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

July 6, 2011

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

RE: **EM-SPRINT-NEXTEL-034-110616** – Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 24 Hospital Avenue, Danbury, Connecticut

Dear Attorney Regan:

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 with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated June 16, 2011. 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. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts LHB

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Mark D. Boughton, Mayor, City of Danbury
Dennis Elpern, City Planner, City of Danbury
Danbury Hospital

CSC
CONNECTICUT SITING COUNCIL

BROWNRUDNICK

EM-SPRINT-034-110616

THOMAS J. REGAN
Direct Dial: (860) 509-6522
tregan@brownrudnick.com

CityPlace I
185 Asylum
Street
Hartford
Connecticut
06103
tel 860.509.6500
fax 860.509.6501

June 16, 2011

ORIGINAL

RECEIVED
JUN 16 2011
CONNECTICUT
SITING COUNCIL

Robert Stein, Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Sprint Nextel Corp. –
Notice of Exempt Modification @ 24 Hospital Avenue, Danbury

Dear Chairman Stein:

On behalf of Sprint Nextel Corp. ("Sprint"), enclosed for filing are an original and five (5) copies of Sprint's Notice of Exempt Modification for a Facility located at 24 Hospital Avenue in Danbury, Connecticut.

I also enclose herewith a check in the amount of $625.00 representing the filing fee.

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

If you have any questions, please do not hesitate to contact me.

Very truly yours,

BROWN RUDNICK BERLACK ISRAELS LLP

By: Thomas J Regan
Thomas J. Regan

TJR/bh
Enclosures

cc/encl: Mark D. Boughton, Mayor

40284540 v1 - REGANTJ - 080563/3276

ORIGINAL

CONNECTICUT SITING COUNCIL

In re:		
Sprint Nextel Corporation Notice to Make an	:	**EXEMPT MODIFICATION NO. _____**
Exempt Modification to an Existing Facility at	:	
24 Hospital Avenue, Danbury, Connecticut.	:	June 16, 2011

NOTICE OF EXEMPT MODIFICATION

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), Sprint Nextel Corporation ("Sprint") hereby gives notice to the Connecticut Siting Council ("Council") and the City of Danbury of Sprint's intent to make an exempt modification to an existing six (6) panel antennas on the rooftop of the building located at 24 Hospital Avenue in Danbury, Connecticut (the "Facility"). The landlord is Danbury Hospital. Specifically, Sprint plans to upgrade this site by enhancing its code division multiple access ("CDMA") service to the existing Facility. The enhancement of CDMA service from the Facility will enhance Sprint's overall network in Danbury.

In order to accomplish the upgrade at this site, Sprint will replace the six (6) existing CDMA panel antennas with six (6) newer model CDMA panel antennas. Additionally, Sprint will add six (6) lines of coax to the existing six (6) lines of coax. Finally, Sprint will add a new CDMA radio cabinet and battery back-up cabinet along side the existing radio and back-up cabinet. Also, the antenna azimuths will be adjusted (currently 3 azimuths) so the modified site has six (6) azimuths (each of the six [6] replacement antennas will point in a different direction).

Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), Sprint's plans do not constitute a modification subject to the Council's review because Sprint will not change the

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height of the Facility, 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.

Sprint will have six (6) antennas spread attached to three mounts atop the existing penthouse of the building, which is the thirteenth (13^{th}) floor of the building. Sprint's base station equipment is located in our current lease area within the existing penthouse. Sprint will be replacing the existing 100 amp power plant cabinet, which is wall mounted within in the equipment area, with a 200 amp model and replace the existing 100 amp floor mounted transformer with a 200 amp transformer. A site plan with the Facility specifications is attached.

Sprint plans to replace its six (6) existing CDMA panel antennas with six (6) newer model CDMA panel antennas. The replacement antennas are similar to the existing antennas in size and design. To confirm that the Facility can support these changes, Sprint commissioned Shamrock Engineering P.C. to perform a structural analysis of the Facility and a letter from Shamrock Engineering confirming the structural capacity of the structures is attached. According to the structural analysis dated April 23, 2011 of Shamrock Engineering, P.C. "... our analysis indicates that the existing structures are capable of supporting the proposed installation."

Excluding brief, minor, construction-related noise during the addition of the antennas, the proposed changes to the Facility will not increase noise levels at the site.

The replacement of the antennas will not adversely impact the health and safety of the surrounding community or the people working on the Facility. A complete power density analysis is attached. A rooftop survey and predicted analysis for this site finds that there are some areas of

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the main roof that may exceed the general population limits and some areas of the penthouse roof that may exceed both the general population and the occupational limits as defined by the FCC. Appropriate restrictions are currently in place however, and no additional actions are necessary to bring the site in full FCC compliance. With respect to the Sprint and Nextel equipment, the proposed equipment configuration changes will not cause exposures on the main roof or the penthouse roof to exceed the maximum power density levels as outlined by the FCC.

In conclusion, Sprint's proposed plan to replace its existing six (6) CDMA panel antennas with six (6) newer model CDMA panel antennas, six (6) lines of coax to the existing six (6) lines of coax, and a new CDMA radio cabinet and battery back-up cabinet along side the existing radio and back-up cabinet does not constitute a modification subject to the Council's jurisdiction because Sprint will not increase the height of the Facility, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

Sprint Nextel Corporation

By: _____

Thomas J. Regan
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185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
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Phone - 860.509.6522
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Certificate of Service

This is to certify that on this 16th day of June, 2011, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

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

By: _____
Thomas J. Regan

40284480 v1 - REGANTJ - 080563/3276

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SHAMROCK
ENGINEERING P.C.
Structural Design, Inspection, and Analysis

April 23, 2011

Mr. Paul Fanos
Infinigy Engineering, PLLC
11 Herbert Drive
Latham, NY 12110

Re: Structural Analysis for the Sprint Installation at Site CT81XC007; Danbury Hospital Located at 24 Hospital Avenue in Danbury, CT. (Proj #11001.10)

Dear Mr. Fanos,

As requested, Shamrock Engineering P.C. has performed a structural analysis for the support of the proposed equipment by a portion of the above referenced facility. As discussed and agreed to, the analysis was performed for the purpose of determining whether or not the existing structure is capable of supporting the loads imposed by the proposed Sprint installation at the site. This letter presents the findings and conclusions of our analysis.

Prior to commencing work, we were provided Construction Documents for the installation bearing a revision date of March 21, 2011, and partial original building construction for the building. It is our understanding Sprint has proposed the addition of two equipment cabinets, one weighing approximately 1,450 pounds, the other 1,800 pounds. The proposed cabinets will be located in the existing penthouse equipment area immediately adjacent to the existing equipment cabinets. In addition, Sprint has proposed the replacement of the existing panel antennas in each of the three existing sectors with new panel antennas. The new antennas will be of similar size and type as the existing antennas and will reuse the existing pipe mounting system. With this data, we used the current Connecticut State Building Code with the 2005 Connecticut Supplement and the 2009 Amendment to that supplement to develop live loads and load combinations.

Based on the information provided and the assumption that the original building and the existing equipment and antenna support construction was performed in accordance with good construction practices, our analysis indicates that the existing structures are capable of supporting the proposed installation as shown.

If you have any questions, please call.

Sincerely,
Shamrock Engineering P.C.

Michael J. Kenneally, P.E.
President

STATE OF CONNECTICUT
MICHAEL J. KENNEALLY
No. 20025
LICENSED
PROFESSIONAL ENGINEER

1 Thrush Terrace • East Greenbush, NY 12061
Ph: 518-441-6148 Fax: 518-286-2978
email: shamrockengineering@nycap.rr.com

Shamrock Engineering P.C.
1 Thrush Terrace, East Greenbush, New York 12061
Phone (518)441-6148 Fax (518)286-2978

Project: INFINIGY, SPRINT, DANBURY HOSPITAL CT81XC007 Date: 4-23-11

Re: STRUCTURAL ANALYSIS Page: 1 of 2

- CAN THE EXISTING STRUCTURE SUPPORT THE PROPOSED INSTALL?

- PROPOSED - EQUIPMENT: RADIO 1450# 36" x 38"
BATTERY 1800# 24" x 24" MIN
- ANTENNAS: PANEL 52" x 7" H: 131'

- EXISTING: PER THE DRAWINGS PROVIDED, THE EXISTING STRUCTURE IS A CONCRETE SLAB SUPPORTED BY STRUCTURAL STEEL FRAMING. THE MECHANICAL ROOM HAS A FLOOR LIVE LOAD OF 125 PSF PER DWG. S-7.

THE EXISTING ANTENNA MOUNTS ARE A COMBINATION OF LOW PROFILE WALL MOUNTS AND STAND-OFF MOUNTS.

STATE OF CONNECTICUT
MICHAEL J. KENNELLY
20029
LICENSED
PROFESSIONAL ENGINEER

Shamrock Engineering P.C.
1 Thrush Terrace, East Greenbush, New York 12061
Phone (518)441-6148 Fax (518)286-2978

Project: INFINIGY, SPRINT DANBURY HOSPITAL CT81XC007 Date: 4-23-11

Re: STRUCTURAL ANALYSIS Page: 2 of 2

- CHECK EXISTING FLOOR TO SUPPORT EQUIPMENT CABINETS.

- EQUIVALENT UNIFORM LOADS

EQUIP WT	1450	1800
OCCUPIED SPACE	(36+36+12)(38)	(24+36+12)(24+6+6)
UNIFORM LOAD	65 PSF	100 PSF

BOTH < 125 PSF ✓

- CHECK ANTENNAS ON EXISTING MOUNTS.

- $P = q A G_H$

$G_H = 1.1$

$A = 2.5 \rightarrow 3 FT^2$

$q = 0.00256 K_z K_{zt} K_d I V^2$

$V = 120$ $I = 1.0$

$K_d = 0.95$ $K_{zt} = 1.0$

$K_z = 1.32$

$= 46$

$F = 153\#/ANT$

◎ WALL MOUNT:

ANTENNAS ARE BTW WALL ANCHORS, ∴

WALL LOAD = 153/2 = 77# ✓

∴ WALL OK TO SUPPORT LOAD

◎ STAND-OFF

- STAND-OFF IS SUPPORTED @ ENDS, ∴ EACH SEES 153# PIPE IS 4" STD

$M = Ph = 1.5K'$

$S_x \geq 0.85^{in^3}$ ✓

∴ PIPE OK TO SUPPORT ANTENNAS

C Squared Systems, LLC
65 Dartmouth Dr, Unit 3A
Auburn, NH 03032
Phone: (603) 644 2800
support@csquaredsystems.com

RADIO FREQUENCY EXPOSURE REPORT

CT81XC007

DANBURY HOSPITAL
24 HOSPITAL AVE
DANBURY, CT 06810

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed additions and modifications to the existing Sprint PCS wireless facility located on Danbury Hospital. The site is an eleven story hospital with multiple antenna arrays. Figure 1 below provides a view of the facility.

Sprint is proposing the following modifications:

1) Remove six existing 1900 MHz PCS antennas (two per sector);
2) Install six replacement 1900 MHz PCS antennas in a six-sector configuration;
3) Adjust the azimuths of all antennas;
4) Install an additional equipment cabinet on the existing equipment platform.

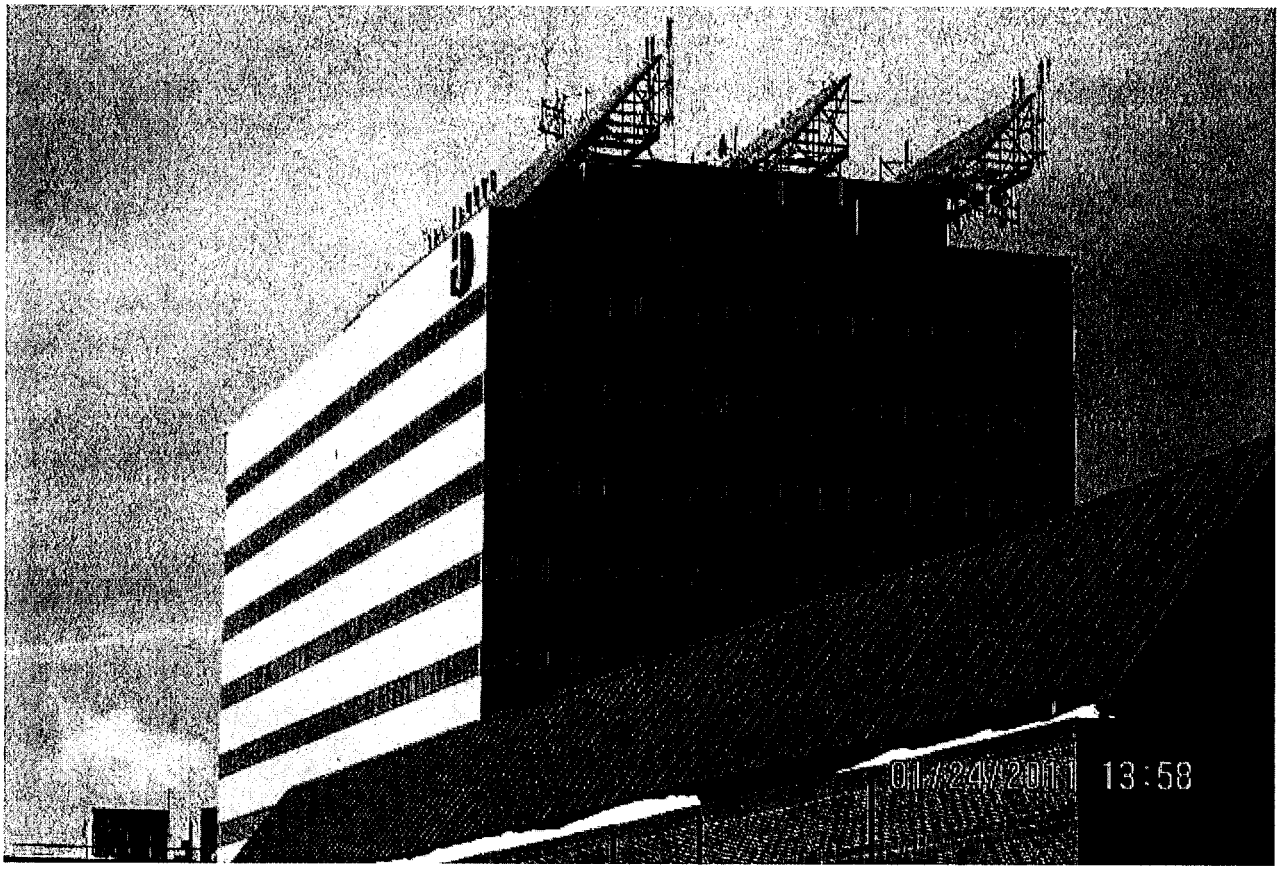


Figure 1: View of CT81XC007

Site Address	24 Hospital Ave, Danbury, CT
Latitude	N 41° 24' 18.34"
Longitude	W 73° 26' 44.43"
Site Elevation AMSL	470 Feet
Main Roof Height AGL	136 Feet
PCS License Information	KNLF204 - B Block
Name of Individual Conducting Survey	Evan Thibodeau
Date and Time of Survey	01/24/2011; 11:00AM – 1:00PM

Table 1: Site Specific Data

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment provided they are fully aware of the potential for exposure, and are able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels considered acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population / uncontrolled exposure and for occupational / controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. Survey Methodology

Prior to measuring exposure levels the following items are photo documented:

- Roof access points
- EME signage (Present and/or missing)
- Directional views
- All antennas on the rooftop
- Neighboring facilities indentified to have RF sources (if applicable)

All antennas on the rooftop are documented and the following information is provided (where available[1]):

- Manufacturer
- Model number
- Height relative to main roof
- Orientation
- Location on rooftop
- Physical characteristics including length and type.

Measurement points are established in a grid pattern, not more than 20 feet apart, over the entire area being surveyed. Additional measurement points are selected at potential "Hot Spots" (in close proximity to antennas).

[1] Where antenna model information is unattainable due to inaccessibility or illegibility of the antenna label, model assumptions are made based on the carrier's licensed frequency band and the physical dimensions and characteristics of the antenna.

4. Equipment, Roof Access, & Site Signage

Sprint's equipment is located in the top floor mechanical area. There are two roof access hatches that lead to the penthouse roof and two roof access doors that lead to the main roof. Access to both rooftops is restricted to authorized personnel only.

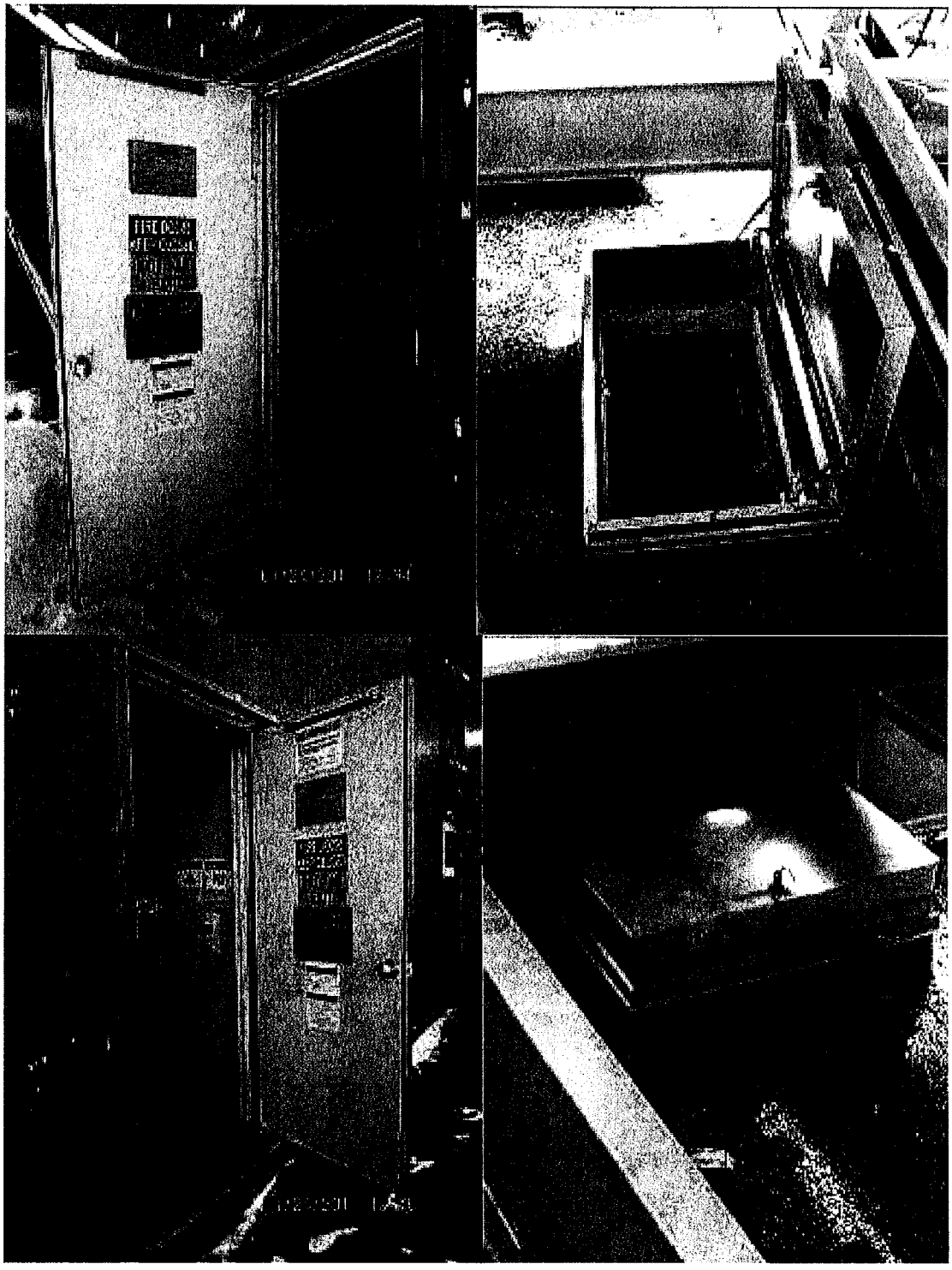


Figure 2: Roof Access Points & Posted Signage

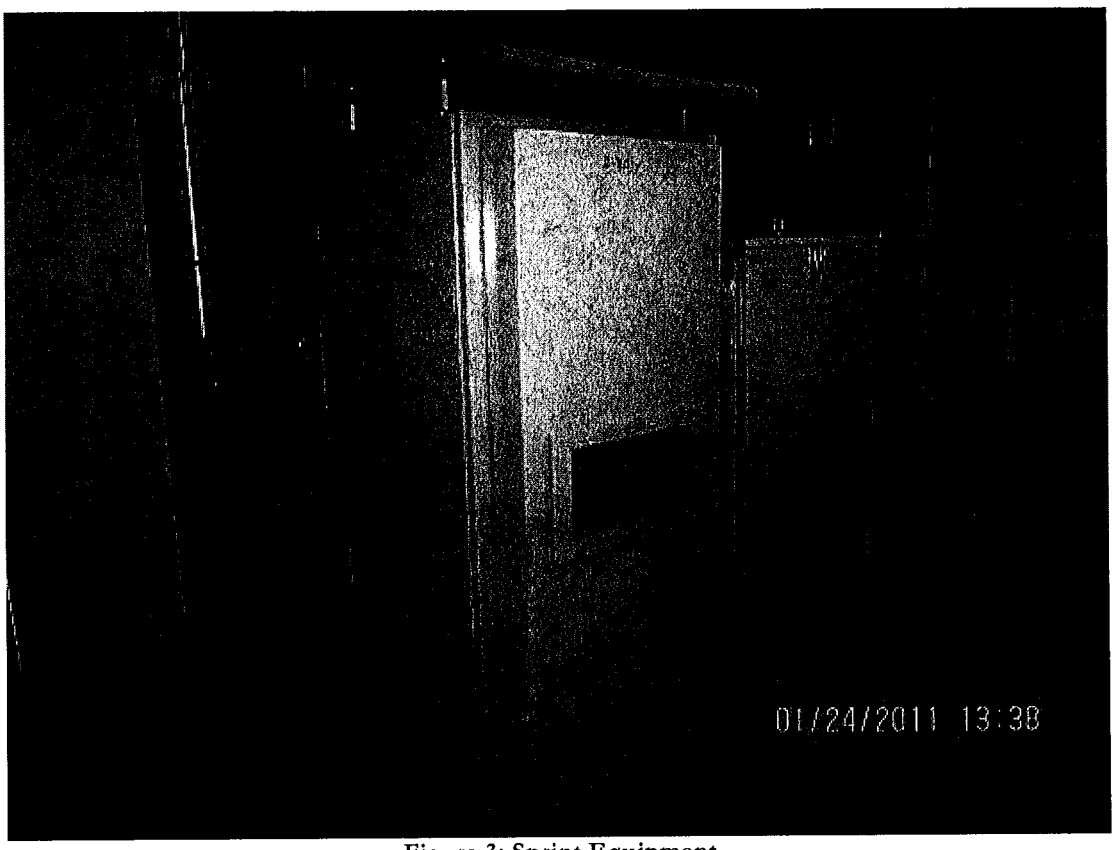


Figure 3: Sprint Equipment

5. Directional Photos

The photos below document the view from each end of the building to show all neighboring structures, foliage, and possible RF sources. Please note that the South view was obstructed by the solar panels.

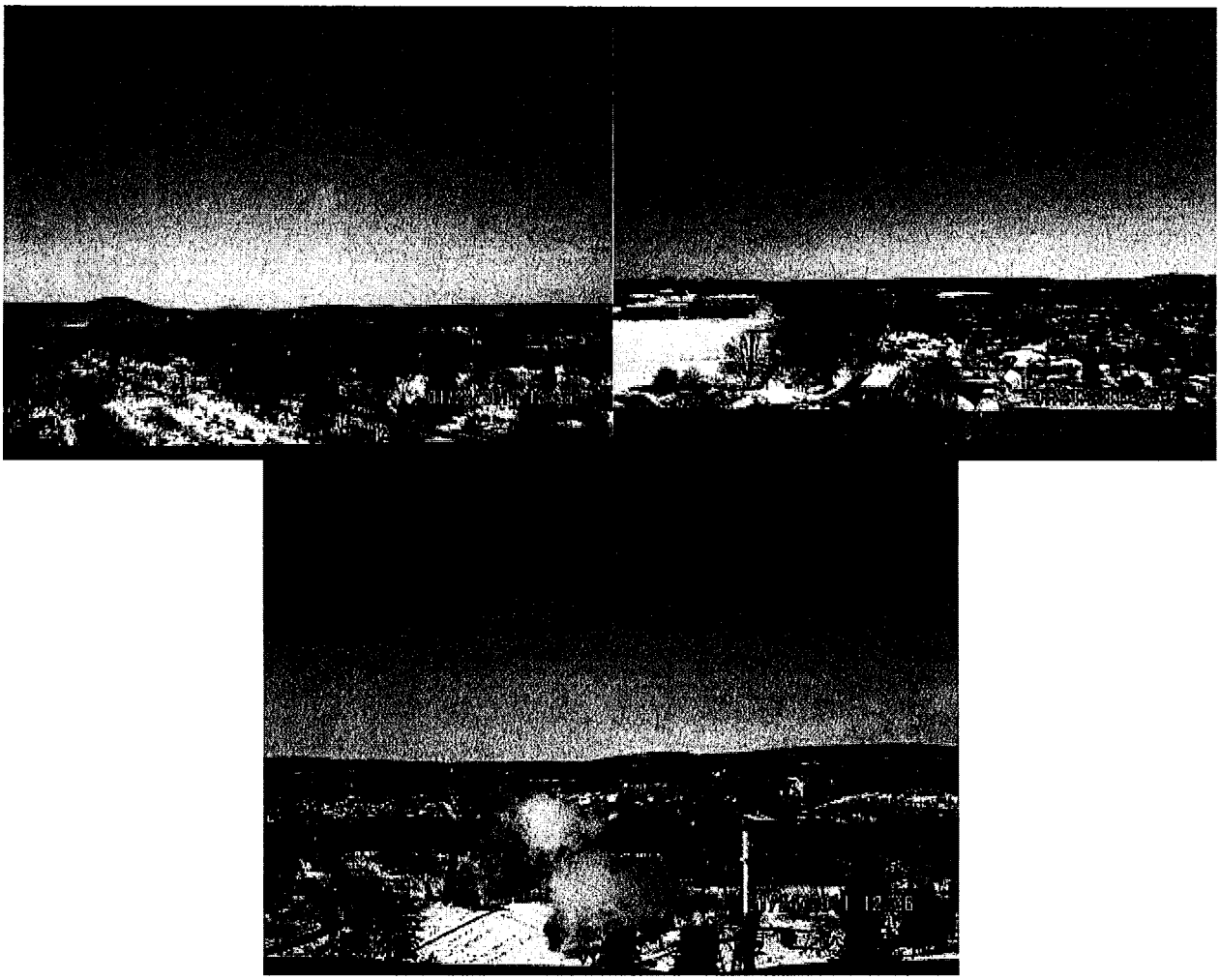


Figure 4: Directional Photos – North, East and West

6. Antenna Inventory, Locations & Photos

Tables 2 & 3 below detail all of the antennas currently installed on the roof of Danbury Hospital. This inventory was taken on January 24, 2011. The lower roof height is 117' and the upper roof height is 134'.

Antenna ID	Operator	TX Freq. (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Downtilt	Length (ft)	Antenna Centerline Height (ft)
A	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
B	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
C	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
D	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
E	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	134
		1900	36	15.5	1277		90			
F	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	134
		1900	36	15.5	1277		90			
G	Dish	22000	0.5	38.1	3228	DA4-W71BB	2.2	0	4	132
H	WDBY	105.5	1200	-0.04	1189	Shively 6810	360	0	5	157
I	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
J	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
K	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
L	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
M	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
N	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
O	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
P	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
Q	Nextel	850	24	14.1	617	RR65-12-05DBL	65	0	4	124
R	Nextel	850	24	14.1	617	RR65-12-05DBL	65	0	4	124
S	Nextel	850	24	14.1	617	RR65-12-05DBL	65	0	4	124
T	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
U	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
V	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
W	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
X	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	131
Y	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	131
Z	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	40	18.0	2524					
AA	T-Mobile	1900	53	16.5	2367	RR90-17-02*	90	0	4.5	132
AB	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	40	18.0	2524					
AC	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	155
		2100	27	18.0	1704					
AD	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	155
		2100	27	18.0	1704					

Table 2: Existing Antenna Inventory

Antenna ID	Operator	TX Freq. (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech Downtilt	Length (ft)	Antenna Centerline Height (ft)
AE	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	155
		2100	27	18.0	1704					
AF	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	27	18.0	1704					
AG	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	27	18.0	1704					
AH	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	27	18.0	1704					
AI	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AJ	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AK	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AL	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AM	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AN	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AO	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AP	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AQ	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AR	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AS	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AT	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AU	Whip	155.28	110	6	437.92	Generic 150-164M_Omni*	360	0	10	154
AV	Whip	152.007	350	6	1393.38	Generic 150-164M_Omni*	360	0	10	158
AW	Whip	453	100	6	398.11	Generic 450–482M_Omni*	360	0	10	156
AX	Whip	155.34	120	6	477.73	Generic 150-164M_Omni*	360	0	10	158
AY	Whip	964.925	125	6	497.63	Generic 870–960M_Omni*	360	0	4	158
AZ	Whip	453.55	100	6	398.11	Generic 450–482M_Omni*	360	0	10	158
BA	Whip	464	100	6	398.11	Generic 450–482M_Omni*	360	0	10	158
BB	Whip	463	75	6	298.58	Generic 450–482M_Omni*	360	0	10	158
BC	Whip	931	250	6	995.27	Generic 870–960M_Omni*	360	0	2	158
BD	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BE	Whip	468	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BF	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BG	Whip	155.34	120	6	477.73	Generic 150-164M_Omni*	360	0	2	149
BH	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BI	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BJ	Whip	155.34	120	6	477.73	Generic 150-164M_Omni*	360	0	2	149
BK	Dish	900	125	18	497.63	PR-900	12	0	3	170
BL	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BM	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BN	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BO	Dish	Receive Only								
BP	Cisco	2400	0.08	13.5	4	AIR-ANT1949	30	0	1.3	130

Table 3: Existing Antenna Inventory (Continued)[2]

[2] Asterisks indicate cases where the antenna model information was unavailable, in which case models shown are based on the carriers licensed frequency band and physical dimensions of the antenna. Where the antennas' electrical and mechanical downtilt information was unavailable, 0° downtilt was assumed. Transmit power assumes 0 dB of cable loss where cable lengths are not specified.

Table 4 below outlines the proposed antenna configuration that will replace the existing antenna configuration. These Sprint antennas were utilized to perform the theoretical calculations as described in the Modeling Procedure section of this report.

Operator	TX Freq. (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Downtilt	Length (ft)	Antenna Centerline Height (ft)
Sprint	1900	139.8	16.8	6691	HBX-9014DS-R2M	90	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	131
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	131

Table 4: Future Sprint Antenna Configuration

Figures 5 through 22 show all the antennas on the roof of Danbury Hospital.

