

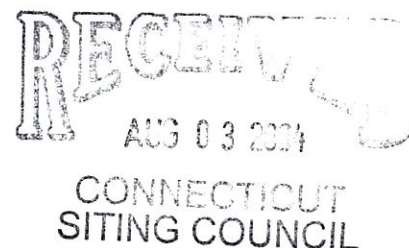
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Hartford, CT 06103-3597
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August 3, 2004

Via Hand Delivery

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



Re: **Notice of Exempt Modification**
Bruce Memorial Golf Course, 1323 King Street Telecommunications
Facility, Greenwich, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains a wireless telecommunications facility at the Bruce Memorial Golf Course, 1323 King Street in Greenwich. This facility consists of six (6) panel-type cellular antennas at the 98-foot level of the 100-foot tower. Equipment associated with the antennas is located in an equipment shelter near the base of the tower.

The Connecticut Siting Council ("the Council") approved Cellco's shared use of the King Street facility on July 14, 1993. Cellco now intends to modify its facility by replacing the two (2) cellular antennas with two (2) PCS antennas and adding two (2) additional PCS antennas to its array of antennas at the same 98-foot level on the tower. Following this modification, Cellco will maintain a total of eight (8) antennas, two sectors of four (4) antennas each. (See Attachment 1- Project Plans).

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 Greenwich First Selectman, Jim Lash.

As the Council knows, on May 23, 2003, Cellco acquired, from Northcoast Communications, a license to provide PCS service throughout Connecticut. The proposed modifications to the King Street facility will allow Cellco to provide its customers in the Greenwich area with enhanced wireless voice and data services.

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S. Derek Phelps
August 3, 2004
Page 2

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

1. The proposed modifications will not result in any increase in the overall height of the existing structure. Cellco's replacement antennas will be mounted at the same 98-foot level on the 100-foot tower.
2. The proposed modifications will not affect associated equipment areas and 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 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. The combined worst-case RF power density calculations for existing and Cellco antennas would be 15.08% of the FCC standard (See Attachment 2).

Also included as Attachment 3 is a Detailed Structural Analysis and Evaluation, prepared by URS Corporation, verifying that the tower can accommodate the existing and proposed antennas and related equipment.

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

Sincerely,

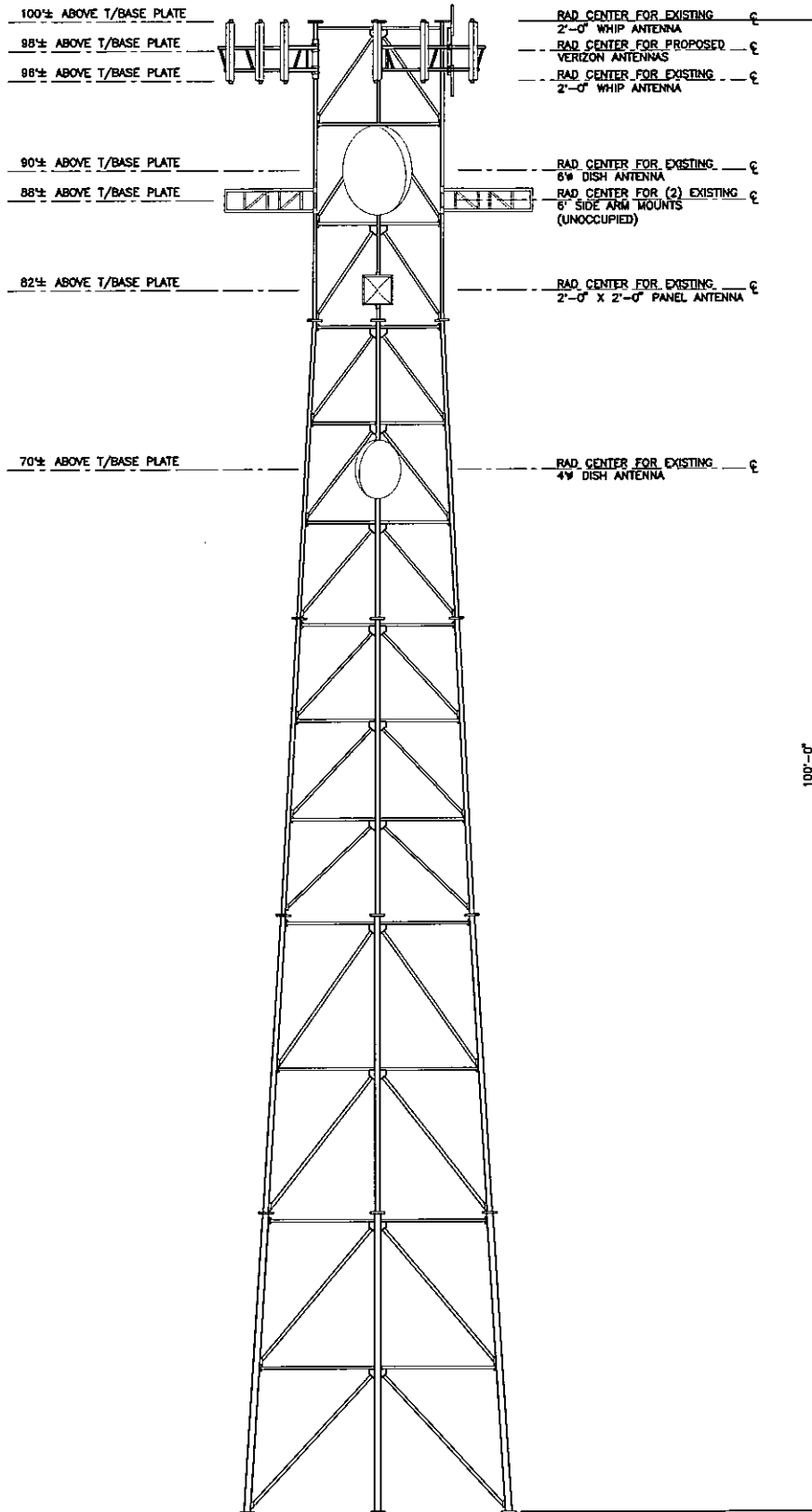


Kenneth C. Baldwin

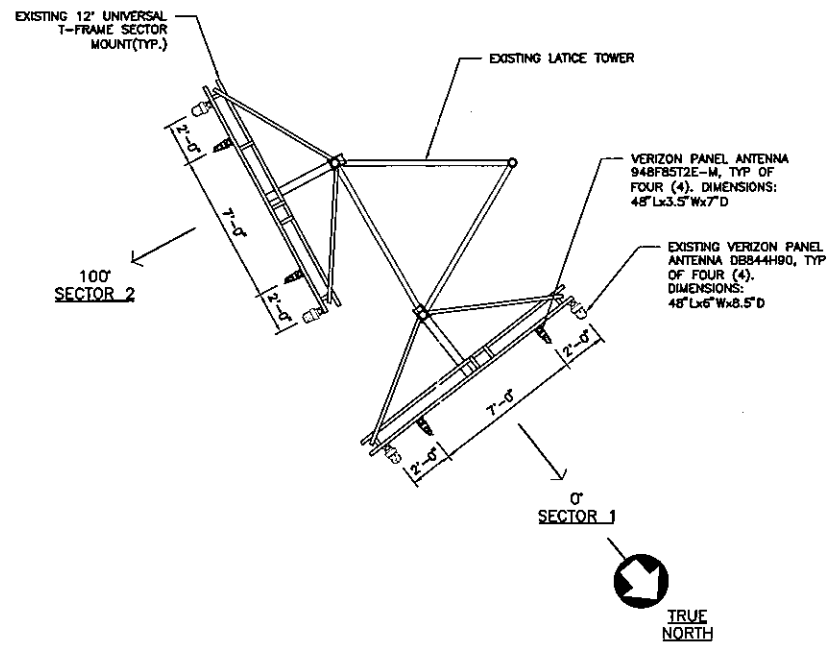
KCB/kmd
Enclosures

cc: Jim Lash, Greenwich First Selectman
Sandy M. Carter

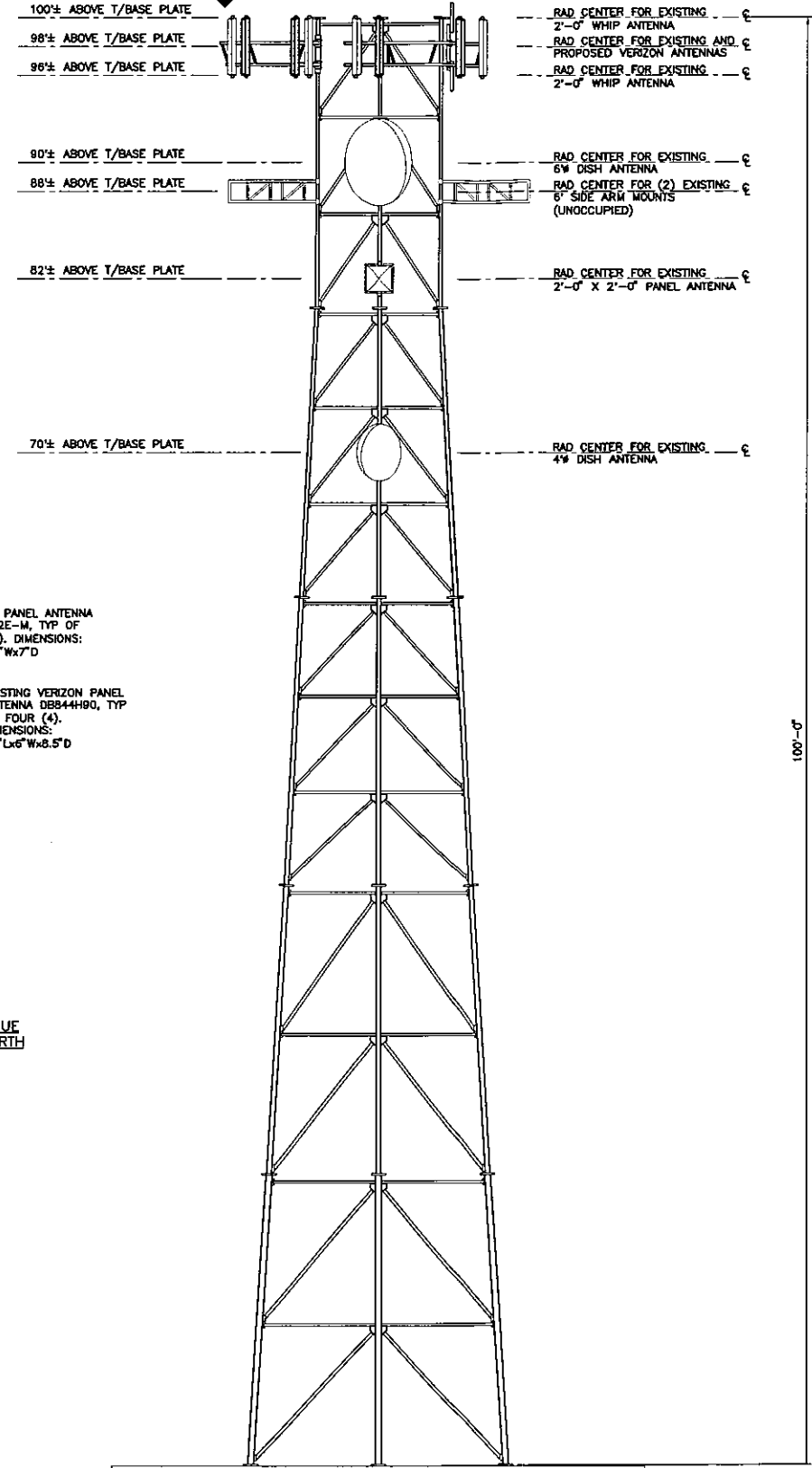




1 EXISTING TOWER ELEVATION
SCALE: 3/16" = 1'-0"



3 SECTION - ANTENNA ORIENTATION
NOT TO SCALE



2 PROPOSED TOWER ELEVATION
SCALE: 3/16" = 1'-0"

REVISIONS		
00	08/02/04	SITING COUNCIL

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

Natcomm, LLC - Engineering Consultants
NATCOMM
Natcomm, LLC - Engineering Consultants
65-2 North Branford Road
Branford, Connecticut 06405
Tel: (203) 488-0200
Fax: (203) 488-0307
Consulting Engineers - Project Management
Civil - Structural - Mechanical - Electrical

