# STATE OF CONNECTICUT

*CONNECTICUT SITING COUNCIL*

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm


September 6, 2002

Peter W. van Wilgen
Southwestern Bell Mobile Systems, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-047-094-115-130-142-020828** - SNET Mobility, LLC notice of intent to modify existing telecommunications facilities located in East Windsor, Newington, Prospect, Southbury, and Tolland, Connecticut.

Dear Mr. van Wilgen:

At a public meeting held on September 5, 2002, the Connecticut Siting Council (Council) acknowledged your notice to modify these existing telecommunications facilities, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the condition that, prior to the replacement of any antennas on the Prospect facility, the guy wire tensions be checked and adjusted as necessary per the recommendation contained within the structural analysis prepared by Gem Engineering dated August 16, 2002.

The proposed modifications are to be implemented as specified here and in your notice dated August 28, 2002. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility sites that would not increase tower heights, extend the boundaries of the tower site, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundaries to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on these towers.

This decision is under the exclusive jurisdiction of the Council. Any additional change to these facilities will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/DM/laf

c: See attached list.

List Attachment.

c: Honorable Linda L. Roberts, First Selectman, Town of East Windsor
Donald Poland, Town Planner, Town of East Windsor
Honorable Thomas B. McBride, First Selectman, Town of Newington
Paul J. Fetherston, Town Manager, Town of Newington
Edmund Meehan, Town Planner, Town of Newington
Honorable Robert J. Chatfield, First Selectman, Town of Prospect
William J. Donovan, Zoning Enforcement Officer, Town of Prospect
Honorable Mark A.R. Cooper, First Selectman, Town of Southbury
Mark D. Cody, Zoning Enforcement Officer, Town of Southbury
Honorable Richard C. Knight, First Selectman, Town of Tolland
Timothy J. Tieperman, Town Manager, Town of Tolland
Ronald Blake, Town Planner, Town of Tolland

EM-CING-047-094-115-130-142-020828

**Southwestern Bell Mobile Systems, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7190

**Peter W. van Wilgen**
*Senior Manager - Construction*

HAND DELIVERED



August 28, 2002

Mr. Mortimer A. Gelston, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Southwestern Bell Mobile Systems, LLC notice of intent to modify existing telecommunications facilities located in East Windsor, Newington, Prospect, Southbury, and Tolland

Dear Mr. Gelston:

In order to accommodate technological changes, implement E-911 capability and enhance system performance, Southwestern Bell Mobile Systems, LLC ("SNET" or "Cingular Wireless"; formerly SNET Mobility, LLC) plans to modify the antenna configurations at its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of each of the municipalities in which an affected cell site is located.

Attached are summary sheets detailing the planned changes, including power density calculations reflecting the change in the effect of Cingular's operations at each site. Also included is documentation of the structural sufficiency of each tower to accommodate the revised antenna configuration.

The changes to the facilities do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facilities will not be significantly changed or altered. Rather, the planned changes to the facilities fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected. At almost all sites, new panel antennas approximately the same size will replace those previously installed. Tower mount amplifiers, approximately 5" x 9" x 13", will be added to the platform on which the panel antennas are mounted to enhance signal reception at the cell site. In addition, the mandated provision of E-911 capability will require installation of one LMU ("location measurement unit"), approximately nine inches high, on either the tower, the equipment shelter or the ice bridge. One GPS receive-only antenna will be attached to the equipment shelter at each site. None of the modifications will extend the height of the tower.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. Radio frequency power density will increase due to use of additional channels broadcasting at higher power. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, Cingular Wireless respectfully submits that the proposed changes at the referenced sites constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 513-7730 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Peter W. van Wilgen
Senior Manager - Construction

Enclosures

**CINGULAR WIRELESS**
**Antenna Modification**

**Site Address:** 232 (aka 236) South Main Street, East Windsor
Initial CSC approval 8/6/97

**Tower Owner/Manager:** Balch Bridge Street Corp.

**Antenna configuration** Antenna Centerline – 170 ft

**Current and/or approved:** Nine Swedcom ALP11011 panels

**Planned:** Nine DUO1417-8686-4-0 panels or comparable
6 tower mount amplifiers

**Power Density:**

Calculations for Cingular's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 4.0 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for Cingular's planned operations would be approximately 5.7 %, or an additional 1.7 % of the standard.

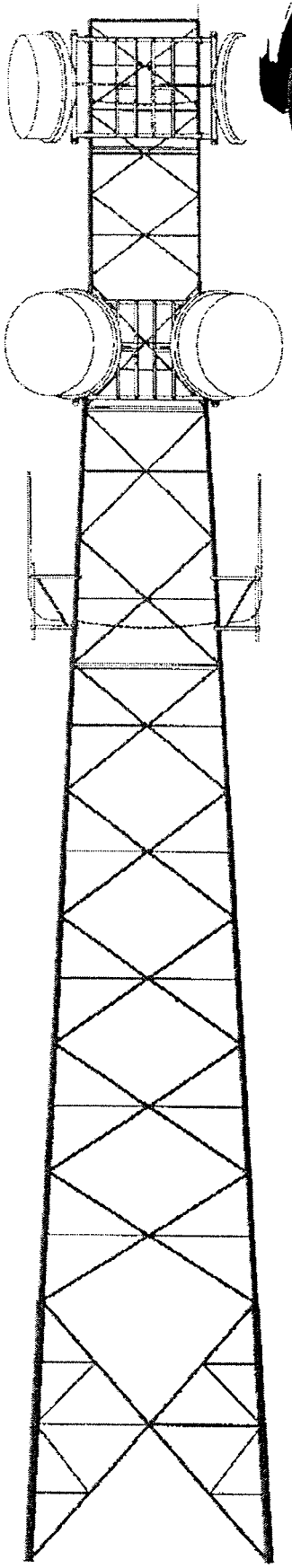
**Cingular Current**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS | 170 | 880 - 894 | 19 | 100 | 0.0236 | 0.5867 | 4.0 |

**Cingular Planned**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS TDMA | 170 | 880 - 894 | 16 | 100 | 0.0199 | 0.5867 | 3.4 |
| SBMS GSM | 170 | 880 - 894 | 2 | 296 | 0.0074 | 0.5867 | 1.3 |
| SBMS GSM | 170 | 1930 - 1935 | 2 | 427 | 0.0106 | 1.0000 | 1.1 |
| | | | | | | | |
| **Total** | | | | | | | **5.7%** |

**Structural information:** Please see attached.



o2 Wireless Solutions, Inc.

