



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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

November 7, 2000

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

RE: **EM-VOICESTREAM-164-001025** - VoiceStream Wireless Corporation notice of intent to modify an existing telecommunications facility located at 482 Pigeon Hill Road, Windsor, Connecticut. (Docket No. 58)

Dear Attorney Sharkey:


At a public meeting held on November 2, 2000, the Connecticut Siting Council (Council) acknowledged 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: 1) that a utility easement be obtained to avoid full time non-emergency use of generators to power this facility, and 2) low-profile antennas and platforms are installed.

The proposed modifications are to be implemented as specified here and in your notice dated October 25, 2000. 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. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,


Mortimer A. Gelston
Chairman

MAG/RKE/laf

c: Honorable Mary Hogan, Mayor, Town of Windsor
Mr. Albert G. Ilg, Town Manager, Town of Windsor
Mr. Mario Zavarella, Town Planner, Town of Windsor
Christopher F. Ciolfi, Crown Atlantic Company LLC
Sandy M. Carter, Verizon Wireless
Peter W. van Wilgen, Springwich Cellular Limited Partnership

25 October, 2000

Joel Rinebold, Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

**Re: Notice of Exempt Modification
482 Pigeon Hill Road
Windsor, Connecticut**

RECEIVED

OCT 25 2000

CONNECTICUT
SITING COUNCIL

Dear Mr. Rinebold:

Crown Atlantic Company LLC ("Crown") holds the Siting Council certificate for the existing telecommunications tower and related facility in Windsor, Connecticut by virtue of a certificate transfer from Bell Atlantic Mobile, approved by the Council on March 24, 1999. VoiceStream Communications, Inc. ("VoiceStream") intends to install a total of twelve (12) panel antennas and related equipment at the existing facility in Windsor. Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Windsor Mayor, Mary Hogan.

The existing facility consists of a 160-foot lattice tower and related equipment at 482 Pigeon Hill Road in Windsor. The tower currently supports antennas of Cellco Partnership d/b/a Bell Atlantic Mobile ("BAM"), as well as various other antennas owned by the Town of Windsor.

VoiceStream plans to install a total of twelve (12) panel-type antennas, EMS Dual-Pol, Model No. RR90-17-02DP, on the existing tower with centerlines at the 145-foot level. VoiceStream will also eventually install three equipment cabinets near the base of the tower. VoiceStream's plan is to temporarily install three antennas and one equipment cabinet and supply power to its equipment using a generator. Upon completion of permanent utility arrangements currently being negotiated by Springwch Cellular Limited Partnership ("SNET"), VoiceStream intends to complete its full installation in conjunction with SNET. (See tower profile and site plan Attached as Exhibit A, and equipment specifications attached hereto as Exhibit B).

The existing tower is structurally capable of supporting VoiceStream's new antennas. A structural analysis of the tower has been completed and is attached as Exhibit C.

The planned modifications to the Windsor facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower. VoiceStream's antennas will be installed with a centerline of approximately 145 feet AGL. The enclosed tower drawing confirms that the planned changes will not increase the overall height of the tower.

2. The installation of VoiceStream equipment near the base of the tower, as reflected on the attached site plan, will not require an extension of the site boundaries. VoiceStream's proposed equipment cabinets will be located entirely within the existing fenced area.

3. The proposed modification to the facility, including the proposed temporary generator, will not increase the noise levels at the existing facility by six decibels or more. VoiceStream's equipment is self-contained and requires no additional heating, ventilation or cooling equipment.

4. The operation of the additional antenna will not increase the total radio frequency (RF) power density, measured at the site boundary, to a level at or above the applicable standard. The "worst-case" RF power density calculations, for a point at the site boundary, are attached hereto as Exhibit D.

For the foregoing reasons, VoiceStream respectfully submits that the proposed addition of antennas and equipment at the Windsor facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



J. Brendan Sharkey

enclosures

cc: Mary Hogan, Mayor

Exhibit A

Design Drawings
482 Pigeon Avenue
Windsor, CT

T/TOWER
EL = 160'-0"

☉ OF VS ANTENNA
EL = 145'-0"

☉ OF (E) ANTENNA
EL = 155'-0"

PROPOSED (12) NEW ANTENNA
MODEL # RR901702-DP
EMS ANTENNA (4 / SECTOR)

(E) LATTICE TOWER

(E) CABLE LADDER

(N) (1) 58000 BTS
SET ON GRAVEL ONLY

(N) ICE BRIDGE

GRADE
EL = 0'-0"

