



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

May 5, 2009

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

RE: **EM-VER-125-090402** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 7 Surdan Mountain Road, Sharon, Connecticut.

Dear Attorney Baldwin:

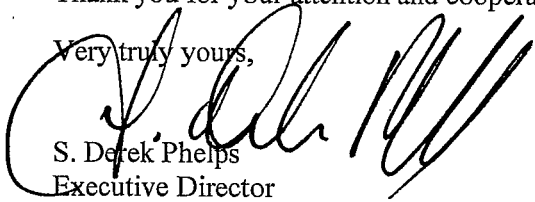
The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated April 2, 2009, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

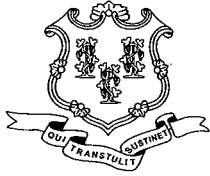
Thank you for your attention and cooperation.

Very truly yours,


S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable Malcom M. Brown, First Selectman, Town of Sharon
Elizabeth H. Casey, Zoning Enforcement Officer, Town of Sharon
Litchfield County Dispatch



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Ten Franklin Square, New Britain, CT 06051

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E-Mail: siting.council@ct.gov

www.ct.gov/csc

April 6, 2009

The Honorable Malcom M. Brown
First Selectman
Town of Sharon
Town Hall
63 Main Street
P. O. Box 224
Sharon, CT 06069-0224

RE: **EM-VER-125-090402** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 7 Surdan Mountain Road, Sharon, Connecticut.

Dear Mr. Brown:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by April 20, 2009.

Thank you for your cooperation and consideration.

Very truly yours,



S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

c: Elizabeth H. Casey, Zoning Enforcement Officer, Town of Sharon

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

EM-VER-125-090402

April 2, 2009

Via Hand Delivery

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

ORIGINAL

RECEIVED
APR - 2 2009
CONNECTICUT
SITING COUNCIL

Re: **Notice of Exempt Modification – Antenna Swap and Shelter Installation
7 Surdan Mountain Road, Sharon, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains nine antennas at the 163-foot level of an existing 195-foot Litchfield County Dispatch tower at 7 Surdan Mountain Road in Sharon, Connecticut. This facility was transferred to Cellco as a part of its acquisition of the Alltel CT-1 RSA FCC license in Litchfield County, Connecticut in May of 2008.

Cellco now intends to remove the existing nine antennas and install twelve (12) newer model antennas, (six (6) LPA 80080/4CF cellular antennas and six (6) LPA 185080/8CF PCS antennas) at the same 163-foot level on the tower. Cellco will also removed Alltel’s equipment cabinets and install a 12’ x 30 equipment shelter on the ground within the existing fenced compound. Attached behind Tab 1 are project plans and 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 Malcolm M. Brown, First Selectman of the Town of Sharon. Pursuant to a Council directive, a copy of this letter is also being sent to Ann Adele Prindle & Darien R. Prindle, the owners 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).



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S. Derek Phelps
April 2, 2009
Page 2

1. The proposed modifications will not result in the increase in the overall height of the existing structure. Cellco's replacement antennas will be located at the 163-foot level of the 195-foot tower.
2. The proposed antenna modifications and shelter installation 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 the facility is included behind Tab 2.

Attached behind Tab 3 is a Detailed Structural Analysis confirming that the tower, with reinforcement, can support Cellco's proposed modifications. Also attached is a letter from URS Corporation indicating that the necessary tower and foundation reinforcement modifications referred to in the Structural Analysis have been completed and the tower and foundation are structurally adequate to support the existing and proposed loading. (See Tab 4).

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:

Malcolm M. Brown, Sharon First Selectman
Ann Adele Prindle & Darien R. Prindle
Sandy M. Carter



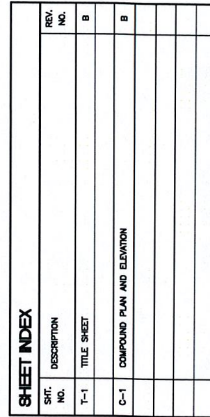
WIRELESS COMMUNICATIONS FACILITY

SURDAN MOUNTAIN ROAD

SHARON, CT

PROJECT SCOPE

1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A 12'-X30' PRECAST/CAST-IN-PLACE WIRELESS EQUIPMENT SHELTER ON A CONCRETE FOUNDATION WITHIN THE EXISTING WIRELESS COMMUNICATIONS LEASE AREA.
2. A TOTAL OF TWELVE (12) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE INSTALLED ON THE EXISTING TOWER AT A 140' CENTER ELEVATION OF 132' ABOVE THE EXISTING TOWER BASE.
3. ELECTRIC AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND TO THE PROPOSED EQUIPMENT SHELTER FROM AN EXISTING UTILITY BACKBOARD LOCATED WITHIN THE EXISTING COMPOUND.



1

LPA-80080/4CF

When ordering replace "___" with connector type.

Mechanical specifications

Length	1200 mm	47.2 in
Width	140 mm	5.5 in
Depth	335 mm	13.2 in
Depth with z-bracket	375 mm	14.8 in
4) Weight	5.4 kg	12.0 lbs
Wind Area		
Fore/Aft	0.17 m ²	1.8 ft ²
Side	0.40 m ²	4.3 ft ²
Rated Wind Velocity (Safety factor 2.0)		
	>369 km/hr	>229 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	254 N	57.1 lbs
Side	574 N	129.0 lbs

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

Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in). If the lock-down brace is used, the maximum diameter is Ø88.9 mm (3.5 in).

Mounting Bracket & Downtilt Bracket Kit
#21699999

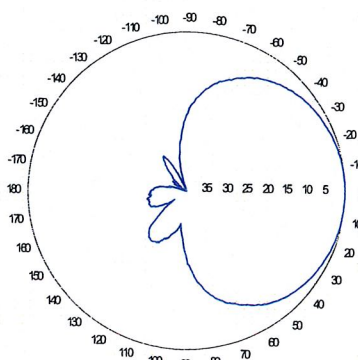
Electrical specifications

Frequency Range	806-960 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 1 port / center
1) VSWR	≤ 1.4:1
Polarization	Vertical
1) Gain	12.5 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	80°
E-Plane	15°
1) Electrical Downtilt	0°
1) Null Fill	15%
Lightning Protection	Direct Ground

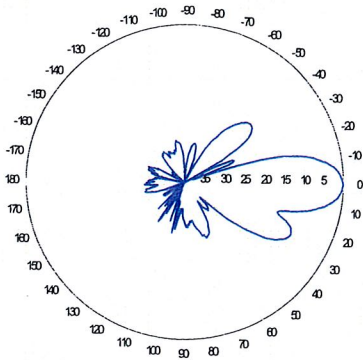
- 1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern¹⁾



Horizontal

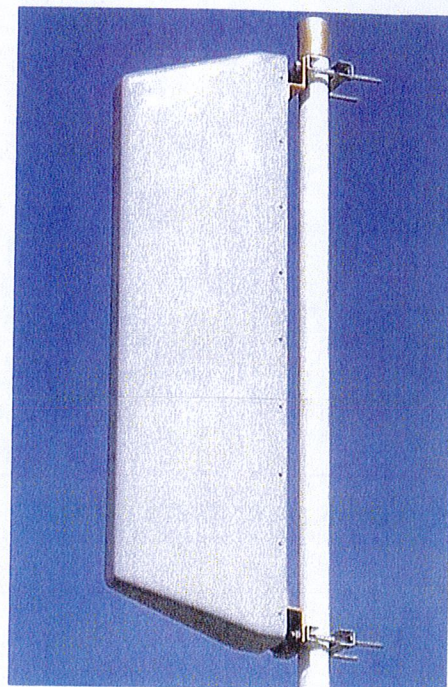


Vertical

Featuring upper side lobe suppression.

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

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



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

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

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

Antenna available with center-fed connector only.

CF Denotes a Center-Fed Connector.

806-960 MHz

**Amphenol
Antel, Inc.**
The Antenna Technology Company

Revision Date: 7/5/07

LPA-185080/8CF __ 2°

When ordering replace " __ " with connector type.

Mechanical specifications

Length	1204 mm	47.4 in
Width	104 mm	4.1 in
Depth	150 mm	5.9 in
Depth with t-bracket	178 mm	7.0 in
4) Weight	3.2 kg	7.0 lbs
Wind Area		
Fore/Aft	0.13 m ²	1.4 ft ²
Side	0.14 m ²	1.6 ft ²
Rated Wind Velocity (Safety factor 2.0)		
	>658 km/hr	>409 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	202 N	45.0 lbs
Side	270 N	60.8 lbs

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

Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in).

Mounting bracket kit #26799997
Downtilt bracket kit #26799999

The downtilt bracket kit includes the mounting bracket kit.

Electrical specifications

Frequency Range	1850-1990 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 1 port / center
1) VSWR	≤ 1.4:1
Polarization	Vertical
1) Gain	16.5 dBi
2) Power Rating	250 W
1) Half Power Angle	
H-Plane	80°
E-Plane	8°
1) Electrical Downtilt	2°
1) Null Fill	10%
Lightning Protection	Direct Ground

1) Typical values.

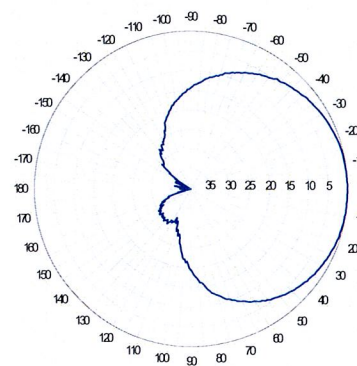
2) Power rating limited by connector only.

3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.

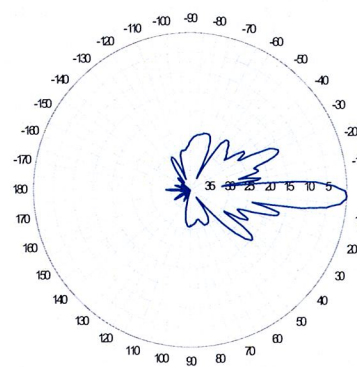
4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern¹⁾



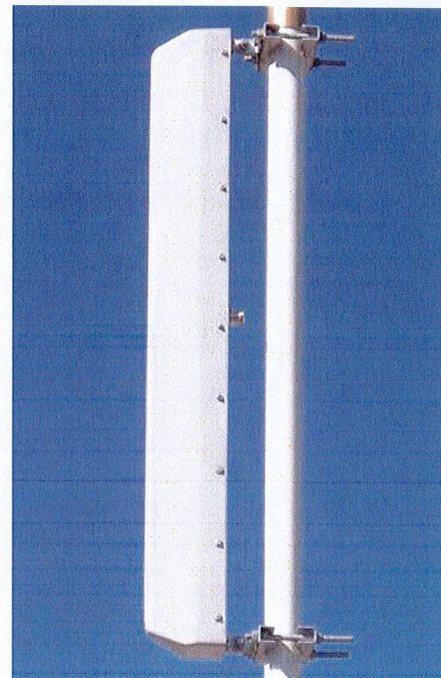
Horizontal



Vertical

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

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



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

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
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- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

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

Antenna available with center-fed connector only.

**CF Denotes a Center-Fed
Connector.**

1850-1990 MHz



Revision Date: 7/12/07

DETAILED STRUCTURAL ANALYSIS AND REINFORCEMENT OF AN EXISTING 195' SELF SUPPORTING LATTICE TOWER AND ITS FOUNDATION FOR NEW ANTENNA ARRANGEMENT

Address: Surdan Mountain Road
Sharon, CT

prepared for



**Northeast
Utilities System**

Northeast Utilities System
107 Selden Street
Berlin, CT 06037

prepared by

URS

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

36923525.00000
NU1-024

July 24, 2008

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 - **FOUNDATION ANALYSIS**
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1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 195' lattice tower located off Surdan Mountain Road in Sharon, Connecticut. The analysis was conducted in accordance with the Connecticut State Police Requirements and the TIA/EIA-222-F standard for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice. The tower was also analyzed for a wind velocity of 70 mph concurrent with 0.5" ice (equivalent to 95 mph at the highest Microwave Dish elevation of 195') to determine twist (rotation) and sway (deflection) in accordance with Connecticut State Police Requirements. The antenna loading considered in the analysis consists of all existing, future, and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction of this report.

The proposed Northeast Utilities System/Verizon installation is based on the following:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
<u>Install:</u> (1) Telewave ANT450D6 RX Dipole on (1) 4' Stand-off Mount at 115' (1) Telewave ANT450D6 TX Dipole on (1) 4' Stand-off Mount at 135' (1) Andrew DB586-Y RX Omni – Whip on (1) 4' Stand-off Mount at 112' (1) Andrew DB586-Y TX Omni – Whip on (1) 4' Stand-off Mount at 92' (1) Sinclair SD110-SFXPASNM Dipole on (1) 4' Stand-off Mount at 81' (5) 7/8" dia. coaxial cables (inside of Leg A) on Valmont T-Line Brackets (P/N 802187) Refer to coax feed line plan within Section 6 for coax locations.	NEU (Proposed)	@ 115' (Face A-B, Azimuth 90 deg) @ 135' (Face A-B, Azimuth 90 deg) @ 115' (Leg B) @ 95' (Leg B) @ 81' (Leg B)
<u>Remove:</u> (1) 6'-8" PiROD Rigid Side Arm (vacant) (1) 6'-8" PiROD Rigid Side Arm (vacant) (1) 6'-8" PiROD Rigid Side Arm (vacant) (1) 6'-8" PiROD Rigid Side Arm (vacant)		196' 120.5' 100.83' 80.67'
<u>Assumed Verizon Wireless Installation:</u> <u>Remove:</u> (9) existing panel antennas (12) existing 7/8" coaxial cables (Face A-C) (12) TMA's and (3) existing 15' T-Frames		@ 163'
<u>Install:</u> (12) 1'x5' panel antennas on (3) 13' Valmont Lightweight T-Frames and (12) 1 5/8 coaxial cables (Face A-C). Refer to coax feed line plan within Section 6 for coax locations.		@ 163'
	Verizon (Proposed)	

1. EXECUTIVE SUMMARY - *continued*

The results of the analysis indicate that with the proposed reinforcements outlined in Section 6 of this report, the tower structure has sufficient capacity to support the proposed loading conditions. **With the above noted reinforcements, the tower and its foundation are considered structurally adequate for the proposed antenna loading with the wind load classifications specified above.**

The tower deflection (sway) is **0.7719** degrees, and the tower twist is **0.1262** degrees with a wind velocity of 70 mph concurrent with 0.5" ice (equivalent to 95 mph at the highest Microwave Dish elevation of 195'. The tower deflection **exceeds** the requirements of both the Connecticut State Police and the Northeast Utilities System specification of 0.75 and 0.5 degrees respectively for deflection (sway) and twist. Northeast Utilities System and the Connecticut State Police have determined that these figures are permissible for the purpose of the proposed installation.

1. EXECUTIVE SUMMARY - *continued*

This analysis is based on:

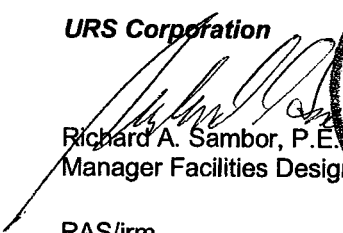
- 1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
- 2) Tower geometry and structural member sizes utilized in the preparation of this report were taken from Tower and Foundation reports prepared by PiRod, Inc. Engineering File No. number A-115074, signed and sealed October 14, 1998.
- 3) Original foundation design established as 'Alternate Foundation #2' consisting of Rock Anchored Pad & Pier, designed by PiROD Inc., signed and sealed October 14, 1998.
- 4) Geotechnical report prepared by Clarence D. Welti P.E., P.C; on behalf of banton Construction Company, Inc., dated March 3, 1998.
- 5) Previous structural analysis report prepared by URS Corporation on behalf of Cingular Wireless, signed and sealed May 20, 2005.
- 6) Tower member documentation prepared by CSB Communications, dated May 05, 2008.
- 7) Site documentation and visual verification of existing appurtenances conducted from existing grade by URS during December 2007.
- 8) Antenna and mount configuration as specified within Section 2 and 6 of this report.
- 9) Coax cable orientation as specified in section 6 of this report.

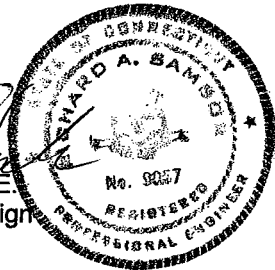
This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration as well as the physical condition of the tower. Notify the engineer in 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.
Manager Facilities Design



RAS/jrm

cc: AA, DR, ICA - URS
CF/Book

2. INTRODUCTION

The subject tower is located off Surdan Mountain Road in Sharon, Connecticut. The structure is a 195' self-supporting three-legged steel tapered lattice tower designed and manufactured by PIROD, Inc.

The inventory is summarized in the table below:

Antenna Type	Carrier	Mount	Centerline Elevation	Cable
(1) Single Dipole	Unknown (existing)	Leg	196.26'	(1) 7/8"
(1) RFS PA6-65C 6' Dish	CSP (existing)	Dish Mount	194.25'	(1) WE-65
(1) 9' Omni Whip	Unknown (existing)	4' Side Arm	192.75'	(1) 1 5/8"
(1) Kathrein OGT9-840N Omni Whip	Unknown (existing)	Low Profile Platform	190.25'	(1) 1 5/8"
(1) 9' Omni Whip	Unknown (existing)	Low Profile Platform	188.75'	(1) 1 5/8"
(1) DB 222-A 2 Bay Dipole	Unknown (existing)	Low Profile Platform	185.25'	(1) 7/8"
(1) RFS PD-220	Unknown (existing)	6' Side Arm	182.25'	(1) 7/8"
(1) Antel BCD87077Omni Whip	Pagenet (existing)	4' Side Arm	181.5'	(1) 7/8"
(1) DB 222-A 2 Bay Dipole (inverted)	Unknown (existing)	4' Side Arm (same as Omni @ 192.75')	180.25'	(1) 7/8"
(1) 12' Omni Whip	Unknown (existing)	Low Profile Platform	175.25'	(1) 1 5/8"
(1) 12' Omni Whip	Unknown (existing)	Side Arm	175.25'	(1) 7/8"
(1) 10' Omni Whip (inverted)	Unknown (existing)	Low Profile Platform	174.25'	(1) 1 5/8"
(1) Telewave ANT150D6-9, 4 Bay Dipole (inverted)	Unknown (existing)	Low Profile Platform	173.75'	(1) 7/8"
(12) 1'x5' panel antennas	Verizon (future)	(3) 13' Valmont Lightweight T-Frames	163'	(12) 1 5/8"
(1) Filter/Diplexer	Unknown (existing)	Tower	157'	n/a
(6) Powerwave 7770 panel antennas, (6) Powerwave 21401 TMA's and (6) Powerwave LPG 13519 Diplexers	AT&T/ Cingular (existing)	(3) T-Arms	150.25'	(12) 1 5/8"
(1) Sinclair SD210 Single Dipole (RX)	NEU (proposed)	(1) 4' Valmont Side Arm (Face A-B)	135'(135')	(1) 7/8"

2. INTRODUCTION - *continued*

The inventory is continued in the table below:

Antenna Type	Carrier	Mount	Centerline Elevation	Cable
(1) RFS PD220 Omni Whip	Verizon (existing)	PiROD Side Arm 6' PiROD Side Arm	133'	(1) 7/8"
(1) DB 230 Yagi	Verizon (existing)	(same as above)	121.5'	(1) 1/2"
(1) Folded Dipole	Unknown (existing)	6' PiROD Side Arm	120.58'	(1) 7/8"
(1) Sinclair SD210 Single Dipole (TX)	NEU (proposed)	(1) 4' Valmont Side Arm (Face A-B)	115'(115')	(1) 7/8"
(1) Andrew DB586-Y RX Omni – Whip	NEU (proposed)	(1) 4' Valmont Side Arm (Leg B)	115'(112')	(1) 7/8"
(1) DB 205-L Omni Whip	Unknown (existing)	PiROD Side Arm	109.25'	(1) 7/8"
(1) RFS PA6-65C 6' Dish w/ ice canopy	CSP (existing)	Dish Mount	102.25'	(1) WE-65
(1) Andrew DB586-Y TX Omni – Whip	NEU (proposed)	(1) 4' Valmont Side Arm (Leg B)	95'(92')	(1) 7/8"
(1) DB 224-A, 4 Bay Dipole (inverted)	Unknown (existing)	2' Side Arm	94'	(1) 1/2"
(1) RFS PD220-2 Omni Whip	Unknown (existing)	PiROD Side Arm	90.41'	(1) 1/2"
(1) Sinclair SD110-SFXPASNM Dipole	NEU (proposed)	(1) 4' Valmont Side Arm (Leg B)	81'(81')	(1) 7/8"
(1) DB 432-A Yagi	KB1AEV (existing)	Leg	70.25'	(1) 1/2"
(1) 6' dia. Channel Master 1.2M dish	Verizon (existing)	Side Arm	17'	(1) 1/4"
(1) 6' dia. Channel Master 1.2M dish	Pagenet (existing)	Side Arm	12.58'	(1) 1/4"
(1) 6' dia. Channel Master 1.2M dish	Pagenet (existing)	Side Arm	10.33'	(1) 1/4"

Notes:

- I. **(XXX')** Denotes proposed NEU antenna mount centerline height.
- II. Proposed NEU coaxial cables shall be located on Valmont T-Line Brackets (P/N 802187) within tower Leg A. Refer to coax feed-line plan within Section 6 of this report for all coax locations.
- III. Proposed NEU antenna elevation based on actual antenna size and respective mount elevation.
- IV. Top of tower foundation taken as 2.0ft above existing grade.

This structural analysis of the communications tower was performed by URS Corporation (URS) for Northeast Utilities System. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing, future and proposed antenna loads. This analysis was conducted to evaluate twist (rotation), sway (deflection), and stress on the tower and the effect of forces to the foundation of the tower resulting from the existing, future 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 analysis was conducted using RISA Tower 5.1.1. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 90 mph (fastest mile) Wind Load + Ice Load + Tower Dead Load

Load Condition 2 = 70 mph (fastest mile) Wind Load + Ice Load + Tower Dead Load

(equivalent to 95 mph at the highest Microwave Dish elevation of 195').

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

Stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The results of the analysis indicate that with the reinforcements outlined in Section 6 of this report, the calculated stresses under the proposed loading are **BELOW** the allowable stresses (see tables below).

The tower deflection (sway) is **0.7719** degrees, and the tower twist is **0.1262** degrees with a wind velocity of 70 mph concurrent with 0.5" ice (equivalent to 95 mph at the highest Microwave Dish elevation of 195'). The tower deflection **exceeds** the requirements of both the Connecticut State Police and the Northeast Utilities System specification of 0.75 and 0.5 degrees respectively for deflection (sway) and twist. Northeast Utilities System and the Connecticut State Police have determined that these figures are permissible for the purpose of the proposed installation.

An evaluation of the existing foundation was not performed due to incomplete information. Additionally, the anchor bolts were found to be within the allowable limits.

TABLE 1: Tower Deflection (Sway) and Twist at the top of the tower (in degrees):

Description	Proposed	Allowable CSP	Allowable NEU
Tower Sway (degrees)	0.7719	0.750	0.5
Tower Twist (degrees)	0.1262	0.750	0.5

TABLE 2: Tower Base Reactions vs. Original design Reactions:

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

Base Reaction	Proposed Reactions	Original Design Reactions
Axial Load (kips)	79	52.4
Shear per Leg (kips)	51	-
Total Shear (kips)	76	68.7
Uplift per Leg (kips)	427	396.4
Comp.per Leg (kips)	488	431.4
O.T. Moment (ft-kips)	7992	7168.4

Note: Original design base reactions per TIA/EIA 222-F for 90mph basic wind speed with 0.5in radial ice.

4. FINDINGS AND EVALUATION - continued

TABLE 3: Tower Component Stress vs. Capacity Summary:

Component/ (Section No.)	Existing/Reinforced Component Size	Controlling Component/Elevation	Stress (% capacity)	Pass/Fail
Tower Leg (T7)	PIROD Truss Leg (reinforced)	Compression/82'-102'	68.8% 88.1%(b)	Pass
Tower Leg (T9)	PIROD Truss Leg (reinforced)	Compression/42'-62'	77.8% 78.1%(b)	Pass
Tower Leg (T10)	PIROD Truss Leg	Compression/22'-42'	97.5%	Pass
Tower Leg (T11)	PIROD Truss Leg (reinforced)	Compression/2'-22'	87.5%	Pass
Diagonal (T5)	L3x3x3/16	Compression/122'-142'	64.0% 81.7%(b)	Pass
Diagonal (T6)	L3x3x3/16	Compression/102'-122'	82.8% 95.9 (b)	Pass
Diagonal (T7)	L3x3x1/4	Compression/82'-102'	76.8%	Pass
Diagonal (T9)	L3 1/2x3 1/2x5/16	Compression/42'-62'	74.9%	Pass
Diagonal (T11)	L4x4x1/4	Compression/2'-22'	80.9% 85.6 (b)	Pass
Top Girt (T7)	L3x3x3/16	Compression/82'-102'	50.0%	Pass
Bottom Girt (T3)	1" SR	Compression/152'-172'	31.1%	Pass
Bolt Checks				
Diagonal (T6)	1" dia A325N	Member Bearing/102'-122'	95.9%	Pass
Anchor Bolts		Tension	88%	Pass

TABLE 4: Foundation Summary:

Foundation	Component	Stress (% capacity/FOS)	Pass/Fail	Comments:
Reinf. Concrete Pad and Pier w/ Rock Anchors	Rock Anchor Bond Length	98.5%/2.03	Pass	Min. F.O.S of 2.0 req'd.
	Rock Anchor Allowable Tension	94.0%	Pass	

TABLE 5: Proposed Reinforcement of Existing Tower Members:

Section No.	Elevation	Truss Legs		Diagonal	
		Existing	Proposed	Existing	Proposed
T5	122'-142'			L2 1/2x2 1/2x3/16	L3x3x3/16⁽¹⁾
T7	82'-102'	1.75 S.R	+ (9) 1" dia. S.R	L3x3x3/16	L3x3x1/4⁽¹⁾
T9	42'-62'	2" S.R	+ (9) 1" dia. S.R	L3x3x5/16	L3 1/2x3 1/2x1/4⁽¹⁾
T11	2'-22'	2.25" S.R	+ (9) 1" dia. S.R	L3 1/2x3 1/2x5/16	L4x4x1/4⁽¹⁾

Notes:

- (1) Remove existing bolts and replace with ASTM A325-X (maintain diameter).
- (2) All proposed steel reinforcement (shown bold) material specification shall meet ASTM A572 Grade 50.
- (3) S.R denotes solid round steel material.
- (4) Diagonal member replacement shall apply to all sides of the tower.
- (5) Refer to drawing SK-1 within Section 6 of this report for details.

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that with the proposed reinforcements outlined in Section 6 of this report, the tower structure has sufficient capacity to support the proposed loading conditions. **With the above noted reinforcements, the tower and its foundation are considered structurally adequate for the proposed antenna loading with the wind load classifications specified above.**

The tower deflection (sway) is **0.7719** degrees, and the tower twist is **0.1262** degrees with a wind velocity of 70 mph concurrent with 0.5" ice (equivalent to 95 mph at the highest Microwave Dish elevation of 195'. The tower deflection **exceeds** the requirements of both the Connecticut State Police and the Northeast Utilities System specification of 0.75 and 0.5 degrees respectively for deflection (sway) and twist. Northeast Utilities System and the Connecticut State Police have determined that these figures are permissible for the purpose of the proposed installation.

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.

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.

5. CONCLUSIONS AND RECOMMENDATIONS - *continued*

Ongoing and Periodic Inspection and Maintenance:

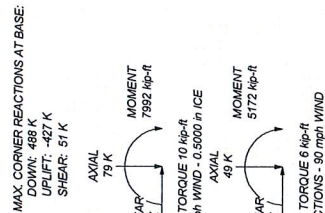
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

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 condition.

6. DRAWINGS AND DATA

**SK-1:
PROPOSED TOWER REINFORCEMENT
DETAILS AND NOTES**

RISA TOWER INPUT / OUTPUT SUMMARY



DESIGNED APPURTENANCE LOADING

SYMBOL LIST			
MARK	SIZE	MARK	SIZE
A	Prod 105245		
B	Prod 105218 rent w 1" dia bar	D	Prod 105220 rent w 1" dia bar
C	Prod 105219 and w 1" dia bar	E	L3 1022 150x16

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 90 mph wind.
5. Top of tower foundation taken as 2.0' above average grade.
6. **TOWER RATING: 97.5%.**

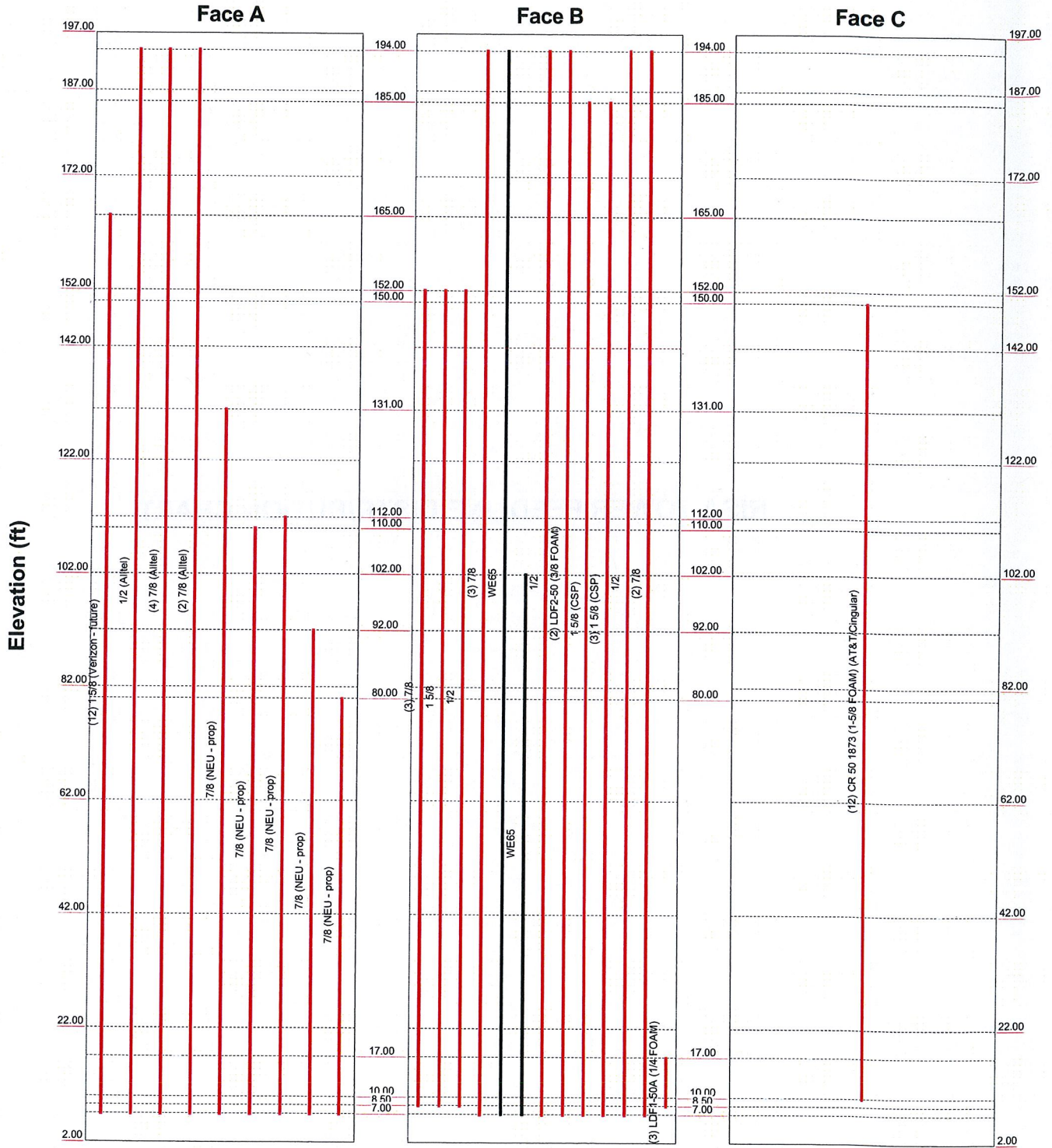
URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3391	Job: U20.0x195' PIROD Lattice Tower Project: Surdan Mountain Road, Sharon, CT Client: Northeast Utilities System Drawn by: Staff App'd: _____ Date: 07/24/08 Scale: N.T.S. Dwg No.: NTS
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RISA TOWER FEEDLINE DISTRIBUTION CHART

Feedline Distribution Chart

2' - 197'

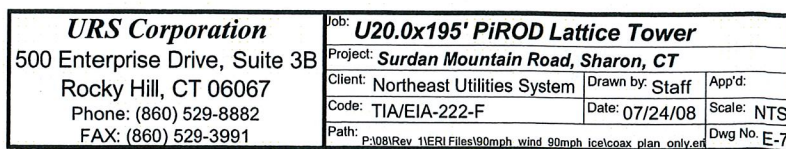
Round Flat App In Face App Out Face Truss Leg



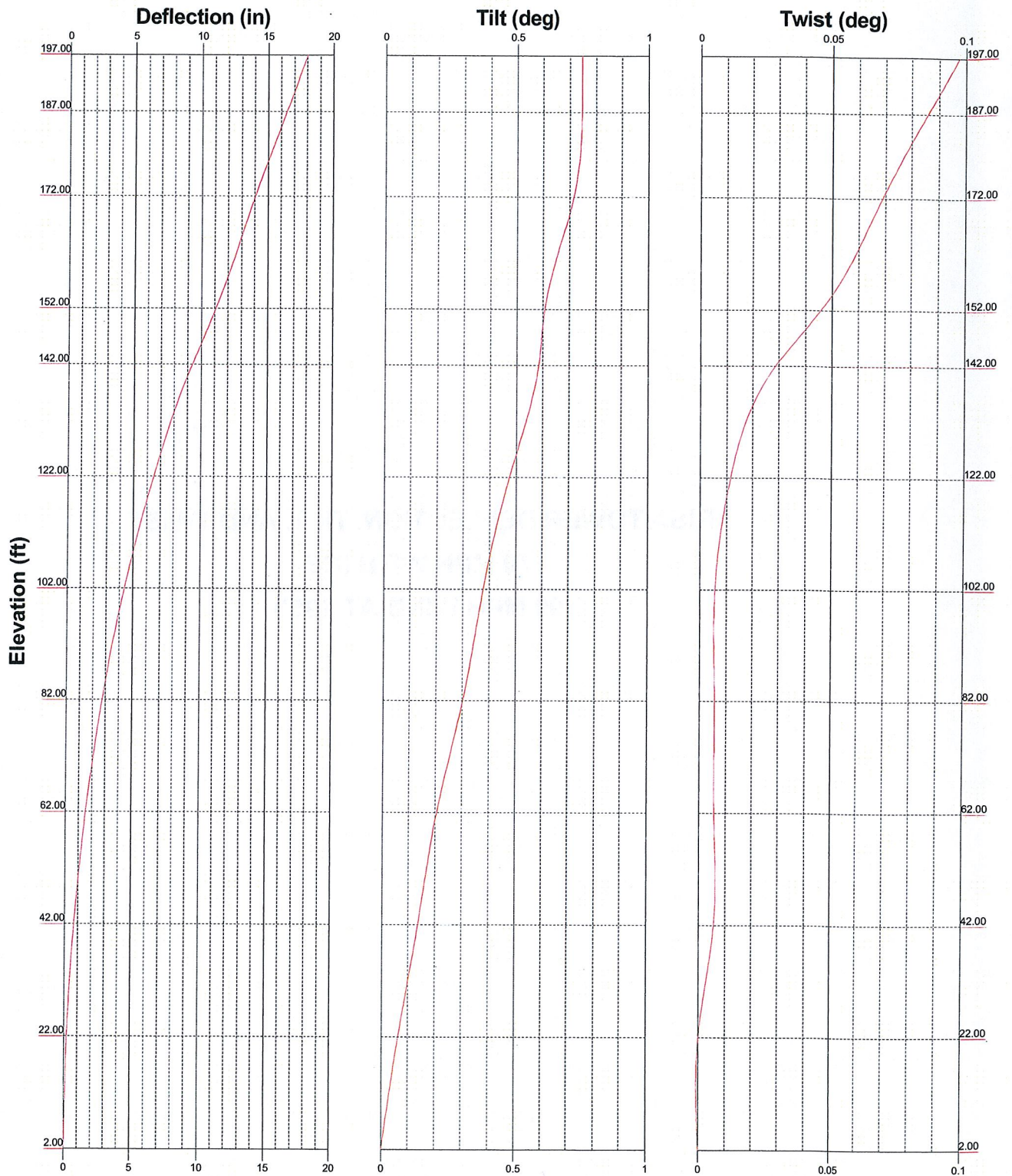
URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991		Job: U20.0x195' PiROD Lattice Tower Project: Surdan Mountain Road, Sharon, CT Client: Northeast Utilities System Code: TIA/EIA-222-F Path: P:\08\Rev 1\ERI Files\08mch_wrd_00mch_scl195' PiROD Self Support Tower Sharon CT.dwg Drawn by: Staff Date: 07/24/08 Scale: NTS Dwg No. E-7	
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RISA TOWER FEEDLINE PLAN

Round _____ Flat _____ App In Face _____ App Out Face _____ Truss-Leg _____



**RISA TOWER DEFLECTION, TILT, AND TWIST
70 MPH WITH ICE
(90 MPH WIND AT 195')**



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500 Enterprise Drive, Suite 3B		Project: Surdan Mountain Road, Sharon, CT	
Rocky Hill, CT 06067		Client: Northeast Utilities System	Drawn by: Staff
Phone: (860) 529-8882		Code: TIA/EIA-222-F	Date: 07/24/08
FAX: (860) 529-3991		Path:	Scale: NTS
		Dwg No. E-5	

RISA TOWER DETAILED OUTPUT

90 MPH WITH ICE

<i>RISATower</i> URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job U20.0x195' PiROD Lattice Tower	Page 1 of 41
	Project Surdan Mountain Road, Sharon, CT	Date 11:44:20 07/24/08
	Client Northeast Utilities System	Designed by Staff

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 197.00 ft above the ground line.

