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@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

October 8, 2002

Kenneth C. Baldwin
Robinson & Cole
280 Trumbull Street
Hartford, CT 06103-3597

RE: **TS-VER-057-020919** - Cellco Partnership d/b/a Verizon Wireless request for an order to approve tower sharing at a telecommunications facility at the Greenwich Hospital, 5 Perryridge Road, Greenwich, Connecticut.

Dear Attorney Baldwin:

At a public meeting held October 7, 2002, 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. 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 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.

The proposed shared use is to be implemented as specified in your letter dated September 19, 2002.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/laf

c: Honorable Lolly H. Prince, First Selectman, Town of Greenwich
Diane Fox, Town Planner, Town of Greenwich

ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

September 19, 2002

Via Hand Delivery

Mr. S. Derek Phelps
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 a Tower Facility at the Greenwich Hospital, 5 Perryridge Road, Greenwich, Connecticut**

Dear Mr. Phelps:

Pursuant to Connecticut General Statutes §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 proposed shared use by Cellco of an approved tower located on the grounds of Greenwich Hospital, 5 Perryridge Road, Greenwich, Connecticut. Cellco requests that the Council find that the proposed shared use of the tower satisfies the criteria stated in Connecticut General Statutes § 16-50aa and issue an order approving the proposed use.

Background

In Docket No. 73, Cellco's predecessor, Metro Mobile CTS of Fairfield County, Inc. received Council approval to install antennas on the roof of the "Old Main" building at Greenwich Hospital. The roof of the Old Main Building also supports antennas used by the Town of Greenwich emergency service providers. As part of its ongoing capital improvements project, Greenwich Hospital now intends to demolish the Old Main Building. By agreement between the Town and Greenwich Hospital, Greenwich Hospital will build a new tower on its property to support the local emergency service communication system.

The Greenwich Hospital tower was approved by the Greenwich Planning and Zoning Commission on February 12, 2002. The tower is a 164-foot self-supporting monopole structure adjacent to the employee parking garage on the 9.3 acre hospital parcel. The tower will be owned by Greenwich Hospital.

Cellco is licensed by the Federal Communications Commission (FCC) to provide cellular wireless telephone service in the State of Connecticut, which includes the area to be served by Cellco's proposed Greenwich installation. Cellco and Greenwich Hospital have agreed to the proposed shared use of this tower pursuant to mutually acceptable terms and conditions, and Greenwich Hospital has authorized Cellco to act on its behalf to apply for all necessary local, state and federal permits, approvals, and authorizations which may be required for the proposed shared use of this facility. As a courtesy to the Town, and pursuant to the Planning and Zoning Commission's conditions of approval, Cellco applied for and received administrative staff sign-off of its tower share proposal.

Cellco proposes to install twelve (12) panel-type antennas at the 124-foot level on the tower. The radio transmission equipment associated with these antennas would be located in an approximately 12-foot by 20-foot equipment room on the ground floor of the staff parking garage. Project plans are included behind Attachment 1.

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." The shared use of the tower satisfies those criteria as follows:

A. **Technical Feasibility.** The tower has been designed to support the Town antennas and five additional carriers, including Cellco. The proposed shared use of this tower therefore is technically feasible. A letter verifying the structural integrity of the existing tower is attached to this filing behind Attachment 2.

B. **Legal Feasibility.** Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the proposed shared use of an existing tower facility such as the facility at 5 Perryridge Road in Greenwich. 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 towers 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 would have a minimal environmental effect, for the following reasons:

1. The proposed installations would have an insignificant incremental visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing site. In particular, the proposed installations would not increase the height of the existing tower, and would not extend the boundaries of the tower site outside the limits of the existing site compound.

2. The proposed installations would not increase the noise levels at the existing facility by six decibels or more.

3. Operation of Cellco antennas at this site would not exceed the total radio frequency (RF) electromagnetic radiation power density level adopted by the Federal Communications Commission. In support of this statement, Attachment 3 contains the report of the Town's Communications Consultant, Langone & Associates. In this report, Mr. Langone provides a calculation of power density levels for the Town emergency service antennas under a "worst-case" scenario. (See Langone Report p. 2). The "worst-case" exposure calculated for operation of the Town antennas would be 75.11% of the applicable FCC standard. Cellco's "worst-case" calculations would add 0.1433 mW/cm^2 (24.74% of the FCC standard), for a total of 99.85% of the standard as measured for mixed frequency sites. Also attached is a more realistic approximation

of power density levels for the Cellco antennas. This analysis indicates that power density levels will range from a level of 0.00% of the FCC standard, at the base of the tower to a high of 2.433% of the FCC standard approximately 140 feet from the base of the tower.

4. The proposed installation, would not require any water or sanitary facilities, or generate air emissions or discharges to water or sanitary facilities, or generate air emissions or discharges to water bodies. After construction is complete the proposed installation would not generate any traffic other than periodic maintenance visits.

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

E. **Economic Feasibility.** As previously mentioned, Greenwich Hospital and Cellco have entered into a mutual agreement to share the use of the replacement tower on terms agreeable to the parties. The proposed tower sharing is therefore economically feasible.

F. **Public Safety Concerns.** As stated above, the proposed replacement tower will be structurally capable of supporting the Cellco antennas. Cellco is not aware of any public safety concerns relative to the proposed sharing of the existing tower. In fact, the provision of new or improved phone service through shared use of the existing tower is expected to enhance the safety and welfare of area residents.

Conclusion

For the reasons discussed above, the proposed shared use of the Greenwich Hospital tower at 5 Perryridge Road, Greenwich, Connecticut satisfies the criteria stated in C.G.S. § 16-50aa and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of towers in Connecticut. The Applicant therefore requests that the Siting Council issue an order approving the proposed shared use.

Thank you for your consideration of this matter.

Sincerely,

Kenneth C. Baldwin

KCB/ct
Attachments
cc: Richard V. Bergstresser, Greenwich First Selectman
Sandy M. Carter

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

GREENWICH HOSPITAL
5 PERRYRIDGE ROAD
GREENWICH, CT 06830

SITE INFORMATION

1. THE SCOPE OF WORK CONSISTS OF CELLCO PARTNERSHIP PANEL ANTENNAS MOUNTED ON AN APPROVED 184' MONOPOLE AND AN EQUIPMENT ROOM LOCATED IN THE EXISTING PARKING GARAGE.
2. THE ELECTRIC SERVICE WILL ORIGINATE FROM THE ELECTRICAL PANEL BOARD IN THE APPROVED EQUIPMENT AREA LOCATED IN THE PARKING GARAGE.