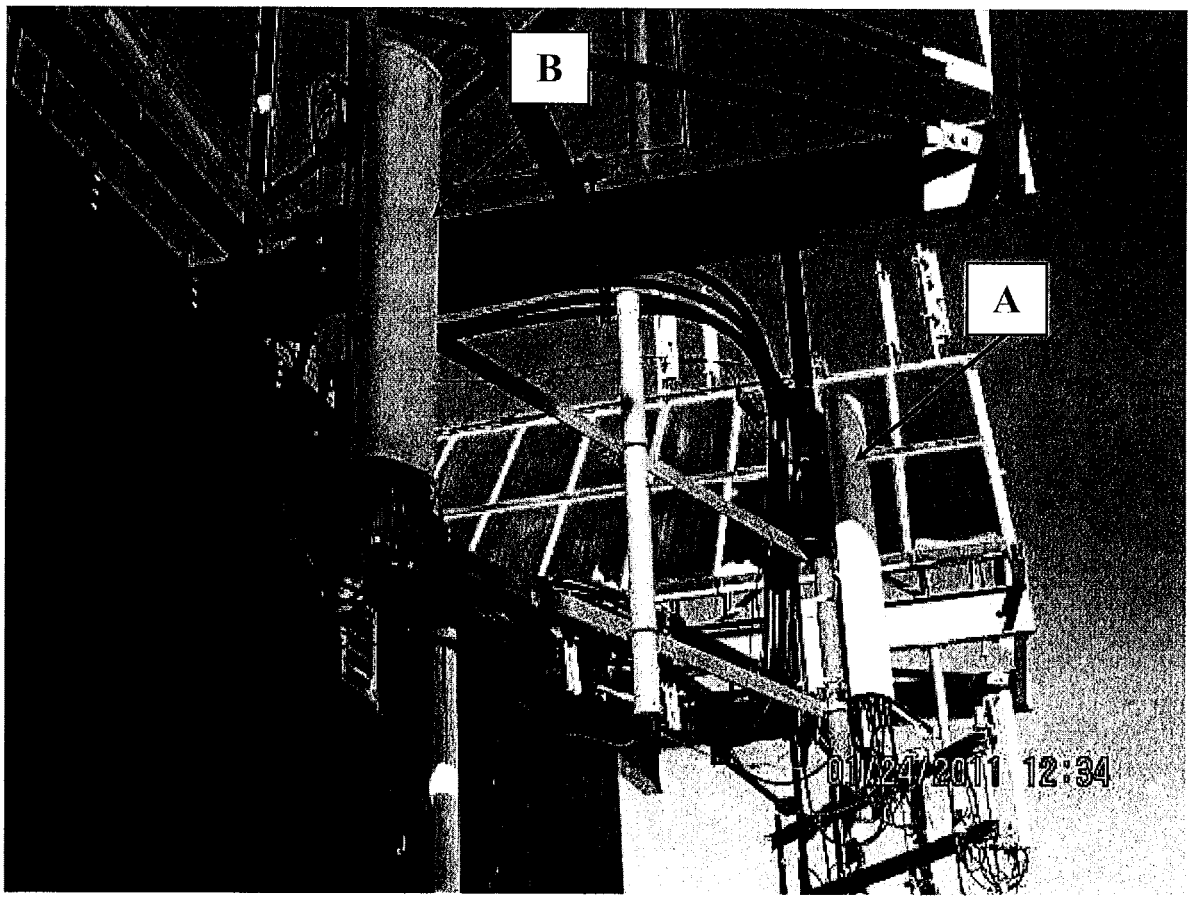


Figure 5: Antennas A & B (AT&T Alpha Sector)

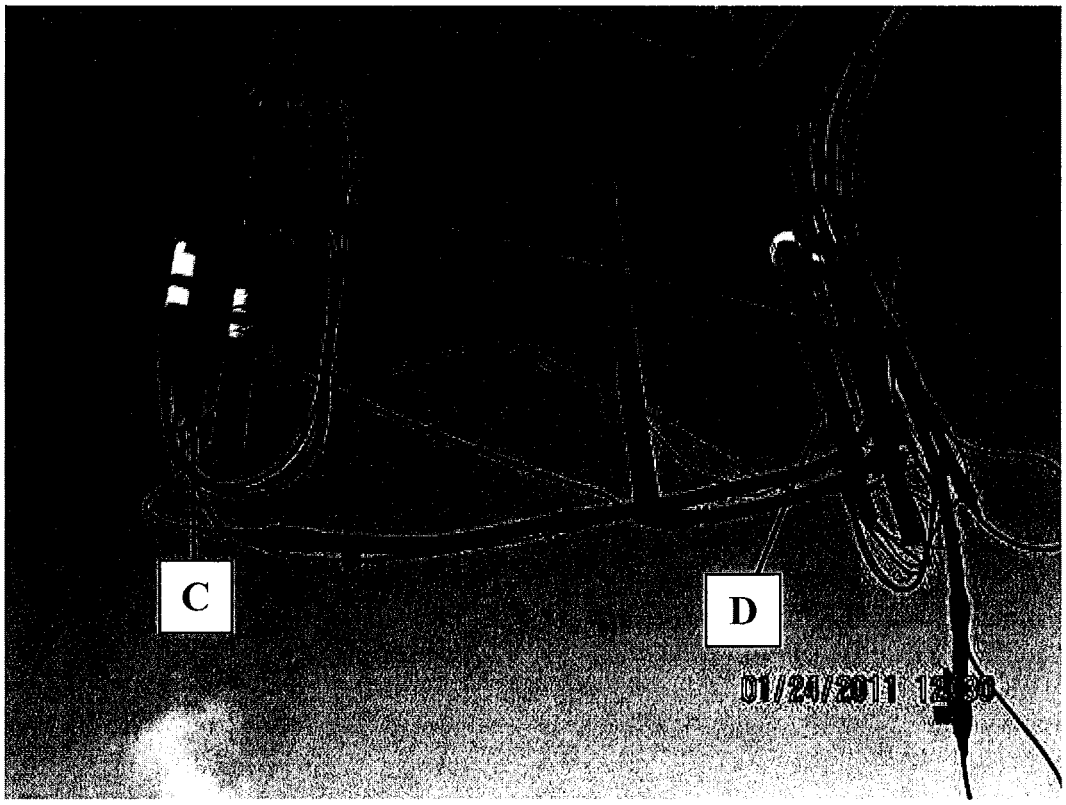


Figure 6: Antennas C & D (AT&T Beta Sector)

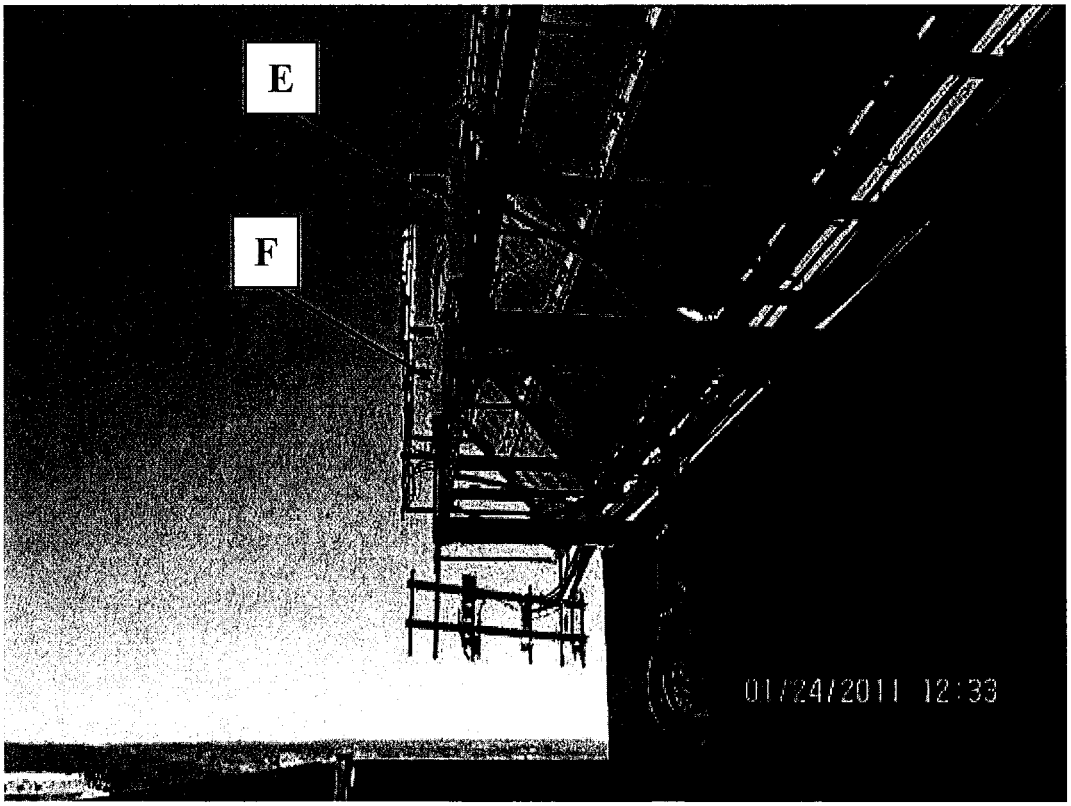


Figure 7: Antennas E & F (AT&T Gamma Sector)

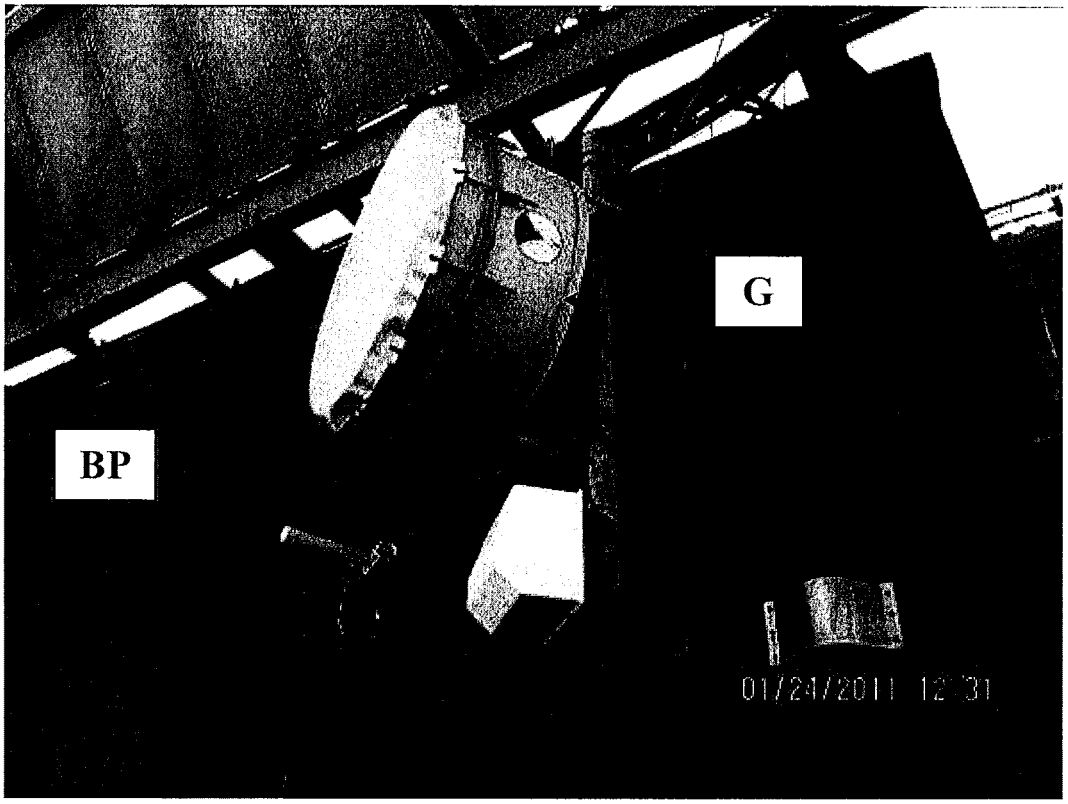


Figure 8: Antennas G & BP

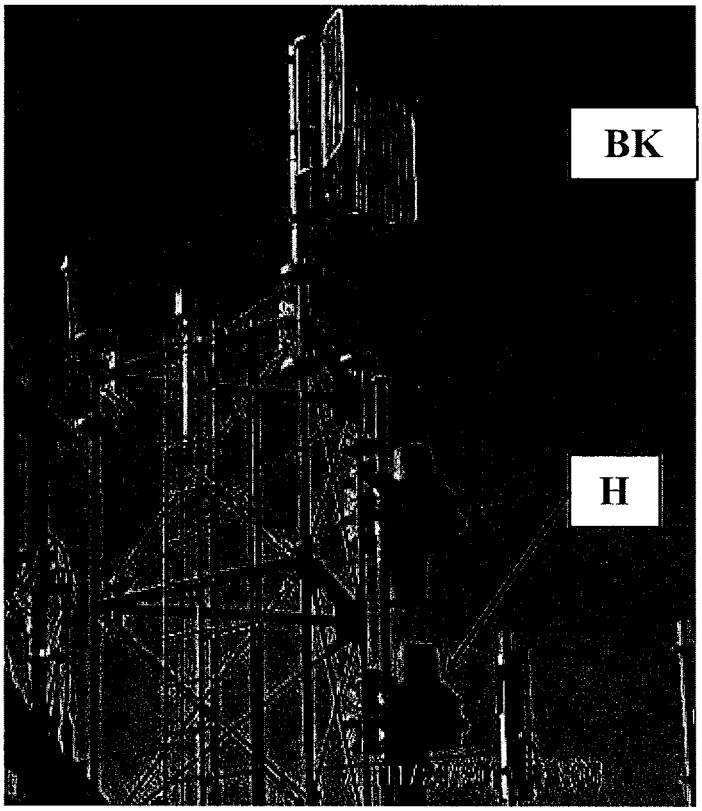


Figure 9: Antennas H & BK

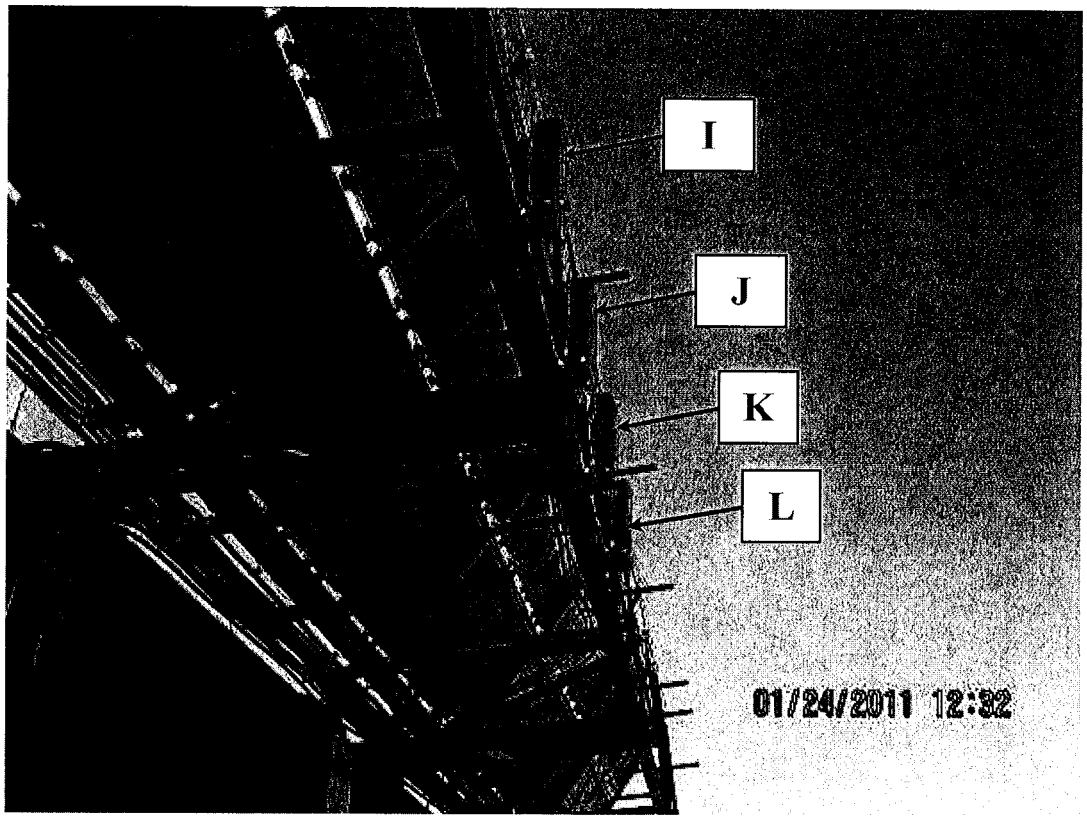


Figure 10: Antennas I, J, K & L (Nextel Alpha Sector)

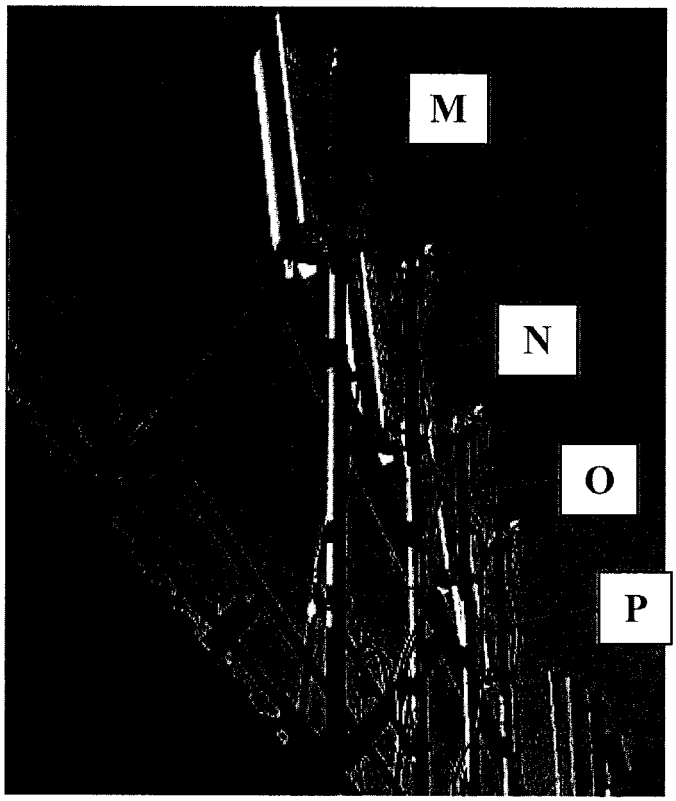


Figure 11: Antennas M, N, O & P (Nextel Beta Sector)

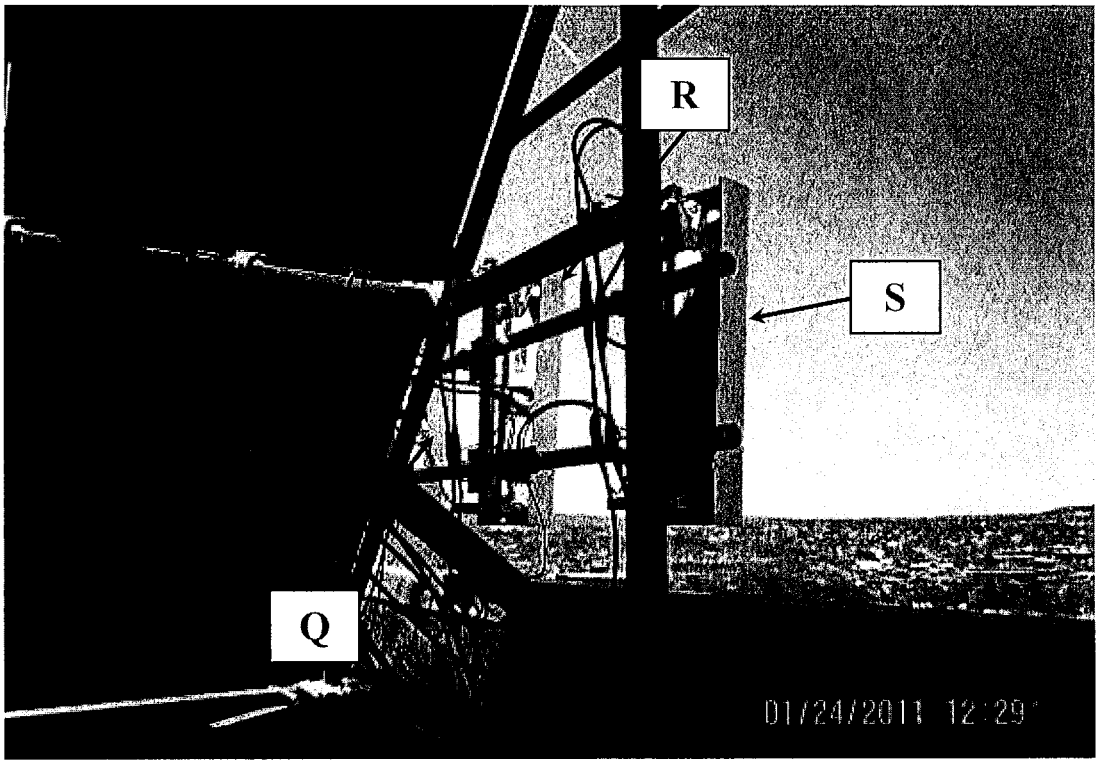


Figure 12: Antennas Q, R & S (Nextel Gamma Sector)

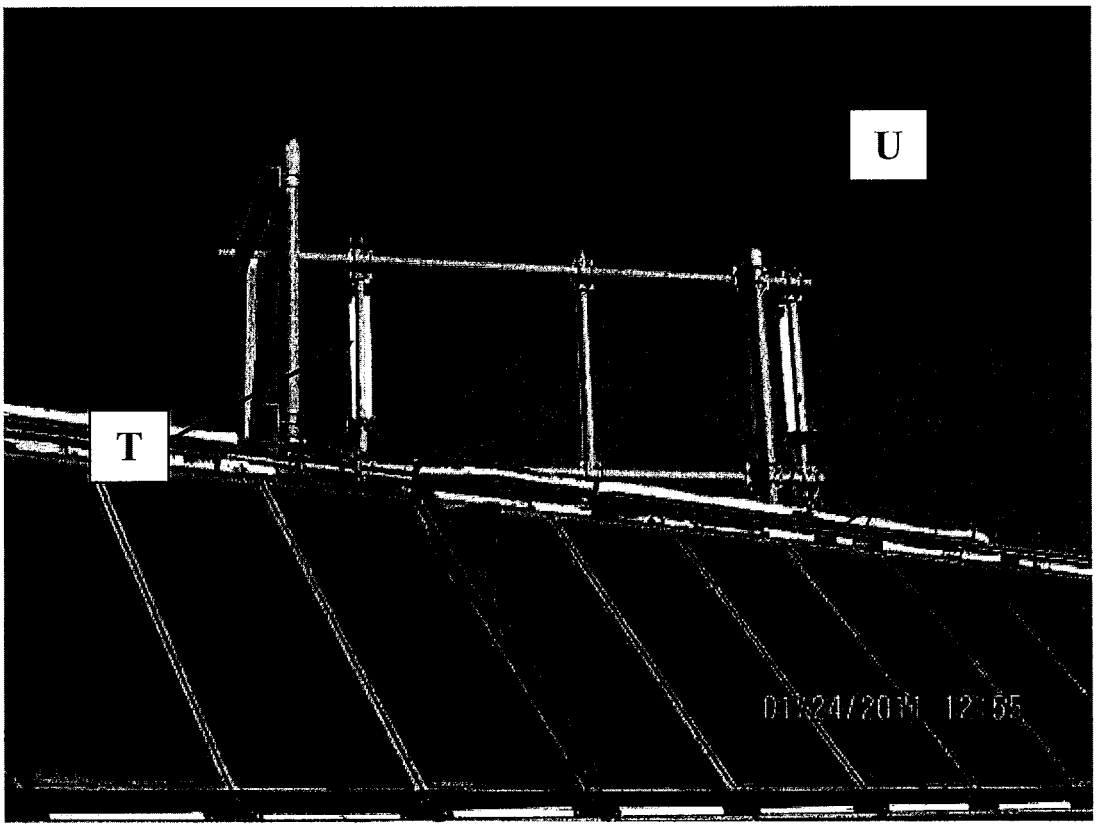


Figure 13: Antennas T & U (Sprint Alpha Sector)

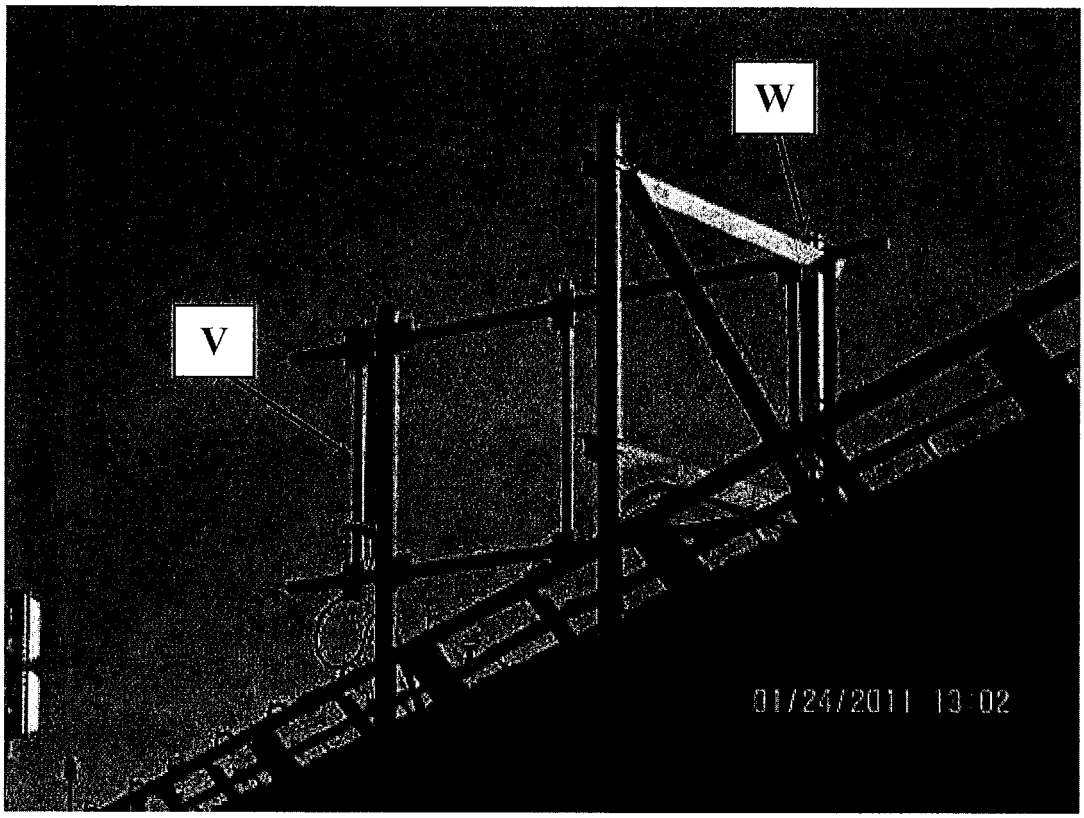


Figure 14: Antennas V & W (Sprint Beta Sector)

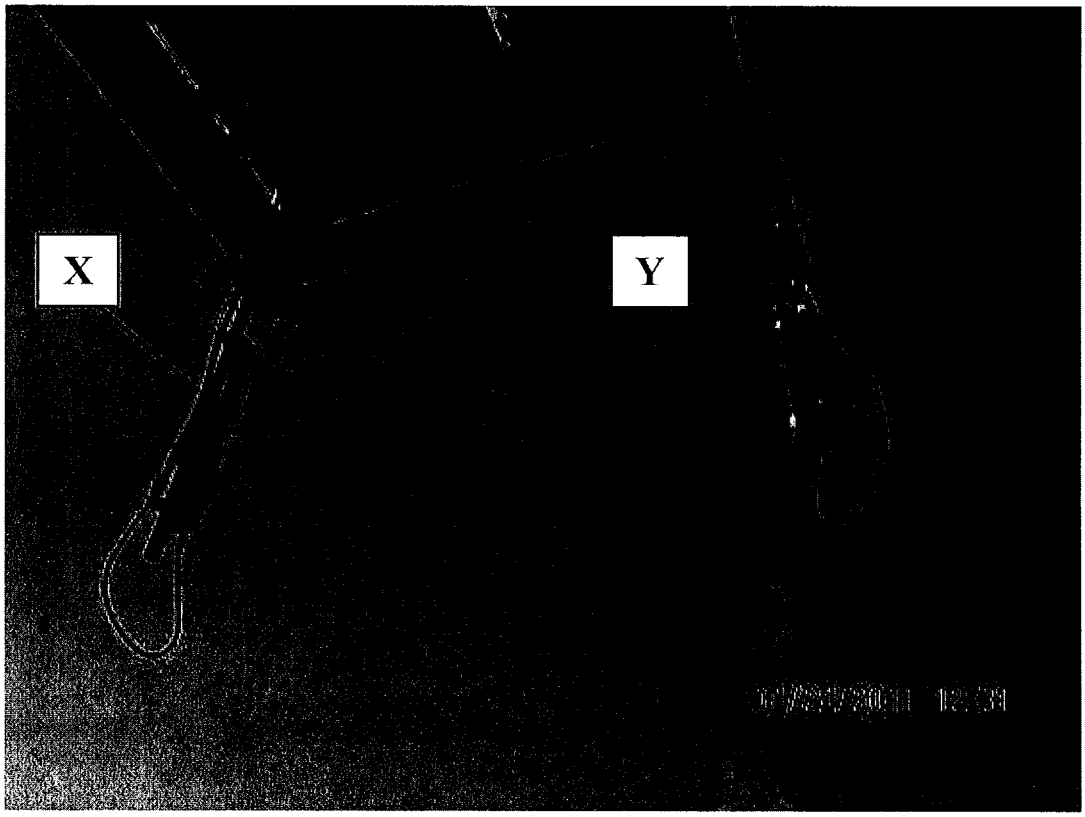


Figure 15: Antennas X & Y (Sprint Gamma Sector)

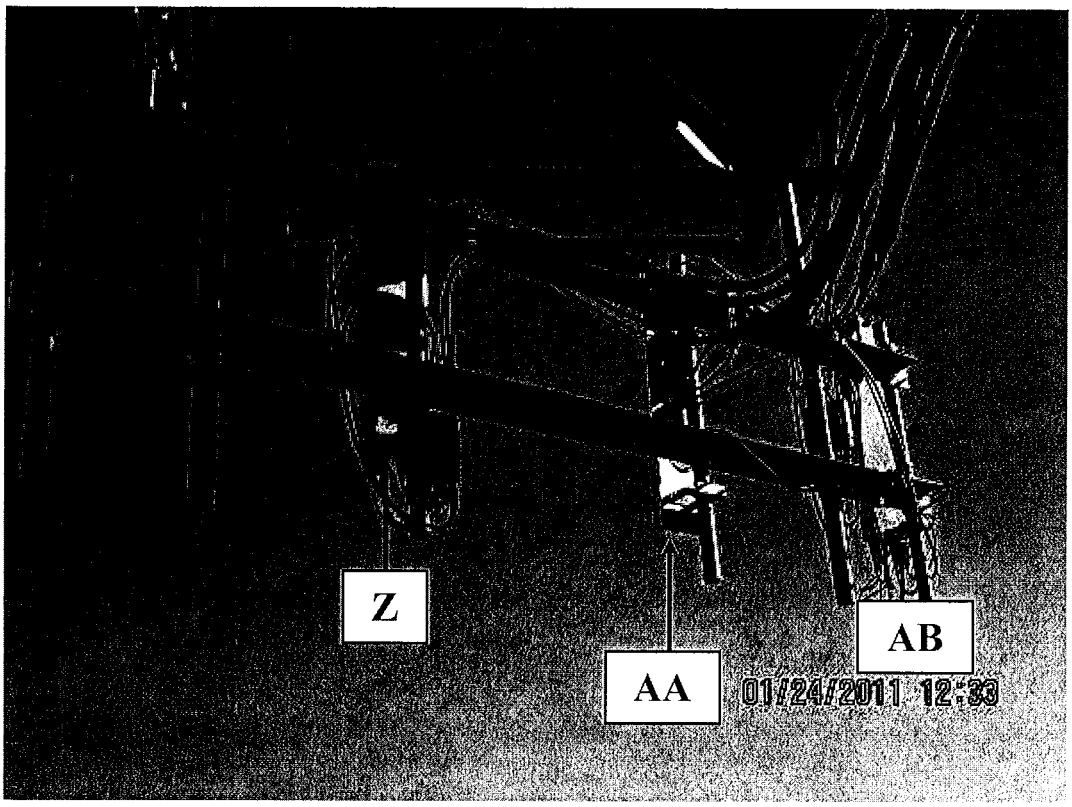


Figure 16: Antennas Z, AA & AB (T-Mobile Alpha Sector)

