



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
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STRUCTURAL ANALYSIS REPORT

PJF Project No.: **A00013-T042**

Structure: Existing 696-ft Guyed Tower

Manufacturer: PiRod, Inc.

Year of Mfr: 1986

Location: Birmingham, Alabama

Site Name: Red Mountain

Prepared For:

Crawford Broadcasting

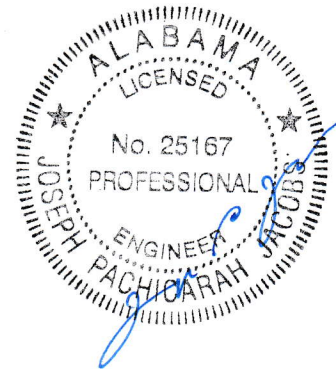
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APR 17 2013

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Executive Summary

Design Standard:

Paul J. Ford and Company has analyzed the existing Red Mountain tower in accordance with the Telecommunications Industry Association Standard ANSI/TIA-222-G for the following design wind velocities:

*90 mph 3-second gust of wind without ice
30 mph 3-second gust of wind with 0.25" radial ice
60 mph (Operational) 3-second gust of wind without ice
Structure Class II (Importance Factor = 1.00)
Topographic Category 1 Exposure Category "C"*

Antenna Loads:

The existing 696-ft guyed tower was analyzed for the following additional antenna and coax loading:

Status	Elev.	Antenna	Coax
New	420	(1) A-ANT-06G-W-A	(1) 1/4" (CAT 5)

Stresses:

When the existing tower is analyzed in accordance with the above mentioned code requirements to support the proposed antenna load it is stressed to 99.5% of its safe capacity. The tower meets the minimum code requirements as it now stands.

Twist and Sway:

At the operational wind velocity noted above, the twist is 0.499 degrees and the sway is 0.119 degrees for the microwave dish antenna at an elevation of 420-ft. For a complete list of twist and sway values for each of the microwave dish antennas see the results section.

Existing Foundations:

We calculated the capacity of the existing foundations using the recommendations of the geotechnical report that was provided to us. Our calculations indicate that the existing foundations are adequate to support the revised foundation loads indicated in our structural analysis.



Tower History:

The Red Mountain tower was originally designed and manufactured by PiRod, Inc. in 1986. This model #52/24 x 696' guyed tower is PiRod, Inc. job number 108747-B. Paul J. Ford and Company was supplied with the original tower and foundation design drawings.

The 696-ft guyed tower was originally designed in accordance with Electronics Industry Association Standard EIA RS-222-C for 50 psf uniform wind pressure and 10 psf uniform wind pressure with 1" radial ice.

Project Description:

Crawford Broadcasting has asked Paul J. Ford and Company to provide a structural analysis of the existing 696-ft guyed tower located in Bessemer, Alaska. In this analysis, we considered the addition of one (1) new A-ANT-06G-W-A antenna at an elevation of 420-ft. The new antenna are fed with one (1) – CAT5 coax.

Proposed Antenna and Feedline Loading:

Our structural analysis was completed considering the following antenna and feedline loading:

Status	Elev.	Antenna	Coax
Existing	661	(1) ERI SHPX8AC	(1) 3 1/8"
Existing	579	(1) ERI SHPX8AC	(1) 3 1/8"
New	420	(1) A-ANT-06G-W-A	(1) 1/4" (CAT 5)
Existing	400	(1) Dish P9A96GN-1	(1) 7/8"
Existing	397	(1) A-ANT-11G-4	(1) 1/4" (CAT5)
Existing	320	(1) PD10017	(1) 7/8"
Existing	280	(1) PD10017	(1) 7/8"
Existing	223	(1) AD18SX	(1) 1/4" (CAT5)
Existing	200	(1) PR-950	(1) 1/2"
Existing	170	(1) NBM5	(1) 1/4" (CAT 5)
Existing	100	(1) A-ANT-18G-2-C	(1) 1/4" (CAT5)

Structural Analysis:

Our structural analysis of this tower was completed according to the recommendations of the "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", ANSI/TIA-222-G. This standard recommends that the tower be designed for a minimum 90 mph 3-second gust of wind (at 33 ft above grade) for Jefferson County. We also considered a reduced design wind gust of 30 mph with a simultaneous 0.25 inch solid radial ice accumulation. The guyed tower was analyzed as a three-dimensional space truss using finite element software.



Results:

Our structural analysis of the existin Red Mountain tower indicates that the guy cables at elevation 400-ft are stressed to 99.5% of their safe capacity. These are the structural components that control the capacity of the tower.

At the operational wind velocity of 60 mph, the twist and the sway for each of the microwave dish antennas are listed below:

Elevation (ft.):	Antenna:	Twist (deg.):	Sway (deg.) :
420	A-ANT-06G-W-A	0.499	0.119
400	P-9A96GN	0.447	0.122
397	A-ANT-11G-4	0.444	0.122
223	AD18SX	0.368	0.118
200	PR-950	0.342	0.105
170	NBM5	0.302	0.095
100	A-ANT-18G-2-C	0.202	0.088

With the information that was provided to us, we were able to calculate the capacity of the existing foundations. Our calculations indicate that the existing foundations are adequate to support the revised foundation loads indicated in our structural analysis.

Conclusion:

Paul J. Ford and Company performed a structural analysis of the existing Red Mountain tower in accordance with the Telecommunications Industry Association Standard ANSI/TIA-222-G. Our analysis indicates that the tower is adequate as it now stands to safely support the proposed antenna loading without the need for any modifications.

We calculated the capacity of the existing foundations using the recommendations of the geotechnical report number B6143-6128 by Bhate dated March 12, 1986. Our calculations indicate that the existing foundations are adequate to support the revised foundation loads indicated in our structural analysis.

We hope that this analysis satisfies your current needs. If you have any questions concerning our analysis, or if we can be of further service to you, please feel free to contact us at (614) 221-6679.

Sincerely,
PAUL J. FORD AND COMPANY

Jeffrey Krus, P.E., LEED AP
Project Engineer