



STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

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

May 25, 2000

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

RE: TS-VOICESTREAM-076-000502 - VoiceStream Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 8 Old Route 79 in Madison, Connecticut.

Dear Mr. Sharkey:

At a public meeting held May 24, 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. Approval is conditioned on the installation of erosion and sedimentation controls to stabilize the area south of the equipment compound. 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 May 2, 2000, and additional information dated May 22, 2000.

Thank you for your attention and cooperation.

Very truly yours,

  
Mortimer A. Gelston  
Chairman

MAG/RKE/rgg

c: Honorable David S. LaFemina, First Selectman, Town of Madison  
Michelle G. Briggs, SNET Mobility  
Sandy M. Carter, Verizon Wireless  
Ronald C. Clark, Nextel

22 May, 2000

Robert Erling  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

RECEIVED

MAY 22 2000  
CONNECTICUT  
SITING COUNCIL

**Re: Request by VoiceStream Wireless for an Order  
to Approve the Shared Use of a Tower Facility  
8 Old Route 79, Madison, Connecticut**

Dear Mr. Erling:

As a follow-up to the above-referenced tower sharing application, VoiceStream Wireless, Inc. ("VoiceStream") is providing the following information to respond to your questions about the possibility of moving our equipment cabinet further from existing wetlands on the property.

It is not possible to move the equipment to the other side of the tower (the north side) because the cable bridge to the SNET and Bell Atlantic Mobile equipment buildings is located in that position. The drawings submitted with our application do not indicate this feature of the existing site.

I am also enclosing a copy of the site plan and wetlands permit that was originally approved by the Madison Inland Wetlands Agency in 1999 and provided to us by the town. As you will see, the Agency originally approved the relocation of a propane storage tank on a concrete slab beyond the area of our proposed equipment slab. Our equipment location, therefore, is well within the approved compound for the replacement tower, and further removed from the wetland boundary than the original proposal.

I trust this should satisfy your inquiry. If you have any additional questions, please feel free to contact me.