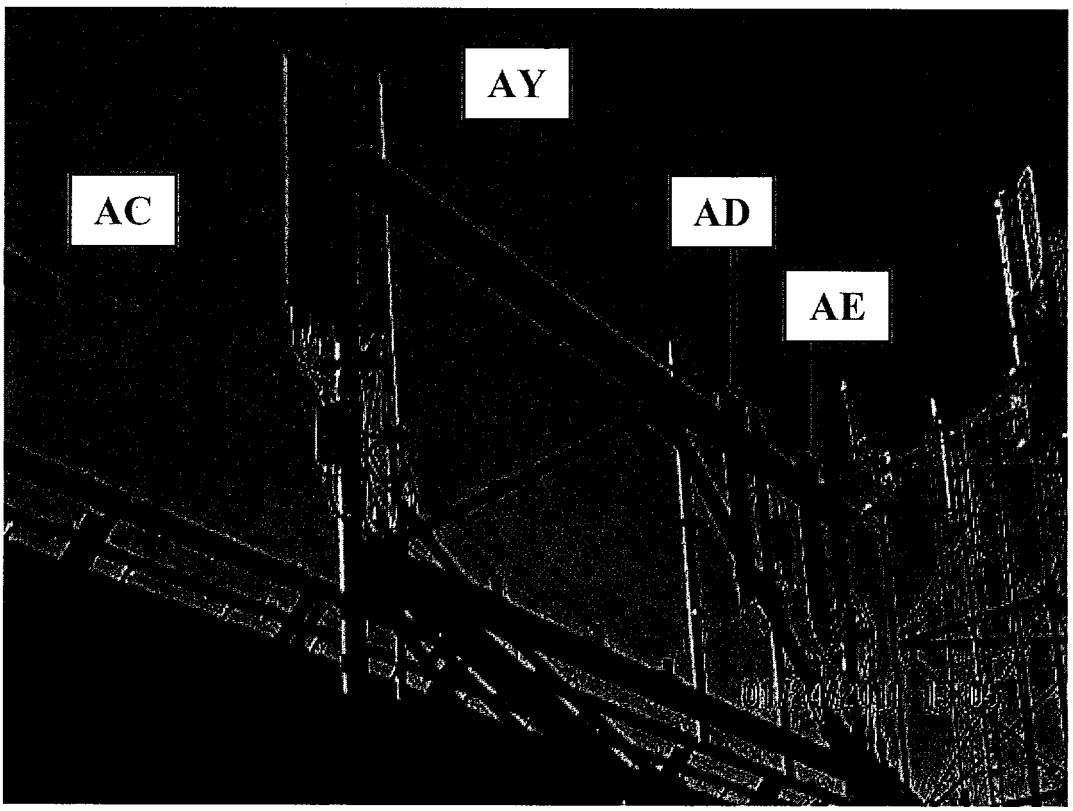


Figure 17: Antennas AC, AD, AE (T-Mobile Beta Sector) & AY

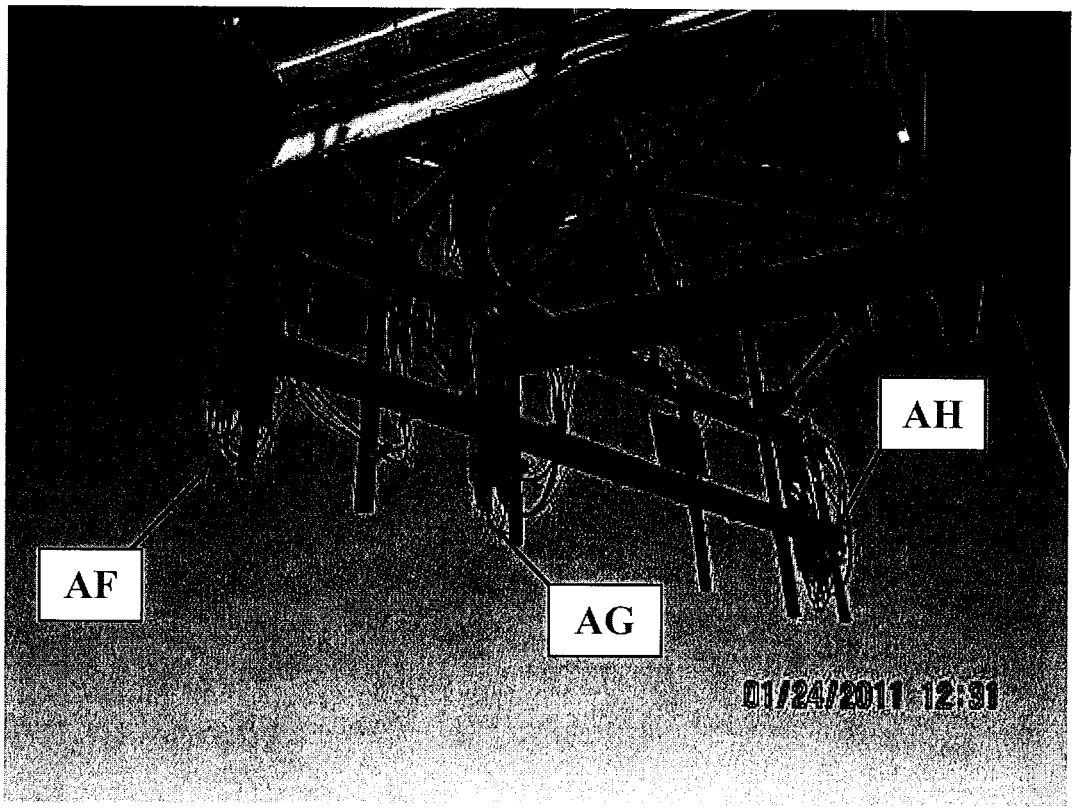


Figure 18: Antennas AF, AG & AH (T-Mobile Gamma Sector)

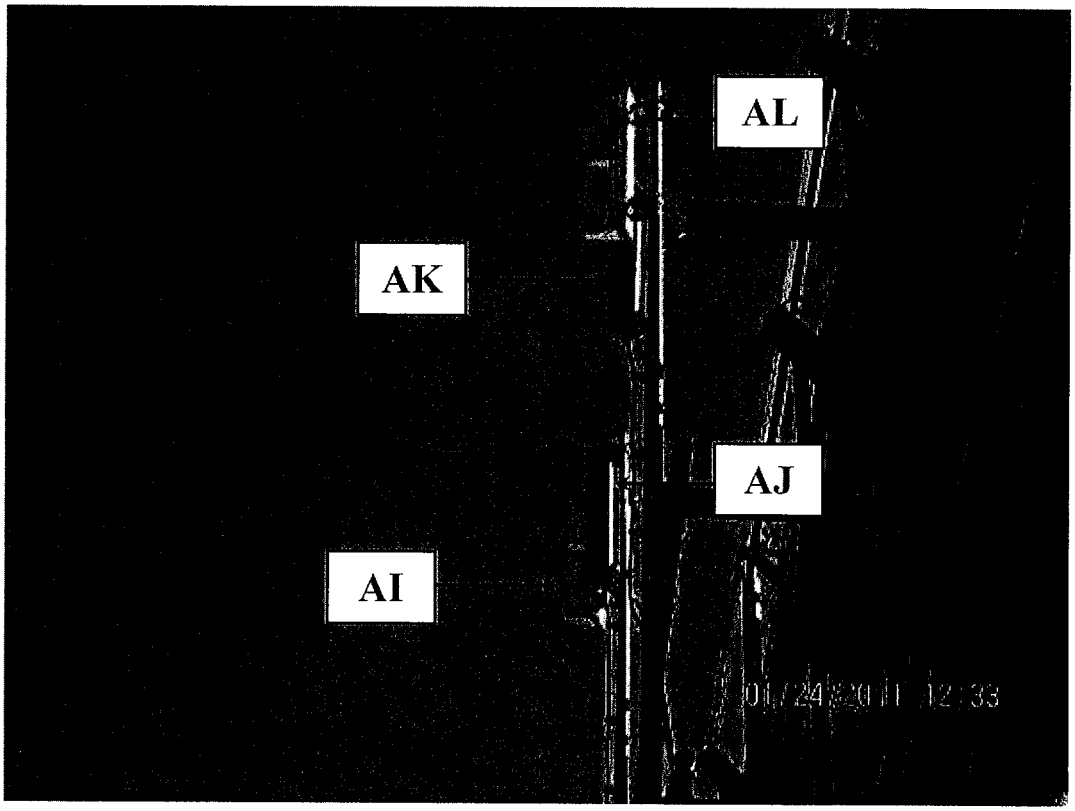


Figure 19: Antennas AI, AJ, AK & AL (Verizon Alpha Sector)

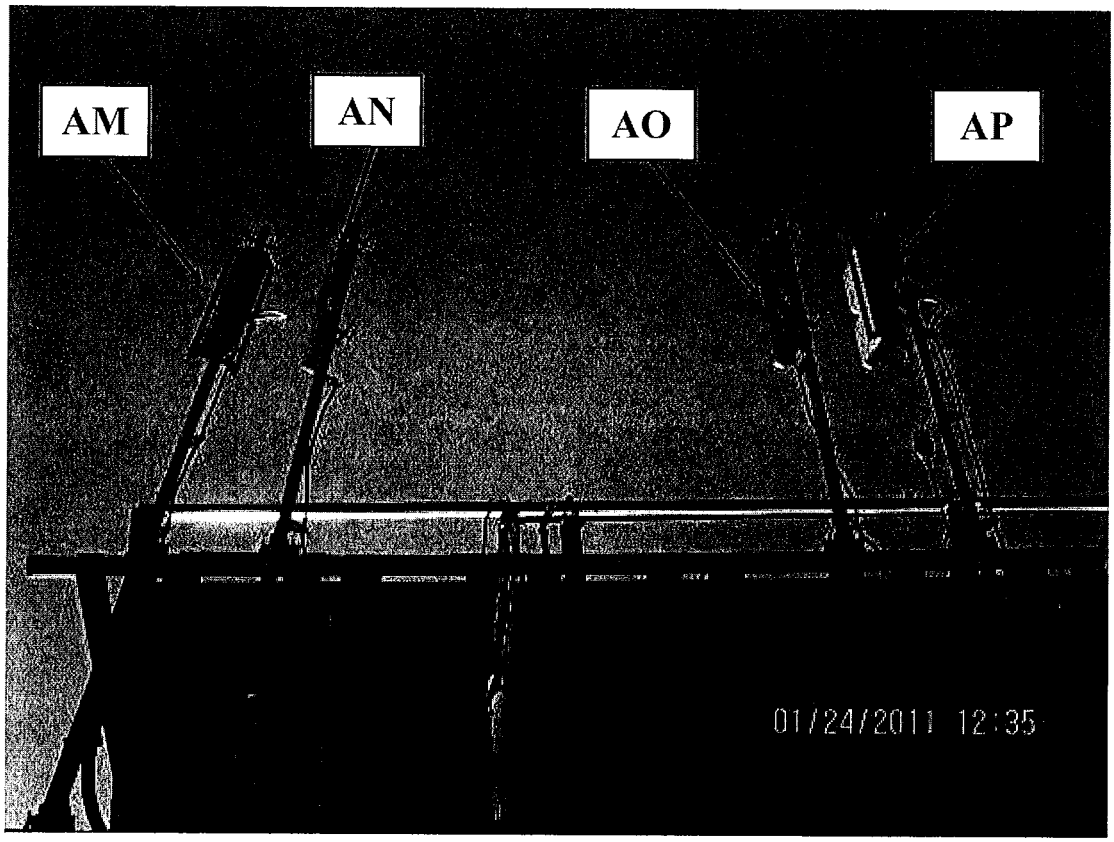


Figure 20: Antennas AM, AN, AO & AP (Verizon Beta Sector)

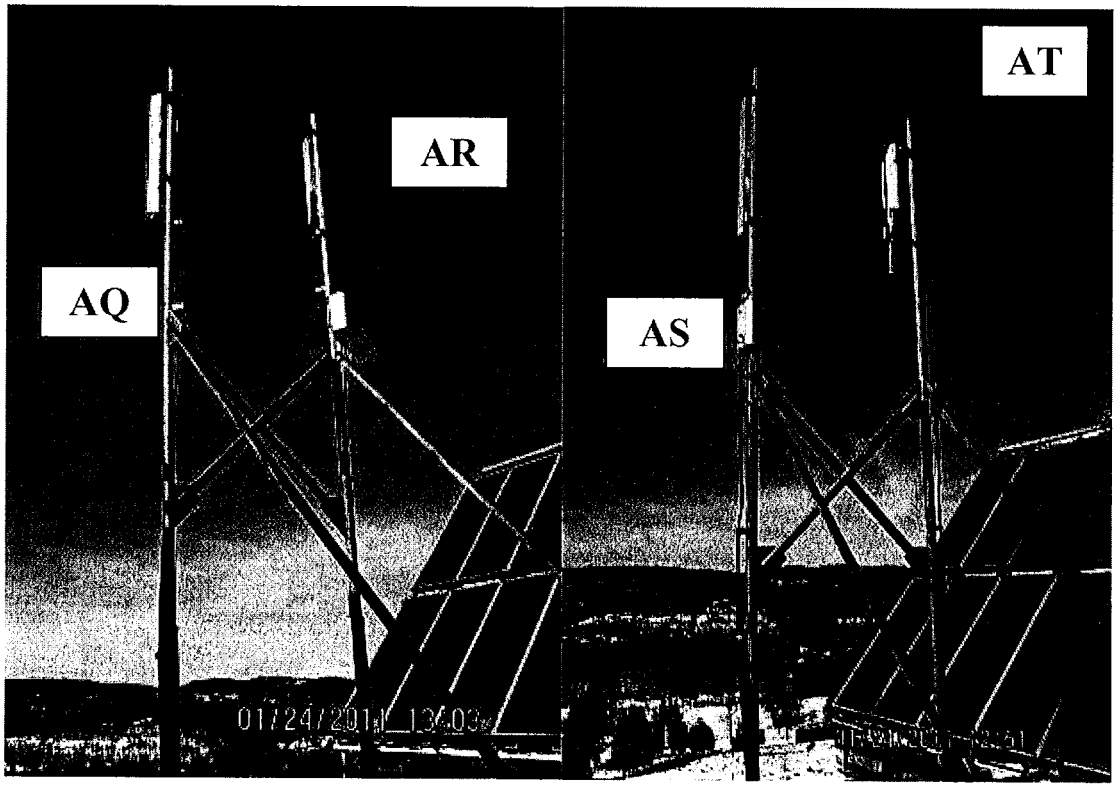


Figure 21: Antennas AQ, AR, AS & AT (Verizon Gamma Sector)

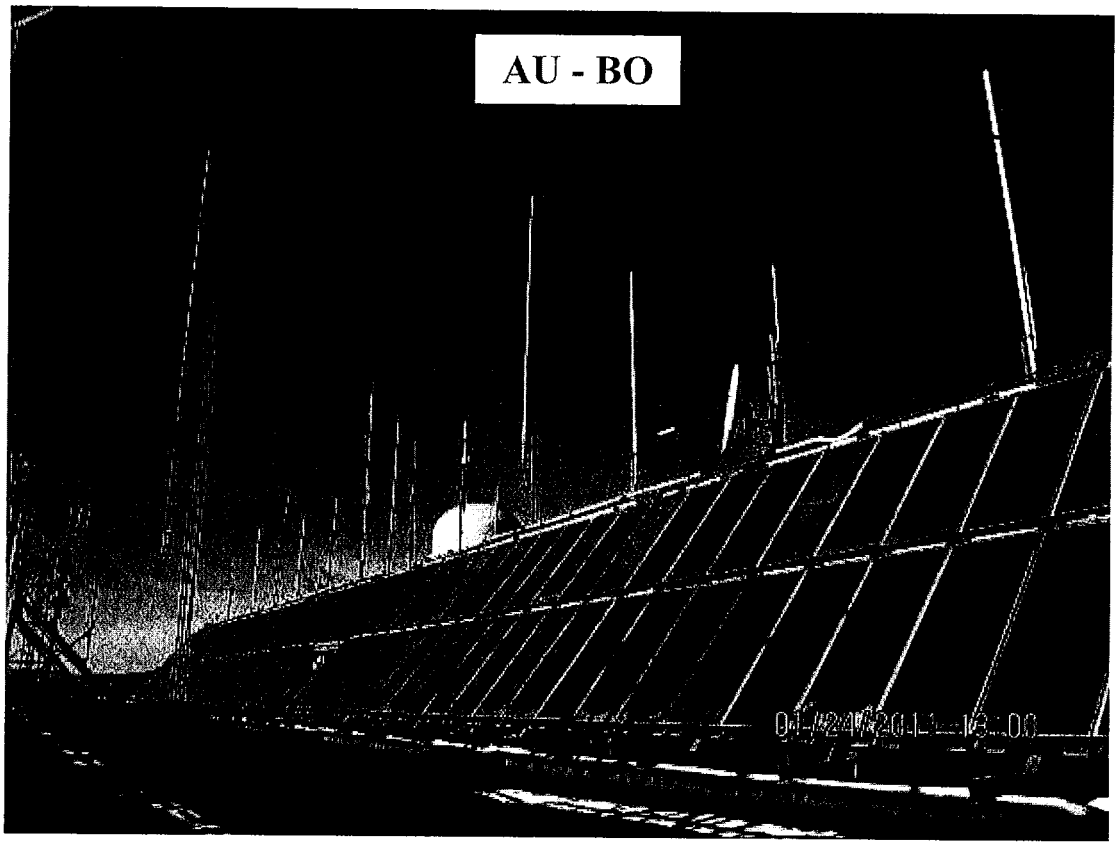


Figure 22: Antennas AU - BO

7. Nearby RF Sources

At the time of this survey, no nearby RF sources were close enough to contribute to MPE levels on the roof of Danbury Hospital. Directional views can be seen in Figure 4.

8. Measured Values

8.1. Survey Equipment and Procedures

Frequencies from 300 KHz to 50 GHz were measured using the Narda Probe EA 5091, E-Field, shaped, FCC probe in conjunction with the NBM550 survey meter. The EA 5091 probe is "shaped" such that in a mixed signal environment (i.e.: more than one frequency band is used in a particular location), it accurately measures the percent of MPE.

From FCC OET Bulletin No. 65 - Edition 97-01 – "A useful characteristic of broadband probes used in multiple-frequency RF environments is a frequency-dependent response that corresponds to the variation in MPE limits with frequency. Broadband probes having such a "shaped" response permit direct assessment of compliance at sites where RF fields result from antennas transmitting over a wide range of frequencies. Such probes can express the composite RF field as a percentage of the applicable MPEs".

Probe Description - As suggested in FCC OET Bulletin No. 65 - Edition 97-01, the response of the measurement instrument should be essentially isotropic, (i.e., independent of orientation or rotation angle of the probe). For this reason, the Narda EA 5091 probe was used for these measurements.

Sampling Description - At each measurement location, a spatially averaged measurement is collected over the height of an average human body. The NBM550 survey meter performs a time average measurement while the user slowly moves the probe over a distance range of 20 cm to 200 cm (about 6 feet) above ground level. The results recorded at each measurement location include average values over the spatial distance.

Instrumentation Information - A summary of specifications for the equipment used is provided in the table below.

Manufacturer	Narda Microwave			
Probe	EA 5091, Serial# 01088			
Calibration Date	October 2010			
Calibration Interval	24 Months			
Meter	NBM550, Serial# B-1149			
Calibration Date	October 2010			
Calibration Interval	24 Months			
Probe Specifications	**Frequency Range**	**Field Measured**	**Standard**	**Measurement Range**
	300 KHz-50 GHz	Electric Field	U.S. FCC 1997 Occupational/Controlled	0.5 – 600 % of Standard

Table 5: Instrumentation Information

Instrument Measurement Uncertainty - The total measurement uncertainty of the NARDA measurement probe and meter is no greater than ±2 dB. The factors which contribute to this include the probe's frequency response deviation, calibration uncertainty, ellipse ratio, and isotropic response. Every effort is taken to reduce the overall uncertainty during measurement collection including rotating the probe about the axis of the handle and pointing the probe directly at the likely highest source of emissions.

8.2. Survey Locations & Results

Figure 23 below shows the location of the measurements taken on January 24, 2011.

Figure 23: Rooftop Measurement Locations

Table 6 below lists 39 measurements taken on the roof, where the Sprint antennas are installed. The highest measurement recorded on the main roof was at Point 38, directly in front of FM station antennas, and was recorded at 15.44% (Average Controlled/Occupational) and 77.20% (Average Uncontrolled/General).

Measurement Point	Ave % Controlled/ Occupational	Ave % Uncontrolled/ General
1	3.49	17.44
2	4.66	23.28
3	4.36	21.81
4	1.64	8.20
5	1.77	8.85
6	1.98	9.91
7	1.73	8.64
8	1.65	8.25
9	1.55	7.77
10	1.67	8.33
11	1.58	7.89
12	2.33	11.66
13	3.08	15.41
14	2.59	12.95
15	2.29	11.45
16	1.73	8.63
17	1.57	7.83
18	1.40	7.00
19	0.98	4.89
20	0.90	4.48

Measurement Point	Ave % Controlled/ Occupational	Ave % Uncontrolled/ General
21	0.57	2.83
22	0.56	2.78
23	0.50	2.50
24	0.58	2.88
25	< 0.5	< 2.5
26	< 0.5	< 2.5
27	< 0.5	< 2.5
28	< 0.5	< 2.5
29	< 0.5	< 2.5
30	< 0.5	< 2.5
31	0.72	3.62
32	1.22	6.08
33	1.32	6.60
34	1.81	9.03
35	3.79	18.94
36	6.32	31.59
37	12.75	63.75
38	**15.44**	**77.20**
39	0.94	4.70

Table 6: Rooftop Measurement Values[3]

[3] Due to measurement uncertainty at low levels (see Table 5), any readings outside the measurement range of the probe (<0.5% FCC Occupational/Controlled MPE, < 2.5% FCC General Population/Uncontrolled MPE) are listed as such.

9. Calculated Values

9.1. Modeling Procedure for the Calculations on Rooftop

The emission field calculation results displayed in the following figures were generated using proprietary computer software modeling prediction tool, PDCalc, as developed and provided by C Squared Systems, LLC. PDCalc uses the following power density calculation formulas:

Dish Antennas:

Near Field

$$\text{End of Near Field} = \frac{D^2}{(4 \times \lambda)}$$

$$\text{Power Density Near} = \text{PDN} = \frac{16 \times A \times P}{\pi \times D^2}$$

Where:

D = *Antenna Diameter*
λ = *Wavelength*
A = *Aperture Efficiency*
P = *Power Input to the Antenna*

- 20 dB of attenuation is added for any points greater than one antenna diameter from the main beam.

Transition Region:

$$\text{End of Transition Region} = \frac{D^2}{\lambda} \times FarFieldFactor$$

$$\text{Power Density Transition} = \frac{PDN \times \text{Near Region}}{R}$$

Where:

D = *Antenna Diameter*
FarFieldFactor = *multiplier which expands or contracts transition region to determine start of Far Field*
λ = *Wavelength*
PDN = *Power Density Near*
R = *Radial Distance*

$$\textit{Near Region} = \frac{D^2}{(4 \times \lambda)}$$

- 20 dB of attenuation is added for any points greater than one antenna diameter from the main beam.

Far Field:

$$\text{Power Density} = \left(\frac{\text{EIRP}}{\pi \times R^2}\right) \times \text{Off Beam Loss}$$

Where:

Off Beam Loss is determined by the selected antenna patterns
R = *Radial Distance*

Directional and Omni Antennas:

Near Field:

$$S = \frac{P_t \times K(H_a, L_a)}{20 \times \pi \times L_a \times R_h \times \left(\frac{BW}{360}\right)}$$

Where:

S = *Power Density in mw/cm²*
P_t = *Actual (or worst case assumed) power delivered to the antenna (watts)*
$K(H_a, La)$ = *Correction factor for antenna mounting height*
Ha = *Antenna mounting height in feet*
L_a = *Antenna length in meters*
R_h = *the horizontal distance along roof from antenna to point of interest*
BW = *Antenna beamwidth*

$K(H_a, L_a) = 0.99013 - 0.14656 \times H_a$ for $0 \leq H_a \leq 6$
$= 1/H_a$ for $H_a > 6$

- If the horizontal distance from the bottom of the antenna is < 1 foot, then 1 foot is used for the distance.

In order to deal with directional antennas, a modified cylindrical model is used. This is done by approximating the horizontal pattern with a model that is conservative, and applying the results to the cylindrical model above. The equation to be used is:

$$A = \cos^n\left(\phi/2\right)$$

Where:

A = *Attenuation*
ϕ = *Angle between antenna azimuth and point in question*
n = *Factor to shape the function for a particular beamwidth*
BW = *Antenna beamwidth*

By setting the attenuation equal to 0.5 at the half power point $(\phi = BW/2)$, n can be solved. However, in order to ensure that the attenuation model is conservative, n is solved when $\phi = (BW/2) \times (4/3)$. This essentially assumes a larger beamwidth for margin. Therefore, solving for n, we have

$$n = \frac{\ln(0.5)}{\ln(\cos(BW/3))}$$

As a result, antennas with a beamwidth wider than 270° will be treated as an omni-directional antenna. Finally, the maximum attenuation is capped at 15 dB to assure a conservative result in the rear of the antenna.

Far Field:

$$\text{Power Density} = \left(\frac{EIRP}{\pi \times R^2} \right) \times \text{Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power Watts

R = *Radial Distance* = $\sqrt{\left(H^2 + V^2\right)}$ meters

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

9.2. Calculated Results for Rooftop Emissions[4]

Figure 24 below shows the current RF environment on the rooftop of Danbury Hospital.

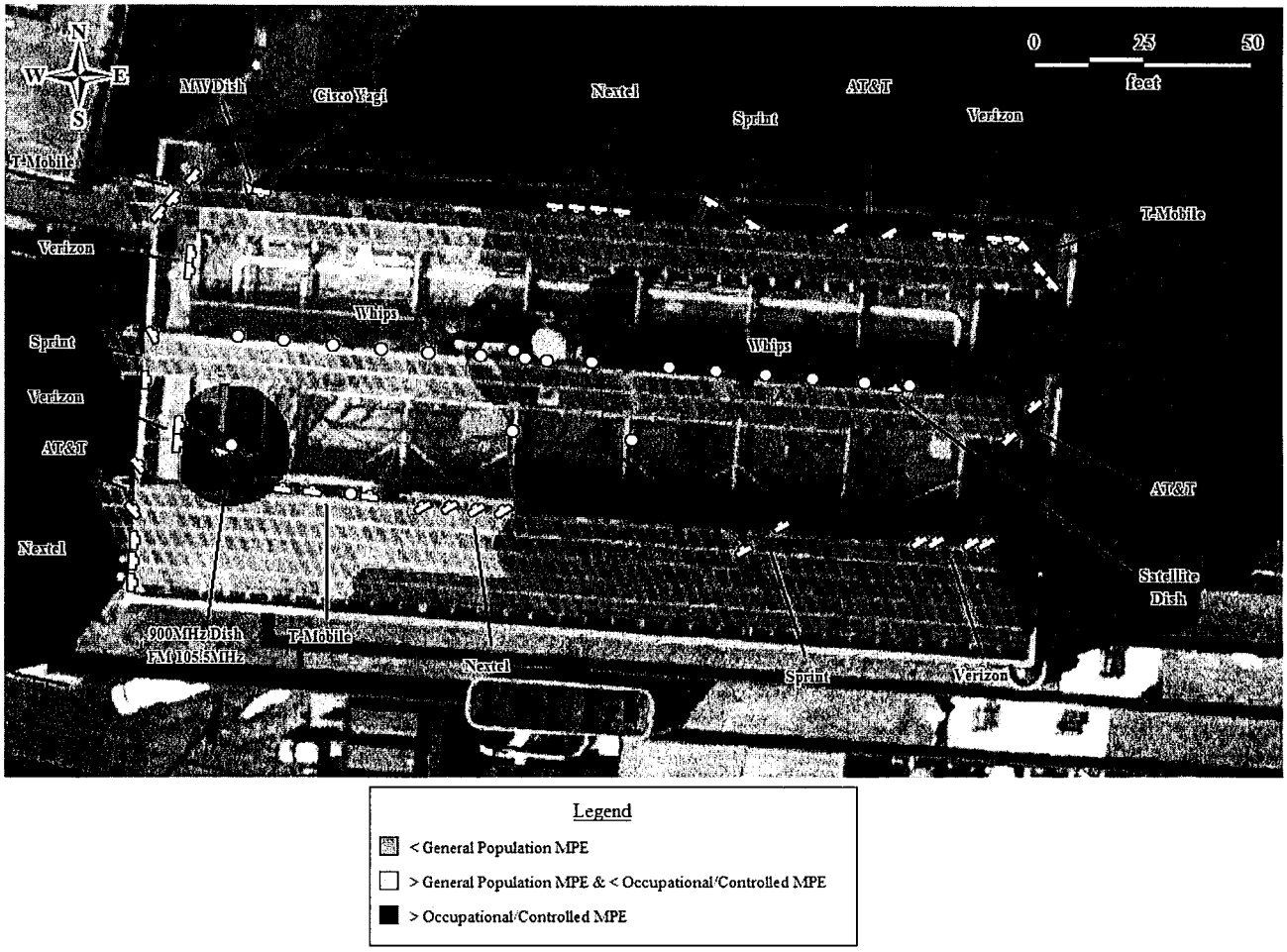


Figure 24: Existing Power Density Levels on Rooftop – All Carriers

[4] Calculated values are referenced to 6' above each roof level to account for an average human height as recommended in OET Bulletin 65.

Figure 25 shows the predicted RF environment once Sprint's proposed changes and modifications are complete.

