

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

August 2, 2012

RECEIVED
AUG - 3 2012
CONNECTICUT
SITING COUNCIL

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-105-120125 – 125 Mile Creek Road, Old Lyme, Connecticut**
EM-VER-117-120306 – 80 Lonetown Road, Redding, Connecticut
EM-VER-108-120227 – 85 Quaker Farms Road, Seymour, Connecticut
EM-VER-056-120217 – 8 Upper Meadow Road, Granby, Connecticut
EM-VER-132-120605 – Burnham Street, South Windsor, Connecticut
EM-VER-064-120622 – 439-455 Homestead Avenue, Hartford, Connecticut
EM-VER-077-120412 – 60 Adams Street, Manchester, Connecticut

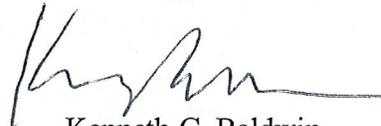
Completion of Construction Activity

Dear Ms. Roberts:

The purpose of this letter is to notify the Siting Council that construction activity associated with the above-referenced Cellco Partnership d/b/a Verizon Wireless telecommunications facilities has been completed.

If you have any questions or need any additional information regarding this facility please do not hesitate to contact me.

Sincerely,



Kenneth C. Baldwin

Copy to:
Sandy M. Carter



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

www.rc.com

11801799-v1



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

May 1, 2012

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

RE: **EM-VER-077-120412** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 60 Adams Street, Manchester, Connecticut.

Dear Attorney Baldwin:

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

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated April 11, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts
Executive Director

LR/CDM/laf

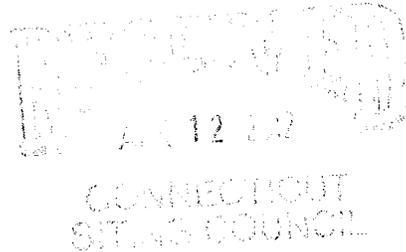
c: The Honorable Louis A. Spadaccini, Mayor, Town of Manchester
Scott A. Shanley, General Manager, Town of Manchester
James Davis, Zoning Enforcement Officer, Town of Manchester
Pom-Pom Gali

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

April 11, 2012

Via U.S. Mail

Linda Roberts
 Executive Director
 Connecticut Siting Council
 10 Franklin Square
 New Britain, CT 06051



Re: **Notice of Exempt Modification – Antenna Swap
 60 Adams Street, Manchester, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 90-foot level on the existing 140-foot tower at the above-referenced address. The tower and underlying property are owned by Pom-Pom Gali, LLC. The Council approved Cellco’s use of the existing tower in 1998. Cellco now intends to modify its installation by replacing six (6) of its existing cellular antennas with six (6) model SC-E 6014 cellular antennas at the same 90-foot level on the tower. Attached behind Tab 1 are the specifications for the proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction 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 is being sent to Leo V. Diana, Mayor for the Town of Manchester. A copy of this letter is being sent to Pom-Pom Gali, LLC, the owner of the property on which the tower is located.

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

1. The proposed modifications will not result in any increase in the overall height of the existing tower. Cellco’s replacement antennas will be located at the 90-foot level on the existing 140-foot tower.



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

www.rc.com

11594635-v1

Linda Roberts
April 11, 2012
Page 2

2. The proposed modifications will not involve any modifications to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

Also attached is a Detailed Structural Analysis confirming that the tower and foundation can support Cellco's proposed modifications. (See Tab 3).

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Leo V. Diana, Manchester Mayor
Pom-Pom Gali, LLC
Sandy M. Carter

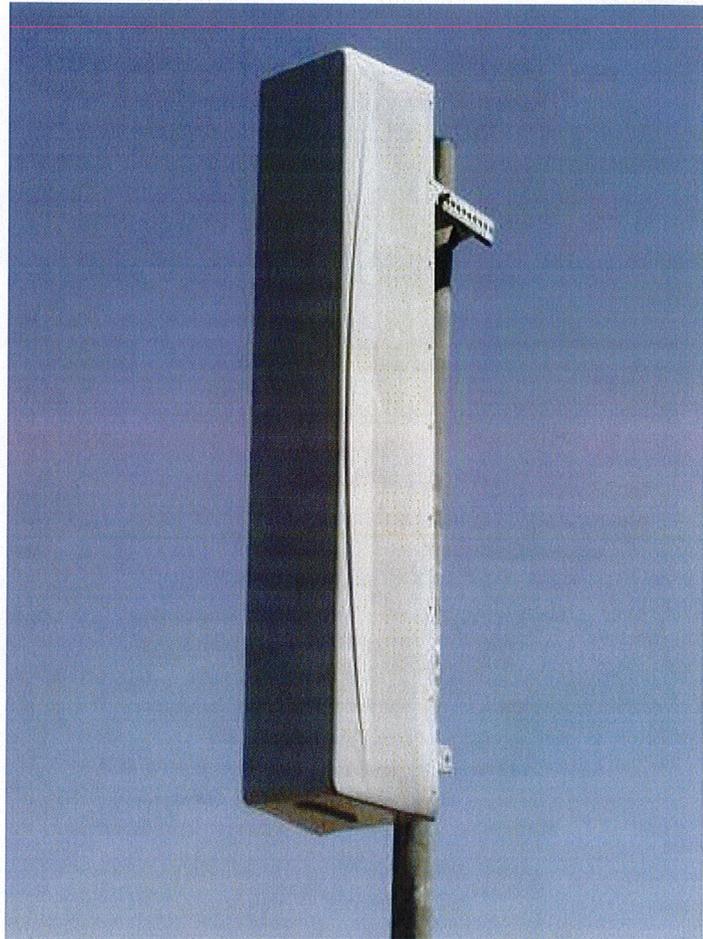


SC-E 6014 rev2

Enhanced 800 - 960 MHz log-periodic antenna

Features

- Small size
- Aesthetically pleasing
- Suitable for TDMA/CDMA/GSM/3G
- High return loss
- Low intermodulation
- High front-to-back ratio
- Outstanding performance over the entire band (800 - 960 MHz)
- Upper side-lobe suppression
- Rugged design
- Dramatically improved signal to interference performance



Electrical specifications

| | |
|------------------------------|--------------------|
| Frequency range: | 800-960 MHz |
| Impedance: | 50 ohm |
| Connector type: | 7/16 Din |
| Return loss: | 20 dB |
| Polarization: | Vertical |
| Gain: | 14 dBd |
| Front-to-back ratio: | > 30 dB |
| Upper side-lobe suppression: | 18 dB |

| | |
|--------------------------|---------------------|
| Intermodulation (2x20W): | IM5 160 dB |
| | IM7/9 170 dB |

| | |
|------------------------|--------------------|
| Power rating: | 500 W |
| H-plane (-3 dB point): | 54 - 60° |
| V-plane (-3 dB point): | 16 - 18° |
| Lightning protection: | DC grounded |

Mechanical specifications

| | | |
|-----------------------------------------------------|---------------------|--------------------|
| Overall height: | 43 in | [1092 mm] |
| Width: | 8.5 in | [216 mm] |
| Depth: | 8 in | [203 mm] |
| Weight (excluding brackets): | 15 lbs | [6.8 Kg] |
| Wind load measured up to: | 150 mph | [240 Km/h] |
| Wind area (side of antenna): | 2.54 sq. ft. | [0.24 sq.m] |
| Lateral thrust At 113 mph/ 180Km/h (worst case): | 122 lbs | [577 N] |

Materials

| | |
|----------------------------------|---------------------------------|
| Radiating Elements: | Aluminum |
| Transformer (Power distribution) | Ceramic PCB |
| Chassis: | Aluminum |
| Radome: | Grey Fiberglass/PVC |
| Tilt-bracket: | Hot dip galvanized steel |
| Mounting bolts: | Stainless steel |

The SC-E 6014 rev2 is made in the U.S.A.

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 140' MONOPOLE FOR PROPOSED ANTENNA ARRANGEMENT

Site Name: Manchester W CT
Site Address: 60 Adams Street
Manchester, CT

prepared for



Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

prepared by



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

36922272
VZ5-114

March 28, 2012

TABLE OF CONTENTS

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

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 140' steel monopole structure, located at 60 Adams Street in Manchester, CT. The analysis was conducted in accordance with the 2005 Connecticut State Building Code and the TIA/EIA-222-F standard for a wind velocity of 80 mph (fastest mile) and 69 mph (fastest mile) 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 modification is as follows:

| Proposed Antenna and Mount | Carrier | Antenna Center Elevation |
|------------------------------------------------|-----------------------|--------------------------|
| On the existing Verizon Platform: | | |
| Remove: (6) ALP6014 antennas | Verizon (Existing) | @ 90' |
| Install: (6) SC-E 6014 REV2 antennas | Verizon (Proposed) | @ 90' |

The results of the analysis indicate that the tower structure has the capacity to support the proposed loading conditions. **The tower and its foundation are considered structurally adequate with the 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 manufacturer design documents by Engineered Endeavors Incorporated, (EEI Project No. 4795); signed and sealed March 26, 1999.
- 3) Structural analysis performed by URS Corporation on behalf of Verizon Wireless, project number VZ5-054 (Rev 2) / 36915665 signed and sealed June 9, 2010.
- 4) Tower inventory taken from structural analysis performed by Malouf Engineering Intl., Inc. project ID CT00874M-07V0 signed and sealed August 17, 2007.
- 5) 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 as well as the physical condition of the tower. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

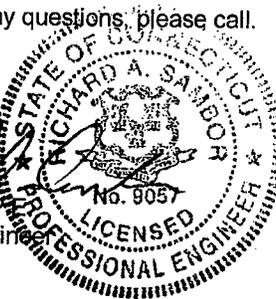
If you should have any questions, please call.

Sincerely,

URS Corporation

Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/mjk



2. INTRODUCTION

The subject tower is located at 60 Adams Street in Manchester, CT. The original structure is a 140' steel monopole designed by Engineered Endeavors Incorporated (EEI).

Tower geometry and structural member sizes taken from manufacturer design documents by Engineered Endeavors Incorporated, (EEI Project #: 4795); signed and sealed March 26, 1999.

The inventory is summarized in Table 1:

Table 1: Antenna and Mount Configuration

| <i>Antenna Type</i> | <i>Carrier</i> | <i>Mount</i> | <i>Antenna Centerline Elevation</i> | <i>Cable</i> |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|-------------------------------------|----------------------|
| --- | Unknown (Existing) | (2) 4' Side Arms | 139' | --- |
| --- | Unknown (Existing) | (1) 8' Side Arm | 134' | --- |
| (6) CSS DUO1417-8686 Antennas (3) Powerwave 7770 Antennas (6) TMAs (6) Duplexers (3) Powerwave 7060 CILOC (3) Powerwave 7020 RCU/RETs | AT&T (Existing) | 13' Platform | 125' | (12) 1 ¼" Coax |
| (6) DB980H90 Antennas | Sprint (Existing) | 15' Low-Profile Platform | 115' | (6) 1 ¼" Coax |
| (2) 6' Whip | Unknown (Existing) | (2) 4' Side Arm | 107' | (2) 7/8" Coax |
| (12) DB844H90 Antennas | Sprint / Nextel (Existing) | 15' Platform | 100' | (12) 7/8" Coax |
| (3) BXA-70063/6CF Antennas (3) MG D3-900T2 Antennas (6) FD9R6004/2C-3L Diplexers | Verizon (Existing) | 13' Platform | 90' | (12) 1 5/8" Coax |
| (6) SC-E 6014 REV2 Antennas | Verizon (Proposed) | Same as Above | 90' | Same as Above |

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 the 2005 Connecticut State Building Code, 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 Connecticut State Building Code requires a three second gust wind speed of 100 mph which converts to a 80 mph fastest mile per 2003 IBC (Table 1609.3.1). The TIA/EIA-222-F requires a basic wind speed of 80 mph fastest mile. In this case the wind speed from the Connecticut State Building Code governs the design.

The analysis was conducted using trn Tower 6.0. 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 (fastest mile) Wind Load (without ice) + Tower Dead Load
 Load Condition 2 = 69 mph (fastest mile) 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. Additionally, the anchor bolts, base plate, and foundation were found to be structurally adequate as shown in Table 2.

Table 2: Tower Component Stress vs. Capacity Table

| Component / Section No. | Existing Component Size | Controlling Elevation | Stress (% Capacity) | Pass/Fail |
|--------------------------------|--------------------------------|------------------------------|----------------------------|------------------|
| L1 | TP27.183x18x0.188 | 91.05'-140' | 51.9 | Pass |
| L2 | TP35.321x26.076x0.313 | 45.04'-91.05' | 74.2 | Pass |
| L3 | TP43x33.786x0.375 | 0-45.04' | 78.5 | Pass |
| Anchor Bolt | 2.25" dia | Tension & Compression | 94.0 | Pass |
| Base Plate | 1.75" Thick x 57" dia | Bending | 78.0 | Pass |
| Foundation | 6' dia x 23' long caisson | Deflection (0.67") | 89.3 | Pass |

Note: Maximum allowable deflection is 0.75" per TIA/EIA.

5. CONCLUSIONS

The results of the analysis indicate that the tower structure has the capacity to support the proposed loading conditions. **The tower and its foundation are considered structurally adequate with the wind load classification specified above and all the existing and proposed antenna loading.**

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

TNX TOWER INPUT/OUTPUT SUMMARY

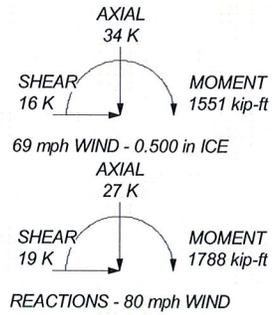
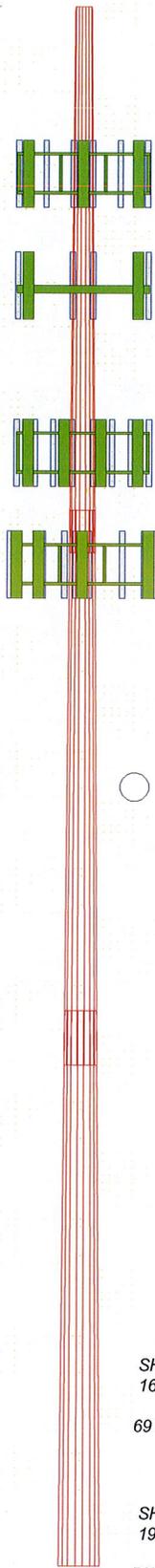
140.0 ft

| | | | |
|--------------------|--------|---------|--------|
| Section | 1 | 2 | 3 |
| Length (ft) ~ | 48.950 | 49.910 | 49.950 |
| Number of Sides | 18 | 18 | 18 |
| Thickness (in) | 0.188 | 0.313 | 0.375 |
| Socket Length (ft) | 3.900 | 4.910 | 33.786 |
| Top Dia (in) | 18.000 | 26.076 | 43.000 |
| Bot Dia (in) | 27.183 | 35.321 | 43.000 |
| Grade | | A572-65 | |
| Weight (K) | 2.2 | 5.1 | 7.7 |
| | | | 15.0 |

45.0 ft

0.0 ft

91.0 ft



DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|-----------------------------------------|-----------|----------------------------------------------------|-----------|
| (2) 4' Side arm (Unknown) | 139 | (2) 4' Side arm (Unknown) | 107 |
| 8' Side arm (Unknown) | 134 | (4) DB844H90 (Sprint / Nextel) | 100 |
| (2) DUO1417-8686 (ATI) | 125 | (4) DB844H90 (Sprint / Nextel) | 100 |
| (2) DUO1417-8686 (ATI) | 125 | (4) DB844H90 (Sprint / Nextel) | 100 |
| (2) DUO1417-8686 (ATI) | 125 | PIROD 15' Platform with handrail (Sprint / Nextel) | 100 |
| (2) TMA (Cingular) (ATI) | 125 | SC-E 6014 rev2 (Verizon) | 90 |
| (2) TMA (Cingular) (ATI) | 125 | SC-E 6014 rev2 (Verizon) | 90 |
| (2) Duplexer (ATI) | 125 | SC-E 6014 rev2 (Verizon) | 90 |
| (2) Duplexer (ATI) | 125 | SC-E 6014 rev2 (Verizon) | 90 |
| (2) Duplexer (ATI) | 125 | SC-E 6014 rev2 (Verizon) | 90 |
| 7770 w mount pipe (ATI) | 125 | SC-E 6014 rev2 (Verizon) | 90 |
| 7770 w mount pipe (ATI) | 125 | BXA-70063/6CF (Verizon) | 90 |
| 7770 w mount pipe (ATI) | 125 | BXA-70063/6CF (Verizon) | 90 |
| 7060 CILOC (ATI) | 125 | BXA-70063/6CF (Verizon) | 90 |
| 7060 CILOC (ATI) | 125 | Rymasa MG D3-900Tx (Verizon) | 90 |
| 7020 RCU/RETS (ATI) | 125 | Rymasa MG D3-900Tx (Verizon) | 90 |
| 7020 RCU/RETS (ATI) | 125 | PIROD 13' Platform w/handrail (Verizon) | 90 |
| 7020 RCU/RETS (ATI) | 125 | FD9R6004/2C-3L Diplexer (Verizon) | 90 |
| PIROD 13' Platform w/handrail (ATI) | 125 | FD9R6004/2C-3L Diplexer (Verizon) | 90 |
| (2) DB980H90 (Sprint) | 115 | FD9R6004/2C-3L Diplexer (Verizon) | 90 |
| (2) DB980H90 (Sprint) | 115 | FD9R6004/2C-3L Diplexer (Verizon) | 90 |
| (2) DB980H90 (Sprint) | 115 | FD9R6004/2C-3L Diplexer (Verizon) | 90 |
| PIROD 15' Low Profile Platform (Sprint) | 115 | FD9R6004/2C-3L Diplexer (Verizon) | 90 |
| (2) 6' Whip (Unknown) | 113 - 107 | FD9R6004/2C-3L Diplexer (Verizon) | 90 |

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. Weld together tower sections have flange connections.
5. Connections use galvanized A325 bolts, nuts and locking devices.
6. Installation per TIA/EIA-222-F and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. TOWER RATING: 78.5%

| | | | |
|--------------------------------|--|------------------------------------------------------------|---------------------------|
| URS Corporation | | Job: 140' Monopole | |
| 500 Enterprise Drive, Suite 3B | | Project: Manchester West | |
| Rocky Hill, CT | | Client: Verizon Wireless | Drawn by: Matthew Kapinos |
| Phone: (860) 529-8882 | | Code: TIA/EIA-222-F | Date: 03/28/12 |
| FAX: (860) 529-3991 | | Path: P:\08\ERI Files\140' EEI Monopole Manchester, CT.eri | Scale: NTS |
| | | | Dwg No. E-1 |

TNX TOWER DETAILED OUTPUT

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 1 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

Tower Input Data

There is a pole section.

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

The following design criteria apply:

Basic wind speed of 80 mph.

Nominal ice thickness of 0.500 in.

Ice density of 56 pcf.

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

Deflections calculated using a wind speed of 50 mph.

Weld together tower sections have flange connections..

Connections use galvanized A325 bolts, nuts and locking devices..

