

STRUCTURAL ANALYSIS REPORT

Prepared for ABC Tower and Tower Maintenance, Inc.

300' Self-Supporting 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
Project No. 04S-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' Self-Supporting Antenna Tower
Henderson, Henderson County, Kentucky
HDA Project No. 04S-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 not in conformance with the referenced design standard. Recommendations for tower modifications are outlined below.* 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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Tower Owner: Tower Leasing Corporation of America, LLC
 Tower Location: Henderson, Henderson County, Kentucky
 Tower Height: 300'
 Face Width: Varies
 Panel Height: Varies
 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

APPURTENANCE LIST		
<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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STRUCTURAL ANALYSIS RESULTS SUMMARY			
EXISTING TOWER CONFIGURATION			
<i>Elevation</i>	<i>Member</i>	<i>Status</i>	<i>Notes and/or Recommendations</i>
0' – 300'	Leg	OK	
0' – 300'	Diagonal	OK	
260' – 300'	Girt/Horizontal	OK	
Notes: See Appendix B of Detailed Structural Analysis Report.			
Assumptions: Where insufficient information regarding member sizes, material strength, etc. has been provided, certain assumptions have been made as noted elsewhere in this report. It is the responsibility of the client to verify the validity of those assumptions.			

STRUCTURAL ANALYSIS RESULTS SUMMARY			
EXISTING TOWER CONFIGURATION WITH PROPOSED ANTENNAS			
<i>Elevation</i>	<i>Member</i>	<i>Status</i>	<i>Notes and/or Recommendations</i>
100' – 300'	Leg	OK	
140' – 160'	Leg	OK	Add 2L 2x2x3/16 Secondary Horizontal Per Detail 1, Appendix E
100' – 140'	Leg	OK	
80' – 100'	Guy	NG	Add 2L 2x2x3/16 Secondary Horizontal Per Detail 1, Appendix E
60' – 80'	Leg	OK	
40' – 60'	Leg	OK	Add 2L 2x2x3/16 Secondary Horizontal Per Detail 1, Appendix E
0' – 40'	Leg	OK	
200' – 300'	Diagonal	OK	
180' – 200'	Diagonal	NG	2L 2x2x3/16 Diagonals per Detail 2, Appendix E
160' – 180'	Diagonal	NG	2L 2x2x1/4 Diagonals per Detail 2, Appendix E
140' – 160'	Diagonal	OK	
120' – 140'	Diagonal	NG	2L 2 1/2 x2 1/4x3/16 Diagonals per Detail 2, Appendix E
100' – 120'	Diagonal	NG	2L 2 1/2 x2 1/4x1/4 Diagonals per Detail 2, Appendix E
80' – 100'	Diagonal	NG	2L 3x3x3/16 Diagonals per Detail 2, Appendix E
60' – 80'	Diagonal	NG	2L 3x3x1/4 Diagonals per Detail 2, Appendix E
40' – 60'	Diagonal	NG	2L 3 1/2x3 1/2x3/16 Diagonals per Detail 2, Appendix E
20' – 40'	Diagonal	OK	2L 3 1/2x3 1/2x1/4 Diagonals per Detail 2, Appendix E
0' – 20'	Diagonal	OK	
Tower Deflections: at 70 mph: Maximum Horizontal Deflection = 45.6" at 50 mph: Maximum Horizontal Deflection = 23.3" Horizontal Deflection at 200' AGL = 9.2" Maximum Tilt = 1.65° Maximum Tilt = 0.84° Tilt at 200' AGL = 0.44° Maximum Twist = 0.10° Maximum Twist = 0.05° Twist at 200' AGL = 0.15° Note: It is the responsibility of the Owner to determine whether tower deflections are within the operational parameters of any appurtenances.			
Notes: See Appendix C of Detailed Structural Analysis Report.			
Assumptions: Where insufficient information regarding member sizes, material strength, etc. has been provided, certain assumptions have been made as noted elsewhere in this report. It is the responsibility of the client to verify the validity of those assumptions.			

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STRUCTURAL ANALYSIS RESULTS SUMMARY			
MODIFIED TOWER CONFIGURATION WITH PROPOSED ANTENNAS			
Elevation	Member	Status	Notes and/or Recommendations
0' – 300'	Leg	OK	See Detail 1, Appendix E
0' – 300'	Diagonal	OK	See Detail 2, Appendix E
40' – 300'	Girt/Horizontal	OK	

Tower Deflections:			
at 70 mph:		at 50 mph:	
Maximum Horizontal Deflection = 45.8"	Maximum Horizontal Deflection = 23.4"	Horizontal Deflection at 200' AGL = 9.14"	
Maximum Tilt = 1.67°	Maximum Tilt = 0.85°	Tilt at 200' AGL = 0.45°	
Maximum Twist = 0.09°	Maximum Twist = 0.05°	Twist at 200' AGL = 0.010°	
Note: It is the responsibility of the Owner to determine whether tower deflections are within the operational parameters of any appurtenances.			

Notes:
See Appendix C of Detailed Structural Analysis Report.

Assumptions:
Where insufficient information regarding member sizes, material strength, etc. has been provided, certain assumptions have been made as noted elsewhere in this report. It is the responsibility of the client to verify the validity of those assumptions.

The adequacy of the foundation is not a part of this report. *No geotechnical or foundation installation information has been provided. The analysis results indicate that the 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.

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

Sincerely,

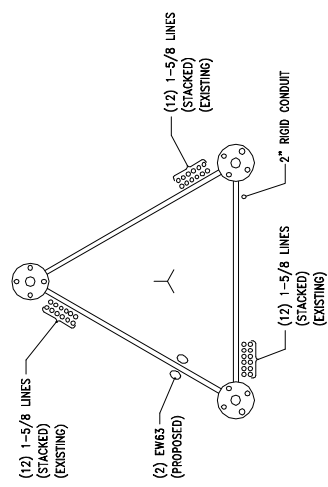
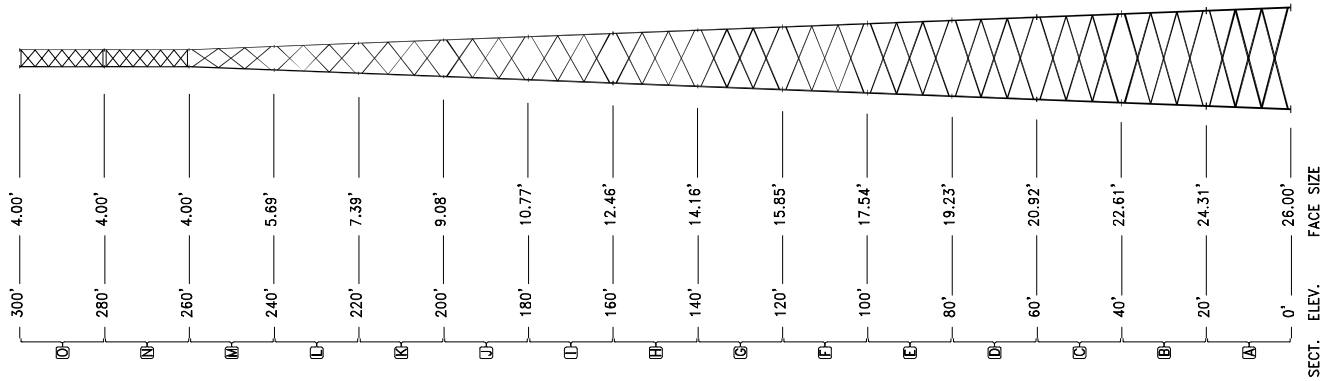
W. Gray Hodge, P.E., S.E.
HODGE DESIGN ASSOCIATES, P.C.
Consulting Engineers

APPENDIX A

Data Supplied By Others
Manufacturers' Data

MEMBER CHART

SECTION	ELEVATION	FACE SIZE	LEGS	GIRTS		SECTION WEIGHT (lbs.)
				DIAGONALS	HORIZONTALS	
A	0' - 20'	26.00' - 24.31'	4-1/4	L 4 x 4 x 1/4	N/A	6300
B	20' - 40'	24.31' - 22.61'	4-1/4	L 3-1/2 x 3-1/2 x 1/4	N/A	5700
C	40' - 60'	22.61' - 20.92'	4	L 3-1/2 x 3-1/2 x 3/16	N/A	4800
D	60' - 80'	20.92' - 19.23'	4	L 3 x 3 x 1/4	N/A	4700
E	80' - 100'	19.23' - 17.54'	3-3/4	L 3 x 3 x 3/16	N/A	3800
F	100' - 120'	17.54' - 15.85'	3-3/4	L 2-1/2 x 2-1/2 x 1/4	N/A	3800
G	120' - 140'	15.85' - 14.16'	3-3/4	L 2-1/2 x 2-1/2 x 3/16	N/A	3400
H	140' - 160'	14.16' - 12.46'	3-1/2	L 2-1/2 x 2-1/2 x 3/16	N/A	3000
I	160' - 180'	12.46' - 10.77'	3-1/2	L 2 x 2 x 1/4	N/A	3000
J	180' - 200'	10.77' - 9.08'	3-1/2	L 2 x 2 x 3/16	N/A	2700
K	200' - 220'	9.08' - 7.39'	3-1/4	L 2 x 2 x 3/16	N/A	2400
L	220' - 240'	7.39' - 5.69'	3-1/4	L 2 x 2 x 3/16	N/A	2300
M	240' - 260'	5.69' - 4.00'	3	L 2 x 2 x 3/16	N/A	2000
N	260' - 280'	4.00'	2	7/8 S.R.	1 S.R.	1100
O	280' - 300'	4.00'	1-1/2	3/4 S.R.	7/8 S.R.	700

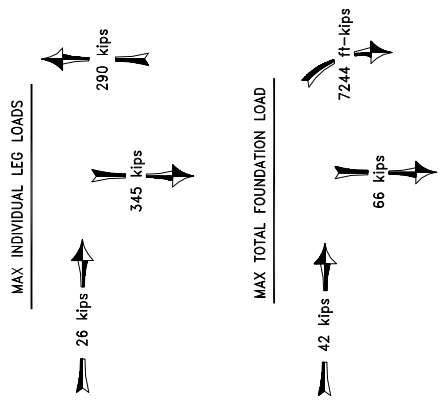


ANTENNA INFORMATION

ANTENNA TYPE	ELEVATION	LINE
(12) DB85DDH65 * (EXISTING)	● 295'	(12) 1-5/8
(12) DB85DDH65 * (EXISTING)	● 280'	(12) 1-5/8
(12) DB85DDH65 * (EXISTING)	● 260'	(12) 1-5/8
(2) 8' HP DISHES (PROPOSED)	● 200'	(2) EW63

* = (3) 12" T-SECTOR MOUNTS AT EACH LEVEL

FEEDLINE DISTRIBUTION



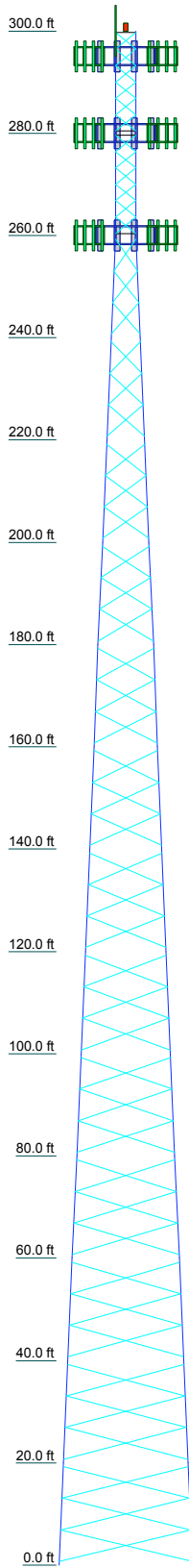
DESIGN & DRAWING NOTES:

- SOME DETAIL HAS BEEN OMITTED FOR CLARITY OF ILLUSTRATION.
- TOWER STRUCTURE IS DESIGNED IN ACCORDANCE WITH ANSI/EIA-222-F STANDARDS FOR A BASIC WIND SPEED OF 70 MPH WITH 1/2" ICE.
- TOWER DESIGNED FOR STEP BOLTS AND DOUBLE STACKED CLIP-ON WAVEGUIDE LADDERS.
- ALL LEG & LEG FLANGE PL MATERIAL IS ASTM A-572 GRADE 50 (Fy ≥ 50 ksi).
- ALL OTHER MATERIAL IS ASTM A36 (Fy ≥ 36 ksi).
- SECTIONS A - M ARE 3-BAY X-BRACED
SECTIONS N - O ARE 6-BAY X-BRACED
- (B) 1-1/4" Ø ASTM A449 ANCHOR BOLTS REQUIRED PER LEG.

APPENDIX B
Existing Antenna Tower

Graphical Computer Output
Structural Analysis Report and Calculations

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	
Legs	SR 1 1/2	SR 2	SR 3	SR 3 1/4	SR 3 1/4	SR 3 1/2	SR 3 1/2	SR 3 3/4	SR 3 3/4	SR 3 3/4	SR 3 3/4	SR 4	SR 4	SR 4 1/4	SR 4 1/4	
Leg Grade	SR 3/4	SR 7/8	SR 3/4	L2x2x3/16	L2x2x3/16	L2x2x1/4	L2 1/2x2 1/2x3/16	A	B	C	L3x3x3/16	L3x3x1/4	B	C	L4x4x1/4	
Diagonals																
Diagonal Grade																
Top Girts	SR 3/4	SR 7/8	SR 3/4													
Bottom Girts	SR 3/4	SR 7/8	SR 3/4													
Face Width (ft)	4	12 @ 3.20633	1.1	2.0	2.3	2.4	2.7	3.0	3.0	3.4	3.8	3.8	4.7	4.6	5.7	6.3
# Panels @ (ft)				5.69271	7.38542	9.07813	10.7682	12.4609	14.1536	15.8464	17.5391	19.2318	20.9219	22.6146	24.3073	26
Weight (K)	0.7	1.1	2.0	2.3	2.4	2.7	3.0	3.0	3.4	3.8	3.8	4.7	4.6	5.7	6.3	49.6



APPURTENANCES

TYPE	ELEVATION	TYPE	ELEVATION
Lighting - Beacon	300	(4) DB85DDH65E-SX	280
Lightning Rod 6'	300	12' T-Frame Sector Mount	280
(4) DB85DDH65E-SX	295	(4) DB85DDH65E-SX	260
12' T-Frame Sector Mount	295	12' T-Frame Sector Mount	260
(4) DB85DDH65E-SX	295	(4) DB85DDH65E-SX	260
12' T-Frame Sector Mount	295	12' T-Frame Sector Mount	260
(4) DB85DDH65E-SX	295	(4) DB85DDH65E-SX	260
12' T-Frame Sector Mount	295	12' T-Frame Sector Mount	260
(4) DB85DDH65E-SX	280	Lighting - Dual Obstruction	200
12' T-Frame Sector Mount	280	Lighting - Dual Obstruction	100
(4) DB85DDH65E-SX	280	See E-7 for Feedlines and Linear Appurtenances	0
12' T-Frame Sector Mount	280		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x1/4	C	L3 1/2x3 1/2x3/16
B	L3 1/2x3 1/2x3/16		

MATERIAL STRENGTH

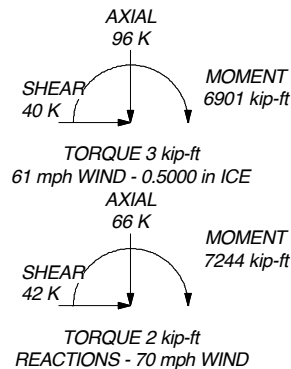
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

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. EXISTING TOWER CONDITION ANALYSIS
6. It is assumed that the tower has been properly maintained and is in good condition.
7. It is assumed that there have been no structural modifications to the tower unless specifically noted otherwise.
8. There are no known structural defects and that there is no structural deterioration.
9. All welds and bolted connections are assumed capable of developing the member strength, unless noted otherwise.
10. Material strengths are as noted elsewhere in this report.
11. This structural analysis is based on information provided by others and assumed to be reliable and correct.
12. See Sheet E-7 for Feedlines and Linear Appurtenances.
13. See Sheet E-8 for Code Check/Stress Distribution.
14. TOWER RATING: 97.1%

MAX PIER FORCES:

DOWN: 344 K
UPLIFT: -287 K
SHEAR: 26 K

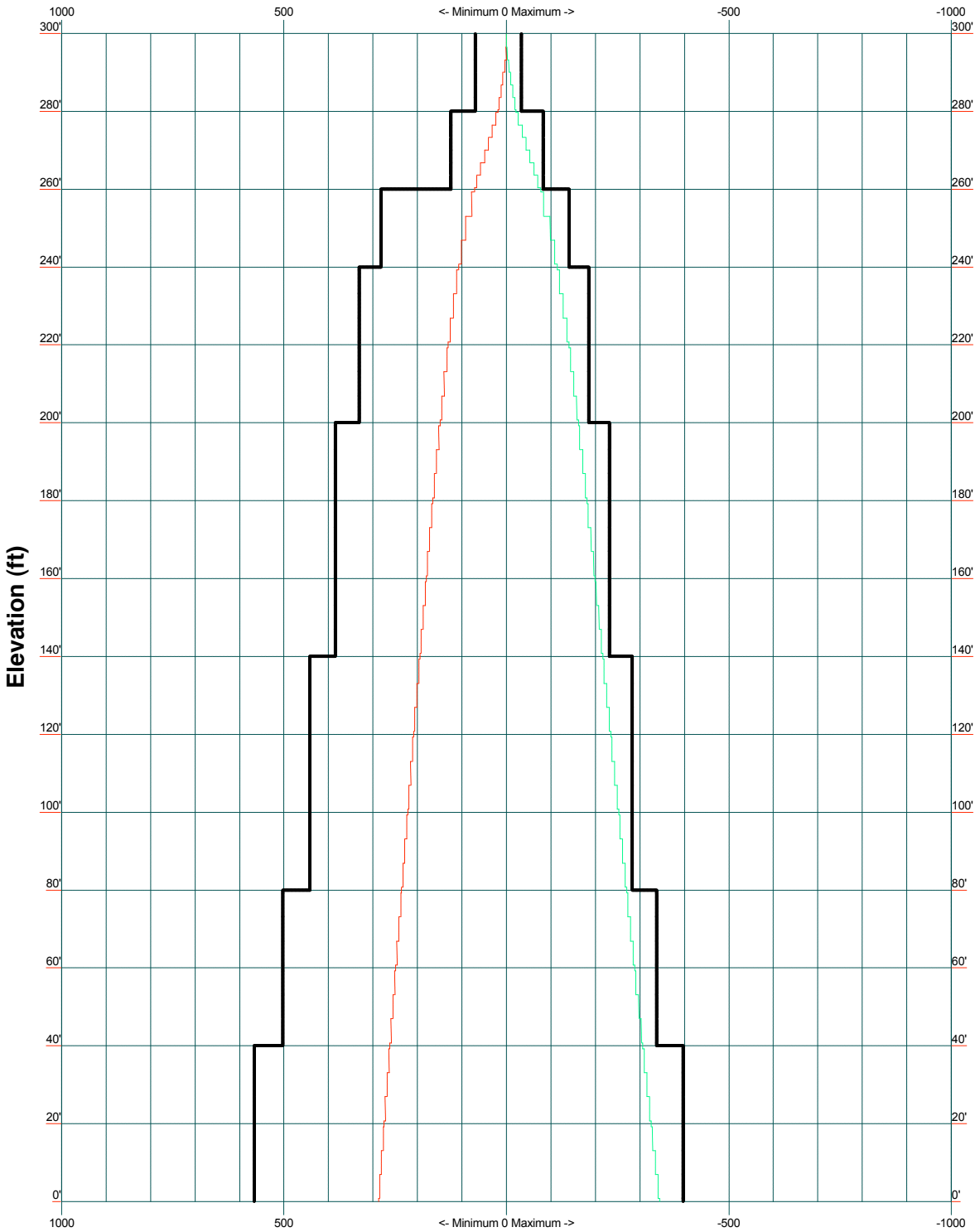


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Job: Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)			
Project: Henderson, Henderson County, KY --- Existing Tower Condition Analysis			
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS	
Path:		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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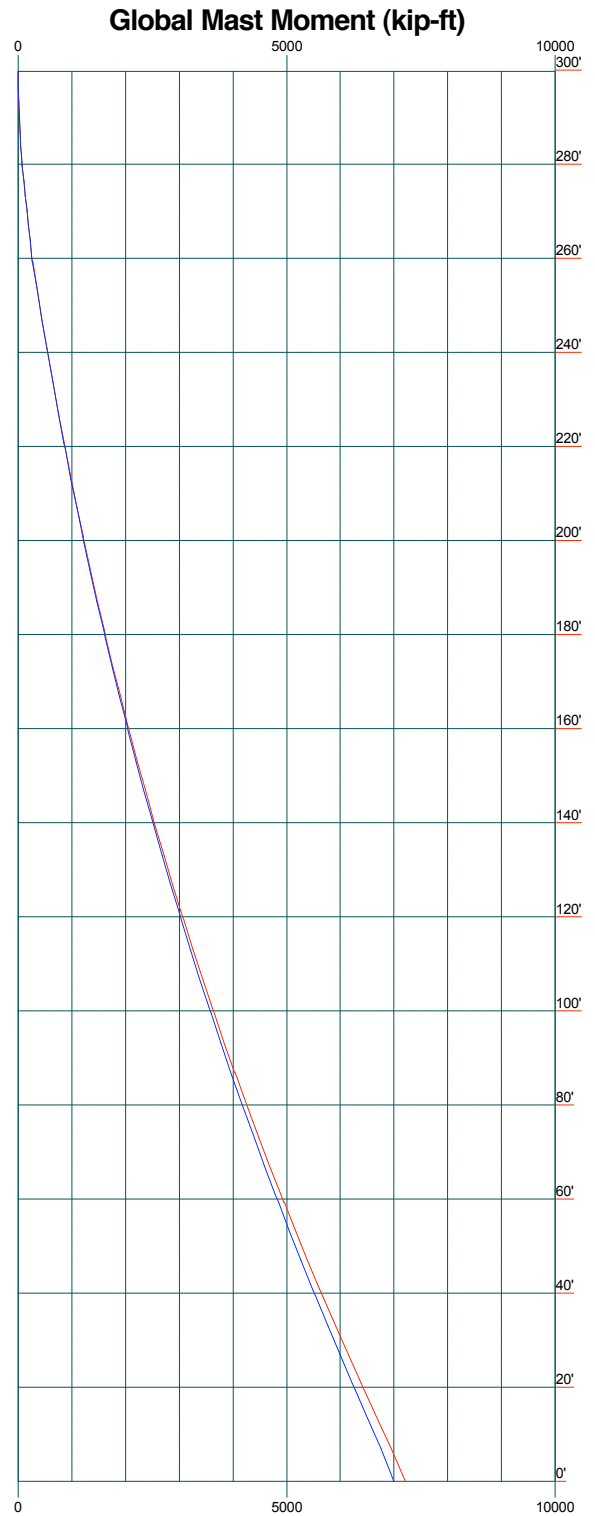
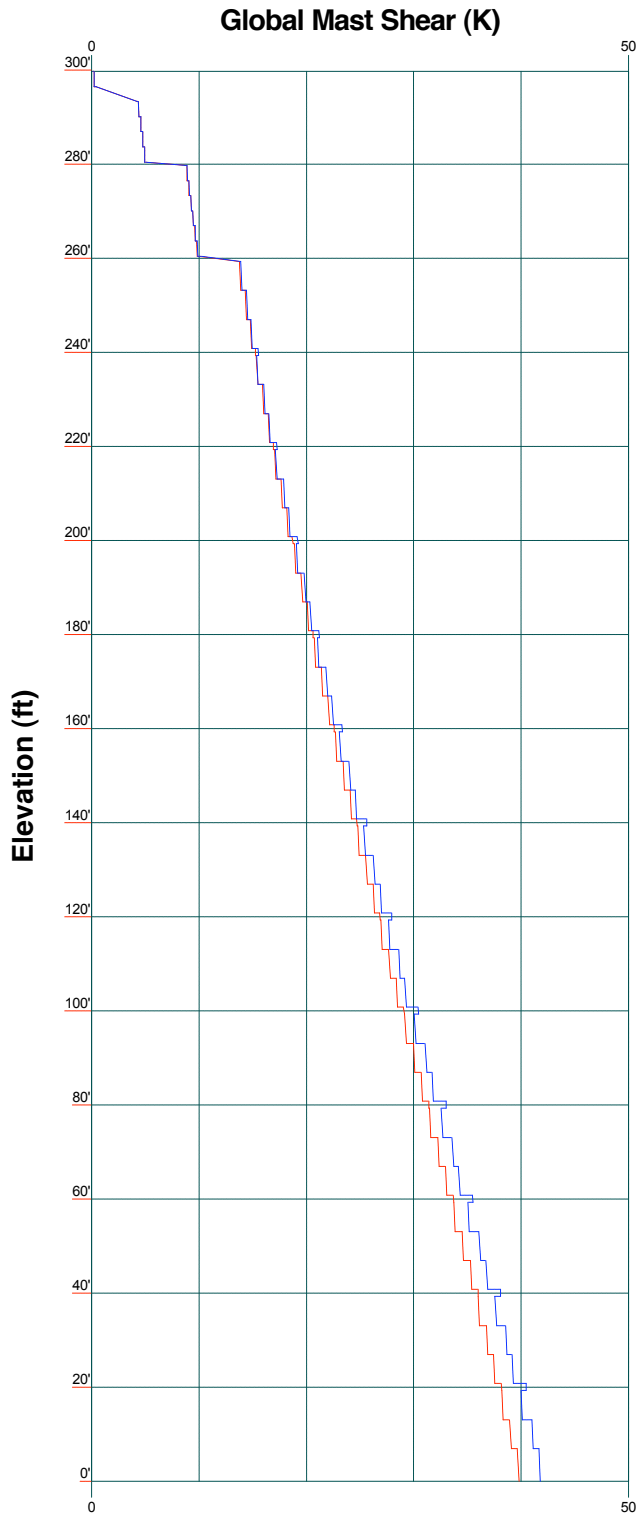
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Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS	
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Vx Vz