(E) ICE BRIDGE

(E) EQUIPMENT TRAILER

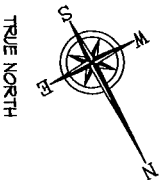
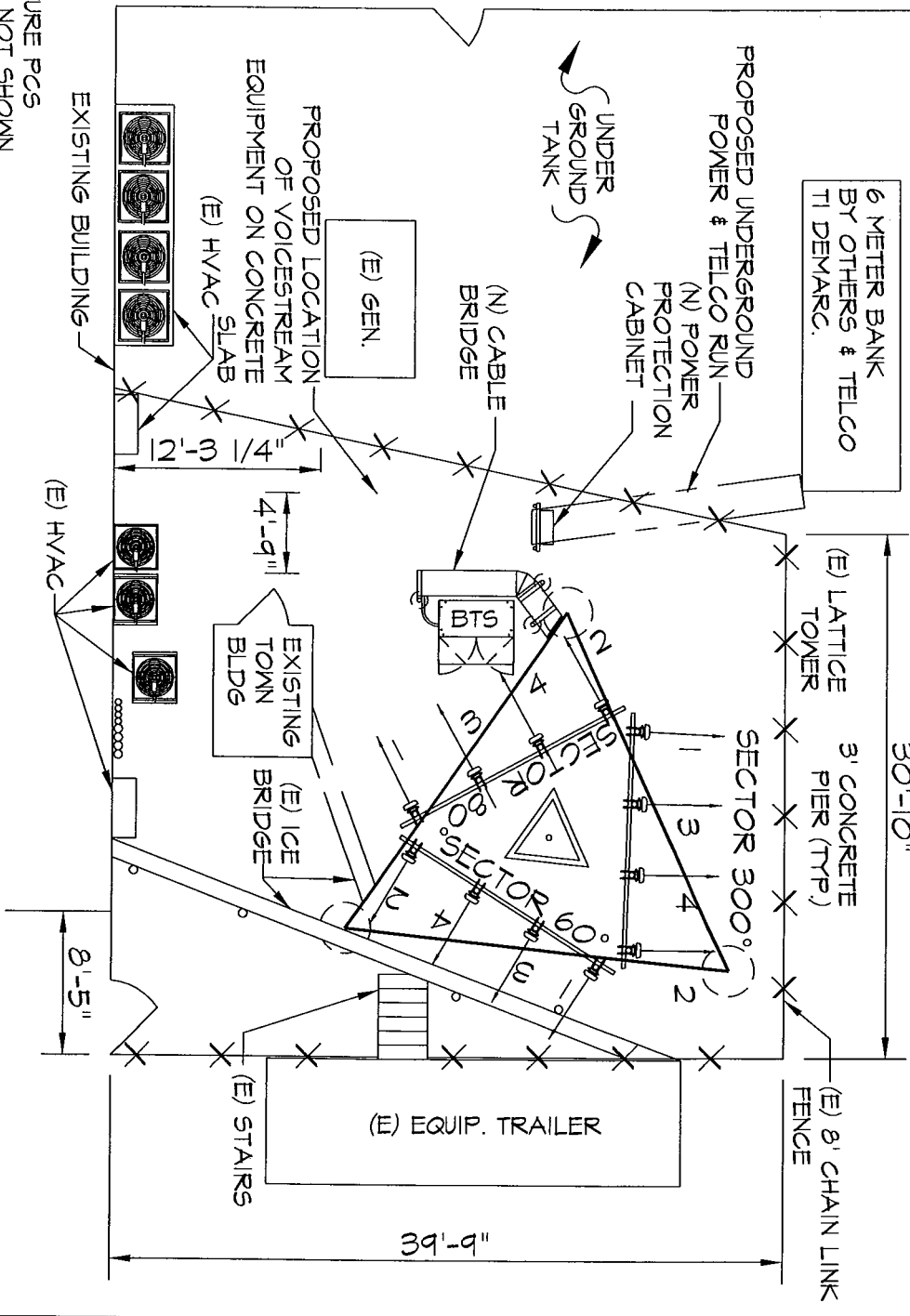
EAST ELEVATION (LOOKING WEST)

SCALE: 1"=40'-0"

