# 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@ct.gov
www.ct.gov/csc


July 27, 2009

Steven L. Levine
Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-096-090626** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 4 Elkington Farms Road, New Milford, Connecticut.

Dear Mr. Levine:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- The additional proposed coax shall be installed inside the monopole if reasonably feasible. Alternatively, if such arrangement is not reasonably feasible, the coax may be installed outside of the monopole; and

- Not more than 45 days after completion of construction, the Council shall be notified in writing that the coax was installed as specified.

The proposed modifications are to be implemented as specified here and in your notice dated June 26, 2009, including the placement of all necessary equipment and shelters within the tower compound. 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 site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility 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,

S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable Patricia A. Murphy, Mayor, Town of New Milford
American Tower Corporation

# 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@ct.gov
Internet: ct.gov/csc

*Daniel F. Caruso*
*Chairman*


July 2, 2009

The Honorable Patricia A. Murphy
Mayor
Town of New Milford
Town Hall
10 Main Street
New Milford, CT 06776

RE: **EM-CING-096-090626** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 4 Elkington Farms Road, New Milford, Connecticut.

Dear Mayor Murphy:

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.

If you have any questions or comments regarding this proposal, please call me or inform the Council by July 16, 2009.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

EM-CING-096-090626

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

**Steven L. Levine**
Real Estate Consultant

ORIGINAL



HAND DELIVERED

June 26, 2009

Honorable Daniel F. Caruso, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 4 Elkington Farms Road, New Milford (owner, American Tower)

Dear Chairman Caruso and Members of the Council:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of 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 the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile (GSM) communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility

will not be significantly changed or altered. Rather, the planned changes to the facility 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.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.

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

4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. 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, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 513-7636 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Steven L. Levine
Real Estate Consultant

Attachments

**NEW CINGULAR WIRELESS**
**Equipment Modification**

4 Elkington Farms Road, New Milford
Site Number 2155
Exempt Mods approved 8/02 and 11/02

**Tower Owner/Manager:** American Tower

**Equipment Configuration:** Monopole

**Current and/or Approved:** Nine CSS panel antennas @ 152 ft AGL
Six TMA's and three diplexers @ 152 ft
Nine runs 1¼ inch coax cable
Equipment shelter

**Planned Modifications:** Remove existing antennas, TMA's, diplexers, and 1 run coax
Install six Powerwave 7770 antennas (or equivalent) @ 152 ft
Install six TMA's and six diplexers @ 152 ft
Install three additional runs 1¼ inch coax

**Power Density:**

Worst-case calculations for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the tower, of approximately 45.7 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 45.1 % of the standard.

**Existing**

| 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 |
|---|---|---|---|---|---|---|---|
| Other Users * | | | | | | | 38.54 |
| AT&T TDMA * | 152 | 880 - 894 | 16 | 100 | 0.0249 | 0.5867 | 4.24 |
| AT&T GSM * | 152 | 1900 Band | 2 | 427 | 0.0133 | 1.0000 | 1.33 |
| AT&T GSM * | 152 | 880 - 894 | 2 | 296 | 0.0092 | 0.5867 | 1.57 |
| Total | | | | | | | 45.7% |

* Per CSC records

## Proposed

| 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 |
|---|---|---|---|---|---|---|---|
| Other Users * | | | | | | | 38.54 |
| AT&T UMTS | 152 | 880 - 894 | 1 | 500 | 0.0078 | 0.5867 | 1.33 |
| AT&T UMTS | 152 | 1900 Band | 1 | 500 | 0.0078 | 1.0000 | 0.78 |
| AT&T GSM | 152 | 1900 Band | 2 | 427 | 0.0133 | 1.0000 | 1.33 |
| AT&T GSM | 152 | 880 - 894 | 4 | 296 | 0.0184 | 0.5867 | 3.14 |
| Total | | | | | | | 45.1% |

* Per CSC records

## Structural information:

The attached structural analysis demonstrates that the tower and foundation have sufficient structural capacity to accommodate the proposed equipment modifications. (American Tower, 5/18/09)


cingular
raising the bar

**New Cingular Wireless PCS, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

**Steven L. Levine**
Real Estate Consultant

June 26, 2009

Mayor Patricia A. Murphy
Town of New Milford
Town Hall 10 Main Street
New Milford, CT 06776

Re: Telecommunications Facility – 4 Elkington Farms Road

Dear Mayor Murphy:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

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 AT&T'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 to the Siting Council fully describes AT&T's proposal for the referenced cell site. 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) 513-7636 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

AMERICAN TOWER

# Structural Analysis Report

| | | |
|---|---|---|
| **Structure** | : | **150 ft ITT Meyer Monopole** |
| **ATC Site Name** | : | **New Milford CT 2, CT** |
| **ATC Site Number** | : | **302523** |
| **Proposed Carrier** | : | **AT&T Mobility** |
| **Carrier Site Name** | : | **New Milford** |
| **Carrier Site Number** | : | **2155** |
| **County** | : | **Litchfield** |
| **Eng. Number** | : | **43410921** |
| **Date** | : | **May 18, 2009*** |
| **Usage** | : | **95%** |
| **Portholes Required** | : | **No** |