PROFESSIONAL ENGINEER SEAL

BRUCE GOLF COURSE
1323 KING STREET
GREENWICH, CT 06483

PROJECT NO: 04115
DRAWN BY: AAJ
CHECKED BY: TSG
SCALE: AS NOTED
DATE: 07/15/04

ELEVATIONS
AND ANTENNA
ORIENTATIONS

C-1
DWG. 1 OF 1

General Power Density

Site Name: Bruce's Golf, CT
Tower Height: 98 Ft. rad center

Operator	Operating Frequency (MHz)	Number of Trans	ERP Per Trans (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm ²)	Maximum Permissible Exposure (mW/cm ²)	Fraction of MPE (%)	
Verizon	880	9	200	1800	98	0.0674	0.56733	11.88%	
Verizon	1900	3	285	855	98	0.0320	1	3.20%	
Total Percentage of Maximum Permissible Exposure								15.08%	

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

MHz = Megahertz
mW/cm² = milliwatts per square centimeter
ERP = Effective Radiated Power
Absolute worst case scenario, maximum values used.



DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 100' EXISTING SELF SUPPORTING TOWER FOR PROPOSED ANTENNA ADDITION

Bruce's Golf Course
1300 King Street
Greenwich, Connecticut

prepared for



Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

prepared by



URS CORPORATION
795 BROOK STREET, BUILDING 5
ROCKY HILL, CT 06067
TEL. 860-529-8882

36929198.00000
VZ1-084

July 21, 2004

TABLE OF CONTENTS

- 1. EXECUTIVE SUMMARY**
- 2. INTRODUCTION**
- 3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS**
- 4. FINDINGS AND EVALUATION**
- 5. CONCLUSIONS AND RECOMMENDATIONS**
- 6. DRAWINGS AND DATA**
 - **ERI TOWER INPUT / OUTPUT DATA FOR TOWER WITH PROPOSED ANTENNA LOADING**
 - **ROHN TOWER ASSEMBLY WITH DESIGN REACTIONS**

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 100' self-supporting lattice tower located at Bruce's Golf Course, 1300 King Street, Greenwich, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222 requirements for wind velocity of 85 mph and 74 mph concurrent with 1/2" ice design wind load. The loading considered in the analysis consists of all proposed antennas and existing antennas, transmission lines, and ancillary items as outlined in following section of this report. The proposed Verizon Wireless modification as follows:

ANTENNA & MOUNT DESCRIPTION	CARRIER	CENTERLINE ELEVATION
Remove (2) of (6) existing Decibel DB844H90 antennas and add (4) Decibel DB948F85T2E-M antennas on existing T-frames and add (2) 7/8" coaxial cables to the existing (6) 7/8" cables.	Verizon Wireless	@ 98' elevation

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

This analysis is based on:

- 1) The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- 2) Tower geometry, structural member sizes, and foundation details taken from Rohn Industries, Inc. final erection drawings, file no. 29307JC dated April 21, 1993.
- 3) Existing antennas, transmission lines, and ancillary item details were taken from a tower evaluation report prepared by Natcomm, LLC, project number 02601, signed and sealed October 15, 2002 for Verizon Wireless.
- 4) TIA/EIA-222 wind load classification.
- 5) All existing and proposed coaxial cables installed in single tower face, between support legs.

This report is only valid per the assumptions and data utilized in this report for the structural member sizing, antenna inventory, mounting, and coaxial cable sizes and locations. The user of this report shall field verify the assumption of the structural member sizes, antennas, mount configurations, and cable sizes and locations. Notify the engineer in writing immediately if any of the assumptions in this report are found to be other than specified.

If you should have any questions, please call.

Sincerely,
URS Corporation AES

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



RAS/ddm

cc: Mark Gauger – Verizon Wireless
Douglas Roberts, AIA – URS
CF/Book

2. INTRODUCTION

The subject tower is located at Bruce's Golf Course, 1300 King Street, Greenwich, Connecticut. The structure is a 100' self-supporting lattice tower designed and manufactured by Rohn Industries, Inc. The tower is constructed of steel pipe legs, diagonals, and horizontal members. The tower sections are bolted together. Tower geometry, structural member sizes, and foundation details taken from Rohn Industries, Inc. final erection drawings, file no. 29307JC dated April 21, 1993.

Existing antennas, transmission lines, and ancillary item details were taken from a tower evaluation report prepared by Natcomm, LLC, project number 02601, signed and sealed October 15, 2002 for Verizon Wireless. The existing structure supports numerous communication antennas. The antenna and mount configuration considered in the analysis is as follows:

ANTENNA & MOUNT DESCRIPTION	CARRIER	CENTERLINE ELEVATION
(1) Omni antenna on side arm mount with (1) 7/8" coaxial cable	(existing)	@ 100'-0"
Remove (2) of (6) existing Decibel DB844H90 antennas and add (4) Decibel DB948F85T2E-M antennas on existing T-frames and add (2) 7/8" coaxial cables to the existing (6) 7/8" cables.	Verizon WS (proposed)	@ 98'-0"
(1) Inverted omni antenna on side arm mount with (1) 7/8" coaxial cable	(existing)	@ 96'-0"
(1) Andrew 6' dia. HP dish, leg mounted, with (1) 7/8" coaxial cable	(existing)	@ 90'-0"
(2) Empty side-arm mounts	(existing)	@ 88'-0"
(1) Andrew 4' dia. HP dish, leg mounted, with (1) EW90 cable	(existing)	@ 70'-0"

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

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

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

The analysis was conducted using ERI Tower 3.0. The load conditions were evaluated as shown below which were compared to allowable stresses according to AISC, and TIA/EIA requirements. The load combinations were investigated in ERI Tower 3.0 to determine the stress, sway and rotation.

Load Condition 1 = 85 mph Wind Load + Tower Dead Load

Load Condition 2 = 74 mph Wind Load (with ice) + Ice Load + Tower Dead Load

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

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The foundation reactions were compared with the original design from the Rohn Industries, Inc. drawings. The tower legs, diagonal and horizontal members, and foundations have sufficient capacity to carry the loads applied.

Tower Foundation Summary:

Load Description	Current	Design	Usage (%)
Max Pier Force (Down) (kips)	61.0	133.0	45.9
Max Pier Force (Uplift) (kips)	52.0	113.1	46.0
Total Shear Force (kips)	14.0	29.3	47.8
Overturning Moment (kip-ft)	844.0	1,811.1	46.6

For detailed loadings, see ERI tower output data in section 6 of this report

Tower Member Usage Summary:

Elevation Range (from base)	Member Description	Member Force (kips)	Member Usage (%)	Member Description	Member Force (kips)	Member Usage (%)
80' – 100'	Leg	6.36	15.5	Diagonal	4.51	30.3
60' – 80'	Leg	19.14	30.5	Diagonal	4.35	32.6
40' – 60'	Leg	32.53	40.1	Diagonal	4.16	36.1
20' – 40'	Leg	43.52	39.6	Diagonal	4.87	34.2
0' – 20'	Leg	55.90	31.5	Diagonal	4.72	37.3

For detailed member analysis, see ERI tower output data in section 6 of this report

5. CONCLUSIONS AND RECOMMENDATIONS

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

Limitations/Assumptions:

This report is based on the following:

- A. Tower is properly installed and maintained.
- B. Tower geometry, structural member sizes, and foundation details taken from Rohn Industries, Inc. final erection drawings, file no. 29307JC dated April 21, 1993.
- C. Existing antennas, transmission lines, and ancillary item details were taken from a tower evaluation report prepared by Natcomm, LLC, project number 02601, signed and sealed October 15, 2002 for Verizon Wireless.
- D. All existing and proposed coaxial cables installed in single tower face, between support legs.
- E. All required members are in place.
- F. All bolts are in place and are properly tightened.
- G. Tower is in plumb condition.
- H. All member coatings are in good condition.
- I. All tower members were properly designed, detailed, fabricated, installed, and have been properly maintained since erection.

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

- A. Adding antennas
- B. 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.

6.) DRAWINGS AND DATA

**ERI TOWER INPUT / OUTPUT DATA FOR TOWER WITH PROPOSED
ANTENNA LOADING**

Section	T1	T2	T3	T4	T5
Side	ROHN 2.5 STD	ROHN 3 STD	3.5" SCH 40 PIPE A572-50	ROHN 4 EH	ROHN 5 X-STR
Diagonals		ROHN 2 STD		ROHN 2.5 STD	
Diagonal Grade			A500-33		
Top Girts		ROHN 1.5 STD		ROHN 2 STD	
Horizontal		ROHN 1.5 STD		ROHN 2 STD	
Inner Bracing			L2x2x1/8		L2 1/2x2 1/2x3/16
Face Width (ft)	8.5	8.542	10.583	12.625	14.958
# Panels @ (ft)		9 @ 6.66667		4 @ 10	
Weight (K)	1.1		1.6	2.1	2.6

100.0 ft

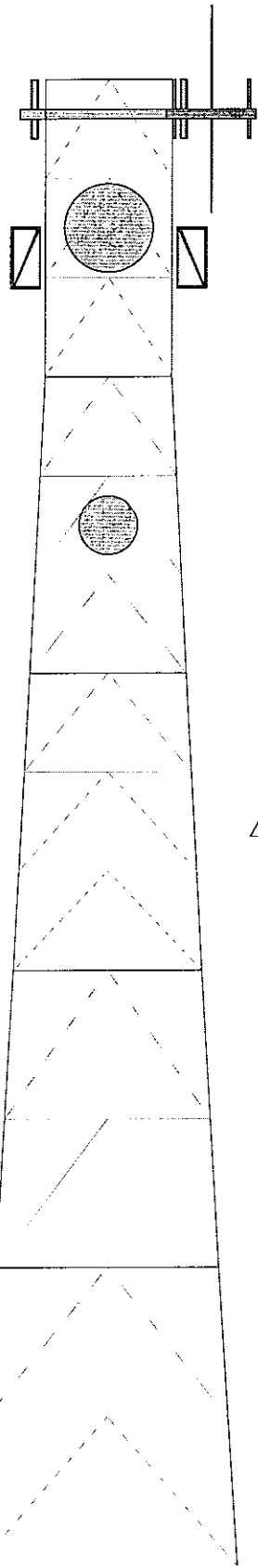
80.0 ft

60.0 ft

40.0 ft

20.0 ft

0.0 ft



APPURTENANCES

TYPE	ELEVATION	TYPE	ELEVATION
Omni Antenna (Town)	100	(2) DB844H90 w/Mount Pipe (Verizon)	98
(2) DB844H90 w/Mount Pipe (Verizon)	98	Omni Antenna (Town)	96
(2) DB948F85T2E-M w/Mount Pipe (Verizon)	98	HP6-107	90
(2) DB948F85T2E-M w/Mount Pipe (Verizon)	98	Pirol 4' Side Mount Standoff (1) (Empty)	88
PiROD 12' Universal T-Frame Sector Mount (Verizon)	98	Pirol 4' Side Mount Standoff (1) (Empty)	88
PiROD 12' Universal T-Frame Sector Mount (Verizon)	98	HP4-102	70