Installation per TIA/EIA-222-F and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

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

- | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity √ Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> √ Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feedline Torque Include Angle Block Shear Check <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Tapered Pole Section Geometry

| 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 | |
| L1 | 140.000-91.050 | 48.950 | 3.900 | 18 | 18.000 | 27.183 | 0.188 | 0.563 | A572-65 (65 ksi) |
| L2 | 91.050-45.040 | 49.910 | 4.910 | 18 | 26.076 | 35.321 | 0.313 | 0.938 | A572-65 (65 ksi) |
| L3 | 45.040-0.000 | 49.950 | | 18 | 33.786 | 43.000 | 0.375 | 1.125 | A572-65 (65 ksi) |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 2 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

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 | 18.278 | 10.601 | 424.933 | 6.323 | 9.144 | 46.471 | 850.425 | 5.301 | 2.904 | 15.488 |
| | 27.602 | 16.066 | 1479.176 | 9.583 | 13.809 | 107.117 | 2960.298 | 8.034 | 4.520 | 24.108 |
| L2 | 27.212 | 25.555 | 2143.025 | 9.146 | 13.247 | 161.777 | 4288.870 | 12.780 | 4.149 | 13.278 |
| | 35.866 | 34.724 | 5376.643 | 12.428 | 17.943 | 299.651 | 10760.360 | 17.365 | 5.776 | 18.485 |
| L3 | 35.227 | 39.768 | 5608.692 | 11.861 | 17.164 | 326.780 | 11224.764 | 19.888 | 5.418 | 14.449 |
| | 43.663 | 50.734 | 11645.786 | 15.132 | 21.844 | 533.134 | 23306.896 | 25.372 | 7.040 | 18.773 |

| 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 in | Double Angle Stitch Bolt Spacing Horizontals in |
|----------------------|---------------------------|------------------|--------------|----------------------------------|----------------------------------|--------------|-----------------------------------------------------------|-------------------------------------------------------------|
| ft | ft ² | in | | | | | | |
| L1 140.000-91.050 | | | | 1 | 1 | 1 | | |
| L2 91.050-45.040 | | | | 1 | 1 | 1 | | |
| L3 45.040-0.000 | | | | 1 | 1 | 1 | | |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | | C _{AA} ft ² /ft | Weight klf |
|-----------------------|-------------|--------------|----------------|-----------------|--------------|----------|----------------------------------------|---------------|
| 1 1/4 (AT&T) | C | No | Inside Pole | 125.000 - 0.000 | 12 | No Ice | 0.000 | 0.001 |
| 1 1/4 (Sprint) | C | No | Inside Pole | 115.000 - 0.000 | 6 | 1/2" Ice | 0.000 | 0.001 |
| 7/8 (Unknown) | C | No | Inside Pole | 107.000 - 0.000 | 1 | No Ice | 0.000 | 0.001 |
| 7/8 (Sprint / Nextel) | C | No | Inside Pole | 100.000 - 0.000 | 12 | 1/2" Ice | 0.000 | 0.001 |
| 1 5/8 (Verizon) | C | No | Inside Pole | 90.000 - 0.000 | 12 | No Ice | 0.000 | 0.001 |
| | | | | | | 1/2" Ice | 0.000 | 0.001 |

Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation ft | Face | A _R ft ² | A _F ft ² | C _{AA} In Face ft ² | C _{AA} Out Face ft ² | Weight K |
|---------------|-----------------------|------|-----------------------------------|-----------------------------------|-----------------------------------------------|------------------------------------------------|-------------|
| L1 | 140.000-91.050 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.430 |
| L2 | 91.050-45.040 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 1.431 |
| L3 | 45.040-0.000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 1.413 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 3 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

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 _{AA} In Face ft ² | C _{AA} Out Face ft ² | Weight K |
|---------------|-----------------------|-------------|---------------------|-----------------------------------|-----------------------------------|-----------------------------------------------|------------------------------------------------|-------------|
| L1 | 140.000-91.050 | A | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.430 |
| L2 | 91.050-45.040 | A | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 1.431 |
| L3 | 45.040-0.000 | A | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 1.413 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment ° | Placement ft | C _{AA} Front ft ² | C _{AA} Side ft ² | Weight K |
|---------------------------|-------------|-------------|-------------------------------------------------------|-------------------------|-----------------|---------------------------------------------|--------------------------------------------|----------------|
| (2) 4' Side arm (Unknown) | C | None | | 0.000 | 139.000 | No Ice 1.920 1/2" Ice 2.580 | 1.920 2.580 | 0.069 0.082 |
| 8' Side arm (Unknown) | C | None | | 0.000 | 134.000 | No Ice 3.840 1/2" Ice 5.160 | 3.840 5.160 | 0.139 0.164 |
| (2) DUO1417-8686 (AT&T) | A | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 6.533 1/2" Ice 6.940 | 4.200 4.574 | 0.020 0.062 |
| (2) DUO1417-8686 (AT&T) | B | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 6.533 1/2" Ice 6.940 | 4.200 4.574 | 0.020 0.062 |
| (2) DUO1417-8686 (AT&T) | C | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 6.533 1/2" Ice 6.940 | 4.200 4.574 | 0.020 0.062 |
| (2) TMA (Cingular) (AT&T) | A | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 1.225 1/2" Ice 1.378 | 0.340 0.452 | 0.020 0.027 |
| (2) TMA (Cingular) (AT&T) | B | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 1.225 1/2" Ice 1.378 | 0.340 0.452 | 0.020 0.027 |
| (2) TMA (Cingular) (AT&T) | C | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 1.225 1/2" Ice 1.378 | 0.340 0.452 | 0.020 0.027 |
| (2) Duplexer (AT&T) | A | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 0.424 1/2" Ice 0.521 | 0.186 0.266 | 0.005 0.007 |
| (2) Duplexer (AT&T) | B | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 0.424 1/2" Ice 0.521 | 0.186 0.266 | 0.005 0.007 |
| (2) Duplexer (AT&T) | C | From Face | 3.000 0.000 0.000 | 0.000 | 125.000 | No Ice 0.424 1/2" Ice 0.521 | 0.186 0.266 | 0.005 0.007 |
| 7770 w mount pipe | A | From Face | 3.000 | 0.000 | 125.000 | No Ice 5.882 | 3.980 | 0.052 |

| | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--|------------------|--|--------------------|-------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | | 140' Monopole | | Page | 4 of 22 |
| | Project | | Manchester West | | Date | 11:01:18 03/28/12 |
| | Client | | Verizon Wireless | | Designed by | Matthew Kapinos |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _{AA} Front | C _{AA} Side | Weight |
|----------------------------------------------------|-------------|-------------|----------|---------|--------------------|-----------|-----------------------|----------------------|--------|
| | | | Horz | Lateral | | | | | |
| (AT&T) | | | 0.000 | | | 1/2" Ice | 6.314 | 4.603 | 0.095 |
| 7770 w mount pipe (AT&T) | B | From Face | 3.000 | 0.000 | 125.000 | No Ice | 5.882 | 3.980 | 0.052 |
| | | | 0.000 | | | 1/2" Ice | 6.314 | 4.603 | 0.095 |
| 7770 w mount pipe (AT&T) | C | From Face | 3.000 | 0.000 | 125.000 | No Ice | 5.882 | 3.980 | 0.052 |
| | | | 0.000 | | | 1/2" Ice | 6.314 | 4.603 | 0.095 |
| 7060 CILOC (AT&T) | A | From Face | 3.000 | 0.000 | 125.000 | No Ice | 0.067 | 0.058 | 0.002 |
| | | | 0.000 | | | 1/2" Ice | 0.107 | 0.095 | 0.003 |
| 7060 CILOC (AT&T) | B | From Face | 3.000 | 0.000 | 125.000 | No Ice | 0.067 | 0.058 | 0.002 |
| | | | 0.000 | | | 1/2" Ice | 0.107 | 0.095 | 0.003 |
| 7060 CILOC (AT&T) | C | From Face | 3.000 | 0.000 | 125.000 | No Ice | 0.067 | 0.058 | 0.002 |
| | | | 0.000 | | | 1/2" Ice | 0.107 | 0.095 | 0.003 |
| 7020 RCU/RET's (AT&T) | A | From Face | 3.000 | 0.000 | 125.000 | No Ice | 0.401 | 0.117 | 0.002 |
| | | | 0.000 | | | 1/2" Ice | 0.491 | 0.169 | 0.005 |
| 7020 RCU/RET's (AT&T) | B | From Face | 3.000 | 0.000 | 125.000 | No Ice | 0.401 | 0.117 | 0.002 |
| | | | 0.000 | | | 1/2" Ice | 0.491 | 0.169 | 0.005 |
| 7020 RCU/RET's (AT&T) | C | From Face | 3.000 | 0.000 | 125.000 | No Ice | 0.401 | 0.117 | 0.002 |
| | | | 0.000 | | | 1/2" Ice | 0.491 | 0.169 | 0.005 |
| PiROD 13' Platform w/handrail (AT&T) | C | None | | 0.000 | 125.000 | No Ice | 31.300 | 31.300 | 1.822 |
| | | | | | | 1/2" Ice | 40.200 | 40.200 | 2.452 |
| (2) DB980H90 (Sprint) | A | From Face | 3.000 | 0.000 | 115.000 | No Ice | 3.799 | 2.194 | 0.085 |
| | | | 0.000 | | | 1/2" Ice | 4.178 | 2.556 | 0.105 |
| (2) DB980H90 (Sprint) | B | From Face | 3.000 | 0.000 | 115.000 | No Ice | 3.799 | 2.194 | 0.085 |
| | | | 0.000 | | | 1/2" Ice | 4.178 | 2.556 | 0.105 |
| (2) DB980H90 (Sprint) | C | From Face | 3.000 | 0.000 | 115.000 | No Ice | 3.799 | 2.194 | 0.085 |
| | | | 0.000 | | | 1/2" Ice | 4.178 | 2.556 | 0.105 |
| PiROD 15' Low Profile Platform (Sprint) | C | None | | 0.000 | 115.000 | No Ice | 17.300 | 17.300 | 1.500 |
| | | | | | | 1/2" Ice | 22.100 | 22.100 | 2.030 |
| (2) 6' Whip (Unknown) | C | None | | 0.000 | 113.000 - 107.000 | No Ice | 1.200 | 1.200 | 0.018 |
| | | | | | | 1/2" Ice | 1.802 | 1.802 | 0.027 |
| (2) 4' Side arm (Unknown) | C | None | | 0.000 | 107.000 | No Ice | 1.920 | 1.920 | 0.069 |
| | | | | | | 1/2" Ice | 2.580 | 2.580 | 0.082 |
| (4) DB844H90 (Sprint / Nextel) | A | From Face | 3.000 | 0.000 | 100.000 | No Ice | 2.867 | 3.967 | 0.010 |
| | | | 0.000 | | | 1/2" Ice | 3.177 | 4.337 | 0.036 |
| (4) DB844H90 (Sprint / Nextel) | B | From Face | 3.000 | 0.000 | 100.000 | No Ice | 2.867 | 3.967 | 0.010 |
| | | | 0.000 | | | 1/2" Ice | 3.177 | 4.337 | 0.036 |
| (4) DB844H90 (Sprint / Nextel) | C | From Face | 3.000 | 0.000 | 100.000 | No Ice | 2.867 | 3.967 | 0.010 |
| | | | 0.000 | | | 1/2" Ice | 3.177 | 4.337 | 0.036 |
| PiROD 15' Platform with handrail (Sprint / Nextel) | C | None | | 0.000 | 100.000 | No Ice | 33.800 | 33.800 | 2.043 |
| | | | | | | 1/2" Ice | 43.600 | 43.600 | 2.748 |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------|-------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 140' Monopole | Page | 5 of 22 |
| | Project | Manchester West | Date | 11:01:18 03/28/12 |
| | Client | Verizon Wireless | Designed by | Matthew Kapinos |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _{Front} | C _A A _{Side} | Weight |
|-----------------------------------------------|-------------|-------------|--------------------------|-------|--------------------|--------------------|-----------------------------------|----------------------------------|----------------|
| | | | Horz Lateral | Vert | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K |
| SC-E 6014 rev2 (Verizon) | A | From Face | 3.000 6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 3.553 3.892 | 3.344 3.679 | 0.015 0.042 |
| SC-E 6014 rev2 (Verizon) | A | From Face | 3.000 -6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 3.553 3.892 | 3.344 3.679 | 0.015 0.042 |
| SC-E 6014 rev2 (Verizon) | B | From Face | 3.000 6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 3.553 3.892 | 3.344 3.679 | 0.015 0.042 |
| SC-E 6014 rev2 (Verizon) | B | From Face | 3.000 -6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 3.553 3.892 | 3.344 3.679 | 0.015 0.042 |
| SC-E 6014 rev2 (Verizon) | C | From Face | 3.000 6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 3.553 3.892 | 3.344 3.679 | 0.015 0.042 |
| SC-E 6014 rev2 (Verizon) | C | From Face | 3.000 -6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 3.553 3.892 | 3.344 3.679 | 0.015 0.042 |
| BXA-70063/6CF (Verizon) | A | From Face | 3.000 0.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 5.500 6.500 | 2.200 3.200 | 0.038 0.092 |
| BXA-70063/6CF (Verizon) | B | From Face | 3.000 0.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 5.500 6.500 | 2.200 3.200 | 0.038 0.092 |
| BXA-70063/6CF (Verizon) | C | From Face | 3.000 0.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 5.500 6.500 | 2.200 3.200 | 0.038 0.092 |
| RymSa MG D3-900Tx (Verizon) | A | From Face | 3.000 4.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 5.381 5.863 | 5.024 5.957 | 0.047 0.089 |
| RymSa MG D3-900Tx (Verizon) | B | From Face | 3.000 4.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 5.381 5.863 | 5.024 5.957 | 0.047 0.089 |
| RymSa MG D3-900Tx (Verizon) | C | From Face | 3.000 4.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 5.381 5.863 | 5.024 5.957 | 0.047 0.089 |
| PiROD 13' Platform w/handrail (Verizon) | C | None | | 0.000 | 90.000 | No Ice 1/2" Ice | 31.300 40.200 | 31.300 40.200 | 1.822 2.452 |
| FD9R6004/2C-3L Diplexer (Verizon) | A | From Face | 3.000 6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 0.367 0.451 | 0.085 0.136 | 0.003 0.005 |
| FD9R6004/2C-3L Diplexer (Verizon) | A | From Face | 3.000 -6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 0.367 0.451 | 0.085 0.136 | 0.003 0.005 |
| FD9R6004/2C-3L Diplexer (Verizon) | B | From Face | 3.000 6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 0.367 0.451 | 0.085 0.136 | 0.003 0.005 |
| FD9R6004/2C-3L Diplexer (Verizon) | B | From Face | 3.000 -6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 0.367 0.451 | 0.085 0.136 | 0.003 0.005 |
| FD9R6004/2C-3L Diplexer (Verizon) | C | From Face | 3.000 6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 0.367 0.451 | 0.085 0.136 | 0.003 0.005 |
| FD9R6004/2C-3L Diplexer (Verizon) | C | From Face | 3.000 -6.000 0.000 | 0.000 | 90.000 | No Ice 1/2" Ice | 0.367 0.451 | 0.085 0.136 | 0.003 0.005 |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------|-------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 140' Monopole | Page | 6 of 22 |
| | Project | Manchester West | Date | 11:01:18 03/28/12 |
| | Client | Verizon Wireless | Designed by | Matthew Kapinos |

Tower Pressures - No Ice

$G_H = 1.690$

| Section Elevation ft | z ft | K_z | q_z ksf | A_G ft ² | F a c e | A_F ft ² | A_R ft ² | A_{leg} ft ² | Leg % | C_{AA} In Face ft ² | C_{AA} Out Face ft ² |
|-------------------------|---------|-------|--------------|--------------------------|------------------|--------------------------|--------------------------|------------------------------|----------|-------------------------------------------|--------------------------------------------|
| L1 140.000-91.050 | 114.235 | 1.426 | 0.023 | 92.154 | A | 0.000 | 92.154 | 92.154 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 92.154 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 92.154 | | 100.00 | 0.000 | 0.000 |
| L2 91.050-45.040 | 67.553 | 1.227 | 0.020 | 119.089 | A | 0.000 | 119.089 | 119.089 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 119.089 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 119.089 | | 100.00 | 0.000 | 0.000 |
| L3 45.040-0.000 | 21.745 | 1 | 0.016 | 145.802 | A | 0.000 | 145.802 | 145.802 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 145.802 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 145.802 | | 100.00 | 0.000 | 0.000 |

Tower Pressure - With Ice

$G_H = 1.690$

| Section Elevation ft | z ft | K_z | q_z ksf | t_z in | A_G ft ² | F a c e | A_F ft ² | A_R ft ² | A_{leg} ft ² | Leg % | C_{AA} In Face ft ² | C_{AA} Out Face ft ² |
|-------------------------|---------|-------|--------------|-------------|--------------------------|------------------|--------------------------|--------------------------|------------------------------|----------|-------------------------------------------|--------------------------------------------|
| L1 140.000-91.050 | 114.235 | 1.426 | 0.017 | 0.500 | 96.234 | A | 0.000 | 96.234 | 96.234 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 96.234 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 96.234 | | 100.00 | 0.000 | 0.000 |
| L2 91.050-45.040 | 67.553 | 1.227 | 0.015 | 0.500 | 122.923 | A | 0.000 | 122.923 | 122.923 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 122.923 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 122.923 | | 100.00 | 0.000 | 0.000 |
| L3 45.040-0.000 | 21.745 | 1 | 0.012 | 0.500 | 149.556 | A | 0.000 | 149.556 | 149.556 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 149.556 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 149.556 | | 100.00 | 0.000 | 0.000 |

Tower Pressure - Service

$G_H = 1.690$

| Section Elevation ft | z ft | K_z | q_z ksf | A_G ft ² | F a c e | A_F ft ² | A_R ft ² | A_{leg} ft ² | Leg % | C_{AA} In Face ft ² | C_{AA} Out Face ft ² |
|-------------------------|---------|-------|--------------|--------------------------|------------------|--------------------------|--------------------------|------------------------------|----------|-------------------------------------------|--------------------------------------------|
| L1 140.000-91.050 | 114.235 | 1.426 | 0.009 | 92.154 | A | 0.000 | 92.154 | 92.154 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 92.154 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 92.154 | | 100.00 | 0.000 | 0.000 |
| L2 91.050-45.040 | 67.553 | 1.227 | 0.008 | 119.089 | A | 0.000 | 119.089 | 119.089 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 119.089 | | 100.00 | 0.000 | 0.000 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 7 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Section Elevation ft | z ft | K _Z | q _z ksf | A _G ft ² | F a c e e | A _F ft ² | A _R ft ² | A _{leg} ft ² | Leg % | C _{AA} In Face ft ² | C _{AA} Out Face ft ² |
|-------------------------|---------|----------------|-----------------------|-----------------------------------|--------------|-----------------------------------|-----------------------------------|-------------------------------------|--------|-----------------------------------------------|------------------------------------------------|
| L3 45.040-0.000 | 21.745 | 1 | 0.006 | 145.802 | C | 0.000 | 119.089 | 145.802 | 100.00 | 0.000 | 0.000 |
| | | | | | A | 0.000 | 145.802 | | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 145.802 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 145.802 | | 100.00 | 0.000 | 0.000 |

Tower Forces - No Ice - Wind Normal To Face

| Section Elevation ft | Add Weight K | Self Weight K | F a c e e | e | C _F | R _R | D _F | D _R | A _E ft ² | F K | w klf | Ctrl. Face |
|-------------------------|-----------------|------------------|--------------|---|----------------|----------------|----------------|----------------|-----------------------------------|--------|----------|------------|
| L1 140.000-91.050 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 2.360 | 0.048 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 91.050-45.040 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 2.616 | 0.057 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 45.040-0.000 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 2.630 | 0.058 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 503.517 kip-ft | 7.606 | | |

Tower Forces - No Ice - Wind 45 To Face

| Section Elevation ft | Add Weight K | Self Weight K | F a c e e | e | C _F | R _R | D _F | D _R | A _E ft ² | F K | w klf | Ctrl. Face |
|-------------------------|-----------------|------------------|--------------|---|----------------|----------------|----------------|----------------|-----------------------------------|--------|----------|------------|
| L1 140.000-91.050 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 2.360 | 0.048 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 91.050-45.040 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 2.616 | 0.057 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 45.040-0.000 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 2.630 | 0.058 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 503.517 kip-ft | 7.606 | | |