Submitted by:
Bryan Lanier, P.E., S.E.
Senior Design Engineer

STATE OF CONNECTICUT
RAPHAEL I. MOHAMED
No. 25112
LICENSED
PROFESSIONAL ENGINEER

5|19|09

**American Tower Engineering Services**
400 Regency Forest Drive
Cary, NC 27518
Phone: 919-468-0112

## Introduction

The purpose of this report is to summarize results of the structural analysis performed on the 150 ft ITT Meyer Monopole located at 4 Elkington Farm Road, New Milford, CT 06776, Litchfield County (ATC site #302523). The tower was originally designed and manufactured by ITT Meyer per design specification by AT&T Technologies (Specification No. AT-8935, dated April 13, 1984). The tower has been strengthened per design by Scientel CMS (dated March 7, 2002) and American Tower Corporation (Project No. 41658239, dated December 22, 2008).

## Analysis

The tower was analyzed using Semaan Engineering Solutions, Inc., Software. The analysis assumes that the tower is in good, undamaged, and non-corroded condition.

| | |
|---|---|
| Basic Wind Speed: | 95 mph (3-Second Gust) |
| Radial Ice: | 40 mph (3-Second Gust) w/ 3/4" ice |
| Code: | ANSI/TIA-222-G / 2003 International Building Code with 2005 Connecticut State Building Code Amendments and 2008 Connecticut Supplement |

## Antenna Loads

The following antenna loads were used in the tower analysis.

Existing Antennas

| Elev. (ft) | Qty | Antennas | Mount | Coax (in) | Carrier |
|---|---|---|---|---|---|
| 140.0 | 9 | Decibel DB980H90E-M | Round Low Profile Platform | (9) 1 5/8 | Sprint Nextel |
| 133.0 | 4 | Decibel DB950F852E-M | Round Low Profile Platform | (12) 1 5/8 | Verizon Wireless |
| | 4 | Antel LPA-80080/6CF | | | |
| | 2 | Decibel DB950F65E-M | | | |
| | 2 | Antel LPA-80063/6CF | | | |
| 110.0 | 3 | 72" x 12" Panels | (3) Round T-Arm | (12) 1 5/8 | Sprint Nextel |
| | 9 | 48" x 12" Panels | | | |
| 75.0 | 1 | GPS | Pipe | (1) 1/2 | |
| 50.0 | 1 | GPS | Pipe | (1) 7/8 | Verizon Wireless |

Proposed Antennas

| Elev. (ft) | Qty | Antennas | Mount | Coax (in) | Carrier |
|---|---|---|---|---|---|
| 151.0 | 6 | Powerwave 7770.00 | Round Low Profile Platform | (12) 1 1/4 | AT&T Mobility |
| | 6 | Powerwave LGP21401 | | | |
| | 6 | Powerwave 7020.00 | | | |
| | 6 | Powerwave LGP21901 | | | |

ATC Engineering Services recommends installing the additional proposed coax inside monopole. If this is cannot be accomplished, additional coax may be installed outside the monopole shaft.

**Results**

The maximum structure usage is: 95%

| Pole Reactions | Calculated Capacity | Current Analysis Reactions | % Of Capacity |
|---|---|---|---|
| Moment (ft-kips) | 2,821.9 | 2,424.5 | 93 |
| Axial (kips) | 61.2 | 49.6 | 81 |
| Shear (kips) | 112.0 | 25.0 | 22 |

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

**Conclusion**

Based on the analysis results, the structure meets the requirements per ANSI/TIA-222-G and 2003 IBC with 2005 CT Amendments and 2008 Supplement standards. The tower and foundation can support the existing and proposed antennas with the TX line distribution as described in this report. If you have any questions or require additional information, please call 919-466-5777.