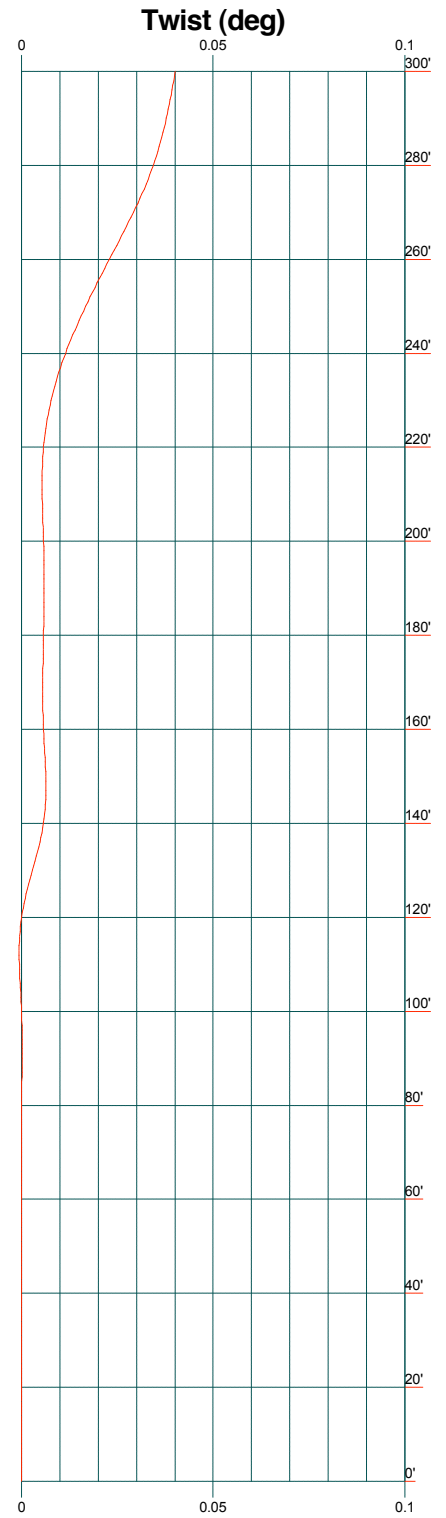
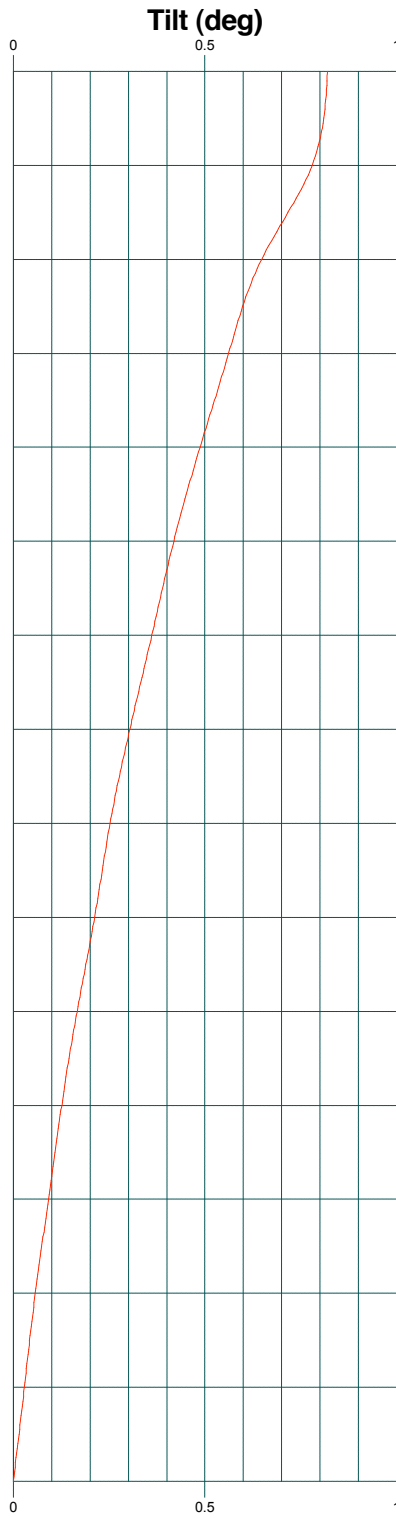
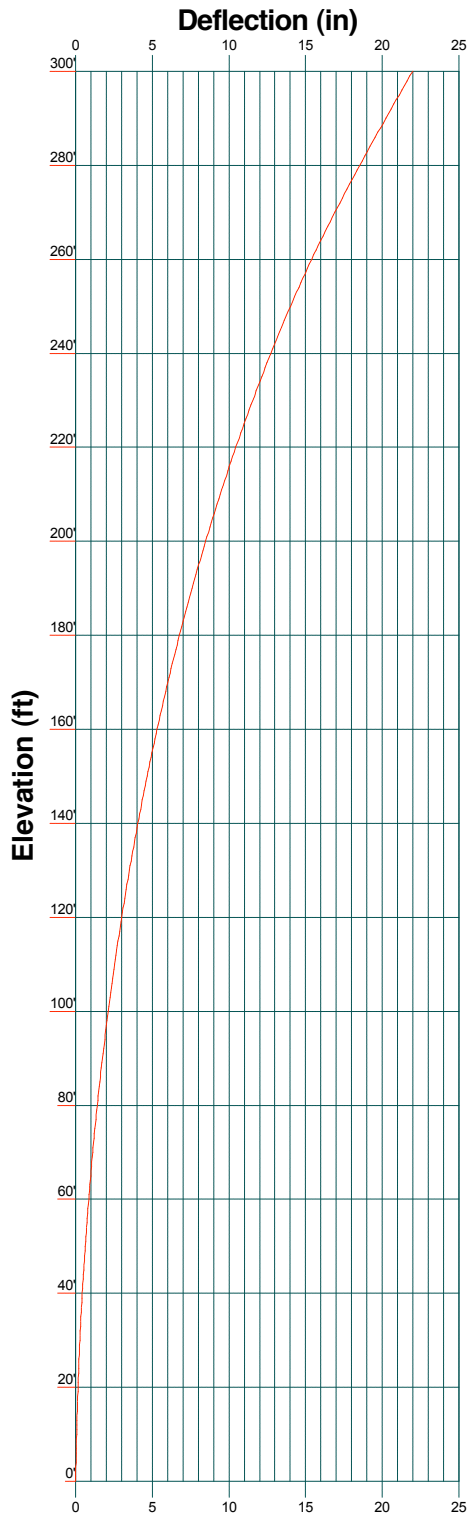
Mx Mz



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Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
Path:	Dwg No. E-4	

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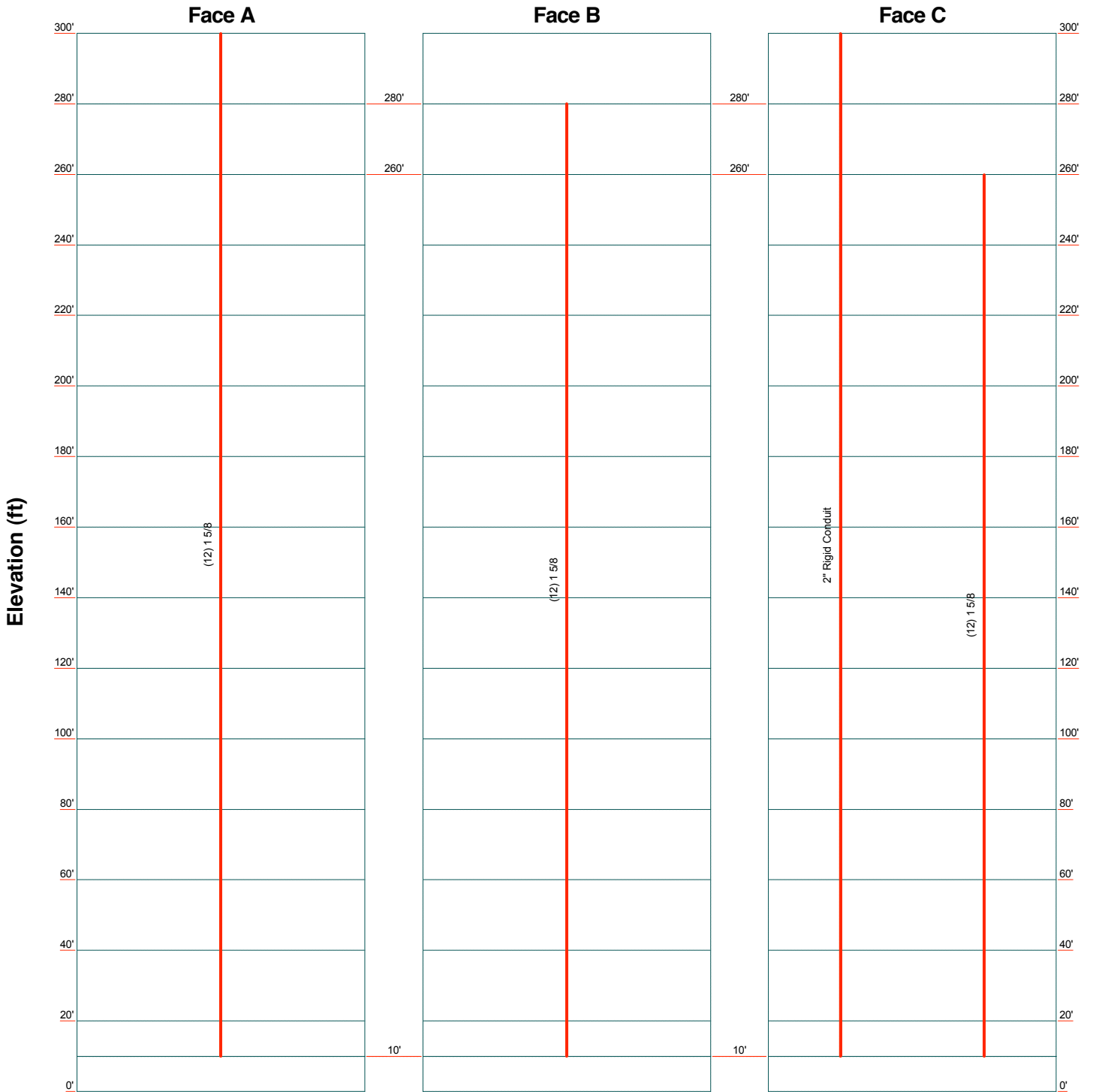
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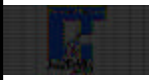
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Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS	
Path:	Dwg No. E-5		

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Feedline Distribution Chart 0' - 300'

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

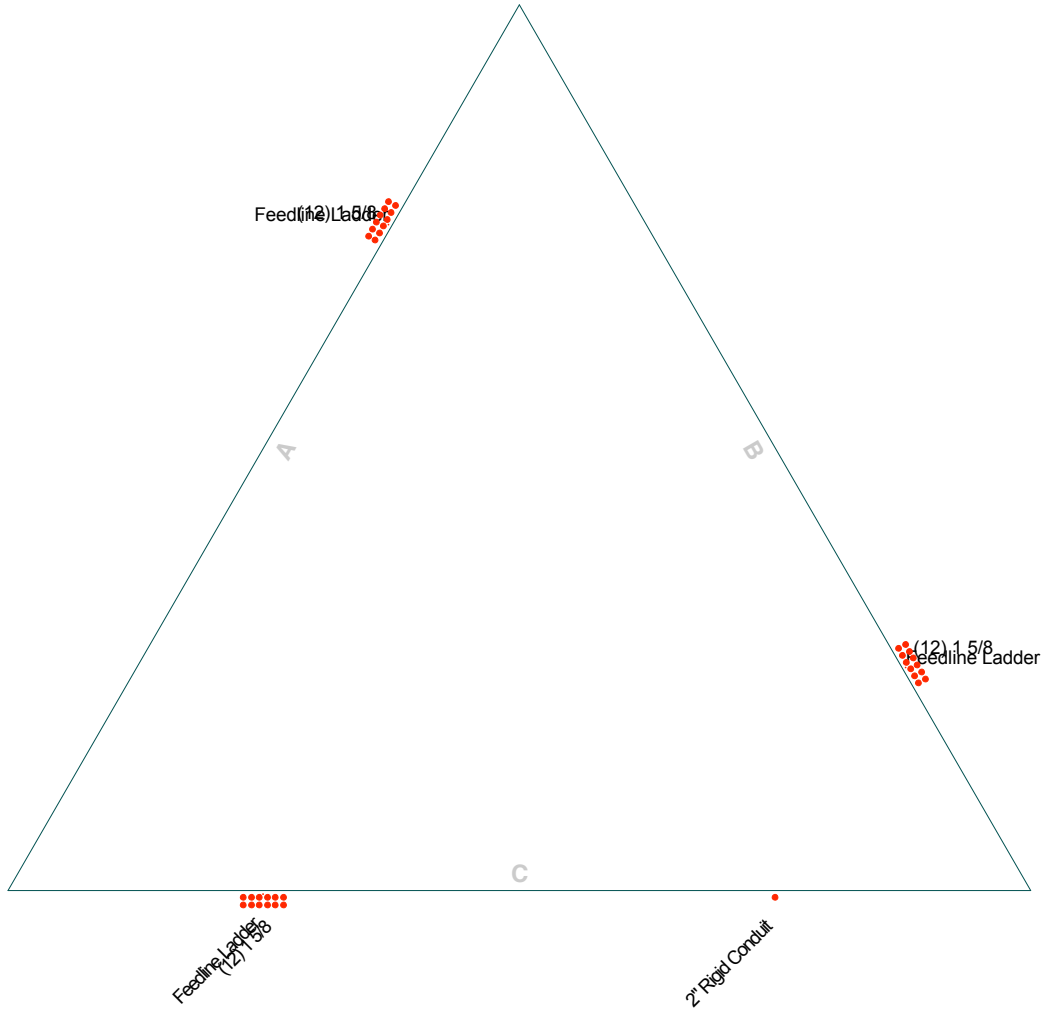


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	22 Chestnut Street	Project: Henderson, Henderson County, KY -- Existing Tower Condition Analysis		
	Evansville, Indiana 47713-1022	Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
	Phone: 812.422.2558	Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
	FAX: 812.422.3337	Path:	Dwg No. E-7	

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Feedline Plan

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



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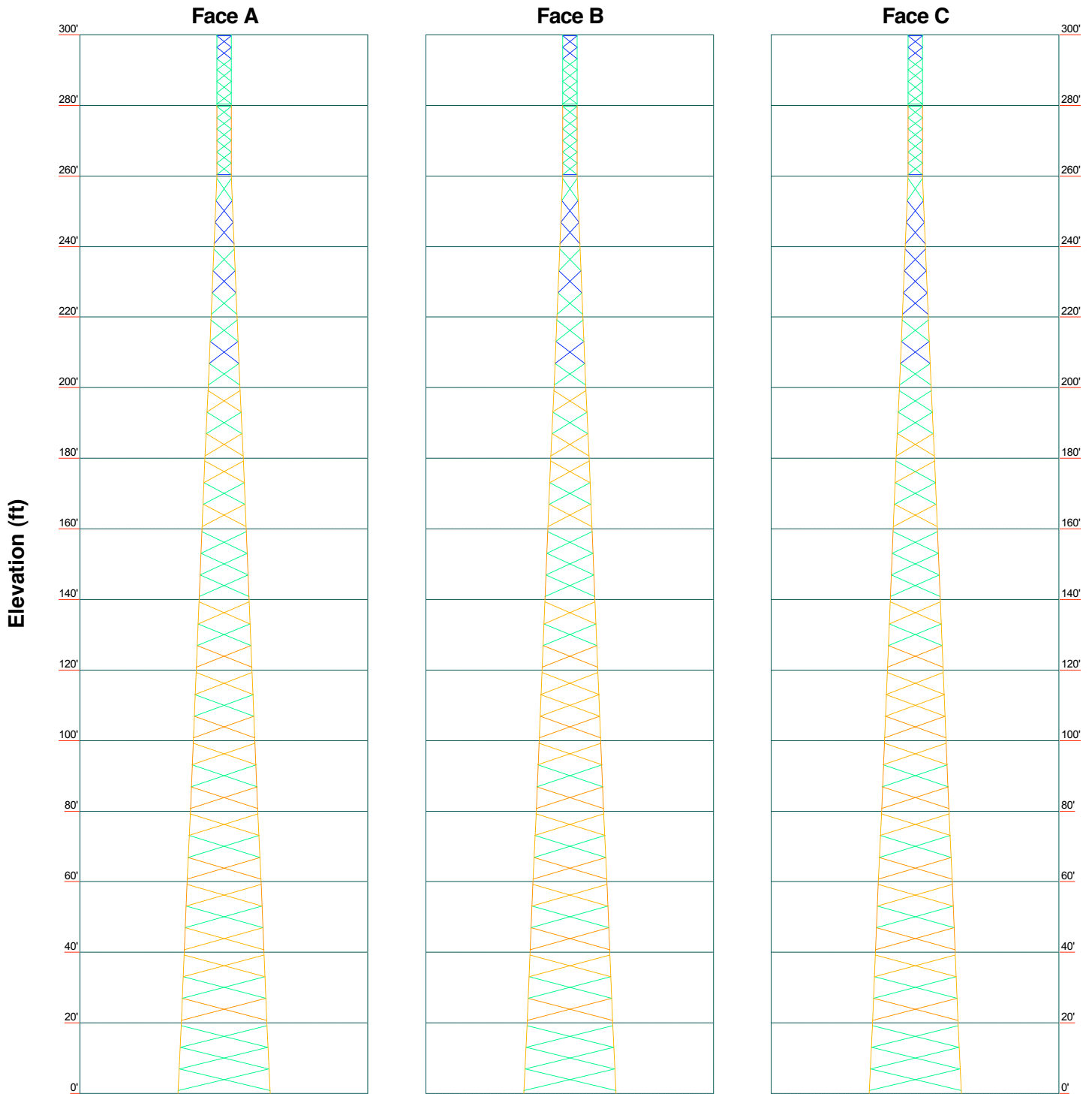
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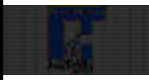
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Path:	Scale: NTS
Dwg No. E-7	

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Stress Distribution Chart 0' - 300'

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



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	Evansville, Indiana 47713-1022	Code: TIA/EIA-222-F	Date: 07/23/04	App'd:
	Phone: 812.422.2558 FAX: 812.422.3337	Path:	Scale: NTS	Dwg No. E-8
C:\Documents and Settings\ghodge\HODGEDESIGN\004\Documents\ERT\Tower Project Data Files\Sample Reports\Sample_SS.R1.plt				

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 1 of 20</p>
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Tower Input Data

The main tower is a 3x free standing 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 4' at the top and 26' 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.

EXISTING TOWER CONDITION ANALYSIS.

It is assumed that the tower has been properly maintained and is in good condition..

It is assumed that there have been no structural modifications to the tower unless specifically noted otherwise..

There are no known structural defects and that there is no structural deterioration..

All welds and bolted connections are assumed capable of developing the member strength, unless noted otherwise..

Material strengths are as noted elsewhere in this report..

This structural analysis is based on information provided by others and assumed to be reliable and correct..

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

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

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

Pressures are calculated at each section.

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

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 3 of 20</p>
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Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	300'-280'	3'-17/32"	X Brace	No	No	4.5000	4.5000
T2	280'-260'	3'-17/32"	X Brace	No	No	4.5000	4.5000
T3	260'-240'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T4	240'-220'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T5	220'-200'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T6	200'-180'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T7	180'-160'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T8	160'-140'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T9	140'-120'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T10	120'-100'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T11	100'-80'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T12	80'-60'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T13	60'-40'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T14	40'-20'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T15	20'-0'	6'-1/32"	X Brace	No	No	9.0000	9.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 300'-280'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 280'-260'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 260'-240'	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 240'-220'	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 220'-200'	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 200'-180'	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T7 180'-160'	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T8 160'-140'	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 140'-120'	Solid Round	3 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T10 120'-100'	Solid Round	3 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T11 100'-80'	Solid Round	3 3/4	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T12 80'-60'	Solid Round	4	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T13 60'-40'	Solid Round	4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x3/16	A36 (36 ksi)
T14 40'-20'	Solid Round	4 1/4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T15 20'-0'	Solid Round	4 1/4	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 4 of 20</p>
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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	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in
T1 300'-280'	0.00	0.0000	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T2 280'-260'	0.00	0.0000	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T3 260'-240'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T4 240'-220'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T5 220'-200'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T6 200'-180'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T7 180'-160'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T8 160'-140'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T9 140'-120'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T10 120'-100'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T11 100'-80'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T12 80'-60'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T13 60'-40'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T14 40'-20'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T15 20'-0'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000

Tower Section Geometry (cont'd)

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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
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'-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

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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 _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	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

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T9	140'-120'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
T10	120'-100'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
T11	100'-80'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
T12	80'-60'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
T13	60'-40'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
T14	40'-20'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	0.000	0.000	0.000	0.25
		B	23.314	0.000	0.000	0.000	0.25
T15	20'-0'	C	26.647	0.000	0.000	0.000	0.31
		A	11.657	0.000	0.000	0.000	0.12
		B	11.657	0.000	0.000	0.000	0.12
		C	13.323	0.000	0.000	0.000	0.15

Feed Line/Linear Appurtenances Section Areas - With Ice

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
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

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
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'-0'	A	0.500	2.483	10.007	0.000	0.000	0.28
		B		2.483	10.007	0.000	0.000	0.28
		C		4.983	10.007	0.000	0.000	0.32

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	1.076	3.117	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.181	0.634	0.000	0.000
T2	280'-260'	A	1.255	3.340	0.000	0.000
		B	1.255	3.340	0.000	0.000
		C	0.211	0.679	0.000	0.000
T3	260'-240'	A	0.000	0.000	1.611	2.668
		B	0.000	0.000	1.611	2.668
		C	0.000	0.000	1.882	3.210
T4	240'-220'	A	0.000	0.000	1.364	2.259
		B	0.000	0.000	1.364	2.259
		C	0.000	0.000	1.594	2.718
T5	220'-200'	A	0.000	0.000	1.238	2.051
		B	0.000	0.000	1.238	2.051
		C	0.000	0.000	1.447	2.468
T6	200'-180'	A	0.000	0.000	1.166	1.932
		B	0.000	0.000	1.166	1.932
		C	0.000	0.000	1.363	2.324
T7	180'-160'	A	0.000	0.000	1.121	1.857
		B	0.000	0.000	1.121	1.857
		C	0.000	0.000	1.310	2.234
T8	160'-140'	A	0.000	0.000	1.364	2.146
		B	0.000	0.000	1.364	2.146
		C	0.000	0.000	1.594	2.583
T9	140'-120'	A	0.000	0.000	1.338	2.105
		B	0.000	0.000	1.338	2.105
		C	0.000	0.000	1.563	2.533
T10	120'-100'	A	0.000	0.000	1.319	2.076
		B	0.000	0.000	1.319	2.076
		C	0.000	0.000	1.542	2.498
T11	100'-80'	A	0.000	0.000	1.566	2.378
		B	0.000	0.000	1.566	2.378
		C	0.000	0.000	1.830	2.861
T12	80'-60'	A	0.000	0.000	1.554	2.358
		B	0.000	0.000	1.554	2.358
		C	0.000	0.000	1.815	2.838

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 9 of 20</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p>Date 12:49:20 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Section	Elevation ft	Face	A_R	$A_{R\ Ice}$	A_F	$A_{F\ Ice}$
			ft^2	ft^2	ft^2	ft^2
T13	60'-40'	A	0.000	0.000	1.801	2.663
		B	0.000	0.000	1.801	2.663
		C	0.000	0.000	2.104	3.204
T14	40'-20'	A	0.000	0.000	1.791	2.649
		B	0.000	0.000	1.791	2.649
		C	0.000	0.000	2.093	3.187
T15	20'-0'	A	0.000	0.000	1.019	1.477
		B	0.000	0.000	1.019	1.477
		C	0.000	0.000	1.191	1.777

Feed Line Center of Pressure

Section	Elevation ft	CP_X	CP_Z	$CP_X\ Ice$	$CP_Z\ Ice$
		in	in	in	in
T1	300'-280'	-2.9383	-6.9500	-1.1734	-3.0794
T2	280'-260'	3.6777	-3.9680	2.3019	-1.9675
T3	260'-240'	0.3397	0.4390	0.4246	0.5487
T4	240'-220'	0.4414	0.5547	0.5525	0.6943
T5	220'-200'	0.5420	0.6698	0.6767	0.8362
T6	200'-180'	0.6253	0.7641	0.7803	0.9534
T7	180'-160'	0.7116	0.8626	0.8850	1.0727
T8	160'-140'	0.7345	0.8850	0.9197	1.1080
T9	140'-120'	0.7897	0.9470	0.9885	1.1854
T10	120'-100'	0.8507	1.0162	1.0623	1.2691
T11	100'-80'	0.8345	0.9939	1.0513	1.2521
T12	80'-60'	0.8699	1.0334	1.0962	1.3021
T13	60'-40'	0.8380	0.9932	1.0653	1.2628
T14	40'-20'	0.8630	1.0210	1.0977	1.2987
T15	20'-0'	0.4600	0.5436	0.5838	0.6898

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	$C_A A_A$	$C_A A_A$	Weight K
			Horz Lateral ft	Vert ft			Front ft^2	Side ft^2	
See E-7 for Feedlines and Linear Appurtenances	C	None			0.0000	0'	No Ice 1/2" Ice	0.00 0.00	0.00 0.00
Lighting - Beacon	C	None			0.0000	300'	No Ice 1/2" Ice	2.70 3.10	2.70 3.10
Lighting - Dual Obstruction	C	None			0.0000	200'	No Ice 1/2" Ice	2.70 3.60	2.70 3.60
Lighting - Dual Obstruction	C	None			0.0000	100'	No Ice 1/2" Ice	2.70 3.60	2.70 3.60
Lightning Rod 6'	C	From Leg	0.00 0' 0'		0.0000	300'	No Ice 1/2" Ice	2.09 2.46	2.09 2.46
(4) DB858DDH65E-SX	A	From Leg	3.50		0.0000	295'	No Ice	11.54	6.14

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job</p> <p>Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page</p> <p>10 of 20</p>
	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p>Date</p> <p>12:49:20 07/23/04</p>
	<p>Client</p> <p>ABC Towers and Tower Maintenance</p>	<p>Designed by</p> <p>Gray Hodge</p>

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

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

Load Combinations

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

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	343.67	22.25	-12.80
	Max. H _x	10	343.67	22.25	-12.80
	Max. H _z	16	-216.66	-17.38	11.60
	Min. Vert	4	-286.94	-19.49	11.21
	Min. H _x	17	-248.71	-20.16	11.58
	Min. H _z	10	343.67	22.25	-12.80
Leg B	Max. Vert	6	343.87	-22.23	-12.83
	Max. H _x	25	-248.39	20.13	11.61
	Max. H _z	26	-216.34	17.34	11.66

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	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p>Date</p> <p>12:49:20 07/23/04</p>
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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Min. Vert	12	-286.74	19.47	11.24
	Min. H _x	6	343.87	-22.23	-12.83
	Min. H _z	6	343.87	-22.23	-12.83
	Max. Vert	2	343.59	0.04	25.67
	Max. H _x	10	-138.78	3.03	-11.25
	Max. H _z	2	343.59	0.04	25.67
	Min. Vert	8	-287.01	-0.03	-22.49
	Min. H _x	6	-138.78	-3.06	-11.25
	Min. H _z	21	-248.77	-0.04	-23.24

