0.5000
70	A	35'	13	10	0.5000
	B	35'	13	10	0.5000
	C	35'	13	10	0.5000

**Feed Line/Linear Appurtenances - Entered As Round Or Flat**

# ERITower

Hodge Design Associates, P.C.  
22 Chestnut Street

Evansville, Indiana 47713-1022  
Phone: 812.422.2558  
FAX: 812.422.3337

**Job**  
Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)

**Page**  
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**Project**  
Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas

**Date**  
12:43:27 07/23/04

**Client**  
ABC Towers and Tower Maintenance

**Designed by**  
Gray Hodge

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Feedline Ladder	A	Yes	Ar (CfAe)	10' - 10'	1.0000	0.25	1	1	1.5000	0.0000		0.01
Feedline Ladder	B	Yes	Ar (CfAe)	10' - 10'	1.0000	0.25	1	1	1.5000	0.0000		0.01
Feedline Ladder	C	Yes	Ar (CfAe)	10' - 10'	1.0000	0.25	1	1	1.5000	0.0000		0.01
2" Rigid Conduit	C	Yes	Ar (CfAe)	300' - 10'	1.0000	-0.25	1	1	2.0000	2.0000		0.00
1 5/8	A	Yes	Ar (CfAe)	300' - 10'	1.0000	0.25	12	6	0.3750	1.9800		0.00
1 5/8	B	Yes	Ar (CfAe)	280' - 10'	1.0000	0.25	12	6	0.3750	1.9800		0.00
1 5/8	C	Yes	Ar (CfAe)	260' - 10'	1.0000	0.25	12	6	0.3750	1.9800		0.00
EW63	A	Yes	Af (CfAe)	200' - 10'	1.0000	-0.25	2	1	1.5742	1.5742	5.0668	0.00

(to Proposed Antennas)

## Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
T1	300'-280'	A	23.314	0.000	0.000	0.000	0.25
		B	0.000	0.000	0.000	0.000	0.00
		C	3.333	0.000	0.000	0.000	0.06
T2	280'-260'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	3.333	0.000	0.000	0.000	0.06
T3	260'-240'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T4	240'-220'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T5	220'-200'	A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T6	200'-180'	A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T7	180'-160'	A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T8	160'-140'	A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T9	140'-120'	A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T10	120'-100'	A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T11	100'-80'	A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T12	80'-60'	A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
T13	60'-40'	A	23.314	5.247	0.000	0.000	0.27

Tower Section	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
T14	40'-20'	B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
T15	20'-6'8-1/32"	B	23.314	0.000	0.000	0.000	0.25
		C	26.647	0.000	0.000	0.000	0.31
		A	11.657	2.624	0.000	0.000	0.14
T16	6'8-1/32"-0'	B	11.657	0.000	0.000	0.000	0.12
		C	13.323	0.000	0.000	0.000	0.15
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

**Feed Line/Linear Appurtenances Section Areas - With Ice**

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
T1	300'-280'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		0.000	0.000	0.000	0.000	0.00
		C		5.000	0.000	0.000	0.000	0.09
T2	280'-260'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		5.000	0.000	0.000	0.000	0.09
T3	260'-240'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T4	240'-220'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T5	220'-200'	A	0.500	4.967	20.014	0.000	0.000	0.56
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T6	200'-180'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T7	180'-160'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T8	160'-140'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T9	140'-120'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T10	120'-100'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T11	100'-80'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T12	80'-60'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T13	60'-40'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
		C		9.967	20.014	0.000	0.000	0.65
T14	40'-20'	A	0.500	4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>12 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b></p> <p>12:43:27 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ $ft^2$	$A_F$ $ft^2$	$C_{AA}$ In Face $ft^2$	$C_{AA}$ Out Face $ft^2$	Weight K
T15	20'-6'-1/32"	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		2.483	13.742	0.000	0.000	0.32
		B		2.483	10.007	0.000	0.000	0.28
T16	6'-8'-1/32"-0'	C	0.500	4.983	10.007	0.000	0.000	0.32
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

### Feed Line Shielding

Section	Elevation ft	Face	$A_R$ $ft^2$	$A_R$ Ice $ft^2$	$A_F$ $ft^2$	$A_F$ Ice $ft^2$
T1	300'-280'	A	1.362	3.811	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.271	0.921	0.000	0.000
T2	280'-260'	A	1.280	3.710	0.000	0.000
		B	1.280	3.710	0.000	0.000
		C	0.257	0.900	0.000	0.000
T3	260'-240'	A	1.301	3.736	0.000	0.000
		B	1.301	3.736	0.000	0.000
		C	1.809	5.359	0.000	0.000
T4	240'-220'	A	1.067	3.445	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T5	220'-200'	A	1.159	3.559	0.000	0.000
		B	1.159	3.559	0.000	0.000
		C	1.595	5.084	0.000	0.000
T6	200'-180'	A	1.208	4.046	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T7	180'-160'	A	1.208	4.046	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T8	160'-140'	A	1.243	4.091	0.000	0.000
		B	1.097	3.483	0.000	0.000
		C	1.523	4.993	0.000	0.000
T9	140'-120'	A	1.278	4.136	0.000	0.000
		B	1.128	3.522	0.000	0.000
		C	1.559	5.039	0.000	0.000
T10	120'-100'	A	1.208	4.046	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T11	100'-80'	A	1.208	4.046	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T12	80'-60'	A	1.312	4.180	0.000	0.000
		B	1.159	3.559	0.000	0.000
		C	1.595	5.084	0.000	0.000
T13	60'-40'	A	1.208	4.046	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T14	40'-20'	A	1.208	4.046	0.000	0.000
		B	1.067	3.445	0.000	0.000
		C	1.488	4.947	0.000	0.000
T15	20'-6'-1/32"	A	0.601	2.011	0.000	0.000
		B	0.530	1.712	0.000	0.000

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 13 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b> 12:43:27 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Section	Elevation	Face	$A_R$	$A_{R, Ice}$	$A_F$	$A_{F, Ice}$
	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>
T16	6'8"-1/32"-0'	C	0.755	2.511	0.000	0.000
		A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