**Standard Conditions**

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

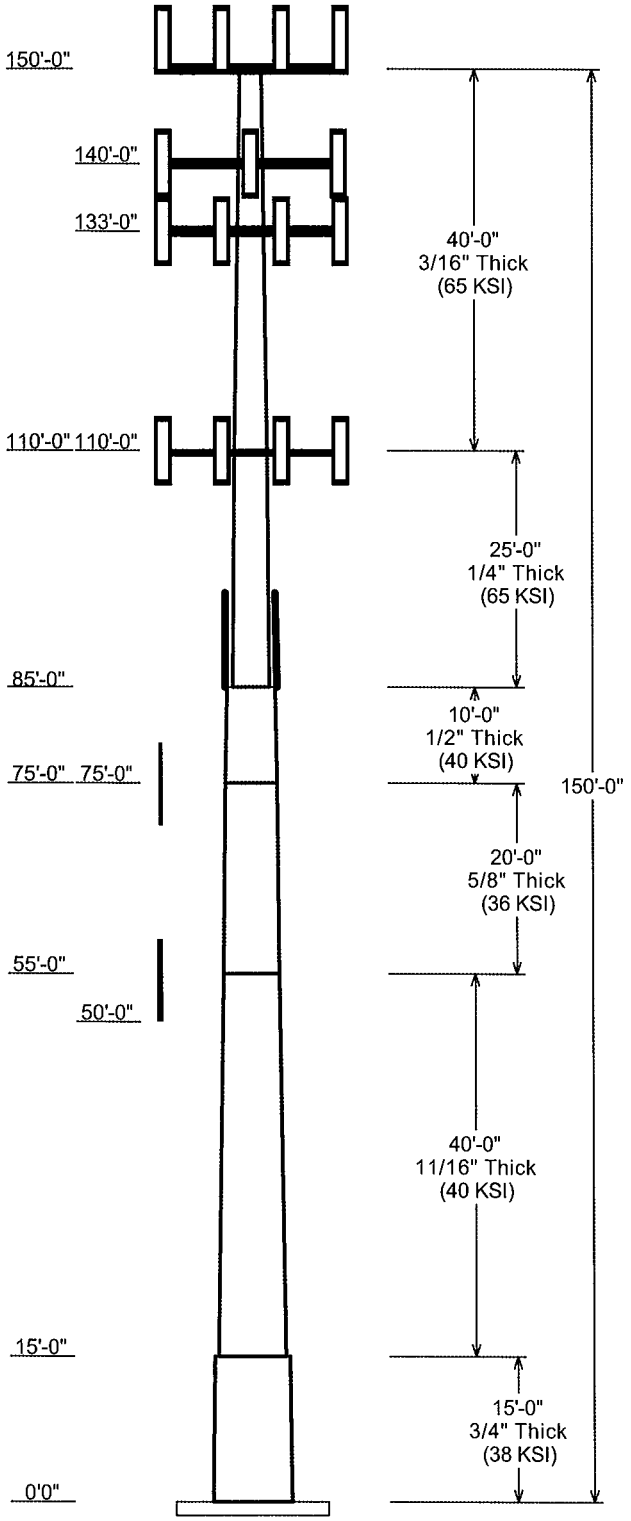
-- Information supplied by the client regarding the structure itself, the antenna and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to ATC Engineering Services and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated; and we, therefore, assume that their capacity has not significantly changed from the "as new" condition.

All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/EIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Engineering Services is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.




## Job Information

| | | | |
|---|---|---|---|
| Pole : | 302523 | Code: ANSI/TIA-222 Rev G | |
| Description : | 150 ft Monopole | | Struct Class : II |
| Client : | Verizon | | Exposure : B |
| Location : | New Milford CT 2, CT | | Topo : 1 |
| Shape : | 12 Sides | Base Elev (ft): 0.00 | |
| Height : | 150.00 (ft) | Taper: 0.156700(in/ft) | |

## Sections Properties

| Shaft Section | Length (ft) | Diameter (in) Accross Flats Top | Bottom | Thick (in) | Joint Type | Overlap Length (in) | Taper (in/ft) | Steel Grade (ksi) |
|---|---|---|---|---|---|---|---|---|
| 1 | 15.000 | 45.39 | 53.90 | 0.750 | | 0.000 | 0.567000 | 38 |
| 2 | 40.000 | 39.10 | 45.60 | 0.688 | Butt Joint | 0.000 | 0.162500 | 40 |
| 3 | 20.000 | 36.13 | 39.40 | 0.625 | Butt Joint | 0.000 | 0.163330 | 36 |
| 4 | 10.000 | 34.49 | 36.13 | 0.500 | Butt Joint | 0.000 | 0.163333 | 40 |
| 5 | 25.000 | 21.25 | 25.23 | 0.250 | Butt Joint | 0.000 | 0.159200 | 65 |
| 6 | 40.000 | 15.00 | 21.25 | 0.188 | Butt Joint | 0.000 | 0.156250 | 65 |

## Discrete Appurtenance

| Attach Elev (ft) | Force Elev (ft) | Qty | Description |
|---|---|---|---|
| 150.000 | 151.000 | 6 | Powerwave 7770.00 |
| 150.000 | 151.000 | 6 | Powerwave LGP21401 |
| 150.000 | 151.000 | 1 | Round Low Profile Platform |
| 150.000 | 151.000 | 6 | Powerwave 7020.00 Dual Band |
| 150.000 | 151.000 | 6 | Powerwave LGP21901 |
| 140.000 | 140.000 | 1 | Round Low Profile Platform |
| 140.000 | 140.000 | 9 | Decibel DB980H90E-M |
| 133.000 | 133.000 | 4 | Decibel DB950F852E-M |
| 133.000 | 133.000 | 4 | Antel LPA-80080/6CF |
| 133.000 | 133.000 | 2 | Decibel DB950F65E-M |
| 133.000 | 133.000 | 2 | Antel LPA-80063/6CF |
| 133.000 | 133.000 | 1 | Round Low Profile Platform |
| 110.000 | 110.000 | 3 | Round T-Arm |
| 110.000 | 110.000 | 3 | 72" x 12" Panels |
| 110.000 | 110.000 | 9 | 48" x 12" Panels |
| 75.000 | 75.000 | 1 | GPS |
| 50.000 | 50.500 | 1 | GPS |

