STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

November 16, 2000

J. Brendan Sharkey, Esq.
VoiceStream Wireless Corporation
100 Filley Street
Bloomfield, CT 06002

RE: **TS-VOICESTREAM-064-001031** - VoiceStream Wireless Corporation request for an order to approve tower sharing at an existing telecommunications facility located at 99 Meadow Street, Hartford, Connecticut.

Dear Attorney Sharkey:

At a public meeting held November 14, 2000, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures, subject to a third party engineering inspection to confirm the structural capability of the tower. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated October 31, 2000. No construction shall commence until the specified third party engineering inspection is provided to the Council.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/laf

c: Honorable Michael P. Peters, Mayor, City of Hartford
Ms. Saundra Kee-Borges, City Manager, City of Hartford
SpectraSite Communications
Ronald C. Clark, Nextel Communications
Christopher B. Fisher, Esq., Cuddy & Feder & Worby LLP
Julie M. Cashin, Esq., Hurwitz & Sagarin LLC

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

November 7, 2000

Honorable Michael P. Peters
Mayor
City of Hartford
Municipal Building
550 Main Street
Hartford, CT 06103

RE: **TS-VOICESTREAM-064-001031** - VoiceStream Wireless Corporation request for an order to approve tower sharing at an existing telecommunications facility located at 99 Meadow Street, Hartford, Connecticut.

Dear Mayor Peters:

The Connecticut Siting Council (Council) received this request for tower sharing, pursuant to Connecticut General Statutes § 16-50aa.

The Council will consider this item at the next meeting scheduled for November 14, 2000, at 11:00 a.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,

Joel M. Rinebold
Executive Director

JMR/RKE/laf

Enclosure: Notice of Tower Sharing

c: Ms. Saundra Kee-Borges, City Manager, City of Hartford

I:\siting\em\voicestream\hartford\peters1.doc

VoiceStream WIRELESS

VOICESTREAM WIRELESS
100 Filley Street
Bloomfield, CT 06002
Phone: (860) 692-7100
Fax: (860) 692-7159

Fax Cover Sheet

To: Bob Erling	Phone No:
Department: Siting Council	Fax No: (860) 827-2950
From:	Phone No:
	Fax No:
Date: 11/13/00	Pages: 5 (Including Cover Sheet)

Bob -

Revised power densities for our Hartford & Wallingford tower sharing applications -

Brendan

100 Filley St., Bloomfield, CT 06002
Phone: (860) 692 - 7129
Fax: (860) 692 - 7159

Technical Memo

To: Brendan Sharkey
From: Haider Syed (Radio Engineering Consultant)
cc: Mike Fulton
Subject: Power Density Report for CT11661
Date: 10/31/00

1. Introduction:
This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the proposed VoiceStream Wireless PCS antenna installation on Tower 99 Meadow Rd, Hartford CT. This study incorporates the most conservative considerations for determining the practical combined worst case power density levels that would be theoretically encountered from several locations surrounding the transmitting location.

2. Discussion:
The following assumptions were used in the calculations:

1) The emissions from the Voicestream transmitters are in the 1930-1945 MHz frequency band.
2) The antenna cluster consists of three sectors, with two antennas per sector. The model number for each antenna is EMS RR90 17 02 DP
3) The antenna height is 123 feet centerline.
4) The maximum transmit power from each sector is 1979.2 Watts Effective Isotropic Radiated Power (EiRP) assuming four channel capacity.
5) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
6) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
7) The average ground level of the studied area does not significantly change with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

3. Conclusion:
Based on the above worse case assumptions, the power density calculations from the proposed VoiceStream Wireless, PCS antenna installation at Tower on 99 Meadow Rd, Hartford CT is 0.028701 mw/cm^2. This value represents only 2.8701% of the Maximum Permissible Emission (MPE) standard of 1000 microwatts per square centimeter (μw/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. The combined Power Density with other carriers will be 32% of the standard. Details are shown in the attachment. Furthermore, the proposed antenna location for VoiceStream Wireless will not interfere with existing public safety telecommunications, AM band and FM band radio broadcast, TV, Police Communication, HAM Radio communications and other signals in the area.

Worst Case Power Density for Antenna installation on Tower at 99 Meadow Street, Hartford CT

Region 11 - Connecticut Power Density Calculation - Worst Case			
Base Station TX output	20 W	43.01	
Number of channels	4		
Antenna Model	EMS: RR-90-17/ RV-90-17		
Antenna Gain	16.5 dBi		
Cable Size	1 5/8"		
Cable Length	135 ft		
Jumper & Connector loss	1 dB		
Cable Loss per foot	0.0116		
Total Cable Loss	1.566 dB		
Total Attenuation	2.566 dB		
Total EIRP per channel	56.94 dB	494.80	W
Total EIRP per sector	62.96 dB	1979.20	W
Ground Reflection	1.6		
Frequency	1930 MHz		
Antenna Height	123 ft	3749.04	cm
mpg	13.934		
Power Density (S) =	0.028701 mW / cm^2		
% MPE =	2.8701%		

