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

October 8, 2002

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

RE: **EM-CING-012-019-049-062-083-020930** - Southwestern Bell Mobile Systems, LLC notice of intent to modify existing telecommunications facilities located in Bolton, Brooklyn, Enfield, Hamden, and Middlebury, Connecticut.

Dear Mr. van Wilgen:

At a public meeting held on October 7, 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 following conditions: 1) that, at the Brooklyn site, diagonal members be replaced according to the recommendations of Bayar Engineering and that a certified engineer certify to the Council the successful replacement of these members; 2) that, at the Enfield site, the flange plate at 110' be reinforced according to the recommendation of SpectraSite Engineering before the installation of any additional antennas; and 3) that, at the Middlebury site, the tower be reinforced according to the recommendations of URS Corporation and that a professional engineer certify the successful reinforcement to the Council.

The proposed modifications are to be implemented as specified here and in your notice dated September 30, 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.

I:\siting\em\cing\multiple\020930\dc100702.doc

List Attachment.

c: Honorable Carl A. Preuss, First Selectman, Town of Bolton
Lincoln B. White, Zoning Enforcement Officer, Town of Bolton
Honorable Maurice F. Bowen, First Selectman, Town of Brooklyn
Chester Dobrowski, Zoning Enforcement Officer, Town of Brooklyn
Honorable Mary Lou Strom, Mayor, Town of Enfield
Scott A. Shanley, Town Manager, Town of Enfield
Jose Giner, Director of Planning and Community Development, Town of Enfield
Honorable Carl J. Amento, Mayor, Town of Hamden
Roger O'Brien, Town Planner, Town of Hamden
Honorable Edward B. St. John, First Selectman, Town of Middlebury
William J. Stowell, Planning and Zoning Chairman, Town of Middlebury

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

October 1, 2002

Honorable Carl A. Preuss
First Selectman
Town of Bolton
222 Bolton Center Road
Bolton, CT 06043

RE: **EM-CING-012-019-049-062-083-020930** - Southwestern Bell Mobile Systems, LLC notice of intent to modify existing telecommunications facilities located in Bolton, Brooklyn, Enfield, Hamden, and Middlebury, Connecticut.

Dear Mr. Preuss:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

The Council will consider this item at the next meeting tentatively scheduled for October 7, 2002, at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/slm

Enclosure: Notice of Intent

c: Lincoln B. White, Zoning Enforcement Officer, Town of Bolton

EM-CING-012-018-049-062-081-020930

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

September 30, 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 Bolton, Brooklyn, Enfield, Hamden, and Middlebury.

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 *may* require installation of one LMU ("location measurement unit"), approximately nine inches high, on either the tower, the equipment shelter, or the ice bridge. At this writing, however, it appears that the new panel antennas will serve this purpose as well. 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/SLC

Peter W. van Wilgen
Senior Manager - Construction

Enclosures

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

September 27, 2002

Honorable Robert R. Morra
1st Selectman, Town of Bolton
Town Hall, 222 Bolton Center Rd.
Bolton, CT 06043

Re: Telecommunications facility – 130 Vernon Road (280' Guyed Lattice)

Dear Mr. Morra:

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 / SLL

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

CINGULAR WIRELESS
Antenna Modification

130 Vernon Road, Bolton
Exempt Modif. Approved 7/31/91

Tower Owner/Manager: Mountaintop Enterprises

Antenna configuration Antenna center line – 165 ft

Current and/or approved: 9 Swedcom ALP 110-11 panels

Planned: 9 CSS DUO1417-8686-4-0 panels or comparable
6 tower mount amplifiers
3 duplexers

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 4.3% 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 6.1%, or an additional 1.8% 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
Cingular	165	880 - 894	19	100	0.0251	0.5867	4.3

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
Cingular TDMA	165	880 - 894	16	100	0.0211	0.5867	3.6
Cingular GSM	165	880 - 894	2	296	0.0078	0.5867	1.3
Cingular GSM	165	1930 - 1935	2	427	0.0113	1.0000	1.1
Total							6.1%

Structural information: Please see attached.

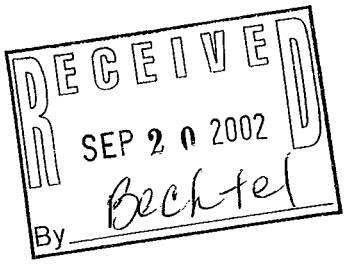
DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 280' GUYED TOWER FOR REPLACEMENT ANTENNA ARRANGEMENT

130 Vernon Road
Bolton, Connecticut
Site No.: 1069

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

36911793.00000

Revision 3: September 19, 2002

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 280' guyed tower located on 130 Vernon Road in Bolton, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-E standard for wind velocity of 85 mph and 74 mph concurrent with ½" ice design wind load. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Analysis Methodology and Loading Condition Section of this report. The proposed Cingular Wireless modification is to add the antennas listed below:

(9) DUO1417-8686 antenna with (3) Duplexer and (6) TMA mounted on (3) 6' Side arm with (9) 1 5/8" coax cables	Cingular	@ 165' elevation

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. The tower is considered feasible with the TIA/EIA-222-E wind load classification specified above and all the existing and proposed antenna loading. No further analysis was conducted on the tower foundation since the forces calculated were below the previous analysis reactions.

This analysis is based on:

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

2) The tower report prepared by Paul J. Ford and Company job no. 36500-16 approved October 6, 2000.

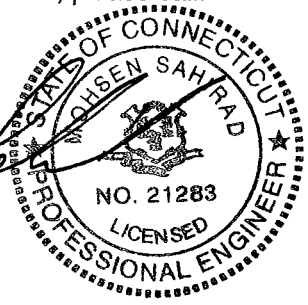
3) Antenna inventory obtained by URS and as specified in section 2 and 6 of this report.

4) TIA\EIA-222-E wind load classification.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration. 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 Johanson – Cingular Wireless
Doug Roberts – URS
N.A. – URS
A.A. – URS
CF/Book

2. INTRODUCTION

The subject tower is located on 130 Vernon Road in Bolton, Connecticut. The structure is a self supporting 280' steel guyed tower manufactured by LeBlanc Communications.

The tower is constructed of solid rod legs, diagonal rod braces and horizontal angle braces. The tower members are bolted or welded. The width of the tower is 4'-0". The tower geometry and structural sizes were taken from Paul J. Ford and Company job no. 36500-16 approved October 6, 2000.