Tower Forces - No Ice - Wind 60 To Face

| Section Elevation ft | Add Weight K | Self Weight K | F a c e e | e | C _F | R _R | D _F | D _R | A _E ft ² | F K | w klf | Ctrl. Face |
|-------------------------|-----------------|------------------|--------------|---|----------------|----------------|----------------|----------------|-----------------------------------|--------|----------|------------|
| L1 140.000-91.050 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 2.360 | 0.048 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------|-------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 140' Monopole | Page | 8 of 22 |
| | Project | Manchester West | Date | 11:01:18 03/28/12 |
| | Client | Verizon Wireless | Designed by | Matthew Kapinos |

| 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 | K | K | | | | | | | ft ² | K | klf | |
| 0 | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 2.616 | 0.057 | C |
| 91.050-45.040 | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 2.630 | 0.058 | C |
| 45.040-0.000 | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 503.517 kip-ft | 7.606 | | |

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 | K | K | | | | | | | ft ² | K | klf | |
| L1 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 2.360 | 0.048 | C |
| 140.000-91.050 | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 2.616 | 0.057 | C |
| 91.050-45.040 | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 2.630 | 0.058 | C |
| 45.040-0.000 | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 503.517 kip-ft | 7.606 | | |

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 | K | K | | | | | | | ft ² | K | klf | |
| L1 | 0.430 | 2.918 | A | 1 | 0.65 | 1 | 1 | 1 | 96.234 | 1.833 | 0.037 | C |
| 140.000-91.050 | | | B | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| L2 | 1.431 | 6.015 | A | 1 | 0.65 | 1 | 1 | 1 | 122.923 | 2.009 | 0.044 | C |
| 91.050-45.040 | | | B | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| L3 | 1.413 | 8.785 | A | 1 | 0.65 | 1 | 1 | 1 | 149.556 | 2.007 | 0.045 | C |
| 45.040-0.000 | | | B | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| Sum Weight: | 3.274 | 17.718 | | | | | | OTM | 388.775 kip-ft | 5.849 | | |

Tower Forces - With Ice - Wind 45 To Face

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 9 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| 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 | K | K | | | | | | | ft ² | K | klf | |
| L1 140.000-91.050 | 0.430 | 2.918 | A | 1 | 0.65 | 1 | 1 | 1 | 96.234 | 1.833 | 0.037 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| L2 91.050-45.040 | 1.431 | 6.015 | A | 1 | 0.65 | 1 | 1 | 1 | 122.923 | 2.009 | 0.044 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| L3 45.040-0.000 | 1.413 | 8.785 | A | 1 | 0.65 | 1 | 1 | 1 | 149.556 | 2.007 | 0.045 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| Sum Weight: | 3.274 | 17.718 | | | | | | OTM | 388.775 kip-ft | 5.849 | | |

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 | K | K | | | | | | | ft ² | K | klf | |
| L1 140.000-91.050 | 0.430 | 2.918 | A | 1 | 0.65 | 1 | 1 | 1 | 96.234 | 1.833 | 0.037 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| L2 91.050-45.040 | 1.431 | 6.015 | A | 1 | 0.65 | 1 | 1 | 1 | 122.923 | 2.009 | 0.044 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| L3 45.040-0.000 | 1.413 | 8.785 | A | 1 | 0.65 | 1 | 1 | 1 | 149.556 | 2.007 | 0.045 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| Sum Weight: | 3.274 | 17.718 | | | | | | OTM | 388.775 kip-ft | 5.849 | | |

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 | K | K | | | | | | | ft ² | K | klf | |
| L1 140.000-91.050 | 0.430 | 2.918 | A | 1 | 0.65 | 1 | 1 | 1 | 96.234 | 1.833 | 0.037 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 96.234 | | | |
| L2 91.050-45.040 | 1.431 | 6.015 | A | 1 | 0.65 | 1 | 1 | 1 | 122.923 | 2.009 | 0.044 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 122.923 | | | |
| L3 45.040-0.000 | 1.413 | 8.785 | A | 1 | 0.65 | 1 | 1 | 1 | 149.556 | 2.007 | 0.045 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 149.556 | | | |
| Sum Weight: | 3.274 | 17.718 | | | | | | OTM | 388.775 kip-ft | 5.849 | | |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 10 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

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 | K | K | | | | | | | ft ² | K | klf | |
| L1 140.000-91.050 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 0.922 | 0.019 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 91.050-45.040 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 1.022 | 0.022 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 45.040-0.000 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 1.027 | 0.023 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 196.686 kip-ft | 2.971 | | |

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 | K | K | | | | | | | ft ² | K | klf | |
| L1 140.000-91.050 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 0.922 | 0.019 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 91.050-45.040 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 1.022 | 0.022 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 45.040-0.000 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 1.027 | 0.023 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 196.686 kip-ft | 2.971 | | |

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 | K | K | | | | | | | ft ² | K | klf | |
| L1 140.000-91.050 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 0.922 | 0.019 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 91.050-45.040 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 1.022 | 0.022 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 45.040-0.000 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 1.027 | 0.023 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 196.686 kip-ft | 2.971 | | |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 11 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

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 | K | K | | | | | | | ft ² | K | k/f | |
| L1 140.000-91.050 | 0.430 | 2.221 | A | 1 | 0.65 | 1 | 1 | 1 | 92.154 | 0.922 | 0.019 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.154 | | | |
| L2 91.050-45.040 | 1.431 | 5.119 | A | 1 | 0.65 | 1 | 1 | 1 | 119.089 | 1.022 | 0.022 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 119.089 | | | |
| L3 45.040-0.000 | 1.413 | 7.691 | A | 1 | 0.65 | 1 | 1 | 1 | 145.802 | 1.027 | 0.023 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 145.802 | | | |
| Sum Weight: | 3.274 | 15.031 | | | | | | OTM | 196.686 kip-ft | 2.971 | | |

Discrete Appurtenance Pressures - No Ice *G_H = 1.690*

| Description | Aiming Azimuth ° | Weight K | Offset _x ft | Offset _z ft | z ft | K _z | q _z ksf | C _{MAc} Front ft ² | C _{MAc} Side ft ² |
|--------------------------------|------------------|----------|------------------------|------------------------|---------|----------------|--------------------|----------------------------------------|---------------------------------------|
| 4' Side arm | 0.000 | 0.139 | 0.000 | 0.000 | 139.000 | 1.508 | 0.025 | 3.840 | 3.840 |
| 8' Side arm | 0.000 | 0.139 | 0.000 | 0.000 | 134.000 | 1.492 | 0.024 | 3.840 | 3.840 |
| DUO1417-8686 | 300.000 | 0.040 | -3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 13.067 | 8.400 |
| DUO1417-8686 | 60.000 | 0.040 | 3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 13.067 | 8.400 |
| DUO1417-8686 | 180.000 | 0.040 | 0.000 | 3.867 | 125.000 | 1.463 | 0.024 | 13.067 | 8.400 |
| TMA (Cingular) | 300.000 | 0.040 | -3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 2.450 | 0.681 |
| TMA (Cingular) | 60.000 | 0.040 | 3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 2.450 | 0.681 |
| TMA (Cingular) | 180.000 | 0.040 | 0.000 | 3.867 | 125.000 | 1.463 | 0.024 | 2.450 | 0.681 |
| Duplexer | 300.000 | 0.010 | -3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 0.849 | 0.372 |
| Duplexer | 60.000 | 0.010 | 3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 0.849 | 0.372 |
| Duplexer | 180.000 | 0.010 | 0.000 | 3.867 | 125.000 | 1.463 | 0.024 | 0.849 | 0.372 |
| 7770 w mount pipe | 300.000 | 0.052 | -3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 5.882 | 3.980 |
| 7770 w mount pipe | 60.000 | 0.052 | 3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 5.882 | 3.980 |
| 7770 w mount pipe | 180.000 | 0.052 | 0.000 | 3.867 | 125.000 | 1.463 | 0.024 | 5.882 | 3.980 |
| 7060 CILOC | 300.000 | 0.002 | -3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 0.067 | 0.058 |
| 7060 CILOC | 60.000 | 0.002 | 3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 0.067 | 0.058 |
| 7060 CILOC | 180.000 | 0.002 | 0.000 | 3.867 | 125.000 | 1.463 | 0.024 | 0.067 | 0.058 |
| 7020 RCU/RETs | 300.000 | 0.002 | -3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 0.401 | 0.117 |
| 7020 RCU/RETs | 60.000 | 0.002 | 3.349 | -1.934 | 125.000 | 1.463 | 0.024 | 0.401 | 0.117 |
| 7020 RCU/RETs | 180.000 | 0.002 | 0.000 | 3.867 | 125.000 | 1.463 | 0.024 | 0.401 | 0.117 |
| PiROD 13' Platform w/handrail | 0.000 | 1.822 | 0.000 | 0.000 | 125.000 | 1.463 | 0.024 | 31.300 | 31.300 |
| DB980H90 | 300.000 | 0.170 | -3.417 | -1.973 | 115.000 | 1.429 | 0.023 | 7.597 | 4.389 |
| DB980H90 | 60.000 | 0.170 | 3.417 | -1.973 | 115.000 | 1.429 | 0.023 | 7.597 | 4.389 |
| DB980H90 | 180.000 | 0.170 | 0.000 | 3.945 | 115.000 | 1.429 | 0.023 | 7.597 | 4.389 |
| PiROD 15' Low Profile Platform | 0.000 | 1.500 | 0.000 | 0.000 | 115.000 | 1.429 | 0.023 | 17.300 | 17.300 |
| 6' Whip | 0.000 | 0.036 | 0.000 | 0.000 | 110.000 | 1.411 | 0.023 | 2.400 | 2.400 |
| 4' Side arm | 0.000 | 0.139 | 0.000 | 0.000 | 107.000 | 1.399 | 0.023 | 3.840 | 3.840 |
| DB844H90 | 300.000 | 0.040 | -3.518 | -2.031 | 100.000 | 1.373 | 0.022 | 11.467 | 15.867 |
| DB844H90 | 60.000 | 0.040 | 3.518 | -2.031 | 100.000 | 1.373 | 0.022 | 11.467 | 15.867 |
| DB844H90 | 180.000 | 0.040 | 0.000 | 4.063 | 100.000 | 1.373 | 0.022 | 11.467 | 15.867 |
| PiROD 15' Platform with | 0.000 | 2.043 | 0.000 | 0.000 | 100.000 | 1.373 | 0.022 | 33.800 | 33.800 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 12 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Description | Aiming Azimuth ° | Weight K | Offset _x ft | Offset _z ft | z ft | K _z | q _z ksf | C _{dAc} Front ft ² | C _{dAc} Side ft ² |
|----------------------------------|---------------------|-------------|---------------------------|---------------------------|---------|----------------|-----------------------|----------------------------------------------|---------------------------------------------|
| handrail | | | | | | | | | |
| SC-E 6014 rev2 | 300.000 | 0.015 | -0.572 | -7.259 | 90.000 | 1.332 | 0.022 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 300.000 | 0.015 | -6.572 | 3.134 | 90.000 | 1.332 | 0.022 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 60.000 | 0.015 | 6.572 | 3.134 | 90.000 | 1.332 | 0.022 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 60.000 | 0.015 | 0.572 | -7.259 | 90.000 | 1.332 | 0.022 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 180.000 | 0.015 | -6.000 | 4.125 | 90.000 | 1.332 | 0.022 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 180.000 | 0.015 | 6.000 | 4.125 | 90.000 | 1.332 | 0.022 | 3.553 | 3.344 |
| BXA-70063/6CF | 300.000 | 0.038 | -3.572 | -2.062 | 90.000 | 1.332 | 0.022 | 5.500 | 2.200 |
| BXA-70063/6CF | 60.000 | 0.038 | 3.572 | -2.062 | 90.000 | 1.332 | 0.022 | 5.500 | 2.200 |
| BXA-70063/6CF | 180.000 | 0.038 | 0.000 | 4.125 | 90.000 | 1.332 | 0.022 | 5.500 | 2.200 |
| Rymsa MG D3-900Tx | 300.000 | 0.047 | -1.572 | -5.526 | 90.000 | 1.332 | 0.022 | 5.381 | 5.024 |
| Rymsa MG D3-900Tx | 60.000 | 0.047 | 5.572 | 1.402 | 90.000 | 1.332 | 0.022 | 5.381 | 5.024 |
| Rymsa MG D3-900Tx | 180.000 | 0.047 | -4.000 | 4.125 | 90.000 | 1.332 | 0.022 | 5.381 | 5.024 |
| PiROD 13' Platform w/handrail | 0.000 | 1.822 | 0.000 | 0.000 | 90.000 | 1.332 | 0.022 | 31.300 | 31.300 |
| FD9R6004/2C-3L Diplexer | 300.000 | 0.003 | -0.572 | -7.259 | 90.000 | 1.332 | 0.022 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 300.000 | 0.003 | -6.572 | 3.134 | 90.000 | 1.332 | 0.022 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 60.000 | 0.003 | 6.572 | 3.134 | 90.000 | 1.332 | 0.022 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 60.000 | 0.003 | 0.572 | -7.259 | 90.000 | 1.332 | 0.022 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 180.000 | 0.003 | -6.000 | 4.125 | 90.000 | 1.332 | 0.022 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 180.000 | 0.003 | 6.000 | 4.125 | 90.000 | 1.332 | 0.022 | 0.367 | 0.085 |
| Sum Weight: | | 9.072 | | | | | | | |

Discrete Appurtenance Pressures - With Ice G_H = 1.690

| Description | Aiming Azimuth ° | Weight K | Offset _x ft | Offset _z ft | z ft | K _z | q _z ksf | C _{dAc} Front ft ² | C _{dAc} Side ft ² | t _z in |
|----------------------------------|---------------------|-------------|---------------------------|---------------------------|---------|----------------|-----------------------|----------------------------------------------|---------------------------------------------|----------------------|
| 4' Side arm | 0.000 | 0.164 | 0.000 | 0.000 | 139.000 | 1.508 | 0.018 | 5.160 | 5.160 | 0.500 |
| 8' Side arm | 0.000 | 0.164 | 0.000 | 0.000 | 134.000 | 1.492 | 0.018 | 5.160 | 5.160 | 0.500 |
| DUO1417-8686 | 300.000 | 0.125 | -3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 13.879 | 9.148 | 0.500 |
| DUO1417-8686 | 60.000 | 0.125 | 3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 13.879 | 9.148 | 0.500 |
| DUO1417-8686 | 180.000 | 0.125 | 0.000 | 3.867 | 125.000 | 1.463 | 0.018 | 13.879 | 9.148 | 0.500 |
| TMA (Cingular) | 300.000 | 0.054 | -3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 2.757 | 0.903 | 0.500 |
| TMA (Cingular) | 60.000 | 0.054 | 3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 2.757 | 0.903 | 0.500 |
| TMA (Cingular) | 180.000 | 0.054 | 0.000 | 3.867 | 125.000 | 1.463 | 0.018 | 2.757 | 0.903 | 0.500 |
| Duplexer | 300.000 | 0.014 | -3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 1.041 | 0.533 | 0.500 |
| Duplexer | 60.000 | 0.014 | 3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 1.041 | 0.533 | 0.500 |
| Duplexer | 180.000 | 0.014 | 0.000 | 3.867 | 125.000 | 1.463 | 0.018 | 1.041 | 0.533 | 0.500 |
| 7770 w mount pipe | 300.000 | 0.095 | -3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 6.314 | 4.603 | 0.500 |
| 7770 w mount pipe | 60.000 | 0.095 | 3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 6.314 | 4.603 | 0.500 |
| 7770 w mount pipe | 180.000 | 0.095 | 0.000 | 3.867 | 125.000 | 1.463 | 0.018 | 6.314 | 4.603 | 0.500 |
| 7060 CILOC | 300.000 | 0.003 | -3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 0.107 | 0.095 | 0.500 |
| 7060 CILOC | 60.000 | 0.003 | 3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 0.107 | 0.095 | 0.500 |
| 7060 CILOC | 180.000 | 0.003 | 0.000 | 3.867 | 125.000 | 1.463 | 0.018 | 0.107 | 0.095 | 0.500 |
| 7020 RCU/RETs | 300.000 | 0.005 | -3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 0.491 | 0.169 | 0.500 |
| 7020 RCU/RETs | 60.000 | 0.005 | 3.349 | -1.934 | 125.000 | 1.463 | 0.018 | 0.491 | 0.169 | 0.500 |
| 7020 RCU/RETs | 180.000 | 0.005 | 0.000 | 3.867 | 125.000 | 1.463 | 0.018 | 0.491 | 0.169 | 0.500 |
| PiROD 13' Platform w/handrail | 0.000 | 2.452 | 0.000 | 0.000 | 125.000 | 1.463 | 0.018 | 40.200 | 40.200 | 0.500 |
| DB980H90 | 300.000 | 0.210 | -3.417 | -1.973 | 115.000 | 1.429 | 0.017 | 8.356 | 5.112 | 0.500 |

| | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------|
| <p>tnxTower</p> <p>URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991</p> | <p>Job</p> <p>140' Monopole</p> | <p>Page</p> <p>13 of 22</p> |
| | <p>Project</p> <p>Manchester West</p> | <p>Date</p> <p>11:01:18 03/28/12</p> |
| | <p>Client</p> <p>Verizon Wireless</p> | <p>Designed by</p> <p>Matthew Kapinos</p> |

