

# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

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E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

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*Daniel F. Caruso*

*Chairman*

June 24, 2010

Thomas J. Regan, Esq.  
Brown Rudnick LLP  
185 Asylum Street, CityPlace I  
Hartford, CT 06103-3402

RE: **TS-CLEARWIRE-034-100430** -Clear Wireless, LLC request for an order to approve tower sharing at an approved telecommunications facility located at 52 Stadley Rough Road, Danbury, Connecticut.

Dear Attorney Regan:

At a public meeting held June 17, 2010, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures with the following conditions:

- The proposed coax shall be installed inside the monopole's shaft; and
- Not more than 45 days after completion of construction, the Council shall be notified in writing that the coax was installed as specified.

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

This decision applies only to this request for tower sharing and is not applicable to any other request or construction. Please be advised that the validity of this action shall expire one year from the date of this letter.

The proposed shared use is to be implemented as specified in your letter dated April 30, 2010, including the placement of all necessary equipment and shelters within the tower compound.

Thank you for your attention and cooperation.

Very truly yours,

  
Daniel F. Caruso  
Chairman

DFC/MP/laf

c: The Honorable Mark D. Boughton, Mayor, City of Danbury  
Dennis Elpern, City Planner, City of Danbury  
SBA Network Services, Inc.

THOMAS J. REGAN  
Direct Dial: (860) 509-6522  
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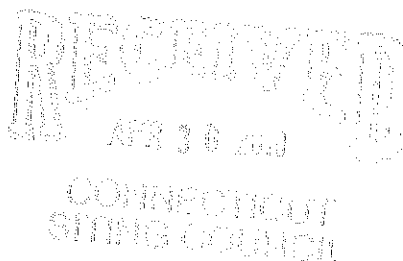
TS-CLEARWIRE-034-100430

*Via Hand Delivery*

April 30, 2010

Daniel F. Caruso, Chairman  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

ORIGINAL



**RE: Clearwire Corporation – Tower Sharing Application**

Dear Mr. Caruso:


At the request of the Siting Council, enclosed for refiling you will find an original and twenty (20) copies of a "*Tower Sharing Application*", at 52 Stadley Rough Road, Danbury, Connecticut. Previously, a Notice of Exempt Modification was filed on behalf of Clearwire Corporation for this site but the Siting Council requested that a Tower Sharing Application be filled for this site.

Initially when this site was first filed with the Siting Council, the fee was \$500.00. We hereby request that \$500.00 previously submitted be used to cover this filing. If you have any questions, please feel free to contact me.

I would appreciate it if you could please date stamp the copy of this transmittal letter and return it to the courier delivering this package.

Very truly yours,

**BROWN RUDNICK LLP**

By:   
Thomas J. Regan

TJR/bh  
Enclosures

cc/encls: via 1<sup>st</sup> Class Mail: Mark D. Boughton, Mayor, City of Danbury  
# 40272587 v1 - REGANTJ - 025064/0017

CONNECTICUT

ORIGINAL

In re:

Request of Clear Wireless LLC for the Approval :  
of the Shared Use of a Tower to be Located at :  
52 Stadley Rough Road, Danbury, Connecticut. : April 30, 2010

**TOWER SHARING APPLICATION**

Clear Wireless LLC ("Clearwire") proposes herein to share a telecommunications tower (the "Tower") to be located at 52 Stadley Rough Road in Danbury, Connecticut (the "Facility"). Optasite Towers LLC was issued a Certificate of Environmental Compatibility and Public Need from the Connecticut Siting Council (the "Council") for the Tower on April 23, 2009 in Docket No. 366. Pursuant to Connecticut General Statutes §16-50aa (the "Statute"), Clearwire requests a finding from the Council that the shared use of this Facility is technically, legally, environmentally, and economically feasible, will meet public safety concerns, will avoid the unnecessary proliferation of towers and is in the public interest. Clearwire further requests an order approving the shared use of this Facility.

The purpose of this request is to utilize a telecommunications tower that has been Certified by the Council to develop Clearwire's 4G wireless broadband network to provide high-speed wireless data and to develop VoIP service within the State of Connecticut and in this area of Danbury. Therefore, this application avoids the construction of an additional tower in Danbury.

### A. The Facility

The Facility is located at a latitude of 41° 25' 59.17" N and longitude of 73° 25' 54.9" W. The Tower is a 140-foot monopole. Pursuant to the Structural Report, multiple carriers plan to locate on the Tower. A site plan is attached.

### B. Proposed Project

Clearwire will install three (3) WiMAX antennas (Model No. Argus LLPX310R), two (2) Dragonwave dishes (Model No. A-ANT-32G-2-C) and three (3) Remote Radio Heads (Model No. Samsung FDD-R6-RHH BTS). Clearwire plans to flush-mount its three (3) antennas with a centerline of 107 feet and flush-mount its two (2) proposed dishes with a centerline of 109 feet.<sup>1</sup> The Remote Radio Heads will be installed on the same mount as the proposed antennas. Six (6) cables, 5/16" in diameter, will run to the new WiMAX antennas (two (2) cables per panel). Additionally, two (2) coax cables, 1/2" in diameter, will run to the new dishes (one (1) cable per dish). Clearwire's proposed cables will be installed inside shaft of the Tower.

Clearwire plans to lease a 10-foot by 10-foot (approximately) area within the previously approved fenced compound. Within its lease area, Clearwire proposes to locate its equipment cabinet in an 8-foot by 8-foot (approximately) shed. Clearwire's shed will be wood sided with a cedar appearance and a peaked roof. A proposed ice bridge will connect Clearwire's equipment to the Tower. No upgrades to the access road or parking area will be necessary.

### C. Technical Feasibility

Consistent with the requirements of the Statute, it is technically feasible for Clearwire to collocate at this Facility. To analyze whether the Tower can support Clearwire's proposed modifications, Clearwire commissioned FDH Engineering, Inc. to perform a structural analysis

of the Tower with Clearwire's proposed antennas. FDH utilized the most recent available information provide by the Tower owner. The structural analysis is attached. According to the Structural Analysis Report, dated March 11, 2010, "... the foundation should have the necessary capacity to support the reserved and proposed loading" (Page 3, Structural Analysis Report).

#### D. Legal Feasibility

The Council has the authority, pursuant to the Statute, to issue an order approving the shared use of this Tower. By issuing an order approving Clearwire's use of the Tower, Clearwire will be able to proceed with obtaining a building permit for its proposed installation on the Tower. Therefore, consistent with the Statute, Clearwire's proposal is legally feasible.