The base of the tower is set at an elevation of 2.00 ft above the ground line.

The face width of the tower is 4.50 ft at the top and 20.00 ft at the base.

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

The following design criteria apply:

Tower is located in Litchfield County, Connecticut.

Basic wind speed of 90 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 90 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 90 mph.

Top of tower foundation taken as 2.0' above average grade..

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

Pressures are calculated at each section.

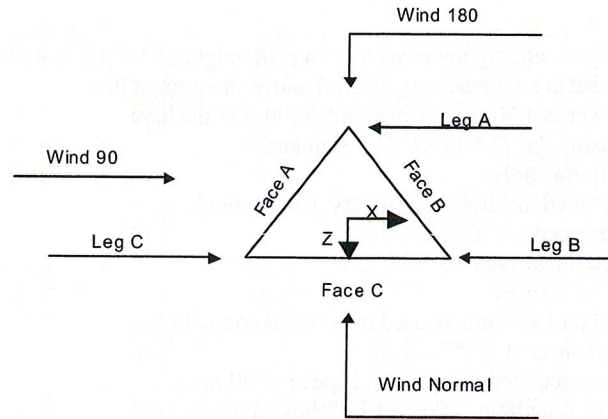
Stress ratio used in tower member design is 1.333.

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

Options

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

<i>RISA</i>Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	2 of 41
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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	197.00-187.00		V4.5 111574	4.50	1	10.00
T2	187.00-172.00		V4.5 111574	4.50	1	15.00
T3	172.00-152.00		H5.0 116640	4.50	1	20.00
T4	152.00-142.00		U6.0 105245	5.00	1	10.00
T5	142.00-122.00		U8.0 105217	6.00	1	20.00
T6	122.00-102.00		U10.0 105217 L3x3/16	8.00	1	20.00
T7	102.00-82.00		U12.0 105218	10.00	1	20.00
T8	82.00-62.00		U14.0 105218	12.00	1	20.00
T9	62.00-42.00		U16.0 105219	14.00	1	20.00
T10	42.00-22.00		U18.0 105219	16.00	1	20.00
T11	22.00-2.00		U20.0 105219 L3.5x5/16	18.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	197.00-187.00	2.17	X Brace	No	Steps	8.0160	8.0160
T2	187.00-172.00	2.28	X Brace	No	Steps	8.0160	8.0160
T3	172.00-152.00	2.34	X Brace	No	Steps	7.4880	7.4880
T4	152.00-142.00	10.00	X Brace	No	No	0.0000	0.0000

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Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T5	142.00-122.00	10.00	X Brace	No	No	0.0000	0.0000
T6	122.00-102.00	10.00	X Brace	No	No	0.0000	0.0000
T7	102.00-82.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	82.00-62.00	10.00	X Brace	No	No	0.0000	0.0000
T9	62.00-42.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	42.00-22.00	10.00	X Brace	No	No	0.0000	0.0000
T11	22.00-2.00	10.00	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 197.00-187.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 187.00-172.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 172.00-152.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 152.00-142.00	Truss Leg	PiROD 105245	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 142.00-122.00	Truss Leg	PiROD 105217	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A572-50 (50 ksi)
T6 122.00-102.00	Truss Leg	PiROD 105218	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T7 102.00-82.00	Truss Leg	PiROD 105218 reinf w /1" dia bar	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T8 82.00-62.00	Truss Leg	PiROD 105219	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T9 62.00-42.00	Truss Leg	PiROD 105219 reinf w /1" dia bar	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 42.00-22.00	Truss Leg	PiROD 105220	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T11 22.00-2.00	Truss Leg	PiROD 105220 reinf w /1" dia bar	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 197.00-187.00	Single Angle	L3x3x5/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 187.00-172.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 172.00-152.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 102.00-82.00	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

RISATower

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Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
T1 197.00-187.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T2 187.00-172.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T3 172.00-152.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T4 152.00-142.00	1.78	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T5 142.00-122.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000
T6 122.00-102.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T7 102.00-82.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000
T8 82.00-62.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T9 62.00-42.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000
T10 42.00-22.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T11 22.00-2.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 197.00-187.00	No	Yes	1	1	1	1	1	1	1	1
T2 187.00-172.00	No	Yes	1	1	1	1	1	0.5	1	1
T3 172.00-152.00	No	Yes	1	1	1	1	1	0.5	1	1
T4 152.00-142.00	Yes	No	1	1	1	1	1	0.5	1	1
T5 142.00-122.00	Yes	No	1	1	1	1	1	1	1	1
T6 122.00-102.00	Yes	No	1	1	1	1	1	1	1	1
T7 102.00-82.00	Yes	No	1	1	1	1	1	1	1	1
T8 82.00-62.00	Yes	No	1	1	1	1	1	1	1	1
T9 62.00-42.00	Yes	No	1	1	1	1	1	1	1	1
T10 42.00-22.00	Yes	No	1	1	1	1	1	1	1	1

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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T2 187.00-172.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 172.00-152.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 152.00-142.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 142.00-122.00	Flange	1.0000 A325N	6	1.0000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 122.00-102.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 102.00-82.00	Flange	1.0000 A325N	6	1.0000 A325X	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 82.00-62.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 62.00-42.00	Flange	1.2500 A325N	6	1.2500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 42.00-22.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 22.00-2.00	Flange	1.2500 A687	6	1.2500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon - future)	A	Yes	Ar (CfAe)	165.00 - 7.00	2.0000	-0.35	12	6	1.9800	1.9800		1.04
1/2 (Alltel)	A	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.42	1	1	0.5800	0.5800		0.25
7/8 (Alltel)	A	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.445	4	4	1.1100	1.1100		0.54
7/8 (Alltel)	A	Yes	Ar (CfAe)	194.00 - 7.00	4.0000	-0.45	2	2	1.1100	1.1100		0.54
CR 50 1873 (1-5/8 FOAM)	C	No	Ar (Leg)	150.00 - 10.00	0.0000	0.1	12	6	1.9800	1.9800		0.83
(AT&T/Cingular)												
7/8	B	No	Ar (Leg)	152.00 - 8.50	0.0000	0.1	3	2	1.1100	1.1100		0.54
1 5/8	B	No	Ar (Leg)	152.00 - 8.50	0.0000	0.12	1	1	1.9800	1.9800		1.04
1/2	B	No	Ar (Leg)	152.00 - 8.50	0.0000	0.12	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.46	3	3	1.1100	1.1100		0.54
WE65	B	Yes	Af (CfAe)	194.00 - 7.00	2.0000	-0.44	1	1	1.5836	1.5836	5.1284	0.53
WE65	B	Yes	Af (CfAe)	102.00 - 7.00	2.0000	-0.425	1	1	1.5836	1.5836	5.1284	0.53
1/2	B	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.41	1	1	0.5800	0.5800		0.25
LDF2-50 (3/8 FOAM)	B	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.4	2	2	0.4400	0.4400		0.08
1 5/8 (CSP)	B	Yes	Ar (CfAe)	185.00 - 7.00	2.0000	-0.38	1	1	1.9800	1.9800		1.04
1 5/8 (CSP)	B	Yes	Ar (CfAe)	185.00 - 7.00	3.0000	-0.345	3	3	1.9800	1.9800		1.04
1/2	B	Yes	Ar (CfAe)	194.00 - 7.00	1.0000	-0.365	1	1	1.9800 0.5800	0.5800		0.25

RISA Tower

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Job	U20.0x195' PiROD Lattice Tower	Page	8 of 41
Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8	B	Yes	Ar (CfAc)	194.00 - 7.00	1.0000	-0.34	2	2	1.9800	1.1100		0.54
LDF1-50A (1/4 FOAM)	B	No	Ar (Leg)	17.00 - 8.50	0.0000	0.08	3	3	0.3500	0.3500		0.06
7/8 (NEU - prop)	A	No	Ar (Leg)	131.00 - 7.00	0.0000	0.08	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	110.00 - 7.00	0.0000	0.09	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	112.00 - 7.00	0.0000	0.1	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	92.00 - 7.00	0.0000	0.11	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	80.00 - 7.00	0.0000	0.12	1	1	1.1100	1.1100		0.54

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	197.00-187.00	A	4.223	0.000	0.000	0.000	0.02
		B	4.428	0.924	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
T2	187.00-172.00	A	9.050	0.000	0.000	0.000	0.05
		B	18.067	1.979	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
T3	172.00-152.00	A	24.937	0.000	0.000	0.000	0.23
		B	25.850	2.639	0.000	0.000	0.16
		C	0.000	0.000	0.000	0.000	0.00
T4	152.00-142.00	A	23.853	0.000	0.000	0.000	0.16
		B	16.908	1.320	0.000	0.000	0.11
		C	11.903	0.000	0.000	0.000	0.08
T5	142.00-122.00	A	52.499	0.000	0.000	0.000	0.32
		B	34.649	2.639	0.000	0.000	0.22
		C	27.767	0.000	0.000	0.000	0.20
T6	122.00-102.00	A	55.182	0.000	0.000	0.000	0.34
		B	37.332	2.639	0.000	0.000	0.22
		C	27.767	0.000	0.000	0.000	0.20
T7	102.00-82.00	A	58.142	0.000	0.000	0.000	0.36
		B	40.292	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T8	82.00-62.00	A	60.732	0.000	0.000	0.000	0.37
		B	42.882	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T9	62.00-42.00	A	60.917	0.000	0.000	0.000	0.37
		B	43.067	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T10	42.00-22.00	A	60.917	0.000	0.000	0.000	0.37
		B	43.067	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T11	22.00-2.00	A	42.718	0.000	0.000	0.000	0.28
		B	32.446	3.959	0.000	0.000	0.17
		C	18.001	0.000	0.000	0.000	0.12

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	9 of 41
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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
T1	197.00-187.00	A	0.500	8.307	0.000	0.000	0.000	0.07
		B		8.838	1.826	0.000	0.000	0.09
		C		0.000	0.000	0.000	0.000	0.00
T2	187.00-172.00	A	0.500	17.800	0.000	0.000	0.000	0.15
		B		31.851	3.913	0.000	0.000	0.32
		C		0.000	0.000	0.000	0.000	0.00
T3	172.00-152.00	A	0.500	43.103	0.000	0.000	0.000	0.60
		B		45.117	5.217	0.000	0.000	0.45
		C		0.000	0.000	0.000	0.000	0.00
T4	152.00-142.00	A	0.500	38.687	0.000	0.000	0.000	0.41
		B		29.875	2.609	0.000	0.000	0.31
		C		19.237	0.000	0.000	0.000	0.23
T5	142.00-122.00	A	0.500	84.916	0.000	0.000	0.000	0.83
		B		61.332	5.217	0.000	0.000	0.62
		C		44.433	0.000	0.000	0.000	0.56
T6	122.00-102.00	A	0.500	90.015	0.000	0.000	0.000	0.87
		B		66.432	5.217	0.000	0.000	0.62
		C		44.433	0.000	0.000	0.000	0.56
T7	102.00-82.00	A	0.500	95.642	0.000	0.000	0.000	0.92
		B		72.058	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T8	82.00-62.00	A	0.500	100.565	0.000	0.000	0.000	0.96
		B		76.982	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T9	62.00-42.00	A	0.500	100.917	0.000	0.000	0.000	0.97
		B		77.333	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T10	42.00-22.00	A	0.500	100.917	0.000	0.000	0.000	0.97
		B		77.333	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T11	22.00-2.00	A	0.500	71.218	0.000	0.000	0.000	0.72
		B		57.859	7.717	0.000	0.000	0.49
		C		28.714	0.992	0.000	0.000	0.34

Feed Line Shielding

Section	Elevation ft	Face	A _R ft ²	A _R Ice ft ²	A _F ft ²	A _F Ice ft ²
T1	197.00-187.00	A	0.304	1.351	0.106	0.208
		B	0.385	1.766	0.134	0.271
		C	0.000	0.000	0.000	0.000
T2	187.00-172.00	A	0.692	2.889	0.000	0.000
		B	1.533	5.873	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	172.00-152.00	A	2.062	7.129	0.000	0.000
		B	2.356	8.416	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	152.00-142.00	A	0.000	0.925	1.376	2.312
		B	0.000	0.879	1.230	2.198
		C	0.000	0.000	0.000	0.000
T5	142.00-122.00	A	0.000	1.561	2.788	4.684
		B	0.000	1.484	2.492	4.452
		C	0.000	0.000	0.000	0.000

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Section	Elevation	Face	A_R	$A_{R\text{ Ice}}$	A_F	$A_{F\text{ Ice}}$
	ft		ft ²	ft ²	ft ²	ft ²
T6	122.00-102.00	A	0.000	1.336	2.386	4.008
		B	0.000	1.270	2.133	3.810
		C	0.000	0.000	0.000	0.000
T7	102.00-82.00	A	0.000	1.430	2.554	4.290
		B	0.000	1.475	2.495	4.424
		C	0.000	0.000	0.000	0.000
T8	82.00-62.00	A	0.000	1.126	2.011	3.379
		B	0.000	1.161	1.965	3.484
		C	0.000	0.000	0.000	0.000
T9	62.00-42.00	A	0.000	1.073	2.235	3.755
		B	0.000	1.106	2.183	3.871
		C	0.000	0.000	0.000	0.000
T10	42.00-22.00	A	0.000	1.035	2.157	3.624
		B	0.000	1.068	2.107	3.736
		C	0.000	0.000	0.000	0.000
T11	22.00-2.00	A	0.000	0.756	1.801	3.025
		B	0.000	0.780	1.759	3.119
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	$CP_{X\text{ Ice}}$	$CP_{Z\text{ Ice}}$
	ft	in	in	in	in
T1	197.00-187.00	-2.8982	-3.0791	-2.9267	-2.6393
T2	187.00-172.00	-2.3605	-7.2302	-2.7169	-6.0460
T3	172.00-152.00	-5.5148	-5.6944	-5.3389	-5.0503
T4	152.00-142.00	-4.7004	-0.8267	-4.5440	-0.7687
T5	142.00-122.00	-6.0937	-0.7086	-5.9617	-0.7155
T6	122.00-102.00	-7.4539	-1.3791	-7.3248	-1.5370
T7	102.00-82.00	-8.0456	-2.6917	-7.9478	-2.9278
T8	82.00-62.00	-9.5933	-3.8748	-9.4522	-4.3152
T9	62.00-42.00	-10.1898	-4.0977	-10.1832	-4.6433
T10	42.00-22.00	-11.4773	-4.5826	-11.5158	-5.2215
T11	22.00-2.00	-8.9156	-4.4984	-9.2572	-5.1975

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	$C_{AA\text{ Front}}$ ft ²	$C_{AA\text{ Side}}$ ft ²	Weight K
Single Dipole (Unknown)	C	From Leg	0.00	0.0000	196.26	No Ice	0.23	0.00
			0.00			1/2" Ice	0.41	0.00
			0.00					
6'x4" Pipe Mount (CSP)	A	From Face	0.67	0.0000	194.92	No Ice	2.09	0.05
			0.00			1/2" Ice	2.46	0.07
			0.00					
OGT9-840	A	From Leg	3.00	0.0000	190.25	No Ice	2.27	0.02

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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	
(Unknown)			6.00 0.00			1/2" Ice 3.44	3.44	0.04	
10' x 3" Dia Omni (Unknown)	A	From Leg	3.00 6.00 0.00	0.0000	174.25	No Ice 1/2" Ice 4.03	3.00 3.00 4.03	0.03 0.05	
9' x 3" Dia Omni (Unknown)	B	From Leg	3.00 6.00 0.00	0.0000	188.75	No Ice 1/2" Ice 3.63	2.70 2.70 3.63	0.03 0.05	
12' x 3" Dia Omni (Unknown)	B	From Leg	3.00 6.00 0.00	0.0000	175.25	No Ice 1/2" Ice 4.83	3.60 3.60 4.83	0.04 0.06	
DB222-A (Unknown)	C	From Leg	3.00 6.00 0.00	0.0000	187.25	No Ice 1/2" Ice 2.88	1.60 1.60 2.88	0.02 0.02	
ANT150D6-9 (Unknown)	C	From Leg	3.00 6.00 0.00	0.0000	173.75	No Ice 1/2" Ice 0.00	0.00 0.00 0.00	0.07 0.10	
9' x 3" Dia Omni (Unknown)	C	From Leg	4.00 0.00 0.00	-60.0000	192.75	No Ice 1/2" Ice 3.63	2.70 2.70 3.63	0.03 0.05	
PiROD 4' Side Mount Standoff (1) (Unknown)	C	From Leg	2.00 0.00 0.00	-60.0000	186.50	No Ice 1/2" Ice 4.91	2.72 2.72 4.91	0.05 0.09	
DB222-A (Unknown)	C	From Leg	4.00 0.00 0.00	-60.0000	180.25	No Ice 1/2" Ice 2.88	1.60 1.60 2.88	0.02 0.02	
PiROD 4' Side Mount Standoff (1) (Unknown)	A	From Leg	2.00 0.00 0.00	0.0000	174.25	No Ice 1/2" Ice 4.91	2.72 2.72 4.91	0.05 0.09	
BCD87077 (Pagenet)	A	From Leg	4.00 0.00 0.00	0.0000	181.50	No Ice 1/2" Ice 4.24	3.06 3.06 4.24	0.03 0.04	
PiROD 6' Side Mount Standoff (1) (Unknown)	B	From Leg	3.00 0.00 0.00	0.0000	172.25	No Ice 1/2" Ice 6.12	4.97 4.97 6.12	0.07 0.13	
PD220 (Unknown)	B	From Leg	6.00 0.00 0.00	0.0000	182.25	No Ice 1/2" Ice 7.13	3.56 3.56 7.13	0.02 0.05	
PiROD 15' Rotatable Platform (Lattice) (Unknown)	C	None		0.0000	181.25	No Ice 1/2" Ice 30.70	24.90 24.90 30.70	1.81 2.44	
12' x 3" Dia Omni (Unknown)	A	From Leg	2.50 0.00 0.00	-10.0000	175.25	No Ice 1/2" Ice 4.83	3.60 3.60 4.83	0.04 0.06	
(2) 7770.00 (AT&T/Cingular)	A	From Leg	3.00 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 6.31	5.88 2.93 3.27	0.04 0.07	
(2) 7770.00 (AT&T/Cingular)	B	From Leg	3.00 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 6.31	5.88 2.93 3.27	0.04 0.07	
(2) 7770.00 (AT&T/Cingular)	C	From Leg	3.00 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 6.31	5.88 2.93 3.27	0.04 0.07	
(2) LPG 21401 TMA (AT&T/Cingular)	A	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 1.09	0.95 0.37 0.48	0.02 0.02	
(2) LPG 21401 TMA	B	From Leg	2.50	0.0000	150.25	No Ice	0.95	0.37	0.02

RISATower

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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	
(AT&T/Cingular)			0.00 0.00		1/2" Ice	1.09	0.48	0.02	
(2) LPG 21401 TMA (AT&T/Cingular)	C	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	0.02 0.02
T-Arm (1) (AT&T/Cingular)	A	From Leg	1.20 0.00 0.00	0.0000	149.63	No Ice 1/2" Ice	10.54 14.45	10.54 14.45	0.34 0.41
T-Arm (1) (AT&T/Cingular)	B	From Leg	1.20 0.00 0.00	0.0000	149.63	No Ice 1/2" Ice	10.54 14.45	10.54 14.45	0.34 0.41
T-Arm (1) (AT&T/Cingular)	C	From Leg	1.20 0.00 0.00	0.0000	149.63	No Ice 1/2" Ice	10.54 14.45	10.54 14.45	0.34 0.41
(2) LPG 13519 Diplexer (AT&T/Cingular)	A	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	0.01 0.01
(2) LPG 13519 Diplexer (AT&T/Cingular)	B	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	0.01 0.01
(2) LPG 13519 Diplexer (AT&T/Cingular)	C	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	0.01 0.01
(4) 60"x12"x4" Panel (Verizon - future)	A	From Leg	2.50 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice	7.00 7.47	2.78 3.15	0.05 0.09
(4) 60"x12"x4" Panel (Verizon - future)	B	From Leg	2.50 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice	7.00 7.47	2.78 3.15	0.05 0.09
(4) 60"x12"x4" Panel (Verizon - future)	C	From Leg	2.50 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice	7.00 7.47	2.78 3.15	0.05 0.09
PiROD 13' Lightweight T- Frame (Verizon - future)	A	From Leg	1.25 0.00 0.00	0.0000	163.25	No Ice 1/2" Ice	10.60 16.80	10.60 16.80	0.26 0.36
PiROD 13' Lightweight T- Frame (Verizon - future)	B	From Leg	1.25 0.00 0.00	0.0000	163.25	No Ice 1/2" Ice	10.60 16.80	10.60 16.80	0.26 0.36
PiROD 13' Lightweight T- Frame (Verizon - future)	C	From Leg	1.25 0.00 0.00	0.0000	163.25	No Ice 1/2" Ice	10.60 16.80	10.60 16.80	0.26 0.36
PD220 (Verizon)	B	From Leg	5.20 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice	3.56 7.13	3.56 7.13	0.02 0.05
DB230-2A (Verizon)	B	From Leg	8.20 0.00 0.00	-10.0000	121.50	No Ice 1/2" Ice	3.00 5.40	3.00 5.40	0.11 0.15
Folded Dipole (Unknown)	C	From Leg	6.00 0.00 0.00	0.0000	120.58	No Ice 1/2" Ice	3.10 6.22	3.10 6.22	0.03 0.06
DB205-L (Unknown)	A	From Leg	5.20 0.00 0.00	0.0000	109.25	No Ice 1/2" Ice	1.72 3.45	1.72 3.45	0.04 0.05
6'8"x4" Pipe Mount (CSP)	B	From Leg	0.67 0.00 0.00	0.0000	101.20	No Ice 1/2" Ice	2.60 3.01	2.60 3.01	0.07 0.09
DB224-A	C	From Leg	2.00	60.0000	94.00	No Ice	3.15	3.15	0.03

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	13 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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
(Unknown)			0.00 0.00			1/2" Ice 5.67	5.67	0.04
PD220	A	From Leg	5.20	0.0000	90.41	No Ice 3.56	3.56	0.02
(Unknown)			0.00 0.00			1/2" Ice 7.13	7.13	0.05
2' Sidearm	B	From Leg	1.00	0.0000	15.00	No Ice 3.90	3.90	0.09
(Unknown)			0.00 0.00			1/2" Ice 4.40	4.40	0.10
2' Sidearm	B	From Leg	1.00	0.0000	11.00	No Ice 3.90	3.90	0.09
(Unknown)			0.00 0.00			1/2" Ice 4.40	4.40	0.10
2' Sidearm	B	From Leg	1.00	0.0000	9.00	No Ice 3.90	3.90	0.09
(Unknown)			0.00 0.00			1/2" Ice 4.40	4.40	0.10
DB432-A (KB1AEV)	A	From Leg	1.50 0.00 0.00	90.0000	70.25	No Ice 0.30 1/2" Ice 0.54	0.30 0.54	0.01 0.01
3' Sidearm	A	From Leg	1.25 0.00 0.00	10.0000	170.20	No Ice 5.90 1/2" Ice 6.60	5.90 6.60	0.13 0.15
6' Rigid Side Arm w/ 3" STD mount pipe	B	From Leg	2.60 0.00 0.00	0.0000	120.50	No Ice 2.60 1/2" Ice 4.21	3.41 7.18	0.20 0.30
6' Rigid Side Arm w/ 3" STD mount pipe	C	From Leg	2.60 0.00 0.00	0.0000	120.67	No Ice 2.60 1/2" Ice 4.21	3.41 7.18	0.20 0.30
6' Rigid Side Arm w/ 3" STD mount pipe	A	From Leg	2.60 0.00 0.00	0.0000	100.67	No Ice 2.60 1/2" Ice 4.21	3.41 7.18	0.20 0.30
2' Sidearm	C	From Leg	1.00 0.00 0.00	60.0000	85.00	No Ice 3.90 1/2" Ice 4.40	3.90 4.40	0.09 0.10
6' Rigid Side Arm w/ 3" STD mount pipe	A	From Leg	2.60 0.00 0.00	0.0000	79.50	No Ice 2.60 1/2" Ice 4.21	3.41 7.18	0.20 0.30
Filter/Diplexer	B	None		0.0000	157.00	No Ice 4.70 1/2" Ice 5.10	1.93 2.24	0.03 0.06
Ice Canopy	B	From Leg	3.00 0.00 0.00	-50.0000	106.00	No Ice 3.73 1/2" Ice 4.39	2.80 3.30	0.30 0.55
SD210-SF3P4LDF (NEU - prop)	B	From Face	4.00 0.00 0.00	0.0000	135.00	No Ice 0.90 1/2" Ice 1.40	0.90 1.40	0.01 0.03
Piroad 4' Side Mount Standoff (1)	B	From Face	2.00 0.00 0.00	0.0000	135.00	No Ice 2.72 1/2" Ice 4.91	2.72 4.91	0.05 0.09
(NEU - prop)								
SD210-SF3P4LDF (NEU - prop)	B	From Face	4.00 0.00 0.00	0.0000	115.00	No Ice 0.90 1/2" Ice 1.40	0.90 1.40	0.01 0.03
Piroad 4' Side Mount Standoff (1)	B	From Face	2.00 0.00 0.00	0.0000	115.00	No Ice 2.72 1/2" Ice 4.91	2.72 4.91	0.05 0.09
(NEU - prop)								
DB586-Y (NEU - prop)	B	From Leg	4.00 0.00 0.00	0.0000	115.00	No Ice 1.01 1/2" Ice 1.28	1.01 1.28	0.01 0.02
Piroad 4' Side Mount Standoff (1)	B	From Leg	2.00 0.00	0.0000	112.00	No Ice 2.72 1/2" Ice 4.91	2.72 4.91	0.05 0.09

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
(NEU - prop)			0.00					
DB586-Y	B	From Leg	4.00	0.0000	95.00	No Ice 1.01	1.01	0.01
(NEU - prop)			0.00			1/2" Ice 1.28	1.28	0.02
PiROD 4' Side Mount Standoff	B	From Leg	2.00	0.0000	92.00	No Ice 2.72	2.72	0.05
(1)			0.00			1/2" Ice 4.91	4.91	0.09
(NEU - prop)			0.00					
SD110-SFXPASNM	B	From Leg	4.00	0.0000	81.00	No Ice 9.00	9.00	0.03
(SRL110A)			0.00			1/2" Ice 10.58	10.58	0.09
(NEU - prop)			0.00					
PiROD 4' Side Mount Standoff	B	From Leg	2.00	0.0000	81.00	No Ice 2.72	2.72	0.05
(1)			0.00			1/2" Ice 4.91	4.91	0.09
(NEU - prop)			0.00					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
PA6-65AC	B	Paraboloid w/o	From	1.00	-50.0000		102.25	6.00	No Ice 28.27	0.09
(CSP)		Radome	Leg	0.00					1/2" Ice 29.05	0.24
(NEU - prop)				0.00						
PA6-65AC	A	Paraboloid w/o	From	1.00	-10.0000		194.25	6.00	No Ice 28.27	0.09
(CSP)		Radome	Face	0.00					1/2" Ice 29.05	0.24
(NEU - prop)				0.00						
1.2M	B	Paraboloid w/o	From	2.00	40.0000		17.00	4.00	No Ice 12.17	0.17
(Verizon)		Radome	Leg	0.00					1/2" Ice 13.09	0.23
(NEU - prop)				0.00						
1.2M	B	Paraboloid w/o	From	2.00	50.0000		12.58	4.00	No Ice 12.17	0.17
(Pagenet)		Radome	Leg	0.00					1/2" Ice 13.09	0.23
(NEU - prop)				0.00						
1.2M	B	Paraboloid w/o	From	2.00	50.0000		10.33	4.00	No Ice 12.17	0.17
(Pagenet)		Radome	Leg	0.00					1/2" Ice 13.09	0.23
(NEU - prop)				0.00						

Truss-Leg Properties

Section Designation	Area in ²	Area Ice in ²	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in ²
PiROD 105245	1090.3344	1814.3549	0.68	0.22	7.5718	12.5997	5.3014
PiROD 105217	2130.7479	3520.4599	0.62	0.44	7.3984	12.2238	5.3014
PiROD 105218	2263.4687	3690.8612	0.75	0.46	7.8593	12.8155	7.2158
PiROD 105218 reinf w /1" dia bar	2478.7820	3979.9267	1.01	0.48	8.6069	13.8192	10.8915

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Section Designation	Area <i>in</i> ²	Area Ice <i>in</i> ²	Self Weight <i>K</i>	Ice Weight <i>K</i>	Equiv. Diameter <i>in</i>	Equiv. Diameter Ice <i>in</i>	Leg Area <i>in</i> ²
PiROD 105219	2441.8688	3942.2854	0.94	0.49	8.4787	13.6885	9.4248
PiROD 105219 reinf w /1" dia bar	2642.9258	4222.9884	1.21	0.51	9.1768	14.6632	13.1787
PiROD 105220	2578.8005	4132.5504	1.12	0.50	8.9542	14.3491	11.9282
PiROD 105220 reinf w /1" dia bar	2719.2667	4331.5590	1.32	0.52	9.4419	15.0401	14.7262