The existing structure supports several communication antennas. The antenna and mount configuration as specified below:

Antenna Type	*Mount*	*Elev.(ft)*	*Cable*
(5) Decibel DB809 (1) ERI FM Antenna 2 Bay	(3) 10' Lightweight T-Frame Mount	282'	(5) 1 1/4" coax (1) 7/8" coax
(1) DB809K-XC	(1) 4' Standoff Whip Antenna Mount	255'	(1) 1 5/8" coax
(12) DB844H90N-XY	(3) 12' Lightweight T Sector Frame	226'	(12) 1 5/8" coax
(1) 8' STD Dish w/Radome	Mounted to leg	210'	(1) 7/8" coax
(1) 6' Dish w/Radome	Mounted to leg	200'	(1) 7/8" coax
(1) 8' STD Dish w/Radome	Mounted to leg	200'	(1) 7/8" coax
(4) EMS RR90-17-02DP (2) CSA wireless PCSA015-19-2	(2) 10' Lightweight T-Frame Mounts	180'	(8) 1 5/8" coax
- - -	(1) 7' Standoff Bracket Mount	176'	- - -
(9) DUO1417-8686 with (6) TMA and (3) Duplexers	**(3) 6' Side Arm Mounts**	**165'**	**(9) 1 5/8" coax**
(2) 6' Dish w/Radome	Mounted to leg	150'	(2) 7/8" coax
(3) Swedcom ALP 9011 6' Yagi (3) Swedcom ALP 6014 (1) DB910C (1) HP6-44F	(1) 10' Lightweight T-Frame Mount or Mounted to Leg	110'	(6) 1 1/4" coax (1) 1 5/8" coax (2) 1 5/8" coax
(1) 4' Grid Dish	Mounted to Leg	105'	(2) 1 5/8" coax
(1) 8' STD Dish w/Radome	Mounted to leg	100'	(1) 1 5/8" coax

Note: The proposed Cingular Wireless modification will utilize the existing mounts, cables and orientation.

This structural analysis of the communications tower was performed by URS Corporation, AES (URS) for Cingular Wireless. The purpose of this analysis was to analyze the existing tower for its existing and proposed antenna loads. This analysis was conducted to evaluate twist (rotation), sway (deflection) and stress on the tower, and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

Methodology:

The structural analysis was done in accordance with the TIA/EIA-222-E, 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. The two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA. The load combinations were investigated in ERI Tower 2.0 to determine the stress, sway and rotation.

Load Condition 1 = 85 mph Wind Load + Tower Dead Load
Load Condition 2 = 74 mph Wind Load (with ½" radial ice) + Tower Dead Load

The TIA/EIA standard permits one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For purposes of this analysis, allowable stresses of tower members were increased by one-third in computing the load capacity; in addition, the appropriate "k" factors were assigned to each member.

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The analysis indicates that the tower legs, diagonal members and horizontal members have sufficient capacity to carry the loads applied. No further analysis was conducted on the tower foundation since the forces calculated were below the previous analysis reaction.

The tower reactions are as follows:

Previous Analysis Reaction	
Horizontal force at anchor block (kips)	74.6
Uplift force at anchor block (kips)	61.9
Resultant force at anchor block (kips)	96.9
Shear at tower base (kips)	6.9
Compression at tower base (kips)	159

Proposed Reactions	
Horizontal force at anchor block (kips)	71
Uplift force at anchor block (kips)	57
Resultant force at anchor block (kips)	91
Shear at tower base (kips)	3
Compression at tower base (kips)	155

For detailed proposed tower reactions, see drawing no. E-1 in section 6 of this report.

5. CONCLUSIONS

The results of the analysis indicate that the structure is in compliance with the loading conditions and the materials and member sizes for the tower. The tower is considered feasible with the TIA/EIA-222-E wind load classification specified above and all the existing and proposed antenna

loading. The user of this report shall field verify the assumption of the antenna and mount configuration. Notify the engineer in writing immediately if any of the assumptions in this report are found to be other than specified.

Limitations/Assumptions:

This report is based on the following:

A. Tower is properly installed and maintained.

B. All members were as specified in the original Construction Documents and are in good condition.

C. All required members are in place.

D. All bolts are in place and are properly tightened.

E. Tower is in plumb condition.

F. All members protective coating is in good condition.

G. All tower members were properly designed, detailed, fabricated, installed, and have been properly maintained since erection.

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

A. Removing/Replacing antennas
B. 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:

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

2. The owner shall refer to TIA/EIA-222-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-E. 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

September 30, 2002

Hon. Maurice F. Bowen
1st Selectman, Town of Brooklyn
Town Hall, 4 Wolf Den Rd
Brooklyn, CT 06234

Re: Telecommunications facility – Tatnic Hill Rd.

Dear Mr. Bowen:

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 /SLL

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

CINGULAR WIRELESS
Antenna Modification

Tatnic Hill Road, Brooklyn
Exempt Mod. Approved 4/30/90

Tower Owner/Manager: SNET

Antenna configuration Antenna center line – 80 ft

Current and/or approved: 6 ASPD 951 whip antennas

Planned: 9 CSS DUO1417-8686-4-0 panels or comparable
6 tower mount amplifiers
3 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 18.3% 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 25.8%, or an additional 7.5% 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
Cingular	85	880 - 894	10	100	0.0498	0.5867	8.5
Cingular	75	880 - 894	9	100	0.0575	0.5867	9.8
Total							18.3

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
Cingular TDMA	80	880 - 894	16	100	0.0899	0.5867	15.3
Cingular GSM	80	880 - 894	2	296	0.0333	0.5867	5.7
Cingular GSM	80	1930 - 1935	2	427	0.0480	1.0000	4.8
Total							25.8%

Structural information: Please see attached.

BAYAR ENGINEERING, P.C.
Structural Engineers
P.O. Box 1267, Port Chester, N.Y. 10573-8267
TEL: (914) 681-8749 FAX: (914) 421-0416

Demirtas C. Bayar, P.E.

August 28, 2002

Mr. V. G. Duvall, PE
Director of Engineering
o2wireless Solutions
10430 Rodgers Road
Houston, TX 77070

Re: Brooklyn, CT. tower
BE Job No. 0217-C
Site # 2075

Dear Mr. Duvall,

We analyzed the existing 80' guyed tower located at Brooklyn, CT for a condition of removing the existing 6 ASPD951 cellular antennas and adding nine new cellular antennas that have maximum dimensions of 48"x14"x9". Two antennas in each sector will receive a TMA diplexer. Sketch No. 0217-C shows the existing and the proposed new antenna configuration,

Our analysis showed that some of the existing diagonal members were overstresses and need to be replaced. Our sketch shows the location of these diagonals. Leg members are adequate. We also checked the guy strands and the foundation anchors. These are adequate and will support the proposed new loading condition.

We will be glad to prepare design drawings and specifications for you to send to bidders. Our engineering fees for this work will be $5,300.00 which will include all expenses and one reproducible drawing that you can use for printing duplicates.

Yours truly,

Demirtas Bayar, P.E.
President

Encl: 4 sheets of calcs.