% MPE Existing = 29.13 %

Additional % MPE contribution Omnipoint = 2.87 %

Total % MPE with carriers = 32.0001 %

Equation Used :

$$S = \frac{(1000)(grf)^2(Power) * 10^{(ms/10)}}{4\pi (R)^2}$$

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

* 0.46 % submitted previously

TS - VoiceStream WIRELESS -064-
00/031

100 Filley Street, Bloomfield, CT 06002
(860) 692-7154 phone
(860) 692-7159 fax

31 October, 2000

Mortimer A. Gelston, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Request by VoiceStream Communications, Inc.
for an Order to Approve the Shared Use of a Tower Facility
99 Meadow Street, Hartford, Connecticut

RECEIVED
OCT 31 2000
CONNECTICUT
SITING COUNCIL

Dear Chairman Gelston and Members of the Council:

Pursuant to Connecticut General Statutes §16-50aa, VoiceStream Wireless Corporation ("VoiceStream") hereby requests an order from the Connecticut Siting Council ("Council") to approve the proposed shared of an existing monopole tower located at 99 Meadow Street in Hartford, Connecticut. The tower is owned and operated by SpectraSite Communications ("SpectraSite"). VoiceStream proposes to install antennas on the existing tower located within SpectraSite's leased compound area, and to install related equipment near the base of the tower within the existing compound (see "Exhibit A"). VoiceStream requests that the Council find that the proposed shared use of the tower satisfies the criteria stated in §16-50aa and issue an order approving the proposed use.

Background

VoiceStream is licensed by the Federal Communications Commission (FCC) to provide PCS wireless telecommunications service in the State of Connecticut, which includes the area to be served by the proposed installation.

The SpectraSite tower at 99 Meadow Street in Hartford was approved by the Hartford zoning authorities and is a 150-foot monopole located within an existing fenced compound. The coordinates for this location are 41-44-36 N and 72-40-04 W. Nextel Communications ('Nextel") currently has its antennas installed extending to 155 feet above ground level ("AGL"), AT&T Wireless ("AT&T") has antennas with centerlines at 137 feet AGL, and Sprint Spectrum LLC ("Sprint") has recently been approved for antennas with centerlines at 98 feet AGL. VoiceStream and SpectraSite have agreed to mutually acceptable terms and conditions for the proposed shared use of this tower, and SpectraSite has authorized VoiceStream to act on its behalf to apply for all necessary local, state and federal permits and approvals that may be required for the proposed shared use of this facility.

As shown on the site plan drawings and tower elevations attached as Exhibit A, VoiceStream proposes to install a total of six (6) antennas, two per sector, with centerlines at 123 feet AGL. The antennas are EMS RR90-1702 DP. The radio transmission equipment associated with these antennas, a Nortel S8000 cabinet, would be mounted on a concrete slab at the base of the pole.

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

A. **Technical Feasibility** - The existing tower was designed to accommodate multiple carriers, and VoiceStream is the fourth carrier to propose co-location. As the structural analysis attached as Exhibit C indicates, the tower is structurally sound and capable of supporting the proposed antennas. The proposed shared use of this tower therefore is technically feasible.

B. **Legal Feasibility** - Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the proposed shared use of an existing tower facility such as the facility on Meadow Street in Hartford. (Public Acts 93-268, Section 2; and 94-242, Section 6 (c)). This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. C.G.S. § 16-50x (a) vests exclusive jurisdiction over these facilities in the Council, which shall "give such consideration to other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing towers facilities. Under this statutory authority vested in the Council, an order by the Council approving the shared use would permit the applicant to obtain a building permit for the proposed installations.

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

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

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

3. Operation of antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the American National Standards Institute ("ANSI"). The "worst-case" exposure calculated for operation of this facility (i.e., calculated at the base of the tower, which represents the closest publicly accessible point within the broadcast field of the antennas), with the Nextel, AT&T, Sprint and VoiceStream antennas, would be 29.159% of the ANSI standard. These calculations are attached as Exhibit D. [1]

---

[1] These calculations are based on the most recent power density report on file with the Connecticut Siting Council. VoiceStream believes there may be a typographical error in Sprint's power density calculation involving the misplacement of a decimal point, but we will defer to the record unless otherwise instructed.

4. The proposed installations would not require any water or sanitary facilities, or generate air emissions or discharges to water or sanitary facilities, or generate air emissions or discharges to water bodies. After construction is complete (approximately two weeks), the proposed installations would not generate any traffic other than for periodic maintenance visits.

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

E. **Economic Feasibility** - As previously mentioned, VoiceStream has entered into an agreement with SpectraSite to share the use of the existing tower on terms agreeable to the parties. The proposed tower sharing is therefore economically feasible.

F. **Public Safety Concerns** - As stated above, the existing tower is structurally capable of supporting the proposed VoiceStream antennas. The tower stands on a raw land compound on Meadow Street. The size and location of the tower have also been approved by the Hartford Planning and Zoning Commission which considered public health and safety in its review. VoiceStream is not aware of any other public safety concerns relative to the proposed sharing of the existing tower. In fact, the provision of new or improved phone service through shared use of the existing tower is expected to enhance the safety and welfare of area residents and travelers.