#### E. Economic Feasibility

Clearwire is a wireless telecommunications provider licensed by the Federal Communications Commission to provide service in areas of Connecticut, including but not limited to Fairfield County. Clearwire has entered into a lease with SBA for the purpose of locating its antennas and associated equipment at the Facility so that it may provide wireless telecommunications service to this area of Danbury. A copy of the Letter of Authorization is attached. Therefore, the shared use of this Facility is economically feasible.

#### F. Environmental Feasibility

Pursuant to the Statute, the proposal will be environmentally feasible for the following reasons:

- The overall impact on the City of Danbury will be decreased with the sharing of a single tower versus the proliferation of towers.

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<sup>1</sup> Please note the site plan states the dishes are at 110 feet because the site plan shows the height at the top of the dishes, not at the centerline. Clearwire's proposed dishes will have a centerline of 109 feet.

- The proposal will not increase the height of the Tower.
- There will be little increase in the visibility of the Tower with the addition of Clearwire's antennas, Remote Radio Heads and dishes.
- There will be no impact on any wetlands or water resources as a result of Clearwire's modifications.
- There will be no increased impact on air quality because no air pollutants will be generated during the normal operation of the Facility.
- There will only be a brief, slight increase in noise pollution while the antennas are attached and the equipment building is installed.
- During construction, the proposed project will generate a small amount of traffic as workers arrive and depart and materials are delivered. Upon completion, traffic will be limited to an average of one monthly maintenance/inspection visit.

#### G. Public Safety Concerns / Benefits

There will be no adverse impact to the health and safety of the surrounding community or the workers at the Facility due to the addition of Clearwire's antennas to the Tower. Clearwire performed an analysis of the radio frequency fields emanating from the transmitting antennas on the Tower to ensure compliance with the National Council on Radiation Protection and Measurements' ("NCRP") standard for maximum permissible exposure ("MPE") adopted by the Federal Communications Commission ("FCC"). The analysis, dated March 7, 2010, indicates that Clearwire's antennas will emit .000179% of the NCRP's standard for maximum permissible exposure. A cumulative power density analysis indicates that together, T-Mobile and Clearwire

will cumulatively emit 0.001523% of the NCRP's standard for maximum permissible exposure. The power density analysis is attached.<sup>2</sup> Therefore, the analysis demonstrates that the maximum level of radio-frequency energy emitted from the Tower will be well below the FCC's mandated radio frequency exposure limits. The analysis was performed by Julius G. De La Cruz, Radio Frequency Engineer, and his resume is attached.

Moreover, Clearwire expects to enhance safety in the Danbury area by improving wireless communications for local residents and travelers. Clearwire is currently developing its 4G wireless broadband network to provide high-speed wireless data and its VoIP service within the State of Connecticut. Clearwire's 4G service leverages the WiMAX technology to enable enhanced wireless data communications. In order to provide reliable coverage to residents and travelers in this area of Danbury and fulfill their coverage goals to comply with their FCC license, this site is a necessary part of Clearwire's network development.

Specifically, this proposal is designed to provide reliable wireless coverage along Stadley Rough Road, along approximately 1 mile of Great Plain Road and along approximately 0.8 miles of Corn Tassle Road. Clearwire's proposal will also provide a reliable signal level in and around the surrounding commercial and residential areas within close proximity to the site.

### Conclusion

For the reasons stated above, the attachment of Clearwire's antennas, Remote Radio Heads and dishes to the Tower would meet all the requirements set forth in the Statute. This proposal is technically, legally, environmentally and economically feasible and meets all public


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<sup>2</sup> Please note, pursuant to the Council's request the power density analysis includes analysis of T-Mobile's installation and Clearwire's installation.



safety concerns. Therefore, Clearwire respectfully requests that the Council approve this request for the shared use of the Tower located at 52 Stadley Rough Road in Danbury, Connecticut.


Clear Wireless LLC

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Thomas J. Regan  
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Fax - 860.509.6501

**Certificate of Service**

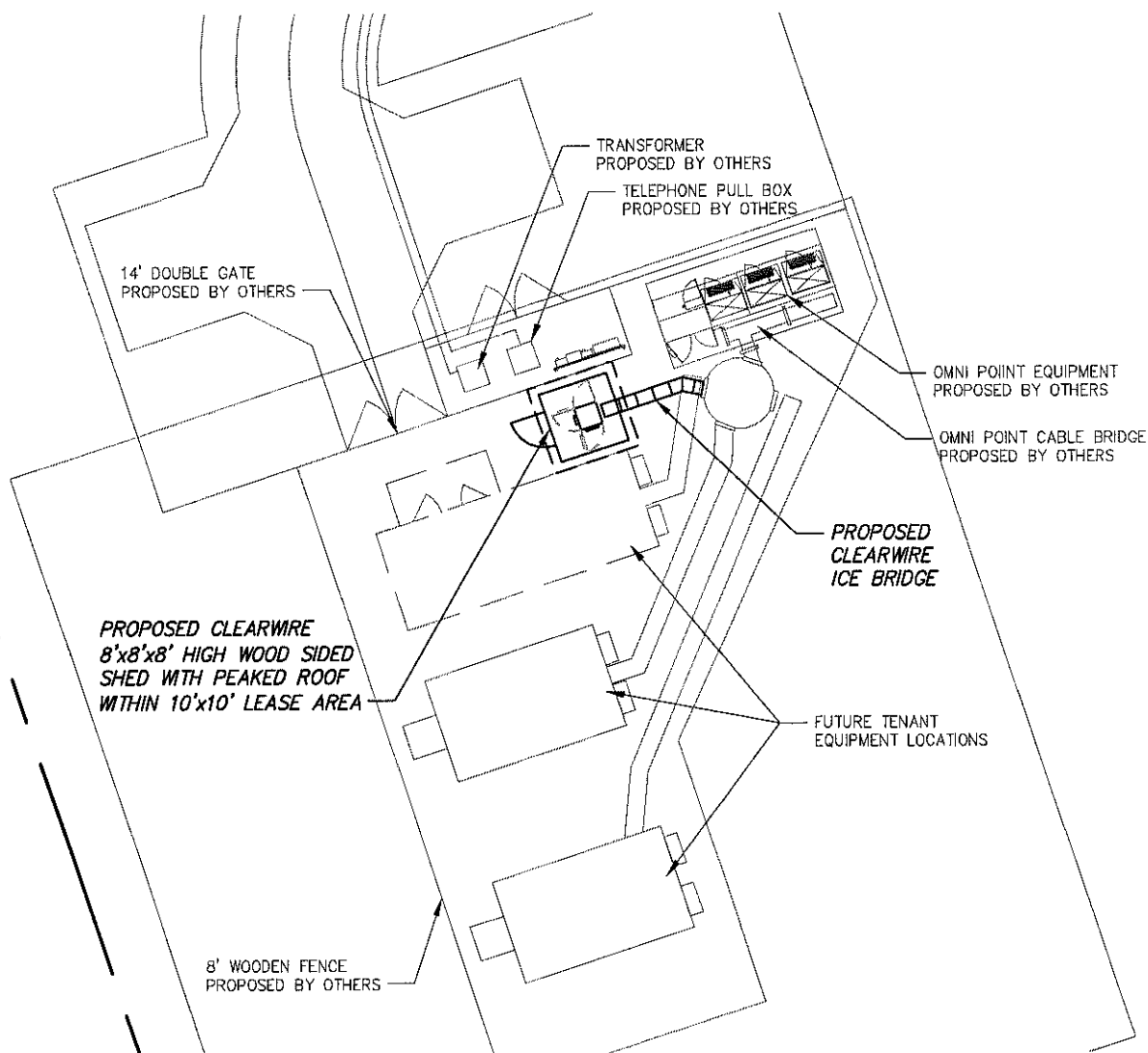
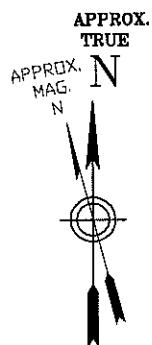
This is to certify that on this 30<sup>th</sup> day of April, 2010, the foregoing Tower Sharing Application was sent, via first class mail, to the following:

Mayor Mark D. Boughton  
City of Danbury  
City Hall  
155 Deer Hill Avenue  
Danbury, CT 06810

By:   
Thomas J. Regan

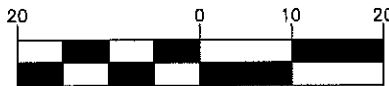
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### SITE PLAN

GRAPHIC SCALE



IN FEET

## LEASE EXHIBIT

SCALE: 1" = 20'  
MARCH 16, 2010

1 OF 3

REVISION  
NUMBER 4

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# CHA

III Winans Circle, PO Box 5269 - Albany, NY 12205-0269  
Main: (518) 463-4600 • www.chacompanies.com

## clearw're

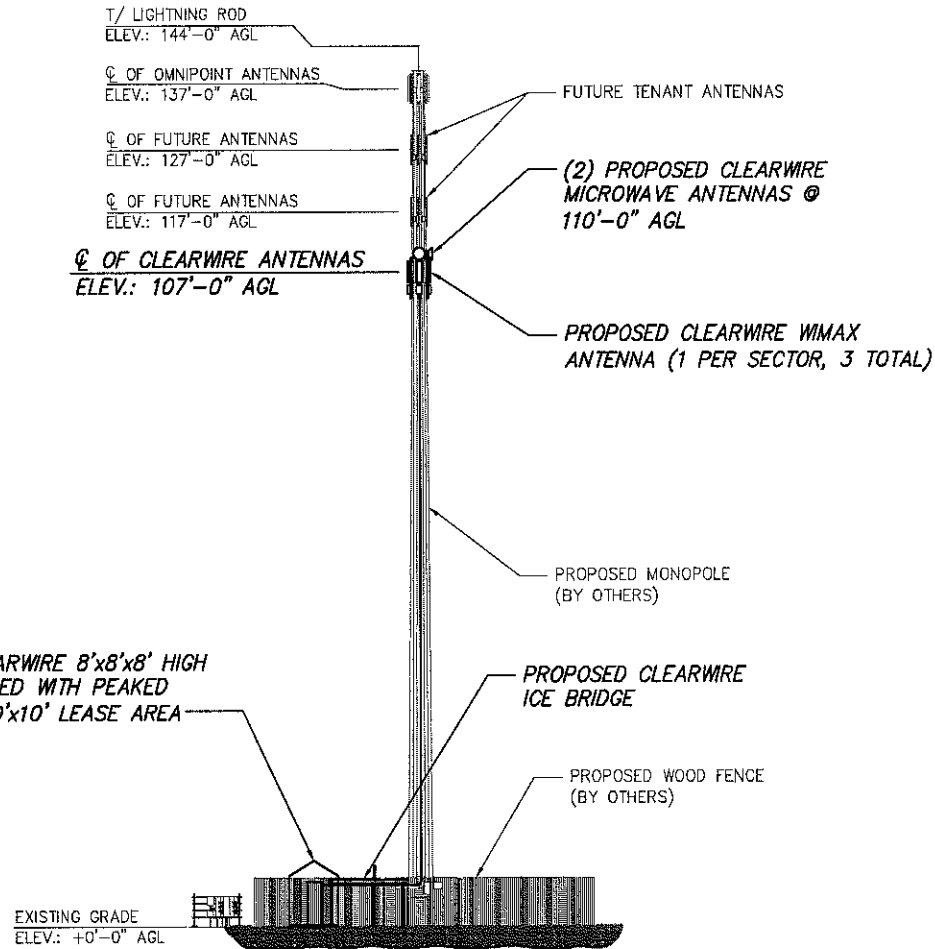
TECHNOLOGIES, INC.

