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

November 17, 2008

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

RE: **EM-CING-086-080922-** New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 57 Cook Drive, Montville, Connecticut.

Dear Mr. Levine:

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

- The reinforcements specified on the structural analysis report dated October 3, 2008 and sealed by Trichur A. Venkataraman, P.E. are performed prior to the antenna installation;
- A post-construction tower rating of not more than 100 percent is achieved; and
- A signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the reinforcements have been properly completed and a post-construction tower rating of not more than 100 percent has been achieved.

The proposed modifications are to be implemented as specified here and in your notice dated September 22, 2008 and additional information received on October 17, 2008, 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 failureand 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/jb

c: The Honorable Joseph W. Jaskiewicz, Mayor, Town of Montville
Marcia Vlaun, Town Planner, Town of Montville
Wireless Solutions

Perrone, Michael

From: LEVINE, STEVEN (ATTCINW) [SL3764@att.com]
Sent: Tuesday, October 20, 2009 12:22 PM
To: Perrone, Michael
Subject: RE: Cook Rd, Montville

Mike,

The reference to the earlier mods being completed was in the original (failing) structural – general conditions section.

- **Legs:** Leg members consist of 2.5" to 3" extra-strong pipe and are comprised of 50 ksi steel, according to ROHN specifications. Leg members appeared to be in good condition, with no rusting observed. Tower reinforcing was performed on two tower sections, from 20' to 60'. This leg reinforcing extends past each section's flange plate; APT believes the solid rod reinforcing should terminate on the respective flange plates.

36 Sugar Hollow Rd – our records show AT&T at 95 ft. centerline

Later,

AT&T Mobility / New Cingular Wireless PCS, LLC
Steve Levine 500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067
Real Estate Consultant Office 860-513-7636 Mobile 203-556-1655 Fax 860-513-7190

From: Perrone, Michael [mailto:Michael.Perrone@ct.gov]
Sent: Tuesday, October 20, 2009 11:55 AM
To: LEVINE, STEVEN (ATTCINW)
Subject: RE: Cook Rd, Montville

Hi Steve.

We would still need a PE letter from one of the carriers. Which carrier it comes from isn't that critical.

I took another look at MetroPCS' structural analysis report. I'm not seeing the part indicating that the modifications have been completed. What section is that in?

Thanks.

Mike

PS: Off topic question. Is AT&T/Cingular located on a 105-foot monopole at 36 Sugar Hollow Road, Danbury? If so, at what height?

From: LEVINE, STEVEN (ATTCINW) [mailto:SL3764@att.com]
Sent: Monday, October 19, 2009 9:42 AM
To: Perrone, Michael
Subject: RE: Cook Rd, Montville

Mike,

So far I haven't been able to turn up a PE report saying the AT&T / T-Mobile tower bracing last spring was performed.

However:

- T-Mobile reports that the re-enforcement was completed, as well as the tower owner Ken Thomas.
- The contractor who fabricated the bracing reports that he installed the bracing and sent me pictures of the completed work. I believe I forwarded these to you last week.
- The Metro PCS structural states that the required bracing at 20-60 ft (the bracing AT&T and T-Mobile joined forces in having installed) was observed to have been installed, and this bracing was included in their structural.

I'll keep trying to locate a PE report certifying the structural work required in the AT&T approval. However, if I cannot obtain one, will the above facts (especially the Metro PCS structural) satisfy the AT&T approval condition?

Thanks.

AT&T Mobility / New Cingular Wireless PCS, LLC
Steve Levine 500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067
Real Estate Consultant Office 860-513-7636 Mobile 203-556-1655 Fax 860-513-7190

From: LEVINE, STEVEN (ATTCINW)
Sent: Monday, October 19, 2009 9:11 AM
To: 'Perrone, Michael'
Subject: RE: Cook Rd, Montville

Thanks, Mike.

AT&T Mobility / New Cingular Wireless PCS, LLC
Steve Levine 500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067
Real Estate Consultant Office 860-513-7636 Mobile 203-556-1655 Fax 860-513-7190

From: Perrone, Michael [mailto:Michael.Perrone@ct.gov]
Sent: Monday, October 19, 2009 9:02 AM
To: LEVINE, STEVEN (ATTCINW)
Subject: RE: Cook Rd, Montville

See attached.

Mike

From: LEVINE, STEVEN (ATTCINW) [mailto:SL3764@att.com]
Sent: Thursday, October 15, 2009 12:31 PM
To: Perrone, Michael
Subject: Cook Rd, Montville

Mike,

Could you email a copy of Metro's structural analysis from August?

Thanks.

AT&T Mobility / New Cingular Wireless PCS, LLC
Steve Levine 500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067
Real Estate Consultant Office 860-513-7636 Mobile 203-556-1655 Fax 860-513-7190

Perrone, Michael

From: Levine, Steven [SL3764@att.com]
Sent: Friday, October 17, 2008 12:52 PM
To: Perrone, Michael
Subject: Cook Rd, Montville -- new structural with mods -- <100% capacity used
Attachments: CTNL023C Montville Revised Structural.pdf

Mike,

On 9/22 I resubmitted the Cook Rd, Montville UMTS exempt mod. The structural I submitted with the application was rated at approximately 103% of capacity, but I requested conditional approval pending efforts to achieve a resultant loading of less than 100% of capacity.

T-Mobile has since had tower mod plans developed that would reduce capacity usage of the proposed loading to 99.9%. I am attaching that structural analysis and proposed tower mods for your review prior to approval of the 9/22 exempt mod. This should change the nature of the conditional approval to specify this set of tower mods.

Thank you.

AT&T Mobility / New Cingular Wireless PCS, LLC
Steve Levine 500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067
Real Estate Consultant Office 860-513-7636 Mobile 203-556-1655 Fax 860-513-7190

From: Fiedler, Hans [mailto:Hans.Fiedler@t-mobile.com]
Sent: Monday, October 06, 2008 9:04 AM
To: Levine, Steven
Subject: T-Mobile CTNL023 - Montville Structural

Steve,

Good morning,

Attached is the revised structural. We are below 100% with the proposed revisions.

I do not have a cost as of yet. Mid week or so.

<<CTNL023C Montville Revised Structural.pdf>>

Hans Fiedler

Development Manager CT

T-Mobile

35 Griffin Road

Bloomfield, CT 06002

Office 860-692-7123

Mobile: 860-436-0333

BAY STATE
DESIGN

October 3, 2008

Ms. Karina Fournier
Maxton Technology, Inc.
35Griffin Road South
Bloomfield, CT 06002

Reg: CTNL023C Montville
T-Mobile Facility
57 Cook Drive, Montville, CT 06382
BSD Job No.: 2806.102
190 Ft Guyed Tower

Dear Ms. Fournier:

As requested by your organization, Bay State Design, Inc. (BSD) has reanalyzed the above referenced monopole tower for the proposed loading of adding three (3) APX16DWV-16DWVL-X (1 per sector) with twelve (12) TMA's and twelve (12) 1 5/8" diameter coax cables at elevation 192 feet.

Maxton Technology provided the site photographs. We assumed that the tower structure is in good condition and without any structural defects. If the existing field condition differs from this report, please notify BSD immediately.

BSDA completed the analysis for the proposed loading as described above according to the Telecommunication Industry Association Standard TIA/EIA-222-F. The existing self supporting tower with proposed additional loading will meet the requirements of ANSI/TIA-222-F Standard after structural modifications are implemented as follow:

Two (2) sections (Elevation 20' to 60') of the existing tower's legs will require strengthening by adding new reinforcing consisting of 1 1/4" diameter solid rod members clamped to the existing legs with a universal pipe adapter kit (See attached sketch).

BSD also reviewed the foundation allowable base reactions provided by URS Corporation AES report (dated: 08/10/04). Based on the available data, the existing foundation is satisfactory for the new base reactions. The existing tower with the proposed loading is rated at 99.9%.

Please feel free to contact this office if you have any questions.

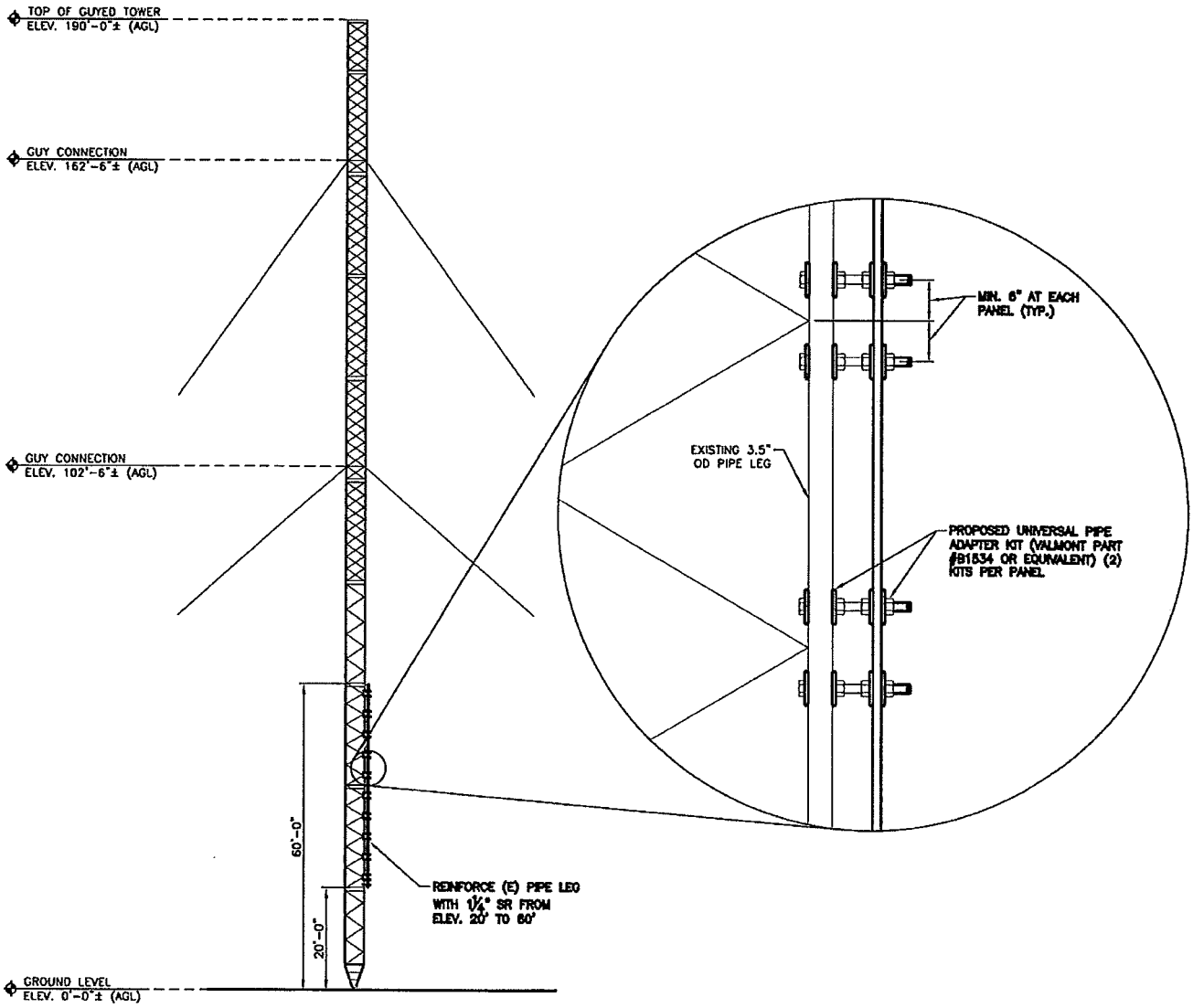
Sincerely Yours,

BAY STATE DESIGN, INC.

T. A. Venkataraman, P.E

STATE OF CONNECTICUT
THIAGARAJA A. VENKATARAMAN
No. 22948
LICENSED PROFESSIONAL ENGINEER

M:\PROJECTS\T-Mobile Legacy\@pm\Structural Letter\Montville CTNL023C 10.03.08 Revised.doc



LEG REINFORCEMENT AT ELEV. 20' TO 60'

1

SCALE: N.T.S.

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 936-6393
Fax: (508) 936-6395

OMNIPOINT COMMUNICATIONS INC.
A WHOLLY-OWNED SUBSIDIARY OF T-MOBILE USA, INC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860)-692-7100
FAX: (860)-692-7159

PROJECT LOCATION: MONTVILLE COOK ST. CTNL023C 57 COOK ROAD MONTVILLE, CT 06382	SITE TYPE: GUYED TOWER		BSOA PROJ. #: 2806.102
	PROJECT MANAGER: SA	DRAWN BY: MC	SHEET: SK-1
APPROVED BY:	DATE: 10/03/08	REVISION: 1	

BAY STATE
DESIGN

Assumption:

This engineering study is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. BSDA has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural stress analysis:

- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.

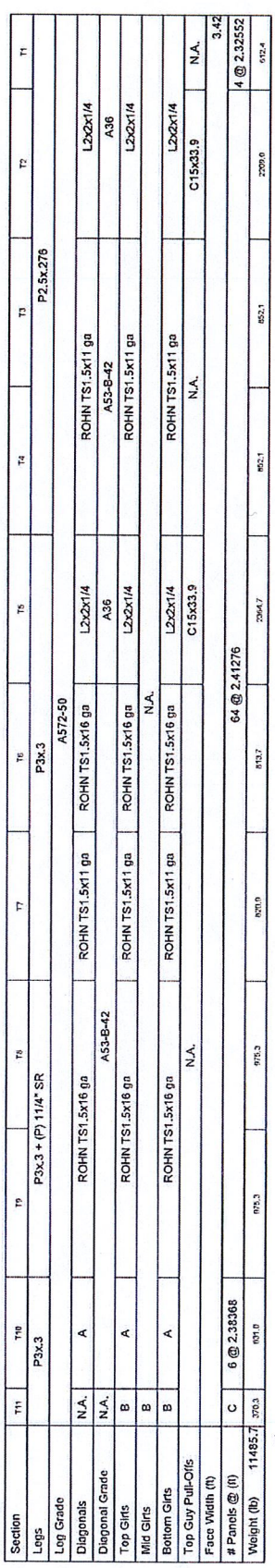
- The antenna configuration is as supplied and/or as stated in the analysis section. It is assumed to be complete and accurate. All antennas, mounts coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.

- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of the best knowledge of antenna type & industry practice.

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained in accordance with the TIA/EIA standard and/or its original manufacturer and to be in good condition with no structural defects and with no deterioration to its member capacities.

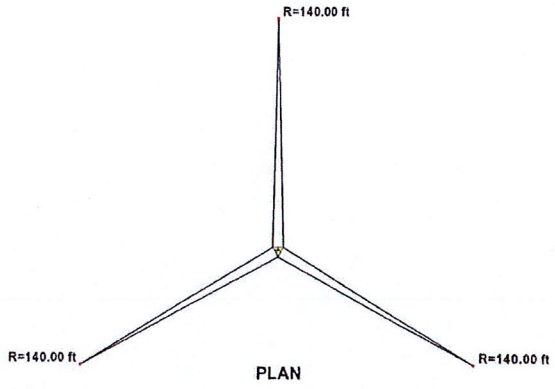
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.

- All prior structural modifications, if any, are assumed to be as per data supplied/ available, to have been properly installed and to be fully effective.



Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		P3x3	P3x3 + (P) 11/4" SR			P3x3			P2.5x.276		
Log Grade						A572-50					
Diagonals	N.A.	A		ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	L2x2x1/4	ROHN TS1.5x11 ga		L2x2x1/4	
Diagonal Grade	N.A.			A53-B-42			A36	A53-B-42		A36	
Top Girts	B	A		ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	L2x2x1/4	ROHN TS1.5x11 ga		L2x2x1/4	
Mid Girts	B			N.A.							
Bottom Girts	B	A		ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	L2x2x1/4	ROHN TS1.5x11 ga		L2x2x1/4	
Top Guy Pull-Offs				N.A.			C15x33.9	N.A.		C15x33.9	N.A.
Face Width (ft)											3.42
# Panels @ (ft)	C	6 @ 2.38368				64 @ 2.41276					4 @ 2.32552
Weight (lb)	370.3	931.0	975.3	975.3	820.0	819.7	2364.7	852.1	852.1	2269.6	512.4

11485.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APX16PV-16PVL-C	190	T-Frame Sector Mount	168
APX16PV-16PVL-C	190	T-Frame Sector Mount	168
APX16PV-16PVL-C	190	DB948F85T2E-M	168
(4) G20057A1 TMA	190	DB948F85T2E-M	168
(4) G20057A1 TMA	190	DB948F85T2E-M	168
(4) G20057A1 TMA	190	DB948F85T2E-M	168
DB840NS-C	188	DB948F85T2E-M	168
(2) 7770.00	178	DB948F85T2E-M	168
(2) 7770.00	178	DB408	155
(2) LGP 21901 Diplexer	178	(2) DB980H90E-M	150
(2) LGP 21901 Diplexer	178	(2) DB980H90E-M	150
(2) LGP 21901 Diplexer	178	(2) DB980H90E-M	150
T-Frame Sector Mount	178	T-Frame Sector Mount	150
T-Frame Sector Mount	178	T-Frame Sector Mount	150
T-Frame Sector Mount	178	(2) T-Frame Sector Mount	150
(2) 7770.00	178	FG4503	147
(2) LGP 21401 TMA	178	(4) DB844H90-XY	140
(2) LGP 21401 TMA	178	T-Frame Sector Mount	140
(2) LGP 21401 TMA	178	T-Frame Sector Mount	140
FG4503	170	T-Frame Sector Mount	140
FG4503	170	(4) DB844H90-XY	140
ALP 9212	168	(4) DB844H90-XY	140
ALP 9212	168	DB408	126
ALP 9212	168	PD220	121
ALP 9212	168	PD220	121
ALP 9212	168	DB304-A	111
ALP 9212	168	DB633-A	105
T-Frame Sector Mount	168		

SYMBOL LIST

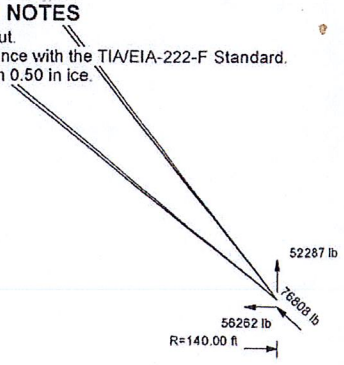
MARK	SIZE	MARK	SIZE
A	ROHN TS1.5x11 ga	C	3 @ 1.44444
B	L3x3x1/2		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.9%



BAY STATE DESIGN
Architects - Engineers
Bay State Design, Inc.
70 Tower Office Park
Woburn, MA 01801
Phone: (781 932-2467
FAX: (781) 932-9771

Job: CTNL023C Montville		
Project: 190' Guyed Tower		
Client: T-Mobile	Drawn by: Sabed	App'd:
Code: TIA/EIA-222-F	Date: 10/03/08	Scale: NTS
Path:		Dwg No. E-1

BSD

Bay State Design, Inc.
70 Tower Office Park
Woburn, MA 01801
Phone: (781 932-2467
FAX: (781) 932-9771