### Feed Line Center of Pressure

Section	Elevation	$CP_x$	$CP_z$	$CP_x, Ice$	$CP_z, Ice$
	ft	in	in	in	in
T1	300'-280'	-2.4351	-5.2242	-0.9915	-2.2818
T2	280'-260'	2.9988	-3.4587	1.8007	-1.6696
T3	260'-240'	0.3072	0.3570	0.3531	0.3344
T4	240'-220'	0.3043	0.3646	0.3512	0.3439
T5	220'-200'	0.3012	0.3607	0.3482	0.3403
T6	200'-180'	-0.4944	0.4071	-0.5020	0.3902
T7	180'-160'	-0.4944	0.4071	-0.5020	0.3902
T8	160'-140'	-0.4934	0.4057	-0.5011	0.3890
T9	140'-120'	-0.4924	0.4043	-0.5003	0.3877
T10	120'-100'	-0.5006	0.4121	-0.5067	0.3939
T11	100'-80'	-0.5006	0.4121	-0.5067	0.3939
T12	80'-60'	-0.4975	0.4080	-0.5041	0.3901
T13	60'-40'	-0.5006	0.4121	-0.5067	0.3939
T14	40'-20'	-0.5006	0.4121	-0.5067	0.3939
T15	20'-6'8"-1/32"	-0.4577	0.3747	-0.4403	0.3366
T16	6'8"-1/32"-0'	0.0000	0.0000	0.0000	0.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	$C_{AA, Front}$	$C_{AA, Side}$	Weight	
			Horz Lateral	Vert						ft
See E-7 for Feedlines and Linear Appurtenances	C	None			0.0000	0'	No Ice 0.00 1/2" Ice 0.00	0.00	0.00	0.00
Lighting - Beacon	C	None			0.0000	300'	No Ice 2.70 1/2" Ice 3.10	2.70	3.10	0.05
Lighting - Dual Obstruction	C	None			0.0000	200'	No Ice 2.70 1/2" Ice 3.60	2.70	3.60	0.05
Lighting - Dual Obstruction	C	None			0.0000	100'	No Ice 2.70 1/2" Ice 3.60	2.70	3.60	0.05
Lightning Rod 6'	C	From Leg	0.00	0'	0.0000	300'	No Ice 2.09 1/2" Ice 2.46	2.09	2.46	0.08
(4) DB858DDH65E-SX	A	From Leg	3.50	0'	0.0000	295'	No Ice 11.54 1/2" Ice 12.16	6.14	6.73	0.04
12' T-Frame Sector Mount	A	From Leg	3.50	0'	0.0000	295'	No Ice 13.60 1/2" Ice 18.40	13.60	18.40	0.47



<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 14 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b> 12:43:27 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert	Lateral						°
(4) DB858DDH65E-SX	B	From Leg	3.50	0'	0'	0.0000	295'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	B	From Leg	3.50	0'	0'	0.0000	295'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	C	From Leg	3.50	0'	0'	0.0000	295'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	C	From Leg	3.50	0'	0'	0.0000	295'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	A	From Leg	3.50	0'	0'	0.0000	280'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	A	From Leg	3.50	0'	0'	0.0000	280'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	B	From Leg	3.50	0'	0'	0.0000	280'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	B	From Leg	3.50	0'	0'	0.0000	280'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	C	From Leg	3.50	0'	0'	0.0000	280'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	C	From Leg	3.50	0'	0'	0.0000	280'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	A	From Leg	3.50	0'	0'	0.0000	260'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	A	From Leg	3.50	0'	0'	0.0000	260'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	B	From Leg	3.50	0'	0'	0.0000	260'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	B	From Leg	3.50	0'	0'	0.0000	260'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	C	From Leg	3.50	0'	0'	0.0000	260'	No Ice 1/2" Ice	11.54 12.16	6.14 6.73	0.04 0.10
12' T-Frame Sector Mount	C	From Leg	3.50	0'	0'	0.0000	260'	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60

**Dishes**

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>15 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b></p> <p>12:43:27 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				ft	°	°	ft	ft	ft <sup>2</sup>	K	
UHX8-59 (Proposed)	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0' 0'	0.0000		200'	8.00	No Ice 1/2" Ice	50.26 51.29	0.25 0.51
UHX8-59 (Proposed)	C	Paraboloid w/Shroud (HP)	From Face	1.00 0' 0'	0.0000		200'	8.00	No Ice 1/2" Ice	50.26 51.29	0.25 0.51

## Load Combinations

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

## Maximum Reactions

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>16 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b></p> <p>12:43:27 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K	
Mast	Max. Vert	15	111.82	-0.00	0.38	
	Max. H <sub>x</sub>	12	71.52	0.57	0.20	
	Max. H <sub>z</sub>	15	111.82	-0.00	0.38	
	Max. M <sub>x</sub>	1	0.00	0.00	0.02	
	Max. M <sub>z</sub>	1	0.00	0.00	0.02	
	Max. Torsion	26	0.28	0.20	0.33	
	Min. Vert	1	55.84	0.00	0.02	
	Min. H <sub>x</sub>	4	71.52	-0.57	0.20	
	Min. H <sub>z</sub>	8	71.73	0.00	-0.53	
	Min. M <sub>x</sub>	1	0.00	0.00	0.02	
	Min. M <sub>z</sub>	1	0.00	0.00	0.02	
	Min. Torsion	20	-0.24	-0.27	-0.30	
	Guy C @ 240 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.52	-0.76	0.44
		Max. H <sub>x</sub>	10	-0.52	-0.76	0.44
Max. H <sub>z</sub>		17	-34.00	-35.66	20.61	
Min. Vert		17	-34.00	-35.66	20.61	
Min. H <sub>x</sub>		17	-34.00	-35.66	20.61	
Min. H <sub>z</sub>		10	-0.52	-0.76	0.44	
Guy B @ 240 ft Elev 0 ft Azimuth 120 deg		Max. Vert	6	-0.52	0.76	0.44
		Max. H <sub>x</sub>	25	-34.00	35.67	20.61
		Max. H <sub>z</sub>	25	-34.00	35.67	20.61
		Min. Vert	25	-34.00	35.67	20.61
	Min. H <sub>x</sub>	6	-0.52	0.76	0.44	
	Min. H <sub>z</sub>	6	-0.52	0.76	0.44	
Guy A @ 240 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.50	-0.00	-0.86	
	Max. H <sub>x</sub>	24	-18.14	1.74	-22.07	
	Max. H <sub>z</sub>	2	-0.50	-0.00	-0.86	
	Min. Vert	21	-34.45	0.00	-41.77	
	Min. H <sub>x</sub>	18	-18.14	-1.74	-22.07	
	Min. H <sub>z</sub>	21	-34.45	0.00	-41.77	

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	55.84	-0.00	-0.02	-0.00	-0.00	-0.00
Dead+Wind 0 deg - No Ice+Guy	85.02	-0.00	-0.37	-0.00	-0.00	-0.13
Dead+Wind 30 deg - No Ice+Guy	80.88	0.32	-0.30	-0.00	-0.00	-0.07
Dead+Wind 60 deg - No Ice+Guy	71.52	0.57	-0.20	-0.00	-0.00	-0.26
Dead+Wind 90 deg - No Ice+Guy	79.04	0.51	-0.08	-0.00	-0.00	-0.24
Dead+Wind 120 deg - No Ice+Guy	83.61	0.40	0.17	-0.00	-0.00	0.03
Dead+Wind 150 deg - No Ice+Guy	79.66	0.19	0.41	-0.00	-0.00	0.10
Dead+Wind 180 deg - No Ice+Guy	71.73	-0.00	0.53	-0.00	-0.00	0.14