Sincerely

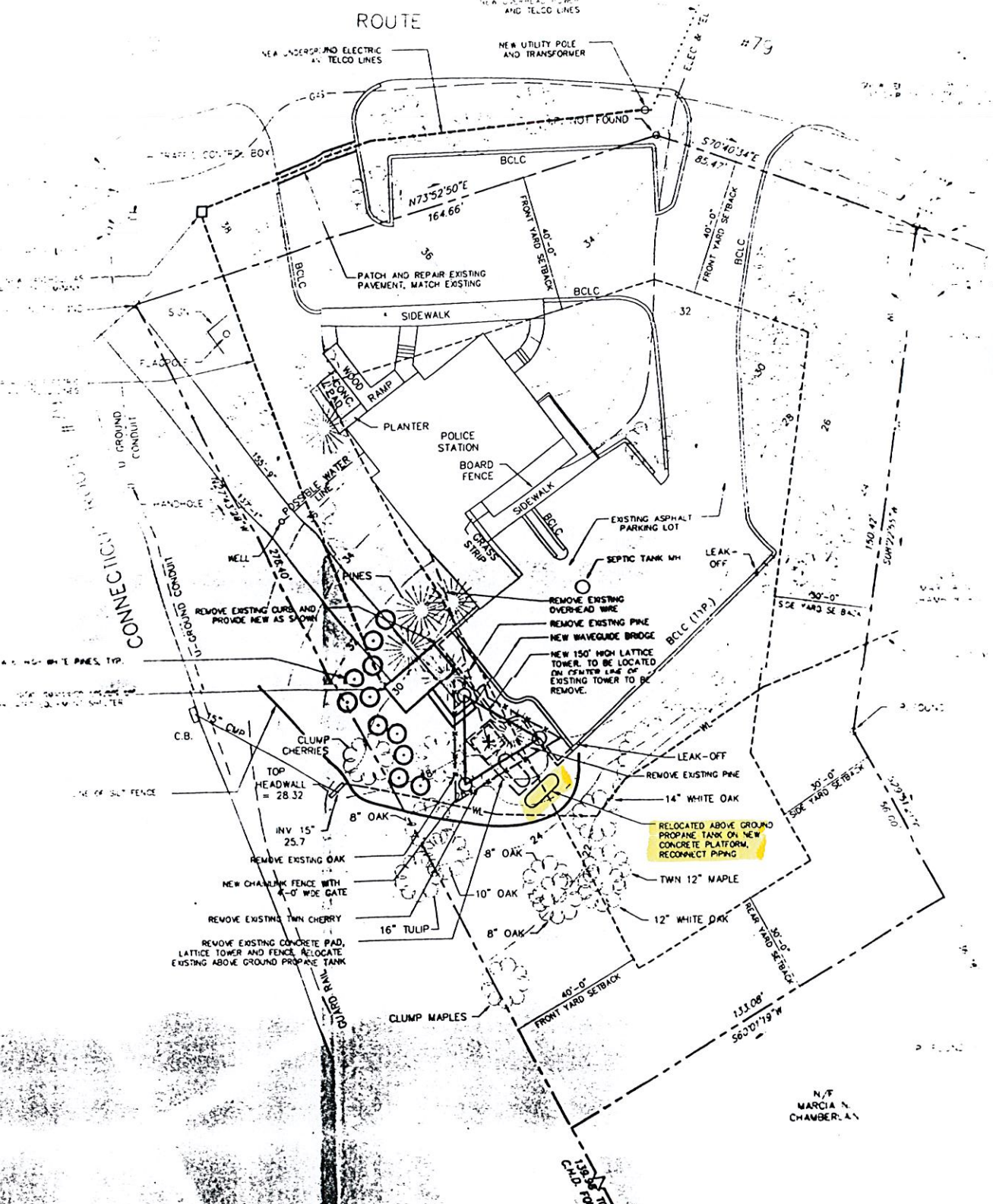


J. Brendan Sharkey, Esq.  
for VoiceStream Wireless Corp.

enclosures

ROUTE

#79



① SITE PLAN SCALE 1"=20'-0"

N/F MARCIA N. CHAMBERLAIN



8 CAMPUS DRIVE  
MADISON, CONNECTICUT 06443-2563  
(203) 245-5832  
FAX (203) 245-5813

February 2, 1999

SMART SMR of New York, Inc.  
Nextel Communications  
100 Corporate Place  
Rocky Hill, CT 06067

TOW

Z 594 530 629

US Postal Service  
**Receipt for Certified Mail**  
No Insurance Coverage Provided.  
Do not use for International Mail (See reverse)

Street & Number: **100 CORPORATE PLACE**  
City, State & ZIP Code: **Rocky Hill, CT 06067**

Postage: \$ **1.33**

Certified Fee: **1.40**

Special Delivery Fee

Restricted Delivery Fee

Return Receipt Showing Whom & Date Delivered

Return Receipt Showing Whom, Date, & Address of Recipient

TOTAL Postage & Fees: \$ **2.73**

Postmark or Date: **FEB 9 1999 06443**

PS Form 3800, April 1995

Re: Application 99-4: 8 OLD ROUTE 79. Request for Regulated Activity Permit to allow replacement of tower with monopole encroaching into the wetlands buffer.

Gentlemen:

At their regular meeting on February 1, 1999, the Madison Inland Wetlands Agency approved the application above referenced as presented at the meeting and as shown on the *Site Plan Modification Plan* and *Site Plan Modification Plan Details*, sheets C-1 and C-2, dated 11-09-98.

The duration of this permit is for two years, unless extended by the Agency, and all activities must be completed within this time.

Very truly yours,

*Robert E. Kuchta*

Robert E. Kuchta  
Inland Wetlands Enforcement Officer

For GLENN W. FALK  
Chairman, Madison Inland Wetlands Agency

:drk

Copy to URS Greiner Woodward Clyde

logged



STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

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

May 16, 2000

Honorable David S. LaFemina  
First Selectman  
Town of Madison  
Madison Town Campus  
8 Campus Drive  
Madison, CT 06443-2563

RE: TS-VOICESTREAM-076-000502 - VoiceStream Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 8 Old Route 79 in Madison, Connecticut.