| Description | Aiming Azimuth ° | Weight | Offset _x | Offset _z | z | K _z | q _z | C _A A _C Front | C _A A _C Side | t _z |
|----------------------------------|------------------|--------|---------------------|---------------------|---------|----------------|----------------|-------------------------------------|------------------------------------|----------------|
| | | K | ft | ft | ft | | ksf | ft ² | ft ² | in |
| DB980H90 | 60.000 | 0.210 | 3.417 | -1.973 | 115.000 | 1.429 | 0.017 | 8.356 | 5.112 | 0.500 |
| DB980H90 | 180.000 | 0.210 | 0.000 | 3.945 | 115.000 | 1.429 | 0.017 | 8.356 | 5.112 | 0.500 |
| PiROD 15' Low Profile Platform | 0.000 | 2.030 | 0.000 | 0.000 | 115.000 | 1.429 | 0.017 | 22.100 | 22.100 | 0.500 |
| 6' Whip | 0.000 | 0.055 | 0.000 | 0.000 | 110.000 | 1.411 | 0.017 | 3.605 | 3.605 | 0.500 |
| 4' Side arm | 0.000 | 0.164 | 0.000 | 0.000 | 107.000 | 1.399 | 0.017 | 5.160 | 5.160 | 0.500 |
| DB844H90 | 300.000 | 0.145 | -3.518 | -2.031 | 100.000 | 1.373 | 0.017 | 12.707 | 17.349 | 0.500 |
| DB844H90 | 60.000 | 0.145 | 3.518 | -2.031 | 100.000 | 1.373 | 0.017 | 12.707 | 17.349 | 0.500 |
| DB844H90 | 180.000 | 0.145 | 0.000 | 4.063 | 100.000 | 1.373 | 0.017 | 12.707 | 17.349 | 0.500 |
| PiROD 15' Platform with handrail | 0.000 | 2.748 | 0.000 | 0.000 | 100.000 | 1.373 | 0.017 | 43.600 | 43.600 | 0.500 |
| SC-E 6014 rev2 | 300.000 | 0.042 | -0.572 | -7.259 | 90.000 | 1.332 | 0.016 | 3.892 | 3.679 | 0.500 |
| SC-E 6014 rev2 | 300.000 | 0.042 | -6.572 | 3.134 | 90.000 | 1.332 | 0.016 | 3.892 | 3.679 | 0.500 |
| SC-E 6014 rev2 | 60.000 | 0.042 | 6.572 | 3.134 | 90.000 | 1.332 | 0.016 | 3.892 | 3.679 | 0.500 |
| SC-E 6014 rev2 | 60.000 | 0.042 | 0.572 | -7.259 | 90.000 | 1.332 | 0.016 | 3.892 | 3.679 | 0.500 |
| SC-E 6014 rev2 | 180.000 | 0.042 | -6.000 | 4.125 | 90.000 | 1.332 | 0.016 | 3.892 | 3.679 | 0.500 |
| SC-E 6014 rev2 | 180.000 | 0.042 | 6.000 | 4.125 | 90.000 | 1.332 | 0.016 | 3.892 | 3.679 | 0.500 |
| BXA-70063/6CF | 300.000 | 0.092 | -3.572 | -2.062 | 90.000 | 1.332 | 0.016 | 6.500 | 3.200 | 0.500 |
| BXA-70063/6CF | 60.000 | 0.092 | 3.572 | -2.062 | 90.000 | 1.332 | 0.016 | 6.500 | 3.200 | 0.500 |
| BXA-70063/6CF | 180.000 | 0.092 | 0.000 | 4.125 | 90.000 | 1.332 | 0.016 | 6.500 | 3.200 | 0.500 |
| Ryma MG D3-900Tx | 300.000 | 0.089 | -1.572 | -5.526 | 90.000 | 1.332 | 0.016 | 5.863 | 5.957 | 0.500 |
| Ryma MG D3-900Tx | 60.000 | 0.089 | 5.572 | 1.402 | 90.000 | 1.332 | 0.016 | 5.863 | 5.957 | 0.500 |
| Ryma MG D3-900Tx | 180.000 | 0.089 | -4.000 | 4.125 | 90.000 | 1.332 | 0.016 | 5.863 | 5.957 | 0.500 |
| PiROD 13' Platform w/handrail | 0.000 | 2.452 | 0.000 | 0.000 | 90.000 | 1.332 | 0.016 | 40.200 | 40.200 | 0.500 |
| FD9R6004/2C-3L Diplexer | 300.000 | 0.005 | -0.572 | -7.259 | 90.000 | 1.332 | 0.016 | 0.451 | 0.136 | 0.500 |
| FD9R6004/2C-3L Diplexer | 300.000 | 0.005 | -6.572 | 3.134 | 90.000 | 1.332 | 0.016 | 0.451 | 0.136 | 0.500 |
| FD9R6004/2C-3L Diplexer | 60.000 | 0.005 | 6.572 | 3.134 | 90.000 | 1.332 | 0.016 | 0.451 | 0.136 | 0.500 |
| FD9R6004/2C-3L Diplexer | 60.000 | 0.005 | 0.572 | -7.259 | 90.000 | 1.332 | 0.016 | 0.451 | 0.136 | 0.500 |
| FD9R6004/2C-3L Diplexer | 180.000 | 0.005 | -6.000 | 4.125 | 90.000 | 1.332 | 0.016 | 0.451 | 0.136 | 0.500 |
| FD9R6004/2C-3L Diplexer | 180.000 | 0.005 | 6.000 | 4.125 | 90.000 | 1.332 | 0.016 | 0.451 | 0.136 | 0.500 |
| Sum Weight: | | 13.005 | | | | | | | | |

Discrete Appurtenance Pressures - Service $G_H = 1.690$

| Description | Aiming Azimuth ° | Weight | Offset _x | Offset _z | z | K _z | q _z | C _A A _C Front | C _A A _C Side |
|-------------------|------------------|--------|---------------------|---------------------|---------|----------------|----------------|-------------------------------------|------------------------------------|
| | | K | ft | ft | ft | | ksf | ft ² | ft ² |
| 4' Side arm | 0.000 | 0.139 | 0.000 | 0.000 | 139.000 | 1.508 | 0.010 | 3.840 | 3.840 |
| 8' Side arm | 0.000 | 0.139 | 0.000 | 0.000 | 134.000 | 1.492 | 0.010 | 3.840 | 3.840 |
| DUO1417-8686 | 300.000 | 0.040 | -3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 13.067 | 8.400 |
| DUO1417-8686 | 60.000 | 0.040 | 3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 13.067 | 8.400 |
| DUO1417-8686 | 180.000 | 0.040 | 0.000 | 3.867 | 125.000 | 1.463 | 0.009 | 13.067 | 8.400 |
| TMA (Cingular) | 300.000 | 0.040 | -3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 2.450 | 0.681 |
| TMA (Cingular) | 60.000 | 0.040 | 3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 2.450 | 0.681 |
| TMA (Cingular) | 180.000 | 0.040 | 0.000 | 3.867 | 125.000 | 1.463 | 0.009 | 2.450 | 0.681 |
| Duplexer | 300.000 | 0.010 | -3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 0.849 | 0.372 |
| Duplexer | 60.000 | 0.010 | 3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 0.849 | 0.372 |
| Duplexer | 180.000 | 0.010 | 0.000 | 3.867 | 125.000 | 1.463 | 0.009 | 0.849 | 0.372 |
| 7770 w mount pipe | 300.000 | 0.052 | -3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 5.882 | 3.980 |
| 7770 w mount pipe | 60.000 | 0.052 | 3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 5.882 | 3.980 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 14 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Description | Aiming Azimuth ° | Weight K | Offset _x ft | Offset _z ft | z ft | K _z | q _z ksf | C _A A _c Front ft ² | C _A A _c Side ft ² |
|-------------------------------------|---------------------|-------------|---------------------------|---------------------------|---------|----------------|-----------------------|-----------------------------------------------------------|----------------------------------------------------------|
| 7770 w mount pipe | 180.000 | 0.052 | 0.000 | 3.867 | 125.000 | 1.463 | 0.009 | 5.882 | 3.980 |
| 7060 CILOC | 300.000 | 0.002 | -3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 0.067 | 0.058 |
| 7060 CILOC | 60.000 | 0.002 | 3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 0.067 | 0.058 |
| 7060 CILOC | 180.000 | 0.002 | 0.000 | 3.867 | 125.000 | 1.463 | 0.009 | 0.067 | 0.058 |
| 7020 RCU/RETs | 300.000 | 0.002 | -3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 0.401 | 0.117 |
| 7020 RCU/RETs | 60.000 | 0.002 | 3.349 | -1.934 | 125.000 | 1.463 | 0.009 | 0.401 | 0.117 |
| 7020 RCU/RETs | 180.000 | 0.002 | 0.000 | 3.867 | 125.000 | 1.463 | 0.009 | 0.401 | 0.117 |
| PiROD 13' Platform w/handrail | 0.000 | 1.822 | 0.000 | 0.000 | 125.000 | 1.463 | 0.009 | 31.300 | 31.300 |
| DB980H90 | 300.000 | 0.170 | -3.417 | -1.973 | 115.000 | 1.429 | 0.009 | 7.597 | 4.389 |
| DB980H90 | 60.000 | 0.170 | 3.417 | -1.973 | 115.000 | 1.429 | 0.009 | 7.597 | 4.389 |
| DB980H90 | 180.000 | 0.170 | 0.000 | 3.945 | 115.000 | 1.429 | 0.009 | 7.597 | 4.389 |
| PiROD 15' Low Profile Platform | 0.000 | 1.500 | 0.000 | 0.000 | 115.000 | 1.429 | 0.009 | 17.300 | 17.300 |
| 6' Whip | 0.000 | 0.036 | 0.000 | 0.000 | 110.000 | 1.411 | 0.009 | 2.400 | 2.400 |
| 4' Side arm | 0.000 | 0.139 | 0.000 | 0.000 | 107.000 | 1.399 | 0.009 | 3.840 | 3.840 |
| DB844H90 | 300.000 | 0.040 | -3.518 | -2.031 | 100.000 | 1.373 | 0.009 | 11.467 | 15.867 |
| DB844H90 | 60.000 | 0.040 | 3.518 | -2.031 | 100.000 | 1.373 | 0.009 | 11.467 | 15.867 |
| DB844H90 | 180.000 | 0.040 | 0.000 | 4.063 | 100.000 | 1.373 | 0.009 | 11.467 | 15.867 |
| PiROD 15' Platform with handrail | 0.000 | 2.043 | 0.000 | 0.000 | 100.000 | 1.373 | 0.009 | 33.800 | 33.800 |
| SC-E 6014 rev2 | 300.000 | 0.015 | -0.572 | -7.259 | 90.000 | 1.332 | 0.009 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 300.000 | 0.015 | -6.572 | 3.134 | 90.000 | 1.332 | 0.009 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 60.000 | 0.015 | 6.572 | 3.134 | 90.000 | 1.332 | 0.009 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 60.000 | 0.015 | 0.572 | -7.259 | 90.000 | 1.332 | 0.009 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 180.000 | 0.015 | -6.000 | 4.125 | 90.000 | 1.332 | 0.009 | 3.553 | 3.344 |
| SC-E 6014 rev2 | 180.000 | 0.015 | 6.000 | 4.125 | 90.000 | 1.332 | 0.009 | 3.553 | 3.344 |
| BXA-70063/6CF | 300.000 | 0.038 | -3.572 | -2.062 | 90.000 | 1.332 | 0.009 | 5.500 | 2.200 |
| BXA-70063/6CF | 60.000 | 0.038 | 3.572 | -2.062 | 90.000 | 1.332 | 0.009 | 5.500 | 2.200 |
| BXA-70063/6CF | 180.000 | 0.038 | 0.000 | 4.125 | 90.000 | 1.332 | 0.009 | 5.500 | 2.200 |
| Rymasa MG D3-900Tx | 300.000 | 0.047 | -1.572 | -5.526 | 90.000 | 1.332 | 0.009 | 5.381 | 5.024 |
| Rymasa MG D3-900Tx | 60.000 | 0.047 | 5.572 | 1.402 | 90.000 | 1.332 | 0.009 | 5.381 | 5.024 |
| Rymasa MG D3-900Tx | 180.000 | 0.047 | -4.000 | 4.125 | 90.000 | 1.332 | 0.009 | 5.381 | 5.024 |
| PiROD 13' Platform w/handrail | 0.000 | 1.822 | 0.000 | 0.000 | 90.000 | 1.332 | 0.009 | 31.300 | 31.300 |
| FD9R6004/2C-3L Diplexer | 300.000 | 0.003 | -0.572 | -7.259 | 90.000 | 1.332 | 0.009 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 300.000 | 0.003 | -6.572 | 3.134 | 90.000 | 1.332 | 0.009 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 60.000 | 0.003 | 6.572 | 3.134 | 90.000 | 1.332 | 0.009 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 60.000 | 0.003 | 0.572 | -7.259 | 90.000 | 1.332 | 0.009 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 180.000 | 0.003 | -6.000 | 4.125 | 90.000 | 1.332 | 0.009 | 0.367 | 0.085 |
| FD9R6004/2C-3L Diplexer | 180.000 | 0.003 | 6.000 | 4.125 | 90.000 | 1.332 | 0.009 | 0.367 | 0.085 |
| Sum Weight: | | 9.072 | | | | | | | |

Force Totals

| Load Case | Vertical Forces K | Sum of Forces X K | Sum of Forces Z K | Sum of Overturning Moments, M _x kip-ft | Sum of Overturning Moments, M _z kip-ft | Sum of Torques kip-ft |
|----------------|----------------------|-------------------------|-------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------|
| Leg Weight | 15.031 | | | | | |
| Bracing Weight | 0.000 | | | | | |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 15 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Load Case | Vertical Forces K | Sum of Forces X K | Sum of Forces Z K | Sum of Overturning Moments, M_x kip-ft | Sum of Overturning Moments, M_z kip-ft | Sum of Torques kip-ft |
|--------------------------|----------------------|-------------------------|-------------------------|---------------------------------------------|---------------------------------------------|--------------------------|
| Total Member Self-Weight | 15.031 | | | 0.000 | 0.000 | |
| Total Weight | 27.377 | | | 0.000 | 0.000 | |
| Wind 0 deg - No Ice | | 0.000 | -18.851 | -1719.684 | 0.000 | 0.000 |
| Wind 30 deg - No Ice | | 9.425 | -16.325 | -1489.290 | -859.842 | 0.000 |
| Wind 45 deg - No Ice | | 13.329 | -13.329 | -1216.000 | -1216.000 | 0.000 |
| Wind 60 deg - No Ice | | 16.325 | -9.425 | -859.842 | -1489.290 | 0.000 |
| Wind 90 deg - No Ice | | 18.851 | 0.000 | 0.000 | -1719.684 | 0.000 |
| Wind 120 deg - No Ice | | 16.325 | 9.425 | 859.842 | -1489.290 | 0.000 |
| Wind 135 deg - No Ice | | 13.329 | 13.329 | 1216.000 | -1216.000 | 0.000 |
| Wind 150 deg - No Ice | | 9.425 | 16.325 | 1489.290 | -859.842 | 0.000 |
| Wind 180 deg - No Ice | | 0.000 | 18.851 | 1719.684 | 0.000 | 0.000 |
| Wind 210 deg - No Ice | | -9.425 | 16.325 | 1489.290 | 859.842 | 0.000 |
| Wind 225 deg - No Ice | | -13.329 | 13.329 | 1216.000 | 1216.000 | 0.000 |
| Wind 240 deg - No Ice | | -16.325 | 9.425 | 859.842 | 1489.290 | 0.000 |
| Wind 270 deg - No Ice | | -18.851 | 0.000 | 0.000 | 1719.684 | 0.000 |
| Wind 300 deg - No Ice | | -16.325 | -9.425 | -859.842 | 1489.290 | 0.000 |
| Wind 315 deg - No Ice | | -13.329 | -13.329 | -1216.000 | 1216.000 | 0.000 |
| Wind 330 deg - No Ice | | -9.425 | -16.325 | -1489.290 | 859.842 | 0.000 |
| Member Ice | 2.687 | | | | | |
| Total Weight Ice | 33.997 | | | 0.000 | 0.000 | |
| Wind 0 deg - Ice | | 0.000 | -15.855 | -1470.712 | 0.000 | 0.000 |
| Wind 30 deg - Ice | | 7.928 | -13.731 | -1273.674 | -735.356 | 0.000 |
| Wind 45 deg - Ice | | 11.211 | -11.211 | -1039.950 | -1039.950 | 0.000 |
| Wind 60 deg - Ice | | 13.731 | -7.928 | -735.356 | -1273.674 | 0.000 |
| Wind 90 deg - Ice | | 15.855 | 0.000 | 0.000 | -1470.712 | 0.000 |
| Wind 120 deg - Ice | | 13.731 | 7.928 | 735.356 | -1273.674 | 0.000 |
| Wind 135 deg - Ice | | 11.211 | 11.211 | 1039.950 | -1039.950 | 0.000 |
| Wind 150 deg - Ice | | 7.928 | 13.731 | 1273.674 | -735.356 | 0.000 |
| Wind 180 deg - Ice | | 0.000 | 15.855 | 1470.712 | 0.000 | 0.000 |
| Wind 210 deg - Ice | | -7.928 | 13.731 | 1273.674 | 735.356 | 0.000 |
| Wind 225 deg - Ice | | -11.211 | 11.211 | 1039.950 | 1039.950 | 0.000 |
| Wind 240 deg - Ice | | -13.731 | 7.928 | 735.356 | 1273.674 | 0.000 |
| Wind 270 deg - Ice | | -15.855 | 0.000 | 0.000 | 1470.712 | 0.000 |
| Wind 300 deg - Ice | | -13.731 | -7.928 | -735.356 | 1273.674 | 0.000 |
| Wind 315 deg - Ice | | -11.211 | -11.211 | -1039.950 | 1039.950 | 0.000 |
| Wind 330 deg - Ice | | -7.928 | -13.731 | -1273.674 | 735.356 | 0.000 |
| Total Weight | 27.377 | | | 0.000 | 0.000 | |
| Wind 0 deg - Service | | 0.000 | -7.363 | -671.751 | 0.000 | 0.000 |
| Wind 30 deg - Service | | 3.682 | -6.377 | -581.754 | -335.876 | 0.000 |
| Wind 45 deg - Service | | 5.207 | -5.207 | -475.000 | -475.000 | 0.000 |
| Wind 60 deg - Service | | 6.377 | -3.682 | -335.876 | -581.754 | 0.000 |
| Wind 90 deg - Service | | 7.363 | 0.000 | 0.000 | -671.751 | 0.000 |
| Wind 120 deg - Service | | 6.377 | 3.682 | 335.876 | -581.754 | 0.000 |
| Wind 135 deg - Service | | 5.207 | 5.207 | 475.000 | -475.000 | 0.000 |
| Wind 150 deg - Service | | 3.682 | 6.377 | 581.754 | -335.876 | 0.000 |
| Wind 180 deg - Service | | 0.000 | 7.363 | 671.751 | 0.000 | 0.000 |
| Wind 210 deg - Service | | -3.682 | 6.377 | 581.754 | 335.876 | 0.000 |
| Wind 225 deg - Service | | -5.207 | 5.207 | 475.000 | 475.000 | 0.000 |
| Wind 240 deg - Service | | -6.377 | 3.682 | 335.876 | 581.754 | 0.000 |
| Wind 270 deg - Service | | -7.363 | 0.000 | 0.000 | 671.751 | 0.000 |
| Wind 300 deg - Service | | -6.377 | -3.682 | -335.876 | 581.754 | 0.000 |
| Wind 315 deg - Service | | -5.207 | -5.207 | -475.000 | 475.000 | 0.000 |
| Wind 330 deg - Service | | -3.682 | -6.377 | -581.754 | 335.876 | 0.000 |

Load Combinations

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------|-------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 140' Monopole | Page | 16 of 22 |
| | Project | Manchester West | Date | 11:01:18 03/28/12 |
| | Client | Verizon Wireless | Designed by | Matthew Kapinos |

| 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 |
| 18 | Dead+Ice |
| 19 | Dead+Wind 0 deg+Ice |
| 20 | Dead+Wind 30 deg+Ice |
| 21 | Dead+Wind 45 deg+Ice |
| 22 | Dead+Wind 60 deg+Ice |
| 23 | Dead+Wind 90 deg+Ice |
| 24 | Dead+Wind 120 deg+Ice |
| 25 | Dead+Wind 135 deg+Ice |
| 26 | Dead+Wind 150 deg+Ice |
| 27 | Dead+Wind 180 deg+Ice |
| 28 | Dead+Wind 210 deg+Ice |
| 29 | Dead+Wind 225 deg+Ice |
| 30 | Dead+Wind 240 deg+Ice |
| 31 | Dead+Wind 270 deg+Ice |
| 32 | Dead+Wind 300 deg+Ice |
| 33 | Dead+Wind 315 deg+Ice |
| 34 | Dead+Wind 330 deg+Ice |
| 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 K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|--------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L1 | 140 - 91.05 | Pole | Max Tension | 19 | 0.000 | 0.000 | -0.000 |
| | | | Max. Compression | 18 | -12.766 | 0.000 | 0.000 |
| | | | Max. Mx | 6 | -8.515 | -223.070 | 0.000 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 17 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|---------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L2 | 91.05 - 45.04 | Pole | Max. My | 10 | -8.515 | 0.000 | -223.070 |
| | | | Max. Vy | 6 | 11.064 | -223.070 | 0.000 |
| | | | Max. Vx | 10 | 11.064 | 0.000 | -223.070 |
| | | | Max. Torque | 26 | | | 0.000 |
| | | | Max Tension | 1 | 0.000 | 0.000 | 0.000 |
| | | | Max. Compression | 18 | -22.966 | 0.000 | 0.000 |
| | | | Max. Mx | 6 | -16.916 | -901.050 | 0.000 |
| | | | Max. My | 2 | -16.916 | 0.000 | 901.050 |
| | | | Max. Vy | 6 | 16.594 | -901.050 | 0.000 |
| | | | Max. Vx | 2 | -16.594 | 0.000 | 901.050 |
| L3 | 45.04 - 0 | Pole | Max. Torque | 26 | | | 0.000 |
| | | | Max Tension | 1 | 0.000 | 0.000 | 0.000 |
| | | | Max. Compression | 18 | -33.997 | 0.000 | 0.000 |
| | | | Max. Mx | 6 | -27.360 | -1788.017 | 0.000 |
| | | | Max. My | 2 | -27.360 | 0.000 | 1788.017 |
| | | | Max. Vy | 6 | 18.875 | -1788.017 | 0.000 |
| | | | Max. Vx | 2 | -18.875 | 0.000 | 1788.017 |
| | | | Max. Torque | 26 | | | 0.000 |

Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| Pole | Max. Vert | 23 | 33.997 | -15.855 | 0.000 |
| | Max. H _x | 14 | 27.377 | 18.851 | 0.000 |
| | Max. H _z | 2 | 27.377 | 0.000 | 18.851 |
| | Max. M _x | 2 | 1788.017 | 0.000 | 18.851 |
| | Max. M _z | 6 | 1788.017 | -18.851 | 0.000 |
| | Max. Torsion | 26 | 0.000 | -7.928 | -13.731 |
| | Min. Vert | 1 | 27.377 | 0.000 | 0.000 |
| | Min. H _x | 6 | 27.377 | -18.851 | 0.000 |
| | Min. H _z | 10 | 27.377 | 0.000 | -18.851 |
| | Min. M _x | 10 | -1788.017 | 0.000 | -18.851 |
| | Min. M _z | 14 | -1788.017 | 18.851 | 0.000 |
| | Min. Torsion | 24 | -0.000 | -13.731 | -7.928 |

Tower Mast Reaction Summary

| Load Combination | Vertical K | Shear _x K | Shear _z K | Overturning Moment, M _x kip-ft | Overturning Moment, M _z kip-ft | Torque kip-ft |
|----------------------------|------------|----------------------|----------------------|-------------------------------------------|-------------------------------------------|---------------|
| Dead Only | 27.377 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Dead+Wind 0 deg - No Ice | 27.377 | 0.000 | -18.851 | -1788.017 | 0.000 | 0.000 |
| Dead+Wind 30 deg - No Ice | 27.377 | 9.425 | -16.325 | -1548.475 | -894.012 | 0.000 |
| Dead+Wind 45 deg - No Ice | 27.377 | 13.329 | -13.329 | -1264.324 | -1264.324 | 0.000 |
| Dead+Wind 60 deg - No Ice | 27.377 | 16.325 | -9.425 | -894.012 | -1548.475 | -0.000 |
| Dead+Wind 90 deg - No Ice | 27.377 | 18.851 | 0.000 | 0.000 | -1788.017 | 0.000 |
| Dead+Wind 120 deg - No Ice | 27.377 | 16.325 | 9.425 | 894.012 | -1548.475 | 0.000 |
| Dead+Wind 135 deg - No Ice | 27.377 | 13.329 | 13.329 | 1264.324 | -1264.324 | 0.000 |
| Dead+Wind 150 deg - No Ice | 27.377 | 9.425 | 16.325 | 1548.475 | -894.012 | -0.000 |
| Dead+Wind 180 deg - No Ice | 27.377 | 0.000 | 18.851 | 1788.017 | 0.000 | 0.000 |
| Dead+Wind 210 deg - No Ice | 27.377 | -9.425 | 16.325 | 1548.475 | 894.012 | 0.000 |

| | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------|-------------------|
| <p>tnxTower</p> <p>URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991</p> | Job | 140' Monopole | Page | 18 of 22 |
| | Project | Manchester West | Date | 11:01:18 03/28/12 |
| | Client | Verizon Wireless | Designed by | Matthew Kapinos |

| Load Combination | Vertical | Shear _x | Shear _z | Overturning Moment, M _x | Overturning Moment, M _z | Torque |
|-----------------------------|----------|--------------------|--------------------|------------------------------------|------------------------------------|--------|
| | K | K | K | kip-ft | kip-ft | kip-ft |
| Dead+Wind 225 deg - No Ice | 27.377 | -13.329 | 13.329 | 1264.324 | 1264.324 | 0.000 |
| Dead+Wind 240 deg - No Ice | 27.377 | -16.325 | 9.425 | 894.012 | 1548.475 | -0.000 |
| Dead+Wind 270 deg - No Ice | 27.377 | -18.851 | 0.000 | 0.000 | 1788.017 | 0.000 |
| Dead+Wind 300 deg - No Ice | 27.377 | -16.325 | -9.425 | -894.012 | 1548.475 | 0.000 |
| Dead+Wind 315 deg - No Ice | 27.377 | -13.329 | -13.329 | -1264.324 | 1264.324 | 0.000 |
| Dead+Wind 330 deg - No Ice | 27.377 | -9.425 | -16.325 | -1548.475 | 894.012 | -0.000 |
| Dead+Ice | 33.997 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Dead+Wind 0 deg+Ice | 33.997 | 0.000 | -15.855 | -1551.185 | 0.000 | 0.000 |
| Dead+Wind 30 deg+Ice | 33.997 | 7.928 | -13.731 | -1343.385 | -775.604 | 0.000 |
| Dead+Wind 45 deg+Ice | 33.997 | 11.211 | -11.211 | -1096.869 | -1096.869 | 0.000 |
| Dead+Wind 60 deg+Ice | 33.997 | 13.731 | -7.928 | -775.604 | -1343.385 | -0.000 |
| Dead+Wind 90 deg+Ice | 33.997 | 15.855 | 0.000 | 0.000 | -1551.185 | 0.000 |
| Dead+Wind 120 deg+Ice | 33.997 | 13.731 | 7.928 | 775.604 | -1343.385 | 0.000 |
| Dead+Wind 135 deg+Ice | 33.997 | 11.211 | 11.211 | 1096.869 | -1096.869 | 0.000 |
| Dead+Wind 150 deg+Ice | 33.997 | 7.928 | 13.731 | 1343.385 | -775.604 | -0.000 |
| Dead+Wind 180 deg+Ice | 33.997 | 0.000 | 15.855 | 1551.185 | 0.000 | 0.000 |
| Dead+Wind 210 deg+Ice | 33.997 | -7.928 | 13.731 | 1343.385 | 775.604 | 0.000 |
| Dead+Wind 225 deg+Ice | 33.997 | -11.211 | 11.211 | 1096.869 | 1096.869 | 0.000 |
| Dead+Wind 240 deg+Ice | 33.997 | -13.731 | 7.928 | 775.604 | 1343.385 | -0.000 |
| Dead+Wind 270 deg+Ice | 33.997 | -15.855 | 0.000 | 0.000 | 1551.185 | 0.000 |
| Dead+Wind 300 deg+Ice | 33.997 | -13.731 | -7.928 | -775.604 | 1343.385 | -0.000 |
| Dead+Wind 315 deg+Ice | 33.997 | -11.211 | -11.211 | -1096.869 | 1096.869 | 0.000 |
| Dead+Wind 330 deg+Ice | 33.997 | -7.928 | -13.731 | -1343.385 | 775.604 | -0.000 |
| Dead+Wind 0 deg - Service | 27.377 | 0.000 | -7.363 | -699.125 | 0.000 | 0.000 |
| Dead+Wind 30 deg - Service | 27.377 | 3.682 | -6.377 | -605.460 | -349.562 | 0.000 |
| Dead+Wind 45 deg - Service | 27.377 | 5.207 | -5.207 | -494.356 | -494.356 | 0.000 |
| Dead+Wind 60 deg - Service | 27.377 | 6.377 | -3.682 | -349.562 | -605.460 | -0.000 |
| Dead+Wind 90 deg - Service | 27.377 | 7.363 | 0.000 | 0.000 | -699.125 | 0.000 |
| Dead+Wind 120 deg - Service | 27.377 | 6.377 | 3.682 | 349.562 | -605.460 | 0.000 |
| Dead+Wind 135 deg - Service | 27.377 | 5.207 | 5.207 | 494.356 | -494.356 | 0.000 |
| Dead+Wind 150 deg - Service | 27.377 | 3.682 | 6.377 | 605.460 | -349.562 | -0.000 |
| Dead+Wind 180 deg - Service | 27.377 | 0.000 | 7.363 | 699.125 | 0.000 | 0.000 |
| Dead+Wind 210 deg - Service | 27.377 | -3.682 | 6.377 | 605.460 | 349.562 | 0.000 |
| Dead+Wind 225 deg - Service | 27.377 | -5.207 | 5.207 | 494.356 | 494.356 | 0.000 |
| Dead+Wind 240 deg - Service | 27.377 | -6.377 | 3.682 | 349.562 | 605.460 | -0.000 |
| Dead+Wind 270 deg - Service | 27.377 | -7.363 | 0.000 | 0.000 | 699.125 | 0.000 |
| Dead+Wind 300 deg - Service | 27.377 | -6.377 | -3.682 | -349.562 | 605.460 | 0.000 |
| Dead+Wind 315 deg - Service | 27.377 | -5.207 | -5.207 | -494.356 | 494.356 | 0.000 |
| Dead+Wind 330 deg - Service | 27.377 | -3.682 | -6.377 | -605.460 | 349.562 | -0.000 |

Solution Summary

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 1 | 0.000 | -27.377 | 0.000 | 0.000 | 27.377 | 0.000 | 0.000% |
| 2 | 0.000 | -27.377 | -18.851 | 0.000 | 27.377 | 18.851 | 0.000% |
| 3 | 9.425 | -27.377 | -16.325 | -9.425 | 27.377 | 16.325 | 0.000% |
| 4 | 13.329 | -27.377 | -13.329 | -13.329 | 27.377 | 13.329 | 0.000% |
| 5 | 16.325 | -27.377 | -9.425 | -16.325 | 27.377 | 9.425 | 0.000% |
| 6 | 18.851 | -27.377 | 0.000 | -18.851 | 27.377 | 0.000 | 0.000% |
| 7 | 16.325 | -27.377 | 9.425 | -16.325 | 27.377 | -9.425 | 0.000% |
| 8 | 13.329 | -27.377 | 13.329 | -13.329 | 27.377 | -13.329 | 0.000% |
| 9 | 9.425 | -27.377 | 16.325 | -9.425 | 27.377 | -16.325 | 0.000% |
| 10 | 0.000 | -27.377 | 18.851 | 0.000 | 27.377 | -18.851 | 0.000% |
| 11 | -9.425 | -27.377 | 16.325 | 9.425 | 27.377 | -16.325 | 0.000% |
| 12 | -13.329 | -27.377 | 13.329 | 13.329 | 27.377 | -13.329 | 0.000% |
| 13 | -16.325 | -27.377 | 9.425 | 16.325 | 27.377 | -9.425 | 0.000% |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 19 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|--------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 14 | -18.851 | -27.377 | 0.000 | 18.851 | 27.377 | 0.000 | 0.000% |
| 15 | -16.325 | -27.377 | -9.425 | 16.325 | 27.377 | 9.425 | 0.000% |
| 16 | -13.329 | -27.377 | -13.329 | 13.329 | 27.377 | 13.329 | 0.000% |
| 17 | -9.425 | -27.377 | -16.325 | 9.425 | 27.377 | 16.325 | 0.000% |
| 18 | 0.000 | -33.997 | 0.000 | 0.000 | 33.997 | 0.000 | 0.000% |
| 19 | 0.000 | -33.997 | -15.855 | 0.000 | 33.997 | 15.855 | 0.000% |
| 20 | 7.928 | -33.997 | -13.731 | -7.928 | 33.997 | 13.731 | 0.000% |
| 21 | 11.211 | -33.997 | -11.211 | -11.211 | 33.997 | 11.211 | 0.000% |
| 22 | 13.731 | -33.997 | -7.928 | -13.731 | 33.997 | 7.928 | 0.000% |
| 23 | 15.855 | -33.997 | 0.000 | -15.855 | 33.997 | 0.000 | 0.000% |
| 24 | 13.731 | -33.997 | 7.928 | -13.731 | 33.997 | -7.928 | 0.000% |
| 25 | 11.211 | -33.997 | 11.211 | -11.211 | 33.997 | -11.211 | 0.000% |
| 26 | 7.928 | -33.997 | 13.731 | -7.928 | 33.997 | -13.731 | 0.000% |
| 27 | 0.000 | -33.997 | 15.855 | 0.000 | 33.997 | -15.855 | 0.000% |
| 28 | -7.928 | -33.997 | 13.731 | 7.928 | 33.997 | -13.731 | 0.000% |
| 29 | -11.211 | -33.997 | 11.211 | 11.211 | 33.997 | -11.211 | 0.000% |
| 30 | -13.731 | -33.997 | 7.928 | 13.731 | 33.997 | -7.928 | 0.000% |
| 31 | -15.855 | -33.997 | 0.000 | 15.855 | 33.997 | 0.000 | 0.000% |
| 32 | -13.731 | -33.997 | -7.928 | 13.731 | 33.997 | 7.928 | 0.000% |
| 33 | -11.211 | -33.997 | -11.211 | 11.211 | 33.997 | 11.211 | 0.000% |
| 34 | -7.928 | -33.997 | -13.731 | 7.928 | 33.997 | 13.731 | 0.000% |
| 35 | 0.000 | -27.377 | -7.363 | 0.000 | 27.377 | 7.363 | 0.000% |
| 36 | 3.682 | -27.377 | -6.377 | -3.682 | 27.377 | 6.377 | 0.000% |
| 37 | 5.207 | -27.377 | -5.207 | -5.207 | 27.377 | 5.207 | 0.000% |
| 38 | 6.377 | -27.377 | -3.682 | -6.377 | 27.377 | 3.682 | 0.000% |
| 39 | 7.363 | -27.377 | 0.000 | -7.363 | 27.377 | 0.000 | 0.000% |
| 40 | 6.377 | -27.377 | 3.682 | -6.377 | 27.377 | -3.682 | 0.000% |
| 41 | 5.207 | -27.377 | 5.207 | -5.207 | 27.377 | -5.207 | 0.000% |
| 42 | 3.682 | -27.377 | 6.377 | -3.682 | 27.377 | -6.377 | 0.000% |
| 43 | 0.000 | -27.377 | 7.363 | 0.000 | 27.377 | -7.363 | 0.000% |
| 44 | -3.682 | -27.377 | 6.377 | 3.682 | 27.377 | -6.377 | 0.000% |
| 45 | -5.207 | -27.377 | 5.207 | 5.207 | 27.377 | -5.207 | 0.000% |
| 46 | -6.377 | -27.377 | 3.682 | 6.377 | 27.377 | -3.682 | 0.000% |
| 47 | -7.363 | -27.377 | 0.000 | 7.363 | 27.377 | 0.000 | 0.000% |
| 48 | -6.377 | -27.377 | -3.682 | 6.377 | 27.377 | 3.682 | 0.000% |
| 49 | -5.207 | -27.377 | -5.207 | 5.207 | 27.377 | 5.207 | 0.000% |
| 50 | -3.682 | -27.377 | -6.377 | 3.682 | 27.377 | 6.377 | 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 | 0.00026383 |
| 3 | Yes | 5 | 0.00000001 | 0.00041307 |
| 4 | Yes | 5 | 0.00000001 | 0.00046476 |
| 5 | Yes | 5 | 0.00000001 | 0.00041307 |
| 6 | Yes | 4 | 0.00000001 | 0.00026383 |
| 7 | Yes | 5 | 0.00000001 | 0.00041307 |
| 8 | Yes | 5 | 0.00000001 | 0.00046476 |
| 9 | Yes | 5 | 0.00000001 | 0.00041307 |
| 10 | Yes | 4 | 0.00000001 | 0.00026383 |
| 11 | Yes | 5 | 0.00000001 | 0.00041307 |
| 12 | Yes | 5 | 0.00000001 | 0.00046476 |
| 13 | Yes | 5 | 0.00000001 | 0.00041307 |
| 14 | Yes | 4 | 0.00000001 | 0.00026383 |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------|-------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job | 140' Monopole | Page | 20 of 22 |
| | Project | Manchester West | Date | 11:01:18 03/28/12 |
| | Client | Verizon Wireless | Designed by | Matthew Kapinos |

| | | | | |
|----|-----|---|-----------|------------|
| 15 | Yes | 5 | 0.0000001 | 0.00041307 |
| 16 | Yes | 5 | 0.0000001 | 0.00046476 |
| 17 | Yes | 5 | 0.0000001 | 0.00041307 |
| 18 | Yes | 4 | 0.0000001 | 0.0000001 |
| 19 | Yes | 4 | 0.0000001 | 0.00066579 |
| 20 | Yes | 5 | 0.0000001 | 0.00064521 |
| 21 | Yes | 5 | 0.0000001 | 0.00073510 |
| 22 | Yes | 5 | 0.0000001 | 0.00064521 |
| 23 | Yes | 4 | 0.0000001 | 0.00066579 |
| 24 | Yes | 5 | 0.0000001 | 0.00064521 |
| 25 | Yes | 5 | 0.0000001 | 0.00073510 |
| 26 | Yes | 5 | 0.0000001 | 0.00064521 |
| 27 | Yes | 4 | 0.0000001 | 0.00066579 |
| 28 | Yes | 5 | 0.0000001 | 0.00064521 |
| 29 | Yes | 5 | 0.0000001 | 0.00073510 |
| 30 | Yes | 5 | 0.0000001 | 0.00064521 |
| 31 | Yes | 4 | 0.0000001 | 0.00066579 |
| 32 | Yes | 5 | 0.0000001 | 0.00064521 |
| 33 | Yes | 5 | 0.0000001 | 0.00073510 |
| 34 | Yes | 5 | 0.0000001 | 0.00064521 |
| 35 | Yes | 4 | 0.0000001 | 0.0006288 |
| 36 | Yes | 4 | 0.0000001 | 0.00073548 |
| 37 | Yes | 4 | 0.0000001 | 0.00084689 |
| 38 | Yes | 4 | 0.0000001 | 0.00073548 |
| 39 | Yes | 4 | 0.0000001 | 0.0006288 |
| 40 | Yes | 4 | 0.0000001 | 0.00073548 |
| 41 | Yes | 4 | 0.0000001 | 0.00084689 |
| 42 | Yes | 4 | 0.0000001 | 0.00073548 |
| 43 | Yes | 4 | 0.0000001 | 0.0006288 |
| 44 | Yes | 4 | 0.0000001 | 0.00073548 |
| 45 | Yes | 4 | 0.0000001 | 0.00084689 |
| 46 | Yes | 4 | 0.0000001 | 0.00073548 |
| 47 | Yes | 4 | 0.0000001 | 0.0006288 |
| 48 | Yes | 4 | 0.0000001 | 0.00073548 |
| 49 | Yes | 4 | 0.0000001 | 0.00084689 |
| 50 | Yes | 4 | 0.0000001 | 0.00073548 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1 | 140 - 91.05 | 33.843 | 35 | 1.922 | 0.000 |
| L2 | 94.95 - 45.04 | 16.503 | 35 | 1.601 | 0.000 |
| L3 | 49.95 - 0 | 4.585 | 35 | 0.847 | 0.000 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|------------------|-----------------|------------------|-----------|------------|---------------------------|
| 139.000 | (2) 4' Side arm | 35 | 33.437 | 1.917 | 0.000 | 38690 |
| 134.000 | 8' Side arm | 35 | 31.410 | 1.894 | 0.000 | 32242 |
| 125.000 | (2) DUO1417-8686 | 35 | 27.789 | 1.849 | 0.000 | 12896 |
| 115.000 | (2) DB980H90 | 35 | 23.857 | 1.788 | 0.000 | 7737 |
| 113.000 | (2) 6' Whip | 35 | 23.087 | 1.774 | 0.000 | 7164 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 21 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Elevation | Appurtenance | Gov. Load Comb. | Deflection | Tilt | Twist | Radius of Curvature |
|-----------|----------------|-----------------|------------|-------|-------|---------------------|
| ft | | | in | ° | ° | ft |
| 110.000 | (2) 6' Whip | 35 | 21.945 | 1.751 | 0.000 | 6447 |
| 107.000 | (2) 6' Whip | 35 | 20.820 | 1.726 | 0.000 | 5861 |
| 100.000 | (4) DB844H90 | 35 | 18.269 | 1.659 | 0.000 | 4834 |
| 90.000 | SC-E 6014 rev2 | 35 | 14.841 | 1.537 | 0.000 | 3978 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation | Horz. Deflection | Gov. Load Comb. | Tilt | Twist |
|-------------|---------------|------------------|-----------------|-------|-------|
| | ft | in | | ° | ° |
| L1 | 140 - 91.05 | 86.439 | 6 | 4.911 | 0.000 |
| L2 | 94.95 - 45.04 | 42.171 | 6 | 4.092 | 0.000 |
| L3 | 49.95 - 0 | 11.722 | 6 | 2.164 | 0.000 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation | Appurtenance | Gov. Load Comb. | Deflection | Tilt | Twist | Radius of Curvature |
|-----------|------------------|-----------------|------------|-------|-------|---------------------|
| ft | | | in | ° | ° | ft |
| 139.000 | (2) 4' Side arm | 6 | 85.403 | 4.899 | 0.000 | 15342 |
| 134.000 | 8' Side arm | 6 | 80.228 | 4.840 | 0.000 | 12785 |
| 125.000 | (2) DUO1417-8686 | 6 | 70.986 | 4.725 | 0.000 | 5112 |
| 115.000 | (2) DB980H90 | 6 | 60.947 | 4.570 | 0.000 | 3065 |
| 113.000 | (2) 6' Whip | 6 | 58.982 | 4.533 | 0.000 | 2838 |
| 110.000 | (2) 6' Whip | 6 | 56.066 | 4.475 | 0.000 | 2553 |
| 107.000 | (2) 6' Whip | 6 | 53.194 | 4.411 | 0.000 | 2320 |
| 100.000 | (4) DB844H90 | 6 | 46.681 | 4.239 | 0.000 | 1913 |
| 90.000 | SC-E 6014 rev2 | 6 | 37.927 | 3.928 | 0.000 | 1571 |