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 17 of 34</p>
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	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead+Wind 210 deg - No Ice+Guy	79.66	-0.19	0.41	-0.00	-0.00	0.13
Dead+Wind 240 deg - No Ice+Guy	83.61	-0.40	0.17	-0.00	-0.00	0.10
Dead+Wind 270 deg - No Ice+Guy	79.04	-0.52	-0.08	-0.00	-0.00	0.24
Dead+Wind 300 deg - No Ice+Guy	71.52	-0.57	-0.20	-0.00	-0.00	0.12
Dead+Wind 330 deg - No Ice+Guy	80.88	-0.32	-0.30	-0.00	-0.00	-0.16
Dead+Ice+Temp+Guy	87.93	0.00	-0.03	-0.00	-0.00	0.00
Dead+Wind 0 deg+Ice+Temp+Guy	111.82	0.00	-0.38	-0.00	-0.00	-0.13
Dead+Wind 30 deg+Ice+Temp+Guy	109.96	0.20	-0.33	-0.00	-0.00	0.08
Dead+Wind 60 deg+Ice+Temp+Guy	107.05	0.37	-0.13	-0.00	-0.00	-0.10
Dead+Wind 90 deg+Ice+Temp+Guy	108.91	0.45	0.02	-0.00	-0.00	-0.19
Dead+Wind 120 deg+Ice+Temp+Guy	110.81	0.39	0.17	-0.00	-0.00	0.10
Dead+Wind 150 deg+Ice+Temp+Guy	109.33	0.27	0.30	-0.00	-0.00	0.24
Dead+Wind 180 deg+Ice+Temp+Guy	107.29	0.00	0.33	-0.00	-0.00	0.11
Dead+Wind 210 deg+Ice+Temp+Guy	109.32	-0.26	0.30	-0.00	-0.00	-0.04
Dead+Wind 240 deg+Ice+Temp+Guy	110.81	-0.39	0.17	-0.00	-0.00	0.02
Dead+Wind 270 deg+Ice+Temp+Guy	108.91	-0.44	0.02	-0.00	-0.00	0.19
Dead+Wind 300 deg+Ice+Temp+Guy	107.05	-0.37	-0.13	-0.00	-0.00	-0.01
Dead+Wind 330 deg+Ice+Temp+Guy	109.96	-0.20	-0.33	-0.00	-0.00	-0.28
Dead+Wind 0 deg - Service+Guy	60.81	-0.00	-0.34	-0.00	-0.00	-0.08
Dead+Wind 30 deg - Service+Guy	60.40	0.18	-0.28	-0.00	-0.00	-0.04
Dead+Wind 60 deg - Service+Guy	59.47	0.31	-0.16	-0.00	-0.00	-0.18
Dead+Wind 90 deg - Service+Guy	59.91	0.35	-0.02	-0.00	-0.00	-0.19
Dead+Wind 120 deg - Service+Guy	60.32	0.32	0.14	-0.00	-0.00	-0.00
Dead+Wind 150 deg - Service+Guy	60.10	0.18	0.26	-0.00	-0.00	0.06
Dead+Wind 180 deg - Service+Guy	59.56	-0.00	0.31	-0.00	-0.00	0.08
Dead+Wind 210 deg - Service+Guy	60.09	-0.18	0.26	-0.00	-0.00	0.08
Dead+Wind 240 deg - Service+Guy	60.32	-0.32	0.14	-0.00	-0.00	0.09
Dead+Wind 270 deg - Service+Guy	59.91	-0.35	-0.02	-0.00	-0.00	0.19
Dead+Wind 300 deg - Service+Guy	59.47	-0.31	-0.16	-0.00	-0.00	0.10
Dead+Wind 330 deg - Service+Guy	60.40	-0.18	-0.28	-0.00	-0.00	-0.09

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 18 of 34
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## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-30.64	0.00	-0.00	30.64	0.00	0.002%
2	0.00	-30.82	-31.51	0.00	30.82	31.50	0.019%
3	14.78	-30.64	-27.27	-14.78	30.64	27.26	0.019%
4	25.63	-30.46	-16.17	-25.63	30.46	16.17	0.000%
5	30.05	-30.64	0.00	-30.04	30.64	0.00	0.016%
6	25.95	-30.82	16.35	-25.94	30.82	-16.35	0.017%
7	14.78	-30.64	27.27	-14.77	30.64	-27.27	0.005%
8	0.00	-30.46	31.14	0.00	30.46	-31.14	0.000%
9	-14.78	-30.64	27.27	14.78	30.64	-27.27	0.004%
10	-25.95	-30.82	16.35	25.94	30.82	-16.35	0.017%
11	-30.05	-30.64	0.00	30.04	30.64	0.00	0.016%
12	-25.63	-30.46	-16.17	25.63	30.46	16.17	0.001%
13	-14.78	-30.64	-27.27	14.78	30.64	27.26	0.019%
14	0.00	-54.50	0.00	-0.00	54.50	0.00	0.001%
15	0.00	-54.90	-34.43	0.00	54.90	34.43	0.011%
16	15.83	-54.50	-28.70	-15.83	54.50	28.69	0.010%
17	27.09	-54.10	-16.69	-27.09	54.10	16.68	0.004%
18	32.03	-54.50	0.00	-32.03	54.50	0.00	0.008%
19	28.79	-54.90	17.67	-28.79	54.90	-17.67	0.010%
20	15.83	-54.50	28.70	-15.83	54.50	-28.69	0.001%
21	0.00	-54.10	32.46	-0.00	54.10	-32.46	0.000%
22	-15.83	-54.50	28.70	15.83	54.50	-28.69	0.001%
23	-28.79	-54.90	17.67	28.79	54.90	-17.67	0.010%
24	-32.03	-54.50	0.00	32.03	54.50	0.00	0.008%
25	-27.09	-54.10	-16.69	27.09	54.10	16.68	0.005%
26	-15.83	-54.50	-28.70	15.83	54.50	28.69	0.010%
27	0.00	-30.73	-16.08	0.00	30.73	16.08	0.004%
28	7.54	-30.64	-13.91	-7.54	30.64	13.91	0.004%
29	13.08	-30.55	-8.25	-13.08	30.55	8.25	0.007%
30	15.33	-30.64	0.00	-15.33	30.64	0.00	0.007%
31	13.24	-30.73	8.34	-13.24	30.73	-8.34	0.006%
32	7.54	-30.64	13.91	-7.54	30.64	-13.91	0.006%
33	0.00	-30.55	15.89	0.00	30.55	-15.89	0.001%
34	-7.54	-30.64	13.91	7.54	30.64	-13.91	0.006%
35	-13.24	-30.73	8.34	13.24	30.73	-8.34	0.006%
36	-15.33	-30.64	0.00	15.33	30.64	0.00	0.007%
37	-13.08	-30.55	-8.25	13.08	30.55	8.25	0.007%
38	-7.54	-30.64	-13.91	7.54	30.64	13.91	0.004%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	8	0.00000001	0.00006201
2	Yes	31	0.00013202	0.00013161
3	Yes	30	0.00014715	0.00013574
4	Yes	41	0.00006554	0.00014788
5	Yes	30	0.00013542	0.00013039
6	Yes	31	0.00012409	0.00012290
7	Yes	34	0.00005483	0.00014526
8	Yes	32	0.00008521	0.00014215
9	Yes	35	0.00004432	0.00013235

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>19 of 34</p>
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10	Yes	31	0.00012415	0.00012311
11	Yes	30	0.00013549	0.00013047
12	Yes	43	0.00007940	0.00000000
13	Yes	30	0.00014730	0.00013577
14	Yes	11	0.00015000	0.00002365
15	Yes	32	0.00013157	0.00010977
16	Yes	30	0.00014184	0.00010724
17	Yes	27	0.00007300	0.00010626
18	Yes	30	0.00012244	0.00012002
19	Yes	32	0.00012565	0.00010730
20	Yes	38	0.00000001	0.00013073
21	Yes	30	0.00004449	0.00013128
22	Yes	38	0.00000001	0.00014398
23	Yes	32	0.00012582	0.00010760
24	Yes	30	0.00012276	0.00012036
25	Yes	26	0.00009489	0.00013039
26	Yes	30	0.00014197	0.00010731
27	Yes	28	0.00011536	0.00013918
28	Yes	26	0.00014045	0.00012304
29	Yes	19	0.00011371	0.00005895
30	Yes	23	0.00013469	0.00005761
31	Yes	26	0.00010892	0.00005096
32	Yes	24	0.00009883	0.00004749
33	Yes	13	0.00000001	0.00007860
34	Yes	24	0.00009893	0.00004747
35	Yes	26	0.00010913	0.00005141
36	Yes	23	0.00013460	0.00005759
37	Yes	19	0.00011364	0.00005895
38	Yes	26	0.00013982	0.00012080