5808 LAKE WASHINGTON  
BLVD, NE STE. 300  
KIRKLAND, WA 98033  
OFFICE: (425) 216-7600  
FAX: (425) 216-7900

CT-BDR0011  
52 STADLEY ROUGH ROAD  
DANBURY, CT 06811

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### SOUTH ELEVATION

NO SCALE

## LEASE EXHIBIT

NO SCALE  
MARCH 16, 2010

2 OF 3

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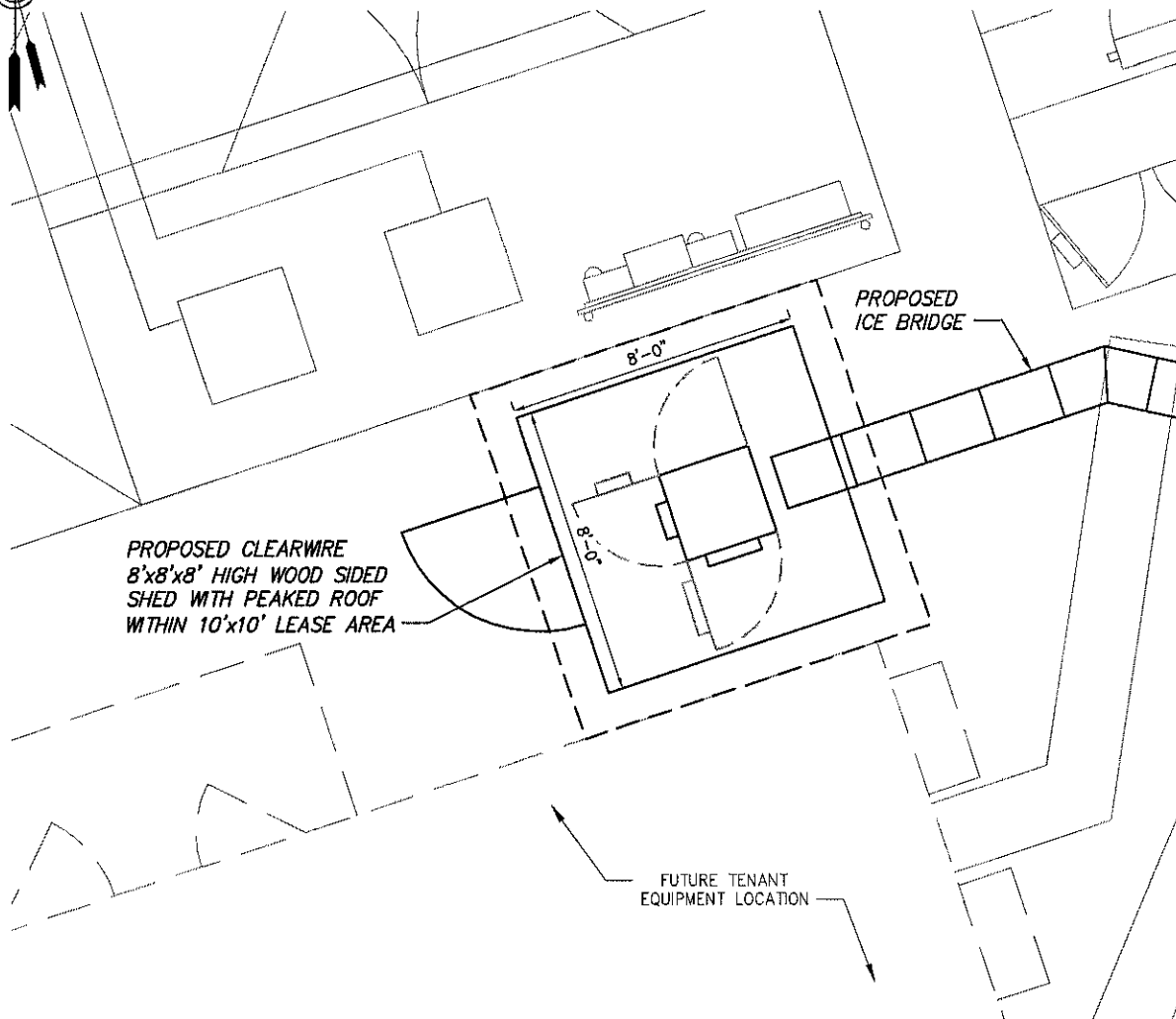
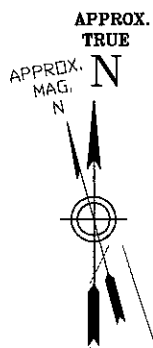
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CT-BDR0011  
52 STADLEY ROUGH ROAD  
DANBURY, CT 06811

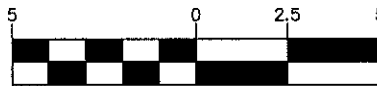
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### EQUIPMENT LAYOUT

GRAPHIC SCALE



IN FEET

## LEASE EXHIBIT

SCALE: 1" = 5'  
MARCH 16, 2010

3 OF 3

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NUMBER 4

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DANBURY, CT 06811

CHA PROJ. NO. - 20592.1053.1101



FDH Engineering, Inc., 2730 Rowland Rd. Raleigh, NC 27615, Ph. 919.755.1012, Fax 919.755.1031

**Structural Analysis for  
SBA Network Services, Inc.**

**140 ft Monopole**

**Site Name: Danbury 1  
Site ID: CT13549-S**

**FDH Project Number 10-01091E S3**

**Prepared By:**

**James Mathewson III, EI  
Project Engineer**

**Reviewed By:**

**Christopher M. Murphy, PE  
Vice President  
CT PE License No. 25842**

**FDH Engineering, Inc.  
2730 Rowland Rd.  
Raleigh, NC 27615  
(919) 755-1012  
info@fdh-inc.com**



**March 11, 2010**

*Prepared pursuant to ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas*

TABLE OF CONTENTS

EXECUTIVE SUMMARY..... 3  
    Conclusions  
    Recommendations

APPURTENANCE LISTING..... 4

RESULTS..... 5

GENERAL COMMENTS..... 6

LIMITATIONS..... 6

POLE PROFILE..... 7

BASE LEVEL SKETCH..... 8



FDH Engineering, Inc., 2730 Rowland Rd. Raleigh, NC 27615, Ph. 919.755.1012, Fax 919.755.1031

**Structural Analysis for  
SBA Network Services, Inc.**

**140 ft Monopole**

**Site Name: Danbury 1  
Site ID: CT13549-S**

**FDH Project Number 10-01091E S3**

**Prepared By:**

**James Mathewson III, EI  
Project Engineer**

**Reviewed By:**

**Christopher M. Murphy, PE  
Vice President  
CT PE License No. 25842**

**FDH Engineering, Inc.**  
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info@fdh-inc.com



**March 11, 2010**

*Prepared pursuant to ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas*



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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Danbury, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standard for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G*. Information pertaining to the soil parameters, proposed antenna loading, current tower geometry, and member sizes was obtained from Sabre Towers & Poles (Job No. 10-01206) Structural Design Report dated January 28, 2010, Tower Engineering Professionals (Project 091184.01) Subsurface Exploration Report dated May 13, 2009 and SBA Network Services, Inc.