   THE TELEPHONE SERVICE WILL ORIGINATE FROM THE TELCO PANEL BOARD IN THE APPROVED EQUIPMENT AREA LOCATED IN THE PARKING GARAGE.
3. DESIGN OF STRUCTURAL MODIFICATIONS FOR THE INSTALLATION OF THE VERIZON WIRELESS EQUIPMENT ROOM AND ANTENNA MOUNTS WILL BE INCLUDED IN THE FINAL CONSTRUCTION DOCUMENTS.
4. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 1996 BOCA NATIONAL BUILDING CODE AS MODIFIED BY THE 1999 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA 222-C-01 "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES."
5. THERE WILL NOT BE ANY LIGHTING UNLESS REQUIRED BY THE FCC OR THE FAA.
6. THERE WILL NOT BE ANY SIGNS OR ADVERTISING ON THE ANTENNAS OR EQUIPMENT.

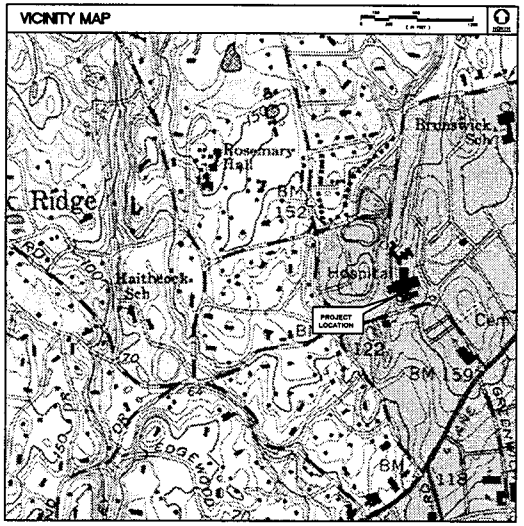
SITE DIRECTIONS FROM: 99-101 EAST RIVER DR.,EAST HARTFORD, CT.

START OUT GOING EAST ON E RIVER DR TOWARDS US-5/ME RIVER DR EXT. TAKE THE US-5 S RAMP. MERGE ONTO US-5 S. TAKE THE I-91 S EXIT. EXIT NUMBER 8M. TOWARDS NEW HAVEN/HLY, CITY. TAKE THE CT-15 S/ME CROSS PKWY/E.MAIN ST EXIT. EXIT NUMBER 17. KEEP LEFT AT FORK IN THE RAMP. MERGE ONTO CT-15 S. TAKE THE EXIT- EXIT NUMBER 54- TOWARDS I-95/MILFORD/US-1. MERGE ONTO MILFORD PKWY. TAKE THE I-95 S EXIT TOWARDS BRIDGEPORT/NLY, CITY. MERGE ONTO I-95 S. TAKE THE ARCH ST EXIT- EXIT NUMBER 5- TOWARDS GREENWICH. TURN RIGHT ONTO ARCH ST. STAY STRAIGHT TO GO ONTO SOUND VIEW DR. TURN RIGHT ONTO FIELD POINT RD. TURN RIGHT ONTO W PUTNAM AVE/US-1.TURN LEFT ONTO LAFAYETTE PL. ENTER NEXT ROUNDABOUT AND TAKE 1ST EXIT ONTO WILLIAM ST. TURN RIGHT ONTO PERRYRIDGE RD.

PROJECT SUMMARY

SITE NAME:	GREENWICH HOSPITAL
SITE ADDRESS:	5 PERRYRIDGE ROAD GREENWICH, CT 06830
PROPERTY OWNER	GREENWICH HOSPITAL 5 PERRYRIDGE ROAD GREENWICH, CT 06830
CONTACT PERSON:	MARK GAUGER, VERIZON WIRELESS - (860) 803-8240
GOVERNING CODE:	CONNECTICUT BUILDING CODE CONNECTICUT LIFE SAFETY CODES
LESSEE:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS
APPLICANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99-101 EAST RIVER DRIVE EAST HARTFORD, CT. 06108
ENGINEER:	NATCOMM LLC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405 OFC. (203) 488-0580 FAX. (203) 488-8587
TOWER COORDINATES:	LATITUDE: 41°-02'-02.17" (NAD 83) LONGITUDE: 73°-37'-51.05" (NAD 83) GROUND ELEVATION: 131.1 A.M.S.L. (NGVD 29) * COORDINATES AND GROUND ELEVATIONS ARE BASED ON "FAA 1A CERTIFICATION" PREPARED BY: MARTINEZ COUCH & ASSOCIATES DATED: 05/03/02 ON FILE IN TOWN HALL.

VICINITY MAP



LEGEND

SYMBOL	DESCRIPTION
	SECTION OR DETAIL NUMBER SHEET WHERE DETAIL/SECTION OCCURS
	ELEVATION NUMBER
	SHEET WHERE ELEVATION OCCURS

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-0	TITLE SHEET	00
C-1	SITE PLAN	00
C-2	COMPOUND PLAN AND DETAILS	00
C-3	TOWER ELEVATION AND MOUNTING DETAILS	00

REVISIONS		
00	09/12/02	SITING COUNCIL REVIEW

Cellco Partnership
d.b.a. verizon wireless

Natcomm, LLC • Engineering Consultants
NATCOMM
Natcomm, LLC.
63-2 North Branford Road
Branford, Connecticut 06405
Tel. (203) 488-0580
Fax (203) 488-8587
Consulting Engineers • Project Management
Civil • Structural • Mechanical • Electrical

