# STATE OF CONNECTICUT

***CONNECTICUT SITING COUNCIL***

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

*Daniel F. Caruso*
*Chairman*


May 27, 2010

Thomas F. Flynn III
Site Development Project Manager
Maxton Technology Inc.
1296 Blue Hills Avenue
Bloomfield, CT 06002

RE: **EM-CLEARWIRE-004-100326** – Clearwire Corporation notice of intent to modify an existing telecommunications facility located at 10 Redwood Lane, Avon, Connecticut.

Dear Mr. Flynn:

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

The proposed modifications are to be implemented as specified here and in your notice dated March 25, 2010, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/MP/CDM/laf

c: The Honorable Mark W. Zacchio, Chairman Town Council, Town of Avon
Brandon Robertson, Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
SBA

G:\EM\Clearwire\Avon\dc050310RedwoodLa.DOC

# 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
www.ct.gov/csc


April 1, 2010

The Honorable John F. Carlson
Chairman Town Council
Town of Avon
60 West Main Street
Avon, CT 06001-3743

RE: **EM-CLEARWIRE-004-100326** – Clearwire Corporation notice of intent to modify an existing telecommunications facility located at 10 Redwood Lane, Avon, Connecticut.

Dear Chairman Town Council Carlson:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by April 15, 2010.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jbw

Enclosure: Notice of Intent

c: Brandon Robertson, Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon

**EM-CLEARWIRE-004-100326**

March 25, 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 10 Redwood Lane, Avon, CT**
**Clearwire Site Number CT-HFD0049**

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 Avon, CT. of Clearwire's intent to make an exempt modification to an existing monopole tower (tower) located at 10 Redwood Lane, AKA 1 Stratmore Lane, Avon, CT. Specifically, Clearwire plans to add three (3) antennas to the tower, one (1) per sector and to add three (3) microwave dishes, one (1) per sector for backhaul at the 91' 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 Brandon Robinson of the Town of Avon, 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, three (3) dishes and to install additional WiMAX related electronic equipment at the base of the tower.

The tower is a 150' monopole located at 10 Redwood Lane, Connecticut (Latitude 41 46 21 N Longitude 72 52 48W). The tower is owned by SBA Network Services Inc.. Currently, T-Mobile, AT&T, Cingular and Pocket are located on the tower, as well as a number of other public service antennas. Presently, Clearwire is not located at the site. Clearwire's base station 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 three (3) microwave dishes, one (1) above each of those antennas. The center line for the microwave dishes will be 91'. 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 FDH Engineering Inc. to perform a structural analysis of the tower and the proposed changes. According to that structural dated March 18, 2010 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 less than 51.1% 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.