Compression Checks

Pole Design Data

| Section No. | Elevation | Size | L | L _u | Kl/r | F _a | A | Actual P | Allow. P _a | Ratio P/P _a |
|-------------|-------------------|-----------------------|--------|----------------|------|----------------|-----------------|----------|-----------------------|------------------------|
| | ft | | ft | ft | | ksi | in ² | K | K | |
| L1 | 140 - 91.05 (1) | TP27.183x18x0.188 | 48.950 | 0.000 | 0.0 | 39.000 | 15.630 | -8.515 | 609.581 | 0.014 |
| L2 | 91.05 - 45.04 (2) | TP35.321x26.076x0.313 | 49.910 | 0.000 | 0.0 | 39.000 | 33.822 | -16.916 | 1319.050 | 0.013 |
| L3 | 45.04 - 0 (3) | TP43x33.786x0.375 | 49.950 | 0.000 | 0.0 | 39.000 | 50.734 | -27.360 | 1978.640 | 0.014 |

Pole Bending Design Data

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| tnxTower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: (860) 529-8882 FAX: (860) 529-3991 | Job 140' Monopole | Page 22 of 22 |
| | Project Manchester West | Date 11:01:18 03/28/12 |
| | Client Verizon Wireless | Designed by Matthew Kapinos |

| Section No. | Elevation ft | Size | Actual M_x kip-ft | Actual f_{bx} ksi | Allow. F_{bx} ksi | Ratio $\frac{f_{bx}}{F_{bx}}$ | Actual M_y kip-ft | Actual f_{by} ksi | Allow. F_{by} ksi | Ratio $\frac{f_{by}}{F_{by}}$ |
|-------------|----------------------|-----------------------|---------------------------|---------------------------|---------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|----------------------------------|
| L1 | 140 - 91.05 (1) | TP27.183x18x0.188 | 223.072 | 26.407 | 39.000 | 0.677 | 0.000 | 0.000 | 39.000 | 0.000 |
| L2 | 91.05 - 45.04 (2) | TP35.321x26.076x0.313 | 901.058 | 38.044 | 39.000 | 0.975 | 0.000 | 0.000 | 39.000 | 0.000 |
| L3 | 45.04 - 0 (3) | TP43x33.786x0.375 | 1788.02 | 40.246 | 39.000 | 1.032 | 0.000 | 0.000 | 39.000 | 0.000 |

Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual V K | Actual f_v ksi | Allow. F_v ksi | Ratio $\frac{f_v}{F_v}$ | Actual T kip-ft | Actual f_t ksi | Allow. F_t ksi | Ratio $\frac{f_t}{F_t}$ |
|-------------|----------------------|-----------------------|--------------------|------------------------|------------------------|----------------------------|-------------------------|------------------------|------------------------|----------------------------|
| L1 | 140 - 91.05 (1) | TP27.183x18x0.188 | 11.065 | 0.708 | 26.000 | 0.054 | 0.000 | 0.000 | 26.000 | 0.000 |
| L2 | 91.05 - 45.04 (2) | TP35.321x26.076x0.313 | 16.594 | 0.491 | 26.000 | 0.038 | 0.000 | 0.000 | 26.000 | 0.000 |
| L3 | 45.04 - 0 (3) | TP43x33.786x0.375 | 18.875 | 0.372 | 26.000 | 0.029 | 0.000 | 0.000 | 26.000 | 0.000 |

Pole Interaction Design Data

| Section No. | Elevation ft | Ratio P P_a | Ratio $\frac{f_{bx}}{F_{bx}}$ | Ratio $\frac{f_{by}}{F_{by}}$ | Ratio $\frac{f_v}{F_v}$ | Ratio $\frac{f_t}{F_t}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|----------------------|-----------------------|----------------------------------|----------------------------------|----------------------------|----------------------------|--------------------------|---------------------------|-----------|
| L1 | 140 - 91.05 (1) | 0.014 | 0.677 | 0.000 | 0.054 | 0.000 | 0.692 | 1.333 | H1-3+VT ✓ |
| L2 | 91.05 - 45.04 (2) | 0.013 | 0.975 | 0.000 | 0.038 | 0.000 | 0.989 | 1.333 | H1-3+VT ✓ |
| L3 | 45.04 - 0 (3) | 0.014 | 1.032 | 0.000 | 0.029 | 0.000 | 1.046 | 1.333 | H1-3+VT ✓ |

Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $SF * P_{allow}$ K | % Capacity | Pass Fail | |
|-------------|-----------------|-------------------|-----------------------|---------------------|----------|-----------------------|---------------|--------------|------|
| L1 | 140 - 91.05 | Pole | TP27.183x18x0.188 | 1 | -8.515 | 812.571 | 51.9 | Pass | |
| L2 | 91.05 - 45.04 | Pole | TP35.321x26.076x0.313 | 2 | -16.916 | 1758.294 | 74.2 | Pass | |
| L3 | 45.04 - 0 | Pole | TP43x33.786x0.375 | 3 | -27.360 | 2637.527 | 78.5 | Pass | |
| | | | | | | | Summary | | |
| | | | | | | | Pole (L3) | 78.5 | Pass |
| | | | | | | | RATING = | 78.5 | Pass |

ANCHOR BOLT AND BASE PLATE ANALYSIS

ANCHOR BOLT AND BASE PLATE ANALYSIS

Input Data

Tower Reactions:

| | | |
|---------------------|--------------------|-------------------|
| Overturning Moment: | OM := 1788·ft·kips | <i>user input</i> |
| Shear Force: | Shear := 19·kips | <i>user input</i> |
| Axial Force: | Axial := 27·kips | <i>user input</i> |

Anchor Bolt Data:

| | | |
|----------------------------|--------------------------------|-------------------|
| Use ASTM A615 Grade 75 | | <i>user input</i> |
| Number of Anchor Bolts = N | $N_{\text{an}} := 12$ | <i>user input</i> |
| Diameter of Bolt Circle: | $D_{\text{bc}} := 51\text{in}$ | <i>user input</i> |
| Bolt "Column" Distance: | $l_{\text{c}} := 6\text{in}$ | <i>user input</i> |
| Bolt Ultimate Strength: | $F_u := 100\text{ksi}$ | <i>user input</i> |
| Bolt Yield Strength: | $F_y := 75\text{ksi}$ | <i>user input</i> |
| Bolt Modulus: | $E := 29000\text{ksi}$ | <i>user input</i> |
| Anchor Bolt Diameter | $D := 2.25\text{in}$ | <i>user input</i> |
| Threads per Inch: | $n := 4.5$ | <i>user input</i> |

Base Plate Data:

| | | |
|------------------------|-------------------------------------|-------------------|
| Use ASTM A871 Grade 60 | | <i>user input</i> |
| Plate Yield Strength: | $F_{y_{\text{bp}}} := 60\text{ksi}$ | <i>user input</i> |
| Base Plate Thickness: | PlateThickness := 1.75·in | <i>user input</i> |
| Base Plate Diameter: | $D_{\text{bp}} := 57\text{in}$ | <i>user input</i> |
| Outer Pole Diameter: | $D_{\text{pole}} := 43\text{in}$ | <i>user input</i> |

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: $i := 1..N$

$$d_i := \begin{cases} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{cases}$$

| | |
|-------------------------------|-----------------------------------|
| $d_1 = 12.75 \cdot \text{in}$ | $d_7 = -12.75 \cdot \text{in}$ |
| $d_2 = 22.08 \cdot \text{in}$ | $d_8 = -22.08 \cdot \text{in}$ |
| $d_3 = 25.50 \cdot \text{in}$ | $d_9 = -25.50 \cdot \text{in}$ |
| $d_4 = 22.08 \cdot \text{in}$ | $d_{10} = -22.08 \cdot \text{in}$ |
| $d_5 = 12.75 \cdot \text{in}$ | $d_{11} = -12.75 \cdot \text{in}$ |
| $d_6 = 0.00 \cdot \text{in}$ | etc. |

Critical Distances For Bending in Plate:

Outer Pole Radius: $R_{pole} := \frac{D_{pole}}{2}$ $R_{pole} = 21.50 \cdot \text{in}$

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

| | |
|-------------------------------|----------------------------------|
| $MA_1 = 0.00 \cdot \text{in}$ | $MA_7 = 0.00 \cdot \text{in}$ |
| $MA_2 = 0.58 \cdot \text{in}$ | $MA_8 = 0.00 \cdot \text{in}$ |
| $MA_3 = 4.00 \cdot \text{in}$ | $MA_9 = 0.00 \cdot \text{in}$ |
| $MA_4 = 0.58 \cdot \text{in}$ | $MA_{10} = 0.00 \cdot \text{in}$ |
| $MA_5 = 0.00 \cdot \text{in}$ | $MA_{11} = 0.00 \cdot \text{in}$ |
| $MA_6 = 0.00 \cdot \text{in}$ | etc. |

Effective Width of Baseplate for Bending: $\text{EffectiveWidth} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2}$ $\text{EffectiveWidth} = 29.93 \cdot \text{in}$

Anchor Bolt Analysis:

Polar Moment of Inertia I_p :

$$I_p := \sum_i (d_i)^2 \quad I_p = 3.902 \times 10^3 \cdot \text{in}^2$$

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \quad A_g = 3.976 \cdot \text{in}^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 \quad A_n = 3.248 \cdot \text{in}^2$$

Net Diameter:

$$D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} \quad D_n = 2.03 \cdot \text{in}$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \quad r = 0.51 \cdot \text{in}$$

Section Modulus of Bolt:

$$S_x := \frac{\pi \cdot D_n^3}{32} \quad S_x = 0.826 \cdot \text{in}^3$$

Anchor Bolt Bending Stress:

Maximum Applied Bending:

$$M_x := \left(\frac{\text{Shear}}{N} \right) \cdot l \quad M_x = 0.792 \cdot \text{ft} \cdot \text{kips}$$

$$f_{bx} := \frac{M_x}{S_x} \quad f_{bx} = 11.5 \cdot \text{ksi}$$

Allowable Bending

$$F_{bx} := 1.333 \cdot 0.60 \cdot F_y \quad F_{bx} = 60.0 \cdot \text{ksi}$$

Note: 1.333 increase allowed per TIA/EIA

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$\text{AllowableTension} := 1.333 \cdot (0.33 \cdot A_g \cdot F_u) \quad \text{AllowableTension} = 174.9 \cdot \text{kips}$$

Note: 1.333 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{\text{net.area}} := 1.333 \cdot (0.60 \cdot A_n \cdot F_y) \quad F_{\text{net.area}} = 194.8 \cdot \text{kips}$$

Note: 1.333 increase allowed per TIA/EIA

Applied Tension:

$$\text{MaxTension} := \frac{\text{OM} \cdot R_{bc}}{I_p} - \frac{\text{Axial}}{N} \quad \text{MaxTension} = 138.0 \cdot \text{kips}$$

Check Stresses:

Note: Bolts supplied are "upset bolts." Use net area for checking per AISC.

$$\frac{\text{MaxTension}}{F_{\text{net.area}}} = 0.71$$

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

Condition = "OK"

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:

$$l_{\text{w}} := \begin{cases} 1 & \text{if } l > 2 \cdot D_n \\ 0.00 \text{in} & \text{otherwise} \end{cases} \quad l = 6.00 \text{-in}$$

$$f_{\text{bx}} := \begin{cases} f_{\text{bx}} & \text{if } l > 2 \cdot D_n \\ 0.0 \text{ksi} & \text{otherwise} \end{cases} \quad f_{\text{bx}} = 11.5 \text{-ksi}$$

Allowable Compressive Force:

$$K := 0.65$$

$$C_c := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{F_y}} \quad C_c = 87.36$$

$$F_a := \begin{cases} \frac{\left[1 - \frac{\left(\frac{K \cdot l}{r} \right)^2}{2 \cdot C_c^2} \right] \cdot F_y}{\frac{5}{3} + \frac{3 \cdot \left(\frac{K \cdot l}{r} \right)}{8 \cdot C_c} - \frac{\left(\frac{K \cdot l}{r} \right)^3}{8 \cdot C_c^3}} & \text{if } \frac{K \cdot l}{r} \leq C_c \\ \frac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r} \right)^2} & \text{if } \frac{K \cdot l}{r} > C_c \end{cases} \quad F_a = 44.0 \text{-ksi}$$

$$F_{\text{a}} := 1.333 \cdot F_a \quad \text{Note: 1.333 increase allowed per TIA/EIA} \quad F_a = 58.6 \text{-ksi}$$

Applied Compressive Force:

$$\text{MaxCompression} := \frac{OM \cdot R_{bc}}{I_p} + \frac{\text{Axial}}{N} \quad \text{MaxCompression} = 142.5 \text{-kips}$$

$$f_a := \frac{\text{MaxCompression}}{A_n} \quad f_a = 43.9 \text{-ksi}$$

Check Combined Stresses:

$$\frac{f_a}{F_a} + \frac{f_{\text{bx}}}{F_{\text{bx}}} = 0.94$$

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

Base Plate Analysis:

Force from Bolt(s):

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

$$C_1 = 72.4 \cdot \text{kips}$$

$$C_7 = -67.9 \cdot \text{kips}$$

$$C_2 = 123.7 \cdot \text{kips}$$

$$C_8 = -119.2 \cdot \text{kips}$$

$$C_3 = 142.5 \cdot \text{kips}$$

$$C_9 = -138.0 \cdot \text{kips}$$

$$C_4 = 123.7 \cdot \text{kips}$$

$$C_{10} = -119.2 \cdot \text{kips}$$

$$C_5 = 72.4 \cdot \text{kips}$$

$$C_{11} = -67.9 \cdot \text{kips}$$

$$C_6 = 2.3 \cdot \text{kips}$$

etc.

Bending Stress in Plate:

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\text{EffectiveWidth} \cdot \text{PlateThickness}^2}$$

$$f_{bp} = 46.8 \cdot \text{ksi}$$

Check Stresses:

$$\frac{f_{bp}}{1.333 \cdot 0.75 F_{y_{bp}}} = 0.78$$

$$\text{Condition} := \text{if} \left(\frac{f_{bp}}{1.333 \cdot 0.75 F_{y_{bp}}} < 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

Condition = "OK"

FOUNDATION ANALYSIS

Check Foundation Depth TIA/EIA-222-F 7.2.5

| | | |
|--------------------------------------|-------------------------------------|-------------------|
| Shear Force: | $S := 19k$ | <i>USER INPUT</i> |
| Overturing Moment: | $M := 1788ft \cdot k$ | <i>USER INPUT</i> |
| Foundation Diameter: | $d := 6.0ft$ | <i>USER INPUT</i> |
| Overall Length of Caisson: | $L_c := 23.0ft$ | <i>USER INPUT</i> |
| Depth From Top of Caisson to Grade: | $L_{pag} := 1.0ft$ | <i>USER INPUT</i> |
| Depth of Caisson Below Ground Level: | $LD := L_c - L_{pag}$ $LD = 22.0ft$ | <i>USER INPUT</i> |

Depth Required:

$$LD1 := 2.0ft + \left(\frac{S \cdot ft^2}{3k \cdot d} \right) + 2ft \cdot \left(\frac{M \cdot ft}{3 \cdot k \cdot d} + \frac{S \cdot ft}{2k} + \frac{S^2 \cdot ft^3}{18k^2 \cdot d^2} \right)^{.5} \quad LD1 = 24.0ft$$

DepthCheck := if(LD1 ≤ LD, "OK", "NO GOOD") DepthCheck = "NO GOOD" Note: Result not applicable. Actual soil is better than normal soil as defined in TIA/EIA 222 F. Refer to L-Pile analysis.