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	66.38	0.00	-0.00	2.56	-2.57	0.00
Dead+Wind 0 deg - No Ice	66.38	-0.00	-42.23	-7238.41	-2.59	1.68
Dead+Wind 30 deg - No Ice	66.38	20.04	-34.71	-6084.58	-3516.99	1.76
Dead+Wind 60 deg - No Ice	66.38	34.09	-19.68	-3476.49	-6028.48	1.52
Dead+Wind 90 deg - No Ice	66.38	40.08	-0.00	2.57	-7031.42	0.99
Dead+Wind 120 deg - No Ice	66.38	36.57	21.11	3623.05	-6273.46	0.11
Dead+Wind 150 deg - No Ice	66.38	20.04	34.71	6089.70	-3517.02	-0.91
Dead+Wind 180 deg - No Ice	66.38	-0.00	39.37	6960.67	-2.59	-1.50
Dead+Wind 210 deg - No Ice	66.38	-20.04	34.71	6089.71	3511.84	-1.76
Dead+Wind 240 deg - No Ice	66.38	-36.57	21.11	3623.05	6268.28	-1.79
Dead+Wind 270 deg - No Ice	66.38	-40.08	-0.00	2.57	7026.24	-0.99
Dead+Wind 300 deg - No Ice	66.38	-34.09	-19.68	-3476.49	6023.31	-0.02
Dead+Wind 330 deg - No Ice	66.38	-20.04	-34.71	-6084.59	3511.82	0.91
Dead+Ice+Temp	96.00	0.00	0.00	3.39	-4.08	-0.00
Dead+Wind 0 deg+Ice+Temp	96.00	-0.00	-40.22	-6891.92	-4.13	2.11
Dead+Wind 30 deg+Ice+Temp	96.00	18.43	-31.91	-5593.74	-3235.59	2.47
Dead+Wind 60 deg+Ice+Temp	96.00	30.94	-17.86	-3155.96	-5476.31	2.36
Dead+Wind 90 deg+Ice+Temp	96.00	36.85	-0.00	3.44	-6467.12	1.80
Dead+Wind 120 deg+Ice+Temp	96.00	34.83	20.11	3451.05	-5975.64	0.68
Dead+Wind 150 deg+Ice+Temp	96.00	18.43	31.91	5600.49	-3235.66	-0.77
Dead+Wind 180 deg+Ice+Temp	96.00	-0.00	35.73	6322.13	-4.14	-1.79
Dead+Wind 210 deg+Ice+Temp	96.00	-18.43	31.91	5600.49	3227.41	-2.47
Dead+Wind 240 deg+Ice+Temp	96.00	-34.83	20.11	3451.05	5967.39	-2.79
Dead+Wind 270 deg+Ice+Temp	96.00	-36.85	-0.00	3.44	6458.87	-1.80
Dead+Wind 300 deg+Ice+Temp	96.00	-30.94	-17.86	-3155.97	5468.06	-0.57
Dead+Wind 330 deg+Ice+Temp	96.00	-18.43	-31.91	-5593.74	3227.33	0.77
Dead+Wind 0 deg - Service	66.38	-0.00	-21.54	-3691.96	-2.59	0.85
Dead+Wind 30 deg - Service	66.38	10.23	-17.71	-3103.25	-1795.73	0.91
Dead+Wind 60 deg - Service	66.38	17.39	-10.04	-1772.54	-3077.15	0.78
Dead+Wind 90 deg - Service	66.38	20.45	-0.00	2.57	-3588.87	0.49
Dead+Wind 120 deg - Service	66.38	18.66	10.77	1849.83	-3202.14	0.06
Dead+Wind 150 deg - Service	66.38	10.23	17.71	3108.38	-1795.73	-0.45
Dead+Wind 180 deg - Service	66.38	-0.00	20.09	3552.77	-2.59	-0.77
Dead+Wind 210 deg - Service	66.38	-10.23	17.71	3108.38	1790.55	-0.91
Dead+Wind 240 deg - Service	66.38	-18.66	10.77	1849.83	3196.97	-0.91
Dead+Wind 270 deg - Service	66.38	-20.45	-0.00	2.57	3583.70	-0.49
Dead+Wind 300 deg - Service	66.38	-17.39	-10.04	-1772.54	3071.98	-0.01
Dead+Wind 330 deg - Service	66.38	-10.23	-17.71	-3103.25	1790.55	0.45

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

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	-66.38	0.00	0.00	66.38	0.00	0.000%
2	0.00	-66.38	-42.23	0.00	66.38	42.23	0.005%
3	20.04	-66.38	-34.72	-20.04	66.38	34.71	0.005%
4	34.10	-66.38	-19.69	-34.09	66.38	19.68	0.005%
5	40.09	-66.38	0.00	-40.08	66.38	0.00	0.005%
6	36.57	-66.38	21.12	-36.57	66.38	-21.11	0.005%
7	20.04	-66.38	34.72	-20.04	66.38	-34.71	0.005%
8	0.00	-66.38	39.37	0.00	66.38	-39.37	0.005%
9	-20.04	-66.38	34.72	20.04	66.38	-34.71	0.005%
10	-36.57	-66.38	21.12	36.57	66.38	-21.11	0.005%
11	-40.09	-66.38	0.00	40.08	66.38	0.00	0.005%
12	-34.10	-66.38	-19.69	34.09	66.38	19.68	0.005%
13	-20.04	-66.38	-34.72	20.04	66.38	34.71	0.005%
14	0.00	-96.00	0.00	0.00	96.00	0.00	0.000%
15	0.00	-96.00	-40.22	0.00	96.00	40.22	0.003%
16	18.43	-96.00	-31.92	-18.43	96.00	31.91	0.003%
17	30.95	-96.00	-17.87	-30.94	96.00	17.86	0.003%
18	36.86	-96.00	0.00	-36.85	96.00	0.00	0.003%
19	34.83	-96.00	20.11	-34.83	96.00	-20.11	0.003%
20	18.43	-96.00	31.92	-18.43	96.00	-31.91	0.003%
21	0.00	-96.00	35.73	0.00	96.00	-35.73	0.003%
22	-18.43	-96.00	31.92	18.43	96.00	-31.91	0.003%
23	-34.83	-96.00	20.11	34.83	96.00	-20.11	0.003%
24	-36.86	-96.00	0.00	36.85	96.00	0.00	0.003%
25	-30.95	-96.00	-17.87	30.94	96.00	17.86	0.003%
26	-18.43	-96.00	-31.92	18.43	96.00	31.91	0.003%
27	0.00	-66.38	-21.55	0.00	66.38	21.54	0.003%
28	10.23	-66.38	-17.71	-10.23	66.38	17.71	0.003%
29	17.40	-66.38	-10.04	-17.39	66.38	10.04	0.003%
30	20.45	-66.38	0.00	-20.45	66.38	0.00	0.003%
31	18.66	-66.38	10.77	-18.66	66.38	-10.77	0.003%
32	10.23	-66.38	17.71	-10.23	66.38	-17.71	0.003%
33	0.00	-66.38	20.09	0.00	66.38	-20.09	0.003%
34	-10.23	-66.38	17.71	10.23	66.38	-17.71	0.003%
35	-18.66	-66.38	10.77	18.66	66.38	-10.77	0.003%
36	-20.45	-66.38	0.00	20.45	66.38	0.00	0.003%
37	-17.40	-66.38	-10.04	17.39	66.38	10.04	0.003%
38	-10.23	-66.38	-17.71	10.23	66.38	17.71	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	16	0.00006794	0.00011238
3	Yes	16	0.00006526	0.00010819
4	Yes	16	0.00006274	0.00010412
5	Yes	16	0.00006526	0.00010818
6	Yes	16	0.00006793	0.00011235
7	Yes	16	0.00006526	0.00010817
8	Yes	16	0.00006273	0.00010411
9	Yes	16	0.00006526	0.00010817
10	Yes	16	0.00006793	0.00011237

<i>ERITower</i> 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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 14 of 20
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11	Yes	16	0.00006527	0.00010819
12	Yes	16	0.00006273	0.00010413
13	Yes	16	0.00006526	0.00010819
14	Yes	6	0.00000001	0.00000001
15	Yes	17	0.00006125	0.00010186
16	Yes	17	0.00005966	0.00009947
17	Yes	17	0.00005825	0.00009724
18	Yes	17	0.00005966	0.00009945
19	Yes	17	0.00006124	0.00010181
20	Yes	17	0.00005965	0.00009942
21	Yes	17	0.00005824	0.00009719
22	Yes	17	0.00005965	0.00009943
23	Yes	17	0.00006125	0.00010183
24	Yes	17	0.00005966	0.00009946
25	Yes	17	0.00005825	0.00009724
26	Yes	17	0.00005966	0.00009948
27	Yes	16	0.00006572	0.00010793
28	Yes	16	0.00006449	0.00010606
29	Yes	16	0.00006329	0.00010415
30	Yes	16	0.00006449	0.00010604
31	Yes	16	0.00006571	0.00010789
32	Yes	16	0.00006448	0.00010602
33	Yes	16	0.00006328	0.00010412
34	Yes	16	0.00006448	0.00010603
35	Yes	16	0.00006572	0.00010791
36	Yes	16	0.00006449	0.00010606
37	Yes	16	0.00006329	0.00010416
38	Yes	16	0.00006449	0.00010607

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	21.975	31	0.8178	0.0384
T2	280 - 260	18.536	31	0.7804	0.0335
T3	260 - 240	15.395	31	0.6499	0.0219
T4	240 - 220	12.734	31	0.5634	0.0105
T5	220 - 200	10.452	31	0.4888	0.0061
T6	200 - 180	8.480	31	0.4177	0.0045
T7	180 - 160	6.777	31	0.3602	0.0039
T8	160 - 140	5.313	31	0.3054	0.0034
T9	140 - 120	4.064	31	0.2534	0.0029
T10	120 - 100	3.007	31	0.2102	0.0024
T11	100 - 80	2.131	31	0.1682	0.0020
T12	80 - 60	1.413	31	0.1277	0.0015
T13	60 - 40	0.860	31	0.0928	0.0012
T14	40 - 20	0.437	31	0.0589	0.0007
T15	20 - 0	0.157	27	0.0292	0.0003

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	31	21.975	0.8178	0.0384	60360

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 15 of 20</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower Condition Analysis</p>	<p>Date 12:49:20 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
295'	(4) DB858DDH65E-SX	31	21.103	0.8149	0.0376	60360
280'	(4) DB858DDH65E-SX	31	18.536	0.7804	0.0335	15248
260'	(4) DB858DDH65E-SX	31	15.395	0.6499	0.0219	8903
200'	Lighting - Dual Obstruction	31	8.480	0.4177	0.0045	18042
100'	Lighting - Dual Obstruction	31	2.131	0.1682	0.0020	32630
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.0000	0.0000	129954

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	43.065	6	1.6009	0.0758
T2	280 - 260	36.326	6	1.5278	0.0661
T3	260 - 240	30.175	6	1.2726	0.0431
T4	240 - 220	24.962	6	1.1032	0.0207
T5	220 - 200	20.490	6	0.9572	0.0130
T6	200 - 180	16.627	6	0.8178	0.0116
T7	180 - 160	13.291	6	0.7053	0.0109
T8	160 - 140	10.422	6	0.5981	0.0101
T9	140 - 120	7.973	6	0.4962	0.0090
T10	120 - 100	5.900	6	0.4116	0.0077
T11	100 - 80	4.183	6	0.3294	0.0064
T12	80 - 60	2.775	6	0.2500	0.0049
T13	60 - 40	1.690	6	0.1818	0.0036
T14	40 - 20	0.859	6	0.1153	0.0022
T15	20 - 0	0.308	2	0.0573	0.0010

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
300'	Lighting - Beacon	6	43.065	1.6009	0.0758	31014
295'	(4) DB858DDH65E-SX	6	41.357	1.5954	0.0741	31014
280'	(4) DB858DDH65E-SX	6	36.326	1.5278	0.0661	7830
260'	(4) DB858DDH65E-SX	6	30.175	1.2726	0.0431	4549
200'	Lighting - Dual Obstruction	6	16.627	0.8178	0.0116	9211
100'	Lighting - Dual Obstruction	6	4.183	0.3294	0.0064	16679
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.0000	0.0000	66454

Compression Checks

Leg Design Data (Compression)

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 16 of 20</p>
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	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	1 1/2	20'	3'-17/32"	102.7 K=1.00	14.083	1.7672	-21.22	24.89	0.853
T2	280 - 260	2	20'	3'-17/32"	77.0 K=1.00	19.605	3.1416	-76.31	61.59	1.239
T3	260 - 240	3	20'1/4"	6'-1/32"	98.8 K=1.00	14.986	7.0686	-114.29	105.93	1.079
T4	240 - 220	3 1/4	20'1/4"	6'-1/32"	91.2 K=1.00	16.682	8.2958	-140.44	138.39	1.015
T5	220 - 200	3 1/4	20'1/4"	6'-1/32"	91.2 K=1.00	16.682	8.2958	-161.64	138.39	1.168
T6	200 - 180	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-181.12	173.78	1.042
T7	180 - 160	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-199.34	173.78	1.147
T8	160 - 140	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-216.96	173.78	1.248
T9	140 - 120	3 3/4	20'1/4"	6'-1/32"	79.0 K=1.00	19.206	11.0447	-234.68	212.13	1.106
T10	120 - 100	3 3/4	20'1/4"	6'-1/32"	79.0 K=1.00	19.206	11.0447	-252.41	212.13	1.190
T11	100 - 80	3 3/4	20'1/4"	6'-1/32"	79.0 K=1.00	19.206	11.0447	-270.21	212.13	1.274
T12	80 - 60	4	20'1/4"	6'-1/32"	74.1 K=1.00	20.168	12.5664	-288.61	253.44	1.139
T13	60 - 40	4	20'1/4"	6'-1/32"	74.1 K=1.00	20.168	12.5664	-306.90	253.44	1.211
T14	40 - 20	4 1/4	20'1/4"	6'-1/32"	69.7 K=1.00	20.988	14.1863	-325.76	297.74	1.094
T15	20 - 0	4 1/4	20'1/4"	6'-1/32"	69.7 K=1.00	20.988	14.1863	-344.66	297.74	1.158

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	5'-9/16"	2'-5-3/4"	159.0 K=1.00	5.910	0.4418	-2.46	2.61	0.942
T2	280 - 260	7/8	5'-9/16"	2'-17/32"	134.8 K=1.00	8.220	0.6013	-4.84	4.94	0.980
T3	260 - 240	L2x2x3/16	7'-6-3/8"	3'-19/32"	115.8 K=1.00	10.870	0.7150	-5.86	7.77	0.754
T4	240 - 220	L2x2x3/16	8'-7-7/16"	4'-27/32"	131.4 K=1.00	8.643	0.7150	-4.24	6.18	0.686
T5	220 - 200	L2x2x3/16	10'-8-17/32"	5'-4-3/16"	162.9 K=1.00	5.628	0.7150	-3.32	4.02	0.826
T6	200 - 180	L2x2x3/16	12'-1-9/16"	6'-19/32"	184.2 K=1.00	4.403	0.7150	-3.47	3.15	1.103
T7	180 - 160	L2x2x1/4	13'-7-	6'-9-	208.4	3.439	0.9380	-3.64	3.23	1.127

<p>ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 18 of 20</p>
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Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	1 1/2	20'	3'-17/32"	102.7	30.000	1.7672	19.39	53.01	0.366
T2	280 - 260	2	20'	3'-17/32"	77.0	30.000	3.1416	72.11	94.25	0.765
T3	260 - 240	3	20'1/4"	6'-1/32"	98.8	30.000	7.0686	106.98	212.06	0.505
T4	240 - 220	3 1/4	20'1/4"	6'-1/32"	91.2	30.000	8.2958	130.62	248.87	0.525
T5	220 - 200	3 1/4	20'1/4"	6'-1/32"	91.2	30.000	8.2958	149.18	248.87	0.599
T6	200 - 180	3 1/2	20'1/4"	6'-1/32"	84.7	30.000	9.6211	165.58	288.63	0.574
T7	180 - 160	3 1/2	20'1/4"	6'-1/32"	84.7	30.000	9.6211	180.51	288.63	0.625
T8	160 - 140	3 1/2	20'1/4"	6'-1/32"	84.7	30.000	9.6211	194.69	288.63	0.675
T9	140 - 120	3 3/4	20'1/4"	6'-1/32"	79.0	30.000	11.0447	208.58	331.34	0.630
T10	120 - 100	3 3/4	20'1/4"	6'-1/32"	79.0	30.000	11.0447	222.13	331.34	0.670
T11	100 - 80	3 3/4	20'1/4"	6'-1/32"	79.0	30.000	11.0447	235.58	331.34	0.711
T12	80 - 60	4	20'1/4"	6'-1/32"	74.1	30.000	12.5664	248.94	376.99	0.660
T13	60 - 40	4	20'1/4"	6'-1/32"	74.1	30.000	12.5664	262.15	376.99	0.695
T14	40 - 20	4 1/4	20'1/4"	6'-1/32"	69.7	30.000	14.1863	275.08	425.59	0.646
T15	20 - 0	4 1/4	20'1/4"	6'-1/32"	69.7	30.000	14.1863	287.83	425.59	0.676

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	5'-9/16"	2'-3/4"	159.0	21.600	0.4418	2.46	9.54	0.257
T2	280 - 260	7/8	5'-9/16"	2'-17/32"	134.8	21.600	0.6013	4.81	12.99	0.370
T3	260 - 240	L2x2x3/16	7'-3/8"	3'-19/32"	74.0	21.600	0.7150	5.36	15.44	0.347

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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 19 of 20
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Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
T4	240 - 220	L2x2x3/16	8'7-7/16"	4'3-27/32"	83.9	21.600	0.7150	3.81	15.44	0.246
T5	220 - 200	L2x2x3/16	10'8-17/32"	5'4-3/16"	104.0	21.600	0.7150	3.45	15.44	0.223
T6	200 - 180	L2x2x3/16	12'1-9/16"	6'19/32"	117.6	21.600	0.7150	3.61	15.44	0.234
T7	180 - 160	L2x2x1/4	13'7-5/16"	6'9-15/32"	133.8	21.600	0.9380	3.83	20.26	0.189
T8	160 - 140	L2 1/2x2 1/2x3/16	15'1-11/16"	7'6-19/32"	116.5	21.600	0.9020	4.07	19.48	0.209
T9	140 - 120	L2 1/2x2 1/2x3/16	16'8-13/32"	8'3-27/32"	128.4	21.600	0.9020	4.48	19.48	0.230
T10	120 - 100	L2 1/2x2 1/2x1/4	18'3-15/32"	9'1-7/16"	142.3	21.600	1.1900	4.93	25.70	0.192
T11	100 - 80	L3x3x3/16	19'10-11/16"	9'11-1/32"	126.7	21.600	1.0900	5.27	23.54	0.224
T12	80 - 60	L3x3x1/4	21'6"	10'8-17/32"	138.2	21.600	1.4400	5.88	31.10	0.189
T13	60 - 40	L3 1/2x3 1/2x3/16	23'1-9/16"	11'6-3/8"	125.7	21.600	1.2773	6.17	27.59	0.224
T14	40 - 20	L3 1/2x3 1/2x1/4	24'9-1/8"	12'3-31/32"	135.8	21.600	1.6900	6.72	36.50	0.184
T15	20 - 0	L4x4x1/4	26'4-29/32"	13'1-29/32"	126.3	21.600	1.9400	8.63	41.90	0.206

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0	21.600	0.4418	0.12	9.54	0.012
T2	280 - 260	7/8	4'	3'9-31/32"	210.3	21.600	0.6013	1.75	12.99	0.134

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0	21.600	0.4418	0.85	9.54	0.089
T2	280 - 260	7/8	4'	3'9-31/32"	210.3	21.600	0.6013	0.23	12.99	0.017

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 20 of 20</p>
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Section Capacity Table

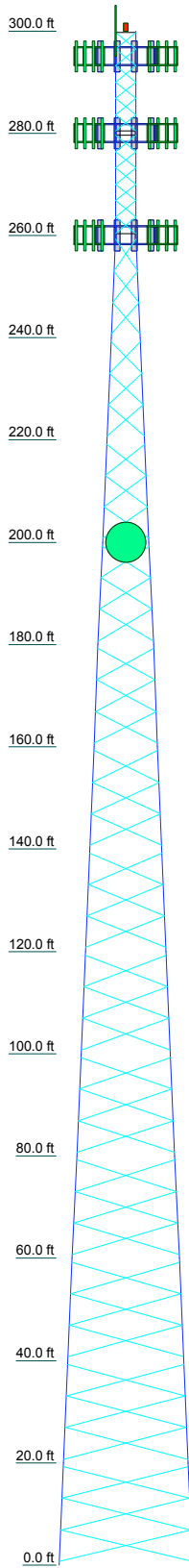
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
T1	300 - 280	Leg	1 1/2	3	-21.22	33.17	64.0	Pass	
T2	280 - 260	Leg	2	48	-76.31	82.10	92.9	Pass	
T3	260 - 240	Leg	3	93	-114.29	141.21	80.9	Pass	
T4	240 - 220	Leg	3 1/4	114	-140.44	184.47	76.1	Pass	
T5	220 - 200	Leg	3 1/4	134	-161.64	184.47	87.6	Pass	
T6	200 - 180	Leg	3 1/2	155	-181.12	231.65	78.2	Pass	
T7	180 - 160	Leg	3 1/2	176	-199.34	231.64	86.1	Pass	
T8	160 - 140	Leg	3 1/2	197	-216.96	231.64	93.7	Pass	
T9	140 - 120	Leg	3 3/4	218	-234.68	282.76	83.0	Pass	
T10	120 - 100	Leg	3 3/4	239	-252.41	282.76	89.3	Pass	
T11	100 - 80	Leg	3 3/4	260	-270.21	282.76	95.6	Pass	
T12	80 - 60	Leg	4	281	-288.61	337.84	85.4	Pass	
T13	60 - 40	Leg	4	302	-306.90	337.84	90.8	Pass	
T14	40 - 20	Leg	4 1/4	323	-325.76	396.88	82.1	Pass	
T15	20 - 0	Leg	4 1/4	344	-344.66	396.88	86.8	Pass	
T1	300 - 280	Diagonal	3/4	15	-2.46	3.48	70.7	Pass	
T2	280 - 260	Diagonal	7/8	60	-4.84	6.59	73.5	Pass	
T3	260 - 240	Diagonal	L2x2x3/16	111	-5.86	10.36	56.5	Pass	
T4	240 - 220	Diagonal	L2x2x3/16	129	-4.24	8.24	51.5	Pass	
T5	220 - 200	Diagonal	L2x2x3/16	138	-3.32	5.36	61.9	Pass	
T6	200 - 180	Diagonal	L2x2x3/16	160	-3.47	4.20	82.8	Pass	
T7	180 - 160	Diagonal	L2x2x1/4	181	-3.64	4.30	84.6	Pass	
T8	160 - 140	Diagonal	L2 1/2x2 1/2x3/16	202	-3.86	5.35	72.1	Pass	
T9	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	223	-4.28	4.41	97.0	Pass	
T10	120 - 100	Diagonal	L2 1/2x2 1/2x1/4	244	-4.64	4.77	97.1	Pass	
T11	100 - 80	Diagonal	L3x3x3/16	265	-5.01	5.44	92.0	Pass	
T12	80 - 60	Diagonal	L3x3x1/4	286	-5.54	6.08	91.1	Pass	
T13	60 - 40	Diagonal	L3 1/2x3 1/2x3/16	307	-5.88	6.47	90.9	Pass	
T14	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	325	-6.79	7.40	91.8	Pass	
T15	20 - 0	Diagonal	L4x4x1/4	352	-7.38	10.18	72.4	Pass	
T1	300 - 280	Top Girt	3/4	5	-0.13	1.43	9.3	Pass	
T2	280 - 260	Top Girt	7/8	50	-1.74	2.71	64.2	Pass	
T1	300 - 280	Bottom Girt	3/4	7	-0.91	1.43	63.4	Pass	
T2	280 - 260	Bottom Girt	7/8	54	-0.50	2.71	18.3	Pass	
							Summary		
							Leg (T11)	95.6	Pass
							Diagonal (T10)	97.1	Pass
							Top Girt (T2)	64.2	Pass
							Bottom Girt (T1)	63.4	Pass
							RATING =	97.1	Pass

APPENDIX C

Antenna Tower With Proposed Additional Antennas

Graphical Computer Output
Structural Analysis Report and Calculations

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	
Legs	SR 1 1/2	SR 2	SR 3	SR 3 1/4	SR 3 1/4	SR 3 1/2	SR 3 1/2	SR 3 3/4	SR 3 3/4	SR 3 3/4	SR 4	SR 4 1/4	SR 4 1/4	SR 4 1/4	SR 4 1/4	
Leg Grade	SR 3/4	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	
Diagonals	L2x2x3/16	L2x2x3/16	L2x2x1/4	L2x2x1/4	L2 1/2x2 1/2x3/16	L3x3x3/16	L3x3x1/4	L4x4x1/4	L4x4x1/4	L4x4x1/4	L4x4x1/4	L4x4x1/4	L4x4x1/4	L4x4x1/4	L4x4x1/4	
Diagonal Grade	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	
Top 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.	
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.	
Face Width (ft)	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	
# Panels @ (ft)	4	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	12 @ 3.20633	
Weight (K)	0.7	1.1	2.0	2.3	2.4	2.7	3.0	3.0	3.4	3.8	3.8	4.7	4.6	5.7	6.3	49.6



APPURTENANCES

TYPE	ELEVATION	TYPE	ELEVATION
Lighting - Beacon	300	12' T-Frame Sector Mount	280
Lightning 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	L2 1/2x2 1/2x1/4	C	L3 1/2x3 1/2x1/4
B	L3 1/2x3 1/2x3/16		

MATERIAL STRENGTH

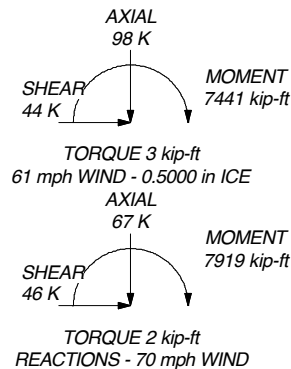
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

- Tower is located in Henderson County, Kentucky.
- Tower designed for a 70 mph basic wind in accordance with the TIA/EIA-222-F Standard.
- Tower is also designed for a 61 mph basic wind with 0.50 in ice.
- Deflections are based upon a 50 mph wind.
- EXISTING TOWER WITH PROPOSED ADDITIONAL ANTENNAS
- It is assumed that the tower has been properly maintained and is in good condition.
- It is assumed that there have been no structural modifications to the tower unless specifically noted otherwise.
- There are no known structural defects and that there is no structural deterioration.
- All welds and bolted connections are assumed capable of developing the member strength, unless noted otherwise.
- Material strengths are as noted elsewhere in this report.
- This structural analysis is based on information provided by others and assumed to be reliable and correct.
- See Sheet E-7 for Feedlines and Linear Appurtenances.
- See Sheet E-8 for Code Check/Stress Distribution.
- TOWER RATING: 113.8%

MAX PIER FORCES:

DOWN: 374 K
 UPLIFT: -315 K
 SHEAR: 28 K



Hodge Design Associates, P.C.