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	9.967	27	0.1967	0.4767
T2	280 - 260	9.354	27	0.2102	0.4743
T3	260 - 240	8.498	27	0.2885	0.4608
T4	240 - 220	7.496	27	0.2651	0.4451
T5	220 - 200	6.654	27	0.2174	0.4297
T6	200 - 180	6.029	27	0.1483	0.4189
T7	180 - 160	5.400	27	0.1676	0.3831
T8	160 - 140	4.630	27	0.1891	0.3481
T9	140 - 120	3.843	27	0.1610	0.3167
T10	120 - 100	3.266	27	0.1306	0.2890
T11	100 - 80	2.724	27	0.1346	0.2611
T12	80 - 60	2.141	27	0.1343	0.2346
T13	60 - 40	1.677	35	0.1068	0.2123
T14	40 - 20	1.259	35	0.1168	0.1900
T15	20 - 6.66667	0.699	35	0.1517	0.1691
T16	6.66667 - 0	0.242	35	0.1687	0.1560

### Critical Deflections and Radius of Curvature - Service Wind

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 20 of 34
	<b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas	<b>Date</b> 12:43:27 07/23/04
	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
300'	Lighting - Beacon	27	9.967	0.1967	0.4767	56369
295'	(4) DB858DDH65E-SX	27	9.826	0.1944	0.4767	56369
290'	Guy	27	9.680	0.1944	0.4765	28184
280'	(4) DB858DDH65E-SX	27	9.354	0.2102	0.4743	14889
260'	(4) DB858DDH65E-SX	27	8.498	0.2885	0.4608	20905
250'	Guy	27	7.995	0.2873	0.4531	173844
210'	Guy	27	6.326	0.1803	0.4259	18546
200'	UHX8-59	27	6.029	0.1483	0.4189	28380
139'9"	Guy	27	3.834	0.1605	0.3163	15328
100'	Lighting - Dual Obstruction	27	2.724	0.1346	0.2611	43043
70'	Guy	35	1.888	0.1200	0.2232	43928
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.1687	0.1560	85974

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	32.712	6	0.7330	0.6383
T2	280 - 260	30.078	2	0.7606	0.6369
T3	260 - 240	26.988	2	0.9112	0.6171
T4	240 - 220	23.610	2	0.8529	0.5947
T5	220 - 200	20.584	2	0.7412	0.5780
T6	200 - 180	18.073	2	0.5847	0.5701
T7	180 - 160	15.666	2	0.5950	0.5154
T8	160 - 140	13.102	2	0.6072	0.4627
T9	140 - 120	10.633	2	0.5203	0.4165
T10	120 - 100	8.713	2	0.4280	0.3783
T11	100 - 80	7.008	2	0.4001	0.3429
T12	80 - 60	5.365	2	0.3681	0.3076
T13	60 - 40	4.039	23	0.2895	0.2944
T14	40 - 20	3.019	19	0.2936	0.2727
T15	20 - 6.66667	1.670	19	0.3641	0.2482
T16	6.66667 - 0	0.578	19	0.4027	0.2309

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
300'	Lighting - Beacon	6	32.712	0.7330	0.6383	28873
295'	(4) DB858DDH65E-SX	2	32.055	0.7289	0.6391	28873
290'	Guy	2	31.419	0.7291	0.6394	14436
280'	(4) DB858DDH65E-SX	2	30.078	0.7606	0.6369	7627
260'	(4) DB858DDH65E-SX	2	26.988	0.9112	0.6171	9457
250'	Guy	2	25.294	0.9036	0.6058	29952
210'	Guy	2	19.285	0.6574	0.5772	8151
200'	UHX8-59	2	18.073	0.5847	0.5701	11147
139'9"	Guy	2	10.606	0.5190	0.4159	6599
100'	Lighting - Dual Obstruction	2	7.008	0.4001	0.3429	24147
70'	Guy	2	4.643	0.3251	0.3016	14649

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 21 of 34
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	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.1687	0.1560	38417

### Guy Design Data

Section No.	Elevation	Size	Initial Tension	Breaking Load	Actual T	Allowable $T_a$	Required S.F.	Actual S.F.
	ft		K	K	K	K		
T1	290' (A) (782)	5/8 EHS	4.24	42.40	18.37	21.20	2.000	2.308 ✓
	290' (B) (781)	5/8 EHS	4.24	42.40	18.47	21.20	2.000	2.296 ✓
	290' (C) (780)	5/8 EHS	4.24	42.40	18.47	21.20	2.000	2.296 ✓
T3	250' (A) (785)	1/2 EHS	2.69	26.90	12.02	13.45	2.000	2.238 ✓
	250' (B) (784)	1/2 EHS	2.69	26.90	11.84	13.45	2.000	2.272 ✓
	250' (C) (783)	1/2 EHS	2.69	26.90	11.84	13.45	2.000	2.272 ✓
T5	210' (A) (788)	1/2 EHS	2.69	26.90	11.55	13.45	2.000	2.328 ✓
	210' (B) (787)	1/2 EHS	2.69	26.90	11.13	13.45	2.000	2.417 ✓
	210' (C) (786)	1/2 EHS	2.69	26.90	11.12	13.45	2.000	2.418 ✓
T9	139'9" (A) (791)	7/16 EHS	2.08	20.80	7.99	10.40	2.000	2.603 ✓
	139'9" (B) (790)	7/16 EHS	2.08	20.80	7.77	10.40	2.000	2.678 ✓
	139'9" (C) (789)	7/16 EHS	2.08	20.80	7.76	10.40	2.000	2.680 ✓
T12	70' (A) (794)	7/16 EHS	2.08	20.80	6.33	10.40	2.000	3.285 ✓
	70' (B) (793)	7/16 EHS	2.08	20.80	6.33	10.40	2.000	3.285 ✓
	70' (C) (792)	7/16 EHS	2.08	20.80	6.33	10.40	2.000	3.285 ✓

### Compression Checks

### Leg Design Data (Compression)

Section No.	Elevation	Size	L	$L_u$	$Kl/r$	Mast Stability Index	$F_a$	A	Actual P	Allow. $P_a$	Ratio $\frac{P}{P_a}$
	ft		ft	ft			ksi	in <sup>2</sup>	K	K	
T1	300 - 280	1 1/2	20'	3'3"	104.0 K=1.00	1.00	13.767	1.7672	-22.36	24.33	0.919 ✓
T2	280 - 260	1 1/2	20'	3'3"	104.0 K=1.00	1.00	13.767	1.7672	-24.30	24.33	0.999 ✓
T3	260 - 240	1 1/2	20'	3'3"	104.0 K=1.00	1.00	13.767	1.7672	-25.01	24.33	1.028 ✓
T4	240 - 220	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-34.71	41.18	0.843 ✓