MATERIAL STRENGTH

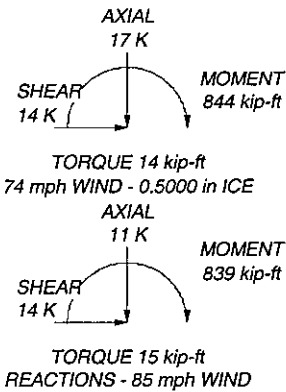
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A500-33	33 ksi	45 ksi

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 40.1%

MAX PIER FORCES:

DOWN: 61 K
UPLIFT: -52 K
SHEAR: 9 K



URS Corp. AES		Job: 100' Rohn SSMW Tower	
795 Brook Street		Project: Bruce's Golf Course, Greenwich, CT	
Rocky Hill, CT 06067		Client: Verizon WS	Drawn by: Daniel D. McClure
Phone: (860) 529-8882		Code: TIA/EIA-222-F	Date: 07/21/04
FAX: (860) 529-5566		Path: P:\Telecom\F12\ERI Files\100' Rohn SSMW Tower.eri	Scale: NTS
		Dwg No. E-1	

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	1 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 100.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 8.50 ft at the top and 17.46 ft at the base.

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

The following design criteria apply:

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

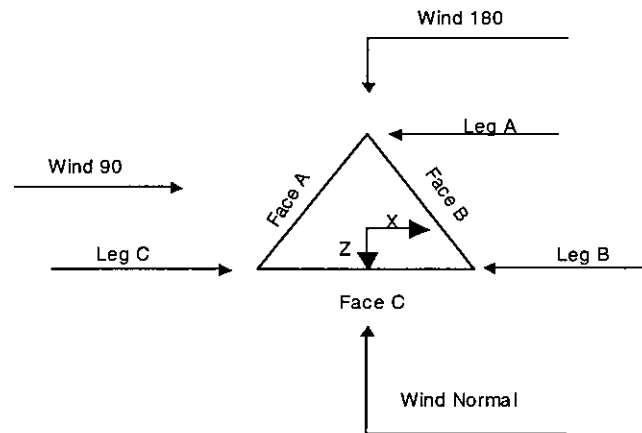
Stress ratio used in tower member design is 1.333.

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	Include Angle Block Shear Check 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		

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	2 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	100.00-80.00			8.50	1	20.00
T2	80.00-60.00			8.54	1	20.00
T3	60.00-40.00			10.58	1	20.00
T4	40.00-20.00			12.63	1	20.00
T5	20.00-0.00			14.96	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	100.00-80.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T2	80.00-60.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T3	60.00-40.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T4	40.00-20.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T5	20.00-0.00	10.00	K Brace Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	3 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 100.00-80.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)
T2 80.00-60.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)
T3 60.00-40.00	Pipe	3.5" SCH 40 PIPE	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)
T4 40.00-20.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A500-33 (33 ksi)
T5 20.00-0.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A500-33 (33 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 100.00-80.00	Pipe	ROHN 1.5 STD	A500-33 (33 ksi)	Pipe	ROHN 1.5 STD	A500-33 (33 ksi)
T2 80.00-60.00	Pipe	ROHN 1.5 STD	A500-33 (33 ksi)	Pipe	ROHN 1.5 STD	A500-33 (33 ksi)
T3 60.00-40.00	Pipe	ROHN 2 STD	A500-33 (33 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)
T4 40.00-20.00	Pipe	ROHN 2 STD	A500-33 (33 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)
T5 20.00-0.00	Pipe	ROHN 2 STD	A500-33 (33 ksi)	Pipe		A500-33 (33 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A500-33 (33 ksi)
T2 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A500-33 (33 ksi)
T3 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)
T4 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)
T5 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A500-33 (33 ksi)

Tower Section Geometry (cont'd)

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	4 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
<i>ft</i>						
T1 100.00-80.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A500-33 (33 ksi)
T2 80.00-60.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A500-33 (33 ksi)
T3 60.00-40.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A500-33 (33 ksi)
T4 40.00-20.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A500-33 (33 ksi)
T5 20.00-0.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A500-33 (33 ksi)

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
<i>ft</i>	<i>ft²</i>	<i>in</i>						
T1 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	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 100.00-80.00	No	No	1	1	1	1	1	1	1	1
T2 80.00-60.00	No	No	1	1	1	1	1	1	1	1
T3 60.00-40.00	No	No	1	1	1	1	1	1	1	1
T4 40.00-20.00	No	No	1	1	1	1	1	1	1	1
T5 20.00-0.00	No	No	1	1	1	1	1	1	1	1

¹Note: 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.

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page 5 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date 09:39:25 07/21/04
	Client	Verizon WS	Designed by Daniel D. McClure

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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
7/8	A	No	Ar (CfAe)	98.00 - 5.00	0.0000	0	1	1	1.5000	1.1100		0.54
1 5/8	A	No	Ar (CfAe)	98.00 - 5.00	0.0000	0	1	1	1.9800	1.9800		1.04
(RG Type)												
7/8	A	No	Ar (CfAe)	98.00 - 5.00	4.0000	0	8	8	1.5000	1.1100		0.54
7/8	A	No	Ar (CfAe)	90.00 - 5.00	0.0000	0	1	1	1.5000	1.1100		0.54
1 5/8	A	No	Ar (CfAe)	82.00 - 5.00	0.0000	0	1	1	1.9800	1.9800		1.04
(RG Type)												
1 5/8	A	No	Ar (CfAe)	82.00 - 5.00	0.0000	0	1	1	1.9800	1.9800		1.04
(RG Type)												
EW90	A	No	Af (CfAe)	70.00 - 5.00	0.0000	0	1	1	1.5000	0.9869	3.2550	0.32

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	100.00-80.00	A	19.540	0.000	0.000	0.000	0.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	80.00-60.00	A	28.400	0.822	0.000	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	60.00-40.00	A	28.400	1.645	0.000	0.000	0.18
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T4	40.00-20.00	A	28.400	1.645	0.000	0.000	0.18
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T5	20.00-0.00	A	21.300	1.234	0.000	0.000	0.13
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page 6 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date 09:39:25 07/21/04
	Client	Verizon WS	Designed by Daniel D. McClure

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	100.00-80.00	A	0.500	35.707	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	80.00-60.00	A	0.500	50.067	1.378	0.000	0.000	0.47
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	60.00-40.00	A	0.500	50.067	2.756	0.000	0.000	0.48
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T4	40.00-20.00	A	0.500	50.067	2.756	0.000	0.000	0.48
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T5	20.00-0.00	A	0.500	37.550	2.067	0.000	0.000	0.36
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
T1	100.00-80.00	-6.3623	-3.6733	-7.7632	-4.4821
T2	80.00-60.00	-8.5895	-4.9591	-10.2381	-5.9110
T3	60.00-40.00	-9.2441	-5.3371	-11.2592	-6.5005
T4	40.00-20.00	-10.5050	-6.0650	-13.1339	-7.5829
T5	20.00-0.00	-8.4768	-4.8941	-11.0109	-6.3572

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
(2) DB844H90 w/Mount Pipe (Verizon)	A	From Leg	3.00	0.0000	98.00	No Ice	3.58	0.04
			0.00			1/2" Ice	4.20	0.08
			0.00					
(2) DB844H90 w/Mount Pipe (Verizon)	B	From Leg	3.00	0.0000	98.00	No Ice	3.58	0.04
			0.00			1/2" Ice	4.20	0.08
			0.00					
(2) DB948F85T2E-M w/Mount Pipe (Verizon)	A	From Leg	3.00	0.0000	98.00	No Ice	2.62	0.03
			0.00			1/2" Ice	3.23	0.07
			0.00					
(2) DB948F85T2E-M w/Mount Pipe (Verizon)	B	From Leg	3.00	0.0000	98.00	No Ice	2.62	0.03
			0.00			1/2" Ice	3.23	0.07
			0.00					

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	7 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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
PiROD 12' Universal T- Frame Sector Mount (Verizon)	A	From Leg	3.00 0.00 0.00	0.0000	98.00	No Ice 13.60 1/2" Ice 18.40	13.60 18.40	0.47 0.60
PiROD 12' Universal T- Frame Sector Mount (Verizon)	B	From Leg	3.00 0.00 0.00	0.0000	98.00	No Ice 13.60 1/2" Ice 18.40	13.60 18.40	0.47 0.60
Omni Antenna (Town)	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 5.44 1/2" Ice 6.05	5.44 6.05	0.03 0.07
Omni Antenna (Town)	B	From Leg	3.00 0.00 0.00	0.0000	96.00	No Ice 5.44 1/2" Ice 6.05	5.44 6.05	0.03 0.07
PiROD 4' Side Mount Standoff (1)	B	From Leg	1.50 0.00 0.00	0.0000	88.00	No Ice 2.72 1/2" Ice 4.91	2.72 4.91	0.05 0.09
(Empty)			0.00					
PiROD 4' Side Mount Standoff (1)	C	From Leg	1.50 0.00 0.00	0.0000	88.00	No Ice 2.72 1/2" Ice 4.91	2.72 4.91	0.05 0.09
(Empty)			0.00					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
HP6-107	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		90.00	6.00	No Ice 28.27 1/2" Ice 29.05	0.14 0.29
HP4-102	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		70.00	4.00	No Ice 12.57 1/2" Ice 13.09	0.08 0.15

Tower Pressures - No Ice

$$G_H = 1.162$$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg % ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
T1 100.00- 80.00	90.00	1.332	25	175.212	A	0.000	42.187	9.583	22.72	0.000	0.000
					B	0.000	22.647		42.32		
					C	0.000	22.647		42.32		
T2 80.00-60.00	70.00	1.24	23	197.091	A	0.822	53.914	11.687	21.35	0.000	0.000
					B	0.000	25.514		45.81		
					C	0.000	25.514		45.81		

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	8 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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			
T3 60.00-40.00	50.00	1.126	21	238.755	A	1.645	58.592	13.356	22.17	0.000	0.000
					B	0.000	30.192		44.24		
					C	0.000	30.192		44.24		
T4 40.00-20.00	30.00	1	18	283.343	A	1.645	60.022	15.034	24.38	0.000	0.000
					B	0.000	31.622		47.54		
					C	0.000	31.622		47.54		
T5 20.00-0.00	10.00	1	18	333.453	A	1.234	58.082	18.592	31.34	0.000	0.000
					B	0.000	36.782		50.55		
					C	0.000	36.782		50.55		

