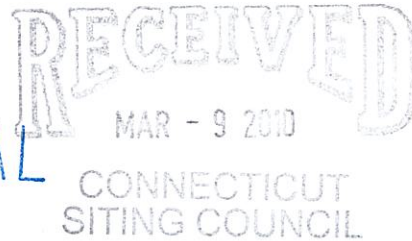


March 9, 2010

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

ORIGINAL



**Re: Notice of Exempt Modification
Clearwire Corporation Notice to make an Exempt Modification to an Existing
Facility at 188 Moody Street, Enfield, CT
Clearwire Site Number CT-HFD0003**

Dear Mr. Phelps,

Pursuant to Conn. Agency Regulations Sections 16-50j-73 and 16-50j-72(b), Clearwire Corporation (Clearwire) hereby gives notice to the Connecticut Siting Council (Council) and the Town of , CT. of Clearwire's intent to make an exempt modification to an existing monopole tower (tower) located at 188 Moody Street, Enfield, CT. Specifically, Clearwire plans to add three (3) antennas to the tower, one (1) per sector and to add two (2) microwave dishes for backhaul at the XXX' AGL. Pursuant to the Council's regulations, (Conn. Agency Regulations Section 16-50j-72(b)), Clearwire's plans do not constitute a modification subject to the Council's review because Clearwire will not change the height of the tower, will not extend the boundaries of the compound, will not increase the noise levels at the site and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards. A copy of this notice has been sent to Town Manager of the Town of Enfield, CT.

Clearwire is currently developing a 4G wireless broadband network to provide high-speed wireless data and VoIP service within the State of Connecticut. Clearwire's 4G service leverages the WiMAX technology to enable enhanced wireless data communications. In order to accomplish the upgrade at this site, Clearwire plans to add three (3) WiMAX antennas, two (2) dishes and to install additional WiMAX related electronic equipment at the base of the tower.

The tower is a 190' monopole located at 188 moody Street, Enfield, Connecticut (Latitude 42 00 27 N Longitude 73 31 20 W). The tower is owned by TowerCo. Inc. Currently, Sprint, Nextel, Cingular, TMO and Pocket are located on the tower. Presently, Clearwire is not located at the site. Clearwire's base equipment will be located on the ground next to the pole. A site plan with the tower elevations and site plan specifications is attached.

Clearwire will add three (3) antennas, one (1) to each sector, and mount two (2) microwave dishes, one (1) above each of those antennas. The center line for the microwave dishes will be 178'. Nine coaxial cables will be added to the structure, 2 per antenna and one per microwave dish. These cables will be inside the tower and bundled. To confirm that the tower can support these changes, Clearwire commissioned Vertical Solutions, Inc. to perform a structural analysis of the tower and the proposed changes. According to that structural dated

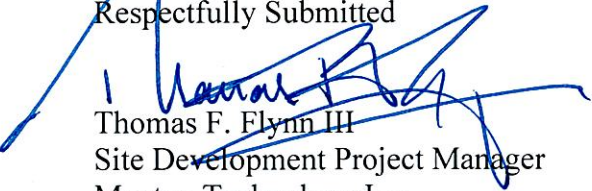
February 24, 20010 and attached hereto, the structure is sufficient to support the proposed loading and will not need to be modified. The tower, with the additions and the modifications will be at 97.5% of its capacity.

Within the existing compound, Clearwire will install one (1) WiMAX radio and power cabinet on the existing pad at the site. The new equipment will be adjacent to the existing tower. Excluding brief, construction related noise during the addition of this equipment, the proposed changes to the tower will not increase noise levels at the site.

The addition of new WiMAX antennas and microwave dishes will not adversely impact the health and safety of the surrounding community or the people working on the tower. The total radio frequency exposure measured around the base of the tower will be well below the National Council on Radiation Protection and Measurements' (NCRP) standard adopted by the Federal Communications Commission (FCC). The worst case power density analysis for the WiMAX antennas and dishes, measured at the base of the tower, indicates that the WiMAX antennas and dishes will emit .36% of the NCRP's standard for maximum permissible exposure. The cumulative power density analysis indicates that all the antennas on the structure will emit 16.36% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be well below the FCC mandated radio frequency exposure limits in all locations around the base of the tower. The power density analysis is attached.

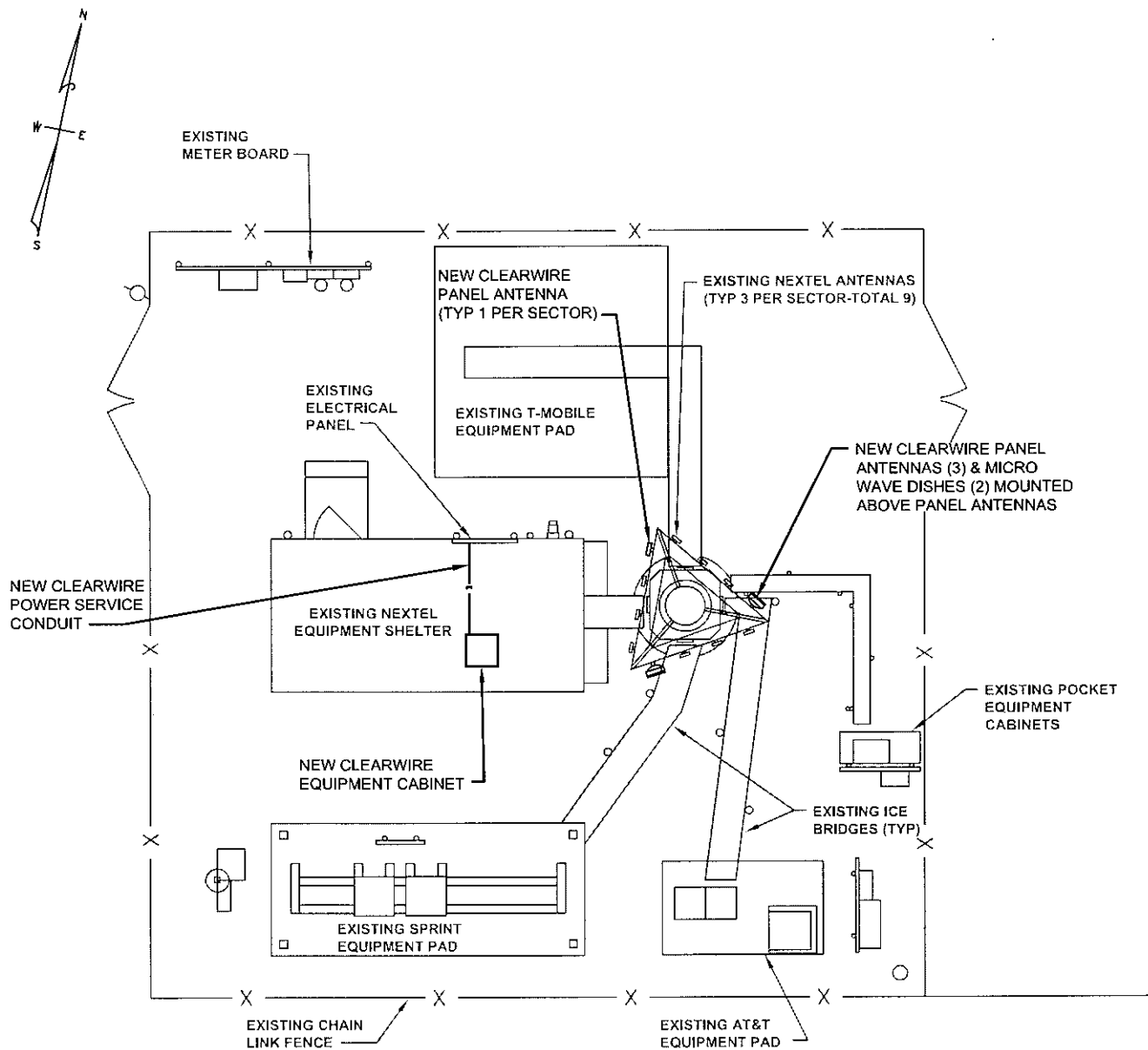
In conclusion, Clearwire's proposed plan to add three (3) WiMAX antennas, two (2) microwave dishes and the associated base station equipment does not constitute a modification subject to the Council's jurisdiction because Clearwire will not increase the height of the tower, will not extend the boundaries of the compound at the site, will not increase the noise levels at the site and the radio frequency electromagnetic radiation power density will stay within all applicable standards.