<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>22 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b></p> <p>12:43:27 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	Mast Stability Index	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T5	220 - 200	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-40.10	41.18	0.974
T6	200 - 180	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-31.67	41.18	0.769
T7	180 - 160	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-31.32	41.18	0.760
T8	160 - 140	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-44.22	41.18	1.074
T9	140 - 120	1 3/4	20'	3'3"	89.1 K=1.00	1.00	17.122	2.4053	-44.22	41.18	1.074
T10	120 - 100	1 5/8	20'	3'3"	96.0 K=1.00	1.00	15.618	2.0739	-34.79	32.39	1.074
T11	100 - 80	1 5/8	20'	3'3"	96.0 K=1.00	1.00	15.618	2.0739	-36.90	32.39	1.139
T12	80 - 60	1 5/8	20'	3'3"	96.0 K=1.00	1.00	15.618	2.0739	-40.69	32.39	1.256
T13	60 - 40	1 5/8	20'	3'3"	96.0 K=1.00	1.00	15.618	2.0739	-40.36	32.39	1.246
T14	40 - 20	1 5/8	20'	3'3"	96.0 K=1.00	1.00	15.618	2.0739	-42.00	32.39	1.297
T15	20 - 6.66667	1 5/8	13'3- 31/32"	3'2- 17/32"	94.8 K=1.00	1.00	15.894	2.0739	-41.05	32.96	1.245
T16	6.66667 - 0	1 5/8	6'10- 11/16"	1'7- 29/32"	49.0 K=1.00	0.94	22.952	2.0739	-30.30	47.60	0.637*

\* DL controls

### Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	4'5-1/32"	2'1-7/16"	101.7 K=0.75	12.758	0.4418	-2.65	5.64	0.470
T2	280 - 260	3/4	4'5-1/32"	2'1-7/16"	101.7 K=0.75	12.758	0.4418	-1.64	5.64	0.290
T3	260 - 240	3/4	4'5-1/32"	2'1-7/16"	101.7 K=0.75	12.758	0.4418	-3.35	5.64	0.594
T4	240 - 220	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.74	3.10	0.560
T5	220 - 200	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-2.41	3.10	0.777
T6	200 - 180	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.79	3.10	0.578
T7	180 - 160	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.31	3.10	0.423
T8	160 - 140	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.68	3.10	0.542

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 23 of 34
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	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T9	140 - 120	5/8	4'5-1/32"	2'1-3/16"	121.2 K=0.75	10.111	0.3068	-1.91	3.10	0.616 ✓
T10	120 - 100	5/8	4'5-1/32"	2'1-5/16"	121.6 K=0.75	10.047	0.3068	-1.25	3.08	0.407* ✓
T11	100 - 80	5/8	4'5-1/32"	2'1-5/16"	121.6 K=0.75	10.047	0.3068	-1.30	3.08	0.422* ✓
T12	80 - 60	5/8	4'5-1/32"	2'1-5/16"	121.6 K=0.75	10.047	0.3068	-1.41	3.08	0.457* ✓
T13	60 - 40	5/8	4'5-1/32"	2'1-5/16"	121.6 K=0.75	10.047	0.3068	-1.44	3.08	0.468* ✓
T14	40 - 20	5/8	4'5-1/32"	2'1-5/16"	121.6 K=0.75	10.047	0.3068	-1.48	3.08	0.481* ✓
T15	20 - 6.66667	5/8	4'-11/16"	2'1-3/16"	120.8 K=0.75	10.169	0.3068	-1.49	3.12	0.477* ✓

\* DL controls

### Guy Lower Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-7/16"	116.3 K=1.00	10.812	0.6013	-2.57	6.50	0.396 ✓
T3	260 - 240	3/4	4'5-1/32"	2'1-7/16"	135.6 K=1.00	8.117	0.4418	-1.56	3.59	0.435 ✓
T5	220 - 200	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-2.84	3.64	0.781 ✓
T9	140 - 120	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-2.85	3.64	0.785 ✓
T12	80 - 60	3/4	4'5-1/32"	2'1-5/16"	135.1 K=1.00	8.176	0.4418	-2.86	3.61	0.792 ✓

### Guy Upper Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-7/16"	116.3 K=1.00	10.812	0.6013	-2.26	6.50	0.348 ✓
T3	260 - 240	3/4	4'5-1/32"	2'1-7/16"	135.6 K=1.00	8.117	0.4418	-3.20	3.59	0.891 ✓
T5	220 - 200	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-2.26	3.64	0.622 ✓
T8	160 - 140	3/4	4'5-1/32"	2'1-3/16"	134.7 K=1.00	8.236	0.4418	-2.74	3.64	0.752 ✓

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 24 of 34
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	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T12	80 - 60	3/4	4'5-1/32"	2'1-5/16"	135.1 K=1.00	8.176	0.4418	-2.68	3.61	0.741 ✓

### Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	3'	2'10-9/16"	128.8 K=0.70	9.002	0.4418	-0.32	3.98	0.081 ✓
T16	6.66667 - 0	C12x20.7	8-5/8"	7-3/32"	19.9 K=1.00	20.603	6.0900	-0.07	125.47	0.001 ✓

### Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	3'	2'10-9/16"	128.8 K=0.70	9.002	0.4418	-0.36	3.98	0.091 ✓
T2	280 - 260	3/4	3'	2'10-9/16"	128.8 K=0.70	9.002	0.4418	-0.01	3.98	0.002 ✓
T3	260 - 240	3/4	3'	2'10-9/16"	128.8 K=0.70	9.002	0.4418	-0.74	3.98	0.186 ✓
T6	200 - 180	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.01	1.95	0.005 ✓

### Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	3'	2'10-9/16"	128.8 K=0.70	9.002	0.4418	-0.67	3.98	0.168 ✓
T4	240 - 220	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.15	1.95	0.077 ✓
T5	220 - 200	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.22	1.95	0.115 ✓
T8	160 - 140	5/8	3'	2'10-3/16"	153.4 K=0.70	6.343	0.3068	-0.03	1.95	0.015 ✓

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 25 of 34
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	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

### Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T2	280 - 260	3/4	3'	2'10-9/16"	128.8 K=0.70	9.002	0.4418	-0.04	3.98	0.010 ✓

### Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	K/l/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	1	3'	2'10-9/16"	138.0 K=1.00	21.600	0.7854	0.00	6.16	0.000*
T3	260 - 240	1	3'	2'10-9/16"	138.0 K=1.00	21.600	0.7854	0.00	6.16	0.000*
T5	220 - 200	1	3'	2'10-3/16"	137.0 K=1.00	21.600	0.7854	0.00	6.25	0.000*
T9	140 - 120	1	3'	2'10-3/16"	137.0 K=1.00	21.600	0.7854	0.00	6.25	0.000*
T12	80 - 60	1	3'	2'10-5/16"	137.5 K=1.00	21.600	0.7854	0.00	6.20	0.000*

\* DL controls

### Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> F <sub>by</sub>
T1	300 - 280	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T3	260 - 240	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T5	220 - 200	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T9	140 - 120	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000
T12	80 - 60	1	0.00	-0.497	27.000	0.018	0.00	0.000	27.000	0.000

### Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio P P <sub>a</sub>	Ratio f <sub>bx</sub> F <sub>bx</sub>	Ratio f <sub>by</sub> F <sub>by</sub>	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	300 - 280	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T3	260 - 240	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T5	220 - 200	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T9	140 - 120	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓
T12	80 - 60	1	0.000	0.018	0.000	0.018* ✓	1.000	H1-3 ✓

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 26 of 34
	<b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas	<b>Date</b> 12:43:27 07/23/04
	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
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\* DL controls