PROFESSIONAL ENGINEER SEAL

GREENWICH HOSPITAL
5 PERRYRIDGE ROAD
GREENWICH, CT

PROJECT NO:	02585
DRAWN BY:	AAJ
CHECKED BY:	JJP
SCALE:	AS NOTED
DATE:	07/15/02

TITLE SHEET

T-0

DWG. 1 OF 4

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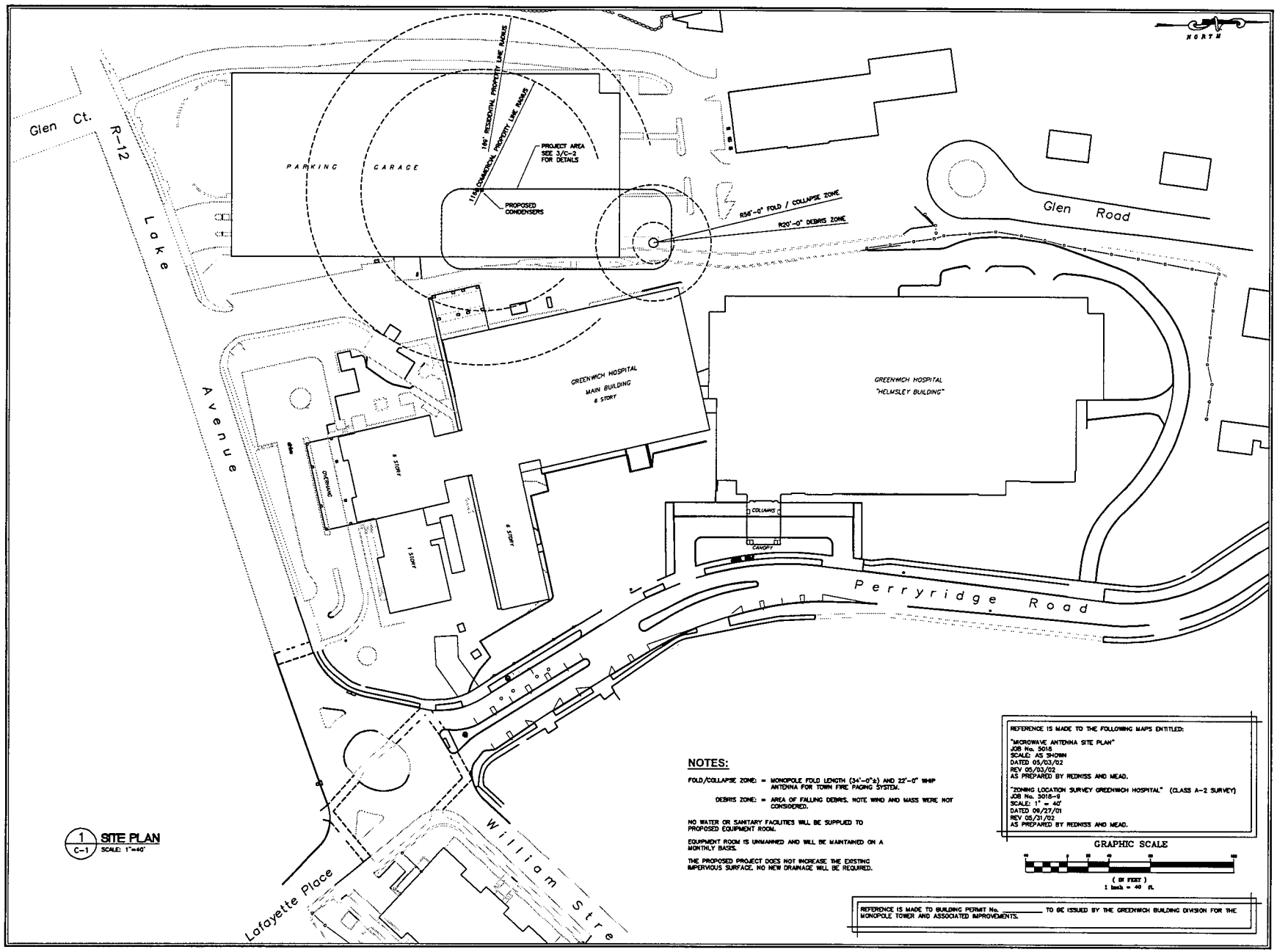

1 / C-1 **SITE PLAN**
SCALE: 1"=40'

NOTES:

FOLD/COLLAPSE ZONE: = MONOPOLE FOLD LENGTH (34'-0"±) AND 22'-0" WHIP ANTENNA FOR TOWN FIRE PAGING SYSTEM.

DEBRIS ZONE: = AREA OF FALLING DEBRIS. NOTE WIND AND MASS WERE NOT CONSIDERED.

NO WATER OR SANITARY FACILITIES WILL BE SUPPLIED TO PROPOSED EQUIPMENT ROOM.

EQUIPMENT ROOM IS UNMANNED AND WILL BE MAINTAINED ON A MONTHLY BASIS.

THE PROPOSED PROJECT DOES NOT INCREASE THE EXISTING IMPERVIOUS SURFACE. NO NEW DRAINAGE WILL BE REQUIRED.

REFERENCE IS MADE TO THE FOLLOWING MAPS ENTITLED:

"MICROWAVE ANTENNA SITE PLAN"
JOB No. 5018
SCALE: AS SHOWN
DATED 05/03/02
REV 05/03/02
AS PREPARED BY REDNISS AND MEAD.

"ZONING LOCATION SURVEY GREENWICH HOSPITAL" (CLASS A-2 SURVEY)
JOB No. 5018-S
SCALE: 1" = 40'
DATED 09/27/01
REV 05/21/02
AS PREPARED BY REDNISS AND MEAD.

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

REFERENCE IS MADE TO BUILDING PERMIT No. _____ TO BE ISSUED BY THE GREENWICH BUILDING DIVISION FOR THE MONOPOLE TOWER AND ASSOCIATED IMPROVEMENTS.