The *basic design wind speed* per the *ANSI/TIA-222-G* standard is 100 mph without ice and 50 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

## Conclusions

With the reserved and proposed antennas from Verizon at 97 ft, the tower meets the requirements of the *ANSI/TIA-222-G* standard, provided the **Recommendation** below is satisfied. Furthermore, provided the foundation is designed and constructed to support the original design reactions (see Sabre Job No. 10-01206), the foundation should have the necessary capacity to support the reserved and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e. the steel data, tower layout, reserved and proposed antenna loading) and that the tower will be properly erected and maintained per the original design drawings.

## Recommendation

To ensure the requirements of the *ANSI/TIA-222-G* standard are met with the reserved and proposed loading in place, we have the following recommendation:

1. The proposed coax should be installed inside the monopole's shaft.

## APPURTENANCE LISTING

The proposed antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from this layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

**Table 1 – Appurtenance Loading**

### Reserved Loading:

Antenna No.	Antenna Elevation (ft)	Description	Coax and Lines <sup>1</sup>	Carrier	Mount Elevation (ft)	Mount Type
1-6	137	(6) RFS APX16PV-16VL-E	(12) 1-5/8"	T-Mobile	137	Flush
7-12	127	(6) Decibel DB848H90E-XY	(12) 1-5/8"	Sprint	127	Flush
13-18	117	(3) Kathrein 800-10504 (3) Kathrein 742-351	(12) 1-5/8"	Metro PCS	117	Flush
19-23	109	(2) Dragonwave A-ANT-23G-2-C Dishes	(6) 5/16" (2) 1/2"	Clearwire	109	Flush
	107	(3) Argus LLPX310R (3) Samsung FDD-R6-RRH BTSs			107	Flush

<sup>1</sup> Coax installed inside the pole's shaft unless otherwise noted.

### Proposed Loading:

Antenna No.	Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
1-6	97	(3) Decibel DB856DG65E-XY (3) Antel BXA-70063/6CF	(12) 1-5/8"	Verizon	97	Flush

## RESULTS

Based on information obtained from the original design drawings, the yield strength of steel for individual members was as follows:

**Table 2 - Material Strength**

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	50 ksi
Anchor Bolts	75 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. Table 4 displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the Pole Profile and Base Level Sketch for detailed modeling information.

**Table 3 – Summary of Working Percentage of Structural Components**

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	139 - 98.75	Pole	TP25.3x16x0.1875	36.2	Pass
L2	98.75 - 48.5	Pole	TP36.53x24.1741x0.25	59.9	Pass
L3	48.5 - 0	Pole	TP47.23x34.933x0.3125	59.8	Pass
		Anchor Bolts	(12) 2.25" $\phi$ w/ 53.5" BC	51.6	Pass
		Base Plate	51.5" x 51.5" x 2.75" Thk	47.7	Pass

**Table 4 – Maximum Base Reactions**

Base Reactions	Current Analysis (ANSI/TIA-222-G)*	Original Design (TIA/EIA-222-F)
Axial	25 k	22 k
Shear	19 k	21 k
Moment	1,723 k-ft	2,074 k-ft

\* Current analysis reactions are within an allowable factor of 1.35 when the original design reactions are based on an allowable stress design per ANSI/TIA-222-G.

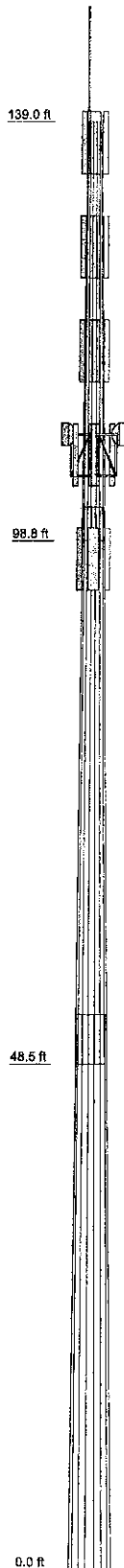
## GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

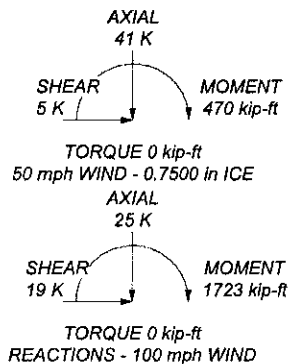
## LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

Section	1	2	3
Length (ft)	40.25	53.50	53.25
Number of Sides	18	18	18
Thickness (in)	0.1875	0.2500	0.3125
Socket Length (ft)	3.25	4.75	34.9330
Top Dia (in)	16.0000	24.1741	47.2300
Bot Dia (in)	25.3000	36.5300	
Grade		A572-85	
Weight (K)	1.7	4.3	7.3



ALL REACTIONS  
ARE FACTORED



## DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	140	8'-6" x 4" Pipe Mount	107
(2) APX16PV-16VL-E w/ mount pipe	137	LLPX310R	107
(2) APX16PV-16VL-E w/ mount pipe	137	LLPX310R	107
(2) APX16PV-16VL-E w/ mount pipe	137	LLPX310R	107
(2) DB848H90E-XY w/ mount pipe	127	FDD-R6-RRH BTS	107
(2) DB848H90E-XY w/ mount pipe	127	FDD-R6-RRH BTS	107
(2) DB848H90E-XY w/ mount pipe	127	FDD-R6-RRH BTS	107
800-10504 w/ mount pipe	117	8'-6" x 4" Pipe Mount	107
800-10504 w/ mount pipe	117	8'-6" x 4" Pipe Mount	107
800-10504 w/ mount pipe	117	BXA-70063/6CF w/ mount pipe	97
742-351 w/ mount pipe	117	DB856DG65E-XY w/ mount pipe	97
742-351 w/ mount pipe	117	DB856DG65E-XY w/ mount pipe	97
742-351 w/ mount pipe	117	DB856DG65E-XY w/ mount pipe	97
A-ANT-23G-2-C Dish	109	BXA-70063/6CF w/ mount pipe	97
A-ANT-23G-2-C Dish	109	BXA-70063/6CF w/ mount pipe	97

## MATERIAL STRENGTH

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

## TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-G Addendum 2, Table 4-8 was used in this analysis.
9. TOWER RATING: 59.9%



