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Also admitted in Massachusetts

January 17, 2014

Via Hand Delivery

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Request of Cellco Partnership d/b/a Verizon Wireless for an Order to Approve the Shared Use of an Existing Tower at 2577 Main Street, Glastonbury, Connecticut**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, Cellco Partnership d/b/a Verizon Wireless ("Cellco") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by Cellco of an existing telecommunications tower, owned by SBA Communications Corporation ("SBA"), at 2577 Main Street in Glastonbury, Connecticut. Cellco requests that the Council find that the proposed shared use of the SBA tower satisfies the criteria of C.G.S § 16-50aa and issue an order approving the proposed shared use. A copy of this letter is being sent to Glastonbury's Town Manager Richard J. Johnson and St. Paul's Church, the owner of the property where the tower is located.

Background

The existing SBA facility consists of a 130-foot self-supporting lattice tower within a fenced compound. The tower is currently being shared by Sprint Nextel, AT&T, Metro PCS and T-Mobile. The wireless carriers' equipment cabinets and shelters are located within a fenced facility compound.

Cellco is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. Cellco and SBA have agreed to the proposed shared use of the 2577 Main Street tower pursuant to mutually acceptable terms and conditions, and SBA has authorized Cellco to apply for all necessary permits and approvals that may be required to share the existing tower. (*See* Owner's authorization letter included in Attachment 1).

Cellco proposes to install a total of twelve (12) antennas at the 80-foot level on the tower. Equipment associated with Cellco's antennas and an emergency back-up generator will be located inside a 12' x 24' shelter installed near the base of the tower within the existing facility compound. Included in Attachment 2 are Cellco's project plans showing the location of all site improvements.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such shared use." Cellco respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing tower is structurally capable of supporting Cellco's antennas. The proposed shared use of this tower is, therefore, technically feasible. A Structural Analysis verifying the structural integrity of the tower, and its ability to support Cellco's antennas and related equipment is included in Attachment 3. Also included in Attachment 3 is a letter from SBA confirming that the modifications referenced on page 3 of the Structural Analysis (Project No. 13SB5C1400), required to accommodate Cellco's shared use, were completed.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the shared use of an existing tower such as the SBA tower in Glastonbury. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the SBA tower would have a minimal environmental effect, for the following reasons:

1. The proposed installation of twelve (12) antennas at the 80-foot level on the existing 130-foot tower would have an insignificant incremental visual impact on the area around the existing tower. Cellco's shelter would be located within the limits of the existing gravel facility compound. Cellco's shared use of this tower would therefore, not cause any significant change or alteration in the physical or environmental characteristics of the existing site.

2. Noise associated with the equipment shelter's air conditioning ("A/C") units was evaluated for compliance with State and/or local noise standards. According to the Noise Compliance Study included in Attachment 4 ("Study"), noise from the shelter's A/C units will not exceed State and/or local noise limits. Noise associated with Cellco's emergency back-up generator is exempt from State and local noise standards.

3. Operation of Cellco's antennas at this site would not exceed the RF emissions standards adopted by the Federal Communications Commission ("FCC"). Included in Attachment 5 of the filing are Far Field Approximation tables for Cellco's antennas at each of its licensed operating frequencies. These tables demonstrate that Cellco's proposed facility will operate well within the FCC limits.

4. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the SBA facility other than periodic (monthly) maintenance visits to the cell site.

The proposed use of this 2577 Main Street facility would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, SBA and Cellco have entered into a lease for the shared use of the existing tower on mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible. (*See* Attachment 1).

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Cellco's full array of twelve (12) antennas and related equipment. Cellco is not aware of any public safety concerns relative to the proposed sharing of the existing SBA tower. In fact, the provision of new and improved wireless service through shared use of the existing tower is expected to enhance the safety and welfare of area residents and members of the general public traveling through Glastonbury.

Conclusion

For the reasons discussed above, the proposed shared use of the existing SBA tower at 2577 Main Street in Glastonbury satisfies the criteria stated in C.G.S. § 16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use of the SBA tower.

Thank you for your consideration of this matter.

Very truly yours,

Kenneth C. Baldwin

Enclosures
Copy to:
Richard J. Johnson, Town Manager
St. Paul's Church
Sandy M. Carter

ATTACHMENT 1

SBA Communications Corporation
5900 Broken Sound Parkway NW
Boca Raton, FL 33487-2797

T + 561.995.7670
F + 561.995.7626

sbasite.com

RE: 2577 Main Street Glastonbury, CT
SBA 2012 TC Assets, LLC Site ID: Glastonbury Main St. CT46126-A

To whom this may concern,

Please accept this letter as authorization for Verizon Wireless to apply for permit at above mentioned address on behalf of SBA Communications.

Should you have any questions or need further information, please feel free to contact me.

Stephen Roth

Regional Site Manager
CT and SE-NY
SBA COMMUNICATIONS CORPORATION
5900 Broken Sound Parkway NW
Boca Raton, FL 33487-2797
Alternate Address:
105 Kimberly Road
East Granby, CT 06026
860.413.3493 + **T**
860.539.4920 + **C**
sroth@sbasite.com

ATTACHMENT 2

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

GLASTONBURY WEST
2577 MAIN STREET
GLASTONBURY, CT 06033

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE, EAST HARTFORD, CT **TO:** 2577 MAIN STREET, GLASTONBURY, CT 06033

1.	Head east on E River Dr.	246 ft
2.	Turn left onto the CT-2 E ramp to Norwich	0.2 mi
3.	Merge onto I-84 E	348 ft
4.	Take exit 55 to merge onto CT-2 E toward Norwich/New London/I-84 E	4.8 mi
5.	Take exit 8 for Connecticut 94/Hebron Ave.	0.2 mi
6.	Keep right at the fork, follow signs for Hebron Ave./Glastonbury Ctr.	230 ft
7.	Turn right onto Hebron Ave.	0.5 mi
8.	Turn right onto Main St. and the destination will be on the left	0.2 mi

GENERAL NOTES

1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

PROJECT SCOPE

1. THE SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF (12) PANEL ANTENNAS MOUNTED TO AN EXISTING 130'-0" TALL LATTICE TOWER AT A CENTERLINE ELEVATION OF 80' ABOVE GRADE.
2. AN EQUIPMENT SHELTER WITH DIESEL FUELED EMERGENCY POWER GENERATOR WILL BE INSTALLED AT GRADE.

VICINITY MAP

SCALE: 1" = 2000'

PROJECT SUMMARY

SITE NAME:	GLASTONBURY WEST
SITE ADDRESS:	2577 MAIN STREET GLASTONBURY, CT 06033
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. CELLCO PARTNERSHIP WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELLCO PARTNERSHIP (860) 803-8219
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405 (203) 488-0580
TOWER COORDINATES:	LATITUDE: 41°-42'-51.69" LONGITUDE: 72°-36'-46.97" GROUND ELEVATION: ±30' A.M.S.L. (REFERENCED FROM CSC DATABASE)

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	1
C-1	ELEVATION, PLAN AND ANTENNA CONFIG.	1

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	01/02/14	HMR	DMD	ISSUED FOR CSC
0	12/19/13	HMR	DMD	ISSUED FOR CSC - CLIENT REVIEW

