



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

www.ct.gov/csc

March 24, 2006

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: EM-VER-123-007-010-099-060308 - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 165 Huntington Road, Scotland; 1657 Wilbur Cross Parkway, Berlin; 310 Watertown Road, Bethlehem; and 88 Parsonage Hill Road, Northford (North Branford), Connecticut.

Dear Attorney Baldwin:

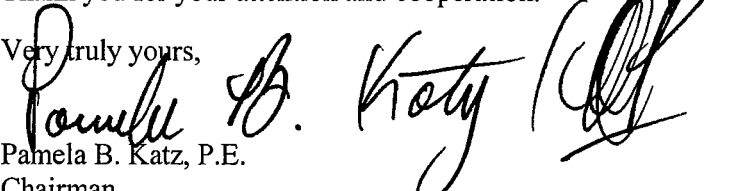
At a public meeting held on March 22, 2006, the Connecticut Siting Council (Council) acknowledged your notice to modify these existing telecommunications facilities, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated March 8, 2006, including the placement of all necessary equipment and shelters within the tower compounds. 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 existing facility sites that would not increase tower heights, extend the boundaries of the tower sites, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power densities 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. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to any of 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,


Pamela B. Katz, P.E.
Chairman

PBK/laf

See Attached List.

List Attachment.

- c: The Honorable Adam P. Salina, Mayor, Town of Berlin
- Hellyn Riggins, Town Planner, Town of Berlin
- The Honorable Leo S. Bulvanoski, First Selectman, Town of Bethlehem
- Jeffrey Hamel, Chairman, Planning and Zoning, Town of Bethlehem
- The Honorable Andrew Esposito III, Mayor, Town of North Branford
- Carol Zeeb, Town Planner, Town of North Branford
- The Honorable Elizabeth A. Wilson, First Selectman, Town of Scotland
- Carl S. Fontneau, Town Planner, Town of Scotland
- Berlin Fire Department
- Jean Szwabowski, Ochenknowski Towers LLC
- Sheila R. Becker, Regional Director of Compliance, SBA, Inc.
- Christopher B. Fisher, Esq., Cuddy & Feder LLP
- Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP
- Michele G. Briggs, New Cingular Wireless PCS, LLC
- Christine Farrell, T-Mobile, Inc.
- Thomas F. Flynn III, Nextel Communications, Inc.

ROBINSON & COLE LLP

KENNETH C. BALDWIN

RECEIVED
MAY 10 2006

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

CONNECTICUT
SITING COUNCIL

May 10, 2006

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-123-007-010-099-060308 – Cellco Partnership d/b/a Verizon
Wireless Exempt Modification to Approve the Shared Use of a Tower
Facility at 86 Parsonage Hill Road, Northford (North Branford),
Connecticut**

Dear Mr. Phelps:

On March 22, 2006, the Siting Council approved Cellco Partnership's exempt modification request to share the existing telecommunications tower at 86 Parsonage Hill Road in Northford, Connecticut. Cellco has recently decided to utilize different antennas than those described in the filing. Enclosed please find the specifications for the new antenna and a new structural letter, verifying that the tower can support the new antennas. There will be no change in radio frequency power density levels, therefore a new calculation table is not being submitted.

If you have any questions or concerns regarding this minor modification please contact me.



Law Offices

BOSTON

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

SARASOTA

www.rc.com

Enclosures

Copy to:

Sandy M. Carter

Sincerely,

Kenneth C. Baldwin

HART1-1328876-1

Vertically Polarized, Panel 62° / 15 dBd

RWB-80015/62CF

When ordering, replace "___" with connector type.

Mechanical specifications

| | | |
|---------------------|----------------------|----------------------|
| Length | 1828.8 mm | 72.0 in |
| Width | 286 mm | 11.2 in |
| Depth | 104 mm | 4.1 in |
| Weight | 10.3 kg | 22.7 lbs |
| Wind Area | 0.521 m ² | 5.61 ft ² |
| Wind load at 50 m/s | 986.7 N | 221.8 lbs |

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting & Downtilting:

Mounting brackets attach to a pipe diameter of Ø50-160 mm (2.0-6.3 in).

Mounting bracket kit #36210002

Downtilt bracket kit #36114003

Electrical specifications

| | |
|---------------------|---------------|
| Frequency Range | 806-941 MHz |
| Impedance | 50Ω |
| Connector | NE, E-DIN |
| VSWR | <1.4:1 |
| Polarization | Vertical |
| Gain | 15 dBd |
| Power Rating | 500 W |
| Half Power Angle | |
| H-Plane | 62° |
| E-Plane | 10° |
| Electrical Downtilt | 0° |
| Null Fill | 15% |
| Lighting Protection | Direct Ground |

¹ Typical Values

² Power Rating limited by connector only

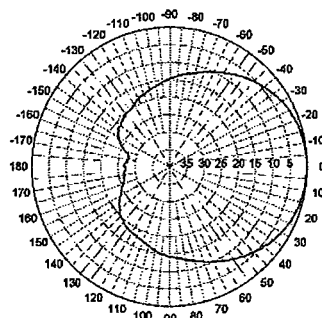
NE indicates an elongated N Connector

E-DIN indicates an elongated DIN Connector

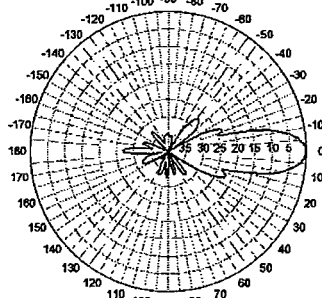
⁴ The antenna weight listed above does not include the bracket weight

Improvements to mechanical wind or electrical performance of the antenna may be made without notice

Radiation-pattern¹⁾



Horizontal



Vertical

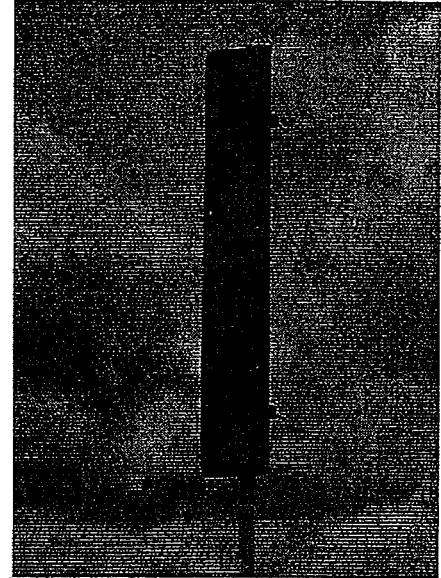
Specially designed for enhanced upper side lobe suppression.

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back Ratio.

CF Denotes a Center-Fed Connector.

806-941 MHz



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- A 1 1/2" four-channel extrusion running the entire length of the antenna for unmatched strength and rigidity.
- Durable brass feedline design that eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band width and superior performance.
- Air as insulation for virtually no internal signal loss.

Every Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with center-fed connector only.



Revision Date: 6/3/04

Vertically Polarized, Log Periodic 63° / 19 dBi

LPA-185063/12CF

When ordering, replace "___" with connector type.

Mechanical specifications

| | | |
|--|----------------------|----------------------|
| Length | 1806 mm | 74.1 in |
| Width | 167 mm | 6.6 in |
| Depth | 148 mm | 5.8 in |
| ¹⁾ Weight | 6.1 kg | 13.5 lbs |
| Wind Area | | |
| Front | 0.302 m ² | 3.25 ft ² |
| Side | 0.267 m ² | 2.88 ft ² |
| Rated Wind Velocity (Safety factor 2.0) | | |
| | >224 km/hr | >139 mph |
| Wind load @ 100 mph (161 km/hr) | | |
| Front | 479 N | 107.6 lbs |
| Side | 434 N | 97.6 lbs |

Antenna consisting of aluminum alloy with brass feedlines covered by a UV-safe fiberglass radome

Mounting & Downtilting

Wall mounted or pole tower mount with mounting brackets

Mounting bracket kit #26799997

Down tilt bracket kit #26799999

The down tilt bracket kit includes the mounting bracket kit

Electrical specifications

| | |
|------------------------------------|---------------|
| Frequency Range | 1850-1990 MHz |
| Impedance | 50Ω |
| ²⁾ Connector | NE-E-DIN |
| ¹⁾ VSWR | <1.4:1 |
| Polarization | Vertical |
| ¹⁾ Gain | 19 dBi |
| ²⁾ Power Rating | 250 W |
| ¹⁾ Half Power Angle | |
| H-Plane | 63° |
| E-Plane | 5° |
| ¹⁾ Electrical Down tilt | 0° |
| ¹⁾ Noise Floor | -16% |
| Lightning Protection | Direct Ground |

¹⁾ Typical Values

²⁾ Power Rating limited by connector only

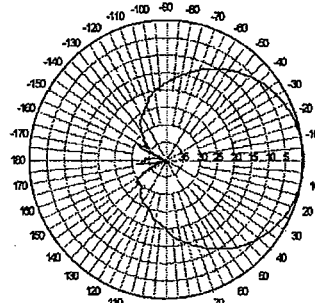
³⁾ NE indicates an elongated N Connector

E-DIN indicates an elongated DIN Connector

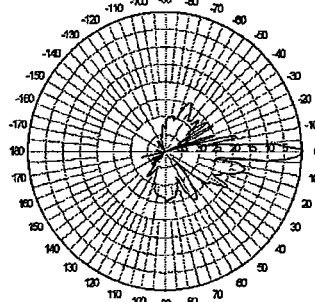
⁴⁾ The antenna weight listed above does not include the bracket weight

Improvements to mechanical and/or electrical performance of the antenna may be made without notice

Radiation-pattern ¹⁾



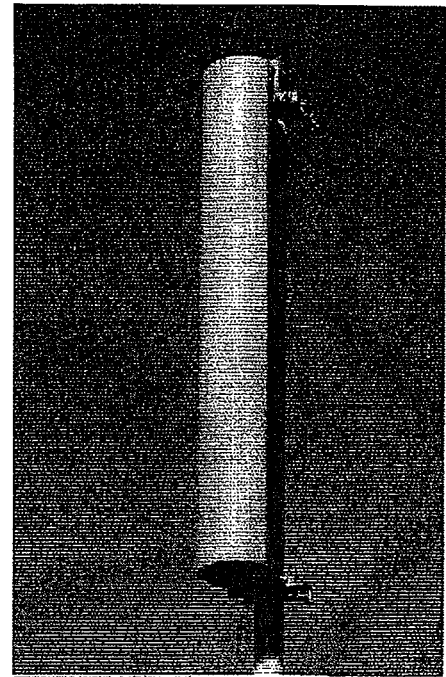
Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back Ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

Every Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with center-fed connector only.

CF Denotes a Center-Fed Connector.

1850-1990 MHz



Revision Date: 1/27/05

Vertically Polarized, Panel 78° / 13 dBd

RWA-80013

When ordering, replace * ___ with connector type.

Mechanical specifications

| | | |
|---|----------------------|-----------------------|
| Length | 1225 mm | 48.2 in |
| Width | 285 mm | 11.2 in |
| Depth | 150 mm | 5.9 in |
| Weight | 6.5 kg | 14.3 lbs |
| Wind Area | | |
| Fore/Aft | 0.349 m ² | 3.757 ft ² |
| Side | 0.184 m ² | 1.981 ft ² |
| Rated Wind Velocity (Safety factor 2:0) | | |
| | >380 Km/hr | >236 mph |
| Windload @ 100 mph (161 km/hr) | | |
| Fore/Aft | 500 N | 112.3 lbs |
| Side | 277 N | 62.2 lbs |

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome

Mounting & Downtilting

Mounting brackets attach to a pipe diameter of 050-160 mm (2.0-6.3 in)

Mounting bracket kit #36240002

Downtilt bracket kit #3614003

Electrical specifications

| | |
|----------------------|---------------|
| Frequency Range | 806-960 MHz |
| Impedance | 50Ω |
| Connector | NE, E-DIN |
| VSWR | <1.4:1 |
| Polarization | Vertical |
| Gain | 13 dBd |
| Power Rating | 500 W |
| Half Power Angle | |
| H-Plane | 78° |
| E-Plane | 14° |
| Electrical Downtilt | 1-25° |
| Null Fill | 6% |
| Lightning Protection | Direct Ground |

¹⁾ Typical Values

²⁾ Power Rating limited by connector only

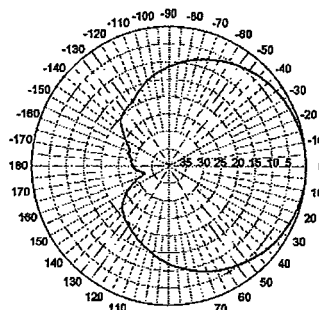
³⁾ NE indicates an elongated N Connector

⁴⁾ E-DIN indicates an elongated DIN Connector

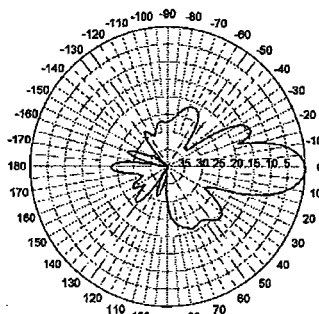
⁵⁾ The antenna weight listed above does not include the brackets weight

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation-pattern¹⁾



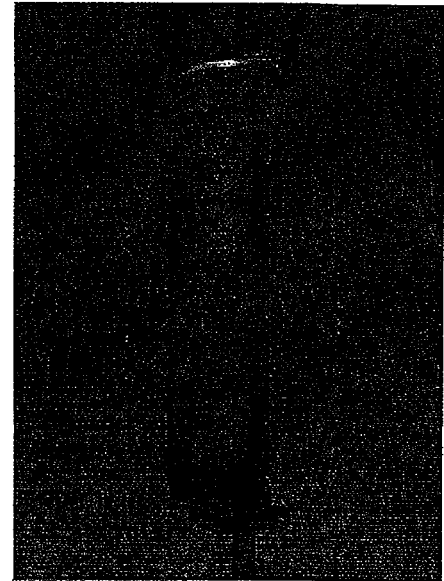
Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back Ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- A 1 1/4" four-channel extrusion running the entire length of the antenna for unmatched strength and rigidity.
- Durable brass feedline design that eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band width and superior performance.
- Air as insulation for virtually no internal signal loss.

Every Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with bottom-fed connector. Contact your Amphenol Antel representative or our company headquarters for the availability of a center-fed connector.

806-960 MHz



Revision Date: 3/28/06

1300 Capital Drive Rockford, IL 61109 Toll-Free (888) 417-9562 Tel. (815) 399-0001
 Fax: (815) 399-0156 Email: antel@antelinc.com www.antelinc.com

Vertically Polarized, Log Periodic 80° / 16 dBi

LPA-185080/8CF

When ordering, replace "___" with connector type.

Mechanical specifications

| | | |
|---|----------------------|----------------------|
| Length | 1204 mm | 47.4 in |
| Width | 104 mm | 4.1 in |
| Depth | 150 mm | 5.9 in |
| Weight | 3.2 kg | 7.0 lbs |
| Wind Area | | |
| Front | 0.125 m ² | 1.35 ft ² |
| Side | 0.144 m ² | 1.55 ft ² |
| Rated Wind Velocity (Safety factor 2.0) | | |
| | >658 km/hr | >409 mph |
| Wind load @ 100 mph (161 km/hr) | | |
| Front | 202 N | 45 lbs |
| Side | 270 N | 60.8 lbs |

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting & Downtilting

Wall mounted or pole tower mount with mounting brackets.

Mounting bracket kit #26799997

Downtilt bracket kit #26799999

The downtilt bracket kit includes the mounting bracket kit.

Electrical specifications

| | |
|----------------------|---------------|
| Frequency Range | 1850-1990 MHz |
| Impedance | 50Ω |
| Connector | NE E-DIN |
| VSWR | <1.4:1 |
| Polarization | Vertical |
| Gain | 16 dBi |
| Power Rating | 250W |
| Half Power Angle | |
| H-Plane | 80° |
| E-Plane | 8° |
| Electrical Downtilt | 0° |
| Null Fill | 10% |
| Lightning Protection | Direct Ground |

¹ Typical Values

² Power Rating limited by connector only

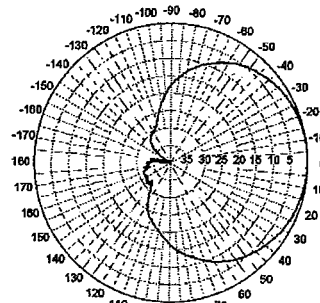
NE indicates an elongated N Connector

E-DIN indicates an elongated DIN Connector

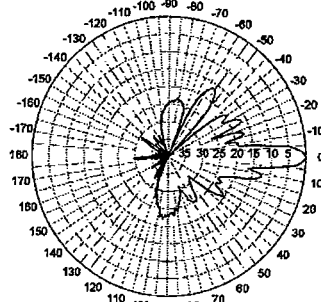
³ The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

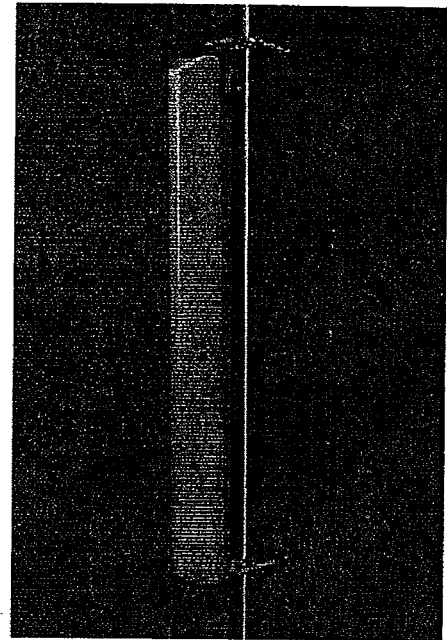
Radiation-pattern¹⁾



Horizontal



Vertical



**Amphenol Antel's
Exclusive 3T (True
Transmission Line
Technology)
Antenna Design:**

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back Ratio.

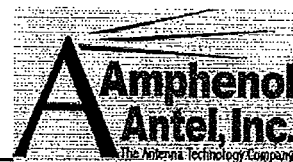
- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

Every Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with center-fed connector only.

CF Denotes a Center-Fed Connector.

1850-1990 MHz



Revision Date: 9/21/04



NATCOMM, LLC

Consulting Engineers

May 3, 2006

Mr. Mark Gauger
Verizon Wireless
99 East River Road
East Hartford, CT 06002

Re: *Verizon – Ochenkowski Tower*
86 Parsonage Hill Road
Northford, CT 06472

Natcomm Project No. 05094

Dear Mark,

We have reviewed the proposed Verizon antenna installation at the above referenced site. The purpose of the review was to determine the feasibility of adding antennas to the existing 195ft. lattice tower located at 86 Parsonage Hill Road in Northford, Connecticut. The review considered the effects of wind load, dead load, ice load and seismic forces in accordance with TIA/EIA-222-G and Connecticut State Building Code. Structural design documents prepared by Central Tower, Inc. dated June 3, 2002 were used as reference material.

The existing antenna configurations are as follows:

| Carrier | Installed Antennas | Future Antennas | Mount | Coax | Elevation (AGL) |
|----------|--------------------|-----------------|---------------|--------|-----------------|
| Sprint | (6) DB980-H90 | (3) DB-980-H90 | 14' Boom-gate | 1-5/8" | 190 feet |
| Sprint | (1) GPS Antenna | n/a | Pipe mount | 7/8" | 75 feet |
| T-Mobile | (6) 59000X/59010X | n/a | 14' Boom-gate | 1-5/8" | 180 feet |
| AT&T | (3) Allgon 7250 | (3) Allgon 7250 | 14' Boom-gate | 1-5/8" | 170 feet |
| Nextel | (12) DB844-H90 | n/a | 14' Boom-gate | 1-5/8" | 160 feet |

The proposed antenna loading is as follows:

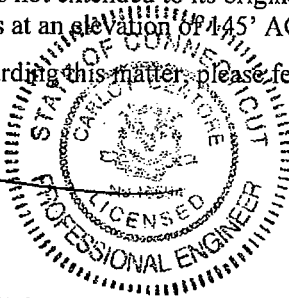
| Carrier | Installed Antennas | Future Antennas | Mount | Coax | Elevation (AGL) |
|---------|--------------------|-----------------|-------------|--------|-----------------|
| Verizon | (2) RWB80015/62CF | n/a | 15' T-Frame | 1-5/8" | 145 feet |
| Verizon | (2) LPA185063/12CF | n/a | 15' T-Frame | 1-5/8" | 145 feet |
| Verizon | (4) RWA80013 | n/a | 15' T-Frame | 1-5/8" | 145 feet |
| Verizon | (4) LPA185080/8CF | n/a | 15' T-Frame | 1-5/8" | 145 feet |

The existing tower is engineered to be extendable to a height of 245'. Provided that the existing tower remains at the height of 195' and that it is not extended to its original design height, it is feasible for Verizon Wireless to install their proposed antennas at an elevation of 145' AGL.

If there are any questions regarding this matter, please feel free to call.

Submitted by:

Carlo F. Centore, P.E.
Senior Project Manger





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

www.ct.gov/csc

March 14, 2006

The Honorable Andrew Esposito III
Mayor
Town of North Branford
Town Hall
1599 Foxon Road
P. O. Box 287
North Branford, CT 06471

RE: **EM-VER-123-007-010-099-060308** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 165 Huntington Road, Scotland; 1657 Wilbur Cross Parkway, Berlin; 310 Watertown Road, Bethlehem; and 88 Parsonage Hill Road, Northford (North Branford), Connecticut.

Dear Mayor Esposito:

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 scheduled for Wednesday, March 22, 2006 at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

If you have any questions or comments regarding this proposal, please call me or inform the council by March 21, 2006.

Thank you for your cooperation and consideration.

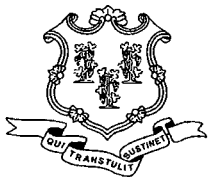
Very truly yours,

S. Derek Phelps
Executive Director

SDP/ap

Enclosure: Notice of Intent

c: Carol Zeeb, Town Planner, Town of North Branford



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

www.ct.gov/csc

March 14, 2006

The Honorable Leo S. Bulvanoski
First Selectman
Town of Bethlehem
P. O. Box 160
Bethlehem, CT 06751-0160

RE: **EM-VER-123-007-010-099-060308** - Celco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 165 Huntington Road, Scotland; 1657 Wilbur Cross Parkway, Berlin; 310 Watertown Road, Bethlehem; and 88 Parsonage Hill Road, Northford (North Branford), Connecticut.

Dear Mr. Bulvanoski:

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If you have any questions or comments regarding this proposal, please call me or inform the council by March 21, 2006.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/ap

Enclosure: Notice of Intent

c: Jeffrey Hamel, Planning and Zoning Chairman, Town of Bethlehem



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

www.ct.gov/csc

March 14, 2006

The Honorable Adam P. Salina
Mayor
Town of Berlin
240 Kensington Road
Kensington, CT 06037

RE: **EM-VER-123-007-010-099-060308** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 165 Huntington Road, Scotland; 1657 Wilbur Cross Parkway, Berlin; 310 Watertown Road, Bethlehem; and 88 Parsonage Hill Road, Northford (North Branford), Connecticut.

Dear Mayor Salina:

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Thank you for your cooperation and consideration.

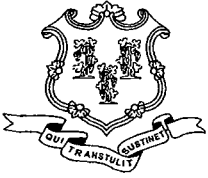
Very truly yours,

S. Derek Phelps
Executive Director

SDP/ap

Enclosure: Notice of Intent

c: Hellyn Riggins, Town Planner, Town of Berlin



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

www.ct.gov/csc

March 14, 2006

The Honorable Elizabeth A. Wilson
First Selectman
Town of Scotland
Town Hall
9 Devotion Road
P. O. Box 122
Scotland, CT 06264

RE: **EM-VER-123-007-010-099-060308** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 165 Huntington Road, Scotland; 1657 Wilbur Cross Parkway, Berlin; 310 Watertown Road, Bethlehem; and 88 Parsonage Hill Road, Northford (North Branford), Connecticut.

Dear Ms. Wilson:

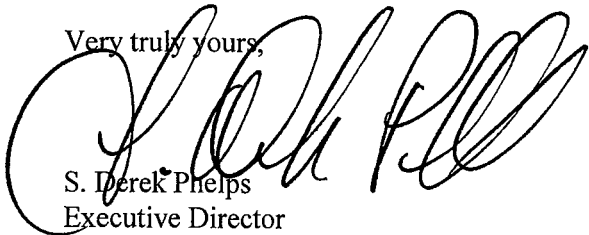
The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

The Council will consider this item at the next meeting scheduled for Wednesday, March 22, 2006 at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

If you have any questions or comments regarding this proposal, please call me or inform the council by March 21, 2006.

Thank you for your cooperation and consideration.

Very truly yours,



S. Derek Phelps
Executive Director

SDP/ap

Enclosure: Notice of Intent

c: Carl S. Fontneau, Town Planner, Town of Scotland

ORIGINAL

ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

EM-VER-123-007-010-099-060908

March 8, 2006

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RECEIVED
MAR 08 2006
CONNECTICUT
SITING COUNCIL

Re: **Notice of Exempt Modification**
165 Huntington Road, Scotland, CT
1657 Wilbur Cross Parkway, Berlin, CT
310 Watertown Road, Bethlehem, CT
88 Parsonage Hill Road, Northford (North Branford), CT

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on each of the existing telecommunications towers described below. Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction, at each facility tower, that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter and attachments are being sent to the chief elected official of each affected municipality.

Huntington Road, Scotland, CT

The Huntington Road facility consists of a 240-foot self-supporting lattice tower capable of supporting multiple carriers within a fenced compound at 165 Huntington Road in Scotland. The tower currently supports Cingular antennas at the 238-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 228-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 1 are Project Plans; a structural letter; and a cumulative power density table for the proposed facility.



Law Offices

BOSTON

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

SARASOTA

www.rc.com

HART1-1315131-1

ORIGINAL

S. Derek Phelps
March 8, 2006
Page 2

Berlin Fire Department, Berlin, CT

The Berlin Fire Department facility consists of a 176-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 1657 Wilbur Cross Parkway in Berlin. The tower is currently shared the Town of Berlin at various levels on the tower; Cingular at the 168-foot level; T-Mobile at the 160-foot level; and Sprint at the 150-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 118-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 2 are Project Plans; a structural analysis; and a cumulative power density table for the proposed Berlin facility.

Watertown Road, Bethlehem, CT

The Watertown Road facility consists of a 195-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound at 310 Watertown Road in Bethlehem. The tower is currently shared by Sprint at the 195-foot level; Nextel at the 185-foot level; and Cingular at the 165-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 175-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 3 are Project Plans; a structural analysis; and a cumulative power density table for the proposed facility.