1
L2

<p>L2</p> <p>17143-0001</p>	<p>SHEET NUMBER</p>	<p>REVISION</p>	<p>SHEET TITLE</p> <p>EAST ELEVATION (LOOKING WEST)</p>	<p>LICENSEE</p>	<p>PLAN BY: XXX</p>	<p>CHECK BY: XXX</p>	<p>DATE: JAN. XXX</p>	<p>APPROVALS</p> <p>PROPERTY OWNER _____</p> <p>ZONING _____</p> <p>CONSTRUCTION _____</p> <p>OPERATIONS _____</p> <p>RF _____</p> <p>NETWORK _____</p> <p>CONTRACTOR _____</p>	<p>SCIENTECH</p> <p>44 SHELTER ROCK RD. DANBURY, CT 06810 TEL: 203-796-5300 FAX: 203-796-5372</p>	<p>PLANS PREPARED BY:</p>	<p>REV. DATE: 10/25/00</p>	<p>DESCRIPTION: ANTENNA TO 155'-0"</p>	<p>REV. DATE: 10/25/00</p>	<p>DESCRIPTION: REVISED PER VS</p>	<p>REV. DATE: 10/25/00</p>	<p>DESCRIPTION: REVISED PER VS</p>	<p>REV. DATE: 10/25/00</p>	<p>DESCRIPTION: LEASE AGREEMENT</p>	<p>ISSUED FOR: LEASE EXHIBIT</p>	<p>ISSUED DATE: 10/25/00</p>	<p>ARGUMENT ISSUE DATE:</p>	<p>482 Pigeon Hill Rd. CT-11-227TD 482 Pigeon Hill Rd. Syracuse, CT 06095</p>	<p>720 EAST INFORMATION</p> <p>100 MILLER STREET SUITE 1000 DANBURY, CT 06810 TEL: 203-796-5300 FAX: 203-796-5372</p>	<p>Voicestream WIRELESS</p>
					<p>17143-0001</p>	<p>17143-0001</p>	<p>17143-0001</p>			<p>17143-0001</p>														

EXISTING BUILDING



- NOTES:
1. OTHER/FUTURE PCS CARRIERS NOT SHOWN.
 2. EXISTING 8' CHAIN LINK FENCE TO BE REMOVED AND REINSTALLED AFTER SITE BUILD OUT COMPLETE.

SITE PLAN
SCALE 1"=10'-0"



Voicestream
WIRELESS

100 HILL STREET
SUITE 200
HARTFORD, CT 06103
PHONE (860) 763-7100
FAX (860) 763-7194

PROJECT INFORMATION:
PIGEON HILL, RD.
CT-11-22TD
482 PIGEON HILL RD.
MINDSOR, CT
HARTFORD COUNTY

CURRENT LEASE DATE:
08/09/00

LEASE FOR:
LEASE EXHIBIT

REV. DATE	DESCRIPTION	BY
08/09/00	ISSUED FOR LEASE EXHIBIT	RC
	REVISION REQUEST	RC
	REVISION PER VS	RC

PLANS PREPARED BY:

SCIENTECH.

44 SHELTER ROCK RD.
DANBURY, CT 06810
TEL: 203-796-5212
FAX: 203-796-5212

APPROVALS:

PROPERTY OWNER	_____
ZONING	_____
CONSTRUCTION	_____
OPERATIONS	_____
RF	_____
NETWORK	_____
CONTRACTOR	_____

DRAWN BY: CM
CHECKED BY: APV.
SCALE: 1"=10'-0"

SHEET TITLE:
SITE PLAN

SHEET NUMBER:
L1

REVISION:
B

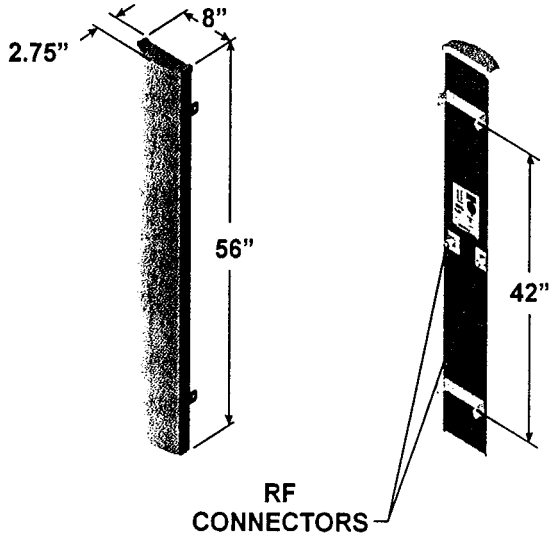
Exhibit B

Equipment Specifications

482 Pigeon Avenue

Windsor, CT

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	3.1ft (.29 m)
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)

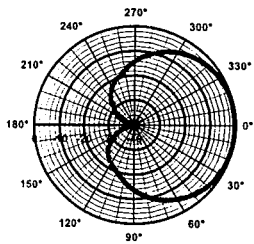
Note: Patent Pending and US Patent number 5, 757, 246.