Cellco Partnership d.b.a. verizon wireless

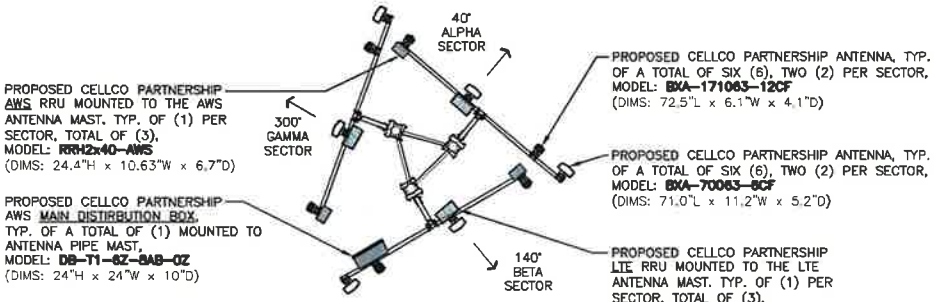
CENTEK engineering
Centered on Solutions
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless
GLASTONBURY WEST
2577 MAIN STREET
GLASTONBURY, CT 06033
DATE: 12/17/13
SCALE: AS NOTED
JOB NO. 13183.000

TITLE SHEET

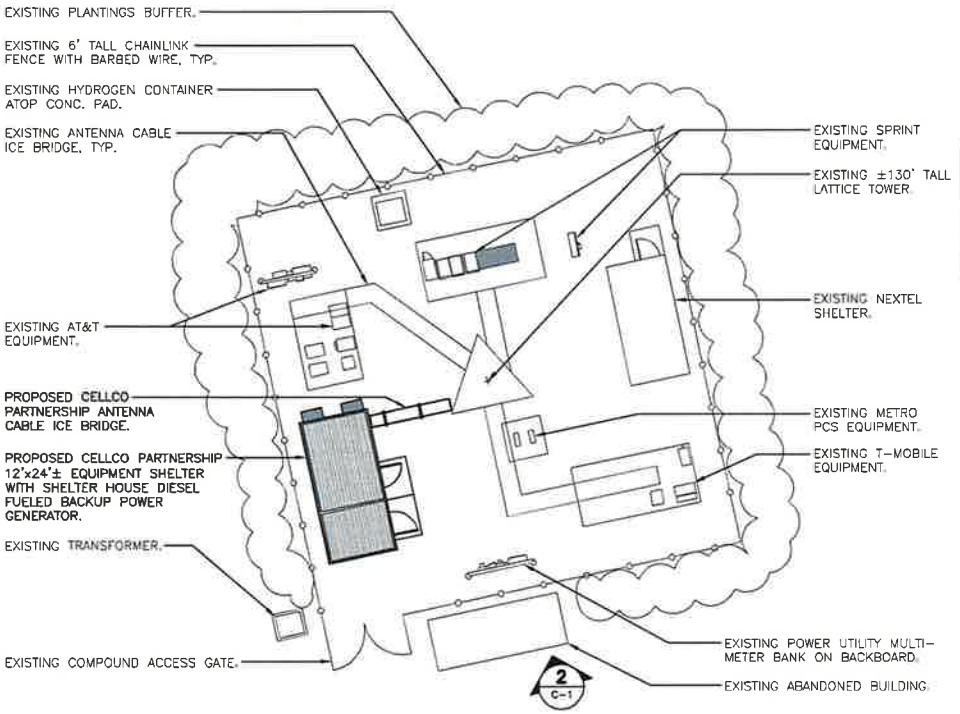
T-1

DWG. 1 OF 2



3 C-1 **ANTENNA CONFIGURATION - PLAN** (PROPOSED)
SCALE: 3/32" = 1'-0"

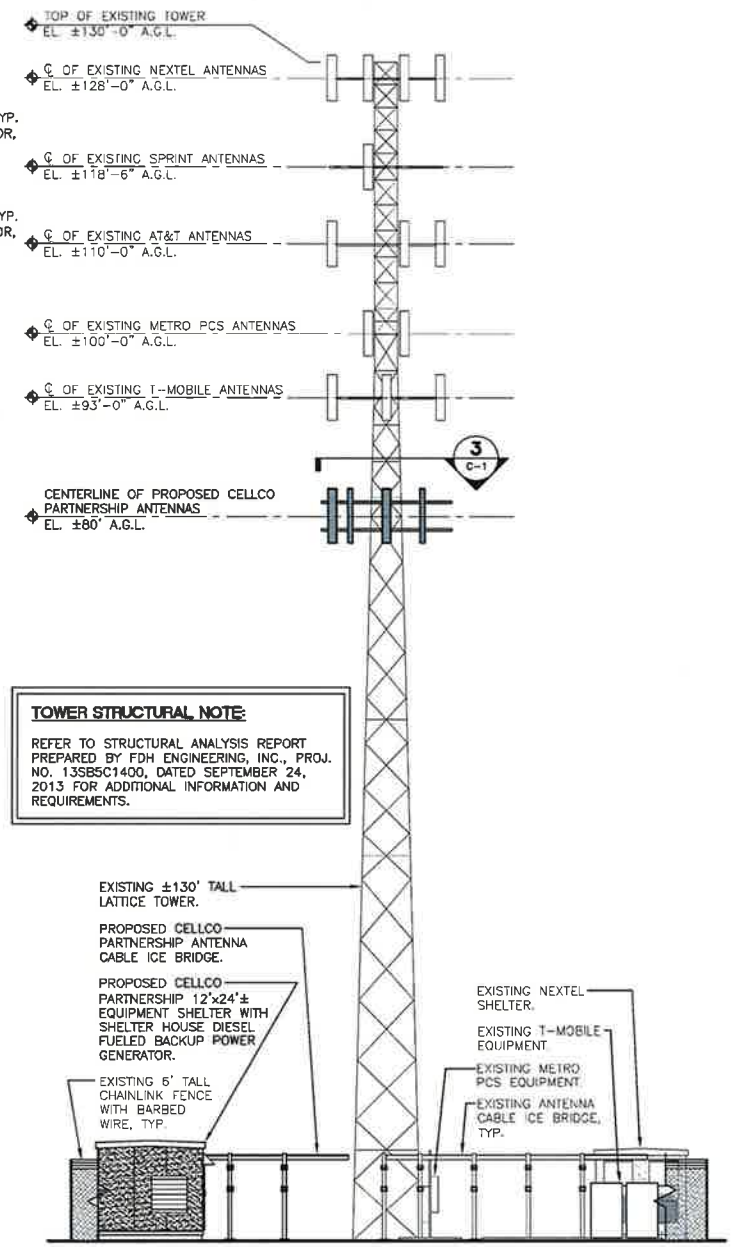
APPROXIMATE NORTH



1 C-1 **COMPOUND PLAN - PROPOSED**
SCALE: 1" = 30'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
0 15 30
(IN FEET)
1 inch = 30 ft.



TOWER STRUCTURAL NOTE:

REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY FDH ENGINEERING, INC., PROJ. NO. 13SB5C1400, DATED SEPTEMBER 24, 2013 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

2 C-1 **NORTH ELEVATION - PROPOSED**
SCALE: 1" = 20'-0"

GRAPHIC SCALE
0 10 20
(IN FEET)
1 inch = 20 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	01/02/14	HMR	DMD	ISSUED FOR CSC
0	12/19/13	HMR	DMD	ISSUED FOR CSC - CLIENT REVIEW

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless
GLASTONBURY WEST
2577 MAIN STREET
GLASTONBURY, CT 06033

DATE: 12/17/13
SCALE: AS NOTED
JOB NO. 13183.000

ELEVATION, PLAN AND ANTENNA CONFIG.

C-1
DWG. 2 OF 2

ATTACHMENT 3

FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

Structural Analysis for SBA Network Services, Inc.