Job	Page
CTNL023C Montville	1 of 28
Project	**Date**
190' Guyed Tower	08:21:04 10/03/08
Client	**Designed by**
T-Mobile	Sabed

Tower Input Data

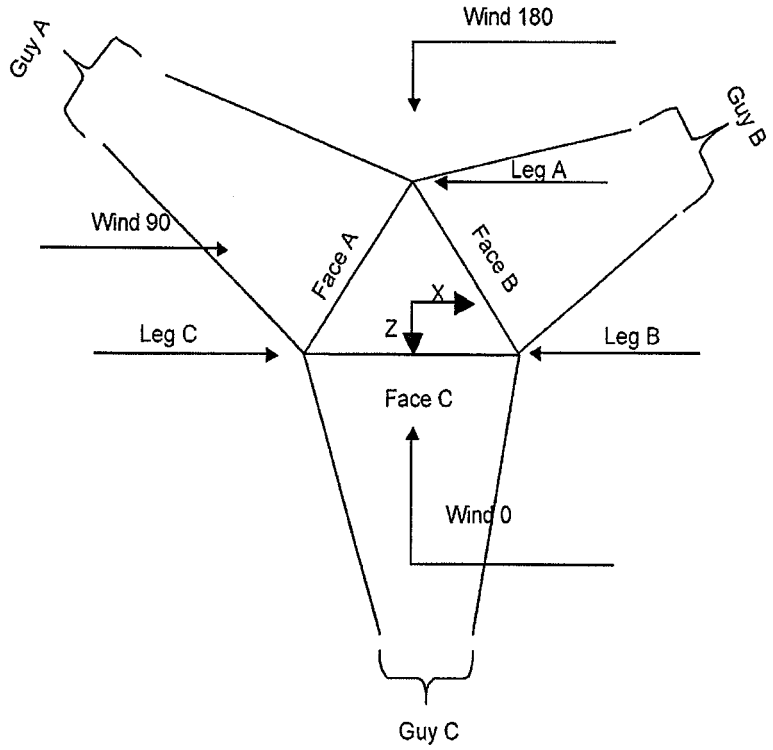
The main tower is a 3x guyed tower with an overall height of 190.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
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 60 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
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		

BSD	Job	Page
Bay State Design, Inc. 70 Tower Office Park Woburn, MA 01801 Phone: (781 932-2467 FAX: (781) 932-9771	CTNL023C Montville	2 of 28
	Project 190' Guyed Tower	Date 08:21:04 10/03/08
	Client T-Mobile	Designed by Sabed



Face Guyed

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	190.00-180.00			3.42	1	10.00
T2	180.00-160.00			3.42	1	20.00
T3	160.00-140.00			3.42	1	20.00
T4	140.00-120.00			3.42	1	20.00
T5	120.00-100.00			3.42	1	20.00
T6	100.00-80.00			3.42	1	20.00
T7	80.00-60.00			3.42	1	20.00
T8	60.00-40.00			3.42	1	20.00
T9	40.00-20.00			3.42	1	20.00
T10	20.00-5.00			3.42	1	15.00
T11	5.00-0.00			3.42	1	5.00

Tower Section Geometry *(cont'd)*

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
T1	190.00-180.00	2.33	X Brace	No	No	7.3750	1.0000
T2	180.00-160.00	2.41	X Brace	No	No	7.3750	1.0000
T3	160.00-140.00	2.41	X Brace	No	No	7.3750	1.0000
T4	140.00-120.00	2.41	X Brace	No	No	7.3750	1.0000
T5	120.00-100.00	2.41	X Brace	No	No	7.3750	1.0000
T6	100.00-80.00	2.41	X Brace	No	No	7.3750	1.0000
T7	80.00-60.00	2.41	K Brace Left	No	No	7.3750	1.0000
T8	60.00-40.00	2.41	K Brace Left	No	No	7.3750	1.0000
T9	40.00-20.00	2.41	K Brace Left	No	No	7.3750	1.0000
T10	20.00-5.00	2.38	K Brace Left	No	Yes	7.3750	1.0000
T11	5.00-0.00	1.44	X Brace	No	Yes	2.0000	6.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 190.00-180.00	Pipe	P2.5x.276	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 180.00-160.00	Pipe	P2.5x.276	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 160.00-140.00	Pipe	P2.5x.276	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T4 140.00-120.00	Pipe	P2.5x.276	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Pipe	P3x.3	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T8 60.00-40.00	Arbitrary Shape	P3x.3 + (P) 11/4" SR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 40.00-20.00	Arbitrary Shape	P3x.3 + (P) 11/4" SR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Pipe	P3x.3	A572-50 (50 ksi)	Equal Angle		A36 (36 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 190.00-180.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 180.00-160.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 160.00-140.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T4 140.00-120.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T8 60.00-40.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 40.00-20.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Equal Angle	L3x3x1/2	A36 (36 ksi)	Equal Angle	L3x3x1/2	A36 (36 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
T11 5.00-0.00	2	Equal Angle	L3x3x1/2	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	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
T1 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	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
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-5.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 5.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	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
T1 190.00-180.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 180.00-160.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 160.00-140.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 140.00-120.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 120.00-100.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 100.00-80.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 80.00-60.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 60.00-40.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 40.00-20.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 20.00-5.00	Yes	No	0.85	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 5.00-0.00	Yes	No	0.85	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)*

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 190.00-180.00	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

BSD

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Job	Page
CTNL023C Montville	6 of 28
Project	**Date**
190' Guyed Tower	08:21:04 10/03/08
Client	**Designed by**
T-Mobile	Sabed

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
T2 180.00-160.00	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 160.00-140.00	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 140.00-120.00	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 120.00-100.00	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
T6 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
T7 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
T8 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
T9 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
T10 20.00-5.00	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
T11 5.00-0.00	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

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
162.496	EHS	A	3/4	5830.00	10%	19000	1.16	213.04	140.00	0.0000	0.00	100%
		B	3/4	5830.00	10%	19000	1.16	213.04	140.00	0.0000	0.00	100%
		C	3/4	5830.00	10%	19000	1.16	213.04	140.00	0.0000	0.00	100%
102.496	EHS	A	5/8	4240.00	10%	21000	0.81	171.81	140.00	0.0000	0.00	100%
		B	5/8	4240.00	10%	21000	0.81	171.81	140.00	0.0000	0.00	100%
		C	5/8	4240.00	10%	21000	0.81	171.81	140.00	0.0000	0.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
162.496	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C15x33.9
102.496	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C15x33.9

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
162.50	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	C15x33.9
102.50	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	C15x33.9

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
162.496	246.06	246.06	246.06		4.43	4.43	4.43	
					3.6 sec/pulse	3.6 sec/pulse	3.6 sec/pulse	
102.496	139.68	139.68	139.68		2.81	2.81	2.81	
					2.9 sec/pulse	2.9 sec/pulse	2.9 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
162.496	No	No	1	1	1	1	1	1
102.496	No	No	1	1	1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
162.496	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
102.496	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
162.496	A	81.25	24	18	0.5000
	B	81.25	24	18	0.5000
	C	81.25	24	18	0.5000

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
102.496	A	51.25	21	16	0.5000
	B	51.25	21	16	0.5000
	C	51.25	21	16	0.5000

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
162.496	A	49.6459	6017.51 5830.00	-94.86	4637.09	-3833.90	-9142.73	13279.78	-15835.67
	A	49.6459	6017.51 5830.00	94.86	4637.09	-3833.90	-9142.73	-13279.78	15835.67
	B	49.6459	6017.51 5830.00	3367.68	4637.09	1834.80	18285.46	13279.78	0.00
	B	49.6459	6017.51 5830.00	3272.82	4637.09	1999.10	-9142.73	-13279.78	-15835.67
	C	49.6459	6017.51 5830.00	-3272.82	4637.09	1999.10	-9142.73	13279.78	15835.67
	C	49.6459	6017.51 5830.00	-3367.68	4637.09	1834.80	18285.46	-13279.78	0.00
			Sum:	0.00	27822.56	0.00	-0.00	0.00	0.00
102.496	A	36.5882	4323.26 4240.00	-85.02	2621.87	-3436.44	-5169.42	11903.07	-8953.69
	A	36.5882	4323.26 4240.00	85.02	2621.87	-3436.44	-5169.42	-11903.07	8953.69
	B	36.5882	4323.26 4240.00	3018.55	2621.87	1644.59	10338.83	11903.07	0.00
	B	36.5882	4323.26 4240.00	2933.53	2621.87	1791.85	-5169.42	-11903.07	-8953.69
	C	36.5882	4323.26 4240.00	-2933.53	2621.87	1791.85	-5169.42	11903.07	8953.69
	C	36.5882	4323.26 4240.00	-3018.55	2621.87	1644.59	10338.83	-11903.07	0.00
			Sum:	0.00	15731.23	0.00	-0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
162.496	A	49.6459	8639.25 8327.78	-135.83	6669.02	-5490.20	-13148.99	19016.85	-22774.72
	A	49.6459	8639.25 8327.78	135.83	6669.02	-5490.20	-13148.99	-19016.85	22774.72
	B	49.6459	8639.25 8327.78	4822.57	6669.02	2627.46	26297.98	19016.85	0.00
	B	49.6459	8639.25 8327.78	4686.73	6669.02	2862.74	-13148.99	-19016.85	-22774.72

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
	C	49.6459	8639.25 8327.78	-4686.73	6669.02	2862.74	-13148.99	19016.85	22774.72
	C	49.6459	8639.25 8327.78	-4822.57	6669.02	2627.46	26297.98	-19016.85	0.00
			Sum:	0.00	40014.14	0.00	-0.00	0.00	0.00
102.496	A	36.5882	6372.27 6218.63	-125.00	3881.17	-5052.39	-7652.31	17500.38	-13254.20
	A	36.5882	6372.27 6218.63	125.00	3881.17	-5052.39	-7652.31	-17500.38	13254.20
	B	36.5882	6372.27 6218.63	4438.00	3881.17	2417.94	15304.63	17500.38	0.00
	B	36.5882	6372.27 6218.63	4313.00	3881.17	2634.45	-7652.31	-17500.38	-13254.20
	C	36.5882	6372.27 6218.63	-4313.00	3881.17	2634.45	-7652.31	17500.38	13254.20
	C	36.5882	6372.27 6218.63	-4438.00	3881.17	2417.94	15304.63	-17500.38	0.00
			Sum:	0.00	23287.02	0.00	-0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
162.496	A	49.6459	6017.51 5830.00	-94.86	4637.09	-3833.90	-9142.73	13279.78	-15835.67
	A	49.6459	6017.51 5830.00	94.86	4637.09	-3833.90	-9142.73	-13279.78	15835.67
	B	49.6459	6017.51 5830.00	3367.68	4637.09	1834.80	18285.46	13279.78	0.00
	B	49.6459	6017.51 5830.00	3272.82	4637.09	1999.10	-9142.73	-13279.78	-15835.67
	C	49.6459	6017.51 5830.00	-3272.82	4637.09	1999.10	-9142.73	13279.78	15835.67
	C	49.6459	6017.51 5830.00	-3367.68	4637.09	1834.80	18285.46	-13279.78	0.00
			Sum:	0.00	27822.56	0.00	-0.00	0.00	0.00
102.496	A	36.5882	4323.26 4240.00	-85.02	2621.87	-3436.44	-5169.42	11903.07	-8953.69
	A	36.5882	4323.26 4240.00	85.02	2621.87	-3436.44	-5169.42	-11903.07	8953.69
	B	36.5882	4323.26 4240.00	3018.55	2621.87	1644.59	10338.83	11903.07	0.00
	B	36.5882	4323.26 4240.00	2933.53	2621.87	1791.85	-5169.42	-11903.07	-8953.69
	C	36.5882	4323.26 4240.00	-2933.53	2621.87	1791.85	-5169.42	11903.07	8953.69
	C	36.5882	4323.26 4240.00	-3018.55	2621.87	1644.59	10338.83	-11903.07	0.00
			Sum:	0.00	15731.23	0.00	-0.00	0.00	0.00

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Job	Page
CTNL023C Montville	10 of 28
Project	**Date**
190' Guyed Tower	08:21:04 10/03/08
Client	**Designed by**
T-Mobile	Sabed

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*
LDF7-50A (1-5/8 FOAM)	A	No	Ar (CfAe)	188.00 - 3.00	0.0000	0	6	3	1.9800	1.9800		0.82
1 1/4	A	No	Ar (CfAe)	142.00 - 3.00	0.0000	0.2	9	9	1.5500	1.5500		0.66
1 1/4	A	Yes	Ar (CfAe)	142.00 - 3.00	2.0000	0.33	3	3	1.5500	1.5500		0.66
1 5/8	C	Yes	Ar (CfAe)	150.00 - 3.00	0.0000	-0.3	6	3	1.9800	1.9800		1.04
1/2	A	No	Ar (CfAe)	105.00 - 3.00	0.0000	-0.1	2	2	0.5800	0.5800		0.25
1 5/8	B	No	Ar (CfAe)	170.00 - 3.00	0.0000	-0.1	12	12	1.9800	1.9800		1.04
7/8	B	No	Ar (CfAe)	179.00 - 3.00	3.0000	0.1	1	1	1.1100	1.1100		0.54
1 1/4	C	No	Ar (CfAe)	180.00 - 3.00	0.0000	0.2	12	12	1.5500	1.5500		0.66
7/8	C	No	Ar (CfAe)	170.00 - 3.00	0.0000	-0.3	2	2	1.1100	1.1100		0.54
1 1/4	B	No	Ar (CfAe)	152.00 - 3.00	0.0000	-0.4	1	1	1.5500	1.5500		0.66
7/8	B	No	Ar (CfAe)	144.00 - 3.00	3.0000	-0.35	1	1	1.1100	1.1100		0.54
1 1/4	B	No	Ar (CfAe)	122.00 - 3.00	2.5000	-0.4	1	1	1.5500	1.5500		0.66
1 5/8	B	No	Ar (CfAe)	110.00 - 3.00	3.5000	-0.3	2	2	1.9800	1.9800		1.04
1 1/4	B	No	Ar (CfAe)	108.00 - 3.00	5.0000	-0.4	1	1	1.5500	1.5500		0.66

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement ft*	*Face Offset in*	*Lateral Offset (Frac FW)*	*#*		*C_AA_A ft^2/ft*	*Weight plf*
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	188.00 - 3.00	3.0000	0	6	No Ice	0.20	0.82
								1/2" Ice	0.30	2.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	*Tower Elevation ft*	*Face*	*A_R ft^2*	*A_F ft^2*	*C_AA_A In Face ft^2*	*C_AA_A Out Face ft^2*	*Weight lb*
T1	190.00-180.00	A	3.960	0.000	0.000	0.000	39.36
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.504	39.36
T2	180.00-160.00	A	9.900	0.000	0.000	0.000	98.40
		B	21.558	0.000	0.000	0.000	135.06
		C	32.850	0.000	0.000	23.760	267.60
T3	160.00-140.00	A	13.000	0.000	0.000	0.000	114.24
		B	43.370	0.000	0.000	0.000	270.48
		C	39.650	0.000	0.000	23.760	340.80
T4	140.00-120.00	A	40.900	0.000	0.000	0.000	256.80
		B	46.142	0.000	0.000	0.000	285.72
		C	44.600	0.000	0.000	23.760	403.20
T5	120.00-100.00	A	41.383	0.000	0.000	0.000	259.30
		B	52.800	0.000	0.000	0.000	323.68
		C	44.600	0.000	0.000	23.760	403.20
T6	100.00-80.00	A	42.833	0.000	0.000	0.000	266.80
		B	57.650	0.000	0.000	0.000	352.40
		C	44.600	0.000	0.000	23.760	403.20
T7	80.00-60.00	A	42.833	0.000	0.000	0.000	266.80

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	57.650	0.000	0.000	0.000	352.40
		C	44.600	0.000	0.000	23.760	403.20
T8	60.00-40.00	A	42.833	0.000	0.000	0.000	266.80
		B	57.650	0.000	0.000	0.000	352.40
		C	44.600	0.000	0.000	23.760	403.20
T9	40.00-20.00	A	42.833	0.000	0.000	0.000	266.80
		B	57.650	0.000	0.000	0.000	352.40
		C	44.600	0.000	0.000	23.760	403.20
T10	20.00-5.00	A	32.125	0.000	0.000	0.000	200.10
		B	43.237	0.000	0.000	0.000	264.30
		C	33.450	0.000	0.000	17.820	302.40
T11	5.00-0.00	A	4.283	0.000	0.000	0.000	26.68
		B	5.765	0.000	0.000	0.000	35.24
		C	4.460	0.000	0.000	2.376	40.32

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_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	190.00-180.00	A	0.500	5.960	0.000	0.000	0.000	112.08
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	14.304	112.08
T2	180.00-160.00	A	0.500	14.900	0.000	0.000	0.000	280.19
		B		33.141	0.000	0.000	0.000	335.54
		C		54.517	0.000	0.000	35.760	769.61
T3	160.00-140.00	A	0.500	20.000	0.000	0.000	0.000	326.09
		B		66.370	0.000	0.000	0.000	672.70
		C		65.483	0.000	0.000	35.760	953.38
T4	140.00-120.00	A	0.500	65.900	0.000	0.000	0.000	739.14
		B		71.308	0.000	0.000	0.000	716.20
		C		72.933	0.000	0.000	35.760	1106.67
T5	120.00-100.00	A	0.500	66.558	0.483	0.000	0.000	747.99
		B		81.800	0.000	0.000	0.000	817.01
		C		72.933	0.000	0.000	35.760	1106.67
T6	100.00-80.00	A	0.500	68.533	1.933	0.000	0.000	774.53
		B		89.317	0.000	0.000	0.000	891.06
		C		72.933	0.000	0.000	35.760	1106.67
T7	80.00-60.00	A	0.500	68.533	1.933	0.000	0.000	774.53
		B		89.317	0.000	0.000	0.000	891.06
		C		72.933	0.000	0.000	35.760	1106.67
T8	60.00-40.00	A	0.500	68.533	1.933	0.000	0.000	774.53
		B		89.317	0.000	0.000	0.000	891.06
		C		72.933	0.000	0.000	35.760	1106.67
T9	40.00-20.00	A	0.500	68.533	1.933	0.000	0.000	774.53
		B		89.317	0.000	0.000	0.000	891.06
		C		72.933	0.000	0.000	35.760	1106.67
T10	20.00-5.00	A	0.500	51.400	1.450	0.000	0.000	580.90
		B		66.987	0.000	0.000	0.000	668.30
		C		54.700	0.000	0.000	26.820	830.00
T11	5.00-0.00	A	0.500	6.853	0.193	0.000	0.000	77.45
		B		8.932	0.000	0.000	0.000	89.11
		C		7.293	0.000	0.000	3.576	110.67

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Project	**Date**
190' Guyed Tower	08:21:04 10/03/08
Client	**Designed by**
T-Mobile	Sabed