## Linear Appurtenance

| Elev (ft) From | To | Description | Exposed To Wind |
|---|---|---|---|
| 85.000 | 110.0 | 1 5/8" Coax | Yes |
| 85.000 | 133.0 | 1 5/8" Coax | Yes |
| 79.000 | 100.0 | #20 Dywidag Bars | Yes |
| 0.000 | 140.0 | 1 5/8" Coax | No |
| 0.000 | 150.0 | 1 1/4" Coax | No |
| 0.000 | 50.000 | 7/8" Coax | Yes |
| 0.000 | 75.000 | 1/2" Coax | Yes |
| 0.000 | 85.000 | 1 5/8" Coax | No |
| 0.000 | 85.000 | 1 5/8" Coax | No |

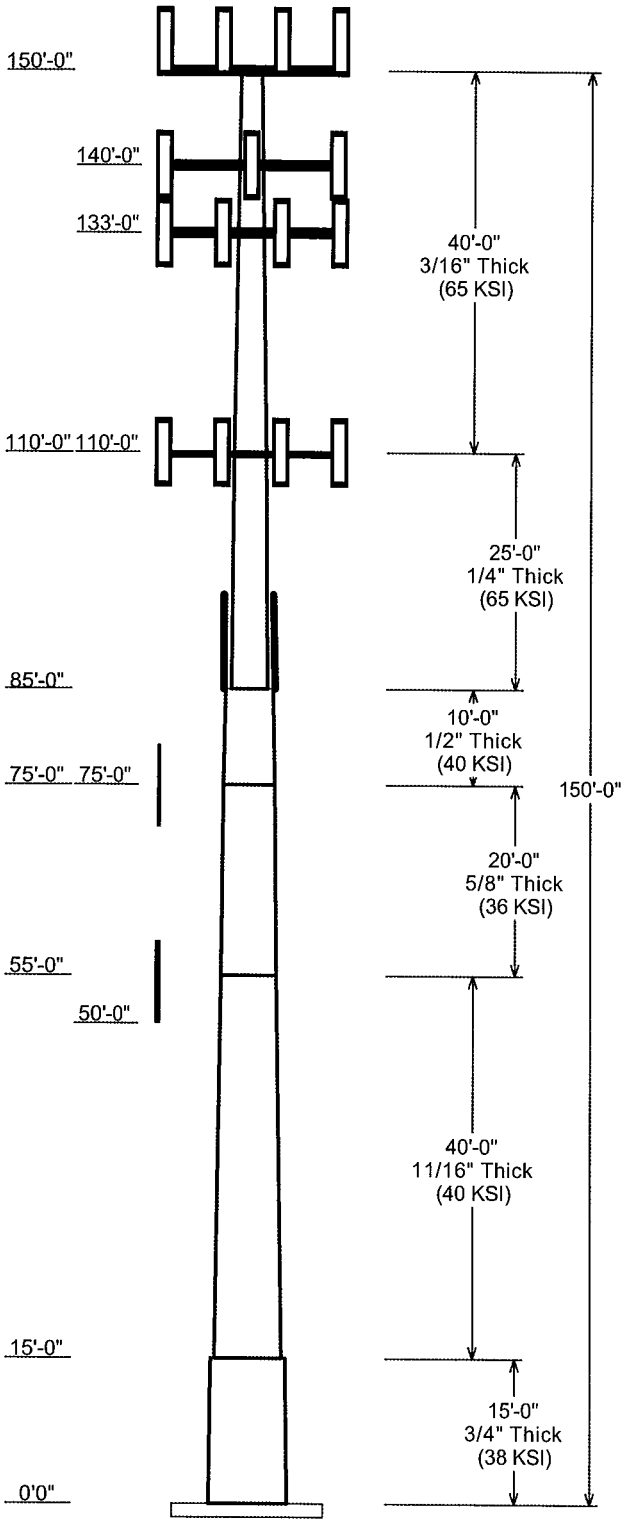
## Load Cases

| | |
|---|---|
| 1.2D + 1.6W | 95.00 mph with No Ice |
| 0.9D + 1.6W | 95.00 mph with No Ice (Reduced DL) |
| 1.2D + 1.0Di + 1.0Wi | 40.00 mph with 1.25 in Radial Ice |
| 1.2D + 1.0E | Dead Load with Seismic |
| 0.9D + 1.0E | Dead Load with Seismic (Reduced DL) |