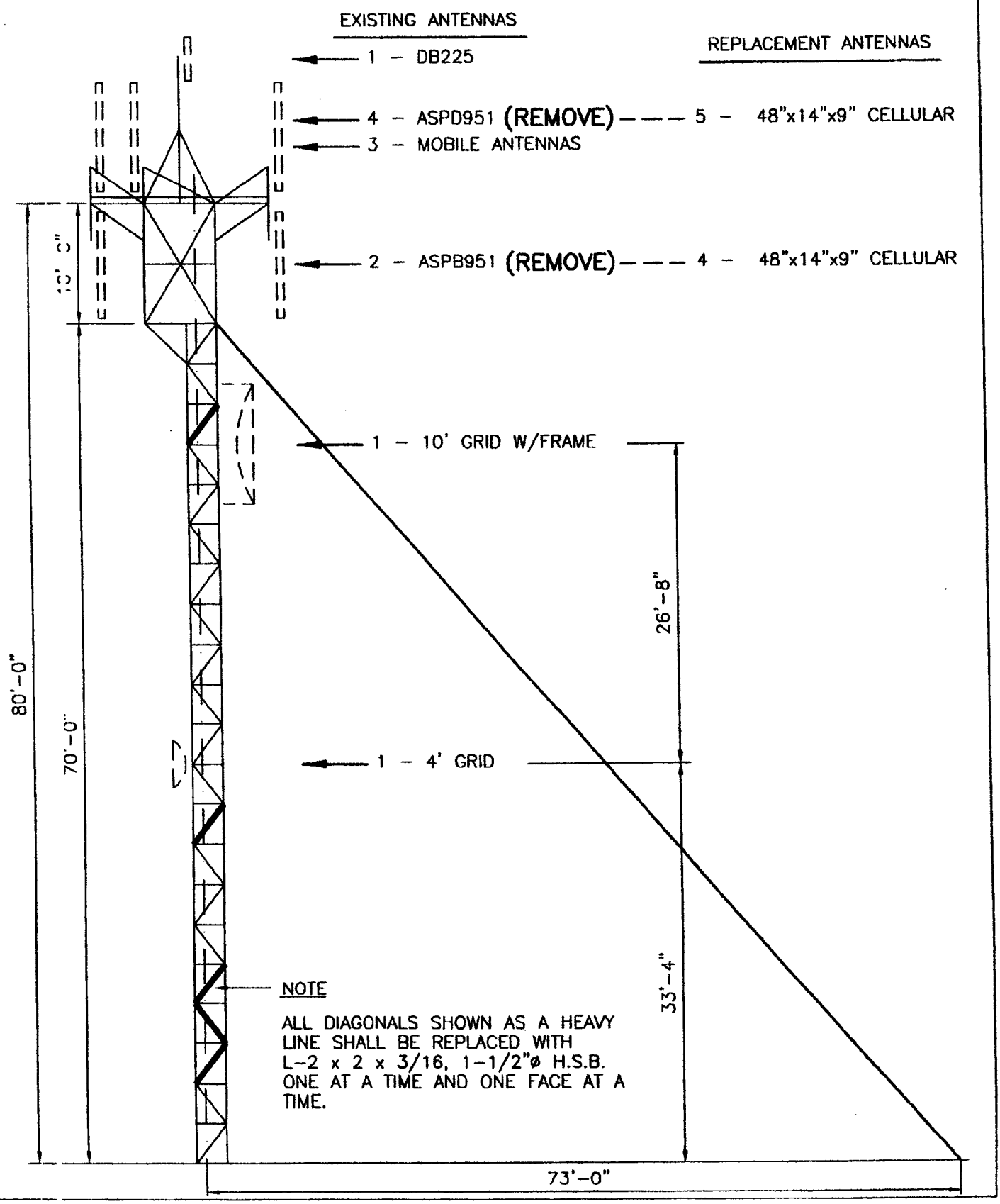
BAYAR ENGINEERING, P.C.

(80c)

SH. NO. 0217-C

DATE. 8/27/2002

PROJECT: BROOKLYN, CT. 80' GUYED TOWER (WIND TURB.) BY. _____



NOTE

ALL DIAGONALS SHOWN AS A HEAVY LINE SHALL BE REPLACED WITH L-2 x 2 x 3/16, 1-1/2"ø H.S.B. ONE AT A TIME AND ONE FACE AT A TIME.

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

September 27, 2002

Honorable Scott A. Shanley
Town Manager, Town of Enfield
820 Enfield St.
Enfield, CT 06082

Re: Telecommunications facility – Town Farm Road

Dear Mr. Shanley:

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/SCL

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

CINGULAR WIRELESS
Antenna Modification

Town Farm Road, Enfield
Docket 51 and Exempt Mod. Approved 7/15/92

Tower Owner/Manager: Spectrasite

Antenna configuration Antenna center line – 154 ft

Current and/or approved: 9 Allgon 7120.16 panels

Planned: 9 CSS 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 4.9% 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 7.0%, or an additional 2.1% 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
Cingular	154	880 - 894	19	100	0.0288	0.5867	4.9

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
Cingular TDMA	154	880 - 894	16	100	0.0243	0.5867	4.1
Cingular GSM	154	880 - 894	2	296	0.0090	0.5867	1.5
Cingular GSM	154	1930 - 1935	2	427	0.0129	1.0000	1.3
Total							7.0%

Structural information: Please see attached.

SpectraSite

#1021

Structural Analysis of 150' ITT Meyer Monopole **CT-0025**

ENFD-Enfield, ~~820 Enfield Street,~~ TOWN FARM ROAD Enfield, CT 06082 9/12/2002

1.0 Introduction

A structural analysis was performed on the above noted tower for the addition of proposed antennas as listed below. The analysis consisted of applying the forces caused by the existing and proposed loads, and determining the resulting stresses in the structure and its foundation.

The following criteria were used in the analysis:

1. ANSI/TIA/EIA-222-F, **80 mph** wind [Hartford County], considering two loading cases:
   - Load Case 1. 100% wind pressure, without radial ice
   - Load Case 2. 75% wind pressure, with ½" radial ice

Tower information, including geometry and member sizes was obtained from Smith-Cullum Report Number CT-0025, dated 05/14/01. Foundation and geotechnical information was obtained from SNET Enfield Site, dated 06/06/85, and MB&A Project #011107, dated 07/16/01, respectively.