Conclusion

For the reasons discussed above, the proposed shared use of the existing tower facility at 99 Meadow Street in Hartford, Connecticut satisfies the criteria stated in C.G.S. §16-50aa, and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of towers in Connecticut. VoiceStream therefore request that the Siting Council issue an order approving the proposed shared use.

Thank you for your consideration of this matter.

Sincerely,

J. Brendan Sharkey, Esq.
for VoiceStream Communications, Inc.

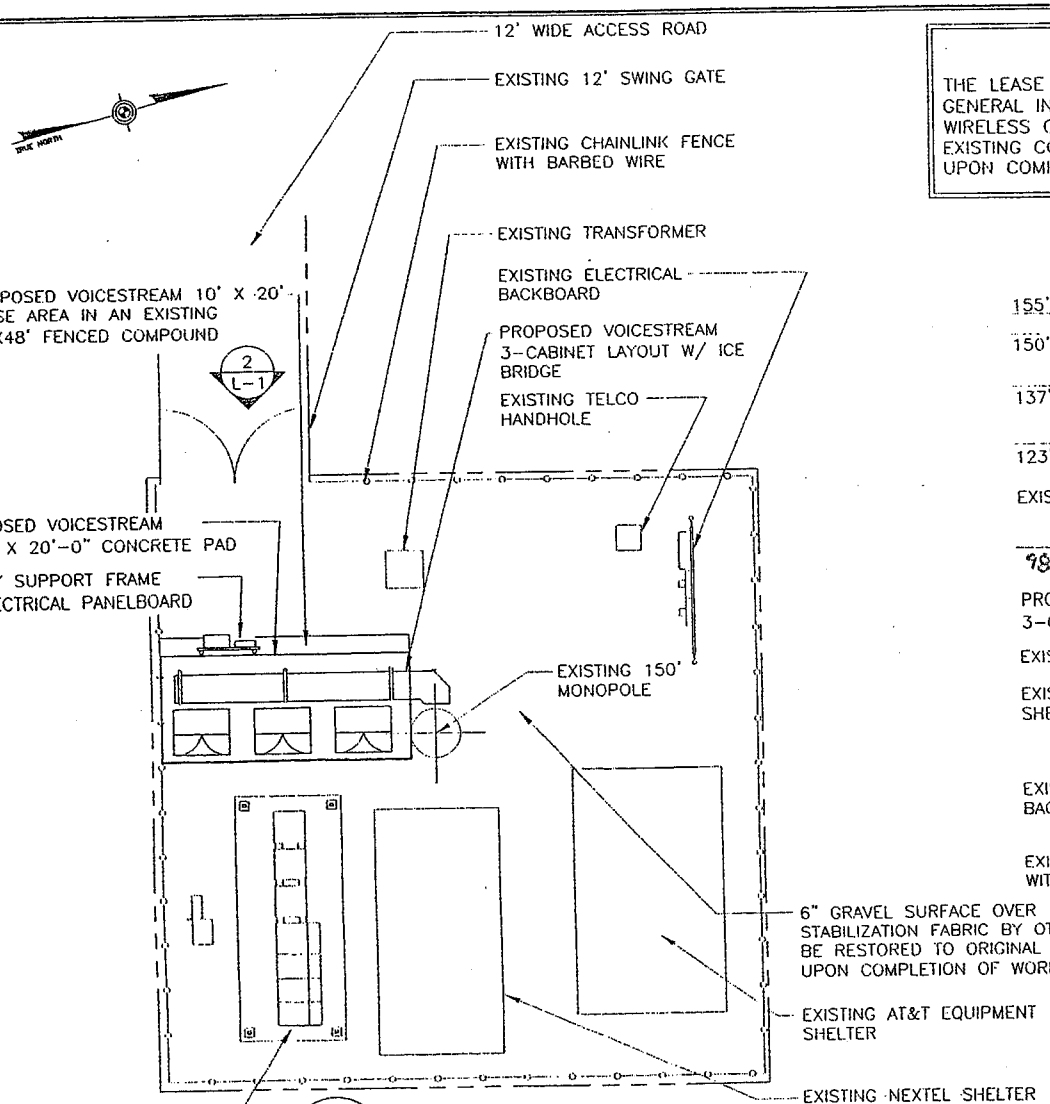
Attachments
cc: Michael Peters, Mayor of Hartford