Dear Mr. LaFemina:

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 Wednesday, May 24, 2000, at 1:30 p.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/jlh

Enclosure: Notice of Tower Sharing

2 May, 2000

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

**RECEIVED**  
MAY - 2 2000  
CONNECTICUT  
SITING COUNCIL

**Re: Request by VoiceStream Wireless for an Order  
to Approve the Shared Use of a Tower Facility  
8 Old Route 79, Madison, Connecticut**

Dear Chairman Gelston and Members of the Council:

Pursuant to Connecticut General Statutes §16-50aa, VoiceStream Wireless, Inc. ("VoiceStream") hereby requests an order from the Connecticut Siting Council ("Council") to approve the proposed shared use of an existing tower located at 8 Old Route 79 in Madison, Connecticut adjacent to the Madison Police Headquarters. The tower is owned and operated by Spectrasite, Inc. ("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 on Old Route 79 in Madison is a 150-foot monopole located on a 20' x 30', or approximately 600 sq. ft. compound. The coordinates for this location are 41-17-09 N and 72-36-07 W. Nextel Communications ("Nextel") currently has antennas mounted on the tower with centerlines at approximately 148 feet above ground level ("AGL") extending to 150 feet AGL. Bell Atlantic Mobile ("BAM") and Springwichee Cellular Limited Partnership ("SNET") have also recently been approved by the Council to install its antennas with centerlines at the 140- and 130-foot levels, respectively. The Town of Madison will also install whip antennas for its police and fire departments at the 100- and 90-foot levels 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, approvals, and authorizations which may be required for the proposed shared use of this facility.

**8 Old Route 79, Madison**  
**Page 2**

As shown on the site plan drawings and tower elevations attached as Exhibit A, VoiceStream proposes to install a total of six antennas on a platform with centerlines at 120-feet AGL. A total of four antennas, two per sector, will be EMS Dual-Pol Model RR90-17-02DP. The third sector will have two Allgon 7250.02 antennas. The radio transmission equipment associated with these antennas, Nortel S8000 cabinets, would be mounted on a concrete slab at the base of the monopole.

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 recently rebuilt and was designed to accommodate at least five 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 Old Route 79 in Madison. (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, BAM, SNET, Town of Madison and VoiceStream antennas, would be 21.23% of the ANSI standard. These calculations are attached as Exhibit D.
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 compound behind the Madison Police Station off Old Route 79. The size and location of the tower have been approved by the Town of Madison 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 on Old Route 79 in Madison, 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.





**8 Meetinghouse Lane, Madison**  
**Page 4**

Thank you for your consideration of this matter.