22 Chestnut Street
 Evansville, Indiana 47713-1022

www.hodgedesign.com

Phone: 812.422.2558
 FAX: 812.422.3337

Job: Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-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

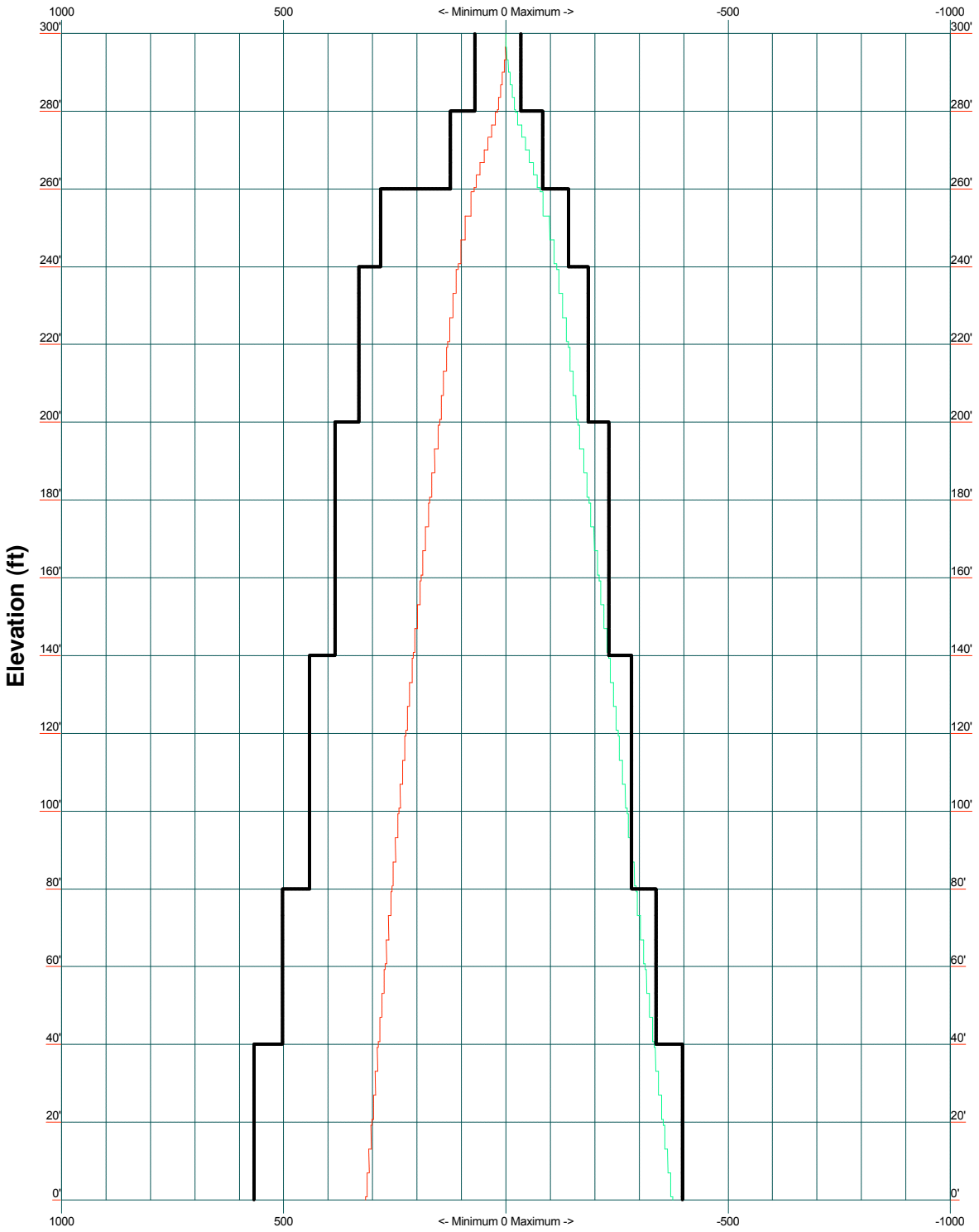
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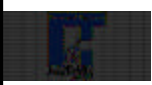
Dwg No. E-1

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

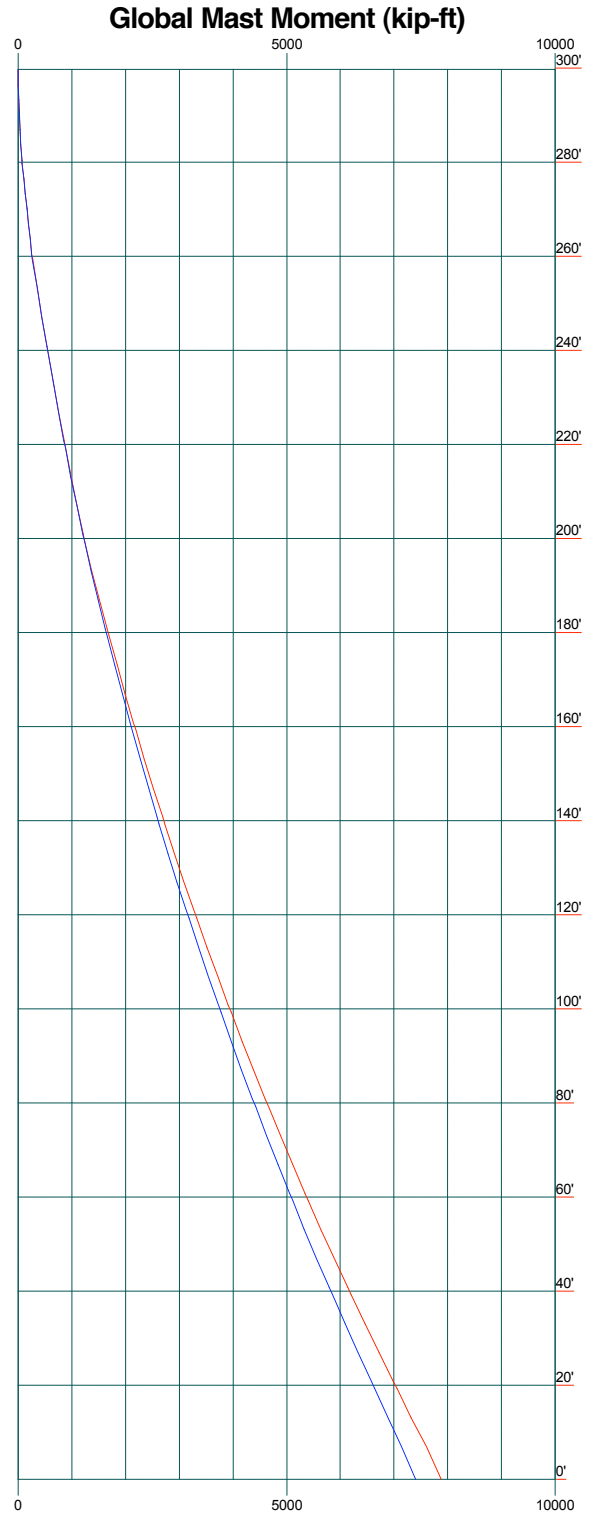
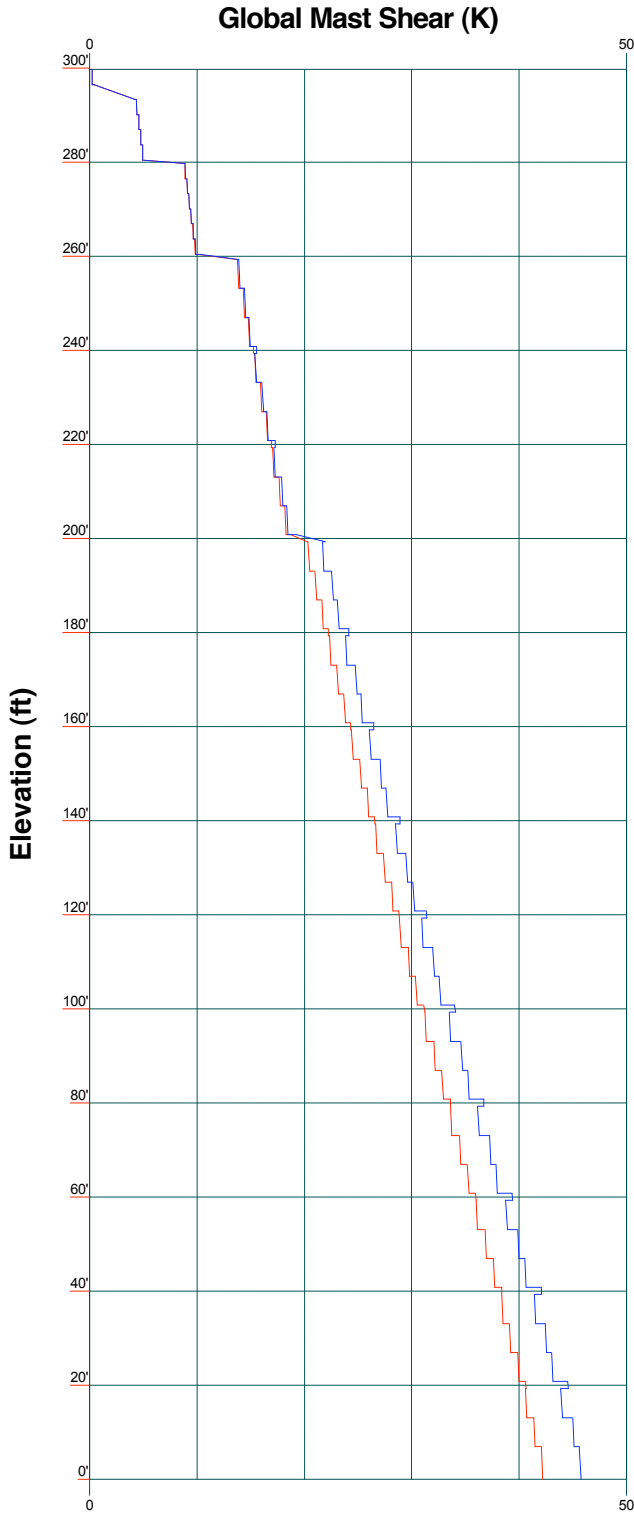
Leg Capacity ——— Leg Compression (K)



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	<small>©\Documents and Settings\ghodge\HODGEDESIGN\004\Documents\ERT\Tower Project Data Files\Sample Reports\Sample_SS-R2.dwg</small>			
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Vx Vz

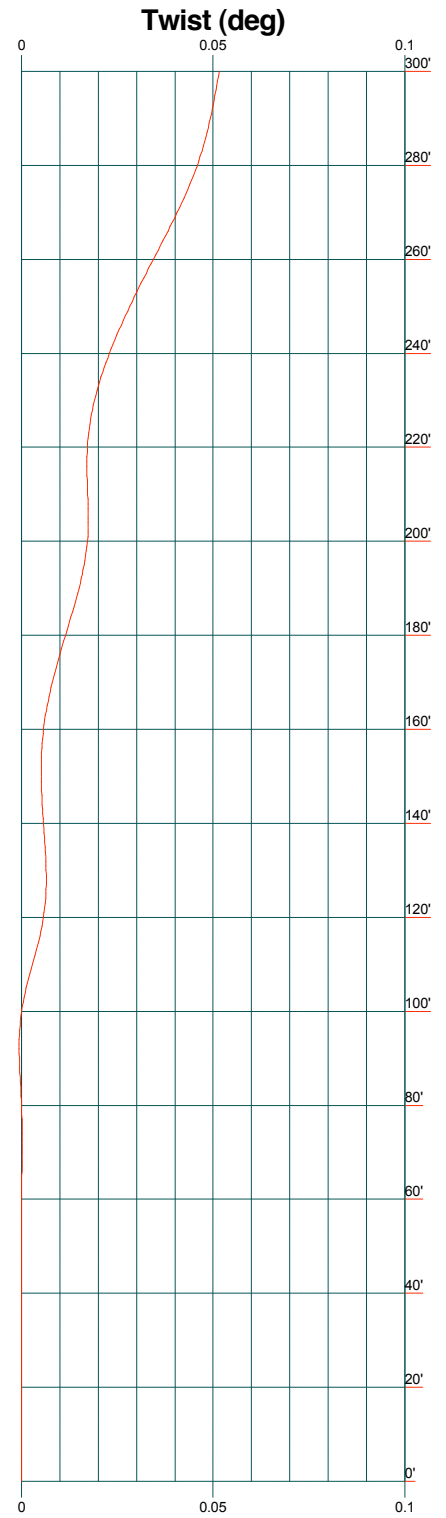
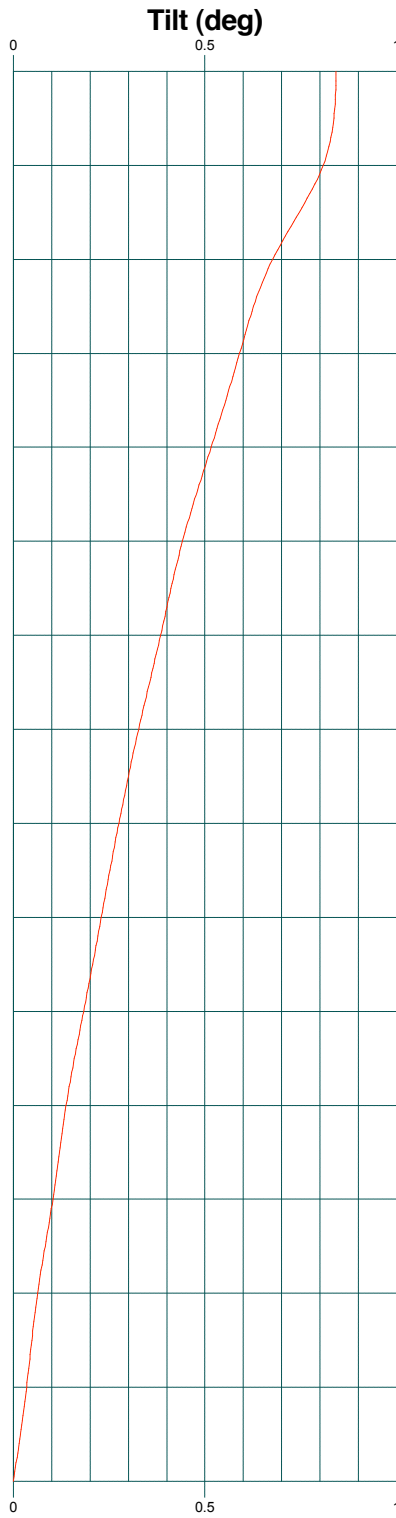
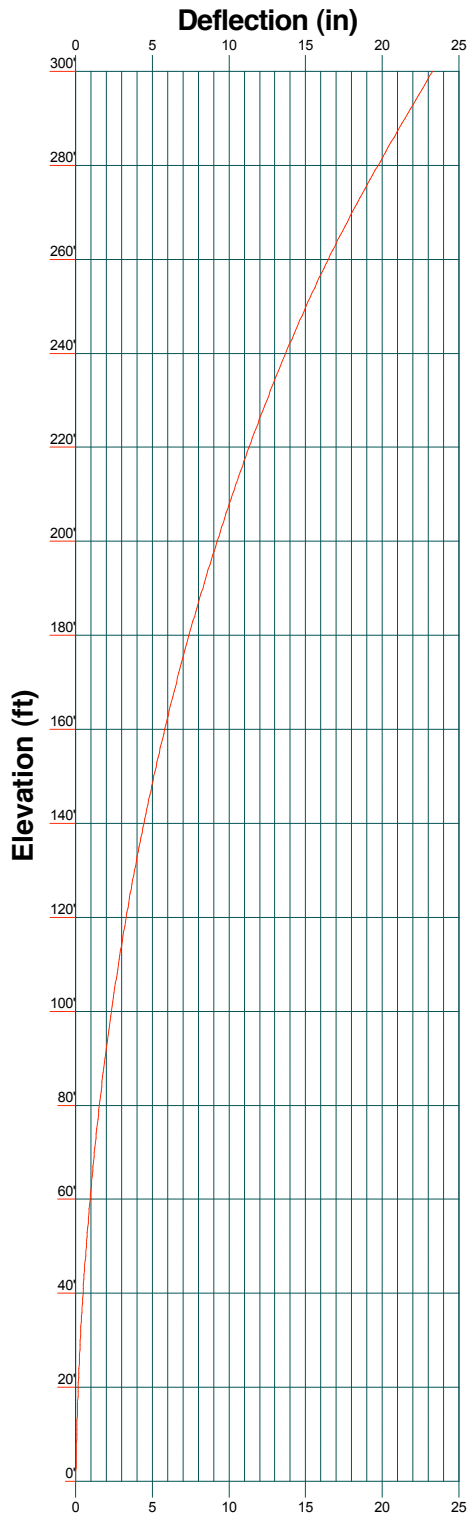
Mx Mz

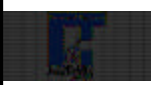


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Project: Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas		
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
Path:	Dwg No. E-4	

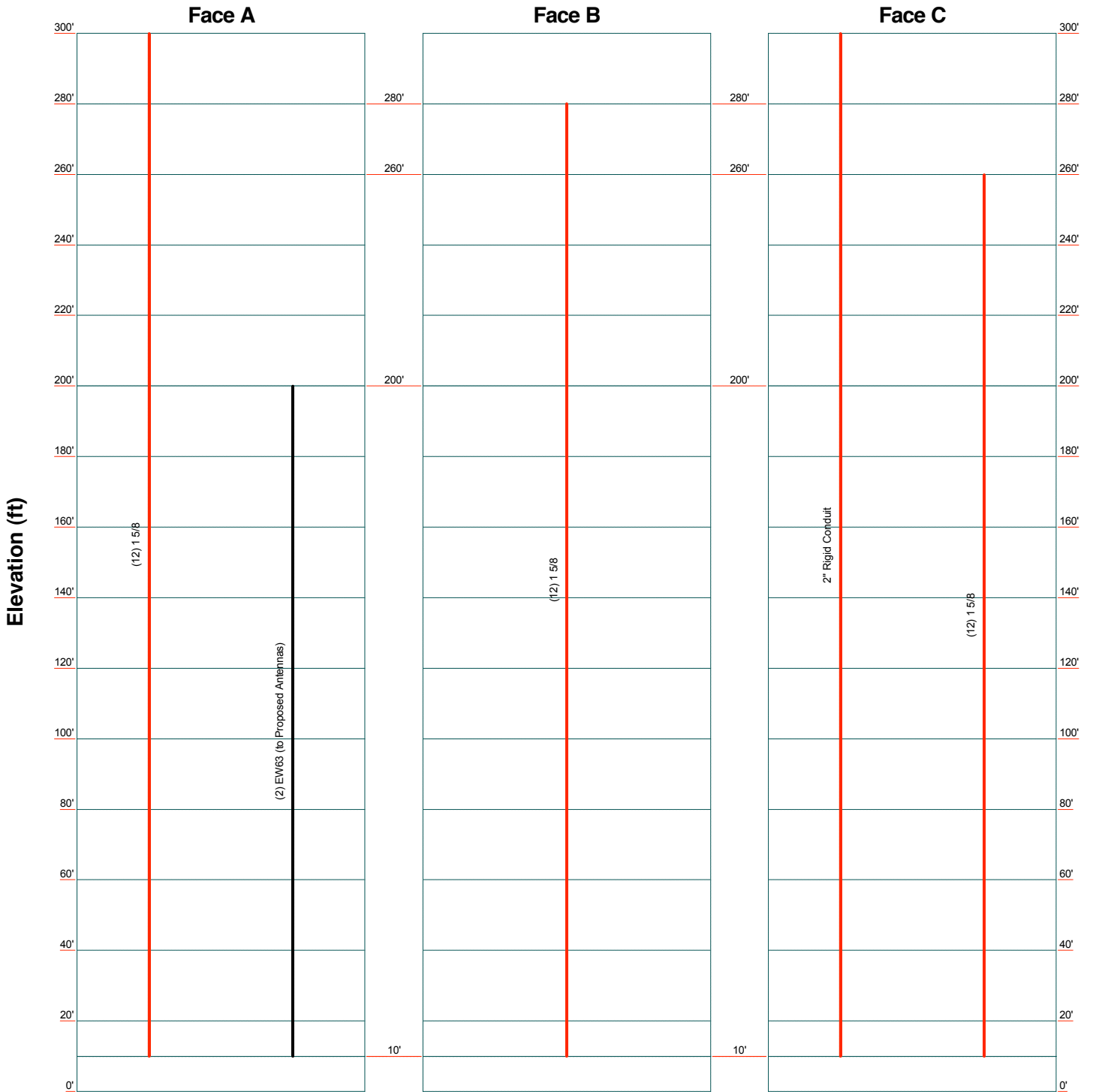
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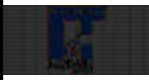


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	Project: Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas		Drawn by: Gray Hodge	
	Client: ABC Towers and Tower Maintenance		App'd:	
	Code: TIA/EIA-222-F		Date: 07/23/04	
	Path:		Scale: NTS Dwg No. E-5	

Feedline Distribution Chart 0' - 300'

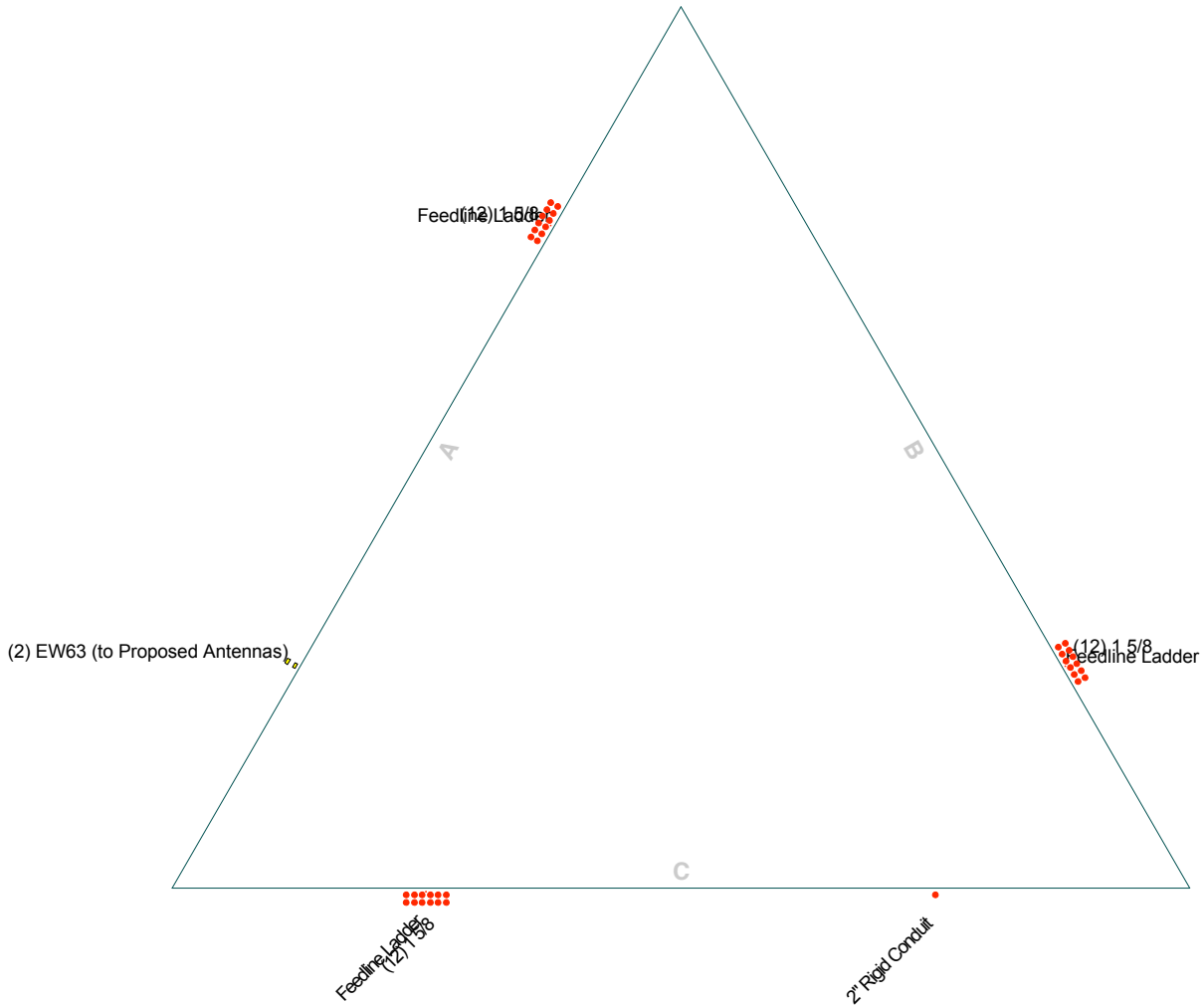
— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg




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	Phone: 812.422.2558	Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
	FAX: 812.422.3337	Path:	Dwg No. E-7	
C:\Documents and Settings\phodge\HODGEDESIGN\0004\Documents\ERT\Tower Project Data Files\Sample Reports\Sample_SS-R2.dwg				

Feedline Plan

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

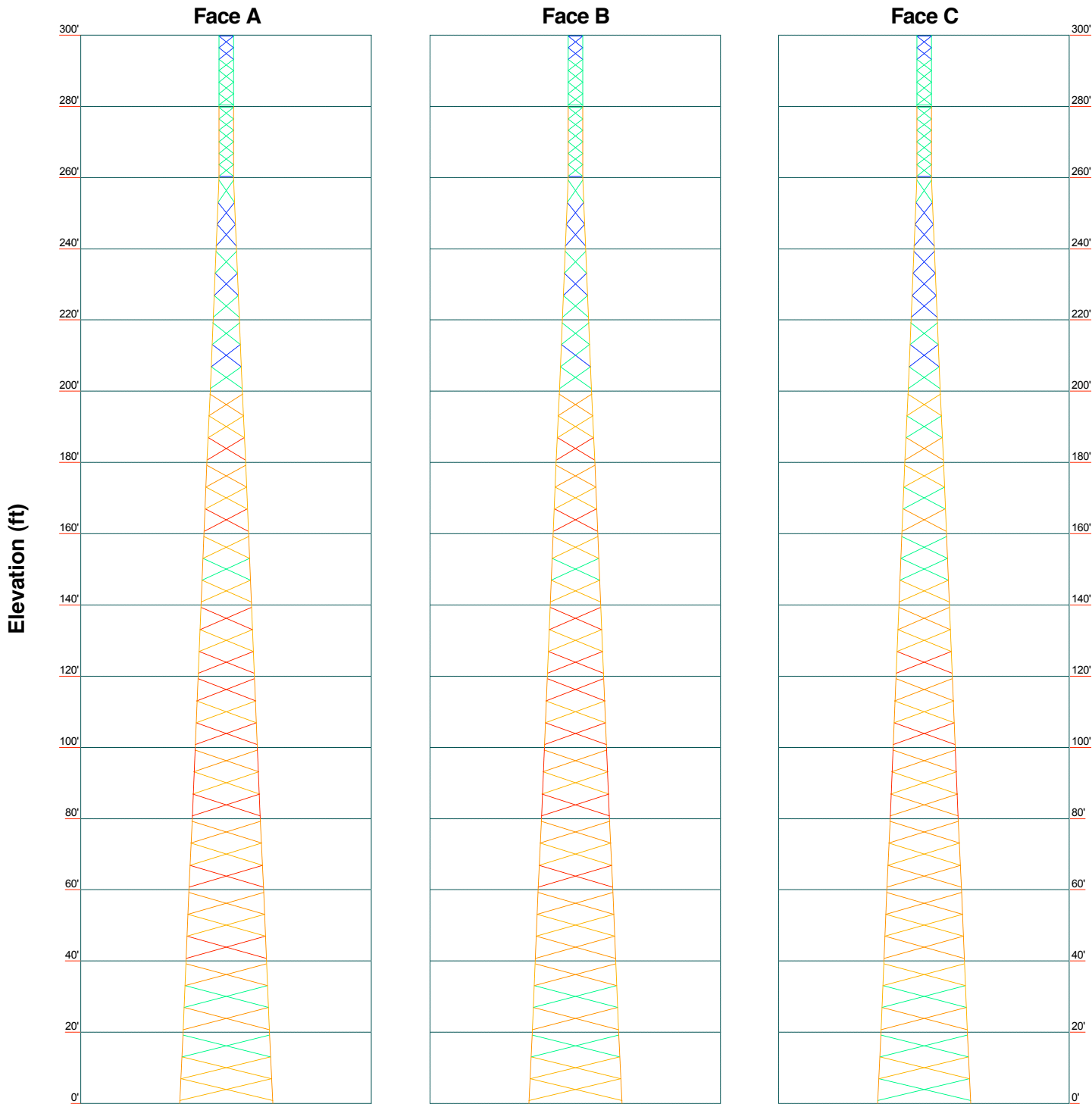


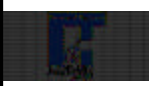
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	22 Chestnut Street	Project: Henderson, Henderson County, KY -- Existing Tower With Proposed Additional Antennas		
	Evansville, Indiana 47713-1022	Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
	Phone: 812.422.2558	Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
	FAX: 812.422.3337	Path:	Dwg No. E-7	
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Stress Distribution Chart

0' - 300'

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



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	Scale: NTS		
	Dwg No. E-8		

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 1 of 21</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p>Date 12:55:40 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Tower Input Data

The main tower is a 3x free standing 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 4' at the top and 26' 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.

EXISTING TOWER WITH PROPOSED ADDITIONAL ANTENNAS.

It is assumed that the tower has been properly maintained and is in good condition..

It is assumed that there have been no structural modifications to the tower unless specifically noted otherwise..

There are no known structural defects and that there is no structural deterioration..

All welds and bolted connections are assumed capable of developing the member strength, unless noted otherwise..

Material strengths are as noted elsewhere in this report..

This structural analysis is based on information provided by others and assumed to be reliable and correct..

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

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

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

Pressures are calculated at each section.