Tower Pressure - With Ice

$$G_H = 1.162$$

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 100.00-80.00	90.00	1.332	18	0.5000	176.878	A	0.000	67.601	12.917	19.11	0.000	0.000
						B	0.000	31.895		40.50		
						C	0.000	31.895		40.50		
T2 80.00-60.00	70.00	1.24	17	0.5000	198.760	A	1.378	85.189	15.026	17.36	0.000	0.000
						B	0.000	35.122		42.78		
						C	0.000	35.122		42.78		
T3 60.00-40.00	50.00	1.126	16	0.5000	240.424	A	2.756	90.686	16.696	17.87	0.000	0.000
						B	0.000	40.619		41.10		
						C	0.000	40.619		41.10		
T4 40.00-20.00	30.00	1	14	0.5000	285.012	A	2.756	91.172	18.375	19.56	0.000	0.000
						B	0.000	41.106		44.70		
						C	0.000	41.106		44.70		
T5 20.00-0.00	10.00	1	14	0.5000	335.123	A	2.067	84.440	21.934	25.35	0.000	0.000
						B	0.000	46.890		46.78		
						C	0.000	46.890		46.78		

Tower Pressure - Service

$$G_H = 1.162$$

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 100.00-80.00	90.00	1.332	9	175.212	A	0.000	42.187	9.583	22.72	0.000	0.000
					B	0.000	22.647		42.32		
					C	0.000	22.647		42.32		
T2 80.00-60.00	70.00	1.24	8	197.091	A	0.822	53.914	11.687	21.35	0.000	0.000
					B	0.000	25.514		45.81		
					C	0.000	25.514		45.81		
T3 60.00-40.00	50.00	1.126	7	238.755	A	1.645	58.592	13.356	22.17	0.000	0.000
					B	0.000	30.192		44.24		
					C	0.000	30.192		44.24		
T4 40.00-20.00	30.00	1	6	283.343	A	1.645	60.022	15.034	24.38	0.000	0.000

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	9 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{reg}	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			
T5 20.00-0.00	10.00	1	6	333.453	B C A B C	0.000 0.000 1.234 0.000 0.000	31.622 31.622 58.082 36.782 36.782	18.592	47.54 47.54 31.34 50.55 50.55	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 100.00-80.00	0.12	1.14	A B C	0.241 0.129 0.129	2.465 2.849 2.849	0.6 0.579 0.579	1 1 1	1 1 1	25.294 13.102 13.102	1.79	89.27	A
T2 80.00-60.00	0.17	1.30	A B C	0.278 0.129 0.129	2.357 2.849 2.849	0.609 0.579 0.579	1 1 1	1 1 1	33.674 14.761 14.761	2.11	105.74	A
T3 60.00-40.00	0.18	1.59	A B C	0.252 0.126 0.126	2.431 2.86 2.86	0.602 0.578 0.578	1 1 1	1 1 1	36.944 17.456 17.456	2.17	108.67	A
T4 40.00-20.00	0.18	2.11	A B C	0.218 0.112 0.112	2.538 2.918 2.918	0.594 0.576 0.576	1 1 1	1 1 1	37.308 18.226 18.226	2.04	101.77	A
T5 20.00-0.00	0.13	2.65	A B C	0.178 0.11 0.11	2.672 2.923 2.923	0.586 0.576 0.576	1 1 1	1 1 1	35.277 21.194 21.194	2.03	101.29	A
Sum Weight:	0.78	8.79						OTM	498.72 kip-ft	10.13		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 100.00-80.00	0.12	1.14	A B C	0.241 0.129 0.129	2.465 2.849 2.849	0.6 0.579 0.579	0.825 0.825 0.825	1 1 1	25.294 13.102 13.102	1.79	89.27	A
T2 80.00-60.00	0.17	1.30	A B C	0.278 0.129 0.129	2.357 2.849 2.849	0.609 0.579 0.579	0.825 0.825 0.825	1 1 1	33.530 14.761 14.761	2.11	105.29	A
T3 60.00-40.00	0.18	1.59	A B C	0.252 0.126 0.126	2.431 2.86 2.86	0.602 0.578 0.578	0.825 0.825 0.825	1 1 1	36.656 17.456 17.456	2.16	107.83	A
T4 40.00-20.00	0.18	2.11	A B C	0.218 0.112 0.112	2.538 2.918 2.918	0.594 0.576 0.576	0.825 0.825 0.825	1 1 1	37.020 18.226 18.226	2.02	100.98	A
T5 20.00-0.00	0.13	2.65	A B C	0.178 0.11 0.11	2.672 2.923 2.923	0.586 0.576 0.576	0.825 0.825 0.825	1 1 1	35.062 21.194 21.194	2.01	100.67	A
Sum Weight:	0.78	8.79						OTM	496.64 kip-ft	10.08		

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	10 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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 100.00- 80.00	0.12	1.14	A	0.241	2.465	0.6	0.8	1	25.294	1.79	89.27	A
			B	0.129	2.849	0.579	0.8	1	13.102			
			C	0.129	2.849	0.579	0.8	1	13.102			
T2 80.00- 60.00	0.17	1.30	A	0.278	2.357	0.609	0.8	1	33.510	2.10	105.23	A
			B	0.129	2.849	0.579	0.8	1	14.761			
			C	0.129	2.849	0.579	0.8	1	14.761			
T3 60.00- 40.00	0.18	1.59	A	0.252	2.431	0.602	0.8	1	36.615	2.15	107.71	A
			B	0.126	2.86	0.578	0.8	1	17.456			
			C	0.126	2.86	0.578	0.8	1	17.456			
T4 40.00- 20.00	0.18	2.11	A	0.218	2.538	0.594	0.8	1	36.979	2.02	100.87	A
			B	0.112	2.918	0.576	0.8	1	18.226			
			C	0.112	2.918	0.576	0.8	1	18.226			
T5 20.00-0.00	0.13	2.65	A	0.178	2.672	0.586	0.8	1	35.031	2.01	100.58	A
			B	0.11	2.923	0.576	0.8	1	21.194			
			C	0.11	2.923	0.576	0.8	1	21.194			
Sum Weight:	0.78	8.79						OTM	496.35 kip-ft	10.07		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 100.00- 80.00	0.12	1.14	A	0.241	2.465	0.6	0.85	1	25.294	1.79	89.27	A
			B	0.129	2.849	0.579	0.85	1	13.102			
			C	0.129	2.849	0.579	0.85	1	13.102			
T2 80.00- 60.00	0.17	1.30	A	0.278	2.357	0.609	0.85	1	33.551	2.11	105.36	A
			B	0.129	2.849	0.579	0.85	1	14.761			
			C	0.129	2.849	0.579	0.85	1	14.761			
T3 60.00- 40.00	0.18	1.59	A	0.252	2.431	0.602	0.85	1	36.698	2.16	107.95	A
			B	0.126	2.86	0.578	0.85	1	17.456			
			C	0.126	2.86	0.578	0.85	1	17.456			
T4 40.00- 20.00	0.18	2.11	A	0.218	2.538	0.594	0.85	1	37.061	2.02	101.09	A
			B	0.112	2.918	0.576	0.85	1	18.226			
			C	0.112	2.918	0.576	0.85	1	18.226			
T5 20.00-0.00	0.13	2.65	A	0.178	2.672	0.586	0.85	1	35.092	2.02	100.76	A
			B	0.11	2.923	0.576	0.85	1	21.194			
			C	0.11	2.923	0.576	0.85	1	21.194			
Sum Weight:	0.78	8.79						OTM	496.94 kip-ft	10.09		

Tower Forces - With Ice - Wind Normal To Face

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	11 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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 100.00- 80.00	0.32	1.70	A	0.382	2.1	0.644	1	1	43.569	1.96	98.25	A
			B	0.18	2.663	0.587	1	1	18.709			
			C	0.18	2.663	0.587	1	1	18.709			
T2 80.00- 60.00	0.47	1.91	A	0.436	1.998	0.667	1	1	58.177	2.32	116.15	A
			B	0.177	2.676	0.586	1	1	20.579			
			C	0.177	2.676	0.586	1	1	20.579			
T3 60.00- 40.00	0.48	2.32	A	0.389	2.087	0.647	1	1	61.433	2.33	116.37	A
			B	0.169	2.703	0.585	1	1	23.744			
			C	0.169	2.703	0.585	1	1	23.744			
T4 40.00- 20.00	0.48	2.82	A	0.33	2.22	0.625	1	1	59.774	2.14	106.98	A
			B	0.144	2.793	0.581	1	1	23.866			
			C	0.144	2.793	0.581	1	1	23.866			
T5 20.00-0.00	0.36	3.47	A	0.258	2.413	0.604	1	1	53.067	2.06	103.23	A
			B	0.14	2.809	0.58	1	1	27.196			
			C	0.14	2.809	0.58	1	1	27.196			
Sum Weight:	2.12	12.21						OTM	540.64 kip-ft	10.82		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 100.00- 80.00	0.32	1.70	A	0.382	2.1	0.644	0.825	1	43.569	1.96	98.25	A
			B	0.18	2.663	0.587	0.825	1	18.709			
			C	0.18	2.663	0.587	0.825	1	18.709			
T2 80.00- 60.00	0.47	1.91	A	0.436	1.998	0.667	0.825	1	57.936	2.31	115.66	A
			B	0.177	2.676	0.586	0.825	1	20.579			
			C	0.177	2.676	0.586	0.825	1	20.579			
T3 60.00- 40.00	0.48	2.32	A	0.389	2.087	0.647	0.825	1	60.951	2.31	115.45	A
			B	0.169	2.703	0.585	0.825	1	23.744			
			C	0.169	2.703	0.585	0.825	1	23.744			
T4 40.00- 20.00	0.48	2.82	A	0.33	2.22	0.625	0.825	1	59.292	2.12	106.11	A
			B	0.144	2.793	0.581	0.825	1	23.866			
			C	0.144	2.793	0.581	0.825	1	23.866			
T5 20.00-0.00	0.36	3.47	A	0.258	2.413	0.604	0.825	1	52.706	2.05	102.53	A
			B	0.14	2.809	0.58	0.825	1	27.196			
			C	0.14	2.809	0.58	0.825	1	27.196			
Sum Weight:	2.12	12.21						OTM	538.40 kip-ft	10.76		

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 100.00- 80.00	0.32	1.70	A	0.382	2.1	0.644	0.8	1	43.569	1.96	98.25	A
			B	0.18	2.663	0.587	0.8	1	18.709			
			C	0.18	2.663	0.587	0.8	1	18.709			

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page 12 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date 09:39:25 07/21/04
	Client	Verizon WS	Designed by Daniel D. McClure