Sincerely,

J. Brendan Sharkey, Esq.  
for VoiceStream Wireless

Attachments

cc: David LaFemina, First Selectman

# **Exhibit A**

## **Design Drawings**

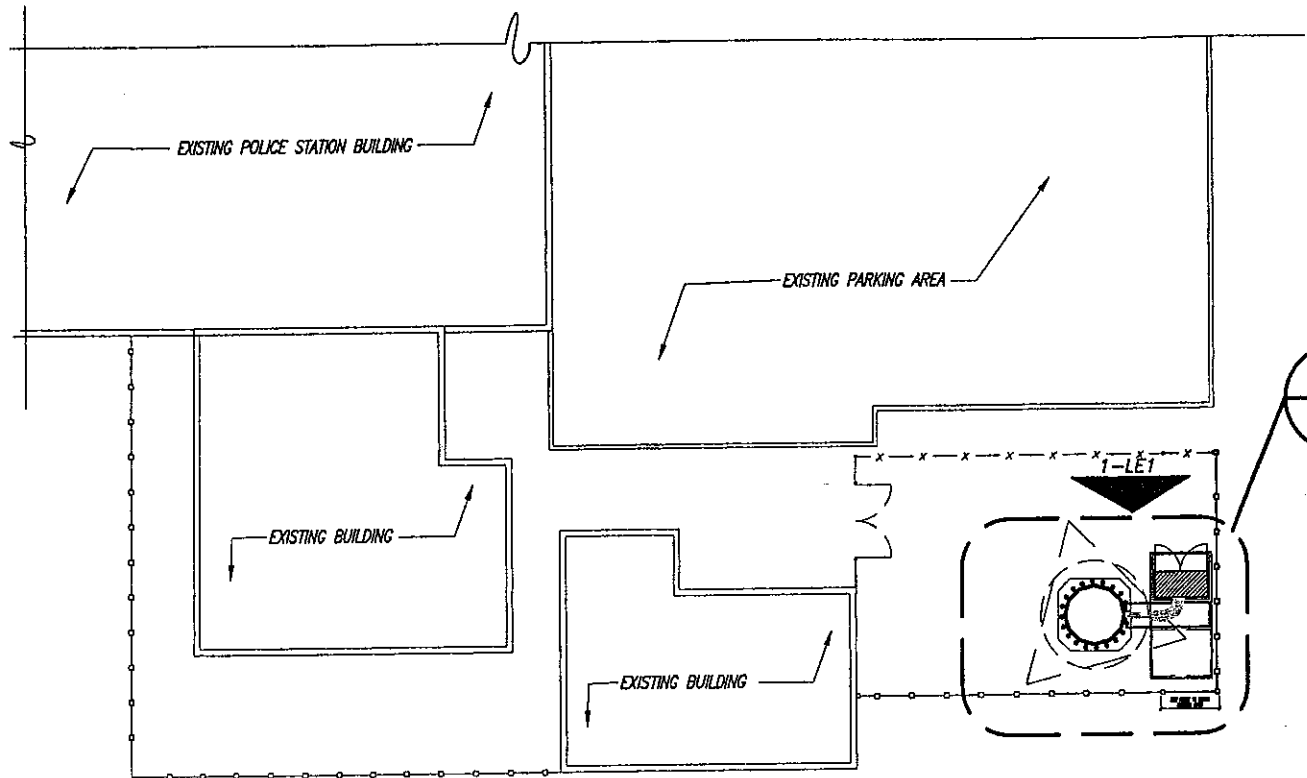
**Old Route 79**

**Madison, CT**

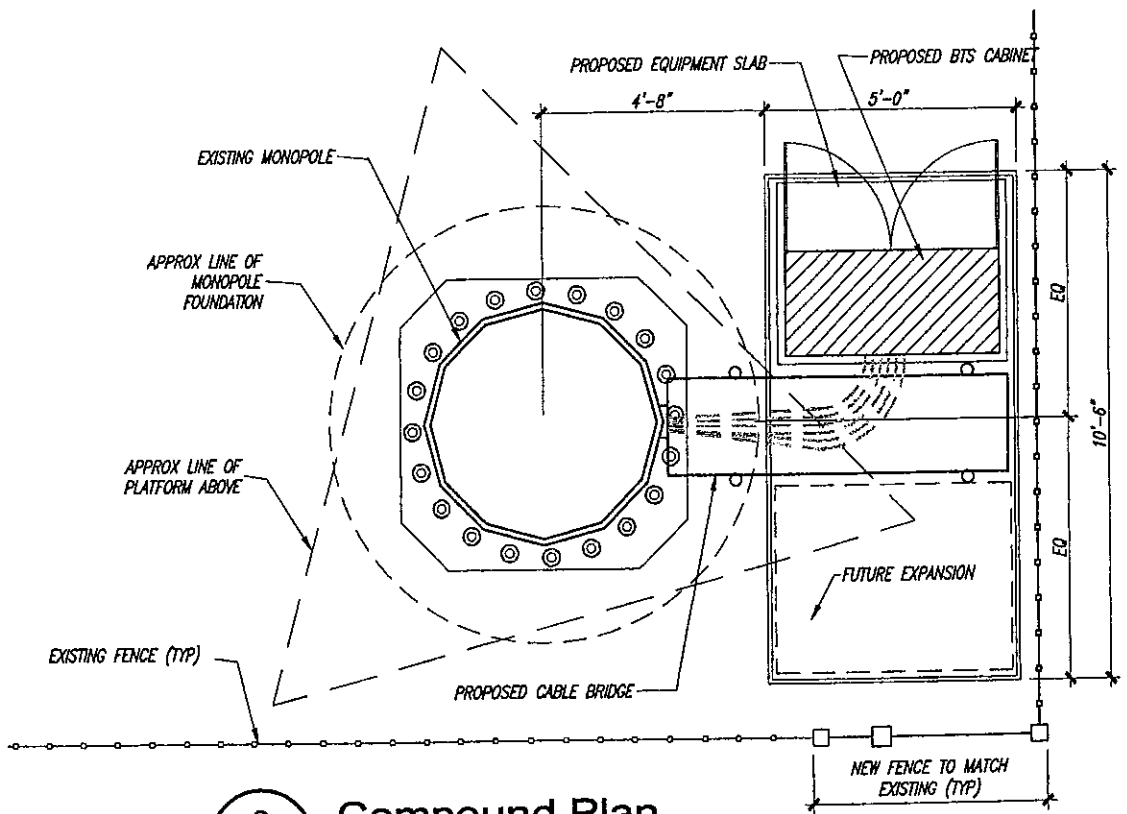
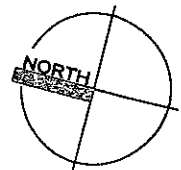
X-REFS. 320325-167A-BORDER.DWG