REVISIONS		
00	09/12/02	SITING COUNCIL REVIEW

Cellco Partnership
d.b.a. verizon wireless

Natcomm, LLC.
63-2 North Branford Road
Branford, Connecticut 06405
Tel. (203) 488-0580
Fax (203) 488-8587
Consulting Engineers - Project Management
Civil-Structural-Mechanical-Electrical

GREENWICH HOSPITAL
5 PERRYRIDGE ROAD
GREENWICH, CT

PROJECT NO:	02585
DRAWN BY:	AAJ
CHECKED BY:	JJP
SCALE:	AS NOTED
DATE:	07/15/02

SITE PLAN

C-1
DWG. 2 OF 4

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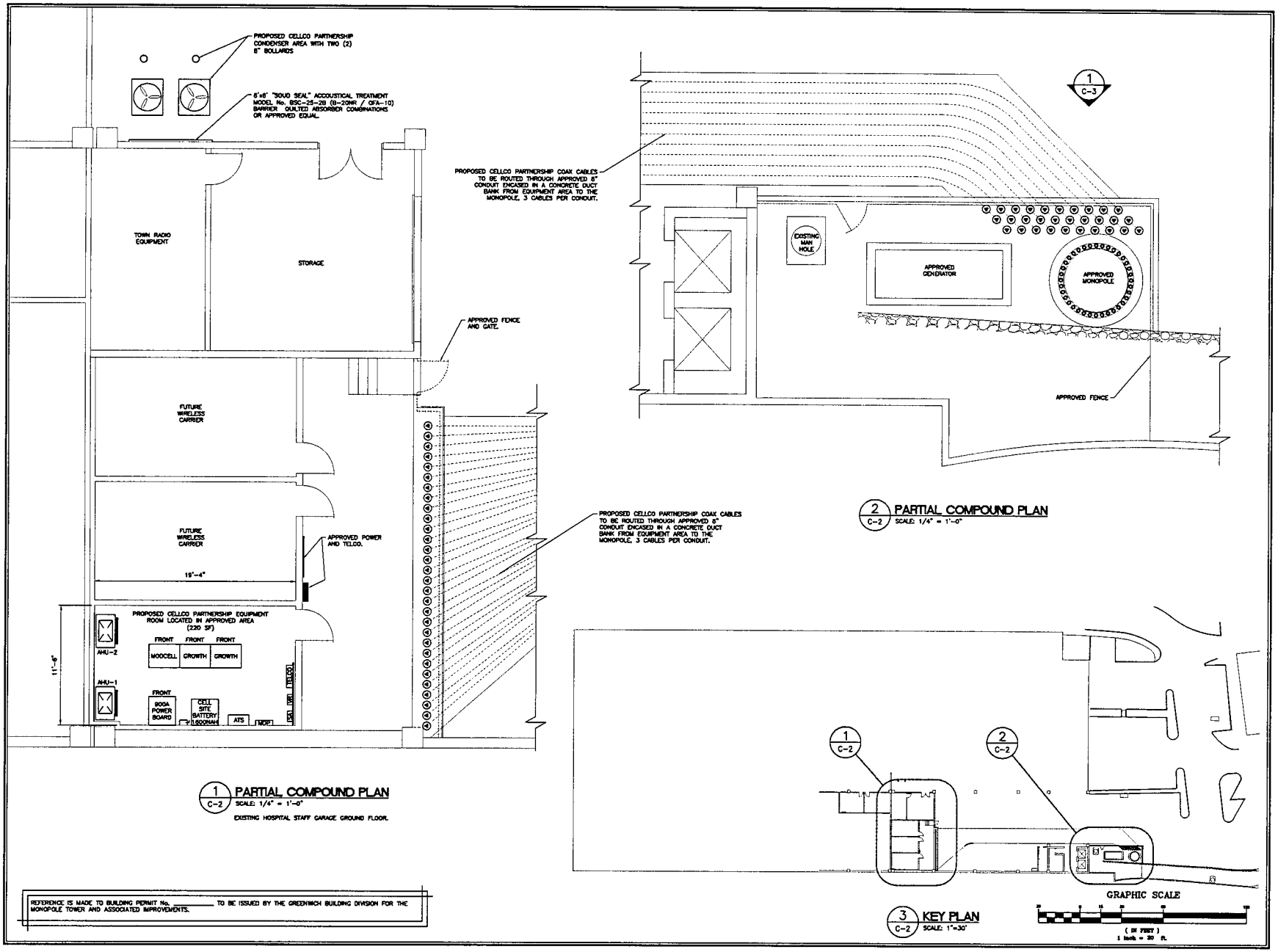

1 C-2 **PARTIAL COMPOUND PLAN**
SCALE: 1/4" = 1'-0"
EXISTING HOSPITAL STAFF GARAGE GROUND FLOOR.

2 C-2 **PARTIAL COMPOUND PLAN**
SCALE: 1/4" = 1'-0"

3 C-2 **KEY PLAN**
SCALE: 1"=30'

REFERENCE IS MADE TO BUILDING PERMIT No. _____ TO BE ISSUED BY THE GREENWICH BUILDING DIVISION FOR THE MONOPOLE TOWER AND ASSOCIATED IMPROVEMENTS.

REVISIONS		
00	09/12/02	SITING COUNCIL REVIEW

Cellco Partnership
d.b.a. verizon wireless

Natcomm, LLC.
63-2 North Branford Road
Branford, Connecticut 06405
Tel. (203) 488-0580
Fax (203) 488-8587
Consulting Engineers - Project Management
Civil - Structural - Mechanical - Electrical

GREENWICH HOSPITAL
5 PERRYRIDGE ROAD
GREENWICH, CT

PROJECT NO:	02585
DRAWN BY:	AAJ
CHECKED BY:	JJP
SCALE:	AS NOTED
DATE:	07/15/02

COMPOUND PLAN AND DETAILS

C-2
DWG. 3 OF 4

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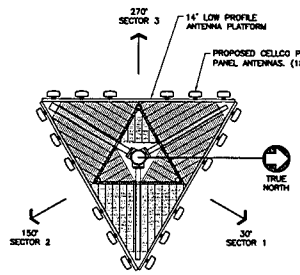