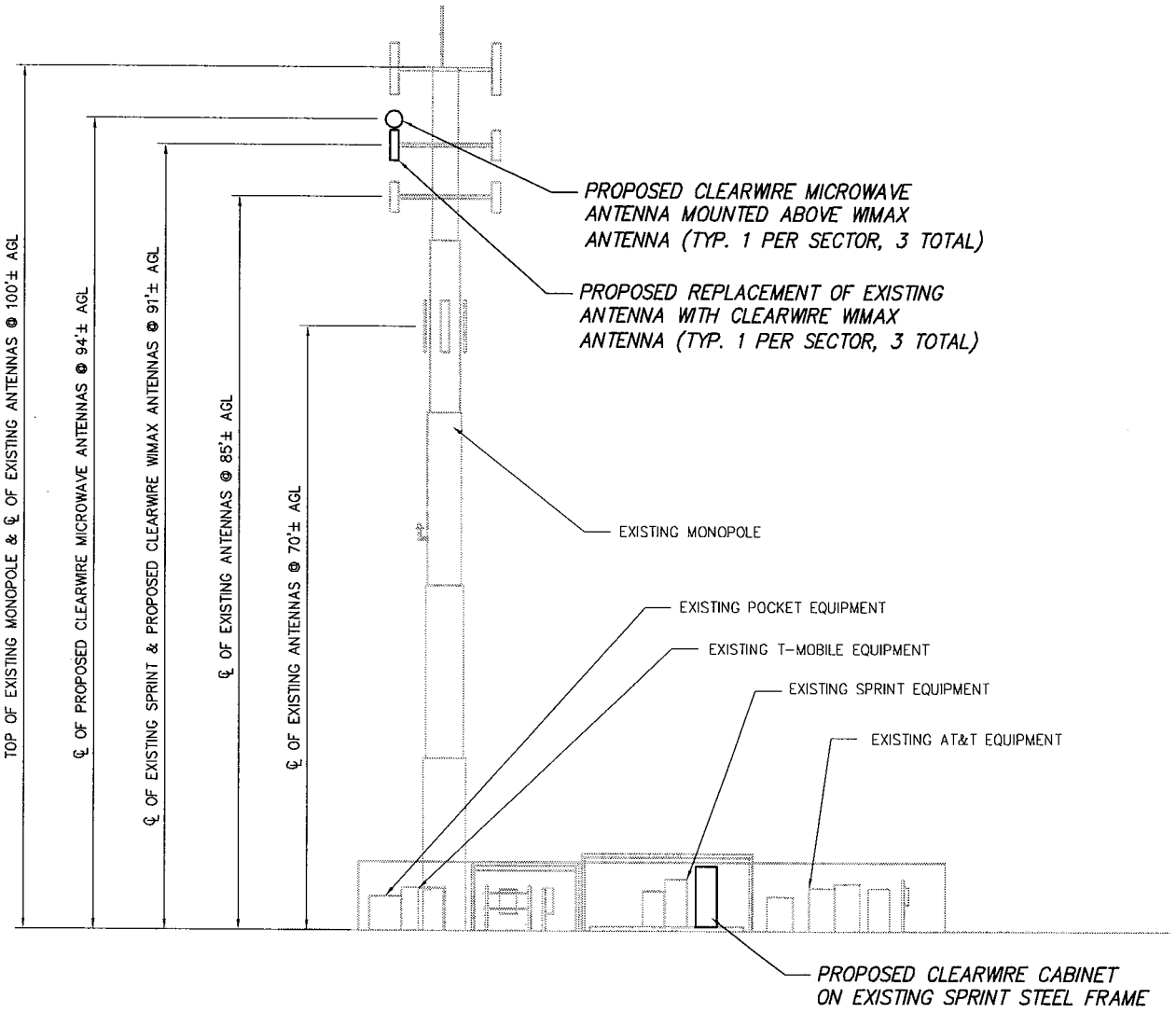
The addition of new WiMAX antennas and microwave dishes will not adversely impact the health and safety of the surrounding community or the people working on the tower. The total radio frequency exposure measured around the base of the tower will be well below the National Council on Radiation Protection 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 27.52% of the NRCP'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, three (3) 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 Brandon Robinson
Avon, CT