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	190.00-180.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	180.00-160.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	160.00-140.00	A	0.105	0.287	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.668	1.675	0.000	0.000
T4	140.00-120.00	A	1.045	2.866	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.335	3.350	0.000	0.000
T5	120.00-100.00	A	0.000	1.200	1.878	3.090
		B	0.000	0.000	0.000	0.000
		C	0.000	1.402	2.399	3.611
T6	100.00-80.00	A	1.045	2.866	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.335	3.350	0.000	0.000
T7	80.00-60.00	A	0.571	1.566	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.730	1.830	0.000	0.000
T8	60.00-40.00	A	0.571	1.566	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.730	1.830	0.000	0.000
T9	40.00-20.00	A	0.571	1.566	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.730	1.830	0.000	0.000
T10	20.00-5.00	A	0.451	1.237	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.576	1.446	0.000	0.000
T11	5.00-0.00	A	0.000	0.072	0.119	0.204
		B	0.000	0.000	0.000	0.000
		C	0.000	0.084	0.152	0.238

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	190.00-180.00	-3.2815	1.1114	-3.3515	1.1350
T2	180.00-160.00	-2.7299	1.7821	-2.8080	1.9784
T3	160.00-140.00	-1.6204	0.9108	-1.6342	1.0256
T4	140.00-120.00	-1.8262	-0.5952	-1.8768	-0.6122
T5	120.00-100.00	-1.5429	-0.9794	-1.6224	-1.0291
T6	100.00-80.00	-1.5134	-1.3595	-1.5341	-1.3914
T7	80.00-60.00	-1.5519	-1.4089	-1.5658	-1.4480
T8	60.00-40.00	-1.4873	-1.3502	-1.5226	-1.4081
T9	40.00-20.00	-1.4873	-1.3502	-1.5226	-1.4081
T10	20.00-5.00	-1.5493	-1.4056	-1.5637	-1.4443
T11	5.00-0.00	-0.9402	-0.8778	-0.9927	-0.9423

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Project	**Date**
190' Guyed Tower	08:21:04 10/03/08
Client	**Designed by**
T-Mobile	Sabed

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
APX16PV-16PVL-C	A	From Leg	4.50 0.00 2.00	0.0000	190.00	No Ice 1/2" Ice	6.70 7.13	2.00 2.33	39.60 70.94
APX16PV-16PVL-C	B	From Leg	4.50 0.00 2.00	0.0000	190.00	No Ice 1/2" Ice	6.70 7.13	2.00 2.33	39.60 70.94
APX16PV-16PVL-C	C	From Leg	4.50 0.00 2.00	0.0000	190.00	No Ice 1/2" Ice	6.70 7.13	2.00 2.33	39.60 70.94
(4) G20057A1 TMA	A	From Leg	4.50 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	0.82 0.95	0.39 0.49	10.00 20.00
(4) G20057A1 TMA	B	From Leg	4.50 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	0.82 0.95	0.39 0.49	10.00 20.00
(4) G20057A1 TMA	C	From Leg	4.50 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	0.82 0.95	0.39 0.49	10.00 20.00
(2) 7770.00	A	From Leg	4.50 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.00 67.63
(2) 7770.00	B	From Leg	4.50 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.00 67.63
(2) 7770.00	C	From Leg	4.50 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.00 67.63
(2) LGP 21901 Diplexer	A	From Leg	4.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
(2) LGP 21901 Diplexer	B	From Leg	4.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
(2) LGP 21901 Diplexer	C	From Leg	4.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
T-Frame Sector Mount	A	From Leg	3.50 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	15.00 15.00	20.00 20.00	50.00 65.00
T-Frame Sector Mount	B	From Leg	3.50 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	15.00 15.00	20.00 20.00	50.00 65.00
T-Frame Sector Mount	C	From Leg	3.50 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	15.00 15.00	20.00 20.00	50.00 65.00
DB948F85T2E-M	A	From Leg	3.00 -4.00 0.00	0.0000	168.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
DB948F85T2E-M	A	From Leg	3.00 -4.00 0.00	0.0000	168.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
DB948F85T2E-M	B	From Leg	3.00	0.0000	168.00	No Ice	1.92	3.26	8.50

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Project	**Date**
190' Guyed Tower	08:21:04 10/03/08
Client	**Designed by**
T-Mobile	Sabed

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			-4.00			1/2" Ice	2.22	3.62	27.57
			0.00						
DB948F85T2E-M	B	From Leg	3.00	0.0000	168.00	No Ice	1.92	3.26	8.50
			-4.00			1/2" Ice	2.22	3.62	27.57
			0.00						
DB948F85T2E-M	C	From Leg	3.00	0.0000	168.00	No Ice	1.92	3.26	8.50
			-4.00			1/2" Ice	2.22	3.62	27.57
			0.00						
DB948F85T2E-M	C	From Leg	3.00	0.0000	168.00	No Ice	1.92	3.26	8.50
			-4.00			1/2" Ice	2.22	3.62	27.57
			0.00						
ALP 9212	A	From Leg	3.00	0.0000	168.00	No Ice	5.46	5.46	17.20
			-6.00			1/2" Ice	6.09	6.09	50.00
			0.00						
ALP 9212	A	From Leg	3.00	0.0000	168.00	No Ice	5.46	5.46	17.20
			-6.00			1/2" Ice	6.09	6.09	50.00
			0.00						
ALP 9212	B	From Leg	3.00	0.0000	168.00	No Ice	5.46	5.46	17.20
			-6.00			1/2" Ice	6.09	6.09	50.00
			0.00						
ALP 9212	B	From Leg	3.00	0.0000	168.00	No Ice	5.46	5.46	17.20
			-6.00			1/2" Ice	6.09	6.09	50.00
			0.00						
ALP 9212	C	From Leg	3.00	0.0000	168.00	No Ice	5.46	5.46	17.20
			-6.00			1/2" Ice	6.09	6.09	50.00
			0.00						
ALP 9212	C	From Leg	3.00	0.0000	168.00	No Ice	5.46	5.46	17.20
			-6.00			1/2" Ice	6.09	6.09	50.00
			0.00						
T-Frame Sector Mount	A	From Leg	3.50	0.0000	168.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
T-Frame Sector Mount	B	From Leg	3.50	0.0000	168.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
T-Frame Sector Mount	C	From Leg	3.50	0.0000	168.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
(4) DB844H90-XY	A	From Leg	3.00	0.0000	140.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
(4) DB844H90-XY	B	From Leg	3.00	0.0000	140.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
(4) DB844H90-XY	C	From Leg	3.00	0.0000	140.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
T-Frame Sector Mount	A	From Leg	2.50	0.0000	140.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
T-Frame Sector Mount	B	From Leg	2.50	0.0000	140.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
T-Frame Sector Mount	C	From Leg	2.50	0.0000	140.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
DB304-A	C	From Leg	1.50	0.0000	111.00	No Ice	4.85	4.85	45.00

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Project	**Date**
190' Guyed Tower	08:21:04 10/03/08
Client	**Designed by**
T-Mobile	Sabed

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	8.73	8.73	58.50
			0.00						
PD220	B	From Leg	4.00	0.0000	121.00	No Ice	3.56	3.56	23.00
			0.00			1/2" Ice	7.13	7.13	46.00
			0.00						
DB633-A	B	From Leg	4.00	0.0000	105.00	No Ice	0.65	0.65	8.00
			0.00			1/2" Ice	0.86	0.86	13.57
			0.00						
DB408	B	From Leg	3.00	0.0000	126.00	No Ice	1.90	1.90	17.00
			0.00			1/2" Ice	3.42	3.42	22.10
			0.00						
FG4503	A	From Leg	4.50	0.0000	147.00	No Ice	0.79	0.79	6.00
			0.00			1/2" Ice	1.02	1.02	13.03
			0.00						
DB408	A	From Leg	4.50	0.0000	155.00	No Ice	1.90	1.90	17.00
			0.00			1/2" Ice	3.42	3.42	22.10
			0.00						
FG4503	A	From Leg	4.50	0.0000	170.00	No Ice	0.79	0.79	6.00
			0.00			1/2" Ice	1.02	1.02	13.03
			0.00						
FG4503	C	From Leg	4.50	0.0000	170.00	No Ice	0.79	0.79	6.00
			0.00			1/2" Ice	1.02	1.02	13.03
			0.00						
DB640NS-C	A	From Leg	4.50	0.0000	188.00	No Ice	5.95	5.95	68.00
			0.00			1/2" Ice	8.36	8.36	111.93
			0.00						
PD220	A	From Leg	4.00	0.0000	121.00	No Ice	3.56	3.56	23.00
			0.00			1/2" Ice	7.13	7.13	46.00
			0.00						
(2) LGP 21401 TMA	A	From Leg	4.00	0.0000	178.00	No Ice	1.26	0.38	14.10
			0.00			1/2" Ice	1.42	0.49	21.23
			0.00						
(2) LGP 21401 TMA	B	From Leg	4.00	0.0000	178.00	No Ice	1.26	0.38	14.10
			0.00			1/2" Ice	1.42	0.49	21.23
			0.00						
(2) LGP 21401 TMA	C	From Leg	4.00	0.0000	178.00	No Ice	1.26	0.38	14.10
			0.00			1/2" Ice	1.42	0.49	21.23
			0.00						
(2) DB980H90E-M	A	From Leg	3.00	0.0000	150.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
(2) DB980H90E-M	B	From Leg	3.00	0.0000	150.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
(2) DB980H90E-M	C	From Leg	3.00	0.0000	150.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
T-Frame Sector Mount	A	From Leg	2.50	0.0000	150.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
T-Frame Sector Mount	B	From Leg	2.50	0.0000	150.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						
(2) T-Frame Sector Mount	C	From Leg	2.50	0.0000	150.00	No Ice	15.00	20.00	50.00
			0.00			1/2" Ice	15.00	20.00	65.00
			0.00						

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	5819.22			
Bracing Weight	5666.49			
Total Member Self-Weight	11485.71			
Guy Weight	2314.48			
Total Weight	23756.63			
Wind 0 deg - No Ice		-68.96	-53509.76	-7731.68
Wind 30 deg - No Ice		26554.16	-46131.07	-7812.28
Wind 60 deg - No Ice		46003.70	-26560.25	-5848.04
Wind 90 deg - No Ice		53227.76	68.96	-2317.74
Wind 120 deg - No Ice		46306.33	26814.60	1881.54
Wind 150 deg - No Ice		26673.60	46200.03	5494.54
Wind 180 deg - No Ice		68.96	53239.93	7666.36
Wind 210 deg - No Ice		-26554.16	46131.07	7812.28
Wind 240 deg - No Ice		-46237.37	26695.16	5850.15
Wind 270 deg - No Ice		-53227.76	-68.96	2317.74
Wind 300 deg - No Ice		-46072.65	-26679.68	-1818.32
Wind 330 deg - No Ice		-26673.60	-46200.03	-5494.54
Member Ice	4372.79			
Guy Ice	1684.49			
Total Weight Ice	45407.16			
Wind 0 deg - Ice		-51.72	-46974.82	-6619.10
Wind 30 deg - Ice		23391.36	-40618.46	-6833.78
Wind 60 deg - Ice		40554.39	-23414.09	-5228.49
Wind 90 deg - Ice		46872.30	51.72	-2223.65
Wind 120 deg - Ice		40655.52	23532.20	1387.31
Wind 150 deg - Ice		23480.94	40670.18	4610.13
Wind 180 deg - Ice		51.72	46917.75	6603.16
Wind 210 deg - Ice		-23391.36	40618.46	6833.78
Wind 240 deg - Ice		-40603.81	23442.62	5231.79
Wind 270 deg - Ice		-46872.30	-51.72	2223.65
Wind 300 deg - Ice		-40606.11	-23503.66	-1374.67
Wind 330 deg - Ice		-23480.94	-40670.18	-4610.13
Total Weight	23756.63			
Wind 0 deg - Service		-23.86	-18515.49	-2675.32
Wind 30 deg - Service		9188.29	-15962.31	-2703.21
Wind 60 deg - Service		15918.23	-9190.40	-2023.54
Wind 90 deg - Service		18417.91	23.86	-801.99
Wind 120 deg - Service		16022.95	9278.41	651.05
Wind 150 deg - Service		9229.62	15986.17	1901.22
Wind 180 deg - Service		23.86	18422.12	2652.72
Wind 210 deg - Service		-9188.29	15962.31	2703.21
Wind 240 deg - Service		-15999.09	9237.08	2024.27
Wind 270 deg - Service		-18417.91	-23.86	801.99
Wind 300 deg - Service		-15942.09	-9231.72	-629.18
Wind 330 deg - Service		-9229.62	-15986.17	-1901.22

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Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T2	162.50 (A) (471)	3/4 EHS	5830.00	58299.92	20620.30	29150.00	2.000	2.827 ✓
	162.50 (A) (472)	3/4 EHS	5830.00	58299.92	21243.90	29150.00	2.000	2.744 ✓
	162.50 (B) (467)	3/4 EHS	5830.00	58299.92	21074.40	29150.00	2.000	2.766 ✓
	162.50 (B) (468)	3/4 EHS	5830.00	58299.92	20854.70	29150.00	2.000	2.796 ✓
	162.50 (C) (460)	3/4 EHS	5830.00	58299.92	21082.10	29150.00	2.000	2.765 ✓
	162.50 (C) (461)	3/4 EHS	5830.00	58299.92	20674.00	29150.00	2.000	2.820 ✓
T5	102.50 (A) (486)	5/8 EHS	4240.00	42399.99	18451.10	21200.00	2.000	2.298 ✓
	102.50 (A) (487)	5/8 EHS	4240.00	42399.99	18929.70	21200.00	2.000	2.240 ✓
	102.50 (B) (482)	5/8 EHS	4240.00	42399.99	18530.60	21200.00	2.000	2.288 ✓
	102.50 (B) (483)	5/8 EHS	4240.00	42399.99	18442.90	21200.00	2.000	2.299 ✓
	102.50 (C) (475)	5/8 EHS	4240.00	42399.99	18939.90	21200.00	2.000	2.239 ✓
	102.50 (C) (476)	5/8 EHS	4240.00	42399.99	18540.10	21200.00	2.000	2.287 ✓

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	P2.5x.276	10.00	2.33	30.2 K=1.00	1.00	27.128	2.2535	-5606.96	61134.10	0.092 ✓
T2	180 - 160	P2.5x.276	20.00	2.41	26.6 K=0.85	1.00	27.559	2.2535	-44380.10	62105.60	0.715 ✓
T3	160 - 140	P2.5x.276	20.00	2.41	26.6 K=0.85	0.98	26.939	2.2535	-42885.60	60707.10	0.706 ✓
T4	140 - 120	P2.5x.276	20.00	2.41	26.6 K=0.85	0.96	26.570	2.2535	-39847.40	59877.60	0.665 ✓
T5	120 - 100	P3x.3	20.00	2.41	21.7 K=0.85	0.98	27.475	3.0159	-81846.70	82862.40	0.988 ✓
T6	100 - 80	P3x.3	20.00	2.41	21.7 K=0.85	0.88	24.853	3.0159	-77752.90	74955.10	1.037 ✓
T7	80 - 60	P3x.3	20.00	2.41	43.3 K=1.70	0.95	23.995	3.0159	-93695.00	72366.90	1.295 ✓
T8	60 - 40	P3x.3 + (P) 11/4" SR	20.00	2.41	50.7 K=1.70	0.96	23.247	4.2472	-100881.00	98735.90	1.022 ✓

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Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	40 - 20	P3x.3 + (P) 11/4" SR	20.00	2.41	50.7 K=1.70	0.96	23.226	4.2472	-99553.40	98644.30	1.009 ✓
T10	20 - 5	P3x.3	15.00	2.38	42.8 K=1.70	0.90	22.975	3.0159	-77784.00	69290.30	1.123 ✓
T11	5 - 0	P3x.3	5.38	1.55	13.9 K=0.85	0.79	22.764	3.0159	-56465.30	68654.70	0.822 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L2x2x1/4	4.14	1.92	74.3 K=1.26	15.981	0.9380	-1092.70	14990.50	0.073 ✓
T2	180 - 160	L2x2x1/4	4.19	1.95	74.8 K=1.25	15.924	0.9380	-6894.97	14937.00	0.462 ✓
T3	160 - 140	ROHN TS1.5x11 ga	4.19	1.95	47.7 K=1.00	21.253	0.5202	-4502.88	11057.00	0.407 ✓
T4	140 - 120	ROHN TS1.5x11 ga	4.19	1.95	47.7 K=1.00	21.253	0.5202	-3084.28	11057.00	0.279 ✓
T5	120 - 100	L2x2x1/4	4.19	1.91	74.1 K=1.26	16.003	0.9380	-9780.88	15010.70	0.652 ✓
T6	100 - 80	ROHN TS1.5x16 ga	4.19	1.91	45.0 K=1.00	21.549	0.2627	-6443.35	5662.06	1.138 ✓
T7	80 - 60	ROHN TS1.5x11 ga	4.19	3.83	93.8 K=1.00	14.944	0.5202	-7732.00	7774.81	0.994 ✓
T8	60 - 40	ROHN TS1.5x16 ga	4.19	3.83	90.0 K=1.00	15.543	0.2627	-2745.63	4083.85	0.672 ✓
T9	40 - 20	ROHN TS1.5x16 ga	4.19	3.83	90.0 K=1.00	15.543	0.2627	-5438.43	4083.85	1.332 ✓
T10	20 - 5	ROHN TS1.5x11 ga	4.17	3.81	93.4 K=1.00	15.005	0.5202	-7322.12	7806.08	0.938 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L2x2x1/4	3.42	3.18	108.8 K=1.11	11.832	0.9380	-186.26	11098.70	0.017 ✓
T2	180 - 160	L2x2x1/4	3.42	3.18	108.8 K=1.11	11.832	0.9380	-256.13	11098.70	0.023 ✓
T3	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	17.365	0.5202	-1086.63	9034.18	0.120 ✓
T4	140 - 120	ROHN TS1.5x11 ga	3.42	3.18	77.9	17.365	0.5202	-179.76	9034.18	0.020

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Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=1.00					✓
T5	120 - 100	L2x2x1/4	3.42	3.13	108.0 K=1.12	11.939	0.9380	-128.73	11198.70	0.011 ✓
T6	100 - 80	ROHN TS1.5x16 ga	3.42	3.13	73.6 K=1.00	17.983	0.2627	-618.11	4725.13	0.131 ✓
T7	80 - 60	ROHN TS1.5x11 ga	3.42	3.13	76.7 K=1.00	17.548	0.5202	-2739.86	9129.49	0.300 ✓
T8	60 - 40	ROHN TS1.5x16 ga	3.42	3.13	73.6 K=1.00	17.983	0.2627	-370.17	4725.13	0.078 ✓
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.6 K=1.00	17.983	0.2627	-238.92	4725.13	0.051 ✓
T10	20 - 5	ROHN TS1.5x11 ga	3.42	3.13	76.7 K=1.00	17.548	0.5202	-1207.24	9129.49	0.132 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L2x2x1/4	3.42	3.18	108.8 K=1.11	11.832	0.9380	-326.25	11098.70	0.029 ✓
T3	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	17.365	0.5202	-54.28	9034.18	0.006 ✓
T4	140 - 120	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	17.365	0.5202	-382.70	9034.18	0.042 ✓
T6	100 - 80	ROHN TS1.5x16 ga	3.42	3.13	73.6 K=1.00	17.983	0.2627	-548.77	4725.13	0.116 ✓
T7	80 - 60	ROHN TS1.5x11 ga	3.42	3.13	76.7 K=1.00	17.548	0.5202	-612.05	9129.49	0.067 ✓
T8	60 - 40	ROHN TS1.5x16 ga	3.42	3.13	73.6 K=1.00	17.983	0.2627	-157.11	4725.13	0.033 ✓
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.6 K=1.00	17.983	0.2627	-909.37	4725.13	0.192 ✓
T11	5 - 0	L3x3x1/2	0.34	0.05	60.5 K=58.51	17.380	2.7500	-3674.72	47794.80	0.077 ✓