# SELF SUPPORTER
# STRUCTURAL ANALYSIS REPORT

for

## BECHTEL CORPORATION
175 CAPITAL BOULEVARD
SUITE 100
ROCKY HILL, CT 06067



August 13, 2002

SITE:
East Windsor 1194
Hartford County, CT
188' Rohn SS Tower
Project Designer: Hachem K. Domloj
o2wireless Solutions Job No. 103-3637-19

10430 Rodgers Road Houston, TX 77070 • 713.973.6904 • Fax 713.973.0205

## INTRODUCTION

This report summarizes the results of the structural analysis performed on the 188' Rohn self supported tower at the East Windsor site in Hartford County, Connecticut. The tower analysis was performed using 1999 GuyMast/Mast program.

## ANALYSIS CRITERIA

The tower was analyzed for the specified loads in accordance with the current EIA-222-F publication, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." This analysis derives its applied forces from EIA minimum 80 MPH basic wind speed with no ice accumulation and 70 MPH wind speed with 1/2" ice.

## TOWER LOADING INFORMATION

Bechtel Corporation requested o2wireless Solutions analyze the tower to verify its structural integrity under the following antenna and transmission line loading:

| ELEVATION | STATUS | DESCRIPTION | LINE |
|---|---|---|---|
| 188' | EXISTING | 1- BCD 87010 | 1- 1 5/8" COAX |
| 188' | EXISTING | 9- SP 9011-DIN | 9- 1 5/8" COAX |
| 184' | EXISTING | 3- ALLGON 7250.03 | 6- 1 5/8" COAX |
| 184 | FUTURE | 3- ALLGON 7250.03 | 6- 1 5/8" COAX |
| **170'** | **PROPOSED** | **9- DUO1417-8686-4-0*** | **9- 1 ¼" COAX** |
| 153' | EXISTING | 6- APN 199015-52TO | 6- 1 ¼" COAX |
| 140' | EXISTING | 12- ALP 9011 DIN | 12- 1 5/8" COAX |
| 124' | EXISTING | 6- ALLGON 7184.05 | 6- 1 5/8" COAX |

* 6 DDD TMA 1900 to accompany the antennas at level 170'.

## AVAILABLE DOCUMENTS

- All tower data information, antenna types and locations were obtained from tower mapping.
- RF sheet.

## RESULTS

The graphs enclosed summarize the results of the tower study and itemize the structural components, specifying member function, elevation, and size. Values for allowable and actual member loads are reported along with the corresponding allowable wind conditions. The graphs summarize the existing structural components and their corresponding applied loads.

## CONCLUSIONS AND RECOMMENDATIONS:

The East Windsor tower will support the proposed loading and meet the requirements of the EIA Standard without any further modifications required. The analysis is reflected in run M3637-19 and shown in the drawing.

Information on the foundations and geotechnical report was not provided, thus, precluding any comments on their performance under the proposed loading criteria.

Thank you for this opportunity to work with you and do not hesitate to call if you should have any questions.

Respectfully submitted:

Hachem K. Domloj, EIT
Project Designer

STATE OF CONNECTICUT
V. G. DUVALL, JR.
No. 22527
LICENSED
PROFESSIONAL ENGINEER

VG Duvall, Jr., PE
Connecticut Professional Engineer

**Southwestern Bell Mobile Systems, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7190

**Peter W. van Wilgen**
*Senior Manager - Construction*

August 28, 2002

Honorable Linda L. Roberts, 1st Selectman
Town Hall
11 Rye St., P.O. Box 213
Broad Brook, Connecticut 06016-0213

Re: Telecommunications facility – 232 South Main St.

Dear Ms. Roberts:

In order to meet the requirements for improved E-911 capability and to implement a more advanced telecommunications system, Southwestern Bell Mobile Systems, LLC, a/k/a Cingular Wireless ("SBMS" or "Cingular"; formerly SNET Mobility, LLC) will be changing its antenna configuration at certain cell sites. Cingular will install panel antennas, small amplifiers and a small locator unit on the tower. As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Cingular's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter fully describes Cingular's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7730 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

**CINGULAR WIRELESS**
**Antenna Modification**

**Site Address:** 99 Cedarwood Lane, Newington
CSC approval 12/10/97

**Tower Owner/Manager:** Fred Callahan

**Antenna configuration** Antenna Centerline – 120 ft

**Current and/or approved:** Nine ALP 11011N panels

**Planned:** Nine DUO1417-8686-4-0 panels or comparable
6 tower mount amplifiers

**Power Density:**

Calculations for Cingular's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 8.1 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for Cingular's planned operations would be approximately 11.5 %, or an additional 3.4 % of the standard.

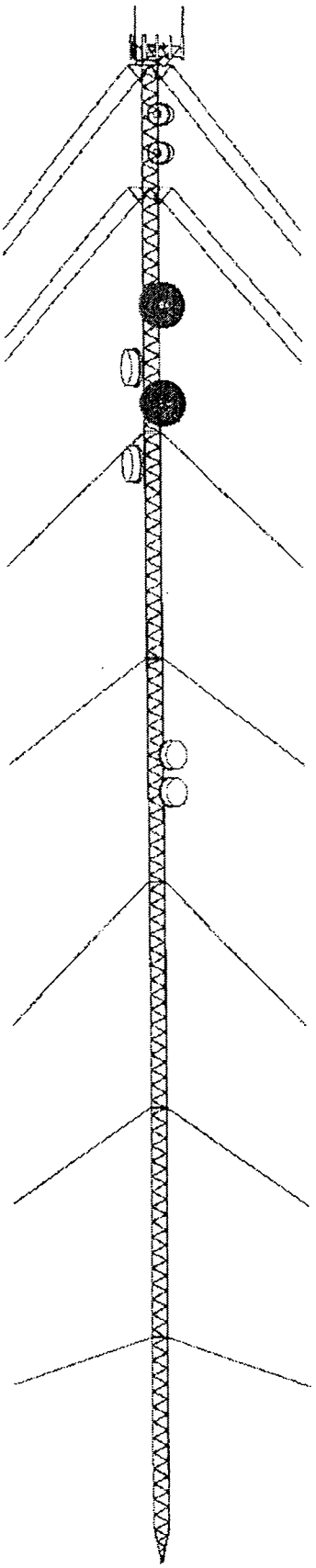
**Cingular Current**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS | 120 | 880 - 894 | 19 | 100 | 0.0474 | 0.5867 | 8.1 |