## TOWER ELEVATION

NO SCALE

# LEASE EXHIBIT

NO SCALE
FEBRUARY 04, 2010

2 OF 3

REVISION NUMBER 1

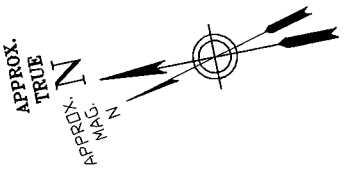


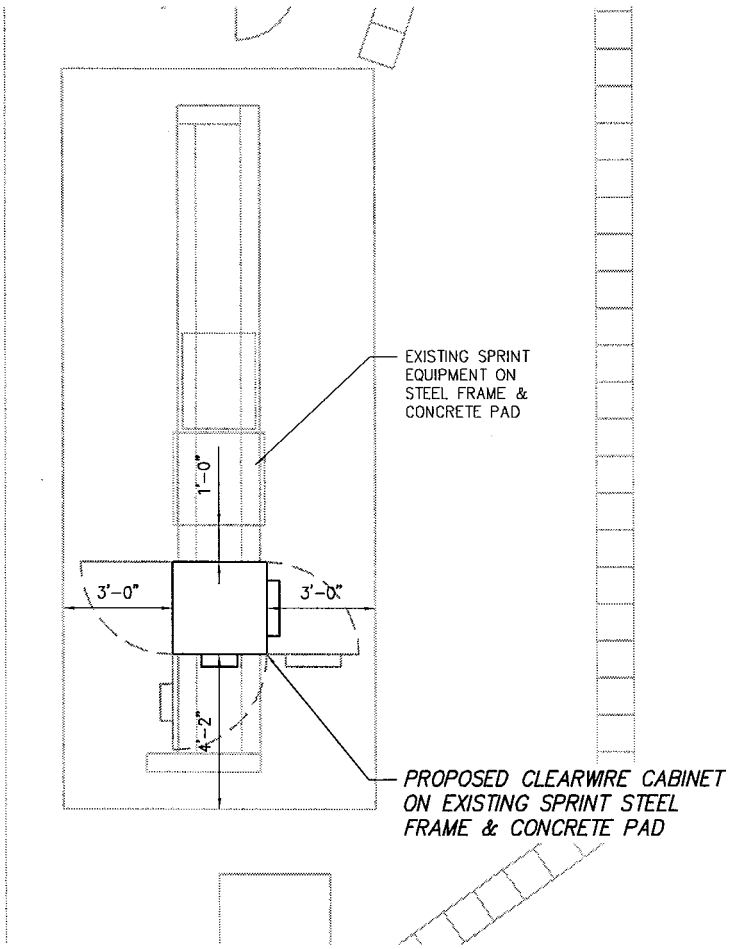
CHA
III Winners Circle, PO Box 5269 - Albany, NY 12205-0269
Main: (518) 453-4500 · www.chacompanies.com

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

# CT-HFD0049A
# 1 STRATMORE LANE
# AVON, CT 06001

CHA PROJ. NO. - 20592.1012.1101




## EQUIPMENT LAYOUT

GRAPHIC SCALE

5 0 2.5 5

IN FEET

# LEASE EXHIBIT

SCALE: 1" = 5'
FEBRUARY 04, 2010

3 OF 3

REVISION NUMBER 1



CHA
III Winners Circle, PO Box 5269 · Albany, NY 12205-0269
Main: (518) 453-4500 · www.chacompanies.com

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

## CT-HFD0049A
## 1 STRATMORE LANE
## AVON, CT 06001

CHA PROJ. NO. - 20592.1012.1101

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

# Structural Analysis for SBA Network Services, Inc.

**105 ft Monopole**

**Site Name: Avon**
**Site ID: CT01498-S**

FDH Project Number 10-02143E S1

Prepared By:

Krystyn Wagner, 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

February 17, 2010

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

## TABLE OF CONTENTS

## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Avon, 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 existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Pirod, Inc. (Eng. File No. A-117586) original design drawings dated September 26, 2000, 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 1" radial ice. Ice is considered to increase in thickness with height.

### Conclusions

With the current and proposed antennas from Clearwire/Sprint at 87 ft and 91 ft., the tower meets the requirements of the *ANSI/TIA-222-G* standard provided the **Recommendations** below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Pirod Eng. File No. A-117586), the foundation should have the necessary capacity to support the existing 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, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

### Recommendations

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

1. Proposed coax should be installed inside the monopole's shaft.
2. The proposed radios should be installed directly behind the proposed dishes.