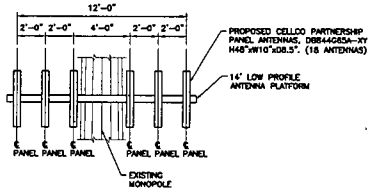

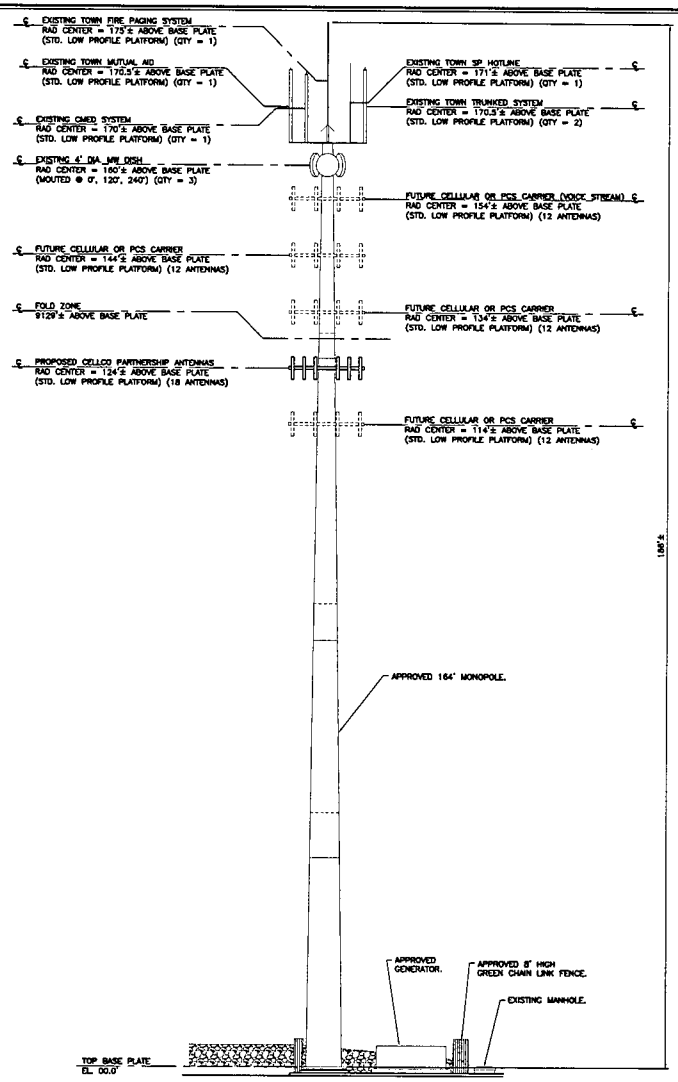

REFERENCE IS MADE TO BUILDING PERMIT No._____ TO BE ISSUED BY THE GREENWICH BUILDING DIVISION FOR THE MONOPOLE TOWER AND ASSOCIATED IMPROVEMENTS.

6 / C-3 TOWER ELEVATION
SCALE: 1"=10'

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

REVISIONS		
00	09/12/02	SITING COUNCIL REVIEW

Cellco Partnership
d.b.a. verizon wireless

Natcomm, LLC.
60-2 North Branford Road
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Civil-Structural-Mechanical-Electrical

GREENWICH HOSPITAL

5 PERRYRIDGE ROAD
GREENWICH, CT

PROJECT NO:	02585
DRAWN BY:	AAJ
CHECKED BY:	JJP
SCALE:	AS NOTED
DATE:	07/15/02

TOWER ELEVATION AND MOUNTING DETAILS

C-3
DWG. 4 OF 4

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NATCOMM, LLC

Consulting Engineers

May 23, 2002

Mr. Mark Gauger
Verizon Wireless
99-101 East River Drive
East Hartford, CT 06108

Re: *Greenwich Hospital*
5 Perryridge Road
Greenwich, CT

Natcomm Project No. 02585

Dear Mark,

We have reviewed the proposed Verizon antenna installation at the above referenced site. The purpose of the review is to determine the adequacy of an existing 164ft. monopole. The review considered the effects of wind load, dead load, ice load and seismic forces in accordance with TIA/EIA-222-F and Connecticut State Building Code.

The proposed antenna configuration is as follows:

Town:	▪ Two (2) Cleave BMR10-O-B1 mounted on a low profile platform at an elevation of 164 ft.
Town:	▪ One (1) Cleave PD620-3 mounted on a low profile platform at an elevation of 164 ft.
Town:	▪ One (1) Cleave ALR8L-O-B1 mounted on a low profile platform at an elevation of 164 ft.
Town:	▪ One (1) Cleave PD1142-2B mounted on a low profile platform at an elevation of 164 ft.
Town:	▪ Three (3) HP-4 Microwave Dish mounted at elevation 160ft.
Future Carrier	▪ Twelve (12) ALP9212 mounted on a low profile platform at an elevation of 154 ft.
Future Carrier	▪ Twelve (12) ALP9212 mounted on a low profile platform at an elevation of 144 ft
Future Carrier	▪ Twelve (12) ALP9212 mounted on a low profile platform at an elevation of 134 ft.
Verizon Wireless	▪ Eighteen (18) DB844G65A-XY mounted on a low profile platform at an elevation of 124 ft.
Future Carrier	▪ Twelve (12) ALP9212 mounted on a low profile platform at an elevation of 114 ft.

The result of our review shows that the design of the 164ft approved monopole tower with a ½" radial ice in accordance with all applicable building codes, will be adequate to carry the proposed loads.

If there are any questions regarding this matter, please feel free to call.

Submitted by:

Carlo F. Centore, P.E.
Senior Project Manger

STATE OF CONNECTICUT
CARLO F. CENTORE
No. 16694
LICENSED
PROFESSIONAL ENGINEER

(203) 488-0580 • Fax (203) 488-8587 • www.natcommllc.com 63-2 North Branford Rd. Branford, CT 06405

GREENWICH HOSPITAL

ANALYSIS OF THE POTENTIAL EXPOSURE OF THE GENERAL PUBLIC TO RF RADIATION FROM THE PROPOSED MONOPOLE

JANUARY 8, 2002
LANGONE & ASSOCIATES

INTRODUCTION

The Greenwich Hospital has proposed to install a 164' AGL (above ground level) monopole to provide a location to install antennas for the Town's mission critical public safety radio communications systems. These antennas are currently located on top of one of the hospital buildings that is due to be demolished to make room for the new Watson building. The new building's seismic design requirements make it incompatible as a public safety radio system antenna site. In order to maintain the current level of public safety system performance, a monopole is proposed at the hospital to mount the antennas.

Due to the concerns of the health effects of RF radiation, the Town has directed that an analysis of the RF radiation levels from the new monopole be made to ensure that no harmful levels exist in the public areas of the hospital complex.

All transmitting facilities and devices regulated by the FCC and subject to the grant of an application (this includes the Town's public safety radio systems) are expected to comply with the appropriate RF radiation exposure guidelines as outlined in the FCC OET Bulletin 65 "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" August 1997. Applicable portions of this bulletin are included in the Attachments.