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	
T2 80.00- 60.00	0.47	1.91	A	0.436	1.998	0.667	0.8	1	57.901	2.31	115.59	A
			B	0.177	2.676	0.586	0.8	1	20.579			
			C	0.177	2.676	0.586	0.8	1	20.579			
T3 60.00- 40.00	0.48	2.32	A	0.389	2.087	0.647	0.8	1	60.882	2.31	115.32	A
			B	0.169	2.703	0.585	0.8	1	23.744			
			C	0.169	2.703	0.585	0.8	1	23.744			
T4 40.00- 20.00	0.48	2.82	A	0.33	2.22	0.625	0.8	1	59.223	2.12	105.99	A
			B	0.144	2.793	0.581	0.8	1	23.866			
			C	0.144	2.793	0.581	0.8	1	23.866			
T5 20.00-0.00	0.36	3.47	A	0.258	2.413	0.604	0.8	1	52.654	2.05	102.42	A
			B	0.14	2.809	0.58	0.8	1	27.196			
			C	0.14	2.809	0.58	0.8	1	27.196			
Sum Weight:	2.12	12.21						OTM	538.08 kip-ft	10.75		

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 100.00- 80.00	0.32	1.70	A	0.382	2.1	0.644	0.85	1	43.569	1.96	98.25	A
			B	0.18	2.663	0.587	0.85	1	18.709			
			C	0.18	2.663	0.587	0.85	1	18.709			
T2 80.00- 60.00	0.47	1.91	A	0.436	1.998	0.667	0.85	1	57.970	2.31	115.73	A
			B	0.177	2.676	0.586	0.85	1	20.579			
			C	0.177	2.676	0.586	0.85	1	20.579			
T3 60.00- 40.00	0.48	2.32	A	0.389	2.087	0.647	0.85	1	61.020	2.31	115.58	A
			B	0.169	2.703	0.585	0.85	1	23.744			
			C	0.169	2.703	0.585	0.85	1	23.744			
T4 40.00- 20.00	0.48	2.82	A	0.33	2.22	0.625	0.85	1	59.361	2.12	106.24	A
			B	0.144	2.793	0.581	0.85	1	23.866			
			C	0.144	2.793	0.581	0.85	1	23.866			
T5 20.00-0.00	0.36	3.47	A	0.258	2.413	0.604	0.85	1	52.757	2.05	102.63	A
			B	0.14	2.809	0.58	0.85	1	27.196			
			C	0.14	2.809	0.58	0.85	1	27.196			
Sum Weight:	2.12	12.21						OTM	538.72 kip-ft	10.77		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 100.00- 80.00	0.12	1.14	A	0.241	2.465	0.6	1	1	25.294	0.62	30.89	A
			B	0.129	2.849	0.579	1	1	13.102			
			C	0.129	2.849	0.579	1	1	13.102			
T2 80.00- 60.00	0.17	1.30	A	0.278	2.357	0.609	1	1	33.674	0.73	36.59	A
			B	0.129	2.849	0.579	1	1	14.761			
			C	0.129	2.849	0.579	1	1	14.761			

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	13 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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	
T3 60.00- 40.00	0.18	1.59	A	0.252	2.431	0.602	1	1	36.944	0.75	37.60	A
			B	0.126	2.86	0.578	1	1	17.456			
			C	0.126	2.86	0.578	1	1	17.456			
T4 40.00- 20.00	0.18	2.11	A	0.218	2.538	0.594	1	1	37.308	0.70	35.21	A
			B	0.112	2.918	0.576	1	1	18.226			
			C	0.112	2.918	0.576	1	1	18.226			
T5 20.00-0.00	0.13	2.65	A	0.178	2.672	0.586	1	1	35.277	0.70	35.05	A
			B	0.11	2.923	0.576	1	1	21.194			
			C	0.11	2.923	0.576	1	1	21.194			
Sum Weight:	0.78	8.79						OTM	172.57 kip-ft	3.51		

Tower Forces - Service - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 100.00- 80.00	0.12	1.14	A	0.241	2.465	0.6	0.825	1	25.294	0.62	30.89	A
			B	0.129	2.849	0.579	0.825	1	13.102			
			C	0.129	2.849	0.579	0.825	1	13.102			
T2 80.00- 60.00	0.17	1.30	A	0.278	2.357	0.609	0.825	1	33.530	0.73	36.43	A
			B	0.129	2.849	0.579	0.825	1	14.761			
			C	0.129	2.849	0.579	0.825	1	14.761			
T3 60.00- 40.00	0.18	1.59	A	0.252	2.431	0.602	0.825	1	36.656	0.75	37.31	A
			B	0.126	2.86	0.578	0.825	1	17.456			
			C	0.126	2.86	0.578	0.825	1	17.456			
T4 40.00- 20.00	0.18	2.11	A	0.218	2.538	0.594	0.825	1	37.020	0.70	34.94	A
			B	0.112	2.918	0.576	0.825	1	18.226			
			C	0.112	2.918	0.576	0.825	1	18.226			
T5 20.00-0.00	0.13	2.65	A	0.178	2.672	0.586	0.825	1	35.062	0.70	34.83	A
			B	0.11	2.923	0.576	0.825	1	21.194			
			C	0.11	2.923	0.576	0.825	1	21.194			
Sum Weight:	0.78	8.79						OTM	171.85 kip-ft	3.49		

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 100.00- 80.00	0.12	1.14	A	0.241	2.465	0.6	0.8	1	25.294	0.62	30.89	A
			B	0.129	2.849	0.579	0.8	1	13.102			
			C	0.129	2.849	0.579	0.8	1	13.102			
T2 80.00- 60.00	0.17	1.30	A	0.278	2.357	0.609	0.8	1	33.510	0.73	36.41	A
			B	0.129	2.849	0.579	0.8	1	14.761			
			C	0.129	2.849	0.579	0.8	1	14.761			
T3 60.00- 40.00	0.18	1.59	A	0.252	2.431	0.602	0.8	1	36.615	0.75	37.27	A
			B	0.126	2.86	0.578	0.8	1	17.456			
			C	0.126	2.86	0.578	0.8	1	17.456			

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page 14 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date 09:39:25 07/21/04
	Client	Verizon WS	Designed by Daniel D. McClure

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	
T4 40.00- 20.00	0.18	2.11	A	0.218	2.538	0.594	0.8	1	36.979	0.70	34.90	A
			B	0.112	2.918	0.576	0.8	1	18.226			
			C	0.112	2.918	0.576	0.8	1	18.226			
T5 20.00-0.00	0.13	2.65	A	0.178	2.672	0.586	0.8	1	35.031	0.70	34.80	A
			B	0.11	2.923	0.576	0.8	1	21.194			
			C	0.11	2.923	0.576	0.8	1	21.194			
Sum Weight:	0.78	8.79						OTM	171.75 kip-ft	3.49		

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 100.00- 80.00	0.12	1.14	A	0.241	2.465	0.6	0.85	1	25.294	0.62	30.89	A
			B	0.129	2.849	0.579	0.85	1	13.102			
			C	0.129	2.849	0.579	0.85	1	13.102			
T2 80.00- 60.00	0.17	1.30	A	0.278	2.357	0.609	0.85	1	33.551	0.73	36.46	A
			B	0.129	2.849	0.579	0.85	1	14.761			
			C	0.129	2.849	0.579	0.85	1	14.761			
T3 60.00- 40.00	0.18	1.59	A	0.252	2.431	0.602	0.85	1	36.698	0.75	37.35	A
			B	0.126	2.86	0.578	0.85	1	17.456			
			C	0.126	2.86	0.578	0.85	1	17.456			
T4 40.00- 20.00	0.18	2.11	A	0.218	2.538	0.594	0.85	1	37.061	0.70	34.98	A
			B	0.112	2.918	0.576	0.85	1	18.226			
			C	0.112	2.918	0.576	0.85	1	18.226			
T5 20.00-0.00	0.13	2.65	A	0.178	2.672	0.586	0.85	1	35.092	0.70	34.86	A
			B	0.11	2.923	0.576	0.85	1	21.194			
			C	0.11	2.923	0.576	0.85	1	21.194			
Sum Weight:	0.78	8.79						OTM	171.95 kip-ft	3.49		

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	3.50					
Bracing Weight	5.28					
Total Member Self-Weight	8.79					
Total Weight	11.16			-4.61	-2.09	
				-4.61	-2.09	
Wind 0 deg - No Ice		0.00	-14.09	-869.23	-2.09	1.81
Wind 30 deg - No Ice		7.02	-12.16	-751.85	-433.51	-6.04
Wind 45 deg - No Ice		9.92	-9.92	-614.52	-612.00	-9.50
Wind 60 deg - No Ice		12.15	-7.01	-435.73	-748.82	-12.30
Wind 90 deg - No Ice		14.04	0.00	-4.61	-864.93	-15.29
Wind 120 deg - No Ice		12.20	7.04	427.70	-750.87	-14.16
Wind 135 deg - No Ice		9.92	9.92	605.30	-612.00	-12.12
Wind 150 deg - No Ice		7.02	12.16	742.63	-433.51	-9.24

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	15 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Load Case	Vertical Forces <i>K</i>	Sum of Forces <i>X</i> <i>K</i>	Sum of Forces <i>Z</i> <i>K</i>	Sum of Overturning Moments, <i>M_x</i> <i>kip-ft</i>	Sum of Overturning Moments, <i>M_z</i> <i>kip-ft</i>	Sum of Torques <i>kip-ft</i>
Wind 180 deg - No Ice		0.00	14.03	857.64	-2.09	-1.86
Wind 210 deg - No Ice		-7.02	12.16	742.63	429.33	6.04
Wind 225 deg - No Ice		-9.92	9.92	605.30	607.82	9.50
Wind 240 deg - No Ice		-12.20	7.04	427.70	746.69	12.35
Wind 270 deg - No Ice		-14.04	0.00	-4.61	860.75	15.29
Wind 300 deg - No Ice		-12.15	-7.01	-435.73	744.64	14.16
Wind 315 deg - No Ice		-9.92	-9.92	-614.52	607.82	12.12
Wind 330 deg - No Ice		-7.02	-12.16	-751.85	429.33	9.24
Member Ice	3.42					
Total Weight Ice	16.87			-9.03	-0.26	
Wind 0 deg - Ice		0.00	-14.34	-877.32	-0.26	-1.24
Wind 30 deg - Ice		7.15	-12.38	-759.33	-433.45	-8.26
Wind 45 deg - Ice		10.10	-10.10	-621.42	-612.65	-11.06
Wind 60 deg - Ice		12.36	-7.14	-441.89	-750.00	-13.10
Wind 90 deg - Ice		14.29	0.00	-9.03	-866.63	-14.46
Wind 120 deg - Ice		12.42	7.17	425.11	-752.22	-11.93
Wind 135 deg - Ice		10.10	10.10	603.36	-612.65	-9.39
Wind 150 deg - Ice		7.15	12.38	741.26	-433.45	-6.20
Wind 180 deg - Ice		0.00	14.27	856.69	-0.26	1.17
Wind 210 deg - Ice		-7.15	12.38	741.26	432.92	8.26
Wind 225 deg - Ice		-10.10	10.10	603.36	612.13	11.06
Wind 240 deg - Ice		-12.42	7.17	425.11	751.70	13.17
Wind 270 deg - Ice		-14.29	0.00	-9.03	866.11	14.46
Wind 300 deg - Ice		-12.36	-7.14	-441.89	749.48	11.93
Wind 315 deg - Ice		-10.10	-10.10	-621.42	612.13	9.39
Wind 330 deg - Ice		-7.15	-12.38	-759.33	432.92	6.20
Total Weight	11.16			-4.61	-2.09	
Wind 0 deg - Service		0.00	-4.87	-302.36	-4.56	0.63
Wind 30 deg - Service		2.43	-4.21	-261.75	-153.84	-2.09
Wind 45 deg - Service		3.43	-3.43	-214.23	-215.60	-3.29
Wind 60 deg - Service		4.20	-2.43	-152.36	-262.94	-4.26
Wind 90 deg - Service		4.86	0.00	-3.18	-303.12	-5.29
Wind 120 deg - Service		4.22	2.44	146.40	-263.65	-4.90
Wind 135 deg - Service		3.43	3.43	207.86	-215.60	-4.19
Wind 150 deg - Service		2.43	4.21	255.38	-153.84	-3.20
Wind 180 deg - Service		0.00	4.85	295.17	-4.56	-0.64
Wind 210 deg - Service		-2.43	4.21	255.38	144.72	2.09
Wind 225 deg - Service		-3.43	3.43	207.86	206.49	3.29
Wind 240 deg - Service		-4.22	2.44	146.40	254.54	4.27
Wind 270 deg - Service		-4.86	0.00	-3.18	294.00	5.29
Wind 300 deg - Service		-4.20	-2.43	-152.36	253.83	4.90
Wind 315 deg - Service		-3.43	-3.43	-214.23	206.49	4.19
Wind 330 deg - Service		-2.43	-4.21	-261.75	144.72	3.20