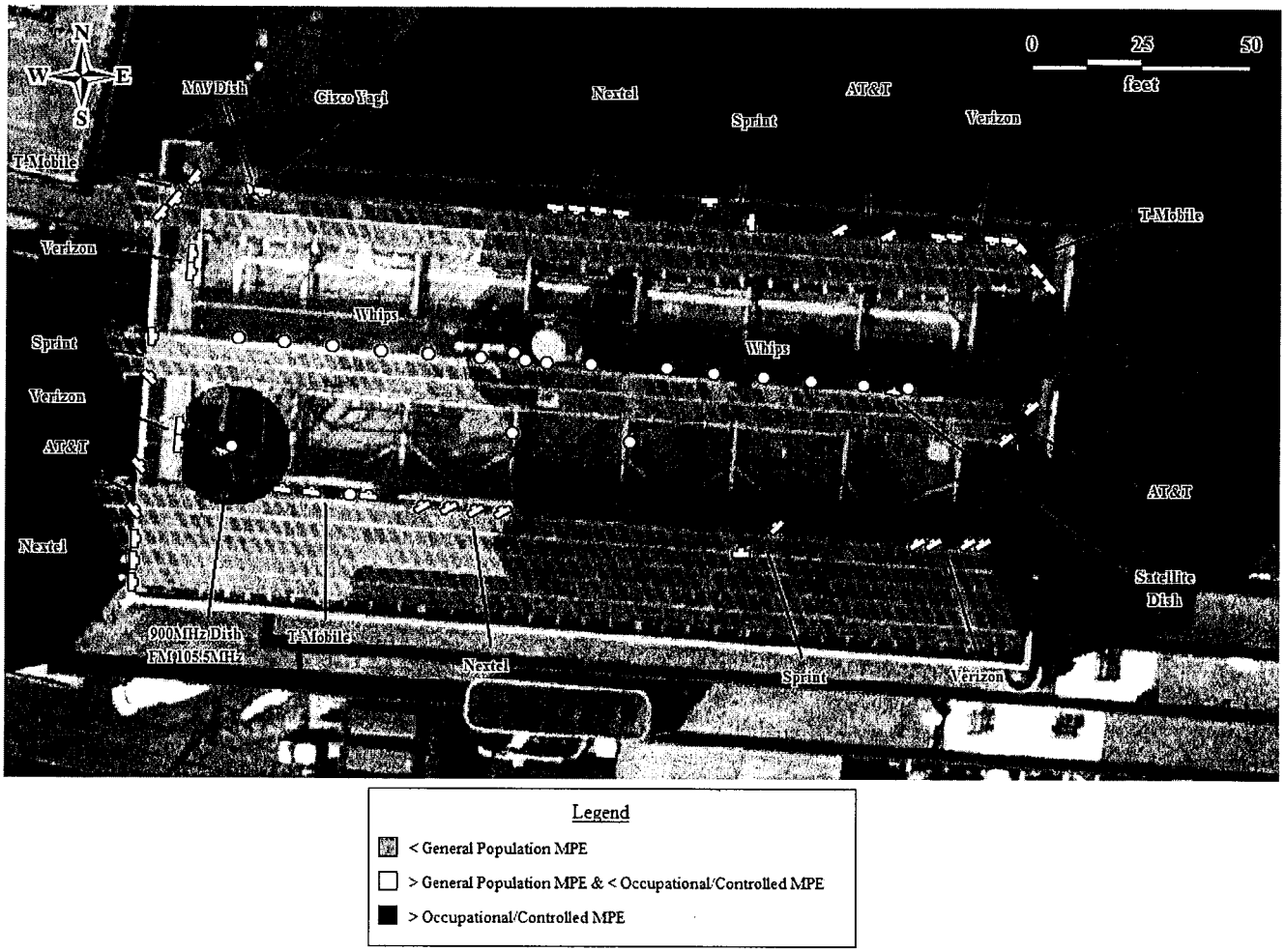


Figure 25: Predicted Power Density Levels on Rooftop – All Carriers (Post-Modification)

The rules adopted by the FCC specify that, in general, at multiple transmitter sites, actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limit applicable to their particular transmitter. Figure 26 below shows the 5% boundary from the existing Sprint-Nextel antenna configuration.

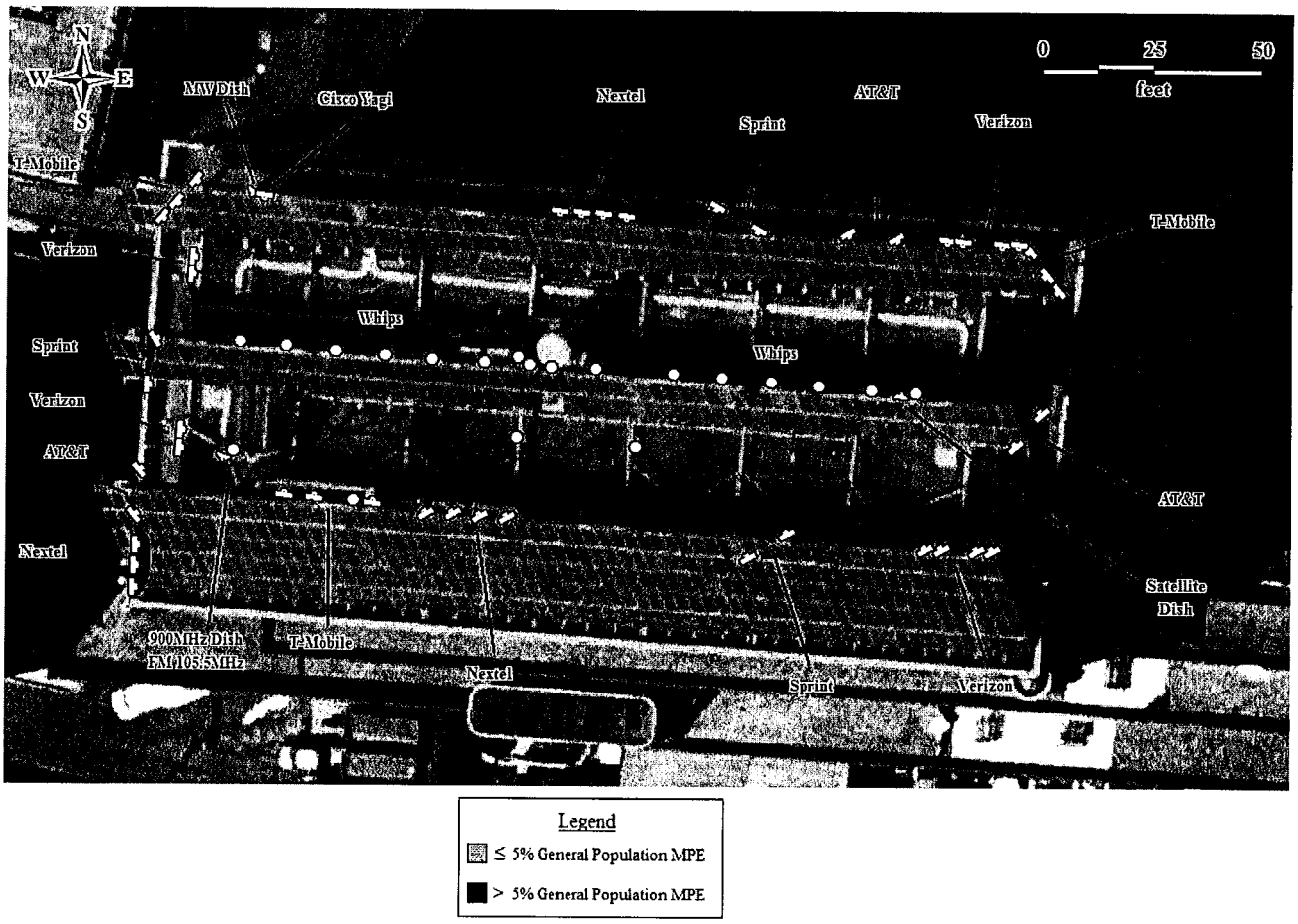


Figure 26: Existing 5% Levels on Rooftop – Sprint-Nextel Antennas Only

Figure 27 provides a visual representation of this 5% boundary from the proposed Sprint-Nextel antenna configuration.

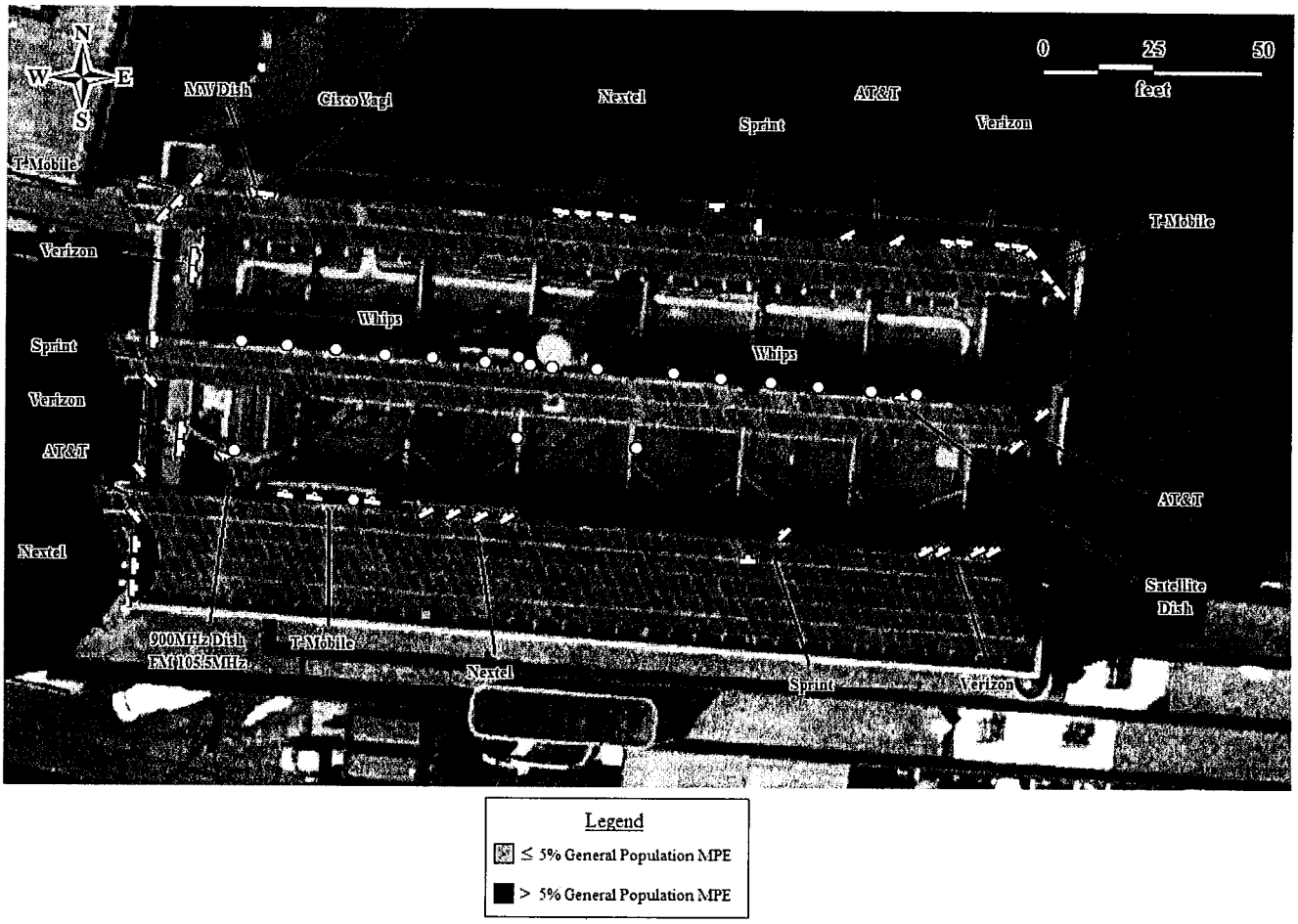


Figure 27: Predicted 5% Levels on Rooftop – Sprint-Nextel Antennas Only (Post-Modification)

10. Recommendations

- Access to the rooftop of Danbury Hospital is currently restricted. All roof access doors are currently kept locked at all times.
- There are currently yellow RF "CAUTION" signs posted at all roof access points to caution personnel that there may be areas on the roof where RF emission levels exceed the FCC Uncontrolled/General Population standard and that a potential hazard may exist. These signs are in compliance.
- **Figure 25 of this report should be inserted in a protective sleeve and posted in conspicuous locations prior to all roof access points to alert personnel of potential "hot spots" on the rooftop.** The rooftop EME map in this report should replace any other rooftop EME maps that are currently posted.

The following guidelines should be followed by all persons accessing the rooftop at Danbury Hospital:

- All personnel accessing the rooftop must be authorized and have the necessary intellectual and physical tools to allow them to control or mitigate their exposure.
- Obey all posted signs
- Assume all antennas are active
- Do not stop in front of antennas

11. Summary of Findings

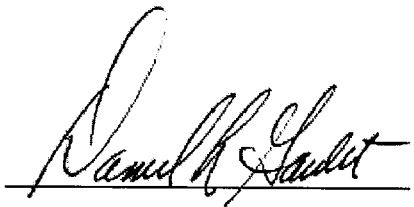
The rooftop survey and predicted analysis for this site finds that there are some areas of the main roof that may exceed the general population limits and some areas of the penthouse roof that may exceed both general population and occupational limits as defined by the FCC. Appropriate restrictions are currently in place however, and no additional actions are necessary to bring the site into full FCC compliance.

With respect to the Sprint and Nextel equipment, the proposed equipment configuration changes will not cause exposures on the main roof or penthouse roof to exceed the maximum power density levels as outlined by the FCC OET Bulletin 65 Edition 97-01.

Although roof access is currently restricted, all precautions should be taken to limit roof access to authorized personnel only. It should be noted that there are areas that may exceed the occupational/controlled limit in close proximity to WDBY's FM antenna array, however the existing Nextel and proposed Sprint equipment does not contribute greater than 5% of the exposure limits in these areas.

12. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1, ANSI/IEEE Std. C95.7 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

April 21, 2011
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

IEEE Std C95.7-2005, IEEE Recommended Practice for Radio Frequency Safety Programs, 3 kHz to 300 GHz. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[6]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 7: FCC Limits for Maximum Permissible Exposure

[5] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[6] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

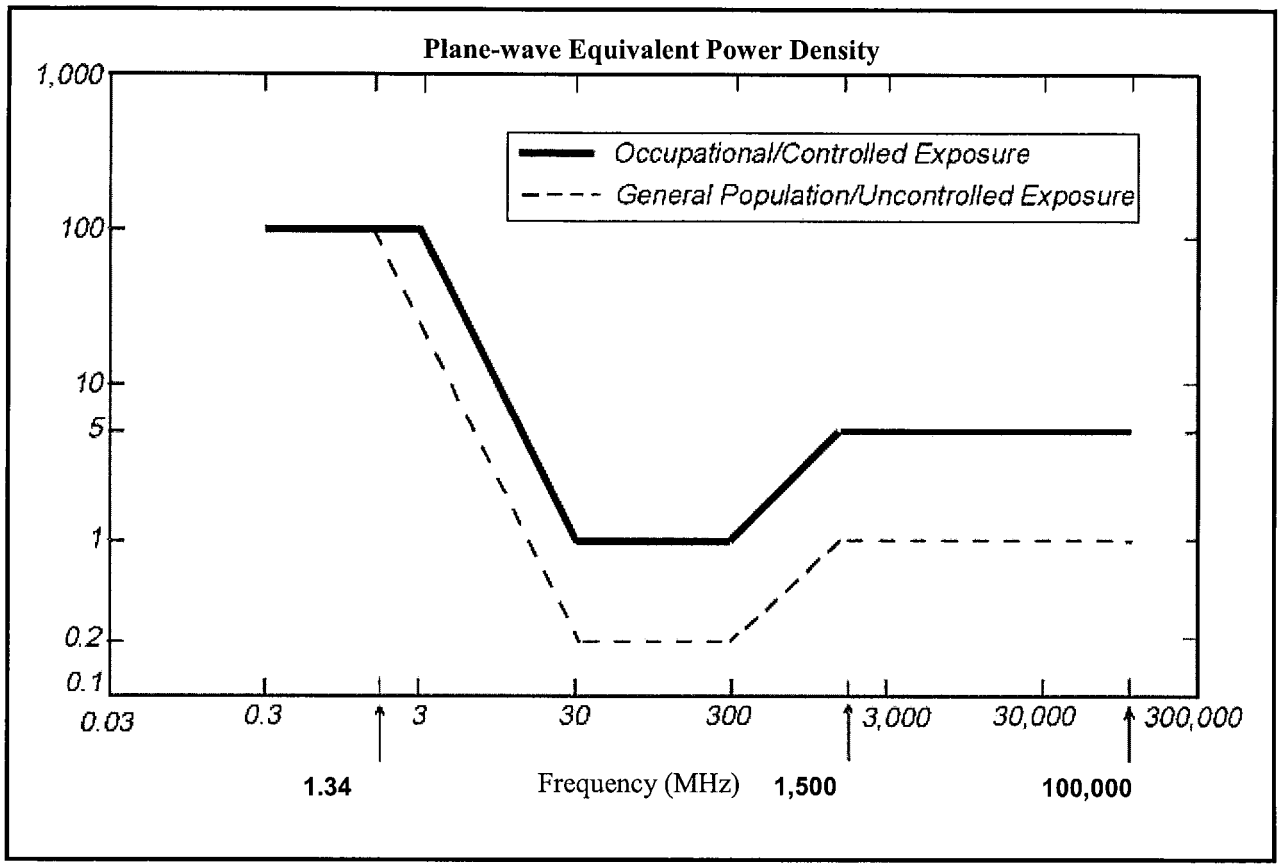


Figure 28: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

CODE COMPLIANCE:

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING:

1. 2005 CONNECTICUT STATE BUILDING CODE.
2. 2003 INTERNATIONAL BUILDING CODE
3. 2005 CONNECTICUT BUILDING CODE SUPPLEMENT
4. 2009 AMENDMENT TO 2005 CT BUILDING CODE SUPP.
5. 2003 INTERNATIONAL MECHANICAL CODE
6. 2003 INTERNATIONAL PLUMBING CODE
7. 2005 NATIONAL ELECTRICAL CODE (NFPA-70)
8. ANSI/TIA/EIA-222-F
9. LOCAL BUILDING CODE
10. CITY/COUNTY ORDINANCES

Sprint

Together with Nextel.

8 AIRLINE DRIVE, SUITE 105
ALBANY, NY 12205

SITE NUMBER: CT81XC007
SITE NAME: DANBURY HOSPITAL

24 HOSPITAL AVE.
DANBURY, CT 06810
SITE TYPE: ROOFTOP

DIG ALERT:
CALL FOR UNDERGROUND UTILITIES PRIOR TO DIGGING:
1-800-922-4455
EMERGENCY:
CALL 911

infinigy engineering

11 Herbert Drive
Latham, NY 12110
OFFICE: (518) 690-0790
FAX: (518) 690-0793

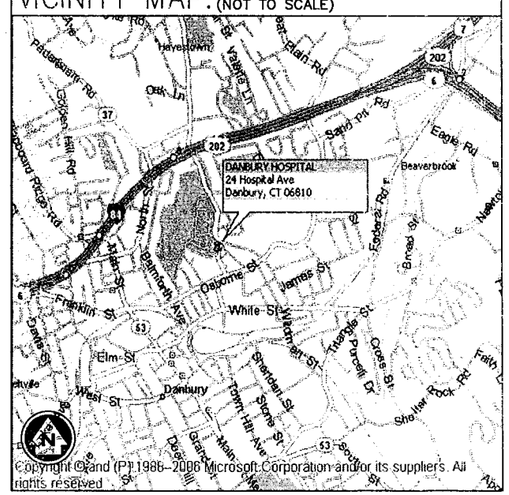
PROJECT TEAM:

ENGINEER:	INFINIGY ENGINEERING PLLC 11 HERBERT DRIVE LATHAM, NY 12110
CONTACT:	PAUL FANOS (518) 690-0790
APPLICANT:	SPRINT NEXTEL CORP. 8 AIRLINE DRIVE SUITE 105 ALBANY, NY 12205
CONTACT:	COLLEEN BISCEGLIA (518) 365-8180

PROJECT DESCRIPTION:

1. THIS IS AN UNMANNED TELECOMMUNICATIONS FACILITY CONSISTING OF BTS EQUIPMENT & ANTENNAS.
2. SIGNALS FROM THE ANTENNAS SHALL NOT INTERFERE WITH ANY EXISTING COMMUNICATION SITES. ALL ITEMS SHOWN HEREON ARE EXISTING UNLESS OTHERWISE NOTED.
3. THIS IS AN UNMANNED FACILITY – NO SOLID WASTE. THE SITE WILL CREATE NO TRASH. THUS REQUIRING NO DUMPSTER.
4. DEVELOPMENT & USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.

VICINITY MAP: (NOT TO SCALE)



PROJECT INDEX:

SITE NAME:	DANBURY HOSPITAL
SITE NUMBER:	CT81XC007
SITE ADDRESS:	24 HOSPITAL AVE. DANBURY, CT 06810
PROPERTY OWNER:	DANBURY HOSPITAL 24 HOSPITAL AVE. DANBURY, CT 06810
APPLICANT:	SPRINT NEXTEL CORP. & AIRLINE DRIVE SUITE 105 ALBANY, NY 12205
CONTACT:	COLLEEN BISCEGLIA (518) 365-8180
LATITUDE: LONGITUDE:	41° 24' 18.00" N 73° 26' 47.40" W

SHEET INDEX:

SHEET #	TITLE	REV.#	DATE
T1	TITLE SHEET	2	5/2/11
C1	GENERAL NOTES	2	5/2/11
C2	OVERALL ROOF PLAN	2	5/2/11
C3	OVERALL PENTHOUSE LAYOUT	2	5/2/11
C4	ENLARGED SITE LAYOUT	2	5/2/11
C5	BUILDING ELEV. & ANTENNA DETAILS	2	5/2/11
C6	ANTENNA & RF DETAIL	2	5/2/11
E1	ELECTRICAL PLAN	2	5/2/11
E2	GROUNDING PLAN	2	5/2/11

DO NOT SCALE DRAWINGS:

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SIGNATURE BLOCK

OWNER/OWNER'S AGENT APPROVAL _____ DATE _____

RF APPROVAL _____ DATE _____

CM APPROVAL _____ DATE _____

infinigy engineering
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Latham, NY 12110
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1	REVISED PER COMMENT	SKB	4/14/11
0	ISSUED FOR REVIEW	SKB	3/21/11

Drawn: SKB Date: 3/21/11
Designed: AGF Date: 3/21/11
Checked: AGF Date: 3/21/11

Project Number
195-036

Project Title

CT81XC007
DANBURY
HOSPITAL

24 HOSPITAL AVENUE
DANBURY, CT 06810

Prepared For

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Together with Nextel.

Drawing Scale:
AS NOTED

Date:
5/2/11

Drawing Title

TITLE SHEET

Drawing Number

T1

GENERAL NOTES

1. ALL CONSTRUCTION, LABOR AND MATERIAL SHALL COMPLY WITH ALL LOCAL AND STATE BUILDING CODES, ORDINANCES AND TO THE RULES AND REGULATIONS OF ALL AGENCIES HAVING JURISDICTION.

2. THE CONTRACTOR MUST VISIT THE SITE AND BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND CONDITIONS. NOTE THAT NORTH ORIENTATION INDICATED ON THE PLANS IS APPROXIMATE & MUST BE VERIFIED. CONTRACTOR SHALL LOCATED TRUE NORTH AND ANTENNA SUPPORTS UTILIZING THE APPROPRIATE U.S.G.S. 7 1/2 MINUTE MAP AND A THEODOLITE. CONTRACTOR SHALL PROVIDE DOCUMENTATION OF COORDINATES AND BEARINGS USED FOR ALIGNMENT. ANY DISCREPANCIES OR CONCERN SHALL BE REPORTED TO THE ARCHITECT BEFORE PROCEEDING WITH ANY WORK, PURCHASE, FABRICATION OR ERECTION OF ANY MATERIAL.

3. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS, APPROVALS, INSPECTIONS AND TESTS REQUIRED BY ALL AGENCIES HAVING JURISDICTION.

4. THE CONTRACTOR SHALL PROVIDE ALL ITEMS OF LABOR AND MATERIALS, WHETHER OR NOT SPECIFICALLY INDICATED, IF REQUIRED TO COMPLETE THE INSTALLATION.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATE BRACING AND PROTECTING OF ALL WORK DURING CONSTRUCTION TO AVOID DAMAGE COLLAPSE, DISTORTION, MISALIGNMENT, VOIDING ROOFING GUARANTEES AND WARRANTIES, ETC. PRODUCTION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CODES, STANDARDS AND BEST PRACTICES. ROOF SURFACES SHALL BE RESTORED TO COMPLETE WATER TIGHTNESS WITH THE APPROVED MATERIAL AND AS PRE-APPROVED BY THE OWNER IN WRITING.

6. ALL MATERIALS SHALL BE INSTALLED AS PER THE MANUFACTURER'S SPECIFICATIONS.

7. DO NOT SCALE DRAWINGS.

8. THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR THE MEANS AND METHODS OF CONSTRUCTION. THE WORK SHOWN ON THESE PLANS AND ALL WORK PERFORMED SHALL BE DONE IN A GOOD WORKMANSHIP MANNER TO THE SATISFACTION OF THE OWNER. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY EFFORTS TO PROTECT THE NEW EQUIPMENT DURING THIS INSTALLATION AND SHALL ADHERE TO THE FOLLOWING:

-THE TENANT'S EGRESS TO AND FROM THE BUILDING AND/OR THE SITE SHALL NOT BE IMPACTED.
-THE BUILDINGS FIRE SAFETY OR SHALL NOT CREATE ANY FIRE HAZARDS.
-THE STRUCTURAL INTEGRITY AND SAFETY OF THE BUILDING SHALL NOT BE COMPROMISED.
-THERE SHALL NOT BE ANY CREATION OF NOISE OUTSIDE THE NORMAL HOURS OF 7 AM TO 6 PM. UNLESS OTHERWISE AGREED UPON WITH THE OWNER.
-THE BUILDINGS SECURITY SHALL BE MAINTAINED IN ORDER TO PREVENT ANY UNAUTHORIZED PERSONS. FROM ENTERING THE PREMISES.
-THE BUILDINGS UTILITYIES (ELECTRICITY, GAS, WATER AND OTHER UTILITIES) SHALL NOT BE INTERRUPTED DURING THIS APPLICATION & INSTALLATION.
-ALL MASONRY PENETRATIONS SHALL BE DONE USING ROTARY ACTION ONLY (NO HAMMERING ACTION).
-ALL PENETRATIONS SHALL BE FIRE STOPPED WITH 3M FS 195 WRAP STRIP FIRE STOP AND CP25 NON-SHRINK PUTTY FIRE BARRIER SEALANT. MAINTAIN THE FIRE RATING OF ALL PENETRATED SURFACES.

9. THE CONTRACTOR SHALL, AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE, CONSTRUCTION MATERIAL AND RUBBISH. UPON COMPLETION, ALL DEBRIS SHALL BE REMOVED AND THE PREMISES LEFT IN A "BROOM CLEAN" CONDITION ALL RUBBISH SHALL BE DISPOSED OF IN A LEGAL MANNER.

10. THE CONTRACTOR SHALL COORDINATE ALL SPECIAL CONSIDERATIONS OF THE CONSTRUCTION (EX. NOISY OPERATIONS, INTERRUPTIONS OF ANY MECHANICAL AND/OR ELECTRICAL SERVICES, MATERIAL DELIVERIES AND/OR STORAGE) WITH THE BUILDING OWNER OR SITE MANAGEMENT PRIOR TO THE START OF THE WORK.

11. THE CONTRACTOR SHALL PATCH AND REPAIR EXISTING CONDITIONS WHERE DISTURBED BY NEW WORK OR AS REQUIRED BY THE PLANS. ALL EXISTING AREAS OF THE BUILDING/SITE DAMAGED BY THE CONTRACTOR SHALL BE RESTORED TO ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.

GENERAL NOTES CONTINUED

12. ALL ELECTRICAL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICIAN AND CONFORM TO ALL BUILDING CODE AND LOCAL UTILITIES REQUIREMENTS.

13. THE GENERAL NOTES CONTAINED HEREIN ARE PART OF THE PLANS AND SPECIFICATIONS AND ARE TO BE COMPLIED WITH IN ALL RESPECTS. THE MOST RESTRICTIVE NOTES SPECIFIED ARE TO TAKE PRECEDENCE.

14. THESE DOCUMENTS ARE IN COMPLIANCE & ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE FOLLOWING CODES & STANDARDS, LATEST EDITINGS:
- 2005 CONNECTICUT STATE BUILDING CODE
- 2003 INTERNATIONAL BUILDING CODE
- 2005 CONNECTICUT BUILDING CODE SUPPLEMENT
- 2009 AMENDMENT TO 2005 CONNECTICUT BUILDING CODE SUPPLEMENT
- 2003 INTERNATIONAL MECHANICAL CODE
- 2003 INTERNATIONAL PLUMBING CODE
- 2005 NATIONAL ELECTRICAL CODE (NFPA-70)
- EIA/TIA-222-F STANDARDS "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES"
- LOCAL BUILDING CODE
- CITY/COUNTY ORDINANCES

15. ALL PROPOSED STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC CODE AND ASTM SPECIFICATIONS, LATEST EDITION. ALL NEW STEEL SHALL:
- CONFORM WITH TO ASTM A-36
- ALL STEEL PIPES SHALL CONFORM TO ASTM A-501 OR A-53, GRADE B.
- CONNECTIONS SHALL MADE USING SPECIFIED WELDS AND WELDING ELECTRODES E-70XX OR SPECIFIED HIGH STRENGTH BOLTS SHALL BE ASTM A325 THREADS ARE EXCLUDED FROM THE SHEAR PLANE.
- ALL SHOP AND FIELD WELDING SHALL BE DONE BY WELDERS QUALIFIED AS DESCRIBED IN THE "AMERICAN WELDING SOCIETY'S STANDARDS QUALIFICATION PROCEDURE" TO PERFORM THE PROPOSED WORK.
- BE HOT DIPPED GALVANIZED AFTER FABRICATION (ONLY EXPOSED TO MOISTURE APPLICATIONS) PER ASTM A-123. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (NEW OR OLD) SHALL BE PAINTED WITH TWO (2) COAST OF ZRC COLD GALVANIZING COMPOUND MANUFACTURED BY ZRC CHEMICAL PRODUCTS.
- ALL PIPES SIZES INDICATED HEREIN ARE NOMINAL DIAMETER (INSIDE DIAMETER).

16. ALL EQUIPMENT SHALL BE INSTALLED LEVEL AND PLUMB.

17. MATERIALS AND CONDITIONS NOT FABRICATED CORRECTLY, DAMAGED OR NON-CONFORMING SHALL BE REPORTED TO CONSTRUCTION MANAGER, ARCHITECT AND OWNER. PRIOR TO ANY CORRECTIVE ACTION ALL ACTIONS REQUIRE APPROVAL FROM THE OWNER.

18. SPRINT NEXTEL SHALL BE RESPONSIBLE FOR EVALUATING LEVELS OF RF EMISSIONS TO DETERMINE CONTROLLED ACCESS LIMITS AND SHALL POST APPROPRIATE SIGNAGE.

STEEL NOTES (IF APPLICABLE)

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND ORDINANCES.

2. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED WELDS WITH WELDING ELECTRODES E-70XX OR SPECIFIED HIGH STRENGTH BOLTS TO BE ASTM A325.

3. ALL STEEL EXPOSED TO MOISTURE, SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A-123. ALL DAMAGED SURFACES, WELDED AREAS AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH (2) TWO COATS OF ZRC COLD GALVANIZING COMPOUND MANUFACTURED BY ZRC CHEMICAL PRODUCT CO. QUINCY, MASS OR USE THERMAL SPRAYING WITH PLATTING 85/15 AS MANUFACTURED BY PLATT BROTHERS & COMPANY, WATERBURY, CT.