Exhibit A

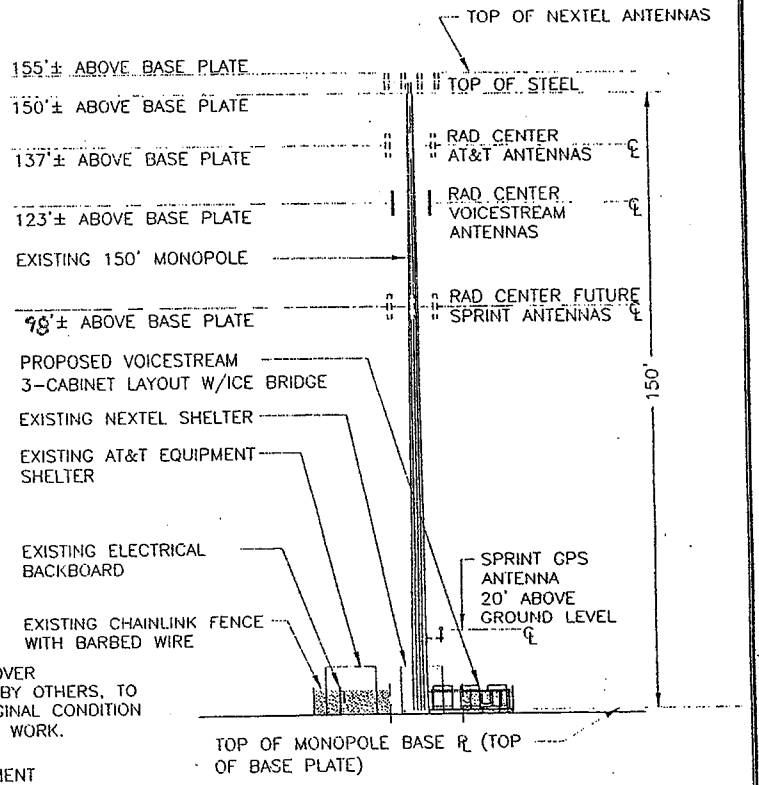
Design Drawings
99 Meadow Street
Hartford, CT

LEASE EXHIBIT

THE LEASE PLAN IS DIAGRAMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION EQUIPMENT AND ANTENNA MOUNTS WITHIN THE EXISTING COMPOUND. ACTUAL LOCATION OF LEASE AREA WILL BE FINALIZED UPON COMPLETION OF DESIGN.



1 L-1 **PARTIAL SITE PLAN**
NOT TO SCALE



2 L-1 **TOWER ELEVATION**
NOT TO SCALE

REVISIONS		
01	10/24/00	LEASE EXHIBIT

VoiceStream WIRELESS
100 PEARL STREET
HARTFORD, CT 06103

NATCOMM
Natcomm LLC.

HARTFORD
CT-11-661-A
99 MEADOW STREET
HARTFORD, CT

PROJECT NO:	257A
DRAWN BY:	P.A.M.
CHECKED BY:	J.P.
SCALE:	NONE
DATE:	10/23/00

LEASE EXHIBIT
SITE PLAN
AND ELEVATION

L-1
DWG. 1 OF 1

VoiceStream WIRELESS

Exhibit B

Equipment Specifications

99 Meadow Street

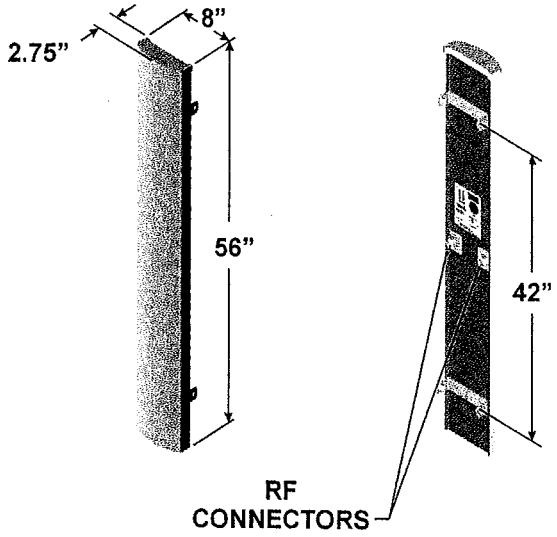
Hartford, CT

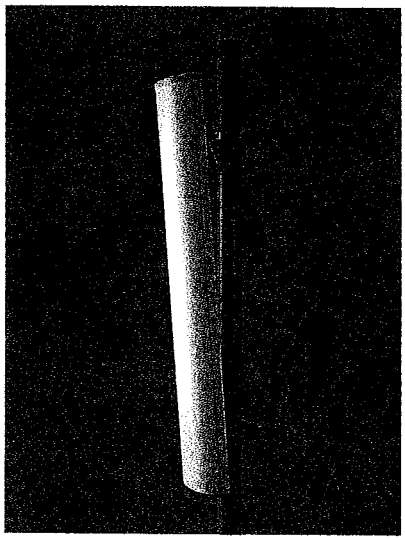
EMS WIRELESS

OptiRange™

RR90-17-XXXP

1850 MHz - 1990 MHz (P)





- 90° beamwidth
- 16.5 dBi gain
- ±45° DualPol™
- 56 inch

SPECIFICATIONS

Electrical

Azimuth Beamwidth	90°
Elevation Beamwidth	6°
Gain	16.5 dBi (14.4 dBd)
Polarization	Slant, ±45°
Port-to-Port Isolation	≥ 30 dB
Front-to-Back Ratio	≥ 25 dB (≥ 30 dB Typ.)
Electrical Downtilt Options	0°, 2°, 4°, 6°
VSWR	1.35:1 Max
Connectors	2;Type N or 7-16 DIN (female)
Power Handling	250 Watts CW
Passive Intermodulation	<-147 dBc (2 tone @ +43 dBm {20W} ea.)
Lightning Protection	Chassis Ground