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

<i>ERITower</i> Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337	Job	Page	
	Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)		3 of 21
	Project	Date	
Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas		12:55:40 07/23/04	
Client	Designed by		
ABC Towers and Tower Maintenance		Gray Hodge	

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'-2-17/32"	X Brace	No	No	4.5000	4.5000
T2	280'-260'	3'-2-17/32"	X Brace	No	No	4.5000	4.5000
T3	260'-240'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T4	240'-220'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T5	220'-200'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T6	200'-180'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T7	180'-160'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T8	160'-140'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T9	140'-120'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T10	120'-100'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T11	100'-80'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T12	80'-60'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T13	60'-40'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T14	40'-20'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000
T15	20'-0'	6'-2-1/32"	X Brace	No	No	9.0000	9.0000

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	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 260'-240'	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 240'-220'	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 220'-200'	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 200'-180'	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T7 180'-160'	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T8 160'-140'	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 140'-120'	Solid Round	3 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T10 120'-100'	Solid Round	3 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T11 100'-80'	Solid Round	3 3/4	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T12 80'-60'	Solid Round	4	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T13 60'-40'	Solid Round	4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x3/16	A36 (36 ksi)
T14 40'-20'	Solid Round	4 1/4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T15 20'-0'	Solid Round	4 1/4	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 4 of 21</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p>Date 12:55:40 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

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	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in
T1 300'-280'	0.00	0.0000	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T2 280'-260'	0.00	0.0000	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T3 260'-240'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T4 240'-220'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T5 220'-200'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T6 200'-180'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T7 180'-160'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T8 160'-140'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T9 140'-120'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T10 120'-100'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T11 100'-80'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T12 80'-60'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T13 60'-40'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T14 40'-20'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T15 20'-0'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000

Tower Section Geometry (cont'd)

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 6 of 21</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p>Date 12:55:40 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

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
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'-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

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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 _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	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

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T8	160'-140'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
T9	140'-120'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
T10	120'-100'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
T11	100'-80'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
T12	80'-60'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
T13	60'-40'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
T14	40'-20'	C	26.647	0.000	0.000	0.000	0.31
		A	23.314	5.247	0.000	0.000	0.27
		B	23.314	0.000	0.000	0.000	0.25
T15	20'-0'	C	26.647	0.000	0.000	0.000	0.31
		A	11.657	2.624	0.000	0.000	0.14
		B	11.657	0.000	0.000	0.000	0.12
		C	13.323	0.000	0.000	0.000	0.15

Feed Line/Linear Appurtenances Section Areas - With Ice

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
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

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
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
		C		9.967	20.014	0.000	0.000	0.65
T15	20'-0'	A	0.500	2.483	13.742	0.000	0.000	0.32
		B		2.483	10.007	0.000	0.000	0.28
		C		4.983	10.007	0.000	0.000	0.32

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	1.076	3.117	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.181	0.634	0.000	0.000
T2	280'-260'	A	1.255	3.340	0.000	0.000
		B	1.255	3.340	0.000	0.000
		C	0.211	0.679	0.000	0.000
T3	260'-240'	A	0.000	0.000	1.611	2.668
		B	0.000	0.000	1.611	2.668
		C	0.000	0.000	1.882	3.210
T4	240'-220'	A	0.000	0.000	1.364	2.259
		B	0.000	0.000	1.364	2.259
		C	0.000	0.000	1.594	2.718
T5	220'-200'	A	0.000	0.000	1.238	2.051
		B	0.000	0.000	1.238	2.051
		C	0.000	0.000	1.447	2.468
T6	200'-180'	A	0.000	0.000	1.321	2.268
		B	0.000	0.000	1.166	1.932
		C	0.000	0.000	1.363	2.324
T7	180'-160'	A	0.000	0.000	1.270	2.181
		B	0.000	0.000	1.121	1.857
		C	0.000	0.000	1.310	2.234
T8	160'-140'	A	0.000	0.000	1.545	2.521
		B	0.000	0.000	1.364	2.146
		C	0.000	0.000	1.594	2.583
T9	140'-120'	A	0.000	0.000	1.516	2.473
		B	0.000	0.000	1.338	2.105
		C	0.000	0.000	1.563	2.533
T10	120'-100'	A	0.000	0.000	1.494	2.438
		B	0.000	0.000	1.319	2.076
		C	0.000	0.000	1.542	2.498
T11	100'-80'	A	0.000	0.000	1.774	2.793
		B	0.000	0.000	1.566	2.378
		C	0.000	0.000	1.830	2.861

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 9 of 21
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Section	Elevation	Face	A_R	A_R	A_F	A_F
			ft^2	Ice ft^2	ft^2	Ice ft^2
T12	80'-60'	A	0.000	0.000	1.759	2.770
		B	0.000	0.000	1.554	2.358
		C	0.000	0.000	1.815	2.838
T13	60'-40'	A	0.000	0.000	2.039	3.127
		B	0.000	0.000	1.801	2.663
		C	0.000	0.000	2.104	3.204
T14	40'-20'	A	0.000	0.000	2.029	3.111
		B	0.000	0.000	1.791	2.649
		C	0.000	0.000	2.093	3.187
T15	20'-0'	A	0.000	0.000	1.154	1.735
		B	0.000	0.000	1.019	1.477
		C	0.000	0.000	1.191	1.777

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X	CP_Z
		in	in	Ice in	Ice in
T1	300'-280'	-2.9383	-6.9500	-1.1734	-3.0794
T2	280'-260'	3.6777	-3.9680	2.3019	-1.9675
T3	260'-240'	0.3397	0.4390	0.4246	0.5487
T4	240'-220'	0.4414	0.5547	0.5525	0.6943
T5	220'-200'	0.5420	0.6698	0.6767	0.8362
T6	200'-180'	-0.9463	0.9770	-1.0841	1.1978
T7	180'-160'	-1.0628	1.1133	-1.2128	1.3603
T8	160'-140'	-1.1024	1.1552	-1.2649	1.4207
T9	140'-120'	-1.1770	1.2439	-1.3500	1.5296
T10	120'-100'	-1.2607	1.3414	-1.4424	1.6458
T11	100'-80'	-1.2488	1.3225	-1.4398	1.6365
T12	80'-60'	-1.2973	1.3803	-1.4962	1.7086
T13	60'-40'	-1.2633	1.3356	-1.4686	1.6680
T14	40'-20'	-1.2980	1.3770	-1.5097	1.7206
T15	20'-0'	-0.7058	0.7428	-0.8198	0.9276

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C_{AA}	C_{AA}	Weight	
			Horz	Vert			Front	Side		
			ft	ft	°	ft	ft^2	ft^2	K	
See E-7 for Feedlines and Linear Appurtenances	C	None			0.0000	0'	No Ice	0.00	0.00	0.00
Lighting - Beacon	C	None			0.0000	300'	1/2" Ice	0.00	0.00	0.00
							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		0.0000	300'	No Ice	2.09	2.09	0.08

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job</p> <p>Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page</p> <p>10 of 21</p>
	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p>Date</p> <p>12:55:40 07/23/04</p>
	<p>Client</p> <p>ABC Towers and Tower Maintenance</p>	<p>Designed by</p> <p>Gray Hodge</p>

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral	Vert					
			0'				1/2" Ice	2.46	2.46	0.09
(4) DB858DDH65E-SX	A	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	A	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	B	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	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

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 11 of 21
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Dishes

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

Load Combinations

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

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Comb. No.	Description
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	366.41	23.71	-13.75
	Max. H _x	10	366.41	23.71	-13.75
	Max. H _z	16	-231.34	-18.35	12.42
	Min. Vert	4	-306.82	-20.82	12.16
	Min. H _x	17	-264.12	-21.23	12.33
	Min. H _z	10	366.41	23.71	-13.75
Leg B	Max. Vert	6	366.51	-23.73	-13.71
	Max. H _x	25	-264.17	21.26	12.29
	Max. H _z	26	-231.38	18.39	12.35
	Min. Vert	12	-306.72	20.84	12.12
	Min. H _x	6	366.51	-23.73	-13.71
	Min. H _z	6	366.51	-23.73	-13.71
Leg A	Max. Vert	2	374.04	-0.04	27.90
	Max. H _x	10	-158.94	3.31	-12.81
	Max. H _z	2	374.04	-0.04	27.90
	Min. Vert	8	-314.64	0.05	-24.66
	Min. H _x	6	-158.94	-3.25	-12.81
	Min. H _z	21	-270.27	0.05	-24.98

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	67.07	0.00	0.00	2.12	-1.29	0.00
Dead+Wind 0 deg - No Ice	67.07	0.00	-46.20	-7918.83	-1.29	-2.20
Dead+Wind 30 deg - No Ice	67.07	21.02	-38.08	-6685.23	-3667.64	-1.37
Dead+Wind 60 deg - No Ice	67.07	35.80	-22.03	-3910.49	-6300.87	-1.37
Dead+Wind 90 deg - No Ice	67.07	42.53	-0.00	2.12	-7433.40	-0.25
Dead+Wind 120 deg - No Ice	67.07	38.67	23.70	4082.28	-6591.10	1.93
Dead+Wind 150 deg - No Ice	67.07	21.02	38.08	6689.46	-3667.67	1.59
Dead+Wind 180 deg - No Ice	67.07	0.00	42.88	7587.95	-1.29	1.92
Dead+Wind 210 deg - No Ice	67.07	-21.02	38.08	6689.45	3665.09	1.86
Dead+Wind 240 deg - No Ice	67.07	-38.67	23.70	4082.27	6588.50	0.27
Dead+Wind 270 deg - No Ice	67.07	-42.53	-0.00	2.12	7430.80	0.25
Dead+Wind 300 deg - No Ice	67.07	-35.80	-22.03	-3910.49	6298.28	-0.55
Dead+Wind 330 deg - No Ice	67.07	-21.02	-38.08	-6685.23	3665.06	-2.08
Dead+Ice+Temp	97.73	-0.00	0.00	2.85	0.60	0.00
Dead+Wind 0 deg+Ice+Temp	97.73	0.00	-43.50	-7441.49	0.60	-2.37
Dead+Wind 30 deg+Ice+Temp	97.73	19.26	-34.63	-6071.04	-3356.65	-0.90
Dead+Wind 60 deg+Ice+Temp	97.73	32.36	-19.73	-3497.25	-5695.10	-0.27
Dead+Wind 90 deg+Ice+Temp	97.73	38.89	-0.00	2.88	-6790.31	1.06
Dead+Wind 120 deg+Ice+Temp	97.73	36.65	22.21	3816.91	-6239.05	3.06
Dead+Wind 150 deg+Ice+Temp	97.73	19.26	34.63	6076.65	-3356.74	2.32
Dead+Wind 180 deg+Ice+Temp	97.73	0.00	38.56	6819.11	0.61	1.98
Dead+Wind 210 deg+Ice+Temp	97.73	-19.26	34.63	6076.64	3357.95	1.28
Dead+Wind 240 deg+Ice+Temp	97.73	-36.65	22.21	3816.91	6240.25	-0.68

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 13 of 21</p>
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	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 270 deg+Ice+Temp	97.73	-38.89	-0.00	2.88	6791.51	-1.06
Dead+Wind 300 deg+Ice+Temp	97.73	-32.36	-19.73	-3497.23	5696.31	-1.71
Dead+Wind 330 deg+Ice+Temp	97.73	-19.26	-34.63	-6071.04	3357.85	-2.70
Dead+Wind 0 deg - Service	67.07	0.00	-23.57	-4039.36	-1.30	-1.12
Dead+Wind 30 deg - Service	67.07	10.72	-19.43	-3409.94	-1871.98	-0.68
Dead+Wind 60 deg - Service	67.07	18.26	-11.24	-1994.19	-3215.51	-0.70
Dead+Wind 90 deg - Service	67.07	21.70	-0.00	2.12	-3793.35	-0.15
Dead+Wind 120 deg - Service	67.07	19.73	12.09	2083.92	-3363.59	0.99
Dead+Wind 150 deg - Service	67.07	10.72	19.43	3414.18	-1871.98	0.83
Dead+Wind 180 deg - Service	67.07	0.00	21.88	3872.62	-1.30	0.98
Dead+Wind 210 deg - Service	67.07	-10.72	19.43	3414.18	1869.39	0.93
Dead+Wind 240 deg - Service	67.07	-19.73	12.09	2083.92	3360.99	0.13
Dead+Wind 270 deg - Service	67.07	-21.70	-0.00	2.12	3790.75	0.15
Dead+Wind 300 deg - Service	67.07	-18.26	-11.24	-1994.19	3212.91	-0.28
Dead+Wind 330 deg - Service	67.07	-10.72	-19.43	-3409.94	1869.38	-1.08

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	-67.07	0.00	-0.00	67.07	0.00	0.000%
2	0.00	-67.07	-46.21	-0.00	67.07	46.20	0.005%
3	21.02	-67.07	-38.08	-21.02	67.07	38.08	0.005%
4	35.80	-67.07	-22.04	-35.80	67.07	22.03	0.005%
5	42.54	-67.07	0.00	-42.53	67.07	0.00	0.005%
6	38.68	-67.07	23.70	-38.67	67.07	-23.70	0.005%
7	21.02	-67.07	38.08	-21.02	67.07	-38.08	0.005%
8	0.00	-67.07	42.88	0.00	67.07	-42.88	0.005%
9	-21.02	-67.07	38.08	21.02	67.07	-38.08	0.005%
10	-38.68	-67.07	23.70	38.67	67.07	-23.70	0.005%
11	-42.54	-67.07	0.00	42.53	67.07	0.00	0.005%
12	-35.80	-67.07	-22.04	35.80	67.07	22.03	0.005%
13	-21.02	-67.07	-38.08	21.02	67.07	38.08	0.005%
14	0.00	-97.73	0.00	0.00	97.73	0.00	0.000%
15	0.00	-97.73	-43.51	-0.00	97.73	43.50	0.003%
16	19.26	-97.73	-34.64	-19.26	97.73	34.63	0.003%
17	32.37	-97.73	-19.73	-32.36	97.73	19.73	0.003%
18	38.89	-97.73	0.00	-38.89	97.73	0.00	0.003%
19	36.65	-97.73	22.21	-36.65	97.73	-22.21	0.003%
20	19.26	-97.73	34.64	-19.26	97.73	-34.63	0.003%
21	0.00	-97.73	38.56	0.00	97.73	-38.56	0.003%
22	-19.26	-97.73	34.64	19.26	97.73	-34.63	0.003%
23	-36.65	-97.73	22.21	36.65	97.73	-22.21	0.003%
24	-38.89	-97.73	0.00	38.89	97.73	0.00	0.003%
25	-32.37	-97.73	-19.73	32.36	97.73	19.73	0.003%
26	-19.26	-97.73	-34.64	19.26	97.73	34.63	0.003%
27	0.00	-67.07	-23.58	0.00	67.07	23.57	0.003%
28	10.73	-67.07	-19.43	-10.72	67.07	19.43	0.003%
29	18.26	-67.07	-11.24	-18.26	67.07	11.24	0.003%
30	21.70	-67.07	0.00	-21.70	67.07	0.00	0.003%
31	19.73	-67.07	12.09	-19.73	67.07	-12.09	0.003%
32	10.73	-67.07	19.43	-10.72	67.07	-19.43	0.003%
33	0.00	-67.07	21.88	0.00	67.07	-21.88	0.003%
34	-10.73	-67.07	19.43	10.72	67.07	-19.43	0.003%
35	-19.73	-67.07	12.09	19.73	67.07	-12.09	0.003%
36	-21.70	-67.07	0.00	21.70	67.07	0.00	0.003%
37	-18.26	-67.07	-11.24	18.26	67.07	11.24	0.003%

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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 14 of 21
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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	
38	-10.73	-67.07	-19.43	10.72	67.07	19.43	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	16	0.00006924	0.00011391
3	Yes	16	0.00006620	0.00010920
4	Yes	16	0.00006300	0.00010418
5	Yes	16	0.00006592	0.00010891
6	Yes	16	0.00006904	0.00011371
7	Yes	16	0.00006571	0.00010840
8	Yes	16	0.00006287	0.00010382
9	Yes	16	0.00006571	0.00010840
10	Yes	16	0.00006905	0.00011372
11	Yes	16	0.00006592	0.00010891
12	Yes	16	0.00006300	0.00010418
13	Yes	16	0.00006619	0.00010920
14	Yes	6	0.00000001	0.00000001
15	Yes	17	0.00006237	0.00010322
16	Yes	17	0.00006057	0.00010057
17	Yes	17	0.00005886	0.00009792
18	Yes	17	0.00006047	0.00010049
19	Yes	17	0.00006229	0.00010316
20	Yes	17	0.00006033	0.00010013
21	Yes	17	0.00005875	0.00009763
22	Yes	17	0.00006033	0.00010013
23	Yes	17	0.00006229	0.00010315
24	Yes	17	0.00006046	0.00010048
25	Yes	17	0.00005885	0.00009792
26	Yes	17	0.00006057	0.00010056
27	Yes	16	0.00006646	0.00010867
28	Yes	16	0.00006508	0.00010662
29	Yes	16	0.00006360	0.00010436
30	Yes	16	0.00006500	0.00010659
31	Yes	16	0.00006641	0.00010866
32	Yes	16	0.00006484	0.00010619
33	Yes	16	0.00006348	0.00010404
34	Yes	16	0.00006484	0.00010620
35	Yes	16	0.00006641	0.00010867
36	Yes	16	0.00006500	0.00010660
37	Yes	16	0.00006360	0.00010436
38	Yes	16	0.00006508	0.00010662

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	23.280	27	0.8440	0.0514
T2	280 - 260	19.724	27	0.8066	0.0465

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 15 of 21</p>
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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	260 - 240	16.472	27	0.6761	0.0349
T4	240 - 220	13.702	27	0.5892	0.0224
T5	220 - 200	11.312	27	0.5144	0.0174
T6	200 - 180	9.232	27	0.4434	0.0145
T7	180 - 160	7.399	27	0.3856	0.0100
T8	160 - 140	5.813	27	0.3289	0.0074
T9	140 - 120	4.453	27	0.2740	0.0053
T10	120 - 100	3.297	27	0.2280	0.0037
T11	100 - 80	2.339	27	0.1829	0.0027
T12	80 - 60	1.552	27	0.1390	0.0019
T13	60 - 40	0.945	27	0.1012	0.0014
T14	40 - 20	0.480	27	0.0642	0.0009
T15	20 - 0	0.172	27	0.0319	0.0004

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	23.280	0.8440	0.0514	60372
295'	(4) DB858DDH65E-SX	27	22.379	0.8412	0.0505	60372
280'	(4) DB858DDH65E-SX	27	19.724	0.8066	0.0465	15249
260'	(4) DB858DDH65E-SX	27	16.472	0.6761	0.0349	8893
200'	UHX8-59	27	9.232	0.4434	0.0145	19547
100'	Lighting - Dual Obstruction	27	2.339	0.1829	0.0027	30330
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.0000	0.0000	118290

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	45.627	2	1.6522	0.1013
T2	280 - 260	38.667	2	1.5790	0.0915
T3	260 - 240	32.300	2	1.3237	0.0687
T4	240 - 220	26.874	2	1.1538	0.0440
T5	220 - 200	22.190	2	1.0076	0.0342
T6	200 - 180	18.114	2	0.8685	0.0284
T7	180 - 160	14.520	2	0.7553	0.0192
T8	160 - 140	11.411	2	0.6444	0.0141
T9	140 - 120	8.742	2	0.5369	0.0102
T10	120 - 100	6.476	2	0.4468	0.0072
T11	100 - 80	4.595	2	0.3584	0.0062
T12	80 - 60	3.049	2	0.2724	0.0050
T13	60 - 40	1.858	2	0.1983	0.0038
T14	40 - 20	0.944	2	0.1259	0.0024
T15	20 - 0	0.339	2	0.0625	0.0011

<p>ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 16 of 21</p>
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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	45.627	1.6522	0.1013	31023
295'	(4) DB858DDH65E-SX	2	43.863	1.6466	0.0996	31023
280'	(4) DB858DDH65E-SX	2	38.667	1.5790	0.0915	7832
260'	(4) DB858DDH65E-SX	2	32.300	1.3237	0.0687	4543
200'	UHX8-59	2	18.114	0.8685	0.0284	9979
100'	Lighting - Dual Obstruction	2	4.595	0.3584	0.0062	15491
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.0000	0.0000	60443

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
T1	300 - 280	1 1/2	20'	3'-17/32"	102.7 K=1.00	14.083	1.7672	-21.23	24.89	0.853 ✓
T2	280 - 260	2	20'	3'-17/32"	77.0 K=1.00	19.605	3.1416	-76.34	61.59	1.239 ✓
T3	260 - 240	3	20'1/4"	6'-1/32"	98.8 K=1.00	14.986	7.0686	-114.35	105.93	1.079 ✓
T4	240 - 220	3 1/4	20'1/4"	6'-1/32"	91.2 K=1.00	16.682	8.2958	-140.51	138.39	1.015 ✓
T5	220 - 200	3 1/4	20'1/4"	6'-1/32"	91.2 K=1.00	16.682	8.2958	-161.86	138.39	1.170 ✓
T6	200 - 180	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-187.26	173.78	1.078 ✓
T7	180 - 160	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-209.99	173.78	1.208 ✓
T8	160 - 140	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-231.28	173.78	1.331 ✓
T9	140 - 120	3 3/4	20'1/4"	6'-1/32"	79.0 K=1.00	19.206	11.0447	-252.14	212.13	1.189 ✓
T10	120 - 100	3 3/4	20'1/4"	6'-1/32"	79.0 K=1.00	19.206	11.0447	-272.60	212.13	1.285 ✓
T11	100 - 80	3 3/4	20'1/4"	6'-1/32"	79.0 K=1.00	19.206	11.0447	-292.81	212.13	1.380 X
T12	80 - 60	H1-3 (1.38 CR) - 261 4	20'1/4"	6'-1/32"	74.1 K=1.00	20.168	12.5664	-313.40	253.44	1.237 ✓
T13	60 - 40	4	20'1/4"	6'-1/32"	74.1 K=1.00	20.168	12.5664	-333.66	253.44	1.317 ✓
T14	40 - 20	4 1/4	20'1/4"	6'-1/32"	69.7 K=1.00	20.988	14.1863	-354.34	297.74	1.190 ✓
T15	20 - 0	4 1/4	20'1/4"	6'-1/32"	69.7 K=1.00	20.988	14.1863	-374.90	297.74	1.259 ✓

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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 17 of 21
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Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
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Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	5'1-9/16"	2'5-3/4"	159.0 K=1.00	5.910	0.4418	-2.46	2.61	0.943 ✓
T2	280 - 260	7/8	5'1-9/16"	2'5-17/32"	134.8 K=1.00	8.220	0.6013	-4.85	4.94	0.981 ✓
T3	260 - 240	L2x2x3/16	7'6-3/8"	3'9-19/32"	115.8 K=1.00	10.870	0.7150	-5.86	7.77	0.754 ✓
T4	240 - 220	L2x2x3/16	8'7-7/16"	4'3-27/32"	131.4 K=1.00	8.643	0.7150	-4.25	6.18	0.688 ✓
T5	220 - 200	L2x2x3/16	10'8-17/32"	5'4-3/16"	162.9 K=1.00	5.628	0.7150	-3.43	4.02	0.853 ✓
T6	200 - 180	L2x2x3/16	12'1-9/16"	6'19/32"	184.2 K=1.00	4.403	0.7150	-4.43	3.15	1.409 ✗
T7	180 - 160	H1-3 (1.41 CR) - 159 L2x2x1/4	13'7-5/16"	6'9-15/32"	208.4 K=1.00	3.439	0.9380	-4.52	3.23	1.400 ✗
T8	160 - 140	KL/R > 200 (C) - 183 L2 1/2x2 1/2x3/16	15'1-11/16"	7'6-19/32"	183.1 K=1.00	4.452	0.9020	-4.64	4.02	1.155 ✓
T9	140 - 120	L2 1/2x2 1/2x3/16	16'8-13/32"	8'3-27/32"	201.8 K=1.00	3.668	0.9020	-5.02	3.31	1.517 ✗
T10	120 - 100	KL/R > 200 (C) - 225 L2 1/2x2 1/2x1/4	18'3-15/32"	9'1-7/16"	222.8 K=1.00	3.009	1.1900	-5.33	3.58	1.489 ✗
T11	100 - 80	KL/R > 200 (C) - 246 L3x3x3/16	19'10-11/16"	9'11-1/32"	199.7 K=1.00	3.746	1.0900	-5.66	4.08	1.387 ✗
T12	80 - 60	H1-3 (1.39 CR) - 267 L3x3x1/4	21'6"	10'8-17/32"	217.2 K=1.00	3.167	1.4400	-6.18	4.56	1.356 ✗
T13	60 - 40	KL/R > 200 (C) - 288 L3 1/2x3 1/2x3/16	23'1-9/16"	11'6-3/8"	198.2 K=1.00	3.802	1.2773	-6.50	4.86	1.338 ✗
T14	40 - 20	H1-3 (1.34 CR) - 309 L3 1/2x3 1/2x1/4	24'9-1/8"	12'3-31/32"	213.3 K=1.00	3.283	1.6900	-7.27	5.55	1.309 ✓
T15	20 - 0	KL/R > 200 (C) - 330 L4x4x1/4	25'10-13/16"	12'10-13/16"	194.7 K=1.00	3.938	1.9400	-7.78	7.64	1.018 ✓

Top Girt Design Data (Compression)

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 18 of 21</p>
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Section No.	Elevation ft	Size	L ft	L _a ft	KL/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0 K=1.00	2.428	0.4418	-0.13	1.07	0.124 ✓
T2	280 - 260	KL/R > 200 (C) - 5 7/8	4'	3'9-31/32"	210.3 K=1.00	3.377	0.6013	-1.74	2.03	0.856 ✓
		KL/R > 200 (C) - 49								

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	KL/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0 K=1.00	2.428	0.4418	-0.91	1.07	0.845 ✓
T2	280 - 260	KL/R > 200 (C) - 7 7/8	4'	3'9-31/32"	210.3 K=1.00	3.377	0.6013	-0.49	2.03	0.244 ✓
		KL/R > 200 (C) - 54								

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	KL/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	1 1/2	20'	3'2-17/32"	102.7	30.000	1.7672	19.40	53.01	0.366 ✓
T2	280 - 260	2	20'	3'2-17/32"	77.0	30.000	3.1416	72.14	94.25	0.765 ✓
T3	260 - 240	3	20'1/4"	6'2-1/32"	98.8	30.000	7.0686	107.03	212.06	0.505 ✓
T4	240 - 220	3 1/4	20'1/4"	6'2-1/32"	91.2	30.000	8.2958	130.68	248.87	0.525 ✓
T5	220 - 200	3 1/4	20'1/4"	6'2-1/32"	91.2	30.000	8.2958	149.33	248.87	0.600 ✓
T6	200 - 180	3 1/2	20'1/4"	6'2-1/32"	84.7	30.000	9.6211	171.24	288.63	0.593 ✓
T7	180 - 160	3 1/2	20'1/4"	6'2-1/32"	84.7	30.000	9.6211	190.59	288.63	0.660 ✓
T8	160 - 140	3 1/2	20'1/4"	6'2-1/32"	84.7	30.000	9.6211	208.29	288.63	0.722 ✓
T9	140 - 120	3 3/4	20'1/4"	6'2-1/32"	79.0	30.000	11.0447	225.11	331.34	0.679 ✓
T10	120 - 100	3 3/4	20'1/4"	6'2-1/32"	79.0	30.000	11.0447	241.14	331.34	0.728 ✓

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job</p> <p>Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page</p> <p>19 of 21</p>
	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p>Date</p> <p>12:55:40 07/23/04</p>
	<p>Client</p> <p>ABC Towers and Tower Maintenance</p>	<p>Designed by</p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T11	100 - 80	3 3/4	20'1/4"	6'2-1/32"	79.0	30.000	11.0447	256.74	331.34	0.775
T12	80 - 60	H1-3 (1.38 CR) - 261 4	20'1/4"	6'2-1/32"	74.1	30.000	12.5664	272.02	376.99	0.722
T13	60 - 40	4	20'1/4"	6'2-1/32"	74.1	30.000	12.5664	286.93	376.99	0.761
T14	40 - 20	4 1/4	20'1/4"	6'2-1/32"	69.7	30.000	14.1863	301.40	425.59	0.708
T15	20 - 0	4 1/4	20'1/4"	6'2-1/32"	69.7	30.000	14.1863	315.54	425.59	0.741