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.

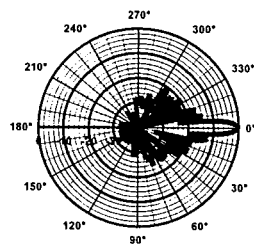
MOUNTING OPTIONS

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"

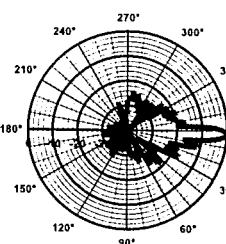
* Model number shown represents a series of products. See mounting options section for specific model number.



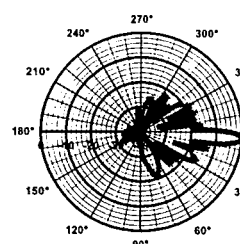
Azimuth



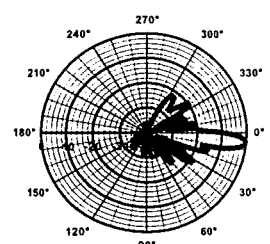
Elevation
0° Downtilt



Elevation
2° Downtilt



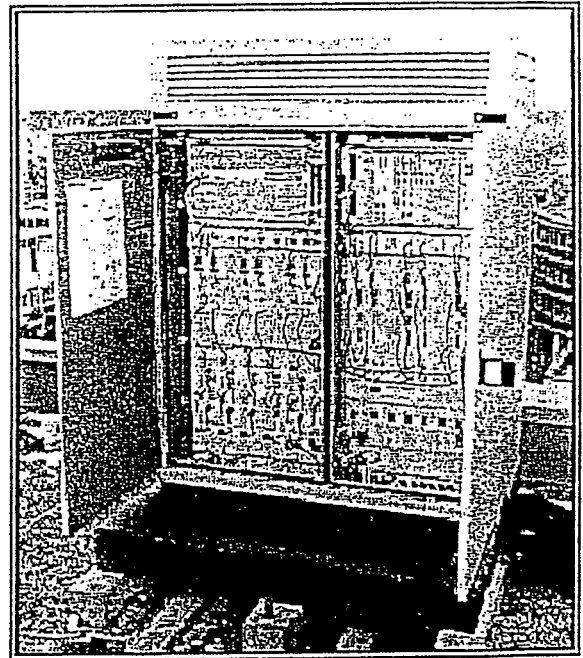
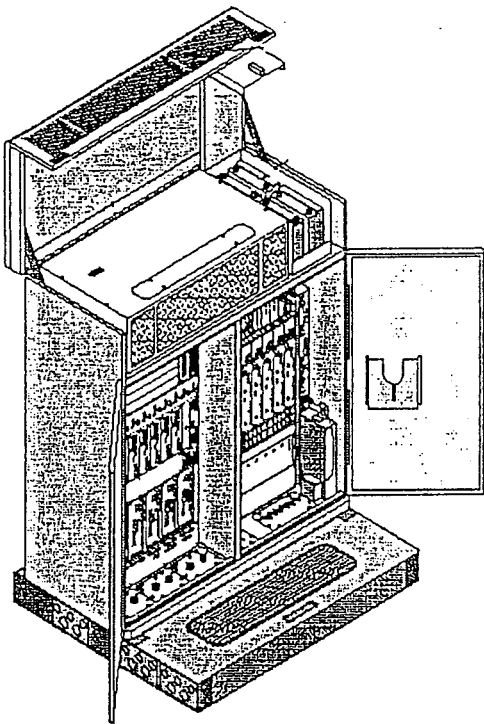
Elevation
4° Downtilt