2.0 Antenna and Transmission Line Loading

Table 1. Existing and Proposed Antennas

Elevation (Ft AGL)	Antenna	Carrier	Transmission Lines*	Notes
157	(1) Decibel 809-Y** on Platform Mount with Handrails	Cingular	(1) 1-5/8"	Existing
154	(1) Yagi** on Platform Mount with Handrails	Cingular	(1) ½"	Existing
154	(9) Allgon 7120.16** on Platform Mount with Handrails	Cingular	(9) 7/8"	Remove Existing
154	(9) CSS DUO4-8670** (6) ADC Amplifiers on Platform Mount with Handrails	Cingular	(9) 7/8"	Proposed Replacement
140	(6) EMS RR90-17-02DP on Low Profile Platform Mount	Voicestream	(12) 1-5/8"	* Existing
38.5	(1) Nokia CS72187.01 on Standoff Mount	Cingular	(1) ½"	Proposed

** Coax installed inside monopole.*

*** Multiple antennas on a single platform mount.*

* LEASED, BUT NOT INSTALLED

100 Regency Forest Drive, Suite 400 • Cary, NC 27511 • Tel 919.468.0112 • Fax 919.468.8522

3.0 Results

Monopole Stress Levels

Elevation *(Ft. A.G.L.)*	Combined Stress Index*
0 to 31.5	0.91
31.5 to 70	***1.01****
70 to 110	***1.04****
110 to 150	0.92

**Maximum Stress Ratio: 1.00=Full Allowable.*
***Overstressed; Considered acceptable.*

Foundation Stress Levels

Base Reactions	Current Analysis	Result*
Moment *(kip.ft)*	1576.0	*Satisfactory*
Compression *(kips)*	16.3	*Satisfactory*
Shear *(kips)*	16.0	*Satisfactory*

**Based on foundation analysis.*

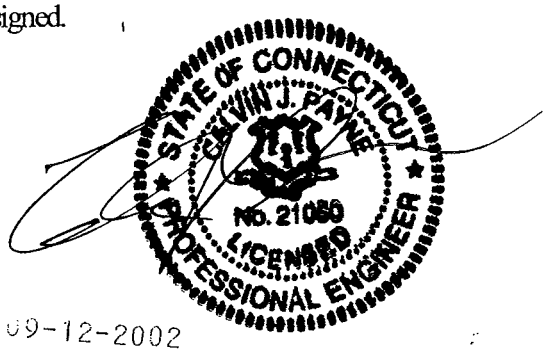
Conclusions and Recommendations

1. The tower, foundation, base plate and anchor bolts are *structurally adequate* to accommodate the proposed antenna and transmission line loading used in this analysis.

2. The flange plate at 110' is *not structurally adequate* to accommodate the existing and proposed antenna and transmission line loading used in this analysis. The flange plate is *structurally adequate* after *reinforcing* per the attached Drawing CT-0025-M1.

3. Any future changes in loading must be reviewed by the SpectraSite Engineering Department.

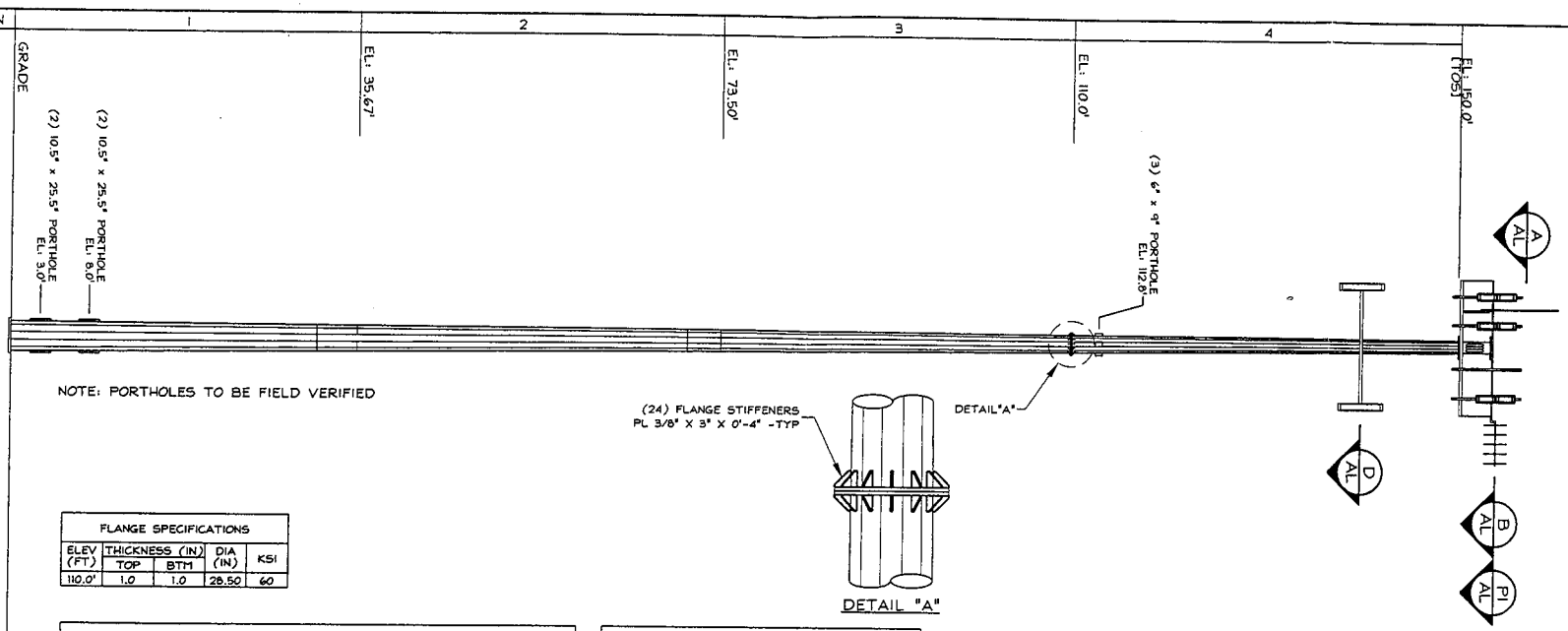
Should any questions arise concerning this report please contact the undersigned.



09-12-2002

Raphael Mohamed, *P.Eng.*
Project Engineer
919-465-6629

Calvin J Payne, P.E.
Chief Engineer



ENFIELD, CT [CT-0025]
150.0' ITT MEYER MONOPOLE

NOTE: PORTHOLES TO BE FIELD VERIFIED

DETAIL "A"

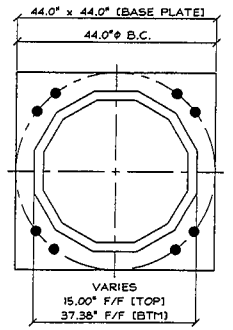
FLANGE SPECIFICATIONS				
ELEV (FT)	THICKNESS (IN) TOP	BTM	DIA (IN)	KSI
110.0'	1.0	1.0	28.50	60

POLE MATERIAL SPECIFICATIONS	
TAPER:	0.155 (IN/FT)
SHAFT STEEL:	65 KSI
BASE PLATE STEEL:	SQUARE PL 2.5" x 44" x 44" 60 KSI
ANCHOR BOLTS:	(8) 2.25"ø ASTM A615, GR. 75 44.0"ø B.C.