4. CUT AND REMOVE EXISTING ROOF AS REQUIRED TO INSTALL NEW BEARING PLATES.

5. ATTACHMENTS AND BEAM PENETRATIONS AT ROOF MUST BE SEALED WATERTIGHT.

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Project Number
195-036

Project Title

CT81XC007
DANBURY
HOSPITAL

24 HOSPITAL AVENUE
DANBURY, CT 06810

Prepared For

Sprint
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Drawing Scale:
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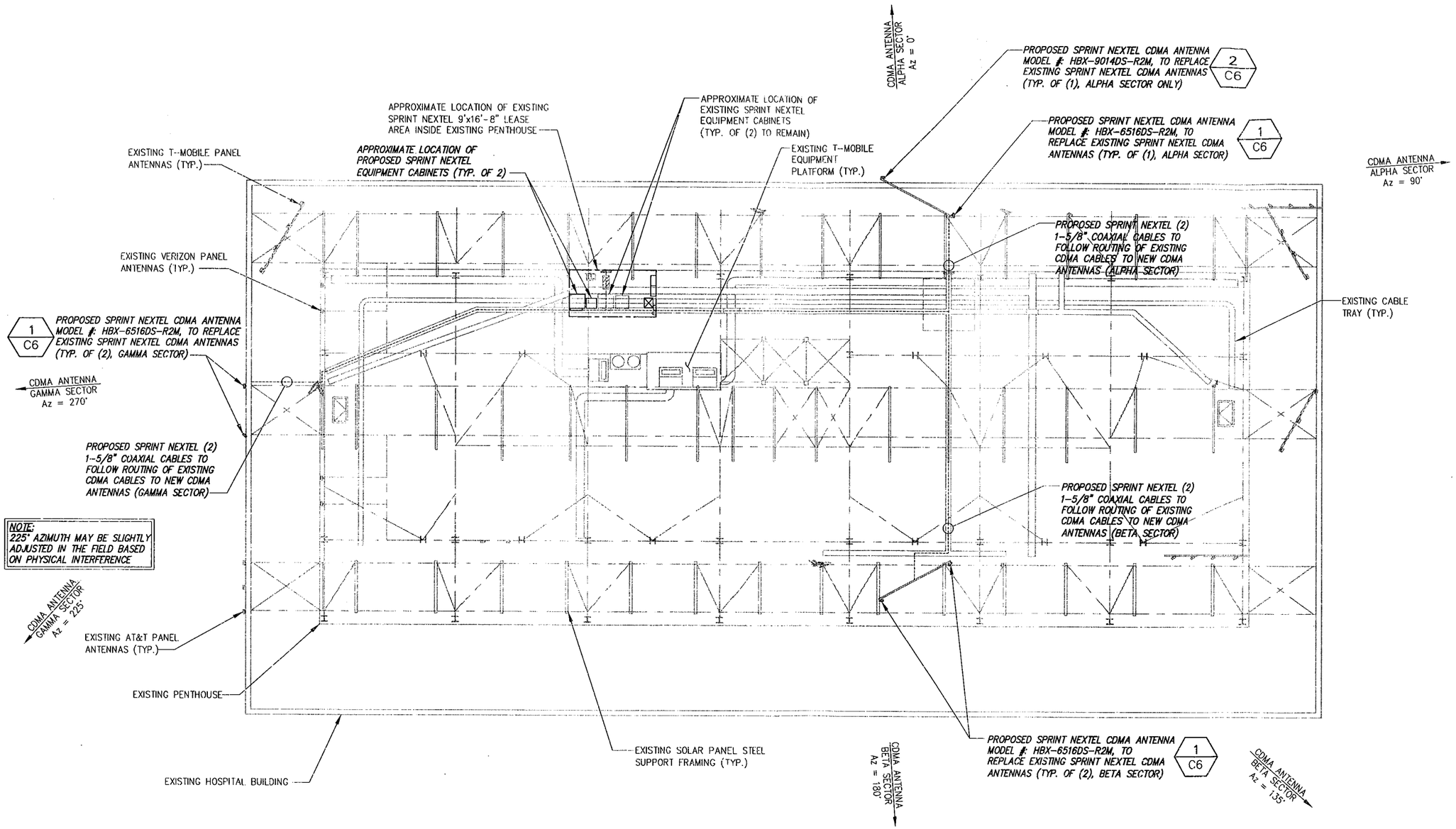
Date:
5/2/11

Drawing Title

GENERAL NOTES

Drawing Number

C1



FOR ADDITIONAL STRUCTURAL INFORMATION, PLEASE REFER TO REPORT PREPARED BY SHAMROCK ENGINEERING DATED 4/23/11.

BASEMAPPING PREPARED FROM A SITE VISIT PERFORMED BY INFINIGY ENGINEERING, AND INFORMATION PROVIDED BY SPRINT NEXTEL, AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

APPROXIMATE NORTH

1 C6 OVERALL ROOF PLAN
SCALE:

GRAPHIC SCALE

20' 10' 0 10' 20'

SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

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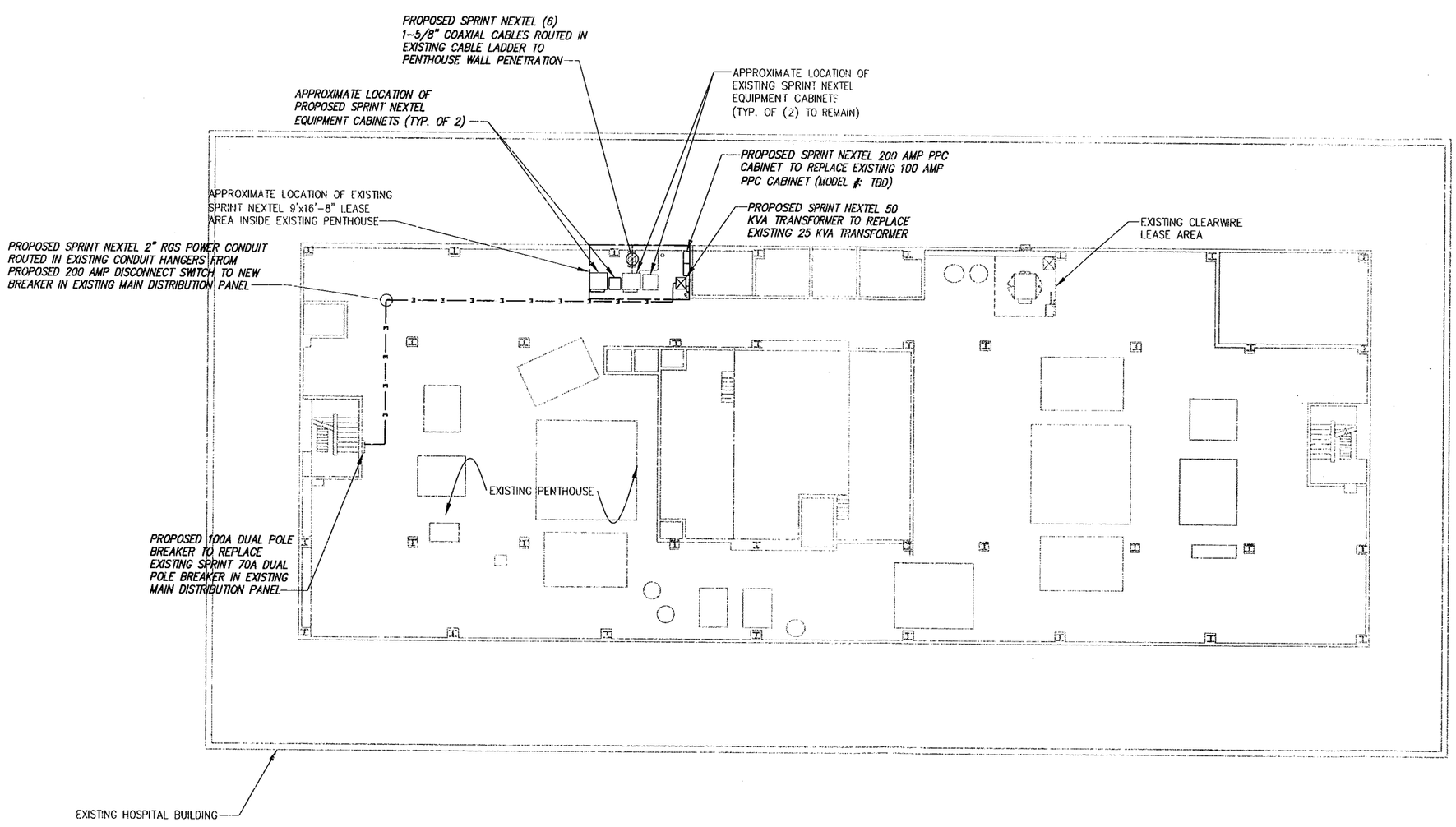
OVERALL ROOF PLAN

Drawing Number

C2



FOR ADDITIONAL STRUCTURAL INFORMATION, PLEASE REFER TO REPORT PREPARED BY SHAMROCK ENGINEERING DATED 4/23/11.

BASEMAPPING PREPARED FROM A SITE VISIT PERFORMED BY INFINIGY ENGINEERING, AND INFORMATION PROVIDED BY SPRINT NEXTEL. AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

APPROXIMATE NORTH

1 OVERALL PENTHOUSE LAYOUT
SCALE:

GRAPHIC SCALE

20' 10' 0 10' 20'

SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

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DANBURY
HOSPITAL

24 HOSPITAL AVENUE
DANBURY, CT 06810

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Drawing Scale:
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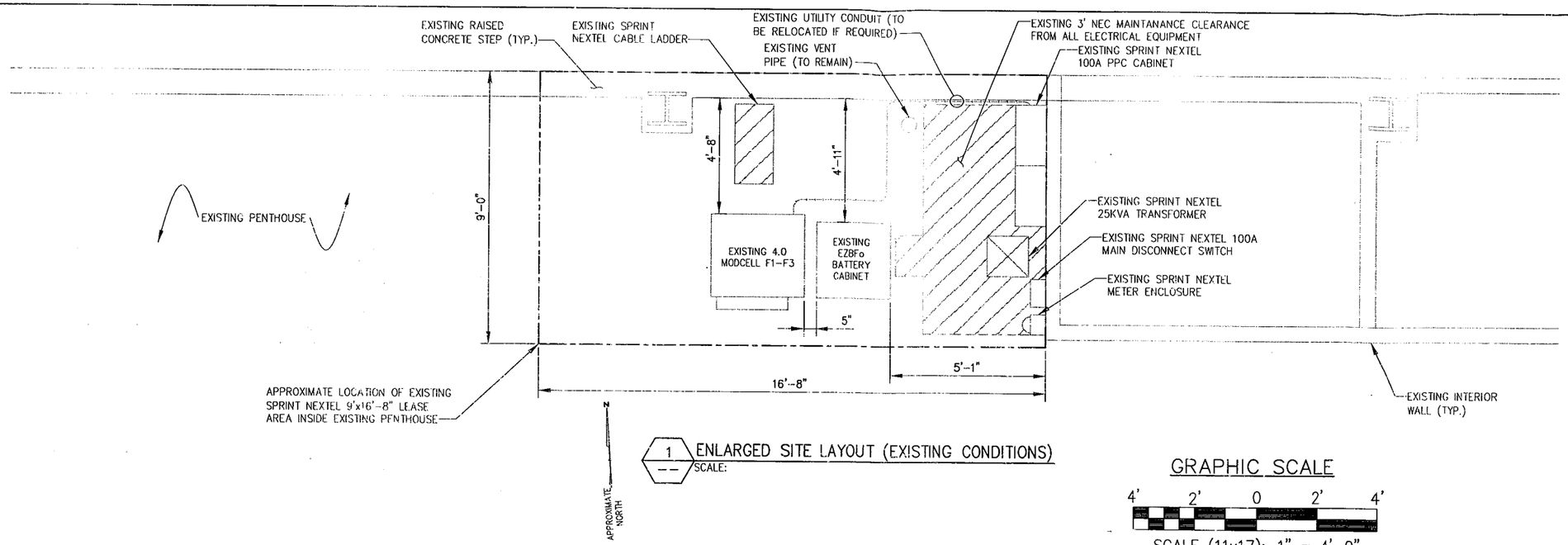
Drawing Title

OVERALL PENTHOUSE LAYOUT

Drawing Number

C3

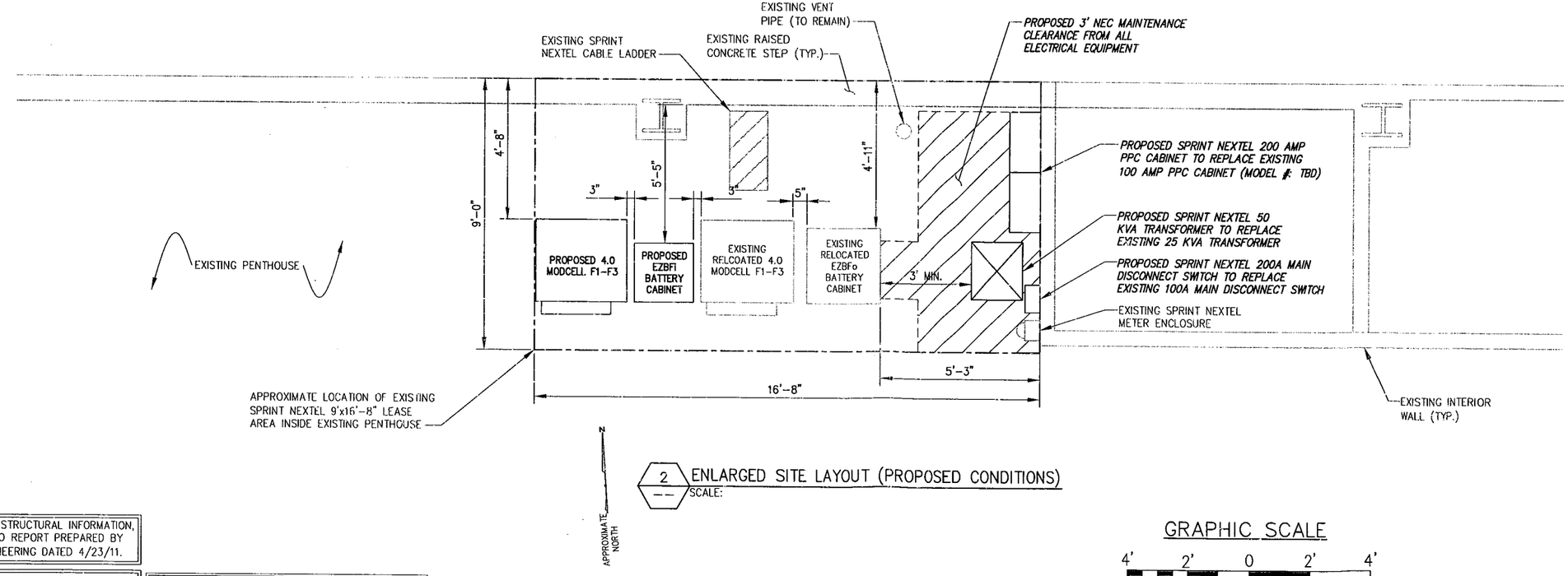


1 — ENLARGED SITE LAYOUT (EXISTING CONDITIONS)
SCALE:

GRAPHIC SCALE

4' 2' 0 2' 4'

SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"



2 — ENLARGED SITE LAYOUT (PROPOSED CONDITIONS)
SCALE:

GRAPHIC SCALE

4' 2' 0 2' 4'

SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

FOR ADDITIONAL STRUCTURAL INFORMATION, PLEASE REFER TO REPORT PREPARED BY SHAMROCK ENGINEERING DATED 4/23/11.

BASEMAPPING PREPARED FROM A SITE VISIT PERFORMED BY INFINIGY ENGINEERING, AND INFORMATION PROVIDED BY SPRINT NEXTEL, AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

NOTE:
EXISTING MODCELL 4.0 AND EXISTING EZBFO BATTERY CABINET TO BE RELOCATED AS REQUIRED TO MEET NEC MAINTENANCE CLEARANCE REQUIREMENTS FROM ELECTRICAL EQUIPMENT ON AND NEAR WALL.

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Project Title

CT81XC007
DANBURY
HOSPITAL

24 HOSPITAL AVENUE
DANBURY, CT 06810

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Drawing Scale:
AS NOTED

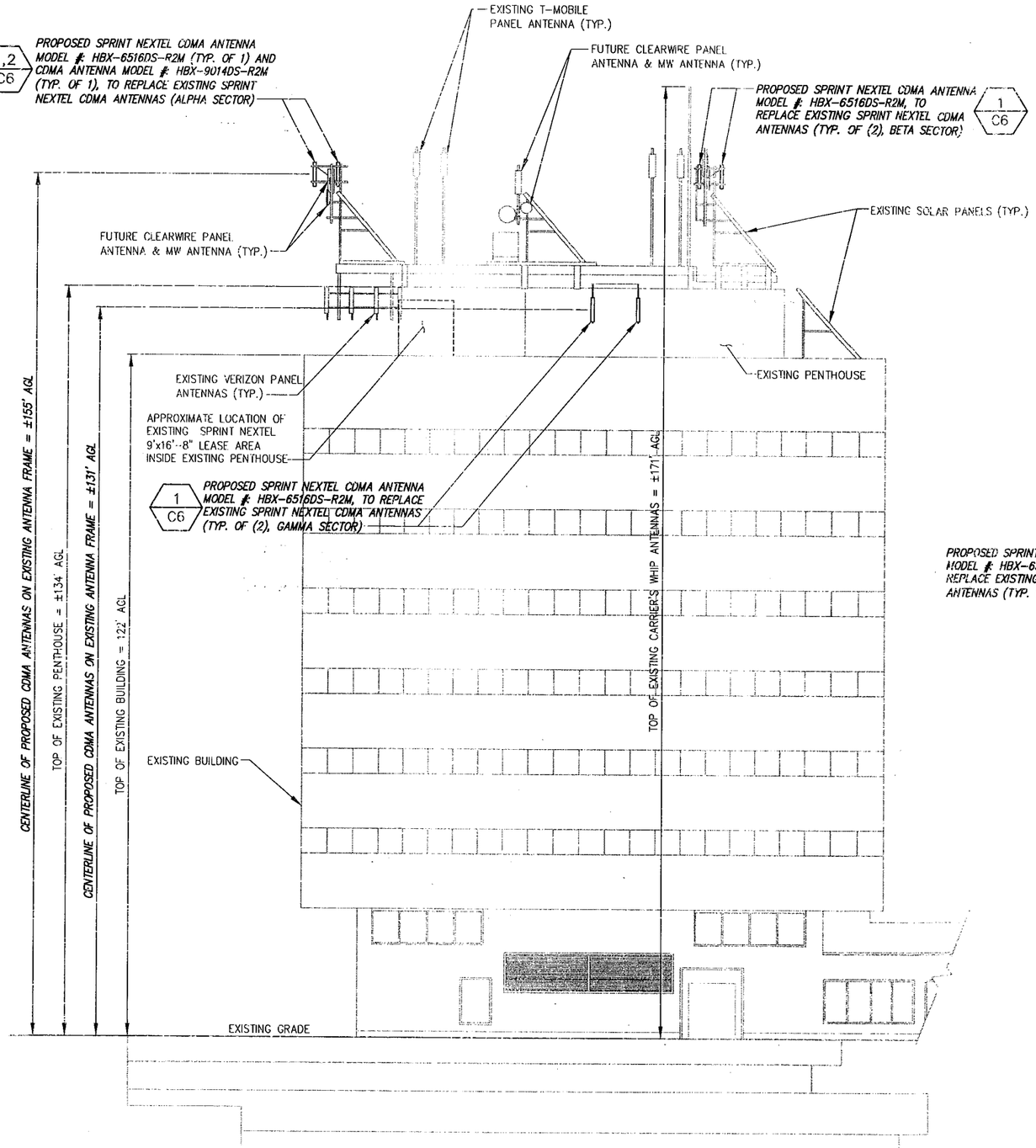
Date:
5/2/11

Drawing Title

ENLARGED SITE LAYOUT

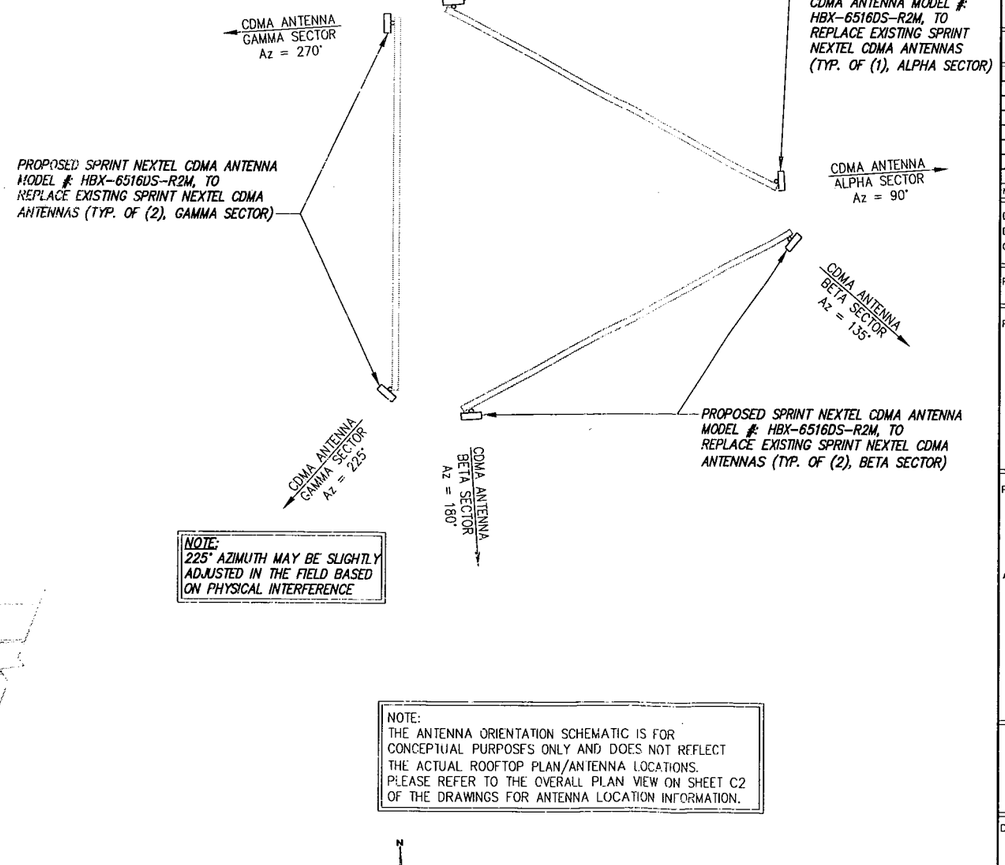
Drawing Number

C4



1 BUILDING ELEVATION
NOT TO SCALE

FOR ADDITIONAL STRUCTURAL INFORMATION, PLEASE REFER TO REPORT PREPARED BY SHAMROCK ENGINEERING DATED 4/23/11.



NOTE:
225° AZIMUTH MAY BE SLIGHTLY ADJUSTED IN THE FIELD BASED ON PHYSICAL INTERFERENCE

NOTE:
THE ANTENNA ORIENTATION SCHEMATIC IS FOR CONCEPTUAL PURPOSES ONLY AND DOES NOT REFLECT THE ACTUAL ROOFTOP PLAN/ANTENNA LOCATIONS. PLEASE REFER TO THE OVERALL PLAN VIEW ON SHEET C2 OF THE DRAWINGS FOR ANTENNA LOCATION INFORMATION.

2 ANTENNA ORIENTATION PLAN
NOT TO SCALE

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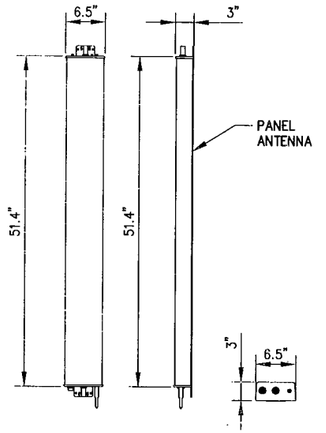
Drawing Title
BUILDING ELEVATION & ANTENNA DETAILS

Drawing Number
C5



PART NUMBER: HBX-6516DS-R2M

ANTENNA DIMENSIONS (CDMA ANTENNAS)

1 / --

NOT TO SCALE

CDMA ANTENNA & EBTS SPECIFICATIONS:

Sector Level Information	NEW BTS Alpha CT81XC007-1	NEW BTS Beta CT81XC007-2	NEW BTS Gamma CT81XC007-3	Original BTS Alpha CT03XC350-1	Original BTS Beta CT03XC350-2	Original BTS Gamma CT03XC350-3
Orientation (degrees)	0°	90°	135°	180°	225°	270°
Coaxial Cable Line Length (feet)						
Number of Coaxial Cable Runs (quantity)	2	2	2	2	2	2
Coaxial Cable Manufacturer and Size						
Cross Band Coupler (Manufacture, Model)						
Other Unique Combiner, Splitter, Connector						
Number of Cross Band Coupled Coaxial Cables						
Antenna Height (Rad Center) in feet	131'	131'	131'	131'	131'	131'
Number of Antennas (quantity) - RET's and Dual Pol only need 1/sector	1	1	1	1	1	1
Antenna Manufacturer						
Antenna Model #	HBX-9014DS-R2M	HBX-6516DS-R2M	HBX-6516DS-R2M	HBX-6516DS-R2M	HBX-6516DS-R2M	HBX-6516DS-R2M
Antenna Gain (dBd)						
RET Antenna Electrical Downtilt	2	2	2	2	2	2
RET Antenna Horizontal Setting (if required)						
RET Antenna Vertical Setting (if required)						
Mechanical Tilt (degrees) - Non RET Only	0°	0°	0°	0°	0°	0°
MCPA on Sector (Yes / No)	NO	NO	NO	NO	NO	NO
Type of MCPA System (Balanced Link Only)						
Expected Balanced Link Gain Improvement from MCPA						
Type of Reverse Link Mercury Equipment TTA/LNA (Type)						

**Antennas should be ordered with 7/16-DIN Female connector, unless stated otherwise.

NOTE: (6) NEW COAXIAL CABLES ARE PROPOSED FOR THIS INSTALLATION. COAXIAL CABLE ROUTE TO FOLLOW ROUTING OF EXISTING CDMA CABLES TO NEW CDMA ANTENNAS. CONTRACTOR TO VERIFY EXISTING SPARE LINES SWEEP GOOD, OR REPLACE.

NOTE:
225° AZIMUTH MAY BE SLIGHTLY ADJUSTED IN THE FIELD BASED ON PHYSICAL INTERFERENCE

PART NUMBER: HBX-9014DS-R2M

ANTENNA DIMENSIONS (CDMA ANTENNAS)

2 / --

NOT TO SCALE

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Drawing Scale:
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Date:
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Drawing Title

ANTENNA & RF DETAIL

Drawing Number

C6

GENERAL ELECTRICAL NOTES:

1. GENERAL: ALL WIRING IN FINISHED AREAS SHALL BE CONCEALED UNLESS NOTED OTHERWISE. IN UNFINISHED AREAS SUCH AS BASEMENTS, MECHANICAL ROOMS, ELECTRICAL CLOSETS, ETC. WIRING SHALL BE ROUTED ON THE INTERIOR SURFACE. NO WIRING SHALL BE ROUTED ON THE OUTSIDE SURFACES OF THE BUILDING UNLESS SPECIFICALLY NOTED. ALL NEC AND LOCAL ELECTRIC CODES SHALL BE ADHERED TO. ALL CONDUCTORS SHALL BE COPPER UNLESS OTHERWISE NOTED.

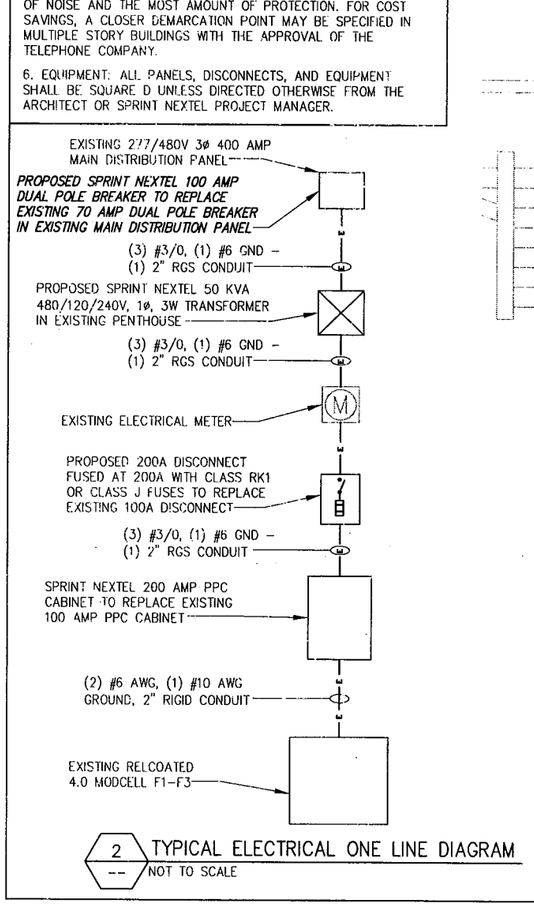
2. INDOORS (UNCLASSIFIED AREAS): ALL FEEDERS SHALL CONSIST OF PULLED CONDUCTORS IN EMT. ALL BRANCH CIRCUITS SHALL CONSIST OF PULLED CONDUCTORS IN EMT. EXCEPT 15 AND 20 AMPERE I POLE LIGHTING RECEPTACLE, OR MISCELLANEOUS BRANCH CIRCUITS CONCEALED ABOVE SUSPENDED CEILING OR WITHIN DRY WALLS SHALL CONSIST OF TYPE MC METAL CLAD CABLE IF ALLOWED BY CODE. CONNECTIONS TO COMMUNICATION CABINETS AND VIBRATING EQUIPMENT SHALL CONSIST OF PULLED CONDUCTORS IN FLEXIBLE METALLIC CONDUIT, MAXIMUM 3' IN LENGTH.

3. OUTDOORS OR INDOORS CLASSIFIED 'DAMP' OR 'WET' LOCATION: ALL FEEDERS AND BRANCH CIRCUITS SHALL CONSIST OF PULLED CONDUCTORS IN RGS CONDUIT CONNECTIONS TO COMMUNICATION CABINET AND VIBRATING EQUIPMENT SHALL CONSIST OF PULLED CONDUCTORS IN LIQUID TIGHT FLEXIBLE STEEL CONDUIT, MAXIMUM 3' IN LENGTH.

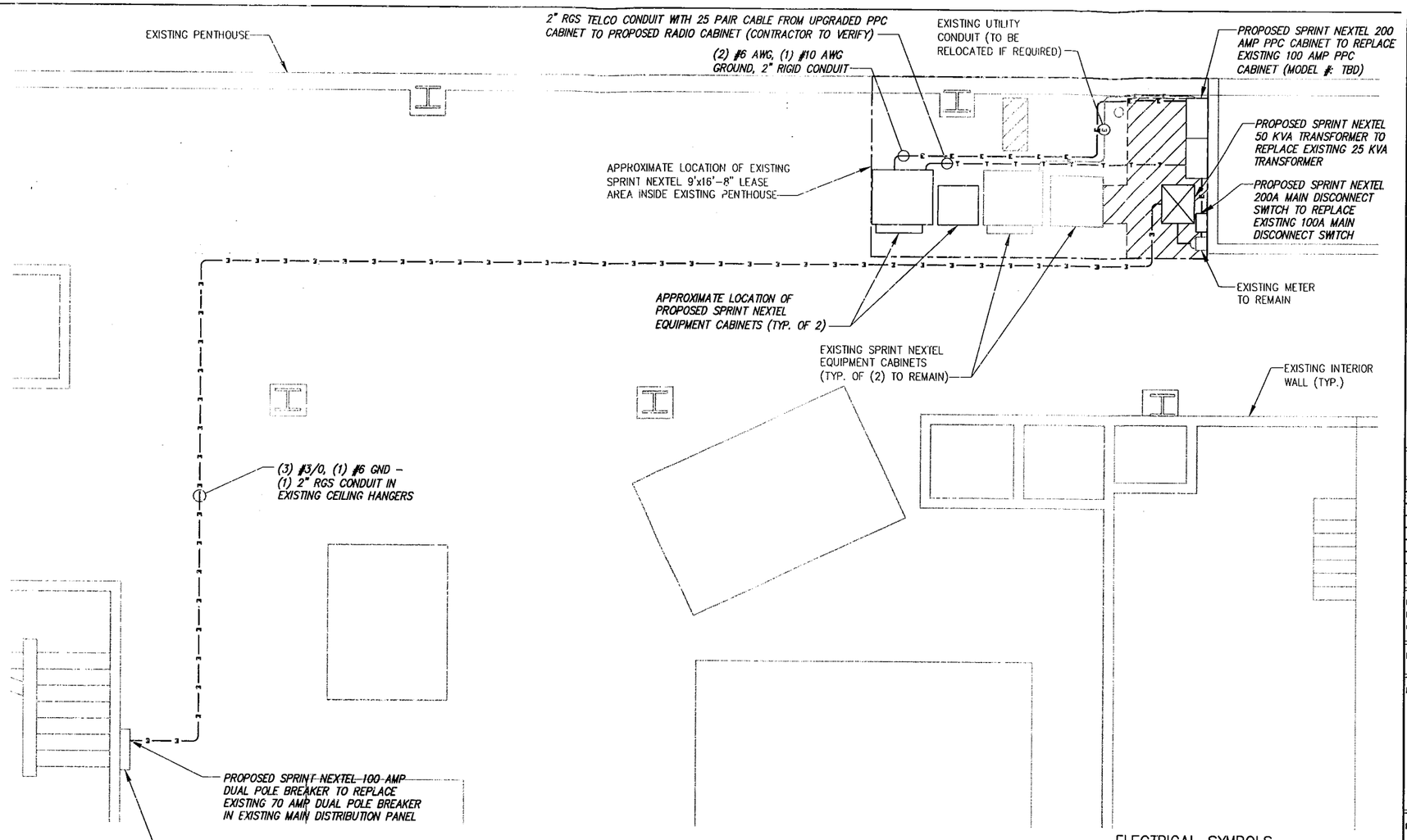
4. ELECTRIC: PROVIDE AND INSTALL A 110/220VAC FROM A RELIABLE SOURCE (CONTRACTOR TO VERIFY) TO THE COMMUNICATION CABINET. THIS SOURCE SHALL BE LOCKED ON WITH A CB LOCK. THE CONTRACTOR SHALL VERIFY (BEFORE ANY CONSTRUCTION IS STARTED) THAT THE POWER SOURCE IS BETWEEN 208V AND 240V LINE TO LINE. IF IT IS NOT BETWEEN THE SPECIFIED VOLTAGE, THEN CALL THE ARCHITECT.