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	5'1-9/16"	2'5-3/4"	159.0	21.600	0.4418	2.46	9.54	0.258
T2	280 - 260	7/8	5'1-9/16"	2'5-17/32"	134.8	21.600	0.6013	4.81	12.99	0.370
T3	260 - 240	L2x2x3/16	7'6-3/8"	3'9-19/32"	74.0	21.600	0.7150	5.37	15.44	0.347
T4	240 - 220	L2x2x3/16	8'7-7/16"	4'3-27/32"	83.9	21.600	0.7150	3.80	15.44	0.246
T5	220 - 200	L2x2x3/16	10'8-17/32"	5'4-3/16"	104.0	21.600	0.7150	3.62	15.44	0.235
T6	200 - 180	L2x2x3/16	12'1-9/16"	6'19/32"	117.6	21.600	0.7150	4.70	15.44	0.305
T7	180 - 160	H1-3 (1.40 CR) - 160 L2x2x1/4	13'7-5/16"	6'9-15/32"	133.8	21.600	0.9380	4.77	20.26	0.235
T8	160 - 140	L2 1/2x2 1/2x3/16	15'1-11/16"	7'6-19/32"	116.5	21.600	0.9020	4.92	19.48	0.252
T9	140 - 120	L2 1/2x2 1/2x3/16	16'8-13/32"	8'3-27/32"	128.4	21.600	0.9020	5.28	19.48	0.271
T10	120 - 100	L2 1/2x2 1/2x1/4	18'3-15/32"	9'1-7/16"	142.3	21.600	1.1900	5.69	25.70	0.221
T11	100 - 80	L3x3x3/16	19'10-11/16"	9'11-1/32"	126.7	21.600	1.0900	5.99	23.54	0.254
T12	80 - 60	H1-3 (1.38 CR) - 266 L3x3x1/4	21'6"	10'8-17/32"	138.2	21.600	1.4400	6.58	31.10	0.212
T13	60 - 40	L3 1/2x3 1/2x3/16	23'1-9/16"	11'6-3/8"	125.7	21.600	1.2773	6.84	27.59	0.248
T14	40 - 20	H1-3 (1.33 CR) - 308 L3 1/2x3 1/2x1/4	24'9-1/8"	12'3-31/32"	135.8	21.600	1.6900	7.38	36.50	0.202
T15	20 - 0	L4x4x1/4	26'4-29/32"	13'1-29/32"	126.3	21.600	1.9400	9.11	41.90	0.217

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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 20 of 21
	Project Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas	Date 12:55:40 07/23/04
	Client ABC Towers and Tower Maintenance	Designed by Gray Hodge

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
-------------	-----------------	------	---------	----------------------	------	-----------------------	----------------------	---------------	----------------------------	---------------------------

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0	21.600	0.4418	0.12	9.54	0.012
T2	280 - 260	7/8	4'	3'9-31/32"	210.3	21.600	0.6013	1.75	12.99	0.134

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0	21.600	0.4418	0.85	9.54	0.089
T2	280 - 260	7/8	4'	3'9-31/32"	210.3	21.600	0.6013	0.23	12.99	0.017

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 1/2	3	-21.23	33.17	64.0	Pass
T2	280 - 260	Leg	2	48	-76.34	82.10	93.0	Pass
T3	260 - 240	Leg	3	93	-114.35	141.21	81.0	Pass
T4	240 - 220	Leg	3 1/4	114	-140.51	184.47	76.2	Pass
T5	220 - 200	Leg	3 1/4	135	-161.86	184.47	87.7	Pass
T6	200 - 180	Leg	3 1/2	156	-187.26	231.65	80.8	Pass
T7	180 - 160	Leg	3 1/2	177	-209.99	231.64	90.7	Pass
T8	160 - 140	Leg	3 1/2	198	-231.28	231.64	99.8	Pass
T9	140 - 120	Leg	3 3/4	219	-252.14	282.76	89.2	Pass
T10	120 - 100	Leg	3 3/4	240	-272.60	282.76	96.4	Pass
T11	100 - 80	Leg	3 3/4	261	-292.81	282.76	103.6	Fail X
T12	80 - 60	Leg	4	282	-313.40	337.84	92.8	Pass
T13	60 - 40	Leg	4	303	-333.66	337.84	98.8	Pass
T14	40 - 20	Leg	4 1/4	324	-354.34	396.88	89.3	Pass
T15	20 - 0	Leg	4 1/4	345	-374.90	396.88	94.5	Pass
T1	300 - 280	Diagonal	3/4	15	-2.46	3.48	70.7	Pass
T2	280 - 260	Diagonal	7/8	60	-4.85	6.59	73.6	Pass
T3	260 - 240	Diagonal	L2x2x3/16	111	-5.86	10.36	56.5	Pass
T4	240 - 220	Diagonal	L2x2x3/16	129	-4.25	8.24	51.6	Pass
T5	220 - 200	Diagonal	L2x2x3/16	139	-3.43	5.36	64.0	Pass
T6	200 - 180	Diagonal	L2x2x3/16	159	-4.43	4.20	105.7	Fail X

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 21 of 21</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Additional Antennas</p>	<p>Date 12:55:40 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

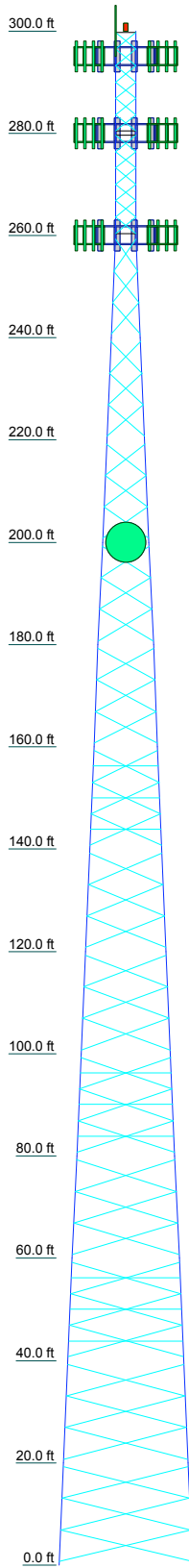
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
T7	180 - 160	Diagonal	L2x2x1/4	183	-4.52	4.30	105.0	Fail X	
T8	160 - 140	Diagonal	L2 1/2x2 1/2x3/16	204	-4.64	5.35	86.7	Pass	
T9	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	225	-5.02	4.41	113.8	Fail X	
T10	120 - 100	Diagonal	L2 1/2x2 1/2x1/4	246	-5.33	4.77	111.7	Fail X	
T11	100 - 80	Diagonal	L3x3x3/16	267	-5.66	5.44	104.1	Fail X	
T12	80 - 60	Diagonal	L3x3x1/4	288	-6.18	6.08	101.7	Fail X	
T13	60 - 40	Diagonal	L3 1/2x3 1/2x3/16	309	-6.50	6.47	100.4	Fail X	
T14	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	330	-7.27	7.40	98.2	Pass	
T15	20 - 0	Diagonal	L4x4x1/4	357	-7.78	10.18	76.4	Pass	
T1	300 - 280	Top Girt	3/4	5	-0.13	1.43	9.3	Pass	
T2	280 - 260	Top Girt	7/8	49	-1.74	2.71	64.2	Pass	
T1	300 - 280	Bottom Girt	3/4	7	-0.91	1.43	63.4	Pass	
T2	280 - 260	Bottom Girt	7/8	54	-0.49	2.71	18.3	Pass	
							Summary		
							Leg (T11)	103.6	Fail X
							Diagonal (T9)	113.8	Fail X
							Top Girt (T2)	64.2	Pass
							Bottom Girt (T1)	63.4	Pass
							RATING =	113.8	Fail X

APPENDIX D

Antenna Tower With Proposed Additional Antennas and Modifications

Graphical Computer Output
Structural Analysis Report and Calculations

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Legs	SR 1 1/2	SR 2	SR 3	SR 3 1/4	SR 3 1/4	SR 3 1/2	SR 3 1/2	SR 3 3/4	SR 3 3/4	SR 3 3/4	SR 4	SR 4	SR 4 1/4	SR 4 1/4	SR 4 1/4
Leg Grade	SR 3/4	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8
Diagonals	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16
Diagonal Grade	A572-50	A36	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	SR 3/4	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8
Bottom Girts	SR 3/4	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8	SR 7/8
Sec. Horizontals	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)	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54
# Panels @ (ft)	12 @ 3.20833	11	10	9	8	7	6	5	4	3	2	1	1	1	1
Weight (K)	64.1	67	70	73	76	79	82	85	88	91	94	97	100	103	106



APPURTENANCES

TYPE	ELEVATION	TYPE	ELEVATION
Lighting - Beacon	300	12' T-Frame Sector Mount	280
Lightning 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	L2 1/2x2 1/2x3/16	C	2L2 1/2x2 1/2x1/4x3/4
B	2L2 1/2x2 1/2x3/16x3/4		

MATERIAL STRENGTH

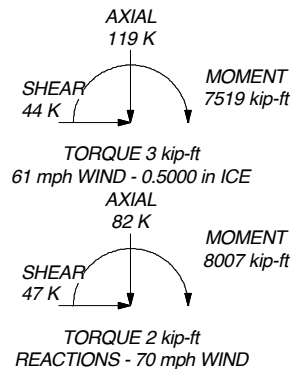
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

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. EXISTING TOWER WITH PROPOSED MODIFICATIONS
6. It is assumed that the tower has been properly maintained and is in good condition.
7. It is assumed that there have been no structural modifications to the tower unless specifically noted otherwise.
8. There are no known structural defects and that there is no structural deterioration.
9. All welds and bolted connections are assumed capable of developing the member strength, unless noted otherwise.
10. Material strengths are as noted elsewhere in this report.
11. This structural analysis is based on information provided by others and assumed to be reliable and correct.
12. See Sheet E-7 for Feedlines and Linear Appurtenances.
13. See Sheet E-8 for Code Check/Stress Distribution.
14. TOWER RATING: 97.2%

MAX PIER FORCES:

DOWN: 383 K
 UPLIFT: -313 K
 SHEAR: 29 K



Hodge Design Associates, P.C.

22 Chestnut Street
 Evansville, Indiana 47713-1022

Phone: 812.422.2558
 FAX: 812.422.3337

www.hodgedesign.com

Job: Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)

Project: Henderson, Henderson County, KY -- Existing Tower With Proposed Modifications

Client: ABC Towers and Tower Maintenance Drawn by: Gray Hodge App'd:

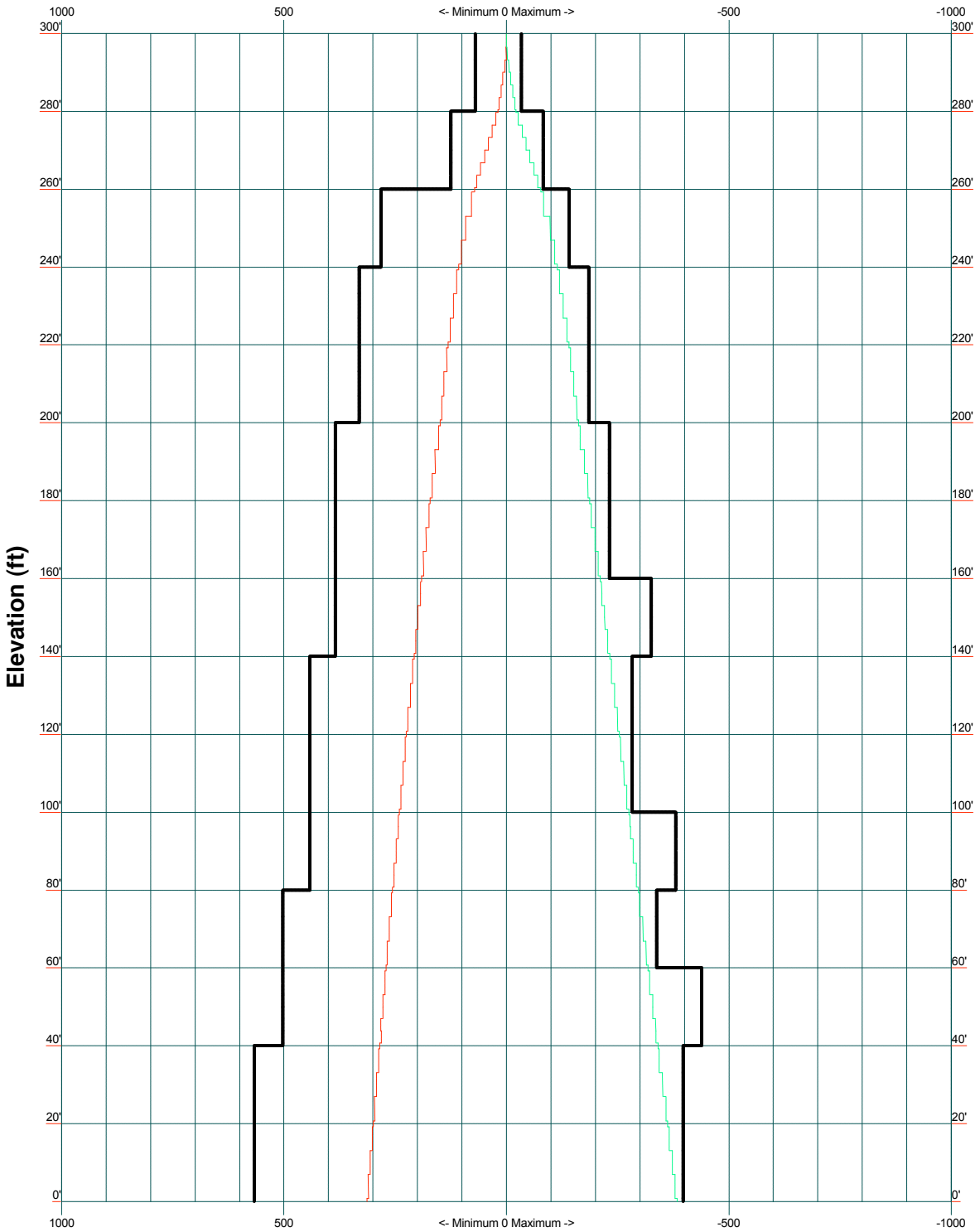
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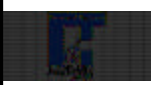
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TIA/EIA-222-F - 70 mph/61 mph 0.5000 in Ice

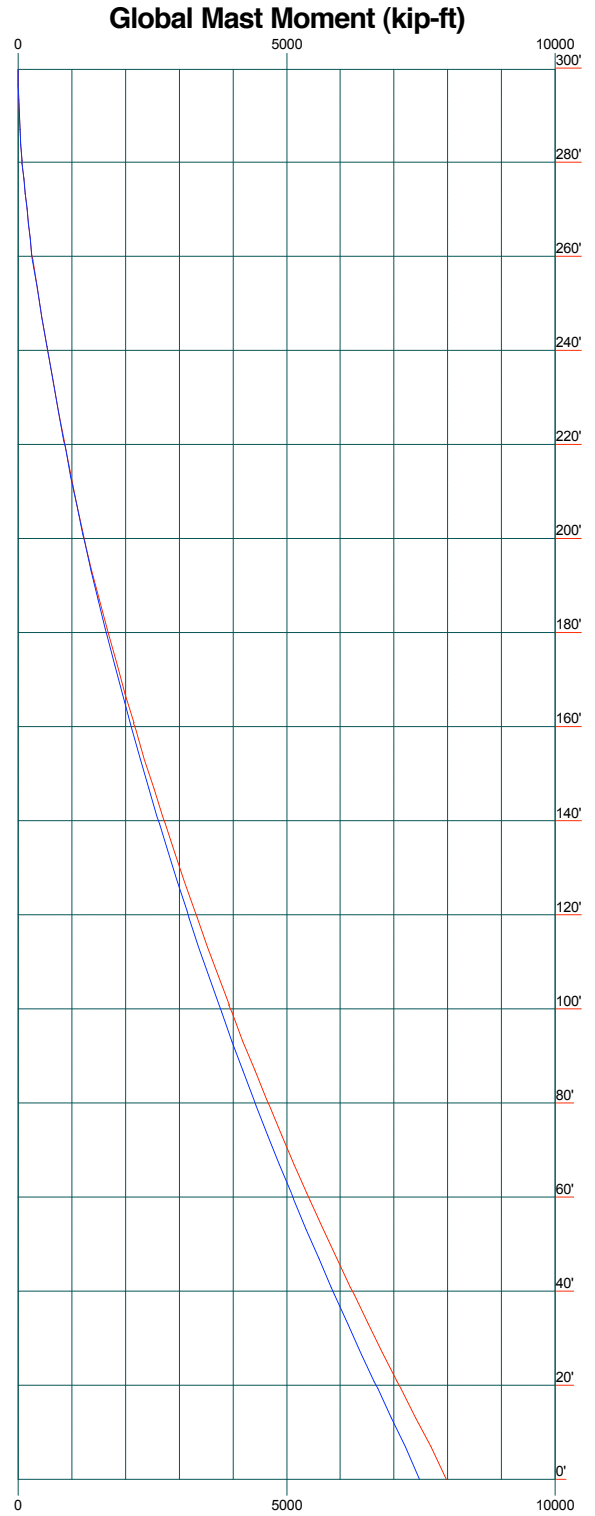
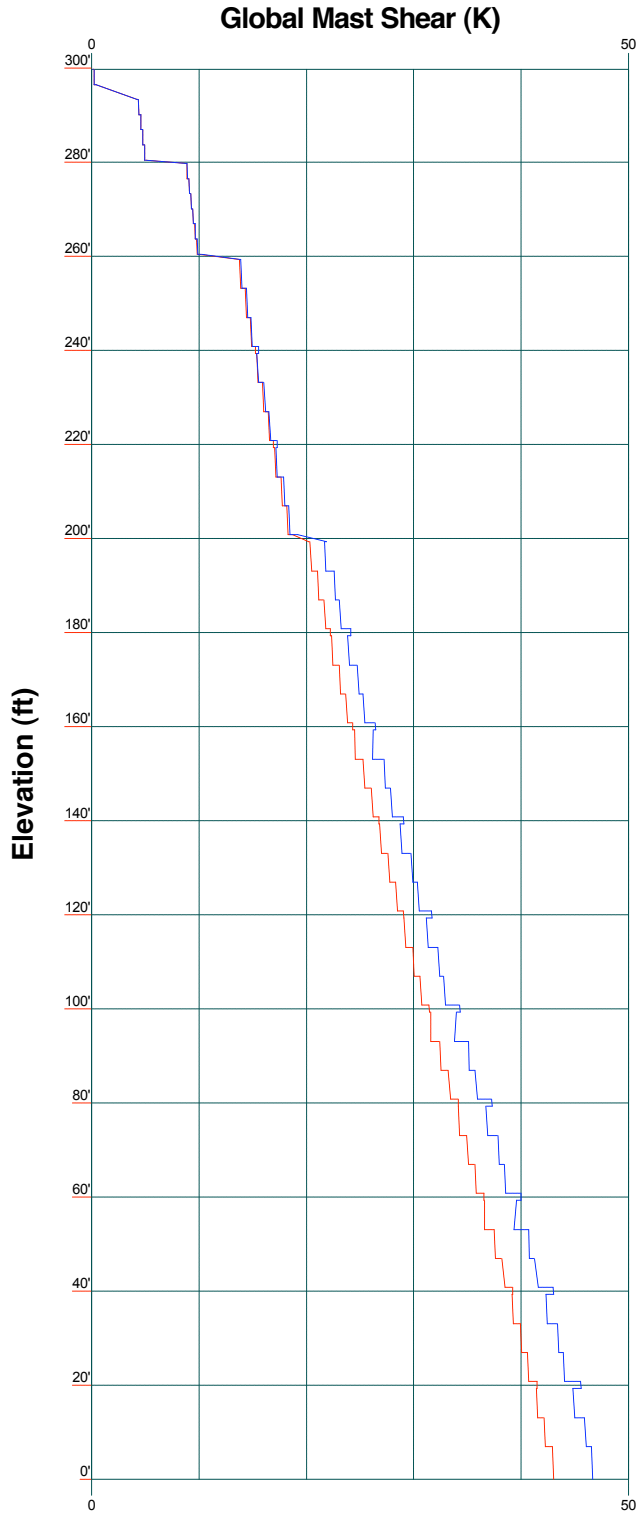
Leg Capacity ——— Leg Compression (K)



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	Client: ABC Towers and Tower Maintenance		

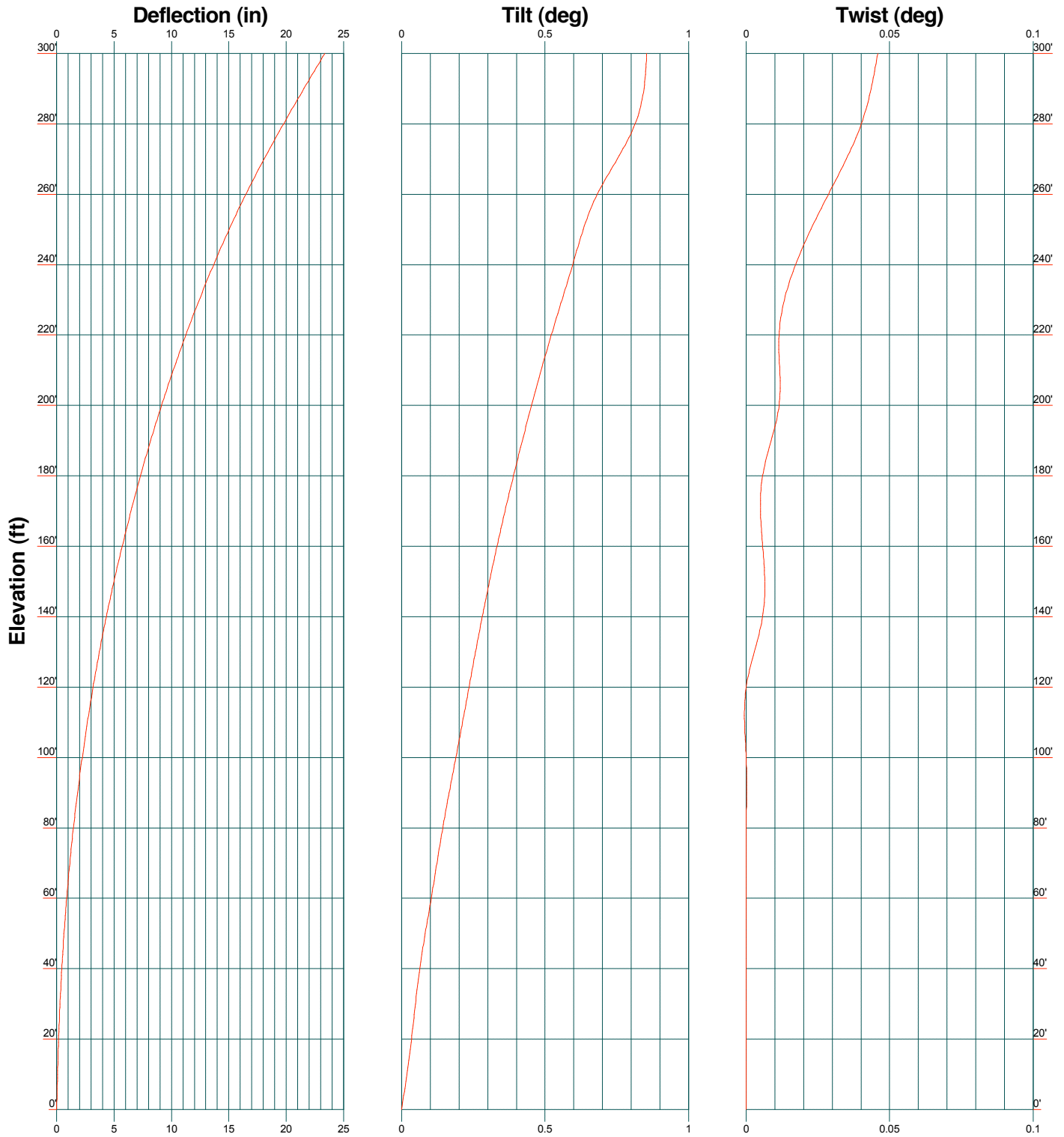
Vx Vz

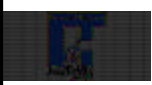
Mx Mz



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 Phone: 812.422.2558
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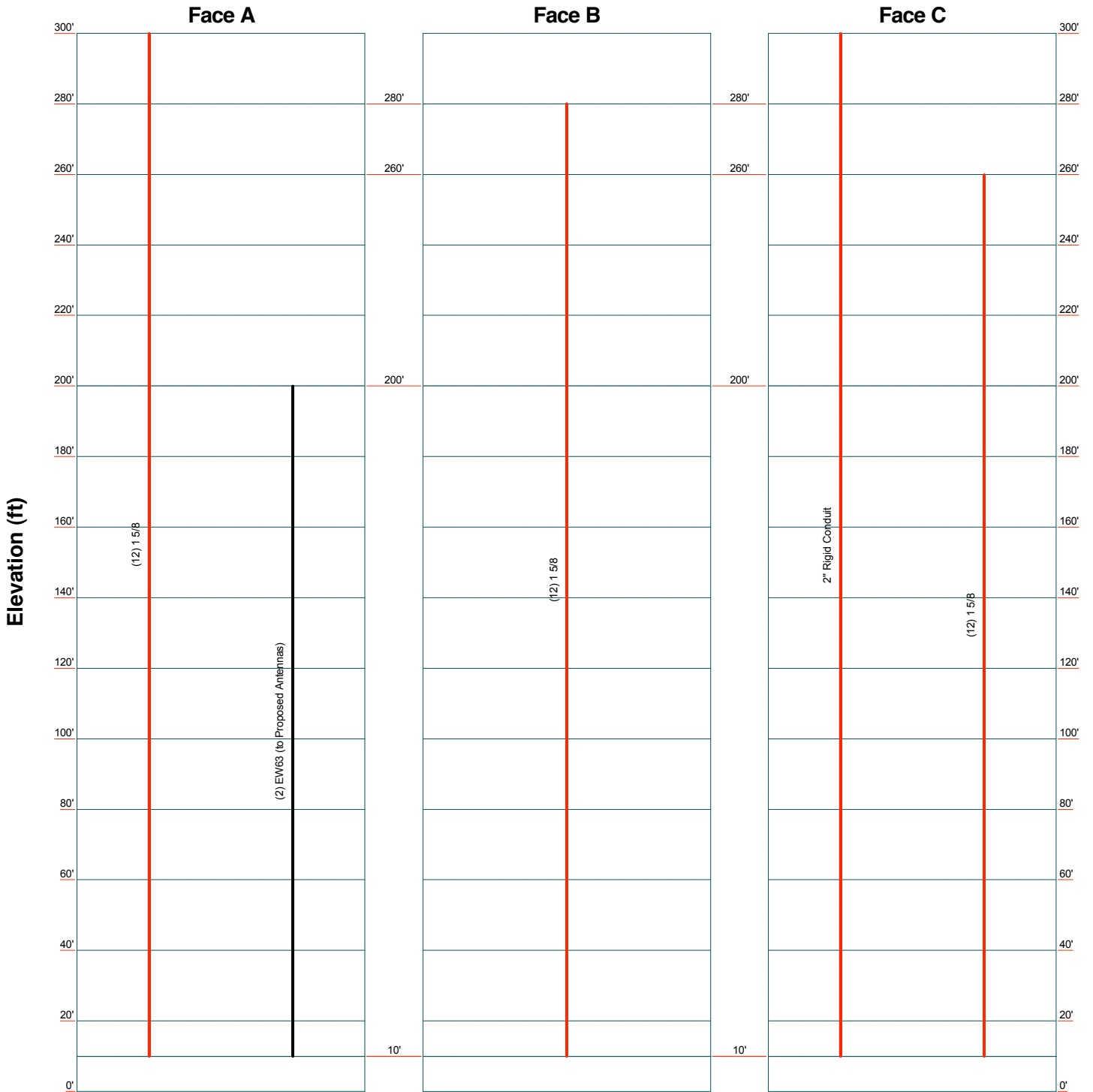
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Project: Henderson, Henderson County, KY -- Existing Tower With Proposed Modifications			
Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:	
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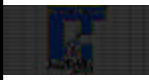