**Cingular Planned**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS TDMA | 120 | 880 - 894 | 16 | 100 | 0.0400 | 0.5867 | 6.8 |
| SBMS GSM | 120 | 880 - 894 | 2 | 296 | 0.0148 | 0.5867 | 2.5 |
| SBMS GSM | 120 | 1930 - 1935 | 2 | 427 | 0.0213 | 1.0000 | 2.1 |
| | | | | | | | |
| **Total** | | | | | | | **11.5%** |

**Structural information:** Please see attached.



o2wireless Solutions

# GUYED TOWER
# STRUCTURAL ANALYSIS REPORT

for

## BECHTEL CORPORATION
**175 CAPITAL BOULEVARD**
**SUITE 100**
**ROCKY HILL, CT 06067**



**August 14, 2002**

**SITE:**
**Newington, 1145**
**Hartford County, CT**
**150' Rohn 80 Guyed Tower**
**Project Designer: Hachem k. Domloj**
**o2wireless Job No. 103-3637-01**

10430 Rodgers Road Houston, TX 77070 • 713.973.6904 • Fax 713.973.0205

## INTRODUCTION

This report summarizes the results of the structural analysis performed on the 150' Rohn 80 guyed tower at the Newington site in Hartford County, Connecticut. The tower analysis was performed using 1999 GuyMast/Mast program.

## ANALYSIS CRITERIA

The tower was analyzed for the specified loads in accordance with the current EIA-222-F publication, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." This analysis derives its applied forces from EIA minimum 80 MPH basic wind speed with no ice accumulation and 70 MPH wind speed with 1/2" ice.

## TOWER LOADING INFORMATION

Bechtel Corporation requested o2wireless Solutions analyze the tower to verify its structural integrity under the following antenna and transmission line loading:

| ELEVATION | STATUS | DESCRIPTION | LINE |
|---|---|---|---|
| 140' | EXISTING | 9- DB844H90E-XY | 9- 1 1/4" COAX |
| **120'** | **PROPOSED** | **9- DUO1417-8686-4-0 *** | **9- 7/8" COAX** |

* 6 DDD TMA 1900 to accompany the antennas at level 120'.

## AVAILABLE DOCUMENTS

- All tower data information, antenna types and locations were obtained from tower mapping.
- RF sheet.

## RESULTS

The graphs enclosed summarize the results of the tower study and itemize the structural components, specifying member function, elevation, and size. Values for allowable and actual member loads are reported along with the corresponding allowable wind conditions. The graphs summarize the existing structural components and their corresponding applied loads.

## CONCLUSIONS AND RECOMMENDATIONS:

The Newington tower will support the proposed loading and meet the requirements of the EIA Standard without any modifications required. The analysis is reflected in run GM3637-01 and shown in the drawing pages.

Information on the foundations and geotechnical report were not provided, thus, precluding any comments on their performance under the proposed loading criteria.

Thank you for this opportunity to work with you and do not hesitate to call if you should have any questions.

Respectfully submitted:

Hachem K. Domloj, EIT
Project Designer

STATE OF CONNECTICUT
V. G. DUVALL, JR.
No. 22527
LICENSED
PROFESSIONAL ENGINEER

VG Duvall, Jr., PE
Connecticut Professional Engineer

**Southwestern Bell Mobile Systems, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7190

**Peter W. van Wilgen**
*Senior Manager - Construction*

August 28, 2002

Honorable Paul J. Fetherston, Town Manager
Town Hall
131 Cedar St.
Newington, Connecticut 06111-2644

Re: Telecommunications facility – 99 Cedarwood Lane

Dear Mr. Fetherston:

In order to meet the requirements for improved E-911 capability and to implement a more advanced telecommunications system, Southwestern Bell Mobile Systems, LLC, a/k/a Cingular Wireless ("SBMS" or "Cingular"; formerly SNET Mobility, LLC) will be changing its antenna configuration at certain cell sites. Cingular will install panel antennas, small amplifiers and a small locator unit on the tower. As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Cingular's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter fully describes Cingular's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7730 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

**CINGULAR WIRELESS**
**Antenna Modification**

**Site Address:** 54 Waterbury Road, Prospect
TS-SCLP-115-990315

**Tower Owner/Manager:** Charles Bradshaw

**Antenna configuration** Antenna Centerline – 124 ft

**Current and/or approved:** Two RS90-12-00-A2 panels

**Planned:** Two EMS MB96RR900200 panels or comparable
4 tower mount amplifiers

**Power Density:**

Calculations for Cingular's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 7.6 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for Cingular's planned operations would be approximately 10.7 %, or an additional 3.1 % of the standard.

**Cingular Current**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS | 124 | 880 - 894 | 19 | 100 | 0.0444 | 0.5867 | 7.6 |

**Cingular Planned**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS TDMA | 124 | 880 - 894 | 16 | 100 | 0.0374 | 0.5867 | 6.4 |
| SBMS GSM | 124 | 880 - 894 | 2 | 296 | 0.0138 | 0.5867 | 2.4 |
| SBMS GSM | 124 | 1930 - 1935 | 2 | 427 | 0.0200 | 1.0000 | 2.0 |
| **Total** | | | | | | | **10.7%** |

**Structural information:** Please see attached.

GEM ENGINEERING COMPANY

2500 Wilcrest, Suite 100
Houston, Texas 77042

Phone 713-339-1550
Fax 713-339-9922

A Subsidiary of Quanta Services, Inc.

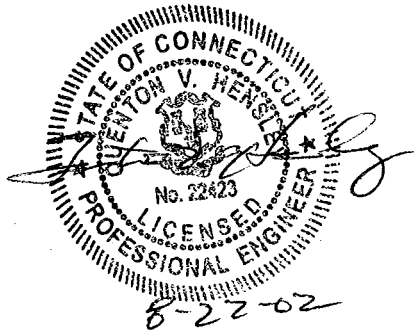
Quanta Services

# TOWER ANALYSIS REPORT

## Bechtel Telecommunications

## Site Name: Prospect-Bradshaw
## Site Number: 2218
## Prospect, CT

### (160' Guyed Tower)




**GEM Engineering Company, Inc.**
**August 16, 2002**

# TOWER INFORMATION

| | |
|---|---|
| **Tower Height:** | **160'** |
| **Tower Type:** | **Guyed Tower** |
| **Tower Manufacturer:** | **-** |
| **Tower Model Number:** | **-** |
| **Location:** | **Prospect, CT** |
| **Report Prepared for:** | **Bechtel** |
| **Report Prepared by:** | **Sue Lee** |
| **Report Checked by:** | ahmad Ayyobi |
| **GEM Project Number:** | **460556** |
| **Site Name:** | **Prospect-Bradshaw** |
| **Site Number:** | **2218** |
| **Report Date:** | **August 16, 2002** |

# Section 1 Introduction

The purpose of this report is to investigate the structural adequacy of an existing tower, to support the proposed antennas, in addition to the load from existing antennas.