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	5 - 0	L3x3x1/2	2.32	2.03	80.8 K=1.94	15.264	2.7500	-573.59	41975.90	0.014 ✓

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Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	180 - 160	C15x33.9	3.42	3.18	110.9 K=1.00	11.556	9.9600	-12399.20	115092.00	0.108
T5	120 - 100	C15x33.9	3.42	3.13	109.3 K=1.00	11.767	9.9600	-13559.30	117197.00	0.116

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	180 - 160	C15x33.9	49.55	-0.014	21.600	0.001	0.00	-0.000	21.600	0.000
T5	120 - 100	C15x33.9	49.55	-0.014	21.600	0.001	0.00	0.000	21.600	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160	C15x33.9	0.108	0.001	0.000	0.108 ✓	1.333	H1-3 ✓
T5	120 - 100	C15x33.9	0.116	0.001	0.000	0.116 ✓	1.333	H1-3 ✓

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	180 - 160 (462)	C15x33.9	3.41	3.30	114.3 K=1.00	11.088	9.9600	-6631.77	110434.00	0.060
T2	180 - 160 (463)	C15x33.9	3.41	3.30	114.3 K=1.00	11.088	9.9600	-6633.15	110434.00	0.060
T2	180 - 160 (469)	C15x33.9	3.41	3.30	114.3 K=1.00	11.088	9.9600	-6452.63	110434.00	0.058
T2	180 - 160 (470)	C15x33.9	3.41	3.30	114.3 K=1.00	11.088	9.9600	-6430.51	110434.00	0.058
T2	180 - 160 (473)	C15x33.9	3.41	3.30	114.3 K=1.00	11.088	9.9600	-6367.22	110434.00	0.058
T2	180 - 160 (474)	C15x33.9	3.41	3.30	114.3 K=1.00	11.088	9.9600	-6349.18	110434.00	0.057
T5	120 - 100 (477)	C15x33.9	3.41	3.27	113.5 K=1.00	11.194	9.9600	-8864.14	111493.00	0.080
T5	120 - 100 (478)	C15x33.9	3.41	3.27	113.5 K=1.00	11.194	9.9600	-8858.34	111493.00	0.079
T5	120 - 100 (484)	C15x33.9	3.41	3.27	113.5	11.194	9.9600	-8590.23	111493.00	0.077

BSD

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70 Tower Office Park
Woburn, MA 01801
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Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T5	120 - 100 (485)	C15x33.9	3.41	3.27	K=1.00 113.5	11.194	9.9600	-8594.47	111493.00	0.077
T5	120 - 100 (488)	C15x33.9	3.41	3.27	K=1.00 113.5	11.194	9.9600	-8526.14	111493.00	0.076
T5	120 - 100 (489)	C15x33.9	3.41	3.27	K=1.00 113.5	11.194	9.9600	-8530.91	111493.00	0.077

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	180 - 160 (462)	C15x33.9	-53747.08	-15.356	21.600	0.711	-0.00	-0.000	21.600	0.000
T2	180 - 160 (463)	C15x33.9	-53805.67	-15.373	21.600	0.712	0.00	-0.000	21.600	0.000
T2	180 - 160 (469)	C15x33.9	-53316.33	-15.233	21.600	0.705	0.00	-0.000	21.600	0.000
T2	180 - 160 (470)	C15x33.9	-53115.58	-15.176	21.600	0.703	-0.00	-0.000	21.600	0.000
T2	180 - 160 (473)	C15x33.9	-53078.75	-15.165	21.600	0.702	-0.00	-0.000	21.600	0.000
T2	180 - 160 (474)	C15x33.9	-52949.08	-15.128	21.600	0.700	0.00	-0.000	21.600	0.000
T5	120 - 100 (477)	C15x33.9	-35663.42	-10.190	21.600	0.472	-0.00	-0.000	21.600	0.000
T5	120 - 100 (478)	C15x33.9	-35641.50	-10.183	21.600	0.471	0.00	-0.000	21.600	0.000
T5	120 - 100 (484)	C15x33.9	-34907.67	-9.974	21.600	0.462	0.00	-0.000	21.600	0.000
T5	120 - 100 (485)	C15x33.9	-34926.75	-9.979	21.600	0.462	-0.00	-0.000	21.600	0.000
T5	120 - 100 (488)	C15x33.9	-34790.00	-9.940	21.600	0.460	-0.00	-0.000	21.600	0.000
T5	120 - 100 (489)	C15x33.9	-34801.75	-9.943	21.600	0.460	0.00	-0.000	21.600	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160 (462)	C15x33.9	0.060	0.711	0.000	0.771 ✓	1.333	H1-3 ✓
T2	180 - 160 (463)	C15x33.9	0.060	0.712	0.000	0.772 ✓	1.333	H1-3 ✓
T2	180 - 160 (469)	C15x33.9	0.058	0.705	0.000	0.764 ✓	1.333	H1-3 ✓
T2	180 - 160 (470)	C15x33.9	0.058	0.703	0.000	0.761 ✓	1.333	H1-3 ✓

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160 (473)	C15x33.9	0.058	0.702	0.000	0.760 ✓	1.333	H1-3 ✓
T2	180 - 160 (474)	C15x33.9	0.057	0.700	0.000	0.758 ✓	1.333	H1-3 ✓
T5	120 - 100 (477)	C15x33.9	0.080	0.472	0.000	0.551 ✓	1.333	H1-3 ✓
T5	120 - 100 (478)	C15x33.9	0.079	0.471	0.000	0.551 ✓	1.333	H1-3 ✓
T5	120 - 100 (484)	C15x33.9	0.077	0.462	0.000	0.539 ✓	1.333	H1-3 ✓
T5	120 - 100 (485)	C15x33.9	0.077	0.462	0.000	0.539 ✓	1.333	H1-3 ✓
T5	120 - 100 (488)	C15x33.9	0.076	0.460	0.000	0.537 ✓	1.333	H1-3 ✓
T5	120 - 100 (489)	C15x33.9	0.077	0.460	0.000	0.537 ✓	1.333	H1-3 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	P2.5x.276	10.00	2.33	30.2	30.000	2.2535	4754.56	67606.20	0.070 ✓
T2	180 - 160	P2.5x.276	20.00	2.41	31.3	30.000	2.2535	41457.30	67606.20	0.613 ✓
T3	160 - 140	P2.5x.276	20.00	2.41	31.3	30.000	2.2535	7809.18	67606.20	0.116 ✓
T4	140 - 120	P2.5x.276	20.00	2.41	31.3	30.000	2.2535	2450.31	67606.20	0.036 ✓
T5	120 - 100	P3x.3	20.00	2.41	25.5	30.000	3.0159	47313.20	90477.90	0.523 ✓
T6	100 - 80	P3x.3	20.00	2.41	25.5	30.000	3.0159	18262.90	90477.90	0.202 ✓
T7	80 - 60	P3x.3	20.00	2.41	25.5	30.000	3.0159	38723.00	90477.90	0.428 ✓
T8	60 - 40	P3x.3 + (P) 11/4" SR	20.00	2.41	29.8	30.000	4.2472	45429.70	127416.00	0.357 ✓
T9	40 - 20	P3x.3 + (P) 11/4" SR	20.00	2.41	29.8	30.000	4.2472	43185.10	127416.00	0.339 ✓
T10	20 - 5	P3x.3	15.00	2.38	25.2	30.000	3.0159	16242.40	90477.90	0.180 ✓

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Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L2x2x1/4	4.14	1.92	37.9	21.600	0.9380	1044.82	20260.80	0.052 ✓
T2	180 - 160	L2x2x1/4	4.19	1.95	38.3	21.600	0.9380	4768.84	20260.80	0.235 ✓
T3	160 - 140	ROHN TS1.5x11 ga	4.19	1.95	47.7	25.200	0.5202	4011.23	13110.20	0.306 ✓
T4	140 - 120	ROHN TS1.5x11 ga	4.19	1.95	47.7	25.200	0.5202	2571.97	13110.20	0.196 ✓
T5	120 - 100	L2x2x1/4	4.19	1.91	37.7	21.600	0.9380	5281.01	20260.80	0.261 ✓
T6	100 - 80	ROHN TS1.5x16 ga	4.19	1.91	45.0	25.200	0.2627	6046.08	6621.31	0.913 ✓
T7	80 - 60	ROHN TS1.5x11 ga	4.19	3.83	93.8	25.200	0.5202	7387.61	13110.20	0.563 ✓
T8	60 - 40	ROHN TS1.5x16 ga	4.19	3.83	90.0	25.200	0.2627	2335.19	6621.31	0.353 ✓
T9	40 - 20	ROHN TS1.5x16 ga	4.19	3.83	90.0	25.200	0.2627	5137.19	6621.31	0.776 ✓
T10	20 - 5	ROHN TS1.5x11 ga	4.17	3.81	93.4	25.200	0.5202	7563.54	13110.20	0.577 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L2x2x1/4	3.42	3.18	62.7	21.600	0.9380	174.37	20260.80	0.009 ✓
T2	180 - 160	L2x2x1/4	3.42	3.18	62.7	21.600	0.9380	272.85	20260.80	0.013 ✓
T3	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	1760.21	13110.20	0.134 ✓
T4	140 - 120	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	652.05	13110.20	0.050 ✓
T5	120 - 100	L2x2x1/4	3.42	3.13	61.6	21.600	0.9380	949.62	20260.80	0.047 ✓
T6	100 - 80	ROHN TS1.5x16 ga	3.42	3.13	73.6	25.200	0.2627	1514.04	6621.31	0.229 ✓
T7	80 - 60	ROHN TS1.5x11 ga	3.42	3.13	76.7	25.200	0.5202	2945.07	13110.20	0.225 ✓
T8	60 - 40	ROHN TS1.5x16 ga	3.42	3.13	73.6	25.200	0.2627	512.41	6621.31	0.077 ✓
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.6	25.200	0.2627	428.71	6621.31	0.065 ✓
T10	20 - 5	ROHN TS1.5x11 ga	3.42	3.13	76.7	25.200	0.5202	1564.89	13110.20	0.119 ✓
T11	5 - 0	L3x3x1/2	3.31	3.01	40.3	21.600	2.7500	9057.69	59400.00	0.152

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
										✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L2x2x1/4	3.42	3.18	62.7	21.600	0.9380	335.05	20260.80	0.017 ✓
T2	180 - 160	L2x2x1/4	3.42	3.18	62.7	21.600	0.9380	2007.34	20260.80	0.099 ✓
T3	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	606.90	13110.20	0.046 ✓
T4	140 - 120	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	946.34	13110.20	0.072 ✓
T5	120 - 100	L2x2x1/4	3.42	3.13	61.6	21.600	0.9380	2167.74	20260.80	0.107 ✓
T6	100 - 80	ROHN TS1.5x16 ga	3.42	3.13	73.6	25.200	0.2627	1039.83	6621.31	0.157 ✓
T7	80 - 60	ROHN TS1.5x11 ga	3.42	3.13	76.7	25.200	0.5202	930.54	13110.20	0.071 ✓
T8	60 - 40	ROHN TS1.5x16 ga	3.42	3.13	73.6	25.200	0.2627	331.24	6621.31	0.050 ✓
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.6	25.200	0.2627	1007.57	6621.31	0.152 ✓
T10	20 - 5	ROHN TS1.5x11 ga	3.42	3.13	76.7	25.200	0.5202	3305.86	13110.20	0.252 ✓
T11	5 - 0	L3x3x1/2	0.34	0.05	0.7	21.600	2.7500	1983.39	59400.00	0.033 ✓

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	5 - 0	L3x3x1/2	1.33	1.04	13.9	21.600	2.7500	182.27	59400.00	0.003 ✓

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	180 - 160	C15x33.9	3.42	3.18	42.2	21.600	9.9600	14748.20	215136.00	0.069

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T5	120 - 100	C15x33.9	3.42	3.13	41.5	21.600	9.9600	18406.20	215136.00	0.086

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	180 - 160	C15x33.9	49.55	0.014	21.600	0.001	-0.00	0.000	27.000	0.000
T5	120 - 100	C15x33.9	49.55	0.014	21.600	0.001	-0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160	C15x33.9	0.069	0.001	0.000	0.069 ✓	1.333	H2-1 ✓
T5	120 - 100	C15x33.9	0.086	0.001	0.000	0.086 ✓	1.333	H2-1 ✓

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	180 - 160 (462)	C15x33.9	3.41	3.30	43.7	21.600	9.9600	106.17	215136.00	0.000
T2	180 - 160 (463)	C15x33.9	3.41	3.30	43.7	21.600	9.9600	5879.72	215136.00	0.027
T2	180 - 160 (469)	C15x33.9	3.41	3.30	43.7	21.600	9.9600	5636.36	215136.00	0.026
T2	180 - 160 (470)	C15x33.9	3.41	3.30	43.7	21.600	9.9600	523.35	215136.00	0.002
T2	180 - 160 (473)	C15x33.9	3.41	3.30	43.7	21.600	9.9600	61.49	215136.00	0.000
T2	180 - 160 (474)	C15x33.9	3.41	3.30	43.7	21.600	9.9600	480.93	215136.00	0.002
T5	120 - 100 (477)	C15x33.9	3.41	3.27	43.4	21.600	9.9600	6763.83	215136.00	0.031
T5	120 - 100 (478)	C15x33.9	3.41	3.27	43.4	21.600	9.9600	6577.97	215136.00	0.031
T5	120 - 100 (484)	C15x33.9	3.41	3.27	43.4	21.600	9.9600	6256.31	215136.00	0.029
T5	120 - 100 (485)	C15x33.9	3.41	3.27	43.4	21.600	9.9600	7081.78	215136.00	0.033
T5	120 - 100 (488)	C15x33.9	3.41	3.27	43.4	21.600	9.9600	6345.07	215136.00	0.029
T5	120 - 100 (489)	C15x33.9	3.41	3.27	43.4	21.600	9.9600	126.22	215136.00	0.001

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	180 - 160 (462)	C15x33.9	-53697.2	15.342	21.600	0.710	0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	180 - 160 (463)	C15x33.9	-45704.05	13.058	21.600	0.605	-0.00	0.000	27.000	0.000
T2	180 - 160 (469)	C15x33.9	-45318.18	12.948	21.600	0.599	0.00	0.000	27.000	0.000
T2	180 - 160 (470)	C15x33.9	-54385.07	15.539	21.600	0.719	0.00	0.000	27.000	0.000
T2	180 - 160 (473)	C15x33.9	-53894.28	15.398	21.600	0.713	-0.00	0.000	27.000	0.000
T2	180 - 160 (474)	C15x33.9	-54440.65	15.555	21.600	0.720	-0.00	0.000	27.000	0.000
T5	120 - 100 (477)	C15x33.9	-31287.75	8.939	21.600	0.414	0.00	0.000	27.000	0.000
T5	120 - 100 (478)	C15x33.9	-31023.00	8.864	21.600	0.410	0.00	0.000	27.000	0.000
T5	120 - 100 (484)	C15x33.9	-30565.00	8.733	21.600	0.404	-0.00	0.000	27.000	0.000
T5	120 - 100 (485)	C15x33.9	-31737.08	9.068	21.600	0.420	-0.00	0.000	27.000	0.000
T5	120 - 100 (488)	C15x33.9	-30627.50	8.751	21.600	0.405	0.00	0.000	27.000	0.000
T5	120 - 100 (489)	C15x33.9	-33968.50	9.705	21.600	0.449	-0.00	0.000	27.000	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160 (462)	C15x33.9	0.000	0.710	0.000	0.711 ✓	1.333	H2-1 ✓
T2	180 - 160 (463)	C15x33.9	0.027	0.605	0.000	0.632 ✓	1.333	H2-1 ✓
T2	180 - 160 (469)	C15x33.9	0.026	0.599	0.000	0.626 ✓	1.333	H2-1 ✓
T2	180 - 160 (470)	C15x33.9	0.002	0.719	0.000	0.722 ✓	1.333	H2-1 ✓
T2	180 - 160 (473)	C15x33.9	0.000	0.713	0.000	0.713 ✓	1.333	H2-1 ✓
T2	180 - 160 (474)	C15x33.9	0.002	0.720	0.000	0.722 ✓	1.333	H2-1 ✓
T5	120 - 100 (477)	C15x33.9	0.031	0.414	0.000	0.445 ✓	1.333	H2-1 ✓
T5	120 - 100 (478)	C15x33.9	0.031	0.410	0.000	0.441 ✓	1.333	H2-1 ✓
T5	120 - 100 (484)	C15x33.9	0.029	0.404	0.000	0.433 ✓	1.333	H2-1 ✓
T5	120 - 100 (485)	C15x33.9	0.033	0.420	0.000	0.453 ✓	1.333	H2-1 ✓
T5	120 - 100 (488)	C15x33.9	0.029	0.405	0.000	0.435 ✓	1.333	H2-1 ✓
T5	120 - 100 (489)	C15x33.9	0.001	0.449	0.000	0.450 ✓	1.333	H2-1 ✓