Parsonage Hill Road, Northford (North Branford), CT

The Parsonage Hill Road facility consists of a 195-foot self-supporting lattice tower capable of supporting multiple carriers within a fenced compound at 88 Parsonage Hill Road in North Branford. The tower is currently shared by Sprint at the 190-foot level; T-Mobile at the 180-foot level; AT&T at the 170-foot level; and Nextel at the 160-foot level on the tower. Cellco proposes to install twelve (12) panel-type antennas at the 145-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower within the fenced compound. Attached behind Tab 4 are Project Plans; a structural letter; and a cumulative power density table for the proposed facility.

The planned modifications to each of these facilities fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. Cellco's proposed modifications will not result in any increase in the overall height of any of the existing structures.



S. Derek Phelps
March 8, 2006
Page 3

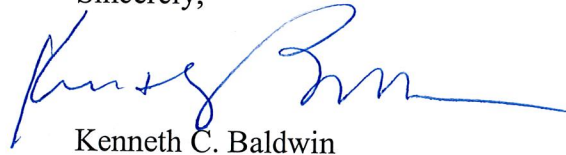
2. Cellco's proposed modifications will not require the extension of the existing site boundaries at any of the sites identified.

3. Cellco's proposed modifications will not increase noise levels at the facility by six decibels or more at any of the facilities.

4. Cellco's proposed modifications will not result in radio frequency (RF) power density levels at any of the facilities that would exceed the Federal Communications Commission (FCC) adopted safety standard.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facilities constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Enclosures

cc: Elizabeth Wilson, Scotland First Selectman
Herman Middlebrooks, Jr., Berlin Town Manager
Leo S. Bulvanoski, Bethlehem First Selectman
Karl F. Kilduff, North Branford Town Manager
Sandy M. Carter



Cellco Partnership

d.b.a. **verizon** wireless

SCOTLAND

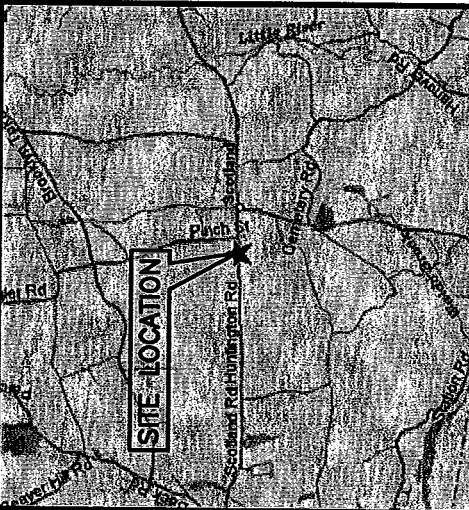
165 HUNTINGTON ROAD
SCOTLAND, CONNECTICUT 06264

NOTE: THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

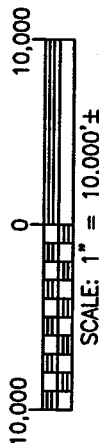
STRUCTURAL NOTE:

NEW CONSTRUCTION REPRESENTED ON THESE PLANS IS PROPOSED PREDICATED ON THE REQUIREMENT THAT A STRUCTURAL ANALYSIS BE PERFORMED BY A LICENSED CONNECTICUT PROFESSIONAL STRUCTURAL ENGINEER AND CERTIFICATION IS GIVEN BY THE ENGINEER THAT THE EXISTING TOWER AND ALL EXISTING AND PROPOSED ANTENNAS AND APPURTENANCES SUPPORTED BY THE TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT STRUCTURAL CAPACITY AND COMPLY WITHOUT THE CONNECTICUT BUILDING CODE AND ALL APPLICABLE EIA/TIA CRITERIA. NO WORK PROPOSED HEREON SHALL BE PROGRESSED WITHOUT CONFIRMATION OF THIS CERTIFICATION.

DIRECTIONS (FROM NEW HAVEN):
START OUT GOING SOUTHEAST ON ELM ST TOWARD ORANGE ST. TURN LEFT ONTO ORANGE ST. TURN RIGHT ONTO TRUMBULL ST. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD I-95. MERGE ONTO GOVERNOR JOHN DAVIS LODGE TURNPIKE/I-95 N VIA THE EXIT ON THE LEFT TOWARD NEW LONDON. MERGE ONTO GOVERNOR JOHN DAVIS LODGE TURNPIKE/I-395 N VIA EXIT 76 ON THE LEFT TOWARD NORWICH/PLAINFIELD. TAKE EXIT 83-TOWARD OCCUM/TAFTVILLE. TURN LEFT ONTO TAFTVILLE OCCUM RD. TURN RIGHT ONTO SCOTLAND RD. TURN RIGHT ONTO BAL TIC RD. STAY STRAIGHT TO GO ONTO DEVOTION RD. TURN LEFT ONTO HUNTINGTON RD.



LOCATION MAP
SCOTLAND, CT



PROJECT SUMMARY

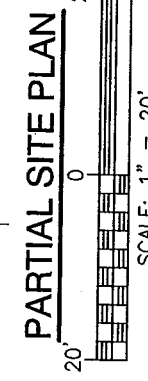
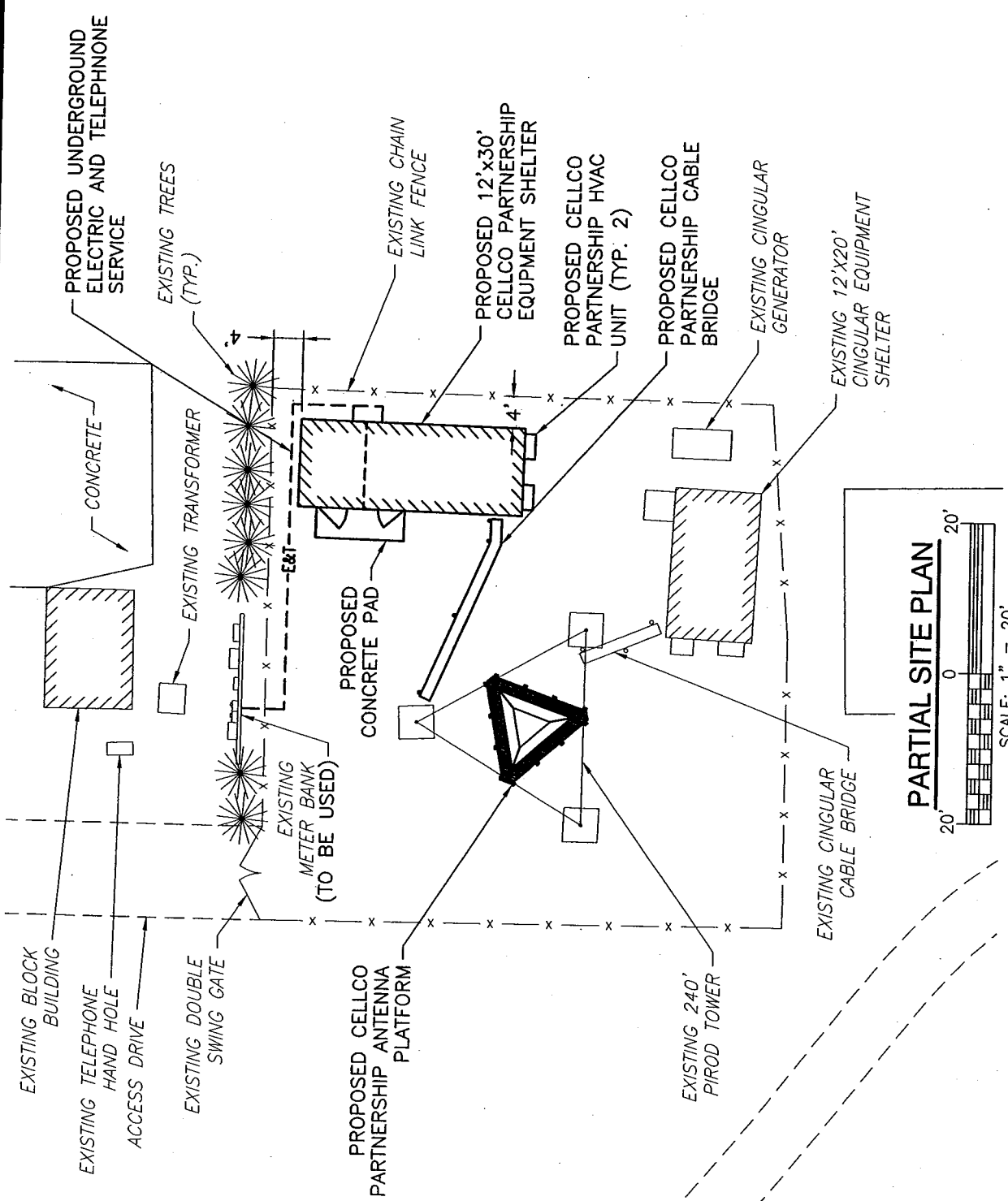
SITE NAME: SCOTLAND
SITE ADDRESS: 165 HUNTINGTON ROAD SCOTLAND, CT 06033
PROPERTY OWNER: GUY PASSARELLO 165 HUNTINGTON ROAD SCOTLAND, CT 06264
TOWER OWNER: SBA NETWORK SERVICES INC. 80 EASTERN BLVD. GLASTONBURY, CT 06033
LESSEE: CELCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
APPLICANT: CELCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON: SANDY CARTER CELCO PARTNERSHIP (860) 830-8219
COORDINATES: LATITUDE: 41°-41'-45" N (NAD 83)
LONGITUDE: 72°-05'-49" W (NAD 83)

SHEET INDEX

| SHEET NO. | DESCRIPTION |
|-----------|--------------------|
| T-1 | TITLE SHEET |
| S-1 | PARTIAL SITE PLAN |
| S-2 | MONOPOLE ELEVATION |

NOTE: DRAWINGS FOR SITING COUNCIL ONLY. NOT TO BE USED FOR CONSTRUCTION.

| | | | | | |
|---|------|---|-------------|---|--|
| SCALE: AS SHOWN | | DESIGNED BY: CKD | | DATE: 02/24/06 | |
| Dewberry-Goodkmd, Inc. A Dewberry Company 59 Elm Street, Suite 101 New Haven, CT 06510 P: (203) 776-2277 F: (203) 776-2288 | | Engineers Planners Surveyors | | PROJECT: 1994000469 LOCATION CODE: 118619 | |
| 0 02/24/06 CMS FINAL SITING COUNCIL | | A 01/30/06 JRF PRELIMINARY SITING COUNCIL | | SITE NAME: SCOTLAND 165 HUNTINGTON ROAD SCOTLAND, CONNECTICUT | |
| NO. | DATE | BY | DESCRIPTION | Cellco Partnership d.b.a. verizon wireless SHEET NO. T-1 | |



PARTIAL SITE PLAN

Cellco Partnership
d.b.a. **verizon wireless**

PROJECT: 1994000469 LOCATION CODE: 118619
SHEET NO. S - 1

SCALE: AS SHOWN
DESIGNED BY: CKD
DATE: 02/24/06

Dewberry-Goodkind, Inc.
A Dewberry Company
Engineers
Planners
Surveyors
59 Elm Street, Suite 101
New Haven, CT 06510
P: (203) 776-2277
F: (203) 776-2268

| NO. | DATE | BY | DESCRIPTION |
|-----|----------|-----|----------------------------|
| 0 | 02/24/06 | CMS | FINAL SITING COUNCIL |
| A | 01/30/06 | JRF | PRELIMINARY SITING COUNCIL |

C OF EXISTING CINGULAR
 ANTENNAS EL. = 238' AGL
 C OF PROPOSED CELCO
 PARTNERSHIP ANTENNAS EL. = 228' AGL

TOP OF TOWER
 EL. = 240' AGL

PROPOSED CELCO
 PARTNERSHIP ANTENNAS
 (4 PER SECTOR, 3 SECTORS,
 12 TOTAL ANTENNAS)

PROPOSED COAX CABLES
 ROUTED UP EXISTING T-LINE
 BRACKETS

EXISTING 240'
 PIROD TOWER

EXISTING CINGULAR
 CABLE BRIDGE

EXISTING CINGULAR
 EQUIPMENT SHELTER

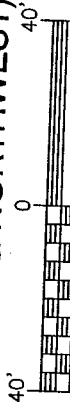
EXISTING CHAIN
 LINK FENCE

PROPOSED CELCO
 PARTNERSHIP CABLE
 BRIDGE

PROPOSED CELCO
 PARTNERSHIP 12'x30'
 EQUIPMENT SHELTER

EXISTING METER BANK
 (TO BE USED)

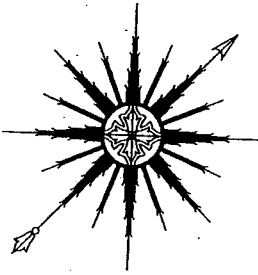
TOWER ELEVATION
 (LOOKING NORTHWEST)



SCALE: 1" = 40'

| NO. | DATE | BY | DESCRIPTION |
|-----|----------|-----|----------------------------|
| 0 | 02/24/06 | CMS | FINAL SITING COUNCIL |
| A | 01/30/06 | JRF | PRELIMINARY SITING COUNCIL |

| | | | | |
|--|--|---------------------------|--|--|
| Dewberry-Goodkind, Inc. A Dewberry Company 59 Elm Street, Suite 101 New Haven, CT 06510 P. (203) 776-2377 F. (203) 776-2288 | | SCALE: AS SHOWN | TOWER ELEVATION | Cellco Partnership d.b.a. verizon wireless |
| Sited by: CKD | | DESIGNED BY: CKD | SITE NAME: SCOTLAND 165 HUNTINGTON ROAD SCOTLAND, CONNECTICUT | PROJECT: 1994000469 LOCATION CODE: 118619 |
| DATE: 02/24/06 | | SHEET NO. S - 2 | | |



ALL-POINTS TECHNOLOGY CORPORATION, P.C.

February 23, 2006

Verizon Wireless
99 East River Drive, 9th Floor
East Hartford, CT 06108

Attn: Esther McNany
Re: 240' Self-Supporting Tower, Scotland, CT

Dear Esther,

I am writing with regard to Verizon Wireless' proposed antennas to be installed on the 240' PiROD self-supporting tower located on Huntington Road in Scotland, Connecticut.

According to PiROD design drawings (Eng. File No. A-115649), the tower is designed to support five 12-panel antenna arrays. The tower currently supports one 12-panel array at approximately 240'. Verizon proposes to install six Antel LPA-185080/12 and six Antel LPA-80080/6 panel antennas on three sector mounts at 230'. Waveguide cables will consist of twelve 1-5/8" lines.

My evaluation, performed in accordance with the Connecticut State Building Code and EIA/TIA-222 Revisions F & G, indicates that the tower is capable of supporting Verizon Wireless' proposed antennas and associated appurtenances. The proposed installation meets original design loads and the anticipated stress levels in the tower and foundation will be significantly less than design capacity.

We appreciate this opportunity to provide our services to you. Please call if you have any questions.

Sincerely,
All-Points Technology Corporation, P.C.

Robert E. Adair, P.E.
Principal

CT141890 Scotland 2-23-06 ltr.doc



General Power Density

Site Name: Scotland, CT
 Tower Height: 240 Ft

| Operator | Operating Frequency (MHz) | Number of Trans | ERP Per Trans (watts) | Total ERP (watts) | Distance to Target (feet) | Calculated Power Density (mW/cm ²) | Maximum Permissible Exposure (mW/cm ²) | Fraction of MPE Exposure (%) |
|---|---------------------------|-----------------|-----------------------|-------------------|---------------------------|--|--|------------------------------|
| Verizon | 875 | 9 | 200 | 1800 | 228 | 0.0125 | 0.583 | 2.13% |
| Verizon | 1900 | 3 | 256 | 768 | 228 | 0.0053 | 1 | 0.53% |
| Cingular | 880 | 6 | 296 | 1776 | 238 | 0.0113 | 0.587 | 1.92% |
| Cingular | 1900 | 3 | 427 | 1281 | 238 | 0.0081 | 1 | 0.81% |
| Total Percentage of Maximum Permissible Exposure | | | | | | | | 5.40% |

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
 mW/cm² = milliwatts per square centimeter
 ERP = Effective Radiated Power



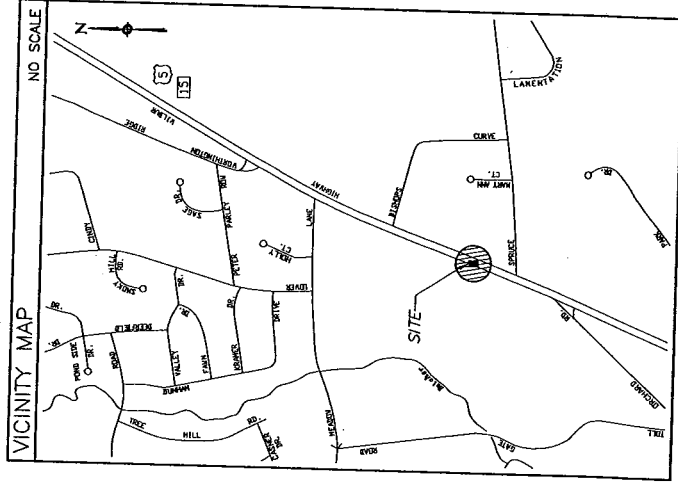
CELLCO PARTNERSHIP
DBA



verizon wireless

BERLIN FIRE DEPARTMENT

1657 WILBUR CROSS PARKWAY
BERLIN, CONNECTICUT



PROJECT SUMMARY

| | |
|-----------------|--|
| SITE NAME: | BERLIN FIRE DEPARTMENT |
| SITE ADDRESS: | 1657 WILBUR CROSS PARKWAY BERLIN, CONNECTICUT |
| CONTACT PERSON: | CELLCO PARTNERSHIP DBA VERIZON WIRELESS (860) 503-1240 |
| ZONE: | BERLIN VOLUNTEER FIRE DEPARTMENT, INC. MAP 23-1, LOT #17, BLOCK 141 |
| CONCRETE CODE: | CONCRETE TYPE BUILDING AND USE CATEGORY |
| OWNER: | BERLIN FIRE DEPARTMENT 1657 WILBUR CROSS PARKWAY BERLIN, CONNECTICUT 06027 |
| APPLICANT: | CELLCO PARTNERSHIP DBA VERIZON WIRELESS EAST HARTFORD, CT 06108 |
| ARCHITECT: | URS CORPORATION A.E.S. 200 ENTERPRISE DRIVE SUITE 30 ROCKY HILL, CT 06067 |
| M/E/P ENGINEER: | URS CORPORATION A.E.S. 200 ENTERPRISE DRIVE SUITE 30 ROCKY HILL, CT 06067 |
| SURVEYOR: | URS CORPORATION A.E.S. 200 ENTERPRISE DRIVE SUITE 30 ROCKY HILL, CT 06067 |

LEGEND

SYMBOL DESCRIPTION

| | |
|---|-----------------------------------|
| (Symbol: Section or Detail Number) | SECTION OR DETAIL NUMBER |
| (Symbol: Sheet Where Detail/Section Occurs) | SHEET WHERE DETAIL/SECTION OCCURS |
| (Symbol: Elevation Number) | ELEVATION NUMBER |
| (Symbol: Sheet Where Elevation Occurs) | SHEET WHERE ELEVATION OCCURS |

ABBREVIATIONS

| | |
|--------|-------------------|
| MIN. | MINIMUM |
| V.I.F. | VERIFY IN FIELD |
| O.C. | ON CENTER |
| P.F. | POUND/SQUARE FOOT |
| TYP. | TYPICAL |
| CONC. | CONCRETE |
| TOP | TOP OF WALL |

SHEET INDEX

| SHEET NO. | DESCRIPTION |
|-----------|---|
| T-1 | TITLE SHEET - GENERAL NOTES AND LEGENDS |
| Z-1 | SITE PLAN AND PARTIAL SITE PLAN |
| Z-2 | EXTERIOR ELEVATIONS |

CELLCO PARTNERSHIP
DBA
verizon wireless

A/E FIRM
URS CORPORATION A.E.S.
785 BRACK AVE SUITE 100
ROCKY HILL, CONNECTICUT
1-800-528-2822

A/E STA.

PROJECT NO.: 389125558

JOB NO.: VT1-005

DRAWN BY: CRS

CHECKED BY:

ISSUED FOR

| | |
|---|--------------------------|
| 1 | 10-08-01-DRAWING |
| 2 | 10-08-01-DRAWING |
| 3 | 10-10-01-DRAWING |
| 4 | 01-23-01-DRAWING |
| 5 | 03-08-01-DRAWING-REVISED |

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BERLIN FIRE DEPARTMENT
1657 WILBUR CROSS PARKWAY
BERLIN, CONNECTICUT

SCALE: AS NOTED

**TITLE SHEET -
GENERAL NOTES
AND LEGENDS**

T-1

| ISSUED FOR | |
|------------|----------------------|
| 1 | 01-06-01 REVIEW |
| 2 | 01-06-01 REVIEW |
| 3 | 07-10-01 REVIEW |
| 4 | 07-10-01 REVIEW |
| 5 | 11-06-01 FINAL-REDES |

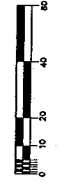
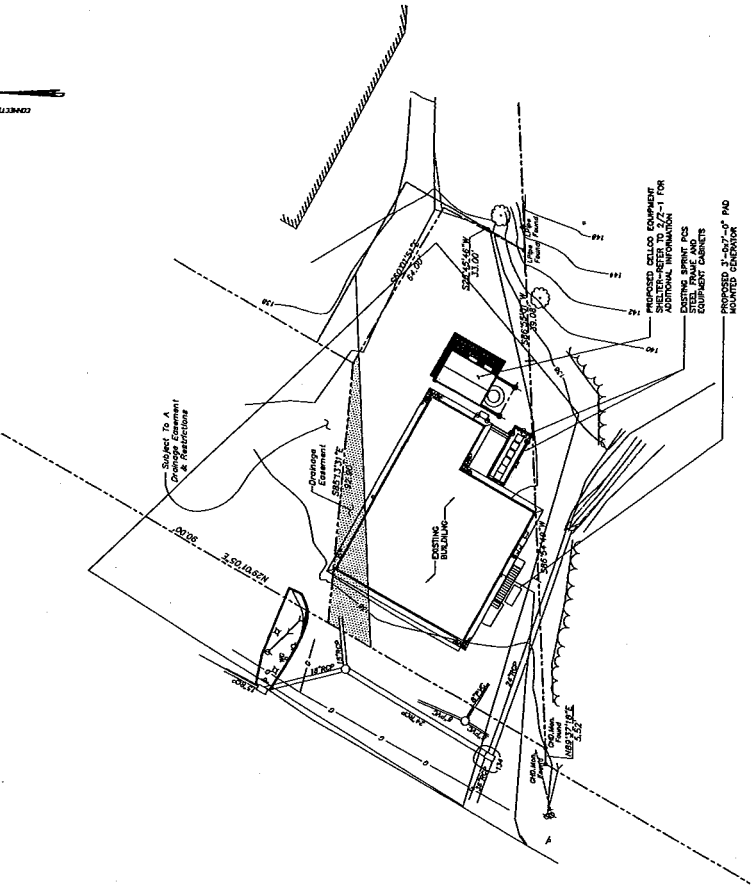
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IS STRICTLY PROHIBITED.