Tower Pressures - No Ice

$$G_H = 1.116$$

Section Elevation <i>ft</i>	<i>z</i> <i>ft</i>	<i>K_Z</i>	<i>q_z</i> <i>psf</i>	<i>A_G</i> <i>ft</i> ²	<i>F_a</i> <i>c</i> <i>e</i>	<i>A_F</i> <i>ft</i> ²	<i>A_R</i> <i>ft</i> ²	<i>A_{leg}</i> <i>ft</i> ²	Leg % <i>ft</i> ²	<i>C_AA_A</i> In Face <i>ft</i> ²	<i>C_AA_A</i> Out Face <i>ft</i> ²
T1 197.00-187.00	192.00	1.654	34	46.458	A	0.983	9.972	2.917	26.62	0.000	0.000
					B	1.879	10.095		24.36	0.000	0.000
					C	1.089	6.053		40.84	0.000	0.000
T2 187.00-172.00	179.50	1.622	34	70.000	A	0.000	18.330	5.000	27.28	0.000	0.000
					B	1.979	26.506		17.55	0.000	0.000
					C	0.000	9.972		50.14	0.000	0.000
T3 172.00-152.00	162.00	1.576	33	98.750	A	0.000	37.920	7.501	19.78	0.000	0.000
					B	2.639	38.540		18.22	0.000	0.000
					C	0.000	15.045		49.85	0.000	0.000
T4 152.00-142.00	147.00	1.532	32	66.264	A	4.526	36.494	12.641	30.82	0.000	0.000
					B	5.991	29.549		35.57	0.000	0.000
					C	5.902	24.544		41.52	0.000	0.000
T5 142.00-122.00	132.00	1.486	31	162.528	A	10.988	77.696	24.703	27.85	0.000	0.000
					B	13.922	59.846		33.49	0.000	0.000
					C	13.776	52.963		37.01	0.000	0.000
T6 122.00-102.00	112.00	1.418	29	202.945	A	12.505	81.423	26.241	27.94	0.000	0.000
					B	15.397	63.573		33.23	0.000	0.000
					C	14.891	54.008		38.09	0.000	0.000
T7 102.00-82.00	92.00	1.34	28	243.613	A	15.917	87.454	28.737	27.80	0.000	0.000
					B	21.255	69.604		31.63	0.000	0.000
					C	18.471	57.079		38.04	0.000	0.000
T8 82.00-62.00	72.00	1.25	26	283.362	A	15.502	89.041	28.309	27.08	0.000	0.000
					B	20.827	71.191		30.77	0.000	0.000
					C	17.513	56.076		38.47	0.000	0.000
T9 62.00-42.00	52.00	1.139	24	323.972	A	19.509	92.170	30.640	27.44	0.000	0.000
					B	24.839	74.320		30.90	0.000	0.000
					C	21.744	59.020		37.94	0.000	0.000
T10 42.00-22.00	32.00	1	21	363.780	A	21.535	90.814	29.897	26.61	0.000	0.000
					B	26.864	72.964		29.95	0.000	0.000
					C	23.692	57.664		36.75	0.000	0.000
T11 22.00-2.00	12.00	1	21	404.197	A	27.127	74.873	31.525	30.91	0.000	0.000
					B	31.127	64.602		32.93	0.000	0.000
					C	28.928	50.157		39.86	0.000	0.000

Tower Pressure - With Ice

$$G_H = 1.116$$

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	Client	Northeast Utilities System	Designed by	Staff

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
T1 197.00- 187.00	192.00	1.654	34	0.5000	47.292	A	0.881	18.622	4.583	23.50	0.000	0.000
						B	2.643	18.738		21.44	0.000	0.000
						C	1.089	11.667		35.93	0.000	0.000
T2 187.00- 172.00	179.50	1.622	34	0.5000	71.250	A	0.000	32.961	7.500	22.75	0.000	0.000
						B	3.913	44.029		15.64	0.000	0.000
						C	0.000	18.051		41.55	0.000	0.000
T3 172.00- 152.00	162.00	1.576	33	0.5000	100.417	A	0.000	61.898	10.834	17.50	0.000	0.000
						B	5.217	62.624		15.97	0.000	0.000
						C	0.000	25.924		41.79	0.000	0.000
T4 152.00- 142.00	147.00	1.532	32	0.5000	67.098	A	3.590	60.667	21.034	32.73	0.000	0.000
						B	6.313	51.901		36.13	0.000	0.000
						C	5.902	42.142		43.78	0.000	0.000
T5 142.00- 122.00	132.00	1.486	31	0.5000	164.197	A	9.092	128.873	40.814	29.58	0.000	0.000
						B	14.540	105.367		34.04	0.000	0.000
						C	13.776	89.951		39.35	0.000	0.000
T6 122.00- 102.00	112.00	1.418	29	0.5000	204.614	A	10.883	135.658	42.789	29.20	0.000	0.000
						B	16.298	112.140		33.32	0.000	0.000
						C	14.891	91.412		40.25	0.000	0.000
T7 102.00-82.00	92.00	1.34	28	0.5000	245.282	A	14.181	146.759	46.141	28.67	0.000	0.000
						B	23.015	123.132		31.57	0.000	0.000
						C	18.471	96.981		39.97	0.000	0.000
T8 82.00-62.00	72.00	1.25	26	0.5000	285.031	A	14.134	150.206	45.704	27.81	0.000	0.000
						B	22.997	126.588		30.55	0.000	0.000
						C	17.513	95.201		40.55	0.000	0.000
T9 62.00-42.00	52.00	1.139	24	0.5000	325.640	A	17.990	155.479	48.959	28.22	0.000	0.000
						B	26.840	131.863		30.85	0.000	0.000
						C	21.744	100.069		40.19	0.000	0.000
T10 42.00-22.00	32.00	1	21	0.5000	365.448	A	20.068	153.940	47.910	27.53	0.000	0.000
						B	28.923	130.324		30.09	0.000	0.000
						C	23.692	98.492		39.21	0.000	0.000
T11 22.00-2.00	12.00	1	21	0.5000	405.866	A	25.902	128.537	50.217	32.52	0.000	0.000
						B	33.526	115.155		33.78	0.000	0.000
						C	29.919	86.790		43.03	0.000	0.000

Tower Pressure - Service

$$G_H = 1.116$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 197.00- 187.00	192.00	1.654	34	46.458	A	0.983	9.972	2.917	26.62	0.000	0.000
					B	1.879	10.095		24.36	0.000	0.000
					C	1.089	6.053		40.84	0.000	0.000
T2 187.00- 172.00	179.50	1.622	34	70.000	A	0.000	18.330	5.000	27.28	0.000	0.000
					B	1.979	26.506		17.55	0.000	0.000
					C	0.000	9.972		50.14	0.000	0.000
T3 172.00- 152.00	162.00	1.576	33	98.750	A	0.000	37.920	7.501	19.78	0.000	0.000
					B	2.639	38.540		18.22	0.000	0.000
					C	0.000	15.045		49.85	0.000	0.000
T4 152.00- 142.00	147.00	1.532	32	66.264	A	4.526	36.494	12.641	30.82	0.000	0.000
					B	5.991	29.549		35.57	0.000	0.000
					C	5.902	24.544		41.52	0.000	0.000
T5 142.00-	132.00	1.486	31	162.528	A	10.988	77.696	24.703	27.85	0.000	0.000

RISATower

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Job

U20.0x195' PIROD Lattice Tower

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Project

Surdan Mountain Road, Sharon, CT

Date

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Client

Northeast Utilities System

Designed by

Staff

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
122.00					B	13.922	59.846		33.49	0.000	0.000
					C	13.776	52.963		37.01	0.000	0.000
T6 122.00- 102.00	112.00	1.418	29	202.945	A	12.505	81.423	26.241	27.94	0.000	0.000
					B	15.397	63.573		33.23	0.000	0.000
					C	14.891	54.008		38.09	0.000	0.000
T7 102.00- 82.00	92.00	1.34	28	243.613	A	15.917	87.454	28.737	27.80	0.000	0.000
					B	21.255	69.604		31.63	0.000	0.000
					C	18.471	57.079		38.04	0.000	0.000
T8 82.00-62.00	72.00	1.25	26	283.362	A	15.502	89.041	28.309	27.08	0.000	0.000
					B	20.827	71.191		30.77	0.000	0.000
					C	17.513	56.076		38.47	0.000	0.000
T9 62.00-42.00	52.00	1.139	24	323.972	A	19.509	92.170	30.640	27.44	0.000	0.000
					B	24.839	74.320		30.90	0.000	0.000
					C	21.744	59.020		37.94	0.000	0.000
T10 42.00- 22.00	32.00	1	21	363.780	A	21.535	90.814	29.897	26.61	0.000	0.000
					B	26.864	72.964		29.95	0.000	0.000
					C	23.692	57.664		36.75	0.000	0.000
T11 22.00-2.00	12.00	1	21	404.197	A	27.127	74.873	31.525	30.91	0.000	0.000
					B	31.127	64.602		32.93	0.000	0.000
					C	28.928	50.157		39.86	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	1	1	6.950	0.74	73.66	B
			B	0.258	2.415	0.604	1	1	7.975			
			C	0.154	2.758	0.582	1	1	4.612			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	1	1	11.089	1.49	99.14	B
			B	0.407	2.05	0.654	1	1	19.326			
			C	0.142	2.799	0.58	1	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	1	1	24.466	2.07	103.73	B
			B	0.417	2.031	0.659	1	1	28.025			
			C	0.152	2.763	0.582	1	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	1	1	32.459	2.06	206.35	A
			B	0.536	1.857	0.717	1	1	27.169			
			C	0.459	1.958	0.678	1	1	22.534			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	1	1	67.072	4.26	212.99	A
			B	0.454	1.967	0.675	1	1	54.322			
			C	0.411	2.043	0.656	1	1	48.519			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	1	1	67.811	4.34	217.18	A
			B	0.389	2.086	0.647	1	1	56.543			
			C	0.339	2.196	0.629	1	1	48.850			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	1	1	73.796	4.62	230.84	A
			B	0.373	2.12	0.641	1	1	65.867			
			C	0.31	2.269	0.619	1	1	53.805			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	1	1	72.436	4.46	222.88	A
			B	0.325	2.232	0.624	1	1	65.234			
			C	0.26	2.409	0.604	1	1	51.405			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	1	1	77.632	4.47	223.28	A
			B	0.306	2.28	0.618	1	1	70.753			
			C	0.249	2.44	0.602	1	1	57.256			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	1	1	77.716	4.09	204.29	A
			B	0.274	2.366	0.608	1	1	71.255			
			C	0.224	2.519	0.596	1	1	58.032			

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	18 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	1	1	72.236	4.06	203.06	A
			B	0.237	2.478	0.599	1	1	69.799			
			C	0.196	2.611	0.59	1	1	58.496			
Sum Weight:	7.71	34.21						OTM	3180.66 kip-ft	36.65		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	0.8	1	6.753	0.70	70.19	B
			B	0.258	2.415	0.604	0.8	1	7.599			
			C	0.154	2.758	0.582	0.8	1	4.394			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	0.8	1	11.089	1.46	97.11	B
			B	0.407	2.05	0.654	0.8	1	18.930			
			C	0.142	2.799	0.58	0.8	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	0.8	1	24.466	2.04	101.78	B
			B	0.417	2.031	0.659	0.8	1	27.497			
			C	0.152	2.763	0.582	0.8	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	0.8	1	31.554	2.01	200.59	A
			B	0.536	1.857	0.717	0.8	1	25.971			
			C	0.459	1.958	0.678	0.8	1	21.354			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	0.8	1	64.874	4.12	206.02	A
			B	0.454	1.967	0.675	0.8	1	51.538			
			C	0.411	2.043	0.656	0.8	1	45.764			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	0.8	1	65.310	4.18	209.17	A
			B	0.389	2.086	0.647	0.8	1	53.464			
			C	0.339	2.196	0.629	0.8	1	45.872			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	0.8	1	70.613	4.42	220.88	A
			B	0.373	2.12	0.641	0.8	1	61.616			
			C	0.31	2.269	0.619	0.8	1	50.111			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	0.8	1	69.336	4.27	213.34	A
			B	0.325	2.232	0.624	0.8	1	61.069			
			C	0.26	2.409	0.604	0.8	1	47.903			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	0.8	1	73.730	4.24	212.06	A
			B	0.306	2.28	0.618	0.8	1	65.785			
			C	0.249	2.44	0.602	0.8	1	52.907			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	0.8	1	73.409	3.86	192.96	A
			B	0.274	2.366	0.608	0.8	1	65.882			
			C	0.224	2.519	0.596	0.8	1	53.293			
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	0.8	1	66.811	3.76	187.80	A
			B	0.237	2.478	0.599	0.8	1	63.573			
			C	0.196	2.611	0.59	0.8	1	52.711			
Sum Weight:	7.71	34.21						OTM	3065.95 kip-ft	35.04		

Tower Forces - No Ice - Wind 90 To Face

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	19 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	0.85	1	6.802	0.71	71.06	B
			B	0.258	2.415	0.604	0.85	1	7.693			
			C	0.154	2.758	0.582	0.85	1	4.448			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	0.85	1	11.089	1.46	97.62	B
			B	0.407	2.05	0.654	0.85	1	19.029			
			C	0.142	2.799	0.58	0.85	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	0.85	1	24.466	2.05	102.27	B
			B	0.417	2.031	0.659	0.85	1	27.629			
			C	0.152	2.763	0.582	0.85	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	0.85	1	31.780	2.02	202.03	A
			B	0.536	1.857	0.717	0.85	1	26.270			
			C	0.459	1.958	0.678	0.85	1	21.649			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	0.85	1	65.424	4.16	207.76	A
			B	0.454	1.967	0.675	0.85	1	52.234			
			C	0.411	2.043	0.656	0.85	1	46.453			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	0.85	1	65.936	4.22	211.17	A
			B	0.389	2.086	0.647	0.85	1	54.233			
			C	0.339	2.196	0.629	0.85	1	46.617			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	0.85	1	71.409	4.47	223.37	A
			B	0.373	2.12	0.641	0.85	1	62.678			
			C	0.31	2.269	0.619	0.85	1	51.035			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	0.85	1	70.111	4.31	215.72	A
			B	0.325	2.232	0.624	0.85	1	62.110			
			C	0.26	2.409	0.604	0.85	1	48.778			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	0.85	1	74.705	4.30	214.87	A
			B	0.306	2.28	0.618	0.85	1	67.027			
			C	0.249	2.44	0.602	0.85	1	53.994			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	0.85	1	74.486	3.92	195.79	A
			B	0.274	2.366	0.608	0.85	1	67.226			
			C	0.224	2.519	0.596	0.85	1	54.478			
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	0.85	1	68.167	3.83	191.62	A
			B	0.237	2.478	0.599	0.85	1	65.130			
			C	0.196	2.611	0.59	0.85	1	54.157			
Sum Weight:	7.71	34.21						OTM	3094.63 kip-ft	35.45		

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	plf	
T1 197.00- 187.00	0.16	0.80	A	0.412	2.04	0.657	1	1	13.111	1.15	115.14	B
			B	0.452	1.97	0.674	1	1	15.277			
			C	0.27	2.38	0.607	1	1	8.172			
T2 187.00- 172.00	0.47	1.19	A	0.463	1.953	0.679	1	1	22.386	2.61	174.16	B
			B	0.673	1.777	0.801	1	1	39.175			
			C	0.253	2.428	0.603	1	1	10.880			
T3 172.00- 152.00	1.05	1.96	A	0.616	1.795	0.764	1	1	47.277	3.59	179.64	B
			B	0.676	1.777	0.803	1	1	55.490			
			C	0.258	2.413	0.604	1	1	15.658			
T4 152.00- 142.00	1.08	1.68	A	0.958	2.017	1	1	1	64.257	4.59	459.45	A
			B	0.868	1.882	0.954	1	1	55.821			
			C	0.716	1.778	0.831	1	1	40.942			
T5 142.00- 122.00	2.25	4.03	A	0.84	1.851	0.93	1	1	128.952	8.21	410.29	A
			B	0.73	1.781	0.842	1	1	103.257			

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	20 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T6 122.00- 102.00	2.30	4.57	C	0.632	1.788	0.774	1	1	83.356			
			A	0.716	1.778	0.832	1	1	123.694	7.21	360.62	A
			B	0.628	1.789	0.771	1	1	102.753			
			C	0.52	1.876	0.708	1	1	79.580			
T7 102.00- 82.00	2.38	5.92	A	0.656	1.78	0.79	1	1	130.057	7.18	358.86	A
			B	0.596	1.807	0.751	1	1	115.494			
			C	0.471	1.941	0.683	1	1	84.708			
T8 82.00- 62.00	2.43	5.85	A	0.577	1.82	0.74	1	1	125.218	6.59	329.46	A
			B	0.525	1.87	0.71	1	1	112.933			
			C	0.395	2.073	0.65	1	1	79.370			
T9 62.00- 42.00	2.43	6.90	A	0.533	1.861	0.715	1	1	129.114	6.33	316.48	A
			B	0.487	1.917	0.691	1	1	117.975			
			C	0.374	2.118	0.641	1	1	85.925			
T10 42.00- 22.00	2.43	7.10	A	0.476	1.933	0.686	1	1	125.614	5.62	280.82	A
			B	0.436	1.998	0.667	1	1	115.829			
			C	0.334	2.209	0.627	1	1	85.448			
T11 22.00- 2.00	1.80	7.93	A	0.381	2.104	0.644	1	1	108.660	5.29	264.40	A
			B	0.366	2.135	0.638	1	1	107.045			
			C	0.288	2.33	0.612	1	1	83.050			
Sum Weight:	18.78	49.42						OTM	5428.65 kip-ft	58.37		

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	plf	
T1 197.00- 187.00	0.16	0.80	A	0.412	2.04	0.657	0.8	1	12.935	1.11	111.16	B
			B	0.452	1.97	0.674	0.8	1	14.748			
			C	0.27	2.38	0.607	0.8	1	7.954			
T2 187.00- 172.00	0.47	1.19	A	0.463	1.953	0.679	0.8	1	22.386	2.56	170.68	B
			B	0.673	1.777	0.801	0.8	1	38.393			
			C	0.253	2.428	0.603	0.8	1	10.880			
T3 172.00- 152.00	1.05	1.96	A	0.616	1.795	0.764	0.8	1	47.277	3.53	176.26	B
			B	0.676	1.777	0.803	0.8	1	54.447			
			C	0.258	2.413	0.604	0.8	1	15.658			
T4 152.00- 142.00	1.08	1.68	A	0.958	2.017	1	0.8	1	63.539	4.54	454.32	A
			B	0.868	1.882	0.954	0.8	1	54.558			
			C	0.716	1.778	0.831	0.8	1	39.761			
T5 142.00- 122.00	2.25	4.03	A	0.84	1.851	0.93	0.8	1	127.133	8.09	404.50	A
			B	0.73	1.781	0.842	0.8	1	100.348			
			C	0.632	1.788	0.774	0.8	1	80.600			
T6 122.00- 102.00	2.30	4.57	A	0.716	1.778	0.832	0.8	1	121.518	7.09	354.27	A
			B	0.628	1.789	0.771	0.8	1	99.493			
			C	0.52	1.876	0.708	0.8	1	76.601			
T7 102.00- 82.00	2.38	5.92	A	0.656	1.78	0.79	0.8	1	127.221	7.02	351.03	A
			B	0.596	1.807	0.751	0.8	1	110.891			
			C	0.471	1.941	0.683	0.8	1	81.014			
T8 82.00- 62.00	2.43	5.85	A	0.577	1.82	0.74	0.8	1	122.391	6.44	322.03	A
			B	0.525	1.87	0.71	0.8	1	108.333			
			C	0.395	2.073	0.65	0.8	1	75.868			
T9 62.00- 42.00	2.43	6.90	A	0.533	1.861	0.715	0.8	1	125.516	6.15	307.66	A
			B	0.487	1.917	0.691	0.8	1	112.607			
			C	0.374	2.118	0.641	0.8	1	81.576			
T10 42.00-	2.43	7.10	A	0.476	1.933	0.686	0.8	1	121.600	5.44	271.85	A

RISA Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	21 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
22.00			B	0.436	1.998	0.667	0.8	1	110.044			
			C	0.334	2.209	0.627	0.8	1	80.709			
T11 22.00- 2.00	1.80	7.93	A	0.381	2.104	0.644	0.8	1	103.480	5.04	251.79	A
			B	0.366	2.135	0.638	0.8	1	100.340			
			C	0.288	2.33	0.612	0.8	1	77.066			
Sum Weight:	18.78	49.42						OTM	5323.34 kip-ft	57.00		

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	plf	
T1 197.00- 187.00	0.16	0.80	A	0.412	2.04	0.657	0.85	1	12.979	1.12	112.15	B
			B	0.452	1.97	0.674	0.85	1	14.881			
			C	0.27	2.38	0.607	0.85	1	8.008			
T2 187.00- 172.00	0.47	1.19	A	0.463	1.953	0.679	0.85	1	22.386	2.57	171.55	B
			B	0.673	1.777	0.801	0.85	1	38.589			
			C	0.253	2.428	0.603	0.85	1	10.880			
T3 172.00- 152.00	1.05	1.96	A	0.616	1.795	0.764	0.85	1	47.277	3.54	177.10	B
			B	0.676	1.777	0.803	0.85	1	54.708			
			C	0.258	2.413	0.604	0.85	1	15.658			
T4 152.00- 142.00	1.08	1.68	A	0.958	2.017	1	0.85	1	63.719	4.56	455.60	A
			B	0.868	1.882	0.954	0.85	1	54.874			
			C	0.716	1.778	0.831	0.85	1	40.056			
T5 142.00- 122.00	2.25	4.03	A	0.84	1.851	0.93	0.85	1	127.588	8.12	405.95	A
			B	0.73	1.781	0.842	0.85	1	101.075			
			C	0.632	1.788	0.774	0.85	1	81.289			
T6 122.00- 102.00	2.30	4.57	A	0.716	1.778	0.832	0.85	1	122.062	7.12	355.86	A
			B	0.628	1.789	0.771	0.85	1	100.308			
			C	0.52	1.876	0.708	0.85	1	77.346			
T7 102.00- 82.00	2.38	5.92	A	0.656	1.78	0.79	0.85	1	127.930	7.06	352.99	A
			B	0.596	1.807	0.751	0.85	1	112.042			
			C	0.471	1.941	0.683	0.85	1	81.937			
T8 82.00- 62.00	2.43	5.85	A	0.577	1.82	0.74	0.85	1	123.098	6.48	323.88	A
			B	0.525	1.87	0.71	0.85	1	109.483			
			C	0.395	2.073	0.65	0.85	1	76.743			
T9 62.00- 42.00	2.43	6.90	A	0.533	1.861	0.715	0.85	1	126.416	6.20	309.86	A
			B	0.487	1.917	0.691	0.85	1	113.949			
			C	0.374	2.118	0.641	0.85	1	82.663			
T10 42.00- 22.00	2.43	7.10	A	0.476	1.933	0.686	0.85	1	122.603	5.48	274.09	A
			B	0.436	1.998	0.667	0.85	1	111.491			
			C	0.334	2.209	0.627	0.85	1	81.894			
T11 22.00- 2.00	1.80	7.93	A	0.381	2.104	0.644	0.85	1	104.775	5.10	254.94	A
			B	0.366	2.135	0.638	0.85	1	102.016			
			C	0.288	2.33	0.612	0.85	1	78.562			
Sum Weight:	18.78	49.42						OTM	5349.67 kip-ft	57.34		

Tower Forces - Service - Wind Normal To Face

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	22 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	1	1	6.950	0.74	73.66	B
			B	0.258	2.415	0.604	1	1	7.975			
			C	0.154	2.758	0.582	1	1	4.612			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	1	1	11.089	1.49	99.14	B
			B	0.407	2.05	0.654	1	1	19.326			
			C	0.142	2.799	0.58	1	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	1	1	24.466	2.07	103.73	B
			B	0.417	2.031	0.659	1	1	28.025			
			C	0.152	2.763	0.582	1	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	1	1	32.459	2.06	206.35	A
			B	0.536	1.857	0.717	1	1	27.169			
			C	0.459	1.958	0.678	1	1	22.534			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	1	1	67.072	4.26	212.99	A
			B	0.454	1.967	0.675	1	1	54.322			
			C	0.411	2.043	0.656	1	1	48.519			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	1	1	67.811	4.34	217.18	A
			B	0.389	2.086	0.647	1	1	56.543			
			C	0.339	2.196	0.629	1	1	48.850			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	1	1	73.796	4.62	230.84	A
			B	0.373	2.12	0.641	1	1	65.867			
			C	0.31	2.269	0.619	1	1	53.805			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	1	1	72.436	4.46	222.88	A
			B	0.325	2.232	0.624	1	1	65.234			
			C	0.26	2.409	0.604	1	1	51.405			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	1	1	77.632	4.47	223.28	A
			B	0.306	2.28	0.618	1	1	70.753			
			C	0.249	2.44	0.602	1	1	57.256			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	1	1	77.716	4.09	204.29	A
			B	0.274	2.366	0.608	1	1	71.255			
			C	0.224	2.519	0.596	1	1	58.032			
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	1	1	72.236	4.06	203.06	A
			B	0.237	2.478	0.599	1	1	69.799			
			C	0.196	2.611	0.59	1	1	58.496			
Sum Weight:	7.71	34.21						OTM	3180.66 kip-ft	36.65		

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	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	0.8	1	6.753	0.70	70.19	B
			B	0.258	2.415	0.604	0.8	1	7.599			
			C	0.154	2.758	0.582	0.8	1	4.394			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	0.8	1	11.089	1.46	97.11	B
			B	0.407	2.05	0.654	0.8	1	18.930			
			C	0.142	2.799	0.58	0.8	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	0.8	1	24.466	2.04	101.78	B
			B	0.417	2.031	0.659	0.8	1	27.497			
			C	0.152	2.763	0.582	0.8	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	0.8	1	31.554	2.01	200.59	A
			B	0.536	1.857	0.717	0.8	1	25.971			
			C	0.459	1.958	0.678	0.8	1	21.354			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	0.8	1	64.874	4.12	206.02	A
			B	0.454	1.967	0.675	0.8	1	51.538			

RISA Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PIROD Lattice Tower	Page	23 of 41
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	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T6 122.00- 102.00	0.96	2.81	C	0.411	2.043	0.656	0.8	1	45.764			
			A	0.463	1.953	0.679	0.8	1	65.310	4.18	209.17	A
			B	0.389	2.086	0.647	0.8	1	53.464			
			C	0.339	2.196	0.629	0.8	1	45.872			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	0.8	1	70.613	4.42	220.88	A
			B	0.373	2.12	0.641	0.8	1	61.616			
			C	0.31	2.269	0.619	0.8	1	50.111			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	0.8	1	69.336	4.27	213.34	A
			B	0.325	2.232	0.624	0.8	1	61.069			
			C	0.26	2.409	0.604	0.8	1	47.903			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	0.8	1	73.730	4.24	212.06	A
			B	0.306	2.28	0.618	0.8	1	65.785			
			C	0.249	2.44	0.602	0.8	1	52.907			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	0.8	1	73.409	3.86	192.96	A
			B	0.274	2.366	0.608	0.8	1	65.882			
			C	0.224	2.519	0.596	0.8	1	53.293			
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	0.8	1	66.811	3.76	187.80	A
			B	0.237	2.478	0.599	0.8	1	63.573			
			C	0.196	2.611	0.59	0.8	1	52.711			
Sum Weight:	7.71	34.21						OTM	3065.95 kip-ft	35.04		

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	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	0.85	1	6.802	0.71	71.06	B
			B	0.258	2.415	0.604	0.85	1	7.693			
			C	0.154	2.758	0.582	0.85	1	4.448			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	0.85	1	11.089	1.46	97.62	B
			B	0.407	2.05	0.654	0.85	1	19.029			
			C	0.142	2.799	0.58	0.85	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	0.85	1	24.466	2.05	102.27	B
			B	0.417	2.031	0.659	0.85	1	27.629			
			C	0.152	2.763	0.582	0.85	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	0.85	1	31.780	2.02	202.03	A
			B	0.536	1.857	0.717	0.85	1	26.270			
			C	0.459	1.958	0.678	0.85	1	21.649			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	0.85	1	65.424	4.16	207.76	A
			B	0.454	1.967	0.675	0.85	1	52.234			
			C	0.411	2.043	0.656	0.85	1	46.453			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	0.85	1	65.936	4.22	211.17	A
			B	0.389	2.086	0.647	0.85	1	54.233			
			C	0.339	2.196	0.629	0.85	1	46.617			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	0.85	1	71.409	4.47	223.37	A
			B	0.373	2.12	0.641	0.85	1	62.678			
			C	0.31	2.269	0.619	0.85	1	51.035			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	0.85	1	70.111	4.31	215.72	A
			B	0.325	2.232	0.624	0.85	1	62.110			
			C	0.26	2.409	0.604	0.85	1	48.778			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	0.85	1	74.705	4.30	214.87	A
			B	0.306	2.28	0.618	0.85	1	67.027			
			C	0.249	2.44	0.602	0.85	1	53.994			
T10 42.00-	1.00	4.94	A	0.309	2.273	0.619	0.85	1	74.486	3.92	195.79	A

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	24 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
22.00			B	0.274	2.366	0.608	0.85	1	67.226			
			C	0.224	2.519	0.596	0.85	1	54.478			
T11 22.00-	0.77	5.57	A	0.252	2.43	0.602	0.85	1	68.167	3.83	191.62	A
2.00			B	0.237	2.478	0.599	0.85	1	65.130			
			C	0.196	2.611	0.59	0.85	1	54.157			
Sum Weight:	7.71	34.21						OTM	3094.63 kip-ft	35.45		

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M _x	Sum of Overturning Moments, M _z	Sum of Torques
	K	K	K	kip-ft	kip-ft	kip-ft
Leg Weight	23.57					
Bracing Weight	9.15					
Total Member Self-Weight	32.72			5.42	4.22	
Gusset Weight	1.49					
Total Weight	48.50			5.42	4.22	
Wind 0 deg - No Ice		-0.38	-49.78	-4940.84	41.74	1.39
Wind 30 deg - No Ice		24.13	-42.03	-4141.01	-2547.68	2.52
Wind 60 deg - No Ice		42.37	-23.85	-2274.02	-4439.91	5.78
Wind 90 deg - No Ice		49.07	0.86	125.80	-5069.12	-3.68
Wind 120 deg - No Ice		43.72	24.81	2518.50	-4493.07	0.48
Wind 150 deg - No Ice		25.59	41.52	4203.32	-2700.23	2.38
Wind 180 deg - No Ice		0.21	48.41	4936.65	-128.19	-4.22
Wind 210 deg - No Ice		-25.32	41.31	4163.47	2592.73	-0.30
Wind 240 deg - No Ice		-43.34	24.90	2497.66	4398.01	-0.20
Wind 270 deg - No Ice		-49.10	-0.20	45.81	5017.83	3.73
Wind 300 deg - No Ice		-42.44	-24.30	-2387.50	4360.96	3.83
Wind 330 deg - No Ice		-24.57	-42.06	-4200.55	2506.99	1.63
Member Ice	15.21					
Gusset Ice	0.38					
Total Weight Ice	78.61			6.72	25.42	
Wind 0 deg - Ice		-0.41	-75.44	-7740.82	64.03	-6.45
Wind 30 deg - Ice		37.03	-64.43	-6570.27	-3935.36	-7.08
Wind 60 deg - Ice		64.83	-36.82	-3674.60	-6862.58	-2.70
Wind 90 deg - Ice		74.95	0.90	130.43	-7865.16	-9.46
Wind 120 deg - Ice		65.99	37.62	3921.27	-6906.38	-0.19
Wind 150 deg - Ice		38.56	63.87	6636.12	-4092.27	6.83
Wind 180 deg - Ice		0.22	74.30	7751.14	-110.53	3.92
Wind 210 deg - Ice		-38.28	63.65	6595.22	4024.12	9.61
Wind 240 deg - Ice		-65.59	37.73	3900.15	6850.85	8.58
Wind 270 deg - Ice		-74.99	-0.23	47.95	7854.70	9.70
Wind 300 deg - Ice		-64.91	-37.29	-3791.17	6823.60	5.11
Wind 330 deg - Ice		-37.51	-64.45	-6631.29	3935.79	-2.35
Total Weight	48.50			5.42	4.22	
Wind 0 deg - Service		-0.38	-49.78	-4941.05	24.20	1.39
Wind 30 deg - Service		24.13	-42.03	-4141.22	-2565.22	2.52
Wind 60 deg - Service		42.37	-23.85	-2274.22	-4457.45	5.78
Wind 90 deg - Service		49.07	0.86	125.59	-5086.66	-3.68
Wind 120 deg - Service		43.72	24.81	2518.30	-4510.61	0.48
Wind 150 deg - Service		25.59	41.52	4203.11	-2717.78	2.38
Wind 180 deg - Service		0.21	48.41	4936.44	-145.74	-4.22
Wind 210 deg - Service		-25.32	41.31	4163.26	2575.19	-0.30
Wind 240 deg - Service		-43.34	24.90	2497.46	4380.47	-0.20

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	25 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
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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
Wind 270 deg - Service		-49.10	-0.20	45.60	5000.29	3.73
Wind 300 deg - Service		-42.44	-24.30	-2387.70	4343.42	3.83
Wind 330 deg - Service		-24.57	-42.06	-4200.76	2489.44	1.63

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	197 - 187	Leg	Max Tension	17	3.78	0.58	-0.16