## APPURTENANCE LISTING

The proposed and existing 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

### Existing Loading:

| Antenna No. | Antenna Elevation (ft) | Description | Coax and Lines [1] | Carrier | Mount Elevation (ft) | Mount Type |
|---|---|---|---|---|---|---|
| 1 | 116 | (1) 20' Omni | (1) 7/8" | Farmington Woods | 106 | (1) Low Profile Platform |
| 2-7 | 106 | (3) EMS RR901702DP<br>(3) RFS APX16PV-16PVL-C<br>(6) Allen FE15501P77-75 TMAs<br>(6) Andrew ETW200VA12UB TMAs | (12) 1-5/8" | T-Mobile | | |
| 8-19 | 97[2] | (9) Allgon 7250<br>(3) Powerwave 7770 panels<br>(6) Powerwave LGP 21401 TMAs | (12) 1-5/8" | AT&T | 97 | (1) Low Profile Platform |
| 20-31 | 87[3,4] | (12) Decibel DB980H90 | (12) 1-5/8" | Clearwire/ Sprint | 87 | (1) Low Profile Platform |
| 32-34 | 77[5,6] | (6) Kathrein 742-213 | (6) 1-5/8" | Pocket | 77 | (1) Low Profile Platform (assumed) |
| --- | 75[7] | (1) GPS | (1) 1/2" | Sprint | 75 | Standoff |

1 The existing coax is located inside the pole's shaft, unless otherwise noted.
2 AT&T currently has (6) Allgon 7250 antennas and (3) Powerwave 7770 antennas installed at 97 ft. According to information provided by SBA, AT&T may add an additional (3) Allgon 7250 antennas. Analysis performed with total leased loading in place.
3 Currently Sprint has (6) Decibel DB980H90 panels and (6) 1-5/8" coax installed at 87 ft. According to information provided by SBA, Sprint may install (12) antennas and (12) coax at 87 ft.
4 The loading for Sprint/Clearwire at 87 ft will be altered. See the proposed loading below.
5 Pocket currently has (3) Kathrein 742-213 antennas installed at 77 ft. According to information provided by SBA, Pocket may install up to (6) Kathrein 742-213 antennas. Analysis performed with total leased loading in place.
6 The coax for Pocket to 77 ft is installed outside the monopole shaft in a single row.
7 Sprint currently has (1) GPS and (1) 1/2" coax installed at 30 ft. According to information provided by SBA, Sprint may install this GPS and coax at 75 ft. Analysis performed with the loading installed at the highest allowable elevation.

### Proposed Loading:

| Antenna No. | Antenna Elevation (ft) | Description | Coax and Lines | Carrier | Mount Elevation (ft) | Mount Type |
|---|---|---|---|---|---|---|
| 1-3 | 91 | (3) Andrew VHLP2.5 Dishes<br>(3) Samsung RRU Radios<br>(3) Horizon DUO Radio | (12) 1-5/8"<br>(6) 5/16"<br>(3) 1/2" | Clearwire/ Sprint | 87 | (1) Low Profile Platform |
| 4-12 | 87 | (6) Decibel DB980H90<br>(3) Kathrein 840-10054 | | | | |

1 This represents the final configuration for Clearwire/Sprint on the tower. According to information provided by SBA, Clearwire/Sprint will remove (6) Decibel DB980H90 antennas from 87 ft, and install (3) Kathrein 840-10054 antennas. Clearwire/Sprint will also add (3) Andrew VHLP2.5 dishes, (3) Samsung RRU Radios, (3) Horizon DUO Radio, (6) 5/16" coax, and (3) 1/2" coax at 91 ft.

## 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 | 42 ksi |
| Base Plate | 36 ksi |
| Anchor Bolts | 105 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. **Table 5** displays the maximum antenna rotations at service wind speeds.

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 existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Pole Profile & 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 | 105 - 80 | Pole | P36x3/8 | 15.3 | Pass |
| | | Flange Bolts | (28) 1" ø Bolts on a 39" BC | 13.4 | Pass |
| | | Flange Plate | 1.25" thick | 15.6 | Pass |
| L2 | 80 - 60 | Pole | P42x3/8 | 29.1 | Pass |
| | | Flange Bolts | (32) 1" ø Bolts on a 45" BC | 26.7 | Pass |
| | | Flange Plate | 1.25" thick | 30.3 | Pass |
| L3 | 60 - 40 | Pole | P48x3/8 | 38.8 | Pass |
| | | Flange Bolts | (36) 1" ø Bolts on a 51" BC | 36.3 | Pass |
| | | Flange Plate | 1.25" thick | 40.7 | Pass |
| L4 | 40 - 20 | Pole | P54x3/8 | 45.8 | Pass |
| | | Flange Bolts | (48) 1" ø Bolts on a 57" BC | 36.4 | Pass |
| | | Flange Plate | 1.25" thick | 48.5 | Pass |
| L5 | 20 - 0 | Pole | P60x3/8 | 51.0 | Pass |
| | | Anchor Bolts | (48) 1" Bolts on a 63" BC | 37.2 | Pass |
| | | Base Plate | 1" thick x 66.125" round | 80.0 | Pass |