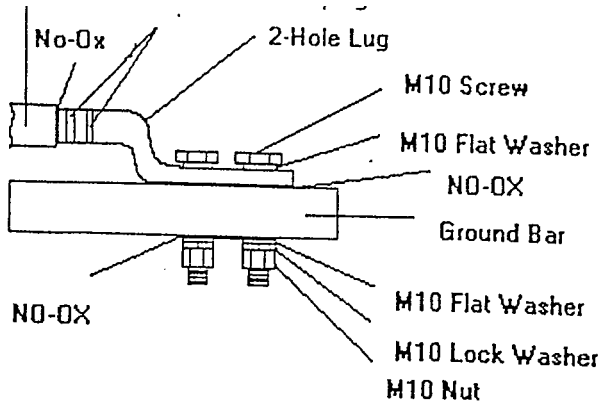
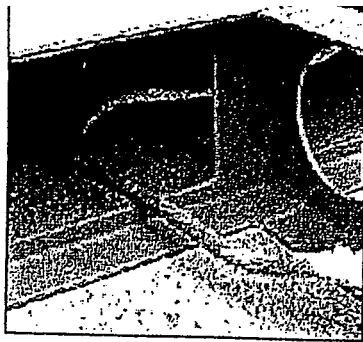


Elevation
6° Downtilt

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

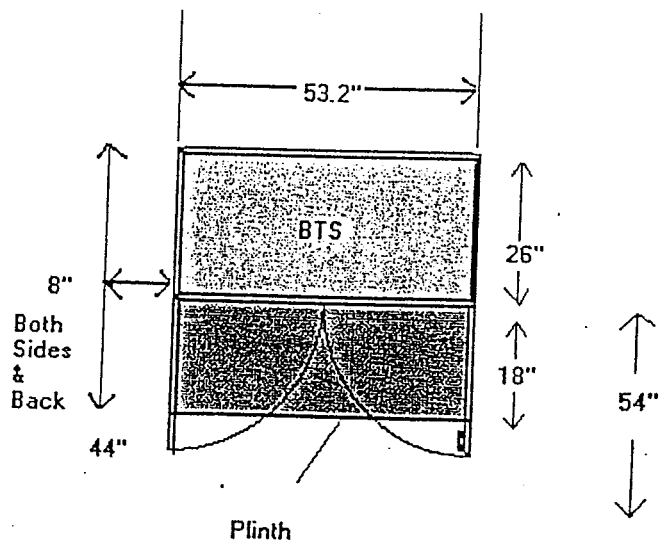
Weight:
 87 pounds

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

Floor Characteristics

Minimum Floor Resistance:
 123 pounds/foot²

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

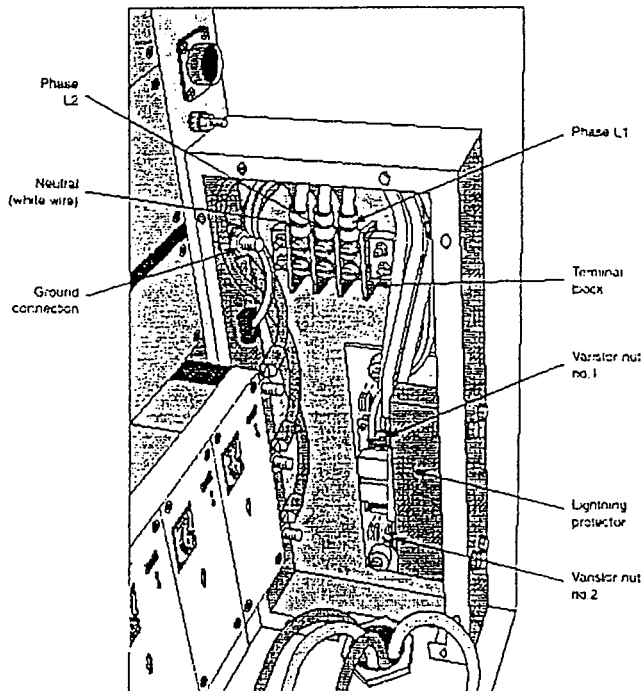
Ground: Yellow/Green 6 gauge

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

482 Pigeon Avenue

Windsor, CT

P.O. Box 440
2605 White Mountain Highway
North Conway, NH 03860
(603) 356-6936
(603) 356-7715 (fax)

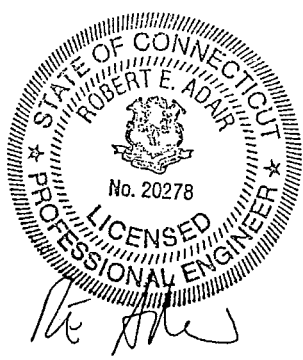
65 W. Commercial Street
Portland, ME 04101
(207) 780-1100
(207) 780-1101 (fax)
www.hebcivil.com