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	187 - 172	Diagonal	Max. Compression	19	-5.41	0.60	0.30
			Max. Mx	17	-0.38	0.62	-0.06
			Max. My	21	-0.52	0.25	0.53
			Max. Vy	17	1.18	-0.11	0.01
			Max. Vx	21	1.04	-0.05	-0.10
			Max Tension	20	1.41	0.00	0.00
			Max. Compression	20	-1.56	0.00	0.00
			Max. Mx	19	0.48	-0.00	0.00
			Max. My	16	-1.28	-0.00	-0.00
			Max. Vy	19	-0.00	-0.00	0.00
		Top Girt	Max. Vx	16	0.00	-0.00	-0.00
			Max Tension	17	0.22	0.00	0.00
			Max. Compression	20	-0.31	0.00	0.00
			Max. Mx	14	-0.01	-0.02	0.00
			Max. My	16	-0.12	0.00	-0.00
		Bottom Girt	Max. Vy	14	0.02	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	17	0.75	0.00	0.00
			Max. Compression	19	-0.85	0.00	0.00
			Max. Mx	14	0.01	0.01	0.00
		Leg	Max. My	23	0.34	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
			Max Tension	17	24.18	-0.42	0.25
			Max. Compression	19	-30.52	-0.46	-0.33
		Diagonal	Max. Mx	18	-24.63	1.56	0.30
			Max. My	21	19.37	0.22	1.52
			Max. Vy	18	3.13	-0.48	-0.17
			Max. Vx	21	3.03	-0.04	-0.47
			Max Tension	20	4.17	0.00	0.00
		Top Girt	Max. Compression	20	-4.21	0.00	0.00
			Max. Mx	19	0.82	-0.00	0.00
			Max. My	20	-4.21	-0.00	-0.00
			Max. Vy	19	-0.00	-0.00	0.00
			Max. Vx	20	0.00	-0.00	-0.00
		Bottom Girt	Max Tension	19	0.99	0.00	0.00
			Max. Compression	17	-0.89	0.00	0.00
			Max. Mx	14	-0.01	0.01	0.00
			Max. My	23	-0.40	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
T3	172 - 152	Leg	Max. Vx	23	-0.00	0.00	0.00
			Max Tension	17	1.82	0.00	0.00
			Max. Compression	19	-1.97	0.00	0.00
			Max. Mx	14	0.01	0.01	0.00
			Max. My	24	0.12	0.00	-0.00
		Diagonal	Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
			Max Tension	17	78.86	2.13	0.06
			Max. Compression	19	-90.54	-2.18	-0.04
			Max. Mx	19	-34.13	2.40	0.17
			Max. My	18	1.54	-0.18	2.15
			Max. Vy	19	-6.66	1.97	0.17
		Top Girt	Max. Vx	18	-3.95	-0.14	0.76
			Max Tension	20	6.98	0.00	0.00
			Max. Compression	20	-6.93	0.00	0.00
			Max. Mx	19	0.70	-0.01	0.00
			Max. My	20	-4.86	-0.00	-0.00
		Bottom Girt	Max. Vy	18	-0.01	-0.01	0.00
			Max. Vx	20	0.00	-0.00	-0.00
			Max Tension	19	1.99	0.00	0.00
		Top Girt	Max. Compression	17	-1.84	0.00	0.00

RISA Tower

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Rocky Hill, CT 06067
Phone: (860) 529-8882
FAX: (860) 529-3991

Job

U20.0x195' PiROD Lattice Tower

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Project

Surdan Mountain Road, Sharon, CT

Date

11:44:20 07/24/08

Client

Northeast Utilities System

Designed by

Staff

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T4	152 - 142	Bottom Girt	Max. Mx	14	-0.00	0.01	0.00
			Max. My	23	-0.98	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	23	0.00	0.00	0.00
			Max Tension	17	1.84	0.00	0.00
			Max. Compression	19	-1.87	0.00	0.00
		Leg	Max. Mx	14	0.25	0.01	0.00
			Max. My	16	0.29	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	17	86.11	2.74	-0.14
			Max. Compression	19	-97.22	17.62	0.24
		Diagonal	Max. Mx	19	-97.22	17.62	0.24
			Max. My	18	1.37	-0.56	13.60
			Max. Vy	17	2.50	-17.44	-0.42
			Max. Vx	18	-2.33	-0.56	13.60
			Max Tension	17	9.25	0.05	0.01
			Max. Compression	23	-9.92	0.00	0.00
T5	142 - 122	Leg	Max. Mx	18	8.25	0.05	0.01
			Max. My	23	-9.86	-0.02	-0.04
			Max. Vy	18	0.02	0.05	0.01
			Max. Vx	22	0.01	0.00	0.00
			Max Tension	17	141.75	0.71	-0.93
			Max. Compression	19	-158.94	16.69	0.07
		Diagonal	Max. Mx	19	-158.94	16.69	0.07
			Max. My	18	-0.26	-0.46	12.16
			Max. Vy	19	-2.03	16.22	0.05
			Max. Vx	22	-0.59	-0.29	10.57
			Max Tension	22	9.95	0.09	-0.01
			Max. Compression	16	-10.86	0.00	0.00
T6	122 - 102	Leg	Max. Mx	19	7.97	0.19	-0.01
			Max. My	22	-10.66	-0.08	-0.03
			Max. Vy	19	-0.05	0.19	-0.01
			Max. Vx	22	0.01	0.00	0.00
			Max Tension	17	191.48	-1.45	-0.78
			Max. Compression	19	-215.64	17.04	-0.08
		Diagonal	Max. Mx	19	-215.64	17.04	-0.08
			Max. My	20	2.01	-1.48	-14.09
			Max. Vy	23	-2.32	16.65	-0.39
			Max. Vx	26	-1.33	-1.10	13.86
			Max Tension	21	10.43	0.00	0.00
			Max. Compression	15	-11.78	0.00	0.00
T7	102 - 82	Leg	Max. Mx	19	6.72	0.15	-0.01
			Max. My	26	-10.58	-0.06	0.03
			Max. Vy	19	-0.04	0.15	-0.01
			Max. Vx	26	-0.01	-0.06	0.03
			Max Tension	17	243.56	-2.13	-0.64
			Max. Compression	19	-275.50	13.37	-0.05
		Diagonal	Max. Mx	17	216.59	-13.44	-0.55
			Max. My	18	-3.46	-0.88	11.50
			Max. Vy	23	-1.56	13.29	-0.11
			Max. Vx	26	-1.31	-0.52	11.33
			Max Tension	24	11.68	0.00	0.00
			Max. Compression	24	-11.77	0.00	0.00
		Top Girt	Max. Mx	19	10.00	0.13	-0.00
			Max. My	25	-9.22	-0.02	0.03
			Max. Vy	19	-0.04	0.13	-0.00
			Max. Vx	25	-0.01	0.00	0.00
			Max Tension	17	5.43	0.00	0.00
			Max. Compression	19	-3.59	0.00	0.00
			Max. Mx	14	1.05	-0.08	0.00

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	28 of 41
	Project	Surdan Mountain Road, Sharon, CT	Date	11:44:20 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T8	82 - 62	Leg	Max. My	26	0.76	0.00	0.00
			Max. Vy	14	0.03	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
			Max Tension	17	291.60	-2.38	-0.44
			Max. Compression	19	-328.67	12.40	-0.08
			Max. Mx	17	267.29	-13.54	-0.34
		Diagonal	Max. My	18	-7.45	-0.43	11.02
			Max. Vy	17	1.44	-13.54	-0.34
			Max. Vx	18	-0.92	-0.43	11.02
			Max Tension	16	11.74	0.00	0.00
			Max. Compression	16	-12.38	0.00	0.00
			Max. Mx	19	9.52	0.18	-0.01
		Leg	Max. My	25	-10.47	-0.02	0.01
			Max. Vy	19	-0.05	0.18	-0.01
			Max. Vx	25	-0.00	0.00	0.00
			Max Tension	25	337.06	-3.60	-0.02
			Max. Compression	19	-380.41	11.70	-0.08
			Max. Mx	19	-355.77	12.62	-0.06
T9	62 - 42	Leg	Max. My	18	-12.03	-0.69	9.66
			Max. Vy	19	-1.24	12.62	-0.06
			Max. Vx	26	-0.70	-0.43	9.54
			Max Tension	16	12.12	0.00	0.00
			Max. Compression	16	-12.61	0.00	0.00
			Max. Mx	19	10.23	0.17	-0.01
		Diagonal	Max. My	16	-12.57	-0.02	0.02
			Max. Vy	19	-0.05	0.17	-0.01
			Max. Vx	16	-0.00	0.00	0.00
			Max Tension	25	378.43	-2.03	0.08
			Max. Compression	19	-429.64	4.81	-0.04
			Max. Mx	25	377.89	-14.78	-0.05
		Leg	Max. My	18	-13.39	1.95	9.07
			Max. Vy	17	1.43	-14.73	-0.08
			Max. Vx	26	-0.37	2.18	8.94
			Max Tension	16	13.79	0.00	0.00
			Max. Compression	16	-13.45	0.00	0.00
			Max. Mx	19	10.10	0.22	-0.01
T10	42 - 22	Leg	Max. My	16	-13.40	-0.03	0.02
			Max. Vy	19	-0.06	0.22	-0.01
			Max. Vx	16	-0.00	0.00	0.00
			Max Tension	25	414.07	2.52	0.29
			Max. Compression	19	-478.18	2.05	0.00
			Max. Mx	19	-451.25	18.34	-0.10
		Diagonal	Max. My	18	-14.94	8.70	12.44
			Max. Vy	15	-2.23	18.24	0.04
			Max. Vx	16	-1.41	7.61	-10.12
			Max Tension	16	17.39	0.00	0.00
			Max. Compression	16	-15.37	0.00	0.00
			Max. Mx	19	8.93	0.26	-0.01
		Leg	Max. My	16	-15.32	0.04	0.03
			Max. Vy	25	0.07	0.25	0.02
			Max. Vx	16	-0.00	0.00	0.00
T11	22 - 2	Leg					
		Diagonal					

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
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RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	29 of 41
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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	23	484.16	37.00	-21.67
	Max. H _x	23	484.16	37.00	-21.67
	Max. H _z	17	-425.82	-43.86	25.62
	Min. Vert	17	-425.82	-43.86	25.62
	Min. H _x	17	-425.82	-43.86	25.62
	Min. H _z	23	484.16	37.00	-21.67
Leg B	Max. Vert	19	487.60	-37.33	-21.56
	Max. H _x	25	-427.23	44.04	25.70
	Max. H _z	25	-427.23	44.04	25.70
	Min. Vert	25	-427.23	44.04	25.70
	Min. H _x	19	487.60	-37.33	-21.56
	Min. H _z	19	487.60	-37.33	-21.56
Leg A	Max. Vert	15	475.90	-0.21	42.63
	Max. H _x	24	23.43	3.47	-3.98
	Max. H _z	15	475.90	-0.21	42.63
	Min. Vert	21	-424.10	0.21	-50.63
	Min. H _x	18	18.62	-3.44	-4.69
	Min. H _z	21	-424.10	0.21	-50.63

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	48.50	0.00	0.00	5.42	4.23	0.00
Dead+Wind 0 deg - No Ice	48.50	-0.38	-49.78	-4961.07	42.10	1.31
Dead+Wind 30 deg - No Ice	48.50	24.13	-42.03	-4157.83	-2558.39	2.56
Dead+Wind 60 deg - No Ice	48.50	42.37	-23.85	-2283.01	-4458.61	5.87
Dead+Wind 90 deg - No Ice	48.50	49.07	0.86	126.52	-5090.28	-3.64
Dead+Wind 120 deg - No Ice	48.50	43.72	24.81	2528.87	-4511.88	0.48
Dead+Wind 150 deg - No Ice	48.50	25.59	41.52	4220.63	-2711.81	2.35
Dead+Wind 180 deg - No Ice	48.50	0.21	48.41	4957.04	-129.33	-4.27
Dead+Wind 210 deg - No Ice	48.50	-25.32	41.31	4180.44	2603.39	-0.25
Dead+Wind 240 deg - No Ice	48.50	-43.34	24.90	2507.84	4416.02	-0.17
Dead+Wind 270 deg - No Ice	48.50	-49.10	-0.20	45.92	5038.54	3.74
Dead+Wind 300 deg - No Ice	48.50	-42.44	-24.30	-2397.44	4378.97	3.80
Dead+Wind 330 deg - No Ice	48.50	-24.57	-42.06	-4217.88	2517.33	1.57
Dead+Ice+Temp	78.61	0.00	-0.00	6.72	25.47	0.00
Dead+Wind 0 deg+Ice+Temp	78.61	-0.41	-75.44	-7788.91	64.76	-6.74
Dead+Wind 30 deg+Ice+Temp	78.61	37.03	-64.43	-6610.79	-3960.32	-7.11
Dead+Wind 60 deg+Ice+Temp	78.61	64.83	-36.82	-3696.96	-6905.94	-2.63
Dead+Wind 90 deg+Ice+Temp	78.61	74.95	0.90	131.36	-7914.60	-9.42
Dead+Wind 120 deg+Ice+Temp	78.61	65.99	37.62	3945.70	-6949.91	-0.11
Dead+Wind 150 deg+Ice+Temp	78.61	38.56	63.87	6677.54	-4118.32	6.95
Dead+Wind 180 deg+Ice+Temp	78.61	0.22	74.30	7799.49	-112.13	4.00
Dead+Wind 210 deg+Ice+Temp	78.61	-38.28	63.65	6636.07	4049.07	9.80
Dead+Wind 240 deg+Ice+Temp	78.61	-65.59	37.73	3924.26	6893.40	8.70
Dead+Wind 270 deg+Ice+Temp	78.61	-74.99	-0.23	47.96	7903.67	9.76
Dead+Wind 300 deg+Ice+Temp	78.61	-64.91	-37.29	-3814.93	6866.14	4.98
Dead+Wind 330 deg+Ice+Temp	78.61	-37.51	-64.45	-6672.55	3960.47	-2.64
Dead+Wind 0 deg - Service	48.50	-0.38	-49.78	-4961.07	42.10	1.31
Dead+Wind 30 deg - Service	48.50	24.13	-42.03	-4157.83	-2558.39	2.56
Dead+Wind 60 deg - Service	48.50	42.37	-23.85	-2283.01	-4458.61	5.87
Dead+Wind 90 deg - Service	48.50	49.07	0.86	126.52	-5090.28	-3.64
Dead+Wind 120 deg - Service	48.50	43.72	24.81	2528.87	-4511.88	0.48
Dead+Wind 150 deg - Service	48.50	25.59	41.52	4220.63	-2711.81	2.35
Dead+Wind 180 deg - Service	48.50	0.21	48.41	4957.04	-129.33	-4.27

RISA Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	30 of 41
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Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Dead+Wind 210 deg - Service	48.50	-25.32	41.31	4180.44	2603.39	-0.25
Dead+Wind 240 deg - Service	48.50	-43.34	24.90	2507.84	4416.02	-0.17
Dead+Wind 270 deg - Service	48.50	-49.10	-0.20	45.92	5038.54	3.74
Dead+Wind 300 deg - Service	48.50	-42.44	-24.30	-2397.44	4378.97	3.80
Dead+Wind 330 deg - Service	48.50	-24.57	-42.06	-4217.88	2517.33	1.57

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	0.00	-48.50	0.00	0.00	48.50	0.00	0.000%
2	-0.38	-48.50	-49.78	0.38	48.50	49.78	0.000%
3	24.13	-48.50	-42.03	-24.13	48.50	42.03	0.000%
4	42.37	-48.50	-23.85	-42.37	48.50	23.85	0.000%
5	49.07	-48.50	0.86	-49.07	48.50	-0.86	0.000%
6	43.72	-48.50	24.81	-43.72	48.50	-24.81	0.000%
7	25.59	-48.50	41.52	-25.59	48.50	-41.52	0.000%
8	0.21	-48.50	48.41	-0.21	48.50	-48.41	0.000%
9	-25.32	-48.50	41.31	25.32	48.50	-41.31	0.000%
10	-43.34	-48.50	24.90	43.34	48.50	-24.90	0.000%
11	-49.10	-48.50	-0.20	49.10	48.50	0.20	0.000%
12	-42.44	-48.50	-24.30	42.44	48.50	24.30	0.000%
13	-24.57	-48.50	-42.06	24.57	48.50	42.06	0.000%
14	0.00	-78.61	0.00	-0.00	78.61	0.00	0.000%
15	-0.41	-78.61	-75.44	0.41	78.61	75.44	0.000%
16	37.03	-78.61	-64.43	-37.03	78.61	64.43	0.000%
17	64.83	-78.61	-36.82	-64.83	78.61	36.82	0.000%
18	74.95	-78.61	0.90	-74.95	78.61	-0.90	0.000%
19	65.99	-78.61	37.62	-65.99	78.61	-37.62	0.000%
20	38.56	-78.61	63.87	-38.56	78.61	-63.87	0.000%
21	0.22	-78.61	74.30	-0.22	78.61	-74.30	0.000%
22	-38.28	-78.61	63.65	38.28	78.61	-63.65	0.000%
23	-65.59	-78.61	37.73	65.59	78.61	-37.73	0.000%
24	-74.99	-78.61	-0.23	74.99	78.61	0.23	0.000%
25	-64.91	-78.61	-37.29	64.91	78.61	37.29	0.000%
26	-37.51	-78.61	-64.45	37.51	78.61	64.45	0.000%
27	-0.38	-48.50	-49.78	0.38	48.50	49.78	0.000%
28	24.13	-48.50	-42.03	-24.13	48.50	42.03	0.000%
29	42.37	-48.50	-23.85	-42.37	48.50	23.85	0.000%
30	49.07	-48.50	0.86	-49.07	48.50	-0.86	0.000%
31	43.72	-48.50	24.81	-43.72	48.50	-24.81	0.000%
32	25.59	-48.50	41.52	-25.59	48.50	-41.52	0.000%
33	0.21	-48.50	48.41	-0.21	48.50	-48.41	0.000%
34	-25.32	-48.50	41.31	25.32	48.50	-41.31	0.000%
35	-43.34	-48.50	24.90	43.34	48.50	-24.90	0.000%
36	-49.10	-48.50	-0.20	49.10	48.50	0.20	0.000%
37	-42.44	-48.50	-24.30	42.44	48.50	24.30	0.000%
38	-24.57	-48.50	-42.06	24.57	48.50	42.06	0.000%

Non-Linear Convergence Results

RISATower

URS Corporation
500 Enterprise Drive, Suite 3B
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Job

U20.0x195' PiROD Lattice Tower

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Project

Surdan Mountain Road, Sharon, CT

Date

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Client

Northeast Utilities System

Designed by

Staff

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00028904
2	Yes	5	0.00000001	0.00064814
3	Yes	5	0.00000001	0.00065943
4	Yes	5	0.00000001	0.00068102
5	Yes	5	0.00000001	0.00067431
6	Yes	5	0.00000001	0.00066590
7	Yes	5	0.00000001	0.00067229
8	Yes	5	0.00000001	0.00067587
9	Yes	5	0.00000001	0.00065152
10	Yes	5	0.00000001	0.00064478
11	Yes	5	0.00000001	0.00066240
12	Yes	5	0.00000001	0.00067515
13	Yes	5	0.00000001	0.00066400
14	Yes	4	0.00000001	0.00054830
15	Yes	5	0.00000001	0.00065234
16	Yes	5	0.00000001	0.00066662
17	Yes	5	0.00000001	0.00068835
18	Yes	5	0.00000001	0.00067676
19	Yes	5	0.00000001	0.00066462
20	Yes	5	0.00000001	0.00067455
21	Yes	5	0.00000001	0.00068431
22	Yes	5	0.00000001	0.00066042
23	Yes	5	0.00000001	0.00065017
24	Yes	5	0.00000001	0.00066909
25	Yes	5	0.00000001	0.00068483
26	Yes	5	0.00000001	0.00067013
27	Yes	5	0.00000001	0.00064814
28	Yes	5	0.00000001	0.00065943
29	Yes	5	0.00000001	0.00068102
30	Yes	5	0.00000001	0.00067431
31	Yes	5	0.00000001	0.00066590
32	Yes	5	0.00000001	0.00067229
33	Yes	5	0.00000001	0.00067587
34	Yes	5	0.00000001	0.00065152
35	Yes	5	0.00000001	0.00064478
36	Yes	5	0.00000001	0.00066240
37	Yes	5	0.00000001	0.00067515
38	Yes	5	0.00000001	0.00066400

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	197 - 187	20.369	31	0.8775	0.1662
T2	187 - 172	18.484	31	0.8728	0.1443
T3	172 - 152	15.660	31	0.8296	0.0980
T4	152 - 142	12.264	31	0.6888	0.0534
T5	142 - 122	10.280	31	0.6576	0.0283
T6	122 - 102	7.097	31	0.5284	0.0186
T7	102 - 82	4.765	31	0.4121	0.0183
T8	82 - 62	2.990	31	0.3285	0.0109
T9	62 - 42	1.667	31	0.2257	0.0074
T10	42 - 22	0.760	31	0.1512	0.0041
T11	22 - 2	0.219	31	0.0673	0.0012

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Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
196.26	Single Dipole	31	20.231	0.8773	0.1648	26718
194.92	6"x4" Pipe Mount	31	19.980	0.8770	0.1622	26718
194.25	PA6-65AC	31	19.854	0.8768	0.1608	26718
192.75	9' x 3" Dia Omni	31	19.573	0.8763	0.1578	26718
190.25	OGT9-840	31	19.102	0.8752	0.1523	20214
188.75	9' x 3" Dia Omni	31	18.818	0.8743	0.1488	18153
187.25	DB222-A	31	18.532	0.8731	0.1449	18757
186.50	PiROD 4' Side Mount Standoff (1)	31	18.388	0.8724	0.1429	20645
182.25	PD220	31	17.569	0.8665	0.1302	33245
181.50	BCD87077	31	17.425	0.8650	0.1278	21439
181.25	PiROD 15' Rotatable Platform (Lattice)	31	17.376	0.8645	0.1270	19169
180.25	DB222-A	31	17.185	0.8622	0.1237	13466
175.25	12' x 3" Dia Omni	31	16.244	0.8458	0.1076	5471
174.25	10' x 3" Dia Omni	31	16.061	0.8414	0.1045	5017
173.75	ANT150D6-9	31	15.971	0.8390	0.1030	4866
172.25	PiROD 6' Side Mount Standoff (1)	31	15.704	0.8311	0.0987	4706
170.20	3' Sidearm	31	15.349	0.8185	0.0932	5333
163.25	PiROD 13' Lightweight T-Frame	31	14.202	0.7660	0.0776	22986
163.00	(4) 60"x12"x4" Panel	31	14.162	0.7640	0.0771	19743
157.00	Filter/Diplexer	31	13.164	0.7180	0.0649	4464
150.25	(2) 7770.00	31	11.925	0.6819	0.0488	4343
149.63	T-Arm (1)	31	11.803	0.6798	0.0472	5037
135.00	SD210-SF3P4LDF	31	9.027	0.6217	0.0196	3656
133.00	PD220	31	8.700	0.6086	0.0194	3920
121.50	DB230-2A	31	7.030	0.5249	0.0186	6370
120.67	6' Rigid Side Arm w/ 3" STD mount pipe	31	6.921	0.5191	0.0187	6524
120.58	Folded Dipole	31	6.909	0.5184	0.0187	6539
120.50	6' Rigid Side Arm w/ 3" STD mount pipe	31	6.899	0.5179	0.0187	6552
115.00	SD210-SF3P4LDF	31	6.207	0.4817	0.0198	7181
112.00	PiROD 4' Side Mount Standoff (1)	31	5.851	0.4637	0.0199	7514
109.25	DB205-L	31	5.538	0.4483	0.0197	7848
106.00	Ice Canopy	31	5.182	0.4312	0.0193	8282
102.25	PA6-65AC	31	4.791	0.4133	0.0184	8793
101.20	6"x4" Pipe Mount	31	4.684	0.4085	0.0181	8917
100.67	6' Rigid Side Arm w/ 3" STD mount pipe	31	4.631	0.4062	0.0179	8975
95.00	DB586-Y	31	4.088	0.3827	0.0159	9517
94.00	DB224-A	31	3.996	0.3788	0.0155	9614
92.00	PiROD 4' Side Mount Standoff (1)	31	3.816	0.3708	0.0147	9815
90.41	PD220	31	3.677	0.3645	0.0141	9980
85.00	2' Sidearm	31	3.226	0.3421	0.0119	10581
81.00	SD110-SFXPASNM (SRL110A)	31	2.913	0.3237	0.0106	10922
79.50	6' Rigid Side Arm w/ 3" STD mount pipe	31	2.801	0.3163	0.0102	10979
70.25	DB432-A	31	2.161	0.2671	0.0084	11123
17.00	1.2M	31	0.143	0.0486	0.0009	16119
15.00	2' Sidearm	31	0.118	0.0416	0.0007	18599
12.58	1.2M	31	0.091	0.0334	0.0006	22853
11.00	2' Sidearm	31	0.075	0.0282	0.0005	26865
10.33	1.2M	31	0.068	0.0260	0.0005	29026
9.00	2' Sidearm	31	0.056	0.0218	0.0004	34540

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	197 - 187	30.688	19	1.2803	0.2089
T2	187 - 172	27.950	19	1.2752	0.1853
T3	172 - 152	23.828	19	1.2205	0.1359
T4	152 - 142	18.811	19	1.0287	0.0830
T5	142 - 122	15.839	19	0.9908	0.0549
T6	122 - 102	10.992	19	0.8096	0.0327
T7	102 - 82	7.392	19	0.6369	0.0231
T8	82 - 62	4.637	19	0.5093	0.0173
T9	62 - 42	2.583	19	0.3503	0.0140
T10	42 - 22	1.174	19	0.2347	0.0088
T11	22 - 2	0.335	19	0.1043	0.0036

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
196.26	Single Dipole	19	30.487	1.2801	0.2073	16930
194.92	6'x4" Pipe Mount	19	30.123	1.2798	0.2045	16930
194.25	PA6-65AC	19	29.941	1.2796	0.2030	16930
192.75	9' x 3" Dia Omni	19	29.533	1.2790	0.1997	16930
190.25	OGT9-840	19	28.848	1.2778	0.1939	12792
188.75	9' x 3" Dia Omni	19	28.435	1.2767	0.1901	11441
187.25	DB222-A	19	28.019	1.2754	0.1860	11831
186.50	PiROD 4' Side Mount Standoff (1)	19	27.810	1.2746	0.1838	12935
182.25	PD220	19	26.617	1.2679	0.1703	29017
181.50	BCD87077	19	26.407	1.2662	0.1677	17079
181.25	PiROD 15' Rotatable Platform (Lattice)	19	26.336	1.2656	0.1669	15019
180.25	DB222-A	19	26.057	1.2628	0.1634	10131
175.25	12' x 3" Dia Omni	19	24.682	1.2420	0.1462	3899
174.25	10' x 3" Dia Omni	19	24.415	1.2362	0.1429	3566
173.75	ANT150D6-9	19	24.283	1.2330	0.1413	3457
172.25	PiROD 6' Side Mount Standoff (1)	19	23.892	1.2224	0.1366	3347
170.20	3' Sidearm	19	23.373	1.2054	0.1307	3835
163.25	PiROD 13' Lightweight T-Frame	19	21.687	1.1333	0.1131	13193
163.00	(4) 60"x12"x4" Panel	19	21.627	1.1306	0.1125	11503
157.00	Filter/Diplexer	19	20.151	1.0675	0.0976	2820
150.25	(2) 7770.00	19	18.305	1.0200	0.0771	2727
149.63	T-Arm (1)	19	18.122	1.0174	0.0749	3139
135.00	SD210-SF3P4LDF	19	13.943	0.9424	0.0421	2557
133.00	PD220	19	13.446	0.9241	0.0395	2735
121.50	DB230-2A	19	10.890	0.8045	0.0325	4339
120.67	6' Rigid Side Arm w/ 3" STD mount pipe	19	10.722	0.7960	0.0322	4435
120.58	Folded Dipole	19	10.704	0.7950	0.0321	4444
120.50	6' Rigid Side Arm w/ 3" STD mount pipe	19	10.688	0.7942	0.0321	4452
115.00	SD210-SF3P4LDF	19	9.622	0.7411	0.0296	4826
112.00	PiROD 4' Side Mount Standoff (1)	19	9.072	0.7144	0.0281	5017
109.25	DB205-L	19	8.588	0.6913	0.0267	5207
106.00	Ice Canopy	19	8.037	0.6658	0.0251	5450
102.25	PA6-65AC	19	7.431	0.6386	0.0232	5737

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
101.20	6'8"x4" Pipe Mount	19	7.266	0.6315	0.0227	5809
100.67	6' Rigid Side Arm w/ 3" STD mount pipe	19	7.184	0.6280	0.0225	5844
95.00	DB586-Y	19	6.341	0.5923	0.0201	6185
94.00	DB224-A	19	6.199	0.5863	0.0197	6246
92.00	Pi rod 4' Side Mount Standoff (1)	19	5.920	0.5742	0.0189	6374
90.41	PD220	19	5.704	0.5646	0.0184	6479
85.00	2' Sidearm	19	5.004	0.5302	0.0176	6862
81.00	SD110-SFXPASNM (SRL110A)	19	4.519	0.5019	0.0171	7074
79.50	6' Rigid Side Arm w/ 3" STD mount pipe	19	4.344	0.4904	0.0170	7108
70.25	DB432-A	19	3.349	0.4145	0.0156	7175
17.00	1.2M	19	0.217	0.0753	0.0026	10296
15.00	2' Sidearm	19	0.179	0.0644	0.0023	11880
12.58	1.2M	19	0.138	0.0517	0.0018	14598
11.00	2' Sidearm	19	0.114	0.0437	0.0015	17160
10.33	1.2M	19	0.104	0.0403	0.0014	18541
9.00	2' Sidearm	19	0.085	0.0337	0.0012	22063

Bolt Design Data

Section No.	Elevation	Component Type	Bolt Grade	Bolt Size	Number Of Bolts	Maximum Load per Bolt	Allowable Load	Ratio Load Allowable	Allowable Ratio	Criteria
	ft			in		K	K			
T1	197	Leg	A325N	0.6250	5	1.08	12.89	0.084 ✓	1.333	Bolt DS
T2	187	Leg	A325N	0.7500	5	6.10	18.56	0.329 ✓	1.333	Bolt DS
T3	172	Leg	A325N	1.0000	6	13.14	34.48	0.381 ✓	1.333	Bolt Tension
T4	152	Leg	A325N	1.0000	6	14.35	34.55	0.415 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	9.25	8.16	1.134 ✓	1.333	Member Bearing
T5	142	Leg	A325N	1.0000	6	23.63	34.55	0.684 ✓	1.333	Bolt Tension
		Diagonal	A325X	1.0000	1	9.95	9.14	1.089 ✓	1.333	Member Bearing
T6	122	Leg	A325N	1.0000	6	31.92	34.55	0.924 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	10.43	8.16	1.279 ✓	1.333	Member Bearing
T7	102	Leg	A325N	1.0000	6	40.60	34.55	1.175 ✓	1.333	Bolt Tension
		Diagonal	A325X	1.0000	1	11.68	12.19	0.958 ✓	1.333	Member Bearing
		Top Girt	A325N	1.0000	1	5.43	8.16	0.666 ✓	1.333	Member Bearing
T8	82	Leg	A325N	1.2500	6	48.60	53.99	0.900 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	11.74	16.99	0.691 ✓	1.333	Member Bearing
T9	62	Leg	A325N	1.2500	6	56.18	53.99	1.040 ✓	1.333	Bolt Tension
		Diagonal	A325X	1.2500	1	12.12	15.23	0.796 ✓	1.333	Member Bearing
T10	42	Leg	A325N	1.2500	6	63.07	53.99	1.168 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	13.79	16.99	0.811 ✓	1.333	Member Bearing
T11	22	Leg	A687	1.2500	6	69.01	60.75	1.136 ✓	1.333	Bolt Tension
		Diagonal	A325X	1.2500	1	17.39	15.23	1.142 ✓	1.333	Member Bearing

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Client

Northeast Utilities System

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Compression Checks**Leg Design Data (Compression)**

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	197 - 187	1 3/4	10.00	2.17	59.4 K=1.00	22.818	2.4053	-5.41	54.88	0.099
T2	187 - 172	2	15.00	2.28	54.7 K=1.00	23.609	3.1416	-30.52	74.17	0.412
T3	172 - 152	2 1/4	20.00	2.34	50.0 K=1.00	24.349	3.9761	-90.54	96.81	0.935
T4	152 - 142	Pirol 105245	10.02	10.02	37.8 K=1.00	26.132	5.3014	-97.22	138.54	0.702
T5	142 - 122	Pirol 105217	20.03	10.02	37.8 K=1.00	26.132	5.3014	-158.94	138.54	1.147
T6	122 - 102	Pirol 105218	20.03	10.02	32.4 K=1.00	26.848	7.2158	-215.63	193.73	1.113
T7	102 - 82	Pirol 105218 reinf w /1" dia bar	20.03	10.02	26.4 K=1.00	27.587	10.8915	-275.50	300.46	0.917
T8	82 - 62	Pirol 105219	20.03	10.02	28.4 K=1.00	27.351	9.4248	-328.67	257.78	1.275
T9	62 - 42	Pirol 105219 reinf w /1" dia bar	20.03	10.02	24.4 K=1.00	27.822	13.1787	-380.41	366.66	1.038
T10	42 - 22	Pirol 105220	20.03	10.02	25.2 K=1.00	27.723	11.9282	-429.64	330.69	1.299
T11	22 - 2	Pirol 105220 reinf w /1" dia bar	20.03	10.02	24.3 K=1.00	27.824	14.7262	-478.18	409.75	1.167

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	F _a ksi	A in ²	Actual V K	Allow. V _a K	Stress Ratio
T4	152 - 142	0.5	1.47	120.0	14.277	0.1963	2.50	3.14	0.796
T5	142 - 122	0.5	1.47	120.0	14.277	0.1963	2.03	3.14	0.646
T6	122 - 102	0.5	1.46	119.0	14.476	0.1963	2.36	3.18	0.741
T7	102 - 82	0.5	1.44	117.4	14.785	0.1963	1.57	3.25	0.483
T8	82 - 62	0.625	1.45	94.4	18.988	0.3068	1.44	6.52	0.221
T9	62 - 42	0.625	1.43	93.3	19.179	0.3068	1.24	6.59	0.188

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Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in ²	Actual V K	Allow. V_a K	Stress Ratio
T10	42 - 22	0.625	1.43	93.6	19.119	0.3068	1.43	6.57	0.217
T11	22 - 2	0.625	1.42	92.9	19.248	0.3068	2.24	6.61	0.339