All of the Town's public safety radio systems currently at the hospital are included in this analysis. These systems are:

- Town Public Safety Trunked Radio System (Six 800 MHz frequencies with six transmitters combined into one antenna) = Antenna #1
- Town Public Safety Mutual Aid Radio System (Five 800 MHz frequencies with two transmitters combined into one antenna; one transmitter has a single frequency and the other transmitter can be selected to operate on any one of the five frequencies) = Antenna #2
- Town Public Safety Microwave Radio System (Three 17,000 or 18,000 MHz frequencies with three transmitters and three individual antennas) = Antennas #3, #4 & #5
- CMED Radio System (One UHF frequency with one transmitter into one antenna) = Antenna #6
- Town Fire Department Paging System (One VHF frequency with one transmitter into one antenna) = Antenna #7
- Town State Police Hotline System (One Low Band frequency with one transmitter into one antenna) = Antenna #8

This analysis will include the summation of the contributions of all transmitters and associated antennas (the emitters of RF radiation) on the monopole. For the purposes of this worst-case analysis, each transmitter is listed on the spreadsheet and treated separately whether or not it has its own antenna or is combined into a single antenna. The transmitters as listed on the spreadsheet are:

1. 800 MHz Trunked Trunked Transmitter
2. 800 MHz Trunked Trunked Transmitter
3. 800 MHz Trunked Trunked Transmitter
4. 800 MHz Trunked Trunked Transmitter
5. 800 MHz Trunked Trunked Transmitter
6. 800 MHz Trunked Trunked Transmitter

The above are combined onto antenna #1.

7. 800 MHz Mutual Aid Transmitter
8. 800 MHz Mutual Aid Transmitter

The above are combined onto antenna #2

9. Microwave Transmitter to Bruce Golf Course on antenna #3
10. Microwave Transmitter to Police Department on antenna #4
11. Microwave Transmitter to Putnam Avenue on antenna #5
12. CMED Transmitter on antenna #6
13. Fire Paging Transmitter on antenna #7
14. State Police Hotline Transmitter on antenna #8

The information used for this analysis was gained from the information listed in the Attachments and discussions with Police Officer Judson VanIngen of the Greenwich Police Department and Steve Carbery of the Greenwich Hospital.

CALCULATION OF POWER DENSITY

The calculations on the attached spreadsheet represents the worst-case situation by assuming that all energy radiating from the monopole will be concentrated at the closet point where the general public could have access. That point was identified as the top of the Watson building. The attached sketch illustrates the layout of the building, monopole and antennas. This approach to the analysis is extremely conservative because:

- Antenna gain is typically concentrated at the horizon and drops off dramatically as you go below the horizon
- Microwave antennas are directional and under actual conditions when installed on this monopole will not have all three antennas radiating in the same direction; microwave antenna gain drops off dramatically as you get further away from the direction of the main beam

- Microwave EIRP value is assumed to be at full power and typically operates at less than 10% of the maximum power output due to automatic power control

The calculation of the power density uses the following formula that is given in the FCC OET Bulletin 65 "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" August 1997.

$$S = 33.4 \times ERP/R^2$$

S = Power Density in $\mu w/cm^2$; this value is listed under the Calculated PD ($\mu w/cm^2$) on the spreadsheet

ERP = Power in watts; values used are listed on the spreadsheet under the ERP (Watts) column; this value is either calculated as a worst-case number or taken from the FCC license

R = Distance from antenna to the general public in meters; values used are listed on the spreadsheet under the Distance (Meters) column

CONCLUSION

The process described above includes an initial analysis using the worst-case. That is to assume that all of the radiated RF energy is concentrated at the lowest antenna point on the monopole (assumed to be 140' AGL). Since the worst-case analysis calculates the Total % of exposure to be 75.11 (from the attached spreadsheet) of the allowed limit. No further analysis is needed. Therefore, with the given parameters, this site is well within the guidelines established by the FCC and posses no health threat to the general public. It is important to note that the number 75.11 does not represent the actual % of acceptable radiation at the point but is a number that if less than 100 does not require any further and more detailed analysis to indicate compliance.

Additional information supporting the above conclusion is contained in the Attachments.

Since the monopole has been designed to include other radio antennas, each new antenna(s) will require an analysis of the total site. Therefore, all antennas will have to be considered as each new user's compliance is evaluated.

CERTIFICATION

I, Anthony Langone, am a RF Engineer who has worked in the RF industry for over 25 years. I understand the principles of RF radiation as provided in the FCC OET Bulletin 65 "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" August 1997. I have applied the appropriate requirements to this analysis to support the conclusion stated.

Anthony Langone

1/8/02
Date

ATTACHMENTS

RF RADIATION ANALYSIS

SPREADSHEET LEGEND

SKETCH TO ILLUSTRATE THE SITE LAYOUT AS IT RELATES TO THE CLOSEST PUBLIC AREA TO THE ANTENNAS

ZONING LOCATION SURVEY (REDNISS & MEAD) DATED 9/27/01 (PARTIAL DRAWING)

PARTIAL NORTH ELEVATION OF THE PROPOSED WATSON BUILDING (PARTIAL DRAWING)

PAUL J. FORD AND COMPANY DRAWING OF THE PROPOSED MONOPOLE DATED 11/29/01

FCC LICENSE FOR THE TRUNKED AND MUTUAL AID RADIO SYSTEMS (CALL SIGN – WNNM890)

FCC LICENSE FOR THE FIRE PAGING SYSTEM (CALL SIGN – KGW738)

FCC LICENSE FOR THE MICROWAVE SYSTEM (CALL SIGN – WNTN531)

SELECTED PORTIONS OF THE FCC OET BULLETIN 65 "EVALUATING COMPLIANCE WITH FCC GUIDELINES FOR HUMAN EXPOSURE TO RADIOFREQUENCY ELECTROMAGNETIC FIELDS" AUGUST 1997