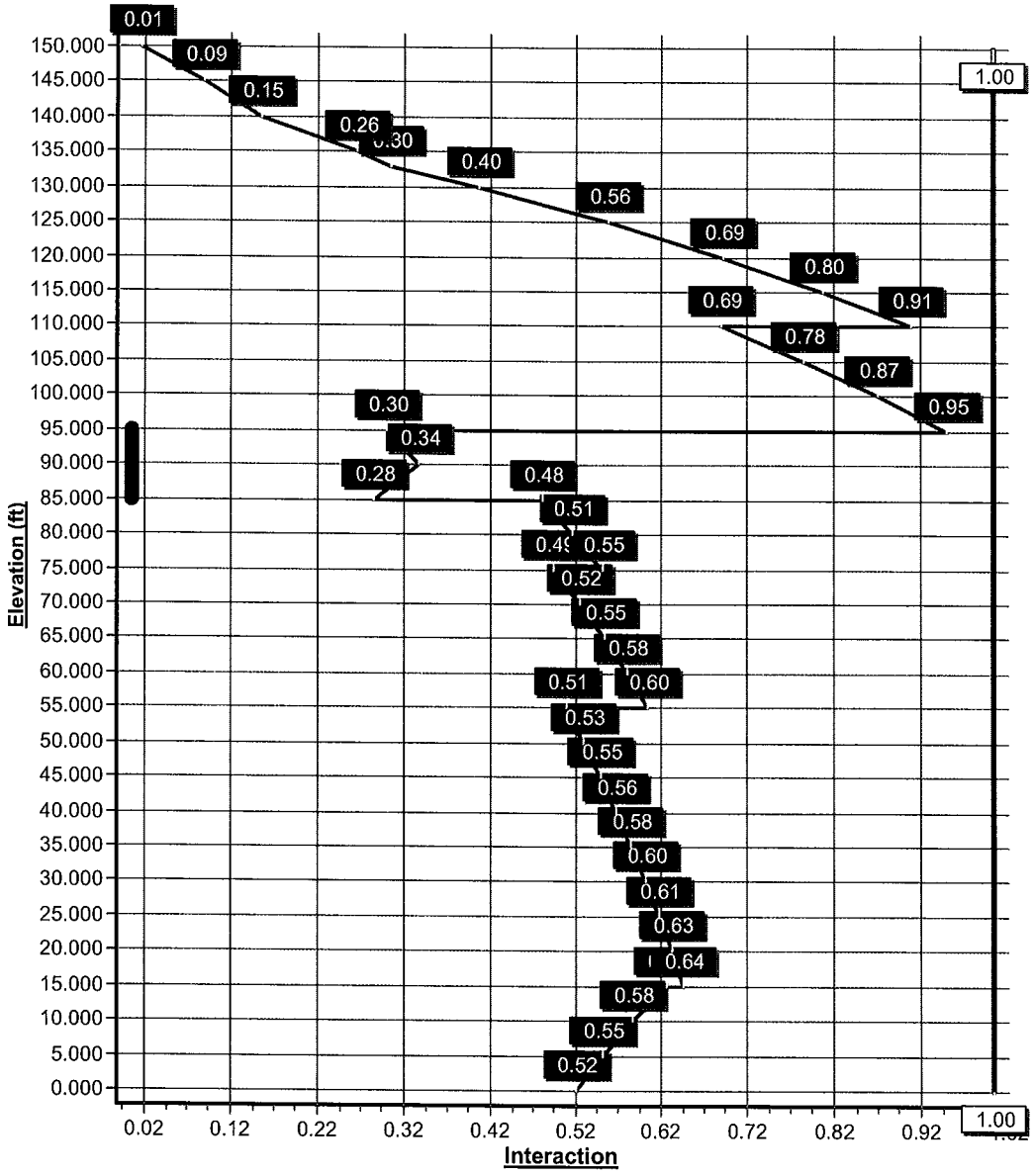
## Reactions

| Load Case | Moment (Kip-ft) | Shear (Kips) | Axial (Kips) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1.2D + 1.6W | 2424.53 | 24.99 | 49.59 |
| 0.9D + 1.6W | 2367.69 | 24.62 | 37.31 |
| 1.2D + 1.0Di + 1.0Wi | 454.31 | 4.27 | 88.44 |
| 1.2D + 1.0E | 599.99 | 7.12 | 49.60 |
| 0.9D + 1.0E | 596.68 | 7.12 | 37.33 |

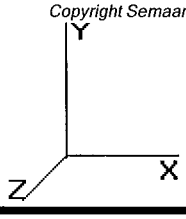


**Load Case : 1.2D + 1.6W**
**Max Ratio 94.76% at 95.0ft**



| | | | |
|---|---|---|---|
| Pole : | 302523 | Code: ANSI/TIA-222 Rev G | |
| Location : | New Milford CT 2, CT | Struct Class : II | |
| Height : | 150.0 (ft) | Exposure Category : B | |
| Shape : | 12 Sides | Topographic Category : 1 | |
| Base Dia : | 53.90 (in) | | |
| Top Dia : | 15.00 (in) | | |
| Taper : | 0.156700 (in/ft) | Base Elev : 0.000 (ft) | |