Mechanical

Dimensions (L x W x D)	56in x 8in x 2.75in (142 cm x 20.3 cm x 7.0 cm)
Rated Wind Velocity	150 mph (241 km/hr)
Equivalent Flat Plate Area	3.1ft² (.29 m²)
Front Wind Load @ 100 mph (161 kph)	90 lbs (400 N)
Side Wind Load @ 100 mph (161 kph)	31 lbs (139 N)
Weight	18 lbs (8.2 kg)

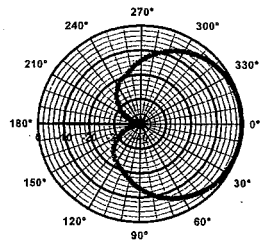
Note: Patent Pending and US Patent number 5, 757, 246.

Values and patterns are representative and variations may occur. Specifications may change without notice due to continuous product enhancements. Digitized pattern data is available from the factory or via the web site www.emswireless.com and reflect all updates.

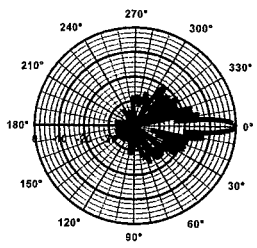
MOUNTING OPTIONS

Model Number	Description	Comments
MTG-P00-10	Standard Mount (Supplied with antenna)	Mounts to Wall or 1.5 inch to 5.0 inch O.D. Pole (3.8 cm to 12.7 cm)
MTG-S02-10	Swivel Mount	Mounting kit providing azimuth adjustment.
MTG-DXX-20*	Mechanical Downtilt Kits	0° - 10° or 0° - 15° Mechanical Downtilt
MTG-CXX-10*	Cluster Mount Kits	3 antennas 120° apart or 2 antennas 180° apart
MTG-C02-10	U-Bolt Cluster Mount Kit	3 antennas 120° apart , 4.5" O.D. pole.
MTG-TXX-10*	Steel Band Mount	Pole diameters 7.5" - 45"

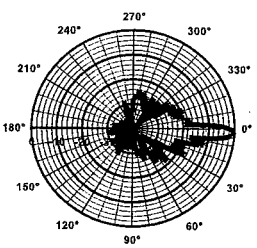
* Model number shown represents a series of products. See mounting options section for specific model number.