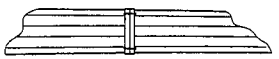
DESIGN SPECIFICATIONS	
CODE:	ANSI/TIA/EIA-222-F
WIND:	80 MPH (HARTFORD COUNTY)
ICE:	1/2" RADIAL

SHAFT SPECIFICATIONS							
SHAFT SECTION	SECTION LENGTH (FT)	# SIDES	THICKNESS (IN)	GRADE (KSI)	OVERLAP (IN)	DIAMETER ACROSS FLATS (IN) BOTTOM	TOP
1	35.67	12	0.375	65	50	37.38	35.67
2	42.00	12	0.313	65	42	33.10	26.55
3	40.00	12	0.250	65	0	27.61	21.25
4	40.00	12	0.188	65	0	21.25	15.00

TOWER IDENTIFICATION	
MANUFACTURER:	SMITH CULLUM MAPPING
IDENTIFICATION No:	CT-0025



PLAN VIEW



TYPICAL FLANGE CONNECTION DETAIL

TYPICAL SPLICE DETAIL

ANTENNA INFORMATION								
No.	ELEV	ANTENNA TYPE	ANT. DIMS. (LxWxD)	AZIMUTH	MOUNT	TX-LINE **	CUSTOMER	STATUS
A	157.0'	(1) DECIBEL 809-Y	8.0'	OMNI	PLATFORM W/ HANDRAILS	(1) 1-5/8"	CINGULAR	E
B	154.0'	(1) YAGI	6.0'	200°	PLATFORM W/ HANDRAILS	(1) 1/2"	CINGULAR	E
C	154.0'	(9) CSS DU04-8670	48" x 14" x 9"	23°,143°,263°	PLATFORM W/ HANDRAILS	(9) 7/8"	CINGULAR	P
D	140.0'	(6) EMS RR90-17-02DP	96" x 8" x 2.75"	0°,120°,240°	LP PLATFORM	(12) 1-5/8"	VOICESTREAM	E

** COAX INSTALLED INSIDE MONOPOLE

SEAL:

ISSUE	DESCRIPTION	DATE	BY

SpectraSite
100 REGENCY FOREST DRIVE, SUITE 400
CARY, NORTH CAROLINA 27511
PHONE:(919)460-0112 / FAX:(919)460-8522

TITLE: MODIFICATION DRAWING
PROJECT: 150.0' ITT MEYER MONOPOLE
SITE: ENFIELD, CT

DATE:	DWN:	APP'D:	SITE #:	DWG #:	REV:
9/12/02	JMB	RIM	CT-0025	M1	-

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

September 30, 2002

Honorable Carl J. Amento, Mayor
Memorial Town Hall
2372 Whitney Avenue
Hamden, Connecticut 06518

Re: Telecommunications facility – 265 Benham Street

Dear Mayor Amento:

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 / SLC

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

CINGULAR WIRELESS
Antenna Modification

265 Benham Street, Hamden
EM-SCLP-062-001102 approved 12/14/2000

Tower Owner/Manager: Apostles of the Sacred Heart of Jesus

Antenna configuration Antenna center line – 154 ft

Current and/or approved: 3 EMS RS90-12-00NA panels

Planned: 3 EMS MB96RR900200DPBL panels or compar.
6 tower mount amplifiers
6 duplexers

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 39.2% 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 56.6%, or an additional 17.4% 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
Cingular	54.5	880 - 894	19	100	0.2300	0.5867	39.2

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
Cingular TDMA	54	880 - 894	16	100	0.1973	0.5867	33.6
Cingular GSM	54	880 - 894	2	296	0.0730	0.5867	12.4
Cingular GSM	54	1930 - 1935	2	427	0.1053	1.0000	10.5
Total							56.6%

Structural information: Please see attached.

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 65' EXISTING ROOFTOP GUYED TOWER FOR NEW ANTENNA ARRANGEMENT

265 Benham Street
Hamden, Connecticut
Site No.: 2040

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

36911769.00000

September 26, 2002

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 65' guyed tower located atop a building in the Sacred Heart Academy on 265 Benham Street in Hamden, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-F standard for wind velocity of 85 mph and 74 mph concurrent with ½" ice design wind load. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Analysis Methodology and Loading Condition Section of this report. The proposed Cingular Wireless modification is to add the antennas listed below:

(3) EMS MB96RR900200DPBL antennas with (6) duplexers and (9) 1 ¼" Coax Cable (6) TMAs mounted on the tower legs	Cingular	@ 54.1' elevation

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. The tower is considered feasible with the TIA/EIA-222-F wind load classification specified above and all the existing and proposed antenna loading. No information on the tower foundation was available for review.

This analysis is based on:

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

2) Antenna inventory as specified in section 2 and 6 of this report. The tower antenna inventory was obtained by URS Corporation dated 9/3/2002.

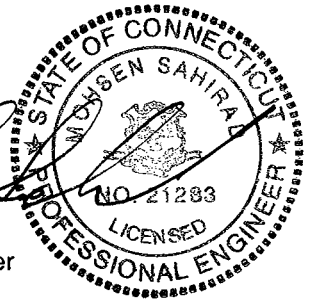
3) TIA\EIA-222-F wind load classification.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration. 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

Released by:



Mohsen Sahirad, P.E.
Senior Structural Engineer

2. INTRODUCTION

The subject tower is located atop a building in the Sacred Heart Academy on 265 Benham Street in Hamden, Connecticut. The structure is a 65' guyed tower manufactured by Fred A. Nudd Corporation.

The tower is constructed of solid rod legs, diagonal rod braces and horizontal angle braces. The tower members are welded in 20-foot sections, with the various sections bolted together. The width of the tower face is 2'-6" from top to bottom. Original tower drawings were not available. The tower geometry and structural sizes were taken from a site survey performed September 3, 2002 and a previous analysis by Nudd (dated October 2000).

The existing structure supports several communication antennas. The antenna and mount configuration are as specified below:

Antenna Type	Carrier	Mount	Elev (ft)	Cable
(1) 18' whip antenna	Police	Leg Mount	93.5'	(1) 7/8" coax
(1) 20' whip antenna	Fire Dept.	Leg Mount	72.3'	(1) 7/8" coax
(12) Decibel DB844H90 antennas	Verizon	(3) Frame	63.7'	(12) 1-5/8" coax
(3) EMS MB96RR900200DPBL (6) Duplexers antennas with (6) TMAs	**Cingular (Proposed)**	**Leg Mount**	**54.1'**	**(9) 1-1/4" coax**

Note: All antenna elevations are based upon their centerlines except for the whip antennas which are based upon their bottom elevations. The proposed Cingular Wireless modification will utilize existing mounts and cables.