130' Self-Support Tower

SBA Site Name: Glastonbury-Main St
SBA Site ID: CT46126-A-06
Verizon Site Name: Glastonbury

FDH Project Number 13SB5C1400

Analysis Results

Tower Components	97.5%	Sufficient
Foundation	71.7%	Sufficient

Prepared By:

Joshua H. Carden, EI
Project Engineer

Reviewed By:

Bradley R. Newman, PE
Senior Engineer
CT PE License No. 29630

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com

STATE OF CONNECTICUT BRADLEY R. NEWMAN 29630 LICENSED PROFESSIONAL ENGINEER 9/24/13

September 24, 2013

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures & 2005 Connecticut Building Code

TABLE OF CONTENTS

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the existing self-supported tower located in Glastonbury, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and the *2005 Connecticut Building Code (CTBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, the member sizes, geotechnical data, and foundation dimensions was obtained from:

- Fred A. Nudd Corporation (Project No. 6893) Design of 130' Lattice Tower dated September 12, 1999
- Vertical Solutions, Inc. (Project No. 121081 Rev 0) Rigorous Structural Analysis dated June 4, 2012
- Vertical Solutions, Inc. (Project No. 130126.01 Rev 0) Pre-Modification Installation Letter dated February 14, 2013
- Vertical Solutions, Inc. (Site No. CT46126-A) Modification Drawings for a 130' Self-Support Tower dated December 6, 2012
- Tectonic Engineering Consultants, P.C. (W.O. No. 1170.C057) Boring Logs and Results of Laboratory Testing dated August 26, 1999
- FDH Engineering, Inc. (Project No. 1338401400) Modification Drawings for a 130' Self-Support Tower dated June 17, 2013
- FDH Engineering, Inc. (Project No. 13SB5C1400) Modification Drawings for a 130' Self-Support Tower dated September 10, 2013
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 CTBC* is 80 mph without ice and 38 mph with 1" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from Verizon in place at 80 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and the *2005 CTBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was constructed per the original design drawings (see Fred A. Nudd Corporation Project No. 6893) and utilizing the existing geotechnical data (see Tectonic Engineering Consultants, P.C. W.O. No. 1170.C057), the foundation should have the necessary capacity to support both the proposed and existing 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 *TIA/EIA-222-F* standards and the *2005 CTBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. Coax lines must be installed as shown in **Figure 1.**
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.
3. Modifications listed in FDH Engineering, Inc. (Project No. 1338401400) Modification Drawings for a 130' Self-Support Tower dated June 17, 2013 must be completed for this analysis to be valid.
4. Modifications listed in FDH Engineering, Inc. (Project No. 13SB5C1400) Modification Drawings for a 130' Self-Support Tower dated September 10, 2013 must be completed for this analysis to be valid.

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 the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
128	(12) Decibel DB844H90E-M (2) Argus technologies LLPX310R (1) Kathrein 840 10054 (3) 24"x14"x9" TMAs (1) Motorola TIMING 2000	(12) 1-1/4" (6) 5/16" (4) 1/2"	Sprint/Clearwire	128 [1]	(3) T-Frames
124	(3) IDU Modem (3) Andrew VHLP2.5 Dishes				
118.5	(2) RFS APXVSPP18-C-A20 (1) Powerwave P40-16-XLPP-RR-A (3) Alcatel Lucent 1900 MHz RRUs (3) Alcatel Lucent 800 MHz RRUs (4) RFS ACU-A20-N RETs (3) Alcatel Lucent 800 MHz Filters	(3) 1-1/4"	Sprint	118.5	(3) T-Arms
110	(6) Allgon 7700.00 (2) KMW AM-X-CD-16-65-00T-RET (1) Andrew SBNH-1D6565C (6) Powerwave LGP13519 TMAs (6) Powerwave LGP21401 TMAs (6) Ericsson RRUS-11 1900MHz RRUs (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-1/4" (1) 3/8"	AT&T	110 [2]	(3) T-Frames
100	(3) RFS APXV18-206517S-C	(6) 1-5/8"	Pocket	100	(3) Standoffs
93	(6) EMS RR65-19-02DP (3) RFS APX16DWV-16WV-S-E-ACU (3) 6.3"x7.7"x3" TMAs	(18) 1-5/8"	T-Mobile	93	(3) T-Frames
55.5	(1) GPS	(1) 1/2"	---	55.5	(1) Standoff
50.5	(2) GPS	(2) 1/2"	---	50.5	(2) Standoffs

1. Sprint/Clearwire has (6) 5/16" and (2) 1/2" coax installed inside (2) 2" conduits.
2. AT&T has (1) 3/8" coax installed inside (1) 3" conduit.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
80	(6) Amphenol BXA-70063/6CF (6) Amphenol BXA-171062/12CF (3) Alcatel Lucent RRH2x40-700-U RRUs (3) Alcatel Lucent RRH2x40-AWS RRUs (1) RFS DB-T1-6Z-8AB-0Z Distribution Box	(2) 1-5/8" Hybrid	Verizon	80	(3) T-Frames [CaAa = 33.11 ft^2]