*All flange plates have existing stiffeners installed. Due to the lack of information of these existing stiffeners, they were not utilized in the analysis of these flange plates.

**Table 4 – Maximum Base Reactions**

| Base Reactions | Current Analysis *(ANSI/TIA-222-G)* | Original Design *(TIA/EIA-222-F)* |
|---|---|---|
| Axial | 38 k | 41 k |
| Shear | 22 k | 31 k |
| Moment | 1,595 k-ft | 2,555 k-ft |

## Table 5 – Maximum Antenna Rotations at Service Wind Speed (Proposed Antennas Only)

| Centerline Elevation (ft) | Antenna | Tilt (deg) | Twist (deg) |
|---|---|---|---|
| 91 | Andrew VHLP2.5 | 0.1866 | 0.0006 |

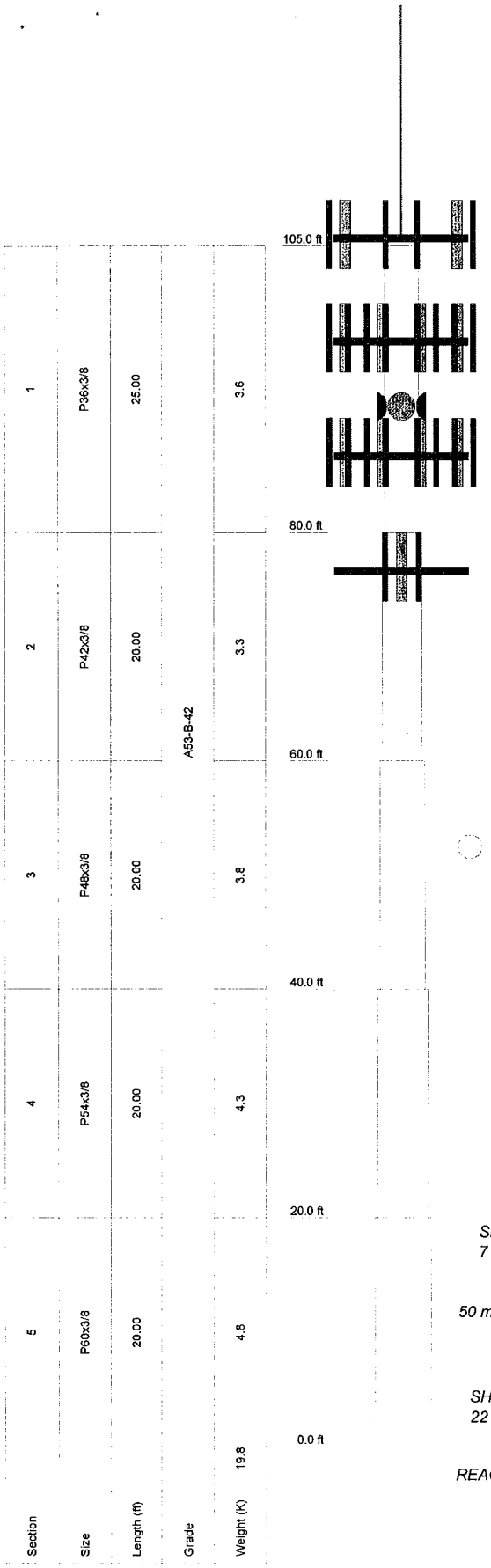
*Tilt and twist values to be considered acceptable by Clearwire.