**FDH Engineering, Inc.**  
2730 Rowland Road  
Raleigh, North Carolina  
Phone: (919) 755-1012  
FAX: (919) 755-1031

Job: **Danbury 1, CT13549-S**

Project: **10-01091E S3**

Client: **SBA Network Services, Inc.**

Code: **TIA-222-G**

Path:

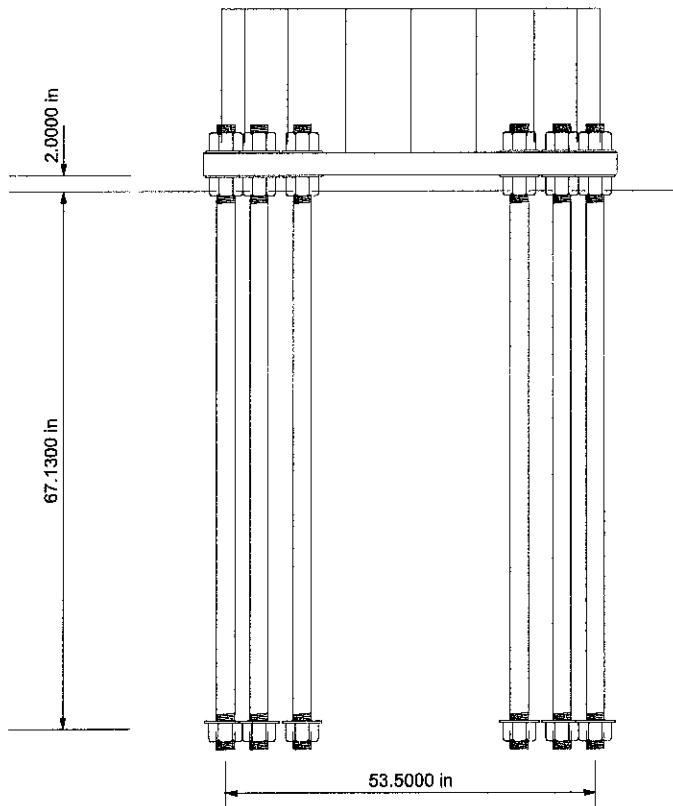
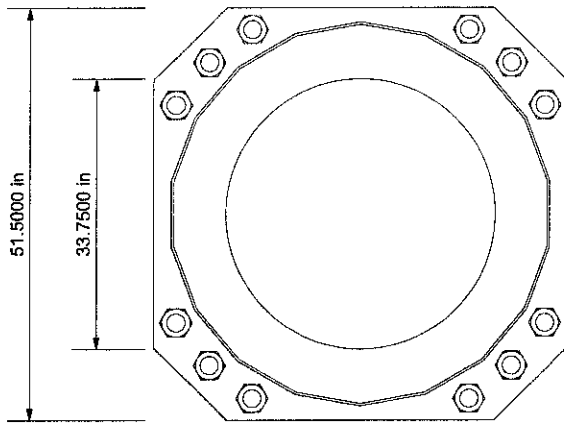
Drawn by: **James Mathewson III**

Date: **03/11/10**

Scale: **NTS**


App'd:

Dwg No. **E-1**



#### FOUNDATION NOTES

1. Plate thickness is 2.7500 in.
2. Plate grade is A572-50.
3. Anchor bolt grade is A615-75.
4.  $f'_c$  is 4 ksi.

 Tower Analysis	<b>FDH Engineering, Inc.</b> 2730 Rowland Road Raleigh, North Carolina Phone: (919) 755-1012 FAX: (919) 755-1031			<b>Job: Danbury 1, CT13549-S</b>	
	<b>Project: 10-01091E S3</b>			<b>Client: SBA Network Services, Inc.</b>	
	<b>Code: TIA-222-G</b>			<b>Drawn by: James Mathewson III</b>	<b>App'd:</b>
	<b>Path:</b>			<b>Date: 03/11/10</b>	<b>Scale: NTS</b>
	<b>Dwg No. F-1</b>				



## LETTER OF AUTHORIZATION

Date: November 11, 2009

SBA Site ID: CT13549-S-04/Danbury 1

Property Located at: 52 Stadley Rough Road, Danbury, CT 06811

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THE CITY/COUNTY OF: DANBURY / FAIRFIELD

### APPLICATION FOR ZONING/USE/BUILDING PERMIT

To Whom It May Concern:

This letter authorizes Clearwire and it's authorized agents to file for all necessary zoning, planning and building permits (local, state and federal) for the purposes of installing, operating and maintaining a telecommunications facility at the site/property referenced above on behalf of Candlewood Baptist Church.

All approval conditions that may be granted to Clearwire in connection with this facility relating to this specific application are the sole responsibility of Clearwire.

Thank you,

SBA Towers II LLC


By: 


Name: Jason Silberstein

Its: Sr. VP, Property Management

Date: 11 / 11 / 2009

Sworn and subscribed this 11<sup>th</sup> day of November, 2009

  
NOTARY PUBLIC

NOTARY PUBLIC STATE OF FLORIDA  
 Wendy Carrick  
Commission # DD495151  
Expires: NOV. 30, 2009  
Bonded Thru Atlantic Bonding Co., Inc.





To: HPC  
From: Julius De La Cruz – Radio Frequency Engineer  
Cc: Micah Hawthorne  
Subject: Power Density Report for CT-BDR0011  
Date: March 7, 2010

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**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 52 Stadley Rough Road, Danbury, CT 06811. 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 – 2690) Frequency Band
- 2) The emissions from the Clearwire microwave dishes are in the 18 GHz Frequency Band
- 3) The model number for Clearwire antenna is Argus LLPX310R
- 4) The model number for the microwave dish is Dragonwave A-ANT-23G-2-C with 24" diameter.
- 5) The Clearwire panel antenna centerline is 107 feet.
- 6) The Clearwire microwave dish centerline is 109 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 self-support tower at 52 Stadley Rough Road, Danbury, CT 06811 is 0.0000018 mW/cm<sup>2</sup>. This value represents 0.000179% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm<sup>2</sup>) 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.



4400 Carillon Point  
Kirkland, WA 98035

The combined Power Density from all other carriers is 0.001344 %. The combined Power Density for this site is 0.001523% of the M.P.E. standard.

Per the FCC OET 65 guidelines for emissions, the Clearwire antennas are categorically excluded because they are not mounted on a building and the lowest point of any antenna is at least 10 meters (about 33 feet) above ground level. Furthermore, the Clearwire antenna arrays are categorically excluded because the total effective radiated power of not only all channels in any one sector's direction are less than 2000 watts, but also all channels operated by Clearwire at the site combine to less than 2000 watts.