BERLIN FIRE DEPARTMENT
1637 WILBUR CROSS BUSHWAY
BERLIN, CONNECTICUT

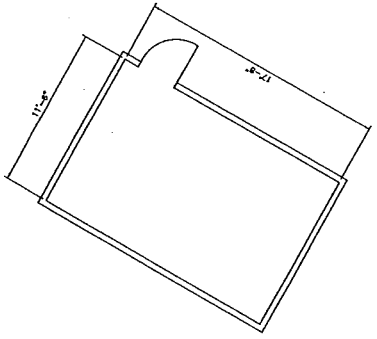
SCALE: AS NOTED

**SITE PLAN AND
PARTIAL SITE PLAN**

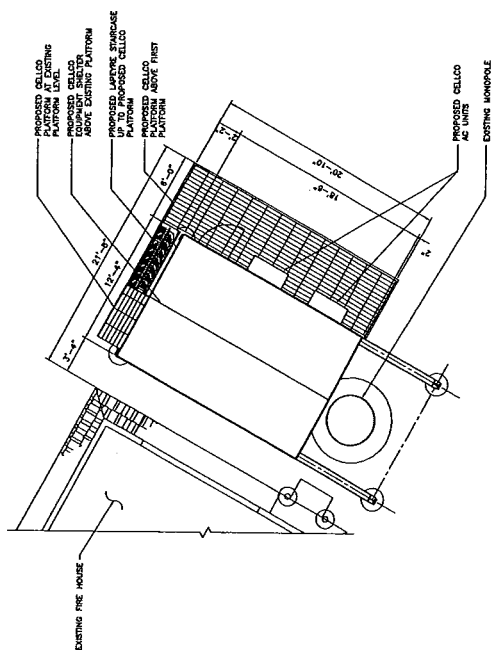
Z-1



1 SITE PLAN
SCALE: 1"=20'-0"
2-1



3 EQUIPMENT ROOM PLAN
SCALE: 1/4"=1'-0"
2-1



2 PARTIAL SITE PLAN
SCALE: 1"=25'-0"
2-1

CELLO PARTNERSHIP
DBA
verizon wireless

AKC FIRM
AKC CONSULTING LLC
795 BROOK STREET, BLDG 5
ROCKY HILL, CONNECTICUT
1-860-833-8882

AKC SCA

PROJECT NO: 35912356

JOB NO: VZ1-1008

DRAWN BY: CRS

CHECKED BY:

ISSUED FOR
1 07-06-20 REVIEW
2 07-06-20 REVIEW
3 07-10-20 REVIEW
4 07-10-20 REVIEW
5 07-06-20 FINAL-REDES

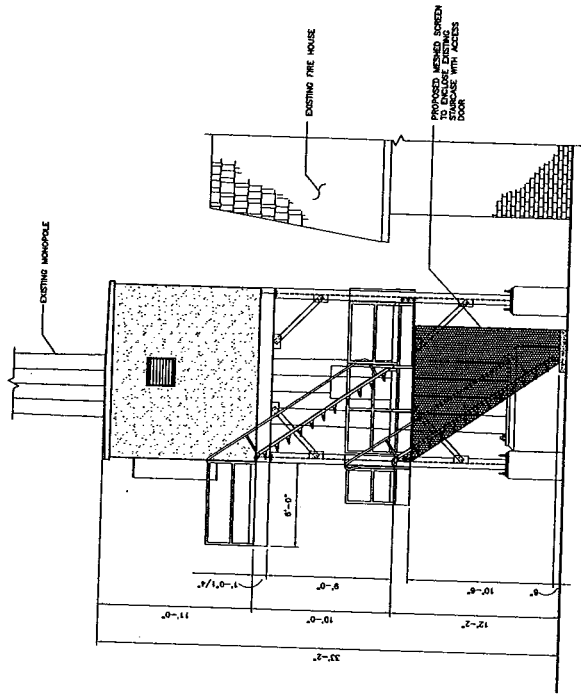
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BERLIN FIRE
DEPARTMENT
1637 MILBURN CROSS PARKWAY
BERLIN, CONNECTICUT

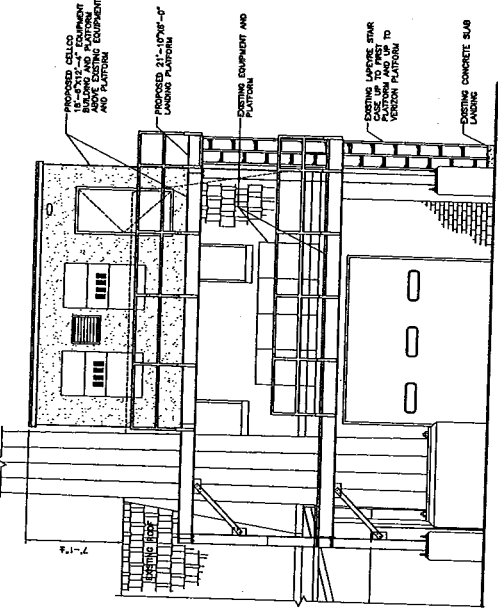
SCALE: AS NOTED

EXTERIOR
ELEVATIONS

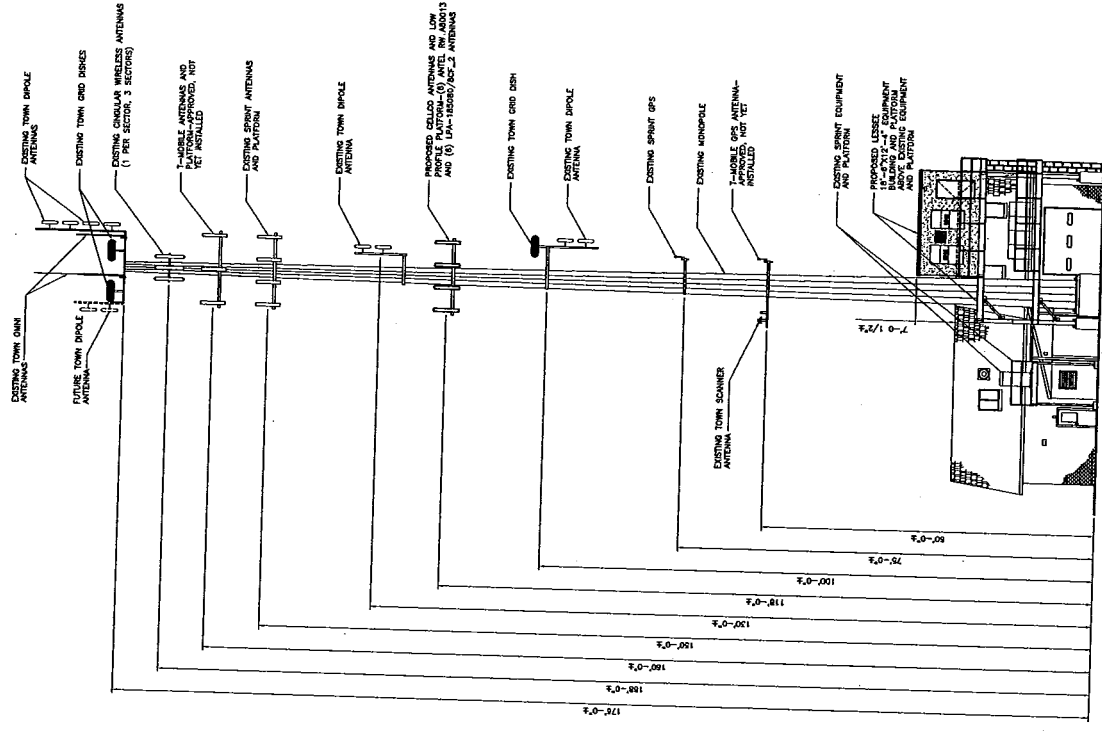
Z-2



2-2 PARTIAL SOUTH ELEVATION
SCALE: 1/4"=1'-0"



3-2 PARTIAL EAST ELEVATION
SCALE: 1/4"=1'-0"



1-2 EAST ELEVATION
SCALE: 1"=10'-0"

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 176' MONOPOLE FOR NEW ANTENNA ARRANGEMENT

Berlin Fire Department
1657 Wilbur Cross Parkway
Berlin, Connecticut

prepared for



veri onwireless

Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

prepared by

URS

URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882

36912556.00008
VZ1-005

February 21, 2006

TABLE OF CONTENTS

- 1. EXECUTIVE SUMMARY**
- 2. INTRODUCTION**
- 3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS**
- 4. FINDINGS AND EVALUATION**
- 5. CONCLUSIONS**
- 6. DRAWINGS AND DATA**
 - **ERI TOWER INPUT / OUTPUT SUMMARY**
 - **ERI TOWER DETAILED OUTPUT**
 - **ANCHOR BOLT AND BASE PLATE ANALYSIS**

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 176' steel monopole structure located at 1657 Wilbur Cross Parkway in Berlin, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-F standard for wind velocity of 80 mph and 69 mph concurrent with 1/2" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report. The proposed Verizon Wireless modification is as follows:

| Proposed Antenna and Mount | Carrier | Antenna Center Elevation |
|---|--------------------|--------------------------|
| Install (6) Antel RWA80013 antennas and (6) Antel LPA-185080/8CF_2 antennas on (1) new 13' low-profile platform with (12) 1 5/8" coax cables within the monopole. | Verizon (Proposed) | @ 118' |

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. **The tower and its foundation are considered structurally adequate with the TIA/EIA-222-F wind load classification specified above and all the existing and proposed antenna loading.**

This analysis is based on:

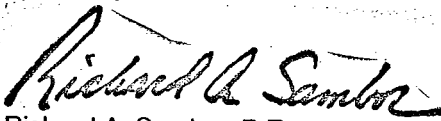
- 1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
- 2) Tower geometry and structural member sizes taken from original construction drawings (EEI Job #: 11129) prepared by Engineered Endeavors, Inc., signed and sealed September 16, 2002.
- 3) Antenna and mount configuration as specified on the following page 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 information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

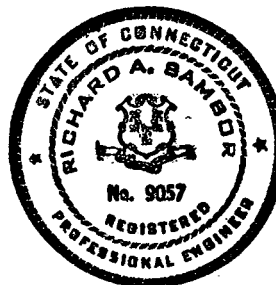
URS Corporation



Richard A. Sambor, P.E.
Manager Facilities Design

RAS/jek

cc: AA, DR, IA – URS
CF/Book



2. INTRODUCTION

The subject tower is located at 1657 Wilbur Cross Parkway in Berlin, Connecticut. The structure is a 176' steel monopole designed by EEI, Inc.

The tower geometry and structure member sizes were taken from the original construction drawings (EEI Job #: 11129) prepared by Engineered Endeavors, Inc., signed and sealed September 16, 2002.

The inventory is summarized in the table below:

| <i>Antenna Type</i> | <i>Carrier</i> | <i>Mount</i> | <i>Antenna Centerline Elevation</i> | <i>Cable</i> |
|--|------------------------------|-------------------------------------|-------------------------------------|--|
| (2) Dipole antennas | Town (existing) | Low-Profile Platform | 176' | (2) 1 5/8" coax cables (within monopole) |
| (2) Grid Dishes | Town (existing) | Low-Profile Platform (listed above) | 176' | (2) 1 5/8" coax cables (within monopole) |
| (2) Omni antennas | Town (existing) | Low-Profile Platform (listed above) | 176' | (2) 1 5/8" coax cables (within monopole) |
| (1) Dipole antenna | Town (future) | Low-Profile Platform (listed above) | 176' | (1) 1 5/8" coax cable (within monopole) |
| (3) Allgon 7184 antennas | Cingular (existing) | (3) Flush Mounts | 168' | (6) 1 5/8" coax cables (within monopole) |
| (9) EMS DR65-19-00DPQ antennas and (12) Decibel PCS 1900 TMA's | T-Mobile (existing) | Low-Profile Platform | 160' | (24) 1 5/8" coax cables (within monopole) |
| (12) Dapa 48000 antennas | Sprint (existing and future) | Low-Profile Platform | 150' | (12) 1 5/8" coax cables (within monopole) |
| (1) Dipole antenna | Town (existing) | Standoff Mount | 130' | (1) 1 5/8" coax cable (within monopole) |
| (1) Dipole antenna | Town (existing) | Standoff Mount | 100' | (1) 1 5/8" coax cable (within monopole) |
| (1) Grid Dish | Town (existing) | Standoff Mount (listed above) | 100' | (1) 1 5/8" coax cable (within monopole) |
| (1) GPS antenna | Sprint (existing) | Standoff Mount | 75' | (1) 1/2" coax cable (within monopole) |
| (1) VIC-100 GPS antenna | T-Mobile (existing) | Standoff Mount | 60' | (1) 1/2" coax cable (within monopole) |
| (1) Scanner antenna | Town (existing) | Standoff Mount | 60' | (1) 1/2" coax cable (within monopole) |
| (6) Antel RWA80013 antennas and (6) Antel LPA-185080/8CF_2 antennas | Verizon (proposed) | Low-Profile Platform | 118' | (12) 1 5/8" coax cables (within monopole) |

This structural analysis of the communications tower was performed by URS Corporation (URS) for Verizon Wireless. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate 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

The structural analysis was done in accordance with TIA/EIA-222-F, Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction, Allowable Stress Design (ASD).

The analysis was conducted using ERI Tower 3.0. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 80 mph Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 69 mph Wind Load (with ice) + Ice Load + Tower Dead Load

Please note that wind pressure is a function of velocity squared. Under Load Condition 2, a 25 percent reduction in wind pressure is allowed by code to account for the unlikelihood of the full wind pressure and ice load occurring at the same time. The same results may be achieved by utilizing a lower wind pressure without taking the 25 percent reduction, as shown above.

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

4. FINDINGS AND EVALUATION

Combined axial and bending stresses on the monopole structure were evaluated to compare with allowable stresses in accordance with AISC. The calculated stresses under the proposed loading were below the allowable stresses. Detailed analysis and calculations for the proposed load condition are provided in section 6 of this report. The anchor bolts and base plate were found to be within allowable limits. No further analysis was conducted on the foundation since the shear and the moment at the top of the foundation were below the original design.

5. CONCLUSIONS

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. **The tower and its foundation are structurally adequate under the TIA/EIA-222-F wind load classification specified above and the proposed antenna loadings.**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cable is installed within the monopole unless specified otherwise.

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. Adding antennas
- B. Removing/replacing antennas
- C. Adding coaxial cables

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:

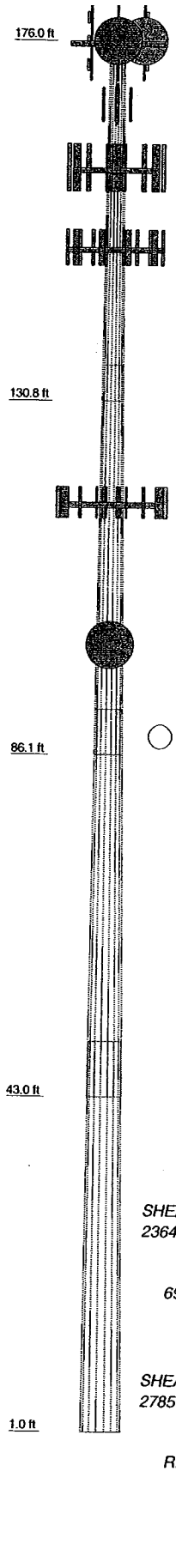
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

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 be 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.

6. DRAWINGS AND DATA

ERI TOWER INPUT/OUTPUT SUMMARY

| | | | | | | |
|---|-------|----|--------|---------|---------|---------|
| 1 | 45.25 | 18 | 0.2500 | 21.0000 | 31.8000 | 3195.0 |
| 2 | 49.13 | 18 | 0.3125 | 30.2260 | 41.8200 | 5921.5 |
| 3 | 48.8 | 18 | 0.3750 | 39.8381 | 51.3600 | 8953.1 |
| 4 | 48.00 | 18 | 0.4375 | 48.9600 | 60.5000 | 12570.6 |
| | | | | | | A572-65 |
| | | | | | | 8953.1 |
| | | | | | | 12570.6 |
| | | | | | | 30640.1 |



APPURTENANCES

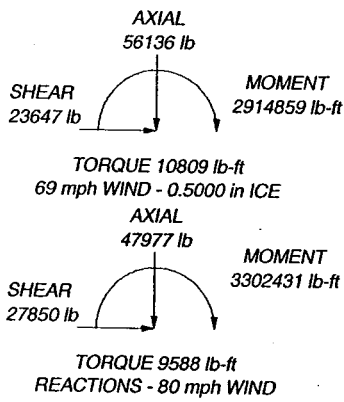
| TYPE | ELEVATION | TYPE | ELEVATION |
|-------------------------------------|-----------|------------------------------------|-----------|
| 12' Low Profile Platform (Town) | 176 | 2 Bay Dipole (Town) | 130 |
| 4 Bay Dipole (Town) | 176 | 6' Side Mount Standoff (Town) | 130 |
| Omni (Town) | 176 | 13' Low Profile Platform (Verizon) | 118 |
| Grid Dish (Town) | 176 | RWA-80013 (Verizon) | 118 |
| Dipole (Town) | 176 | RWA-80013 (Verizon) | 118 |
| Grid Dish (Town) | 176 | LPA-185080/BCFx2 (Verizon) | 118 |
| Omni (Town) | 176 | LPA-185080/BCFx2 (Verizon) | 118 |
| Dipole (future) (Town) | 176 | RWA-80013 (Verizon) | 118 |
| 5'3"x4" Pipe Mount (Cingular) | 168 | RWA-80013 (Verizon) | 118 |
| 5'3"x4" Pipe Mount (Cingular) | 168 | LPA-185080/BCFx2 (Verizon) | 118 |
| 5'3"x4" Pipe Mount (Cingular) | 168 | LPA-185080/BCFx2 (Verizon) | 118 |
| 7184 (Cingular) | 168 | RWA-80013 (Verizon) | 118 |
| 7184 (Cingular) | 168 | RWA-80013 (Verizon) | 118 |
| 7184 (Cingular) | 168 | LPA-185080/BCFx2 (Verizon) | 118 |
| 10' Low Profile Platform (T-Mobile) | 160 | LPA-185080/BCFx2 (Verizon) | 118 |
| (3) DR65-19-00DPQ (T-Mobile) | 160 | 6' Side Mount Standoff (Town) | 100 |
| (3) DR65-19-00DPQ (T-Mobile) | 160 | 4 Bay Dipole (Town) | 100 |
| (3) DR65-19-00DPQ (T-Mobile) | 160 | Grid Dish (Town) | 100 |
| (4) Decibel PCS 1900 TMA (T-Mobile) | 160 | GPS (Sprint) | 75 |
| (4) Decibel PCS 1900 TMA (T-Mobile) | 160 | Side Mount Standoff (Sprint) | 75 |
| (4) Decibel PCS 1900 TMA (T-Mobile) | 160 | Side Mount Standoff (Town) | 60 |
| Low Profile Platform (Sprint) | 150 | Side Mount Standoff (T-Mobile) | 60 |
| (4) 48000 (Sprint) | 150 | GPS (T-Mobile) | 60 |
| (4) 48000 (Sprint) | 150 | Scanner Antenna (Town) | 60 |
| (4) 48000 (Sprint) | 150 | | |

MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---------|--------|--------|-------|----|----|
| A572-65 | 65 ksi | 80 ksi | | | |

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 69%



| | | | |
|--------------------------------|--|---|------------------------------|
| URS Corporation | | Job: 176' EEI Monopole, Berlin, CT | |
| 500 Enterprise Drive, Suite 3B | | Project: Berlin Fire Department | |
| Rocky Hill, CT 06067 | | Client: Verizon Wireless | Drawn by: Jed Kiernan |
| Phone: (860) 529-8882 | | Code: TIA/EIA-222-F | Date: 02/21/06 |
| FAX: (860) 529-3991 | | Scale: NTS | |
| | | Path: P:\F08\ERI Files\176' EEI Monopole.eri | Dwg No. E-1 |

ERI TOWER DETAILED OUTPUT

ERITower

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| | | | |
|---------|-------------------------------|-------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 1 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 69 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

| | | |
|-------------------------------------|--------------------------------------|--|
| Consider Moments - Legs | Distribute Leg Loads As Uniform | Treat Feedline Bundles As Cylinder |
| Consider Moments - Horizontals | Assume Legs Pinned | Use ASCE 10 X-Brace Ly Rules |
| Consider Moments - Diagonals | √ Assume Rigid Index Plate | Calculate Redundant Bracing Forces |
| Use Moment Magnification | Use Clear Spans For Wind Area | Ignore Redundant Members in FEA |
| √ Use Code Stress Ratios | Use Clear Spans For KL/r | SR Leg Bolts Resist Compression |
| √ Use Code Safety Factors - Guys | Retension Guys To Initial Tension | All Leg Panels Have Same Allowable |
| Escalate Ice | Bypass Mast Stability Checks | Offset Girt At Foundation |
| Always Use Max Kz | Use Azimuth Dish Coefficients | Consider Feedline Torque |
| Use Special Wind Profile | Project Wind Area of Appurt. | Include Angle Block Shear Check |
| Include Bolts In Member Capacity | Autocalc Torque Arm Areas | Include Angle Block Shear Check |
| Leg Bolts Are At Top Of Section | SR Members Have Cut Ends | √ Include Shear-Torsion Interaction |
| Secondary Horizontal Braces Leg | √ Sort Capacity Reports By Component | Always Use Sub-Critical Flow |
| Use Diamond Inner Bracing (4 Sided) | Triangulate Diamond Inner Bracing | Use Top Mounted Sockets |
| Add IBC .6D+W Combination | | |

Tapered Pole Section Geometry

| Section | Elevation ft | Section Length ft | Splice Length ft | Number of Sides | Top Diameter in | Bottom Diameter in | Wall Thickness in | Bend Radius in | Pole Grade |
|---------|-----------------|-------------------------|------------------------|-----------------------|-----------------------|--------------------------|-------------------------|----------------------|---------------------|
| L1 | 176.01-130.76 | 45.25 | 4.50 | 18 | 21.0000 | 31.8000 | 0.2500 | 1.0000 | A572-65 (65 ksi) |
| L2 | 130.76-86.13 | 49.13 | 5.75 | 18 | 30.2260 | 41.8200 | 0.3125 | 1.2500 | A572-65 (65 ksi) |
| L3 | 86.13-43.00 | 48.88 | 7.00 | 18 | 39.8381 | 51.3600 | 0.3750 | 1.5000 | A572-65 (65 ksi) |
| L4 | 43.00-1.00 | 49.00 | | 18 | 48.9600 | 60.5000 | 0.4375 | 1.7500 | A572-65 (65 ksi) |

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| | | | |
|----------------|-------------------------------|--------------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 2 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

Tapered Pole Properties

| Section | Tip Dia. in | Area in ² | I in ⁴ | r in | C in | I/C in ³ | J in ⁴ | I/Q in ² | w in | w/t |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|------------------------|---------|--------|
| L1 | 21.3240 | 16.4651 | 895.6507 | 7.3663 | 10.6680 | 83.9568 | 1792.4800 | 8.2341 | 3.2560 | 13.024 |
| | 32.2906 | 25.0349 | 3148.3461 | 11.2003 | 16.1544 | 194.8909 | 6300.8349 | 12.5198 | 5.1568 | 20.627 |
| L2 | 31.7706 | 29.6704 | 3354.2440 | 10.6193 | 15.3548 | 218.4493 | 6712.9015 | 14.8380 | 4.7698 | 15.263 |
| | 42.4651 | 41.1703 | 8961.3641 | 14.7352 | 21.2446 | 421.8192 | 17934.5198 | 20.5890 | 6.8103 | 21.793 |
| L3 | 41.8289 | 46.9709 | 9241.6271 | 14.0094 | 20.2377 | 456.6531 | 18495.4146 | 23.4899 | 6.3515 | 16.937 |
| | 52.1523 | 60.6849 | 19929.7987 | 18.0997 | 26.0909 | 763.8607 | 39885.8215 | 30.3482 | 8.3794 | 22.345 |
| L4 | 51.3893 | 67.3795 | 20042.4648 | 17.2255 | 24.8717 | 805.8353 | 40111.3021 | 33.6962 | 7.8470 | 17.936 |
| | 61.4333 | 83.4043 | 38013.0437 | 21.3222 | 30.7340 | 1236.8401 | 76076.1060 | 41.7101 | 9.8780 | 22.578 |

| Tower Elevation | Gusset Area (per face) | Gusset Thickness | Gusset Grade | Adjust. Factor A _f | Adjust. Factor A _r | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals | Double Angle Stitch Bolt Spacing Horizontals |
|------------------|------------------------|------------------|--------------|-------------------------------|-------------------------------|--------------|--|--|
| ft | ft ² | in | | | | | in | in |
| L1 176.01-130.76 | | | | 1 | 1 | 1 | | |
| L2 130.76-86.13 | | | | 1 | 1 | 1 | | |
| L3 86.13-43.00 | | | | 1 | 1 | 1 | | |
| L4 43.00-1.00 | | | | 1 | 1 | 1 | | |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement | Total Number | C _{AA} | Weight |
|------------------|-------------|--------------|----------------|---------------|--------------|---------------------|--------------|
| | | | | ft | | ft ² /ft | plf |
| 1 5/8 (Town) | C | No | Inside Pole | 176.00 - 4.00 | 7 | No Ice 1/2" Ice | 0.00 1.04 |
| 1 5/8 (Cingular) | C | No | Inside Pole | 169.00 - 7.00 | 6 | No Ice 1/2" Ice | 0.00 1.04 |
| 1 5/8 (T-Mobile) | C | No | Inside Pole | 161.00 - 7.00 | 24 | No Ice 1/2" Ice | 0.00 1.04 |
| 1 5/8 (Town) | C | No | Inside Pole | 161.00 - 7.00 | 2 | No Ice 1/2" Ice | 0.00 1.04 |
| 1 5/8 (Sprint) | C | No | Inside Pole | 151.00 - 7.00 | 12 | No Ice 1/2" Ice | 0.00 1.04 |
| 1 5/8 (Town) | C | No | Inside Pole | 131.00 - 7.00 | 1 | No Ice 1/2" Ice | 0.00 1.04 |
| 1 5/8 (Town) | C | No | Inside Pole | 101.00 - 7.00 | 2 | No Ice 1/2" Ice | 0.00 1.04 |
| 1/2 (Sprint) | C | No | Inside Pole | 76.00 - 7.00 | 1 | No Ice 1/2" Ice | 0.00 0.25 |
| 1/2 (Town) | C | No | Inside Pole | 61.00 - 7.00 | 1 | No Ice 1/2" Ice | 0.00 0.25 |
| 1/2 (T-Mobile) | C | No | Inside Pole | 61.00 - 7.00 | 1 | No Ice 1/2" Ice | 0.00 0.25 |
| 1 5/8 (Verizon) | C | No | Inside Pole | 119.00 - 7.00 | 12 | No Ice 1/2" Ice | 0.00 1.04 |

Feed Line/Linear Appurtenances Section Areas

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| | | | |
|---------|-------------------------------|-------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 3 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

| Tower Section | Tower Elevation ft | Face | A _R ft ² | A _F ft ² | C _A A _A In Face ft ² | C _A A _A Out Face ft ² | Weight lb |
|---------------|-----------------------|------|-----------------------------------|-----------------------------------|---|--|--------------|
| L1 | 176.01-130.76 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L2 | 130.76-86.13 | A | 0.000 | 0.000 | 0.000 | 0.000 | 1638.50 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L3 | 86.13-43.00 | A | 0.000 | 0.000 | 0.000 | 0.000 | 2854.74 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L4 | 43.00-1.00 | A | 0.000 | 0.000 | 0.000 | 0.000 | 2977.69 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | | 0.000 | 0.000 | 0.000 | 0.000 | 2519.88 |

Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | A _R ft ² | A _F ft ² | C _A A _A In Face ft ² | C _A A _A Out Face ft ² | Weight lb |
|---------------|-----------------------|-------------|---------------------|-----------------------------------|-----------------------------------|---|--|--------------|
| L1 | 176.01-130.76 | A | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L2 | 130.76-86.13 | A | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1638.50 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L3 | 86.13-43.00 | A | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 2854.74 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L4 | 43.00-1.00 | A | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 2977.69 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | | | 0.000 | 0.000 | 0.000 | 0.000 | 2519.88 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment | Placement ft | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight lb | |
|---------------------------------|-------------|-------------|---|--------------------|-----------------|---|--|--------------|---------|
| 12' Low Profile Platform (Town) | C | None | | 0.0000 | 176.00 | No Ice | 15.70 | 15.70 | 1300.00 |
| 4 Bay Dipole (Town) | C | From Face | 3.00 | 0.0000 | 176.00 | 1/2" Ice | 20.10 | 20.10 | 1765.00 |
| | | | 0.00 | | | No Ice | 5.40 | 5.40 | 50.00 |
| | | | 0.00 | | | 1/2" Ice | 9.00 | 9.00 | 80.00 |
| Omni (Town) | C | From Face | 3.00 | 0.0000 | 176.00 | No Ice | 5.40 | 5.40 | 50.00 |
| | | | 0.00 | | | 1/2" Ice | 9.00 | 9.00 | 80.00 |
| | | | 0.00 | | | | | | |
| Grid Dish (Town) | C | From Face | 3.00 | 0.0000 | 176.00 | No Ice | 5.40 | 5.40 | 50.00 |
| | | | 0.00 | | | 1/2" Ice | 9.00 | 9.00 | 80.00 |
| | | | 0.00 | | | | | | |
| Dipole (Town) | B | From Face | 3.00 | 0.0000 | 176.00 | No Ice | 5.40 | 5.40 | 50.00 |
| | | | 0.00 | | | 1/2" Ice | 9.00 | 9.00 | 80.00 |
| | | | 0.00 | | | | | | |