Moment Capacity:

| | | |
|-------------------|------------------------------------|------------------------------|
| Bending Moment: | $M_u := 1874ft \cdot k$ | <i>USER INPUT-FROM LPILE</i> |
| Moment Capacity: | $M_n := 3508ft \cdot k$ | <i>USER INPUT-FROM LPILE</i> |
| Factor of Safety: | $FS := \frac{M_n}{M_u}$ $FS = 1.9$ | |

Factor of Safety Required $FS_{reqd} := 1.3$ FOSCheck := if(FS ≥ FS_{reqd}, "OK", "NO GOOD") FOSCheck = "OK"

Factor of Safety Ratio:

$$FS_{ratio} := \left(\frac{FS_{reqd}}{FS} \right) = 0.69$$

Axial Capacity:

Applied Axial Load: $A1 := 34k$ *USER INPUT*

Concrete Weight: $A2 := .150 \frac{k}{ft^3} \cdot LD \cdot \pi \frac{d^2}{4}$ $A2 = 93.3 \cdot k$

Total Axial Load: $AT := A1 + A2$ $AT = 127.3 \cdot k$

Number of Rebar: $n := 14$ *USER INPUT*

Area of Rebar: $Ar := 1.56in^2$ *USER INPUT* #11

Rebar Yield Strength: $fy := 60ksi$ *USER INPUT*

Area of Concrete: $Ag := \pi \cdot \frac{d^2}{4}$ $Ag = 28.3 ft^{2.0}$

Concrete Comp Strength: $fc := 4ksi$ *USER INPUT*

Axial Capacity: $Po := n \cdot Ar \cdot fy + (Ag - n \cdot Ar) \cdot 0.85 \cdot fc$ $Po = 15079.3 \cdot k$

AxialCheck := if(AT ≤ Po, "OK", "NO GOOD") AxialCheck = "OK"

140' EEI Monopole - Manchester, CT.lpo

LPILE Plus for windows, Version 4

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

(c) Copyright ENSOFT, Inc., 1985-2000
All Rights Reserved

This program is licensed to:

Software Coordinator

URS Corp

Name of input data file: P:\08\MathCAD\LPile\140' EEI Monopole - Manchester, CT.lpd

Name of output file: P:\08\MathCAD\LPile\140' EEI Monopole - Manchester, CT.lpo

Name of plot output file: P:\08\MathCAD\LPile\140' EEI Monopole - Manchester, CT.lpp

Name of runtime file: P:\08\MathCAD\LPile\140' EEI Monopole - Manchester, CT.lpr

Time and Date of Analysis

Date: March 28, 2012 Time: 10:37:53

Problem Title

140' EEI Monopole - Manchester, CT

Program Options

Units Used in Computations - US Customary Units, inches, pounds

Basic Program Options:

Analysis Type 3:

- Computations of Ultimate Bending Moment Capacity and Pile Response
Using Nonlinear EI

Computation Options:

- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers
(individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip

140' EEI Monopole - Manchester, CT.lpo

- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix elements
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:

- Number of pile increments = 100
- Deflection tolerance for closure = 1.0000E-05 in
- Maximum number of iterations allowed = 100
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:

- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 1

Pile Structural Properties and Geometry

- Pile Length = 276.00 in
- Depth of ground surface below top of pile = 12.00 in
- Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 2 points

| Point | Depth X in | Pile Diameter in | Moment of Inertia in**4 | Pile Area Sq.in | Modulus of Elasticity lbs/Sq.in |
|-------|------------------|------------------------|-------------------------------|-----------------------|---------------------------------------|
| 1 | .000 | 72.000 | 1.6377E+06 | 4.5360E+03 | 3.6050E+06 |
| 2 | 276.000 | 72.000 | 1.6377E+06 | 4.5360E+03 | 3.6050E+06 |

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 12.000 in
Distance from top of pile to bottom of layer = 48.000 in
p-y subgrade modulus k for top of soil layer = 1.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 1.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 48.000 in
Distance from top of pile to bottom of layer = 180.000 in
p-y subgrade modulus k for top of soil layer = 100.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 100.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 180.000 in
Distance from top of pile to bottom of layer = 204.000 in
p-y subgrade modulus k for top of soil layer = 300.000 lbs/in**3

140' EEI Monopole - Manchester, CT.lpo
 p-y subgrade modulus k for bottom of layer = 300.000 lbs/in**3

Layer 4 is sand, p-y criteria by Reese et al., 1974
 Distance from top of pile to top of layer = 204.000 in
 Distance from top of pile to bottom of layer = 432.000 in
 p-y subgrade modulus k for top of soil layer = 300.000 lbs/in**3
 p-y subgrade modulus k for bottom of layer = 300.000 lbs/in**3

(Depth of lowest layer extends 156.00 in below pile tip)

 Effective Unit weight of Soil vs. Depth

Distribution of effective unit weight of soil with depth
 is defined using 8 points

| Point No. | Depth X in | Eff. Unit weight lbs/in**3 |
|-----------|------------|----------------------------|
| 1 | .00 | .07200 |
| 2 | 48.00 | .07200 |
| 3 | 48.00 | .07200 |
| 4 | 180.00 | .07200 |
| 5 | 180.00 | .07200 |
| 6 | 204.00 | .07200 |
| 7 | 204.00 | .03640 |
| 8 | 432.00 | .03640 |

 Shear Strength of Soils

Distribution of shear strength parameters with depth
 defined using 8 points

| Point No. | Depth X in | Cohesion c lbs/in**2 | Angle of Friction Deg. | E50/k_rm | RQD % |
|-----------|------------|----------------------|------------------------|----------|-------|
| 1 | .000 | .00000 | 34.00 | ----- | ----- |
| 2 | 48.000 | .00000 | 34.00 | ----- | ----- |
| 3 | 48.000 | .00000 | 34.00 | ----- | ----- |
| 4 | 180.000 | .00000 | 34.00 | ----- | ----- |
| 5 | 180.000 | .00000 | 34.00 | ----- | ----- |
| 6 | 204.000 | .00000 | 34.00 | ----- | ----- |
| 7 | 204.000 | .00000 | 34.00 | ----- | ----- |
| 8 | 432.000 | .00000 | 34.00 | ----- | ----- |

Notes:

- (1) Cohesion = uniaxial compressive strength for rock materials.
- (2) E50 is reported for clay strata.
- (3) k_rm is reported for rock strata.
- (4) RQD is input and reported only for rock materials.
- (5) Internal default values for E50 will be generated when input value is 0.

Static loading criteria was used for computation of p-y curves

140' EEI Monopole - Manchester, CT.lpo

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 16000.000 lbs
Bending moment at pile head = 18612000.000 in-lbs
Axial load at pile head = 34000.000 lbs

(Non-zero moment for this load indicates pile-head is free to rotate under the applied pile-head load)

Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 19000.000 lbs
Bending moment at pile head = 21456000.000 in-lbs
Axial load at pile head = 27000.000 lbs

(Non-zero moment for this load indicates pile-head is free to rotate under the applied pile-head load)

Computations of Ultimate Moment Capacity and Nonlinear Bending Stiffness

Pile Description:

The pile shape is a circular solid pile.

Outside Diameter = 72.000 In

Material Properties:

Compressive Strength of Concrete = 4. Kip/In**2
Yield stress for rebar = 60. Kip/In**2
Modulus of elasticity of steel = 29000. Kip/In**2
Number of reinforcing bars = 14
Area of single rebar = 1.56000 In**2
Number of rows of reinforcing bars = 7
Cover Thickness = 4.000 In

Ultimate squash load capacity = 15079.26 kip

Distribution and Area of Steel Reinforcement

| Row Number | Area of Reinforcement In**2 | Distance to Centroidal Axis In |
|------------|-----------------------------|--------------------------------|
| 1 | 3.120000 | 31.1977 |
| 2 | 3.120000 | 25.0186 |
| 3 | 3.120000 | 13.8843 |
| 4 | 3.120000 | .0000 |
| 5 | 3.120000 | -13.8843 |
| 6 | 3.120000 | -25.0186 |

| 140' EEI Monopole - Manchester, CT.lpo | | | | | |
|----------------------------------------|-----------|-----------|-----------|------------|--|
| 4.128E+07 | 2.386E+11 | .00017300 | .00201888 | 11.670 | |
| 4.171E+07 | 2.055E+11 | .00020300 | .00228534 | 11.258 | |
| 4.179E+07 | 1.793E+11 | .00023300 | .00253156 | 10.865 | |
| 4.189E+07 | 1.593E+11 | .00026300 | .00282125 | 10.727 | |
| 4.192E+07 | 1.431E+11 | .00029300 | .00305986 | 10.443 | |
| 4.193E+07 | 1.298E+11 | .00032300 | .00330298 | 10.226 | |
| 4.194E+07 | 1.188E+11 | .00035300 | .00354867 | 10.053 | |
| 4.195E+07 | 1.095E+11 | .00038300 | .00379630 | 9.91200256 | |
| 4.196E+07 | 1.016E+11 | .00041300 | .00404579 | 9.79609680 | |

Ultimate moment capacity at concrete strain of 0.003 = 4.191E+07 In-lb

 Computed Values of Load Distribution and Deflection
 for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
 Specified shear force at pile head = 16000.000 lbs
 Specified bending moment at pile head = 18612000.000 in-lbs
 Specified axial load at pile head = 34000.000 lbs

(Non-zero moment for this load does not indicate free-head conditions)

| Depth X in | Deflect. y in | Moment M lbs-in | Shear V lbs | Slope S Rad. | Total Stress lbs/in**2 | Flx. Rig. EI lbs-in**2 | Soil Res p lbs/in |
|------------------|---------------------|-----------------------|-------------------|--------------------|------------------------------|------------------------------|-------------------------|
| 0.000 | .568689 | 1.86E+07 | 16000.0 | -.005263 | 416.6 | 7.54E+11 | 0.000 |
| 2.760 | .554256 | 1.87E+07 | 16000.0 | -.005195 | 417.6 | 7.54E+11 | 0.000 |
| 5.520 | .540012 | 1.87E+07 | 16000.0 | -.005127 | 418.6 | 7.54E+11 | 0.000 |
| 8.280 | .525957 | 1.87E+07 | 16000.0 | -.005058 | 419.6 | 7.53E+11 | 0.000 |
| 11.040 | .512092 | 1.88E+07 | 16000.0 | -.004989 | 420.6 | 7.53E+11 | 0.000 |
| 13.800 | .498416 | 1.88E+07 | 15998.8 | -.004920 | 421.5 | 7.53E+11 | -.897149 |
| 16.560 | .484932 | 1.89E+07 | 15994.5 | -.004851 | 422.5 | 7.53E+11 | -2.211 |
| 19.320 | .471638 | 1.89E+07 | 15986.7 | -.004782 | 423.5 | 7.53E+11 | -3.452 |
| 22.080 | .458535 | 1.90E+07 | 15975.5 | -.004713 | 424.5 | 7.53E+11 | -4.622 |
| 24.840 | .445625 | 1.90E+07 | 15961.2 | -.004643 | 425.5 | 7.53E+11 | -5.722 |
| 27.600 | .432906 | 1.91E+07 | 15944.0 | -.004573 | 426.4 | 7.53E+11 | -6.753 |
| 30.360 | .420381 | 1.91E+07 | 15924.1 | -.004503 | 427.4 | 7.53E+11 | -7.718 |
| 33.120 | .408049 | 1.91E+07 | 15901.5 | -.004433 | 428.4 | 7.53E+11 | -8.618 |
| 35.880 | .395911 | 1.92E+07 | 15876.6 | -.004363 | 429.4 | 7.53E+11 | -9.454 |
| 38.640 | .383967 | 1.92E+07 | 15849.4 | -.004292 | 430.3 | 7.52E+11 | -10.229 |
| 41.400 | .372218 | 1.93E+07 | 15820.2 | -.004222 | 431.3 | 7.52E+11 | -10.943 |
| 44.160 | .360664 | 1.93E+07 | 15789.1 | -.004151 | 432.3 | 7.52E+11 | -11.599 |
| 46.920 | .349305 | 1.94E+07 | 15756.2 | -.004080 | 433.2 | 7.52E+11 | -12.198 |
| 49.680 | .338143 | 1.94E+07 | 13923.1 | -.004009 | 434.2 | 7.52E+11 | -1316.165 |
| 52.440 | .327177 | 1.94E+07 | 10224.8 | -.003937 | 434.9 | 7.52E+11 | -1363.784 |
| 55.200 | .316408 | 1.95E+07 | 6402.2 | -.003866 | 435.5 | 7.52E+11 | -1406.225 |
| 57.960 | .305837 | 1.95E+07 | 2469.3 | -.003795 | 435.7 | 7.52E+11 | -1443.652 |
| 60.720 | .295462 | 1.95E+07 | -1560.1 | -.003723 | 435.8 | 7.52E+11 | -1476.230 |
| 63.480 | .285285 | 1.95E+07 | -5673.0 | -.003652 | 435.6 | 7.52E+11 | -1504.121 |
| 66.240 | .275306 | 1.95E+07 | -9856.6 | -.003580 | 435.1 | 7.52E+11 | -1527.489 |
| 69.000 | .265523 | 1.94E+07 | -14098.7 | -.003509 | 434.4 | 7.52E+11 | -1546.496 |
| 71.760 | .255937 | 1.94E+07 | -18387.5 | -.003438 | 433.4 | 7.52E+11 | -1561.302 |
| 74.520 | .246547 | 1.93E+07 | -22711.5 | -.003367 | 432.2 | 7.52E+11 | -1572.068 |
| 77.280 | .237353 | 1.92E+07 | -27059.9 | -.003296 | 430.7 | 7.52E+11 | -1578.952 |
| 80.040 | .228354 | 1.92E+07 | -31422.2 | -.003225 | 428.9 | 7.53E+11 | -1582.110 |
| 82.800 | .219548 | 1.91E+07 | -35788.3 | -.003155 | 426.9 | 7.53E+11 | -1581.699 |
| 85.560 | .210936 | 1.90E+07 | -40148.5 | -.003086 | 424.6 | 7.53E+11 | -1577.872 |

140' EEI Monopole - Manchester, CT.lpo

| | | | | | | | |
|---------|-----------|----------|-----------|-----------|---------|----------|-----------|
| 88.320 | .202516 | 1.89E+07 | -44493.6 | -.003016 | 422.0 | 7.53E+11 | -1570.779 |
| 91.080 | .194286 | 1.87E+07 | -48814.9 | -.002947 | 419.2 | 7.53E+11 | -1560.571 |
| 93.840 | .186246 | 1.86E+07 | -53103.9 | -.002879 | 416.1 | 7.54E+11 | -1547.392 |
| 96.600 | .178393 | 1.84E+07 | -57352.6 | -.002811 | 412.7 | 7.54E+11 | -1531.389 |
| 99.360 | .170727 | 1.83E+07 | -61553.4 | -.002744 | 409.1 | 7.54E+11 | -1512.700 |
| 102.120 | .163246 | 1.81E+07 | -65699.2 | -.002678 | 405.3 | 7.55E+11 | -1491.466 |
| 104.880 | .155947 | 1.79E+07 | -69783.0 | -.002612 | 401.2 | 7.55E+11 | -1467.821 |
| 107.640 | .148828 | 1.77E+07 | -73798.4 | -.002547 | 396.8 | 7.56E+11 | -1441.897 |
| 110.400 | .141888 | 1.75E+07 | -77739.3 | -.002482 | 392.2 | 7.56E+11 | -1413.823 |
| 113.160 | .135125 | 1.73E+07 | -81599.9 | -.002419 | 387.4 | 7.56E+11 | -1383.724 |
| 115.920 | .128535 | 1.71E+07 | -85374.8 | -.002356 | 382.3 | 7.57E+11 | -1351.722 |
| 118.680 | .122118 | 1.68E+07 | -89058.9 | -.002295 | 377.1 | 7.57E+11 | -1317.935 |
| 121.440 | .115869 | 1.66E+07 | -92647.5 | -.002234 | 371.5 | 7.58E+11 | -1282.476 |
| 124.200 | .109787 | 1.63E+07 | -96136.1 | -.002174 | 365.8 | 7.59E+11 | -1245.456 |
| 126.960 | .103868 | 1.60E+07 | -99520.4 | -.002115 | 359.9 | 7.59E+11 | -1206.981 |
| 129.720 | .098110 | 1.58E+07 | -102796.7 | -.002058 | 353.8 | 7.60E+11 | -1167.152 |
| 132.480 | .092510 | 1.55E+07 | -105961.4 | -.002001 | 347.4 | 7.61E+11 | -1126.067 |
| 135.240 | .087065 | 1.52E+07 | -109011.0 | -.001945 | 340.9 | 7.62E+11 | -1083.819 |
| 138.000 | .081772 | 1.49E+07 | -111942.6 | -.001891 | 334.2 | 7.62E+11 | -1040.496 |
| 140.760 | .076627 | 1.45E+07 | -114753.2 | -.001838 | 327.3 | 7.63E+11 | -996.182 |
| 143.520 | .071628 | 1.42E+07 | -117440.2 | -.001786 | 320.3 | 7.64E+11 | -950.955 |
| 146.280 | .066770 | 1.39E+07 | -120001.3 | -.001735 | 313.1 | 7.65E+11 | -904.891 |
| 149.040 | .062051 | 1.36E+07 | -122434.2 | -.001685 | 305.7 | 7.66E+11 | -858.060 |
| 151.800 | .057466 | 1.32E+07 | -124736.8 | -.001637 | 298.2 | 7.67E+11 | -810.526 |
| 154.560 | .053013 | 1.29E+07 | -126907.4 | -.001590 | 290.6 | 7.68E+11 | -762.351 |
| 157.320 | .048688 | 1.25E+07 | -128944.2 | -.001545 | 282.8 | 7.70E+11 | -713.590 |
| 160.080 | .044487 | 1.22E+07 | -130845.7 | -.001500 | 275.0 | 7.71E+11 | -664.292 |
| 162.840 | .040406 | 1.18E+07 | -132610.4 | -.001458 | 267.0 | 7.73E+11 | -614.503 |
| 165.600 | .036441 | 1.14E+07 | -134237.1 | -.001416 | 258.9 | 7.74E+11 | -564.263 |
| 168.360 | .032589 | 1.11E+07 | -135724.6 | -.001376 | 250.7 | 7.76E+11 | -513.608 |
| 171.120 | .028845 | 1.07E+07 | -137071.7 | -.001337 | 242.4 | 7.77E+11 | -462.569 |
| 173.880 | .025206 | 1.03E+07 | -138277.4 | -.001300 | 234.1 | 7.79E+11 | -411.171 |
| 176.640 | .021668 | 9.92E+06 | -139340.9 | -.001264 | 225.6 | 7.81E+11 | -359.437 |
| 179.400 | .018227 | 9.54E+06 | -140261.1 | -.001230 | 217.2 | 7.84E+11 | -307.381 |
| 182.160 | .014878 | 9.15E+06 | -141766.5 | -.001197 | 208.6 | 7.87E+11 | -253.530 |
| 184.920 | .011618 | 8.76E+06 | -143705.4 | -.001166 | 200.0 | 7.90E+11 | -198.461 |
| 187.680 | .008442 | 8.36E+06 | -145195.9 | -.001136 | 191.2 | 7.93E+11 | -143.581 |
| 190.440 | .005347 | 7.95E+06 | -146235.7 | -.001108 | 182.3 | 7.96E+11 | -88.870 |
| 193.200 | .002328 | 7.55E+06 | -146822.4 | -.001081 | 173.5 | 7.99E+11 | -34.297 |
| 195.960 | -6.19E-04 | 7.14E+06 | -146953.6 | -.001056 | 164.5 | 8.08E+11 | 20.187 |
| 198.720 | -.003499 | 6.74E+06 | -146626.8 | -.001032 | 155.6 | 8.50E+11 | 65.669 |
| 201.480 | -.006319 | 6.33E+06 | -145838.7 | -.001012 | 146.7 | 8.92E+11 | 121.392 |
| 204.240 | -.009084 | 5.93E+06 | -144590.5 | -9.93E-04 | 137.9 | 9.34E+11 | 177.142 |
| 207.000 | -.011801 | 5.54E+06 | -142879.1 | -9.77E-04 | 129.2 | 9.76E+11 | 232.971 |
| 209.760 | -.014475 | 5.15E+06 | -140696.4 | -9.62E-04 | 120.6 | 1.02E+12 | 288.682 |
| 212.520 | -.017110 | 4.76E+06 | -138037.0 | -9.54E-04 | 112.1 | 5.10E+12 | 344.453 |
| 215.280 | -.019738 | 4.38E+06 | -134892.5 | -9.51E-04 | 103.9 | 5.10E+12 | 399.146 |
| 218.040 | -.022360 | 4.02E+06 | -131252.2 | -9.49E-04 | 95.7755 | 5.10E+12 | 453.779 |
| 220.800 | -.024976 | 3.66E+06 | -127105.1 | -9.47E-04 | 87.9322 | 5.10E+12 | 508.370 |
| 223.560 | -.027586 | 3.31E+06 | -122440.2 | -9.45E-04 | 80.3560 | 5.10E+12 | 562.940 |
| 226.320 | -.030191 | 2.98E+06 | -117246.7 | -9.43E-04 | 73.0787 | 5.10E+12 | 617.507 |
| 229.080 | -.032792 | 2.67E+06 | -111523.9 | -9.42E-04 | 66.1327 | 5.10E+12 | 671.455 |
| 231.840 | -.035388 | 2.37E+06 | -105482.8 | -9.40E-04 | 59.5499 | 5.10E+12 | 725.105 |
| 234.600 | -.037982 | 2.09E+06 | -99335.0 | -9.39E-04 | 53.3369 | 5.10E+12 | 778.848 |
| 237.360 | -.040572 | 1.82E+06 | -93090.7 | -9.38E-04 | 47.5000 | 5.10E+12 | 832.009 |
| 240.120 | -.043159 | 1.57E+06 | -86759.5 | -9.37E-04 | 42.0448 | 5.10E+12 | 885.855 |
| 242.880 | -.045744 | 1.34E+06 | -80350.1 | -9.36E-04 | 36.9762 | 5.10E+12 | 939.606 |
| 245.640 | -.048327 | 1.13E+06 | -73870.9 | -9.36E-04 | 32.2987 | 5.10E+12 | 993.449 |
| 248.400 | -.050909 | 933496.4 | -67329.7 | -9.35E-04 | 28.0163 | 5.10E+12 | 1047.538 |
| 251.160 | -.053488 | 756821.0 | -60734.0 | -9.35E-04 | 24.1325 | 5.10E+12 | 1101.009 |
| 253.920 | -.056067 | 598420.3 | -54090.7 | -9.34E-04 | 20.6504 | 5.10E+12 | 1154.975 |
| 256.680 | -.058645 | 458415.9 | -47406.6 | -9.34E-04 | 17.5728 | 5.10E+12 | 1208.536 |
| 259.440 | -.061222 | 336911.1 | -40688.3 | -9.34E-04 | 14.9018 | 5.10E+12 | 1261.779 |