H:\VOICESTREAM-OMNIPPOINT\MADISON\320325-167A\CAD\320325-167A-LE-1.DWG

FRI, APR 28, 2000 08:40 A



**2 Site Diagram**  
LE1 SCALE: 1/16" = 1'-0"

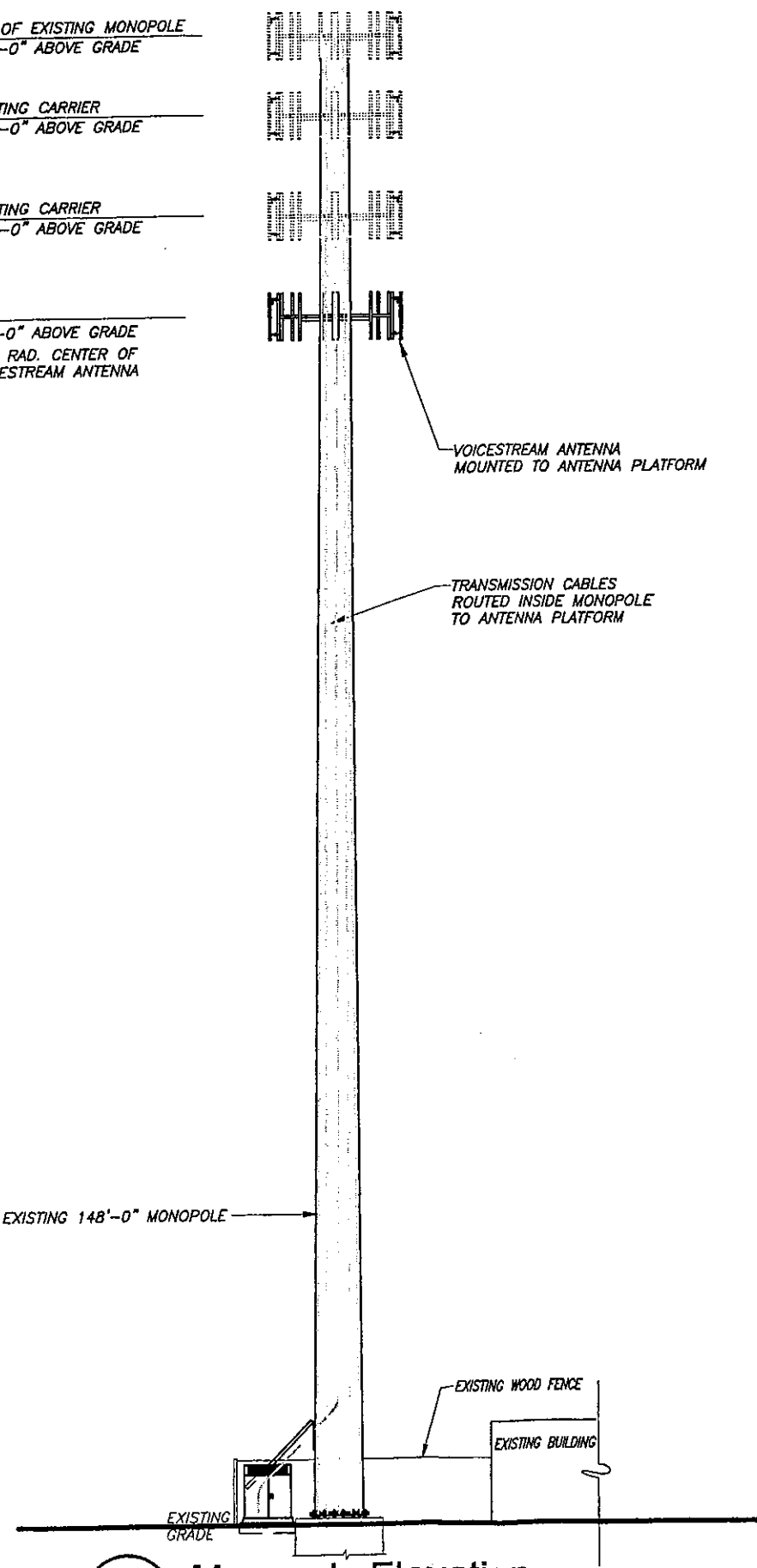


**3 Compound Plan**  
LE1 SCALE: 1/4" = 1'-0"

**NOTE:**  
LEASE EXHIBITS SUBMITTED ARE A CONCEPTUAL REPRESENTATION OF THE LEASE AGREEMENT ONLY. CONSTRUCTION DOCUMENTS MAY VARY FROM THESE EXHIBITS IN ORDER TO COMPLY WITH ALL APPLICABLE CODES.

THIS PLAN WAS PREPARED USING ABILABLE SITE INFORMATION FROM SEVERAL SOURCES, SOME OF WHICH MAY BE UNCONFIRMED, AND REPRESENTS A CONCEPTUAL SITE DEVELOPMENT PLAN BASED ON DEVELOPMENT REQUIREMENTS PROVIDED BY VOICESTREAM WIRELESS.

- TOP OF EXISTING MONOPOLE  
148'-0" ABOVE GRADE
- EXISTING CARRIER  
140'-0" ABOVE GRADE
- EXISTING CARRIER  
130'-0" ABOVE GRADE
- 120'-0" ABOVE GRADE  
RAD. CENTER OF  
VOICESTREAM ANTENNA



**1 Monopole Elevation**  
A2.01 SCALE: 1/16" = 1'-0"

**Carter Burgess**  
481 BUCKLAND ROAD, SUITE 201  
SOUTH WINDSOR, CT 06074  
TEL 860-648-5619 FAX 860-648-5665