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	16 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	100 - 80	Leg	Max Tension	5	4.63	-0.14	0.20
			Max. Compression	19	-6.36	0.00	-0.01
			Max. Mx	15	-0.84	0.86	-0.39
			Max. My	10	-0.84	0.28	-1.37
			Max. Vy	15	-0.44	-0.00	-0.00
			Max. Vx	10	0.69	0.00	0.00
		Diagonal	Max Tension	9	4.45	0.00	0.00
			Max. Compression	9	-4.51	0.00	0.00
			Max. Mx	34	4.09	0.02	0.00
			Max. Vy	34	-0.01	0.00	0.00
		Horizontal	Max Tension	16	2.47	-0.01	0.00

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	17 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	80 - 60	Top Girt	Max. Compression	8	-2.44	-0.01	-0.00
			Max. Mx	22	0.03	-0.02	-0.00
			Max. Vy	22	-0.01	-0.02	-0.00
			Max Tension	10	0.95	-0.01	0.00
			Max. Compression	2	-0.95	-0.01	-0.00
			Max. Mx	22	-0.18	-0.01	-0.00
		Inner Bracing	Max. Vy	22	0.01	-0.01	-0.00
			Max Tension	6	0.00	0.00	0.00
			Max. Compression	8	-0.00	0.00	0.00
			Max. Mx	18	-0.00	-0.01	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max Tension	5	16.26	-0.13	0.09
		Leg	Max. Compression	19	-19.14	0.04	0.02
			Max. Mx	10	11.44	0.16	-0.02
			Max. My	14	-1.47	-0.00	0.34
			Max. Vy	10	-0.10	-0.13	-0.02
			Max. Vx	6	0.19	-0.00	0.24
			Max Tension	8	4.27	0.00	0.00
		Diagonal	Max. Compression	8	-4.35	0.00	0.00
			Max. Mx	34	3.97	0.03	0.00
			Max. Vy	34	-0.01	0.00	0.00
			Max Tension	16	2.72	-0.01	0.00
			Max. Compression	8	-2.71	-0.01	-0.00
			Max. Mx	22	0.23	-0.02	-0.00
		Horizontal	Max. Vy	22	-0.01	-0.02	-0.00
			Max Tension	16	2.29	-0.01	0.00
			Max. Compression	8	-2.35	-0.01	-0.00
			Max. Mx	22	-0.09	-0.02	-0.00
			Max. Vy	22	-0.01	-0.02	-0.00
			Max Tension	14	0.00	0.00	0.00
		Inner Bracing	Max. Compression	26	-0.00	0.00	0.00
			Max. Mx	18	-0.00	-0.01	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max Tension	5	28.06	-0.07	0.01
			Max. Compression	19	-32.53	0.10	0.03
			Max. Mx	5	27.99	-0.12	0.03
T3	60 - 40	Leg	Max. My	6	-2.30	-0.00	0.14
			Max. Vy	10	0.04	-0.12	-0.02
			Max. Vx	13	0.05	-0.04	-0.09
			Max Tension	8	4.13	0.00	0.00
			Max. Compression	8	-4.22	0.00	0.00
			Max. Mx	34	3.88	0.04	0.00
		Diagonal	Max. Vy	34	-0.02	0.00	0.00
			Max Tension	16	2.86	-0.01	0.00
			Max. Compression	8	-2.83	-0.02	-0.00
			Max. Mx	22	0.32	-0.04	-0.01
			Max. My	27	-0.34	-0.04	-0.01
			Max. Vy	22	-0.02	-0.04	-0.01
		Horizontal	Max Tension	16	2.72	-0.01	0.00
			Max. Compression	8	-2.70	-0.02	-0.00
			Max. Mx	22	0.29	-0.03	-0.01
			Max. My	27	-0.39	-0.03	-0.01
			Max. Vy	22	-0.02	-0.03	-0.01
			Max Tension	14	0.00	0.00	0.00
		Inner Bracing	Max. Compression	33	-0.00	0.00	0.00
			Max. Mx	18	-0.00	-0.02	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max Tension	5	37.17	-0.16	0.03
			Max. Compression	19	-43.52	0.07	0.03
			Max. Mx	22	35.24	-0.17	0.03
			Max. My	17	-1.76	-0.01	0.17
T4	40 - 20	Leg					

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	18 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T5	20 - 0	Diagonal	Max. Vy	5	0.05	-0.16	0.03
			Max. Vx	19	-0.06	-0.07	0.16
			Max Tension	8	4.84	0.00	0.00
			Max. Compression	8	-4.98	0.00	0.00
		Horizontal	Max. Mx	34	4.55	0.09	0.00
			Max. Vy	34	-0.03	0.00	0.00
			Max Tension	16	2.90	-0.02	0.00
			Max. Compression	8	-2.89	-0.03	-0.00
		Top Girt	Max. Mx	22	0.30	-0.05	-0.01
			Max. My	27	-0.22	-0.05	-0.01
			Max. Vy	22	-0.03	-0.05	-0.01
			Max Tension	16	2.82	-0.02	0.00
		Inner Bracing	Max. Compression	8	-2.82	-0.02	-0.00
			Max. Mx	22	0.24	-0.04	-0.01
			Max. My	27	-0.33	-0.04	-0.01
			Max. Vy	22	-0.02	-0.04	-0.01
		Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	33	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.02	0.00
			Max. Vy	18	0.01	0.00	0.00
		Diagonal	Max Tension	5	47.02	-0.29	0.02
			Max. Compression	19	-55.90	0.00	0.00
			Max. Mx	24	-48.96	0.45	-0.00
			Max. My	6	-3.38	-0.02	0.28
		Horizontal	Max. Vy	5	-0.09	-0.29	0.02
			Max. Vx	6	0.09	-0.02	0.28
			Max Tension	8	4.46	0.00	0.00
			Max. Compression	29	-4.72	0.00	0.00
		Top Girt	Max. Mx	21	4.39	0.11	0.00
			Max. Vy	21	-0.03	0.00	0.00
			Max Tension	21	3.07	0.00	0.00
			Max. Compression	8	-3.01	-0.03	-0.00
		Inner Bracing	Max. Mx	22	0.33	-0.04	-0.00
			Max. Vy	22	-0.03	-0.04	-0.00
			Max Tension	16	2.90	-0.02	0.00
			Max. Compression	8	-2.89	-0.03	-0.00
		Leg	Max. Mx	22	0.23	-0.05	-0.00
			Max. Vy	22	-0.03	-0.05	-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	33	-0.01	0.00	0.00
		Inner Bracing	Max. Mx	18	-0.00	-0.04	0.00
			Max. Vy	18	0.02	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	60.52	7.16	-4.65
	Max. H _x	30	60.52	7.16	-4.65
	Max. H _z	21	-47.89	-5.89	4.27
	Min. Vert	5	-51.63	-6.33	4.12
	Min. H _x	5	-51.63	-6.33	4.12
	Min. H _z	29	58.50	6.74	-4.77
Leg B	Max. Vert	24	60.55	-7.18	-4.61
	Max. H _x	32	-49.72	6.31	4.09
	Max. H _z	16	-49.53	5.91	4.31

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page 19 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date 09:39:25 07/21/04
	Client	Verizon WS	Designed by Daniel D. McClure

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Min. Vert	15	-51.39	6.29	4.17
	Min. H _x	24	60.55	-7.18	-4.61
	Min. H _z	25	58.54	-6.77	-4.73
	Max. Vert	19	61.43	-0.04	8.54
	Max. H _x	31	6.22	2.00	0.52
	Max. H _z	19	61.43	-0.04	8.54
	Min. Vert	10	-51.05	-0.06	-7.53
	Min. H _x	23	6.22	-2.00	0.52
	Min. H _z	10	-51.05	-0.06	-7.53