Respectfully Submitted



Thomas F. Flynn III
Site Development Project Manager
Maxton Technology Inc.
1296 Blue Hills Avenue
Bloomfield, CT 06002
508-821-6974
Tom.Flynn@maxtontech.com
Agent for Clearwire Corporation

Cc: Town Manager Mathew Coppler



SITE PLAN

SCALE: NTS

ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATION OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITIES COMPANIES.



clearwire®
CLEAR WIRELESS, LLC

4400 CARILLION POINT
KIRKLAND, WA 98033

PROJECT LOCATION:
ENFIELD
CT-HFD0003A

188 MOODY STREET
ENFIELD, CT

APPROVED BY:

SITE TYPE:
MONOPOLE
CO-LOCATION

PROJECT MANAGER:
PB

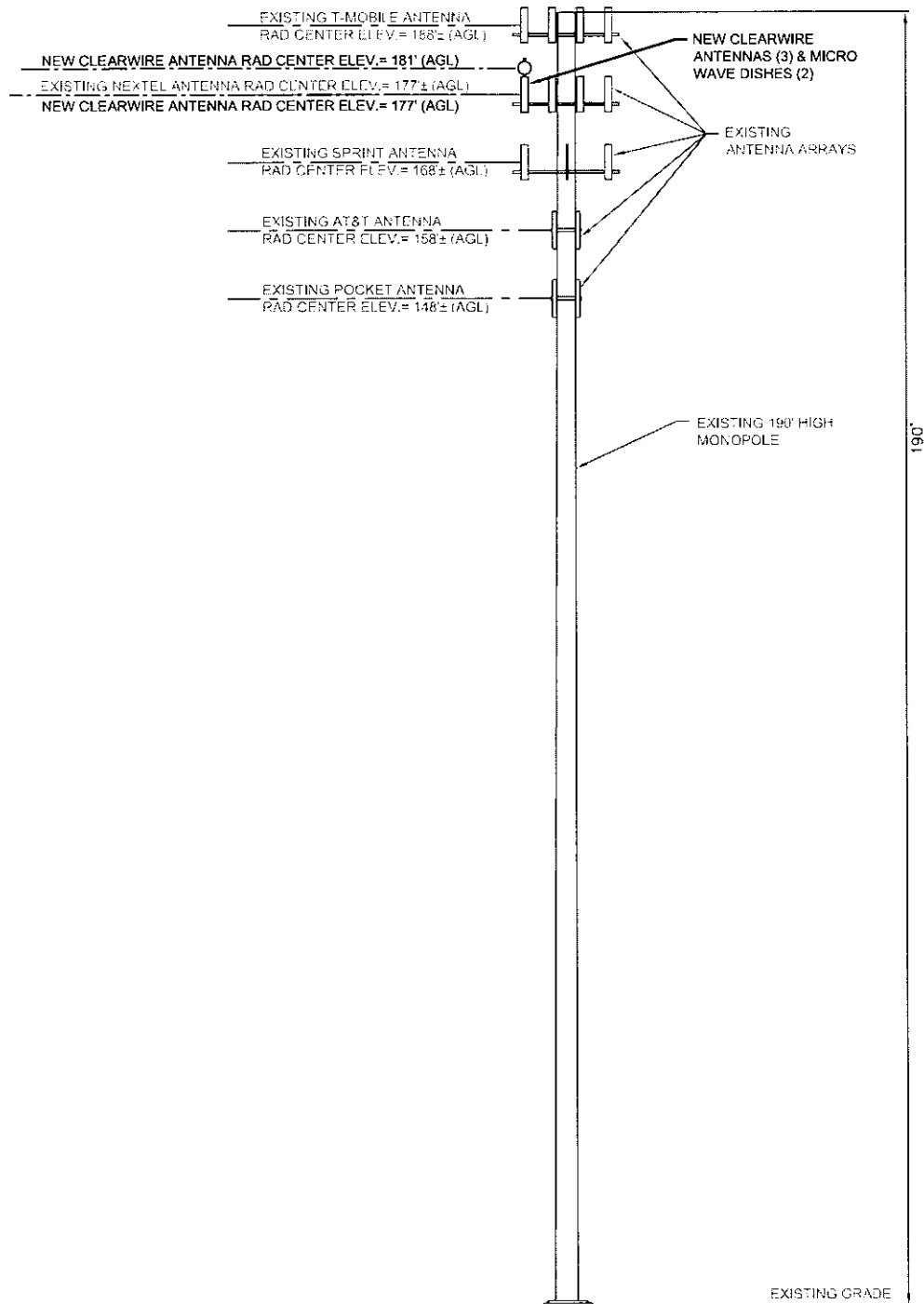
DATE:
2/9/2010

DRAWN BY:
ACG

REVISION:
2

DB PROJ. #:
09-083.13

L1



TOWER ELEVATION

SCALE: NTS

ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATION OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITIES COMPANIES.

 DICESARE BENTLEY ENGINEERS / SURVEYORS / PLANNERS	clearwire® CLEAR WIRELESS, LLC 4400 CARILLION POINT KIRKLAND, WA 98033	PROJECT LOCATION: ENFIELD CT-HFD0003A 188 MOODY STREET ENFIELD, CT APPROVED BY:	SITE TYPE: MONOPOLE CO-LOCATION		DB PROJ. #: 09-083.13 L2
			PROJECT MANAGER: PB	DRAWN BY: ACG	
			DATE: 2/9/2010	REVISION: 2	



PASS
(Tower, Shaft, 98% capacity - PASS)



February 24, 2010

Ms. Catherine Godwin
TowerCo, LLC
5000 Valleystone Drive
Cary, NC 27519
(919) 653-5737

Vertical Solutions, Inc.
PO Box 579
Holly Springs, NC 27540
(888) 321-6167
operations@verticalsolutions-inc.com

Subject:

Rigorous Structural Analysis

Carrier Designation

Sprint/Nextel - Clearwire, Reconfiguration
Site Number: CT-HFD0003-NCT0054
Site Name: CT0054 / Enfield-Moody Rd

TowerCo Designation

Site Number: CT2000
Site Name: Enfield-moody Rd

Engineering Firm Designation

Vertical Solutions Project: 100207.02, Revision 0

Site Data

188 Moody Road, Enfield, Hartford County, CT 06082
Latitude: N42° 00' 7.20"±; Longitude: W072° 31' 18.10"±
Elevation: 189ft±, Topography Category: 1;
189-ft Self-Supporting Pole Structure (Monopole)

Dear Ms. Godwin,

To your request, we present our structural analysis.