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Feedline Distribution Chart 0' - 300'

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

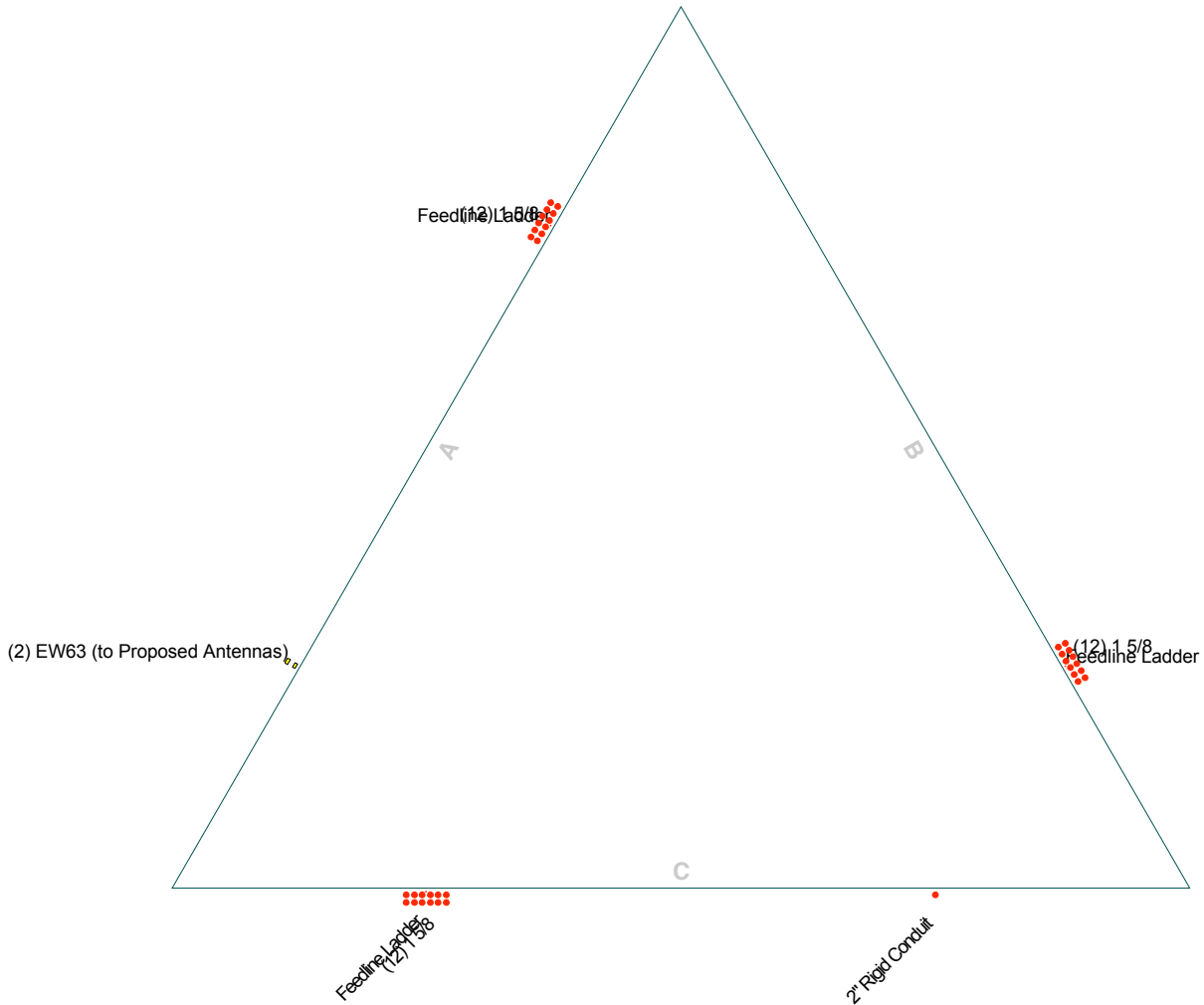


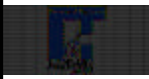
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	22 Chestnut Street	Project: Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications		
	Evansville, Indiana 47713-1022	Client: ABC Towers and Tower Maintenance	Drawn by: Gray Hodge	App'd:
	Phone: 812.422.2558 FAX: 812.422.3337	Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
		Path:	Dwg No. E-7	

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Feedline Plan

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



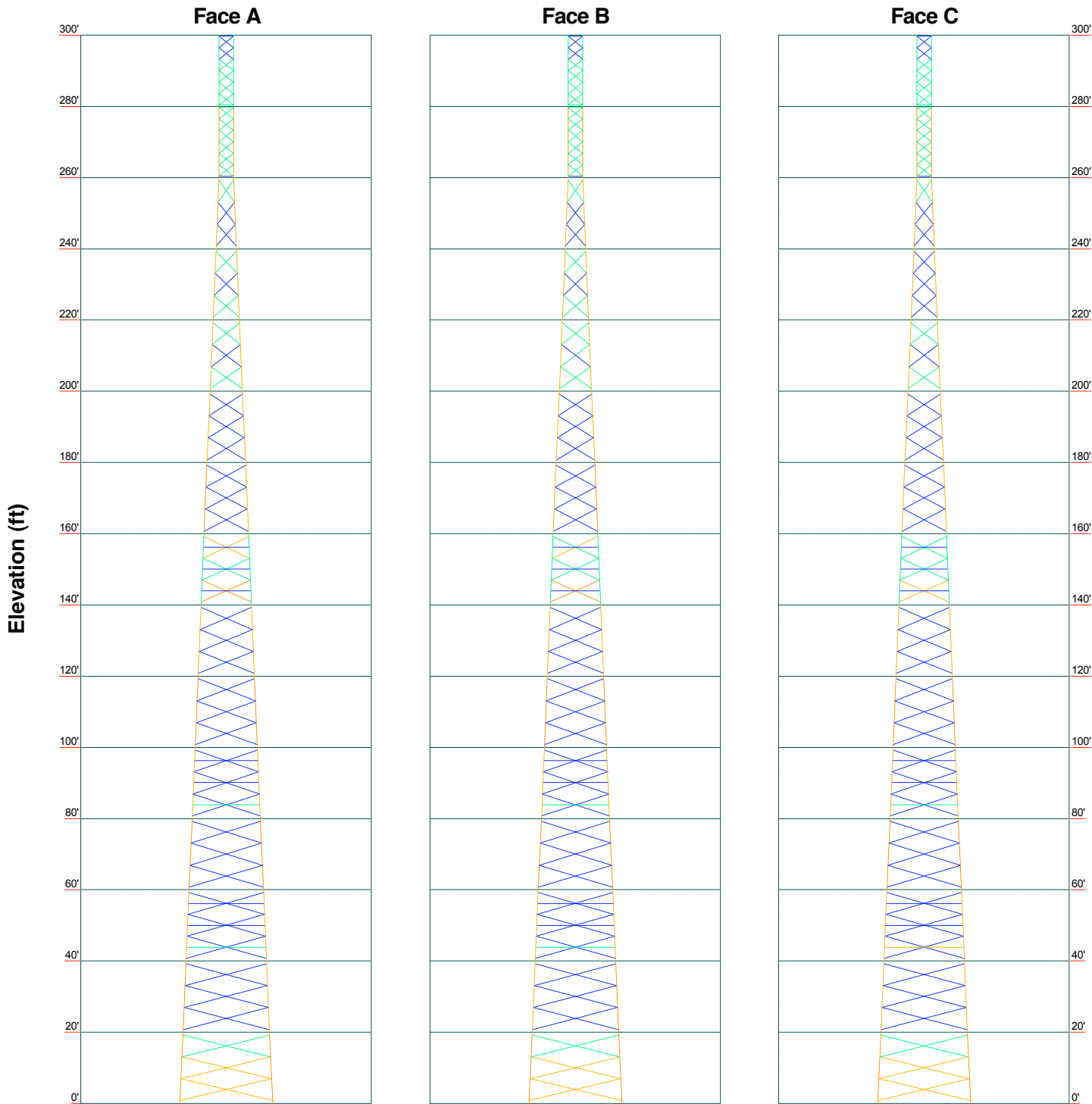
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	22 Chestnut Street	Project: Henderson, Henderson County, KY -- Existing Tower With Proposed Modifications		
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	Phone: 812.422.2558	Code: TIA/EIA-222-F	Date: 07/23/04	Scale: NTS
	FAX: 812.422.3337	Path:	Dwg No. E-7	

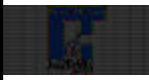
C:\Documents and Settings\ghodge\HODGEDESIGN\004\Documents\ERTower Project Data Files\Sample Reports\Sample-SS-R3.dwg

Stress Distribution Chart

0' - 300'

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



 www.hodgedesign.com	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' Self-Supporting Tower (HDA Project No. 04S-9999) Project: Henderson, Henderson County, KY -- Existing Tower With Proposed Modifications Client: ABC Towers and Tower Maintenance Code: TIA/EIA-222-F Path:	Drawn by: Gray Hodge Date: 07/23/04 App'd: Scale: NTS Dwg No. E-8
	<small>C:\Documents and Settings\ghodge\HODGEDESIGN\004\Documents\ERT\Tower Project Data Files\Sample Reports\Sample_SS-R3.dwg</small>		
	Scale: NTS		
	Dwg No. E-8		

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 1 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Tower Input Data

The main tower is a 3x free standing 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 4' at the top and 26' 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.

EXISTING TOWER WITH PROPOSED MODIFICATIONS.

It is assumed that the tower has been properly maintained and is in good condition..

It is assumed that there have been no structural modifications to the tower unless specifically noted otherwise..

There are no known structural defects and that there is no structural deterioration..

All welds and bolted connections are assumed capable of developing the member strength, unless noted otherwise..

Material strengths are as noted elsewhere in this report..

This structural analysis is based on information provided by others and assumed to be reliable and correct..

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

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

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

Pressures are calculated at each section.

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

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 3 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
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Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	300'-280'	3'-17/32"	X Brace	No	No	4.5000	4.5000
T2	280'-260'	3'-17/32"	X Brace	No	No	4.5000	4.5000
T3	260'-240'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T4	240'-220'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T5	220'-200'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T6	200'-180'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T7	180'-160'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T8	160'-140'	6'-1/32"	X Brace	No	Yes	9.0000	9.0000
T9	140'-120'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T10	120'-100'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T11	100'-80'	6'-1/32"	X Brace	No	Yes	9.0000	9.0000
T12	80'-60'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T13	60'-40'	6'-1/32"	X Brace	No	Yes	9.0000	9.0000
T14	40'-20'	6'-1/32"	X Brace	No	No	9.0000	9.0000
T15	20'-0'	6'-1/32"	X Brace	No	No	9.0000	9.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 300'-280'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 280'-260'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 260'-240'	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 240'-220'	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 220'-200'	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 200'-180'	Solid Round	3 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2x2x3/16x3/4	A36 (36 ksi)
T7 180'-160'	Solid Round	3 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/4	A36 (36 ksi)
T8 160'-140'	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 140'-120'	Solid Round	3 3/4	A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16x3/4	A36 (36 ksi)
T10 120'-100'	Solid Round	3 3/4	A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/4	A36 (36 ksi)
T11 100'-80'	Solid Round	3 3/4	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x3/4	A36 (36 ksi)
T12 80'-60'	Solid Round	4	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x3/8	A36 (36 ksi)
T13 60'-40'	Solid Round	4	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/4	A36 (36 ksi)
T14 40'-20'	Solid Round	4 1/4	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/4	A36 (36 ksi)
T15 20'-0'	Solid Round	4 1/4	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 4 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

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	7/8	A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T8 160'-140'	Double Angle	2L2x2x3/16x3/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T11 100'-80'	Double Angle	2L2x2x3/16x3/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T13 60'-40'	Double Equal Angle	2L2x2x3/16x3/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	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
T1 300'-280'	0.00	0.0000	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T2 280'-260'	0.00	0.0000	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T3 260'-240'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T4 240'-220'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T5 220'-200'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T6 200'-180'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T7 180'-160'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T8 160'-140'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T9 140'-120'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T10 120'-100'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T11 100'-80'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T12 80'-60'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 5 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
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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 ²	in						
T13 60'-40'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T14 40'-20'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000
T15 20'-0'	2.50	0.7500	A36 (36 ksi)	1.01	1.01	1.01	36.0000	36.0000

Tower Section Geometry (cont'd)

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

¹Note: 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.

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'-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

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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 _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	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

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T4	240'-220'	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	0.000	0.000	0.000	0.25
T5	220'-200'	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	0.000	0.000	0.000	0.25
T6	200'-180'	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
T7	180'-160'	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
T8	160'-140'	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
T9	140'-120'	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
T10	120'-100'	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
T11	100'-80'	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
T12	80'-60'	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
T13	60'-40'	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
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'-0'	B	11.657	2.624	0.000	0.000	0.14
		C	11.657	0.000	0.000	0.000	0.12
		A	13.323	0.000	0.000	0.000	0.15

Feed Line/Linear Appurtenances Section Areas - With Ice

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
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

<p style="text-align: center;">ERITower</p> <p style="text-align: center;">Hodge Design Associates, P.C. 22 Chestnut Street</p> <p style="text-align: center;">Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job</p> <p>Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page</p> <p>8 of 22</p>
	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date</p> <p>13:04:30 07/23/04</p>
	<p>Client</p> <p>ABC Towers and Tower Maintenance</p>	<p>Designed by</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
T6	200'-180'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T7	180'-160'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T8	160'-140'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T9	140'-120'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T10	120'-100'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T11	100'-80'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T12	80'-60'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T13	60'-40'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T14	40'-20'	C	0.500	9.967	20.014	0.000	0.000	0.65
		A		4.967	27.483	0.000	0.000	0.63
		B		4.967	20.014	0.000	0.000	0.56
T15	20'-0'	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
		C		4.983	10.007	0.000	0.000	0.32

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F ft^2
T1	300'-280'	A	1.076	3.117	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.181	0.634	0.000	0.000
T2	280'-260'	A	1.255	3.340	0.000	0.000
		B	1.255	3.340	0.000	0.000
		C	0.211	0.679	0.000	0.000
T3	260'-240'	A	0.000	0.000	1.611	2.668
		B	0.000	0.000	1.611	2.668
		C	0.000	0.000	1.882	3.210
T4	240'-220'	A	0.000	0.000	1.364	2.259
		B	0.000	0.000	1.364	2.259
		C	0.000	0.000	1.594	2.718
T5	220'-200'	A	0.000	0.000	1.238	2.051
		B	0.000	0.000	1.238	2.051
		C	0.000	0.000	1.447	2.468
T6	200'-180'	A	0.000	0.000	1.321	2.268
		B	0.000	0.000	1.166	1.932
		C	0.000	0.000	1.363	2.324
T7	180'-160'	A	0.000	0.000	1.270	2.181
		B	0.000	0.000	1.121	1.857

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job</p> <p>Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page</p> <p>9 of 22</p>
	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date</p> <p>13:04:30 07/23/04</p>
	<p>Client</p> <p>ABC Towers and Tower Maintenance</p>	<p>Designed by</p> <p>Gray Hodge</p>

Section	Elevation	Face	A_R	$A_{R, Ice}$	A_F	$A_{F, Ice}$
	ft		ft ²	ft ²	ft ²	ft ²
T8	160'-140'	C	0.000	0.000	1.310	2.234
		A	0.000	0.000	2.106	3.483
		B	0.000	0.000	1.859	2.966
T9	140'-120'	C	0.000	0.000	2.172	3.569
		A	0.000	0.000	1.516	2.473
		B	0.000	0.000	1.338	2.105
T10	120'-100'	C	0.000	0.000	1.563	2.533
		A	0.000	0.000	1.494	2.438
		B	0.000	0.000	1.319	2.076
T11	100'-80'	C	0.000	0.000	1.542	2.498
		A	0.000	0.000	2.335	3.755
		B	0.000	0.000	2.061	3.198
T12	80'-60'	C	0.000	0.000	2.408	3.848
		A	0.000	0.000	1.759	2.770
		B	0.000	0.000	1.554	2.358
T13	60'-40'	C	0.000	0.000	1.815	2.838
		A	0.000	0.000	2.600	4.090
		B	0.000	0.000	2.296	3.482
T14	40'-20'	C	0.000	0.000	2.682	4.190
		A	0.000	0.000	2.029	3.111
		B	0.000	0.000	1.791	2.649
T15	20'-0'	C	0.000	0.000	2.093	3.187
		A	0.000	0.000	1.154	1.735
		B	0.000	0.000	1.019	1.477
		C	0.000	0.000	1.191	1.777

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'	-2.9383	-6.9500	-1.1734	-3.0794
T2	280'-260'	3.6777	-3.9680	2.3019	-1.9675
T3	260'-240'	0.3397	0.4390	0.4246	0.5487
T4	240'-220'	0.4414	0.5547	0.5525	0.6943
T5	220'-200'	0.5420	0.6698	0.6767	0.8362
T6	200'-180'	-0.9463	0.9770	-1.0841	1.1978
T7	180'-160'	-1.0628	1.1133	-1.2128	1.3603
T8	160'-140'	-0.9946	1.0220	-1.1251	1.2333
T9	140'-120'	-1.1770	1.2439	-1.3500	1.5296
T10	120'-100'	-1.2607	1.3414	-1.4424	1.6458
T11	100'-80'	-1.1070	1.1493	-1.2542	1.3909
T12	80'-60'	-1.2973	1.3803	-1.4962	1.7086
T13	60'-40'	-1.1159	1.1563	-1.2723	1.4093
T14	40'-20'	-1.2980	1.3770	-1.5097	1.7206
T15	20'-0'	-0.7058	0.7428	-0.8198	0.9276

Discrete Tower Loads

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 10 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
See E-7 for Feedlines and Linear Appurtenances	C	None			0.0000	0'	No Ice 1/2" Ice	0.00 0.00	0.00 0.00
Lighting - Beacon	C	None			0.0000	300'	No Ice 1/2" Ice	2.70 3.10	0.05 0.07
Lighting - Dual Obstruction	C	None			0.0000	200'	No Ice 1/2" Ice	2.70 3.60	0.05 0.07
Lighting - Dual Obstruction	C	None			0.0000	100'	No Ice 1/2" Ice	2.70 3.60	0.05 0.07
Lightning Rod 6'	C	From Leg	0.00		0.0000	300'	No Ice 1/2" Ice	2.09 2.46	0.08 0.09
(4) DB858DDH65E-SX	A	From Leg	3.50		0.0000	295'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	A	From Leg	3.50		0.0000	295'	No Ice 1/2" Ice	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	B	From Leg	3.50		0.0000	295'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	B	From Leg	3.50		0.0000	295'	No Ice 1/2" Ice	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	C	From Leg	3.50		0.0000	295'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	C	From Leg	3.50		0.0000	295'	No Ice 1/2" Ice	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	A	From Leg	3.50		0.0000	280'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	A	From Leg	3.50		0.0000	280'	No Ice 1/2" Ice	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	B	From Leg	3.50		0.0000	280'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	B	From Leg	3.50		0.0000	280'	No Ice 1/2" Ice	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	C	From Leg	3.50		0.0000	280'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	C	From Leg	3.50		0.0000	280'	No Ice 1/2" Ice	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	A	From Leg	3.50		0.0000	260'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	A	From Leg	3.50		0.0000	260'	No Ice 1/2" Ice	13.60 18.40	0.47 0.60
(4) DB858DDH65E-SX	B	From Leg	3.50		0.0000	260'	No Ice 1/2" Ice	11.54 12.16	0.04 0.10
12' T-Frame Sector Mount	B	From Leg	3.50		0.0000	260'	No Ice	13.60	0.47

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 11 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

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

Dishes

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

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 12 of 22
	Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications	Date 13:04:30 07/23/04
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Comb. No.	Description
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	375.17	24.27	-14.08
	Max. H _x	10	375.17	24.27	-14.08
	Max. H _z	16	-226.76	-18.39	12.51
	Min. Vert	4	-305.09	-21.01	12.27
	Min. H _x	17	-259.77	-21.33	12.39
	Min. H _z	10	375.17	24.27	-14.08
Leg B	Max. Vert	6	375.27	-24.30	-14.04
	Max. H _x	25	-259.81	21.35	12.35
	Max. H _z	26	-226.80	18.43	12.43
	Min. Vert	12	-304.99	21.03	12.23
	Min. H _x	6	375.27	-24.30	-14.04
	Min. H _z	6	375.27	-24.30	-14.04
Leg A	Max. Vert	2	382.81	-0.04	28.55
	Max. H _x	10	-156.07	3.42	-12.87
	Max. H _z	2	382.81	-0.04	28.55
	Min. Vert	8	-312.91	0.05	-24.88
	Min. H _x	6	-156.07	-3.37	-12.87
	Min. H _z	21	-265.92	0.05	-25.09

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	81.59	0.00	0.00	2.12	-1.29	0.00
Dead+Wind 0 deg - No Ice	81.59	0.00	-47.12	-8007.16	-1.29	-2.19
Dead+Wind 30 deg - No Ice	81.59	21.40	-38.74	-6749.87	-3704.88	-1.38
Dead+Wind 60 deg - No Ice	81.59	36.42	-22.39	-3945.56	-6361.41	-1.39
Dead+Wind 90 deg - No Ice	81.59	43.30	-0.00	2.13	-7507.91	-0.28
Dead+Wind 120 deg - No Ice	81.59	39.47	24.15	4126.49	-6667.49	1.91
Dead+Wind 150 deg - No Ice	81.59	21.40	38.74	6754.09	-3704.92	1.56
Dead+Wind 180 deg - No Ice	81.59	0.00	43.60	7657.99	-1.29	1.91

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 210 deg - No Ice	81.59	-21.40	38.74	6754.08	3702.33	1.87
Dead+Wind 240 deg - No Ice	81.59	-39.47	24.15	4126.48	6664.89	0.28
Dead+Wind 270 deg - No Ice	81.59	-43.30	-0.00	2.13	7505.32	0.28
Dead+Wind 300 deg - No Ice	81.59	-36.42	-22.39	-3945.56	6358.81	-0.52
Dead+Wind 330 deg - No Ice	81.59	-21.40	-38.74	-6749.87	3702.29	-2.05
Dead+Ice+Temp	119.05	0.00	-0.00	2.85	0.61	-0.00
Dead+Wind 0 deg+Ice+Temp	119.05	0.00	-44.29	-7518.81	0.60	-2.34
Dead+Wind 30 deg+Ice+Temp	119.05	19.59	-35.21	-6128.03	-3389.44	-0.91
Dead+Wind 60 deg+Ice+Temp	119.05	32.90	-20.04	-3528.30	-5748.66	-0.30
Dead+Wind 90 deg+Ice+Temp	119.05	39.55	-0.00	2.89	-6855.97	1.01
Dead+Wind 120 deg+Ice+Temp	119.05	37.33	22.60	3855.63	-6305.88	2.99
Dead+Wind 150 deg+Ice+Temp	119.05	19.59	35.21	6133.62	-3389.56	2.27
Dead+Wind 180 deg+Ice+Temp	119.05	0.00	39.18	6881.10	0.61	1.96
Dead+Wind 210 deg+Ice+Temp	119.05	-19.59	35.21	6133.62	3390.76	1.28
Dead+Wind 240 deg+Ice+Temp	119.05	-37.33	22.60	3855.63	6307.08	-0.65
Dead+Wind 270 deg+Ice+Temp	119.05	-39.55	-0.00	2.89	6857.16	-1.01
Dead+Wind 300 deg+Ice+Temp	119.05	-32.90	-20.04	-3528.29	5749.86	-1.66
Dead+Wind 330 deg+Ice+Temp	119.05	-19.59	-35.21	-6128.03	3390.64	-2.64
Dead+Wind 0 deg - Service	81.59	0.00	-24.04	-4084.43	-1.30	-1.12
Dead+Wind 30 deg - Service	81.59	10.92	-19.77	-3442.92	-1890.97	-0.68
Dead+Wind 60 deg - Service	81.59	18.58	-11.43	-2012.09	-3246.40	-0.71
Dead+Wind 90 deg - Service	81.59	22.09	-0.00	2.12	-3831.37	-0.16
Dead+Wind 120 deg - Service	81.59	20.14	12.32	2106.48	-3402.56	0.98
Dead+Wind 150 deg - Service	81.59	10.92	19.77	3447.16	-1890.98	0.82
Dead+Wind 180 deg - Service	81.59	0.00	22.24	3908.35	-1.30	0.98
Dead+Wind 210 deg - Service	81.59	-10.92	19.77	3447.15	1888.39	0.93
Dead+Wind 240 deg - Service	81.59	-20.14	12.32	2106.48	3399.97	0.14
Dead+Wind 270 deg - Service	81.59	-22.09	-0.00	2.12	3828.77	0.16
Dead+Wind 300 deg - Service	81.59	-18.58	-11.43	-2012.08	3243.80	-0.27
Dead+Wind 330 deg - Service	81.59	-10.92	-19.77	-3442.92	1888.37	-1.07

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	-81.59	0.00	0.00	81.59	0.00	0.000%
2	0.00	-81.59	-47.12	0.00	81.59	47.12	0.005%
3	21.41	-81.59	-38.75	-21.40	81.59	38.74	0.005%
4	36.42	-81.59	-22.40	-36.42	81.59	22.39	0.004%
5	43.30	-81.59	0.00	-43.30	81.59	0.00	0.005%
6	39.47	-81.59	24.16	-39.47	81.59	-24.15	0.005%
7	21.41	-81.59	38.75	-21.40	81.59	-38.74	0.005%
8	0.00	-81.59	43.60	0.00	81.59	-43.60	0.004%
9	-21.41	-81.59	38.75	21.40	81.59	-38.74	0.005%
10	-39.47	-81.59	24.16	39.47	81.59	-24.15	0.005%
11	-43.30	-81.59	0.00	43.30	81.59	0.00	0.005%
12	-36.42	-81.59	-22.40	36.42	81.59	22.39	0.004%
13	-21.41	-81.59	-38.75	21.40	81.59	38.74	0.005%
14	0.00	-119.05	0.00	-0.00	119.05	0.00	0.000%
15	0.00	-119.05	-44.29	0.00	119.05	44.29	0.003%
16	19.59	-119.05	-35.21	-19.59	119.05	35.21	0.003%
17	32.90	-119.05	-20.04	-32.90	119.05	20.04	0.003%
18	39.55	-119.05	0.00	-39.55	119.05	0.00	0.003%
19	37.33	-119.05	22.60	-37.33	119.05	-22.60	0.003%
20	19.59	-119.05	35.21	-19.59	119.05	-35.21	0.003%
21	0.00	-119.05	39.18	0.00	119.05	-39.18	0.003%
22	-19.59	-119.05	35.21	19.59	119.05	-35.21	0.003%