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	190 - 180	Leg	P2.5x.276	3	-5606.96	81491.75	6.9	Pass
T2	180 - 160	Leg	P2.5x.276	36	-44380.10	82786.76	53.6	Pass
T3	160 - 140	Leg	P2.5x.276	91	-42885.60	80922.56	53.0	Pass
T4	140 - 120	Leg	P2.5x.276	148	-39847.40	79816.84	49.9	Pass
T5	120 - 100	Leg	P3x.3	207	-81846.70	110455.57	74.1	Pass
T6	100 - 80	Leg	P3x.3	264	-77752.90	99915.15	77.8	Pass
T7	80 - 60	Leg	P3x.3	319	-93695.00	96465.07	97.1	Pass
T8	60 - 40	Leg	P3x.3 + (P) 11/4" SR	352	-100881.00	131614.95	76.6	Pass
T9	40 - 20	Leg	P3x.3 + (P) 11/4" SR	385	-99553.40	131492.84	75.7	Pass
T10	20 - 5	Leg	P3x.3	420	-77784.00	92363.96	84.2	Pass
T11	5 - 0	Leg	P3x.3	447	-56465.30	91516.72	61.7	Pass
T1	190 - 180	Diagonal	L2x2x1/4	15	-1092.70	19982.34	5.5	Pass
T2	180 - 160	Diagonal	L2x2x1/4	48	-6894.97	19911.02	34.6	Pass
T3	160 - 140	Diagonal	ROHN TS1.5x11 ga	147	-4502.88	14738.98	30.6	Pass
T4	140 - 120	Diagonal	ROHN TS1.5x11 ga	161	-3084.28	14738.98	20.9	Pass
T5	120 - 100	Diagonal	L2x2x1/4	218	-9780.88	20009.26	48.9	Pass
T6	100 - 80	Diagonal	ROHN TS1.5x16 ga	318	-6443.35	7547.53	85.4	Pass
T7	80 - 60	Diagonal	ROHN TS1.5x11 ga	351	-7732.00	10363.82	74.6	Pass
T8	60 - 40	Diagonal	ROHN TS1.5x16 ga	384	-2745.63	5443.77	50.4	Pass
T9	40 - 20	Diagonal	ROHN TS1.5x16 ga	396	-5438.43	5443.77	99.9	Pass
T10	20 - 5	Diagonal	ROHN TS1.5x11 ga	429	-7322.12	10405.50	70.4	Pass
T1	190 - 180	Top Girt	L2x2x1/4	5	-186.26	14794.57	1.3	Pass
T2	180 - 160	Top Girt	L2x2x1/4	37	-256.13	14794.57	1.7	Pass
T3	160 - 140	Top Girt	ROHN TS1.5x11 ga	96	1760.21	17475.90	10.1	Pass
T4	140 - 120	Top Girt	ROHN TS1.5x11 ga	153	652.05	17475.90	3.7	Pass
T5	120 - 100	Top Girt	L2x2x1/4	210	949.62	27007.65	3.5	Pass
T6	100 - 80	Top Girt	ROHN TS1.5x16 ga	267	1514.04	8826.21	17.2	Pass
T7	80 - 60	Top Girt	ROHN TS1.5x11 ga	324	-2739.86	12169.61	22.5	Pass
T8	60 - 40	Top Girt	ROHN TS1.5x16 ga	357	-370.17	6298.60	5.9	Pass
T9	40 - 20	Top Girt	ROHN TS1.5x16 ga	390	428.71	8826.21	4.9	Pass
T10	20 - 5	Top Girt	ROHN TS1.5x11 ga	423	-1207.24	12169.61	9.9	Pass
T11	5 - 0	Top Girt	L3x3x1/2	450	9057.69	79180.20	11.4	Pass
T1	190 - 180	Bottom Girt	L2x2x1/4	7	-326.25	14794.57	2.2	Pass
T2	180 - 160	Bottom Girt	L2x2x1/4	42	2007.34	27007.65	7.4	Pass
T3	160 - 140	Bottom Girt	ROHN TS1.5x11 ga	98	606.90	17475.90	3.5	Pass
T4	140 - 120	Bottom Girt	ROHN TS1.5x11 ga	154	946.34	17475.90	5.4	Pass
T5	120 - 100	Bottom Girt	L2x2x1/4	211	2167.74	27007.65	8.0	Pass
T6	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	270	1039.83	8826.21	11.8	Pass
T7	80 - 60	Bottom Girt	ROHN TS1.5x11 ga	326	930.54	17475.90	5.3	Pass
T8	60 - 40	Bottom Girt	ROHN TS1.5x16 ga	358	331.24	8826.21	3.8	Pass
T9	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	393	-909.37	6298.60	14.4	Pass
T10	20 - 5	Bottom Girt	ROHN TS1.5x11 ga	426	3305.86	17475.90	18.9	Pass
T11	5 - 0	Bottom Girt	L3x3x1/2	453	-3674.72	63710.47	21.4	Pass
T11	5 - 0	Mid Girt	L3x3x1/2	459	-573.59	55953.87	1.0	Pass
T2	180 - 160	Guy A@162.496	3/4	472	21243.90	29150.00	72.9	Pass
T5	120 - 100	Guy A@102.496	5/8	487	18929.70	21200.00	89.3	Pass
T2	180 - 160	Guy B@162.496	3/4	467	21074.40	29150.00	72.3	Pass
T5	120 - 100	Guy B@102.496	5/8	482	18530.60	21200.00	87.4	Pass
T2	180 - 160	Guy C@162.496	3/4	460	21082.10	29150.00	72.3	Pass
T5	120 - 100	Guy C@102.496	5/8	475	18939.90	21200.00	89.3	Pass
T2	180 - 160	Top Guy	C15x33.9	464	-12399.20	153417.63	8.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
T5	120 - 100	Pull-Off@162.496 Top Guy Pull-Off@102.496	C15x33.9	481	-13559.30	156223.59	8.7	Pass
T2	180 - 160	Torque Arm Top@162.496	C15x33.9	463	-6633.15	147208.52	57.9	Pass
T5	120 - 100	Torque Arm Top@102.496	C15x33.9	477	-8864.14	148620.16	41.4	Pass
							Summary	
						Leg (T7)	97.1	Pass
						Diagonal (T9)	99.9	Pass
						Top Girt (T7)	22.5	Pass
						Bottom Girt (T11)	21.4	Pass
						Mid Girt (T11)	1.0	Pass
						Guy A (T5)	89.3	Pass
						Guy B (T5)	87.4	Pass
						Guy C (T5)	89.3	Pass
						Top Guy Pull-Off (T5)	8.7	Pass
						Torque Arm Top (T2)	57.9	Pass
						RATING =	**99.9**	**Pass**

Program Version 5.2.0.1 - 6/16/2008 File:C:/Documents and Settings/sabed/My Documents/Pocket Wireless/CTNL023C Montville/Reinforced/CTNL023C Montville.eri

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

September 29, 2008

The Honorable Joseph W. Jaskiewicz
Mayor
Town of Montville
Town Hall
310 Norwich New London Turnpike
Uncasville, CT 06382

RE: **EM-CING-086-080922-** New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 57 Cook Drive, Montville, Connecticut.

Dear Mayor Jaskiewicz:

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 October 14, 2008.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

c: Marcia Vlaun, Town Planner, Town of Montville

EM-CING-086-080922

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

Steven L. Levine
Real Estate Consultant

ORIGINAL

HAND DELIVERED

September 22, 2008

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

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 57Cook Drive, Montville (owner, Wireless Solutions)

Dear Chairman Caruso and Members of the Council:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

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

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

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

ORIGINAL

will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected. Modifications to the existing site include all or some of the following as necessary to bring the site into conformance with the plan:

- Replacement of existing panel antennas with new antennas or, installation of additional antennas of a size required to accommodate UMTS.
- Installation of small tower mount amplifiers ("TMA's") and/or diplexers to the platform on which the panel antennas are mounted to enhance signal reception.
- Installation of additional or larger coaxial cables as required.
- Installation of an additional equipment cabinet in existing shelters, or on existing or enlarged concrete pads.
- Radome enlargement for flagpole and "stick" structures to accommodate larger antennas and additional associated equipment.

None of these modifications will extend the height of the tower.

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

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

4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

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

Sincerely,

Steven L. Levine
Real Estate Consultant

Attachments

CINGULAR WIRELESS
Equipment Modification

57 Cook Road, Montville
Site Number 2171
Exempt Modifications approved 4/98 and 8/02

Tower Owner/Manager: Wireless Solutions

Equipment configuration: Guyed Lattice Tower

Current and/or approved: Nine CSS panel antennas @ 177 ft c.l.
Six TMA's and three diplexers @ 177 ft
Nine runs 1 1/4 inch coax

Planned Modifications: Remove all existing antennas
Install six new Powerwave 7770 antennas @ 177 ft c.l.
Remove existing diplexers and TMA's
Install six new TMA's and six new diplexers @ 177 ft
Install three additional runs 1 1/4 inch coax (total of 12)

Power Density:

Calculations for Cingular's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 24 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for Cingular's planned operations would be approximately 23 % of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *							18.76
Cingular TDMA *	177	880 - 894	16	100	0.0184	0.5867	3.13
Cingular GSM *	177	880 - 894	2	296	0.0068	0.5867	1.16
Cingular GSM *	177	1900 Band	2	427	0.0098	1.0000	0.98
Total							24.0%

* Per CSC records.

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *							18.76
Cingular GSM	177	880 - 894	4	296	0.0136	0.5867	2.32
Cingular GSM	177	1900 Band	2	427	0.0098	1.0000	0.98
Cingular UMTS	177	880 - 894	1	500	0.0057	0.5867	0.98
Total							23.0%

* Per CSC records.

Structural information:

T-Mobile recently received conditional approval from the Council to co-locate at a centerline height of 193 ft on the Montville tower. Their structural analysis indicated that the tower was in a 4.7% overstress condition (Bay State Design, 6/3/08), and the Council directed T-Mobile to reduce tower usage to less than 100% in order to co-locate.

AT&T (New Cingular Wireless) subsequently provided the equipment modifications herein to T-Mobile in hopes that these changes would relieve the overstress condition. A re-analysis by Bay State (attached, dated 9/5/08) incorporating AT&T's revised loading indicates that the resulting overstress did indeed decrease, but not sufficiently to bring the tower into < 100% capacity usage.

T-Mobile continues to explore ways to satisfy the Council's condition.

In the meantime, AT&T respectfully requests conditional approval for its UMTS modifications, so that upgrades may proceed as soon as the tower is found to be in a < 100% usage condition.

BAY STATE
DESIGN

September 5, 2008

Ms. Karina Fournier
Maxton Technology, Inc.
35 Griffin Road South
Bloomfield, CT 06002

Reg: CTNL-023 Montville
T-Mobile Facility
57 Cook Drive, Montville
BSD Job No. 2806.102

Dear Ms. Fournier,

As per your request, Bay State Design (BSD) reanalyzed the existing 190 ft. guyed tower. The tower mapping data by CSB Communications and information for revised loading for Cingular Wireless dated 8/26/08 was used.

BSD completed the analysis for the proposed loading as described above according to the Telecommunication Industry Association Standard TIA/EIA-222-F. The existing tower with proposed loading is rated at 103.8% (3.8% overstress).

The calculations are available if you need them.

If you have any questions, please contact our office.

Sincerely yours,

BAY STATE DESIGN, INC.

Gordon Govalet, P.E.
Vice President

STATE OF CONNECTICUT
GORDON E. GOVALET
No. 18430
LICENSED
PROFESSIONAL ENGINEER

cc: Sahnoune Abed

The new at&t Your world. Delivered. cingular raising the bar

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

Steven L. Levine
Real Estate Consultant

September 22, 2008

Honorable Joseph W. Jaskiewicz
1st Selectman, Town of Montville
Town Hall 310 Norwich-New London Tpke.
Uncasville, CT 06382

Re: Telecommunications Facility – 57 Cook Road, Montville

Dear Mr. Jaskiewicz:

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

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Cingular's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Cingular's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7636 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

ALL-POINTS TECHNOLOGY CORPORATION, P.C.

July 30, 2009

Chappell Engineering Associates, LLC
201 Boston Post Road West, Suite 301
Marlborough, MA 01752

Attn: Jay Thibault
Re: 193' Guyed Tower
Montville, Connecticut

Dear Jay,

All-Points Technology Corporation, P.C. performed a condition assessment and structural analysis of the 193' ROHN Model 80 guyed tower located on Cook Road in Montville, Connecticut. The tower was evaluated for MetroPCS's proposed installation of six panel antennas, to be installed on three 12' sector mounts at 130' and fed by six 1-5/8" waveguide cables.

Our analysis found the tower required reinforcement to accommodate the proposed antennas. Reinforcement design was conducted in accordance with the Connecticut State Building Code and EIA/TIA-222, revision F, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* using a fastest mile wind speed of 85-mph (equivalent to 105-mph 3-second gust) and ½" of radial ice.

Antenna loading was as follows (proposed additions shown in **bold** text):

Antenna	Elev.	Mount	Coax.
(3) APX16DW-16DWVS panels, (6) TMAs	190'	(3) 12' sector mounts	(12) 1-5/8"
20' omnidirectional whip	178'	On sector mounts below	7/8"
(9) DUO1417-8686 panels, (9) TMAs	178'	(3) 15' sector mounts	(9) 1-1/4"
(2) 8' omnidirectional whips	168'	On sector mounts below	(2) 7/8"
(6) 7130.16, (6) DB948F85 panel antennas	167'	(3) 12' sector mounts	(12) 1-5/8"
(6) DB980F65 panels, (5) 1' yagis	150'	(3) 14' sector mounts	(6) 1-5/8", 1-1/4"
(12) DB844H90 panels	140'	(3) 14' sector mounts	(12) 1-1/4"
(6) Kathrein 742-351 panel antennas	**130'**	**(3) 12' sector mounts**	**(12) 1-5/8"**
10' 8-bay dipole	122'	3' sidearm	1-1/4"
(2) 20' omnidirectional whips	110'	(2) 3' sidearms	(2) 7/8"
3' dipole	110'	4' x 2-⅜" pipe on leg	7/8"

□ 3 SADDLEBROOK DRIVE · KILLINGWORTH, CT 06419 · PHONE 860-663-1697 · FAX 860-663-0935
⊗ P.O. BOX 1491 · NORTH CONWAY, NH 03860 · PHONE 603-496-5853 · FAX 603-356-5214

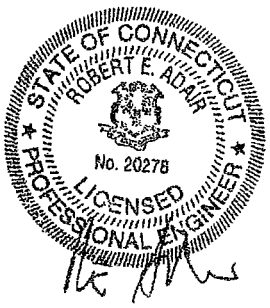
The attached reinforcement drawing shows bracing members and bolts to be replaced to support the proposed antennas. Completion of the attached modifications will result in a tower structure suitable for installation of MetroPCS's proposed antennas and associated equipment. Tower usage capacity will be less than 100 percent upon completion of the recommended modifications and installation of metroPCS's proposed equipment. Tower summary is attached for your records.

Please feel free to call if you have any questions.

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

Robert E. Adair, P.E.
Principal

CT278141 Montville reinf ltr 7-30-09.doc



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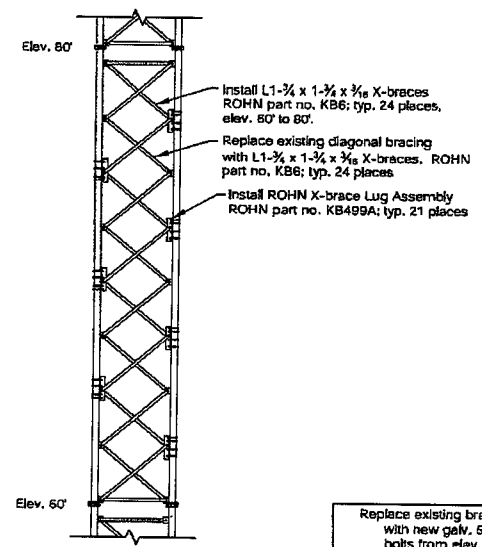
RISATower	Job	Page
	193' ROHN Model 80	1 of 2
All-Points Technology Corporation P.O. Box 1491 North Conway, NH 03860 Phone: (603) 496-5853 FAX: (603) 356-5214	**Project** CT278141 Montville	**Date** 14:40:50 07/30/09
	Client Chappell; metroPCS Site #NLD0039A	**Designed by** Rob Adair

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	**193 - 180**	**Leg**	**ROHN 2.5 EH**	**3**	**-8010.40**	**80862.84**	**9.9**	**Pass**
		Diagonal	L2x2x1/4	11	-1292.97	14003.03	9.2	Pass
		Top Girt	ROHN TS1.5x11 ga	4	-90.16	12050.89	0.7	Pass
		Bottom Girt	ROHN TS1.5x11 ga	7	-389.45	12050.89	3.2	Pass
T2	**180 - 160**	**Leg**	**ROHN 2.5 EH**	**42**	**-46308.60**	**81085.99**	**57.1**	**Pass**
		Diagonal	L2x2x1/4	51	-4962.47	14067.42	35.3	Pass
		Top Girt	ROHN TS1.5x11 ga	43	-170.80	12050.89	1.4	Pass
		Bottom Girt	ROHN TS1.5x11 ga	46	1772.07	17475.90	10.1	Pass
		Guy A@162.774	3/4	529	19002.80	29150.00	10.3 (b) 65.2	Pass
		Guy B@162.774	3/4	525	15864.30	29150.00	54.4	Pass
		Guy C@162.774	3/4	518	18642.40	29150.00	64.0	Pass
		Top Guy	2L2x2x1/4x3/8	521	-9145.86	36960.89	24.7	Pass
		Pull-Off@162.774						
		Torque Arm	C15x33.9	520	9103.04	286776.28	51.6	Pass
		Top@162.774						
T3	**160 - 140**	**Leg**	**ROHN 2.5 EH**	**99**	**-45287.10**	**79349.49**	**57.1**	**Pass**
		Diagonal	ROHN TS1.5x11 ga	148	-3363.56	10202.50	33.0	Pass
		Top Girt	ROHN TS1.5x11 ga	100	1431.67	17475.90	61.2 (b) 8.2	Pass
		Bottom Girt	ROHN TS1.5x11 ga	103	656.99	17475.90	26.0 (b) 3.8	Pass
T4	**140 - 120**	**Leg**	**ROHN 2.5 EH**	**156**	**-37457.80**	**78389.86**	12.0 (b) **47.8**	**Pass**
		Diagonal	ROHN TS1.5x11 ga	164	-2591.86	10202.50	25.4	Pass
		Top Girt	ROHN TS1.5x16 ga	157	317.63	8826.21	47.2 (b) 3.6	Pass
		Bottom Girt	ROHN TS1.5x16 ga	160	689.07	8826.21	7.5 (b) 7.8	Pass
T5	**120 - 100**	**Leg**	**ROHN 3 EH**	**213**	**-77189.00**	**108672.96**	16.2 (b) **71.0**	**Pass**
		Diagonal	L2x2x1/4	220	-7784.70	14234.84	54.7	Pass
		Top Girt	ROHN TS1.5x11 ga	214	750.45	17475.90	4.3	Pass
		Bottom Girt	ROHN TS1.5x11 ga	217	2233.10	17475.90	4.4 (b) 12.8	Pass
		Guy A@102.774	5/8	544	16498.60	21200.00	13.0 (b) 77.8	Pass
		Guy B@102.774	5/8	540	14147.10	21200.00	66.7	Pass
		Guy C@102.774	5/8	533	16729.60	21200.00	78.9	Pass
		Top Guy	2L2x2x1/4x3/8	536	-9246.44	32658.10	28.3	Pass
		Pull-Off@102.774						
		Torque Arm	C15x33.9	542	-7198.69	148533.52	36.9	Pass
		Top@102.774						
T6	**100 - 80**	**Leg**	**ROHN 3 EH**	**270**	**-72024.20**	**96961.22**	**74.3**	**Pass**
		Diagonal	ROHN TS1.5x16 ga	319	-5300.10	5450.21	97.2	Pass
		Top Girt	ROHN TS1.5x11 ga	271	1768.26	17475.90	10.1	Pass
		Bottom Girt	ROHN TS1.5x11 ga	274	1123.94	17475.90	32.2 (b) 6.4	Pass
T7	**80 - 60**	**Leg**	**ROHN 3 EH**	**327**	**-93914.90**	**98910.99**	20.4 (b) **94.9**	**Pass**
		Diagonal	L1 3/4x1 3/4x3/16	376	-3891.72	8024.01	48.5	Pass
		Top Girt	ROHN TS1.5x11 ga	328	829.13	17475.90	4.7	Pass
		Bottom Girt	ROHN TS1.5x11 ga	331	1423.72	17475.90	15.1 (b) 8.1	Pass
T8	**60 - 40**	**Leg**	**3" EH with 1 1/4" SR**	**384**	**-101293.00**	**128591.31**	25.9 (b) **78.8**	**Pass**