Even though this site is categorically excluded, Clearwire, as the new applicant, will not produce exposure levels in excess of 5% of the applicable limit as indicated by Clearwire's contribution percentages of Worker and Public Total MPE values in the attached MPE Calculator.

A handwritten signature in black ink, appearing to read 'Julius De La Cruz'.

Julius De La Cruz  
RF Engineer

# MPE Calculator

## Site Address:

52 Stadley Rough Road  
Danbury, CT 6811

Technology:

Site Name:

Site Number:

Frequency of Carrier:

Total # of Carriers:

EIRP per Carrier (in dbm) from Link Budget:

ERP per Carrier from Link Budget:

Total ERP

Total ERP

RC Height Above Ground [Y]:

Distance Between Tower and Closest Point Worker Would Be\* [X1]:

Distance Between Tower and Closest Point on Fence Line\* [X2]:

Radial Distance to Worker Point of Interest [R1]:

Radial Distance to Public Point of Interest [R2]:

Angle from horizon to Worker Point of Interest

Angle from horizon to Closest point on Fence Line

Antenna centerline mechanical/electrical downtilt, if any

Angle between antenna centerline and radial to Worker Point of Interest

Angle between antenna centerline and radial to Closest Point on Fence Line

Difference between maximum antenna gain and antenna gain along radial to Worker point of interest

Difference between maximum antenna gain and antenna gain along radial to Closest Point on Fence Line

ERP at antenna toward Worker Point of Interest

ERP at antenna toward Closest Point on Fence Line

ERP at antenna toward Worker Point of Interest

ERP at antenna toward Closest Point on Fence Line

Power Density @ Worker Point of Interest:

Power Density @ Public Point of Interest:

ANSI 1992 Standard MPE:

Controlled Environment (Worker):

Uncontrolled Environment (Public):

Percentage of Total MPE per Technology:

Controlled Environment (Worker):

Uncontrolled Environment (Public):

Percentage of Total MPE for Cell Site:

Controlled Environment (Worker):

Uncontrolled Environment (Public):

Clearwire Contribution(Worker)

Clearwire Contribution(Public)

Wimax	GSM	Backhaul	Unit
Clearwire	T-Mobile	Clearwire	
BDR0011		Backhaul	
2500	1940	18000	MHz
6.0	24.0	2	Numeric
54.0	54.2	55.4	dBm
153.46	162.18	211.84	Watts
920.77	3892.34	423.67	Watts
29.6	35.9	26.3	dBW
107	127	109	Feet
4	4	4	Feet
12	12	12	Feet
3263.6	3872.9	3324.8	centimeters
3281.8	3888.2	3342.4	centimeters
87.9	88.2	87.9	Degrees
83.6	84.6	83.7	Degrees
6	6	0	Degrees
81.9	82.2	87.9	Degrees
77.6	78.6	83.7	Degrees
44	40	63	dB
35	38	63	dB
-14.4	-4.1	-36.7	dBW
-5.4	-2.1	-36.7	dBW
36.657	389.234	0.212	milliwatts
291.173	616.895	0.212	milliwatts
0.0000018	0.0000135	0.0000000	mW/cm <sup>2</sup>
0.0000018	0.0000134	0.0000000	mW/cm <sup>2</sup>

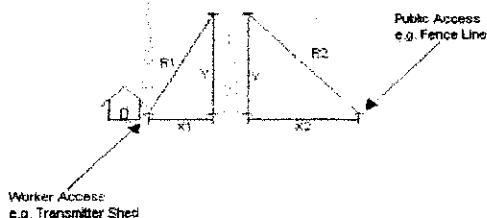
5.000	5.000	5.000	mW/cm <sup>2</sup>
1.000	1.000	1.000	mW/cm <sup>2</sup>

Wimax-Clearwire	GSM-T-Mobile	Backhaul-Clearwire	
0.000036	0.000271	0.000030	%
0.000178	0.001344	0.000001	%

0.000307
0.001523
0.000036
0.000179

\* X1 refers to the horizontal distance between the base of the tower and the nearest point on the property that a worker would work for any length of time e.g. a transmitter shed.

X2 refers to the horizontal distance between the base of the tower and the nearest point on the property line that the public could walk up to or have access e.g. closest point on fence line.



The equations used in this evaluation are based on the equations found in "OET Bulletin 65, Edition 97-01"

Julius De La Cruz  
RF Engineer

## **Curriculum Vitae**

**Julius G. De La Cruz**

*Contact Mobile Number: (714) 941-0099*

*Email Address: Jdelacruz1@hotmail.com*

### **EDUCATION BACKGROUND**

- Bachelor of Science in Electronics and Communications Engineering, Mapua Institute of Technology (Manila, Philippines)

### **EMPLOYMENT HISTORY**

- Nexius Wireless, Senior RF Engineer – March 2004 to Present
- InCode Telecom Group, Senior RF Engineer – January 2004 to March 2004
- Mycom North America, Senior RF Engineer - April 2003 to November 2003
- Marconi/MSI (U.S.A.), Senior Consultant - April 2001 to October 2002
- MSI (U.S.A.), Staff Consultant - May 1996 to March 2001
- Isla Communications Company, RF Planning Supervisor - May 1995 to May 1996
- Isla Communications Company, RF Engineer - May 1994 to Apr 1995

### **PROFESSIONAL EXPERIENCE**

- **WiMAX** (September 2009 to Present) – Engaged by Clearwire New England Market to design overlay, in-fill and capacity sites using Samsung equipment. Responsible for search ring creation, site acquisition support, new site candidates analysis and selection, field surveys, review of lease exhibits and construction drawings, attending and speaking in community and zoning hearings. Also responsible for conducting rooftop Line of Sight (LOS) surveys for microwave communications.
- **PCS1900 GSM** (November 2007 to March 2009) – Engaged by T-Mobile Seattle Market to design in-fill and capacity sites using Nokia equipment. Responsible for search ring creation, site acquisition support, new site candidates analysis and selection, field surveys, attending community and zoning hearings, doing site audits, sweeps results analysis and preparation of close-out packages (including initial KPI statistics) for newly-turned up sites for turn over to the RF Performance Group.
- **PCS1900 GSM** (June 2006 to October 2007) – Engaged by T-Mobile San Francisco Market to design in-fill sites using Ericsson equipment for the Santa Clara, Santa Cruz and Monterey Counties in Northern California (Bay Area). Responsible for the creation of search ring maps, site candidate selection, RF propagation analysis, data fill creation, attending community and zoning hearings, sweeps results analysis, RF shakedowns of newly-turned up sites and preparation of

close-out packages (initial KPI statistics) for newly-turned up sites for turn over to the RF Performance Group.