Our work indicates that with the proposed appurtenance configuration, the tower and foundation will satisfy the structural strength requirements of TIA/EIA-222-F-1996, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* (industry standard) and the 2003 *International Building Code* (local building code) for:

- 80-mph fastest mile basic wind speed
- 69-mph fastest mile basic wind speed with 1/2-in radial ice

We trust you find our work satisfactory. Please do not hesitate to call should you have any questions.

Sincerely,

Kingsley C. Igboanugo, E.I.
Structural Engineer-In-Training



Michael L. Lassiter, S.E., P.E., C.W.I.
Structural Engineer, Civil Engineer, Certified Weld Inspector
& President

FEB 24 2010

Table 1: Existing, Proposed and Reserved Appurtenance Configuration

Elevation (AGL, ft)	Carrier	Mount	Equipment	Coax	Location
184.5	T-Mobile	Low Profile Platform	(9) RFS APX16PV-16-PVL-E (12) TMAs	(18) 1-5/8	Inside
181.0	Clearwire	Low Profile Platform	(2) Andrew VHLP1-23	(2) 1/2	Inside
178.5	Clearwire		(3) Kathrein 840-10054 (3) RRU 26" x 14" x 9" (1) GPS Motorola Timing 2000	(6) 5/16 (1) 1/2	Inside
	Sprint / Nextel		(9) Decibel DB844H90E-XY	(9) 1 5/8	Inside
168.5 ¹	Sprint / Nextel [Existing]	Low Profile Platform	(6) Andrew DB980F90E-M	(6) 1 5/8	Inside
168.5 ¹	Sprint / Nextel [Design]	Low Profile Platform	(12) Decibel DB844	(12) 1 5/8	Inside
158.0	AT&T	Stand Offs	(3) Kathrein 800-10121 (6) TMAs	(6) 1 5/8	Inside
148	Pocket Communication	Stand Offs	(3) Kathrein 742-213	(6) 1 5/8	Outside
60.5	Sprint / Nextel	Sidearm	(1) GPS antenna	(1) 1/2	Outside

1 – Design loading [EPA = 39.6 sq. ft] is greater than existing loading [EPA = 18.6 sq. ft] but less than the maximum reserved loading. Therefore, the design loading was considered in the analysis.

2 – Hand hole rims are available at 179.5-ft

Table 2: Twist and Sway Limitations for Clearwire Equipment¹

Elevation (AGL, ft)	Equipment	Dish Frequency (GHz)	Deformation Limit ² (deg)	Tilt (deg)	Twist (deg)	Resultant (deg)	Result
181.0	VHLP1-23	23	2.30	1.9754	0.0011	1.9754	O.K.

1 – See program output for supporting details.

2 – Deformation limit based on an allowable 10 dB degradation in radio frequency signal level per Annex D of TIA Standard Revision G

Table 3: Tower Structure Results, Percent Capacity Utilized

Elevation (ft)	Shaft	Result	Connections	Result
188 to 178	21	O. K.	2	O.K.
178 to 132.5	87	O. K.	-	-
132.5 to 87.5	96	O. K.	-	-
87.5 to 43.25	98	O. K.	-	-
43.25 to 0	93	O.K.	94	O.K.

Table 4: Foundation Results, Percent Capacity Utilized

Component	Design Foundation	Analysis Requirements	Percent Utilized	Result
Moment	3850 k-ft	3471 k-ft	90	O. K.
Shear	30 k	26 k	87	O. K.

Attachments:

- Project History
- Coax configuration
- Program input and output
- Flange plate and Flange bolts calculations
- Base plate and anchor rod calculations

Project History, 100207.02Rev0, Enfield Moody Rd, CT, CT2000

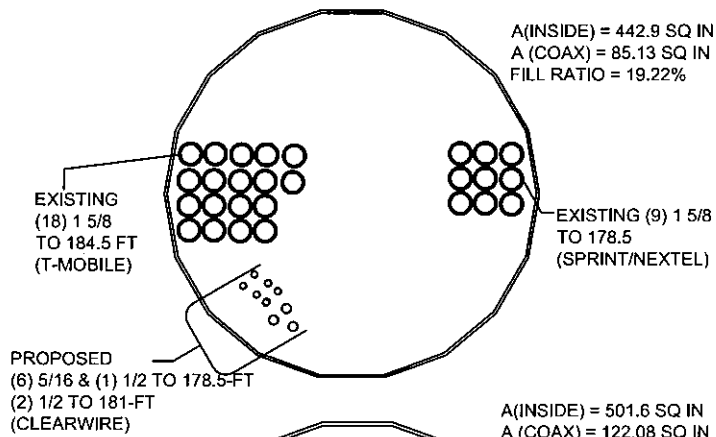
Design Documents						
TowerCo Document	Structure	Document ID	Issued Date	Issued By	Issued to	Description
505442	CT2000	19980930_GEO_CT2000	9/30/1998	Tectonic Engineering & Surveying Consultants	Nextel	Geotechnical Investigation
197314	CT2000	20000212_TFDC_CT2000	2/12/2000	Summit Manufacturing, LLC	Nextel	Tower and Foundation Design Calculations
505401	CT2000	20020531_SLA_CT2000	5/31/2002	TowerCo	AT&T	Site Lease Agreement
242073	CT2000	20070828_SRL_CT2000	8/28/2007	Paul J. Ford	Sprint	Structural Analysis
242083	CT2000	20071217_SAR_CT2000	12/17/2007	Semaan Engineering Solutions	Sprint	Structural Analysis
513579	CT2000	20080312_SLA_CT2000	3/12/2008	TowerCo	Pocket Communications	Site Lease Agreement
779387	CT2000	20080314_TID_CT2000	3/14/2008	Paul J. Ford	Sprint	Tower Improvement Drawings
197321	CT2000	20080319_SAR_CT2000	3/19/2008	Semaan Engineering Solutions	Sprint	Structural Analysis
242081	CT2000	20080326_SLA_CT2000	3/26/2008	TowerCo	T-Mobile	Site Lease Agreement
779315	CT2000	20080828_SAR_CT2000	8/28/2008	Semaan Engineering Solutions	Sprint	Structural Analysis
711875	CT2000	20080923_SLA_CT2000	9/23/2008	TowerCo	Sprint	Site Lease Agreement
719719	CT2000	20081027_SIR_CT2000	10/27/2008	SiteMaster	TowerCo	site inspection report
714939	CT2000	20081027_TED_CT2000	10/27/2008	SiteMaster	TowerCo	Tower Elevation Drawing
--	CT2000	20100218_COR_CT2000	02/18/2010	Towerco	Vertical Solutions, Inc	Correspondence, Email