### Tension Checks

### Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio $\frac{P}{P_a}$
T1	300 - 280	1 1/2	20'	3'3"	104.0	30.000	1.7672	4.82	53.01	0.091
T2	280 - 260	1 1/2	20'	3'3"	104.0	30.000	1.7672	4.82	53.01	0.091
T5	220 - 200	1 3/4	20'	3'3"	89.1	30.000	2.4053	4.60	72.16	0.064

### Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio $\frac{P}{P_a}$
T1	300 - 280	3/4	4'5-1/32"	2'1-7/16"	135.6	21.600	0.4418	2.14	9.54	0.224
T2	280 - 260	3/4	4'5-1/32"	2'1-7/16"	135.6	21.600	0.4418	0.80	9.54	0.084
T3	260 - 240	3/4	4'5-1/32"	2'1-7/16"	135.6	21.600	0.4418	2.84	9.54	0.297
T4	240 - 220	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	1.00	6.63	0.151
T5	220 - 200	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	2.23	6.63	0.336
T6	200 - 180	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	0.87	6.63	0.132
T7	180 - 160	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	1.05	6.63	0.158
T8	160 - 140	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	1.57	6.63	0.237
T9	140 - 120	5/8	4'5-1/32"	2'1-3/16"	161.6	21.600	0.3068	1.48	6.63	0.223
T10	120 - 100	5/8	4'5-1/32"	2'1-5/16"	162.2	21.600	0.3068	1.04	6.63	0.157
T11	100 - 80	5/8	4'5-1/32"	2'1-5/16"	162.2	21.600	0.3068	1.10	6.63	0.166
T12	80 - 60	5/8	4'5-1/32"	2'1-5/16"	162.2	21.600	0.3068	1.57	6.63	0.237

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 27 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b> 12:43:27 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T13	60 - 40	5/8	4'5-1/32"	2'1-5/16"	162.2	21.600	0.3068	1.34	6.63	0.203 ✓
T14	40 - 20	5/8	4'5-1/32"	2'1-5/16"	162.2	21.600	0.3068	0.99	6.63	0.149 ✓
T15	20 - 6.66667	5/8	4'4-11/16"	2'1-3/16"	161.1	21.600	0.3068	0.40	6.63	0.060 ✓

### Guy Lower Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-7/16"	116.3	21.600	0.6013	1.96	12.99	0.151 ✓
T5	220 - 200	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	1.65	9.54	0.173 ✓
T9	140 - 120	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	0.39	9.54	0.041 ✓
T12	80 - 60	3/4	4'5-1/32"	2'1-5/16"	135.1	21.600	0.4418	0.25	9.54	0.026 ✓

### Guy Upper Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	7/8	4'5-1/32"	2'1-7/16"	116.3	21.600	0.6013	2.61	12.99	0.201 ✓
T3	260 - 240	3/4	4'5-1/32"	2'1-7/16"	135.6	21.600	0.4418	2.44	9.54	0.256 ✓
T5	220 - 200	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	0.74	9.54	0.077 ✓
T8	160 - 140	3/4	4'5-1/32"	2'1-3/16"	134.7	21.600	0.4418	0.94	9.54	0.099 ✓
T12	80 - 60	3/4	4'5-1/32"	2'1-5/16"	135.1	21.600	0.4418	0.25	9.54	0.026 ✓

### Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	3'	2'10-	184.0	21.600	0.4418	1.52	9.54	0.159

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>28 of 34</p>
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	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T2	280 - 260	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	1.99	9.54	0.208
T3	260 - 240	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	2.16	9.54	0.227
T4	240 - 220	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.19	6.63	0.180
T5	220 - 200	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.69	6.63	0.255
T6	200 - 180	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.08	6.63	0.163*
T7	180 - 160	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.14	6.63	0.172*
T8	160 - 140	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.88	6.63	0.284
T9	140 - 120	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	2.15	6.63	0.324
T10	120 - 100	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.62	6.63	0.245*
T11	100 - 80	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.69	6.63	0.254*
T12	80 - 60	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.98	6.63	0.299*
T13	60 - 40	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.87	6.63	0.283*
T14	40 - 20	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.92	6.63	0.290*
T15	20 - 6.66667	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.94	6.63	0.293*
T16	6.66667 - 0	C12x20.7	8-5/8"	7-3/32"	8.8	21.600	6.0900	0.12	131.54	0.001

\* DL controls

### Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	0.23	9.54	0.024
T2	280 - 260	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	1.02	9.54	0.107
T3	260 - 240	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	1.64	9.54	0.172
T4	240 - 220	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.58	6.63	0.088
T5	220 - 200	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.61	6.63	0.093
T6	200 - 180	5/8	3'	2'10-	219.2	21.600	0.3068	0.76	6.63	0.115

<p style="text-align: center;"><b>ERITower</b></p> <p style="text-align: center;"><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>29 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b></p> <p>12:43:27 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T7	180 - 160	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.57	6.63	0.085*
T8	160 - 140	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.86	6.63	0.130
T10	120 - 100	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.81	6.63	0.122*
T11	100 - 80	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.85	6.63	0.128*
T12	80 - 60	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.88	6.63	0.133*
T13	60 - 40	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.95	6.63	0.144*
T14	40 - 20	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.98	6.63	0.148*
T15	20 - 6.66667	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.98	6.63	0.148*
T16	6.66667 - 0	C12x20.7	2'10-11/16"	2'9"	41.3	21.600	6.0900	3.43	131.54	0.026*

\* DL controls

### Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	1.49	9.54	0.156
T2	280 - 260	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	0.74	9.54	0.078
T3	260 - 240	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	1.13	9.54	0.118
T4	240 - 220	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.84	6.63	0.127
T5	220 - 200	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.20	6.63	0.181
T6	200 - 180	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.57	6.63	0.085*
T7	180 - 160	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.84	6.63	0.127
T8	160 - 140	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.59	6.63	0.239
T9	140 - 120	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.72	6.63	0.108*
T10	120 - 100	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.85	6.63	0.128*
T11	100 - 80	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.88	6.63	0.133*
T12	80 - 60	5/8	3'	2'10-	220.0	21.600	0.3068	0.95	6.63	0.143*



<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 30 of 34</p>
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	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T13	60 - 40	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	0.97	6.63	0.147*
T14	40 - 20	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.02	6.63	0.154*
T15	20 - 6.66667	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.83	6.63	0.276*

\* DL controls

### Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T2	280 - 260	3/4	3'	2'10-9/16"	184.0	21.600	0.4418	1.83	9.54	0.191
T4	240 - 220	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.11	6.63	0.168
T6	200 - 180	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	0.99	6.63	0.149*
T7	180 - 160	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.04	6.63	0.157*
T8	160 - 140	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.09	6.63	0.165*
T9	140 - 120	5/8	3'	2'10-3/16"	219.2	21.600	0.3068	1.24	6.63	0.188*
T10	120 - 100	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.49	6.63	0.225*
T11	100 - 80	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.55	6.63	0.234*
T13	60 - 40	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.73	6.63	0.261*
T14	40 - 20	5/8	3'	2'10-5/16"	220.0	21.600	0.3068	1.78	6.63	0.268*

\* DL controls

### Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T1	300 - 280	1	3'	2'10-9/16"	138.0	21.600	0.7854	5.47	16.96	0.323
T3	260 - 240	1	3'	2'10-9/16"	138.0	21.600	0.7854	4.99	16.96	0.294