RISATower	Job: 193' ROHN Model 80	Page: 2 of 2
All-Points Technology Corporation P.O. Box 1491 North Conway, NH 03860 Phone: (603) 496-5853 FAX: (603) 356-5214	Project: CT278141 Montville	Date: 14:40:50 07/30/09
	Client: Chappell; metroPCS Site #NLD0039A	Designed by: Rob Adair

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
		Diagonal	ROHN TS1.5x16 ga	412	-2220.56	5450.21	40.7	Pass
		Top Girt	ROHN TS1.5x11 ga	386	-640.72	12177.86	5.3	Pass
							14.9 (b)	
		Bottom Girt	ROHN TS1.5x11 ga	388	296.75	17475.90	1.7	Pass
							5.4 (b)	
T9	40 - 20	**Leg**	**3" EH with 1 1/4" SR**	**417**	**-100410.00**	**128417.49**	**78.2**	**Pass**
		Diagonal	ROHN TS1.5x16 ga	424	-4516.08	5450.21	82.9	Pass
							88.8 (b)	
		Top Girt	ROHN TS1.5x16 ga	419	454.88	8826.21	5.2	Pass
							10.7 (b)	
		Bottom Girt	ROHN TS1.5x16 ga	422	-776.46	6302.52	12.3	Pass
							19.0 (b)	
T10	20 - 5	**Leg**	**ROHN 3 EH**	**450**	**-81071.50**	**89673.71**	**90.4**	**Pass**
		Diagonal	ROHN TS1.5x16 ga	457	-5345.64	5470.78	97.7	Pass
		Top Girt	ROHN TS1.5x16 ga	452	-861.26	6302.52	13.7	Pass
							27.4 (b)	
		Bottom Girt	ROHN TS1.5x16 ga	454	5180.03	8826.21	58.7	Pass
							94.5 (b)	
T11	5 - 0	**Leg**	**ROHN 3 EH**	**475**	**-60996.40**	**89341.79**	**68.3**	**Pass**
		Horizontal	L4x4x1/4	508	-3327.44	30819.50	10.8	Pass
		Top Girt	L4x4x1/4	478	7731.46	55858.03	13.8	Pass
		Bottom Girt	L4x4x1/4	481	-2967.92	32806.30	9.0	Pass
							Summary	
						Leg (T7)	94.9	Pass
						Diagonal (T10)	97.7	Pass
						Horizontal (T11)	10.8	Pass
						Top Girt (T6)	32.2	Pass
						Bottom Girt (T10)	94.5	Pass
						Guy A (T5)	77.8	Pass
						Guy B (T5)	66.7	Pass
						Guy C (T5)	78.9	Pass
						Top Guy Pull-Off (T5)	28.3	Pass
						Torque Arm Top (T2)	51.6	Pass
						Bolt Checks	94.5	Pass
						RATING =	**97.7**	**Pass**



Typical X-Braced Section

Scale: 1" = 5'

NOTE: EXISTING ANTENNAS NOT SHOWN FOR CLARITY.

Tower Elevation

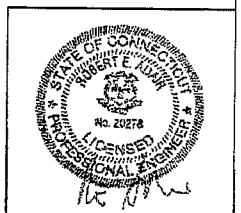
Scale: 1" = 30'

GENERAL NOTES:
1. Reinforcement based on structural analysis by All-Points Technology dated 3 July 2009, File No. CT278140. Refer to report for design loading and analysis criteria.
2. Verify dimensions, part numbers, and existing conditions prior to ordering and/or fabrication. Bring discrepancies to the attention of the Engineer before proceeding with the affected portion of the work.
3. Work is to be performed on an existing in-service tower. Coordinate work to minimize disruption of existing facilities.
4. Design assumes competent and qualified personnel will be performing the work.
5. Temporary relocation of existing mounts and/or hangers may be required.
6. Work shown is typical for three tower faces.
7. Spray a minimum of two coats of cold-galvanizing compound on any field cut, welded or drilled surfaces.

BRACING INSTALLATION NOTES:
1. X-bracing members to be installed on one 20' tower section from elevation 60' to elevation 80'. Existing tube steel diagonal braces are to be replaced with angle steel braces (24), and 24 additional X-braces are to be installed.
2. New bracing members (48 required) to be L1.75 x 1.75 x 3/16, ROHN part no. KB6.
3. Bracing bolts (54 req'd) to be galvanized 5/8" diameter by 1-1/2" long ASTM A-325 bolts. Provide pal nut, lock washer, or anco nut.
4. X-bracing lug assemblies (21 required) to be ROHN part no. KB499A, which include a lug and four U-bolt assemblies. Lugs must be field drilled or reamed to 11/16" Ø. Spray a minimum of two coats of cold galvanizing on all drilled surfaces.
5. Do not re-use existing bolts.

BRACING BOLT INSTALLATION NOTES:
1. Bracing bolts to be replaced on one 16' tower section from 5' to 20' and two 20' tower sections from elevation 60' to elevation 100'.
2. New bracing bolts (33 req'd per 20' section) to be galvanized 5/8" diameter by 1-1/2" long ASTM A-325 bolts. Provide pal nut or lock washer. Field drill or ream existing brace tab holes to 11/16" Ø. Spray a minimum of two coats of cold galvanizing on all drilled surfaces.
3. Tighten bolts using the "turn of the nut method" as specified by AISC.

WELDING NOTES:
1. Welders shall be certified per AWS D1.1 for the positions and procedures to be used. Submit welder certifications for review prior to conducting the work.
2. Grind galvanizing from areas to be welded.
3. Weld with E70XX electrodes in accordance with AWS D1.1; ¼" fillet weld a minimum of 1" long at each location
4. Provide all necessary temporary bracing required to support loads and hold the steel members in alignment.



All-Points Technology Corp., P.C.
100 OLD WESTSIDE ROAD
NORTH CONWAY, NH 03860
PHONE/FAX: (603) 356-5214
MOBILE: (603) 496-5853
www.allpointstech.com

TOWER REINFORCEMENT		CHAPPELL ENGINEERING ASSOCIATES, LLC 201 Boston Post Road West Suite 301 Marlborough, MA 01752	metroPCS SITE #NLD0039A MONTVILLE
SHEET: 1 OF 1			
SCALE: AS NOTED	DRAWN BY: REA		193' ROHN MODEL 80 MONTVILLE, CT
DATE: 30 JUL 09	APT JOB #CT278141		

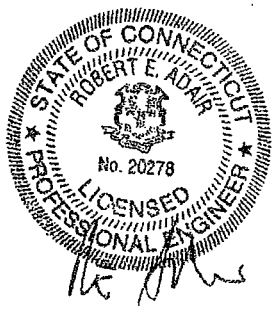
ALL-POINTS TECHNOLOGY CORPORATION, P.C.

STRUCTURAL ANALYSIS REPORT
193' GUYED TOWER
MONTVILLE, CONNECTICUT

Prepared for
Chappell Engineering Associates LLC

MetroPCS Site #NLD0039A

July 3, 2009



APT Project #CT278140

□ 3 SADDLEBROOK DRIVE · KILLINGWORTH, CT 06419 · PHONE 860-663-1697 · FAX 860-663-0935
⊗ P.O. BOX 1491 · NORTH CONWAY, NH 03860 · PHONE 603-496-5853 · FAX 603-356-5214

STRUCTURAL ANALYSIS REPORT
193' ROHN GUYED TOWER
MONTVILLE, CONNECTICUT
prepared for
Chappell Engineering Associates, LLC

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed an assessment and structural analysis of this 193-foot guyed tower. The analysis was performed for MetroPCS's proposed installation of six panel antennas and twelve 1-5/8" waveguide cables at 130'.

Our analysis indicates the tower does **not** meet the requirements of the Connecticut State Building Code with the proposed antennas. One 20' tower section requires leg reinforcement and three tower sections need bracing bolt upgrades to support the proposed loads. Additional maintenance recommendations are included herein.

INTRODUCTION:

A structural analysis was performed on the above-mentioned communications tower by APT for Chappell Engineering Associates, LLC. The tower is located on Cook Road in Montville, Connecticut. APT visited the tower site on June 11, 2009 to record information regarding physical and dimensional properties of the structure and its appurtenances. The analysis also utilized ROHN drawings (File #35489PH) previously provided by the Connecticut Siting Council.

The structure is a 193-foot ROHN galvanized steel guyed tower. The analysis was performed using the following antenna inventory (proposed antennas shown in **bold** text):

Antenna	Elev.	Mount	Coax.
(3) APX16DW-16DWVS panels, (6) TMAs	190'	(3) 12' sector mounts	(12) 1-5/8"
20' omnidirectional whip	178'	On sector mounts below	7/8"
(9) DUO1417-8686 panels, (9) TMAs	178'	(3) 15' sector mounts	(9) 1-1/4"
(2) 8' omnidirectional whips	168'	On sector mounts below	(2) 7/8"
(6) 7130.16, (6) DB948F85 panel antennas	167'	(3) 12' sector mounts	(12) 1-5/8"
(6) DB980F65 panels, (5) 1' yagis	150'	(3) 14' sector mounts	(6) 1-5/8", 1-1/4"
(12) DB844H90 panels	140'	(3) 14' sector mounts	(12) 1-1/4"
(6) Kathrein 742-351 panel antennas	**130'**	**(3) 12' sector mounts**	**(12) 1-5/8"**
10' 8-bay dipole	122'	3' sidearm	1-1/4"
(2) 20' omnidirectional whips	110'	(2) 3' sidearms	(2) 7/8"
3' dipole	110'	4' x 2-⅜" pipe on leg	7/8"

P.O. Box 1491
North Conway, NH 03860
(603) 496-5853

3 Saddlebrook Drive
Killingworth, CT 06419
(860) 663-1697

CONDITION ASSESSMENT:

- **General Observations:** The tower, a galvanized steel structure, appeared to be in sound condition. No signs of movement or overstress of the tower were observed. Guy anchors were observed to be heavily vegetated and in need of clearing.

- **Legs:** Leg members consist of 2.5" to 3" extra-strong pipe and are comprised of 50 ksi steel, according to ROHN specifications. Leg members appeared to be in good condition, with no rusting observed. Tower reinforcing was performed on two tower sections, from 20' to 60'. This leg reinforcing extends past each section's flange plate; APT believes the solid rod reinforcing should terminate on the respective flange plates.

- **Bracing:** Diagonal bracing is comprised of tube and angle steel members and appeared to be in good condition. Connections that were observed appeared to be sound, with no loose or missing bolts noted.

- **Antenna Connections:** Antenna mounting hardware was in good condition, with corrosion resistant hardware and galvanized members prevalent.

- **Splice Connections:** Observed splice bolts and connections were in good condition. No loose or missing bolts or nuts were observed.

- **Guy Cables and Hardware:** Guy cables appeared to be in sound condition. Torque arms and attachment hardware appeared to be in good condition. Guy anchor turnbuckles had recommended end sleeves and safety cable loops in place.

STRUCTURAL ANALYSIS:

Methodology:

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

The analysis was conducted using a fastest mile wind speed of 85 miles per hour (equivalent to 105 mph 3-second gust) and ½" of radial ice over the entire structure and all appurtenances. The EIA/TIA Standard requires a basic wind speed of 85 miles per hour for New London County, Connecticut.

Two loading conditions were evaluated in accordance with TIA/EIA-222-F to determine tower capacity. The more demanding of the two cases is used to calculate tower capacity:

- Case 1 = Wind Load (without ice) + Tower Dead Load
- Case 2 = 0.75 Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers less than 700-feet tall. Allowable stresses of tower members were increased by one-third when computing the load capacity values shown below.

Analysis Results:

Analysis of the tower was conducted in accordance with the criteria outlined herein with antenna changes as previously described. The following table summarizes the results of the analysis based on stresses of individual leg and bracing members:

Elevation	Leg Capacity	Bracing Capacity
180'-193'	10%	9%
160'-180'	57%	35%
140'-160'	57%	33%
120'-140'	48%	25%
100'-120'	71%	55%
80'-100'	74%	97%
60'-80'	**103%**	61%
40'-60'	79%	43%
20'-40'	78%	83%
0'-20'	90%	98%

Bracing and Splice Bolts:

All connection bolts were evaluated under the proposed loading. Three 20' tower sections were found to need bracing bolt upgrades to support the proposed loads.

Guy Cables:

EIA/TIA-222-F paragraph 8.2.1 requires all guy cables to have a factor of safety of 2.0 or greater for structures less than 700-feet in height. Our calculations indicate all guys meet the required safety factor with the proposed antenna changes.

Base Foundation and Guy Anchors:

Evaluation of the base foundation and guy anchors was performed from ROHN tower drawings previously provided to APT. The foundation and guy anchors were found to be adequately sized for the proposed equipment. Base reactions imposed with the additional antennas were calculated as follows:

Location	Vertical	Horizontal
Base:	134.0 kips	5.3 kips
Guy Anchor:	47.3 kips	50.7 kips

CONCLUSIONS AND RECOMMENDATIONS:

Our structural analysis indicates that the 193-foot guyed tower located in Montville, Connecticut does **not** meet the requirements of the Connecticut State Building Code with the additional equipment proposed by MetroPCS. One tower section requires leg reinforcement and three tower sections require bracing bolt upgrades.

Existing leg reinforcement members do not appear to be properly terminated at flange locations. APT recommends these be cut to proper length and welded to the splice flanges. We also recommend guy paths be cleared of vegetation.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in new condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower is in plumb condition.
6. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

All-Points Technology Corporation, P.C. (APT) is not responsible for modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

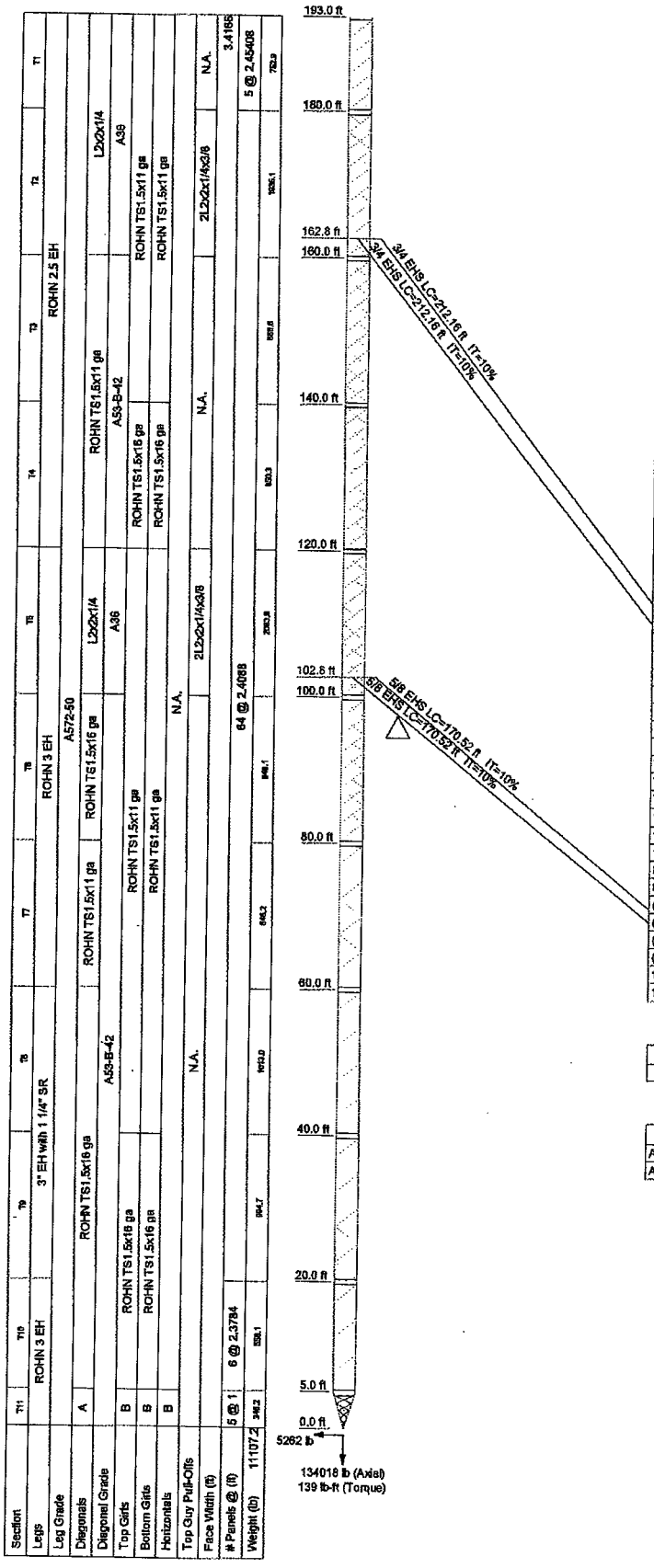
1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Adding or relocating torque arms or guys.

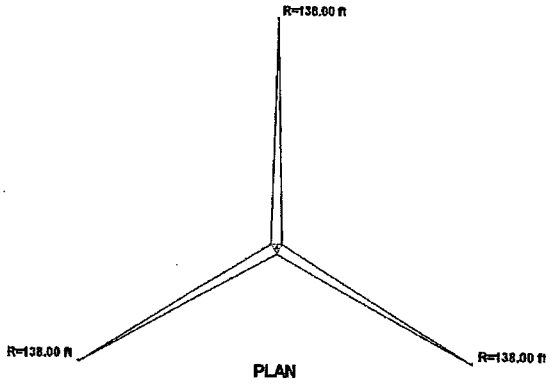
4. Installing antenna mounting gates or side arms.