| 140' EEI Monopole - Manchester, CT.lpo | | | | | | | |
|----------------------------------------|----------|----------|----------|-----------|---------|----------|----------|
| 262.200 | -.063799 | 233991.5 | -33942.1 | -9.34E-04 | 12.6393 | 5.10E+12 | 2448.777 |
| 264.960 | -.066376 | 149725.7 | -27174.1 | -9.33E-04 | 10.7869 | 5.10E+12 | 2455.598 |
| 267.720 | -.068952 | 84165.7 | -20390.2 | -9.33E-04 | 9.3458 | 5.10E+12 | 2460.301 |
| 270.480 | -.071528 | 37347.2 | -13596.1 | -9.33E-04 | 8.3166 | 5.10E+12 | 2462.937 |
| 273.240 | -.074104 | 9290.4 | -6797.5 | -9.33E-04 | 7.6998 | 5.10E+12 | 2463.554 |
| 276.000 | -.076680 | 0.0 | 0.0 | -9.33E-04 | 7.4956 | 5.10E+12 | 2462.193 |

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

| | | |
|----------------------------------|---|---------------------|
| Pile-head deflection | = | .5687 in |
| Computed slope at pile head | = | -5.2633E-03 |
| Maximum bending moment | = | 19482507.983 lbs-in |
| Maximum shear force | = | -146953.640 lbs |
| Depth of maximum bending moment | = | 60.720 in |
| Depth of maximum shear force | = | 195.960 in |
| Number of iterations | = | 11 |
| Number of zero deflection points | = | 1 |

 Computed values of Load Distribution and Deflection
 for Lateral Loading for Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
 Specified shear force at pile head = 19000.000 lbs
 Specified bending moment at pile head = 21456000.000 in-lbs
 Specified axial load at pile head = 27000.000 lbs

(Non-zero moment for this load does not indicate free-head conditions)

| Depth X in | Deflect. y in | Moment M lbs-in | Shear V lbs | Slope S Rad. | Total Stress lbs/in**2 | Flx. Rig. EI lbs-in**2 | Soil Res p lbs/in |
|------------------|---------------------|-----------------------|-------------------|--------------------|------------------------------|------------------------------|-------------------------|
| 0.000 | .667568 | 2.15E+07 | 19000.0 | -.006159 | 477.6 | 7.49E+11 | 0.000 |
| 2.760 | .650678 | 2.15E+07 | 19000.0 | -.006080 | 478.8 | 7.49E+11 | 0.000 |
| 5.520 | .634007 | 2.16E+07 | 19000.0 | -.006001 | 479.9 | 7.49E+11 | 0.000 |
| 8.280 | .617555 | 2.16E+07 | 19000.0 | -.005921 | 481.1 | 7.48E+11 | 0.000 |
| 11.040 | .601324 | 2.17E+07 | 19000.0 | -.005841 | 482.3 | 7.48E+11 | 0.000 |
| 13.800 | .585313 | 2.17E+07 | 18998.5 | -.005761 | 483.4 | 7.48E+11 | -1.054 |
| 16.560 | .569523 | 2.18E+07 | 18993.5 | -.005681 | 484.6 | 7.48E+11 | -2.597 |
| 19.320 | .553954 | 2.18E+07 | 18984.3 | -.005600 | 485.7 | 7.48E+11 | -4.055 |
| 22.080 | .538608 | 2.19E+07 | 18971.2 | -.005520 | 486.9 | 7.48E+11 | -5.429 |
| 24.840 | .523485 | 2.19E+07 | 18954.5 | -.005439 | 488.1 | 7.48E+11 | -6.722 |
| 27.600 | .508585 | 2.20E+07 | 18934.2 | -.005358 | 489.2 | 7.48E+11 | -7.934 |
| 30.360 | .493909 | 2.20E+07 | 18910.8 | -.005277 | 490.4 | 7.48E+11 | -9.068 |
| 33.120 | .479458 | 2.21E+07 | 18884.3 | -.005195 | 491.5 | 7.48E+11 | -10.126 |
| 35.880 | .465232 | 2.21E+07 | 18855.0 | -.005114 | 492.7 | 7.48E+11 | -11.110 |
| 38.640 | .451231 | 2.22E+07 | 18823.1 | -.005032 | 493.8 | 7.48E+11 | -12.021 |

140' EEI Monopole - Manchester, CT.lpo

| | | | | | | | |
|---------|----------|----------|-----------|----------|-------|----------|-----------|
| 41.400 | .437456 | 2.22E+07 | 18788.7 | -.004950 | 495.0 | 7.47E+11 | -12.861 |
| 44.160 | .423908 | 2.23E+07 | 18752.2 | -.004867 | 496.1 | 7.47E+11 | -13.633 |
| 46.920 | .410588 | 2.24E+07 | 18713.6 | -.004785 | 497.3 | 7.47E+11 | -14.338 |
| 49.680 | .397495 | 2.24E+07 | 16558.7 | -.004702 | 498.4 | 7.47E+11 | -1547.185 |
| 52.440 | .384631 | 2.24E+07 | 12211.0 | -.004620 | 499.3 | 7.47E+11 | -1603.270 |
| 55.200 | .371995 | 2.25E+07 | 7717.0 | -.004537 | 499.9 | 7.47E+11 | -1653.272 |
| 57.960 | .359589 | 2.25E+07 | 3093.1 | -.004454 | 500.3 | 7.47E+11 | -1697.380 |
| 60.720 | .347412 | 2.25E+07 | -1644.7 | -.004370 | 500.3 | 7.47E+11 | -1735.785 |
| 63.480 | .335464 | 2.25E+07 | -6480.8 | -.004287 | 500.1 | 7.47E+11 | -1768.678 |
| 66.240 | .323745 | 2.25E+07 | -11400.4 | -.004204 | 499.5 | 7.47E+11 | -1796.247 |
| 69.000 | .312255 | 2.24E+07 | -16389.0 | -.004122 | 498.7 | 7.47E+11 | -1818.680 |
| 71.760 | .300994 | 2.24E+07 | -21432.7 | -.004039 | 497.6 | 7.47E+11 | -1836.166 |
| 74.520 | .289961 | 2.23E+07 | -26518.1 | -.003956 | 496.1 | 7.47E+11 | -1848.888 |
| 77.280 | .279155 | 2.22E+07 | -31632.2 | -.003874 | 494.4 | 7.47E+11 | -1857.032 |
| 80.040 | .268575 | 2.21E+07 | -36762.8 | -.003792 | 492.3 | 7.48E+11 | -1860.780 |
| 82.800 | .258221 | 2.20E+07 | -41897.9 | -.003711 | 489.9 | 7.48E+11 | -1860.312 |
| 85.560 | .248091 | 2.19E+07 | -47026.2 | -.003630 | 487.2 | 7.48E+11 | -1855.806 |
| 88.320 | .238184 | 2.18E+07 | -52136.7 | -.003549 | 484.2 | 7.48E+11 | -1847.438 |
| 91.080 | .228499 | 2.16E+07 | -57218.9 | -.003469 | 480.9 | 7.48E+11 | -1835.381 |
| 93.840 | .219034 | 2.14E+07 | -62263.1 | -.003390 | 477.3 | 7.49E+11 | -1819.804 |
| 96.600 | .209786 | 2.13E+07 | -67259.6 | -.003311 | 473.4 | 7.49E+11 | -1800.875 |
| 99.360 | .200755 | 2.11E+07 | -72199.5 | -.003233 | 469.1 | 7.49E+11 | -1778.757 |
| 102.120 | .191938 | 2.09E+07 | -77074.2 | -.003156 | 464.6 | 7.50E+11 | -1753.612 |
| 104.880 | .183333 | 2.06E+07 | -81875.5 | -.003080 | 459.8 | 7.50E+11 | -1725.594 |
| 107.640 | .174938 | 2.04E+07 | -86595.7 | -.003004 | 454.7 | 7.50E+11 | -1694.858 |
| 110.400 | .166750 | 2.02E+07 | -91227.6 | -.002930 | 449.3 | 7.51E+11 | -1661.553 |
| 113.160 | .158767 | 1.99E+07 | -95764.2 | -.002856 | 443.6 | 7.51E+11 | -1625.823 |
| 115.920 | .150985 | 1.96E+07 | -100199.0 | -.002783 | 437.7 | 7.52E+11 | -1587.809 |
| 118.680 | .143402 | 1.94E+07 | -104525.9 | -.002712 | 431.5 | 7.52E+11 | -1547.648 |
| 121.440 | .136016 | 1.91E+07 | -108739.2 | -.002641 | 425.0 | 7.53E+11 | -1505.470 |
| 124.200 | .128822 | 1.88E+07 | -112833.5 | -.002572 | 418.3 | 7.53E+11 | -1461.403 |
| 126.960 | .121818 | 1.84E+07 | -116803.7 | -.002504 | 411.3 | 7.54E+11 | -1415.569 |
| 129.720 | .115001 | 1.81E+07 | -120645.1 | -.002437 | 404.1 | 7.55E+11 | -1368.086 |
| 132.480 | .108366 | 1.78E+07 | -124353.4 | -.002371 | 396.7 | 7.55E+11 | -1319.064 |
| 135.240 | .101910 | 1.74E+07 | -127924.4 | -.002307 | 389.0 | 7.56E+11 | -1268.611 |
| 138.000 | .095630 | 1.71E+07 | -131354.3 | -.002244 | 381.2 | 7.57E+11 | -1216.829 |
| 140.760 | .089522 | 1.67E+07 | -134639.6 | -.002183 | 373.1 | 7.58E+11 | -1163.813 |
| 143.520 | .083581 | 1.63E+07 | -137777.0 | -.002123 | 364.8 | 7.58E+11 | -1109.655 |
| 146.280 | .077805 | 1.59E+07 | -140763.4 | -.002064 | 356.4 | 7.59E+11 | -1054.440 |
| 149.040 | .072189 | 1.55E+07 | -143596.1 | -.002007 | 347.8 | 7.60E+11 | -998.248 |
| 151.800 | .066728 | 1.51E+07 | -146272.5 | -.001951 | 339.0 | 7.62E+11 | -941.152 |
| 154.560 | .061419 | 1.47E+07 | -148790.2 | -.001897 | 330.0 | 7.63E+11 | -883.222 |
| 157.320 | .056257 | 1.43E+07 | -151146.8 | -.001844 | 320.9 | 7.64E+11 | -824.519 |
| 160.080 | .051238 | 1.39E+07 | -153340.5 | -.001793 | 311.7 | 7.65E+11 | -765.100 |
| 162.840 | .046357 | 1.35E+07 | -155369.3 | -.001744 | 302.3 | 7.66E+11 | -705.017 |
| 165.600 | .041611 | 1.31E+07 | -157231.4 | -.001696 | 292.8 | 7.67E+11 | -644.315 |
| 168.360 | .036994 | 1.26E+07 | -158925.1 | -.001650 | 283.3 | 7.69E+11 | -583.035 |
| 171.120 | .032502 | 1.22E+07 | -160449.0 | -.001606 | 273.6 | 7.71E+11 | -521.209 |
| 173.880 | .028130 | 1.17E+07 | -161801.5 | -.001563 | 263.8 | 7.73E+11 | -458.866 |
| 176.640 | .023874 | 1.13E+07 | -162981.2 | -.001522 | 253.9 | 7.75E+11 | -396.026 |
| 179.400 | .019728 | 1.08E+07 | -163986.9 | -.001483 | 244.0 | 7.77E+11 | -332.708 |
| 182.160 | .015689 | 1.04E+07 | -165586.2 | -.001445 | 234.0 | 7.79E+11 | -262.258 |
| 184.920 | .011752 | 9.92E+06 | -167594.0 | -.001409 | 223.9 | 7.81E+11 | -192.622 |
| 187.680 | .007911 | 9.45E+06 | -169054.5 | -.001375 | 213.7 | 7.85E+11 | -122.717 |
| 190.440 | .004162 | 8.98E+06 | -169964.2 | -.001343 | 203.4 | 7.88E+11 | -52.511 |
| 193.200 | 4.99E-04 | 8.51E+06 | -170319.5 | -.001312 | 193.1 | 7.92E+11 | -27.957 |
| 195.960 | -.003081 | 8.04E+06 | -170116.6 | -.001283 | 182.8 | 7.95E+11 | 175.008 |
| 198.720 | -.006584 | 7.57E+06 | -169351.4 | -.001256 | 172.5 | 7.98E+11 | 379.461 |
| 201.480 | -.010015 | 7.11E+06 | -168019.8 | -.001231 | 162.2 | 8.12E+11 | 585.491 |
| 204.240 | -.013380 | 6.65E+06 | -166124.1 | -.001208 | 152.1 | 8.60E+11 | 788.187 |
| 207.000 | -.016685 | 6.19E+06 | -163660.9 | -.001188 | 142.1 | 9.07E+11 | 996.725 |
| 209.760 | -.019939 | 5.74E+06 | -160619.0 | -.001170 | 132.2 | 9.54E+11 | 1207.589 |
| 212.520 | -.023146 | 5.31E+06 | -156991.5 | -.001155 | 122.6 | 10.0E+12 | 1421.025 |

| 140' EEI Monopole - Manchester, CT.lpo | | | | | | | |
|----------------------------------------|----------|----------|-----------|----------|---------|----------|----------|
| 215.280 | -.026313 | 4.88E+06 | -152771.1 | -.001146 | 113.2 | 5.10E+12 | 1637.258 |
| 218.040 | -.029473 | 4.46E+06 | -147947.2 | -.001144 | 104.0 | 5.10E+12 | 1858.277 |
| 220.800 | -.032627 | 4.06E+06 | -142506.7 | -.001141 | 95.2218 | 5.10E+12 | 2084.103 |
| 223.560 | -.035774 | 3.68E+06 | -136458.2 | -.001139 | 86.7520 | 5.10E+12 | 2298.910 |
| 226.320 | -.038916 | 3.31E+06 | -130043.2 | -.001137 | 78.6672 | 5.10E+12 | 2349.588 |
| 229.080 | -.042052 | 2.96E+06 | -123492.5 | -.001136 | 70.9758 | 5.10E+12 | 2397.326 |
| 231.840 | -.045185 | 2.63E+06 | -116815.8 | -.001134 | 63.6859 | 5.10E+12 | 2440.903 |
| 234.600 | -.048313 | 2.31E+06 | -110024.0 | -.001133 | 56.8046 | 5.10E+12 | 2480.677 |
| 237.360 | -.051438 | 2.02E+06 | -103127.3 | -.001132 | 50.3388 | 5.10E+12 | 2516.941 |
| 240.120 | -.054560 | 1.74E+06 | -96135.0 | -.001131 | 44.2945 | 5.10E+12 | 2549.935 |
| 242.880 | -.057680 | 1.49E+06 | -89055.9 | -.001130 | 38.6771 | 5.10E+12 | 2579.861 |
| 245.640 | -.060797 | 1.25E+06 | -81898.1 | -.001129 | 33.4918 | 5.10E+12 | 2606.889 |
| 248.400 | -.063912 | 1.04E+06 | -74669.6 | -.001128 | 28.7430 | 5.10E+12 | 2631.162 |
| 251.160 | -.067026 | 840775.8 | -67377.8 | -.001128 | 24.4348 | 5.10E+12 | 2652.801 |
| 253.920 | -.070138 | 665001.2 | -60029.7 | -.001128 | 20.5708 | 5.10E+12 | 2671.913 |
| 256.680 | -.073250 | 509580.1 | -52632.2 | -.001127 | 17.1543 | 5.10E+12 | 2688.588 |
| 259.440 | -.076360 | 374639.7 | -45191.9 | -.001127 | 14.1879 | 5.10E+12 | 2702.906 |
| 262.200 | -.079471 | 260288.8 | -37715.3 | -.001127 | 11.6742 | 5.10E+12 | 2714.933 |
| 264.960 | -.082580 | 166619.3 | -30208.5 | -.001127 | 9.6151 | 5.10E+12 | 2724.732 |
| 267.720 | -.085690 | 93705.6 | -22677.8 | -.001127 | 8.0123 | 5.10E+12 | 2732.354 |
| 270.480 | -.088799 | 41605.9 | -15128.9 | -.001127 | 6.8670 | 5.10E+12 | 2737.847 |
| 273.240 | -.091909 | 10362.1 | -7567.7 | -.001127 | 6.1802 | 5.10E+12 | 2741.252 |
| 276.000 | -.095018 | 0.0 | 0.0 | -.001127 | 5.9524 | 5.10E+12 | 2742.606 |

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 2:

Pile-head deflection = .6676 in
 Computed slope at pile head = -6.1591E-03
 Maximum bending moment = 22488657.159 lbs-in
 Maximum shear force = -170319.515 lbs
 Depth of maximum bending moment = 60.720 in
 Depth of maximum shear force = 193.200 in
 Number of iterations = 12
 Number of zero deflection points = 1

 Summary of Pile-head Response

Definition of symbols for pile-head boundary conditions:

y = pile-head displacement, in
 M = pile-head moment, lbs-in
 V = pile-head shear force, lbs
 S = pile-head slope, radians
 R = rotational stiffness of pile-head, in-lbs/rad

BC Boundary Boundary Axial Pile Head Maximum Maximum

| Type | Condition 1 | Condition 2 | 140' EEI Monopole - Manchester, CT. Ipo | Load lbs | Deflection in | Moment in-lbs | Shear lbs |
|------|--------------|-------------|-----------------------------------------|------------|---------------|---------------|------------|
| 1 | V= 16000.000 | M= 1.86E+07 | | 34000.0000 | .5687 | 1.948E+07 | -1.470E+05 |
| 1 | V= 19000.000 | M= 2.15E+07 | | 27000.0000 | .6676 | 2.249E+07 | -1.703E+05 |

The analysis ended normally.