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	11.16	0.00	0.00	-4.61	-2.09	0.00
Dead+Wind 0 deg - No Ice	11.16	-0.00	-14.09	-839.49	-2.10	1.82
Dead+Wind 30 deg - No Ice	11.16	7.02	-12.16	-726.22	-418.71	-6.04
Dead+Wind 45 deg - No Ice	11.16	9.92	-9.92	-593.61	-591.09	-9.50
Dead+Wind 60 deg - No Ice	11.16	12.15	-7.01	-420.97	-723.23	-12.30
Dead+Wind 90 deg - No Ice	11.16	14.04	0.00	-4.63	-835.34	-15.30
Dead+Wind 120 deg - No Ice	11.16	12.20	7.04	412.81	-725.13	-14.18
Dead+Wind 135 deg - No Ice	11.16	9.92	9.92	584.37	-591.11	-12.14
Dead+Wind 150 deg - No Ice	11.16	7.02	12.16	716.99	-418.74	-9.26
Dead+Wind 180 deg - No Ice	11.16	-0.00	14.03	828.08	-2.11	-1.87
Dead+Wind 210 deg - No Ice	11.16	-7.02	12.16	716.98	414.52	6.04
Dead+Wind 225 deg - No Ice	11.16	-9.92	9.92	584.37	586.91	9.50
Dead+Wind 240 deg - No Ice	11.16	-12.20	7.04	412.81	720.93	12.36
Dead+Wind 270 deg - No Ice	11.16	-14.04	0.00	-4.64	831.15	15.30
Dead+Wind 300 deg - No Ice	11.16	-12.15	-7.01	-420.99	719.04	14.18
Dead+Wind 315 deg - No Ice	11.16	-9.92	-9.92	-593.63	586.89	12.13
Dead+Wind 330 deg - No Ice	11.16	-7.02	-12.16	-726.24	414.52	9.26
Dead+Ice+Temp	16.87	-0.00	0.00	-9.03	-0.27	0.00
Dead+Wind 0 deg+Ice+Temp	16.87	-0.00	-14.34	-843.77	-0.27	-1.23
Dead+Wind 30 deg+Ice+Temp	16.87	7.15	-12.38	-730.41	-416.75	-8.26
Dead+Wind 45 deg+Ice+Temp	16.87	10.10	-10.10	-597.83	-589.05	-11.06
Dead+Wind 60 deg+Ice+Temp	16.87	12.36	-7.14	-425.24	-721.12	-13.11
Dead+Wind 90 deg+Ice+Temp	16.87	14.29	0.00	-9.06	-833.24	-14.48
Dead+Wind 120 deg+Ice+Temp	16.87	12.42	7.17	408.30	-723.17	-11.95
Dead+Wind 135 deg+Ice+Temp	16.87	10.10	10.10	579.73	-589.07	-9.41
Dead+Wind 150 deg+Ice+Temp	16.87	7.15	12.38	712.31	-416.77	-6.22
Dead+Wind 180 deg+Ice+Temp	16.87	-0.00	14.27	823.33	-0.28	1.16
Dead+Wind 210 deg+Ice+Temp	16.87	-7.15	12.38	712.31	416.21	8.26
Dead+Wind 225 deg+Ice+Temp	16.87	-10.10	10.10	579.73	588.52	11.06
Dead+Wind 240 deg+Ice+Temp	16.87	-12.42	7.17	408.29	722.62	13.17
Dead+Wind 270 deg+Ice+Temp	16.87	-14.29	0.00	-9.07	832.69	14.48
Dead+Wind 300 deg+Ice+Temp	16.87	-12.36	-7.14	-425.26	720.58	11.95
Dead+Wind 315 deg+Ice+Temp	16.87	-10.10	-10.10	-597.85	588.51	9.41
Dead+Wind 330 deg+Ice+Temp	16.87	-7.15	-12.38	-730.42	416.20	6.22
Dead+Wind 0 deg - Service	11.16	-0.00	-4.87	-293.49	-2.10	0.63
Dead+Wind 30 deg - Service	11.16	2.43	-4.21	-254.30	-146.25	-2.09
Dead+Wind 45 deg - Service	11.16	3.43	-3.43	-208.42	-205.89	-3.29
Dead+Wind 60 deg - Service	11.16	4.20	-2.43	-148.69	-251.62	-4.26
Dead+Wind 90 deg - Service	11.16	4.86	0.00	-4.62	-290.41	-5.29
Dead+Wind 120 deg - Service	11.16	4.22	2.44	139.81	-252.27	-4.91
Dead+Wind 135 deg - Service	11.16	3.43	3.43	199.18	-205.90	-4.20
Dead+Wind 150 deg - Service	11.16	2.43	4.21	245.07	-146.26	-3.20

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	20 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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 180 deg - Service	11.16	-0.00	4.85	283.51	-2.10	-0.65
Dead+Wind 210 deg - Service	11.16	-2.43	4.21	245.07	142.06	2.09
Dead+Wind 225 deg - Service	11.16	-3.43	3.43	199.18	201.71	3.29
Dead+Wind 240 deg - Service	11.16	-4.22	2.44	139.81	248.08	4.28
Dead+Wind 270 deg - Service	11.16	-4.86	0.00	-4.63	286.22	5.29
Dead+Wind 300 deg - Service	11.16	-4.20	-2.43	-148.69	247.43	4.91
Dead+Wind 315 deg - Service	11.16	-3.43	-3.43	-208.42	201.70	4.20
Dead+Wind 330 deg - Service	11.16	-2.43	-4.21	-254.31	142.05	3.20

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	-11.16	0.00	0.00	11.16	0.00	0.000%
2	0.00	-11.16	-14.09	0.00	11.16	14.09	0.001%
3	7.02	-11.16	-12.16	-7.02	11.16	12.16	0.001%
4	9.92	-11.16	-9.92	-9.92	11.16	9.92	0.001%
5	12.15	-11.16	-7.01	-12.15	11.16	7.01	0.001%
6	14.04	-11.16	0.00	-14.04	11.16	-0.00	0.001%
7	12.20	-11.16	7.04	-12.20	11.16	-7.04	0.001%
8	9.92	-11.16	9.92	-9.92	11.16	-9.92	0.001%
9	7.02	-11.16	12.16	-7.02	11.16	-12.16	0.001%
10	0.00	-11.16	14.03	0.00	11.16	-14.03	0.001%
11	-7.02	-11.16	12.16	7.02	11.16	-12.16	0.001%
12	-9.92	-11.16	9.92	9.92	11.16	-9.92	0.001%
13	-12.20	-11.16	7.04	12.20	11.16	-7.04	0.001%
14	-14.04	-11.16	0.00	14.04	11.16	-0.00	0.001%
15	-12.15	-11.16	-7.01	12.15	11.16	7.01	0.001%
16	-9.92	-11.16	-9.92	9.92	11.16	9.92	0.001%
17	-7.02	-11.16	-12.16	7.02	11.16	12.16	0.001%
18	0.00	-16.87	0.00	0.00	16.87	-0.00	0.000%
19	0.00	-16.87	-14.34	0.00	16.87	14.34	0.001%
20	7.15	-16.87	-12.38	-7.15	16.87	12.38	0.001%
21	10.10	-16.87	-10.10	-10.10	16.87	10.10	0.001%
22	12.36	-16.87	-7.14	-12.36	16.87	7.14	0.001%
23	14.29	-16.87	0.00	-14.29	16.87	-0.00	0.001%
24	12.42	-16.87	7.17	-12.42	16.87	-7.17	0.001%
25	10.10	-16.87	10.10	-10.10	16.87	-10.10	0.001%
26	7.15	-16.87	12.38	-7.15	16.87	-12.38	0.001%
27	0.00	-16.87	14.27	0.00	16.87	-14.27	0.001%
28	-7.15	-16.87	12.38	7.15	16.87	-12.38	0.001%
29	-10.10	-16.87	10.10	10.10	16.87	-10.10	0.001%
30	-12.42	-16.87	7.17	12.42	16.87	-7.17	0.001%
31	-14.29	-16.87	0.00	14.29	16.87	-0.00	0.001%
32	-12.36	-16.87	-7.14	12.36	16.87	7.14	0.001%
33	-10.10	-16.87	-10.10	10.10	16.87	10.10	0.001%
34	-7.15	-16.87	-12.38	7.15	16.87	12.38	0.001%
35	0.00	-11.16	-4.87	0.00	11.16	4.87	0.001%
36	2.43	-11.16	-4.21	-2.43	11.16	4.21	0.001%
37	3.43	-11.16	-3.43	-3.43	11.16	3.43	0.001%
38	4.20	-11.16	-2.43	-4.20	11.16	2.43	0.001%
39	4.86	-11.16	0.00	-4.86	11.16	-0.00	0.001%
40	4.22	-11.16	2.44	-4.22	11.16	-2.44	0.001%
41	3.43	-11.16	3.43	-3.43	11.16	-3.43	0.001%
42	2.43	-11.16	4.21	-2.43	11.16	-4.21	0.001%
43	0.00	-11.16	4.85	0.00	11.16	-4.85	0.001%
44	-2.43	-11.16	4.21	2.43	11.16	-4.21	0.000%

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	21 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
45	-3.43	-11.16	3.43	3.43	11.16	-3.43	0.000%
46	-4.22	-11.16	2.44	4.22	11.16	-2.44	0.000%
47	-4.86	-11.16	0.00	4.86	11.16	-0.00	0.001%
48	-4.20	-11.16	-2.43	4.20	11.16	2.43	0.001%
49	-3.43	-11.16	-3.43	3.43	11.16	3.43	0.001%
50	-2.43	-11.16	-4.21	2.43	11.16	4.21	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	6	0.00000001	0.00009091
3	Yes	6	0.00000001	0.00009057
4	Yes	6	0.00000001	0.00009089
5	Yes	6	0.00000001	0.00009126
6	Yes	6	0.00000001	0.00009173
7	Yes	6	0.00000001	0.00009203
8	Yes	6	0.00000001	0.00009228
9	Yes	6	0.00000001	0.00009242
10	Yes	6	0.00000001	0.00009172
11	Yes	6	0.00000001	0.00008995
12	Yes	6	0.00000001	0.00008942
13	Yes	6	0.00000001	0.00008948
14	Yes	6	0.00000001	0.00009133
15	Yes	6	0.00000001	0.00009298
16	Yes	6	0.00000001	0.00009297
17	Yes	6	0.00000001	0.00009244
18	Yes	6	0.00000001	0.00000001
19	Yes	6	0.00000001	0.00013794
20	Yes	6	0.00000001	0.00013769
21	Yes	6	0.00000001	0.00013810
22	Yes	6	0.00000001	0.00013864
23	Yes	6	0.00000001	0.00013936
24	Yes	6	0.00000001	0.00013950
25	Yes	6	0.00000001	0.00013951
26	Yes	6	0.00000001	0.00013925
27	Yes	6	0.00000001	0.00013782
28	Yes	6	0.00000001	0.00013574
29	Yes	6	0.00000001	0.00013533
30	Yes	6	0.00000001	0.00013561
31	Yes	6	0.00000001	0.00013807
32	Yes	6	0.00000001	0.00014010
33	Yes	6	0.00000001	0.00014013
34	Yes	6	0.00000001	0.00013957
35	Yes	6	0.00000001	0.00008887
36	Yes	6	0.00000001	0.00008834
37	Yes	6	0.00000001	0.00008839
38	Yes	6	0.00000001	0.00008895
39	Yes	6	0.00000001	0.00008943
40	Yes	6	0.00000001	0.00008964
41	Yes	6	0.00000001	0.00008969
42	Yes	6	0.00000001	0.00008930
43	Yes	6	0.00000001	0.00008781
44	Yes	6	0.00000001	0.00008616
45	Yes	6	0.00000001	0.00008586

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	22 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

46	Yes	6	0.00000001	0.00008594
47	Yes	6	0.00000001	0.00008775
48	Yes	6	0.00000001	0.00008957
49	Yes	6	0.00000001	0.00008958
50	Yes	6	0.00000001	0.00008955

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	0.798	37	0.0682	0.0539
T2	80 - 60	0.511	36	0.0621	0.0387
T3	60 - 40	0.273	36	0.0461	0.0214
T4	40 - 20	0.112	35	0.0260	0.0104
T5	20 - 0	0.031	46	0.0114	0.0044

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.00	Omni Antenna	37	0.798	0.0682	0.0539	358755
98.00	(2) DB844H90 w/Mount Pipe	37	0.768	0.0678	0.0525	358755
96.00	Omni Antenna	37	0.739	0.0674	0.0511	358755
90.00	HP6-107	37	0.651	0.0660	0.0467	179377
88.00	Pirol 4' Side Mount Standoff (1)	37	0.622	0.0654	0.0452	149481
70.00	HP4-102	36	0.383	0.0553	0.0298	70726

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	2.233	4	0.1837	0.1558
T2	80 - 60	1.445	3	0.1714	0.1119
T3	60 - 40	0.777	19	0.1294	0.0618
T4	40 - 20	0.324	19	0.0737	0.0300
T5	20 - 0	0.090	30	0.0325	0.0126

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.00	Omni Antenna	4	2.233	0.1837	0.1558	155229
98.00	(2) DB844H90 w/Mount Pipe	4	2.152	0.1831	0.1517	155229