The existing tower is a 160' guyed tower. Information on this tower and existing antennas was obtained from tower mapping. Information on new antennas was supplied by "Bechtel".

The new and existing antennas are listed in the "Tower Loading Information & Criteria" section. The main forces that are considered in the analysis of the tower are those resulting from wind. Per TIA/EIA-222-F, the basic wind speed for New Haven County in Connecticut is 85 mph with ½" ice. Wind load combination with ice includes reduction in the tower loading.

The tower was analyzed for the following load combination:

- Dead Load + Wind Load
- Dead Land + Wind Load + Ice

Allowable stresses were increased by 1/3 for these load combinations. This is according to TIA/EIA code. Dead Load consists of the loads due to the weight of all existing and future antennas, coaxes, tower members, and all related appurtenances.

# Section 2 Tower Loading Information & Criteria

**Customer Name:** Bechtel

**Site:** Prospect-Bradshaw, CT

## TOWER ANALYSIS DATA:

**Tower Analysis Criteria**: TIA-EIA-222-F

**Tower Height**: 160'

**Wind Load**: 85 mph

**Ice Load**: 0.5"

**Frequency**: -

## ANTENNAS:

| Model/Size | Carrier | Level | Azimuth | Existing / New | Mount Type | Coaxials |
|---|---|---|---|---|---|---|
| (1) Yagi | | 50'3" | | E | | (1) ½"ϕ |
| (1) 14' Whip | | 94'9" | | E | | (1) ½"ϕ |
| (1) 20' Omni | | 116'10" | | E | | (1) 7/8"ϕ |
| (2) RS90-12-00-A2* | | 124' | | E | | (3) 1 1/4"ϕ |
| **(2) MB96RR900200_BL and (4) TMA** | | **124'** | | **N** | | **(1) 1 1/4"ϕ** |
| (3) 16' Omni | | 140'6" | | E | | (3) 1 5/8"ϕ |
| (5) 12' Omni | | 160' | | E | | (5) 7/8"ϕ |
| (1) Yagi | | 160' | | E | | (1) ½"ϕ |

*** Existing two (2) RS90-12-00-A2 antennas at elevation 124' shall be removed from the tower; their associated existing coaxials shall be reused for the proposed antennas.**

## Section 3 Results

| Structural Element | Stress | Maximum Ratio | Notes |
|---|---|---|---|
| Legs | O.K. | 0.538 | - |
| Leg Bolts | O.K. | 0.197 | - |
| Diagonals | O.K. | 0.591 | - |
| Diagonal Bolts | N/A | - | Welded* |
| Girts | O.K. | 0.199 | - |
| Girt Bolts | N/A | - | Welded* |
| Guy Wires | O.K. | 0.901 | - |

N/A = Not Applicable, N.G. = Not Good (Structurally)  Acceptable Maximum Ratio is 1.05

| BASE REACTIONS | Down (k) | Horizontal (k) |
|---|---|---|
| Original Design Loads** | - | - |
| New Foundation Loads | 56.47 | 0.612 |

| GUY ANCHOR REACTIONS @ 115 ft. | Up (k) | Horizontal (k) |
|---|---|---|
| Original Design Loads** | - | - |
| New Foundation Loads | 21.838 | 23.997 |

* A detailed analysis of the welded end connections has not been performed, as this was not a part of the scope of work. Based on engineering judgment and the acceptable stress ratios of the girts and diagonals, the welded end connections have been assumed to be adequate.

The existing foundation could not be checked in the absence of the foundation drawings and the soil report of the site.

# Section 4 Conclusions

The existing 160' guyed tower was analyzed for loadings from existing and new proposed antennas, including 85 mph basic wind speed & 0.5" ice load. The analysis shows that **the existing tower is structurally adequate** to support two (2) new antennas and their four (4) TMA at elevation 124', in addition to all existing antennas loads (existing two (2) antennas at elevation 124' shall be removed from the tower).

The existing foundation could not be checked in the absence of the foundation drawings and the soil report of the site.

The existing guy wire tension for this tower has not been provided to GEM Engineering Inc. for this analysis. Therefore, for the purpose of this analysis, GEM Engineering Inc. has assumed that the existing guy wire tensions are within acceptable limits for the corresponding guy wire size. It is Gem Engineering Inc. recommendation, that prior to the addition of the new antennas the tension of all the guy wires on the tower be checked for the proper tension and if needed adjusted as necessary according to the TIA/EIA-222-F requirements.

# Section 5 Analysis Summary

**LEG**
**CONNECTIONS: Structural Grade: A-325**

| Elevation | Member Force, k | Allowable force, k | Stress ratio | Member Stress |
|---|---|---|---|---|
| 140' | 18.6614 | 103.208 | 0.181 | O.K. |
| 120' | 20.374 | 103.208 | 0.197 | O.K. |
| 100' | 9.22895 | 103.208 | 0.089 | O.K. |
| 80' | 4.26088 | 103.208 | 0.041 | O.K. |
| 60' | 2.15885 | 103.208 | 0.021 | O.K. |
| 40' | 0.21686 | 103.208 | 0.002 | O.K. |

Allowable Stress Ratio is between 0% - 1.05%
N.G. = Not Good (Structurally), N/A = Not Applicable

**DIAGONAL**
**CONNECTIONS: WELDED**

**GIRTS**
**CONNECTIONS: WELDED**

**Southwestern Bell Mobile Systems, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7190

**Peter W. van Wilgen**
*Senior Manager - Construction*

August 28, 2002

Honorable Robert J. Chatfield, Mayor
Town Office Building
36 Center Street
Prospect, Connecticut 06712-1669

Re: Telecommunications facility – 54 Waterbury Road

Dear Mayor Chatfield:

In order to meet the requirements for improved E-911 capability and to implement a more advanced telecommunications system, Southwestern Bell Mobile Systems, LLC, a/k/a Cingular Wireless ("SBMS" or "Cingular"; formerly SNET Mobility, LLC) will be changing its antenna configuration at certain cell sites. Cingular will install panel antennas, small amplifiers and a small locator unit on the tower. As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Cingular's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter fully describes Cingular's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7730 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

**CINGULAR WIRELESS**
**Antenna Modification**

**Site Address:** Kettletown Road, Southbury
TS-SCLP-130-991105

**Tower Owner/Manager:** VoiceStream

**Antenna configuration** Antenna Centerline – 185 ft

**Current and/or approved:** Up to 12 Allgon 7120.16 panels

**Planned:** Three EMS MB96RR900200 panels or comparable
6 tower mount amplifiers & 6 diplexers

**Power Density:**

Calculations for Cingular's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 3.4 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for Cingular's planned operations would be approximately 4.8 %, or an additional 1.4 % of the standard.