This structural analysis of the communications tower was performed by URS Corporation, AES (URS) for Cingular Wireless. The purpose of this analysis was to analyze the existing tower for its existing and proposed antenna loads. This analysis was conducted to evaluate twist (rotation), sway (deflection) and stress on the tower, and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

Methodology:

The structural analysis was done in accordance with the TIA/EIA-222-F, 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 GuyMAST, an industry recognized tower analysis software system developed by Weisman Consultants. The two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA. The load combinations were investigated in GuyMAST to determine the stress, sway and rotation.

Load Condition 1 = 85 mph Wind Load + Tower Dead Load
Load Condition 2 = 74 mph Wind Load (with ½" radial ice) + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For purposes of this analysis, allowable stresses of tower

4. FINDINGS AND EVALUATION

The combined axial and bending loads on the tower structure were evaluated to compare with the allowable loads in accordance with AISC. The analysis indicates that the tower legs, diagonal members and horizontal members have sufficient capacity to carry the loads applied. No analysis was conducted on the tower base and guy connections to the existing structure since original design drawings and calculations were not available. The proposed reactions are less than the reactions from the previous analysis by Nudd. Assuming the base and guy connections have been designed for the previous Nudd reactions, we can conclude by comparison the existing foundations are adequate for the predicted tower reactions.

The tower base reactions are as follows:

Proposed Tower Reactions	
Compression (kips)	35.5
Total Shear (kips)	.75
Torsion (k-ft)	.72

Proposed Guy Anchor Reactions	
Horizontal (kips)	10.1
Uplift (kips)	17.0
Resultant (kips)	19.8

For detailed proposed tower reactions, see output in section 6 of this report.

5. CONCLUSIONS

The results of the analysis indicate that the structure is in compliance with the proposed loading conditions and the materials and member sizes for the tower. The tower is considered feasible with the TIA/EIA-222-F wind load classification specified above and all the existing and proposed antenna loading. This analysis assumes that the existing base and guy connections to the existing structure were designed adequately for the existing reactions. The proposed reactions are less than the existing reactions. The user of this report shall field verify the assumption of the antenna and mount configuration. Notify the engineer in writing immediately if any of the assumptions in this report are found to be other than specified.

Limitations/Assumptions:

This report is based on the following:

A. Tower is properly installed and maintained.

B. All members were as specified in the previous analysis and are in good condition.

C. All required members are in place.

D. All bolts are in place and are properly tightened.

E. Tower is in plumb condition.

F. All members protective coating is in good condition.

G. All tower members were properly designed, detailed, fabricated, installed, and have been properly maintained since erection.

H. Existing base and guy connections to the existing structure are currently adequate to support existing installation.

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

A. Removing/Replacing antennas
B. 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:

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

2. The owner shall refer to TIA/EIA-222-F, 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. 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

September 30, 2002

Honorable Edward B. St. John
First Selectman, Town of Middlebury
Town Hall, 1212 Whittemore Road
Middlebury, Connecticut 06762

Re: Telecommunications facility – Larkin Drive

Dear Mr. St. John:

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 /SLL

Peter W. van Wilgen
Senior Manager – Construction

Enclosure

CINGULAR WIRELESS
Antenna Modification

2 Larkin Drive (I-84 S. Ave. overpass), Middlebury
Exempt Mod. Approved 5/23/94

Tower Owner/Manager: CT State Police

Antenna configuration Antenna center line – 140 ft

Current and/or approved: 9 Swedcom ALP 110-11 panels

Planned: 9 CSS DUO1417-8686-4-0 panels or comparable
6 tower mount amplifiers
3 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 5.9% 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 8.4%, or an additional 2.5% 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
Cingular	140	880 - 894	19	100	0.0349	0.5867	5.9

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
Cingular TDMA	140	880 - 894	16	100	0.0294	0.5867	5.0
Cingular GSM	140	880 - 894	2	296	0.0109	0.5867	1.9
Cingular GSM	140	1930 - 1935	2	427	0.0157	1.0000	1.6
Total							**8.4%**

Structural information: Please see attached.

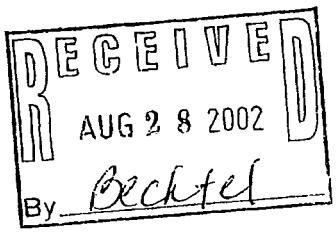
DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 160' EXISTING SELF SUPPORTING LATTICE TOWER FOR REPLACEMENT ANTENNA ARRANGEMENT WITH PROPOSED REINFORCEMENT

Connecticut State Police Tower
2 Larkin Drive
Middlebury, Connecticut
Site No.: 1078

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

36911735.00000

Revised for Reinforcement
August 28, 2002

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the reinforced 160' lattice tower located on 2 Larkin Drive in Middlebury, Connecticut. The analysis was conducted in accordance with the Connecticut State Police requirements and the TIA/EIA-222-F standard for wind velocity of 90 mph concurrent with ½" ice design wind loads. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Analysis Methodology and Loading Condition Section of this report. The proposed Cingular Wireless modification is to replace the existing Cingular Wireless antennas with the antennas listed below:

(9) DUO1417-8686 antennas and (6) TMAs and (3) Diplexers with (3) T-Frame mounts and (9) 1 1/4" coax cables	Cingular	@ 140' elevation

The results of the analysis indicate that the existing tower structure is overstressed with the proposed loading conditions. **URS Corporation has proposed tower reinforcement to support the proposed loading condition. The reinforced tower and its foundation are considered feasible with the Connecticut State Police requirements and the TIA/EIA-222-F wind load classification specified above and the existing and proposed antenna loading.**

This analysis is based on:

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

2) Tower and Foundation documents prepared by Stainless Incorporated project no. 358807 dated November 23, 1993.

3) Antenna inventory as specified in section 2 and 6 of this report.

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

5) **Tower reinforcement as specified on drawings SK-1 and SK-2 in section 6 of this report.**

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration. 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

STATE OF CONNECTICUT MOHSEN SAHIRAD NO. 21283 LICENSED PROFESSIONAL ENGINEER

MS/rmn

cc: Richard R. Johanson – Bechtel
Doug Roberts – URS
N.A. – URS
A.A. – URS
CF/Book

2. INTRODUCTION

The subject tower is located on 2 Larkin Drive in Middlebury, Connecticut. The structure is a self supporting 160' steel triangular tapered lattice tower manufactured by Stainless Incorporated.