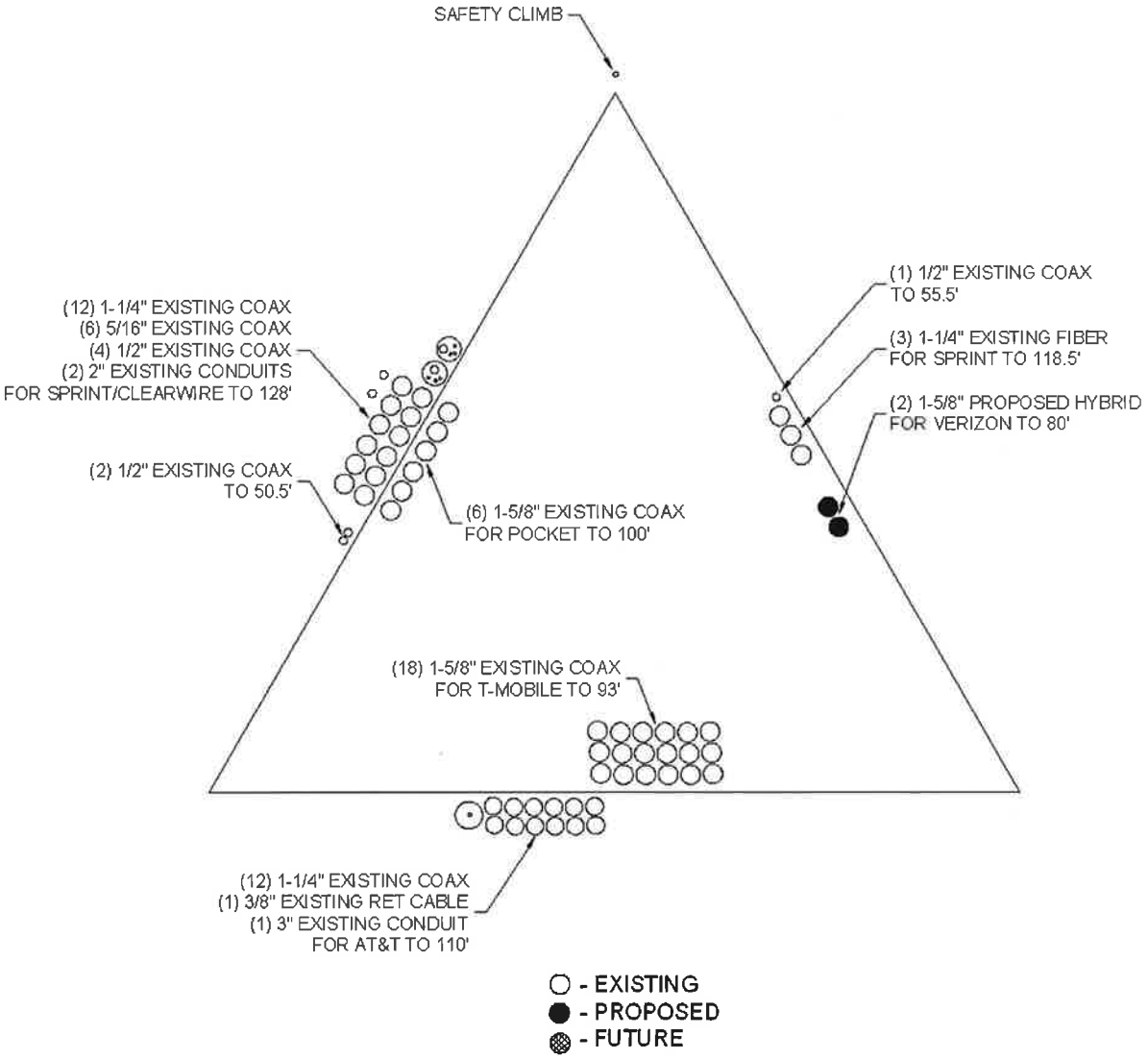


Figure 1 – Assumed Coax Layout

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Legs	45, 50, & 54 ksi
Bracing	36 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. *Note: Capacities up to 100% are considered acceptable.* **Table 4** displays the maximum foundation reactions. **Table 5** displays the maximum antennas 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 **Appendix** for detailed modeling information.

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T1	130 - 120	Leg	1 1/2	26.2	Pass
		Diagonal	1/2	94.5	Pass
		Horizontal	L1 1/4x1 1/4x3/16	7.5	Pass
		Top Girt	L1 1/4x1 1/4x3/16	0.7	Pass
T2	120 - 117.143	Leg	2	23.8	Pass
		Diagonal	3/4	33.4	Pass
		Top Girt	L1 1/4x1 1/4x3/16	3.7	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	6.3	Pass
T3	117.143 - 114.286	Leg	2	27.7	Pass
		Diagonal	3/4	42.3	Pass
		Top Girt	L1 1/4x1 1/4x3/16	1.3	Pass
T4	114.286 - 111.429	Leg	2	37.1	Pass
		Diagonal	3/4	41.4	Pass
		Top Girt	L1 1/4x1 1/4x3/16	14.3	Pass
T5	111.429 - 108.571	Leg	2	47.8	Pass
		Diagonal	3/4	53.6	Pass
		Top Girt	L1 1/4x1 1/4x3/16	12.8	Pass
T6	108.571 - 105.714	Leg	2	60.1	Pass
		Diagonal	3/4	67.4	Pass
		Top Girt	L1 1/4x1 1/4x3/16	17.6	Pass
T7	105.714 - 102.857	Leg	2	73.7	Pass
		Diagonal	3/4	68.5	Pass
		Top Girt	L1 1/4x1 1/4x3/16	27.1	Pass
T8	102.857 - 100	Leg	2	71.3	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
		Diagonal	3/4	79.8	Pass
		Secondary Horizontal	L2x2x1/8	10.6 26.6 (b)	Pass
		Top Girt	L1 1/4x1 1/4x3/16	31.7	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	23.7	Pass
T9	100 - 96	Leg	P4x.237 (4.50 OD)	67.3	Pass
		Diagonal	L1 1/2x1 1/2x3/16	42.2 81.6 (b)	Pass
T10	96 - 92	Leg	P4x.237 (4.50 OD)	77.8	Pass
		Diagonal	L2x2x1/4	22.8 60.5 (b)	Pass
T11	92 - 88	Leg	P4x.237 (4.50 OD)	80.2	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	26.6 63.2 (b)	Pass
		Secondary Horizontal	4x3/8	22.3 31.1 (b)	Pass
T12	88 - 84	Leg	P4.5x0.237 + P5.5625x0.375 [129°] - 12B	58.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	24.4 59.1 (b)	Pass
		Secondary Horizontal	4x3/8	27.0 33.6 (b)	Pass
T13	84 - 80	Leg	P4.5x0.237 + P5.5625x0.375 [129°] - 12B	64.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	22.2 53.8 (b)	Pass
		Secondary Horizontal	4x3/8	27.3 29.3 (b)	Pass
T14	80 - 75	Leg	P6x.28 (6.625 OD)	66.0	Pass
		Diagonal	L2x2x1/4	37.1 84.0 (b)	Pass
T15	75 - 70	Leg	P6x.28 (6.625 OD)	74.3	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	27.6 66.1 (b)	Pass
T16	70 - 65	Leg	P6x.28 (6.625 OD)	82.0	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	25.1 59.4 (b)	Pass
T17	65 - 60	Leg	P6x.28 (6.625 OD)	89.0	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	25.3 59.1 (b)	Pass
T18	60 - 55	Leg	P6x.28 (6.625 OD)	90.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	32.6 67.8 (b)	Pass
		Secondary Horizontal	L2x2x1/8	33.7 77.5 (b)	Pass
T19	55 - 50	Leg	P6.625x0.28 + P7.625x0.301 [136°] - 12B	74.4	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	28.8 56.5 (b)	Pass
T20	50 - 45	Leg	P6.625x0.28 + P7.625x0.301 [136°] - 12B	78.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	31.5 60.9 (b)	Pass
T21	45 - 40	Leg	P6.625x0.28 + P7.625x0.301 [136°] - 12B	79.5	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
		Diagonal	L2x2x1/4	36.6 73.4 (b)	Pass
		Secondary Horizontal	L3x3x5/16	10.0 79.7 (b)	Pass
T22	40 - 20	Leg	P6x.432 (6.625 OD)	93.2	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	34.5 59.8 (b)	Pass
T23	20 - 13.3333	Leg	P6x.432 (6.625 OD)	97.5	Pass
		Diagonal	L2x2x3/16	74.6 86.9 (b)	Pass
T24	13.3333 - 6.66667	Leg	P6x.432 (6.625 OD)	94.2	Pass
		Diagonal	L2x2x3/16	74.4 78.7 (b)	Pass
		Secondary Horizontal	L2x2x1/4	34.3 56.8 (b)	Pass
T25	6.66667 - 0	Leg	P6.625x0.432 + P7.625x0.301 [136°] - 12B	85.3	Pass
		Diagonal	2L2x2x3/16x3/8	30.0 69.8 (b)	Pass
T1	130 - 120	Leg	1 1/2	26.2	Pass

*Capacities include a 1/3 allowable stress increase for wind per *TIA/EIA-222-F* standards.
**Diagonal sizes from 120' to 100' taken from Vertical Solutions, Inc. (Project No. 121081 Rev 0) Rigorous Structural Analysis dated June 4, 2012

Table 4 - Maximum Base Reactions

Load Type	Direction	Current Analysis* *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Individual Foundation	Horizontal	18 k	22 k
	Uplift	324 k	253 k
	Compression	346 k	---
Overturning Moment	---	2,188 k-ft	1,685 k-ft

* Foundation determined to be adequate per independent analysis.

Table 5 – Maximum Antenna Rotations at Service Wind Speeds

Centerline Elevation (ft)	Antenna	Tilt (deg)*	Twist (deg)*
124	(3) Andrew VHLP2.5 Dishes	1.0228	0.0662

*Allowable tilt and twist values to be determined by the carrier.