**STRUCTURAL ANALYSIS REPORT
OF
160' ROHN SELF SUPPORTING TOWER
WINDSOR, CONNECTICUT**

Prepared for Verizon Wireless
SNET Loading

July 24, 2000



Prepared by:
H. E. Bergeron Engineers, P.A.
P.O. Box 440, 2605 White Mountain Highway
North Conway, NH 03860
HEB Project No. 2000-110-002

HEB

STRUCTURAL ANALYSIS REPORT
of
160' SELF-SUPPORTING TOWER
WINDSOR, CONNECTICUT
prepared for Verizon Wireless

EXECUTIVE SUMMARY:

H. E. Bergeron Engineers, P.A. (HEB) performed a structural analysis of this 160-foot ROHN SSV tower. The analysis was performed with the addition of nine Swedcom 9011 panel antennas on three 15' gate boom mounts at an elevation of 145'.

Our analysis indicates this tower is capable of supporting the proposed antennas.

INTRODUCTION:

A structural analysis of this communications tower was performed by HEB for Verizon Wireless. The tower is located in Windsor, Connecticut. Robert E. Adair, P.E. and BB Bush inspected the tower on June 8, 2000 to record information regarding physical and dimensional properties of the structure and its associated appurtenances. Mr. Adair climbed the structure in its entirety to compile data necessary to perform the structural analysis.

The structure is a 160-foot, galvanized steel, three-legged Model SSV self-supporting tower manufactured by UNR-ROHN. This analysis was conducted using the following antenna inventory:

- (9) Swedcom 9011 panel antennas each with 1 5/8" waveguide on 15' gate boom mounts at 145' (proposed)
- (1) Whip antenna with 5/8" waveguide cable at 160'
- (15) ALP7130.16 panel antennas with 7/8" waveguide cables on 15-foot gate boom mounts at 155'
- (1) 12-foot section of 4" tube steel at 151'
- (1) Whip antenna with 7/8" waveguides cable on a 4-foot side-arm at 116'
- (1) 8-foot HP antenna with EW-52 waveguide cable at 110'
- (1) 6-foot dish with radome with 7/8" waveguide cable at 101'
- (1) Whip antenna with 7/8" waveguide cable on a 4-foot side-arm at 97'
- (1) 6-foot HP dish with EW-52 waveguide cable at 93'

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- (1) 10-foot HP dish with EW-52 waveguide cable at 71'
- (1) GPS antenna with 1/2" waveguide cable on a 3-foot side-arm mount at 47'
- (1) Whip antenna with 5/8" waveguide cable on 3-foot side-arm mount at 37'

FIELD INSPECTION:

1. **General Condition:**
The tower, which is a galvanized steel structure, is in very good condition. No signs of movement or overstress of the tower were observed. Surface rust was not observed on any tower members.
2. **Welded and Bolted Connections of Lattice Bracing:**
Connections were visually inspected to the maximum extent practicable. All connections that were observed appeared to be sound, with no loose or missing bolts noted.
3. **Antenna Connections:**
Antenna mounting hardware was observed to be in good condition, with corrosion-resistant hardware and galvanized members prevalent.
4. **Splice Plate Connections:**
Observed splice connections were in good condition. No loose or missing bolts or nuts were observed.

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with TIA/EIA-222-F, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures (EIA), and the American Institute of Steel Construction (AISC), Manual of Steel Construction, Allowable Stress Design, Ninth Edition.

The analysis was conducted using a wind speed of 80 miles per hour and one-half inch of radial ice over the entire structure and all appurtenances. The EIA/TIA Standard requires a minimum of 80 miles per hour for Hartford County, Connecticut. The tower was analyzed by calculating the resultant wind loading and associated maximum bending moments and axial loads. The moments and

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forces were used to calculate compressive and shear stresses in leg members, which were compared to allowable stresses according to AISC.

Two loading conditions were evaluated in accordance with EIA/TIA-222-F to determine the tower's capacity. The more demanding of the two cases is used to calculate the tower capacity:

- Case 1 = Wind Load (without ice) + Tower Dead Load
- Case 2 = 0.75 Wind Load (with ice) + Ice Load + Tower Dead Load

In addition, the EIA/TIA standard permits a one-third increase in allowable stresses for towers less than 700-feet tall. Allowable stresses of tower members were increased by one-third when computing the load capacity values shown below.