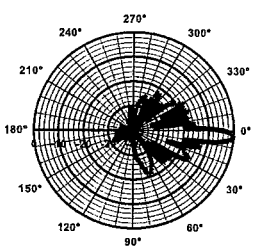
Azimuth



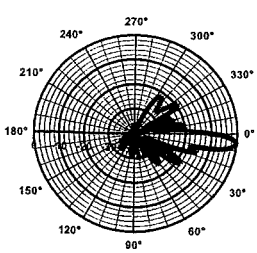
Elevation
0° Downtilt



Elevation
2° Downtilt



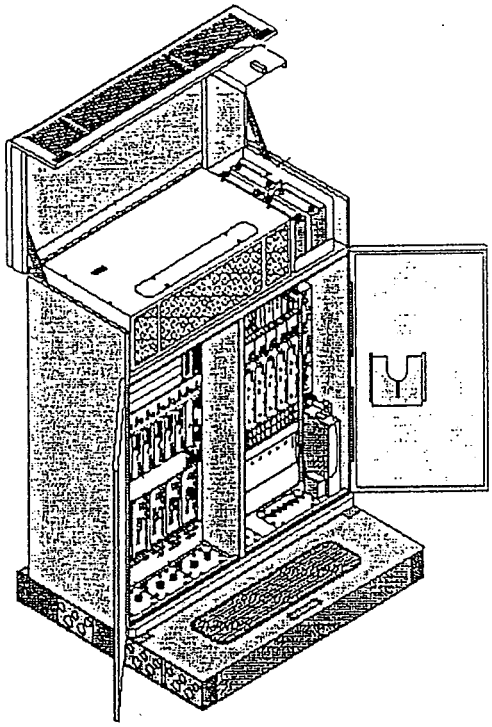
Elevation
4° Downtilt

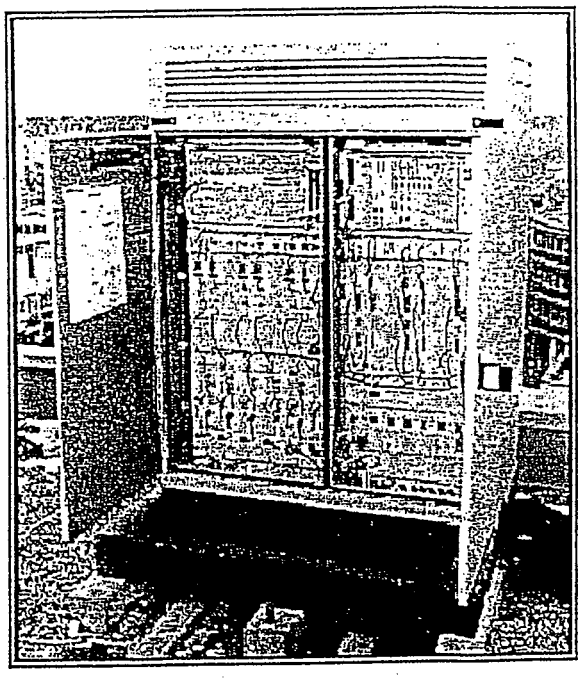


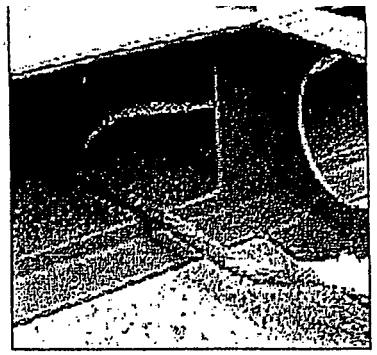
Elevation
6° Downtilt

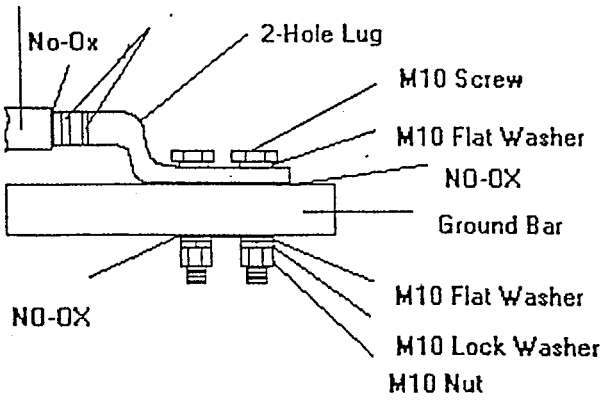
NORTEL NETWORKS™

S8000 BTS
Site Specifications









Apply a light coating of No Oxidation (NO-OX) to the ground bar area.

Dimensions, Weights & Clearances

BTS

Weight: 915 pounds
Dimensions: 53.2"W x 26"D x 63"H

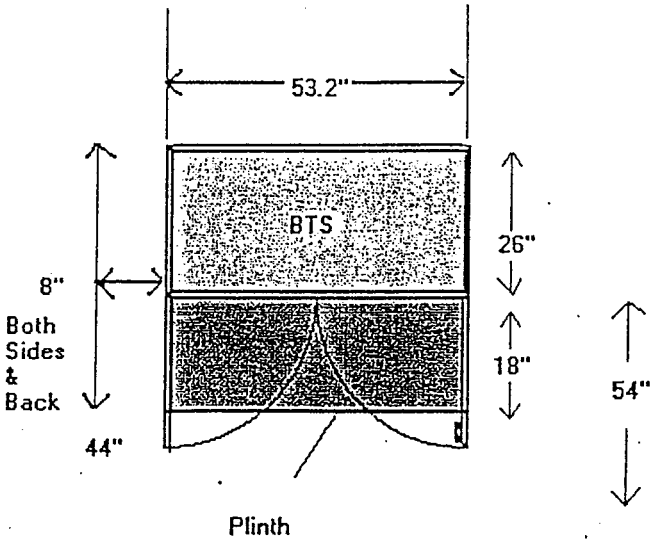
Clearances while transporting in building:
- Door Access:
  - Height: 6.6 feet
  - Width 3 feet
- Corridor Access:
  - Height: 6.6 feet
  - Width: 3.6 feet (straight), 6.6 feet (right angle)

Clearances when installed:
- Above: 28 inches for opening of hood
- Rear: 8 inches for installation of outer skin
- Sides: 8 inches for adjustment of door hinges
- Front: 54 inches to open door and technician access