**Cingular Current**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS | 185 | 880 - 894 | 19 | 100 | 0.0200 | 0.5867 | 3.4 |

**Cingular Planned**

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS TDMA | 185 | 880 - 894 | 16 | 100 | 0.0168 | 0.5867 | 2.9 |
| SBMS GSM | 185 | 880 - 894 | 2 | 296 | 0.0062 | 0.5867 | 1.1 |
| SBMS GSM | 185 | 1930 - 1935 | 2 | 427 | 0.0090 | 1.0000 | 0.9 |
| | | | | | | | |
| **Total** | | | | | | | **4.8%** |

**Structural information:** Please see attached.

# DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 196' EXISTING STEEL POLE FOR REPLACEMENT ANTENNA ARRANGEMENT

**Kettletown Road**
**Southbury, Connecticut**
**Site No.: 2086**

*prepared for*

cingular WIRELESS

Cingular Wireless
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067


*prepared by*

URS

URS CORPORATION
795 BROOK STREET, BUILDING 5
ROCKY HILL, CT 06067
TEL. 860-529-8882

36911753.00000

Revision 2
August 21, 2002

## I. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 196' steel pole located on Kettletown Road in Southbury, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-F standard for wind velocity of 85 mph bare and 74 mph concurrent with ½" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined on the following page of this report. The proposed Cingular Wireless modification is to replace the existing Cingular Wireless antennas with the antennas listed below:

| | | Antenna Centerline Elevation |
|---|---|---|
| (3) EMS MB96RR900200_PBL antennas with (6) TMA amplifiers and (6) Diplexers with (3) 1 1/4" coax cable within the steel pole | Cingular (proposed) | @ 185' elevation |

The results of the analysis indicate the structure to be in compliance with the proposed loading condition for the steel pole. The steel pole is considered feasible with the TIA/EIA-222-F wind load classification specified above. No further analysis was conducted on the tower foundation since the forces calculated were below the original design.

This analysis is based on:

1) The tower structure's theoretical capacity not including any condition assessment of the tower.

2) Tower and foundation design prepared by Pirod Incorporated engineering file no. A-115080 and drawing no. 204240-B dated May 20, 1999.

3) Antenna loading as specified on the following page of this report.

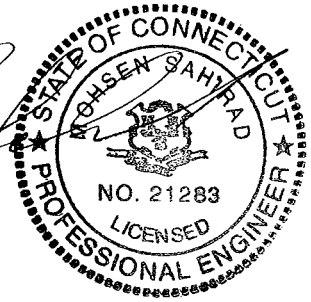
4) TIA/EIA-222-F wind load classification.

This report is only valid as per the assumptions and data utilized in this report for antenna loading, mounts and associated cables. Cingular Wireless requested for URS to incorporate the antenna inventory provided in a previous analysis conducted by Pirod proposal PR-2001-01-008 dated March 8, 2001. The user of this report shall field verify the assumption of the antenna and mount configuration and that adequate space is available for routing the coaxial cable inside the steel pole prior to installation. Notify the engineer in writing immediately if any of the assumptions in this report are found to be other than specified.

If you should have any questions, please call.

Sincerely,

***URS Corporation AES***




Mohsen Sahirad, P.E.
Senior Structural Engineer

MS/rmn

cc: Richard R. Johanson - Bechtel
Doug Roberts - URS
I. Artaiz, AIA - URS
A. Abadjian, PM - URS
CF/Book

**Introduction:**

A structural analysis of this 196' communications steel pole was performed by URS Corporation AES (URS) for Cingular Wireless. The steel pole is located Kettletown Road in Southbury, Connecticut.

Tower and foundation design was prepared by Pirod Incorporated engineering file no. A-115080 and drawing no. 204240-B dated May 20, 1999.

This analysis was conducted to evaluate twist (rotation), sway (deflection), and stress on the steel pole. The analysis was also used to find the effect of the forces to the foundation resulting from the antenna arrangement listed below.

| The antenna and mount configuration: | | Antenna Centerline Elevation |
|---|---|---|
| (12) RR90-17-00DP antennas with low profile platform and (24) 1-5/8" coax cables within the steel pole | | @ 195' elevation |
| **(3) EMS MB96RR900200_PBL antennas with (6) TMA amplifiers and (6) Diplexers with (3) 1 1/4" coax cable within the steel pole** | **Cingular (proposed)** | **@ 185' elevation** |
| (12) Allgon 7184 antennas with low profile platform and (12) 1-5/8" coax cables within the steel pole | | @ 175' elevation |
| (9) DB980H90 antennas with low profile platform and (9) 1-5/8" coax cables within the steel pole | | @ 165' elevation |
| (12) Allgon 7129.16 antennas with low profile platform and (12) 1-5/8" coax cables within the steel pole | | @ 155' elevation |
| (1) GPS antenna with stand off mount and (1) 1/2" coax cable within the steel pole | | @ 90' elevation |

**Structural Analysis:**

Methodology:

The structural analysis was done in accordance with TIA/EIA-222-F June 1996, Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).
The analysis was conducted using ERI Tower 2.0. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA. The two load combinations were investigated in ERI Tower 2.0 to determine the stress, sway and rotation.

Load Condition 1 = 85 mph Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 74 mph Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits one-third increase in allowable stresses for towers and steel poles less than 700 feet tall. For purposes of this analysis, allowable stresses of the steel pole members were increased by one-third in computing the load capacity.

**Evaluation of Steel pole:**

Combined axial and bending stresses on the steel pole structure were evaluated to compare with allowable stresses in accordance with AISC. The calculated stresses under the proposed loading were below the allowable stresses.