ERITower

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Job

176' EEI Monopole, Berlin, CT

Page

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Project

Berlin Fire Department

Date

15:44:19 02/21/06

Client

Verizon Wireless

Designed by

Jed Kiernan

| Description | Face or Leg | Offset Type | Offsets: | | | Azimuth Adjustment | Placement | C _{AA} Front | C _{AA} Side | Weight | |
|-------------------------------------|-------------|-------------|----------|---------|--------|--------------------|-----------|-----------------------|----------------------|--------|---------|
| | | | Horz | Lateral | Vert | | | | | | |
| | | | ft | ft | ft | ° | ft | ft ² | ft ² | lb | |
| Grid Dish (Town) | B | From Face | 0.00 | | | | | | | | |
| | | | 3.00 | 0.0000 | 176.00 | No Ice | 5.40 | 5.40 | 50.00 | | |
| | | | 0.00 | | | 1/2" Ice | 9.00 | 9.00 | 80.00 | | |
| Omni (Town) | A | From Face | 0.00 | | | | | | | | |
| | | | 3.00 | 0.0000 | 176.00 | No Ice | 5.40 | 5.40 | 50.00 | | |
| | | | 0.00 | | | 1/2" Ice | 9.00 | 9.00 | 80.00 | | |
| Dipole (future) (Town) | A | From Face | 0.00 | | | | | | | | |
| | | | 3.00 | 0.0000 | 176.00 | No Ice | 5.40 | 5.40 | 50.00 | | |
| | | | 0.00 | | | 1/2" Ice | 9.00 | 9.00 | 80.00 | | |
| 5'3"x4" Pipe Mount (Cingular) | A | None | 0.00 | | | 0.0000 | 168.00 | No Ice | 1.88 | 1.88 | 57.00 |
| | | | 0.00 | | | | | 1/2" Ice | 2.21 | 2.21 | 73.81 |
| 5'3"x4" Pipe Mount (Cingular) | B | None | 0.00 | | | 0.0000 | 168.00 | No Ice | 1.88 | 1.88 | 57.00 |
| | | | 0.00 | | | | | 1/2" Ice | 2.21 | 2.21 | 73.81 |
| 5'3"x4" Pipe Mount (Cingular) | C | None | 0.00 | | | 0.0000 | 168.00 | No Ice | 1.88 | 1.88 | 57.00 |
| | | | 0.00 | | | | | 1/2" Ice | 2.21 | 2.21 | 73.81 |
| 7184 (Cingular) | A | From Face | 1.00 | 0.0000 | 168.00 | No Ice | 2.21 | 2.21 | 73.81 | | |
| | | | 0.00 | | | 1/2" Ice | 2.68 | 1.89 | 11.20 | | |
| 7184 (Cingular) | B | From Face | 0.00 | | | | | | | | |
| | | | 1.00 | 0.0000 | 168.00 | No Ice | 2.68 | 1.89 | 11.20 | | |
| 7184 (Cingular) | C | From Face | 0.00 | | | | | | | | |
| | | | 1.00 | 0.0000 | 168.00 | No Ice | 2.68 | 1.89 | 11.20 | | |
| 10' Low Profile Platform (T-Mobile) | C | None | 0.00 | | | | | | | | |
| | | | 0.00 | | | 1/2" Ice | 3.00 | 2.21 | 27.10 | | |
| (3) DR65-19-00DPQ (T-Mobile) | A | From Face | 3.00 | 0.0000 | 160.00 | No Ice | 15.70 | 15.70 | 1300.00 | | |
| | | | 0.00 | | | 1/2" Ice | 20.10 | 20.10 | 1765.00 | | |
| (3) DR65-19-00DPQ (T-Mobile) | B | From Face | 0.00 | | | | | | | | |
| | | | 0.00 | | | No Ice | 8.40 | 3.53 | 32.00 | | |
| (3) DR65-19-00DPQ (T-Mobile) | C | From Face | 0.00 | | | | | | | | |
| | | | 0.00 | | | 1/2" Ice | 8.95 | 3.97 | 73.77 | | |
| (4) Decibel PCS 1900 TMA (T-Mobile) | A | From Face | 3.00 | 0.0000 | 160.00 | No Ice | 8.40 | 3.53 | 32.00 | | |
| | | | 0.00 | | | 1/2" Ice | 8.95 | 3.97 | 73.77 | | |
| (4) Decibel PCS 1900 TMA (T-Mobile) | B | From Face | 0.00 | | | | | | | | |
| | | | 0.00 | | | No Ice | 0.00 | 0.63 | 17.60 | | |
| (4) Decibel PCS 1900 TMA (T-Mobile) | C | From Face | 0.00 | | | | | | | | |
| | | | 0.00 | | | 1/2" Ice | 0.00 | 0.81 | 23.50 | | |
| Low Profile Platform (Sprint) | C | None | 0.00 | | | 0.0000 | 150.00 | No Ice | 17.30 | 17.30 | 1500.00 |
| | | | 0.00 | | | | | 1/2" Ice | 22.10 | 22.10 | 2030.00 |
| (4) 48000 (Sprint) | A | From Face | 3.00 | 0.0000 | 150.00 | No Ice | 4.51 | 1.82 | 18.30 | | |
| | | | 0.00 | | | 1/2" Ice | 4.91 | 2.15 | 40.88 | | |
| (4) 48000 (Sprint) | B | From Face | 0.00 | | | | | | | | |
| | | | 3.00 | 0.0000 | 150.00 | No Ice | 4.51 | 1.82 | 18.30 | | |
| (4) 48000 (Sprint) | C | From Face | 0.00 | | | | | | | | |
| | | | 0.00 | | | 1/2" Ice | 4.91 | 2.15 | 40.88 | | |
| 2 Bay Dipole | C | From Face | 3.00 | 0.0000 | 150.00 | No Ice | 4.51 | 1.82 | 18.30 | | |
| | | | 0.00 | | | 1/2" Ice | 4.91 | 2.15 | 40.88 | | |
| 2 Bay Dipole | C | From Face | 6.00 | 0.0000 | 130.00 | No Ice | 5.40 | 5.40 | 50.00 | | |
| | | | 0.00 | | | | | | | | |

ERITower

URS Corporation
 500 Enterprise Drive, Suite 3B
 Rocky Hill, CT 06067
 Phone: (860) 529-8882
 FAX: (860) 529-3991

| | | | |
|----------------|-------------------------------|--------------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 5 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

| Description | Face or Leg | Offset Type | Offsets: | | | Azimuth Adjustment | Placement | CAA Front | CAA Side | Weight |
|------------------------------------|-------------|-------------|----------|---------|------|--------------------|-----------|-----------------|-----------------|---------|
| | | | Horz | Lateral | Vert | | | | | |
| | | | ft | ft | ft | ° | ft | ft ² | ft ² | lb |
| (Town) | | | 0.00 | | | | | | | |
| 6' Side Mount Standoff (Town) | C | From Face | 0.00 | | | 0.0000 | 130.00 | 1/2" Ice 9.00 | 9.00 | 80.00 |
| | | | 3.00 | | | | | No Ice 4.97 | 4.97 | 70.00 |
| | | | 0.00 | | | | | 1/2" Ice 6.12 | 6.12 | 130.00 |
| 6' Side Mount Standoff (Town) | C | From Face | 0.00 | | | 0.0000 | 100.00 | No Ice 4.97 | 4.97 | 70.00 |
| | | | 3.00 | | | | | 1/2" Ice 6.12 | 6.12 | 130.00 |
| 4 Bay Dipole (Town) | C | From Face | 0.00 | | | 0.0000 | 100.00 | No Ice 5.40 | 5.40 | 50.00 |
| | | | 6.00 | | | | | 1/2" Ice 9.00 | 9.00 | 80.00 |
| Grid Dish (Town) | C | From Face | 0.00 | | | 0.0000 | 100.00 | No Ice 5.40 | 5.40 | 50.00 |
| | | | 6.00 | | | | | 1/2" Ice 9.00 | 9.00 | 80.00 |
| Side Mount Standoff (Sprint) | C | From Face | 0.00 | | | 0.0000 | 75.00 | No Ice 4.97 | 4.97 | 70.00 |
| | | | 1.50 | | | | | 1/2" Ice 6.12 | 6.12 | 130.00 |
| GPS (Sprint) | C | From Face | 0.00 | | | 0.0000 | 75.00 | No Ice 1.00 | 1.00 | 15.00 |
| | | | 3.00 | | | | | 1/2" Ice 1.50 | 1.50 | 30.00 |
| Side Mount Standoff (T-Mobile) | C | From Face | 0.00 | | | 0.0000 | 60.00 | No Ice 4.97 | 4.97 | 70.00 |
| | | | 1.50 | | | | | 1/2" Ice 6.12 | 6.12 | 130.00 |
| GPS (T-Mobile) | C | From Face | 0.00 | | | 0.0000 | 60.00 | No Ice 1.00 | 1.00 | 15.00 |
| | | | 3.00 | | | | | 1/2" Ice 1.50 | 1.50 | 30.00 |
| Side Mount Standoff (Town) | C | From Face | 0.00 | | | 0.0000 | 60.00 | No Ice 4.97 | 4.97 | 70.00 |
| | | | 1.50 | | | | | 1/2" Ice 6.12 | 6.12 | 130.00 |
| Scanner Antenna (Town) | C | From Face | 0.00 | | | 0.0000 | 60.00 | No Ice 1.00 | 1.00 | 15.00 |
| | | | 3.00 | | | | | 1/2" Ice 1.50 | 1.50 | 30.00 |
| 13' Low Profile Platform (Verizon) | C | None | 0.00 | | | 0.0000 | 118.00 | No Ice 15.70 | 15.70 | 1300.00 |
| RWA-80013 (Verizon) | A | From Face | 3.00 | | | 0.0000 | 118.00 | 1/2" Ice 20.10 | 20.10 | 1765.00 |
| | | | 6.00 | | | | | No Ice 5.44 | 3.00 | 14.30 |
| | | | 0.00 | | | | | 1/2" Ice 5.83 | 3.31 | 46.80 |
| RWA-80013 (Verizon) | A | From Face | 3.00 | | | 0.0000 | 118.00 | No Ice 5.44 | 3.00 | 14.30 |
| | | | -6.00 | | | | | 1/2" Ice 5.83 | 3.31 | 46.80 |
| LPA-185080/8CFx2 (Verizon) | A | From Face | 0.00 | | | 0.0000 | 118.00 | No Ice 2.09 | 2.79 | 7.00 |
| | | | 3.00 | | | | | 1/2" Ice 2.39 | 3.09 | 25.04 |
| LPA-185080/8CFx2 (Verizon) | A | From Face | 0.00 | | | 0.0000 | 118.00 | No Ice 2.09 | 2.79 | 7.00 |
| | | | -4.00 | | | | | 1/2" Ice 2.39 | 3.09 | 25.04 |
| RWA-80013 (Verizon) | B | From Face | 0.00 | | | 0.0000 | 118.00 | No Ice 5.44 | 3.00 | 14.30 |
| | | | 3.00 | | | | | 1/2" Ice 5.83 | 3.31 | 46.80 |
| RWA-80013 (Verizon) | B | From Face | 0.00 | | | 0.0000 | 118.00 | No Ice 5.44 | 3.00 | 14.30 |
| | | | 6.00 | | | | | 1/2" Ice 5.83 | 3.31 | 46.80 |
| LPA-185080/8CFx2 (Verizon) | B | From Face | 0.00 | | | 0.0000 | 118.00 | No Ice 2.09 | 2.79 | 7.00 |
| | | | 3.00 | | | | | 1/2" Ice 2.39 | 3.09 | 25.04 |
| LPA-185080/8CFx2 (Verizon) | B | From Face | 0.00 | | | 0.0000 | 118.00 | No Ice 2.09 | 2.79 | 7.00 |
| | | | 4.00 | | | | | 1/2" Ice 2.39 | 3.09 | 25.04 |
| | | | 0.00 | | | | | No Ice 2.09 | 2.79 | 7.00 |
| | | | -4.00 | | | | | 1/2" Ice 2.39 | 3.09 | 25.04 |

ERITower

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| | | | |
|----------------|-------------------------------|--------------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 6 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _{Front} | C _A A _{Side} | Weight | |
|-------------------------------|-------------|-------------|----------|------|--------------------|-----------|-----------------------------------|----------------------------------|--------|-------|
| | | | Horz | Vert | | | | | | |
| | | | Lateral | | ° | ft | ft ² | ft ² | lb | |
| | | | ft | ft | | | | | | |
| RWA-80013 (Verizon) | C | From Face | 0.00 | | 0.0000 | 118.00 | No Ice | 5.44 | 3.00 | 14.30 |
| | | | 3.00 | | | | 1/2" Ice | 5.83 | 3.31 | 46.80 |
| | | | 6.00 | | | | | | | |
| RWA-80013 (Verizon) | C | From Face | 0.00 | | 0.0000 | 118.00 | No Ice | 5.44 | 3.00 | 14.30 |
| | | | 3.00 | | | | 1/2" Ice | 5.83 | 3.31 | 46.80 |
| | | | -6.00 | | | | | | | |
| LPA-185080/8CFx2 (Verizon) | C | From Face | 0.00 | | 0.0000 | 118.00 | No Ice | 2.09 | 2.79 | 7.00 |
| | | | 3.00 | | | | 1/2" Ice | 2.39 | 3.09 | 25.04 |
| | | | 4.00 | | | | | | | |
| LPA-185080/8CFx2 (Verizon) | C | From Face | 0.00 | | 0.0000 | 118.00 | No Ice | 2.09 | 2.79 | 7.00 |
| | | | 3.00 | | | | 1/2" Ice | 2.39 | 3.09 | 25.04 |
| | | | -4.00 | | | | | | | |
| | | | 0.00 | | | | | | | |

Tower Pressures - No Ice

$$G_H = 1.690$$

| Section Elevation | z | K _Z | q _z | A _G | F a c e | A _F | A _R | A _{leg} | Leg % | C _A A _{In Face} | C _A A _{Out Face} |
|-------------------|--------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|-------------------------------------|--------------------------------------|
| ft | ft | | psf | ft ² | e | ft ² | ft ² | ft ² | | ft ² | ft ² |
| L1 176.01-130.76 | 152.08 | 1.547 | 25 | 99.550 | A | 0.000 | 99.550 | 99.550 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 99.550 | 100.00 | | | |
| | | | | | C | 0.000 | 99.550 | 100.00 | | | |
| L2 130.76-86.13 | 107.70 | 1.402 | 23 | 135.950 | A | 0.000 | 135.950 | 135.950 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 135.950 | 100.00 | | | |
| | | | | | C | 0.000 | 135.950 | 100.00 | | | |
| L3 86.13-43.00 | 64.29 | 1.21 | 20 | 166.326 | A | 0.000 | 166.326 | 166.326 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 166.326 | 100.00 | | | |
| | | | | | C | 0.000 | 166.326 | 100.00 | | | |
| L4 43.00-1.00 | 21.38 | 1 | 16 | 194.440 | A | 0.000 | 194.440 | 194.440 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 194.440 | 100.00 | | | |
| | | | | | C | 0.000 | 194.440 | 100.00 | | | |

Tower Pressure - With Ice

$$G_H = 1.690$$

| Section Elevation | z | K _Z | q _z | t _z | A _G | F a c e | A _F | A _R | A _{leg} | Leg % | C _A A _{In Face} | C _A A _{Out Face} |
|-------------------|--------|----------------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|-------------------------------------|--------------------------------------|
| ft | ft | | psf | in | ft ² | e | ft ² | ft ² | ft ² | | ft ² | ft ² |
| L1 176.01-130.76 | 152.08 | 1.547 | 19 | 0.5000 | 103.321 | A | 0.000 | 103.321 | 103.321 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 103.321 | 100.00 | | | |
| | | | | | | C | 0.000 | 103.321 | 100.00 | | | |
| L2 130.76-86.13 | 107.70 | 1.402 | 17 | 0.5000 | 139.669 | A | 0.000 | 139.669 | 139.669 | 100.00 | 0.000 | 0.000 |

| | | | | |
|---|---------|-------------------------------|-------------|-------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 176' EEI Monopole, Berlin, CT | Page | 7 of 21 |
| | Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| | Client | Verizon Wireless | Designed by | Jed Kiernan |
| | | | | |

| Section Elevation | z | K _Z | q _z | t _z | A _G | F a c e | A _F | A _R | A _{leg} | Leg % | C _{AA} In Face | C _{AA} Out Face |
|-------------------|-------|----------------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|-------------------------|--------------------------|
| ft | ft | | psf | in | ft ² | | ft ² | ft ² | ft ² | | ft ² | ft ² |
| L3 86.13-43.00 | 64.29 | 1.21 | 15 | 0.5000 | 169.920 | B | 0.000 | 139.669 | 169.920 | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 139.669 | | | | |
| | | | | | | A | 0.000 | 169.920 | | | | |
| L4 43.00-1.00 | 21.38 | 1 | 12 | 0.5000 | 197.940 | B | 0.000 | 169.920 | 197.940 | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 169.920 | | | | |
| | | | | | | A | 0.000 | 197.940 | | | | |
| | | | | | | B | 0.000 | 197.940 | | 100.00 | | |
| | | | | | | C | 0.000 | 197.940 | | 100.00 | | |

Tower Pressure - Service

$G_H = 1.690$

| Section Elevation | z | K _Z | q _z | A _G | F a c e | A _F | A _R | A _{leg} | Leg % | C _{AA} In Face | C _{AA} Out Face |
|-------------------|--------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|-------------------------|--------------------------|
| ft | ft | | psf | ft ² | | ft ² | ft ² | ft ² | | ft ² | ft ² |
| L1 176.01-130.76 | 152.08 | 1.547 | 10 | 99.550 | A | 0.000 | 99.550 | 99.550 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 99.550 | | | | |
| | | | | | C | 0.000 | 99.550 | | | | |
| L2 130.76-86.13 | 107.70 | 1.402 | 9 | 135.950 | A | 0.000 | 135.950 | 135.950 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 135.950 | | | | |
| | | | | | C | 0.000 | 135.950 | | | | |
| L3 86.13-43.00 | 64.29 | 1.21 | 8 | 166.326 | A | 0.000 | 166.326 | 166.326 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 166.326 | | | | |
| | | | | | C | 0.000 | 166.326 | | | | |
| L4 43.00-1.00 | 21.38 | 1 | 6 | 194.440 | A | 0.000 | 194.440 | 194.440 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 194.440 | | | | |
| | | | | | C | 0.000 | 194.440 | | | | |

Tower Forces - No Ice - Wind Normal To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 2769.59 | 61.21 | C |
| | | | B | 1 | 0.65 | 1 | 1 | | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | | | | | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 3423.91 | 76.72 | C |
| | | | B | 1 | 0.65 | 1 | 1 | | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | | | | | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 3603.07 | 83.54 | C |
| | | | B | 1 | 0.65 | 1 | 1 | | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | | | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | A | 1 | 0.65 | 1 | 1 | 1 | 166.326 | 3499.50 | 83.32 | C |
| | | | B | 1 | 0.65 | 1 | 1 | | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | | | | | |
| Sum Weight: | 9990.81 | 30640.15 | | 1 | 0.65 | 1 | 1 | 1 | 1083122.9 | 13296.06 | | |
| | | | | | | | | OTM | 5 lb-ft | | | |

ERITower

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| | | | |
|---------|-------------------------------|-------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 8 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

Tower Forces - No Ice - Wind 45 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|----------------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 2769.59 | 61.21 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 99.550 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 99.550 | | | | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 3423.91 | 76.72 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 135.950 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 135.950 | | | | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | A | 1 | 0.65 | 1 | 1 | 1 | 166.326 | 3603.07 | 83.54 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 166.326 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 166.326 | | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | A | 1 | 0.65 | 1 | 1 | 1 | 194.440 | 3499.50 | 83.32 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 194.440 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 194.440 | | | | |
| Sum Weight: | 9990.81 | 30640.15 | | | | | | OTM | 1083122.9 5 lb-ft | 13296.06 | | |

Tower Forces - No Ice - Wind 60 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|----------------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 2769.59 | 61.21 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 99.550 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 99.550 | | | | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 3423.91 | 76.72 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 135.950 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 135.950 | | | | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | A | 1 | 0.65 | 1 | 1 | 1 | 166.326 | 3603.07 | 83.54 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 166.326 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 166.326 | | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | A | 1 | 0.65 | 1 | 1 | 1 | 194.440 | 3499.50 | 83.32 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 194.440 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 194.440 | | | | |
| Sum Weight: | 9990.81 | 30640.15 | | | | | | OTM | 1083122.9 5 lb-ft | 13296.06 | | |

Tower Forces - No Ice - Wind 90 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 2769.59 | 61.21 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 99.550 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 99.550 | | | | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 3423.91 | 76.72 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 135.950 | | | | |

| | | | | |
|---|---------|-------------------------------|-------------|-------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 176' EEI Monopole, Berlin, CT | Page | 9 of 21 |
| | Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| | Client | Verizon Wireless | Designed by | Jed Kiernan |

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | C | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 3603.07 | 83.54 | C |
| | | | A | 1 | 0.65 | 1 | 1 | 166.326 | | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 166.326 | | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | C | 1 | 0.65 | 1 | 1 | 166.326 | 194.440 | 3499.50 | 83.32 | C |
| | | | A | 1 | 0.65 | 1 | 1 | 194.440 | | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 194.440 | | | | |
| Sum Weight: | 9990.81 | 30640.15 | | | | | | OTM 1083122.9 | 194.440 | 13296.06 | | |
| | | | | | | | | 5 lb-ft | | | | |

Tower Forces - With Ice - Wind Normal To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3946.23 | A | 1 | 0.65 | 1 | 1 | 1 | 103.321 | 2155.87 | 47.64 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| L2 130.76-86.13 | 2854.74 | 6942.14 | A | 1 | 0.65 | 1 | 1 | 1 | 139.669 | 2638.18 | 59.11 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| L3 86.13-43.00 | 2977.69 | 10198.20 | A | 1 | 0.65 | 1 | 1 | 1 | 169.920 | 2760.69 | 64.01 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| L4 43.00-1.00 | 2519.88 | 14023.54 | A | 1 | 0.65 | 1 | 1 | 1 | 169.920 | 197.940 | 63.62 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| Sum Weight: | 9990.81 | 35110.10 | | | | | | OTM 836383.03 | 197.940 | 10226.61 | | |
| | | | | | | | | lb-ft | | | | |

Tower Forces - With Ice - Wind 45 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3946.23 | A | 1 | 0.65 | 1 | 1 | 1 | 103.321 | 2155.87 | 47.64 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| L2 130.76-86.13 | 2854.74 | 6942.14 | A | 1 | 0.65 | 1 | 1 | 1 | 139.669 | 2638.18 | 59.11 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| L3 86.13-43.00 | 2977.69 | 10198.20 | A | 1 | 0.65 | 1 | 1 | 1 | 169.920 | 2760.69 | 64.01 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| L4 43.00-1.00 | 2519.88 | 14023.54 | A | 1 | 0.65 | 1 | 1 | 1 | 169.920 | 197.940 | 63.62 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| Sum Weight: | 9990.81 | 35110.10 | | | | | | OTM 836383.03 | 197.940 | 10226.61 | | |
| | | | | | | | | lb-ft | | | | |

| | | |
|---|---|-----------------------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 176' EEI Monopole, Berlin, CT | Page 10 of 21 |
| | Project Berlin Fire Department | Date 15:44:19 02/21/06 |
| | Client Verizon Wireless | Designed by Jed Kiernan |

Tower Forces - With Ice - Wind 60 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3946.23 | A | 1 | 0.65 | 1 | 1 | 1 | 103.321 | 2155.87 | 47.64 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| L2 130.76-86.13 | 2854.74 | 6942.14 | A | 1 | 0.65 | 1 | 1 | 1 | 139.669 | 2638.18 | 59.11 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| L3 86.13-43.00 | 2977.69 | 10198.20 | A | 1 | 0.65 | 1 | 1 | 1 | 169.920 | 2760.69 | 64.01 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| L4 43.00-1.00 | 2519.88 | 14023.54 | A | 1 | 0.65 | 1 | 1 | 1 | 197.940 | 2671.86 | 63.62 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| Sum Weight: | 9990.81 | 35110.10 | | | | | | OTM | 836383.03 lb-ft | 10226.61 | | |

Tower Forces - With Ice - Wind 90 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|----------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3946.23 | A | 1 | 0.65 | 1 | 1 | 1 | 103.321 | 2155.87 | 47.64 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 103.321 | | | | |
| L2 130.76-86.13 | 2854.74 | 6942.14 | A | 1 | 0.65 | 1 | 1 | 1 | 139.669 | 2638.18 | 59.11 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 139.669 | | | | |
| L3 86.13-43.00 | 2977.69 | 10198.20 | A | 1 | 0.65 | 1 | 1 | 1 | 169.920 | 2760.69 | 64.01 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 169.920 | | | | |
| L4 43.00-1.00 | 2519.88 | 14023.54 | A | 1 | 0.65 | 1 | 1 | 1 | 197.940 | 2671.86 | 63.62 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 197.940 | | | | |
| Sum Weight: | 9990.81 | 35110.10 | | | | | | OTM | 836383.03 lb-ft | 10226.61 | | |

Tower Forces - Service - Wind Normal To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 1081.87 | 23.91 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 99.550 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 99.550 | | | | |

| | | | | |
|---|---------|-------------------------------|-------------|-------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 176' EEI Monopole, Berlin, CT | Page | 11 of 21 |
| | Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| | Client | Verizon Wireless | Designed by | Jed Kiernan |
| | | | | |

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 1337.47 | 29.97 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 166.326 | 1407.45 | 32.63 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | A | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 194.440 | 1366.99 | 32.55 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 194.440 | | | |
| Sum Weight: | 9990.81 | 30640.15 | | | | | | | OTM 423094.90 | 5193.77 | | |
| | | | | | | | | | lb-ft | | | |

Tower Forces - Service - Wind 45 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 1081.87 | 23.91 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 99.550 | | | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 1337.47 | 29.97 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 166.326 | 1407.45 | 32.63 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | A | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 194.440 | 1366.99 | 32.55 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 194.440 | | | |
| Sum Weight: | 9990.81 | 30640.15 | | | | | | | OTM 423094.90 | 5193.77 | | |
| | | | | | | | | | lb-ft | | | |

Tower Forces - Service - Wind 60 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 1081.87 | 23.91 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 99.550 | | | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 1337.47 | 29.97 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 166.326 | 1407.45 | 32.63 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | A | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 194.440 | 1366.99 | 32.55 | C |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 194.440 | | | |

| | | | | |
|---|---------|-------------------------------|-------------|-------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 176' EEI Monopole, Berlin, CT | Page | 12 of 21 |
| | Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| | Client | Verizon Wireless | Designed by | Jed Kiernan |
| | | | | |

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|--------------------|---------|-----|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| Sum Weight: | 9990.81 | 30640.15 | | | | | | OTM | 423094.90 lb-ft | 5193.77 | | |