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in ²	Actual P K	Allow. P_a K	Ratio P P_a
T1	197 - 187	7/8	4.99	2.42	99.4 K=0.75	14.843	0.6013	-1.56	8.93	0.174
T2	187 - 172	7/8	5.04	2.43	99.9 K=0.75	14.727	0.6013	-4.21	8.86	0.475
T3	172 - 152	1	5.48	2.65	95.5 K=0.75	15.727	0.7854	-6.93	12.35	0.561
T4	152 - 142	L2 1/2x2 1/2x3/16	9.89	5.21	126.3 K=1.00	9.367	0.9020	-9.92	8.45	1.174
T5	142 - 122	L3x3x3/16	10.80	5.57	114.2 K=1.02	11.435	1.0900	-10.63	12.46	0.853
T6	122 - 102	L3x3x3/16	11.98	6.12	123.2 K=1.00	9.785	1.0900	-11.78	10.67	1.104
T7	102 - 82	L3x3x1/4	13.35	6.78	137.4 K=1.00	7.906	1.4400	-11.65	11.38	1.024
T8	82 - 62	L3x3x5/16	14.68	7.38	150.4 K=1.00	6.604	1.7800	-12.38	11.76	1.053
T9	62 - 42	L3 1/2x3 1/2x1/4	16.29	8.18	141.4 K=1.00	7.471	1.6900	-12.61	12.63	0.999
T10	42 - 22	L3 1/2x3 1/2x5/16	17.97	9.01	156.8 K=1.00	6.076	2.0900	-12.63	12.70	0.995
T11	22 - 2	L4x4x1/4	18.84	9.45	142.6 K=1.00	7.346	1.9400	-15.37	14.25	1.078

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in ²	Actual P K	Allow. P_a K	Ratio P P_a
T1	197 - 187	L3x3x5/16	4.50	4.35	88.7 K=1.00	14.357	1.7800	-0.31	25.56	0.012
T2	187 - 172	1	4.50	4.33	145.6 K=0.70	7.044	0.7854	-0.89	5.53	0.160
T3	172 - 152	1	4.52	4.33	145.4 K=0.70	7.061	0.7854	-1.84	5.55	0.332
T7	102 - 82	L3x3x3/16	10.00	8.63	173.7 K=1.00	4.952	1.0900	-3.59	5.40	0.665

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Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	197 - 187	7/8	4.50	4.35	167.2 K=0.70	5.342	0.6013	-0.85	3.21	0.263 ✓
T2	187 - 172	1	4.50	4.33	145.6 K=0.70	7.044	0.7854	-1.97	5.53	0.356 ✓
T3	172 - 152	1	4.98	4.80	161.2 K=0.70	5.748	0.7854	-1.87	4.51	0.415 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	197 - 187	1 3/4	10.00	2.17	59.4	32.500	1.3524	3.78	43.95	0.086 ✓
T2	187 - 172	2	15.00	2.28	54.7	32.500	1.7017	24.18	55.30	0.437 ✓
T3	172 - 152	2 1/4	20.00	2.34	50.0	30.000	3.9761	78.86	119.28	0.661 ✓
T4	152 - 142	PiROD 105245	10.02	10.02	37.8	30.000	5.3014	86.11	159.04	0.541 ✓
T5	142 - 122	PiROD 105217	20.03	10.02	37.8	30.000	5.3014	141.75	159.04	0.891 ✓
T6	122 - 102	PiROD 105218	20.03	10.02	32.4	30.000	7.2158	191.50	216.47	0.885 ✓
T7	102 - 82	PiROD 105218 reinf w /1" dia bar	20.03	10.02	26.4	30.000	10.8915	243.58	326.75	0.745 ✓
T8	82 - 62	PiROD 105219	20.03	10.02	28.4	30.000	9.4248	291.60	282.74	1.031 ✓
T9	62 - 42	PiROD 105219 reinf w /1" dia bar	20.03	10.02	24.4	30.000	13.1787	337.06	395.36	0.853 ✓
T10	42 - 22	PiROD 105220	20.03	10.02	25.2	30.000	11.9282	378.43	357.85	1.058 ✓
T11	22 - 2	PiROD 105220 reinf w /1" dia bar	20.03	10.02	24.3	30.000	14.7262	414.07	441.79	0.937 ✓

Truss-Leg Diagonal Data

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Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in ²	Actual V K	Allow. V_a K	Stress Ratio
T4	152 - 142	0.5	1.47	120.0	14.277	0.1963	2.50	3.14	0.796 ✓
T5	142 - 122	0.5	1.47	120.0	14.277	0.1963	2.03	3.14	0.646 ✓
T6	122 - 102	0.5	1.46	119.0	14.476	0.1963	2.36	3.18	0.741 ✓
T7	102 - 82	0.5	1.44	117.4	14.785	0.1963	1.57	3.25	0.483 ✓
T8	82 - 62	0.625	1.45	94.4	18.988	0.3068	1.44	6.52	0.221 ✓
T9	62 - 42	0.625	1.43	93.3	19.179	0.3068	1.24	6.59	0.188 ✓
T10	42 - 22	0.625	1.43	93.6	19.119	0.3068	1.43	6.57	0.217 ✓
T11	22 - 2	0.625	1.42	92.9	19.248	0.3068	2.24	6.61	0.339 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in ²	Actual P K	Allow. P_a K	Ratio P P_a
T1	197 - 187	7/8	4.99	2.42	132.5	30.000	0.6013	1.41	18.04	0.078 ✓
T2	187 - 172	7/8	5.04	2.43	133.2	30.000	0.6013	4.17	18.04	0.231 ✓
T3	172 - 152	1	5.48	2.65	127.4	30.000	0.7854	6.98	23.56	0.296 ✓
T4	152 - 142	L2 1/2x2 1/2x3/16	9.89	5.21	83.2	21.600	0.9020	9.25	19.48	0.475 ✓
T5	142 - 122	L3x3x3/16	10.31	5.36	70.9	32.500	0.8791	9.95	28.57	0.348 ✓
T6	122 - 102	L3x3x3/16	11.98	6.12	80.6	21.600	1.0900	10.43	23.54	0.443 ✓
T7	102 - 82	L3x3x1/4	13.35	6.78	89.9	32.500	1.1588	11.68	37.66	0.310 ✓
T8	82 - 62	L3x3x5/16	14.68	7.38	99.0	21.600	1.7800	11.74	38.45	0.305 ✓
T9	62 - 42	L3 1/2x3 1/2x1/4	16.29	8.18	92.5	32.500	1.3463	12.12	43.75	0.277 ✓
T10	42 - 22	L3 1/2x3 1/2x5/16	17.97	9.01	102.7	21.600	2.0900	13.79	45.14	0.305 ✓
T11	22 - 2	L4x4x1/4	19.72	9.88	97.1	32.500	1.5963	17.39	51.88	0.335 ✓

Top Girt Design Data (Tension)

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	197 - 187	L3x3x5/16	4.50	4.35	56.7	21.600	1.7800	0.22	38.45	0.006
T2	187 - 172	1	4.50	4.33	208.0	30.000	0.7854	0.99	23.56	0.042
T3	172 - 152	1	4.52	4.33	207.7	30.000	0.7854	1.99	23.56	0.084
T7	102 - 82	L3x3x3/16	10.00	8.63	115.0	21.600	1.0900	5.43	23.54	0.231

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	197 - 187	7/8	4.50	4.35	238.9	30.000	0.6013	0.75	18.04	0.041
T2	187 - 172	1	4.50	4.33	208.0	30.000	0.7854	1.82	23.56	0.077
T3	172 - 152	1	4.98	4.80	230.3	30.000	0.7854	1.84	23.56	0.078

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T1	197 - 187	Leg	1 3/4	2	-5.41	73.16	7.4	Pass
T2	187 - 172	Leg	2	34	24.18	73.72	32.8	Pass
T3	172 - 152	Leg	2 1/4	80	-90.54	129.05	70.2	Pass
T4	152 - 142	Leg	Pirol 105245	136	-89.64	184.67	59.7	Pass
T5	142 - 122	Leg	Pirol 105217	146	-158.94	184.67	86.1	Pass
T6	122 - 102	Leg	Pirol 105218	161	-215.63	258.24	83.5	Pass
T7	102 - 82	Leg	Pirol 105218 reinf w /1" dia bar	176	-275.50	400.52	68.8	Pass
							88.1 (b)	
T8	82 - 62	Leg	Pirol 105219	194	-328.67	343.62	95.6	Pass
T9	62 - 42	Leg	Pirol 105219 reinf w /1" dia bar	209	-380.41	488.76	77.8	Pass
							78.1 (b)	
T10	42 - 22	Leg	Pirol 105220	224	-429.64	440.81	97.5	Pass
T11	22 - 2	Leg	Pirol 105220 reinf w /1" dia bar	239	-478.18	546.19	87.5	Pass
T1	197 - 187	Diagonal	7/8	12	-1.56	11.90	13.1	Pass
T2	187 - 172	Diagonal	7/8	45	-4.21	11.80	35.7	Pass
T3	172 - 152	Diagonal	1	90	-6.93	16.46	42.1	Pass
T4	152 - 142	Diagonal	L2 1/2x2 1/2x3/16	144	-9.92	11.26	88.0	Pass
T5	142 - 122	Diagonal	L3x3x3/16	152	-10.63	16.62	64.0	Pass
							81.7 (b)	
T6	122 - 102	Diagonal	L3x3x3/16	167	-11.78	14.22	82.8	Pass
							95.9 (b)	
T7	102 - 82	Diagonal	L3x3x1/4	181	-11.65	15.17	76.8	Pass
T8	82 - 62	Diagonal	L3x3x5/16	200	-12.38	15.67	79.0	Pass
T9	62 - 42	Diagonal	L3 1/2x3 1/2x1/4	215	-12.61	16.83	74.9	Pass
T10	42 - 22	Diagonal	L3 1/2x3 1/2x5/16	230	-12.63	16.93	74.6	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T11	22 - 2	Diagonal	L4x4x1/4	251	-15.37	19.00	80.9	Pass
							85.6 (b)	
T1	197 - 187	Top Girt	L3x3x5/16	6	-0.31	34.07	0.9	Pass
T2	187 - 172	Top Girt	1	38	-0.89	7.37	12.0	Pass
T3	172 - 152	Top Girt	1	83	-1.84	7.39	24.9	Pass
T7	102 - 82	Top Girt	L3x3x3/16	180	-3.59	7.19	49.9	Pass
							50.0 (b)	
T1	197 - 187	Bottom Girt	7/8	9	-0.85	4.28	19.8	Pass
T2	187 - 172	Bottom Girt	1	42	-1.97	7.37	26.7	Pass
T3	172 - 152	Bottom Girt	1	87	-1.87	6.02	31.1	Pass
							Summary	
							Leg (T10)	Pass
							Diagonal (T6)	Pass
							Top Girt (T7)	Pass
							Bottom Girt (T3)	Pass
							Bolt Checks	Pass
							RATING =	Pass
							97.5	

Element Map

Section No.	Section Elevation ft	Component Type	Element List
T1	197.00-187.00	Leg	1-3
		Diagonal	10-33
		Top Girt	4-6
		Bottom Girt	7-9
T2	187.00-172.00	Leg	34-36
		Diagonal	43-78
		Top Girt	37-39
		Bottom Girt	40-42
T3	172.00-152.00	Leg	79-81
		Diagonal	88-135
		Top Girt	82-84
		Bottom Girt	85-87
T4	152.00-142.00	Leg	136-138
		Diagonal	139-144
T5	142.00-122.00	Leg	145-147
		Diagonal	148-159
T6	122.00-102.00	Leg	160-162
		Diagonal	163-174
T7	102.00-82.00	Leg	175-177
		Diagonal	181-192
		Top Girt	178-180
T8	82.00-62.00	Leg	193-195
		Diagonal	196-207
T9	62.00-42.00	Leg	208-210
		Diagonal	211-222
T10	42.00-22.00	Leg	223-225
		Diagonal	226-237
T11	22.00-2.00	Leg	238-240
		Diagonal	241-252
			Total number of elements: 252

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Program Version 5.1.1.4 - 2/25/2008 File:P:/08/Rev_1/ERI Files/90mph_wind_90mph_ice/195' PiRoD_Self_Support_Tower_Sharon_CT.eri

**70 MPH WITH ICE
(90 MPH WIND AT 195')**

<i>RISATower</i> URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	1 of 34
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Tower Input Data

The main tower is a 3x free standing tower with an overall height of 197.00 ft above the ground line.

The base of the tower is set at an elevation of 2.00 ft above the ground line.

The face width of the tower is 4.50 ft at the top and 20.00 ft at the base.

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

The following design criteria apply:

Tower is located in Litchfield County, Connecticut.

Basic wind speed of 70 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 70 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 70 mph.

Top of tower foundation taken as 2.0' above average grade..

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

Pressures are calculated at each section.

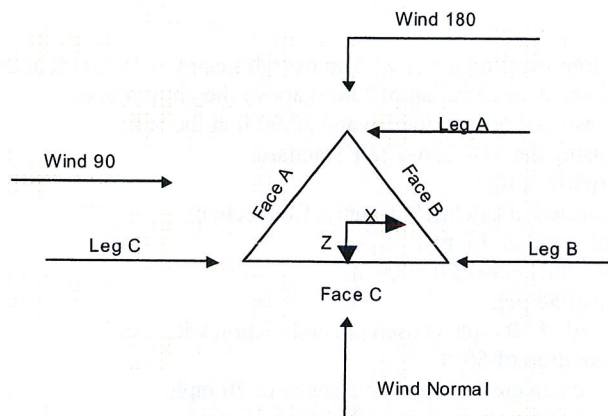
Stress ratio used in tower member design is 1.333.

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

Options

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

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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	197.00-187.00		V4.5 111574	4.50	1	10.00
T2	187.00-172.00		V4.5 111574	4.50	1	15.00
T3	172.00-152.00		H5.0 116640	4.50	1	20.00
T4	152.00-142.00		U6.0 105245	5.00	1	10.00
T5	142.00-122.00		U8.0 105217	6.00	1	20.00
T6	122.00-102.00		U10.0 105217 L3x3/16	8.00	1	20.00
T7	102.00-82.00		U12.0 105218	10.00	1	20.00
T8	82.00-62.00		U14.0 105218	12.00	1	20.00
T9	62.00-42.00		U16.0 105219	14.00	1	20.00
T10	42.00-22.00		U18.0 105219	16.00	1	20.00
T11	22.00-2.00		U20.0 105219 L3.5x5/16	18.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	197.00-187.00	2.17	X Brace	No	Steps	8.0160	8.0160
T2	187.00-172.00	2.28	X Brace	No	Steps	8.0160	8.0160
T3	172.00-152.00	2.34	X Brace	No	Steps	7.4880	7.4880
T4	152.00-142.00	10.00	X Brace	No	No	0.0000	0.0000

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Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	142.00-122.00	10.00	X Brace	No	No	0.0000	0.0000
T6	122.00-102.00	10.00	X Brace	No	No	0.0000	0.0000
T7	102.00-82.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	82.00-62.00	10.00	X Brace	No	No	0.0000	0.0000
T9	62.00-42.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	42.00-22.00	10.00	X Brace	No	No	0.0000	0.0000
T11	22.00-2.00	10.00	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 197.00-187.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 187.00-172.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 172.00-152.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 152.00-142.00	Truss Leg	PiROD 105245	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 142.00-122.00	Truss Leg	PiROD 105217	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A572-50 (50 ksi)
T6 122.00-102.00	Truss Leg	PiROD 105218	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T7 102.00-82.00	Truss Leg	PiROD 105218 reinf w /1" dia bar	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T8 82.00-62.00	Truss Leg	PiROD 105219	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T9 62.00-42.00	Truss Leg	PiROD 105219 reinf w /1" dia bar	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 42.00-22.00	Truss Leg	PiROD 105220	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T11 22.00-2.00	Truss Leg	PiROD 105220 reinf w /1" dia bar	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 197.00-187.00	Single Angle	L3x3x5/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 187.00-172.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 172.00-152.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 102.00-82.00	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

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Tower Section Geometry (cont'd)

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						
T1 197.00-187.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T2 187.00-172.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T3 172.00-152.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T4 152.00-142.00	1.78	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T5 142.00-122.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000
T6 122.00-102.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T7 102.00-82.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000
T8 82.00-62.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T9 62.00-42.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000
T10 42.00-22.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T11 22.00-2.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
ft				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 197.00-187.00	No	Yes	1	1	1	1	1	1	1	1
T2 187.00-172.00	No	Yes	1	1	1	1	1	1	1	1
T3 172.00-152.00	No	Yes	1	1	1	1	1	0.5	1	1
T4 152.00-142.00	Yes	No	1	1	1	1	1	0.5	1	1
T5 142.00-122.00	Yes	No	1	1	1	1	1	0.5	1	1
T6 122.00-102.00	Yes	No	1	1	1	1	1	1	1	1
T7 102.00-82.00	Yes	No	1	1	1	1	1	1	1	1
T8 82.00-62.00	Yes	No	1	1	1	1	1	1	1	1
T9 62.00-42.00	Yes	No	1	1	1	1	1	1	1	1
T10 42.00-22.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T11 22.00- 2.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

Tower Section Geometry (cont'd)

Truss-Leg K Factors						
Truss-Legs Used As Leg Members				Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 152.00- 142.00	1	0.5	0.85	1	0.5	0.85
T5 142.00- 122.00	1	0.5	0.85	1	0.5	0.85
T6 122.00- 102.00	1	0.5	0.85	1	0.5	0.85
T7 102.00- 82.00	1	0.5	0.85	1	0.5	0.85
T8 82.00- 62.00	1	0.5	0.85	1	0.5	0.85
T9 62.00- 42.00	1	0.5	0.85	1	0.5	0.85
T10 42.00- 22.00	1	0.5	0.85	1	0.5	0.85
T11 22.00- 2.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry (cont'd)

[illegible]

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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T2 187.00-172.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 172.00-152.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 152.00-142.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 142.00-122.00	Flange	1.0000 A325N	6	1.0000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 122.00-102.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 102.00-82.00	Flange	1.0000 A325N	6	1.0000 A325X	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 82.00-62.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 62.00-42.00	Flange	1.2500 A325N	6	1.2500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 42.00-22.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 22.00-2.00	Flange	1.2500 A687	6	1.2500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon - future)	A	Yes	Ar (CfAe)	165.00 - 7.00	2.0000	-0.35	12	6	1.9800	1.9800		1.04
1/2 (Alltel)	A	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.42	1	1	0.5800	0.5800		0.25
7/8 (Alltel)	A	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.445	4	4	1.1100	1.1100		0.54
7/8 (Alltel)	A	Yes	Ar (CfAe)	194.00 - 7.00	4.0000	-0.45	2	2	1.1100	1.1100		0.54
CR 50 1873 (1-5/8 FOAM) (AT&T/Cingular)	C	No	Ar (Leg)	150.00 - 10.00	0.0000	0.1	12	6	1.9800	1.9800		0.83
7/8	B	No	Ar (Leg)	152.00 - 8.50	0.0000	0.1	3	2	1.1100	1.1100		0.54
1 5/8	B	No	Ar (Leg)	152.00 - 8.50	0.0000	0.12	1	1	1.9800	1.9800		1.04
1/2	B	No	Ar (Leg)	152.00 - 8.50	0.0000	0.12	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.46	3	3	1.1100	1.1100		0.54
WE65	B	Yes	Af (CfAe)	194.00 - 7.00	2.0000	-0.44	1	1	1.5836	1.5836	5.1284	0.53
WE65	B	Yes	Af (CfAe)	102.00 - 7.00	2.0000	-0.425	1	1	1.5836	1.5836	5.1284	0.53
1/2	B	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.41	1	1	0.5800	0.5800		0.25
LDF2-50 (3/8 FOAM)	B	Yes	Ar (CfAe)	194.00 - 7.00	2.0000	-0.4	2	2	0.4400	0.4400		0.08
1 5/8 (CSP)	B	Yes	Ar (CfAe)	185.00 - 7.00	2.0000	-0.38	1	1	1.9800	1.9800		1.04
1 5/8 (CSP)	B	Yes	Ar (CfAe)	185.00 - 7.00	3.0000	-0.345	3	3	1.9800	1.9800		1.04
1/2	B	Yes	Ar (CfAe)	194.00 - 7.00	1.0000	-0.365	1	1	1.9800 0.5800	0.5800		0.25

RISA Tower

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U20.0x195' PiROD Lattice Tower

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Project

Surdan Mountain Road, Sharon, CT

Date

11:50:00 07/24/08

Client

Northeast Utilities System

Designed by

Staff

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8	B	Yes	Ar (CfAe)	194.00 - 7.00	1.0000	-0.34	2	2	1.9800	1.1100		0.54
LDF1-50A (1/4 FOAM)	B	No	Ar (Leg)	17.00 - 8.50	0.0000	0.08	3	3	1.1100	0.3500	0.3500	0.06
7/8 (NEU - prop)	A	No	Ar (Leg)	131.00 - 7.00	0.0000	0.08	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	110.00 - 7.00	0.0000	0.09	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	112.00 - 7.00	0.0000	0.1	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	92.00 - 7.00	0.0000	0.11	1	1	1.1100	1.1100		0.54
7/8 (NEU - prop)	A	No	Ar (Leg)	80.00 - 7.00	0.0000	0.12	1	1	1.1100	1.1100		0.54

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	197.00-187.00	A	4.223	0.000	0.000	0.000	0.02
		B	4.428	0.924	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
T2	187.00-172.00	A	9.050	0.000	0.000	0.000	0.05
		B	18.067	1.979	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
T3	172.00-152.00	A	24.937	0.000	0.000	0.000	0.23
		B	25.850	2.639	0.000	0.000	0.16
		C	0.000	0.000	0.000	0.000	0.00
T4	152.00-142.00	A	23.853	0.000	0.000	0.000	0.16
		B	16.908	1.320	0.000	0.000	0.11
		C	11.903	0.000	0.000	0.000	0.08
T5	142.00-122.00	A	52.499	0.000	0.000	0.000	0.32
		B	34.649	2.639	0.000	0.000	0.22
		C	27.767	0.000	0.000	0.000	0.20
T6	122.00-102.00	A	55.182	0.000	0.000	0.000	0.34
		B	37.332	2.639	0.000	0.000	0.22
		C	27.767	0.000	0.000	0.000	0.20
T7	102.00-82.00	A	58.142	0.000	0.000	0.000	0.36
		B	40.292	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T8	82.00-62.00	A	60.732	0.000	0.000	0.000	0.37
		B	42.882	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T9	62.00-42.00	A	60.917	0.000	0.000	0.000	0.37
		B	43.067	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T10	42.00-22.00	A	60.917	0.000	0.000	0.000	0.37
		B	43.067	5.279	0.000	0.000	0.23
		C	27.767	0.000	0.000	0.000	0.20
T11	22.00-2.00	A	42.718	0.000	0.000	0.000	0.28
		B	32.446	3.959	0.000	0.000	0.17
		C	18.001	0.000	0.000	0.000	0.12

RISA Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	9 of 34
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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 _{AAA} In Face ft ²	C _{AAA} Out Face ft ²	Weight K
T1	197.00-187.00	A	0.500	8.307	0.000	0.000	0.000	0.07
		B		8.838	1.826	0.000	0.000	0.09
		C		0.000	0.000	0.000	0.000	0.00
T2	187.00-172.00	A	0.500	17.800	0.000	0.000	0.000	0.15
		B		31.851	3.913	0.000	0.000	0.32
		C		0.000	0.000	0.000	0.000	0.00
T3	172.00-152.00	A	0.500	43.103	0.000	0.000	0.000	0.60
		B		45.117	5.217	0.000	0.000	0.45
		C		0.000	0.000	0.000	0.000	0.00
T4	152.00-142.00	A	0.500	38.687	0.000	0.000	0.000	0.41
		B		29.875	2.609	0.000	0.000	0.31
		C		19.237	0.000	0.000	0.000	0.23
T5	142.00-122.00	A	0.500	84.916	0.000	0.000	0.000	0.83
		B		61.332	5.217	0.000	0.000	0.62
		C		44.433	0.000	0.000	0.000	0.56
T6	122.00-102.00	A	0.500	90.015	0.000	0.000	0.000	0.87
		B		66.432	5.217	0.000	0.000	0.62
		C		44.433	0.000	0.000	0.000	0.56
T7	102.00-82.00	A	0.500	95.642	0.000	0.000	0.000	0.92
		B		72.058	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T8	82.00-62.00	A	0.500	100.565	0.000	0.000	0.000	0.96
		B		76.982	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T9	62.00-42.00	A	0.500	100.917	0.000	0.000	0.000	0.97
		B		77.333	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T10	42.00-22.00	A	0.500	100.917	0.000	0.000	0.000	0.97
		B		77.333	8.967	0.000	0.000	0.65
		C		44.433	0.000	0.000	0.000	0.56
T11	22.00-2.00	A	0.500	71.218	0.000	0.000	0.000	0.72
		B		57.859	7.717	0.000	0.000	0.49
		C		28.714	0.992	0.000	0.000	0.34

Feed Line Shielding

Section	Elevation ft	Face	A _R ft ²	A _R Ice ft ²	A _F ft ²	A _F Ice ft ²
T1	197.00-187.00	A	0.304	1.351	0.106	0.208
		B	0.385	1.766	0.134	0.271
		C	0.000	0.000	0.000	0.000
T2	187.00-172.00	A	0.692	2.889	0.000	0.000
		B	1.533	5.873	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	172.00-152.00	A	2.062	7.129	0.000	0.000
		B	2.356	8.416	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	152.00-142.00	A	0.000	0.925	1.376	2.312
		B	0.000	0.879	1.230	2.198
		C	0.000	0.000	0.000	0.000
T5	142.00-122.00	A	0.000	1.561	2.788	4.684
		B	0.000	1.484	2.492	4.452
		C	0.000	0.000	0.000	0.000

RISATower

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U20.0x195' PiROD Lattice Tower

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Project

Surdan Mountain Road, Sharon, CT

Date

11:50:00 07/24/08

Client

Northeast Utilities System

Designed by

Staff

Section	Elevation	Face	A_R	$A_{R\ Ice}$	A_F	$A_{F\ Ice}$
	ft		ft ²	ft ²	ft ²	ft ²
T6	122.00-102.00	A	0.000	1.336	2.386	4.008
		B	0.000	1.270	2.133	3.810
		C	0.000	0.000	0.000	0.000
T7	102.00-82.00	A	0.000	1.430	2.554	4.290
		B	0.000	1.475	2.495	4.424
		C	0.000	0.000	0.000	0.000
T8	82.00-62.00	A	0.000	1.126	2.011	3.379
		B	0.000	1.161	1.965	3.484
		C	0.000	0.000	0.000	0.000
T9	62.00-42.00	A	0.000	1.073	2.235	3.755
		B	0.000	1.106	2.183	3.871
		C	0.000	0.000	0.000	0.000
T10	42.00-22.00	A	0.000	1.035	2.157	3.624
		B	0.000	1.068	2.107	3.736
		C	0.000	0.000	0.000	0.000
T11	22.00-2.00	A	0.000	0.756	1.801	3.025
		B	0.000	0.780	1.759	3.119
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	$CP_{X\ Ice}$	$CP_{Z\ Ice}$
	ft	in	in	in	in
T1	197.00-187.00	-2.8982	-3.0791	-2.9267	-2.6393
T2	187.00-172.00	-2.3605	-7.2302	-2.7169	-6.0460
T3	172.00-152.00	-5.5148	-5.6944	-5.3389	-5.0503
T4	152.00-142.00	-4.7004	-0.8267	-4.5440	-0.7687
T5	142.00-122.00	-6.0937	-0.7086	-5.9617	-0.7155
T6	122.00-102.00	-7.4539	-1.3791	-7.3248	-1.5370
T7	102.00-82.00	-8.0456	-2.6917	-7.9478	-2.9278
T8	82.00-62.00	-9.5933	-3.8748	-9.4522	-4.3152
T9	62.00-42.00	-10.1898	-4.0977	-10.1832	-4.6433
T10	42.00-22.00	-11.4773	-4.5826	-11.5158	-5.2215
T11	22.00-2.00	-8.9156	-4.4984	-9.2572	-5.1975

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	$C_A A_A$ Front	$C_A A_A$ Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
Single Dipole (Unknown)	C	From Leg	0.00	0.0000	196.26	No Ice	0.23	0.00
			0.00			1/2" Ice	0.41	0.00
			0.00					
6"x4" Pipe Mount (CSP)	A	From Face	0.67	0.0000	194.92	No Ice	2.09	0.05
			0.00			1/2" Ice	2.46	0.07
			0.00					
OGT9-840	A	From Leg	3.00	0.0000	190.25	No Ice	2.27	0.02

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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
(Unknown)			6.00					
			0.00					
10' x 3" Dia Omni	A	From Leg	3.00	0.0000	174.25	No Ice	3.00	0.03
(Unknown)			6.00			1/2" Ice	4.03	0.05
			0.00					
9' x 3" Dia Omni	B	From Leg	3.00	0.0000	188.75	No Ice	2.70	0.03
(Unknown)			6.00			1/2" Ice	3.63	0.05
			0.00					
12' x 3" Dia Omni	B	From Leg	3.00	0.0000	175.25	No Ice	3.60	0.04
(Unknown)			6.00			1/2" Ice	4.83	0.06
			0.00					
DB222-A	C	From Leg	3.00	0.0000	187.25	No Ice	1.60	0.02
(Unknown)			6.00			1/2" Ice	2.88	0.02
			0.00					
ANT150D6-9	C	From Leg	3.00	0.0000	173.75	No Ice	0.00	0.07
(Unknown)			6.00			1/2" Ice	0.00	0.10
			0.00					
9' x 3" Dia Omni	C	From Leg	4.00	-60.0000	192.75	No Ice	2.70	0.03
(Unknown)			0.00			1/2" Ice	3.63	0.05
			0.00					
PiROD 4' Side Mount Standoff	C	From Leg	2.00	-60.0000	186.50	No Ice	2.72	0.05
(1)			0.00			1/2" Ice	4.91	0.09
(Unknown)			0.00					
DB222-A	C	From Leg	4.00	-60.0000	180.25	No Ice	1.60	0.02
(Unknown)			0.00			1/2" Ice	2.88	0.02
			0.00					
PiROD 4' Side Mount Standoff	A	From Leg	2.00	0.0000	174.25	No Ice	2.72	0.05
(1)			0.00			1/2" Ice	4.91	0.09
(Unknown)			0.00					
BCD87077	A	From Leg	4.00	0.0000	181.50	No Ice	3.06	0.03
(Pagenet)			0.00			1/2" Ice	4.24	0.04
			0.00					
PiROD 6' Side Mount Standoff	B	From Leg	3.00	0.0000	172.25	No Ice	4.97	0.07
(1)			0.00			1/2" Ice	6.12	0.13
(Unknown)			0.00					
PD220	B	From Leg	6.00	0.0000	182.25	No Ice	3.56	0.02
(Unknown)			0.00			1/2" Ice	7.13	0.05
			0.00					
PiROD 15' Rotatable	C	None		0.0000	181.25	No Ice	24.90	1.81
Platform (Lattice)						1/2" Ice	30.70	2.44
(Unknown)								
12' x 3" Dia Omni	A	From Leg	2.50	-10.0000	175.25	No Ice	3.60	0.04
(Unknown)			0.00			1/2" Ice	4.83	0.06
			0.00					
(2) 7770.00	A	From Leg	3.00	0.0000	150.25	No Ice	5.88	0.04
(AT&T/Cingular)			0.00			1/2" Ice	6.31	0.07
			0.00					
(2) 7770.00	B	From Leg	3.00	0.0000	150.25	No Ice	5.88	0.04
(AT&T/Cingular)			0.00			1/2" Ice	6.31	0.07
			0.00					
(2) 7770.00	C	From Leg	3.00	0.0000	150.25	No Ice	5.88	0.04
(AT&T/Cingular)			0.00			1/2" Ice	6.31	0.07
			0.00					
(2) LPG 21401 TMA	A	From Leg	2.50	0.0000	150.25	No Ice	0.95	0.02
(AT&T/Cingular)			0.00			1/2" Ice	1.09	0.02
			0.00					
(2) LPG 21401 TMA	B	From Leg	2.50	0.0000	150.25	No Ice	0.95	0.02

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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
(AT&T/Cingular)			0.00 0.00			1/2" Ice 1.09	0.48	0.02
(2) LPG 21401 TMA (AT&T/Cingular)	C	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 1.09	0.95 0.37 0.48	0.02 0.02
T-Arm (1) (AT&T/Cingular)	A	From Leg	1.20 0.00 0.00	0.0000	149.63	No Ice 1/2" Ice 14.45	10.54 10.54 14.45	0.34 0.41
T-Arm (1) (AT&T/Cingular)	B	From Leg	1.20 0.00 0.00	0.0000	149.63	No Ice 1/2" Ice 14.45	10.54 10.54 14.45	0.34 0.41
T-Arm (1) (AT&T/Cingular)	C	From Leg	1.20 0.00 0.00	0.0000	149.63	No Ice 1/2" Ice 14.45	10.54 10.54 14.45	0.34 0.41
(2) LPG 13519 Diplexer (AT&T/Cingular)	A	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 0.34	0.27 0.18 0.25	0.01 0.01
(2) LPG 13519 Diplexer (AT&T/Cingular)	B	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 0.34	0.27 0.18 0.25	0.01 0.01
(2) LPG 13519 Diplexer (AT&T/Cingular)	C	From Leg	2.50 0.00 0.00	0.0000	150.25	No Ice 1/2" Ice 0.34	0.27 0.18 0.25	0.01 0.01
(4) 60"x12"x4" Panel (Verizon - future)	A	From Leg	2.50 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice 7.47	7.00 2.78 3.15	0.05 0.09
(4) 60"x12"x4" Panel (Verizon - future)	B	From Leg	2.50 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice 7.47	7.00 2.78 3.15	0.05 0.09
(4) 60"x12"x4" Panel (Verizon - future)	C	From Leg	2.50 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice 7.47	7.00 2.78 3.15	0.05 0.09
PiROD 13' Lightweight T- Frame (Verizon - future)	A	From Leg	1.25 0.00 0.00	0.0000	163.25	No Ice 1/2" Ice 16.80	10.60 10.60 16.80	0.26 0.36
PiROD 13' Lightweight T- Frame (Verizon - future)	B	From Leg	1.25 0.00 0.00	0.0000	163.25	No Ice 1/2" Ice 16.80	10.60 10.60 16.80	0.26 0.36
PiROD 13' Lightweight T- Frame (Verizon - future)	C	From Leg	1.25 0.00 0.00	0.0000	163.25	No Ice 1/2" Ice 16.80	10.60 10.60 16.80	0.26 0.36
PD220 (Verizon)	B	From Leg	5.20 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 7.13	3.56 3.56 7.13	0.02 0.05
DB230-2A (Verizon)	B	From Leg	8.20 0.00 0.00	-10.0000	121.50	No Ice 1/2" Ice 5.40	3.00 3.00 5.40	0.11 0.15
Folded Dipole (Unknown)	C	From Leg	6.00 0.00 0.00	0.0000	120.58	No Ice 1/2" Ice 6.22	3.10 3.10 6.22	0.03 0.06
DB205-L (Unknown)	A	From Leg	5.20 0.00 0.00	0.0000	109.25	No Ice 1/2" Ice 3.45	1.72 1.72 3.45	0.04 0.05
6'8"x4" Pipe Mount (CSP)	B	From Leg	0.67 0.00 0.00	0.0000	101.20	No Ice 1/2" Ice 3.01	2.60 2.60 3.01	0.07 0.09
DB224-A	C	From Leg	2.00	60.0000	94.00	No Ice	3.15	0.03