- **PCS1900 GSM** (March 2004 to May 2006) – Engaged by T-Mobile New York City Market to design in-fill, capacity and replacement sites using Nortel equipment for the Bronx and Manhattan. Responsible for the creation of search ring maps, site candidate selection, RF propagation analysis, data fill creation, RF shakedowns and troubleshooting of new sites that come on air. Also responsible for RF performance of existing sites in the Queens area for a couple of months.
- **PCS1900/850 GSM** (January 2004 to March 2004) – Engaged by SIEMENS to design 200 new sites for Cingular Wireless - St. Louis Market, Missouri. Responsible in analyzing site candidates submitted by the site acquisition group using the WIZARD planning tool. Also responsible in issuing RF Data Sheets, field surveys of candidate sites, rooftop antenna placement recommendations, and other relevant network design activities.
- **PCS1900/850 GSM** (August 2003 to November 2003) - Engaged by NOKIA to do performance monitoring and RF optimization of the PCS1900/850 GSM network of AT&T Wireless - New Jersey Market (AWS Paramus). Responsible in monitoring the site performance (i.e. key performance indicators) of sites using performance tools: Nokia MML, Nokia NetDoctor Reports and EOSFLEX Performance Monitoring Software. Other responsibilities also included giving assistance to Nokia technicians and AWS engineers in troubleshooting sites that are having site performance degradation issues.
- **PCS1900 GSM** (June 2003 to August 2003 ) - Engaged by NOKIA to optimize the GSM PCS 1900 Network of AT&T Wireless – Birmingham Market in Alabama. Responsible for site verifications for RF acceptance, cluster drive test data analysis, frequency retune of sites, neighbor list modifications, and general network parameter changes for network performance enhancements.
- **PCS1900 GSM** (April 2003 to June 2003) - Engaged by NOKIA to optimize the GSM PCS 1900 Network of AT&T Wireless – Jackson Market in Mississippi. Responsible for site verifications for RF acceptance, frequency retune of sites, cluster drive test data analysis, neighbor list modifications, and general network parameter changes for network performance enhancements.
- **PCS1900 GSM** (August 2002 to October 2002) - Involved in the E911/EOTD Accuracy Call Testing of AT&T Wireless PCS 1900 network in Dallas and Denton, Texas. The collected samples were used to come up with a comprehensive study determining which of the two aforementioned methods is better to be implemented in gauging the effectiveness and precision of the EOTD positioning technology of their PCS network. This study has helped AT&T Wireless in making important decisions regarding their EOTD network.
- **PCS1900 GSM** (May 2002 to August 2002) - Engaged by NOKIA to do a PCS1900 GSM network overlay design of the existing TDMA networks of Cingular Wireless in Massachusetts, Philadelphia and New Jersey. Apart from the GSM overlay design other responsibilities also included E911/EOTD Planning and Survey.
- **FIXED WIRELESS** (July 2001 to December 2001) - Contracted by AT&T FWS - Los Angeles Market to design a fixed wireless network in Orange County, California.

Responsibilities included issuance of search ring locations, cell site selection using the DbPlanner Tool, frequency planning, RF Interference Analysis using the AT&T FWS' FACET Tool, site walks, drive test data analysis, and RF propagation model tuning.

- **PCS1900 GSM** (June 1999 to April 2001) - Engaged by VoiceStream Wireless (Now T-Mobile) Chicago Market to design and optimize 115 sites in the northwestern suburbs of Chicago. Design responsibilities were: issuance of search ring locations, site selection, RF coverage planning, CW drive test data analysis, and attending zoning hearings. RF optimization tasks included site assessment and inspection, RF coverage verification, analysis of drive test data, site shakedown, BCCH frequency retunes, neighbor list modifications, general parameter changes, and making recommendations for network enhancements.
- **Traffic Planning** (September 1998 to March 1999) - Contracted by SPRINT PCS Corporate Office in Kansas City to create a cost-effective traffic relief scheme for some of the existing Sprint PCS networks in the US midwest. Responsible for recommending traffic relief schemes through acquisition and analysis of live traffic analysis.
- **Network Design** (October 1997 to June 1998) - Contracted by BellSouth International to design 100 cell sites for BCP- Nordeste in Northeastern Brazil. Responsible for the creation of site search ring areas, site assessment/selection, RF coverage planning, RF propagation modeling, and CW drive test data analysis. Also responsible for training newly hired engineers in using the PlaNET tool.
- **PCS1900 GSM** (July 1996 to August 1997) - Engaged by Aerial Communications (now T-Mobile) - Tampa Market to design and optimize 60 sites in eastern and central Florida using Nokia BTS s. Design tasks included site search area creation, site selection, RF coverage planning, site surveys, zoning presentation assistance, and initial network optimization.
- **GSM900** (February 1994 to April 1996) - Employed by Isla Communications Company, a start-up GSM operator in the Philippines, to design 60 sites deploying Motorola BTS s. Responsible for site selection, RF coverage planning, site surveys, traffic analysis, equipment planning, and RF optimization. Also responsible for recruiting and training newly hired engineers.

### **SOFTWARE & RF TOOLS USED**

- 1 RF Propagation Tools: PlaNET, Odyssey, DBPlanner, Wizard, ASSET, Planet EV
- 2 Drive test & Radio Measurement tools: TOM & SAM (Nemo Tools), TEMS, Optpcs
- 3 Metrica, Nortel OSS, Clearvision

### **TRAINING**

- 1 Introduction to GSM by Nokia
- 2 PlaNET Planning Tool for GSM & CDMA by MSI
- 3 WIZARD Planning Tool for GSM by Agilent

- 4 EME Awareness & Safety by VoiceStream Chicago
- 5 3G Systems Training - WCDMA & CDMA2000 (1XRTT) by Scott Baxter
- 6 GSM Overview by Nokia
- 7 Radio Network Parameters and Optimization by Nokia
- 8 EOTD Planning by Nokia
- 9 Asset Planning Tool by Aircom
- 10 EME Safety Training by SiteSafe