**Analysis Results:**

Our analysis determined that the steel pole will support the proposed antenna replacement under the analysis criteria outlined on the previous page. No further analysis was conducted on the tower foundation since the forces calculated were below the original design.

Our analysis for the proposed antenna replacement and load condition is provided in Appendix A.

**Limitations/Assumptions:**

This report is based on the following:

1. Tower loading for antennas and mounts as listed in this report.
2. Tower is properly installed and maintained.
3. All members were as specified in the original design Documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All members are galvanized.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design Documents.
10. All co-axial cable is installed within or outside the steel pole, except as noted.

URS is not responsible for any modifications completed prior to or hereafter, which URS is not or was not directly involved. Modifications include but are not limited to:

1. Removing/Replacing antennas
2. Adding antennas and amplifiers

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

**Ongoing and Periodic Inspection and Maintenance by the Owner:**

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower and reinforcing system.

The Owner shall refer to TIA/EIA-222-F, Section 14 and Annex E for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the Owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system is performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F Section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

**Southwestern Bell Mobile Systems, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7190

**Peter W. van Wilgen**
*Senior Manager - Construction*

August 28, 2002

Honorable Mark A.R. Cooper, First Selectman
Town Hall
501 Main Street South
Southbury, Connecticut 06488-2295

Re: Telecommunications facilities – Kettletown Road

Dear Mr. Cooper:

In order to meet the requirements for improved E-911 capability and to implement a more advanced telecommunications system, Southwestern Bell Mobile Systems, LLC, a/k/a Cingular Wireless ("SBMS" or "Cingular"; formerly SNET Mobility, LLC) will be changing its antenna configuration at certain cell sites. Cingular will install panel antennas, small amplifiers and a small locator unit on the tower. As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Cingular's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter fully describes Cingular's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7730 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

**CINGULAR WIRELESS**
**Antenna Modification**

**Site Address:** 497 Old Post Road, Tolland
TS-SCLP-142-990708 7/29/99

**Tower Owner/Manager:** Old Post Road Holdings

**Antenna configuration** Antenna Centerline – 127 ft

**Current and/or approved:** 3 EMS RS65-16-00XA2

**Planned:** 3 EMS MB96RR900200 or comparable
6 tower mount amplifiers

**Power Density:**

Calculations for Cingular's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 7.2% of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for Cingular's planned operations would be approximately 10.2%, or an additional 3 % of the standard.

Cingular Current

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS | 127 | 880 - 894 | 19 | 100 | 0.0424 | 0.5867 | 7.2 |

Cingular Planned

| Company | Centerline Ht (feet) | Frequency (MHz) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| SBMS TDMA | 127 | 880 - 894 | 16 | 100 | 0.0357 | 0.5867 | 6.1 |
| SBMS GSM | 127 | 880 - 894 | 2 | 296 | 0.0132 | 0.5867 | 2.2 |
| SBMS GSM | 127 | 1930 - 1935 | 2 | 427 | 0.0190 | 1.0000 | 1.9 |
| Total | | | | | | | 10.2% |

**Structural information:** Please see attached.

# DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 150' EXISTING GUYED TOWER FOR NEW ANTENNA ARRANGEMENT

**497 Old Post Road**
**Tolland, Connecticut**
**Site No.: 1047**

*prepared for*

cingular WIRELESS

Cingular Wireless
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067



*prepared by*

URS

URS CORPORATION
795 BROOK STREET, BUILDING 5
ROCKY HILL, CT 06067
TEL. 860-529-8882

F300002292.56
Revision 1

August 15, 2002

## 1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 150-foot steel guyed tower located at 497 Old Post Road, Tolland, Connecticut in Tolland County. The analysis is conducted in accordance with ANSI/TIA/EIA-222-F-1996, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures.* This analysis utilized a design wind speed of 85 miles per hour (mph) with no ice, 74 mph with ½" radial ice, and a service wind speed of 50 mph for tower deflections. The loading considered in this analysis consists of existing and proposed antennas, antenna supporting mounts, and antenna feed cables as outlined in section 3 (Analysis Methodology and Loading Conditions) contained within this report.

The result of our structural analysis indicates that the tower **does** meet ANSI/TIA/EIA-222-F design specification for wind loads and allowable stress.

## 2. INTRODUCTION

The subject structure is a 150-foot steel guyed tower originally designed and fabricated by PiRod Incorporated (PiRod). For the purpose of this analysis, the tower geometry and structural member sizes were taken from the original PiRod design drawings dated August 4, 1998. In addition, information regarding the existing antennas was obtained from a previous structural analysis report performed by Tectonic Engineering Consultants PC, Incorporated (Tectonic) on May 15, 2002. (See Section 7, Tower Drawings and Antenna Information)

The tower has a triangular cross section with a 3'-4" tapered base and a constant face width of 1'-6". The tower legs are constructed from 1 $^{3}/_{4}$" diameter solid steel rods and are fabricated from ASTM A-572 Grade 50 steel with a minimum yield strength (Fy) of 50,000 pounds per square inch (psi). The diagonal and horizontal bracing members also consist of $^{5}/_{8}$" diameter solid steel rods and are fabricated from ASTM A-572 Grade 50 steel with minimum yield strength of 50,000 psi. All connection bolts conform to ASTM A325 specifications. The table below indicates the size and location of all guy cables.

| Guy Cable Information | | | |
|---|---|---|---|
| **Elevation (ft)** | **Guy Cable Size** | **Torque Arm** | **Radius (ft)** |
| 145 | $^{5}/_{8}$" ϕ EHS | Yes, 6-ft. Spread | 74, 40, 74 |
| 90 | $^{1}/_{2}$" ϕ EHS | Yes, 6-ft. Spread | 74, 40, 74 |
| 50 | $^{7}/_{16}$" ϕ EHS | No | 74, 40, 74 |

The reference design standard upon which our analysis and evaluation is based is ANSI/TIA/EIA-222-F-1996, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures*, using a basic wind speed of 85 mph with no ice or 74 mph with ½" radial ice. It is the purpose of this analysis to investigate the structural integrity of the existing tower with its existing and proposed antenna loading.