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	13 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight K
(Unknown)			0.00 0.00		1/2" Ice	5.67	5.67	0.04
PD220	A	From Leg	5.20	0.0000	90.41	No Ice	3.56	0.02
(Unknown)			0.00 0.00		1/2" Ice	7.13	7.13	0.05
2' Sidearm	B	From Leg	1.00	0.0000	15.00	No Ice	3.90	0.09
(Unknown)			0.00 0.00		1/2" Ice	4.40	4.40	0.10
2' Sidearm	B	From Leg	1.00	0.0000	11.00	No Ice	3.90	0.09
(Unknown)			0.00 0.00		1/2" Ice	4.40	4.40	0.10
2' Sidearm	B	From Leg	1.00	0.0000	9.00	No Ice	3.90	0.09
(Unknown)			0.00 0.00		1/2" Ice	4.40	4.40	0.10
DB432-A	A	From Leg	1.50	90.0000	70.25	No Ice	0.30	0.01
(KB1AEV)			0.00 0.00		1/2" Ice	0.54	0.54	0.01
3' Sidearm	A	From Leg	1.25	10.0000	170.20	No Ice	5.90	0.13
			0.00 0.00		1/2" Ice	6.60	6.60	0.15
6' Rigid Side Arm w/ 3" STD mount pipe	B	From Leg	2.60	0.0000	120.50	No Ice	2.60	0.20
			0.00 0.00		1/2" Ice	4.21	7.18	0.30
6' Rigid Side Arm w/ 3" STD mount pipe	C	From Leg	2.60	0.0000	120.67	No Ice	2.60	0.20
			0.00 0.00		1/2" Ice	4.21	7.18	0.30
6' Rigid Side Arm w/ 3" STD mount pipe	A	From Leg	2.60	0.0000	100.67	No Ice	2.60	0.20
			0.00 0.00		1/2" Ice	4.21	7.18	0.30
2' Sidearm	C	From Leg	1.00	60.0000	85.00	No Ice	3.90	0.09
			0.00 0.00		1/2" Ice	4.40	4.40	0.10
6' Rigid Side Arm w/ 3" STD mount pipe	A	From Leg	2.60	0.0000	79.50	No Ice	2.60	0.20
			0.00 0.00		1/2" Ice	4.21	7.18	0.30
Filter/Diplexer	B	None		0.0000	157.00	No Ice	4.70	0.03
					1/2" Ice	5.10	2.24	0.06
Ice Canopy	B	From Leg	3.00	-50.0000	106.00	No Ice	3.73	0.30
			0.00 0.00		1/2" Ice	4.39	3.30	0.55
SD210-SF3P4LDF (NEU - prop)	B	From Face	4.00	0.0000	135.00	No Ice	0.90	0.01
			0.00 0.00		1/2" Ice	1.40	1.40	0.03
Piroad 4' Side Mount Standoff (1)	B	From Face	2.00	0.0000	135.00	No Ice	2.72	0.05
(NEU - prop)			0.00 0.00		1/2" Ice	4.91	4.91	0.09
SD210-SF3P4LDF (NEU - prop)	B	From Face	4.00	0.0000	115.00	No Ice	0.90	0.01
			0.00 0.00		1/2" Ice	1.40	1.40	0.03
Piroad 4' Side Mount Standoff (1)	B	From Face	2.00	0.0000	115.00	No Ice	2.72	0.05
(NEU - prop)			0.00 0.00		1/2" Ice	4.91	4.91	0.09
DB586-Y (NEU - prop)	B	From Leg	4.00	0.0000	115.00	No Ice	1.01	0.01
			0.00 0.00		1/2" Ice	1.28	1.28	0.02
Piroad 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	112.00	No Ice	2.72	0.05
			0.00		1/2" Ice	4.91	4.91	0.09

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
(NEU - prop)			0.00						
DB586-Y	B	From Leg	4.00	0.0000	95.00	No Ice	1.01	1.01	0.01
(NEU - prop)			0.00			1/2" Ice	1.28	1.28	0.02
			0.00						
Pirod 4' Side Mount Standoff	B	From Leg	2.00	0.0000	92.00	No Ice	2.72	2.72	0.05
(1)			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
SD110-SFXPASNM	B	From Leg	4.00	0.0000	81.00	No Ice	9.00	9.00	0.03
(SRL110A)			0.00			1/2" Ice	10.58	10.58	0.09
(NEU - prop)			0.00						
Pirod 4' Side Mount Standoff	B	From Leg	2.00	0.0000	81.00	No Ice	2.72	2.72	0.05
(1)			0.00			1/2" Ice	4.91	4.91	0.09
(NEU - prop)			0.00						

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft ²	Weight K
PA6-65AC	B	Paraboloid w/o	From	1.00	-50.0000		102.25	6.00	No Ice	28.27	0.09
(CSP)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
PA6-65AC	A	Paraboloid w/o	From	1.00	-10.0000		194.25	6.00	No Ice	28.27	0.09
(CSP)		Radome	Face	0.00					1/2" Ice	29.05	0.24
				0.00							
1.2M	B	Paraboloid w/o	From	2.00	40.0000		17.00	4.00	No Ice	12.17	0.17
(Verizon)		Radome	Leg	0.00					1/2" Ice	13.09	0.23
				0.00							
1.2M	B	Paraboloid w/o	From	2.00	50.0000		12.58	4.00	No Ice	12.17	0.17
(Pagenet)		Radome	Leg	0.00					1/2" Ice	13.09	0.23
				0.00							
1.2M	B	Paraboloid w/o	From	2.00	50.0000		10.33	4.00	No Ice	12.17	0.17
(Pagenet)		Radome	Leg	0.00					1/2" Ice	13.09	0.23
				0.00							

Truss-Leg Properties

Section Designation	Area in ²	Area Ice in ²	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in ²
Pirod 105245	1090.3344	1814.3549	0.68	0.22	7.5718	12.5997	5.3014
Pirod 105217	2130.7479	3520.4599	0.62	0.44	7.3984	12.2238	5.3014
Pirod 105218	2263.4687	3690.8612	0.75	0.46	7.8593	12.8155	7.2158
Pirod 105218 reinf w /1" dia bar	2478.7820	3979.9267	1.01	0.48	8.6069	13.8192	10.8915

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Section Designation	Area <i>in</i> ²	Area Ice <i>in</i> ²	Self Weight <i>K</i>	Ice Weight <i>K</i>	Equiv. Diameter <i>in</i>	Equiv. Diameter Ice <i>in</i>	Leg Area <i>in</i> ²
PiROD 105219	2441.8688	3942.2854	0.94	0.49	8.4787	13.6885	9.4248
PiROD 105219 reinf w /1" dia bar	2642.9258	4222.9884	1.21	0.51	9.1768	14.6632	13.1787
PiROD 105220	2578.8005	4132.5504	1.12	0.50	8.9542	14.3491	11.9282
PiROD 105220 reinf w /1" dia bar	2719.2667	4331.5590	1.32	0.52	9.4419	15.0401	14.7262

Tower Pressures - No Ice

$$G_H = 1.116$$

Section Elevation <i>ft</i>	<i>z</i> <i>ft</i>	<i>K_z</i>	<i>q_z</i> <i>psf</i>	<i>A_G</i> <i>ft</i> ²	<i>F_a</i> <i>c</i> <i>e</i>	<i>A_F</i> <i>ft</i> ²	<i>A_R</i> <i>ft</i> ²	<i>A_{leg}</i> <i>ft</i> ²	Leg %	<i>C_AA_A</i> In Face <i>ft</i> ²	<i>C_AA_A</i> Out Face <i>ft</i> ²
T1 197.00-187.00	192.00	1.654	21	46.458	A	0.983	9.972	2.917	26.62	0.000	0.000
					B	1.879	10.095		24.36	0.000	0.000
					C	1.089	6.053		40.84	0.000	0.000
T2 187.00-172.00	179.50	1.622	20	70.000	A	0.000	18.330	5.000	27.28	0.000	0.000
					B	1.979	26.506		17.55	0.000	0.000
					C	0.000	9.972		50.14	0.000	0.000
T3 172.00-152.00	162.00	1.576	20	98.750	A	0.000	37.920	7.501	19.78	0.000	0.000
					B	2.639	38.540		18.22	0.000	0.000
					C	0.000	15.045		49.85	0.000	0.000
T4 152.00-142.00	147.00	1.532	19	66.264	A	4.526	36.494	12.641	30.82	0.000	0.000
					B	5.991	29.549		35.57	0.000	0.000
					C	5.902	24.544		41.52	0.000	0.000
T5 142.00-122.00	132.00	1.486	19	162.528	A	10.988	77.696	24.703	27.85	0.000	0.000
					B	13.922	59.846		33.49	0.000	0.000
					C	13.776	52.963		37.01	0.000	0.000
T6 122.00-102.00	112.00	1.418	18	202.945	A	12.505	81.423	26.241	27.94	0.000	0.000
					B	15.397	63.573		33.23	0.000	0.000
					C	14.891	54.008		38.09	0.000	0.000
T7 102.00-82.00	92.00	1.34	17	243.613	A	15.917	87.454	28.737	27.80	0.000	0.000
					B	21.255	69.604		31.63	0.000	0.000
					C	18.471	57.079		38.04	0.000	0.000
T8 82.00-62.00	72.00	1.25	16	283.362	A	15.502	89.041	28.309	27.08	0.000	0.000
					B	20.827	71.191		30.77	0.000	0.000
					C	17.513	56.076		38.47	0.000	0.000
T9 62.00-42.00	52.00	1.139	14	323.972	A	19.509	92.170	30.640	27.44	0.000	0.000
					B	24.839	74.320		30.90	0.000	0.000
					C	21.744	59.020		37.94	0.000	0.000
T10 42.00-22.00	32.00	1	13	363.780	A	21.535	90.814	29.897	26.61	0.000	0.000
					B	26.864	72.964		29.95	0.000	0.000
					C	23.692	57.664		36.75	0.000	0.000
T11 22.00-2.00	12.00	1	13	404.197	A	27.127	74.873	31.525	30.91	0.000	0.000
					B	31.127	64.602		32.93	0.000	0.000
					C	28.928	50.157		39.86	0.000	0.000

Tower Pressure - With Ice

$$G_H = 1.116$$

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Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
T1 197.00-187.00	192.00	1.654	21	0.5000	47.292	A	0.881	18.622	4.583	23.50	0.000	0.000
						B	2.643	18.738		21.44	0.000	0.000
						C	1.089	11.667		35.93	0.000	0.000
T2 187.00-172.00	179.50	1.622	20	0.5000	71.250	A	0.000	32.961	7.500	22.75	0.000	0.000
						B	3.913	44.029		15.64	0.000	0.000
						C	0.000	18.051		41.55	0.000	0.000
T3 172.00-152.00	162.00	1.576	20	0.5000	100.417	A	0.000	61.898	10.834	17.50	0.000	0.000
						B	5.217	62.624		15.97	0.000	0.000
						C	0.000	25.924		41.79	0.000	0.000
T4 152.00-142.00	147.00	1.532	19	0.5000	67.098	A	3.590	60.667	21.034	32.73	0.000	0.000
						B	6.313	51.901		36.13	0.000	0.000
						C	5.902	42.142		43.78	0.000	0.000
T5 142.00-122.00	132.00	1.486	19	0.5000	164.197	A	9.092	128.873	40.814	29.58	0.000	0.000
						B	14.540	105.367		34.04	0.000	0.000
						C	13.776	89.951		39.35	0.000	0.000
T6 122.00-102.00	112.00	1.418	18	0.5000	204.614	A	10.883	135.658	42.789	29.20	0.000	0.000
						B	16.298	112.140		33.32	0.000	0.000
						C	14.891	91.412		40.25	0.000	0.000
T7 102.00-82.00	92.00	1.34	17	0.5000	245.282	A	14.181	146.759	46.141	28.67	0.000	0.000
						B	23.015	123.132		31.57	0.000	0.000
						C	18.471	96.981		39.97	0.000	0.000
T8 82.00-62.00	72.00	1.25	16	0.5000	285.031	A	14.134	150.206	45.704	27.81	0.000	0.000
						B	22.997	126.588		30.55	0.000	0.000
						C	17.513	95.201		40.55	0.000	0.000
T9 62.00-42.00	52.00	1.139	14	0.5000	325.640	A	17.990	155.479	48.959	28.22	0.000	0.000
						B	26.840	131.863		30.85	0.000	0.000
						C	21.744	100.069		40.19	0.000	0.000
T10 42.00-22.00	32.00	1	13	0.5000	365.448	A	20.068	153.940	47.910	27.53	0.000	0.000
						B	28.923	130.324		30.09	0.000	0.000
						C	23.692	98.492		39.21	0.000	0.000
T11 22.00-2.00	12.00	1	13	0.5000	405.866	A	25.902	128.537	50.217	32.52	0.000	0.000
						B	33.526	115.155		33.78	0.000	0.000
						C	29.919	86.790		43.03	0.000	0.000

Tower Pressure - Service

$$G_H = 1.116$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 197.00-187.00	192.00	1.654	21	46.458	A	0.983	9.972	2.917	26.62	0.000	0.000
					B	1.879	10.095		24.36	0.000	0.000
					C	1.089	6.053		40.84	0.000	0.000
T2 187.00-172.00	179.50	1.622	20	70.000	A	0.000	18.330	5.000	27.28	0.000	0.000
					B	1.979	26.506		17.55	0.000	0.000
					C	0.000	9.972		50.14	0.000	0.000
T3 172.00-152.00	162.00	1.576	20	98.750	A	0.000	37.920	7.501	19.78	0.000	0.000
					B	2.639	38.540		18.22	0.000	0.000
					C	0.000	15.045		49.85	0.000	0.000
T4 152.00-142.00	147.00	1.532	19	66.264	A	4.526	36.494	12.641	30.82	0.000	0.000
					B	5.991	29.549		35.57	0.000	0.000
					C	5.902	24.544		41.52	0.000	0.000
T5 142.00-	132.00	1.486	19	162.528	A	10.988	77.696	24.703	27.85	0.000	0.000

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	Client	Northeast Utilities System	Designed by	Staff

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
122.00					B	13.922	59.846		33.49	0.000	0.000
T6 122.00- 102.00	112.00	1.418	18	202.945	C	13.776	52.963		37.01	0.000	0.000
					A	12.505	81.423	26.241	27.94	0.000	0.000
					B	15.397	63.573		33.23	0.000	0.000
T7 102.00- 82.00	92.00	1.34	17	243.613	C	14.891	54.008		38.09	0.000	0.000
					A	15.917	87.454	28.737	27.80	0.000	0.000
					B	21.255	69.604		31.63	0.000	0.000
T8 82.00-62.00	72.00	1.25	16	283.362	C	18.471	57.079		38.04	0.000	0.000
					A	15.502	89.041	28.309	27.08	0.000	0.000
					B	20.827	71.191		30.77	0.000	0.000
T9 62.00-42.00	52.00	1.139	14	323.972	C	17.513	56.076		38.47	0.000	0.000
					A	19.509	92.170	30.640	27.44	0.000	0.000
					B	24.839	74.320		30.90	0.000	0.000
T10 42.00- 22.00	32.00	1	13	363.780	C	21.744	59.020		37.94	0.000	0.000
					A	21.535	90.814	29.897	26.61	0.000	0.000
					B	26.864	72.964		29.95	0.000	0.000
T11 22.00-2.00	12.00	1	13	404.197	C	23.692	57.664		36.75	0.000	0.000
					A	27.127	74.873	31.525	30.91	0.000	0.000
					B	31.127	64.602		32.93	0.000	0.000
					C	28.928	50.157		39.86	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	1	1	6.950	0.45	44.56	B
			B	0.258	2.415	0.604	1	1	7.975			
			C	0.154	2.758	0.582	1	1	4.612			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	1	1	11.089	0.90	59.98	B
			B	0.407	2.05	0.654	1	1	19.326			
			C	0.142	2.799	0.58	1	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	1	1	24.466	1.26	62.75	B
			B	0.417	2.031	0.659	1	1	28.025			
			C	0.152	2.763	0.582	1	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	1	1	32.459	1.25	124.83	A
			B	0.536	1.857	0.717	1	1	27.169			
			C	0.459	1.958	0.678	1	1	22.534			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	1	1	67.072	2.58	128.85	A
			B	0.454	1.967	0.675	1	1	54.322			
			C	0.411	2.043	0.656	1	1	48.519			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	1	1	67.811	2.63	131.38	A
			B	0.389	2.086	0.647	1	1	56.543			
			C	0.339	2.196	0.629	1	1	48.850			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	1	1	73.796	2.79	139.64	A
			B	0.373	2.12	0.641	1	1	65.867			
			C	0.31	2.269	0.619	1	1	53.805			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	1	1	72.436	2.70	134.83	A
			B	0.325	2.232	0.624	1	1	65.234			
			C	0.26	2.409	0.604	1	1	51.405			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	1	1	77.632	2.70	135.07	A
			B	0.306	2.28	0.618	1	1	70.753			
			C	0.249	2.44	0.602	1	1	57.256			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	1	1	77.716	2.47	123.58	A
			B	0.274	2.366	0.608	1	1	71.255			
			C	0.224	2.519	0.596	1	1	58.032			

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	18 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	1	1	72.236	2.46	122.84	A
			B	0.237	2.478	0.599	1	1	69.799			
			C	0.196	2.611	0.59	1	1	58.496			
Sum Weight:	7.71	34.21						OTM	1924.10 kip-ft	22.17		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	0.8	1	6.753	0.42	42.46	B
			B	0.258	2.415	0.604	0.8	1	7.599			
			C	0.154	2.758	0.582	0.8	1	4.394			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	0.8	1	11.089	0.88	58.75	B
			B	0.407	2.05	0.654	0.8	1	18.930			
			C	0.142	2.799	0.58	0.8	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	0.8	1	24.466	1.23	61.57	B
			B	0.417	2.031	0.659	0.8	1	27.497			
			C	0.152	2.763	0.582	0.8	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	0.8	1	31.554	1.21	121.35	A
			B	0.536	1.857	0.717	0.8	1	25.971			
			C	0.459	1.958	0.678	0.8	1	21.354			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	0.8	1	64.874	2.49	124.63	A
			B	0.454	1.967	0.675	0.8	1	51.538			
			C	0.411	2.043	0.656	0.8	1	45.764			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	0.8	1	65.310	2.53	126.53	A
			B	0.389	2.086	0.647	0.8	1	53.464			
			C	0.339	2.196	0.629	0.8	1	45.872			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	0.8	1	70.613	2.67	133.62	A
			B	0.373	2.12	0.641	0.8	1	61.616			
			C	0.31	2.269	0.619	0.8	1	50.111			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	0.8	1	69.336	2.58	129.06	A
			B	0.325	2.232	0.624	0.8	1	61.069			
			C	0.26	2.409	0.604	0.8	1	47.903			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	0.8	1	73.730	2.57	128.28	A
			B	0.306	2.28	0.618	0.8	1	65.785			
			C	0.249	2.44	0.602	0.8	1	52.907			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	0.8	1	73.409	2.33	116.73	A
			B	0.274	2.366	0.608	0.8	1	65.882			
			C	0.224	2.519	0.596	0.8	1	53.293			
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	0.8	1	66.811	2.27	113.61	A
			B	0.237	2.478	0.599	0.8	1	63.573			
			C	0.196	2.611	0.59	0.8	1	52.711			
Sum Weight:	7.71	34.21						OTM	1854.71 kip-ft	21.20		

Tower Forces - No Ice - Wind 90 To Face

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	19 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	0.85	1	6.802	0.43	42.99	B
			B	0.258	2.415	0.604	0.85	1	7.693			
			C	0.154	2.758	0.582	0.85	1	4.448			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	0.85	1	11.089	0.89	59.05	B
			B	0.407	2.05	0.654	0.85	1	19.029			
			C	0.142	2.799	0.58	0.85	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	0.85	1	24.466	1.24	61.87	B
			B	0.417	2.031	0.659	0.85	1	27.629			
			C	0.152	2.763	0.582	0.85	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	0.85	1	31.780	1.22	122.22	A
			B	0.536	1.857	0.717	0.85	1	26.270			
			C	0.459	1.958	0.678	0.85	1	21.649			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	0.85	1	65.424	2.51	125.68	A
			B	0.454	1.967	0.675	0.85	1	52.234			
			C	0.411	2.043	0.656	0.85	1	46.453			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	0.85	1	65.936	2.55	127.74	A
			B	0.389	2.086	0.647	0.85	1	54.233			
			C	0.339	2.196	0.629	0.85	1	46.617			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	0.85	1	71.409	2.70	135.13	A
			B	0.373	2.12	0.641	0.85	1	62.678			
			C	0.31	2.269	0.619	0.85	1	51.035			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	0.85	1	70.111	2.61	130.50	A
			B	0.325	2.232	0.624	0.85	1	62.110			
			C	0.26	2.409	0.604	0.85	1	48.778			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	0.85	1	74.705	2.60	129.98	A
			B	0.306	2.28	0.618	0.85	1	67.027			
			C	0.249	2.44	0.602	0.85	1	53.994			
T10 42.00- 22.00	1.00	4.94	A	0.309	2.273	0.619	0.85	1	74.486	2.37	118.44	A
			B	0.274	2.366	0.608	0.85	1	67.226			
			C	0.224	2.519	0.596	0.85	1	54.478			
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	0.85	1	68.167	2.32	115.92	A
			B	0.237	2.478	0.599	0.85	1	65.130			
			C	0.196	2.611	0.59	0.85	1	54.157			
Sum Weight:	7.71	34.21						OTM	1872.06 kip-ft	21.44		

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	plf	
T1 197.00- 187.00	0.16	0.80	A	0.412	2.04	0.657	1	1	13.111	0.70	69.65	B
			B	0.452	1.97	0.674	1	1	15.277			
			C	0.27	2.38	0.607	1	1	8.172			
T2 187.00- 172.00	0.47	1.19	A	0.463	1.953	0.679	1	1	22.386	1.58	105.35	B
			B	0.673	1.777	0.801	1	1	39.175			
			C	0.253	2.428	0.603	1	1	10.880			
T3 172.00- 152.00	1.05	1.96	A	0.616	1.795	0.764	1	1	47.277	2.17	108.67	B
			B	0.676	1.777	0.803	1	1	55.490			
			C	0.258	2.413	0.604	1	1	15.658			
T4 152.00- 142.00	1.08	1.68	A	0.958	2.017	1	1	1	64.257	2.78	277.94	A
			B	0.868	1.882	0.954	1	1	55.821			
			C	0.716	1.778	0.831	1	1	40.942			
T5 142.00- 122.00	2.25	4.03	A	0.84	1.851	0.93	1	1	128.952	4.96	248.20	A
			B	0.73	1.781	0.842	1	1	103.257			

RISATower

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

Job	U20.0x195' PiROD Lattice Tower	Page	20 of 34
Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
Client	Northeast Utilities System	Designed by	Staff

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	plf	
T6 122.00- 102.00	2.30	4.57	C	0.632	1.788	0.774	1	1	83.356			
			A	0.716	1.778	0.832	1	1	123.694	4.36	218.15	A
			B	0.628	1.789	0.771	1	1	102.753			
			C	0.52	1.876	0.708	1	1	79.580			
T7 102.00- 82.00	2.38	5.92	A	0.656	1.78	0.79	1	1	130.057	4.34	217.09	A
			B	0.596	1.807	0.751	1	1	115.494			
			C	0.471	1.941	0.683	1	1	84.708			
T8 82.00- 62.00	2.43	5.85	A	0.577	1.82	0.74	1	1	125.218	3.99	199.30	A
			B	0.525	1.87	0.71	1	1	112.933			
			C	0.395	2.073	0.65	1	1	79.370			
T9 62.00- 42.00	2.43	6.90	A	0.533	1.861	0.715	1	1	129.114	3.83	191.45	A
			B	0.487	1.917	0.691	1	1	117.975			
			C	0.374	2.118	0.641	1	1	85.925			
T10 42.00- 22.00	2.43	7.10	A	0.476	1.933	0.686	1	1	125.614	3.40	169.88	A
			B	0.436	1.998	0.667	1	1	115.829			
			C	0.334	2.209	0.627	1	1	85.448			
T11 22.00- 2.00	1.80	7.93	A	0.381	2.104	0.644	1	1	108.660	3.20	159.94	A
			B	0.366	2.135	0.638	1	1	107.045			
			C	0.288	2.33	0.612	1	1	83.050			
Sum Weight:	18.78	49.42						OTM	3284.00 kip-ft	35.31		

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	plf	
T1 197.00- 187.00	0.16	0.80	A	0.412	2.04	0.657	0.8	1	12.935	0.67	67.24	B
			B	0.452	1.97	0.674	0.8	1	14.748			
			C	0.27	2.38	0.607	0.8	1	7.954			
T2 187.00- 172.00	0.47	1.19	A	0.463	1.953	0.679	0.8	1	22.386	1.55	103.25	B
			B	0.673	1.777	0.801	0.8	1	38.393			
			C	0.253	2.428	0.603	0.8	1	10.880			
T3 172.00- 152.00	1.05	1.96	A	0.616	1.795	0.764	0.8	1	47.277	2.13	106.63	B
			B	0.676	1.777	0.803	0.8	1	54.447			
			C	0.258	2.413	0.604	0.8	1	15.658			
T4 152.00- 142.00	1.08	1.68	A	0.958	2.017	1	0.8	1	63.539	2.75	274.83	A
			B	0.868	1.882	0.954	0.8	1	54.558			
			C	0.716	1.778	0.831	0.8	1	39.761			
T5 142.00- 122.00	2.25	4.03	A	0.84	1.851	0.93	0.8	1	127.133	4.89	244.70	A
			B	0.73	1.781	0.842	0.8	1	100.348			
			C	0.632	1.788	0.774	0.8	1	80.600			
T6 122.00- 102.00	2.30	4.57	A	0.716	1.778	0.832	0.8	1	121.518	4.29	214.31	A
			B	0.628	1.789	0.771	0.8	1	99.493			
			C	0.52	1.876	0.708	0.8	1	76.601			
T7 102.00- 82.00	2.38	5.92	A	0.656	1.78	0.79	0.8	1	127.221	4.25	212.35	A
			B	0.596	1.807	0.751	0.8	1	110.891			
			C	0.471	1.941	0.683	0.8	1	81.014			
T8 82.00- 62.00	2.43	5.85	A	0.577	1.82	0.74	0.8	1	122.391	3.90	194.81	A
			B	0.525	1.87	0.71	0.8	1	108.333			
			C	0.395	2.073	0.65	0.8	1	75.868			
T9 62.00- 42.00	2.43	6.90	A	0.533	1.861	0.715	0.8	1	125.516	3.72	186.12	A
			B	0.487	1.917	0.691	0.8	1	112.607			
			C	0.374	2.118	0.641	0.8	1	81.576			
T10 42.00-	2.43	7.10	A	0.476	1.933	0.686	0.8	1	121.600	3.29	164.45	A

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	21 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
22.00			B	0.436	1.998	0.667	0.8	1	110.044			
			C	0.334	2.209	0.627	0.8	1	80.709			
T11 22.00- 2.00	1.80	7.93	A	0.381	2.104	0.644	0.8	1	103.480	3.05	152.32	A
			B	0.366	2.135	0.638	0.8	1	100.340			
			C	0.288	2.33	0.612	0.8	1	77.066			
Sum Weight:	18.78	49.42						OTM	3220.29 kip-ft	34.48		

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	plf	
T1 197.00- 187.00	0.16	0.80	A	0.412	2.04	0.657	0.85	1	12.979	0.68	67.85	B
			B	0.452	1.97	0.674	0.85	1	14.881			
			C	0.27	2.38	0.607	0.85	1	8.008			
T2 187.00- 172.00	0.47	1.19	A	0.463	1.953	0.679	0.85	1	22.386	1.56	103.78	B
			B	0.673	1.777	0.801	0.85	1	38.589			
			C	0.253	2.428	0.603	0.85	1	10.880			
T3 172.00- 152.00	1.05	1.96	A	0.616	1.795	0.764	0.85	1	47.277	2.14	107.14	B
			B	0.676	1.777	0.803	0.85	1	54.708			
			C	0.258	2.413	0.604	0.85	1	15.658			
T4 152.00- 142.00	1.08	1.68	A	0.958	2.017	1	0.85	1	63.719	2.76	275.61	A
			B	0.868	1.882	0.954	0.85	1	54.874			
			C	0.716	1.778	0.831	0.85	1	40.056			
T5 142.00- 122.00	2.25	4.03	A	0.84	1.851	0.93	0.85	1	127.588	4.91	245.57	A
			B	0.73	1.781	0.842	0.85	1	101.075			
			C	0.632	1.788	0.774	0.85	1	81.289			
T6 122.00- 102.00	2.30	4.57	A	0.716	1.778	0.832	0.85	1	122.062	4.31	215.27	A
			B	0.628	1.789	0.771	0.85	1	100.308			
			C	0.52	1.876	0.708	0.85	1	77.346			
T7 102.00- 82.00	2.38	5.92	A	0.656	1.78	0.79	0.85	1	127.930	4.27	213.54	A
			B	0.596	1.807	0.751	0.85	1	112.042			
			C	0.471	1.941	0.683	0.85	1	81.937			
T8 82.00- 62.00	2.43	5.85	A	0.577	1.82	0.74	0.85	1	123.098	3.92	195.93	A
			B	0.525	1.87	0.71	0.85	1	109.483			
			C	0.395	2.073	0.65	0.85	1	76.743			
T9 62.00- 42.00	2.43	6.90	A	0.533	1.861	0.715	0.85	1	126.416	3.75	187.45	A
			B	0.487	1.917	0.691	0.85	1	113.949			
			C	0.374	2.118	0.641	0.85	1	82.663			
T10 42.00- 22.00	2.43	7.10	A	0.476	1.933	0.686	0.85	1	122.603	3.32	165.81	A
			B	0.436	1.998	0.667	0.85	1	111.491			
			C	0.334	2.209	0.627	0.85	1	81.894			
T11 22.00- 2.00	1.80	7.93	A	0.381	2.104	0.644	0.85	1	104.775	3.08	154.23	A
			B	0.366	2.135	0.638	0.85	1	102.016			
			C	0.288	2.33	0.612	0.85	1	78.562			
Sum Weight:	18.78	49.42						OTM	3236.22 kip-ft	34.69		

Tower Forces - Service - Wind Normal To Face

RISA Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	22 of 34
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	Client	Northeast Utilities System	Designed by	Staff

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	e						ft ²	K	plf	
T1 197.00-187.00	0.05	0.61	A	0.236	2.481	0.598	1	1	6.950	0.45	44.56	B
			B	0.258	2.415	0.604	1	1	7.975			
			C	0.154	2.758	0.582	1	1	4.612			
T2 187.00-172.00	0.16	0.94	A	0.262	2.402	0.605	1	1	11.089	0.90	59.98	B
			B	0.407	2.05	0.654	1	1	19.326			
			C	0.142	2.799	0.58	1	1	5.787			
T3 172.00-152.00	0.39	1.60	A	0.384	2.097	0.645	1	1	24.466	1.26	62.75	B
			B	0.417	2.031	0.659	1	1	28.025			
			C	0.152	2.763	0.582	1	1	8.754			
T4 152.00-142.00	0.46	1.21	A	0.619	1.793	0.765	1	1	32.459	1.25	124.83	A
			B	0.536	1.857	0.717	1	1	27.169			
			C	0.459	1.958	0.678	1	1	22.534			
T5 142.00-122.00	0.94	2.35	A	0.546	1.848	0.722	1	1	67.072	2.58	128.85	A
			B	0.454	1.967	0.675	1	1	54.322			
			C	0.411	2.043	0.656	1	1	48.519			
T6 122.00-102.00	0.96	2.81	A	0.463	1.953	0.679	1	1	67.811	2.63	131.38	A
			B	0.389	2.086	0.647	1	1	56.543			
			C	0.339	2.196	0.629	1	1	48.850			
T7 102.00-82.00	0.98	3.97	A	0.424	2.018	0.662	1	1	73.796	2.79	139.64	A
			B	0.373	2.12	0.641	1	1	65.867			
			C	0.31	2.269	0.619	1	1	53.805			
T8 82.00-62.00	1.00	3.93	A	0.369	2.129	0.639	1	1	72.436	2.70	134.83	A
			B	0.325	2.232	0.624	1	1	65.234			
			C	0.26	2.409	0.604	1	1	51.405			
T9 62.00-42.00	1.00	4.79	A	0.345	2.184	0.631	1	1	77.632	2.70	135.07	A
			B	0.306	2.28	0.618	1	1	70.753			
			C	0.249	2.44	0.602	1	1	57.256			
T10 42.00-22.00	1.00	4.94	A	0.309	2.273	0.619	1	1	77.716	2.47	123.58	A
			B	0.274	2.366	0.608	1	1	71.255			
			C	0.224	2.519	0.596	1	1	58.032			
T11 22.00-2.00	0.77	5.57	A	0.252	2.43	0.602	1	1	72.236	2.46	122.84	A
			B	0.237	2.478	0.599	1	1	69.799			
			C	0.196	2.611	0.59	1	1	58.496			
Sum Weight:	7.71	34.21						OTM	1924.10	22.17		
									kip-ft			