Tower Forces - Service - Wind 90 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|--------------------|---------|-------|------------|
| ft | lb | lb | | | | | | | ft ² | lb | plf | |
| L1 176.01-130.76 | 1638.50 | 3195.00 | A | 1 | 0.65 | 1 | 1 | 1 | 99.550 | 1081.87 | 23.91 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 99.550 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 99.550 | | | |
| L2 130.76-86.13 | 2854.74 | 5921.52 | A | 1 | 0.65 | 1 | 1 | 1 | 135.950 | 1337.47 | 29.97 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 135.950 | | | |
| L3 86.13-43.00 | 2977.69 | 8953.08 | A | 1 | 0.65 | 1 | 1 | 1 | 166.326 | 1407.45 | 32.63 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 166.326 | | | |
| L4 43.00-1.00 | 2519.88 | 12570.55 | A | 1 | 0.65 | 1 | 1 | 1 | 194.440 | 1366.99 | 32.55 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 194.440 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 194.440 | | | |
| Sum Weight: | 9990.81 | 30640.15 | | | | | | OTM | 423094.90 lb-ft | 5193.77 | | |

Force Totals

| Load Case | Vertical Forces | Sum of Forces X | Sum of Forces Z | Sum of Overturning Moments, M _x | Sum of Overturning Moments, M _z | Sum of Torques |
|--------------------------|-----------------|-----------------|-----------------|--|--|----------------|
| | lb | lb | lb | lb-ft | lb-ft | lb-ft |
| Leg Weight | 30640.15 | | | | | |
| Bracing Weight | 0.00 | | | | | |
| Total Member Self-Weight | 30640.15 | | | | | |
| Total Weight | 47977.16 | | | 2884.73 | 0.00 | |
| Wind 0 deg - No Ice | | 0.00 | -27849.50 | 2884.73 | 0.00 | |
| Wind 30 deg - No Ice | | 13924.75 | -24118.38 | -3192300.48 | 0.00 | 0.00 |
| Wind 45 deg - No Ice | | 19692.57 | -19692.57 | -2764226.83 | -1597592.61 | 4815.19 |
| Wind 60 deg - No Ice | | 24118.38 | -13924.75 | -2256452.40 | -2259337.13 | 6809.71 |
| Wind 90 deg - No Ice | | 27849.50 | 0.00 | -1594707.87 | -2767111.56 | 8340.16 |
| Wind 120 deg - No Ice | | 24118.38 | 13924.75 | 2884.73 | -3195185.21 | 9630.39 |
| Wind 135 deg - No Ice | | 19692.57 | 19692.57 | 1600477.34 | -2767111.56 | 8340.16 |
| Wind 150 deg - No Ice | | 13924.75 | 24118.38 | 2262221.86 | -2259337.13 | 6809.71 |
| Wind 180 deg - No Ice | | 0.00 | 27849.50 | 2769996.30 | -1597592.61 | 4815.19 |
| Wind 210 deg - No Ice | | -13924.75 | 24118.38 | 3198069.95 | 0.00 | 0.00 |
| Wind 225 deg - No Ice | | -19692.57 | 19692.57 | 2769996.30 | 1597592.61 | -4815.19 |
| Wind 240 deg - No Ice | | -24118.38 | 13924.75 | 2262221.86 | 2259337.13 | -6809.71 |
| Wind 270 deg - No Ice | | -27849.50 | 0.00 | 1600477.34 | 2767111.56 | -8340.16 |
| Wind 300 deg - No Ice | | -24118.38 | -13924.75 | 2884.73 | 3195185.21 | -9630.39 |
| Wind 315 deg - No Ice | | -19692.57 | -19692.57 | -1594707.87 | 2767111.56 | -8340.16 |
| Wind 330 deg - No Ice | | -13924.75 | -24118.38 | -2256452.40 | 2259337.13 | -6809.71 |
| Member Ice | 4469.95 | | | -2764226.83 | 1597592.61 | -4815.19 |

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| | | | |
|---------|-------------------------------|-------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 13 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

| Load Case | Vertical Forces lb | Sum of Forces X lb | Sum of Forces Z lb | Sum of Overturning Moments, M _x lb-ft | Sum of Overturning Moments, M _z lb-ft | Sum of Torques lb-ft |
|------------------------|-----------------------|-----------------------|-----------------------|---|---|-------------------------|
| Total Weight Ice | 56136.20 | | | 5049.60 | 0.00 | |
| Wind 0 deg - Ice | | 0.00 | -23646.78 | -2785722.53 | 0.00 | 0.00 |
| Wind 30 deg - Ice | | 11823.39 | -20478.71 | -2411829.96 | -1395386.07 | 5423.17 |
| Wind 45 deg - Ice | | 16720.80 | -16720.80 | -1968324.29 | -1973373.90 | 7669.52 |
| Wind 60 deg - Ice | | 20478.71 | -11823.39 | -1390336.46 | -2416879.56 | 9393.20 |
| Wind 90 deg - Ice | | 23646.78 | 0.00 | 5049.60 | -2790772.13 | 10846.33 |
| Wind 120 deg - Ice | | 20478.71 | 11823.39 | 1400435.67 | -2416879.56 | 9393.20 |
| Wind 135 deg - Ice | | 16720.80 | 16720.80 | 1978423.50 | -1973373.90 | 7669.52 |
| Wind 150 deg - Ice | | 11823.39 | 20478.71 | 2421929.17 | -1395386.07 | 5423.17 |
| Wind 180 deg - Ice | | 0.00 | 23646.78 | 2795821.74 | 0.00 | 0.00 |
| Wind 210 deg - Ice | | -11823.39 | 20478.71 | 2421929.17 | 1395386.07 | -5423.17 |
| Wind 225 deg - Ice | | -16720.80 | 16720.80 | 1978423.50 | 1973373.90 | -7669.52 |
| Wind 240 deg - Ice | | -20478.71 | 11823.39 | 1400435.67 | 2416879.56 | -9393.20 |
| Wind 270 deg - Ice | | -23646.78 | 0.00 | 5049.60 | 2790772.13 | -10846.33 |
| Wind 300 deg - Ice | | -20478.71 | -11823.39 | -1390336.46 | 2416879.56 | -9393.20 |
| Wind 315 deg - Ice | | -16720.80 | -16720.80 | -1968324.29 | 1973373.90 | -7669.52 |
| Wind 330 deg - Ice | | -11823.39 | -20478.71 | -2411829.96 | 1395386.07 | -5423.17 |
| Total Weight | 47977.16 | | | 2884.73 | 0.00 | |
| Wind 0 deg - Service | | 0.00 | -10878.71 | -1245234.49 | 0.00 | 0.00 |
| Wind 30 deg - Service | | 5439.36 | -9421.24 | -1078018.22 | -624059.61 | 1880.94 |
| Wind 45 deg - Service | | 7692.41 | -7692.41 | -879668.83 | -882553.57 | 2660.04 |
| Wind 60 deg - Service | | 9421.24 | -5439.36 | -621174.88 | -1080902.95 | 3257.88 |
| Wind 90 deg - Service | | 10878.71 | 0.00 | 2884.73 | -1248119.22 | 3761.87 |
| Wind 120 deg - Service | | 9421.24 | 5439.36 | 626944.34 | -1080902.95 | 3257.88 |
| Wind 135 deg - Service | | 7692.41 | 7692.41 | 885438.30 | -882553.57 | 2660.04 |
| Wind 150 deg - Service | | 5439.36 | 9421.24 | 1083787.69 | -624059.61 | 1880.94 |
| Wind 180 deg - Service | | 0.00 | 10878.71 | 1251003.96 | 0.00 | 0.00 |
| Wind 210 deg - Service | | -5439.36 | 9421.24 | 1083787.69 | 624059.61 | -1880.94 |
| Wind 225 deg - Service | | -7692.41 | 7692.41 | 885438.30 | 882553.57 | -2660.04 |
| Wind 240 deg - Service | | -9421.24 | 5439.36 | 626944.34 | 1080902.95 | -3257.88 |
| Wind 270 deg - Service | | -10878.71 | 0.00 | 2884.73 | 1248119.22 | -3761.87 |
| Wind 300 deg - Service | | -9421.24 | -5439.36 | -621174.88 | 1080902.95 | -3257.88 |
| Wind 315 deg - Service | | -7692.41 | -7692.41 | -879668.83 | 882553.57 | -2660.04 |
| Wind 330 deg - Service | | -5439.36 | -9421.24 | -1078018.22 | 624059.61 | -1880.94 |

Load Combinations

| Comb. No. | Description |
|-----------|----------------------------|
| 1 | Dead Only |
| 2 | Dead+Wind 0 deg - No Ice |
| 3 | Dead+Wind 30 deg - No Ice |
| 4 | Dead+Wind 45 deg - No Ice |
| 5 | Dead+Wind 60 deg - No Ice |
| 6 | Dead+Wind 90 deg - No Ice |
| 7 | Dead+Wind 120 deg - No Ice |
| 8 | Dead+Wind 135 deg - No Ice |
| 9 | Dead+Wind 150 deg - No Ice |
| 10 | Dead+Wind 180 deg - No Ice |
| 11 | Dead+Wind 210 deg - No Ice |
| 12 | Dead+Wind 225 deg - No Ice |
| 13 | Dead+Wind 240 deg - No Ice |
| 14 | Dead+Wind 270 deg - No Ice |
| 15 | Dead+Wind 300 deg - No Ice |
| 16 | Dead+Wind 315 deg - No Ice |
| 17 | Dead+Wind 330 deg - No Ice |

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| | | | |
|----------------|-------------------------------|--------------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 14 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

| Comb. No. | Description |
|-----------|-----------------------------|
| 18 | Dead+Ice+Temp |
| 19 | Dead+Wind 0 deg+Ice+Temp |
| 20 | Dead+Wind 30 deg+Ice+Temp |
| 21 | Dead+Wind 45 deg+Ice+Temp |
| 22 | Dead+Wind 60 deg+Ice+Temp |
| 23 | Dead+Wind 90 deg+Ice+Temp |
| 24 | Dead+Wind 120 deg+Ice+Temp |
| 25 | Dead+Wind 135 deg+Ice+Temp |
| 26 | Dead+Wind 150 deg+Ice+Temp |
| 27 | Dead+Wind 180 deg+Ice+Temp |
| 28 | Dead+Wind 210 deg+Ice+Temp |
| 29 | Dead+Wind 225 deg+Ice+Temp |
| 30 | Dead+Wind 240 deg+Ice+Temp |
| 31 | Dead+Wind 270 deg+Ice+Temp |
| 32 | Dead+Wind 300 deg+Ice+Temp |
| 33 | Dead+Wind 315 deg+Ice+Temp |
| 34 | Dead+Wind 330 deg+Ice+Temp |
| 35 | Dead+Wind 0 deg - Service |
| 36 | Dead+Wind 30 deg - Service |
| 37 | Dead+Wind 45 deg - Service |
| 38 | Dead+Wind 60 deg - Service |
| 39 | Dead+Wind 90 deg - Service |
| 40 | Dead+Wind 120 deg - Service |
| 41 | Dead+Wind 135 deg - Service |
| 42 | Dead+Wind 150 deg - Service |
| 43 | Dead+Wind 180 deg - Service |
| 44 | Dead+Wind 210 deg - Service |
| 45 | Dead+Wind 225 deg - Service |
| 46 | Dead+Wind 240 deg - Service |
| 47 | Dead+Wind 270 deg - Service |
| 48 | Dead+Wind 300 deg - Service |
| 49 | Dead+Wind 315 deg - Service |
| 50 | Dead+Wind 330 deg - Service |

Maximum Member Forces

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|-------------|-----------------|----------------|------------------|-----------------|-----------|-------------------------|-------------------------|
| L1 | 176.01 - 130.76 | Pole | Max Tension | 18 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 18 | -12815.99 | 0.00 | -364.51 |
| | | | Max. Mx | 6 | -8760.31 | -331738.03 | -286.94 |
| | | | Max. My | 10 | -8759.06 | 0.00 | -331951.89 |
| | | | Max. Vy | 6 | 13425.35 | -331738.03 | -286.94 |
| | | | Max. Vx | 10 | 13426.24 | 0.00 | -331951.89 |
| | | | Max. Torque | 23 | | | -1187.42 |
| L2 | 130.76 - 86.13 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 18 | -24628.96 | 0.00 | -3435.61 |
| | | | Max. Mx | 6 | -18649.58 | - | -1939.65 |
| | | | Max. My | 10 | -18648.41 | 1078282.47 | 0.00 |
| | | | Max. Vy | 6 | 20513.29 | - | 1080287.57 |
| | | | Max. Vx | 10 | 20514.54 | 1078282.47 | -1939.65 |
| | | | Max. Torque | 23 | | | 0.00 |
| L3 | 86.13 - 43 | Pole | Max. Torque | 23 | | | 1080287.57 |
| | | | Max Tension | 1 | 0.00 | 0.00 | -8672.80 |
| | | | | | | 0.00 | |

| | | | | |
|---|---------|-------------------------------|-------------|-------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 176' EEI Monopole, Berlin, CT | Page | 15 of 21 |
| | Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| | Client | Verizon Wireless | Designed by | Jed Kiernan |
| | | | | |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft | |
|-------------|--------------|----------------|------------------|-----------------|-----------|-------------------------|-------------------------|-----------|
| L4 | 43 - 1 | Pole | Max. Compression | 18 | -37466.94 | 0.00 | -5214.10 | |
| | | | Max. Mx | 6 | -30457.42 | - | -2959.86 | |
| | | | Max. My | 10 | -30456.83 | 2017085.47 | 0.00 | - |
| | | | Max. Vy | 6 | 24415.19 | - | 2020070.95 | -2959.86 |
| | | | Max. Vx | 10 | 24416.15 | 2017085.47 | 0.00 | - |
| | | | Max. Torque | 23 | - | - | 2020070.95 | - |
| | | | Max Tension | 1 | 0.00 | 0.00 | -10815.54 | 0.00 |
| | | | Max. Compression | 18 | -56136.20 | 0.00 | 0.00 | - |
| | | | Max. Mx | 6 | -47963.79 | - | -5214.08 | -2979.76 |
| | | | Max. My | 10 | -47963.78 | 3299426.31 | 0.00 | - |
| | | | Max. Vy | 6 | 27872.51 | - | 3302431.47 | -2979.76 |
| | | | Max. Vx | 10 | 27872.54 | 3299426.31 | 0.00 | - |
| | | | Max. Torque | 23 | - | - | 3302431.47 | -10812.45 |

Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical lb | Horizontal, X lb | Horizontal, Z lb |
|----------|---------------------|-----------------|-------------|------------------|------------------|
| Pole | Max. Vert | 27 | 56136.20 | 0.00 | -23646.79 |
| | Max. H _x | 14 | 47977.16 | 27849.50 | -0.00 |
| | Max. H _z | 2 | 47977.16 | 0.00 | 27849.51 |
| | Max. M _x | 2 | 3296408.07 | 0.00 | 27849.51 |
| | Max. M _z | 6 | 3299426.31 | -27849.50 | -0.00 |
| | Max. Torsion | 31 | 10808.90 | 23646.79 | 0.00 |
| | Min. Vert | 1 | 47977.16 | 0.00 | -0.00 |
| | Min. H _x | 6 | 47977.16 | -27849.50 | -0.00 |
| | Min. H _z | 10 | 47977.16 | 0.00 | -27849.51 |
| | Min. M _x | 10 | -3302431.47 | 0.00 | -27849.51 |
| | Min. M _z | 14 | -3299426.31 | 27849.50 | -0.00 |
| | Min. Torsion | 23 | -10808.90 | -23646.79 | 0.00 |

Tower Mast Reaction Summary

| Load Combination | Vertical lb | Shear _x lb | Shear _z lb | Overturning Moment, M _x lb-ft | Overturning Moment, M _z lb-ft | Torque lb-ft |
|----------------------------|-------------|-----------------------|-----------------------|--|--|--------------|
| Dead Only | 47977.16 | 0.00 | 0.00 | 2894.92 | 0.00 | 0.00 |
| Dead+Wind 0 deg - No Ice | 47977.16 | 0.00 | -27849.51 | -3296408.07 | 0.00 | 0.00 |
| Dead+Wind 30 deg - No Ice | 47977.16 | 13924.75 | -24118.38 | -2854383.60 | -1649698.75 | 4794.20 |
| Dead+Wind 45 deg - No Ice | 47977.16 | 19692.57 | -19692.57 | -2330051.66 | -2333030.08 | 6779.99 |
| Dead+Wind 60 deg - No Ice | 47977.16 | 24118.38 | -13924.75 | -1646726.44 | -2857372.59 | 8303.72 |
| Dead+Wind 90 deg - No Ice | 47977.16 | 27849.50 | 0.00 | 2978.37 | -3299426.31 | 9588.26 |
| Dead+Wind 120 deg - No Ice | 47977.16 | 24118.38 | 13924.75 | 1652699.85 | -2857401.46 | 8303.64 |
| Dead+Wind 135 deg - No Ice | 47977.16 | 19692.57 | 19692.57 | 2336041.74 | -2333063.42 | 6779.86 |

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| | | | |
|----------------|-------------------------------|--------------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 16 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

| Load Combination | Vertical lb | Shear _x lb | Shear _y lb | Overturning Moment, M _x lb-ft | Overturning Moment, M _y lb-ft | Torque lb-ft |
|-----------------------------|----------------|--------------------------|--------------------------|---|---|-----------------|
| Dead+Wind 150 deg - No Ice | 47977.16 | 13924.75 | 24118.38 | 2860390.34 | -1649727.62 | 4794.06 |
| Dead+Wind 180 deg - No Ice | 47977.16 | 0.00 | 27849.51 | 3302431.47 | 0.00 | 0.00 |
| Dead+Wind 210 deg - No Ice | 47977.16 | -13924.75 | 24118.38 | 2860390.34 | 1649727.62 | -4794.06 |
| Dead+Wind 225 deg - No Ice | 47977.16 | -19692.57 | 19692.57 | 2336041.74 | 2333063.42 | -6779.86 |
| Dead+Wind 240 deg - No Ice | 47977.16 | -24118.38 | 13924.75 | 1652699.85 | 2857401.46 | -8303.64 |
| Dead+Wind 270 deg - No Ice | 47977.16 | -27849.50 | 0.00 | 2978.37 | 3299426.31 | -9588.26 |
| Dead+Wind 300 deg - No Ice | 47977.16 | -24118.38 | -13924.75 | -1646726.44 | 2857372.59 | -8303.72 |
| Dead+Wind 315 deg - No Ice | 47977.16 | -19692.57 | -19692.57 | -2330051.66 | 2333030.08 | -6779.99 |
| Dead+Wind 330 deg - No Ice | 47977.16 | -13924.75 | -24118.38 | -2854383.60 | 1649698.75 | -4794.20 |
| Dead+Ice+Temp | 56136.20 | 0.00 | 0.00 | 5214.08 | 0.00 | 0.00 |
| Dead+Wind 0 deg+Ice+Temp | 56136.20 | 0.00 | -23646.79 | -2904180.97 | 0.00 | 0.00 |
| Dead+Wind 30 deg+Ice+Temp | 56136.20 | 11823.40 | -20478.72 | -2514390.40 | -1454740.71 | 5404.58 |
| Dead+Wind 45 deg+Ice+Temp | 56136.20 | 16720.81 | -16720.81 | -2052024.69 | -2057319.03 | 7643.17 |
| Dead+Wind 60 deg+Ice+Temp | 56136.20 | 20478.72 | -11823.40 | -1449454.56 | -2519698.89 | 9360.86 |
| Dead+Wind 90 deg+Ice+Temp | 56136.20 | 23646.79 | -0.00 | 5294.22 | -2909519.92 | 10808.90 |
| Dead+Wind 120 deg+Ice+Temp | 56136.20 | 20478.72 | 11823.40 | 1460065.29 | -2519737.51 | 9360.70 |
| Dead+Wind 135 deg+Ice+Temp | 56136.20 | 16720.81 | 16720.81 | 2062657.71 | -2057363.62 | 7642.93 |
| Dead+Wind 150 deg+Ice+Temp | 56136.20 | 11823.40 | 20478.72 | 2525045.72 | -1454779.33 | 5404.32 |
| Dead+Wind 180 deg+Ice+Temp | 56136.20 | 0.00 | 23646.79 | 2914858.58 | 0.00 | 0.00 |
| Dead+Wind 210 deg+Ice+Temp | 56136.20 | -11823.40 | 20478.72 | 2525045.72 | 1454779.33 | -5404.32 |
| Dead+Wind 225 deg+Ice+Temp | 56136.20 | -16720.81 | 16720.81 | 2062657.71 | 2057363.62 | -7642.93 |
| Dead+Wind 240 deg+Ice+Temp | 56136.20 | -20478.72 | 11823.40 | 1460065.29 | 2519737.51 | -9360.70 |
| Dead+Wind 270 deg+Ice+Temp | 56136.20 | -23646.79 | -0.00 | 5294.22 | 2909519.92 | -10808.90 |
| Dead+Wind 300 deg+Ice+Temp | 56136.20 | -20478.72 | -11823.40 | -1449454.56 | 2519698.89 | -9360.86 |
| Dead+Wind 315 deg+Ice+Temp | 56136.20 | -16720.81 | -16720.81 | -2052024.69 | 2057319.03 | -7643.17 |
| Dead+Wind 330 deg+Ice+Temp | 56136.20 | -11823.40 | -20478.72 | -2514390.40 | 1454740.71 | -5404.58 |
| Dead+Wind 0 deg - Service | 47977.16 | 0.00 | -10878.72 | -1286745.82 | 0.00 | 0.00 |
| Dead+Wind 30 deg - Service | 47977.16 | 5439.36 | -9421.24 | -1113951.04 | -644881.55 | 1880.37 |
| Dead+Wind 45 deg - Service | 47977.16 | 7692.41 | -7692.41 | -908984.26 | -912000.79 | 2659.23 |
| Dead+Wind 60 deg - Service | 47977.16 | 9421.24 | -5439.36 | -641865.96 | -1116969.19 | 3256.87 |
| Dead+Wind 90 deg - Service | 47977.16 | 10878.72 | 0.00 | 3016.51 | -1289767.45 | 3760.71 |
| Dead+Wind 120 deg - Service | 47977.16 | 9421.24 | 5439.36 | 647901.52 | -1116973.60 | 3256.87 |
| Dead+Wind 135 deg - Service | 47977.16 | 7692.41 | 7692.41 | 915022.38 | -912005.88 | 2659.21 |
| Dead+Wind 150 deg - Service | 47977.16 | 5439.36 | 9421.24 | 1119991.70 | -644885.96 | 1880.34 |
| Dead+Wind 180 deg - Service | 47977.16 | 0.00 | 10878.72 | 1292789.03 | 0.00 | 0.00 |
| Dead+Wind 210 deg - Service | 47977.16 | -5439.36 | 9421.24 | 1119991.70 | 644885.96 | -1880.34 |
| Dead+Wind 225 deg - Service | 47977.16 | -7692.41 | 7692.41 | 915022.38 | 912005.88 | -2659.21 |
| Dead+Wind 240 deg - Service | 47977.16 | -9421.24 | 5439.36 | 647901.52 | 1116973.60 | -3256.87 |
| Dead+Wind 270 deg - Service | 47977.16 | -10878.72 | 0.00 | 3016.51 | 1289767.45 | -3760.71 |
| Dead+Wind 300 deg - Service | 47977.16 | -9421.24 | -5439.36 | -641865.96 | 1116969.19 | -3256.87 |
| Dead+Wind 315 deg - Service | 47977.16 | -7692.41 | -7692.41 | -908984.26 | 912000.79 | -2659.23 |
| Dead+Wind 330 deg - Service | 47977.16 | -5439.36 | -9421.24 | -1113951.04 | 644881.55 | -1880.37 |

Solution Summary

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|-----------|-----------|------------------|----------|-----------|---------|
| | PX lb | PY lb | PZ lb | PX lb | PY lb | PZ lb | |
| 1 | 0.00 | -47977.16 | 0.00 | 0.00 | 47977.16 | -0.00 | 0.000% |
| 2 | 0.00 | -47977.16 | -27849.50 | 0.00 | 47977.16 | 27849.51 | 0.000% |
| 3 | 13924.75 | -47977.16 | -24118.38 | -13924.75 | 47977.16 | 24118.38 | 0.000% |
| 4 | 19692.57 | -47977.16 | -19692.57 | -19692.57 | 47977.16 | 19692.57 | 0.000% |
| 5 | 24118.38 | -47977.16 | -13924.75 | -24118.38 | 47977.16 | 13924.75 | 0.000% |
| 6 | 27849.50 | -47977.16 | 0.00 | -27849.50 | 47977.16 | -0.00 | 0.000% |
| 7 | 24118.38 | -47977.16 | 13924.75 | -24118.38 | 47977.16 | -13924.75 | 0.000% |
| 8 | 19692.57 | -47977.16 | 19692.57 | -19692.57 | 47977.16 | -19692.57 | 0.000% |
| 9 | 13924.75 | -47977.16 | 24118.38 | -13924.75 | 47977.16 | -24118.38 | 0.000% |
| 10 | 0.00 | -47977.16 | 27849.50 | 0.00 | 47977.16 | -27849.51 | 0.000% |

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| | | | |
|----------------|-------------------------------|--------------------|-------------------|
| Job | 176' EEI Monopole, Berlin, CT | Page | 17 of 21 |
| Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by | Jed Kiernan |