## Base Summary

### Reactions

| Original Design | | | Analysis | | | |
|---|---|---|---|---|---|---|
| Moment (kip-ft) | Axial (kip) | Shear (kip) | Moment (kip-ft) | Axial (kip) | Shear (kip) | Moment Design % |
| 1,197.00 | 14.90 | 13.10 | 2,424.53 | 88.44 | 24.99 | 202.55 |

### Base Plate

| Yield (ksi) | Thick (in) | Width (in) | Style | Poly Sides | Clip Len (in) | Effective Len (in) | Mu (kip-in) | Phi Mn (kip-in) | Ratio |
|---|---|---|---|---|---|---|---|---|---|
| 60.0 | 2.500 | 63.000 | Square | 0 | 0.00 | 10.832 | 268.44 | 913.93 | 0.29 |

### Anchor Bolts

| | | | | | | | | Start | Compression | | | Tension | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bolt Circle | Num Bolts | Bolt Type | Bolt Dia (in) | Yield (ksi) | Ultimate (ksi) | Arrange | Cluster Dist (in) | Angle (deg) | Force (kip) | Allow (kip) | Ratio | Force (kip) | Allow (kip) | Ratio |
| 58.00 | 16 | 2.25" 18J | 2.25 | 75.00 | 100.00 | Radial | 6.00 | 45.0 | 130.93 | 260.00 | 0.52 | 119.88 | 260.00 | 0.47 |

| | |
|---|---|
| Site Name: | **New Milford CT2** |
| Site Number: | **302523** |
| Engineer: | **BKL** |
| Date: | **5/18/2009** |

*Concrete Strength Design per ACI318-05*

**Design Loads (Factored)**

| | | | |
|---|---|---|---|
| Compression/Leg: | 49.6 k | Concrete Strength ($f'_c$): | 3000 psi |
| Uplift/Leg: | 0.0 k | Pad Tension Steel Depth: | 32 in |
| Total Shear: | 25.0 k | $\phi_{Shear}$: | 0.75 |
| Moment: | 2424.5 k-ft | $\phi_{Flexure\ /\ Tension}$: | 0.90 |
| Tower + Appurtenance Weight: | 49.6 k | $\phi_{Compression}$: | 0.65 |
| Diameter of Pier (d): | 6.0 ft | b: | 0.85 |
| Length of Pier (l): | 5.5 ft | Pad Rebar Size #: | 10 |
| Height of Pier above Ground (h): | 0.5 | # of Pad Tension Rebar: | 35 |
| Width of Pad (W): | 18.0 ft | Pad Lower Steel Area: | 44.45 $in^2$ |
| Length of Pad (L): | 18.0 ft | Pad Steel $F_y$: | 60000 psi |
| Thickness of Pad (t): | 3.0 ft | Pier Rebar Size #: | 11 |
| Tower Leg Center to Center: | 0.0 ft (0 if not SST) | Pier Steel Area (Single Bar): | 1.56 $in^2$ |
| Number of Tower Legs: | 1 (1 if MP or GT) | # of Pier Rebar: | 52 |
| Tower Center from Mat Center: | 0.0 ft | Pier Steel $F_y$: | 60000 psi |
| Depth Below Ground Surface to Water Table: | 14.0 ft | Pier Cage Diameter: | 60.0 in |
| Unit Weight of Concrete: | 150.0 pcf | Rebar Strain Limit: | 0.008 |
| Unit Weight of Soil Above Water Table: | 110.0 pcf | Steel Elastic Modulus: | 29000 ksi |
| Unit Weight of Water: | 62.4 pcf | Tie Rebar Size #: | 4 |
| Friction Angle of Uplift: | 20.0 Degrees | Tie Steel Area (Single Bar): | 0.20 $in^2$ |
| Ultimate Shear Strength Adhesion of Soil: | 0.0 psf | Tie Spacing: | 12 in |
| Ultimate Coefficient of Shear Friction: | 0.5 | Tie Steel $F_y$: | 60000 psi |
| Ultimate Compressive Bearing Pressure: | 5000.0 psf | $\phi_{TIA-222-G}$: | 0.75 |
| Ultimate Passive Pressure on Pad Face: | 0.0 psf | Minimum Dead Load Factor: | 0.9 |
| Allowable Capacity Increase: | 1.0 | Maximum Dead Load Factor: | 1.2 |

**Axial Weights**

| | |
|---|---|
| Weight of Concrete (Buoyancy Effect Considered): | 169.1 k |
| Weight of Soil (Buoyancy Effect Considered): | 162.6 k |