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.

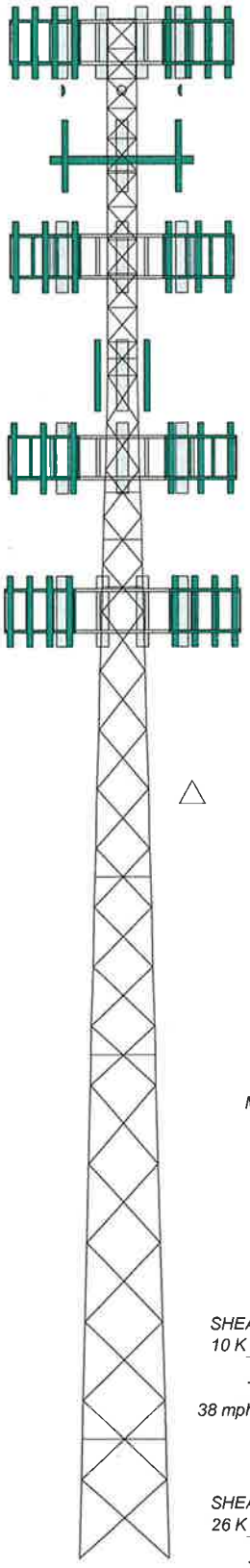
LIMITATIONS

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.

APPENDIX

Section	T25	T24	T23	T22	T21	T20	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	C		P6x.432 (6.825 OD)		B			P6x.28 (6.625 OD)				A			P4x.237 (4.50 OD)						SR 2			SR 1 1/2	
Leg Grade	A572-50		A500M-54		A572-50			A500M-54				A572-50			A500M-54						A570-45				
Diagonals	F		L2x2x3/16	2L1 3/4x1 3/4x3/16x3/8	L2x2x1/4	2L1 1/2x1 1/2x3/16x3/8		2L1 3/4x1 3/4x3/16x3/8			L2x2x1/4	2L1 1/2x1 1/2x3/16x3/8				E	D				SR 3/4				SR 1/2
Diagonal Grade								A36																	
Top Girts						N.A.						L1 1/4x1 1/4x3/16													
Bottom Girts						N.A.										G		G		N.A.		G	N.A.		
Horizontals									N.A.																L1 1/4x1 1/4x3/16
Sec. Horizontals	N.A.	L2x2x1/4		N.A.	I	N.A.		L2x2x1/8			N.A.		4x3/8			N.A.		H				N.A.			
Face Width (ft)	7.5	6.83333	8.5	5.5	5.25	5	4.75	4.5	4.25	4	3.75	3.5	3.3	3.1	2.9	2.7				5 @ 2.85714		2 @ 2.7738			2.5
# Panels @ (ft)			6 @ 6.66667					8 @ 5							5 @ 4									4 @ 2.5	
Weight (K)	11.7	0.8	0.7	2.4	0.7	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3

130.0 ft
120.0 ft
117.1 ft
114.3 ft
111.4 ft
108.6 ft
105.7 ft
102.9 ft
100.0 ft
96.0 ft
92.0 ft
88.0 ft
84.0 ft
80.0 ft
75.0 ft
70.0 ft
65.0 ft
60.0 ft
55.0 ft
50.0 ft
45.0 ft
40.0 ft
20.0 ft
13.3 ft
6.7 ft
0.0 ft



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P4.5x0.237 + P5.5625x0.375 [129°] - 12B	F	2L2x2x3/16x3/8
B	P6.625x0.28 + P7.625x0.301 [136°] - 12B	G	L1 1/4x1 1/4x3/16
C	P6.625x0.432 + P7.625x0.301 [136°] - 12B	H	L2x2x1/8
D	L1 1/2x1 1/2x3/16	I	L3x3x5/16
E	L2x2x1/4		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A570-45	45 ksi	60 ksi	A500M-54	54 ksi	70 ksi
A36	36 ksi	58 ksi	A572-50	50 ksi	65 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 38 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.5%

MAX. CORNER REACTIONS AT BASE:
DOWN: 346 K
SHEAR: 19 K

UPLIFT: -324 K
SHEAR: 18 K

AXIAL
78 K
SHEAR 10 K *MOMENT 838 kip-ft*

TORQUE 1 kip-ft
38 mph WIND - 1.2500 in ICE

AXIAL
29 K
SHEAR 26 K *MOMENT 2188 kip-ft*

TORQUE 3 kip-ft
REACTIONS - 80 mph WIND

FDH Engineering, Inc.
6521 Meridien Dr.
Raleigh, NC 27616
Phone: (919) 755-1012
FAX: (919) 755-1031
Tower Analysis

Job: Glastonbury-Main St, CT46126-A-06		
Project: 13SB5C1400		
Client: SBA Network Services, Inc.	Drawn by: J. Carden	App'd:
Code: TIA/EIA-222-F	Date: 09/24/13	Scale: NTS
Path:		Dwg No. E-1

SBA Communications Corporation
5900 Broken Sound Parkway NW
Boca Raton, FL 33487-2797

T + 561 995.7670
F + 561 995.7626

sbasite.com

RE: Glastonbury Main St. CT46126-A

Mr. Schadler,

The structural modification at "Glastonbury-Main Street" were completed on 12.31.2013; per FDH Structural Analysis project Number 13SB5C1400 dated 9.24.2013.

Should you have any questions or need further information, please feel free to contact me.

Stephen Roth

Regional Site Manager
CT and SE-NY
SBA COMMUNICATIONS CORPORATION
5900 Broken Sound Parkway NW
Boca Raton, FL 33487-2797
Alternate Address:
105 Kimberly Road
East Granby, CT 06026
860.413.3493 + **T**
860.539.4920 + **C**
sroth@sbasite.com

ATTACHMENT 4

HMB

HMB Acoustics LLC 3 Cherry Tree Lane, Avon, Ct. 06001 860-677-5955

January 16, 2014

Doug Drost
Project Engineer, Wireless
Centek Engineering, Inc.
63-2 North Branford Road
Branford, Ct. 06405

Subject: Glastonbury West - CSC Noise Compliance Study

Dear Mr. Drost:

The noise levels for the V1; V2; N1; and N2 wall mounted HVAC units were calculated while each one was operating separately. Typically only one of the two units on each equipment shelter operates at any one time. There is no carry-over acoustical effect from one shelter to the other due to orientation and distance between the two shelters. The noise level was then projected to each property line. The resultant noise level was compared to the State of Ct. Noise Regulation. The Regulation allows a noise level of 55 dBA (daytime) and 45 dBA (nighttime), when measured at a Residential Receptor's property line. I found that the four (4) air-conditioner units meet the conditions for compliance as set forth in the Regulation at all property lines.