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K	e						ft ²	K	plf	
T1 197.00-187.00	0.05	0.61	A	0.236	2.481	0.598	0.8	1	6.753	0.42	42.46	B
			B	0.258	2.415	0.604	0.8	1	7.599			
			C	0.154	2.758	0.582	0.8	1	4.394			
T2 187.00-172.00	0.16	0.94	A	0.262	2.402	0.605	0.8	1	11.089	0.88	58.75	B
			B	0.407	2.05	0.654	0.8	1	18.930			
			C	0.142	2.799	0.58	0.8	1	5.787			
T3 172.00-152.00	0.39	1.60	A	0.384	2.097	0.645	0.8	1	24.466	1.23	61.57	B
			B	0.417	2.031	0.659	0.8	1	27.497			
			C	0.152	2.763	0.582	0.8	1	8.754			
T4 152.00-142.00	0.46	1.21	A	0.619	1.793	0.765	0.8	1	31.554	1.21	121.35	A
			B	0.536	1.857	0.717	0.8	1	25.971			
			C	0.459	1.958	0.678	0.8	1	21.354			
T5 142.00-122.00	0.94	2.35	A	0.546	1.848	0.722	0.8	1	64.874	2.49	124.63	A
			B	0.454	1.967	0.675	0.8	1	51.538			

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	23 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
T6 122.00- 102.00	0.96	2.81	C	0.411	2.043	0.656	0.8	1	45.764			
			A	0.463	1.953	0.679	0.8	1	65.310	2.53	126.53	A
			B	0.389	2.086	0.647	0.8	1	53.464			
T7 102.00- 82.00	0.98	3.97	C	0.339	2.196	0.629	0.8	1	45.872			
			A	0.424	2.018	0.662	0.8	1	70.613	2.67	133.62	A
			B	0.373	2.12	0.641	0.8	1	61.616			
T8 82.00- 62.00	1.00	3.93	C	0.31	2.269	0.619	0.8	1	50.111			
			A	0.369	2.129	0.639	0.8	1	69.336	2.58	129.06	A
			B	0.325	2.232	0.624	0.8	1	61.069			
T9 62.00- 42.00	1.00	4.79	C	0.26	2.409	0.604	0.8	1	47.903			
			A	0.345	2.184	0.631	0.8	1	73.730	2.57	128.28	A
			B	0.306	2.28	0.618	0.8	1	65.785			
T10 42.00- 22.00	1.00	4.94	C	0.249	2.44	0.602	0.8	1	52.907			
			A	0.309	2.273	0.619	0.8	1	73.409	2.33	116.73	A
			B	0.274	2.366	0.608	0.8	1	65.882			
T11 22.00- 2.00	0.77	5.57	C	0.224	2.519	0.596	0.8	1	53.293			
			A	0.252	2.43	0.602	0.8	1	66.811	2.27	113.61	A
			B	0.237	2.478	0.599	0.8	1	63.573			
Sum Weight:	7.71	34.21	C	0.196	2.611	0.59	0.8	1	52.711			
								OTM	1854.71 kip-ft	21.20		

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	plf	
T1 197.00- 187.00	0.05	0.61	A	0.236	2.481	0.598	0.85	1	6.802	0.43	42.99	B
			B	0.258	2.415	0.604	0.85	1	7.693			
			C	0.154	2.758	0.582	0.85	1	4.448			
T2 187.00- 172.00	0.16	0.94	A	0.262	2.402	0.605	0.85	1	11.089	0.89	59.05	B
			B	0.407	2.05	0.654	0.85	1	19.029			
			C	0.142	2.799	0.58	0.85	1	5.787			
T3 172.00- 152.00	0.39	1.60	A	0.384	2.097	0.645	0.85	1	24.466	1.24	61.87	B
			B	0.417	2.031	0.659	0.85	1	27.629			
			C	0.152	2.763	0.582	0.85	1	8.754			
T4 152.00- 142.00	0.46	1.21	A	0.619	1.793	0.765	0.85	1	31.780	1.22	122.22	A
			B	0.536	1.857	0.717	0.85	1	26.270			
			C	0.459	1.958	0.678	0.85	1	21.649			
T5 142.00- 122.00	0.94	2.35	A	0.546	1.848	0.722	0.85	1	65.424	2.51	125.68	A
			B	0.454	1.967	0.675	0.85	1	52.234			
			C	0.411	2.043	0.656	0.85	1	46.453			
T6 122.00- 102.00	0.96	2.81	A	0.463	1.953	0.679	0.85	1	65.936	2.55	127.74	A
			B	0.389	2.086	0.647	0.85	1	54.233			
			C	0.339	2.196	0.629	0.85	1	46.617			
T7 102.00- 82.00	0.98	3.97	A	0.424	2.018	0.662	0.85	1	71.409	2.70	135.13	A
			B	0.373	2.12	0.641	0.85	1	62.678			
			C	0.31	2.269	0.619	0.85	1	51.035			
T8 82.00- 62.00	1.00	3.93	A	0.369	2.129	0.639	0.85	1	70.111	2.61	130.50	A
			B	0.325	2.232	0.624	0.85	1	62.110			
			C	0.26	2.409	0.604	0.85	1	48.778			
T9 62.00- 42.00	1.00	4.79	A	0.345	2.184	0.631	0.85	1	74.705	2.60	129.98	A
			B	0.306	2.28	0.618	0.85	1	67.027			
			C	0.249	2.44	0.602	0.85	1	53.994			
T10 42.00-	1.00	4.94	A	0.309	2.273	0.619	0.85	1	74.486	2.37	118.44	A

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	24 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

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	plf	
22.00			B	0.274	2.366	0.608	0.85	1	67.226			
			C	0.224	2.519	0.596	0.85	1	54.478			
T11 22.00- 2.00	0.77	5.57	A	0.252	2.43	0.602	0.85	1	68.167	2.32	115.92	A
			B	0.237	2.478	0.599	0.85	1	65.130			
			C	0.196	2.611	0.59	0.85	1	54.157			
Sum Weight:	7.71	34.21						OTM	1872.06 kip-ft	21.44		

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M _x	Sum of Overturning Moments, M _z	Sum of Torques
	K	K	K	kip-ft	kip-ft	kip-ft
Leg Weight	23.57					
Bracing Weight	9.15					
Total Member Self-Weight	32.72					
Gusset Weight	1.49			5.42	4.22	
Total Weight	48.50			5.42	4.22	
Wind 0 deg - No Ice		-0.23	-30.11	-2986.77	26.92	0.84
Wind 30 deg - No Ice		14.59	-25.43	-2502.92	-1539.52	1.52
Wind 60 deg - No Ice		25.63	-14.43	-1373.50	-2684.20	3.50
Wind 90 deg - No Ice		29.68	0.52	78.24	-3064.83	-2.23
Wind 120 deg - No Ice		26.45	15.01	1525.68	-2716.36	0.29
Wind 150 deg - No Ice		15.48	25.12	2544.89	-1631.81	1.44
Wind 180 deg - No Ice		0.13	29.28	2988.51	-75.88	-2.55
Wind 210 deg - No Ice		-15.32	24.99	2520.78	1570.11	-0.18
Wind 240 deg - No Ice		-26.22	15.07	1513.07	2662.19	-0.12
Wind 270 deg - No Ice		-29.70	-0.12	29.85	3037.15	2.26
Wind 300 deg - No Ice		-25.67	-14.70	-1442.15	2639.78	2.32
Wind 330 deg - No Ice		-14.86	-25.44	-2538.94	1518.24	0.99
Member Ice	15.21					
Gusset Ice	0.38					
Total Weight Ice	78.61			6.72	25.42	
Wind 0 deg - Ice		-0.25	-45.64	-4680.07	48.78	-3.90
Wind 30 deg - Ice		22.40	-38.97	-3971.95	-2370.61	-4.28
Wind 60 deg - Ice		39.22	-22.27	-2220.25	-4141.39	-1.63
Wind 90 deg - Ice		45.34	0.54	81.56	-4747.90	-5.72
Wind 120 deg - Ice		39.92	22.76	2374.78	-4167.89	-0.12
Wind 150 deg - Ice		23.33	38.63	4017.10	-2465.53	4.13
Wind 180 deg - Ice		0.13	44.94	4691.61	-56.82	2.37
Wind 210 deg - Ice		-23.16	38.50	3992.36	2444.39	5.81
Wind 240 deg - Ice		-39.68	22.82	2362.01	4154.38	5.19
Wind 270 deg - Ice		-45.36	-0.14	31.66	4761.65	5.87
Wind 300 deg - Ice		-39.27	-22.56	-2290.77	4137.90	3.09
Wind 330 deg - Ice		-22.69	-38.99	-4008.86	2390.95	-1.42
Total Weight	48.50			5.42	4.22	
Wind 0 deg - Service		-0.23	-30.11	-2986.97	9.38	0.84
Wind 30 deg - Service		14.59	-25.43	-2503.12	-1557.06	1.52
Wind 60 deg - Service		25.63	-14.43	-1373.71	-2701.74	3.50
Wind 90 deg - Service		29.68	0.52	78.03	-3082.38	-2.23
Wind 120 deg - Service		26.45	15.01	1525.47	-2733.90	0.29
Wind 150 deg - Service		15.48	25.12	2544.68	-1649.35	1.44
Wind 180 deg - Service		0.13	29.28	2988.30	-93.42	-2.55
Wind 210 deg - Service		-15.32	24.99	2520.58	1552.57	-0.18
Wind 240 deg - Service		-26.22	15.07	1512.87	2644.65	-0.12

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Load Case	Vertical Forces	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
Wind 270 deg - Service		-29.70	-0.12	29.64	3019.61	2.26
Wind 300 deg - Service		-25.67	-14.70	-1442.36	2622.24	2.32
Wind 330 deg - Service		-14.86	-25.44	-2539.14	1500.70	0.99

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	197 - 187	Leg	Max Tension	25	2.16	0.07	0.03

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	187 - 172	Diagonal	Max. Compression	19	-3.40	0.36	0.18
			Max. Mx	17	-0.41	0.38	-0.04
			Max. My	21	-0.49	0.15	0.32
			Max. Vy	17	0.72	-0.07	0.01
			Max. Vx	21	0.63	-0.03	-0.06
			Max Tension	20	0.86	0.00	0.00
			Max. Compression	20	-0.95	0.00	0.00
			Max. Mx	19	0.28	-0.00	0.00
			Max. My	16	0.15	-0.00	-0.00
			Max. Vy	19	-0.00	-0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
			Max Tension	17	0.13	0.00	0.00
		Top Girt	Max. Compression	20	-0.19	0.00	0.00
			Max. Mx	14	-0.01	-0.02	0.00
			Max. My	16	-0.08	0.00	-0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	17	0.46	0.00	0.00
			Max. Compression	19	-0.51	0.00	0.00
			Max. Mx	14	0.01	0.01	0.00
			Max. My	16	-0.11	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
			Max Tension	17	13.75	-0.25	0.15
		Bottom Girt	Max. Compression	19	-19.18	-0.28	-0.20
			Max. Mx	18	-15.50	0.94	0.18
			Max. My	21	10.80	0.13	0.92
			Max. Vy	18	1.89	-0.29	-0.10
			Max. Vx	21	1.83	-0.03	-0.28
			Max Tension	20	2.51	0.00	0.00
			Max. Compression	20	-2.56	0.00	0.00
			Max. Mx	19	0.49	-0.00	0.00
			Max. My	20	-2.56	-0.00	-0.00
			Max. Vy	18	-0.00	-0.00	-0.00
			Max. Vx	20	0.00	-0.00	-0.00
			Max Tension	19	0.60	0.00	0.00
		Leg	Max. Compression	17	-0.54	0.00	0.00
			Max. Mx	14	-0.01	0.01	0.00
			Max. My	23	-0.24	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
			Max Tension	17	1.11	0.00	0.00
			Max. Compression	19	-1.18	0.00	0.00
			Max. Mx	14	0.01	0.01	0.00
			Max. My	24	0.05	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
			Max Tension	17	46.08	1.32	0.03
T3	172 - 152	Diagonal	Max. Compression	19	-56.07	-1.28	-0.02
			Max. Mx	19	-21.38	1.45	0.10
			Max. My	18	0.00	-0.11	1.30
			Max. Vy	17	4.24	-1.32	0.06
			Max. Vx	18	-2.39	-0.18	0.46
			Max Tension	20	4.21	0.00	0.00
			Max. Compression	20	-4.22	0.00	0.00
			Max. Mx	19	2.44	-0.01	-0.00
			Max. My	20	-2.93	-0.00	-0.00
			Max. Vy	17	-0.01	-0.01	0.00
			Max. Vx	20	0.00	-0.00	-0.00
			Max Tension	19	1.20	0.00	0.00
		Top Girt	Max. Compression	17	-1.12	0.00	0.00

RISA Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	27 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T4	152 - 142	Bottom Girt	Max. Mx	14	-0.00	0.01	0.00
			Max. My	23	-0.58	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	23	0.00	0.00	0.00
			Max Tension	17	1.27	0.00	0.00
			Max. Compression	19	-0.97	0.00	0.00
		Leg	Max. Mx	14	0.25	0.01	0.00
			Max. My	16	0.25	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	17	51.04	1.94	-0.09
			Max. Compression	19	-59.93	10.61	0.14
			Max. Mx	19	-59.93	10.61	0.14
			Max. My	18	-0.70	-0.42	8.22
			Max. Vy	17	1.55	-10.60	-0.24
			Max. Vx	18	-1.41	-0.42	8.22
		Diagonal	Max Tension	17	5.23	0.00	0.00
			Max. Compression	23	-6.38	0.00	0.00
			Max. Mx	20	-4.93	-0.03	-0.00
			Max. My	16	-5.08	-0.01	0.02
			Max. Vy	18	0.01	0.03	0.01
			Max. Vx	16	-0.01	0.00	0.00
T5	142 - 122	Leg	Max Tension	17	82.80	0.61	-0.55
			Max. Compression	19	-98.78	10.30	0.04
			Max. Mx	19	-98.78	10.30	0.04
			Max. My	18	-2.90	-0.26	7.35
			Max. Vy	19	-1.29	9.85	0.03
			Max. Vx	22	-0.36	-0.16	6.40
		Diagonal	Max Tension	22	6.22	0.05	-0.01
			Max. Compression	16	-6.41	0.00	0.00
			Max. Mx	19	4.86	0.13	-0.01
			Max. My	22	-6.25	-0.03	-0.02
			Max. Vy	19	-0.03	0.13	-0.01
			Max. Vx	22	0.00	0.00	0.00
T6	122 - 102	Leg	Max Tension	25	112.20	-1.25	0.08
			Max. Compression	19	-134.27	10.86	-0.05
			Max. Mx	19	-134.27	10.86	-0.05
			Max. My	20	-2.67	-1.40	-8.53
			Max. Vy	23	-1.48	10.64	-0.23
			Max. Vx	20	0.80	-1.40	-8.53
		Diagonal	Max Tension	17	6.16	0.00	0.00
			Max. Compression	15	-7.33	0.00	0.00
			Max. Mx	19	3.90	0.11	-0.01
			Max. My	26	-6.55	-0.02	0.01
			Max. Vy	19	-0.03	0.11	-0.01
			Max. Vx	26	-0.00	-0.02	0.01
T7	102 - 82	Leg	Max Tension	17	141.95	-1.95	-0.39
			Max. Compression	19	-171.93	8.32	-0.03
			Max. Mx	17	126.53	-8.47	-0.34
			Max. My	18	-6.13	-0.85	6.96
			Max. Vy	19	-1.02	8.32	-0.03
			Max. Vx	26	-0.79	-0.63	6.86
		Diagonal	Max Tension	24	7.25	0.00	0.00
			Max. Compression	24	-7.44	0.00	0.00
			Max. Mx	19	6.22	0.09	-0.00
			Max. My	25	-5.83	-0.03	0.02
			Max. Vy	19	-0.03	0.09	-0.00
			Max. Vx	25	-0.00	0.00	0.00
		Top Girt	Max Tension	21	3.70	0.00	0.00
			Max. Compression	19	-1.75	0.00	0.00
			Max. Mx	14	1.05	-0.08	0.00

RISATower

URS Corporation
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Job	U20.0x195' PiROD Lattice Tower	Page	28 of 34
Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T8	82 - 62	Leg	Max. My	26	0.94	0.00	0.00
			Max. Vy	14	0.03	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
			Max Tension	25	170.38	-1.63	-0.05
			Max. Compression	19	-204.88	7.58	-0.04
			Max. Mx	17	155.52	-8.31	-0.20
		Diagonal	Max. My	18	-10.17	-0.38	6.66
			Max. Vy	17	0.92	-8.31	-0.20
			Max. Vx	18	-0.56	-0.38	6.66
			Max Tension	16	7.17	0.00	0.00
			Max. Compression	16	-7.50	0.00	0.00
			Max. Mx	19	5.79	0.13	-0.01
			Max. My	25	-6.34	-0.00	0.01
			Max. Vy	19	-0.04	0.13	-0.01
T9	62 - 42	Leg	Max. Vx	25	-0.00	0.00	0.00
			Max Tension	25	197.06	-2.17	-0.01
			Max. Compression	19	-237.23	6.85	-0.04
			Max. Mx	17	194.72	-7.84	-0.08
			Max. My	18	-14.78	-0.64	5.83
			Max. Vy	17	0.75	-7.26	-0.09
		Diagonal	Max. Vx	26	-0.42	-0.48	5.77
			Max Tension	16	7.41	0.00	0.00
			Max. Compression	16	-7.65	0.00	0.00
			Max. Mx	19	6.26	0.13	-0.01
			Max. My	16	-7.61	0.01	0.01
			Max. Vy	19	-0.05	0.13	-0.01
			Max. Vx	16	-0.00	0.00	0.00
			Max Tension	25	220.65	-0.62	0.06
T10	42 - 22	Leg	Max. Compression	19	-268.43	0.92	-0.02
			Max. Mx	25	220.10	-10.93	-0.02
			Max. My	24	-19.00	2.01	-5.48
			Max. Vy	17	1.14	-10.89	-0.04
			Max. Vx	26	-0.22	2.14	5.41
		Diagonal	Max Tension	16	8.76	0.00	0.00
			Max. Compression	16	-8.24	0.00	0.00
			Max. Mx	19	7.24	0.17	-0.01
			Max. My	16	-8.19	0.01	0.02
			Max. Vy	19	-0.06	0.17	-0.01
			Max. Vx	16	-0.00	0.00	0.00
		Leg	Max Tension	25	239.98	4.50	0.19
			Max. Compression	19	-300.28	1.04	-0.00
			Max. Mx	19	-281.28	14.57	-0.05
			Max. My	24	-20.32	8.88	-7.54
			Max. Vy	15	-1.86	14.52	0.01
			Max. Vx	16	-0.85	7.58	-6.11
T11	22 - 2	Diagonal	Max Tension	16	11.91	0.00	0.00
			Max. Compression	16	-10.14	0.00	0.00
			Max. Mx	19	4.66	0.21	-0.01
			Max. My	16	-10.09	0.08	0.02
			Max. Vy	25	0.07	0.20	0.02
			Max. Vx	16	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
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RISATower

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Job

U20.0x195' PiROD Lattice Tower

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Project

Surdan Mountain Road, Sharon, CT

Date

11:50:00 07/24/08

Client

Northeast Utilities System

Designed by
Staff

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	23	303.83	21.08	-12.36
	Max. H _x	23	303.83	21.08	-12.36
	Max. H _z	17	-246.67	-27.84	16.25
	Min. Vert	17	-246.67	-27.84	16.25
	Min. H _x	17	-246.67	-27.84	16.25
	Min. H _z	23	303.83	21.08	-12.36
Leg B	Max. Vert	19	304.90	-21.27	-12.27
	Max. H _x	25	-248.54	27.96	16.31
	Max. H _z	25	-248.54	27.96	16.31
	Min. Vert	25	-248.54	27.96	16.31
	Min. H _x	19	304.90	-21.27	-12.27
	Min. H _z	19	304.90	-21.27	-12.27
Leg A	Max. Vert	15	298.09	-0.14	24.27
	Max. H _x	24	24.37	2.09	-3.98
	Max. H _z	15	298.09	-0.14	24.27
	Min. Vert	21	-246.37	0.12	-32.15
	Min. H _x	18	21.45	-2.09	-4.41
	Min. H _z	21	-246.37	0.12	-32.15

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	48.50	0.00	0.00	5.42	4.23	0.00
Dead+Wind 0 deg - No Ice	48.50	-0.23	-30.11	-2999.05	27.15	0.80
Dead+Wind 30 deg - No Ice	48.50	14.59	-25.43	-2513.13	-1546.01	1.52
Dead+Wind 60 deg - No Ice	48.50	25.63	-14.43	-1378.95	-2695.55	3.53
Dead+Wind 90 deg - No Ice	48.50	29.68	0.52	78.70	-3077.68	-2.20
Dead+Wind 120 deg - No Ice	48.50	26.45	15.01	1531.99	-2727.77	0.30
Dead+Wind 150 deg - No Ice	48.50	15.48	25.12	2555.40	-1638.84	1.43
Dead+Wind 180 deg - No Ice	48.50	0.13	29.28	3000.90	-76.56	-2.56
Dead+Wind 210 deg - No Ice	48.50	-15.32	24.99	2531.08	1576.61	-0.14
Dead+Wind 240 deg - No Ice	48.50	-26.22	15.07	1519.26	2673.14	-0.11
Dead+Wind 270 deg - No Ice	48.50	-29.70	-0.12	29.94	3049.74	2.25
Dead+Wind 300 deg - No Ice	48.50	-25.67	-14.70	-1448.19	2650.73	2.30
Dead+Wind 330 deg - No Ice	48.50	-14.86	-25.44	-2549.47	1524.52	0.96
Dead+Ice+Temp	78.61	0.00	-0.00	6.72	25.47	0.00
Dead+Wind 0 deg+Ice+Temp	78.61	-0.25	-45.64	-4709.31	49.27	-4.07
Dead+Wind 30 deg+Ice+Temp	78.61	22.40	-38.97	-3996.63	-2385.66	-4.35
Dead+Wind 60 deg+Ice+Temp	78.61	39.22	-22.27	-2233.82	-4167.72	-1.63
Dead+Wind 90 deg+Ice+Temp	78.61	45.34	0.54	82.24	-4777.91	-5.69
Dead+Wind 120 deg+Ice+Temp	78.61	39.92	22.76	2389.66	-4194.31	-0.05
Dead+Wind 150 deg+Ice+Temp	78.61	23.33	38.63	4042.25	-2481.39	4.22
Dead+Wind 180 deg+Ice+Temp	78.61	0.13	44.94	4721.04	-57.74	2.46
Dead+Wind 210 deg+Ice+Temp	78.61	-23.16	38.50	4017.18	2459.69	5.94
Dead+Wind 240 deg+Ice+Temp	78.61	-39.68	22.82	2376.70	4180.33	5.26
Dead+Wind 270 deg+Ice+Temp	78.61	-45.36	-0.14	31.78	4791.52	5.88
Dead+Wind 300 deg+Ice+Temp	78.61	-39.27	-22.56	-2305.23	4163.86	3.01
Dead+Wind 330 deg+Ice+Temp	78.61	-22.69	-38.99	-4034.02	2405.95	-1.57
Dead+Wind 0 deg - Service	48.50	-0.23	-30.11	-2999.05	27.15	0.80
Dead+Wind 30 deg - Service	48.50	14.59	-25.43	-2513.13	-1546.01	1.52
Dead+Wind 60 deg - Service	48.50	25.63	-14.43	-1378.95	-2695.55	3.53
Dead+Wind 90 deg - Service	48.50	29.68	0.52	78.70	-3077.68	-2.20
Dead+Wind 120 deg - Service	48.50	26.45	15.01	1531.99	-2727.77	0.30
Dead+Wind 150 deg - Service	48.50	15.48	25.12	2555.40	-1638.84	1.43
Dead+Wind 180 deg - Service	48.50	0.13	29.28	3000.90	-76.56	-2.56

RISA Tower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	30 of 34
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Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Dead+Wind 210 deg - Service	48.50	-15.32	24.99	2531.08	1576.61	-0.14
Dead+Wind 240 deg - Service	48.50	-26.22	15.07	1519.26	2673.14	-0.11
Dead+Wind 270 deg - Service	48.50	-29.70	-0.12	29.94	3049.74	2.25
Dead+Wind 300 deg - Service	48.50	-25.67	-14.70	-1448.19	2650.73	2.30
Dead+Wind 330 deg - Service	48.50	-14.86	-25.44	-2549.47	1524.52	0.96

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	0.00	-48.50	0.00	0.00	48.50	0.00	0.000%
2	-0.23	-48.50	-30.11	0.23	48.50	30.11	0.000%
3	14.59	-48.50	-25.43	-14.59	48.50	25.43	0.000%
4	25.63	-48.50	-14.43	-25.63	48.50	14.43	0.000%
5	29.68	-48.50	0.52	-29.68	48.50	-0.52	0.000%
6	26.45	-48.50	15.01	-26.45	48.50	-15.01	0.000%
7	15.48	-48.50	25.12	-15.48	48.50	-25.12	0.000%
8	0.13	-48.50	29.28	-0.13	48.50	-29.28	0.000%
9	-15.32	-48.50	24.99	15.32	48.50	-24.99	0.000%
10	-26.22	-48.50	15.07	26.22	48.50	-15.07	0.000%
11	-29.70	-48.50	-0.12	29.70	48.50	0.12	0.000%
12	-25.67	-48.50	-14.70	25.67	48.50	14.70	0.000%
13	-14.86	-48.50	-25.44	14.86	48.50	25.44	0.000%
14	0.00	-78.61	0.00	-0.00	78.61	0.00	0.000%
15	-0.25	-78.61	-45.64	0.25	78.61	45.64	0.000%
16	22.40	-78.61	-38.97	-22.40	78.61	38.97	0.000%
17	39.22	-78.61	-22.27	-39.22	78.61	22.27	0.000%
18	45.34	-78.61	0.54	-45.34	78.61	-0.54	0.000%
19	39.92	-78.61	22.76	-39.92	78.61	-22.76	0.000%
20	23.33	-78.61	38.63	-23.33	78.61	-38.63	0.000%
21	0.13	-78.61	44.94	-0.13	78.61	-44.94	0.000%
22	-23.16	-78.61	38.50	23.16	78.61	-38.50	0.000%
23	-39.68	-78.61	22.82	39.68	78.61	-22.82	0.000%
24	-45.36	-78.61	-0.14	45.36	78.61	0.14	0.000%
25	-39.27	-78.61	-22.56	39.27	78.61	22.56	0.000%
26	-22.69	-78.61	-38.99	22.69	78.61	38.99	0.000%
27	-0.23	-48.50	-30.11	0.23	48.50	30.11	0.000%
28	14.59	-48.50	-25.43	-14.59	48.50	25.43	0.000%
29	25.63	-48.50	-14.43	-25.63	48.50	14.43	0.000%
30	29.68	-48.50	0.52	-29.68	48.50	-0.52	0.000%
31	26.45	-48.50	15.01	-26.45	48.50	-15.01	0.000%
32	15.48	-48.50	25.12	-15.48	48.50	-25.12	0.000%
33	0.13	-48.50	29.28	-0.13	48.50	-29.28	0.000%
34	-15.32	-48.50	24.99	15.32	48.50	-24.99	0.000%
35	-26.22	-48.50	15.07	26.22	48.50	-15.07	0.000%
36	-29.70	-48.50	-0.12	29.70	48.50	0.12	0.000%
37	-25.67	-48.50	-14.70	25.67	48.50	14.70	0.000%
38	-14.86	-48.50	-25.44	14.86	48.50	25.44	0.000%

Non-Linear Convergence Results

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Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00028904
2	Yes	5	0.00000001	0.00064808
3	Yes	5	0.00000001	0.00065475
4	Yes	5	0.00000001	0.00067340
5	Yes	5	0.00000001	0.00067092
6	Yes	5	0.00000001	0.00066595
7	Yes	5	0.00000001	0.00066925
8	Yes	5	0.00000001	0.00066822
9	Yes	5	0.00000001	0.00064804
10	Yes	5	0.00000001	0.00064481
11	Yes	5	0.00000001	0.00065885
12	Yes	5	0.00000001	0.00066792
13	Yes	5	0.00000001	0.00066028
14	Yes	4	0.00000001	0.00054830
15	Yes	5	0.00000001	0.00065279
16	Yes	5	0.00000001	0.00066057
17	Yes	5	0.00000001	0.00067732
18	Yes	5	0.00000001	0.00067164
19	Yes	5	0.00000001	0.00066486
20	Yes	5	0.00000001	0.00066977
21	Yes	5	0.00000001	0.00067329
22	Yes	5	0.00000001	0.00065556
23	Yes	5	0.00000001	0.00065063
24	Yes	5	0.00000001	0.00066409
25	Yes	5	0.00000001	0.00067447
26	Yes	5	0.00000001	0.00066497
27	Yes	5	0.00000001	0.00064808
28	Yes	5	0.00000001	0.00065475
29	Yes	5	0.00000001	0.00067340
30	Yes	5	0.00000001	0.00067092
31	Yes	5	0.00000001	0.00066595
32	Yes	5	0.00000001	0.00066925
33	Yes	5	0.00000001	0.00066822
34	Yes	5	0.00000001	0.00064804
35	Yes	5	0.00000001	0.00064481
36	Yes	5	0.00000001	0.00065885
37	Yes	5	0.00000001	0.00066792
38	Yes	5	0.00000001	0.00066028

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	197 - 187	12.311	31	0.5297	0.1005
T2	187 - 172	11.173	31	0.5270	0.0872
T3	172 - 152	9.467	31	0.5011	0.0592
T4	152 - 142	7.415	31	0.4163	0.0323
T5	142 - 122	6.216	31	0.3975	0.0174
T6	122 - 102	4.291	31	0.3196	0.0113
T7	102 - 82	2.881	31	0.2492	0.0111
T8	82 - 62	1.807	31	0.1986	0.0066
T9	62 - 42	1.008	31	0.1364	0.0044
T10	42 - 22	0.460	31	0.0914	0.0025
T11	22 - 2	0.133	31	0.0407	0.0008

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	32 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
ft		Comb.	in	°	°	ft
196.26	Single Dipole	31	12.228	0.5296	0.0996	43936
194.92	6'x4" Pipe Mount	31	12.076	0.5294	0.0980	43936
194.25	PA6-65AC	31	12.001	0.5293	0.0972	43936
192.75	9' x 3" Dia Omni	31	11.831	0.5291	0.0954	43936
190.25	OGT9-840	31	11.546	0.5284	0.0921	33238
188.75	9' x 3" Dia Omni	31	11.375	0.5279	0.0899	29892
187.25	DB222-A	31	11.202	0.5271	0.0876	30973
186.50	PiROD 4' Side Mount Standoff (1)	31	11.115	0.5267	0.0864	34097
182.25	PD220	31	10.621	0.5232	0.0787	55682
181.50	BCD87077	31	10.533	0.5223	0.0772	35740
181.25	PiROD 15' Rotatable Platform (Lattice)	31	10.504	0.5220	0.0767	31928
180.25	DB222-A	31	10.388	0.5207	0.0748	22379
175.25	12' x 3" Dia Omni	31	9.820	0.5108	0.0650	9063
174.25	10' x 3" Dia Omni	31	9.710	0.5082	0.0632	8309
173.75	ANT150D6-9	31	9.655	0.5067	0.0623	8059
172.25	PiROD 6' Side Mount Standoff (1)	31	9.494	0.5019	0.0596	7795
170.20	3' Sidearm	31	9.280	0.4944	0.0563	8838
163.25	PiROD 13' Lightweight T-Frame	31	8.587	0.4628	0.0469	37795
163.00	(4) 60"x12"x4" Panel	31	8.563	0.4616	0.0466	32479
157.00	Filter/Diplexer	31	7.960	0.4339	0.0392	7355
150.25	(2) 7770.00	31	7.211	0.4122	0.0295	7156
149.63	T-Arm (1)	31	7.137	0.4109	0.0285	8301
135.00	SD210-SF3P4LDF	31	5.458	0.3759	0.0120	6042
133.00	PD220	31	5.260	0.3679	0.0117	6480
121.50	DB230-2A	31	4.251	0.3174	0.0112	10537
120.67	6' Rigid Side Arm w/ 3" STD mount pipe	31	4.185	0.3139	0.0113	10792
120.58	Folded Dipole	31	4.177	0.3135	0.0113	10817
120.50	6' Rigid Side Arm w/ 3" STD mount pipe	31	4.171	0.3132	0.0113	10839
115.00	SD210-SF3P4LDF	31	3.753	0.2913	0.0120	11876
112.00	PiROD 4' Side Mount Standoff (1)	31	3.538	0.2804	0.0120	12425
109.25	DB205-L	31	3.348	0.2711	0.0119	12975
106.00	Ice Canopy	31	3.133	0.2608	0.0117	13689
102.25	PA6-65AC	31	2.896	0.2499	0.0111	14530
101.20	6'8"x4" Pipe Mount	31	2.832	0.2470	0.0109	14735
100.67	6' Rigid Side Arm w/ 3" STD mount pipe	31	2.800	0.2456	0.0108	14831
95.00	DB586-Y	31	2.471	0.2314	0.0096	15726
94.00	DB224-A	31	2.416	0.2290	0.0094	15887
92.00	PiROD 4' Side Mount Standoff (1)	31	2.307	0.2242	0.0089	16218
90.41	PD220	31	2.223	0.2204	0.0085	16491
85.00	2' Sidearm	31	1.950	0.2068	0.0072	17485
81.00	SD110-SFXPASNM (SRL110A)	31	1.761	0.1957	0.0064	18050
79.50	6' Rigid Side Arm w/ 3" STD mount pipe	31	1.693	0.1912	0.0061	18146
70.25	DB432-A	31	1.306	0.1615	0.0051	18393
17.00	1.2M	31	0.086	0.0294	0.0005	26664
15.00	2' Sidearm	31	0.071	0.0251	0.0005	30766
12.58	1.2M	31	0.055	0.0202	0.0004	37803
11.00	2' Sidearm	31	0.045	0.0170	0.0003	44440
10.33	1.2M	31	0.041	0.0157	0.0003	48014
9.00	2' Sidearm	31	0.034	0.0132	0.0002	57137