APT 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 the information contained and set forth herein. If you are aware of any information which is contrary to that which is contained herein, or you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Appendix A

Tower Schematic





DESIGNED APPURTENANCE LOADING

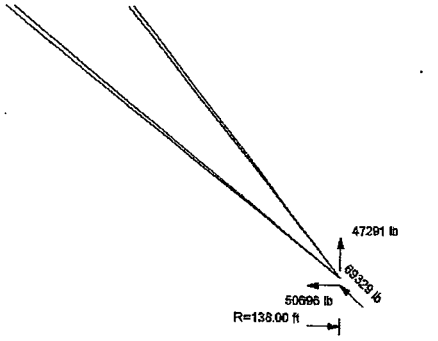
TYPE	ELEVATION	TYPE	ELEVATION
20' x 2.5" omni whip	193 - 176	12' sector mount	167
APX16DWV-16DWVS	190	(2) DB948F85E-M	167
APX16DWV-16DWVS	190	(2) DB948F85E-M	167
(2) G20057A1 TMA	190	(5) 1' yagi	156 - 146
(2) G20057A1 TMA	190	(2) DB980F65E-M	150
(2) G20057A1 TMA	190	(2) DB980F65E-M	150
12' sector mount	190	14' sector mount	150
12' sector mount	190	14' sector mount	150
12' sector mount	190	14' sector mount	150
APX16DWV-16DWVS	190	(2) DB980F65E-M	150
(3) DUO1417-6686	178	(4) DB844H90	140
(3) DUO1417-6686	178	(4) DB844H90	140
(3) DUO1417-6686	178	(4) DB844H90	140
(2) Dual Band TMA	176	14' sector mount	140
(2) Dual Band TMA	176	14' sector mount	140
(2) Dual Band TMA	176	14' sector mount	140
TMA 8" x 8"	176	10' 8-bay dipole	132 - 122
TMA 8" x 8"	176	(2) 742-351 panel	130
TMA 8" x 8"	176	(2) 742-351 panel	130
15' sector mount	176	12' sector mount	130
15' sector mount	176	12' sector mount	130
15' sector mount	176	12' sector mount	130
8' x 1" omni whip	176 - 166	(2) 742-351 panel	130
8' x 1" omni whip	176 - 166	20' x 2.5" omni whip	130 - 110
(2) DB948F85E-M	167	20' x 2.5" omni whip	130 - 110
(2) 7130.16.05	167	3' sidearm	122
(2) 7130.16.05	167	3' sidearm	110
(2) 7130.16.05	167	3' sidearm	110
12' sector mount	167	3' dipole	110
12' sector mount	167	4'x2 3/8" Pipe Mount	110

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 1/4	B	L4x4x1/4

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			



All-Points Technology Corporation
P.O. Box 1491
North Conway, NH 03860
Phone: (603) 496-5853
FAX: (603) 356-5214

Job: *193' ROHN Model 80*			
Project: *CT278140 Montville*			
Client: Chappell; metroPCS Site #NLD0039A	Drawn by: Rob Adair	App'd:	
Code: TIA/EIA-222-F	Date: 07/03/09	Scale: NTS	
Path: C:\Documents and Settings\Rob Adair\My Documents\Jobs\CT278140 Montville\CT278140 Montville.eal		Dwg No. E-1	

Appendix B

Photographs

CHAPPELL ENGINEERING ASSOCIATES, LLC
193' ROHN 80 GUYED TOWER
MONTVILLE, CONNECTICUT
METROPCS SITE #NLD0039A

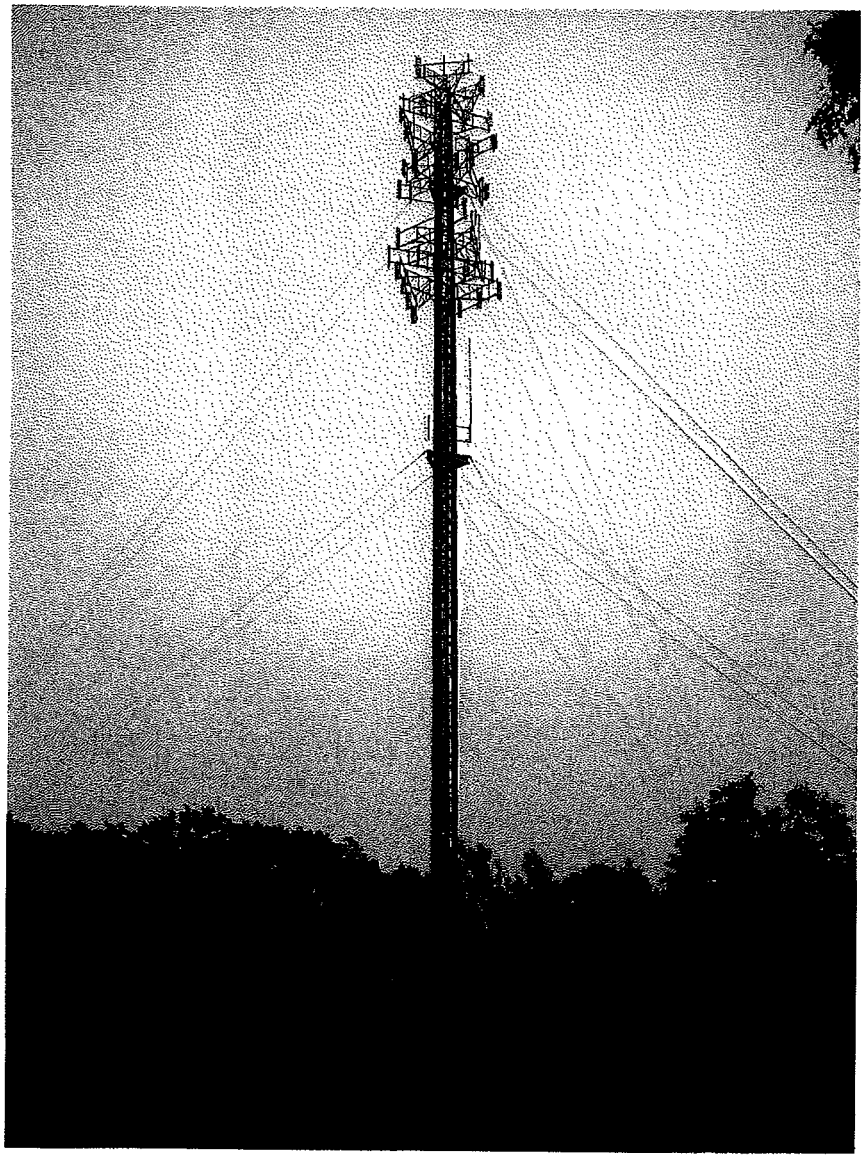


Photo showing overview of 193' ROHN Model 80 guyed tower in Montville, Connecticut.

Photos taken by All-Points Technology Corporation, P.C. on June 11, 2009

CHAPPELL ENGINEERING ASSOCIATES, LLC
193' ROHN 80 GUYED TOWER
MONTVILLE, CONNECTICUT
METROPCS SITE #NLD0039A

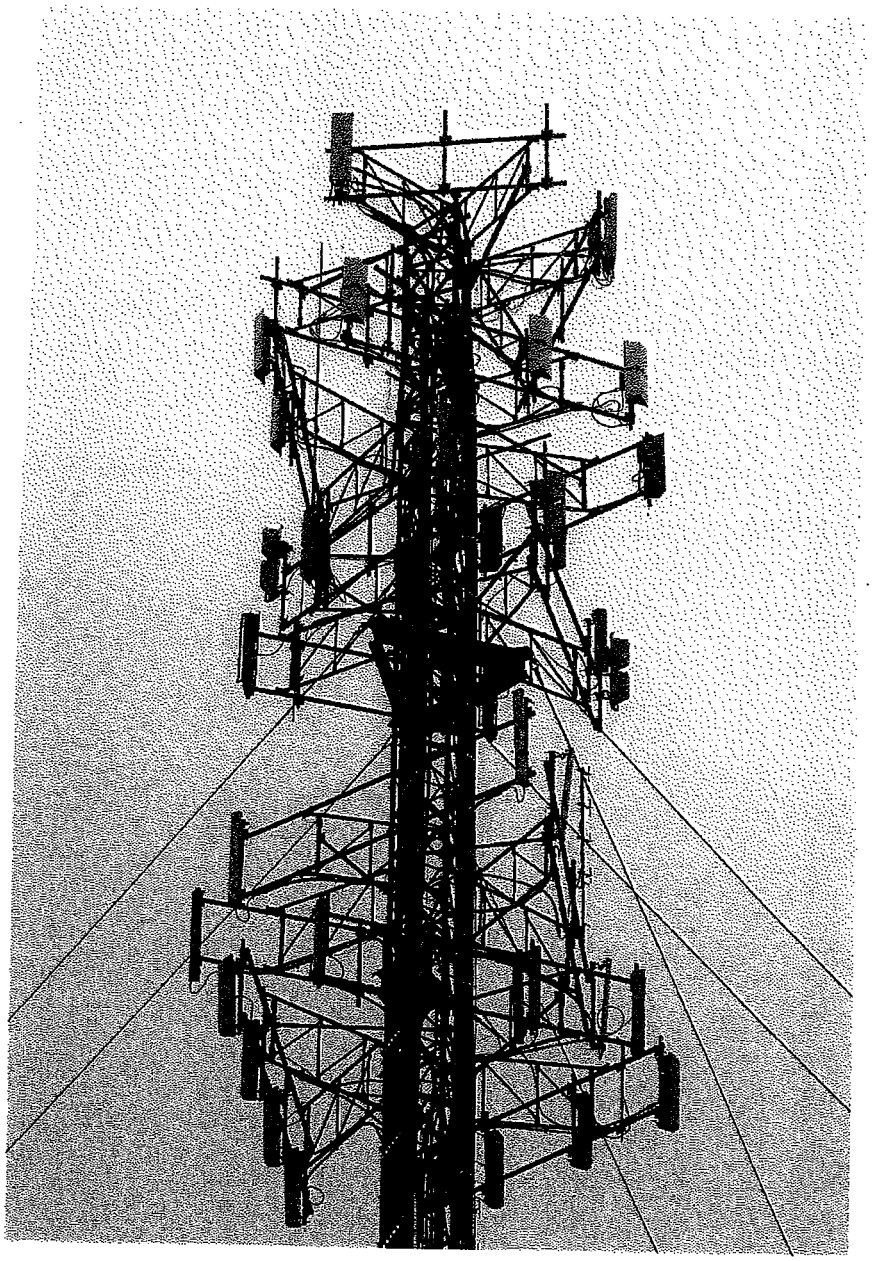


Photo showing existing antennas on tower.

Photos taken by All-Points Technology Corporation, P.C. on June 11, 2009

CHAPPELL ENGINEERING ASSOCIATES, LLC
193' ROHN 80 GUYED TOWER
MONTVILLE, CONNECTICUT
METROPCS SITE #NLD0039A

Photo of existing leg reinforcing extending past flange plate.

Photos taken by All-Points Technology Corporation, P.C. on June 11, 2009

Appendix C

Calculations

RISATower	Job	Page
	193' ROHN Model 80	1 of 11
All-Points Technology Corporation P.O. Box 1491 North Conway, NH 03860 Phone: (603) 496-5853 FAX: (603) 356-5214	**Project** CT278140 Montville	**Date** 11:28:36 07/03/09
	Client Chappell; metroPCS Site #NLD0039A	**Designed by** Rob Adair

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 193.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and tapered 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.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
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.

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	193.00-180.00			3.42	1	13.00
T2	180.00-160.00			3.42	1	20.00
T3	160.00-140.00			3.42	1	20.00
T4	140.00-120.00			3.42	1	20.00
T5	120.00-100.00			3.42	1	20.00
T6	100.00-80.00			3.42	1	20.00
T7	80.00-60.00			3.42	1	20.00
T8	60.00-40.00			3.42	1	20.00
T9	40.00-20.00			3.42	1	20.00
T10	20.00-5.00			3.42	1	15.00
T11	5.00-0.00		85TB	3.42	1	5.00

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	193.00-180.00	2.45	CX Brace	No	No	4.3776	4.3776
T2	180.00-160.00	2.41	CX Brace	No	No	4.3776	4.3776
T3	160.00-140.00	2.41	CX Brace	No	No	4.3776	4.3776
T4	140.00-120.00	2.41	CX Brace	No	No	4.3776	4.3776
T5	120.00-100.00	2.41	CX Brace	No	No	4.3776	4.3776
T6	100.00-80.00	2.41	CX Brace	No	No	4.3776	4.3776
T7	80.00-60.00	2.41	K Brace Right	No	No	4.3776	4.3776
T8	60.00-40.00	2.41	K Brace Right	No	No	4.3776	4.3776
T9	40.00-20.00	2.41	K Brace Right	No	No	4.3776	4.3776
T10	20.00-5.00	2.38	K Brace Right	No	No	4.3776	4.3776
T11	5.00-0.00	1.00	TX Brace	No	Yes	6.0000	6.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 193.00-180.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 180.00-160.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T4 140.00-120.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T8 60.00-40.00	Arbitrary Shape	3" EH with 1 1/4" SR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 40.00-20.00	Arbitrary Shape	3" EH with 1 1/4" SR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Solid Round	1/4	A53-B-42 (42 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 193.00-180.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T2 180.00-160.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 160.00-140.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T4 140.00-120.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T6 100.00-80.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T8 60.00-40.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T9 40.00-20.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Equal Angle	L4x4x1/4	A36 (36 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 193.00-180.00	Flange	0.7500 A325N	4	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	0.7500 A325N	4	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.00-80.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-5.00	Flange	0.8750 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 5.00-0.00	Flange	0.7500 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
162.774	EHS	A	3/4	5830.00	10%	19000	1.155	211.97	138.00	0.0000	0.00	100%
		B	3/4	5830.00	10%	19000	1.155	211.97	138.00	0.0000	0.00	100%
		C	3/4	5830.00	10%	19000	1.155	211.97	138.00	0.0000	0.00	100%
102.774	EHS	A	5/8	4240.00	10%	21000	0.813	170.38	138.00	0.0000	0.00	100%
		B	5/8	4240.00	10%	21000	0.813	170.38	138.00	0.0000	0.00	100%
		C	5/8	4240.00	10%	21000	0.813	170.38	138.00	0.0000	0.00	100%

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
162.774	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C15x33.9
102.774	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C15x33.9

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
162.77	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/8
102.77	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Double Equal Angle	2L2x2x1/4x3/8

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	Number Per Row	Clear Spacing	Width or Diameter	Perimeter	Weight
				ft			in	in	in	plf
1 5/8	A	Yes	Ar (CfAe)	190.00 - 8.00	6	3	0.5000	1.9800		1.04
1 1/4	A	Yes	Ar (CfAe)	140.00 - 8.00	12	9	0.5000	1.5500		0.66
1 5/8	B	Yes	Ar (CfAe)	167.00 - 8.00	12	12	0.0000	1.9800		1.04
7/8	C	Yes	Ar (CfAe)	110.00 - 8.00	3	3	0.5000	1.1100		0.54
1 5/8	C	Yes	Ar (CfAe)	140.00 - 8.00	1	1	0.0000	1.9800		1.04
1 1/4	C	Yes	Ar (CfAe)	150.00 - 8.00	6	6	0.5000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	178.00 - 150.00	9	9	0.5000	1.5500		0.66
1 1/4	C	No	Ar (CfAe)	130.00 - 8.00	12	4	0.5000	1.9800		1.04
1 1/4	C	No	Ar (CfAe)	122.00 - 8.00	1	1	1.5500	1.5500		0.66
1 1/4	C	Yes	Ar (CfAe)	150.00 - 8.00	1	1	1.5500	1.5500		0.66
				150.00 - 8.00	3	3	1.5500	1.5500		0.66

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft²/ft	plf
1 5/8	B	No	CaAa (Out Of Face)	190.00 - 8.00	6	No Ice	0.20	1.04
						1/2" Ice	0.30	2.55
7/8	B	No	CaAa (Out Of Face)	146.00 - 8.00	1	No Ice	0.11	0.54
						1/2" Ice	0.21	1.52

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	°	ft		ft²	ft²	lb
APX16DWV-16DWVS	A	From Leg	4.00	0.0000	190.00	No Ice	6.70	2.00	25.00
			0.00			1/2" Ice	7.13	2.33	56.34
			0.00						
APX16DWV-16DWVS	B	From Leg	4.00	0.0000	190.00	No Ice	6.70	2.00	25.00
			0.00			1/2" Ice	7.13	2.33	56.34
			0.00						
APX16DWV-16DWVS	C	From Leg	4.00	0.0000	190.00	No Ice	6.70	2.00	25.00
			0.00			1/2" Ice	7.13	2.33	56.34
			0.00						
(2) G20057A1 TMA	A	From Leg	4.00	0.0000	190.00	No Ice	0.82	0.39	10.00
			0.00			1/2" Ice	0.95	0.49	15.41
			0.00						
(2) G20057A1 TMA	B	From Leg	4.00	0.0000	190.00	No Ice	0.82	0.39	10.00
			0.00			1/2" Ice	0.95	0.49	15.41
			0.00						
(2) G20057A1 TMA	C	From Leg	4.00	0.0000	190.00	No Ice	0.82	0.39	10.00
			0.00			1/2" Ice	0.95	0.49	15.41
			0.00						
12' sector mount	A	None		0.0000	190.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
12' sector mount	B	None		0.0000	190.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
12' sector mount	C	None		0.0000	190.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
20' x 2.5" omni whip	C	From Leg	4.00	0.0000	193.00 - 178.00	No Ice	5.00	5.00	50.00
			0.00			1/2" Ice	7.03	7.03	86.96
			0.00						
(3) DUO1417-8686	A	From Leg	4.00	0.0000	178.00	No Ice	6.53	4.20	20.30

RISATower	Job	Page
	193' ROHN Model 80	5 of 11
All-Points Technology Corporation P.O. Box 1491 North Conway, NH 03860 Phone: (603) 496-5853 FAX: (603) 356-5214	**Project** CT278140 Montville	**Date** 11:28:36 07/03/09
	Client Chappell; metroPCS Site #NLD0039A	**Designed by** Rob Adair

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	°	ft		ft²	ft²	lb
			0.00						
			0.00			1/2" Ice	6.94	4.57	62.49
(3) DUO1417-8686	B	From Leg	4.00	0.0000	178.00	No Ice	6.53	4.20	20.30
			0.00			1/2" Ice	6.94	4.57	62.49
			0.00						
(3) DUO1417-8686	C	From Leg	4.00	0.0000	178.00	No Ice	6.53	4.20	20.30
			0.00			1/2" Ice	6.94	4.57	62.49
			0.00						
(2) Dual Band TMA	A	From Leg	4.00	0.0000	178.00	No Ice	1.55	0.81	25.00
			0.00			1/2" Ice	1.72	0.94	36.07
			0.00						
(2) Dual Band TMA	B	From Leg	4.00	0.0000	178.00	No Ice	1.55	0.81	25.00
			0.00			1/2" Ice	1.72	0.94	36.07
			0.00						
(2) Dual Band TMA	C	From Leg	4.00	0.0000	178.00	No Ice	1.55	0.81	25.00
			0.00			1/2" Ice	1.72	0.94	36.07
			0.00						
TMA 8" x 8"	A	From Leg	4.00	0.0000	178.00	No Ice	0.62	0.23	12.00
			0.00			1/2" Ice	0.73	0.31	16.28
			0.00						
TMA 8" x 8"	B	From Leg	4.00	0.0000	178.00	No Ice	0.62	0.23	12.00
			0.00			1/2" Ice	0.73	0.31	16.28
			0.00						
TMA 8" x 8"	C	From Leg	4.00	0.0000	178.00	No Ice	0.62	0.23	12.00
			0.00			1/2" Ice	0.73	0.31	16.28
			0.00						
15' sector mount	A	None		0.0000	178.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
15' sector mount	B	None		0.0000	178.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
15' sector mount	C	None		0.0000	178.00	No Ice	9.10	9.10	465.00
						1/2" Ice	12.56	12.56	600.00
(2) DB948F85E-M	A	From Leg	4.00	0.0000	167.00	No Ice	1.92	3.26	8.50
			0.00			1/2" Ice	2.22	3.62	27.57
			0.00						
(2) DB948F85E-M	B	From Leg	4.00	0.0000	167.00	No Ice	1.92	3.26	8.50
			0.00			1/2" Ice	2.22	3.62	27.57
			0.00						
(2) DB948F85E-M	C	From Leg	4.00	0.0000	167.00	No Ice	1.92	3.26	8.50
			0.00			1/2" Ice	2.22	3.62	27.57
			0.00						
(2) 7130.16.05	A	From Leg	4.00	0.0000	167.00	No Ice	5.77	5.77	18.00
			0.00			1/2" Ice	6.39	6.39	63.00
			0.00						
(2) 7130.16.05	B	From Leg	4.00	0.0000	167.00	No Ice	5.77	5.77	18.00
			0.00			1/2" Ice	6.39	6.39	63.00
			0.00						
(2) 7130.16.05	C	From Leg	4.00	0.0000	167.00	No Ice	5.77	5.77	18.00
			0.00			1/2" Ice	6.39	6.39	63.00
			0.00						
12' sector mount	A	None		0.0000	167.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
12' sector mount	B	None		0.0000	167.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
12' sector mount	C	None		0.0000	167.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
8' x 1" omni whip	A	From Leg	4.00	0.0000	176.00 - 168.00	No Ice	0.80	0.80	30.00
			0.00			1/2" Ice	1.62	1.62	37.43
			0.00						