## 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.




*ALL REACTIONS ARE FACTORED*

*AXIAL*
*70 K*

*SHEAR* *7 K*

*MOMENT* *513 kip-ft*

*TORQUE 1 kip-ft*
*50 mph WIND - 1.0000 in ICE*

*AXIAL*
*38 K*

*SHEAR* *22 K*

*MOMENT* *1595 kip-ft*

*TORQUE 1 kip-ft*
*REACTIONS - 100 mph WIND*

## DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| 20' Omni (Farmintgon Woods) | 106 | (2) TMA - Powerwave LGP21401 (ATT) | 97 |
| RR90-17-02DP w/Mount Pipe (T-Mobile) | 106 | Low Profile Platform (ATT) | 97 |
| RR90-17-02DP w/Mount Pipe (T-Mobile) | 106 | (2) DB980H90 w/Mount Pipe (Clearwire/Sprint) | 87 |
| RR90-17-02DP w/Mount Pipe (T-Mobile) | 106 | (2) DB980H90 w/Mount Pipe (Clearwire/Sprint) | 87 |
| RFS APX16PV-16PVL w/ Mount Pipe (T-Mobile) | 106 | (2) DB980H90 w/Mount Pipe (Clearwire/Sprint) | 87 |
| RFS APX16PV-16PVL w/ Mount Pipe (T-Mobile) | 106 | Kathrein 840-10054 w/ Mount Pipe (Clearwire/Sprint) | 87 |
| RFS APX16PV-16PVL w/ Mount Pipe (T-Mobile) | 106 | Kathrein 840-10054 w/ Mount Pipe (Clearwire/Sprint) | 87 |
| (2) Allen FE15501P77-75 TMA (T-Mobile) | 106 | Kathrein 840-10054 w/ Mount Pipe (Clearwire/Sprint) | 87 |
| (2) Allen FE15501P77-75 TMA (T-Mobile) | 106 | Dragonwave Horizon Duo ODU (Clearwire/Sprint) | 87 |
| (2) Allen FE15501P77-75 TMA (T-Mobile) | 106 | Samsung RRU (Clearwire/Sprint) | 87 |
| | | Samsung RRU (Clearwire/Sprint) | 87 |
| (2) ETW200VA12UB TMA (T-Mobile) | 106 | Low Profile Platform (Clearwire/Sprint) | 87 |
| (2) ETW200VA12UB TMA (T-Mobile) | 106 | VHLP2.5 (Clearwire/Sprint) | 87 |
| (2) ETW200VA12UB TMA (T-Mobile) | 106 | VHLP2.5 (Clearwire/Sprint) | 87 |
| Low Profile Platform (T-Mobile) | 106 | VHLP2.5 (Clearwire/Sprint) | 87 |
| (3) 7250.00 w/Mount Pipe (ATT) | 97 | (2) Kathrein 742-213 w/ Mount Pipe (Pocket) | 77 |
| (3) 7250.00 w/Mount Pipe (ATT) | 97 | | |
| (3) 7250.00 w/Mount Pipe (ATT) | 97 | (2) Kathrein 742-213 w/ Mount Pipe (Pocket) | 77 |
| Powerwave 7770 w/ Mount Pipe (ATT) | 97 | | |
| Powerwave 7770 w/ Mount Pipe (ATT) | 97 | Low Profile Platform (Pocket) | 77 |
| Powerwave 7770 w/ Mount Pipe (ATT) | 97 | (2) Kathrein 742-213 w/ Mount Pipe (Pocket) | 77 |
| (2) TMA - Powerwave LGP21401 (ATT) | 97 | Side Mount Standoff (1) (Sprint) | 75 |
| (2) TMA - Powerwave LGP21401 (ATT) | 97 | GPS (Sprint) | 75 |