Table Note:
Files name format YYYYMMDD-XXX-ZZZZZZ.pdf
Where:

YYYY=year
MM=month
DD=day published/issued
XXX=file descriptor
ZZZZZ=TowerCo Site ID

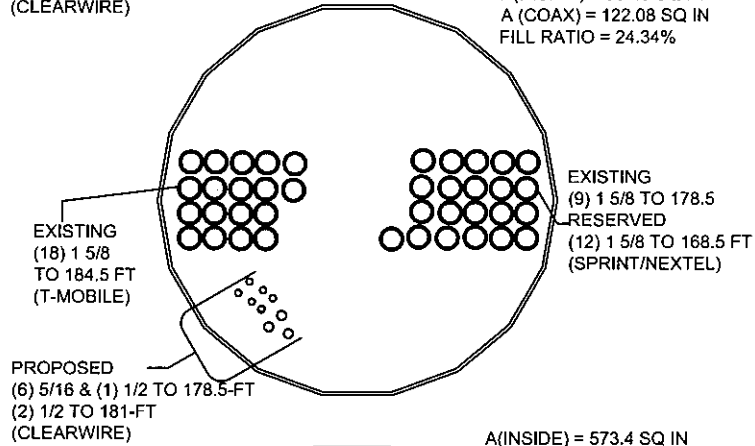
COAX CONFIGURATION PLAN AT 174.5-FT

SCALE: 1" = 1'-0"



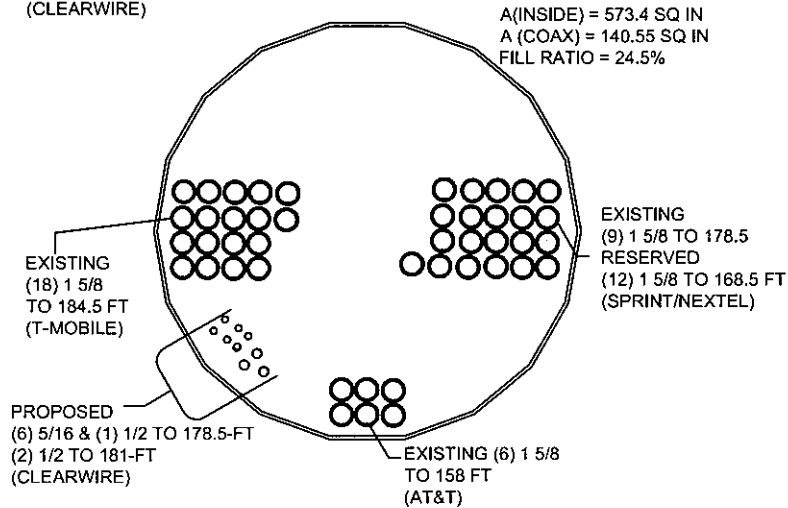
COAX CONFIGURATION PLAN AT 168.5-FT

SCALE: 1" = 1'-0"



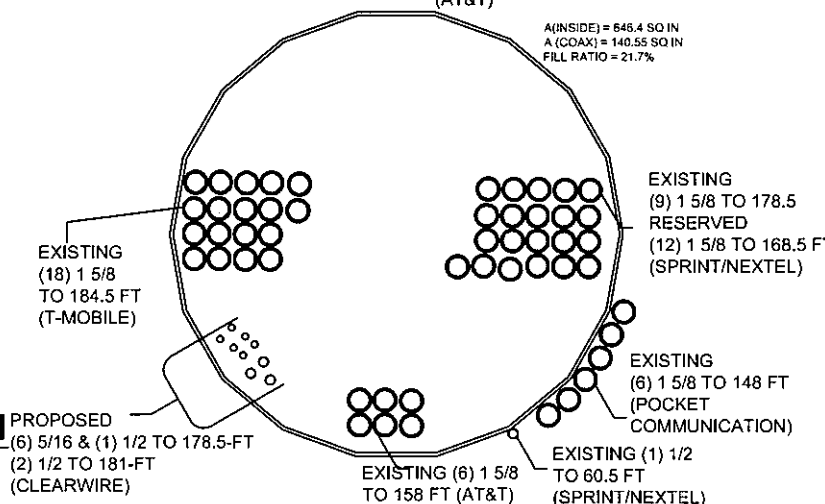
COAX CONFIGURATION PLAN AT 158-FT

SCALE: 1" = 1'-0"



COAX CONFIGURATION PLAN AT 148-FT

SCALE: 1" = 1'-0"



DRAWN BY:	KCI	CHECKED BY:	MILL
SHEET NUMBER:	QP-P		
REVISION:	0		
VSI #:	100207.01		

REV	DATE
0	02/11/2010

PREPARED FOR:	
TowerCo 5000 Valley Stone Drive Cary, NC 27519 Office: (919) 469-5559 Fax: (919) 469-5530 www.towerco.com	

PROJECT NAME:	
ENFIELD MOODY RD TOWERCO JOB #: CT2000	

PREPARED BY:	
Vertical Solutions 2002 Production Drive Apex, NC 27539 Office: (888) 321-6167 Fax: (919) 321-1768 www.verticalsolutions-inc.com	

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AXIAL
51 K

SHEAR
22 K

MOMENT
3059 kip-ft

TORQUE 0 kip-ft
69 mph WIND - 0.5000 in ICE

AXIAL
42 K

MOMENT
3471 kip-ft

SHEAR
26 K

TORQUE 0 kip-ft
REACTIONS - 80 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) APX16PV-16-PVL-E w/ 2" Pipe (T-Mobile (Existing))	184.5	(4) DB844 w/Mount Pipe (Sprint/Nextel (Design))	168.5
(3) APX16PV-16-PVL-E w/ 2" Pipe (T-Mobile (Existing))	184.5	(4) DB844 w/Mount Pipe (Sprint/Nextel (Design))	168.5
(3) APX16PV-16-PVL-E w/ 2" Pipe (T-Mobile (Existing))	184.5	PIROD 13' Low Profile Platform (Sprint/Nextel (Design))	168.5
PIROD 13' Low Profile Platform (T-Mobile (Existing))	184.5	(2) TMA (ATT (Existing))	158
(4) TMA (T-Mobile (Existing))	184.5	Pirod 4' Side Mount Standoff (1) (ATT (Existing))	158
(4) TMA (T-Mobile (Existing))	184.5	Pirod 4' Side Mount Standoff (1) (ATT (Existing))	158
(4) TMA (T-Mobile (Existing))	184.5	Pirod 4' Side Mount Standoff (1) (ATT (Existing))	158
VHLP1-23 (Clearwire)	181	Pirod 4' Side Mount Standoff (1) (ATT (Existing))	158
VHLP1-23 (Clearwire)	181	Kathrein 800 10121 w Mount Pipe (ATT (Existing))	158
(3) DB844H90E-XY (Sprint/Nextel (Existing))	178.5	(2) TMA (ATT (Existing))	158
PIROD 13' Low Profile Platform (Sprint/Nextel (Existing))	178.5	Kathrein 800 10121 w Mount Pipe (ATT (Existing))	158
Kathrein 840-10054 w Mount Pipe (Clearwire (Proposed))	178.5	(2) TMA (ATT (Existing))	158
Kathrein 840-10054 w Mount Pipe (Clearwire (Proposed))	178.5	Kathrein 800 10121 w Mount Pipe (ATT (Existing))	158
Kathrein 840-10054 w Mount Pipe (Clearwire (Proposed))	178.5	Pirod 4' Side Mount Standoff (1) (Pocket PCS (Existing))	148
RRU 26" x 14" x 9" TMA (Clearwire (Proposed))	178.5	Pirod 4' Side Mount Standoff (1) (Pocket PCS (Existing))	148
RRU 26" x 14" x 9" TMA (Clearwire (Proposed))	178.5	Pirod 4' Side Mount Standoff (1) (Pocket PCS (Existing))	148
RRU 26" x 14" x 9" TMA (Clearwire (Proposed))	178.5	Kathrein 742-213 w/MP (Pocket PCS (Existing))	148
GPS Motorola Timing 2000 (Clearwire (Proposed))	178.5	Kathrein 742-213 w/MP (Pocket PCS (Existing))	148
(3) DB844H90E-XY (Sprint/Nextel (Existing))	178.5	Kathrein 742-213 w/MP (Pocket PCS (Existing))	148
(3) DB844H90E-XY (Sprint/Nextel (Existing))	178.5	GPS Antenna (Sprint/Nextel (Existing))	60.5
(4) DB844 w/Mount Pipe (Sprint/Nextel (Design))	168.5		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 97.5%