Allan Smardin
HMB Acoustics LLC

PROJECT INFORMATION:	Centek Job #:13183.000
Applicant:	Cellco Partnership d.b.a. Verizon Wireless
Applicant Site ID:	Glastonbury West
Site Owner:	SBA
Site Address:	2577 Main Street, Glastonbury, CT
Subject Zoning District:	PBD: Planned Business & Development
Abutting Zoning District(s):	PBD: Planned Business & Development (All abutters)

APPLICANT EQUIPMENT:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West
V-1	Wall Mounted HVAC	Bard / W61A1-105EPXXXJ	91	116	285	113
V-2	Wall Mounted HVAC	Bard / W61A1-105EPXXXJ	91	116	292	106

EXISTING COLOCATORS:

☒	AT&T	☒	Metro PCS	☐	Other:
☒	Sprint	☒	T Mobile	☐	Other:
☒	Nextel	☐	None	☐	Other:

EXISTING COLOCATOR EQUIPMENT OWNER: Nextel

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West
N-1	Wall Mounted HVAC	Marvair Compac 2/ unknown	83	106	340	59
N-2	Wall Mounted HVAC	Marvair Compac 2/ unknown	83	106	346	53

EXISTING COLOCATOR EQUIPMENT OWNER:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

CONCLUSION:

Daytime Regulation:	55 dBA	**Nighttime Regulation:**	45 dBA
Compliance:	☒ Yes ☐ No	**Compliance:**	☒ Yes ☐ No

BASIS OF FINDINGS:

North property line: V-1 = 36 dBA; V-2 = 36 dBA; N-1 = 43dBA; N-2 = 43 dBA

South property line: V-1 = 40 dBA; V-2 = 40 dBA; N-1 = 37dBA; N-2 = 37 dBA

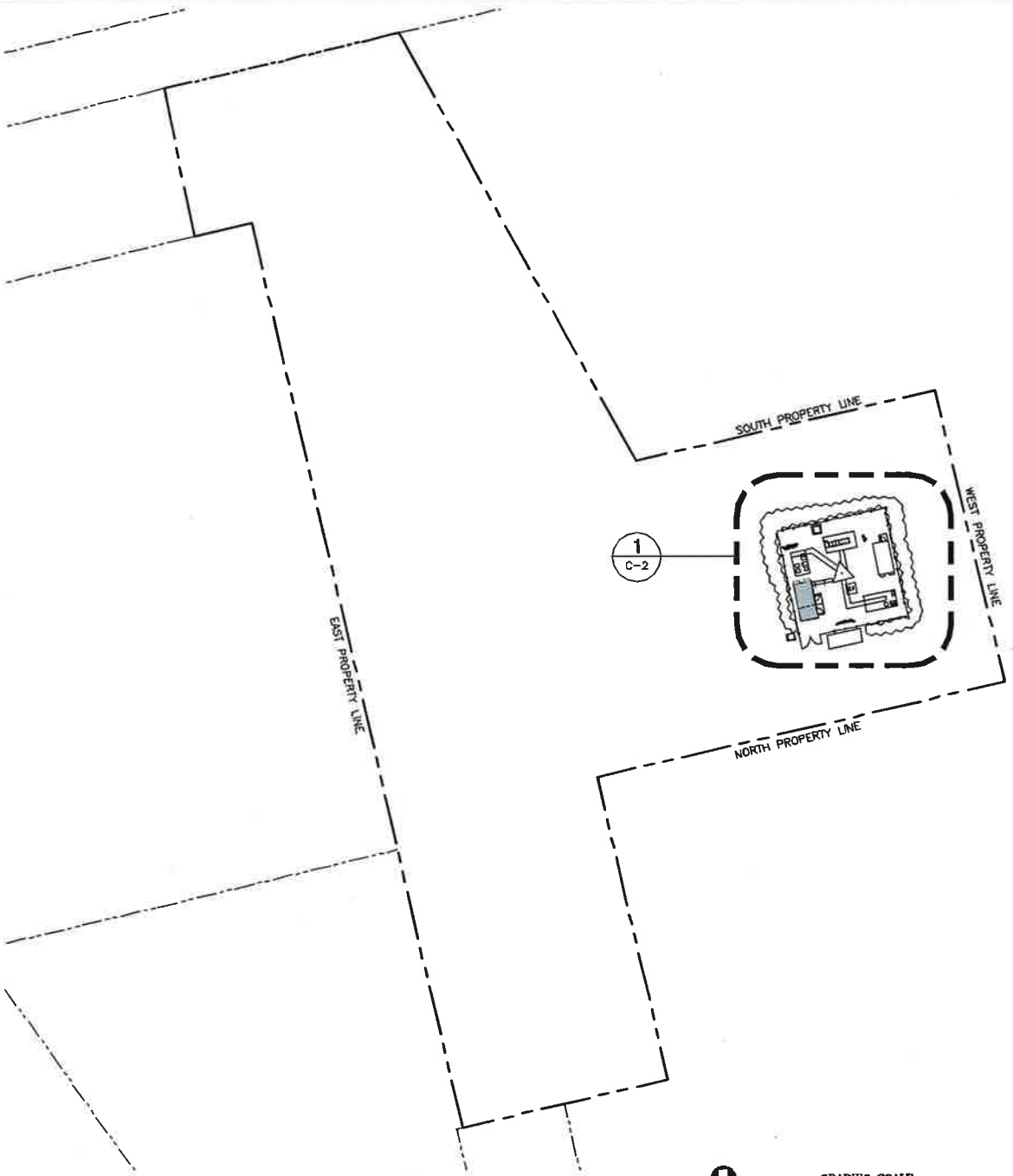
East property line: V-1 = 39 dBA; V-2 = 38 dBA; N-1 = 33dBA; N-2 = 33 dBA

West property line: V-1 = 43 dBA; V-2 = 44 dBA; N-1 = 44dBA; N-2 = 45 dBA

The dBA levels take into account the acoustical shielding effect provided by other structures on the property.

The existing AT&T, T-Mobile, Sprint and Metro PCS Equipment cabinets are inaudible at a distance of 25 feet.

Prepared By: Alan Smardin, HMB ACOUSTICS LLC Date: 01/16/14



1 / C-1 SITE PLAN - PROPOSED
SCALE: 1" = 100'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
0 50 100
(IN FEET)
1 inch = 100 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/15/14	DMD	CFC	NOISE DIMITER INFORMATION

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
www.Centekeng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless

GLASTONBURY WEST

2577 MAIN STREET
GLASTONBURY, CT 06033

DATE: 12/17/13
SCALE: AS NOTED
JOB NO. 13183.000

ELEVATION, PLAN AND ANTENNA CONFIG.