<b>ERITower</b>  <b>Hodge Design Associates, P.C.</b> 22 Chestnut Street  Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	<b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	<b>Page</b> 31 of 34
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	<b>Client</b> ABC Towers and Tower Maintenance	<b>Designed by</b> Gray Hodge

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
T5	220 - 200	1	3'	2'10-3/16"	137.0	21.600	0.7854	4.79	16.96	0.283
T9	140 - 120	1	3'	2'10-3/16"	137.0	21.600	0.7854	4.46	16.96	0.263
T12	80 - 60	1	3'	2'10-5/16"	137.5	21.600	0.7854	4.10	16.96	0.242*

\* DL controls

### Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> F <sub>by</sub>
T1	300 - 280	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000
T3	260 - 240	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000
T5	220 - 200	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000
T9	140 - 120	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000
T12	80 - 60	1	0.00	0.497	27.000	0.018	0.00	0.000	27.000	0.000

### Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio P P <sub>a</sub>	Ratio f <sub>bx</sub> F <sub>bx</sub>	Ratio f <sub>by</sub> F <sub>by</sub>	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	300 - 280	1	0.323	0.018	0.000	0.341 ✓	1.333	H2-1 ✓
T3	260 - 240	1	0.294	0.018	0.000	0.313 ✓	1.333	H2-1 ✓
T5	220 - 200	1	0.283	0.018	0.000	0.301 ✓	1.333	H2-1 ✓
T9	140 - 120	1	0.263	0.018	0.000	0.281 ✓	1.333	H2-1 ✓
T12	80 - 60	1	0.242	0.018	0.000	0.260* ✓	1.000	H2-1 ✓

\* DL controls

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
T1	300 - 280	Leg	1 1/2	1	-22.36	32.43	68.9	Pass
T2	280 - 260	Leg	1 1/2	55	-24.30	32.43	74.9	Pass
T3	260 - 240	Leg	1 1/2	106	-25.01	32.43	77.1	Pass
T4	240 - 220	Leg	1 3/4	158	-34.71	54.90	63.2	Pass
T5	220 - 200	Leg	1 3/4	210	-40.10	54.90	73.0	Pass
T6	200 - 180	Leg	1 3/4	262	-31.67	54.90	57.7	Pass
T7	180 - 160	Leg	1 3/4	314	-31.32	54.90	57.1	Pass
T8	160 - 140	Leg	1 3/4	366	-44.22	54.90	80.6	Pass

<p style="text-align: center;"><b>ERITower</b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<b>Job</b>	<b>Page</b>	
		Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)	32 of 34
	<b>Project</b>	Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas	<b>Date</b> 12:43:27 07/23/04
	<b>Client</b>	<b>Designed by</b>	
	ABC Towers and Tower Maintenance	Gray Hodge	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
T9	140 - 120	Leg	1 3/4	418	-44.22	54.90	80.6	Pass
T10	120 - 100	Leg	1 5/8	471	-34.79	43.18	80.6	Pass
T11	100 - 80	Leg	1 5/8	523	-36.90	43.18	85.5	Pass
T12	80 - 60	Leg	1 5/8	575	-40.69	43.18	94.2	Pass
T13	60 - 40	Leg	1 5/8	625	-40.36	43.18	93.5	Pass
T14	40 - 20	Leg	1 5/8	679	-42.00	43.18	97.3	Pass
T15	20 - 6.66667	Leg	1 5/8	729	-41.05	43.94	93.4	Pass
T16	6.66667 - 0	Leg	1 5/8	765	-30.30	47.60	63.7	Pass
T1	300 - 280	Diagonal	3/4	13	-2.65	7.51	35.3	Pass
T2	280 - 260	Diagonal	3/4	66	-1.64	7.51	21.8	Pass
T3	260 - 240	Diagonal	3/4	151	-3.35	7.51	44.6	Pass
T4	240 - 220	Diagonal	5/8	169	-1.74	4.14	42.0	Pass
T5	220 - 200	Diagonal	5/8	221	-2.41	4.14	58.3	Pass
T6	200 - 180	Diagonal	5/8	308	-1.79	4.14	43.3	Pass
T7	180 - 160	Diagonal	5/8	325	-1.31	4.14	31.8	Pass
T8	160 - 140	Diagonal	5/8	384	-1.68	4.14	40.6	Pass
T9	140 - 120	Diagonal	5/8	457	-1.91	4.14	46.2	Pass
T10	120 - 100	Diagonal	5/8	482	-1.25	3.08	40.7	Pass
T11	100 - 80	Diagonal	5/8	534	-1.30	3.08	42.2	Pass
T12	80 - 60	Diagonal	5/8	586	-1.41	3.08	45.7	Pass
T13	60 - 40	Diagonal	5/8	638	-1.44	3.08	46.8	Pass
T14	40 - 20	Diagonal	5/8	690	-1.48	3.08	48.1	Pass
T15	20 - 6.66667	Diagonal	5/8	760	-1.49	3.12	47.7	Pass
T1	300 - 280	Guy Lower Diagonal@290	7/8	27	-2.57	8.67	29.7	Pass
T3	260 - 240	Guy Lower Diagonal@250	3/4	131	-1.56	4.78	32.6	Pass
T5	220 - 200	Guy Lower Diagonal@210	3/4	235	-2.84	4.85	58.6	Pass
T9	140 - 120	Guy Lower Diagonal@139.75	3/4	463	-2.85	4.85	58.9	Pass
T12	80 - 60	Guy Lower Diagonal@70	3/4	600	-2.86	4.81	59.4	Pass
T1	300 - 280	Guy Upper Diagonal@290	7/8	38	-2.26	8.67	26.1	Pass
T3	260 - 240	Guy Upper Diagonal@250	3/4	137	-3.20	4.78	66.9	Pass
T5	220 - 200	Guy Upper Diagonal@210	3/4	241	-2.26	4.85	46.7	Pass
T8	160 - 140	Guy Upper Diagonal@139.75	3/4	377	-2.74	4.85	56.4	Pass
T12	80 - 60	Guy Upper Diagonal@70	3/4	606	-2.68	4.81	55.6	Pass
T1	300 - 280	Horizontal	3/4	19	1.52	12.72	12.0	Pass
T2	280 - 260	Horizontal	3/4	98	1.99	12.72	15.6	Pass
T3	260 - 240	Horizontal	3/4	123	2.16	12.72	17.0	Pass
T4	240 - 220	Horizontal	5/8	175	1.19	8.83	13.5	Pass
T5	220 - 200	Horizontal	5/8	234	1.69	8.83	19.1	Pass
T6	200 - 180	Horizontal	5/8	279	1.08	6.63	16.3	Pass
T7	180 - 160	Horizontal	5/8	331	1.14	6.63	17.2	Pass
T8	160 - 140	Horizontal	5/8	383	1.88	8.83	21.3	Pass
T9	140 - 120	Horizontal	5/8	462	2.15	8.83	24.3	Pass
T10	120 - 100	Horizontal	5/8	487	1.62	6.63	24.5	Pass
T11	100 - 80	Horizontal	5/8	539	1.69	6.63	25.4	Pass
T12	80 - 60	Horizontal	5/8	598	1.98	6.63	29.9	Pass
T13	60 - 40	Horizontal	5/8	643	1.87	6.63	28.3	Pass
T14	40 - 20	Horizontal	5/8	695	1.92	6.63	29.0	Pass
T15	20 - 6.66667	Horizontal	5/8	758	1.94	6.63	29.3	Pass
T16	6.66667 - 0	Horizontal	C12x20.7	773	0.12	175.35	0.8	Pass
T1	300 - 280	Top Girt	3/4	5	-0.36	5.30	6.8	Pass
T2	280 - 260	Top Girt	3/4	56	1.02	12.72	8.1	Pass