Plinth

Weight:
87 pounds

Dimensions:
53.2"W x 44"D x 10.2"H



Plinth

Floor Characteristics

Minimum Floor Resistance:
123 pounds/foot^2

Flatness:
¼ inch over 78 inches

Electrical Specifications

Split Single-Phase

3 wires plus ground

L1: Black 6 gauge

L2: Red 6 gauge

Neutral: White 6 gauge

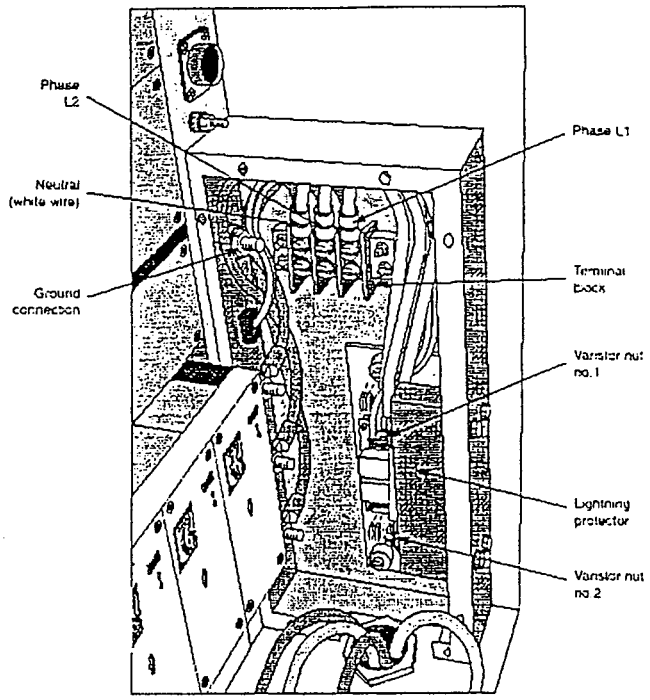
Ground: Yellow/Green 6 gauge

Maximum distance between AC box and BTS: 105 feet

187 ~ 254 VAC between L1 and L2

99 ~ 127 VAC between Neutral and L1 or L2

45 ~ 65 Hertz



AC connection to BTS located at the front, lower, right-hand side of BTS

Circuit Breaker in AC Box

Up to 4 transmitters

30 A, bipolar, C curve

5 or more transmitters

40A, bipolar, C curve

BTS to Ground connection

Minimum 2 AWG, run in most direct route as possible towards true earth, minimizing bends. No bend shall be less than 90 degrees.

Exhibit C

Structural Analysis
99 Meadow Street
Hartford, CT

CT-11-661

1

MORRISON HERSHFIELD / WALKER ENGINEERING
5895 Shiloh Road, Suite 112, Alpharetta, GA 30005
Tel. (678) 937-0004 Fax. (678) 947-0603

TOWER ENGINEERS MHWE

Mr. **Eric Rabon**
SpectraSite Communications, Inc.
100 Regency Forest, Suite 200
Cary, N.C. 27511

10/18/00
CT-0004
Petro Lock

Sub: Structural Analysis of 147 ft. FWT Monopole
99 Meadow Street, Hartford, CT

Dear Mr. Rabon:

MHWE has performed a structural analysis of SpectraSite's above noted monopole in accordance with our agreement of December 1, 1999, for the addition of **VoiceStream (OmniPoint)** proposed antennas outlined below.

The subject monopole is a 147 ft, 18-sided, three section, tapered monopole, designed and manufactured by FWT in 1998. The monopole geometry, section sizes and monopole base design loads were obtained from the manufacturer's drawings for this monopole and are assumed to be accurate (FWT Job No.: 21719000, Dated 09/10/98, rev. dated 07/18/00). The monopole has also been assumed to be in good condition and capable of supporting its full design capacity. Existing, future, and proposed loads were provided by your office[1].

Our analysis was performed in accordance with TIA/EIA-222-**F** for an 80 mph[2] base windload, and 75% of the base windload with ½" radial ice, as specified by SpectraSite. The loading used for our analysis was as follows:

Existing, future, and proposed loads consists of the following:

at Top — Nextel: Nine ALP 9011 panel antennas on an existing platform mount, fed by nine 1-1/4"∅ coax cables. The analysis assumes the existing antennas will be replaced by twelve ALP 9212 antennas on the existing platform mount, fed by a total of twelve 1-5/8"∅ coax cables assumed to be running inside the pole. Total future equipment not to exceed the **E**quivalent flat **P**late **A**rea (**EPA=CaAa**) that the tower was originally designed to support.[3]

at 135 ft — AT&T: Nine Allgon 7184.14 panel antennas on an existing platform mount, fed by twelve 1-1/4"∅ coax cables running inside the pole.

[1] Kimley-Horn Report CT-0004, Dated: 06/12/00.
[2] The minimum windspeed specified by EIA-222-F for Hartford County, CT is 80 mph.
[3] SpectraSite Tower Inventory Sheet CT-0004, Dated: 07/19/00 (0.87).

at 123 ft. **VoiceStream *(proposed)***: Six EMS RR9017-02DP panel antennas on a platform mount (copy attached), fed by twelve 1-5/8"∅ coax cables assumed to be placed inside the monopole.

at 98 ft. Sprint: Nine DB980 panel antennas on three T-arm mounts, fed by eighteen 1-1/4"∅ coax cables running inside the monopole.

Monopole Summary:

This analysis shows that the subject monopole **is adequate** to support the existing, future, and proposed loads.

A summary of the controlling load cases are provided below:

Monopole Section	Combined Stress Index[4]
0 ft to 50 ft	0.64
50 ft to 97 ft	0.52
97 ft to 147 ft	0.38

Foundation Summary:

The forces at the base of the monopole are less than the original design loads. The existing monopole base and foundation **is adequate** to support the existing, future, and proposed loads.