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|-----------|-----------|------------------|----------|-----------|---------|
| | PX lb | PY lb | PZ lb | PX lb | PY lb | PZ lb | |
| 11 | -13924.75 | -47977.16 | 24118.38 | 13924.75 | 47977.16 | -24118.38 | 0.000% |
| 12 | -19692.57 | -47977.16 | 19692.57 | 19692.57 | 47977.16 | -19692.57 | 0.000% |
| 13 | -24118.38 | -47977.16 | 13924.75 | 24118.38 | 47977.16 | -13924.75 | 0.000% |
| 14 | -27849.50 | -47977.16 | 0.00 | 27849.50 | 47977.16 | -0.00 | 0.000% |
| 15 | -24118.38 | -47977.16 | -13924.75 | 24118.38 | 47977.16 | 13924.75 | 0.000% |
| 16 | -19692.57 | -47977.16 | -19692.57 | 19692.57 | 47977.16 | 19692.57 | 0.000% |
| 17 | -13924.75 | -47977.16 | -24118.38 | 13924.75 | 47977.16 | 24118.38 | 0.000% |
| 18 | 0.00 | -56136.20 | 0.00 | 0.00 | 56136.20 | -0.00 | 0.000% |
| 19 | 0.00 | -56136.20 | -23646.78 | 0.00 | 56136.20 | 23646.79 | 0.000% |
| 20 | 11823.39 | -56136.20 | -20478.71 | -11823.40 | 56136.20 | 20478.72 | 0.000% |
| 21 | 16720.80 | -56136.20 | -16720.80 | -16720.81 | 56136.20 | 16720.81 | 0.000% |
| 22 | 20478.71 | -56136.20 | -11823.39 | -20478.72 | 56136.20 | 11823.40 | 0.000% |
| 23 | 23646.78 | -56136.20 | 0.00 | -23646.79 | 56136.20 | 0.00 | 0.000% |
| 24 | 20478.71 | -56136.20 | 11823.39 | -20478.72 | 56136.20 | -11823.40 | 0.000% |
| 25 | 16720.80 | -56136.20 | 16720.80 | -16720.81 | 56136.20 | -16720.81 | 0.000% |
| 26 | 11823.39 | -56136.20 | 20478.71 | -11823.40 | 56136.20 | -20478.72 | 0.000% |
| 27 | 0.00 | -56136.20 | 23646.78 | 0.00 | 56136.20 | -23646.79 | 0.000% |
| 28 | -11823.39 | -56136.20 | 20478.71 | 11823.40 | 56136.20 | -20478.72 | 0.000% |
| 29 | -16720.80 | -56136.20 | 16720.80 | 16720.81 | 56136.20 | -16720.81 | 0.000% |
| 30 | -20478.71 | -56136.20 | 11823.39 | 20478.72 | 56136.20 | -11823.40 | 0.000% |
| 31 | -23646.78 | -56136.20 | 0.00 | 23646.79 | 56136.20 | 0.00 | 0.000% |
| 32 | -20478.71 | -56136.20 | -11823.39 | 20478.72 | 56136.20 | 11823.40 | 0.000% |
| 33 | -16720.80 | -56136.20 | -16720.80 | 16720.81 | 56136.20 | 16720.81 | 0.000% |
| 34 | -11823.39 | -56136.20 | -20478.71 | 11823.40 | 56136.20 | 20478.72 | 0.000% |
| 35 | 0.00 | -47977.16 | -10878.71 | 0.00 | 47977.16 | 10878.72 | 0.000% |
| 36 | 5439.36 | -47977.16 | -9421.24 | -5439.36 | 47977.16 | 9421.24 | 0.000% |
| 37 | 7692.41 | -47977.16 | -7692.41 | -7692.41 | 47977.16 | 7692.41 | 0.000% |
| 38 | 9421.24 | -47977.16 | -5439.36 | -9421.24 | 47977.16 | 5439.36 | 0.000% |
| 39 | 10878.71 | -47977.16 | 0.00 | -10878.72 | 47977.16 | -0.00 | 0.000% |
| 40 | 9421.24 | -47977.16 | 5439.36 | -9421.24 | 47977.16 | -5439.36 | 0.000% |
| 41 | 7692.41 | -47977.16 | 7692.41 | -7692.41 | 47977.16 | -7692.41 | 0.000% |
| 42 | 5439.36 | -47977.16 | 9421.24 | -5439.36 | 47977.16 | -9421.24 | 0.000% |
| 43 | 0.00 | -47977.16 | 10878.71 | 0.00 | 47977.16 | -10878.72 | 0.000% |
| 44 | -5439.36 | -47977.16 | 9421.24 | 5439.36 | 47977.16 | -9421.24 | 0.000% |
| 45 | -7692.41 | -47977.16 | 7692.41 | 7692.41 | 47977.16 | -7692.41 | 0.000% |
| 46 | -9421.24 | -47977.16 | 5439.36 | 9421.24 | 47977.16 | -5439.36 | 0.000% |
| 47 | -10878.71 | -47977.16 | 0.00 | 10878.72 | 47977.16 | -0.00 | 0.000% |
| 48 | -9421.24 | -47977.16 | -5439.36 | 9421.24 | 47977.16 | 5439.36 | 0.000% |
| 49 | -7692.41 | -47977.16 | -7692.41 | 7692.41 | 47977.16 | 7692.41 | 0.000% |
| 50 | -5439.36 | -47977.16 | -9421.24 | 5439.36 | 47977.16 | 9421.24 | 0.000% |

Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1 | Yes | 4 | 0.00000001 | 0.00000001 |
| 2 | Yes | 4 | 0.00000001 | 0.00012599 |
| 3 | Yes | 5 | 0.00000001 | 0.00030816 |
| 4 | Yes | 5 | 0.00000001 | 0.00032708 |
| 5 | Yes | 5 | 0.00000001 | 0.00025843 |
| 6 | Yes | 5 | 0.00000001 | 0.00007835 |
| 7 | Yes | 5 | 0.00000001 | 0.00032841 |
| 8 | Yes | 5 | 0.00000001 | 0.00032860 |
| 9 | Yes | 5 | 0.00000001 | 0.00026939 |
| 10 | Yes | 4 | 0.00000001 | 0.00012638 |
| 11 | Yes | 5 | 0.00000001 | 0.00026939 |

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| | | |
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| Job | 176' EEI Monopole, Berlin, CT | Page 18 of 21 |
| Project | Berlin Fire Department | Date 15:44:19 02/21/06 |
| Client | Verizon Wireless | Designed by Jed Kiernan |

| | | | | |
|----|-----|---|------------|------------|
| 12 | Yes | 5 | 0.00000001 | 0.00032860 |
| 13 | Yes | 5 | 0.00000001 | 0.00032841 |
| 14 | Yes | 5 | 0.00000001 | 0.00007835 |
| 15 | Yes | 5 | 0.00000001 | 0.00025843 |
| 16 | Yes | 5 | 0.00000001 | 0.00032708 |
| 17 | Yes | 5 | 0.00000001 | 0.00030816 |
| 18 | Yes | 4 | 0.00000001 | 0.00000974 |
| 19 | Yes | 5 | 0.00000001 | 0.00018361 |
| 20 | Yes | 5 | 0.00000001 | 0.00059265 |
| 21 | Yes | 5 | 0.00000001 | 0.00064019 |
| 22 | Yes | 5 | 0.00000001 | 0.00052265 |
| 23 | Yes | 5 | 0.00000001 | 0.00024458 |
| 24 | Yes | 5 | 0.00000001 | 0.00062907 |
| 25 | Yes | 5 | 0.00000001 | 0.00064536 |
| 26 | Yes | 5 | 0.00000001 | 0.00053754 |
| 27 | Yes | 5 | 0.00000001 | 0.00018440 |
| 28 | Yes | 5 | 0.00000001 | 0.00053754 |
| 29 | Yes | 5 | 0.00000001 | 0.00064536 |
| 30 | Yes | 5 | 0.00000001 | 0.00062907 |
| 31 | Yes | 5 | 0.00000001 | 0.00024458 |
| 32 | Yes | 5 | 0.00000001 | 0.00052265 |
| 33 | Yes | 5 | 0.00000001 | 0.00064019 |
| 34 | Yes | 5 | 0.00000001 | 0.00059265 |
| 35 | Yes | 4 | 0.00000001 | 0.00005020 |
| 36 | Yes | 4 | 0.00000001 | 0.00070587 |
| 37 | Yes | 4 | 0.00000001 | 0.00073798 |
| 38 | Yes | 4 | 0.00000001 | 0.00052936 |
| 39 | Yes | 4 | 0.00000001 | 0.00038437 |
| 40 | Yes | 4 | 0.00000001 | 0.00081351 |
| 41 | Yes | 4 | 0.00000001 | 0.00074770 |
| 42 | Yes | 4 | 0.00000001 | 0.00054380 |
| 43 | Yes | 4 | 0.00000001 | 0.00005058 |
| 44 | Yes | 4 | 0.00000001 | 0.00054380 |
| 45 | Yes | 4 | 0.00000001 | 0.00074770 |
| 46 | Yes | 4 | 0.00000001 | 0.00081351 |
| 47 | Yes | 4 | 0.00000001 | 0.00038437 |
| 48 | Yes | 4 | 0.00000001 | 0.00052936 |
| 49 | Yes | 4 | 0.00000001 | 0.00073798 |
| 50 | Yes | 4 | 0.00000001 | 0.00070587 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L1 | 176.01 - 130.76 | 35.380 | 43 | 1.7988 | 0.0134 |
| L2 | 135.26 - 86.13 | 20.727 | 43 | 1.5418 | 0.0099 |
| L3 | 91.88 - 43 | 9.047 | 43 | 0.9812 | 0.0057 |
| L4 | 50 - 1 | 2.541 | 43 | 0.4762 | 0.0023 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 176.00 | 12' Low Profile Platform | 43 | 35.377 | 1.7988 | 0.0134 | 38694 |

| | | | | |
|---|----------------|-------------------------------|--------------------|-------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 176' EEI Monopole, Berlin, CT | Page | 19 of 21 |
| | Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| | Client | Verizon Wireless | Designed by | Jed Kiernan |
| | | | | |

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 168.00 | 5'3"x4" Pipe Mount | 43 | 32.368 | 1.7606 | | |
| 160.00 | 10' Low Profile Platform | 43 | 29.391 | 1.7194 | 0.0127 | 24153 |
| 150.00 | Low Profile Platform | 43 | 25.763 | 1.6593 | 0.0121 | 12084 |
| 130.00 | 2 Bay Dipole | 43 | 19.052 | 1.4888 | 0.0112 | 7437 |
| 118.00 | 13' Low Profile Platform | 43 | 15.494 | 1.3478 | 0.0094 | 4713 |
| 100.00 | 6' Side Mount Standoff | 43 | 10.858 | 1.1001 | 0.0083 | 4639 |
| 75.00 | Side Mount Standoff | 43 | 5.848 | 0.7391 | 0.0065 | 4532 |
| 60.00 | Side Mount Standoff | 43 | 3.656 | 0.5599 | 0.0041 | 4403 |
| | | | | | 0.0028 | 4333 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|----------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L1 | 176.01 - 130.76 | 90.213 | 10 | 4.5866 | |
| L2 | 135.26 - 86.13 | 52.872 | 10 | 3.9326 | 0.0404 |
| L3 | 91.88 - 43 | 23.090 | 10 | 2.5036 | 0.0291 |
| L4 | 50 - 1 | 6.488 | 10 | 1.2159 | 0.0167 |
| | | | | | 0.0065 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 176.00 | 12' Low Profile Platform | 10 | 90.203 | 4.5865 | | |
| 168.00 | 5'3"x4" Pipe Mount | 10 | 82.536 | 4.4912 | 0.0404 | 15339 |
| 160.00 | 10' Low Profile Platform | 10 | 74.951 | 4.3879 | 0.0382 | 9575 |
| 150.00 | Low Profile Platform | 10 | 65.705 | 4.2354 | 0.0360 | 4789 |
| 130.00 | 2 Bay Dipole | 10 | 48.602 | 3.7947 | 0.0333 | 2946 |
| 118.00 | 13' Low Profile Platform | 10 | 39.532 | 3.4278 | 0.0276 | 1863 |
| 100.00 | 6' Side Mount Standoff | 10 | 27.711 | 2.7967 | 0.0242 | 1831 |
| 75.00 | Side Mount Standoff | 10 | 14.928 | 1.9230 | 0.0191 | 1786 |
| 60.00 | Side Mount Standoff | 10 | 9.335 | 1.4698 | 0.0121 | 1730 |
| | | | | | 0.0084 | 1700 |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L _n ft | KL/r | F _a ksi | A in ² | Actual P lb | Allow. P _a lb | Ratio P P _a |
|----------------|------------------------|-----------------------|---------|----------------------|-------|-----------------------|----------------------|-------------------|--------------------------------|------------------------------|
| L1 | 176.01 - 130.76 (1) | TP31.8x21x0.25 | 45.25 | 175.01 | 194.1 | 3.963 | 24.1827 | -12074.10 | 95838.30 | 0.126 |
| L2 | 130.76 - 86.13 (2) | TP41.82x30.226x0.3125 | 49.13 | 175.01 | 147.3 | 6.879 | 39.8244 | -18648.40 | 273938.00 | 0.068 |
| L3 | 86.13 - 43 (3) | TP51.36x39.8381x0.375 | 48.88 | 175.01 | 119.9 | 10.386 | 58.7209 | -30456.80 | 609849.00 | 0.050 |

| | | | | |
|---|----------------|-------------------------------|--------------------|-------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 176' EEI Monopole, Berlin, CT | Page | 20 of 21 |
| | Project | Berlin Fire Department | Date | 15:44:19 02/21/06 |
| | Client | Verizon Wireless | Designed by | Jed Kiernan |
| | | | | |

| Section No. | Elevation ft | Size | L ft | L _n ft | Kl/r | F _a ksi | A in ² | Actual P lb | Allow. P _a lb | Ratio P P _a |
|-------------|-----------------|---------------------|---------|----------------------|------|-----------------------|----------------------|-------------------|--------------------------------|------------------------------|
| L4 | 43 - 1 (4) | TP60.5x48.96x0.4375 | 49.00 | 175.01 | 98.5 | 15.393 | 83.4043 | -47963.80 | 1283850.00 | 0.037 |

Pole Bending Design Data

| Section No. | Elevation ft | Size | Actual M _x lb-ft | Actual f _{bx} ksi | Allow. F _{bx} ksi | Ratio f _{bx} F _{bx} | Actual M _y lb-ft | Actual f _{by} ksi | Allow. F _{by} ksi | Ratio f _{by} F _{by} |
|-------------|------------------------|-----------------------|-----------------------------------|----------------------------------|----------------------------------|---|-----------------------------------|----------------------------------|----------------------------------|---|
| L1 | 176.01 - 130.76 (1) | TP31.8x21x0.25 | 314870. 83 | 20.784 | 39.000 | 0.533 | 0.00 | 0.000 | 39.000 | 0.000 |
| L2 | 130.76 - 86.13 (2) | TP41.82x30.226x0.3125 | 1080291. .67 | 32.853 | 39.000 | 0.842 | 0.00 | 0.000 | 39.000 | 0.000 |
| L3 | 86.13 - 43 (3) | TP51.36x39.8381x0.375 | 2020075. .00 | 33.901 | 39.000 | 0.869 | 0.00 | 0.000 | 39.000 | 0.000 |
| L4 | 43 - 1 (4) | TP60.5x48.96x0.4375 | 3302433. .33 | 32.041 | 39.000 | 0.822 | 0.00 | 0.000 | 39.000 | 0.000 |

Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual V lb | Actual f _v ksi | Allow. F _v ksi | Ratio f _v F _v | Actual T lb-ft | Actual f _{vt} ksi | Allow. F _{vt} ksi | Ratio f _{vt} F _{vt} |
|-------------|------------------------|-----------------------|-------------------|---------------------------------|---------------------------------|---|----------------------|----------------------------------|----------------------------------|---|
| L1 | 176.01 - 130.76 (1) | TP31.8x21x0.25 | 12183.6 0 | 0.504 | 26.000 | 0.039 | 0.00 | 0.000 | 26.000 | 0.000 |
| L2 | 130.76 - 86.13 (2) | TP41.82x30.226x0.3125 | 20514.5 0 | 0.515 | 26.000 | 0.040 | 0.00 | 0.000 | 26.000 | 0.000 |
| L3 | 86.13 - 43 (3) | TP51.36x39.8381x0.375 | 24416.2 0 | 0.416 | 26.000 | 0.032 | 0.00 | 0.000 | 26.000 | 0.000 |
| L4 | 43 - 1 (4) | TP60.5x48.96x0.4375 | 27872.5 0 | 0.334 | 26.000 | 0.026 | 0.00 | 0.000 | 26.000 | 0.000 |

Pole Interaction Design Data

| Section No. | Elevation ft | Ratio P P _a | Ratio f _{bx} F _{bx} | Ratio f _{by} F _{by} | Ratio f _v F _v | Ratio f _{vt} F _{vt} | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|------------------------|------------------------------|---|---|---|---|--------------------------|---------------------------|-----------|
| L1 | 176.01 - 130.76 (1) | 0.126 | 0.533 | 0.000 | 0.039 | 0.000 | 0.659 ✓ | 1.333 | H1-3+VT ✓ |
| L2 | 130.76 - 86.13 (2) | 0.068 | 0.842 | 0.000 | 0.040 | 0.000 | 0.911 ✓ | 1.333 | H1-3+VT ✓ |
| L3 | 86.13 - 43 (3) | 0.050 | 0.869 | 0.000 | 0.032 | 0.000 | 0.919 ✓ | 1.333 | H1-3+VT ✓ |
| L4 | 43 - 1 (4) | 0.037 | 0.822 | 0.000 | 0.026 | 0.000 | 0.859 ✓ | 1.333 | H1-3+VT ✓ |

| | | |
|---|---|-----------------------------------|
| ERITower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 176' EEI Monopole, Berlin, CT | Page 21 of 21 |
| | Project Berlin Fire Department | Date 15:44:19 02/21/06 |
| | Client Verizon Wireless | Designed by Jed Kiernan |

Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | SF*P _{allow} lb | % Capacity | Pass Fail | |
|-------------|-----------------|----------------|-----------------------|------------------|-----------|--------------------------|-----------------|-------------|-------------|
| L1 | 176.01 - 130.76 | Pole | TP31.8x21x0.25 | 1 | -12074.10 | 127752.44 | 49.5 | Pass | |
| L2 | 130.76 - 86.13 | Pole | TP41.82x30.226x0.3125 | 2 | -18648.40 | 365159.34 | 68.3 | Pass | |
| L3 | 86.13 - 43 | Pole | TP51.36x39.8381x0.375 | 3 | -30456.80 | 812928.68 | 69.0 | Pass | |
| L4 | 43 - 1 | Pole | TP60.5x48.96x0.4375 | 4 | -47963.80 | 1711371.98 | 64.4 | Pass | |
| | | | | | | | Summary | | |
| | | | | | | | Pole (L3) | 69.0 | Pass |
| | | | | | | | RATING = | 69.0 | Pass |

ANCHOR BOLT AND BASE PLATE ANALYSIS

ANCHOR BOLT AND BASE PLATE ANALYSIS

Input Data

Tower Reactions:

| | | | |
|--------------------|----------------------|------------|--------------------------------------|
| Overturing Moment: | OM := 4306.5-ft-kips | user input | |
| Shear Force: | Shear := 34.94-kips | user input | Original Design Loads - Conservative |
| Axial Force: | Axial := 49.6-kips | user input | |

Anchor Bolt Data:

Use ASTM 615 Grade 75

| | | |
|----------------------------|--------------------------------|------------|
| Number of Anchor Bolts = N | $N_{\text{w}} := 18$ | user input |
| Diameter of Bolt Circle: | $D_{\text{bc}} := 70\text{in}$ | user input |
| Bolt "Column" Distance: | $l := 3\text{in}$ | user input |
| Bolt Ultimate Strength: | $F_u := 100\text{-ksi}$ | user input |
| Bolt Yield Strength: | $F_y := 75\text{-ksi}$ | user input |
| Bolt Modulus: | $E := 29000\text{-ksi}$ | user input |
| Thickness Of Anchor Bolts | $D := 2.25\text{in}$ | user input |
| Threads per Inch: | $n := 4.5$ | user input |

Base Plate Data:

| | | |
|-----------------------|------------------------------------|------------|
| Plate Yield Strength: | $F_{y\text{bp}} := 60\text{-ksi}$ | user input |
| Base Plate Thickness: | PlateThickness := 2-in | user input |
| Base Plate Diameter: | $D_{\text{bp}} := 76\text{-in}$ | user input |
| Outer Pole Diameter: | $D_{\text{pole}} := 60.5\text{in}$ | user input |

| | | | | | | | |
|-------------|-------------------------------------|-------------|---------|-------|----------|----|---|
| Job | 176' Monopole- Berlin, CT | Project No. | VZ1-005 | Sheet | 2 | of | 6 |
| Description | Anchor Bolt and Base Plate Analysis | Computed by | JEK | Date | 02/21/06 | | |
| | | Checked by | | Date | | | |

Geometric Layout Data:

Distance from the center of gravity of the group to bolt in question = d(i)

Radius of Bolt Circle: $R_{bc} := \frac{D_{bc}}{2}$

Distance to Bolts: $i := 1..N$

$$d_i := \begin{cases} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) & d_1 = \text{in} & d_7 = \text{in} \\ d \leftarrow R_{bc} \cdot \sin(\theta) & d_2 = \text{in} & d_8 = \text{in} \\ & d_3 = \text{in} & d_9 = \text{in} \\ & d_4 = \text{in} & d_{10} = \text{in} \\ & d_5 = \text{in} & d_{11} = \text{in} \\ & d_6 = \text{in} & \text{etc.} \end{cases}$$

Critical Distances For Bending in Plate:

Outer Pole Radius: $R_{pole} := \frac{D_{pole}}{2}$ $R_{pole} = 30.25 \text{ in}$

Moment Arms of Bolts about Neutral Axis: $MA_i := \text{if}(d_i \geq R_{pole}, d_i - R_{pole}, 0 \text{ in})$

| | |
|--------------------|-----------------------|
| $MA_1 = \text{in}$ | $MA_7 = \text{in}$ |
| $MA_2 = \text{in}$ | $MA_8 = \text{in}$ |
| $MA_3 = \text{in}$ | $MA_9 = \text{in}$ |
| $MA_4 = \text{in}$ | $MA_{10} = \text{in}$ |
| $MA_5 = \text{in}$ | $MA_{11} = \text{in}$ |
| $MA_6 = \text{in}$ | etc. |

Effective Width of Baseplate for Bending: $\text{EffectiveWidth} := 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2}$ $\text{EffectiveWidth} = 46.00 \text{ in}$

Anchor Bolt Analysis:

Polar Moment of Inertia I_p :

$$I_p := \sum_i (d_i)^2 \quad I_p = \text{in}^2$$

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \quad A_g = \text{in}^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 \quad A_n = \text{in}^2$$

Net Diameter:

$$D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} \quad D_n = \text{in}$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \quad r = \text{in}$$

Section Modulus of Bolt:

$$S_x := \frac{\pi \cdot D_n^3}{32} \quad S_x = \text{in}^3$$

Anchor Bolt Bending Stress:

Maximum Applied Bending:

$$M_x := \left(\frac{\text{Shear}}{N} \right) \cdot l \quad M_x = 0.485 \text{ ft} \cdot \text{kips}$$

$$f_{bx} := \frac{M_x}{S_x} \quad f_{bx} = \text{ksi}$$

Allowable Bending

$$F_{bx} := 1.33 \cdot 0.60 \cdot F_y \quad F_{bx} = 59.8 \text{ ksi}$$

Note: 1.33 increase allowed per TIA/EIA

| | | | | | |
|-------------|-------------------------------------|-------------|---------|-------|----------|
| Job | 176' Monopole- Berlin, CT | Project No. | VZ1-005 | Page | of |
| Description | Anchor Bolt and Base Plate Analysis | Computed by | JEK | Sheet | 4 of 6 |
| | | Checked by | | Date | 02/21/06 |
| | | | | Date | |

Check Tensile Forces:

Allowable Tensile Force:

$$\text{AllowableTension} := 1.33 \cdot (0.33 \cdot A_g \cdot F_u) \quad \text{AllowableTension} = \text{kips}$$

Note: 1.33 increase allowed per TIA/EIA

Applied Tension:

$$\text{MaxTension} := \frac{OM \cdot R_{bc}}{I_p} - \frac{\text{Axial}}{N} \quad \text{MaxTension} = \text{kips}$$

Check Stresses:

$$\frac{\text{MaxTension}}{\text{AllowableTension}} =$$

$$\text{Condition} := \text{if} \left(\frac{\text{MaxTension}}{\text{AllowableTension}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

| |
|-------------|
| Condition = |
|-------------|

| | | | | | |
|-------------|-------------------------------------|-------------|---------|-------|----------|
| Job | 176' Monopole- Berlin, CT | Project No. | VZ1-005 | Sheet | 5 of 6 |
| Description | Anchor Bolt and Base Plate Analysis | Computed by | JEK | Date | 02/21/06 |
| | | Checked by | | Date | |

Check Compression & Combined Stresses (if required):

Check to see if a complete combined stress analysis is required:

Per ASCE Manual 72: "If the clearance between the base plate and concrete does not exceed two times the bolt diameter a bending stress analysis of the bolts is NOT normally required."

Set the clear space between the plate and bolt to zero and remove bending stresses if a combined stress analysis is not required:

$$l := \begin{cases} 1 & \text{if } l > 2 \cdot D_n \\ 0.00 \text{in} & \text{otherwise} \end{cases} \quad l = \text{in} \quad f_{bx} := \begin{cases} f_{bx} & \text{if } l > 2 \cdot D_n \\ 0.0 \text{ksi} & \text{otherwise} \end{cases} \quad f_{bx} = \text{ksi}$$

Allowable Compressive Force:

$$K_w := 0.65$$

$$C_c := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{F_y}} \quad C_c =$$

$$F_a := \begin{cases} \frac{\left[1 - \frac{\left(\frac{K \cdot l}{r} \right)^2}{2 \cdot C_c^2} \right] \cdot F_y}{\frac{5}{3} + \frac{3 \cdot \left(\frac{K \cdot l}{r} \right)}{8 \cdot C_c} - \frac{\left(\frac{K \cdot l}{r} \right)^3}{8 \cdot C_c^3}} & \text{if } \frac{K \cdot l}{r} \leq C_c \\ \frac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r} \right)^2} & \text{if } \frac{K \cdot l}{r} > C_c \end{cases} \quad F_a = \text{ksi}$$

$$F_a := 1.33 \cdot F_a \quad \text{Note: 1.33 increase allowed per TIA/EIA} \quad F_a = \text{ksi}$$

Applied Compressive Force:

$$\text{MaxCompression} := \frac{OM \cdot R_{bc}}{I_p} + \frac{\text{Axial}}{N} \quad \text{MaxCompression} = \text{kips}$$

$$f_a := \frac{\text{MaxCompression}}{A_n} \quad f_a = \text{ksi}$$

Check Combined Stresses:

$$\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} =$$

$$\text{Condition} := \text{if} \left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right) \quad \boxed{\text{Condition} =}$$

Job 176' Monopole- Berlin, CT
 Description Anchor Bolt and Base Plate Analysis

Project No. VZ1-005
 Computed by JEK
 Checked by _____

Page _____ of _____
 Sheet 6 of 6
 Date 02/21/06
 Date _____

Base Plate Analysis:

Force from Bolt(s):

$$C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$$

- C₁ = kips
- C₂ = kips
- C₃ = kips
- C₄ = kips
- C₅ = kips
- C₆ = kips
- C₇ = kips
- C₈ = kips
- C₉ = kips
- C₁₀ = kips
- C₁₁ = kips
- etc.