C-1

DWG. 1 OF 2

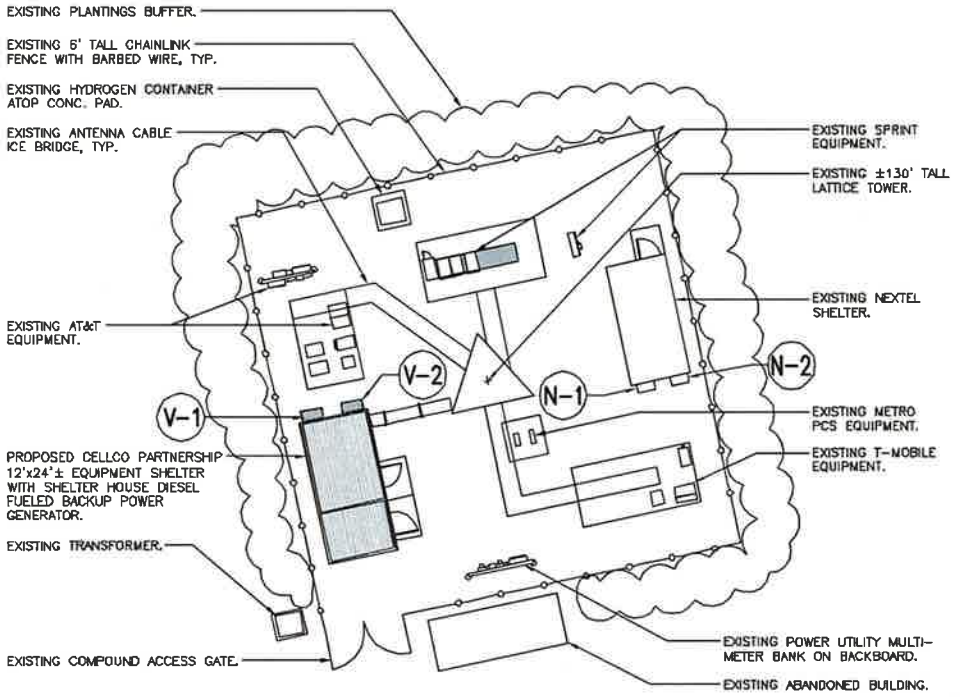
NOISE EMMITTER INFORMATION

(V-1) WALL MOUNTED HVAC UNIT, MAKE: BARD, MODEL: W61A1-A05EPXXXJ

(V-2) WALL MOUNTED HVAC UNIT, MAKE: BARD, MODEL: W61A1-A05EPXXXJ

(N-1) WALL MOUNTED HVAC UNIT, MAKE: MARVAIR, COMPAC 2, MODEL: UNKNOWN

(N-2) WALL MOUNTED HVAC UNIT, MAKE: MARVAIR, COMPAC 2, MODEL: UNKNOWN



1 / C-1 COMPOUND PLAN - PROPOSED
SCALE: 1" = 30'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
0 15 30
(IN FEET)
1 inch = 30 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/15/14	DMD	CFC	NOISE EMMITER INFORMATION

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
www.CentekEng.com
(203) 488-0580
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63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless
GLASTONBURY WEST
2577 MAIN STREET
GLASTONBURY, CT 06033

DATE: 12/17/13
SCALE: AS NOTED
JOB NO. 13183.000

COMPOUND PLAN

C-2
DWG. 2 OF 2

ATTACHMENT 5

Far Field Approximation
with downtilt variation

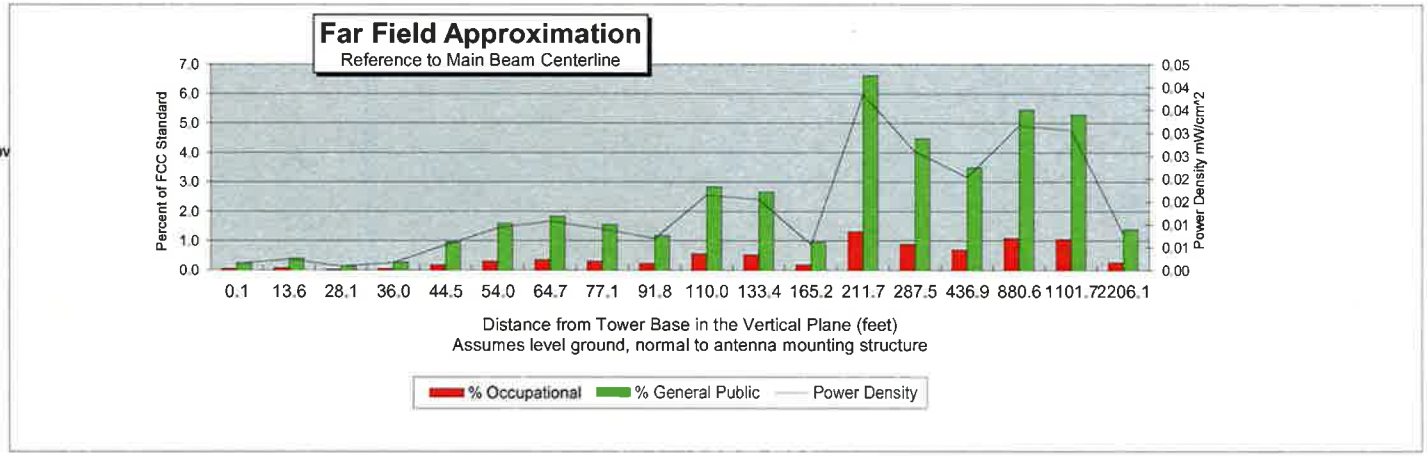
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Glastonbury West, CT
Site #:	8_0428
Date:	01/06/14
Name:	Mark Brauer
File Name:	Glastonbury West, CT - FF Pov

Operating Freq. (MHz)	**869.0**
Antenna Height (ft):	**80.0**
Antenna Gain (dBi):	**16.7**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**3852.0**



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	77.0	78.2	82.0	85.0	88.9	94.0	100.6	108.9	119.8	134.3	154.1	182.3	225.2	297.7	443.6	883.9	1104.4	2207.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	13.6	28.1	36.0	44.5	54.0	64.7	77.1	91.8	110.0	133.4	165.2	211.7	287.5	436.9	880.6	1101.7	2206.1	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.04	0.03	0.02	0.03	0.03	0.01	
Percent of Occupational Standard	0.0	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.2	0.6	0.5	0.2	1.3	0.9	0.7	1.1	1.1	0.3	
Percent of General Population Standard	0.2	0.4	0.1	0.3	0.9	1.6	1.8	1.6	1.2	2.8	2.7	1.0	6.6	4.5	3.5	5.4	5.3	1.4	

Antenna Type BXA-70063-6CF
Max% 6.62%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

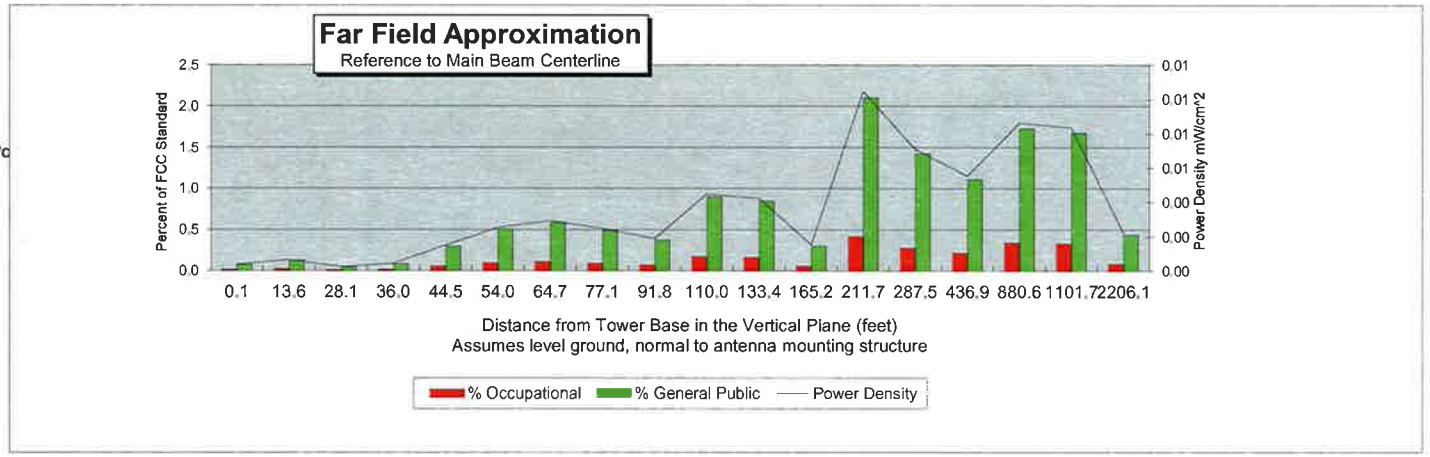
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Glastonbury West, CT
Site #:	8_0428
Date:	01/06/14
Name:	Mark Brauer
File Name:	BXA-171063-12CF, CT - FF Pc