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	Code: TIA/EIA-222-F	Date: 02/24/10	Scale: NTS		
	Path: L:\2010\0207 - Enfield Moody Rd. CT\Task 3-4\Mobile\RSA\CT2000.cad				
	Dwg No. E-1				

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Tower Input Data

There is a pole section.

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

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

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

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	188.00-178.00	10.00	0.00	18	22.3400	24.0000	0.1875	0.7500	A572-65 (65 ksi)
L2	178.00-132.50	45.50	4.00	18	24.0000	31.5540	0.2188	0.8750	A572-65 (65 ksi)
L3	132.50-87.50	49.00	4.75	18	30.4524	38.5880	0.3125	1.2500	A572-65 (65 ksi)
L4	87.50-43.25	49.00	5.75	18	37.1743	45.3090	0.3750	1.5000	A572-65 (65 ksi)
L5	43.25-0.00	49.00		18	43.6044	51.7400	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	Iw/Q _s in ²	w in	w/t
L1	22.6846	13.1835	817.3609	7.8641	11.3487	72.0223	1635.7974	6.5930	3.6018	19.21
	24.3702	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
L2	24.3702	16.5116	1179.7676	8.4423	12.1920	96.7657	2361.0876	8.2574	3.8390	17.55
	32.0408	21.7565	2698.9319	11.1240	16.0294	168.3735	5401.4151	10.8803	5.1685	23.627
L3	31.5966	29.8950	3430.9970	10.6997	15.4698	221.7864	6866.5085	14.9504	4.8096	15.391
	39.1833	37.9645	7026.7906	13.5878	19.6027	358.4603	14062.8273	18.9859	6.2415	19.973
L4	38.5485	43.8004	7493.6938	13.0638	18.8846	396.8157	14997.2479	21.9044	5.8827	15.687
	46.0080	53.4827	13642.7174	15.9516	23.0170	592.7242	27303.3862	26.7464	7.3144	19.505
L5	45.2465	59.9427	14111.5821	15.3243	22.1510	637.0616	28241.7327	29.9770	6.9044	15.781
	52.5382	71.2399	23688.5249	18.2124	26.2839	901.2554	47408.2197	35.6267	8.3362	19.054

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Multi.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in
ft	ft ²	in						
L1 188.00-178.00				1	1	1		
L2 178.00-132.50				1	1	1		
L3 132.50-87.50				1	1	1		
L4 87.50-43.25				1	1	1		
L5 43.25-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		$C_r A_{r1}$ ft ² /ft	Weight plf
LDF7-50A (1-5/8 FOAM) (T-Mobile (Existing)) ****	C	No	Inside Pole	184.50 - 0.00	18	No Ice 1/2" Ice	0.00 0.00	0.82 0.82
LDF4P-50A (1/2 FOAM) (Clearwire)	C	No	Inside Pole	181.00 - 0.00	2	No Ice 1/2" Ice	0.00 0.00	0.15 0.15
LDF4P-50A (1/2 FOAM) (Clearwire)	C	No	Inside Pole	178.50 - 0.00	1	No Ice 1/2" Ice	0.00 0.00	0.15 0.15
RG-11 (5/16 FOAM POLYE.) (Clearwire) **	C	No	Inside Pole	178.50 - 0.00	6	No Ice 1/2" Ice	0.00 0.00	0.09 0.09
LDF7-50A (1-5/8 FOAM) (Sprint/Nextel (Existing)) **	C	No	Inside Pole	178.50 - 0.00	9	No Ice 1/2" Ice	0.00 0.00	0.82 0.82
LDF7-50A (1-5/8 FOAM) (Sprint/Nextel (Existing)) ***	C	No	Inside Pole	168.50 - 0.00	12	No Ice 1/2" Ice	0.00 0.00	0.82 0.82
LDF7-50A (1-5/8 FOAM) (AT&T (Existing)) ***	C	No	Inside Pole	158.00 - 0.00	6	No Ice 1/2" Ice	0.00 0.00	0.82 0.82
LDF7-50A (1-5/8 FOAM) (Pocket PCS (Existing))	C	No	CaAa (Out Of Face)	148.00 - 0.00	5	No Ice 1/2" Ice	0.00 0.00	0.82 2.33
LDF7-50A (1-5/8 FOAM) (Pocket PCS (Existing)) *****	C	No	CaAa (Out Of Face)	148.00 - 0.00	1	No Ice 1/2" Ice	0.20 0.30	0.82 2.33
LDF4P-50A (1/2 FOAM) (Sprint/Nextel (Existing))	C	No	CaAa (Out Of Face)	60.50 - 0.00	1	No Ice 1/2" Ice	0.06 0.16	0.15 0.84

Feed Line/Linear Appurtenances Section Areas

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_{d1}A_{11}$ In Face ft ²	$C_{d1}A_{11}$ Out Face ft ²	Weight K
L1	188.00-178.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.10
L2	178.00-132.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.069	1.61
L3	132.50-87.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.910	1.93
L4	87.50-43.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.848	1.90
L5	43.25-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.288	1.86

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	$C_{d1}A_{11}$ In Face ft ²	$C_{d1}A_{11}$ Out Face ft ²	Weight K
L1	188.00-178.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L2	178.00-132.50	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.619	1.75
L3	132.50-87.50	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	13.410	2.34
L4	87.50-43.25	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.998	2.31
L5	43.25-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	19.938	2.28