Bending Stress in Plate:

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot M A_i}{EffectiveWidth \cdot PlateThickness^2} \quad f_{bp} = ksi$$

Check Stresses:

$$\frac{f_{bp}}{1.33 \cdot 0.75 F_{ybp}} =$$

$$Condition := if \left(\frac{f_{bp}}{1.33 \cdot 0.75 F_{ybp}} < 1.00, "OK", "Overstressed" \right)$$

Condition =

General Power Density

Site Name: Berlin 4
 Tower Height: 118 FT

| Operator | Operating Frequency (MHz) | Number of ERP Per Trans. | ERP Per Trans. (watts) | Total ERP (watts) | Distance to Target (feet) | Calculated Power Density (mW/cm ²) | Maximum Permissible Exposure (mW/cm ²) | Fraction of MPE (%) |
|---|---------------------------|--------------------------|------------------------|-------------------|---------------------------|--|--|---------------------|
| Verizon | 880 | 9 | 200 | 1800 | 118 | 0.0465 | 0.586 | 7.93% |
| Verizon | 1900 | 3 | 200 | 600 | 118 | 0.0155 | 1 | 1.55% |
| Sprint | 1900 | 11 | 200 | 2200 | 150 | 0.0352 | 1 | 3.52% |
| Cingular | 880 | 19 | 100 | 1900 | 168 | 0.0242 | 0.586 | 4.13% |
| T-Mobile | 1900 | 25 | 76 | 1900 | 160 | 0.0267 | 1 | 2.67% |
| Total Percentage of Maximum Permissible Exposure | | | | | | | | 19.80% |

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz

mW/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power



Cellco Partnership

d.b.a. **Verizon** wireless

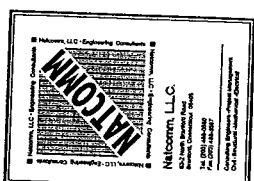
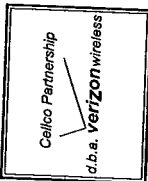
WIRELESS COMMUNICATIONS FACILITY

BETHLEHEM N.E.

310 WATERTOWN ROAD

BETHLEHEM, CT 06751

| REVISIONS | |
|-----------|---|
| 01 | 11/20/04 LITTING COUNCIL REVIEW |
| 02 | 02/27/05 REVISIONS PER LITTING COUNCIL REVIEW |
| 03 | 03/22/05 REVISIONS PER LITTING COUNCIL REVIEW |
| 04 | 03/22/05 LITTING COUNCIL REVIEW |
| 05 | 03/22/05 LITTING COUNCIL REVIEW |
| 06 | 03/22/05 LITTING COUNCIL REVIEW |
| 07 | 03/22/05 LITTING COUNCIL REVIEW |
| 08 | 03/22/05 LITTING COUNCIL REVIEW |
| 09 | 03/22/05 LITTING COUNCIL REVIEW |
| 10 | 03/22/05 LITTING COUNCIL REVIEW |
| 11 | 03/22/05 LITTING COUNCIL REVIEW |
| 12 | 03/22/05 LITTING COUNCIL REVIEW |
| 13 | 03/22/05 LITTING COUNCIL REVIEW |
| 14 | 03/22/05 LITTING COUNCIL REVIEW |
| 15 | 03/22/05 LITTING COUNCIL REVIEW |
| 16 | 03/22/05 LITTING COUNCIL REVIEW |
| 17 | 03/22/05 LITTING COUNCIL REVIEW |
| 18 | 03/22/05 LITTING COUNCIL REVIEW |
| 19 | 03/22/05 LITTING COUNCIL REVIEW |
| 20 | 03/22/05 LITTING COUNCIL REVIEW |



BETHLEHEM N.E.
310 WATERTOWN ROAD
BETHLEHEM, CONNECTICUT 06751

| | |
|-------------|----------|
| PROJECT NO: | 05124 |
| DRAWN BY: | DAD |
| CHECKED BY: | CFC |
| SCALE: | AS NOTED |
| DATE: | 11/17/05 |

TITLE SHEET

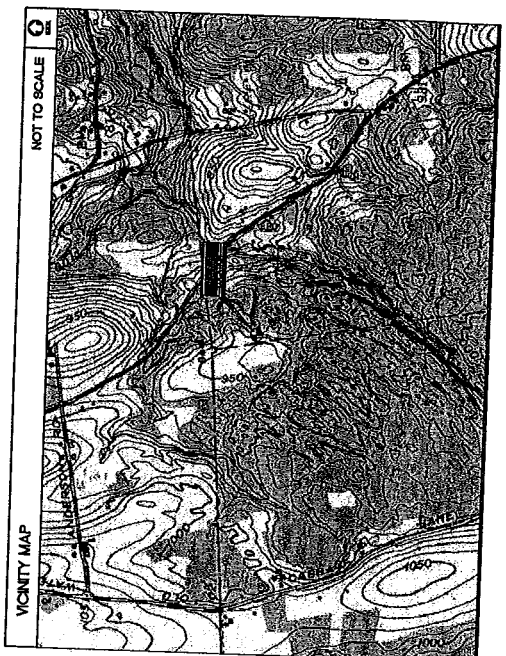
T-1
DWG. 1 OF 2

| SYMBOL | DESCRIPTION |
|----------|-------------------------------|
| (Symbol) | EXISTING 15' DIA. WATER TOWER |
| (Symbol) | PROPOSED 15' DIA. WATER TOWER |
| (Symbol) | EXISTING 15' DIA. WATER TOWER |
| (Symbol) | PROPOSED 15' DIA. WATER TOWER |
| (Symbol) | EXISTING 15' DIA. WATER TOWER |
| (Symbol) | PROPOSED 15' DIA. WATER TOWER |

| SHT. NO. | DESCRIPTION | REV. NO. |
|----------|-----------------------------|----------|
| T-1 | TITLE SHEET | 03 |
| C-1 | COMPOUND PLAN AND ELEVATION | 03 |

SITE INFORMATION

- THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A CELLULAR TELEPHONE TOWER ON A CELLULAR TELEPHONE TOWER WITHIN THE EXISTING WIRELESS COMMUNICATIONS COMPOUND.
- THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A CELLULAR TELEPHONE TOWER ON A CELLULAR TELEPHONE TOWER WITHIN THE EXISTING WIRELESS COMMUNICATIONS COMPOUND.
- THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A CELLULAR TELEPHONE TOWER ON A CELLULAR TELEPHONE TOWER WITHIN THE EXISTING WIRELESS COMMUNICATIONS COMPOUND.



| PROJECT SUMMARY | |
|------------------------------|---|
| SITE NAME: | BETHLEHEM N.E. |
| SITE ADDRESS: | 310 WATERTOWN ROAD BETHLEHEM, CONNECTICUT 06751 |
| PROPERTY OWNER: | 310 WATERTOWN ROAD BETHLEHEM, CONNECTICUT 06751 |
| LESSOR: | SEA TOWERS |
| LESSEE: | CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 400 S. VERIZON WIRELESS EAST WATERTOWN, CT 06108 |
| APPLICANT: | CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 400 S. VERIZON WIRELESS EAST WATERTOWN, CT 06108 |
| CONTACT PERSON: | SANDY CARTER (860) 426-4216 |
| COORDINATES OF TOWER: | LENGTH: 75' TO 114' WIDTH: 75' TO 114' ELEVATION: 100.075' A.M.S.L. COORDINATES AND CIRCUMFERENCE BASED ON ESD DATABASE |
| SITE DIRECTIONS | |
| FROM: | START FROM THE EAST SIDE OF EAST RIVER DRIVE, TURN LEFT ONTO US-44W (CONNECTICUT BLVD.) (CT-47 INTERSECTION) AT 0.17 MI. TAKE RIGHT HAND ONTO SR-4 (CT-47 INTERSECTION) AT 0.17 MI. TAKE RIGHT HAND ONTO SR-4 (CT-47 INTERSECTION) KEEP STRAIGHT ONTO SR-23 (WATERTOWN AVENUE) (MAIN STREET) KEEP STRAIGHT ONTO SR-43 (WATERTOWN ROAD) KEEP STRAIGHT ONTO SR-43 (WATERTOWN ROAD). |
| TO: | 310 WATERTOWN ROAD BETHLEHEM, CT |

| REVISIONS | |
|-----------|--------|
| 1 | ISSUED |
| 2 | ISSUED |
| 3 | ISSUED |
| 4 | ISSUED |
| 5 | ISSUED |
| 6 | ISSUED |
| 7 | ISSUED |
| 8 | ISSUED |
| 9 | ISSUED |
| 10 | ISSUED |

Cellco Partnership
d.b.a. Verizon Wireless

NATCOM
NATCOM LLC Engineering Consulting
NATCOM, LLC
12000 Main Street
Bethel, Connecticut 06801
Tel: 860-488-8887
Fax: 860-488-8887
City of Bethel, Connecticut

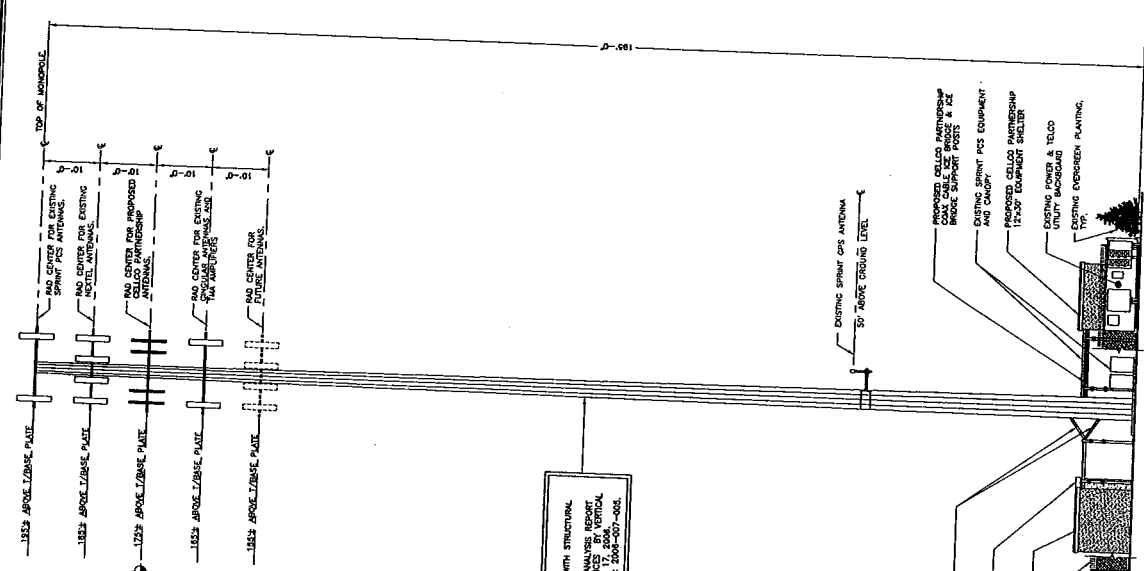


BETHLEHEM NE
310 WATERMAN ROAD
BETHLEHEM, CONNECTICUT 06801

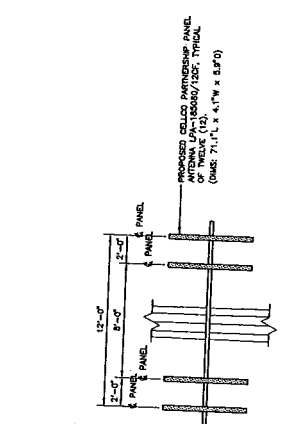
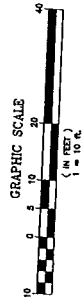
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DRAWN BY: DMD
CHECKED BY: CFC
SCALE: AS NOTED
DATE: 11/17/05

COMPOUND PLAN AND ELEVATION

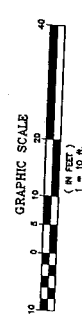
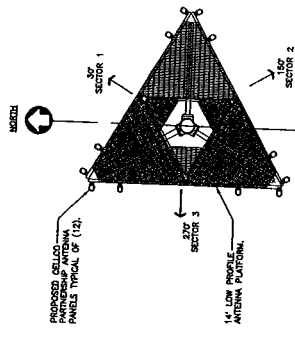
C-1
DWG. 2 OF 2



OWNER NOTES:
1. MONOPOLE WITH STRUCTURAL ANALYSIS REPORT
2. REFER TO MONOPOLE STRUCTURAL ANALYSIS REPORT FOR VERTICAL STRUCTURES AND WIND LOADS. REFER TO VERTICAL STRUCTURES JOB NUMBER: 2005-007-002.



3 ANTENNA MOUNTING CONFIGURATION
N.T.S.



1 COMPOUND PLAN
SCALE: 1" = 10'-0"
N.T.S.



February 17, 2006

Mr. Mark Luther
SBA Network Services
800 South Washington Ave.
Scranton, PA 18505
(570) 558-3450

Subject:

**Structural Analysis Report
Verizon Wireless Co-Locate
SBA Site Name: Morris, CT
SBA Site Number: CT-01501-S
195' Nudd MJ-180 Monopole Tower
Vertical Structures Job Number: 2006-007-005**

Dear Mr. Luther,

Vertical Structures is pleased to provide you with the results of the structural analysis performed on the 195' tall monopole tower at the Morris site in Morris, Connecticut. The purpose of the analysis was to determine the suitability of the tower upon adding twelve (12) proposed Antel LPA-185080/12CF panel antenna mounted on a proposed low-profile platform at 175' for Verizon Wireless when combined with the existing and reserved equipment on the structure. This analysis has been performed in accordance with the TIA/EIA 222-F standard and local code requirements based upon an 80 MPH basic "fastest mile" wind speed, equivalent to a 100 MPH basic "3-second gust" wind speed per IBC Table 1609.3.1.

Based on our analysis we have determined the tower superstructure and foundation are sufficient for the proposed loading.

Vertical Structures appreciates the opportunity to provide this report and our continuing professional services. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Nathan Coomes
Project Engineer

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INTRODUCTION

The subject tower is located in Morris, Connecticut. The 195' Nudd MJ-180 monopole tower was designed and manufactured by Fred A. Nudd Corporation in 2000. The existing structure consists of four (4) 18-sided tapered polygonal tubes joined via slip joint connections and one (1) straight pipe section joined via a bolted flange connection. The tower is founded on a 4' diameter by 12'-6" deep drilled pier embedded 8' into rock. The tower was previously reworked in accordance with o2wireless Solutions Job No. 2230-043 to accommodate additional loading.

ANALYSIS CRITERIA

The Morris Street monopole tower was analyzed in accordance with the current EIA-222-F publication, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." The proposed, existing, and future antennas, cables and mounts considered in this analysis are listed in Table 1. Applied forces in this study were derived from an 80 MPH basic "fastest mile" wind speed with no ice and a reduced 69 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The tower was originally designed for an 80 MPH basic "fastest mile" wind speed with no ice and a reduced 69 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The original design loads are listed in Table 2. All cables are assumed to be routed up the interior of the pole unless otherwise noted.

Table 1 – Proposed, Existing, and Reserved Loads

| Mount Elevation | Carrier Name | Status | Antennas | Mounts | Feedlines |
|-----------------|------------------|----------|---|------------------|-------------------|
| 195' | Sprint | Existing | (6) Decibel DB980H90E-M Panels | (6) 1 5/8" Coax | 14' L.P. Platform |
| 185' | Nextel | Existing | (12) Decibel DB844H80 Panels | (12) 1 5/8" Coax | 12' L.P. Platform |
| 175' | Verizon Wireless | Proposed | (12) Antel LPA-185080/12CF Panels | (12) 1 5/8" Coax | 14' L.P. Platform |
| 165' | Cingular | Existing | (12) Powerwave Technologies 7770.00 | (24) 1 5/8" Coax | 14' L.P. Platform |
| | | | (24) Powerwave Technologies LGP 2140X TMA | | |
| 155' | | Future | (12) Decibel DB844H80 Panels | (12) 1 5/8" Coax | 14' L.P. Platform |

Table 2 – Original Design Loads

| Mount Elevation | Carrier Name | Status | Antennas | Mounts | Feedlines |
|-----------------|--------------|--------|---------------------------|------------------|-------------------|
| 195' | Co-Lo | Design | (12) Decibel DB896 Panels | (12) 1 5/8" Coax | 14' L.P. Platform |
| 185' | Co-Lo | Design | (12) Decibel DB896 Panels | (12) 1 5/8" Coax | 14' L.P. Platform |
| 175' | Co-Lo | Design | (12) Decibel DB896 Panels | (12) 1 5/8" Coax | 14' L.P. Platform |
| 165' | Co-Lo | Design | (12) Decibel DB896 Panels | (12) 1 5/8" Coax | 14' L.P. Platform |
| 155' | Co-Lo | Design | (12) Decibel DB896 Panels | (12) 1 5/8" Coax | 14' L.P. Platform |

ANALYSIS PROCEDURE

Table 3 – Resources Utilized

| Resource | Remarks |
|---------------------|-------------------------------------|
| Proposed Loads | SBA E-mail |
| Existing Loads | SBA |
| Tower Drawings | Nudd Drawing No. DD-7627-1 |
| Foundation Drawings | Nudd Drawing No. DD-7627-1 |
| Geotechnical Report | Jaworski Geotech Project No. 99290G |

Analysis Methods

ERI Tower (Version 3.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/EIA/TIA-222-F or the local building code requirements. Selected output from the analysis is included in Appendix A.

Assumptions

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 1 and any referenced drawings.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222-F.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and Vertical Structures should be allowed to review any new information to determine its effect on the structural integrity of the tower.

ANALYSIS RESULTS

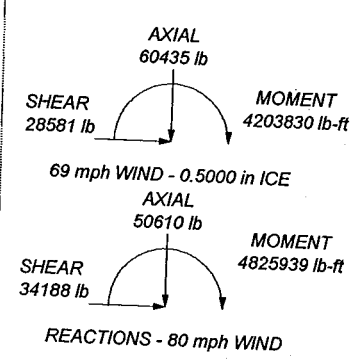
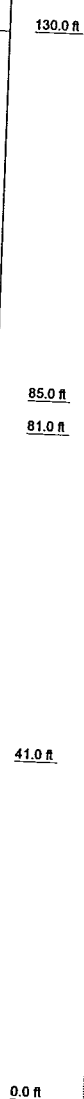
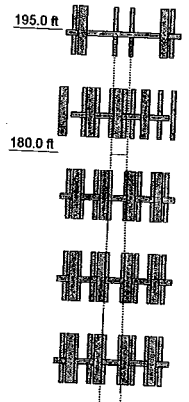
The Morris Street tower superstructure is found to be adequate for the intended loading at the wind and ice conditions considered. Calculated foundation reactions are within the original design limits. Table 4 summarizes the condition of the tower. Capacities up to 105% are considered acceptable based on the analysis procedures used.

Table 4 – Tower Component Capacities

| Section Number | Elevation | Percent Capacity Used | | |
|------------------------|-------------|-----------------------|--------------|--------------|
| | | Pole | Flange Plate | Splice Bolts |
| 1 | 195' – 180' | 23.3 | 90.9 | 61.3 |
| 2 | 180' – 130' | 87.9 | - | - |
| 3 | 130' – 85' | 96.6 | - | - |
| 4 | 85' – 81' | 101.8 | - | - |
| 5 | 81' – 41' | 90.4 | - | - |
| 6 | 41' – 0' | 99.3 | - | - |
| Anchor Bolts – Tension | | 95.1 | | |
| Base Plate – Bending | | 91.9 | | |
| Foundation – Moment | | 98.9 | | |

APPENDIX A

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| Section | 6 | 5 | 4 | 3 | 2 | 1 |
| Length (ft) | 48.00 | 40.00 | 10.00 | 50.00 | 50.00 | 15.00 |
| Number of Sides | 18 | 18 | 18 | 18 | 18 | 1 |
| Thickness (in) | 0.3750 | 0.3750 | 0.3125 | 0.3125 | 0.2500 | 0.2810 |
| Lap Splice (ft) | 7.00 | 6.00 | 6.00 | 5.00 | | |
| Top Dia (in) | 53.1427 | 44.1361 | 34.2600 | 24.0000 | 24.0000 | 24.0000 |
| Bot Dia (in) | 64.5000 | 55.4556 | 46.1944 | 35.9444 | 24.0000 | 24.0000 |
| Grade | A572-65 | A572-65 | A572-65 | A36 | A36 | A36 |
| Weight (lb) | 11362.4 | 9200.0 | 1518.4 | 6735.0 | 4012.7 | 1088.2 |



APPURTENANCES

| TYPE | ELEVATION | TYPE | ELEVATION |
|--|-----------|--|-----------|
| Nudd 14' Low Profile Platform (VSI) (Sprint) | 195 | (4) LPA-185080/12CF w/ mount pipe (Verizon Wireless) | 175 |
| (2) DB980H90E-M w/Mount Pipe (Sprint) | 195 | (4) LPA-185080/12CF w/ mount pipe (Verizon Wireless) | 175 |
| (2) DB980H90E-M w/Mount Pipe (Sprint) | 195 | (4) LPA-185080/12CF w/ mount pipe (Verizon Wireless) | 175 |
| (2) DB980H90E-M w/Mount Pipe (Sprint) | 195 | 14' Low-Profile Platform (Cingular) | 165 |
| (2) 5'x2" Antenna Mount Pipe (Sprint) | 195 | (4) 7770.00 w/ mount pipe (Cingular) | 165 |
| (2) 5'x2" Antenna Mount Pipe (Sprint) | 195 | (4) 7770.00 w/ mount pipe (Cingular) | 165 |
| (2) 5'x2" Antenna Mount Pipe (Sprint) | 195 | (4) 7770.00 w/ mount pipe (Cingular) | 165 |
| 12' L.P. Platform (Nextel) | 185 | (8) LGP2140X (Cingular) | 165 |
| (4) DB844H80 w/Mount Pipe (Nextel) | 185 | (8) LGP2140X (Cingular) | 165 |
| (4) DB844H80 w/Mount Pipe (Nextel) | 185 | (8) LGP2140X (Cingular) | 165 |
| (4) DB844H80 w/Mount Pipe (Nextel) | 185 | 14' Low-Profile Platform (Future) | 155 |
| 14' Low-Profile Platform (Verizon Wireless) | 175 | (4) DB844H80 w/Mount Pipe (Future) | 155 |
| | | (4) DB844H80 w/Mount Pipe (Future) | 155 |
| | | (4) DB844H80 w/Mount Pipe (Future) | 155 |

MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|-------|--------|--------|---------|--------|--------|
| A36 | 36 ksi | 58 ksi | A572-65 | 65 ksi | 80 ksi |

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 101.8%

| | |
|---|--|
| Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369 | Job: Morris, CT (CT-01501-S) |
| | Project: Vertical Structures Job #2006-007-005 |
| | Client: SBA |
| | Code: TIA/EIA-222-F |
| | Path: \\nas1\incomees\OPEN\2006-007-005\Morris_C\TIER1\Morris.et |
| Drawn by: Nathan Coomes | App'd: |
| Date: 02/17/06 | Scale: NTS |
| | Dwg No: E-1 |

| | | | | |
|--|---------|---------------------------------------|-------------|-------------------|
| ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369 | Job | Morris, CT (CT-01501-S) | Page | 1 of 1 |
| | Project | Vertical Structures Job #2006-007-005 | Date | 15:41:26 02/17/06 |
| | Client | SBA | Designed by | Nathan Coomes |

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Litchfield County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 69 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

| | | |
|-------------------------------------|-------------------------------------|--------------------------------------|
| Consider Moments - Legs | Distribute Leg Loads As Uniform | Treat Feedline Bundles As Cylinder |
| Consider Moments - Horizontals | Assume Legs Pinned | Use ASCE 10 X-Brace Ly Rules |
| Consider Moments - Diagonals | √ Assume Rigid Index Plate | √ Calculate Redundant Bracing Forces |
| Use Moment Magnification | √ Use Clear Spans For Wind Area | Ignore Redundant Members in FEA |
| √ Use Code Stress Ratios | √ Use Clear Spans For KL/r | √ SR Leg Bolts Resist Compression |
| √ Use Code Safety Factors - Guys | √ Retension Guys To Initial Tension | √ All Leg Panels Have Same Allowable |
| Escalate Ice | √ Bypass Mast Stability Checks | Offset Girt At Foundation |
| Always Use Max Kz | √ Use Azimuth Dish Coefficients | √ Consider Feedline Torque |
| Use Special Wind Profile | √ Project Wind Area of Appurt. | Include Angle Block Shear Check |
| √ Include Bolts In Member Capacity | √ Autocalc Torque Arm Areas | Poles |
| √ Leg Bolts Are At Top Of Section | √ SR Members Have Cut Ends | Include Shear-Torsion Interaction |
| √ Secondary Horizontal Braces Leg | Sort Capacity Reports By Component | Always Use Sub-Critical Flow |
| Use Diamond Inner Bracing (4 Sided) | √ Triangulate Diamond Inner Bracing | Use Top Mounted Sockets |
| Add IBC .6D+W Combination | | |

Tapered Pole Section Geometry

| Section | Elevation ft | Section Length ft | Splice Length ft | Number of Sides | Top Diameter in | Bottom Diameter in | Wall Thickness in | Bend Radius in | Pole Grade |
|---------|-----------------|-------------------------|------------------------|-----------------------|-----------------------|--------------------------|-------------------------|----------------------|---------------------|
| L1 | 195.00-180.00 | 15.00 | 0.00 | Round | 24.0000 | 24.0000 | 0.2810 | | A36 |
| L2 | 180.00-130.00 | 50.00 | 5.00 | 18 | 24.0000 | 35.9444 | 0.2500 | 1.0000 | (36 ksi) A572-65 |
| L3 | 130.00-85.00 | 50.00 | 6.00 | 18 | 34.2500 | 46.1944 | 0.3125 | 1.2500 | (65 ksi) A572-65 |
| L4 | 85.00-81.00 | 10.00 | 0.00 | 18 | 44.1361 | 46.5250 | 0.3125 | 1.2500 | (65 ksi) A572-65 |
| L5 | 81.00-41.00 | 40.00 | 7.00 | 18 | 46.5250 | 55.4556 | 0.3750 | 1.5000 | (65 ksi) A572-65 |
| L6 | 41.00-0.00 | 48.00 | | 18 | 53.1427 | 64.5000 | 0.3750 | 1.5000 | (65 ksi) A572-65 |

| | | |
|--|---|-------------------------------------|
| ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369 | Job Morris, CT (CT-01501-S) | Page 2 of 2 |
| | Project Vertical Structures Job #2006-007-005 | Date 15:41:26 02/17/06 |
| | Client SBA | Designed by Nathan Coomes |

| Section | Elevation | Section Length | Splice Length | Number of Sides | Top Diameter | Bottom Diameter | Wall Thickness | Bend Radius | Pole Grade |
|---------|-----------|----------------|---------------|-----------------|--------------|-----------------|----------------|-------------|------------|
| | ft | ft | ft | | in | in | in | in | |

(65 ksi)