The tower is constructed of pipe legs, diagonal angle braces and horizontal angle braces. The tower sections are all bolted together. The width of the face is 10'-2 3/8" at the top and 23' at the bottom. The tower geometry and structural member sizes were taken from Stainless Incorporated project no. 358807 dated November 23, 1993.

The existing structure supports several communication antennas. The antenna and mount configuration as specified below:

Antenna Type	Carrier	Mount	Elevation	Cable
(1) Tower Light	Existing	---	165'	(2) 1/2" coax cable
(1) DB810K-Y	Existing	(1) Side arm mount	160'	(1) 1 5/8" coax cable
(2) OGT9-806	Existing	(2) Side arm mount	160'	(2) 1 5/8" coax cable
(2) 6' Whip	Existing	(2) Side arm mount	160'	(2) 3/8" coax cable
(1) PD83	Existing	(1) Side arm mount	160'	(1) 7/8" coax cable
(3) 6' Dish w/ Radome	Future	Mounted to leg	160'	(3) 7/8" coax cable
DB304	Existing	(1) Side arm mount	153'	(1) 7/8" coax cable
(1) 6' Dish w/ Radome	Existing	Mounted to leg	150'	(1) 7/8" coax cable
(1) DB810K-Y	Future	(1) Side arm mount	143'	(1) 1 5/8" coax cable
(2) OGT9-806	Future	(2) Side arm mount	143'	(2) 1 5/8" coax cable
(9) DUO1417-8686 and (6) TMAs and (3) Diplexers (to replace existing Cingular Wireless antennas)	**Cingular (Proposed)**	**(3) T-Frame mount**	**140'**	**(9) 1 1/4" coax cable**
(3) RR90-17-02-DP	Voicestream	(3) Side arm mount	125'	(6) 1 1/4" coax cable
PD1142	Future	(1) Side arm mount	122'	(1) 7/8" coax cable
DB304	Future	(1) Side arm mount	115'	(1) 7/8" coax cable
(2) 6' Dish w/ Radome	Existing	Mounted to leg	110'	(2) 1 5/8" coax cable
(9) DB980H90	Sprint	Flush mount	94'	(9) 1 1/4" coax cable
(1) PD10054	Existing	Mounted to leg	85'	(1) 7/8" coax cable
(1) GPS	Sprint	(1) Side arm mount	67'	(1) 1/2" coax cable

This structural analysis of the reinforced communications tower was performed by URS Corporation, AES (URS) for Cingular Wireless. The purpose of this analysis was to reinforce the existing tower for its existing and proposed antenna loads. This analysis was conducted to evaluate twist (rotation), sway (deflection) and stress on the tower, and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

Methodology:

The structural analysis was done in accordance with the Connecticut State Police requirements and the 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. The load condition was evaluated as shown below which was compared to allowable stresses according to AISC and TIA/EIA. The load combination was investigated in ERI Tower 2.0 to determine the stress, sway and rotation.

Load Condition 1 = 90 mph Wind Load (with ½" radial ice) + Tower Dead Load

The TIA/EIA standard permits one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For purposes of this analysis, allowable stresses of tower members were increased by one-third in computing the load capacity; in addition, the appropriate "k" factors were assigned to each member.

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the reinforced tower structure were evaluated to compare with the allowable stress in accordance with AISC. The analysis indicates that the tower legs, diagonal members, horizontal members and foundation have sufficient capacity to carry the loads applied.

The tower base reactions are as follows:

Proposed Tower Reactions	
Compression (kips)	296
Uplift (kips)	250
Total Shear (kips)	60
Moment (kips-ft)	5543

For detailed proposed tower reactions, see drawing no. E-1 in section 6 of this report.

5. CONCLUSIONS

The results of the analysis indicate the reinforced structure to be in compliance with the loading conditions and the materials and member sizes for the tower. The reinforced tower is considered feasible with the Connecticut State Police requirements and the TIA/EIA-222-F wind load classification specified above and all the existing and proposed antenna loading. The user of this report shall field verify the assumption of the antenna and mount configuration. Notify the engineer in writing immediately if any of the assumptions in this report are found to be other than specified.

Limitations/Assumptions:

This report is based on the following:

A. Tower is properly installed and maintained.

B. All members were as specified in the original Construction Documents and are in good condition.

C. All required members are in place.

D. All bolts are in place and are properly tightened.

E. Tower is in plumb condition.

F. All members are galvanized.

G. All tower members were properly designed, detailed, fabricated, installed, and have been properly maintained since erection.

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

A. Replacing/Removing antennas
B. 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:

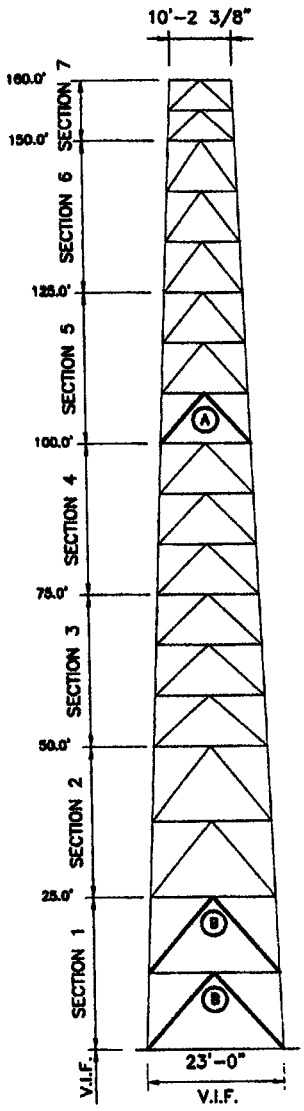
1. After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower and reinforcing system.

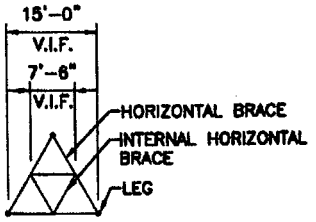
2. The Owner shall refer to TIA/EIA-222-F, Section 14 and Annex E for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the Owner based upon actual site and environmental conditions. It is recommended that a complete and thorough 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.