**Overturning Factor of Safety**

| | |
|---|---|
| Design OTM | 2636.9 k-ft |
| OTM Resistance ($\phi$ = 0.8) (DLF = 0.9): | 2821.9 k-ft |
| OTM Resistance ($\phi$ = 0.8) (DLF = 1.2): | 3643.6 k-ft |
| OTM Design / Factored Nominal OTM Resistance: | 0.93 Result: OK |

**Soil Bearing Pressure Usage:**

| | |
|---|---|
| Total Weight (Foundation, Soil, Tower): | 457.6 k |
| Maximum Bearing Pressure: | 3926 psf |
| Pressure Length: | 6.5 ft |
| Net Bearing Pressure: | 3046 psf |
| Factored Nominal Bearing Pressure: | 3750 psf |
| Net Bearing Pressure/Factored Nominal Bearing Pressure: | 0.81 Result: OK |

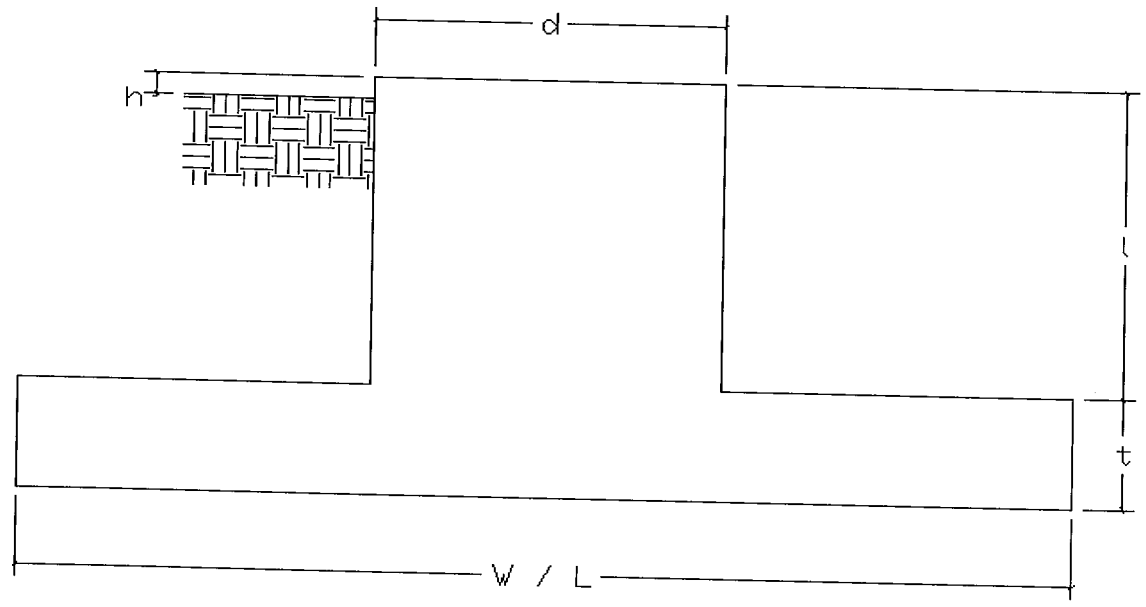
**Sliding Factor of Safety**

| | |
|---|---|
| Ultimate Friction Resistance: | 149.3 k |
| Ultimate Passive Pressure Resistance: | 0.0 k |
| Total Factored Nominal Sliding Resistance: | 112.0 k |
| Sliding Design/Factored Nominal Sliding Resistance: | 0.22 Result: OK |

## One Way Shear, Flexual Capacity, and Punching Shear

| | | |
|---|---|---|
| * Critical Shear Length from Edge of Pad: | 3.33 | ft |
| Factored Pressure at Critical Section: | 3926 | psf |
| Factored One Way Shear ($V_u$): | 235.6 | k |
| One Way Shear Capacity ($\phi V_c$): | 567.9 | k - ACI11.3.1.1 |
| $V_u / \phi V_c$: | 0.41 | Result: OK |
| Critical Moment Length from Edge of Pad: | 6.00 | ft |
| Factored Moment in Pad: | 1272.0 | k-ft |
| Pad Moment Capacity ($\phi M_n$): | 5989.2 | k-ft - ACI10.3 |
| $M_u / \phi M_n$: | 0.21 | Result: OK |
| Pad Flexural Reinforcement Ratio: | 0.0064 | OK - Minimum Reinforcement Ratio Met - ACI10.5.1 |
| Pad Shrinkage Reinforcement Ratio: | 0.0129 | OK - Shrinkage Reinforcement Ratio Met - ACI7.12.2.1 |
| Pad Reinforcement Spacing: | 6 | in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4 |
| Factored Punching Shear ($V_u$): | 0.0 | k |
| Nominal Punching Shear Capacity ($\phi_c V_n$): | 1718.0 | k - ACI11.12.2.1 |
| $V_u / \phi V_c$: | 0.00 | Result: OK |
| Factored Moment in Pier ($M_u$): | 2562.0 | k-ft |
| Pier Moment Capacity ($\phi M_n$): | 10709.3 | k-ft |
| $M_u / \phi M_n$: | 0.24 | Result: OK |
| Factored Shear in Pier ($V_u$): | 25.0 | k |
| Pier Shear Capacity ($\phi V_n$): | 375.6 | k |
| $V_u / \phi V_c$: | 0.07 | Result: OK |
| Pier Shear Reinforcement Ratio: | 0.0015 | No Ties Necessary for Shear - ACI11.5.6.1 |
| Factored Tension in Pier ($T_u$): | 0.0 | k |
| Pier Tension Capacity ($\phi T_n$): | 926.6 | k |
| $T_u / \phi T_n$: | 0.00 | Result: OK |
| Factored Compression in Pier ($P_u$): | 49.6 | k |
| Pier Compression Capacity ($\phi P_n$): | 7822.2 | k - ACI10.3.6.2 |
| $P_u / \phi P_n$: | 0.01 | Result: OK |
| Pier Compression Reinforcement Ratio: | 0.020 | OK - Reinforcement Ratio Met - ACI10.9.1 & 10.8.4 |