Foundation Loads	Original[5]	Existing/Proposed	% of Design
O.T. Moment	2,489 k-ft	2,529.9 k-ft	102 %[6]
Axial Load	36 k	32.6 k	91 %
Base Shear	24 k	23.7 k	99 %

Other Considerations:

Installation of access ports ("Handholes") for the proposed equipment may be required. The Kimley-Horn report and FWT drawing does not indicate access ports at the proposed elevation of 123 feet. MHWE has designed an access port per your request (see attached). Use extreme caution during the installation of

[4] Ratio of calculated loads verses total allowable loads; should be less than, or equal to, 1.00
[5] Original foundation loads were taken from FWT Job No. 21719000, dated 09/10/98, rev. dated 07/18/00.
[6] O.T. Moment is slightly greater than the original design load (increase by 2%). This is considered acceptable.

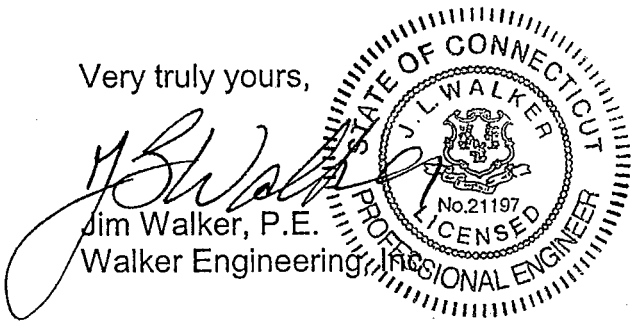
the access ports to insure temporary bracing of the pole, and prevention of fires inside the pole during cutting and welding operations.

As future loads are installed, the monopole should be re-evaluated on a case-by-case basis.

The analysis is based on information provided to this office by SpectraSite Communications, Inc. If the existing conditions are different than the information in this report, MHWE should be contacted for resolution of any issues.

MHWE appreciates the opportunity to be of service in this matter. Please do not hesitate to give me a call if you have any questions or comments.

Very truly yours,



Jim Walker, P.E.
Walker Engineering, Inc.

encl.

Exhibit D

Power Density Calculations
99 Meadow Street
Hartford, CT

100 Filley St., Bloomfield, CT 06002
Phone: (860) 692 - 7129
Fax: (860) 692 - 7159

Technical Memo

To: Brendan Sharkey
From: Haider Syed (Radio Engineering Consultant)
cc: Mike Fulton
Subject: Power Density Report for CT11661
Date: 10/31/00

1. Introduction:
This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the proposed VoiceStream Wireless PCS antenna installation on Tower 99 Meadow Rd, Hartford CT. This study incorporates the most conservative considerations for determining the practical combined worst case power density levels that would be theoretically encountered from several locations surrounding the transmitting location.

2. Discussion:
The following assumptions were used in the calculations:

1) The emissions from the Voicestream transmitters are in the 1930-1945 MHz frequency band.
2) The antenna cluster consists of three sectors, with two antennas per sector. The model number for each antenna is EMS RR90 17 02 DP
3) The antenna height is 123 feet centerline.
4) The maximum transmit power from each sector is 1979.2 Watts Effective Isotropic Radiated Power (EiRP) assuming four channel capacity.
5) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
6) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
7) The average ground level of the studied area does not significantly change with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

3. Conclusion:
Based on the above worse case assumptions, the power density calculations from the proposed VoiceStream Wireless, PCS antenna installation at Tower on 99 Meadow Rd, Hartford CT is 0.028701 mw/cm^2. This value represents only 2.8701% of the Maximum Permissible Emission (MPE) standard of 1000 microwatts per square centimeter (μw/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. The combined Power Density with other carriers will be 29.1587 % of the standard. Details are shown in the attachment. Furthermore, the proposed antenna location for VoiceStream Wireless will not interfere with existing public safety telecommunications, AM band and FM band radio broadcast, TV, Police Communication, HAM Radio communications and other signals in the area.

Worst Case Power Density for Antenna installation on Tower at 99 Meadow Street, Hartford CT

Region 11 - Connecticut Power Density Calculation - Worst Case				
Base Station TX output	20 W		43.01	
Number of channels	4			
Antenna Model	EMS: RR-90-17/ RV-90-17			
Antanna Gain	16.5 dBi			
Cable Size	1 5/8"			
Cable Length	135 ft			
Jumper & Connector loss	1 dB			
Cable Loss per foot	0.0116			
Total Cable Loss	1.566 dB			
Total Attenuation	2.566 dB			
Total EIRP per channel	56.94 dB		494.80	W
Total EIRP per sector	62.96 dB		1979.20	W
Ground Reflection	1.6			
Frequency	1930 MHz			
Antenna Height	123 ft		3749.04	cm
nsg	13.934			
Power Density (S) =	**0.028701 mW / cm^2**			
% MPE =	**2.8701%**			

% MPE Existing = 29.13 %

** Additional % MPE contribution Omnipoint = 2.87 %*

Total % MPE with carriers = 29.1587%

Equation Used :

$$S = \frac{(1000)(grf)^2(Power) * 10^{(nsg/10)}}{4\pi (R)^2}$$

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

* 0.46 % submitted previously