ANALYSIS RESULTS:

Our analysis determined the existing tower and foundation will support the proposed antennas. The following table summarizes the capacity of the tower with the proposed additions, based on compressive stresses of the leg members:

Tower Capacity

Elevation	Capacity
0-20'	80%
20'-40'	82%
40'-60'	69%
60'-80'	88%
80'-100'	87%
100'-120'	96%
120'-140'	76%
140'-160'	27%

Evaluation of Bracing Members:

Bracing consists of angle members installed in an X-bracing configuration. In this arrangement, each compression member is paired with a matching tension

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member. Diagonal bracing was determined to be appropriately sized based on a slenderness ratio (effective length divided by the radius of gyration) of 200 or less, as required by paragraph 3.1.12 of EIA/TIA-222-F.

Evaluation of Anchor and Splice Bolts:

Evaluation of the base anchor bolts and each tower section's splice bolts were conducted in accordance with AISC. We found all splice and anchor bolts to be adequately sized.

Analysis of Tower Foundations:

Evaluation of the existing base foundations was not performed, as information on their design or construction was not available to HEB.

Base reactions imposed by the proposed antennas were calculated to be as follows:

Tension:	144.4 kips
Compression:	168.8 kips
Shear:	35.8 kips
Overturning Moment:	3190.2 ft-kips

CONCLUSIONS AND SUGGESTIONS:

As detailed above, our analysis indicates that Verizon Wireless' 160-foot ROHN self-supporting tower in Windsor, Connecticut is capable of supporting the additional antenna loading proposed.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in new condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Weep holes on tube and pipe members are open.



6. Tower is in plumb condition.
7. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

H. E. Bergeron Engineers, P.A. (HEB) is not responsible for any modifications completed prior to or hereafter which HEB is not or was not directly involved. Modifications include but are not limited to:

1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Adding or relocating stabilizers.
4. Installing antenna mounting gates or side arms.
5. Extending tower.

HEB hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact HEB. HEB disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Exhibit D

Power Density Calculations

482 Pigeon Avenue

Windsor, CT

Technical Memo

To: Brendan Sharkey
From: Chetan Dhaduk (Radio Engineering Consultant)
cc: Mike Fulton
Subject: Power Density Report for CT11227C
Date: 10/25/00

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 Verizon Tower at 482 Pigeon Hill Road, Windsor 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 VSW transmitters are in the 1930-1945 MHz frequency band.
- 2) The antenna cluster consists of three sectors, with up to four antennas per sector. The model number for each antenna is EMS RR90-17-02 DP.
- 3) The EMS antenna height is 145' centerline.
- 4) The maximum transmit power from each sector, based on the worse case calculation with four antennas per sector, is 3172.63 Watts Effective Isotropic Radiated Power (EIRP).
- 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 Verizon Tower is 0.033106 mW/cm². This value represents only 3.3106% of the Maximum Permissible Emission (MPE) standard of 1000 microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$) set forth in the FCC/ANSI/IEEE C95.1-1991. The collective "worst-case" exposure would be only 9.8206% of ANSI/IEE Standard, as calculated for mixed frequency sites. Details are shown in the attachment. Furthermore, the proposed antenna locations for VoiceStream Wireless on Verizon Tower at 482 Pigeon Hill Road, Windsor CT 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 Calculation on Tower at 482 Pigeon Hill Road, Windsor, CT

Region 11 - Connecticut		
Power Density Calculation - Worst Case		
Base Station TX output	17 W	42.30
Number of channels	8	
Antenna Model	EMS: RR-90-17/ RV-90-17	
Antenna Gain	16.5 dBi	
Cable Size	1 5/8"	
Cable Length	157 ft	
Jumper & Connector loss	1 dB	
Cable Loss per foot	0.0116	
Total Cable Loss	1.8212 dB	
Total Attenuation	2.8212 dB	
Total EIRP per channel	55.98 dB	396.58 W
Total EIRP per sector	65.01 dB	3172.63 W
Ground Reflection	1.6	
Frequency	1930 MHz	
Antenna Height	145 ft	4419.6 cm
nsq	13.6788	
Power Density (S) =	0.033106 mW / cm ²	
% MPE =	3.3106%	

Combined %MPE Without Voicestream = 6.5100%

Combined %MPE With Others and Voicestream Wireless = 9.8206%

Equation Used :

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

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