SECT.	LEG	DIAG. BRACE	HORIZ. BRACE	INTERIOR HORIZ. BRACE
7	P.5x0.250	DBL. L2 1/2x2x3/16	L3x3x1/4	
6	P.5x0.250	DBL. L2 1/2x2x3/16	L2 1/2x2 1/2x3/16	
5	P.5x0.250	DBL. L2 1/2x2x3/16	L3x2 1/2x1/4	L2 1/2x2x3/16
4	P.5x0.300	DBL. L3x2 1/2x1/4	L3x3x1/4	L2 1/2x2x3/16
3	P.5x0.400	DBL. L3x2 1/2x1/4	L3x3x1/4	L2 1/2x2x3/16
2	P6.875x0.500	DBL. L3 1/2x3x1/4	L4x4x1/4	L2 1/2x2 1/2x3/16
1	P6.875x0.500	DBL. L3 1/2x3x1/4	L4x4x1/4	L2 1/2x2 1/2x3/16
	(Fy VARIES)		Fy=36 ksi	

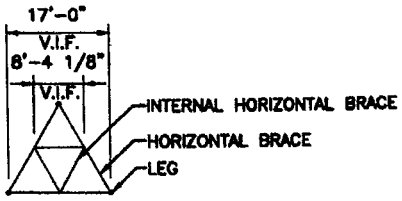
LEGEND

(A)	DOUBLE L2 1/2x2x3/16 GRADE 36 GALV. TYP. AT ALL THREE FACES
(B)	DOUBLE L3 1/2x3x3/8 GRADE 36 GALV. TYP. AT ALL THREE FACES

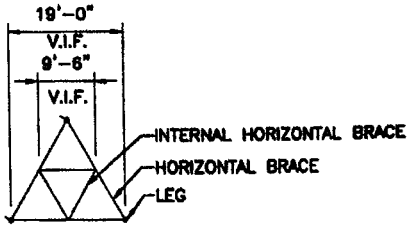




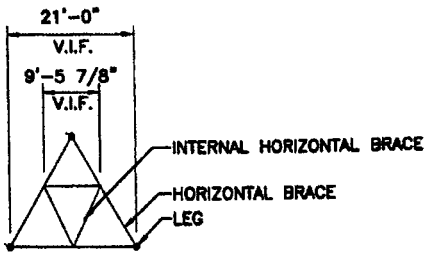
TOWER SECTION @ 100'



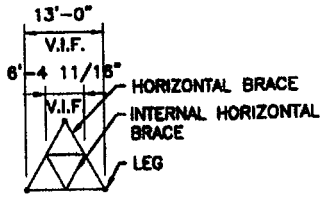
TOWER SECTION @ 75'



TOWER SECTION @ 50'



TOWER SECTION @ 25'



TOWER SECTION @ 125'

1 / SK-1 EXISTING TOWER & PROPOSED REINFORCEMENT

SCALE: N.T.S.

NO: 1078
Designed by:
Drawn by: RRH
Checked by:
Approved by:

ORS CORPORATION AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CONNECTICUT
1-(860)-529-8882

cingular WIRELESS
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CONNECTICUT 06067

CONNECTICUT STATE POLICE TOWER
SITE ADDRESS: 2 LARKIN DRIVE
MIDDLEBURY, CONNECTICUT

REV.	DATE:	DESCRIPTION

Scale: AS NOTED | Date: 08-23-02
Job No. 38911735.00000 | File No. SK-1 | Dwg. 1 of 2

Dwg. No. SK-1

TOWER STRUCTURAL NOTES

TOWER DESIGN CRITERIA:
THIS TOWER IS DESIGNED AND REINFORCED TO RESIST 90 MPH WIND SPEED CONCURRENT WITH 1/2" RADIAL ICE PER ANSI/EIA/IIA 222-F RECOMMENDED STANDARD. ALLOWABLE STEEL STRESSES PER AISC ASD 9TH EDITION.

MATERIAL SPECIFICATIONS FOR REINFORCEMENT OF TOWER:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS . AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
2. CONTRACTOR SHALL TAKE EXTREME CARE NOT TO DAMAGE THE EXISTING TOWER, THE EXISTING COMMUNICATION EQUIPMENT, COAXIAL CABLE AND THEIR COMPONENTS. IN THE EVENT THAT THE EXISTING COMMUNICATION EQUIPMENT IS DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL REPAIR THE DAMAGE IMMEDIATELY (WITH THE APPROVAL OF THE COMMUNICATION CARRIER) AT NO ADDITIONAL COST TO THE CONTRACT.
3. STRUCTURAL STEEL SHALL CONFORM TO THE CURRENT "AISC SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", AND THE "AISC CODE OF STANDARD PRACTICE FOR STEEL".
4. ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER IN ACCORDANCE WITH A.W.S. STANDARDS.
5. CONNECTIONS SHALL CONFORM TO ALL REQUIREMENTS OF THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", LATEST EDITION, AND THE "SPECIFICATION FOR STRUCTURAL STEEL JOINTS USING ASTM A325 OR A490 BOLTS" APPROVED.
6. CONTRACTOR SHALL VISIT THE SITE PRIOR TO THE START OF WORK WITH SUFFICIENT RIGGING EQUIPMENT AND PERSONNEL TO OBTAIN DETAILED FABRICATION MEASUREMENTS OF EXISTING TOWER STEEL MEMBERS TO BE REPLACED.
7. EXISTING DIMENSIONS OF STRUCTURE IS TAKEN FROM STAINLESS INC. AND ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SUBMIT TO STAINLESS INC..
8. TOWER REINFORCING SHALL BE CONDUCTED BY CERTIFIED WELDERS AND FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPIANCE WITH OSHA.
9. CONTRACTOR SHALL SUBMIT THE METHOD OF CONSTRUCTION AND ERECTION FOR REVIEW OF THE ENGINEER PRIOR TO FABRICATION.
10. THE PROPOSED DIAGONAL REINFORCEMENT SHALL REPLACE THE EXISTING DIAGONALS ON THE STRUCTURE.
11. ALL REINFORCEMENT SHOWN FOR DIAGONALS APPLY TO ALL SIDES OF THE TOWER.
12. ALL A-325 BOLTS ARE TO BE TIGHTENED TO A SNUG TIGHT CONDITION AS DEFINED BY AISC SPECIFICATION UNLESS DETERMINED BY ORGINAL TOWER MANUFACTURER. USE LOCK WASHER WITH KOTTER PIN (TYP.).
13. THE REPLACEMENT OF TOWER MEMBERS SHALL BE DONE ONE AT A TIME AND SHALL BE DONE WITH LESS THAN 15 MPH WIND PRESENT. NO MEMBER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY.
14. BOLT HOLES SHALL BE PUNCHED OR DRILLED. FLAME CUT HOLES ARE NOT ACCEPTABLE.
15. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN. PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. AT THE COMPLETION OF ALL WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
16. TOUCH-UP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH-UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.
17. USE PRECAUTIONS & PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.
18. ALL STEEL WORK SHALL BE GALVANIZED AND IN ACCORDANCE WITH THE SPECIFICATION ASTM A123 UNLESS OTHERWISE NOTED. (AFTER FABRICATION) ALL BOLTS SHALL BE GALV. PER ASTM 153.
19. THE EXISTING COAXIAL CABLE AND ALL ACCESSORIES SHALL BE RELOCATED AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH TOWER REINFORCEMENT.