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 14 of 22</p>
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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	
23	-37.33	-119.05	22.60	37.33	119.05	-22.60	0.003%
24	-39.55	-119.05	0.00	39.55	119.05	0.00	0.003%
25	-32.90	-119.05	-20.04	32.90	119.05	20.04	0.003%
26	-19.59	-119.05	-35.21	19.59	119.05	35.21	0.003%
27	0.00	-81.59	-24.04	0.00	81.59	24.04	0.003%
28	10.92	-81.59	-19.77	-10.92	81.59	19.77	0.003%
29	18.58	-81.59	-11.43	-18.58	81.59	11.43	0.002%
30	22.09	-81.59	0.00	-22.09	81.59	0.00	0.003%
31	20.14	-81.59	12.32	-20.14	81.59	-12.32	0.003%
32	10.92	-81.59	19.77	-10.92	81.59	-19.77	0.003%
33	0.00	-81.59	22.25	0.00	81.59	-22.24	0.002%
34	-10.92	-81.59	19.77	10.92	81.59	-19.77	0.003%
35	-20.14	-81.59	12.32	20.14	81.59	-12.32	0.003%
36	-22.09	-81.59	0.00	22.09	81.59	0.00	0.003%
37	-18.58	-81.59	-11.43	18.58	81.59	11.43	0.002%
38	-10.92	-81.59	-19.77	10.92	81.59	19.77	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	16	0.00007202	0.00011799
3	Yes	16	0.00006877	0.00011301
4	Yes	16	0.00006538	0.00010774
5	Yes	16	0.00006848	0.00011274
6	Yes	16	0.00007181	0.00011781
7	Yes	16	0.00006826	0.00011217
8	Yes	16	0.00006525	0.00010734
9	Yes	16	0.00006827	0.00011218
10	Yes	16	0.00007182	0.00011782
11	Yes	16	0.00006848	0.00011274
12	Yes	16	0.00006538	0.00010774
13	Yes	16	0.00006877	0.00011301
14	Yes	6	0.00000001	0.00000001
15	Yes	17	0.00006501	0.00010698
16	Yes	17	0.00006307	0.00010412
17	Yes	17	0.00006122	0.00010132
18	Yes	17	0.00006295	0.00010405
19	Yes	17	0.00006493	0.00010693
20	Yes	17	0.00006281	0.00010367
21	Yes	17	0.00006113	0.00010100
22	Yes	17	0.00006282	0.00010367
23	Yes	17	0.00006493	0.00010692
24	Yes	17	0.00006294	0.00010405
25	Yes	17	0.00006122	0.00010131
26	Yes	17	0.00006307	0.00010412
27	Yes	16	0.00006917	0.00011234
28	Yes	16	0.00006767	0.00011013
29	Yes	16	0.00006608	0.00010774
30	Yes	16	0.00006757	0.00011011
31	Yes	16	0.00006911	0.00011233
32	Yes	16	0.00006741	0.00010969
33	Yes	16	0.00006597	0.00010741
34	Yes	16	0.00006741	0.00010970
35	Yes	16	0.00006911	0.00011234

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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 15 of 22
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36	Yes	16	0.00006757	0.00011012
37	Yes	16	0.00006608	0.00010774
38	Yes	16	0.00006766	0.00011013

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	23.356	27	0.8522	0.0465
T2	280 - 260	19.766	27	0.8148	0.0416
T3	260 - 240	16.479	27	0.6842	0.0300
T4	240 - 220	13.676	27	0.5972	0.0175
T5	220 - 200	11.252	27	0.5225	0.0126
T6	200 - 180	9.139	27	0.4514	0.0097
T7	180 - 160	7.303	27	0.3924	0.0069
T8	160 - 140	5.714	27	0.3349	0.0052
T9	140 - 120	4.330	27	0.2800	0.0032
T10	120 - 100	3.182	27	0.2331	0.0023
T11	100 - 80	2.233	27	0.1871	0.0016
T12	80 - 60	1.465	27	0.1422	0.0012
T13	60 - 40	0.878	27	0.1036	0.0009
T14	40 - 20	0.453	27	0.0654	0.0007
T15	20 - 0	0.175	27	0.0322	0.0004

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	23.356	0.8522	0.0465	60327
295'	(4) DB858DDH65E-SX	27	22.446	0.8494	0.0457	60327
280'	(4) DB858DDH65E-SX	27	19.766	0.8148	0.0416	15240
260'	(4) DB858DDH65E-SX	27	16.479	0.6842	0.0300	8902
200'	UHX8-59	27	9.139	0.4514	0.0097	16876
100'	Lighting - Dual Obstruction	27	2.233	0.1871	0.0016	26627
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.0000	0.0000	164362

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	45.776	2	1.6681	0.0919
T2	280 - 260	38.749	2	1.5950	0.0822
T3	260 - 240	32.315	2	1.3396	0.0593
T4	240 - 220	26.822	2	1.1697	0.0346
T5	220 - 200	22.072	2	1.0234	0.0248
T6	200 - 180	17.930	2	0.8843	0.0192
T7	180 - 160	14.331	2	0.7688	0.0132

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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 16 of 22
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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T8	160 - 140	11.216	2	0.6562	0.0100
T9	140 - 120	8.501	2	0.5487	0.0062
T10	120 - 100	6.250	2	0.4567	0.0044
T11	100 - 80	4.386	2	0.3666	0.0039
T12	80 - 60	2.879	2	0.2788	0.0032
T13	60 - 40	1.726	2	0.2030	0.0025
T14	40 - 20	0.892	2	0.1282	0.0018
T15	20 - 0	0.346	2	0.0632	0.0011

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	2	45.776	1.6681	0.0919	31001
295'	(4) DB858DDH65E-SX	2	43.995	1.6626	0.0902	31001
280'	(4) DB858DDH65E-SX	2	38.749	1.5950	0.0822	7827
260'	(4) DB858DDH65E-SX	2	32.315	1.3396	0.0593	4548
200'	UHX8-59	2	17.930	0.8843	0.0192	8614
100'	Lighting - Dual Obstruction	2	4.386	0.3666	0.0039	13578
0'	See E-7 for Feedlines and Linear Appurtenances	0	0.000	0.0000	0.0000	83862

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
T1	300 - 280	1 1/2	20'	3'-17/32"	102.7 K=1.00	14.083	1.7672	-21.23	24.89	0.853
T2	280 - 260	2	20'	3'-17/32"	77.0 K=1.00	19.605	3.1416	-76.35	61.59	1.240
T3	260 - 240	3	20'1/4"	6'-1/32"	98.8 K=1.00	14.986	7.0686	-114.36	105.93	1.080
T4	240 - 220	3 1/4	20'1/4"	6'-1/32"	91.2 K=1.00	16.682	8.2958	-140.53	138.39	1.016
T5	220 - 200	3 1/4	20'1/4"	6'-1/32"	91.2 K=1.00	16.682	8.2958	-161.87	138.39	1.170
T6	200 - 180	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-187.47	173.78	1.079
T7	180 - 160	3 1/2	20'1/4"	6'-1/32"	84.7 K=1.00	18.062	9.6211	-210.49	173.78	1.211
T8	160 - 140	3 1/2	20'1/4"	3'-13/16"	43.2 K=1.00	25.375	9.6211	-232.18	244.14	0.951
T9	140 - 120	3 3/4	20'1/4"	6'-1/32"	79.0 K=1.00	19.206	11.0447	-253.74	212.13	1.196

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job</p> <p>Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page</p> <p>17 of 22</p>
	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date</p> <p>13:04:30 07/23/04</p>
	<p>Client</p> <p>ABC Towers and Tower Maintenance</p>	<p>Designed by</p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T10	120 - 100	3 3/4	20'1/4"	6'2-1/32"	79.0 K=1.00	19.206	11.0447	-274.94	212.13	1.296
T11	100 - 80	3 3/4	20'1/4"	3'1-9/16"	40.1 K=1.00	25.819	11.0447	-296.31	285.17	1.039
T12	80 - 60	4	20'1/4"	6'2-1/32"	74.1 K=1.00	20.168	12.5664	-318.08	253.44	1.255
T13	60 - 40	4	20'1/4"	3'1-7/16"	37.5 K=1.00	26.178	12.5664	-340.32	328.96	1.035
T14	40 - 20	4 1/4	20'1/4"	6'2-1/32"	69.7 K=1.00	20.988	14.1863	-362.54	297.74	1.218
T15	20 - 0	4 1/4	20'1/4"	6'2-1/32"	69.7 K=1.00	20.988	14.1863	-383.68	297.74	1.289

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	5'1-9/16"	2'5-3/4"	159.0 K=1.00	5.910	0.4418	-2.46	2.61	0.943
T2	280 - 260	7/8	5'1-9/16"	2'5-17/32"	134.8 K=1.00	8.220	0.6013	-4.85	4.94	0.981
T3	260 - 240	L2x2x3/16	7'6-3/8"	3'9-19/32"	115.8 K=1.00	10.870	0.7150	-5.86	7.77	0.754
T4	240 - 220	L2x2x3/16	8'7-7/16"	4'3-27/32"	131.4 K=1.00	8.643	0.7150	-4.25	6.18	0.688
T5	220 - 200	L2x2x3/16	10'8-17/32"	5'4-3/16"	162.9 K=1.00	5.628	0.7150	-3.42	4.02	0.851
T6	200 - 180	2L2x2x3/16x3/4	12'1-9/16"	6'19/32"	117.6 K=1.00	10.623	1.4300	-4.47	15.19	0.294
T7	180 - 160	2L 'a' > 34.7524 in - 159 2L2x2x1/4x3/4	13'7-5/16"	6'9-15/32"	133.8 K=1.00	8.343	1.8800	-4.54	15.68	0.289
T8	160 - 140	L2 1/2x2 1/2x3/16	15'1-11/16"	7'6-19/32"	183.1 K=1.00	4.452	0.9020	-4.93	4.02	1.228
T9	140 - 120	2L2 1/2x2 1/2x3/16x3/4	16'8-13/32"	8'3-27/32"	128.4 K=1.00	9.060	1.8000	-5.17	16.31	0.317
T10	120 - 100	2L2 1/2x2 1/2x1/4x3/4	18'3-15/32"	9'1-7/16"	142.3 K=1.00	7.380	2.3800	-5.46	17.56	0.311
T11	100 - 80	2L3x3x3/16x3/4	19'10-11/16"	9'11-1/32"	126.7 K=1.00	9.292	2.1800	-6.17	20.26	0.305
T12	80 - 60	2L3x3x1/4x3/8	21'6"	10'8-17/32"	138.2 K=1.00	7.815	2.8800	-6.46	22.51	0.287
T13	60 - 40	2L3 1/2x3 1/2x1/4x3/4	23'1-9/16"	11'6-3/8"	126.9 K=1.00	9.274	3.3800	-7.22	31.35	0.230
T14	40 - 20	2L3 1/2x3 1/2x1/4x3/4	24'9-1/8"	12'3-31/32"	135.8 K=1.00	8.100	3.3800	-7.69	27.38	0.281
T15	20 - 0	L4x4x1/4	25'10-13/16"	12'10-13/16"	194.7 K=1.00	3.938	1.9400	-8.07	7.64	1.056

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' Self-Supporting Tower (HDA Project No. 04S-9999)	Page 18 of 22
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Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
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Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T8	160 - 140	2L2x2x3/16x3/4	13'9-27/32"	13'6-3/8"	263.2 K=1.00	2.156	1.4300	-1.05	3.08	0.339 ✓
T11	100 - 80	KL/R > 250 (C) - 205 2L2x2x3/16x3/4	18'10-13/16"	18'7-3/32"	361.6 K=1.00	1.142	1.4300	-1.19	1.63	0.726 ✓
T13	60 - 40	KL/R > 250 (C) - 277 2L2x2x3/16x3/4	22'3-15/32"	21'11-13/32"	427.0 K=1.00	0.819	1.4300	-1.18	1.17	1.011 ✓
		KL/R > 250 (C) - 328								

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0 K=1.00	2.428	0.4418	-0.13	1.07	0.124 ✓
T2	280 - 260	KL/R > 200 (C) - 5 7/8	4'	3'9-31/32"	210.3 K=1.00	3.377	0.6013	-1.74	2.03	0.856 ✓
		KL/R > 200 (C) - 49								

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0 K=1.00	2.428	0.4418	-0.91	1.07	0.845 ✓
T2	280 - 260	KL/R > 200 (C) - 7 7/8	4'	3'9-31/32"	210.3 K=1.00	3.377	0.6013	-0.49	2.03	0.244 ✓
		KL/R > 200 (C) - 54								

Tension Checks

<p>ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 19 of 22</p>
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Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	1 1/2	20'	3'2-17/32"	102.7	30.000	1.7672	19.40	53.01	0.366
T2	280 - 260	2	20'	3'2-17/32"	77.0	30.000	3.1416	72.15	94.25	0.766
T3	260 - 240	3	20'1/4"	6'2-1/32"	98.8	30.000	7.0686	107.04	212.06	0.505
T4	240 - 220	3 1/4	20'1/4"	6'2-1/32"	91.2	30.000	8.2958	130.70	248.87	0.525
T5	220 - 200	3 1/4	20'1/4"	6'2-1/32"	91.2	30.000	8.2958	149.34	248.87	0.600
T6	200 - 180	3 1/2	20'1/4"	6'2-1/32"	84.7	30.000	9.6211	171.10	288.63	0.593
T7	180 - 160	3 1/2	20'1/4"	6'2-1/32"	84.7	30.000	9.6211	190.23	288.63	0.659
T8	160 - 140	3 1/2	20'1/4"	3'1-13/16"	43.2	30.000	9.6211	207.89	288.63	0.720
T9	140 - 120	3 3/4	20'1/4"	6'2-1/32"	79.0	30.000	11.0447	224.72	331.34	0.678
T10	120 - 100	3 3/4	20'1/4"	6'2-1/32"	79.0	30.000	11.0447	240.55	331.34	0.726
T11	100 - 80	3 3/4	20'1/4"	3'1-9/16"	40.1	30.000	11.0447	255.81	331.34	0.772
T12	80 - 60	4	20'1/4"	6'2-1/32"	74.1	30.000	12.5664	270.89	376.99	0.719
T13	60 - 40	4	20'1/4"	3'1-7/16"	37.5	30.000	12.5664	285.02	376.99	0.756
T14	40 - 20	4 1/4	20'1/4"	6'2-1/32"	69.7	30.000	14.1863	299.21	425.59	0.703
T15	20 - 0	4 1/4	20'1/4"	6'2-1/32"	69.7	30.000	14.1863	313.82	425.59	0.737

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	5'1-9/16"	2'5-3/4"	159.0	21.600	0.4418	2.46	9.54	0.258
T2	280 - 260	7/8	5'1-9/16"	2'5-17/32"	134.8	21.600	0.6013	4.81	12.99	0.370
T3	260 - 240	L2x2x3/16	7'6-3/8"	3'9-19/32"	74.0	21.600	0.7150	5.37	15.44	0.347
T4	240 - 220	L2x2x3/16	8'7-7/16"	4'3-27/32"	83.9	21.600	0.7150	3.80	15.44	0.246
T5	220 - 200	L2x2x3/16	10'8-17/32"	5'4-3/16"	104.0	21.600	0.7150	3.58	15.44	0.232

<p style="text-align: center;">ERITower</p> <p>Hodge Design Associates, P.C. 22 Chestnut Street</p> <p>Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job</p> <p>Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page</p> <p>20 of 22</p>
	<p>Project</p> <p>Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date</p> <p>13:04:30 07/23/04</p>
	<p>Client</p> <p>ABC Towers and Tower Maintenance</p>	<p>Designed by</p> <p>Gray Hodge</p>

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio $\frac{P}{P_a}$
T6	200 - 180	2L2x2x3/16x3/4	12'1-9/16"	6'19/32"	117.6	21.600	1.4300	4.73	30.89	0.153
		2L 'a' > 34.7524 in - 160								✓
T7	180 - 160	2L2x2x1/4x3/4	13'7-5/16"	6'9-15/32"	133.8	21.600	1.8800	4.85	40.61	0.119
T8	160 - 140	L2 1/2x2 1/2x3/16	15'1-11/16"	7'6-19/32"	116.5	21.600	0.9020	4.74	19.48	0.243
T9	140 - 120	2L2 1/2x2 1/2x3/16x3/4	16'8-13/32"	8'3-27/32"	128.4	21.600	1.8000	5.40	38.88	0.139
T10	120 - 100	2L2 1/2x2 1/2x1/4x3/4	18'3-15/32"	9'1-7/16"	142.3	21.600	2.3800	5.85	51.41	0.114
T11	100 - 80	2L3x3x3/16x3/4	19'10-11/16"	9'11-1/32"	126.7	21.600	2.1800	5.95	47.09	0.126
T12	80 - 60	2L3x3x1/4x3/8	21'6"	10'8-17/32"	138.2	21.600	2.8800	6.86	62.21	0.110
T13	60 - 40	2L3 1/2x3 1/2x1/4x3/4	23'1-9/16"	11'6-3/8"	126.9	21.600	3.3800	7.02	73.01	0.096
T14	40 - 20	2L3 1/2x3 1/2x1/4x3/4	24'9-1/8"	12'3-31/32"	135.8	21.600	3.3800	7.98	73.01	0.109
T15	20 - 0	L4x4x1/4	26'4-29/32"	13'1-29/32"	126.3	21.600	1.9400	9.39	41.90	0.224

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio $\frac{P}{P_a}$
T8	160 - 140	2L2x2x3/16x3/4	13'9-27/32"	13'6-3/8"	263.2	21.600	1.4300	0.86	30.89	0.028
T11	100 - 80	2L2x2x3/16x3/4	18'10-13/16"	18'7-3/32"	361.6	21.600	1.4300	1.03	30.89	0.033
T13	60 - 40	2L2x2x3/16x3/4	22'3-15/32"	21'11-13/32"	427.0	21.600	1.4300	1.10	30.89	0.036

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio $\frac{P}{P_a}$
T1	300 - 280	3/4	4'	3'10-9/16"	248.0	21.600	0.4418	0.12	9.54	0.012
T2	280 - 260	7/8	4'	3'9-31/32"	210.3	21.600	0.6013	1.75	12.99	0.134

<p style="text-align: center;">ERITower</p> <p style="text-align: center;">Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 21 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
	<p>Client ABC Towers and Tower Maintenance</p>	<p>Designed by Gray Hodge</p>

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _a ft	K/lr	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	300 - 280	3/4	4'	3'10-9/16"	248.0	21.600	0.4418	0.85	9.54	0.089
T2	280 - 260	7/8	4'	3'9-31/32"	210.3	21.600	0.6013	0.23	12.99	0.017

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 1/2	3	-21.23	33.17	64.0	Pass	
T2	280 - 260	Leg	2	48	-76.35	82.10	93.0	Pass	
T3	260 - 240	Leg	3	93	-114.36	141.21	81.0	Pass	
T4	240 - 220	Leg	3 1/4	114	-140.53	184.47	76.2	Pass	
T5	220 - 200	Leg	3 1/4	135	-161.87	184.47	87.7	Pass	
T6	200 - 180	Leg	3 1/2	156	-187.47	231.65	80.9	Pass	
T7	180 - 160	Leg	3 1/2	177	-210.49	231.64	90.9	Pass	
T8	160 - 140	Leg	3 1/2	198	-232.18	325.43	71.3	Pass	
T9	140 - 120	Leg	3 3/4	228	-253.74	282.76	89.7	Pass	
T10	120 - 100	Leg	3 3/4	249	-274.94	282.76	97.2	Pass	
T11	100 - 80	Leg	3 3/4	270	-296.31	380.13	78.0	Pass	
T12	80 - 60	Leg	4	300	-318.08	337.84	94.2	Pass	
T13	60 - 40	Leg	4	321	-340.32	438.50	77.6	Pass	
T14	40 - 20	Leg	4 1/4	351	-362.54	396.88	91.3	Pass	
T15	20 - 0	Leg	4 1/4	372	-383.68	396.88	96.7	Pass	
T1	300 - 280	Diagonal	3/4	15	-2.46	3.48	70.7	Pass	
T2	280 - 260	Diagonal	7/8	60	-4.85	6.59	73.6	Pass	
T3	260 - 240	Diagonal	L2x2x3/16	111	-5.86	10.36	56.6	Pass	
T4	240 - 220	Diagonal	L2x2x3/16	129	-4.25	8.24	51.6	Pass	
T5	220 - 200	Diagonal	L2x2x3/16	139	-3.42	5.36	63.8	Pass	
T6	200 - 180	Diagonal	2L2x2x3/16x3/4	159	-4.47	20.25	22.1	Pass	
T7	180 - 160	Diagonal	2L2x2x1/4x3/4	183	-4.54	20.91	21.7	Pass	
T8	160 - 140	Diagonal	L2 1/2x2 1/2x3/16	204	-4.93	5.35	92.1	Pass	
T9	140 - 120	Diagonal	2L2 1/2x2 1/2x3/16x3/4	234	-5.17	21.74	23.8	Pass	
T10	120 - 100	Diagonal	2L2 1/2x2 1/2x1/4x3/4	255	-5.46	23.41	23.3	Pass	
T11	100 - 80	Diagonal	2L3x3x3/16x3/4	275	-6.17	27.00	22.9	Pass	
T12	80 - 60	Diagonal	2L3x3x1/4x3/8	306	-6.46	30.00	21.5	Pass	
T13	60 - 40	Diagonal	2L3 1/2x3 1/2x1/4x3/4	326	-7.22	41.78	17.3	Pass	
T14	40 - 20	Diagonal	2L3 1/2x3 1/2x1/4x3/4	357	-7.69	36.49	21.1	Pass	
T15	20 - 0	Diagonal	L4x4x1/4	384	-8.07	10.18	79.3	Pass	
T8	160 - 140	Secondary Horizontal	2L2x2x3/16x3/4	205	-1.05	4.11	25.4	Pass	
T11	100 - 80	Secondary Horizontal	2L2x2x3/16x3/4	277	-1.19	2.18	54.5	Pass	
T13	60 - 40	Secondary Horizontal	2L2x2x3/16x3/4	328	-1.18	1.56	75.8	Pass	
T1	300 - 280	Top Girt	3/4	5	-0.13	1.43	9.3	Pass	
T2	280 - 260	Top Girt	7/8	49	-1.74	2.71	64.2	Pass	
T1	300 - 280	Bottom Girt	3/4	7	-0.91	1.43	63.4	Pass	
T2	280 - 260	Bottom Girt	7/8	54	-0.49	2.71	18.3	Pass	
Summary									
Leg (T10)								97.2	Pass
Diagonal (T8)								92.1	Pass
Secondary Horizontal (T13)								75.8	Pass

<p style="text-align: center;"><i>ERITower</i></p> <p>Hodge Design Associates, P.C. 22 Chestnut Street Evansville, Indiana 47713-1022 Phone: 812.422.2558 FAX: 812.422.3337</p>	<p>Job Structural Analysis Report -- 300' Self-Supporting Tower (HDA Project No. 04S-9999)</p>	<p>Page 22 of 22</p>
	<p>Project Henderson, Henderson County, KY --- Existing Tower With Proposed Modifications</p>	<p>Date 13:04:30 07/23/04</p>
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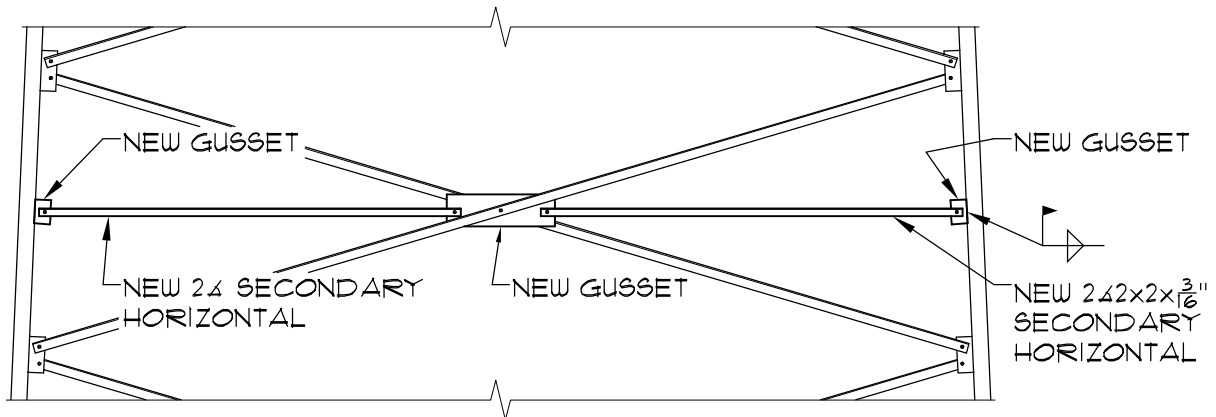
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
						Top Girt (T2)	64.2	Pass
						Bottom Girt (T1)	63.4	Pass
						RATING =	97.2	Pass

Program Version 3.0.0.16 - 7/10/2004 File:C:/Documents and Settings/ghodge.HODGEDESIGN.000/My Documents/ERITower Project Data Files/Sample Reports/Sample-SS-R3.eri

APPENDIX E

Suggested Recommendations for Tower Reinforcement

Graphical Computer Output
Structural Analysis Report and Calculations



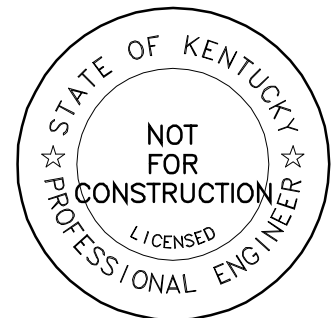
DETAIL 1

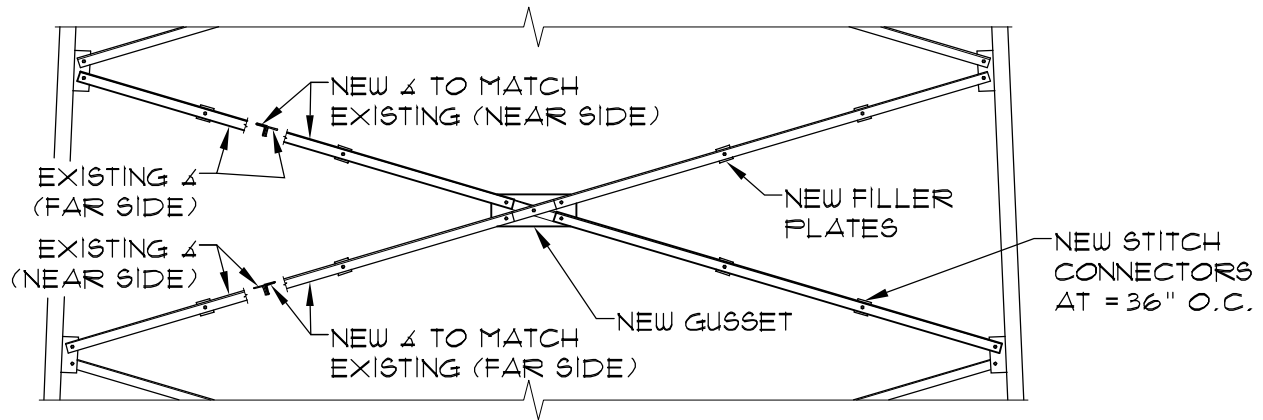
2x4 HORIZONTAL

40'-60' AGL
 80'-100' AGL
 140'-160' AGL

NOTE:

1. ALL NEW STRUCTURAL MATERIAL SHALL BE ASTM A36 MATERIAL.
2. ALL NEW MATERIAL SHALL BE HOT-DIP GALVANIZED.





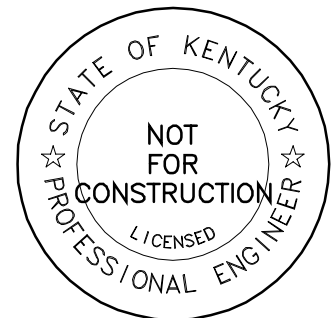
DETAIL 2

2x4 DIAGONAL

20'-140' AGL
160'-200' AGL

NOTE:

1. ALL NEW STRUCTURAL MATERIAL SHALL BE ASTM A36 MATERIAL.
2. ALL NEW MATERIAL SHALL BE HOT-DIP GALVANIZED.



Project Title: 300' GUYED
TOWER ANALYSIS
HDA Project No.: 04S-9999
Date: 12 JULY, 2004
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