Operating Freq. (MHz)	746.0
Antenna Height (ft):	80.0
Antenna Gain (dBi):	16.7
Antenna Size (in.):	72.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	1050.0



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	77.0	78.2	82.0	85.0	88.9	94.0	100.6	108.9	119.8	134.3	154.1	182.3	225.2	297.7	443.6	883.9	1104.4	2207.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	13.6	28.1	36.0	44.5	54.0	64.7	77.1	91.8	110.0	133.4	165.2	211.7	287.5	436.9	880.6	1101.7	2206.1	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.4	0.3	0.2	0.3	0.3	0.1	
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.3	0.5	0.6	0.5	0.4	0.9	0.8	0.3	2.1	1.4	1.1	1.7	1.7	0.4	

Antenna Type BXA-70063-6CF
Max% 2.10%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

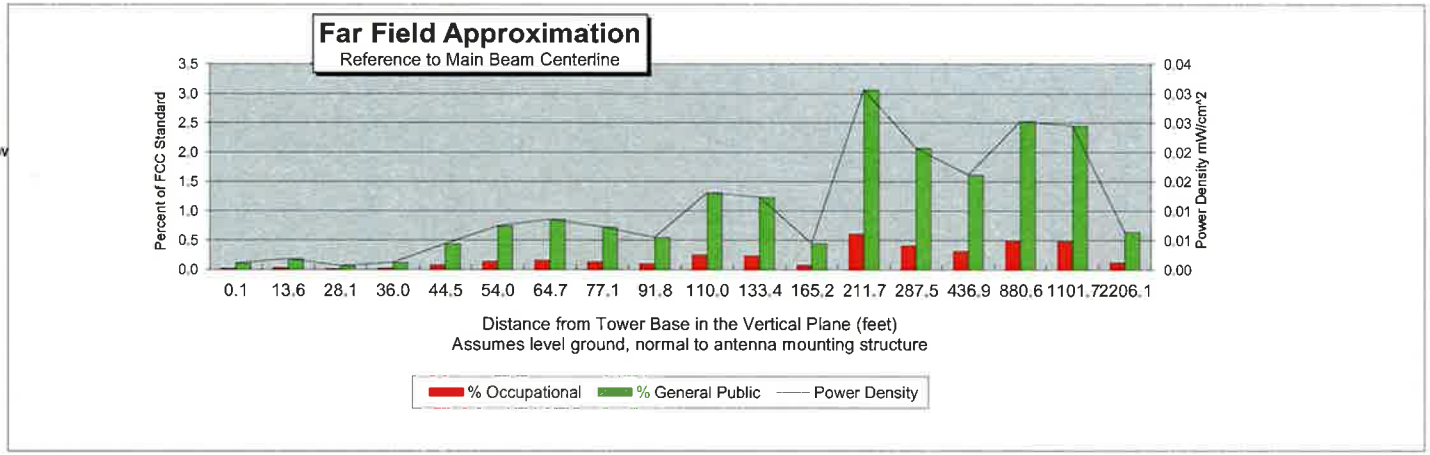
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Glastonbury West, CT
Site #:	8_0428
Date:	01/06/14
Name:	Mark Brauer
File Name:	Glastonbury West, CT - FF Pov

Operating Freq. (MHz)	**2110.0**
Antenna Height (ft):	**80.0**
Antenna Gain (dBi):	**19.1**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**1750.0**



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	77.0	78.2	82.0	85.0	88.9	94.0	100.6	108.9	119.8	134.3	154.1	182.3	225.2	297.7	443.6	883.9	1104.4	2207.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	13.6	28.1	36.0	44.5	54.0	64.7	77.1	91.8	110.0	133.4	165.2	211.7	287.5	436.9	880.6	1101.7	2206.1	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.03	0.02	0.02	0.03	0.02	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.1	0.6	0.4	0.3	0.5	0.5	0.1	
Percent of General Population Standard	0.1	0.2	0.1	0.1	0.4	0.7	0.9	0.7	0.5	1.3	1.2	0.4	3.1	2.1	1.6	2.5	2.4	0.6	

Antenna Type BXA-171063-12CF
Max% 3.06%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

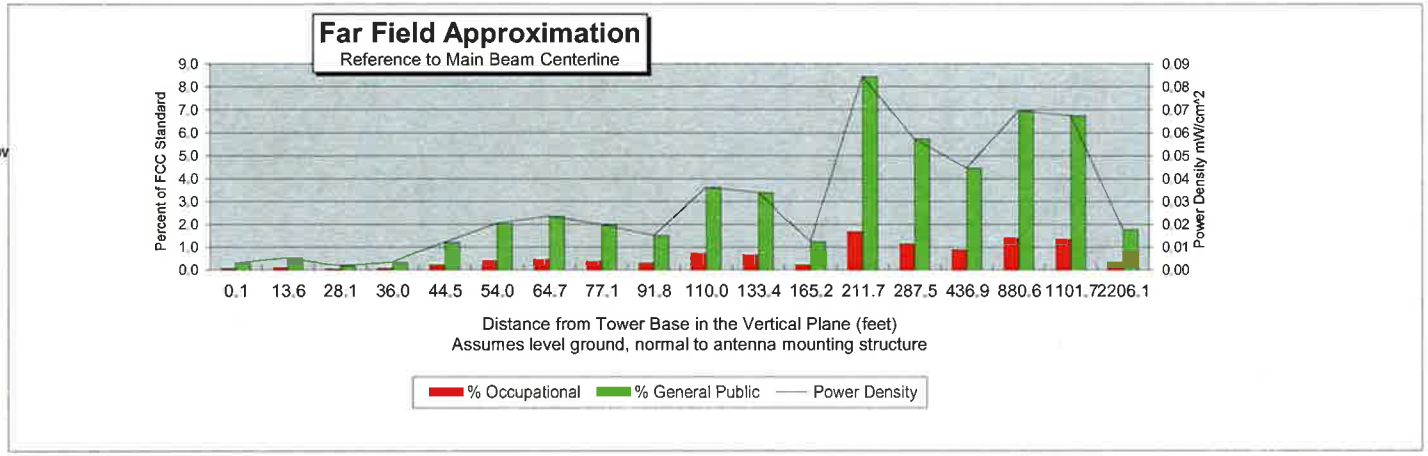
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Glastonbury West, CT
Site #:	8_0428
Date:	01/06/14
Name:	Mark Brauer
File Name:	Glastonbury West, CT - FF Pov

Operating Freq. (MHz)	**1972.0**
Antenna Height (ft):	**80.0**
Antenna Gain (dBi):	**18.7**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**5295.0**



Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	77.0	78.2	82.0	85.0	88.9	94.0	100.6	108.9	119.8	134.3	154.1	182.3	225.2	297.7	443.6	883.9	1104.4	2207.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	13.6	28.1	36.0	44.5	54.0	64.7	77.1	91.8	110.0	133.4	165.2	211.7	287.5	436.9	880.6	1101.7	2206.1	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.01	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.04	0.03	0.01	0.08	0.06	0.04	0.07	0.07	0.02	
Percent of Occupational Standard	0.1	0.1	0.0	0.1	0.2	0.4	0.5	0.4	0.3	0.7	0.7	0.2	1.7	1.1	0.9	1.4	1.3	0.4	
Percent of General Population Standard	0.3	0.5	0.2	0.3	1.2	2.0	2.4	2.0	1.5	3.6	3.4	1.2	8.4	5.7	4.5	7.0	6.7	1.8	

Antenna Type BXA-171063-12CF
Max% 8.45%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.