5. TELEPHONE: PROVIDE A 2" CONDUIT FROM THE COMMUNICATIONS CABINET TO THE MAIN DEMARCATION POINT. THE MAIN DEMARCATION POINT ALLOWS FOR THE LEAST AMOUNT OF NOISE AND THE MOST AMOUNT OF PROTECTION. FOR COST SAVINGS, A CLOSER DEMARCATION POINT MAY BE SPECIFIED IN MULTIPLE STORY BUILDINGS WITH THE APPROVAL OF THE TELEPHONE COMPANY.

6. EQUIPMENT: ALL PANELS, DISCONNECTS, AND EQUIPMENT SHALL BE SQUARE D UNLESS DIRECTED OTHERWISE FROM THE ARCHITECT OR SPRINT NEXTEL PROJECT MANAGER.



2 TYPICAL ELECTRICAL ONE LINE DIAGRAM
NOT TO SCALE



NOTE:
INFINIGY ENGINEERING HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY THE EXISTING ELECTRICAL LOADS PRIOR TO CONSTRUCTION TO ENSURE THERE IS AMPLE SERVICE AVAILABLE TO ACCOMMODATE THE EXISTING AND PROPOSED EQUIPMENT.

PROPOSED ELECTRICAL WORK IN EXISTING SPRINT NEXTEL LEASE AREA, TO UPGRADE FROM A 100A SERVICE TO 200A SERVICE AS FOLLOWS:

- *REPLACE EXISTING 70 AMP DUAL POLE BREAKER IN EXISTING MAIN DISTRIBUTION PANEL WITH PROPOSED SPRINT NEXTEL 100 AMP DUAL POLE BREAKER*
- *REPLACE EXISTING 25 KVA TRANSFORMER WITH PROPOSED SPRINT NEXTEL 50 KVA TRANSFORMER*
- *REPLACE EXISTING 100A MAIN DISCONNECT SWITCH WITH PROPOSED SPRINT NEXTEL 200A DISCONNECT SWITCH*
- *REPLACE EXISTING 100 AMP PPC CABINET WITH PROPOSED SPRINT NEXTEL 200 AMP PPC CABINET*
- *RE–WIRE/INTERCONNECT ALL EXISTING CIRCUITS INTO NEW PANEL*

N
APPROXIMATE NORTH

1 ELECTRICAL SITE PLAN
SCALE:

GRAPHIC SCALE
6' 3' 0 3' 6'
SCALE (11x17): 1" = 6'–0"
SCALE (22x34): 1" = 3'–0"

ELECTRICAL SYMBOLS

—E—E— ELECTRICAL ROUTE
—T—T— TELCO ROUTE
(#) INDICATES CODED NOTE
UTILITY POLE

ABBREVIATIONS

MIGB	MASTER GROUND BAR
CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
W/	WITH
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL

infinigy engineering
11 Herbert Drive
Latham, NY 12110
(518) 690-0790

No.	Submittal / Revision	App'd	Date
2	REVISED PER COMMENT	SKB	5/2/11
1	REVISED PER COMMENT	SKB	4/14/11
0	ISSUED FOR REVIEW	SKB	3/21/11

Drawn: SKB Date: 3/21/11
Designed: AGF Date: 3/21/11
Checked: AGF Date: 3/21/11

Project Number
195-036

Project Title

CT81XC007
DANBURY HOSPITAL

24 HOSPITAL AVENUE
DANBURY, CT 06810

Prepared For

Sprint
Together with Nextel.

Drawing Scale:
AS NOTED

Date:
5/2/11

Drawing Title

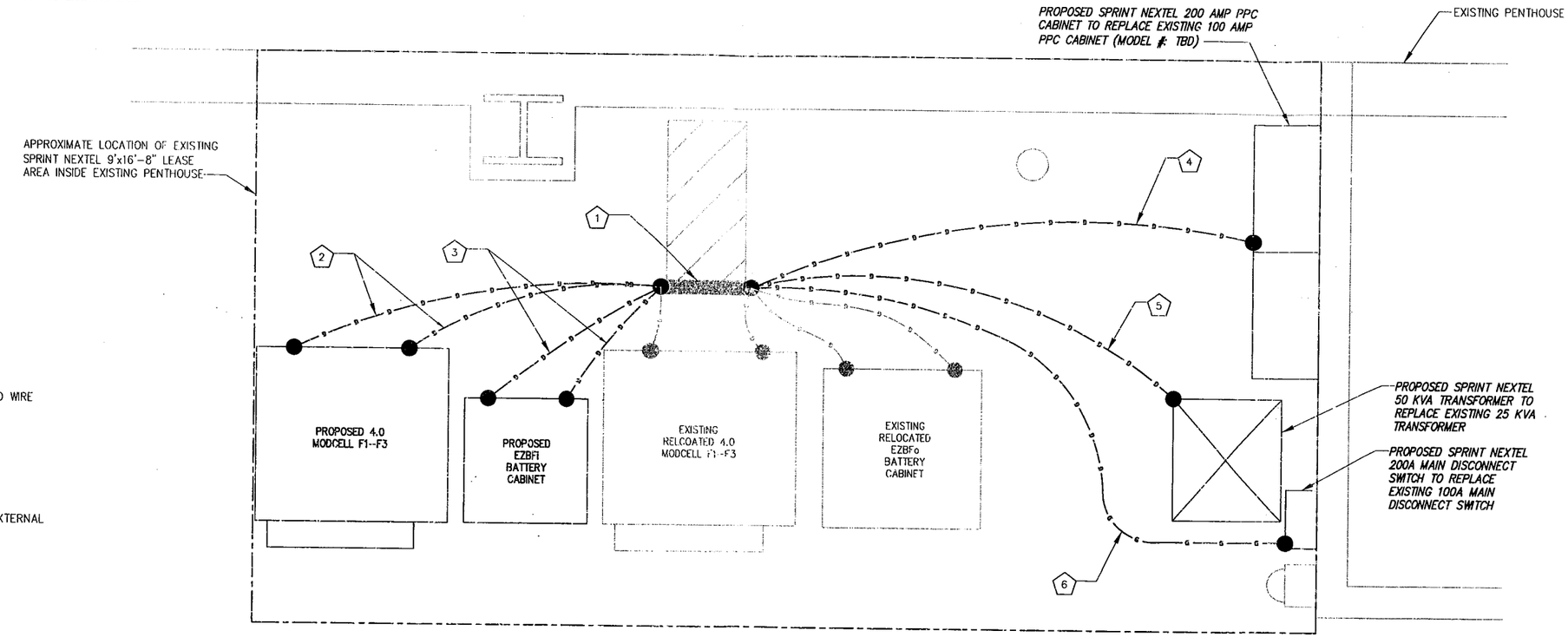
ELECTRICAL PLAN

Drawing Number

E1

CODED DRAWING NOTES

1. EXISTING GROUND BAR (MIGB).
2. BOND PROPOSED 4.0 RADIO CABINET TO EXISTING MIGB.
3. BOND PROPOSED EZBFi BATTERY CABINET TO EXISTING MIGB.
4. BOND PROPOSED 200A PPC CABINET TO EXISTING MIGB.
5. BOND PROPOSED TRANSFORMER TO EXISTING MIGB.
6. BOND PROPOSED 200A MAIN DISCONNECT SWITCH TO EXISTING MIGB.



GROUNDING SYMBOLS

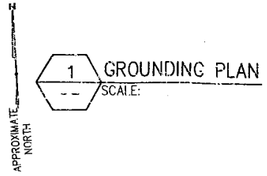
- ⊗ GROUND ROD
- ▢ ACCESS WELL
- ⊠ GROUND ROD WITH ACCESS
- • COMPRESSION TYPE CONNECTION
- ■ CADWELD TYPE CONNECTION
- —— 9 —— 9 —— #2 AWG GREEN SHIELDED GROUND WIRE
- (#) INDICATES CODED NOTE

ABBREVIATIONS

MIGB	MASTER GROUND BAR
CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
W/	WITH
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL

GENERAL GROUNDING SYSTEM NOTES:

1. THE CONTRACTOR SHALL VERIFY THAT THE SYSTEM IS EFFECTIVELY GROUNDED, MEETS NEC ARTICLE 250 REQUIREMENTS, IS ACCEPTABLE TO THE LOCAL UTILITY AND THE LOCAL AUTHORITY HAVING JURISDICTION, AND MEETS SPRINT NEXTEL ELECTRICAL AND GROUNDING SPECIFICATIONS.
2. ALL EXTERIOR AND UNDERGROUND CONNECTIONS SHALL BE IN ACCORDANCE WITH SPRINT NEXTEL ELECTRICAL AND GROUNDING SPECIFICATIONS.
3. ALL INTERIOR GROUNDING AND BONDING CONNECTIONS WITHIN BUILDINGS SHALL BE IN ACCORDANCE WITH SPRINT NEXTEL ELECTRICAL AND GROUNDING SPECIFICATIONS.
4. REFER TO DRAWINGS FOR GROUND SYSTEM REQUIREMENTS. WHERE SHOWN ON DRAWINGS, CABLE SHALL BE AS FOLLOWS:
   A. SOLID OUTDOOR GROUND RING, ALL EQUIPMENT ON POLES AND TOWERS, CABLE TRAY GROUNDING ———————— #2 AWG SOLID TINNED COPPER



GRAPHIC SCALE

2' 1' 0 1' 2'

SCALE (11x17): 1" = 2'-0"
SCALE (22x34): 1" = 1'-0"

NOTE:
CONTRACTOR SHALL GROUND NEW COAXIAL CABLES TO GROUND BAR AS REQUIRED.

NOTE:
CONTRACTOR TO VERIFY AVAILABILE LUG HOLES TO ACCOMADATE GROUNDING OF NEW EQUIPMENT AND SHALL REPLACE WITH LARGER GROUND BAR IF REQUIRED.

NOTE:
CONTRACTOR IS TO ENSURE THAT THE EXISTING & PROPOSED EQUIPMENT IS GROUNDED PROPERLY

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(518) 690-0790

No.	Submittal / Revision	App'd	Date
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CT81XC007
DANBURY
HOSPITAL

24 HOSPITAL AVENUE
DANBURY, CT 06810

Prepared For

Sprint
Together with Nextel.

Drawing Scale:
AS NOTED

Date:
5/2/11

Drawing Title

GROUNDING PLAN

Drawing Number

E2

C Squared Systems, LLC
65 Dartmouth Dr, Unit 3A
Auburn, NH 03032
Phone: (603) 644 2800
support@csquaredsystems.com

RADIO FREQUENCY EXPOSURE REPORT

CT81XC007

DANBURY HOSPITAL
24 HOSPITAL AVE
DANBURY, CT 06810

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed additions and modifications to the existing Sprint PCS wireless facility located on Danbury Hospital. The site is an eleven story hospital with multiple antenna arrays. Figure 1 below provides a view of the facility.

Sprint is proposing the following modifications:

1) Remove six existing 1900 MHz PCS antennas (two per sector);
2) Install six replacement 1900 MHz PCS antennas in a six-sector configuration;
3) Adjust the azimuths of all antennas;
4) Install an additional equipment cabinet on the existing equipment platform.

Figure 1: View of CT81XC007

Site Address	24 Hospital Ave, Danbury, CT
Latitude	N 41° 24' 18.34"
Longitude	W 73° 26' 44.43"
Site Elevation AMSL	470 Feet
Main Roof Height AGL	136 Feet
PCS License Information	KNLF204 - B Block
Name of Individual Conducting Survey	Evan Thibodeau
Date and Time of Survey	01/24/2011; 11:00AM – 1:00PM

Table 1: Site Specific Data

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment provided they are fully aware of the potential for exposure, and are able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels considered acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population / uncontrolled exposure and for occupational / controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. Survey Methodology

Prior to measuring exposure levels the following items are photo documented:

- Roof access points
- EME signage (Present and/or missing)
- Directional views
- All antennas on the rooftop
- Neighboring facilities indentified to have RF sources (if applicable)

All antennas on the rooftop are documented and the following information is provided (where available[1]):

- Manufacturer
- Model number
- Height relative to main roof
- Orientation
- Location on rooftop
- Physical characteristics including length and type.

Measurement points are established in a grid pattern, not more than 20 feet apart, over the entire area being surveyed. Additional measurement points are selected at potential "Hot Spots" (in close proximity to antennas).

[1] Where antenna model information is unattainable due to inaccessibility or illegibility of the antenna label, model assumptions are made based on the carrier's licensed frequency band and the physical dimensions and characteristics of the antenna.

4. Equipment, Roof Access, & Site Signage

Sprint's equipment is located in the top floor mechanical area. There are two roof access hatches that lead to the penthouse roof and two roof access doors that lead to the main roof. Access to both rooftops is restricted to authorized personnel only.

Figure 2: Roof Access Points & Posted Signage

Figure 3: Sprint Equipment

5. Directional Photos

The photos below document the view from each end of the building to show all neighboring structures, foliage, and possible RF sources. Please note that the South view was obstructed by the solar panels.

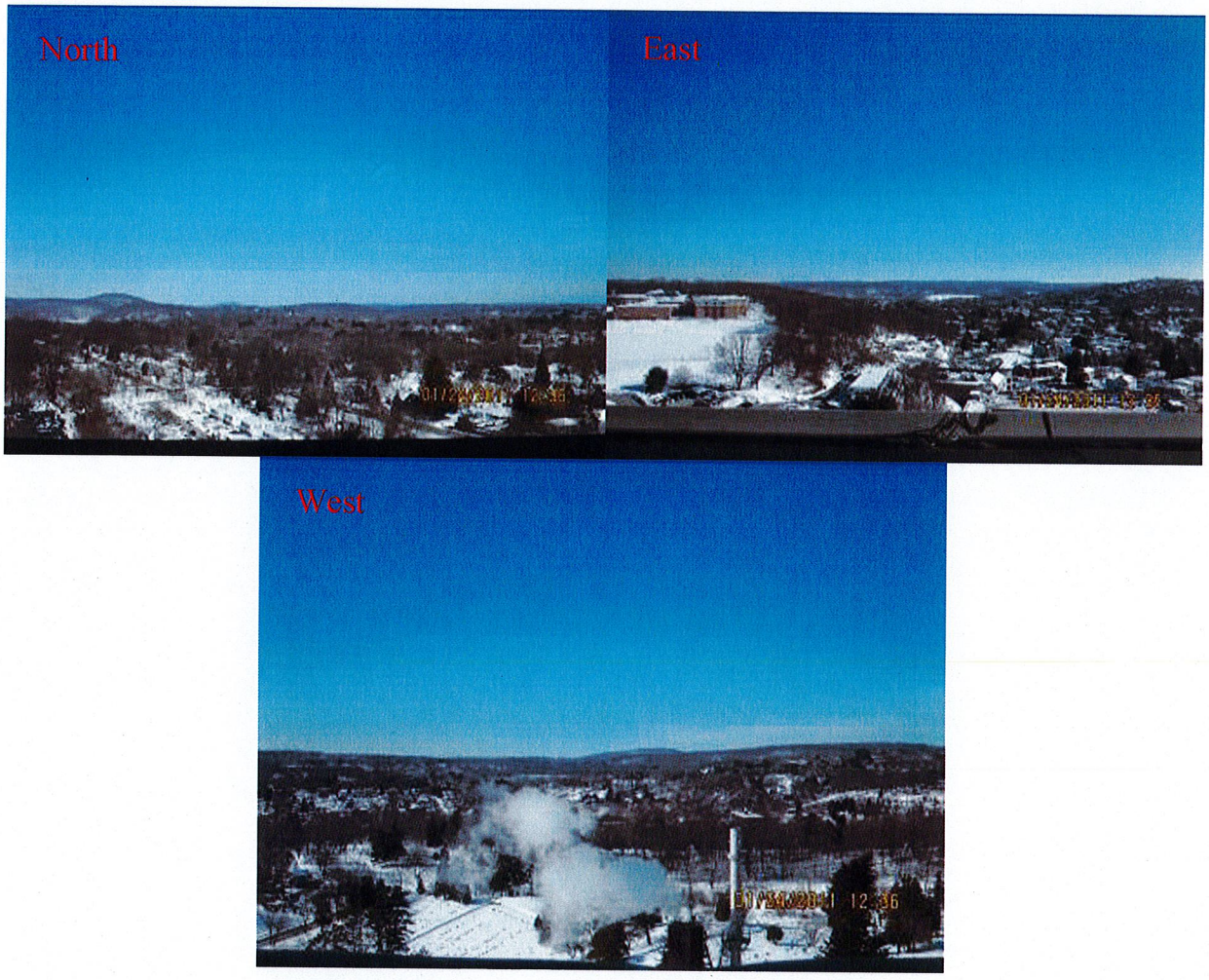

Figure 4: Directional Photos – North, East and West

6. Antenna Inventory, Locations & Photos

Tables 2 & 3 below detail all of the antennas currently installed on the roof of Danbury Hospital. This inventory was taken on January 24, 2011. The lower roof height is 117' and the upper roof height is 134'.

Antenna ID	Operator	TX Freq. (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Downtilt	Length (ft)	Antenna Centerline Height (ft)
A	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
B	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
C	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
D	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	132
		1900	36	15.5	1277		90			
E	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	134
		1900	36	15.5	1277		90			
F	AT&T	850	58	13.5	1298	7770.00	85	0	4.5	134
		1900	36	15.5	1277		90			
G	Dish	22000	0.5	38.1	3228	DA4-W71BB	2.2	0	4	132
H	WDBY	105.5	1200	-0.04	1189	Shively 6810	360	0	5	157
I	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
J	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
K	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
L	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	144
M	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
N	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
O	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
P	Nextel	850	18	14.1	463	DB844H90E-XY*	90	0	4	156
Q	Nextel	850	24	14.1	617	RR65-12-05DBL	65	0	4	124
R	Nextel	850	24	14.1	617	RR65-12-05DBL	65	0	4	124
S	Nextel	850	24	14.1	617	RR65-12-05DBL	65	0	4	124
T	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
U	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
V	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
W	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	155
X	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	131
Y	Sprint	1900	88	16.6	4022	7184.05	90	0	4.5	131
Z	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	40	18.0	2524					
AA	T-Mobile	1900	53	16.5	2367	RR90-17-02*	90	0	4.5	132
AB	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	40	18.0	2524					
AC	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	155
		2100	27	18.0	1704					
AD	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	155
		2100	27	18.0	1704					

Table 2: Existing Antenna Inventory

Antenna ID	Operator	TX Freq. (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech Downtilt	Length (ft)	Antenna Centerline Height (ft)
AE	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	155
		2100	27	18.0	1704					
AF	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	27	18.0	1704					
AG	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	27	18.0	1704					
AH	T-Mobile	1900	53	17.7	3121	APX16DWV-16DWVS-C	65	0	4.5	132
		2100	27	18.0	1704					
AI	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AJ	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AK	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AL	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AM	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AN	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AO	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AP	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AQ	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AR	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AS	Verizon	1900	24	16.1	978	948F85T2E-M_02	85	0	4	156
AT	Verizon	850	90	14.1	2313	ALP-9212	89	0	4	156
AU	Whip	155.28	110	6	437.92	Generic 150-164M_Omni*	360	0	10	154
AV	Whip	152.007	350	6	1393.38	Generic 150-164M_Omni*	360	0	10	158
AW	Whip	453	100	6	398.11	Generic 450–482M_Omni*	360	0	10	156
AX	Whip	155.34	120	6	477.73	Generic 150-164M_Omni*	360	0	10	158
AY	Whip	964.925	125	6	497.63	Generic 870–960M_Omni*	360	0	4	158
AZ	Whip	453.55	100	6	398.11	Generic 450–482M_Omni*	360	0	10	158
BA	Whip	464	100	6	398.11	Generic 450–482M_Omni*	360	0	10	158
BB	Whip	463	75	6	298.58	Generic 450–482M_Omni*	360	0	10	158
BC	Whip	931	250	6	995.27	Generic 870–960M_Omni*	360	0	2	158
BD	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BE	Whip	468	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BF	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BG	Whip	155.34	120	6	477.73	Generic 150-164M_Omni*	360	0	2	149
BH	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BI	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BJ	Whip	155.34	120	6	477.73	Generic 150-164M_Omni*	360	0	2	149
BK	Dish	900	125	18	497.63	PR-900	12	0	3	170
BL	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BM	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BN	Whip	464	250	6	995.27	Generic 450–482M_Omni*	360	0	10	158
BO	Dish	Receive Only								
BP	Cisco	2400	0.08	13.5	4	AIR-ANT1949	30	0	1.3	130

Table 3: Existing Antenna Inventory (Continued)[2]

[2] Asterisks indicate cases where the antenna model information was unavailable, in which case models shown are based on the carriers licensed frequency band and physical dimensions of the antenna. Where the antennas' electrical and mechanical downtilt information was unavailable, 0° downtilt was assumed. Transmit power assumes 0 dB of cable loss where cable lengths are not specified.

Table 4 below outlines the proposed antenna configuration that will replace the existing antenna configuration. These Sprint antennas were utilized to perform the theoretical calculations as described in the Modeling Procedure section of this report.

Operator	TX Freq. (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Downtilt	Length (ft)	Antenna Centerline Height (ft)
Sprint	1900	139.8	16.8	6691	HBX-9014DS-R2M	90	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	155
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	131
Sprint	1900	139.8	18.0	8821	HBX-6516DS-R2M	65	0	4.25	131

Table 4: Future Sprint Antenna Configuration

Figures 5 through 22 show all the antennas on the roof of Danbury Hospital.

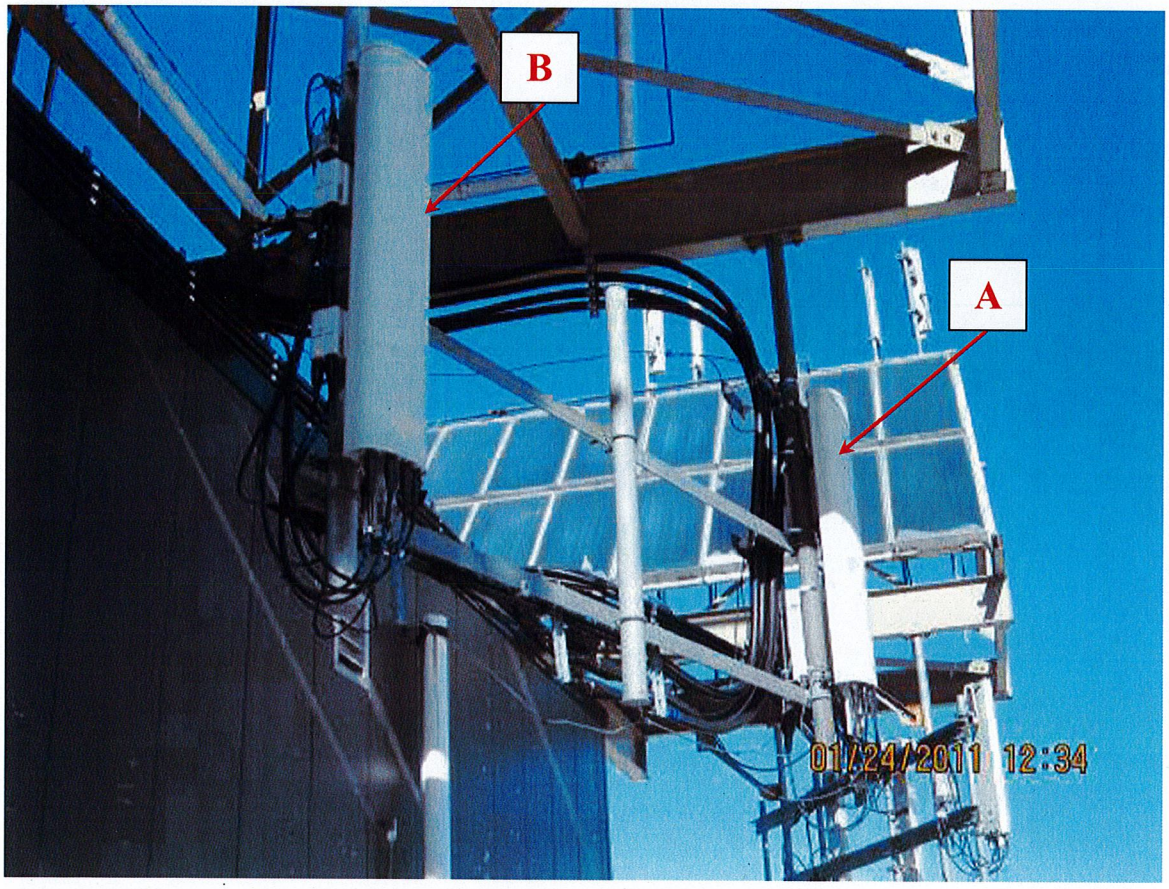

Figure 5: Antennas A & B (AT&T Alpha Sector)

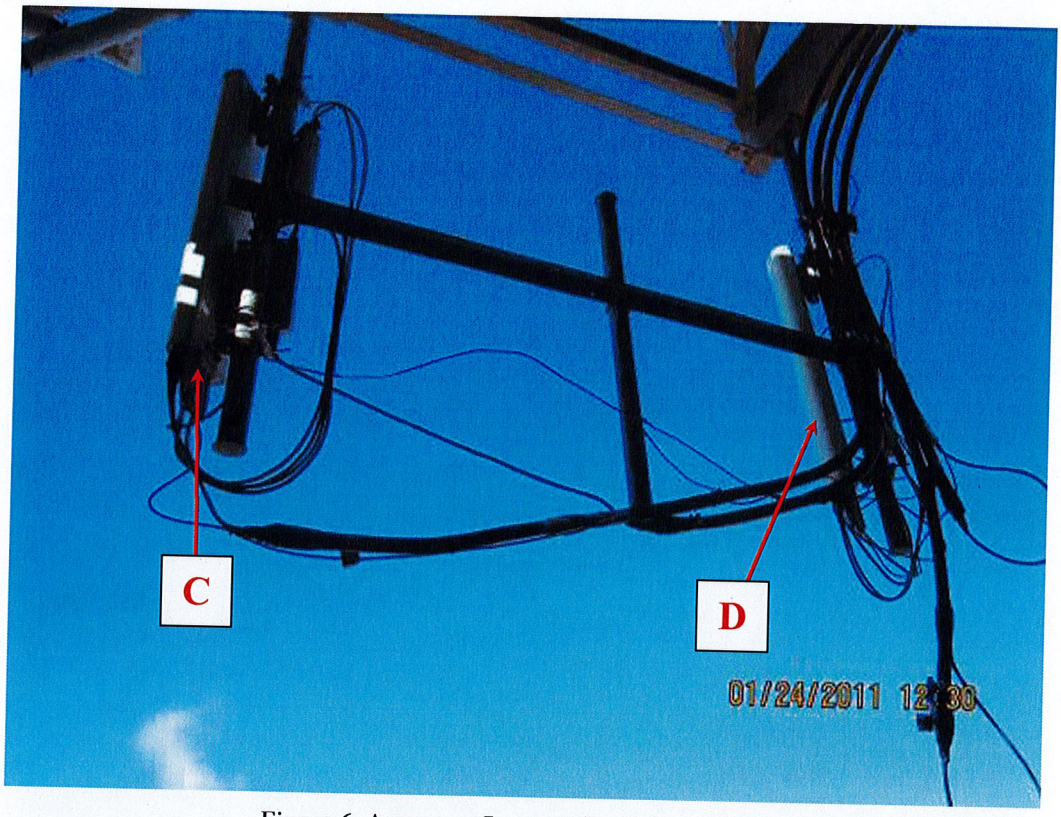

Figure 6: Antennas C & D (AT&T Beta Sector)

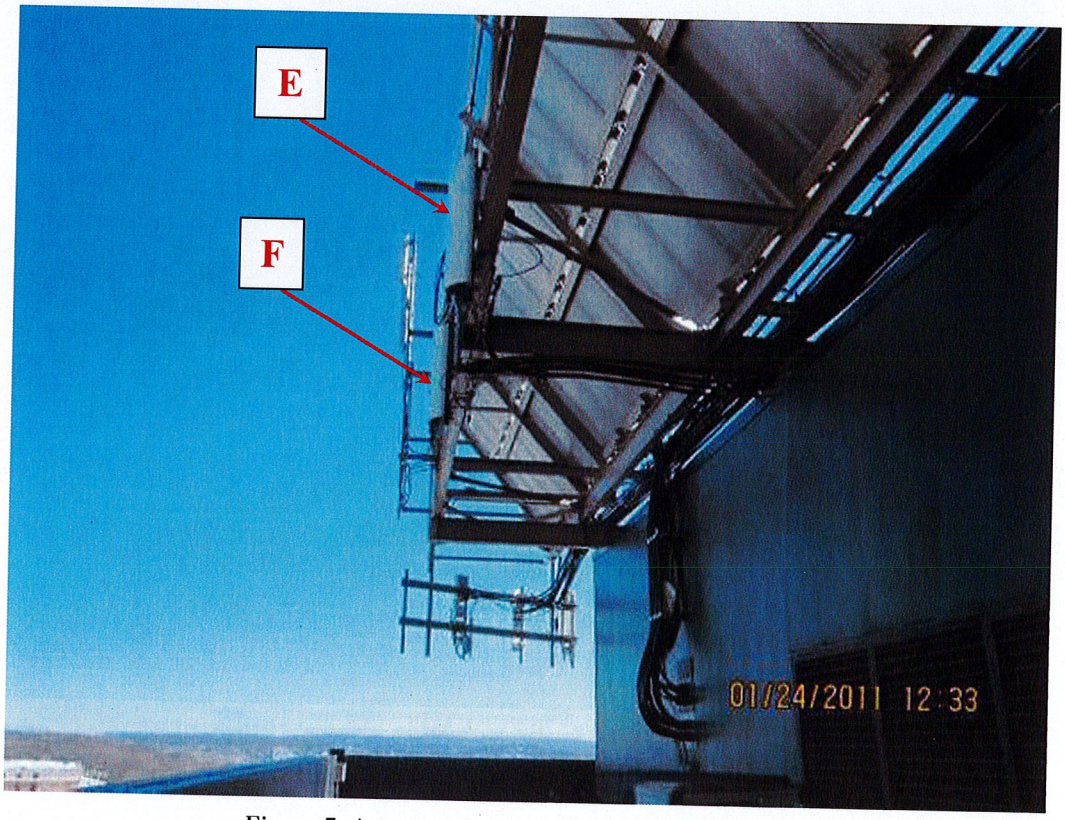

Figure 7: Antennas E & F (AT&T Gamma Sector)