Frequency Component MHz	Tx Source Description	Frequency MHz	Tx Power Watts	Tx Power dbm	Ant Gain db	Ant Line db	Combiner/Filter db	EIRP dbm	ERP dbm	EIRP Watts	ERP Watts	Ant Ht on Pole Feet	Antenna Number	Distance Feet	Distance Meters	Calculated PD μw/cm²	Maximum PD μw/cm²	% Maximum
1,500 - 100,000	MW to Bruce	17960	0.7	28	"	"	"	69.30		8,000	4,676	160	3	81	24.5	270.43	1000	27.04
1,500 - 100,000	MW to PD	18762	0.7	28	"	"	"	53.00		200	122	160	4	81	24.5	6.76	1000	0.68
1,500 - 100,000	MW to Putnam	17800	0.7	28				69.30		8,000	4,676	160	5	81	24.5	270.43	1000	27.04
300 - 1,500	Trunked System	866.7875	70	48.45	"	"	"				148	164	1	81	24.5	8.20	578	1.42
300 - 1,500	Trunked System	867.0625	70	48.45	"	"	"				148	164	1	81	24.5	8.20	578	1.42
300 - 1,500	Trunked System	868.1500	70	48.45	"	"	"				148	164	1	81	24.5	8.20	578	1.42
300 - 1,500	Trunked System	868.4000	70	48.45	"	"	"				148	164	1	81	24.5	8.20	578	1.42
300 - 1,500	Trunked System	868.7000	70	48.45	"	"	"				148	164	1	81	24.5	8.20	578	1.42
300 - 1,500	Trunked System	868.7000	70	48.45	"	"	"				148	164	1	81	24.5	8.20	578	1.42
300 - 1,500	Mutual Aid	866.0125	70	48.45	"	"	"				216.3	164	2	81	24.5	11.99	577	2.08
300 - 1,500	Mutual Aid	866.5125	70	48.45	"	"	"				216.3	164	2	81	24.5	11.99	576	2.08
300 - 1,500	CMED	463.000	70	48.45	9	-3	-3		51.45		150	140	8	81	24.5	8.32	300	2.69
30 - 300	Fire Paging	154.175	75	48.75	"	"	"				100	140	7	81	24.5	5.54	200	2.77
30 - 300	SP Hotline	39.46	100	50.00	0	-1	0		49.00		80	140	6	81	24.5	4.44	200	2.22
*Use ERP from FCC license																	% Total	75.11

SPREADSHEET LEGEND

1. Frequency Component (MHz) – Identifies the range that relates to the maximum power density level to be used

2. Tx Source – Identifies the source for the transmit power

3. Frequency (MHz) – identifies the frequency of the transmitter

4. Tx Power (Watts) – Identifies the transmit power in watts

5. Tx Power (dbm) – Identifies the transmit power in "decibels" above 1 milliwatt

6. Ant Gain (db) – Identifies the transmit antenna gain to be included in the calculation to determine the Effective Radiated Power (ERP)

7. Ant Line (db) – Identifies the antenna line loss to be included in the calculation to determine the ERP

8. Combiner/Duplexer (db) – Identifies the loss associated with a transmitter combiner and/or duplexer to be used in the calculation to determine the ERP

9. EIRP (dbm) – Identifies the Equivalent Istropically Radiated Power using an isotropic antenna gain and the power in "decibels" above 1 milliwatt

10. ERP (dbm) – Identifies the Effective Radiated Power in "decibels" above 1 milliwatt

11. EIRP (Watts) - Identifies the Equivalent Istropically Radiated Power using an isotropic antenna gain to determine the power in watts

12. ERP (Watts) – This is the number that is used to calculate the power density in item 16. In some cases this number is calculated and in other cases the number from the FCC license is used. The calculation represents the transmitter power and all the gains and losses provided by the antenna system that includes antenna gain, line loss and combiner/filter loss. This number is used to calculate the power density.

13. Ant Ht on Pole (Feet) – Identifies the mounting height on the monopole of the antenna base above ground level

14. Distance (Feet) – Identifies the distance from the antenna base to the closest point that can be occupied by the general public as shown on the sketch in feet

15. Distance (Meters) - Identifies the distance from the antenna base to the closest point that can be occupied by the general public as shown on the sketch in meters. This number is used to calculate the power density.

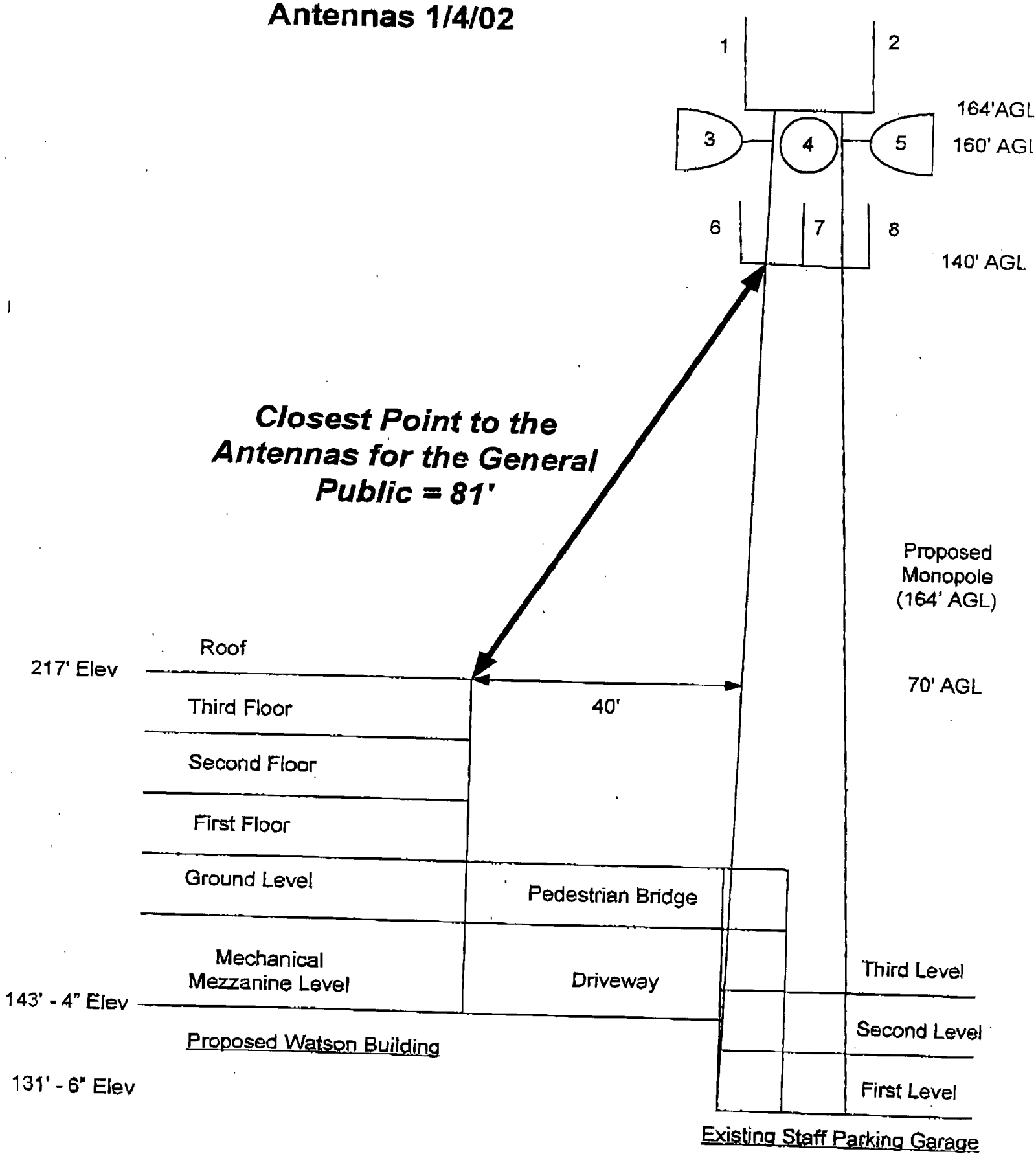
16. Calculated PD ($\mu w/cm^2$) – Identifies the calculated power density from the formula