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	23 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
96.00	Omni Antenna	4	2.071	0.1825	0.1476	155229
90.00	HP6-107	4	1.831	0.1801	0.1349	77614
88.00	Pirol 4' Side Mount Standoff (1)	4	1.752	0.1789	0.1305	64679
70.00	HP4-102	3	1.089	0.1540	0.0861	27180

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P
	ft		ft	ft		ksi	in ²	K	K	P _a
T1	100 - 80	ROHN 2.5 STD	20.00	6.67	84.4 K=1.00	18.110	1.7040	-6.36	30.86	0.206 ✓
T2	80 - 60	ROHN 3 STD	20.03	6.68	68.9 K=1.00	21.146	2.2285	-19.14	47.12	0.406 ✓
T3	60 - 40	3.5" SCH 40 PIPE	20.03	6.68	60.0 K=1.00	22.726	2.6795	-32.53	60.89	0.534 ✓
T4	40 - 20	ROHN 4 EH	20.05	10.02	81.4 K=1.00	18.721	4.4074	-43.52	82.51	0.527 ✓
T5	20 - 0	ROHN 5 X-STR	20.05	10.03	65.4 K=1.00	21.771	6.1120	-55.90	133.06	0.420 ✓

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P
	ft		ft	ft		ksi	in ²	K	K	P _a
T1	100 - 80	ROHN 2 STD	7.92	7.70	117.3 K=1.00	10.410	1.0745	-4.51	11.19	0.404 ✓
T2	80 - 60	ROHN 2 STD	8.51	8.28	126.2 K=1.00	9.314	1.0745	-4.35	10.01	0.434 ✓
T3	60 - 40	ROHN 2 STD	9.18	8.94	136.3 K=1.00	8.038	1.0745	-4.16	8.64	0.481 ✓
T4	40 - 20	ROHN 2.5 STD	12.49	12.18	154.3 K=1.00	6.275	1.7040	-4.87	10.69	0.455 ✓
T5	20 - 0	ROHN 2.5 STD	13.28	12.93	163.7 K=1.00	5.571	1.7040	-4.72	9.49	0.498 ✓

Horizontal Design Data (Compression)

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	24 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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	100 - 80	ROHN 1.5 STD	8.53	4.14	79.9 K=1.00	14.431	0.7995	-2.44	11.54	0.211 ✓
T2	80 - 60	ROHN 1.5 STD	9.90	4.81	92.6 K=1.00	13.164	0.7995	-2.71	10.52	0.257 ✓
T3	60 - 40	ROHN 2 STD	11.94	5.81	88.5 K=1.00	13.585	1.0745	-2.83	14.60	0.194 ✓
T4	40 - 20	ROHN 2 STD	13.79	6.71	102.3 K=1.00	12.137	1.0745	-2.89	13.04	0.222 ✓
T5	20 - 0	ROHN 2 STD	16.21	7.87	120.0 K=1.00	10.084	1.0745	-3.01	10.84	0.277 ✓

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	100 - 80	ROHN 1.5 STD	8.50	4.13	79.6 K=1.00	14.457	0.7995	-0.95	11.56	0.082 ✓
T2	80 - 60	ROHN 1.5 STD	8.54	4.15	80.0 K=1.00	14.418	0.7995	-2.35	11.53	0.204 ✓
T3	60 - 40	ROHN 2 STD	10.58	5.15	78.4 K=1.00	14.567	1.0745	-2.70	15.65	0.173 ✓
T4	40 - 20	ROHN 2 STD	12.63	6.15	93.7 K=1.00	13.053	1.0745	-2.82	14.03	0.201 ✓
T5	20 - 0	ROHN 2 STD	14.96	7.29	111.2 K=1.00	11.135	1.0745	-2.89	11.97	0.242 ✓

Inner Bracing 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	100 - 80	L2x2x1/8	4.26	4.26	128.7 K=1.00	8.994	0.4844	-0.00	4.36	0.001 ✓
T2	80 - 60	L2x2x1/8	4.95	4.95	149.5 K=1.00	6.685	0.4844	-0.00	3.24	0.001 ✓
T3	60 - 40	L2x2x1/8	5.97	5.97	180.3 K=1.00	4.595	0.4844	-0.00	2.23	0.002 ✓
T4	40 - 20	L2x2x1/8	6.90	6.90	208.2 K=1.00	3.447	0.4844	-0.01	1.67	0.003 ✓
T5	20 - 0	L2 1/2x2 1/2x3/16	8.10	8.10	196.5 K=1.00	3.869	0.9020	-0.01	3.49	0.002 ✓

Tension Checks

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	25 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

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	100 - 80	ROHN 2.5 STD	20.00	6.67	84.4	30.000	1.7040	4.63	51.12	0.091 ✓
T2	80 - 60	ROHN 3 STD	20.03	6.68	68.9	30.000	2.2285	16.26	66.85	0.243 ✓
T3	60 - 40	3.5" SCH 40 PIPE	20.03	6.68	60.0	30.000	2.6795	28.06	80.39	0.349 ✓
T4	40 - 20	ROHN 4 EH	20.05	10.02	81.4	30.000	4.4074	37.17	132.22	0.281 ✓
T5	20 - 0	ROHN 5 X-STR	20.05	10.03	65.4	30.000	6.1120	47.02	183.36	0.256 ✓

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	100 - 80	ROHN 2 STD	7.92	7.70	117.3	19.800	1.0745	4.45	21.28	0.209 ✓
T2	80 - 60	ROHN 2 STD	8.51	8.28	126.2	19.800	1.0745	4.27	21.28	0.201 ✓
T3	60 - 40	ROHN 2 STD	8.73	8.49	129.4	19.800	1.0745	4.13	21.28	0.194 ✓
T4	40 - 20	ROHN 2.5 STD	12.15	11.84	150.0	19.800	1.7040	4.84	33.74	0.144 ✓
T5	20 - 0	ROHN 2.5 STD	13.28	12.93	163.7	19.800	1.7040	4.46	33.74	0.132 ✓

Horizontal 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	100 - 80	ROHN 1.5 STD	8.53	4.14	79.9	19.800	0.7995	2.47	15.83	0.156 ✓
T2	80 - 60	ROHN 1.5 STD	9.90	4.81	92.6	19.800	0.7995	2.72	15.83	0.172 ✓
T3	60 - 40	ROHN 2 STD	11.94	5.81	88.5	19.800	1.0745	2.86	21.28	0.134 ✓
T4	40 - 20	ROHN 2 STD	13.79	6.71	102.3	19.800	1.0745	2.90	21.28	0.137 ✓
T5	20 - 0	ROHN 2 STD	16.21	7.87	120.0	19.800	1.0745	3.07	21.28	0.144 ✓

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	26 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
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Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	100 - 80	ROHN 1.5 STD	8.50	4.13	79.6	19.800	0.7995	0.95	15.83	0.060
T2	80 - 60	ROHN 1.5 STD	8.54	4.15	80.0	19.800	0.7995	2.29	15.83	0.145 ✓
T3	60 - 40	ROHN 2 STD	10.58	5.15	78.4	19.800	1.0745	2.72	21.28	0.128 ✓
T4	40 - 20	ROHN 2 STD	12.63	6.15	93.7	19.800	1.0745	2.82	21.28	0.133 ✓
T5	20 - 0	ROHN 2 STD	14.96	7.29	111.2	19.800	1.0745	2.90	21.28	0.136 ✓

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	100 - 80	L2x2x1/8	4.26	4.26	81.7	19.800	0.4844	0.00	9.59	0.000 ✓
T2	80 - 60	L2x2x1/8	4.27	4.27	81.8	19.800	0.4844	0.00	9.59	0.000 ✓
T3	60 - 40	L2x2x1/8	5.29	5.29	101.4	19.800	0.4844	0.00	9.59	0.000 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T1	100 - 80	Leg	ROHN 2.5 STD	3	-6.36	41.14	15.5	Pass
T2	80 - 60	Leg	ROHN 3 STD	45	-19.14	62.81	30.5	Pass
T3	60 - 40	Leg	3.5" SCH 40 PIPE	84	-32.53	81.17	40.1	Pass
T4	40 - 20	Leg	ROHN 4 EH	123	-43.52	109.99	39.6	Pass
T5	20 - 0	Leg	ROHN 5 X-STR	150	-55.90	177.37	31.5	Pass
T1	100 - 80	Diagonal	ROHN 2 STD	14	-4.51	14.91	30.3	Pass
T2	80 - 60	Diagonal	ROHN 2 STD	53	-4.35	13.34	32.6	Pass
T3	60 - 40	Diagonal	ROHN 2 STD	92	-4.16	11.51	36.1	Pass
T4	40 - 20	Diagonal	ROHN 2.5 STD	131	-4.87	14.25	34.2	Pass
T5	20 - 0	Diagonal	ROHN 2.5 STD	159	-4.72	12.65	37.3	Pass
T1	100 - 80	Horizontal	ROHN 1.5 STD	13	-2.44	15.38	15.8	Pass
T2	80 - 60	Horizontal	ROHN 1.5 STD	52	-2.71	14.03	19.3	Pass
T3	60 - 40	Horizontal	ROHN 2 STD	91	-2.83	19.46	14.5	Pass

ERITower URS Corp. AES 795 Brook Street Rocky Hill, CT 06067 Phone: (860) 529-8882 FAX: (860) 529-5566	Job	100' Rohn SSMW Tower	Page	27 of 27
	Project	Bruce's Golf Course, Greenwich, CT	Date	09:39:25 07/21/04
	Client	Verizon WS	Designed by	Daniel D. McClure

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T4	40 - 20	Horizontal	ROHN 2 STD	130	-2.89	17.38	16.6	Pass
T5	20 - 0	Horizontal	ROHN 2 STD	154	-3.01	14.44	20.8	Pass
T1	100 - 80	Top Girt	ROHN 1.5 STD	5	-0.95	15.41	6.2	Pass
T2	80 - 60	Top Girt	ROHN 1.5 STD	8	-2.35	15.37	15.3	Pass
T3	60 - 40	Top Girt	ROHN 2 STD	47	-2.70	20.86	13.0	Pass
T4	40 - 20	Top Girt	ROHN 2 STD	86	-2.82	18.70	15.1	Pass
T5	20 - 0	Top Girt	ROHN 2 STD	125	-2.89	15.95	18.1	Pass
T1	100 - 80	Inner Bracing	L2x2x1/8	21	-0.00	5.81	0.2	Pass
T2	80 - 60	Inner Bracing	L2x2x1/8	58	-0.00	4.32	0.2	Pass
T3	60 - 40	Inner Bracing	L2x2x1/8	97	-0.00	2.97	0.2	Pass
T4	40 - 20	Inner Bracing	L2x2x1/8	136	-0.01	2.23	0.3	Pass
T5	20 - 0	Inner Bracing	L2 1/2x2 1/2x3/16	161	-0.00	3.49	0.4	Pass
Summary								
Leg (T3)							40.1	Pass
Diagonal (T5)							37.3	Pass
Horizontal (T5)							20.8	Pass
Top Girt (T5)							18.1	Pass
Inner Bracing (T5)							0.4	Pass
Bracing (T5)								
RATING =							40.1	Pass

ROHN TOWER ASSEMBLY WITH DESIGN REACTIONS