RISATower	Job: 193' ROHN Model 80	Page: 6 of 11
All-Points Technology Corporation P.O. Box 1491 North Conway, NH 03860 Phone: (603) 496-5853 FAX: (603) 356-5214	Project: CT278140 Montville	Date: 11:28:36 07/03/09
	Client: Chappell; metroPCS Site #NLD0039A	Designed by: Rob Adair

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	°	ft		ft^2	ft^2	lb
8' x 1" omni whip	C	From Leg	4.00	0.0000	176.00 - 168.00	No Ice	0.80	0.80	30.00
			0.00			1/2" Ice	1.62	1.62	37.43
			0.00						
(2) DB980F65E-M	A	From Leg	4.00	0.0000	150.00	No Ice	3.90	2.29	8.50
			0.00			1/2" Ice	4.28	2.65	29.47
			0.00						
(2) DB980F65E-M	B	From Leg	4.00	0.0000	150.00	No Ice	3.90	2.29	8.50
			0.00			1/2" Ice	4.28	2.65	29.47
			0.00						
(2) DB980F65E-M	C	From Leg	4.00	0.0000	150.00	No Ice	3.90	2.29	8.50
			0.00			1/2" Ice	4.28	2.65	29.47
			0.00						
14' sector mount	A	None		0.0000	150.00	No Ice	7.73	7.73	475.00
						1/2" Ice	11.12	11.12	700.00
14' sector mount	B	None		0.0000	150.00	No Ice	7.73	7.73	475.00
						1/2" Ice	11.12	11.12	700.00
14' sector mount	C	None		0.0000	150.00	No Ice	7.73	7.73	475.00
						1/2" Ice	11.12	11.12	700.00
(5) 1' yagi	B	From Leg	4.00	0.0000	156.00 - 146.00	No Ice	0.08	0.08	12.00
			0.00			1/2" Ice	0.14	0.14	13.02
			0.00						
(4) DB844H90	A	From Leg	4.00	0.0000	140.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
(4) DB844H90	B	From Leg	4.00	0.0000	140.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
(4) DB844H90	C	From Leg	4.00	0.0000	140.00	No Ice	2.87	3.97	10.00
			0.00			1/2" Ice	3.18	4.34	36.27
			0.00						
14' sector mount	A	None		0.0000	140.00	No Ice	7.73	7.73	475.00
						1/2" Ice	11.12	11.12	700.00
14' sector mount	B	None		0.0000	140.00	No Ice	7.73	7.73	475.00
						1/2" Ice	11.12	11.12	700.00
14' sector mount	C	None		0.0000	140.00	No Ice	7.73	7.73	475.00
						1/2" Ice	11.12	11.12	700.00
(2) 742-351 panel	A	From Leg	4.00	0.0000	130.00	No Ice	5.89	1.73	30.00
			0.00			1/2" Ice	6.30	2.04	57.30
			0.00						
(2) 742-351 panel	B	From Leg	4.00	0.0000	130.00	No Ice	5.89	1.73	30.00
			0.00			1/2" Ice	6.30	2.04	57.30
			0.00						
(2) 742-351 panel	C	From Leg	4.00	0.0000	130.00	No Ice	5.89	1.73	30.00
			0.00			1/2" Ice	6.30	2.04	57.30
			0.00						
12' sector mount	A	None		0.0000	130.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
12' sector mount	B	None		0.0000	130.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
12' sector mount	C	None		0.0000	130.00	No Ice	5.80	2.90	260.00
						1/2" Ice	8.17	4.09	360.00
10' 8-bay dipole	C	From Leg	3.00	0.0000	132.00 - 122.00	No Ice	2.50	2.50	75.00
			0.00			1/2" Ice	3.53	3.53	93.64
			0.00						
3' sidearm	C	None		0.0000	122.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
20' x 2.5" omni whip	B	From Leg	3.00	0.0000	130.00 - 110.00	No Ice	5.00	5.00	50.00
			0.00			1/2" Ice	7.03	7.03	86.96
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	°	ft		ft^2	ft^2	lb
20' x 2.5" omni whip	C	From Leg	3.00	0.0000	130.00 - 110.00	No Ice	5.00	5.00	50.00
			0.00			1/2" Ice	7.03	7.03	86.96
			0.00						
3' sidearm	B	None		0.0000	110.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
3' sidearm	C	None		0.0000	110.00	No Ice	1.43	0.72	30.00
						1/2" Ice	2.18	1.09	65.00
3' dipole	A	From Leg	1.00	0.0000	110.00	No Ice	0.40	0.40	15.00
			0.00			1/2" Ice	0.81	0.81	18.77
			0.00						
4'x2 3/8" Pipe Mount	A	From Leg	0.50	0.0000	110.00	No Ice	0.87	0.87	14.60
			0.00			1/2" Ice	1.11	1.11	21.91
			0.00						

Solution Summary

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	193 - 180	4.486	11	0.2336	0.0399
T2	180 - 160	3.850	11	0.2261	0.0370
T3	160 - 140	3.063	11	0.1189	0.0282
T4	140 - 120	2.746	10	0.0820	0.0244
T5	120 - 100	2.523	9	0.0709	0.0219
T6	100 - 80	2.484	9	0.0486	0.0180
T7	80 - 60	2.873	9	0.0580	0.0183
T8	60 - 40	2.962	9	0.0589	0.0200
T9	40 - 20	2.488	9	0.1770	0.0260
T10	20 - 5	1.444	9	0.2793	0.0303
T11	5 - 0	0.360	9	0.3343	0.0079

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
193.00	20' x 2.5" omni whip	11	4.486	0.2336	0.0399	90569
190.00	APX16DWV-16DWVS	11	4.337	0.2353	0.0394	90569
188.00	20' x 2.5" omni whip	11	4.238	0.2358	0.0391	90569
183.00	20' x 2.5" omni whip	11	3.994	0.2328	0.0379	44893
178.00	20' x 2.5" omni whip	11	3.756	0.2192	0.0362	24246
176.00	8' x 1" omni whip	11	3.664	0.2103	0.0354	19043
172.00	8' x 1" omni whip	11	3.487	0.1887	0.0335	13101
168.00	8' x 1" omni whip	11	3.326	0.1642	0.0316	9983
167.00	(2) DB948F85E-M	11	3.288	0.1580	0.0311	9422
162.77	Guy	11	3.143	0.1330	0.0292	7686
156.00	(5) 1' yagi	11	2.969	0.1034	0.0270	9434
151.00	(5) 1' yagi	11	2.880	0.0911	0.0261	18100
150.00	(2) DB980F65E-M	10	2.864	0.0895	0.0259	22089
146.00	(5) 1' yagi	10	2.817	0.0848	0.0253	186621

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	(4) DB844H90	10	2.746	0.0820	0.0244	20747
132.00	10' 8-bay dipole	9	2.666	0.0807	0.0225	44163
130.00	(2) 742-351 panel	9	2.642	0.0801	0.0220	76428
127.00	10' 8-bay dipole	9	2.605	0.0787	0.0220	87258
125.00	20' x 2.5" omni whip	9	2.581	0.0772	0.0221	46276
122.00	10' 8-bay dipole	9	2.545	0.0739	0.0220	27049
120.00	20' x 2.5" omni whip	9	2.523	0.0709	0.0219	21003
115.00	20' x 2.5" omni whip	9	2.476	0.0606	0.0211	13134
110.00	20' x 2.5" omni whip	9	2.448	0.0489	0.0200	9497
102.77	Guy	9	2.459	0.0470	0.0184	6846

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	193	Leg	A325N	0.7500	4	1612.95	19431.20	0.083 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	646.49	6442.72	0.100 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	45.08	6442.72	0.007 ✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.6250	2	199.48	6442.72	0.031 ✓	1.333	Bolt Shear
T2	180	Leg	A325N	0.7500	4	2715.47	19384.00	0.140 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	2482.22	6442.72	0.385 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	105.11	6442.72	0.016 ✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.6250	2	886.66	6442.72	0.138 ✓	1.333	Bolt Shear
		Torque Arm Top@162.774	A325N	0.8750	4	3164.61	12627.70	0.251 ✓	1.333	Bolt Shear
T3	160	Leg	A325N	0.7500	4	0.00	19434.20	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3367.77	4123.34	0.817 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	1432.37	4123.34	0.347 ✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.5000	1	658.06	4123.34	0.160 ✓	1.333	Bolt Shear
T4	140	Leg	A325N	0.7500	4	0.00	19395.50	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2590.24	4123.34	0.628 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	317.59	3197.25	0.099 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	687.90	3197.25	0.215 ✓	1.333	Member Bearing
T5	120	Leg	A325N	0.7500	4	2210.72	19298.40	0.115 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	3889.67	6442.72	0.604 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	375.60	6442.72	0.058 ✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.6250	2	1116.77	6442.72	0.173 ✓	1.333	Bolt Shear
T6	100	Leg	A325N	0.7500	4	0.00	19365.10	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	4726.33	3197.25	1.478 ✗	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	1765.89	4123.34	0.428 ✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.5000	1	1160.71	4123.34	0.281 ✓	1.333	Bolt Shear
T7	80	Leg	A325N	0.7500	4	5218.05	19426.40	0.269 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	6276.91	4123.34	1.522 ✗	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	2324.34	4123.34	0.564 ✓	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable		Allowable Ratio	Criteria
		Bottom Girt	A325N	0.5000	1	1134.04	4123.34	0.275	✓	1.333	Bolt Shear
T8	60	Leg	A325N	0.7500	4	6044.57	19435.70	0.311	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2357.52	4123.34	0.572	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	668.55	4123.34	0.162	✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.5000	1	299.77	4123.34	0.073	✓	1.333	Bolt Shear
T9	40	Leg	A325N	0.7500	4	161.79	19394.10	0.008	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3794.28	3197.25	1.187	✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	457.61	3197.25	0.143	✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	925.43	3197.25	0.289	✓	1.333	Member Bearing
T10	20	Leg	A325N	0.8750	4	0.00	25897.90	0.000	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	5698.82	3197.25	1.782	✗	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	1169.23	3197.25	0.366	✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	5167.78	3197.25	1.616	✗	1.333	Member Bearing

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	**193 - 180**	**Leg**	**ROHN 2.5 EH**	**3**	**-8010.49**	**80862.84**	**9.9**	**Pass**
		Diagonal	L2x2x1/4	11	-1292.98	14003.03	9.2	Pass
		Top Girt	ROHN TS1.5x11 ga	4	-90.17	12050.89	0.7	Pass
		Bottom Girt	ROHN TS1.5x11 ga	7	-389.46	12050.89	3.2	Pass
T2	**180 - 160**	**Leg**	**ROHN 2.5 EH**	**42**	**-46304.50**	**81085.99**	**57.1**	**Pass**
		Diagonal	L2x2x1/4	51	-4964.45	14067.42	35.3	Pass
		Top Girt	ROHN TS1.5x11 ga	43	-170.80	12050.89	1.4	Pass
		Bottom Girt	ROHN TS1.5x11 ga	46	1773.32	17475.90	10.1	Pass
		Guy A@162.774	3/4	505	19007.50	29150.00	10.3 (b) 65.2	Pass
		Guy B@162.774	3/4	501	15868.20	29150.00	54.4	Pass
		Guy C@162.774	3/4	494	18647.10	29150.00	64.0	Pass
		Top Guy Pull-Off@162.774	2L2x2x1/4x3/8	497	-9149.66	36960.89	24.8	Pass
		Torque Arm Top@162.774	C15x33.9	496	9106.90	286776.28	51.7	Pass
T3	**160 - 140**	**Leg**	**ROHN 2.5 EH**	**99**	**-45280.40**	**79349.09**	**57.1**	**Pass**
		Diagonal	ROHN TS1.5x11 ga	148	-3367.77	10202.50	33.0	Pass
		Top Girt	ROHN TS1.5x11 ga	100	1432.37	17475.90	61.3 (b) 8.2	Pass
		Bottom Girt	ROHN TS1.5x11 ga	103	658.06	17475.90	26.1 (b) 3.8	Pass
T4	**140 - 120**	**Leg**	**ROHN 2.5 EH**	**156**	**-37384.90**	**78384.66**	12.0 (b) **47.7**	**Pass**
		Diagonal	ROHN TS1.5x11 ga	164	-2590.24	10202.50	25.4	Pass
		Top Girt	ROHN TS1.5x16 ga	157	317.59	8826.21	47.1 (b) 3.6	Pass
		Bottom Girt	ROHN TS1.5x16 ga	160	687.90	8826.21	7.5 (b) 7.8	Pass
T5	**120 - 100**	**Leg**	**ROHN 3 EH**	**213**	**-77095.60**	**108669.62**	16.1 (b) **70.9**	**Pass**
		Diagonal	L2x2x1/4	220	-7779.33	14234.84	54.7	Pass
		Top Girt	ROHN TS1.5x11 ga	214	751.19	17475.90	4.3	Pass

RISATower	Job: 193' ROHN Model 80	Page: 10 of 11
All-Points Technology Corporation P.O. Box 1491 North Conway, NH 03860 Phone: (603) 496-5853 FAX: (603) 356-5214	Project: CT278140 Montville	Date: 11:28:36 07/03/09
	Client: Chappell; metroPCS Site #NLD0039A	Designed by: Rob Adair

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
		Bottom Girt	ROHN TS1.5x11 ga	217	2233.53	17475.90	4.4 (b) 12.8	Pass
		Guy A@102.774	5/8	520	16490.60	21200.00	13.0 (b) 77.8	Pass
		Guy B@102.774	5/8	516	14136.00	21200.00	66.7	Pass
		Guy C@102.774	5/8	509	16718.80	21200.00	78.9	Pass
		Top Guy Pull-Off@102.774	2L2x2x1/4x3/8	512	-9235.79	32658.10	28.3	Pass
		Torque Arm Top@102.774	C15x33.9	518	-7192.73	148533.52	36.9	Pass
T6	**100 - 80**	**Leg**	**ROHN 3 EH**	**270**	**-71935.00**	**96944.69**	**74.2**	**Pass**
		Diagonal	ROHN TS1.5x16 ga	319	-5294.66	5450.21	97.1	Fail ✗
		Top Girt	ROHN TS1.5x11 ga	271	1765.89	17475.90	110.9 (b) 10.1	Pass
		Bottom Girt	ROHN TS1.5x11 ga	274	1160.71	17475.90	32.1 (b) 6.6	Pass
T7	**80 - 60**	**Leg**	**ROHN 3 EH**	**327**	**-93856.70**	**91045.76**	21.1 (b) **103.1**	**Fail ✗**
		Diagonal	ROHN TS1.5x11 ga	355	-6276.91	10377.43	60.5	Fail ✗
		Top Girt	ROHN TS1.5x11 ga	329	-2028.41	12177.86	114.2 (b) 16.7	Pass
		Bottom Girt	ROHN TS1.5x11 ga	332	1134.04	17475.90	42.3 (b) 6.5	Pass
T8	**60 - 40**	**Leg**	**3" EH with 1 1/4" SR**	**360**	**-101319.00**	**128634.36**	20.6 (b) **78.8**	**Pass**
		Diagonal	ROHN TS1.5x16 ga	388	-2357.52	5450.21	43.3	Pass
		Top Girt	ROHN TS1.5x11 ga	362	-560.05	12177.86	4.6	Pass
		Bottom Girt	ROHN TS1.5x11 ga	364	299.77	17475.90	12.2 (b) 1.7	Pass
T9	**40 - 20**	**Leg**	**3" EH with 1 1/4" SR**	**393**	**-100408.00**	**128458.40**	5.5 (b) **78.2**	**Pass**
		Diagonal	ROHN TS1.5x16 ga	400	-4527.34	5450.21	83.1	Pass
		Top Girt	ROHN TS1.5x16 ga	395	457.61	8826.21	89.0 (b) 5.2	Pass
		Bottom Girt	ROHN TS1.5x16 ga	398	-778.58	6302.52	10.7 (b) 12.4	Pass
T10	**20 - 5**	**Leg**	**ROHN 3 EH**	**426**	**-80987.10**	**89701.29**	21.7 (b) **90.3**	**Pass**
		Diagonal	ROHN TS1.5x16 ga	433	-5356.67	5470.78	97.9	Fail ✗
		Top Girt	ROHN TS1.5x16 ga	428	-864.73	6302.52	133.7 (b) 13.7	Pass
		Bottom Girt	ROHN TS1.5x16 ga	430	5167.78	8826.21	27.4 (b) 58.6	Fail ✗
T11	**5 - 0**	**Leg**	**ROHN 3 EH**	**451**	**-60843.60**	**89374.58**	121.3 (b) **68.1**	**Pass**
		Horizontal	L4x4x1/4	484	-3323.51	30819.50	10.8	Pass
		Top Girt	L4x4x1/4	454	7708.82	55858.03	13.8	Pass
		Bottom Girt	L4x4x1/4	457	-2964.87	32806.30	9.0	Pass

Summary		
Leg (T7)	103.1	Fail ✗
Diagonal (T10)	97.9	Pass
Horizontal (T11)	10.8	Pass
Top Girt (T7)	42.3	Pass
Bottom Girt (T10)	121.3	Fail ✗
Guy A (T5)	77.8	Pass
Guy B (T5)	66.7	Pass
Guy C (T5)	78.9	Pass

RISATower	Job	Page
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All-Points Technology Corporation P.O. Box 1491 North Conway, NH 03860 Phone: (603) 496-5853 FAX: (603) 356-5214	**Project** CT278140 Montville	**Date** 11:28:36 07/03/09
	Client Chappell; metroPCS Site #NLD0039A	**Designed by** Rob Adair

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						Top Guy Pull-Off (T5)	28.3	Pass
						Torque Arm Top (T2)	51.7	Pass
						Bolt Checks	133.7	Fail ✗
						RATING =	**133.7**	**Fail ✗**