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b></p> <p>Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b></p> <p>33 of 34</p>
	<p><b>Project</b></p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b></p> <p>12:43:27 07/23/04</p>
	<p><b>Client</b></p> <p>ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b></p> <p>Gray Hodge</p>

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
T3	260 - 240	Top Girt	3/4	110	-0.74	5.30	14.0	Pass
T4	240 - 220	Top Girt	5/8	160	0.58	8.83	6.6	Pass
T5	220 - 200	Top Girt	5/8	212	0.61	8.83	7.0	Pass
T6	200 - 180	Top Girt	5/8	264	0.76	8.83	8.6	Pass
T7	180 - 160	Top Girt	5/8	316	0.57	6.63	8.5	Pass
T8	160 - 140	Top Girt	5/8	368	0.86	8.83	9.7	Pass
T10	120 - 100	Top Girt	5/8	472	0.81	6.63	12.2	Pass
T11	100 - 80	Top Girt	5/8	524	0.85	6.63	12.8	Pass
T12	80 - 60	Top Girt	5/8	576	0.88	6.63	13.3	Pass
T13	60 - 40	Top Girt	5/8	628	0.95	6.63	14.4	Pass
T14	40 - 20	Top Girt	5/8	680	0.98	6.63	14.8	Pass
T15	20 - 6.66667	Top Girt	5/8	732	0.98	6.63	14.8	Pass
T16	6.66667 - 0	Top Girt	C12x20.7	768	3.43	131.54	2.6	Pass
T1	300 - 280	Bottom Girt	3/4	8	-0.67	5.30	12.6	Pass
T2	280 - 260	Bottom Girt	3/4	59	0.74	12.72	5.9	Pass
T3	260 - 240	Bottom Girt	3/4	111	1.13	12.72	8.8	Pass
T4	240 - 220	Bottom Girt	5/8	163	0.84	8.83	9.5	Pass
T5	220 - 200	Bottom Girt	5/8	215	1.20	8.83	13.6	Pass
T6	200 - 180	Bottom Girt	5/8	267	0.57	6.63	8.5	Pass
T7	180 - 160	Bottom Girt	5/8	319	0.84	8.83	9.5	Pass
T8	160 - 140	Bottom Girt	5/8	371	1.59	8.83	18.0	Pass
T9	140 - 120	Bottom Girt	5/8	423	0.72	6.63	10.8	Pass
T10	120 - 100	Bottom Girt	5/8	475	0.85	6.63	12.8	Pass
T11	100 - 80	Bottom Girt	5/8	527	0.88	6.63	13.3	Pass
T12	80 - 60	Bottom Girt	5/8	579	0.95	6.63	14.3	Pass
T13	60 - 40	Bottom Girt	5/8	631	0.97	6.63	14.7	Pass
T14	40 - 20	Bottom Girt	5/8	683	1.02	6.63	15.4	Pass
T15	20 - 6.66667	Bottom Girt	5/8	735	1.83	6.63	27.6	Pass
T2	280 - 260	Mid Girt	3/4	62	1.83	12.72	14.3	Pass
T4	240 - 220	Mid Girt	5/8	166	1.11	8.83	12.6	Pass
T6	200 - 180	Mid Girt	5/8	270	0.99	6.63	14.9	Pass
T7	180 - 160	Mid Girt	5/8	322	1.04	6.63	15.7	Pass
T8	160 - 140	Mid Girt	5/8	374	1.09	6.63	16.5	Pass
T9	140 - 120	Mid Girt	5/8	426	1.24	6.63	18.8	Pass
T10	120 - 100	Mid Girt	5/8	478	1.49	6.63	22.5	Pass
T11	100 - 80	Mid Girt	5/8	530	1.55	6.63	23.4	Pass
T13	60 - 40	Mid Girt	5/8	634	1.73	6.63	26.1	Pass
T14	40 - 20	Mid Girt	5/8	686	1.78	6.63	26.8	Pass
T1	300 - 280	Guy A@290	5/8	782	18.37	21.20	86.7	Pass
T3	260 - 240	Guy A@250	1/2	785	12.02	13.45	89.4	Pass
T5	220 - 200	Guy A@210	1/2	788	11.55	13.45	85.9	Pass
T9	140 - 120	Guy A@139.75	7/16	791	7.99	10.40	76.8	Pass
T12	80 - 60	Guy A@70	7/16	794	6.33	10.40	60.9	Pass
T1	300 - 280	Guy B@290	5/8	781	18.47	21.20	87.1	Pass
T3	260 - 240	Guy B@250	1/2	784	11.84	13.45	88.0	Pass
T5	220 - 200	Guy B@210	1/2	787	11.13	13.45	82.7	Pass
T9	140 - 120	Guy B@139.75	7/16	790	7.77	10.40	74.7	Pass
T12	80 - 60	Guy B@70	7/16	793	6.33	10.40	60.9	Pass
T1	300 - 280	Guy C@290	5/8	780	18.47	21.20	87.1	Pass
T3	260 - 240	Guy C@250	1/2	783	11.84	13.45	88.0	Pass
T5	220 - 200	Guy C@210	1/2	786	11.12	13.45	82.7	Pass
T9	140 - 120	Guy C@139.75	7/16	789	7.76	10.40	74.6	Pass
T12	80 - 60	Guy C@70	7/16	792	6.33	10.40	60.9	Pass
T1	300 - 280	Top Guy Pull-Off@290	1	12	5.47	22.61	25.6	Pass
T3	260 - 240	Top Guy Pull-Off@250	1	114	4.99	22.61	23.4	Pass
T5	220 - 200	Top Guy Pull-Off@210	1	218	4.79	22.61	22.6	Pass
T9	140 - 120	Top Guy Pull-Off@139.75	1	420	4.46	22.61	21.1	Pass

<p style="text-align: center;"><b><i>ERITower</i></b></p> <p><b>Hodge Design Associates, P.C.</b> 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p><b>Job</b> Structural Analysis Report -- 300' Guyed Tower (HDA Project No. 04G-9999)</p>	<p><b>Page</b> 34 of 34</p>
	<p><b>Project</b> Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p><b>Date</b> 12:43:27 07/23/04</p>
	<p><b>Client</b> ABC Towers and Tower Maintenance</p>	<p><b>Designed by</b> Gray Hodge</p>

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
T12	80 - 60	Top Guy Pull-Off@70	1	582	4.10	16.96	26.0	Pass
						Summary		
						Leg (T14)	97.3	Pass
						Diagonal (T5)	58.3	Pass
						Guy Lower Diagonal (T12)	59.4	Pass
						Guy Upper Diagonal (T3)	66.9	Pass
						Horizontal (T12)	29.9	Pass
						Top Girt (T15)	14.8	Pass
						Bottom Girt (T15)	27.6	Pass
						Mid Girt (T14)	26.8	Pass
						Guy A (T3)	89.4	Pass
						Guy B (T3)	88.0	Pass
						Guy C (T3)	88.0	Pass
						Top Guy Pull-Off (T12)	26.0	Pass
						<b>RATING =</b>	<b>97.3</b>	<b>Pass</b>