| | | |
|---|---|---|
| Total Concrete Used: | 41.8 | $yd^3$ |
| Pad Rebar Weight: | 10890 | lb |
| Peir Rebar Weight: | 2346 | lb |
| Tie Weight: | 91 | lb |
| Total Weight: | 14660 | lb |



| | |
|---|---|
| Site Name: | **New Milford CT2** |
| Site Number: | **302523** |
| Engineer: | **BKL** |
| Date: | **5/18/2009** |

**Splice Plate and Bolt Analysis**

| | |
|---|---|
| Moment: | 285.8 k-ft |
| Shear/Leg: | 10.3 k |
| Compression/Leg: | 8.3 k |

**Assumptions**

Splice Bolts are A325N
Flange to Shaft Weld Strength is 70 ksi
Maximum Bolt / Stiffener Ratio is 2/1

| | | | |
|---|---|---|---|
| TIA-222 Code Revision (F/G): | G | Stiffener Height along Pole: | 6.00 in |
| Lower Monopole Shaft Diameter: | 21.3 in | Stiffener Length along Plate: | 3.50 in |
| Lower Monopole Thickness: | 0.250 in | Stiffener Thickness: | 0.50 in |
| Splice Plate Thickness: | 1.00 in | # of Stiffeners: | 6 |
| Splice Plate Yield Strength: | 60 ksi | Stiffener Yield Strength: | 50 ksi |
| Fillet Weld Size: | 0.250 in | Chamfer: | 0.50 in |
| Weld Type (PP/F or F/F): | PP/F | Weld Size Along Pole: | 0.313 |
| Splice Bolt Diameter: | 1.00 in | Weld Size Along Plate: | 0.313 |
| Splice Bolt Circle: | 25.75 in | Weld Strength: | 70 ksi |
| # of Splice Bolts: | 12 | | |
| $A_n$: | 0.61 $in^2$ | | |
| $A_g$: | 0.79 $in^2$ | | |
| Stress Increase: | 1.00 | | |

| | | | |
|---|---|---|---|
| Start Angle: | 156.0 Degrees | Angle: | 59.7 Degrees |
| Error: | 0.00% | Effective Stiffener Area: | 1.30 $in^2$ |
| Difference: | 0.00 | Stiffener Strength Capacity: | 58.3 k |
| Area: | 11.4 $in^2$ | Stiffener Moment Capacity: | 50.4 k-in |
| Centriod from Center of Pole: | -2.18 in | | |
| Inertia: | 691.5 $in^4$ | $P_u$: | 50.4 k |
| Section Modulus, Tension: | 45.9 $in^3$ | $C_1$: | 1.00 |
| Section Modulus, Compression: | 81.9 $in^3$ | l: | 4.50 in |
| | | a: | 0.44 |
| Area of Bolt: | 0.61 $in^2$ | k: | 0.16 |
| Inertia of Bolt: | 0.03 $in^4$ | C: | 2.00 |
| Bolt Tension: | 44.5 k | Minimum Weld Thickness: | 0.279 in |
| Bolt Shear: | 0.1 k | Weld Stress Ratio: | 0.89 Result: OK |
| Tensile Bolt Capacity: | 54.5 k | | |
| Shear Bolt Capacity: | 24.5 k | | |
| Interaction Equation: | 0.67 Result: OK | | |

| | |
|---|---|
| Moment Arm: | 2.25 in |
| Moment in Plate: | 100.2 k-in |
| Baseplate Effective Width: | 5.56 in |
| Section / Plastic Modulus: | 1.39 $in^3$ |
| Plate / Stiffener Moment Capacity: | 125.5 k-in |
| Interaction Equation: | 0.80 Result: OK |

| | |
|---|---|
| Weld Section Modulus: | 354.7 $in^2$ |
| Force / Weld: | 9.7 k/in |
| Weld Capacity: | 13.4 k/in |
| Interaction Equation: | 0.72 Result: OK |