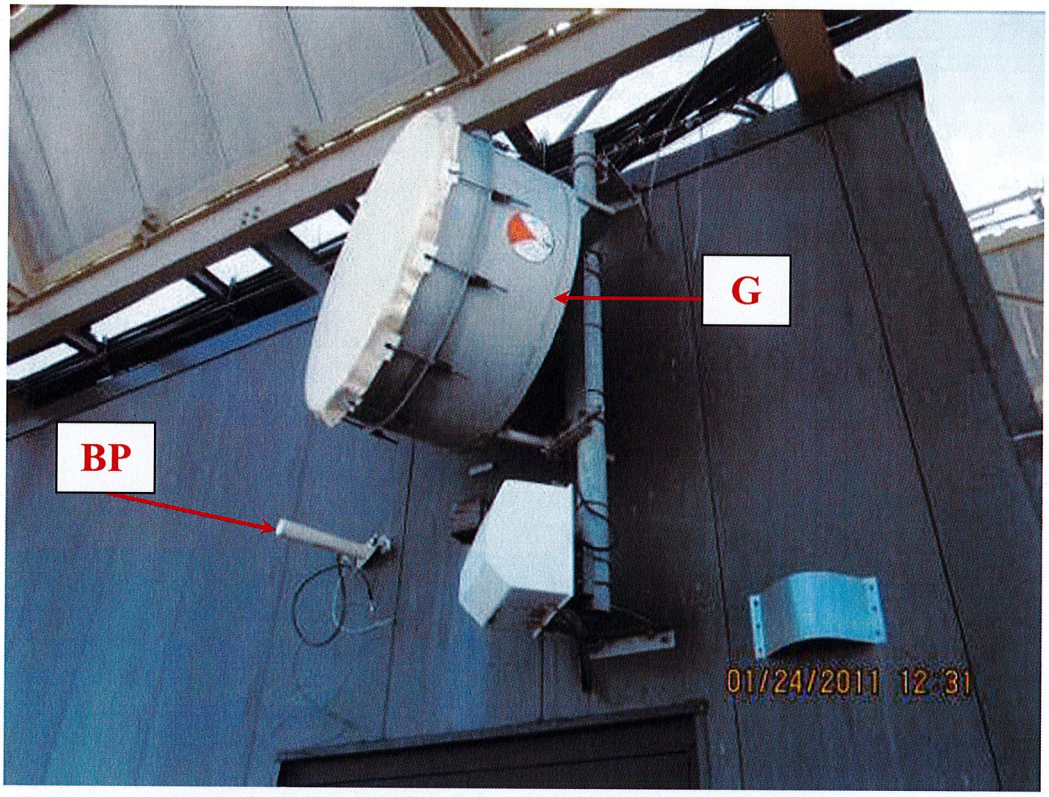

Figure 8: Antennas G & BP

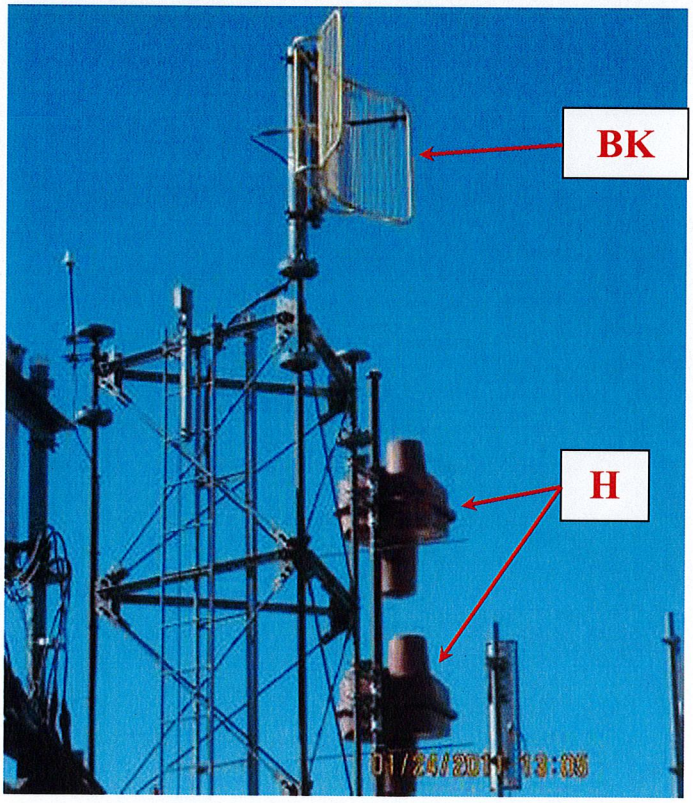

Figure 9: Antennas H & BK

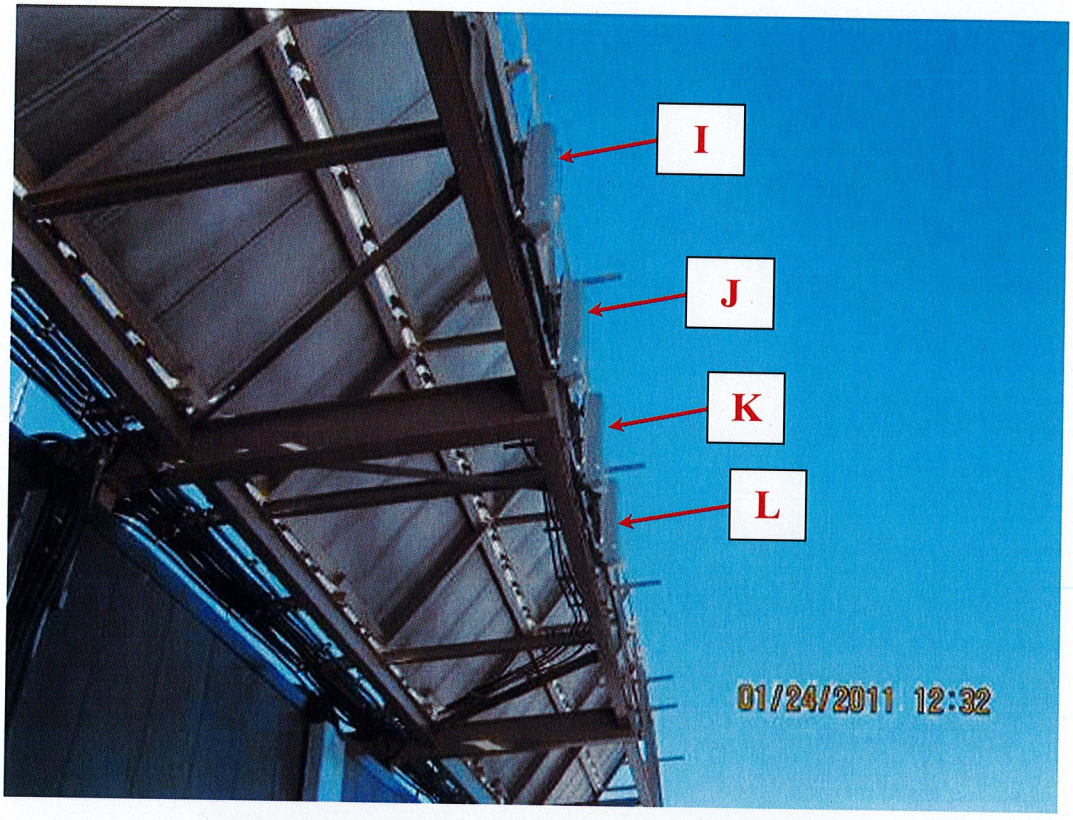

Figure 10: Antennas I, J, K & L (Nextel Alpha Sector)

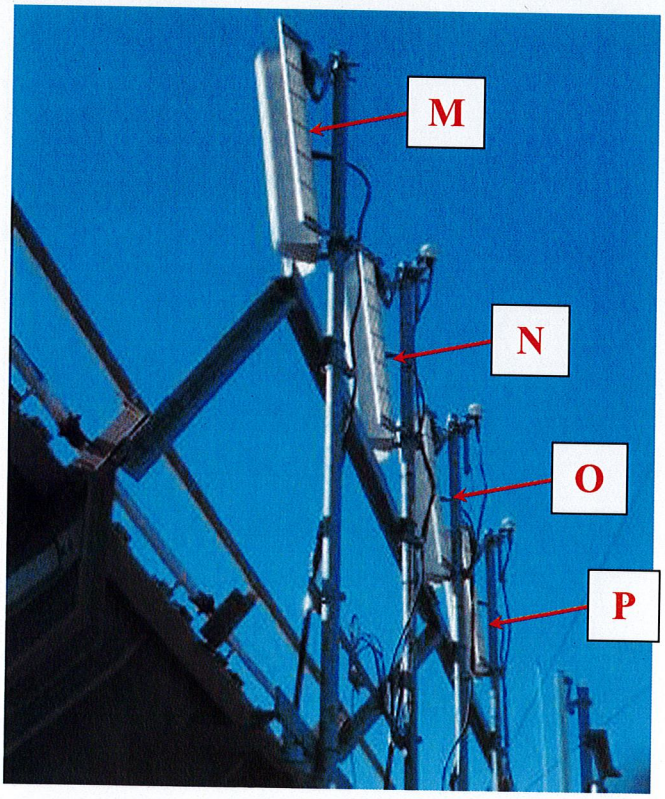

Figure 11: Antennas M, N, O & P (Nextel Beta Sector)

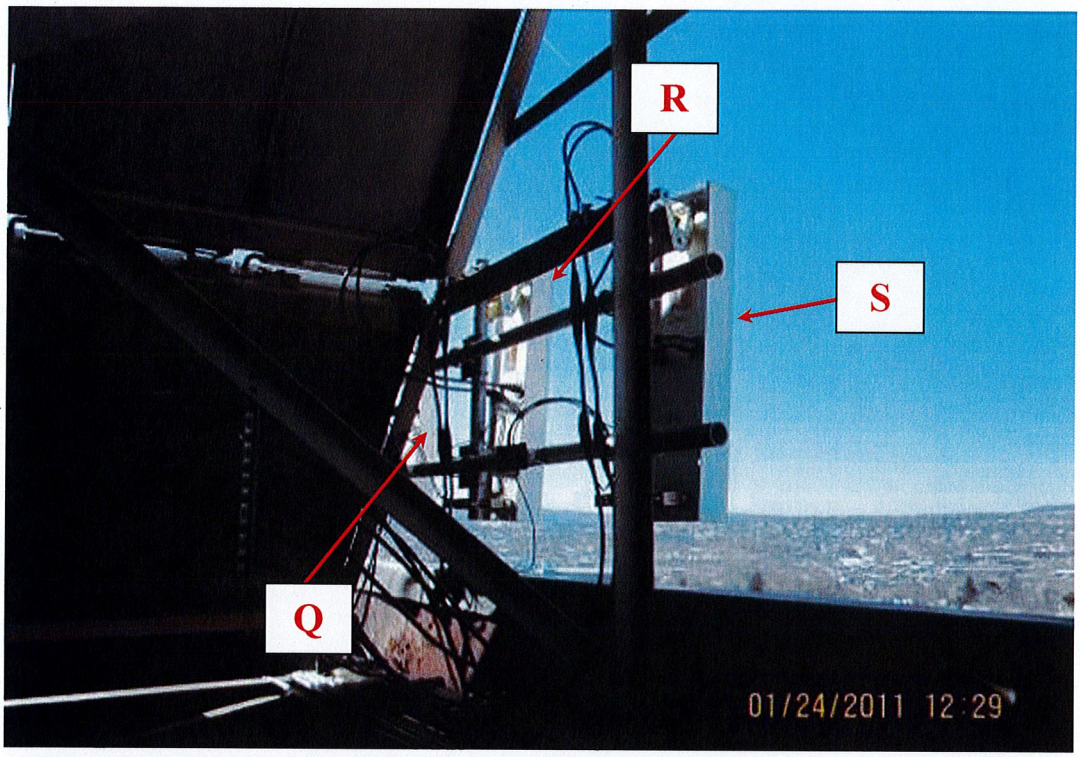

Figure 12: Antennas Q, R & S (Nextel Gamma Sector)

Figure 13: Antennas T & U (Sprint Alpha Sector)

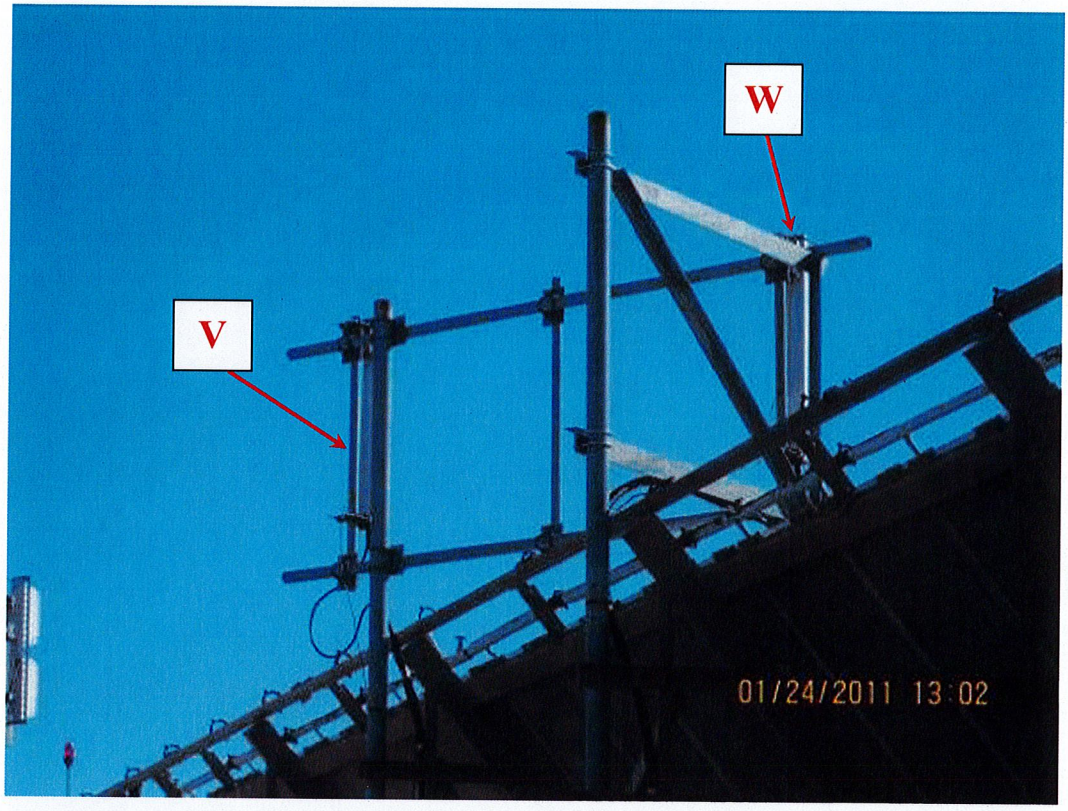

Figure 14: Antennas V & W (Sprint Beta Sector)

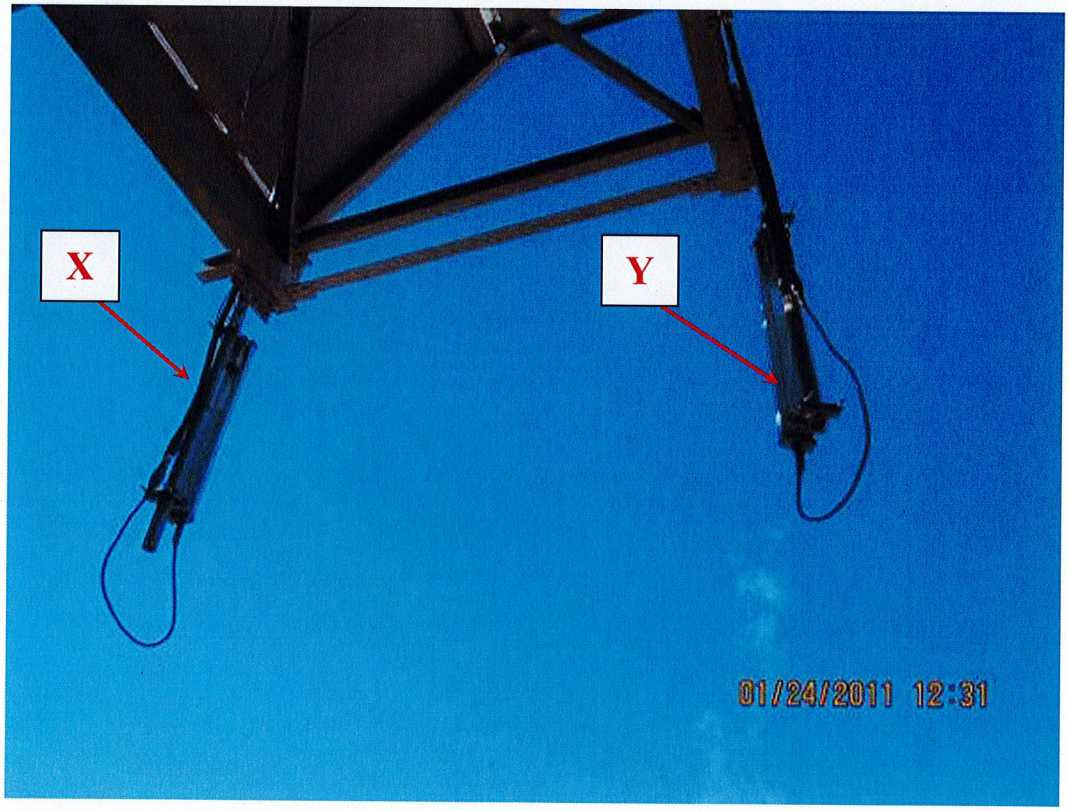

Figure 15: Antennas X & Y (Sprint Gamma Sector)

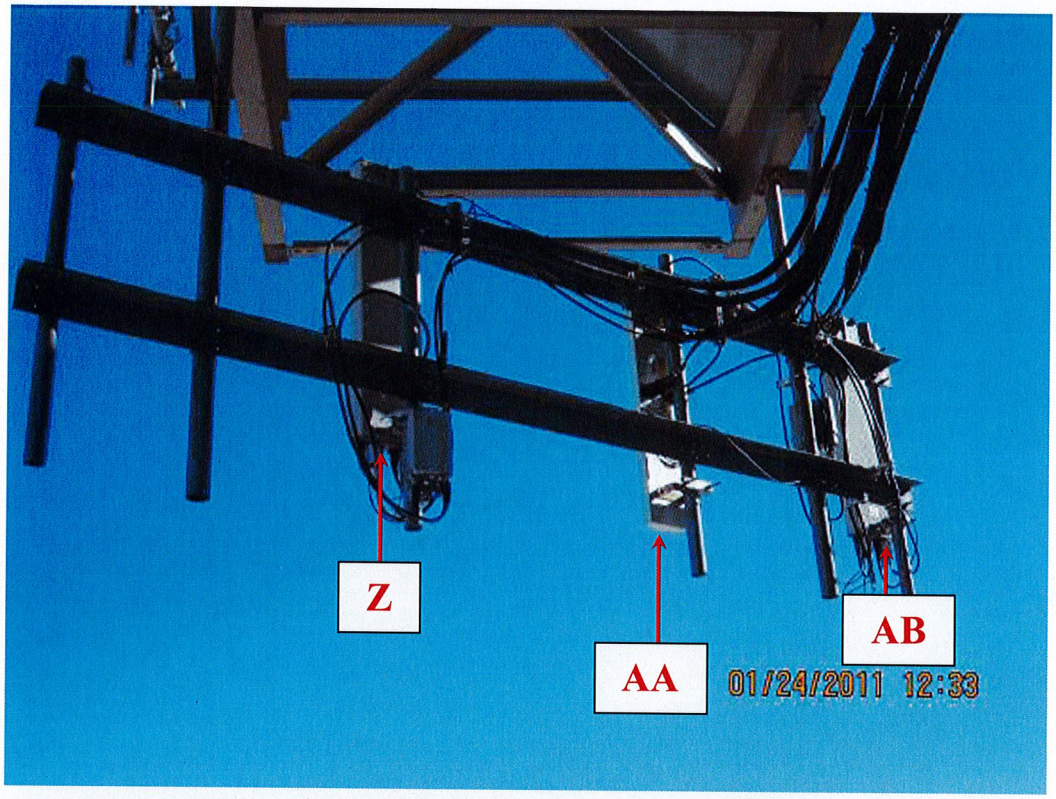

Figure 16: Antennas Z, AA & AB (T-Mobile Alpha Sector)

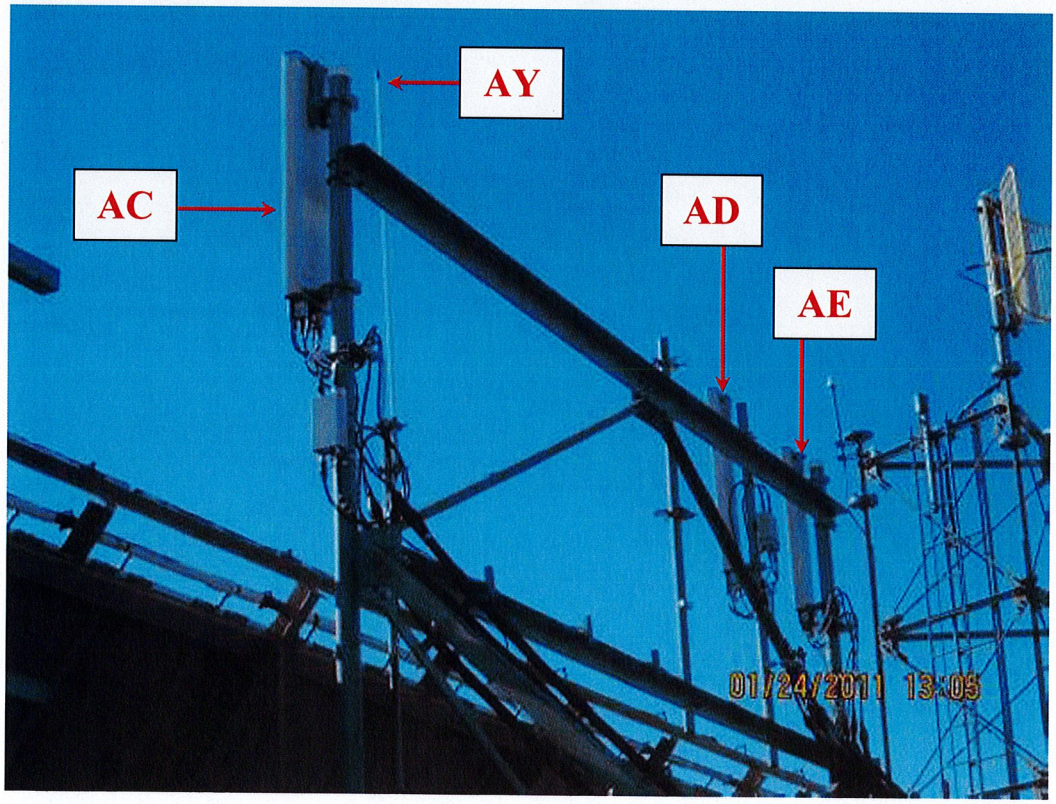

Figure 17: Antennas AC, AD, AE (T-Mobile Beta Sector) & AY

Figure 18: Antennas AF, AG & AH (T-Mobile Gamma Sector)

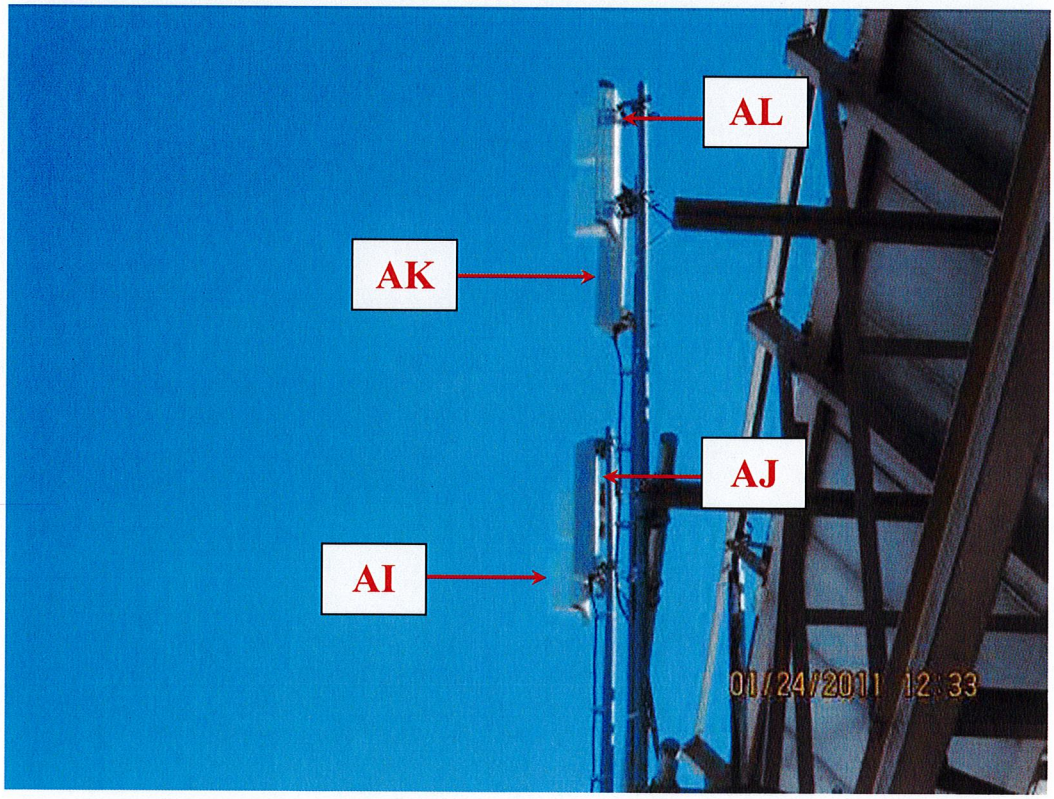

Figure 19: Antennas AI, AJ, AK & AL (Verizon Alpha Sector)

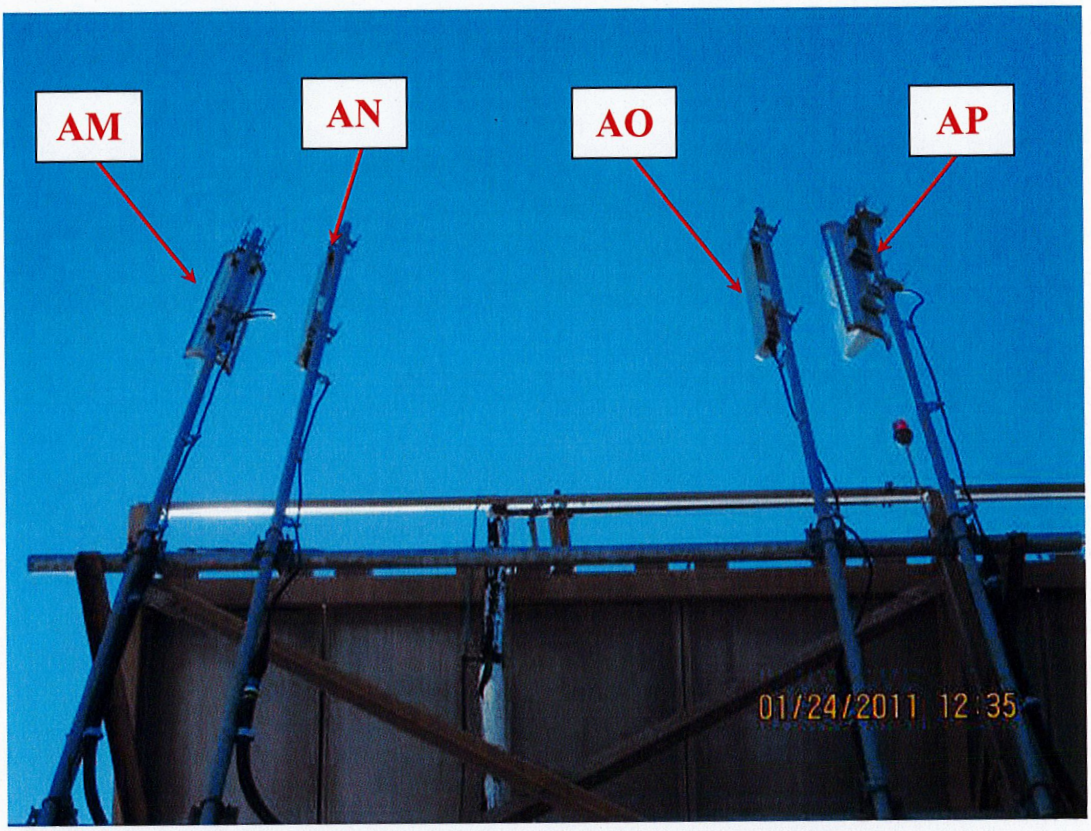

Figure 20: Antennas AM, AN, AO & AP (Verizon Beta Sector)

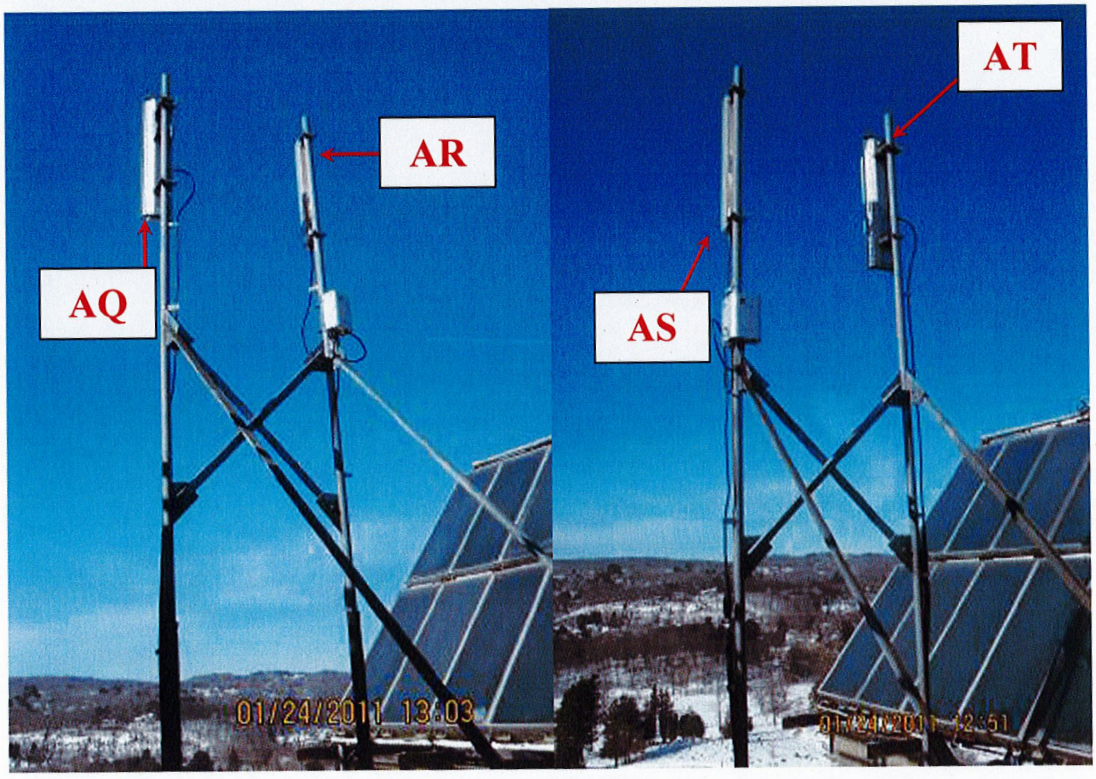

Figure 21: Antennas AQ, AR, AS & AT (Verizon Gamma Sector)

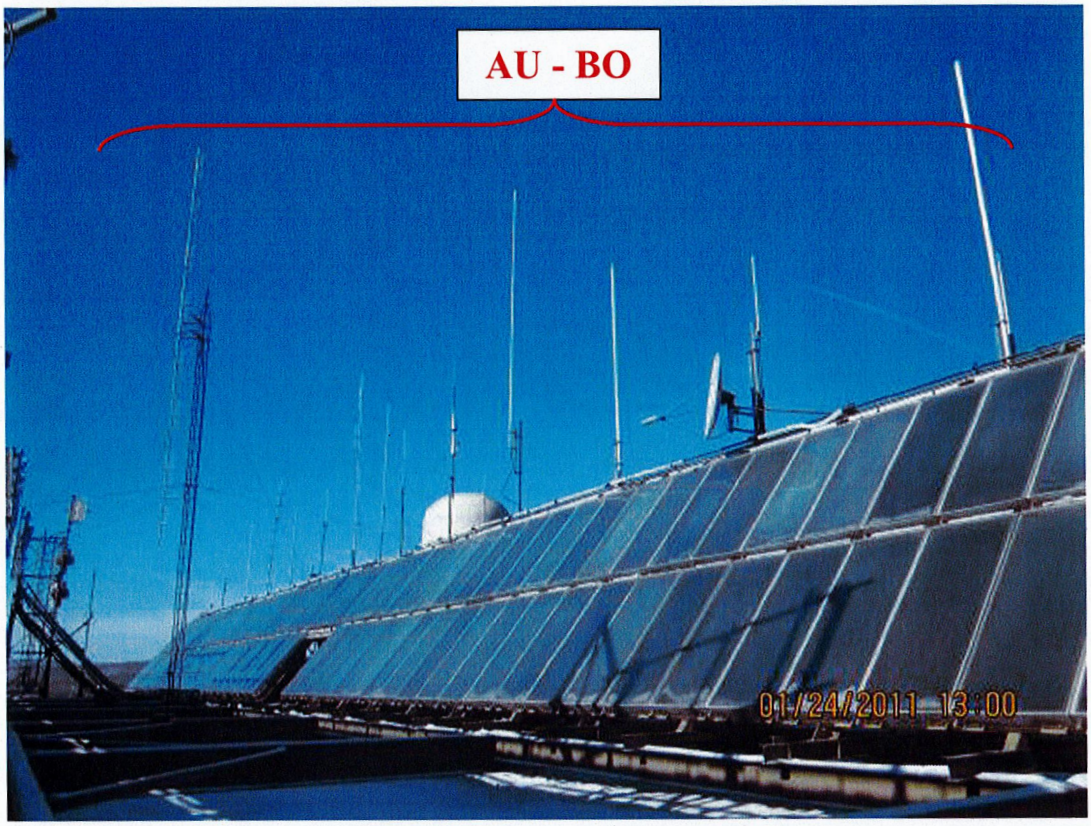

Figure 22: Antennas AU - BO

7. Nearby RF Sources

At the time of this survey, no nearby RF sources were close enough to contribute to MPE levels on the roof of Danbury Hospital. Directional views can be seen in Figure 4.