RISATower URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	33 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	197 - 187	18.530	19	0.7719	0.1262
T2	187 - 172	16.879	19	0.7690	0.1119
T3	172 - 152	14.392	19	0.7364	0.0820
T4	152 - 142	11.364	19	0.6211	0.0501
T5	142 - 122	9.568	19	0.5983	0.0337
T6	122 - 102	6.640	19	0.4891	0.0197
T7	102 - 82	4.465	19	0.3847	0.0139
T8	82 - 62	2.801	19	0.3075	0.0106
T9	62 - 42	1.560	19	0.2115	0.0085
T10	42 - 22	0.709	19	0.1417	0.0054
T11	22 - 2	0.203	19	0.0630	0.0022

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
196.26	Single Dipole	19	18.409	0.7718	0.1252	27772
194.92	6'x4" Pipe Mount	19	18.190	0.7716	0.1235	27772
194.25	PA6-65AC	19	18.080	0.7715	0.1227	27772
192.75	9' x 3" Dia Omni	19	17.833	0.7712	0.1207	27772
190.25	OGT9-840	19	17.421	0.7705	0.1171	20983
188.75	9' x 3" Dia Omni	19	17.172	0.7699	0.1148	18757
187.25	DB222-A	19	16.921	0.7691	0.1123	19467
186.50	PiROD 4' Side Mount Standoff (1)	19	16.795	0.7687	0.1110	21266
182.25	PD220	19	16.075	0.7647	0.1028	49187
181.50	BCD87077	19	15.948	0.7637	0.1013	28647
181.25	PiROD 15' Rotatable Platform (Lattice)	19	15.906	0.7633	0.1008	25146
180.25	DB222-A	19	15.737	0.7617	0.0987	16889
175.25	12' x 3" Dia Omni	19	14.908	0.7493	0.0883	6464
174.25	10' x 3" Dia Omni	19	14.747	0.7458	0.0863	5911
173.75	ANT150D6-9	19	14.667	0.7439	0.0853	5729
172.25	PiROD 6' Side Mount Standoff (1)	19	14.431	0.7375	0.0825	5547
170.20	3' Sidearm	19	14.118	0.7273	0.0789	6360
163.25	PiROD 13' Lightweight T-Frame	19	13.101	0.6840	0.0683	21640
163.00	(4) 60"x12"x4" Panel	19	13.064	0.6823	0.0679	18882
157.00	Filter/Diplexer	19	12.173	0.6444	0.0589	4634
150.25	(2) 7770.00	19	11.058	0.6159	0.0467	4483
149.63	T-Arm (1)	19	10.948	0.6143	0.0458	5160
135.00	SD210-SF3P4LDF	19	8.423	0.5692	0.0259	4228
133.00	PD220	19	8.122	0.5582	0.0243	4523
121.50	DB230-2A	19	6.578	0.4860	0.0196	7183
120.67	6' Rigid Side Arm w/ 3" STD mount pipe	19	6.477	0.4808	0.0194	7342
120.58	Folded Dipole	19	6.466	0.4803	0.0194	7358
120.50	6' Rigid Side Arm w/ 3" STD mount pipe	19	6.456	0.4798	0.0193	7371
115.00	SD210-SF3P4LDF	19	5.812	0.4477	0.0179	7988
112.00	PiROD 4' Side Mount Standoff (1)	19	5.480	0.4316	0.0170	8304
109.25	DB205-L	19	5.187	0.4176	0.0161	8617
106.00	Ice Canopy	19	4.855	0.4022	0.0151	9017
102.25	PA6-65AC	19	4.488	0.3858	0.0140	9489

<i>RISA Tower</i> URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-3991	Job	U20.0x195' PiROD Lattice Tower	Page	34 of 34
	Project	Surdan Mountain Road, Sharon, CT	Date	11:50:00 07/24/08
	Client	Northeast Utilities System	Designed by	Staff

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
101.20	6'8"x4" Pipe Mount	19	4.389	0.3815	0.0137	9608
100.67	6' Rigid Side Arm w/ 3" STD mount pipe	19	4.339	0.3793	0.0136	9665
95.00	DB586-Y	19	3.830	0.3578	0.0121	10228
94.00	DB224-A	19	3.744	0.3541	0.0119	10330
92.00	PiROD 4' Side Mount Standoff (1)	19	3.576	0.3468	0.0114	10541
90.41	PD220	19	3.445	0.3410	0.0111	10714
85.00	2' Sidearm	19	3.022	0.3202	0.0108	11345
81.00	SD110-SFXPASNM (SRL110A)	19	2.729	0.3031	0.0105	11697
79.50	6' Rigid Side Arm w/ 3" STD mount pipe	19	2.624	0.2961	0.0104	11753
70.25	DB432-A	19	2.023	0.2502	0.0095	11874
17.00	1.2M	19	0.131	0.0455	0.0016	17054
15.00	2' Sidearm	19	0.108	0.0389	0.0014	19678
12.58	1.2M	19	0.083	0.0312	0.0011	24179
11.00	2' Sidearm	19	0.069	0.0264	0.0009	28424
10.33	1.2M	19	0.063	0.0244	0.0009	30710
9.00	2' Sidearm	19	0.052	0.0204	0.0007	36545

Program Version 5.1.1.4 - 2/25/2008 File:P:/08/Rev_1/ERI Files/70mph_wind_70mph_ice_at_195/195'
PiROD_Self_Support_Tower_Sharon_CT_70mph.eri

ANCHOR BOLT ANALYSIS

ANCHOR BOLT ANALYSIS

Input Data

Max Pier Reactions:

Uplift:	Uplift := 427 kips	user input
Shear:	Shear := 51 kips	user input
Compression:	Compression := 488 kips	user input

Anchor Bolt Data:

Use ASTM A687

Number of Anchor Bolts = N	N := 6	user input
Bolt Ultimate Strength:	F _u := 150 ksi	user input
Bolt Yield Strength:	F _y := 105 ksi	user input
Bolt Modulus:	E := 29000 ksi	user input
Thickness of Anchor Bolts	D := 1.25 in	user input
Threads per Inch:	n := 7.0	user input
Coefficient of Friction:	μ := 0.55	user input (for baseplate with grout ASCE 10-97)

Anchor Bolt Area:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \quad A_g = 1.227 \cdot \text{in}^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 \quad A_n = 0.969 \cdot \text{in}^2$$

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$\text{AllowableTension} := 1.333 \cdot (0.33 \cdot A_g \cdot F_u) \quad \text{AllowableTension} = 81.0 \cdot \text{kips}$$

Note: 1.333 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{\text{net.area}} := 1.33 \cdot (0.60 \cdot A_n \cdot F_y) \quad F_{\text{net.area}} = 81.2 \cdot \text{kips}$$

Note: 1.333 increase allowed per TIA/EIA

Applied Tension:

$$\text{MaxTension} := \frac{\text{Uplift}}{N} \quad \text{MaxTension} = 71.2 \cdot \text{kips}$$

Check Stresses:

$$\frac{\text{MaxTension}}{F_{\text{net.area}}} = 0.88$$

$$\text{Condition1} := \text{if} \left(\frac{\text{MaxTension}}{F_{\text{net.area}}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

$$\text{Condition1} = \text{"OK"}$$

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Steel Transmission Structures

Required Area:

$$A_{s1} := \frac{\text{Uplift}}{F_y} + \frac{\text{Shear}}{\mu \cdot 0.85 \cdot F_y} \quad A_{s1} = 5.1 \cdot \text{in}^2$$

$$A_{s2} := \left| \frac{\text{Shear} - (0.3 \cdot \text{Compression})}{\mu \cdot 0.85 \cdot F_y} \right| \quad A_{s2} = 1.9 \cdot \text{in}^2$$

Provided Area:

$$A_{\text{provided}} := A_n \cdot N \quad A_{\text{provided}} = 5.8 \cdot \text{in}^2$$

$$\text{Condition2} := \text{if} \left(\frac{A_{s1}}{A_{\text{provided}}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

$$\frac{A_{s1}}{A_{\text{provided}}} = 0.88$$

Condition2 = "OK"

$$\text{Condition3} := \text{if} \left(\frac{A_{s2}}{A_{\text{provided}}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

$$\frac{A_{s2}}{A_{\text{provided}}} = 0.33$$

Condition3 = "OK"

FOUNDATION CHECK

INPUT DATA

Max Pier Reactions:

Uplift:	$\text{Uplift} := 427 \cdot \text{kips}$	<i>user input</i>
Shear:	$\text{Shear} := 51 \cdot \text{kips}$	<i>user input</i>
Compression:	$\text{Compression} := 488 \cdot \text{kips}$	<i>user input</i>

Structure

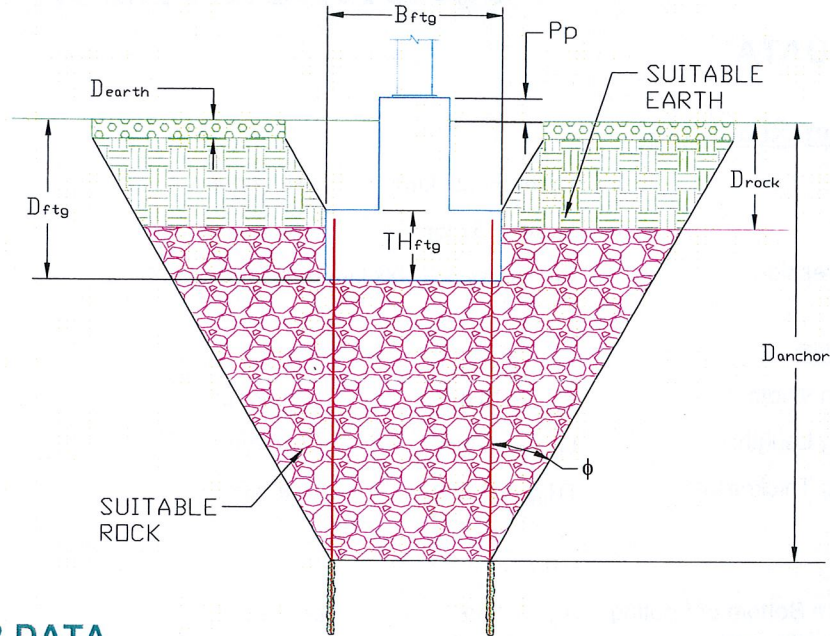
Footing Width:	$B_{\text{fg}} := 10.0 \text{ft}$	<i>user input</i>
Footing Length:	$L_{\text{fg}} := 10.0 \text{ft}$	<i>user input</i>
Footing Thickness:	$TH_{\text{fg}} := 3.25 \text{ft}$	<i>user input</i>

Depths:

Depth to Bottom of Footing: (from grade line)	$D_{\text{fg}} := 3.5 \text{ft}$	<i>user input</i>
Depth to Suitable Rock: (from grade line)	$D_{\text{rock}} := 3.5 \text{ft}$	<i>user input</i>
Depth to Suitable Earth: (from grade line)	$D_{\text{earth}} := 0.0 \text{ft}$	<i>user input</i>
Anchor Depth:	$D_{\text{anchor}} := 30.0 \text{ft}$	<i>user input</i>

Soil Properties:

Internal Friction Angle:	$\mu := 35 \text{deg}$	<i>user input</i>
Unit Weight of Earth:	$\pi_{\text{earth}} := 120 \frac{\text{lb}}{\text{ft}^3}$	<i>user input</i>
Unit Weight of Rock:	$\pi_{\text{rock}} := 165 \frac{\text{lb}}{\text{ft}^3}$	<i>user input</i>
Allowable Bearing:	$\text{Bearing} := 20000 \cdot \text{psf}$	<i>user input</i>
Pier Projection Above Grade:	$P_p := 3.0 \cdot \text{ft}$	<i>user input</i>



ROCK ANCHOR DATA

Anchor:

Number of Anchors (along width):	NW _{anchor} := 2	user input
Number of Anchors (along length):	NL _{anchor} := 2	user input
Hole Diameter:	hole _d := 3.0in	user input
Allowable Bond Stress:	σ _{bond} := 75·psi	user input
Anchor Spacing* (along length):	SL _{anchor} := 5.5ft	user input
Anchor Spacing* (along width):	SW _{anchor} := 5.5ft	user input
Rock Anchor Yield Strength:	Fy _{anchor} := 127.7ksi	user input
Rock Anchor Diameter:	Anchor _{Dia} := 1.375in	user input

Check Tensile Forces:

Force (per anchor):

$$P_{\text{design}} := \frac{\text{Uplift}}{NW_{\text{anchor}} + NL_{\text{anchor}}} \quad P_{\text{design}} = 106.75 \cdot \text{kips}$$

Rock Anchor Allowable Tension:

$$T_{\text{allowable}} := \frac{0.6 \cdot Fy_{\text{anchor}} \cdot \text{Anchor}_{\text{Dia}}^2 \cdot \pi}{4} \quad T_{\text{allowable}} = 113.77 \cdot \text{kips}$$

TensionCheck := if $\left(\frac{P_{\text{design}}}{T_{\text{allowable}}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$ $\frac{P_{\text{design}}}{T_{\text{allowable}}} = 0.94$

TensionCheck = "OK"

CALCULATE RESISTANCE

Intermediate Dimensions:

Suitable Earth Height:	$H := D_{\text{rock}} - D_{\text{earth}}$	H = 3.50 ft
Suitable Rock Height:	$Z := D_{\text{anchor}} - D_{\text{earth}} - D_{\text{rock}}$	Z = 26.50 ft
Total Anchor Width:	$W := (N_{\text{W}_{\text{anchor}}} - 1) \cdot S_{\text{W}_{\text{anchor}}}$	W = 5.50 ft
Total Anchor Length:	$L := (N_{\text{L}_{\text{anchor}}} - 1) \cdot S_{\text{L}_{\text{anchor}}}$	L = 5.50 ft
Earth Above Footing:	$PD := D_{\text{ftg}} - D_{\text{earth}} - TH_{\text{ftg}}$	PD = 0.25 ft

Volumes:

Gross Volume:

$$GV_1 := W \cdot L \cdot (Z + H) \quad GV_1 = 907.50 \cdot \text{ft}^3$$

$$GV_2 := \left[\frac{1}{2} \cdot (Z + H) \cdot \tan(\mu) \cdot (Z + H) \right] \cdot (W + L) \cdot 2 \quad GV_2 = 6932.05 \cdot \text{ft}^3$$

$$GV_3 := \frac{1}{3} \cdot \pi \cdot [(Z + H) \cdot \tan(\mu)]^2 \cdot (Z + H) \quad GV_3 = 13862.64 \cdot \text{ft}^3$$

$$GV := GV_1 + GV_2 + GV_3 \quad GV = 21702.19 \cdot \text{ft}^3$$

Rock Volume:

$$RV_1 := W \cdot L \cdot (H) \quad RV_1 = 105.87 \cdot \text{ft}^3$$

$$RV_2 := \left[\frac{1}{2} \cdot (Z) \cdot \tan(\mu) \cdot (Z) \right] \cdot (W + L) \cdot 2 \quad RV_2 = 5408.93 \cdot \text{ft}^3$$

$$RV_3 := \frac{1}{3} \cdot \pi \cdot [(Z) \cdot \tan(\mu)]^2 \cdot (Z) \quad RV_3 = 9554.76 \cdot \text{ft}^3$$

$$RV := RV_1 + RV_2 + RV_3 \quad RV = 15069.56 \cdot \text{ft}^3$$

Volume of Neglect Above Footing:

$$NV_1 := B_{\text{ftg}} \cdot L_{\text{ftg}} \cdot H \quad NV_1 = 350.00 \cdot \text{ft}^3$$

$$NV_2 := \left[\frac{1}{2} \cdot (PD) \cdot \tan(\mu) \cdot (PD) \right] \cdot (B_{\text{ftg}} + L_{\text{ftg}}) \cdot 2 \quad NV_2 = 0.88 \cdot \text{ft}^3$$

$$NV_3 := \frac{1}{3} \cdot \pi \cdot [(PD) \cdot \tan(\mu)]^2 \cdot (PD) \quad NV_3 = 0.01 \cdot \text{ft}^3$$

$$NV := NV_1 + NV_2 + NV_3 \quad NV = 350.88 \cdot \text{ft}^3$$

Total Suitable Earth Volume: $EV := GV - RV - NV \quad EV = 6281.75 \cdot \text{ft}^3$

Resisting Forces:

Resisting Rock Force:	$F_{rock} := RV \cdot \pi_{rock}$	$F_{rock} = 2486.48 \cdot \text{kips}$
Resisting Earth Force:	$F_{earth} := EV \cdot \pi_{earth}$	$F_{earth} = 753.81 \cdot \text{kips}$
Total Resisting Force:	$F_{total} := F_{rock} + F_{earth}$	$F_{total} = 3240.29 \cdot \text{kips}$

Check Uplift:

Condition1 := if $\left(\frac{F_{total}}{Uplift} \geq 2.00, "OK", "Overstressed" \right)$	$\frac{F_{total}}{Uplift} = 7.59$	Condition1 = "OK"
--	-----------------------------------	-------------------

Required Anchorage Bond Length:

$L_b := \frac{P_{design}}{\pi \cdot hole_d \cdot \sigma_{bond}}$	$L_b = 12.59 \text{ ft}$	
Condition2 := if $\left(\frac{Z}{L_b} \geq 2.00, "OK", "Overstressed" \right)$	$\frac{Z}{L_b} = 2.11$	Condition2 = "OK"

Check Bearing (with Post tension Force included):

$\text{MaxBearing} := \left[\frac{\text{Compression} + (NW_{anchor} + NL_{anchor})(P_{design})}{B_{fig} \cdot L_{fig}} \right] + \frac{\text{Shear} \cdot (D_{fig} + P_p)}{\left(\frac{B_{fig} \cdot L_{fig}^2}{6} \right)}$	$\text{MaxBearing} = 11139.00 \cdot \text{psf}$
Condition3 := if $\left(\frac{\text{MaxBearing}}{\text{Bearing}} \leq 1.00, "OK", "Overstressed" \right)$	$\frac{\text{MaxBearing}}{\text{Bearing}} = 0.56$ Condition3 = "OK"

APPENDIX

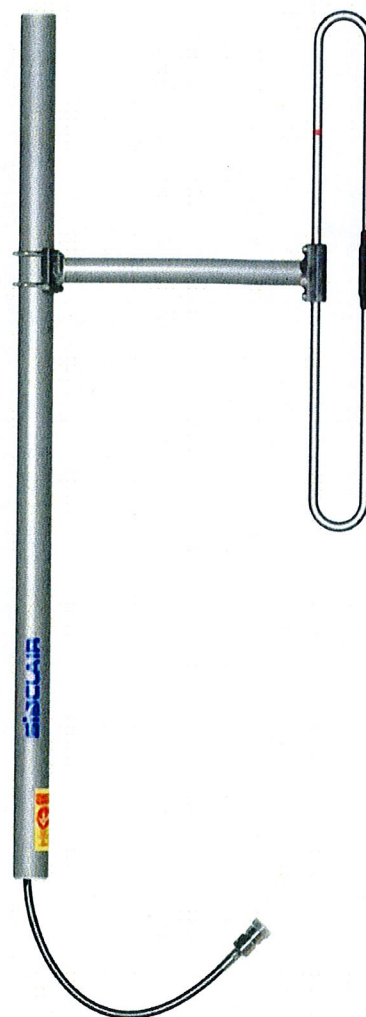
SD210

1 dipole antenna, 2.0/2.5 dBd gain, 118-225 MHz

- Covers 118-225 MHz in 3 band splits
- 2.0 dBd gain in elliptical (bi-directional) pattern (1/2 wave), 2.5 dBd gain in offset pattern (1/4 wave)
- 228 mph/ 367 kph survival wind rating

The SD210 series of antennas is unique in its high efficiency and exceptionally wide bandwidth, covering the frequency ranges of 118-137 or 138-174 MHz at a VSWR of 1.5:1 or better. Because of its bandwidth, the SD210 series is perfectly suited for multicoupled systems.

Two model variants of this rugged antenna are available: Pattern adjustable version with external cable harness enabling its pattern to be changed in the field; and the fixed pattern versions (such as the 1/2 and 1/4 wave options), which cannot be adjusted in the field as the cable harness is inside the mast and dipole booms.



Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 288 2763	International: +44 (0) 1223 42 03 03	International: +1 305 235 2706	Canada: 1 800 263 3238 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com
Product Specification Sheet		SD210		Dated: 19-12-07

Electrical Specifications

Frequency Range	MHz	118 to 174
Gain	dBd (dBi)	2.5 (4.6)
Pattern		Offset or Bi-directional
Input VSWR (max)		1.5:1
Polarization		vertical
Horizontal beamwidth	degrees	210
Vertical beamwidth	degrees	68
Average power input (max)	W	200
Lightning protection		DC ground

Ordering Information

Specify required frequency, pattern and connector option when ordering.

2 x #130 clamps recommended (not included).

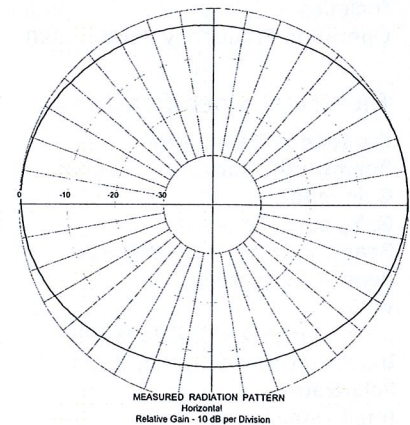
Mechanical Specifications

Height	in (mm)	60 (1524)
Depth	in (mm)	3 (76)
Width	in (mm)	21 (533)
Connector		N (male)
Weight	lbs (kg)	8.3 (3.8)
Base pipe diameter	in (mm)	1.9 (48)
Base pipe mounting length	in (mm)	24 (610)
Mounting hardware		Clamps not supplied.
Shipping dimensions	in (mm)	63x4x42in ()
Shipping weight	lbs (kg)	15 (6.8)

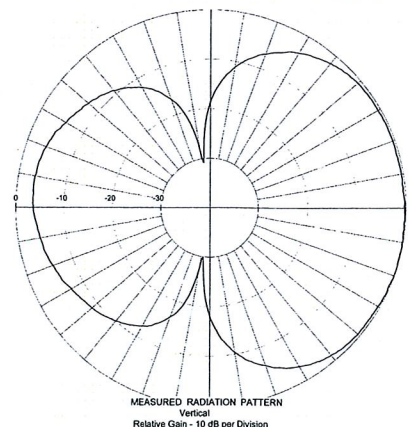
Environmental Specifications

Rated wind velocity (no ice)	mph (km/h)	175 (282)
Rated wind velocity (1/2" radial ice)	mph (km/h)	85 (137)
Rated radial ice	in (mm)	0.5 (13)
Projected area (Flat Plate Equivalent)	ft ² (m ²)	0.89 (0.08)
Projected area (ice)	ft ² (m ²)	1.6 (0.15)
Lateral thrust (100mph)	lbs (N)	55 (244.6)

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Product Specifications



DB586-Y

Omni Antenna, 890–960 MHz, 360° horizontal beamwidth, fixed electrical tilt



- Light weight, low profile omnidirectional antenna ideal for low to moderate gain applications
- Integral dual purpose mount allows top or side mounting

CHARACTERISTICS

General Specifications

Antenna Type	Omni
Includes	V-bolts
Operating Frequency Band	890 – 960 MHz

Electrical Specifications

Frequency Band, MHz

Beamwidth, Horizontal, degrees
Gain, dBd
Gain, dBi
Beamwidth, Vertical, degrees
Beam Tilt, degrees
VSWR
5th Order IMD at 2 x 20 W, dBc
Input Power, maximum, watts
Polarization
Impedance, ohms
Lightning Protection

890–960

360
6.0
8.1
18.0
0
1.5:1
-150
300
Vertical
50
dc Ground

Product Specifications

DB586-Y



Mechanical Specifications

Color	Horizon blue
Connector Interface	N Female
Connector Location	Bottom
Connector Quantity	1
Wind Area, maximum	0.0 m ² 0.3 ft ²
Wind Loading, maximum	89.4 N @ 100 mph 20.1 lbf @ 100 mph
Wind Speed, maximum	201.2 km/h 125.0 mph

Dimensions

Length	1498.6 mm 59.0 in
Outer Diameter	38.1 mm 1.5 in
Net Weight	3.7 kg 8.3 lb

Regulatory Compliance/Certifications

Agency

RoHS 2002/95/EC
China RoHS SJ/T 11364-2006

Classification

Compliant by Exemption
Logo 2

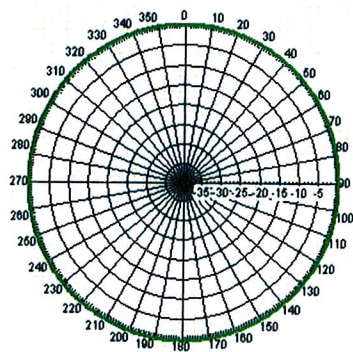


Product Specifications

DB586-Y

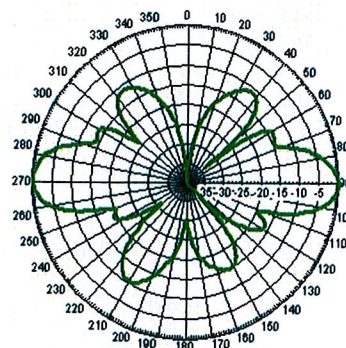


Horizontal Pattern



Freq: 903 MHz, Tilt: 0

Vertical Pattern



Freq: 903 MHz, Tilt: 0

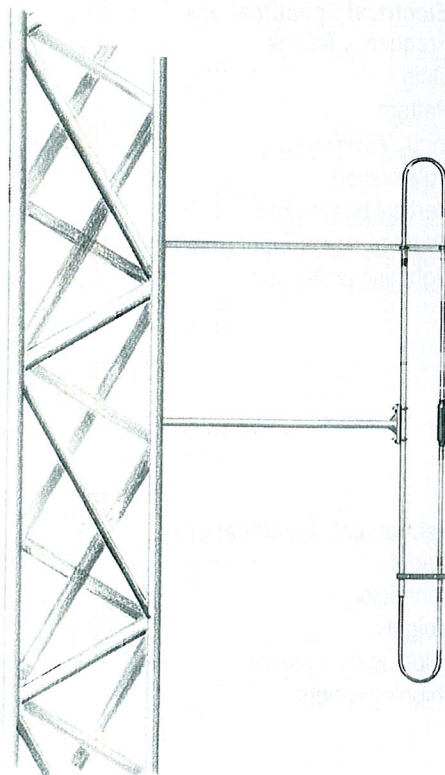
SD110-SFXPASNM

(SRL110A)

Exposed dipole directive antenna, 2.5 dBd gain, 30-79 MHz

- Covers 30-79 MHz in 0.5MHz Increments, this antenna has a 10% BW at 1.5:1 VSWR.
- 2.5dBd gain, offset pattern (1/8 wave)
- 100mph/161kph rated wind rating -300W power handling

The SD110 is a single broadband dipole for side mounting on a supporting structure. The SD110 series is supplied with a special welded boom and anti-torque support. Due to the many mounting possibilities, mounting hardware is not supplied with these antennas. Engineering assistance will be provided in the selection of the proper hardware.



Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 288 2763	International: +44 (0) 1223 42 03 03	International: +1 305 235 2706	Canada: 1 800 263 3238 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com
Product Specification Sheet EPR 017420		SD110-SFXPASNM	Issue: 38	Dated: 19-12-07 Dated: 10-12-01

Electrical Specifications

Frequency Range	MHz	30 to 79
Gain	dBd (dBi)	2.5 (4.6)
Pattern		offset
Input VSWR (max)		1.5:1
Polarization		vertical
Vertical beamwidth	degrees	68
Average power input (max)	W	300
Lightning protection		DC ground

Ordering Information

Specify frequency band of operation.

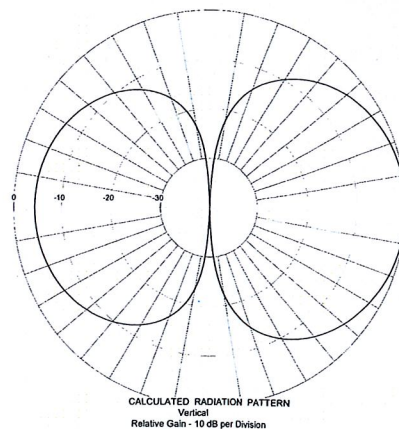
Mechanical Specifications

Height	in (mm)	190 (4826)
Connector		N (male)
Weight	lbs (kg)	25 (11.4)
Shipping dimensions	in (mm)	195x4x55in ()
Shipping weight	lbs (kg)	45 (20.4)

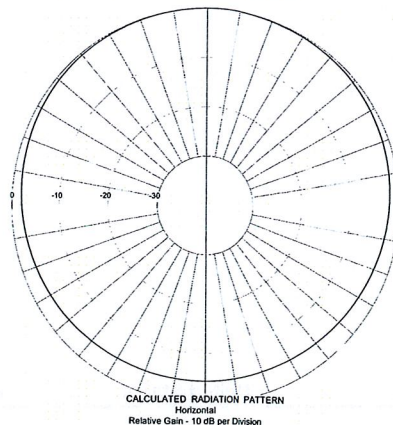
Environmental Specifications

Rated wind velocity (no ice)	mph (km/h)	100 (161)
Rated wind velocity (1/2" radial ice)	mph (km/h)	85 (137)
Lateral thrust (100mph)	lbs (N)	200 (889.6)

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April 1, 2008

Mr. Mark Gauger
Construction Manager
Verizon Wireless
99 East River Drive, 9th Floor
East Hartford, CT 06108

**Reference: Existing Telecommunications Facility
Verizon Wireless Antenna Modification
Cornwall Alltel
Surdan Mountain Road
Sharon, Connecticut
URS Proj. No: 36931123/VZ4 047**

Dear Mr. Gauger:

URS Corporation has been retained by Verizon Wireless to verify that all reinforcements, modifications and removals were completed at the above mentioned site, as outlined in "Structural Analysis Report prepared for Northeast Utilities by URS Corporation, entitled "Detailed Structural Analysis and Reinforcement of an existing 195' Self Supporting Lattice Tower and its Foundation for New Antenna Arrangement" dated July 24, 2008, URS project number 36923525.00000/NU1-024" with regard to its ability to support the proposed antenna modifications. The tower was climbed on March 10, 2009 by Terracon and all modifications were completed. A copy of the field report is attached for your reference.

The tower and its foundation are considered structurally adequate for the antenna loading as noted in the following Structural Analysis Report prepared for Northeast Utilities by URS Corporation, entitled "Detailed Structural Analysis and Reinforcement of an existing 195' Self Supporting Lattice Tower and its Foundation for New Antenna Arrangement" dated July 24, 2008, URS project number 36923525.00000/NU1-024.

If you should have any questions, please call me at (860) 529-8882.

Sincerely,

URS Corporation AES


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



cc: Don Soule, Litchfield County Dispatch
Steve Florio, Northeast Utilities
Michael Egan, AIA
CF/Book

URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Tel: 860.529.8882
Fax: 860.529.3991

DAILY SUMMARY REPORT

Report Number: J2091127.0001
Service Date: 03/10/09
Report Date: 03/18/09
Task:

Terracon

201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

URS Corporation
Attn: Michael Eagen III, AIA
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067

Project

Verizon Wireless Antenna Modification
7 Surdan Mountain Road
Sharon, CT

Project No. J2091127

A Terracon representative visited the above-referenced site to provide construction monitoring services limited to structural steel.

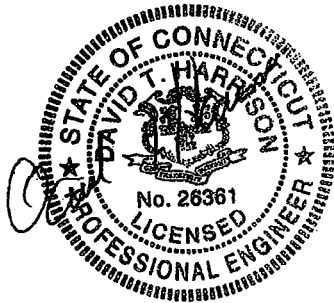
Structural steel was reviewed including welding, bolting and appeared to be in general accordance with project documents.

Please refer to the attached report no(s). .0001A for further information.

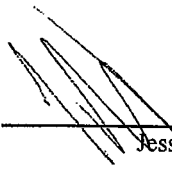
Weather during today's activities was clear, 30s to 40s F.

Report Distribution

(1) URS Corporation



Reviewed by


Jesse S. Jezek

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

TOWER MODIFICATION OBSERVATION REPORT

Report Number: J2091127.0001A
Service Date: 03/10/09
Report Date: 03/18/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

URS Corporation
Attn: Michael Eagen III, AIA
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067

Project

Verizon Wireless Antenna Modification
7 Surdan Mountain Road
Sharon, CT

Project Number: J2091127

Visited site to perform observation and testing of structural connections: Upon arrival, observed the following items:

Framing Level:	0 to 22 feet	Area/Gridlines:	A, B and C legs
(Above Tower Base)	42 feet to 62 feet		
	82 feet to 102 feet		
	122 feet to 142 feet		

Item #	Description	Details	
1	Connection Type:	Welded	
	Status:	Final connection observations	SMAW
	Reference Detail(s):	URS SK-1, dated 7/24/08	
	Discrepancies:	None observed	
	Notes / Exceptions:	The truss leg reinforcement appeared to be sprayed with cold-galvanize paint and was caulked between the existing tower and the reinforcements between the installed welds.	

Items referenced above were field connections unless otherwise noted. Connections were visually observed to be in general accordance with the referenced details of the project plans and specifications unless noted in the Discrepancies section. Discrepancies, if any, are further detailed on the attached Discrepancy List.

Additional Remarks:

The required antenna removals and installations appeared to be in general conformance with the report titled "Detailed Structural Analysis and Reinforcement of an Existing 195' Self Supporting Lattice Tower and Its Foundation for New Antenna Arrangement" prepared by URS Corporation on 7/24/08.

Terracon Rep.: Patrick T. Blume

Report Distribution:
(1) URS Corporation

Reviewed By:


Jesse S. Jezek

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of properties of other apparently similar or identical materials.

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