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	$C_{d1}A_{11}$ Front ft ²	$C_{d1}A_{11}$ Side ft ²	Weight K
(3) APX16PV-16-PVL-E w/ 2" Pipe (T-Mobile (Existing))	A	From Leg	3.00 0.00 0.00	0.0000	184.50	No Ice 1/2" Ice 7.07 7.64	4.27 5.10	0.06 0.11
(3) APX16PV-16-PVL-E w/ 2" Pipe (T-Mobile (Existing))	B	From Leg	3.00 0.00 0.00	0.0000	184.50	No Ice 1/2" Ice 7.07 7.64	4.27 5.10	0.06 0.11
(3) APX16PV-16-PVL-E w/ 2" Pipe	C	From Leg	3.00 0.00	0.0000	184.50	No Ice 1/2" Ice 7.07 7.64	4.27 5.10	0.06 0.11

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{1A1} Front ft ²	C _{1A1} Side ft ²	Weight K
(T-Mobile (Existing))			0.00						
PiROD 13' Low Profile Platform	A	None		0.0000	184.50	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
(T-Mobile (Existing))									
(4) TMA	A	From Leg	3.00	0.0000	184.50	No Ice	0.70	0.23	0.01
(T-Mobile (Existing))			0.00			1/2" Ice	0.82	0.33	0.01
			0.00						
(4) TMA	B	From Leg	3.00	0.0000	184.50	No Ice	0.70	0.23	0.01
(T-Mobile (Existing))			0.00			1/2" Ice	0.82	0.33	0.01
			0.00						
(4) TMA	C	From Leg	3.00	0.0000	184.50	No Ice	0.70	0.23	0.01
(T-Mobile (Existing))			0.00			1/2" Ice	0.82	0.33	0.01
			0.00						

(3) DB844H90E-XY	A	From Leg	3.00	0.0000	178.50	No Ice	2.87	3.73	0.01
(Sprint/Nextel (Existing))			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(3) DB844H90E-XY	B	From Leg	3.00	0.0000	178.50	No Ice	2.87	3.73	0.01
(Sprint/Nextel (Existing))			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(3) DB844H90E-XY	C	From Leg	3.00	0.0000	178.50	No Ice	2.87	3.73	0.01
(Sprint/Nextel (Existing))			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
PiROD 13' Low Profile Platform	A	None		0.0000	178.50	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
(Sprint/Nextel (Existing))									

(4) DB844 w/Mount Pipe	A	From Leg	3.00	0.0000	168.50	No Ice	3.58	5.63	0.04
(Sprint/Nextel (Design))			0.00			1/2" Ice	4.20	6.73	0.08
			0.00						
(4) DB844 w/Mount Pipe	B	From Leg	3.00	0.0000	168.50	No Ice	3.58	5.63	0.04
(Sprint/Nextel (Design))			0.00			1/2" Ice	4.20	6.73	0.08
			0.00						
(4) DB844 w/Mount Pipe	C	From Leg	3.00	0.0000	168.50	No Ice	3.58	5.63	0.04
(Sprint/Nextel (Design))			0.00			1/2" Ice	4.20	6.73	0.08
			0.00						
PiROD 13' Low Profile Platform	A	None		0.0000	168.50	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
(Sprint/Nextel (Design))									

Kathrein 800 10121 w Mount Pipe	A	From Leg	1.00	0.0000	158.00	No Ice	5.80	4.71	0.07
(AT&T (Existing))			0.00			1/2" Ice	6.34	5.56	0.11
			0.00						
(2) TMA	A	From Leg	1.00	0.0000	158.00	No Ice	0.70	0.23	0.01
(AT&T (Existing))			0.00			1/2" Ice	0.82	0.33	0.01
			0.00						
Kathrein 800 10121 w Mount Pipe	B	From Leg	1.00	0.0000	158.00	No Ice	5.80	4.71	0.07
(AT&T (Existing))			0.00			1/2" Ice	6.34	5.56	0.11
			0.00						
(2) TMA	B	From Leg	1.00	0.0000	158.00	No Ice	0.70	0.23	0.01
(AT&T (Existing))			0.00			1/2" Ice	0.82	0.33	0.01
			0.00						
Kathrein 800 10121 w Mount Pipe	C	From Leg	1.00	0.0000	158.00	No Ice	5.80	4.71	0.07
(AT&T (Existing))			0.00			1/2" Ice	6.34	5.56	0.11
			0.00						
(2) TMA	C	From Leg	1.00	0.0000	158.00	No Ice	0.70	0.23	0.01
(AT&T (Existing))			0.00			1/2" Ice	0.82	0.33	0.01
			0.00						

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C ₁ A ₁ Front ft ²	C ₁ A ₁ Side ft ²	Weight K
Pirot 4' Side Mount Standoff (1) (AT&T (Existing))	A	None	0.00	0.0000	158.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirot 4' Side Mount Standoff (1) (AT&T (Existing))	B	None		0.0000	158.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirot 4' Side Mount Standoff (1) (AT&T (Existing))	C	None		0.0000	158.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09

Kathrein 742-213 w/MP (Pocket PCS (Existing))	A	From Leg	1.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice	5.32 5.84	4.88 6.07	0.06 0.11
Kathrein 742-213 w/MP (Pocket PCS (Existing))	B	From Leg	1.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice	5.32 5.84	4.88 6.07	0.06 0.11
Kathrein 742-213 w/MP (Pocket PCS (Existing))	C	From Leg	1.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice	5.32 5.84	4.88 6.07	0.06 0.11
Pirot 4' Side Mount Standoff (1) (Pocket PCS (Existing))	A	None		0.0000	148.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirot 4' Side Mount Standoff (1) (Pocket PCS (Existing))	B	None		0.0000	148.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirot 4' Side Mount Standoff (1) (Pocket PCS (Existing))	C	None		0.0000	148.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09

Kathrein 840-10054 w Mount Pipe (Clearwire (Proposed))	A	From Leg	3.00 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice	5.77 6.23	2.66 3.23	0.05 0.09
Kathrein 840-10054 w Mount Pipe (Clearwire (Proposed))	B	From Leg	3.00 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice	5.77 6.23	2.66 3.23	0.05 0.09
Kathrein 840-10054 w Mount Pipe (Clearwire (Proposed))	C	From Leg	3.00 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice	5.77 6.23	2.66 3.23	0.05 0.09
RRU 26" x 14" x 9" TMA (Clearwire (Proposed))	A	From Leg	3.00 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice	3.54 3.80	2.27 2.51	0.01 0.03
RRU 26" x 14" x 9" TMA (Clearwire (Proposed))	B	From Leg	3.00 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice	3.54 3.80	2.27 2.51	0.01 0.03
RRU 26" x 14" x 9" TMA (Clearwire (Proposed))	C	From Leg	3.00 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice	3.54 3.80	2.27 2.51	0.01 0.03
GPS Motorola Timing 2000 (Clearwire (Proposed))	C	From Leg	3.00 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice	0.30 0.37	0.30 0.37	0.00 0.00

GPS Antenna (Sprint/Nextel (Existing))	C	From Leg	1.00 0.00 0.00	0.0000	60.50	No Ice 1/2" Ice	0.30 0.37	0.30 0.37	0.00 0.00

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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
VHLP1-23 (Clearwire)	A	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		181.00	1.00	No Ice 1/2" Ice 0.79 0.92	0.02 0.02
VHLP1-23 (Clearwire)	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		181.00	1.00	No Ice 1/2" Ice 0.79 0.92	0.02 0.02