8. Measured Values

8.1. Survey Equipment and Procedures

Frequencies from 300 KHz to 50 GHz were measured using the Narda Probe EA 5091, E-Field, shaped, FCC probe in conjunction with the NBM550 survey meter. The EA 5091 probe is "shaped" such that in a mixed signal environment (i.e.: more than one frequency band is used in a particular location), it accurately measures the percent of MPE.

From FCC OET Bulletin No. 65 - Edition 97-01 – "A useful characteristic of broadband probes used in multiple-frequency RF environments is a frequency-dependent response that corresponds to the variation in MPE limits with frequency. Broadband probes having such a "shaped" response permit direct assessment of compliance at sites where RF fields result from antennas transmitting over a wide range of frequencies. Such probes can express the composite RF field as a percentage of the applicable MPEs".

Probe Description - As suggested in FCC OET Bulletin No. 65 - Edition 97-01, the response of the measurement instrument should be essentially isotropic, (i.e., independent of orientation or rotation angle of the probe). For this reason, the Narda EA 5091 probe was used for these measurements.

Sampling Description - At each measurement location, a spatially averaged measurement is collected over the height of an average human body. The NBM550 survey meter performs a time average measurement while the user slowly moves the probe over a distance range of 20 cm to 200 cm (about 6 feet) above ground level. The results recorded at each measurement location include average values over the spatial distance.

Instrumentation Information - A summary of specifications for the equipment used is provided in the table below.

Manufacturer	Narda Microwave			
Probe	EA 5091, Serial# 01088			
Calibration Date	October 2010			
Calibration Interval	24 Months			
Meter	NBM550, Serial# B-1149			
Calibration Date	October 2010			
Calibration Interval	24 Months			
Probe Specifications	**Frequency Range**	**Field Measured**	**Standard**	**Measurement Range**
	300 KHz-50 GHz	Electric Field	U.S. FCC 1997 Occupational/Controlled	0.5 – 600 % of Standard

Table 5: Instrumentation Information

Instrument Measurement Uncertainty - The total measurement uncertainty of the NARDA measurement probe and meter is no greater than ±2 dB. The factors which contribute to this include the probe's frequency response deviation, calibration uncertainty, ellipse ratio, and isotropic response. Every effort is taken to reduce the overall uncertainty during measurement collection including rotating the probe about the axis of the handle and pointing the probe directly at the likely highest source of emissions.

8.2. Survey Locations & Results

Figure 23 below shows the location of the measurements taken on January 24, 2011.

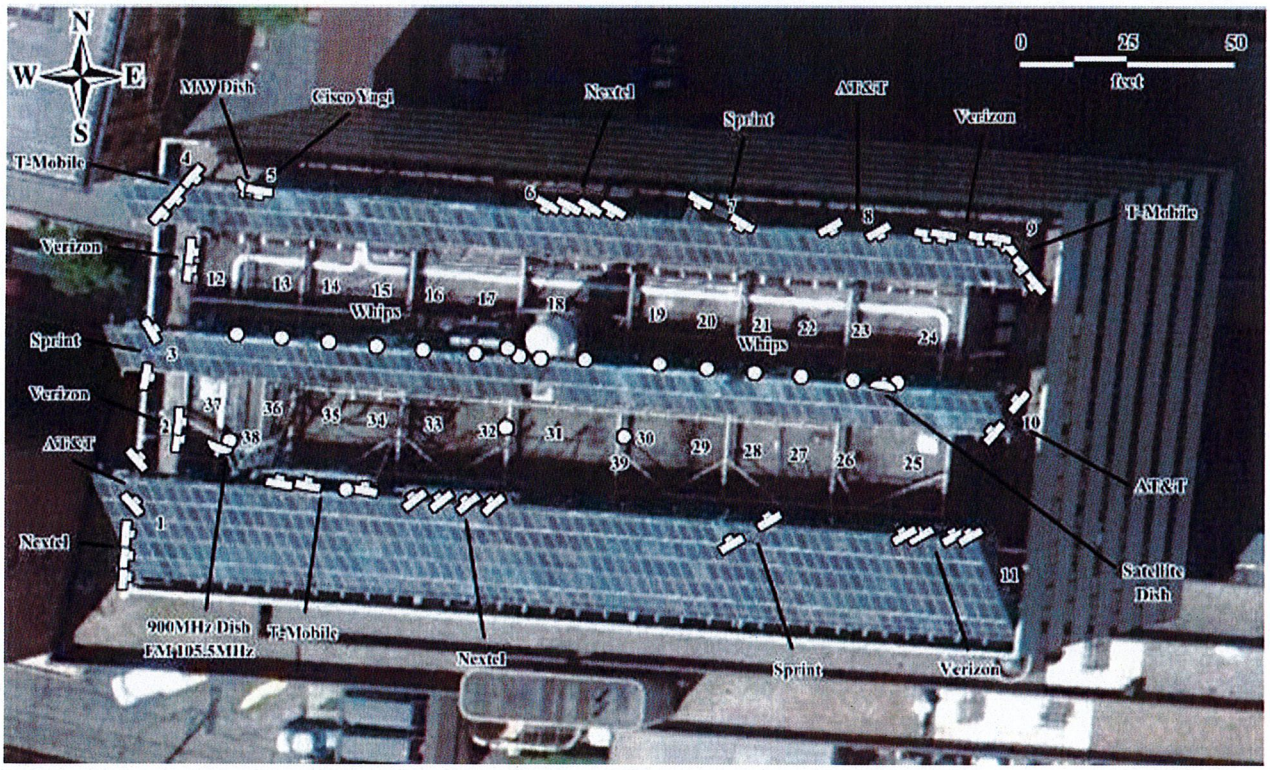

Figure 23: Rooftop Measurement Locations

Table 6 below lists 39 measurements taken on the roof, where the Sprint antennas are installed. The highest measurement recorded on the main roof was at Point 38, directly in front of FM station antennas, and was recorded at 15.44% (Average Controlled/Occupational) and 77.20% (Average Uncontrolled/General).

Measurement Point	Ave % Controlled/ Occupational	Ave % Uncontrolled/ General
1	3.49	17.44
2	4.66	23.28
3	4.36	21.81
4	1.64	8.20
5	1.77	8.85
6	1.98	9.91
7	1.73	8.64
8	1.65	8.25
9	1.55	7.77
10	1.67	8.33
11	1.58	7.89
12	2.33	11.66
13	3.08	15.41
14	2.59	12.95
15	2.29	11.45
16	1.73	8.63
17	1.57	7.83
18	1.40	7.00
19	0.98	4.89
20	0.90	4.48

Measurement Point	Ave % Controlled/ Occupational	Ave % Uncontrolled/ General
21	0.57	2.83
22	0.56	2.78
23	0.50	2.50
24	0.58	2.88
25	< 0.5	< 2.5
26	< 0.5	< 2.5
27	< 0.5	< 2.5
28	< 0.5	< 2.5
29	< 0.5	< 2.5
30	< 0.5	< 2.5
31	0.72	3.62
32	1.22	6.08
33	1.32	6.60
34	1.81	9.03
35	3.79	18.94
36	6.32	31.59
37	12.75	63.75
38	**15.44**	**77.20**
39	0.94	4.70

Table 6: Rooftop Measurement Values[3]

[3] Due to measurement uncertainty at low levels (see Table 5), any readings outside the measurement range of the probe (<0.5% FCC Occupational/Controlled MPE, < 2.5% FCC General Population/Uncontrolled MPE) are listed as such.

9. Calculated Values

9.1. Modeling Procedure for the Calculations on Rooftop

The emission field calculation results displayed in the following figures were generated using proprietary computer software modeling prediction tool, PDCalc, as developed and provided by C Squared Systems, LLC. PDCalc uses the following power density calculation formulas:

Dish Antennas:

Near Field

$$\text{End of Near Field} = \frac{D^2}{(4 \times \lambda)}$$

$$\text{Power Density Near} = \text{PDN} = \frac{16 \times A \times P}{\pi \times D^2}$$

Where:

D = *Antenna Diameter*
λ = *Wavelength*
A = *Aperture Efficiency*
P = *Power Input to the Antenna*

- 20 dB of attenuation is added for any points greater than one antenna diameter from the main beam.

Transition Region:

$$\text{End of Transition Region} = \frac{D^2}{\lambda} \times FarFieldFactor$$

$$\text{Power Density Transition} = \frac{PDN \times \text{Near Region}}{R}$$

Where:

D = *Antenna Diameter*
FarFieldFactor = *multiplier which expands or contracts transition region to determine start of Far Field*
λ = *Wavelength*
PDN = *Power Density Near*
R = *Radial Distance*

$$\text{Near Region} = \frac{D^2}{(4 \times \lambda)}$$

- 20 dB of attenuation is added for any points greater than one antenna diameter from the main beam.

Far Field:

$$\text{Power Density} = \left(\frac{\text{EIRP}}{\pi \times R^2}\right) \times \text{Off Beam Loss}$$

Where:

Off Beam Loss is determined by the selected antenna patterns
R = *Radial Distance*

Directional and Omni Antennas:

Near Field:

$$S = \frac{P_t \times K(H_a, L_a)}{20 \times \pi \times L_a \times R_h \times \left(\frac{BW}{360}\right)}$$

Where:

S = *Power Density in mw/cm²*
P_t = *Actual (or worst case assumed) power delivered to the antenna (watts)*
$K(H_a, La)$ = *Correction factor for antenna mounting height*
Ha = *Antenna mounting height in feet*
L_a = *Antenna length in meters*
R_h = *the horizontal distance along roof from antenna to point of interest*
BW = *Antenna beamwidth*

$$K(H_a, L_a) = 0.99013 - 0.14656 \times H_a \quad \text{for } 0 \le H_a \le 6$$
$$= 1/H_a \quad \text{for } H_a > 6$$

- If the horizontal distance from the bottom of the antenna is < 1 foot, then 1 foot is used for the distance.

In order to deal with directional antennas, a modified cylindrical model is used. This is done by approximating the horizontal pattern with a model that is conservative, and applying the results to the cylindrical model above. The equation to be used is:

$$A = \cos^n\left(\phi/2\right)$$

Where:

A = *Attenuation*
ϕ = *Angle between antenna azimuth and point in question*
n = *Factor to shape the function for a particular beamwidth*
BW = *Antenna beamwidth*

By setting the attenuation equal to 0.5 at the half power point $(\phi = BW/2)$, n can be solved. However, in order to ensure that the attenuation model is conservative, n is solved when $\phi = (BW/2) \times (4/3)$. This essentially assumes a larger beamwidth for margin. Therefore, solving for n, we have

$$n = \frac{\ln(0.5)}{\ln(\cos(BW/3))}$$

As a result, antennas with a beamwidth wider than 270° will be treated as an omni-directional antenna. Finally, the maximum attenuation is capped at 15 dB to assure a conservative result in the rear of the antenna.

Far Field:

$$\text{Power Density} = \left(\frac{EIRP}{\pi \times R^2} \right) \times \text{Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power Watts

R = *Radial Distance* = $\sqrt{\left(H^2 + V^2\right)}$ meters

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

9.2. Calculated Results for Rooftop Emissions[4]

Figure 24 below shows the current RF environment on the rooftop of Danbury Hospital.

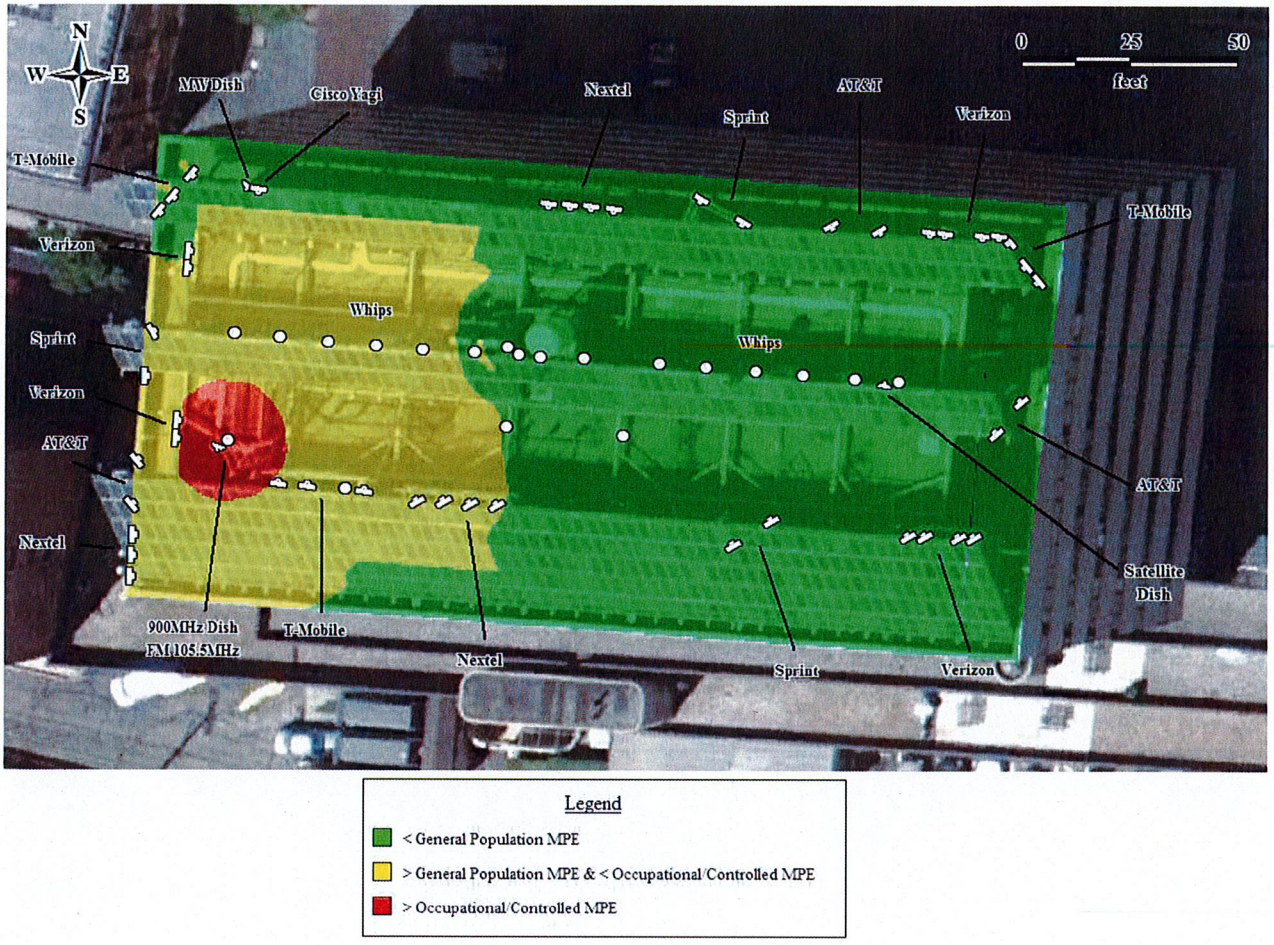

Figure 24: Existing Power Density Levels on Rooftop – All Carriers

[4] Calculated values are referenced to 6' above each roof level to account for an average human height as recommended in OET Bulletin 65.

Figure 25 shows the predicted RF environment once Sprint's proposed changes and modifications are complete.

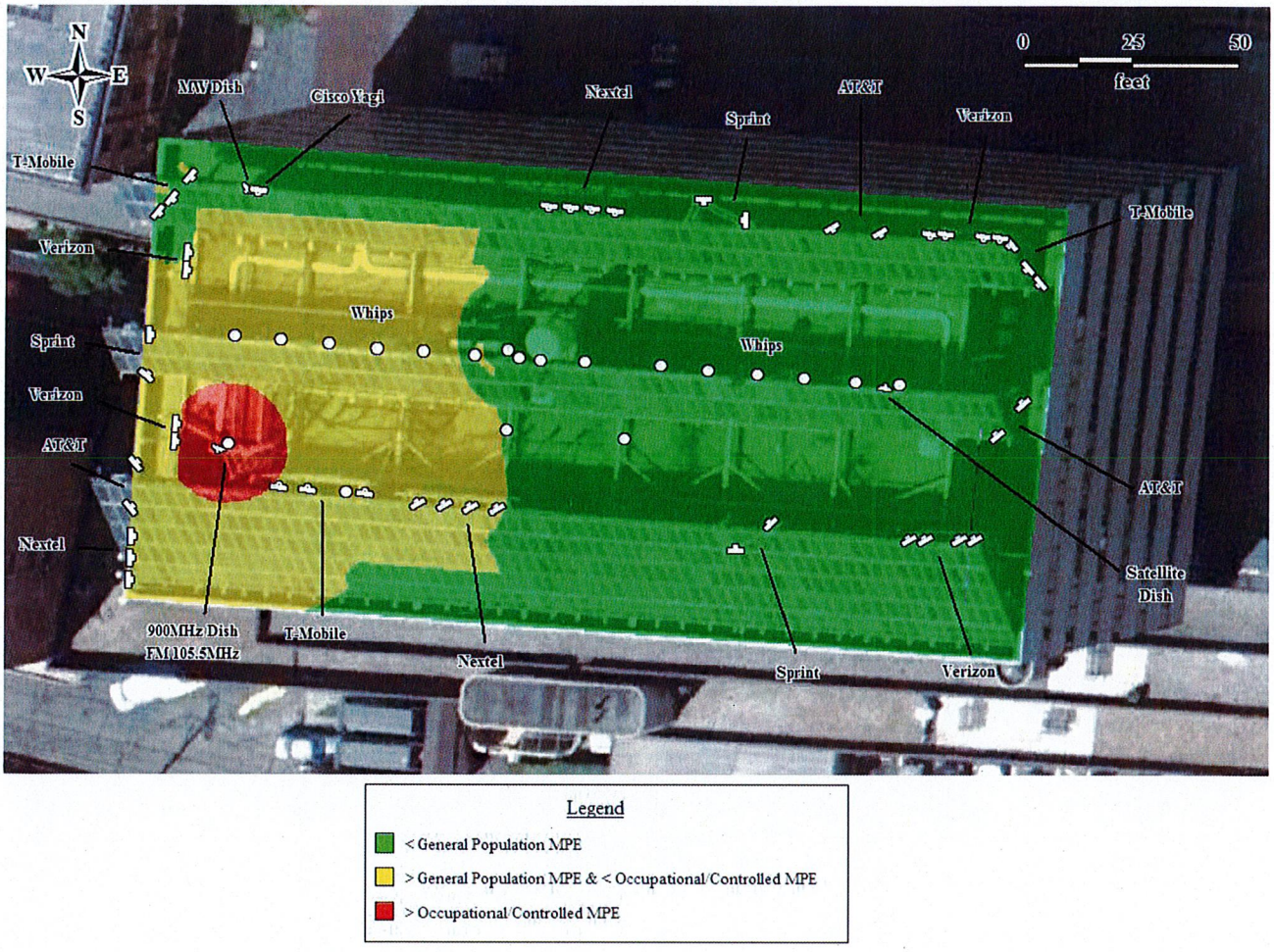

Figure 25: Predicted Power Density Levels on Rooftop – All Carriers (Post-Modification)

The rules adopted by the FCC specify that, in general, at multiple transmitter sites, actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limit applicable to their particular transmitter. Figure 26 below shows the 5% boundary from the existing Sprint-Nextel antenna configuration.

Figure 26: Existing 5% Levels on Rooftop – Sprint-Nextel Antennas Only

Figure 27 provides a visual representation of this 5% boundary from the proposed Sprint-Nextel antenna configuration.

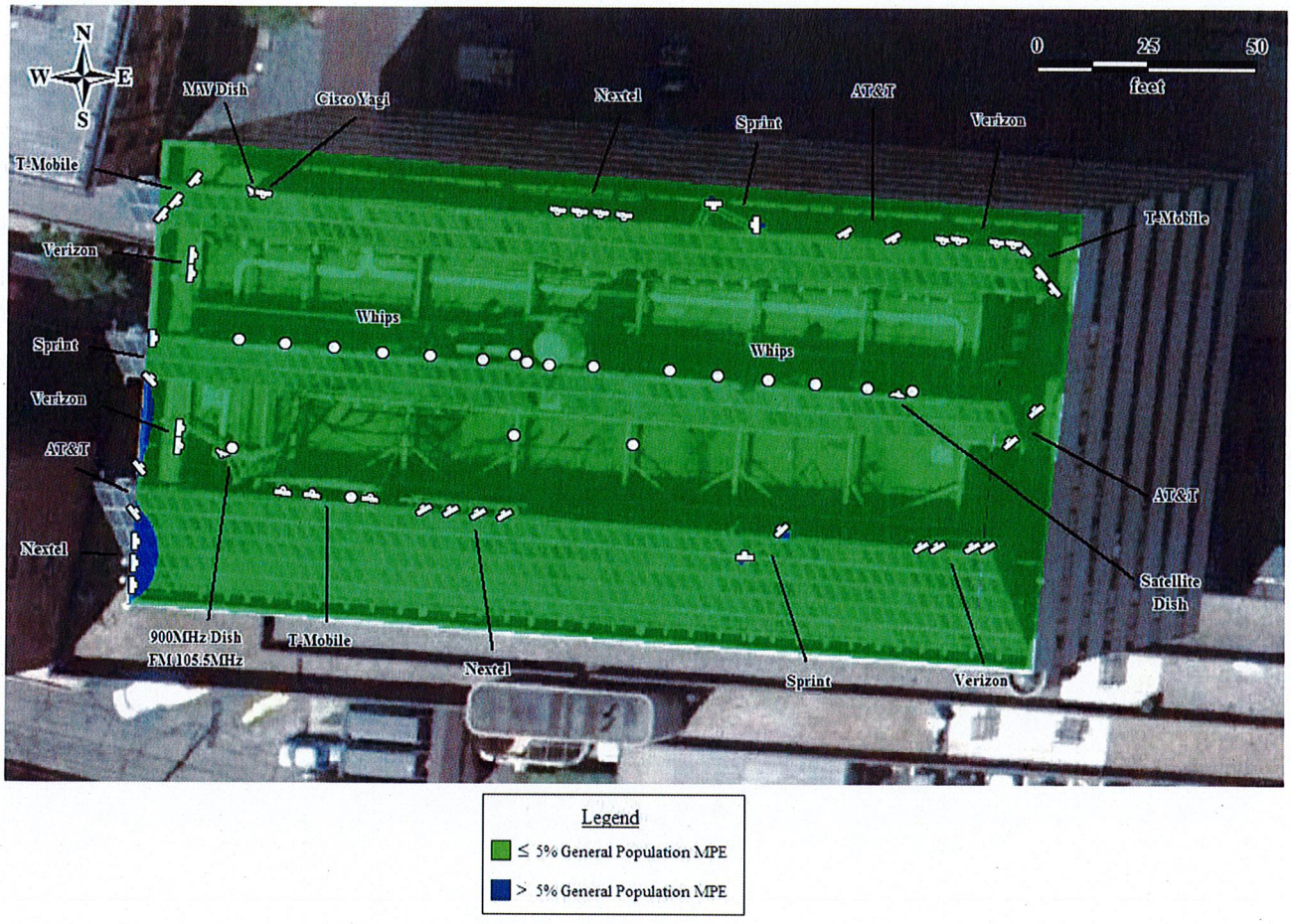

Figure 27: Predicted 5% Levels on Rooftop – Sprint-Nextel Antennas Only (Post-Modification)

10. Recommendations

- Access to the rooftop of Danbury Hospital is currently restricted. All roof access doors are currently kept locked at all times.
- There are currently yellow RF "CAUTION" signs posted at all roof access points to caution personnel that there may be areas on the roof where RF emission levels exceed the FCC Uncontrolled/General Population standard and that a potential hazard may exist. These signs are in compliance.
- **Figure 25 of this report should be inserted in a protective sleeve and posted in conspicuous locations prior to all roof access points to alert personnel of potential "hot spots" on the rooftop.** The rooftop EME map in this report should replace any other rooftop EME maps that are currently posted.

The following guidelines should be followed by all persons accessing the rooftop at Danbury Hospital:

- All personnel accessing the rooftop must be authorized and have the necessary intellectual and physical tools to allow them to control or mitigate their exposure.
- Obey all posted signs
- Assume all antennas are active
- Do not stop in front of antennas

11. Summary of Findings

The rooftop survey and predicted analysis for this site finds that there are some areas of the main roof that may exceed the general population limits and some areas of the penthouse roof that may exceed both general population and occupational limits as defined by the FCC. Appropriate restrictions are currently in place however, and no additional actions are necessary to bring the site into full FCC compliance.

With respect to the Sprint and Nextel equipment, the proposed equipment configuration changes will not cause exposures on the main roof or penthouse roof to exceed the maximum power density levels as outlined by the FCC OET Bulletin 65 Edition 97-01.

Although roof access is currently restricted, all precautions should be taken to limit roof access to authorized personnel only. It should be noted that there are areas that may exceed the occupational/controlled limit in close proximity to WDBY's FM antenna array, however the existing Nextel and proposed Sprint equipment does not contribute greater than 5% of the exposure limits in these areas.

12. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1, ANSI/IEEE Std. C95.7 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet
C Squared Systems, LLC

April 21, 2011
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

IEEE Std C95.7-2005, IEEE Recommended Practice for Radio Frequency Safety Programs, 3 kHz to 300 GHz. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[6]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 7: FCC Limits for Maximum Permissible Exposure

[5] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[6] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

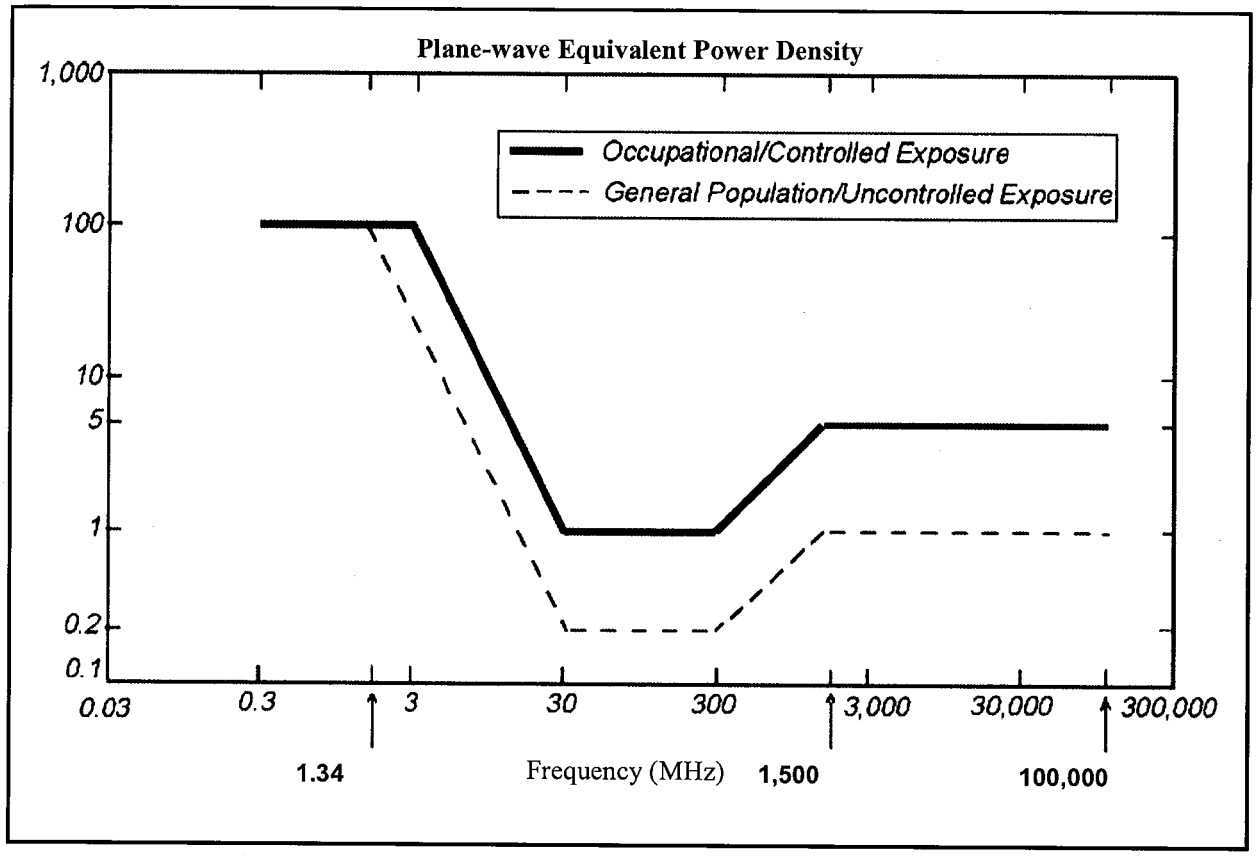

Figure 28: Graph of FCC Limits for Maximum Permissible Exposure (MPE)