## 3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The subject structure was analyzed as a three-dimensional space truss by use of the finite element analysis computer program *ERITower* from C-Concepts, Inc. The structural model input data consists of overall tower geometry, structural member sizes and section properties, and specific loading cases such as number and types of antennas, mounting booms, and antenna feed cables. Information is specified through a series of spreadsheets and user defined databases. The program performs the following:

1. Automatically generates nodes and elements for a subsequent finite element analysis (FEA).
2. Automatically calculates the pressure coefficients, wind pressures, ice loads, and resulting forces in the tower.
3. Allows for entry of panel antennas, feed cables, and user defined appurtenances, such as boom mounts, at any location on the tower.
4. Performs stress checks of all structural members and indicates whether each individual member passes or fails.

The computer output consists of extensive reports in Microsoft Rich Text Format and several graphical displays that indicate tower geometry, loading conditions, member stresses, deflections, leg reactions, and feed cable locations.

Application of wind load on the tower assumes wind blowing from sixteen different directions around the compass:

| Compass Direction | Compass Direction |
|---|---|
| Wind 0 deg | Wind 180 deg |
| Wind 30 deg | Wind 210 deg |
| Wind 45 deg | Wind 225 deg |
| Wind 60 deg | Wind 240 deg |
| Wind 90 deg | Wind 270 deg |
| Wind 120 deg | Wind 300 deg |
| Wind 135 deg | Wind 315 deg |
| Wind 150 deg | Wind 330 deg |

All wind loads applied to the structure, as well as antennas, feed cables and other discrete and linear appurtenances, are computed in accordance with the ANSI/TIA/EIA-222-F-1996 design specification.

The following antenna configuration was utilized for this analysis:

| Load Type | Antennas Description | Elev. (ft) | Coax Lines * |
|---|---|---|---|
| Existing Antennas | (1) Decibel DB420 Dipole Antenna on Leg Mounts | 162.5 | (1) 1 5/8"ϕ Coax |
| | (8) Celwave PD1121 Dipole Antennas on Existing T-Frame Sector Mounts | 154.0 | Assumed (8) 1 5/8"ϕ Coax |
| | (6) Decibel DB978 Panel Antennas on Existing T-Frame Sector Mounts | 144.0 | (6) 1 5/8"ϕ Coax |
| | (2) Decibel DB420 Dipole Antennas on Existing T-Frame Sector Mounts | 142.0 | (2) 7/8"ϕ Coax |
| | (1) Decibel DB222 Dipole Antennas on Existing T-Frame Sector Mounts | 142.0 | (1) 7/8"ϕ Coax |
| | (1) Celwave PD1150 Omni Antennas on Existing Side Arm | 130.0 | Assumed (1) 1 1/4"ϕ Coax |
| | (3) EMS RS65-16-00XA2 Panel Antennas on Existing T-Frame Sector Mounts (**To Be Replaced with Proposed Antennas**) | 127.0 | (9) 7/8"ϕ Coax |
| | (1) Decibel DB225 Dipole Antennas on Existing Leg Mount | 121.0 | (1) 1/2"ϕ Coax |
| | (6) Allgon 7250 Panel Antennas on Existing T-Frame Sector Mounts | 115.0 | (12) 1 1/4"ϕ Coax |
| | (1) Celwave PD1108 Omni Antennas on Existing Torque Arm | 97.0 | (1) 1 1/4"ϕ Coax |
| | (1) Celwave PD458 Omni Antennas on Existing Side Arm | 82.0 | Assumed (1) 1 1/4"ϕ Coax |
| | (1) Decibel DB225 Dipole Antennas on Existing Leg Mount | 53.0 | (1) 3/8"ϕ Coax |
| | (1) GPS Antenna on Existing Side Arm | 50.0 | (1) 1/2"ϕ Coax |

| Load Type | Antennas Description | Elev. (ft) | Coax Lines * |
|---|---|---|---|
| Existing Antennas (Cont.) | (1) Channel Master 3' diameter Solid Dish Antenna on Existing Leg Mount | 33.0 | (1) $^{3}/_{8}$"ϕ Coax |
| | (1) GPS Antenna on Existing Side Arm | 23.0 | (1) $^{3}/_{8}$"ϕ Coax |
| | (1) Channel Master 4' diameter Solid Dish Antenna on Existing Leg Mount | 20.0 | Assumed (1) $^{3}/_{8}$"ϕ Coax |
| Proposed **Cingular** Antennas | (3) EMS MB96RR900200_PBL Panel Antennas and (6) TMA's on Existing T-Frame Sector Mounts | 127.0 | Utilize Existing $^{7}/_{8}$"ϕ Coax |

* *For the purpose of this report it has been assumed that the existing and proposed coax transmission lines have been installed as indicated in* ***Figure 1.***