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 90 deg - No Ice
4	Dead+Wind 180 deg - No Ice
5	Dead+Ice+Temp
6	Dead+Wind 0 deg+Ice+Temp
7	Dead+Wind 90 deg+Ice+Temp
8	Dead+Wind 180 deg+Ice+Temp
9	Dead+Wind 0 deg - Service
10	Dead+Wind 90 deg - Service
11	Dead+Wind 180 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 178	95.282	11	4.4790	0.0007
L2	178 - 132.5	85.918	11	4.4648	0.0007
L3	136.5 - 87.5	49.910	11	3.6088	0.0003
L4	92.25 - 43.25	22.015	11	2.3231	0.0001
L5	49 - 0	6.078	11	1.1411	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
184.50	(3) APX16PV-16-PVL-E w/ 2" Pipe	11	91.998	4.4798	0.0007	17383
181.00	VHLP1-23	11	88.719	4.4758	0.0007	12427
178.50	(3) DB844H90E-XY	11	86.384	4.4673	0.0007	9218

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
168.50	(4) DB844 w/Mount Pipe	11	77.146	4.3687	0.0006	4728
158.00	Kathrein 800 10121 w Mount Pipe	11	67.724	4.1725	0.0005	3142
148.00	Kathrein 742-213 w/MP	11	59.143	3.9266	0.0004	2380
60.50	GPS Antenna	11	9.179	1.3709	0.0001	1886

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	188 - 178	168.611	4	7.9313	0.0012
L2	178 - 132.5	152.065	4	7.9063	0.0011
L3	136.5 - 87.5	88.412	4	6.3935	0.0005
L4	92.25 - 43.25	39.031	4	4.1184	0.0002
L5	49 - 0	10.782	4	2.0240	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
184.50	(3) APX16PV-16-PVL-E w/ 2" Pipe	4	162.808	7.9327	0.0014	10126
181.00	VHLP1-23	4	157.014	7.9255	0.0014	7238
178.50	(3) DB844H90E-XY	4	152.888	7.9106	0.0014	5366
168.50	(4) DB844 w/Mount Pipe	4	136.564	7.7376	0.0013	2742
158.00	Kathrein 800 10121 w Mount Pipe	4	119.910	7.3928	0.0011	1817
148.00	Kathrein 742-213 w/MP	4	104.740	6.9584	0.0008	1374
60.50	GPS Antenna	4	16.280	2.4844	0.0001	1067

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _n	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P/P _a
	ft		ft	ft		ksi	in ²	K	K	
L1	188 - 178 (1)	TP24x22.34x0.1875	10.00	188.00	266.9	2.097	14.1714	-6.14	29.71	0.207*
L2	178 - 132.5 (2)	TP31.554x24x0.2188	45.50	188.00	207.2	3.478	21.2954	-9.04	74.08	0.122
L3	132.5 - 87.5 (3)	TP38.588x30.4524x0.3125	49.00	188.00	169.5	5.196	37.1823	-16.60	193.21	0.086
L4	87.5 - 43.25 (4)	TP45.309x37.1743x0.375	49.00	188.00	144.5	7.152	52.3465	-26.72	374.38	0.071
L5	43.25 - 0 (5)	TP51.74x43.6044x0.4375	49.00	188.00	123.9	9.732	71.2399	-41.59	693.31	0.060

* DL controls

RISATower Vertical Solutions Inc 2002 Production Drive Apex, NC 27539 Phone: (919) 321-6167 FAX: (919) 321-1768	Job	CT2000	Page	8 of 8
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	Client	TowerCo	Designed by	kingsley

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	188 - 178 (1)	TP24x22.34x0.1875	0.05	-0.007	39.000	0.000	0.00	0.000	39.000	0.000
L2	178 - 132.5 (2)	TP31.554x24x0.2188	543.38	-40.428	39.000	1.037	0.00	0.000	39.000	0.000
L3	132.5 - 87.5 (3)	TP38.588x30.4524x0.3125	1336.48	-46.651	39.000	1.196	0.00	0.000	39.000	0.000
L4	87.5 - 43.25 (4)	TP45.309x37.1743x0.375	2265.11	-47.879	39.000	1.228	0.00	0.000	39.000	0.000
L5	43.25 - 0 (5)	TP51.74x43.6044x0.4375	3471.12	-46.217	39.000	1.185	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio P P_u	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	188 - 178 (1)	TP24x22.34x0.1875	0.207	0.000	0.000	0.207* ✓	1.000	H1-3 ✓
L2	178 - 132.5 (2)	TP31.554x24x0.2188	0.122	1.037	0.000	1.159 ✓	1.333	H1-3 ✓
L3	132.5 - 87.5 (3)	TP38.588x30.4524x0.3125	0.086	1.196	0.000	1.282 ✓	1.333	H1-3 ✓
L4	87.5 - 43.25 (4)	TP45.309x37.1743x0.375	0.071	1.228	0.000	1.299 ✓	1.333	H1-3 ✓
L5	43.25 - 0 (5)	TP51.74x43.6044x0.4375	0.060	1.185	0.000	1.245 ✓	1.333	H1-3 ✓

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* P_{allow} K	% Capacity	Pass Fail
L1	188 - 178	Pole	TP24x22.34x0.1875	1	-6.14	29.71	20.7	Pass
L2	178 - 132.5	Pole	TP31.554x24x0.2188	2	-9.04	98.74	86.9	Pass
L3	132.5 - 87.5	Pole	TP38.588x30.4524x0.3125	3	-16.60	257.54	96.2	Pass
L4	87.5 - 43.25	Pole	TP45.309x37.1743x0.375	4	-26.72	499.05	97.5	Pass
L5	43.25 - 0	Pole	TP51.74x43.6044x0.4375	5	-41.59	924.19	93.4	Pass
							Summary	
							Pole (L4)	97.5 Pass
							RATING =	97.5 Pass

FLANGE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

Input - $M := 3471 \cdot \text{kip} \cdot \text{ft}$ = moment at top of flange plate
 $P := 42 \cdot \text{kip}$ = axial load (use zero if base plate is grouted)
 $F_y := 50 \cdot \text{ksi}$ = yield stress of flange plate
 $b_{\text{eff}} := 27 \cdot \text{in}$ = effective width of flange plate in flexure
 $t := 3.25 \cdot \text{in}$ = thickness of flange plate
 $\text{ASI} := 133 \cdot \%$ = allowable stress increase

CONSTANTS:

$\text{psi} = \frac{\text{lb}}{\text{in}^2}$
 $\text{ksi} = 1000 \cdot \text{psi}$
 $\text{kip} = 1000 \cdot \text{lb}$

$$Q := \begin{pmatrix} 4 \\ 4 \\ 4 \\ 4 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \quad d := \begin{pmatrix} 2 \cdot 12 + 5 + \frac{3}{8} \\ 2 \cdot 12 + 4 + \frac{1}{16} \\ 9 \\ 3 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in} \quad A_{\text{stiff}} := \begin{pmatrix} 3.976 \\ 3.976 \\ 3.976 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \text{in}^2 \quad A_{\text{stress}} := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \text{in}^2 \quad F_t := \begin{pmatrix} 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{ksi}$$

$$\sum \overrightarrow{(Q)} = 16 \quad \text{sumQAd} := \sum \overrightarrow{(Q \cdot d^2 \cdot A_{\text{stiff}})}$$

$$\text{sumQAd} = 27679 \cdot \text{in}^4$$

$$\overrightarrow{R} := \frac{M \cdot \overrightarrow{(d \cdot A_{\text{stiff}})}}{\text{sumQAd}} + \frac{P \cdot A_{\text{stiff}}}{\sum \overrightarrow{(A_{\text{stiff}} \cdot Q)}}$$

$$f_t := \left(\frac{R}{A_{\text{stress}}} \right) \quad r := \left(\frac{f_t}{\text{ASI} \cdot F_t} \right)$$

$$R = \begin{pmatrix} 178.4 \\ 170.5 \\ 56.5 \\ 20.6 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip} \quad f_t = \begin{pmatrix} 54.9 \\ 52.5 \\ 17.4 \\ 6.3 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{ksi} \quad r = \begin{pmatrix} 92 \\ 88 \\ 29 \\ 11 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners

d = distance from center

A = area of fastener

F_t = allowable tension stress

$$m := \begin{pmatrix} 3 + \frac{1}{2} \\ 2 + \frac{1}{4} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in} \quad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2} \right) \cdot R \cdot m \right]}$$

$$M_{PL} = \begin{pmatrix} 104.1 \\ 63.9 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip} \cdot \text{ft} \quad \sum M_{PL} = 2016.0 \cdot \text{kip} \cdot \text{in}$$

$$f_b := \frac{\sum M_{PL}}{\left(\frac{b_{eff} \cdot t^2}{6} \right)} \quad f_b = 42.4 \cdot \text{ksi}$$

$$F'_b := ASI \cdot 0.75 \cdot F_y$$

$$r_b := \frac{f_b}{F'_b}$$

$$r_b = 85\%$$

FLANGE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

Input - $M := 0.05 \cdot \text{kip} \cdot \text{ft}$ = moment at top of flange plate
 $P := 6.30 \cdot \text{kip}$ = axial load (use zero if base plate is grouted)
 $F_y := 36 \cdot \text{ksi}$ = yield stress of flange plate
 $b_{\text{eff}} := 10 \cdot \text{in}$ = effective width of flange plate in flexure
 $t := 1.0 \cdot \text{in}$ = thickness of flange plate
 $\text{ASI} := 133 \cdot \%$ = allowable stress increase

CONSTANTS:

$$\text{psi} = \frac{\text{lb}}{\text{in}^2}$$

$$\text{ksi} = 1000 \cdot \text{psi}$$

$$\text{kip} = 1000 \cdot \text{lb}$$

$$Q := \begin{pmatrix} 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \quad d := \begin{pmatrix} 9 + \frac{1}{2} \\ 8 + \frac{15}{16} \\ 7 + \frac{1}{4} \\ 4 + \frac{3}{4} \\ 1 + \frac{5}{8} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in}$$

$$A_{\text{stiff}} := \begin{pmatrix} 0.785 \\ 0.785 \\ 0.785 \\ 0.785 \\ 0.785 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \text{in}^2 \quad A_{\text{stress}} := \begin{pmatrix} 0.785 \\ 0.785 \\ 0.785 \\ 0.785 \\ 0.785 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \text{in}^2$$

$$F_t := \begin{pmatrix} 0.33 \cdot 120 \\ 0.33 \cdot 120 \\ 0.33 \cdot 120 \\ 0.33 \cdot 120 \\ 0.33 \cdot 120 \\ 0.33 \cdot 120 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{ksi}$$

$$\sum(Q) = 9 \quad \text{sumQAd} := \sum(Q \cdot d^2 \cdot A_{\text{stiff}})$$

$$\text{sumQAd} = 318 \cdot \text{in}^4$$

$$R := \frac{M \cdot (d \cdot A_{\text{stiff}})}{\text{sumQAd}} + \frac{P \cdot A_{\text{stiff}}}{\sum(A_{\text{stiff}} \cdot Q)}$$

$$f_t := \left(\frac{R}{A_{\text{stress}}} \right) \quad r := \left(\frac{f_t}{\text{ASI} \cdot F_t} \right)$$

$$R = \begin{pmatrix} 0.7 \\ 0.7 \\ 0.7 \\ 0.7 \\ 0.7 \\ 0.7 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip}$$

$$f_t = \begin{pmatrix} 0.9 \\ 0.9 \\ 0.9 \\ 0.9 \\ 0.9 \\ 0.9 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{ksi}$$

$$r = \begin{pmatrix} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners

d = distance from center

A = area of fastener

Ft = allowable tension stress

$$m := \begin{pmatrix} 2 + \frac{1}{2} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{in} \quad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2} \right) \cdot R \cdot m \right]}$$

$$M_{PL} = \begin{pmatrix} 0.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot \text{kip} \cdot \text{ft} \quad \sum M_{PL} = 0.9 \cdot \text{kip} \cdot \text{in}$$

$$f_b := \frac{\sum M_{PL}}{\left(\frac{b_{eff} \cdot t^2}{6} \right)} \quad f_b = 0.5 \cdot \text{ksi}$$

$$F'_b := ASI \cdot 0.75 \cdot F_y$$

$$r_b := \frac{f_b}{F'_b}$$

$$r_b = 1. \%$$



To: Maxton
From: Frantz Pierre – Radio Frequency Engineer
Cc: Micah Hawthorne
Subject: Power Density Report for CT-HFD0003
Date: March 09, 2010

1. Introduction:

This report is the result of Electromagnetic Field Intensities (EMF – Power Densities) study for the Clearwire broadband antenna installation on a Self Support Tower at 188 Moody St, Enfield, CT, 06082. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location:

2: Discussion:

The following assumptions were used in the calculations:

- 1) The emissions from Clearwire transmitters are in the (2496 – 2960) Frequency Band
- 2) The emissions from the Clearwire Microwave dishes are in the 11 GHz Frequency Band
- 3) The model number for Clearwire Antenna is Argus LLPX310R
- 4) The model number for the Microwave dish is Andrew VHLP2-11 with 24" Diameter.
- 5) The Clearwire Panel antenna centerline is 177 feet.
- 6) The Clearwire Microwave dish centerline is 177 feet.
- 7) The Maximum Transmit power from any Clearwire panel antenna is 251 Watts Effective Isotropic Radiated Power (EiRP) assuming 2 channels per sector.
- 8) The Maximum Transmit power from any Clearwire Microwave Dish is 346 Watts Effective Isotropic Radiated Power (EiRP) assuming 1 channel per dish.
- 9) All antennas are simultaneously transmitting and receiving 24 hours per day.
- 10) The average ground level of the studied area does not change significantly with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were used with the above information to perform the calculations.

3: Conclusion:

Based on the above worst case assumptions, the power density calculation from the Clearwire antenna installation on a Steel Monopole at 188 Moody St, Enfield, CT is 0.003555 mW/cm². This value represents 0.36% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm²) set forth in the FCC/ANSI/IEEE C95-1-1991. Furthermore, the proposed antenna location for Clearwire will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.

The combined Power Density from all other carriers is 16.00 %. The combined Power Density for this site is 16.36% of the M.P.E. standard.