Tapered Pole Properties

| Section | Tip Dia. | Area | I | r | C | IC | J | I/Q | w | w/t |
|---------|----------|-----------------|-----------------|---------|---------|-----------------|-----------------|-----------------|---------|--------|
| | in | in ² | in ⁴ | in | in | in ³ | in ⁴ | in ² | in | |
| L1 | 24.0000 | 20.9282 | 1473.6284 | 8.3965 | 12.0000 | 122.8024 | 2943.2423 | 10.4632 | 0.0000 | 0 |
| | 24.0000 | 20.9282 | 1473.6284 | 8.3965 | 12.0000 | 122.8024 | 2943.2423 | 10.4632 | 0.0000 | 0 |
| L2 | 24.3702 | 18.8456 | 1342.9976 | 8.4313 | 12.1920 | 110.1540 | 2687.7623 | 9.4246 | 3.7840 | 15.136 |
| | 36.4989 | 28.3235 | 4559.1580 | 12.6715 | 18.2598 | 249.6834 | 9124.3150 | 14.1644 | 5.8862 | 23.545 |
| L3 | 35.9912 | 33.6617 | 4898.1536 | 12.0478 | 17.3990 | 281.5196 | 9802.7523 | 16.8341 | 5.4780 | 17.53 |
| | 46.9070 | 45.5091 | 12103.7119 | 16.2881 | 23.4668 | 515.7812 | 24223.3501 | 22.7589 | 7.5802 | 24.257 |
| L4 | 46.2724 | 43.4675 | 10546.7236 | 15.5574 | 22.4211 | 470.3923 | 21107.3249 | 21.7379 | 7.2179 | 23.097 |
| | 47.2427 | 45.8370 | 12367.2399 | 16.4054 | 23.6347 | 523.2662 | 24750.7529 | 22.9229 | 7.6384 | 24.443 |
| L5 | 47.2427 | 54.9300 | 14780.5555 | 16.3833 | 23.6347 | 625.3752 | 29580.5596 | 27.4702 | 7.5284 | 20.076 |
| | 56.3111 | 65.5597 | 25128.7929 | 19.5536 | 28.1714 | 891.9952 | 50290.6510 | 32.7861 | 9.1002 | 24.267 |
| L6 | 55.6444 | 62.8068 | 22094.3508 | 18.7325 | 26.9965 | 818.4149 | 44217.7740 | 31.4094 | 8.6931 | 23.182 |
| | 65.4950 | 76.3248 | 39651.3314 | 22.7644 | 32.7660 | 1210.1365 | 79354.8371 | 38.1696 | 10.6920 | 28.512 |

| Tower Elevation | Gusset Area | Gusset Thickness | Gusset Grade | Adjust. Factor | Adjust. Factor | Weight Mult. | Double Angle | Double Angle |
|------------------|-----------------|------------------|--------------|----------------|----------------|--------------|---------------------|---------------------|
| ft | ft ² | in | | A _f | A _r | | Stitch Bolt Spacing | Stitch Bolt Spacing |
| | | | | | | | Diagonals | Horizontals |
| | | | | | | | in | in |
| L1 195.00-180.00 | | | | 1 | 1 | 1 | | |
| L2 180.00-130.00 | | | | 1 | 1 | 1 | | |
| L3 130.00-85.00 | | | | 1 | 1 | 1 | | |
| L4 85.00-81.00 | | | | 1 | 1 | 1 | | |
| L5 81.00-41.00 | | | | 1 | 1 | 1 | | |
| L6 41.00-0.00 | | | | 1 | 1 | 1 | | |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement | Total Number | C _{AA} | Weight |
|--|-------------|--------------|----------------|---------------|--------------|---------------------|--------------|
| | | | | ft | | ft ² /ft | plf |
| LDF7-50A (1-5/8 FOAM) (Sprint) | C | No | Inside Pole | 195.00 - 5.00 | 6 | No Ice 1/2" Ice | 0.00 0.82 |
| LDF7-50A (1-5/8 FOAM) (Nextel) | C | No | Inside Pole | 185.00 - 5.00 | 12 | No Ice 1/2" Ice | 0.00 0.82 |
| LDF7-50A (1-5/8 FOAM) (Verizon Wireless) | C | No | Inside Pole | 175.00 - 5.00 | 12 | No Ice 1/2" Ice | 0.00 0.82 |
| LDF7-50A (1-5/8 FOAM) (Cingular) | C | No | Inside Pole | 165.00 - 5.00 | 24 | No Ice 1/2" Ice | 0.00 0.82 |
| LDF7-50A (1-5/8) | C | No | Inside Pole | 155.00 - 5.00 | 12 | No Ice | 0.00 0.82 |

| | | | | |
|--|---------|---------------------------------------|-------------|-------------------|
| ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369 | Job | Morris, CT (CT-01501-S) | Page | 4 of 4 |
| | Project | Vertical Structures Job #2006-007-005 | Date | 15:41:26 02/17/06 |
| | Client | SBA | Designed by | Nathan Coomes |

Feed Line Center of Pressure

| Section | Elevation | CP _X | CP _Z | CP _X | CP _Z |
|---------|---------------|-----------------|-----------------|-----------------|-----------------|
| | ft | in | in | Ice in | Ice in |
| L1 | 195.00-180.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| L2 | 180.00-130.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| L3 | 130.00-85.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| L4 | 85.00-81.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| L5 | 81.00-41.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| L6 | 41.00-0.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight | |
|---|-------------|--------------------|----------------------------|--------------------|-----------|-------------------------------------|------------------------------------|----------------|--------------------|
| | | | ft ft ft | ° | ft | ft ² | ft ² | lb | |
| Nudd 14' Low Profile Platform (VSI) (Sprint) | C | None | | 0.0000 | 195.00 | No Ice 1/2" Ice | 32.00 42.00 | 32.00 42.00 | 1350.00 1750.00 |
| (2) DB980H90E-M w/Mount Pipe (Sprint) | A | From Centroid-Face | 4.04 0.00 0.00 | 0.0000 | 195.00 | No Ice 1/2" Ice | 4.27 4.86 | 3.86 4.95 | 34.05 69.84 |
| (2) DB980H90E-M w/Mount Pipe (Sprint) | B | From Centroid-Face | 4.04 0.00 0.00 | 0.0000 | 195.00 | No Ice 1/2" Ice | 4.27 4.86 | 3.86 4.95 | 34.05 69.84 |
| (2) DB980H90E-M w/Mount Pipe (Sprint) | C | From Centroid-Face | 4.04 0.00 0.00 | 0.0000 | 195.00 | No Ice 1/2" Ice | 4.27 4.86 | 3.86 4.95 | 34.05 69.84 |
| (2) 5'x2" Antenna Mount Pipe (Sprint) | A | From Centroid-Face | 4.04 0.00 0.00 | 0.0000 | 195.00 | No Ice 1/2" Ice | 1.19 1.50 | 1.19 1.50 | 18.25 27.32 |
| (2) 5'x2" Antenna Mount Pipe (Sprint) | B | From Centroid-Face | 4.04 0.00 0.00 | 0.0000 | 195.00 | No Ice 1/2" Ice | 1.19 1.50 | 1.19 1.50 | 18.25 27.32 |
| (2) 5'x2" Antenna Mount Pipe (Sprint) | C | From Centroid-Face | 4.04 0.00 0.00 | 0.0000 | 195.00 | No Ice 1/2" Ice | 1.19 1.50 | 1.19 1.50 | 18.25 27.32 |
| 12' L.P. Platform (Nextel) | C | None | | 0.0000 | 185.00 | No Ice 1/2" Ice | 25.00 29.00 | 25.00 29.00 | 1700.00 2530.00 |
| (4) DB844H80 w/Mount Pipe (Nextel) | A | From Centroid-Face | 3.43 2.02 0.00 | 30.0000 | 185.00 | No Ice 1/2" Ice | 3.58 4.20 | 5.63 6.73 | 35.55 77.48 |
| (4) DB844H80 w/Mount Pipe (Nextel) | B | From Centroid-Face | 3.43 2.02 0.00 | 30.0000 | 185.00 | No Ice 1/2" Ice | 3.58 4.20 | 5.63 6.73 | 35.55 77.48 |
| (4) DB844H80 w/Mount Pipe (Nextel) | C | From Centroid-Face | 3.43 2.02 0.00 | 30.0000 | 185.00 | No Ice 1/2" Ice | 3.58 4.20 | 5.63 6.73 | 35.55 77.48 |
| 14' Low-Profile Platform (Verizon Wireless) | C | None | | 0.0000 | 175.00 | No Ice 1/2" Ice | 25.00 31.00 | 25.00 31.00 | 1000.00 1300.00 |
| (4) LPA-185080/12CF w/mount pipe (Verizon Wireless) | A | From Centroid-Face | 4.04 0.00 0.00 | 0.0000 | 175.00 | No Ice 1/2" Ice | 3.55 3.99 | 5.99 6.94 | 32.40 72.35 |

| | | |
|--|---|-------------------------------------|
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| | Client SBA | Designed by Nathan Coomes |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _{AA} | | Weight |
|--|-------------|---------------|----------|--------------|--------------------|-----------|-----------------|-----------------|---------|
| | | | Horz | Lateral Vert | | | Front | Side | |
| | | | ft | ft | ° | ft | ft ² | ft ² | lb |
| (4) LPA-185080/12CF w/ mount pipe (Verizon Wireless) | B | From | 4.04 | | 0.0000 | 175.00 | No Ice | 3.55 | 32.40 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 3.99 | 72.35 |
| (4) LPA-185080/12CF w/ mount pipe (Verizon Wireless) | C | From | 4.04 | | 0.0000 | 175.00 | No Ice | 3.55 | 32.40 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 3.99 | 72.35 |
| 14' Low-Profile Platform (Cingular) | C | None | | | 0.0000 | 165.00 | No Ice | 25.00 | 1000.00 |
| (4) 7770.00 w/ mount pipe (Cingular) | A | From | 4.04 | | 0.0000 | 165.00 | No Ice | 31.00 | 1300.00 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 6.22 | 56.90 |
| (4) 7770.00 w/ mount pipe (Cingular) | B | From | 4.04 | | 0.0000 | 165.00 | No Ice | 6.22 | 102.99 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 4.35 | 56.90 |
| (4) 7770.00 w/ mount pipe (Cingular) | C | From | 4.04 | | 0.0000 | 165.00 | No Ice | 6.22 | 102.99 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 4.35 | 56.90 |
| (8) LGP2140X (Cingular) | A | From | 4.04 | | 0.0000 | 165.00 | No Ice | 1.23 | 17.50 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 1.38 | 24.46 |
| (8) LGP2140X (Cingular) | B | From | 4.04 | | 0.0000 | 165.00 | No Ice | 1.23 | 17.50 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 1.38 | 24.46 |
| (8) LGP2140X (Cingular) | C | From | 4.04 | | 0.0000 | 165.00 | No Ice | 1.23 | 17.50 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 1.38 | 24.46 |
| 14' Low-Profile Platform (Future) | C | None | | | 0.0000 | 155.00 | No Ice | 25.00 | 1000.00 |
| (4) DB844H80 w/Mount Pipe (Future) | A | From | 4.04 | | 0.0000 | 155.00 | No Ice | 31.00 | 1300.00 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 3.58 | 35.55 |
| (4) DB844H80 w/Mount Pipe (Future) | B | From | 4.04 | | 0.0000 | 155.00 | No Ice | 3.58 | 77.48 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 4.20 | 35.55 |
| (4) DB844H80 w/Mount Pipe (Future) | C | From | 4.04 | | 0.0000 | 155.00 | No Ice | 3.58 | 77.48 |
| | | Centroid-Face | 0.00 | | | | 1/2" Ice | 4.20 | 35.55 |

Load Combinations

| Comb. No. | Description |
|-----------|----------------------------|
| 1 | Dead Only |
| 2 | Dead+Wind 0 deg - No Ice |
| 3 | Dead+Wind 30 deg - No Ice |
| 4 | Dead+Wind 60 deg - No Ice |
| 5 | Dead+Wind 90 deg - No Ice |
| 6 | Dead+Wind 120 deg - No Ice |
| 7 | Dead+Wind 150 deg - No Ice |
| 8 | Dead+Wind 180 deg - No Ice |
| 9 | Dead+Wind 210 deg - No Ice |

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

Maximum Member Forces

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|-------------|--------------|----------------|------------------|-----------------|-----------|-------------------------|-------------------------|
| L1 | 195 - 180 | Pole | Max Tension | 5 | 0.07 | 0.08 | -0.00 |
| | | | Max. Compression | 14 | -7208.37 | 0.00 | 0.00 |
| | | | Max. Mx | 5 | -3975.03 | -73311.95 | 0.00 |
| | | | Max. My | 2 | -3975.03 | 0.00 | 73311.95 |
| | | | Max. Vy | 5 | 7952.11 | -73311.95 | 0.00 |
| | | | Max. Vx | 2 | -7952.11 | 0.00 | 73311.95 |
| | | | Max. Torque | 26 | | | 0.00 |
| L2 | 180 - 130 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -21001.90 | 0.00 | 0.00 |
| | | | Max. Mx | 5 | -13042.18 | -879081.83 | 0.00 |
| | | | Max. My | 2 | -13042.18 | 0.00 | 879081.83 |
| | | | Max. Vy | 5 | 23708.48 | -879081.83 | 0.00 |
| | | | Max. Vx | 2 | -23708.48 | 0.00 | 879081.83 |
| | | | Max. Torque | 26 | | | 0.02 |
| L3 | 130 - 85 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -30706.26 | 0.00 | 0.00 |
| | | | Max. Mx | 5 | -22327.50 | - | 0.00 |
| | | | Max. My | 2 | -22327.50 | 2003895.11 | 2003895.11 |
| | | | Max. Vy | 5 | 27398.88 | - | 0.00 |
| | | | Max. Vx | 2 | -27398.88 | 2003895.11 | 2003895.11 |
| | | | Max. Torque | 26 | | | 0.03 |
| L4 | 85 - 81 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |

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|--|---|-------------------------------------|
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| | Client SBA | Designed by Nathan Coomes |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft | |
|-------------|--------------|----------------|------------------|-----------------|-----------|-------------------------|-------------------------|--|
| L5 | 81 - 41 | Pole | Max. Compression | 14 | -33966.68 | 0.00 | 0.00 | |
| | | | Max. Mx | 5 | -25439.26 | - | 0.00 | |
| | | | | | | | 2282568.01 | |
| | | | Max. My | 2 | -25439.26 | 0.00 | 2282568.01 | |
| | | | Max. Vy | 5 | 28316.87 | - | 0.00 | |
| | | | | | | | 2282568.01 | |
| | | | Max. Vx | 2 | -28316.87 | 0.00 | 2282568.01 | |
| | | | Max. Torque | 26 | | | 0.03 | |
| | | | Max. Tension | 1 | 0.00 | 0.00 | 0.00 | |
| | | | Max. Compression | 14 | -43445.95 | 0.00 | 0.00 | |
| L6 | 41 - 0 | Pole | Max. Mx | 5 | -34468.10 | - | 0.00 | |
| | | | | | | | 3260100.96 | |
| | | | Max. My | 2 | -34468.10 | 0.00 | 3260100.96 | |
| | | | Max. Vy | 5 | 30926.77 | - | 0.00 | |
| | | | | | | | 3260100.96 | |
| | | | Max. Vx | 2 | -30926.77 | 0.00 | 3260100.96 | |
| | | | Max. Torque | 26 | | | 0.03 | |
| | | | Max. Tension | 1 | 0.00 | 0.00 | 0.00 | |
| | | | Max. Compression | 14 | -60435.34 | 0.00 | 0.00 | |
| | | | Max. Mx | 5 | -50587.45 | - | 0.00 | |
| L5 | 81 - 41 | Pole | Max. My | 2 | -50587.45 | 0.00 | 4825909.58 | |
| | | | Max. Vy | 5 | 34221.35 | - | 0.00 | |
| | | | | | | | 4825909.58 | |
| | | | Max. Vx | 2 | -34221.35 | 0.00 | 4825909.58 | |
| | | | Max. Torque | 26 | | | 0.04 | |
| | | | | | | | | |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L _u ft | Kl/r | F _a ksi | A in ² | Actual P lb | Allow. P _a lb | Ratio P/P _a |
|-------------|---------------|---|-------|-------------------|------|--------------------|-------------------|-------------|--------------------------|------------------------|
| L1 | 195 - 180 (1) | TP24x24x0.281 | 15.00 | 0.00 | 0.0 | 21.600 | 20.9282 | -3975.00 | 452050.00 | 0.009 |
| L2 | 180 - 130 (2) | TP35.9444x24x0.25 | 50.00 | 0.00 | 0.0 | 39.000 | 27.3757 | -13041.90 | 1067650.00 | 0.012 |
| L3 | 130 - 85 (3) | TP46.1944x34.25x0.3125 | 50.00 | 0.00 | 0.0 | 39.000 | 44.0874 | -22327.30 | 1719410.00 | 0.013 |
| L4 | 85 - 81 (4) | TP46.525x44.1361x0.3125 H1-3 (1.36 CR) - 4 | 10.00 | 0.00 | 0.0 | 39.000 | 45.8370 | -25439.10 | 1787640.00 | 0.014 |
| L5 | 81 - 41 (5) | TP55.4556x46.525x0.375 | 40.00 | 0.00 | 0.0 | 39.000 | 63.6995 | -34468.00 | 2484280.00 | 0.014 |
| L6 | 41 - 0 (6) | TP64.5x53.1427x0.375 | 48.00 | 0.00 | 0.0 | 36.657 | 76.3248 | -50587.40 | 2797840.00 | 0.018 |

Pole Bending Design Data

| Section No. | Elevation ft | Size | Actual M _x lb-ft | Actual f _{bx} ksi | Allow. F _{bx} ksi | Ratio f _{bx} /F _{bx} | Actual M _y lb-ft | Actual f _{by} ksi | Allow. F _{by} ksi | Ratio f _{by} /F _{by} |
|-------------|---------------|-------------------|-----------------------------|----------------------------|----------------------------|--|-----------------------------|----------------------------|----------------------------|--|
| L1 | 195 - 180 (1) | TP24x24x0.281 | 73312.9 | -7.164 | 23.760 | 0.302 | 0.00 | 0.000 | 23.760 | 0.000 |
| L2 | 180 - 130 (2) | TP35.9444x24x0.25 | 879091.2 | -45.237 | 39.000 | 1.160 | 0.00 | 0.000 | 39.000 | 0.000 |

| | | | | |
|--|---------|---------------------------------------|-------------|-------------------|
| ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369 | Job | Morris, CT (CT-01501-S) | Page | 8 of 8 |
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| | Client | SBA | Designed by | Nathan Coomes |
| | | | | |

| Section No. | Elevation ft | Size | Actual M_x lb-ft | Actual f_{bx} ksi | Allow. F_{bx} ksi | Ratio $\frac{f_{bx}}{F_{bx}}$ | Actual M_y lb-ft | Actual f_{by} ksi | Allow. F_{by} ksi | Ratio $\frac{f_{by}}{F_{by}}$ |
|-------------|--------------|-------------------------|--------------------|---------------------|---------------------|-------------------------------|--------------------|---------------------|---------------------|-------------------------------|
| L3 | 130 - 85 (3) | TP46.1944x34.25x0.3125 | 2003908 .67 | -49.689 | 39.000 | 1.274 | 0.00 | 0.000 | 39.000 | 0.000 |
| L4 | 85 - 81 (4) | TP46.525x44.1361x0.3125 | 2282583 .33 | -52.346 | 39.000 | 1.342 | 0.00 | 0.000 | 39.000 | 0.000 |
| L5 | 81 - 41 (5) | TP55.4556x46.525x0.375 | 3260125 .00 | -46.467 | 39.000 | 1.191 | 0.00 | 0.000 | 39.000 | 0.000 |
| L6 | 41 - 0 (6) | TP64.5x53.1427x0.375 | 4825941 .67 | -47.855 | 36.657 | 1.305 | 0.00 | 0.000 | 36.657 | 0.000 |

Pole Interaction Design Data

| Section No. | Elevation ft | Size | Ratio $\frac{P}{P_a}$ | Ratio $\frac{f_{bx}}{F_{bx}}$ | Ratio $\frac{f_{by}}{F_{by}}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|---------------|-------------------------|-----------------------|-------------------------------|-------------------------------|--------------------|---------------------|----------|
| L1 | 195 - 180 (1) | TP24x24x0.281 | 0.009 | 0.302 | 0.000 | 0.310 ✓ | 1.333 | H1-3 ✓ |
| L2 | 180 - 130 (2) | TP35.9444x24x0.25 | 0.012 | 1.160 | 0.000 | 1.172 ✓ | 1.333 | H1-3 ✓ |
| L3 | 130 - 85 (3) | TP46.1944x34.25x0.3125 | 0.013 | 1.274 | 0.000 | 1.287 ✓ | 1.333 | H1-3 ✓ |
| L4 | 85 - 81 (4) | TP46.525x44.1361x0.3125 | 0.014 | 1.342 | 0.000 | 1.356 ✗ | 1.333 | H1-3 ✗ |
| L5 | 81 - 41 (5) | TP55.4556x46.525x0.375 | 0.014 | 1.191 | 0.000 | 1.205 ✓ | 1.333 | H1-3 ✓ |
| L6 | 41 - 0 (6) | TP64.5x53.1427x0.375 | 0.018 | 1.305 | 0.000 | 1.324 ✓ | 1.333 | H1-3 ✓ |

Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | SF*P _{allow} lb | % Capacity | Pass Fail |
|-------------|--------------|----------------|-------------------------|------------------|-----------|--------------------------|------------|-----------|
| L1 | 195 - 180 | Pole | TP24x24x0.281 | 1 | -3975.00 | 602582.62 | 23.3 | Pass |
| L2 | 180 - 130 | Pole | TP35.9444x24x0.25 | 2 | -13041.90 | 1423177.39 | 87.9 | Pass |
| L3 | 130 - 85 | Pole | TP46.1944x34.25x0.3125 | 3 | -22327.30 | 2291973.43 | 96.6 | Pass |
| L4 | 85 - 81 | Pole | TP46.525x44.1361x0.3125 | 4 | -25439.10 | 2382924.02 | 101.8 | Fail ✗ |
| L5 | 81 - 41 | Pole | TP55.4556x46.525x0.375 | 5 | -34468.00 | 3311545.10 | 90.4 | Pass |
| L6 | 41 - 0 | Pole | TP64.5x53.1427x0.375 | 6 | -50587.40 | 3729520.57 | 99.3 | Pass |
| Summary | | | | | | | | |
| Pole (L4) | | | | | | | 101.8 | Fail ✗ |
| RATING = | | | | | | | 101.8 | Fail ✗ |

General Power Density

Site Name: Bethlehem NE
 Tower Height: Verizon @ 175 FT

| Operator | Operating Frequency (MHz) | Number of Trunks | ERP Per Trunk (watts) | Total ERP (watts) | Distance to Target (feet) | Calculated Power Density (mW/cm ²) | Maximum Permissible Exposure (mW/cm ²) | Fraction of MPE |
|---|---------------------------|------------------|-----------------------|-------------------|---------------------------|--|--|-----------------|
| Verizon | 880 | 9 | 200 | 1800 | 175 | 0.0211 | 0.56733 | 3.73% |
| Verizon | 1900 | 6 | 200 | 1200 | 175 | 0.0141 | 1 | 1.41% |
| Sprint | 1900 | 11 | 200 | 2200 | 195 | 0.0208 | 1 | 2.08% |
| Cingular (800MHz) | 880 | 19 | 100 | 1900 | 165 | 0.0251 | 0.5673 | 4.42% |
| Cingular (1900MHz) | 1900 | 25 | 76 | 1900 | 165 | 0.0251 | 1 | 2.51% |
| Nextel | 851 | 24 | 100 | 2400 | 185 | 0.0252 | 0.5673 | 4.45% |
| Total Percentage of Maximum Permissible Exposure | | | | | | | | 18.59% |

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
 mW/cm² = milliwatts per square centimeter
 ERP = Effective Radiated Power





NATCOMM, LLC

Consulting Engineers

February 15, 2006

Mr. Mark Gauger
Verizon Wireless
99 East River Road
East Hartford, CT 06002

Re: *Verizon – Ochenkowski Tower*
86 Parsonage Hill Road
Northford, CT 06472

Natcomm Project No. 05094

Dear Mark,

We have reviewed the proposed Verizon antenna installation at the above referenced site. The purpose of the review was to determine the feasibility of adding antennas to the existing 195ft. lattice tower located at 86 Parsonage Hill Road in Northford, Connecticut. The review considered the effects of wind load, dead load, ice load and seismic forces in accordance with TIA/EIA-222-G and Connecticut State Building Code. Structural design documents prepared by Central Tower, Inc. dated June 3, 2002 were used as reference material.

The existing antenna configurations are as follows:

| Carrier | Installed Antennas | Future Antennas | Mount | Coax | Elevation (AGL) |
|----------|--------------------|-----------------|---------------|--------|-----------------|
| Sprint | (6) DB980-H90 | (3) DB-980-H90 | 14' Boom-gate | 1-5/8" | 190 feet |
| Sprint | (1) GPS Antenna | n/a | Pipe mount | 7/8" | 75 feet |
| T-Mobile | (6) 59000X/59010X | n/a | 14' Boom-gate | 1-5/8" | 180 feet |
| AT&T | (3) Allgon 7250 | (3) Allgon 7250 | 14' Boom-gate | 1-5/8" | 170 feet |
| Nextel | (12) DB844-H90 | n/a | 14' Boom-gate | 1-5/8" | 160 feet |

The proposed antenna loading is as follows:

| Carrier | Installed Antennas | Future Antennas | Mount | Coax | Elevation (AGL) |
|---------|--------------------|-----------------|--------------|--------|-----------------|
| Verizon | (6) LPA80090/4CF | n/a | 15' T-Frame | 1-5/8" | 145 feet |
| Verizon | (6) LPA185090/8CF | n/a | (same frame) | 1-5/8" | 145 feet |

The existing tower is engineered to be extendable to a height of 245'. Provided that the existing tower remains at the height of 195' and that it is not extended to its original design height, it is feasible for Verizon Wireless to install their proposed antennas at an elevation of 145' AGL.

If there are any questions regarding this matter, please feel free to call.

Submitted by:


Carlo F. Centore, P.E.
Senior Project Manager

General Power Density

Site Name: Northford
 Tower Height: Verizon @ 145 Ft.

| Operator | Operating Frequency (MHz) | Number of ERP Per Trans | Total ERP (watts) | Distance to Target (feet) | Calculated Power Density (mW/cm ²) | Maximum Permissible Exposure (mW/cm ²) | Section of NRE |
|---|---------------------------|-------------------------|-------------------|---------------------------|--|--|----------------|
| Verizon | 880 | 9 | 1800 | 145 | 0.0308 | 0.56733 | |
| Verizon | 1900 | 6 | 1536 | 145 | 0.0263 | 1 | 5.43% |
| Sprint | 1900 | 11 | 1342 | 190 | 0.0134 | 1 | 2.63% |
| AT&T | 1900 | 3 | 1281 | 170 | 0.0159 | 1 | 1.34% |
| Nextel | 851 | 24 | 2400 | 160 | 0.0337 | 0.5673 | 1.59% |
| T-Mobile | 1900 | 25 | 1900 | 180 | 0.0211 | 1 | 5.94% |
| Total Percentage of Maximum Permissible Exposure | | | | | | | 19.04% |

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz

mW/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power