# 150 FT. GUYED TOWER, TOLLAND, CT

## COAX TRANSMISSION LINES MOUNTING CONFIGURATION

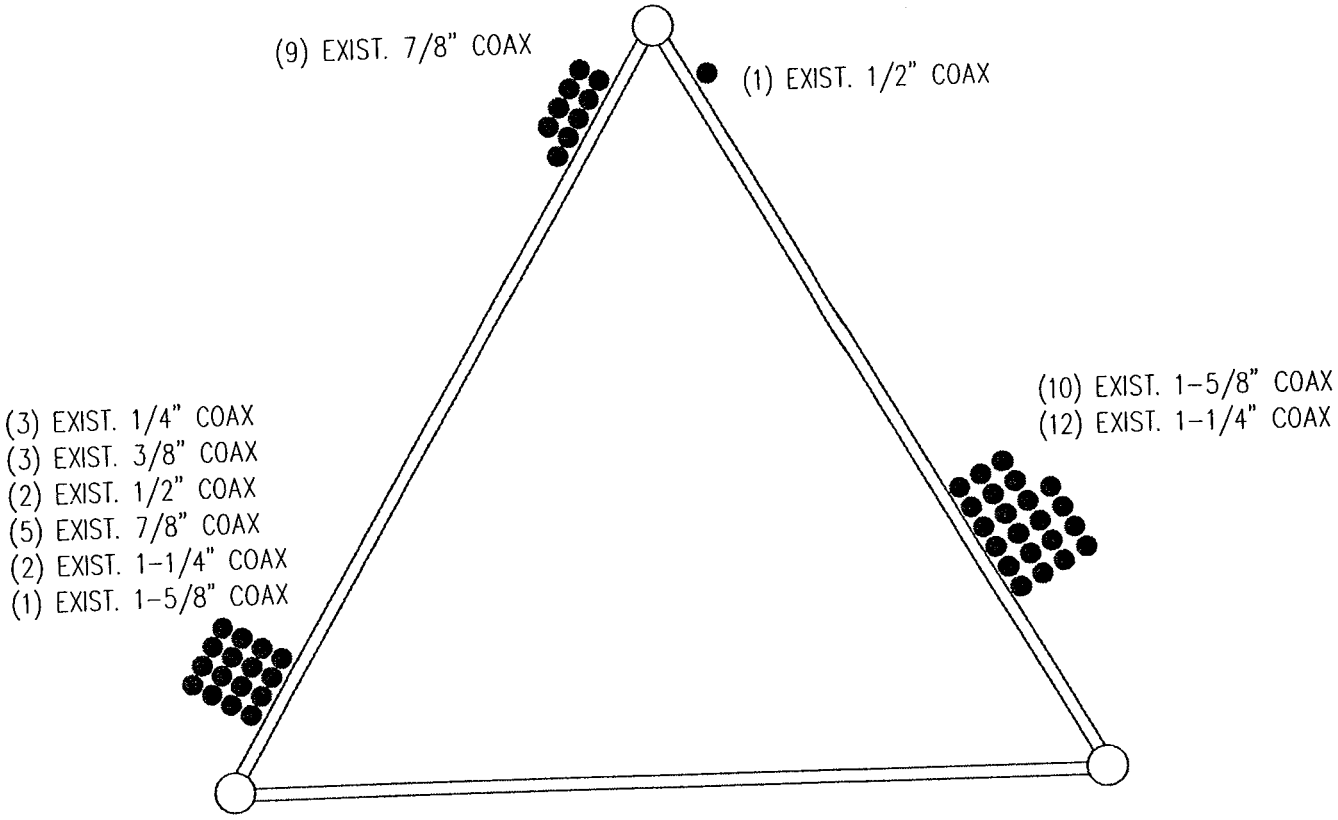



FIGURE 1

## 4. FINDINGS AND EVALUATION

The following is a summary of the structural tower analysis results using a design wind speed of 85 mph with no ice or 74 mph with ½" radial ice.

1. **The results of our structural analysis indicate that the existing guyed tower does meet current TIA/EIA-222-F design specifications for wind loads and allowable stress.**

2. Tower legs, diagonals, and horizontals were all found to be adequately sized for the applied loading. The tower is currently rated at 96.1% of its maximum structural capacity to support the existing and proposed antenna loads as indicated on page 4 of this report.

3. The maximum calculated tower mast and guy anchor reactions are as follows:

| Tower Mast Reactions | Calculated Reactions | Original Design Reactions * |
|---|---|---|
| **Compression (kips)** | 104.296 | 108.7 |
| **Shear (kips)** | 1.291 | 2.7 |
| **Guy Anchor Reactions (40 ft. ± Radius)** | | |
| **Horizontal Force (kips)** | 24.886 | 32.5 |
| **Uplift Force (kips)** | 52.609 | 63.0 |
| **Guy Anchor Reactions (74 ft. ± Radius)** | | |
| **Horizontal Force (kips)** | 24.673 | 32.4 |
| **Uplift Force (kips)** | 34.661 | 63.6 |

* The original design reactions were obtained from PiRod drawing No. 204110-B (p.1 and 3) dated August 4, 1998.

4. Since the reactions calculated by URS are less than those of the original PiRod design, by inspection, foundation modifications are not anticipated.

5. The maximum displacement of the tower based on a service wind speed of 50 mph is 3.752 inches.

## 5. CONCLUSIONS AND RECOMMENDATIONS

**The results of our tower structural analysis indicate that the existing guyed tower does meet current TIA/EIA-222-F design specifications for wind loads and allowable stress.** The tower is currently capable of supporting the existing and proposed antennas using a basic wind speed of 85 miles per hour (mph) with no ice or 74 mph with ½" radial ice.

No conclusions, expressed or implied, shall indicate that URS has made an evaluation of the original design, materials, fabrication, or potential erection deficiencies. In addition, the conclusions expressed herein are based upon the structural information contained within this report. Any information contrary to that assumed for the purpose of preparing this report, such as member size, tower geometry, connection information, material strength, and antenna configuration, could alter the findings and conclusions as stated.

The conclusion was also based on the assumption that the structure has been properly fabricated, erected, maintained, connections are in place, and that the structural integrity of the tower has not been compromised due to damage or corrosion of load carrying members.

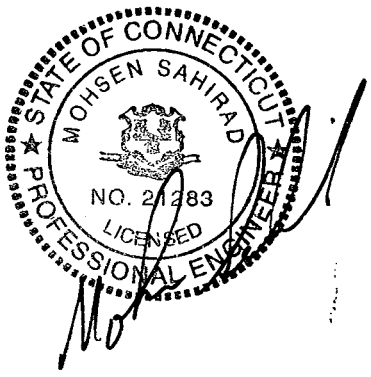
**Analysis Performed by:** Narong Thanasattayawibul

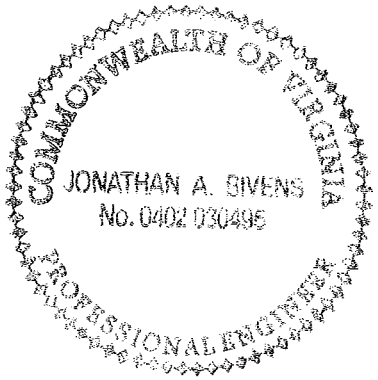
Narong Thanasattayawibul
Structural Engineer

**Checked and Released by:**

Jonathan A. Bivens, P.E.
Senior Structural Engineer

**Date:** 8/15/02



**Southwestern Bell Mobile Systems, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7190

**Peter W. van Wilgen**
*Senior Manager - Construction*

August 22, 2002

Honorable Timothy J. Tieperman, Town Manager
Hicks Memorial Municipal Center
21 Tolland Green
Tolland, Connecticut 06084-9445

Re: Telecommunications facility – 497 Old Post Road

Dear Mr. Tieperman:

In order to meet the requirements for improved E-911 capability and to implement a more advanced telecommunications system, Southwestern Bell Mobile Systems, LLC, a/k/a Cingular Wireless ("SBMS" or "Cingular"; formerly SNET Mobility, LLC) will be changing its antenna configuration at certain cell sites. Cingular will install panel antennas, small amplifiers and a small locator unit on the tower. As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Cingular's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter fully describes Cingular's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7730 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Peter W. van Wilgen
Senior Manager – Construction

Enclosure