## MATERIAL STRENGTH

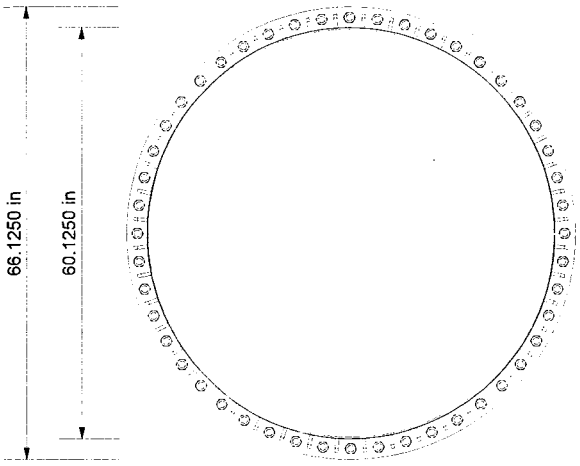
| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A53-B-42 | 42 ksi | 63 ksi | | | |

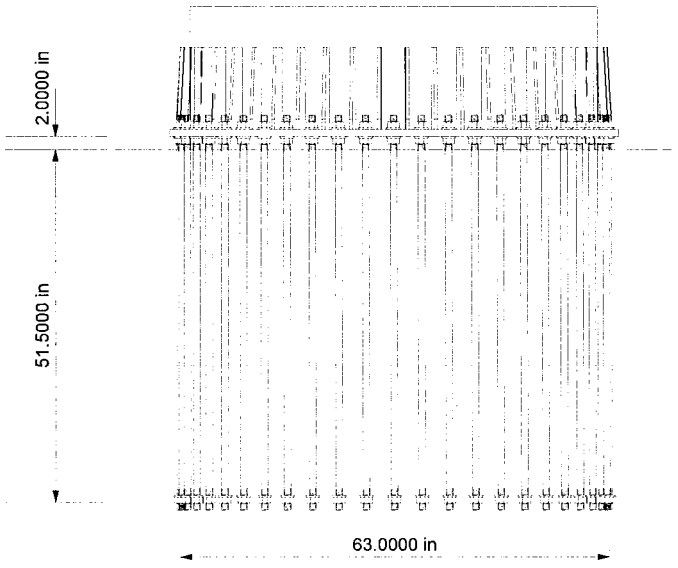
## TOWER DESIGN NOTES

1. Tower is located in Hartford 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 1.00 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. Vertical offsets were utilized to achieve the correct centerline elevations.
9. TOWER RATING: 51.1%


*FDH Engineering, Inc.*
2730 Rowland Road
Raleigh, NC 27615
Phone: (919) 755-1012
FAX: (919) 755-1031


Job: ***Avon, CT01498-S***
Project: ***10-02143E S1***
Client: SBA | Drawn by: Krystyn Wagner | App'd:
Code: TIA-222-G | Date: 02/19/10 | Scale: NTS
Path: | Dwg No. E-1




## FOUNDATION NOTES

1. Plate thickness is 1.0000 in.
2. Plate grade is A36.
3. Anchor bolt grade is A-687.
4. f'c is 4 ksi.

*FDH Engineering, Inc.*
2730 Rowland Road
Raleigh, NC 27615
Phone: (919) 755-1012
FAX: (919) 755-1031

| | | | |
|---|---|---|---|
| Job: *Avon, CT01498-S* | | | |
| Project: *10-02143E S1* | | | |
| Client: SBA | Drawn by: Krystyn Wagner | | App'd: |
| Code: TIA-222-G | Date: 02/19/10 | | Scale: NTS |
| Path: | | | Dwg No. F-1 |

CLEAR

4400 Carillon Point
Kirkland, WA 98033

To: Maxton
From: Frantz Pierre – Radio Frequency Engineer
Cc: Micah Hawthorne
Subject: Power Density Report for CT-HFD0049
Date: March 25, 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 steel monopole at 10 Redwood Lane, AKA 1 Stratmore Lane, Avon, CT. 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 VHLP2.5-11 with 30" Diameter.
5) The Clearwire Panel antenna centerline is 91 feet.
6) The Clearwire Microwave dish centerline is 91 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 10 Redwood Lane AKA 1 Stratmore Lane, Avon CT, is 0.003587 $mW/cm^2$. This value represents 0.36% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter ($mW/cm^2$) 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 27.16 %. The combined Power Density for this site is 27.52% of the M.P.E. standard.