17. Maximum PD ($\mu w/cm^2$) – Identifies the maximum power density as listed in the FCC OET Bulletin 65 "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" August 1997

18. % Maximum – Identifies the % that the calculated power density for the emitter is to the maximum power density allowed for the emitter's frequency range

19. % Total – Identifies the sum of the power density of all the emitters. A number less than 100% indicates that the levels are below the maximum allowed and the site is in compliance. No further action is required.

Sketch To Illustrate The Site Layout As It Relates To The Closest Public Area To The Antennas 1/4/02



General Power Density

Site Name: Greenwich Hospital Tower
Antenna Hgt (ft) 54 (124ft - 70ft)

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Antenna Distance (R) to Target	Horizontal Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
Verizon	869	9	200	1800	67.20119	**40**	0.1433	0.5793	**24.74%**

Total Percentage of Maximum Permissible Exposure 24.74%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992 OET bulletin 65.
MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power
Assumptions for Worse Case Scenario: Trasmitters at maximum power, 100% duty cycle, 100% ground reflection, and person is standing x feet away in the same horizontal plane of antenna.

Far Field Approximation
with downtilt variation

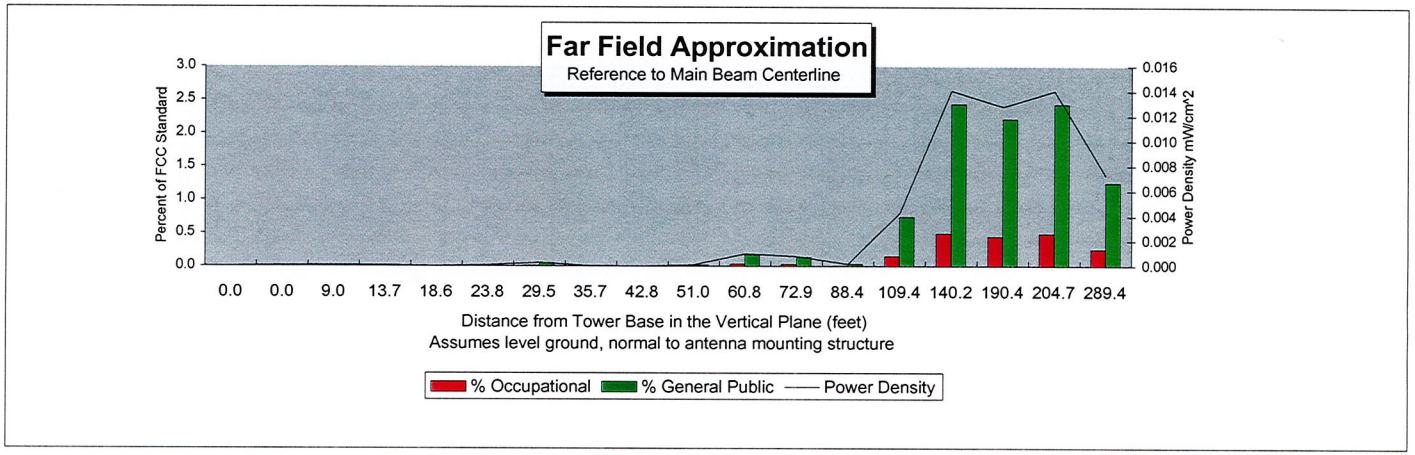
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Greenwich Hospital
Site #:	89
Date:	09/18/02
Name:	Mike Cafasso
File Name:	

Operating Freq. (MHz)	**869.0**
Antenna Height (ft):	**54.0**
Antenna Gain (dBi):	**13.2**
Antenna Size (in.):	**48.0**
Downtilt (degrees):	**10.0**
Feedline Loss (dB):	**1.2**
Power @ J4 (w):	**180.0**



This approximation is only valid in the far field, which begins at: 28.6 Feet

Enter Main Beam Distance in feet below:

Distance from Antenna Structure Base in Horizontal plane	0.0	0.0	9.0	13.7	18.6	23.8	29.5	35.7	42.8	51.0	60.8	72.9	88.4	109.4	140.2	190.4	204.7	289.4	
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	0	
dB down from centerline (referenced to centerline)	60	35	34	35	60	33	28	37	60	30	20	20	25	10	3	1	0	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)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.004	0.014	0.013	0.014	0.007	
Percent of General Population Standard	0.000	0.013	0.016	0.012	0.000	0.017	0.049	0.006	0.000	0.021	0.171	0.137	0.033	0.741	2.433	2.208	2.429	1.251	

Antenna Type Swedecom 9011

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 P
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.