**NOTE:**  
FOR INTERIM REVIEW AND NOT INTENDED FOR BIDDING, PERMIT, OR CONSTRUCTION PURPOSES.

ARCHITECT: ROBERT A. AMATULI  
REGISTRATION NO.: 9168

**Preliminary Drawing**

Rev. No.	Date:

Client:

**VoiceStream WIRELESS**  
100 FILLEY STREET  
BLOOMFIELD, CT 06002

**OMNIPPOINT**  
OmniPoint Communications Inc.  
A subsidiary of VoiceStream Wireless Corporation

Client Approvals:

Approved By:	Signature:	Date:
OWNER/SAC:		
RF ENGINEER:		
CONSTRUCTION:		

Drawing Title:  
**LEASE EXHIBIT**

Project Name:  
**VOICESTREAM CO-LOCATE  
OLD RTE 79  
MADISON, CT**

Client Site I.D.:  
**CT-11167A**

Drawing No.  
**LE1**

Pl:	Drawn By:	Date:
KAM	TK	4/26/2000

CB Project No:  
**320325**

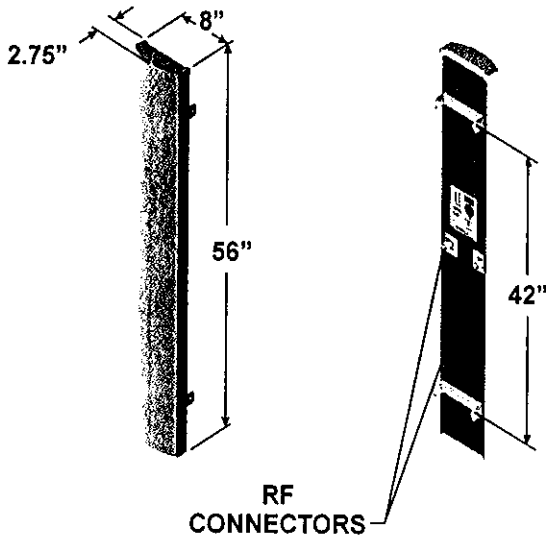
# **Exhibit B**

## **Equipment Specifications**

**Old Route 79**

**Madison, 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)

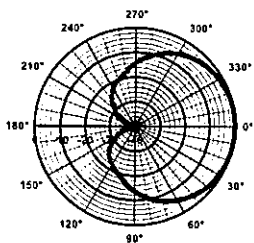
Note: Patent Pending and US Patent number 5, 757, 246.

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](http://www.emswireless.com) and reflect all updates.

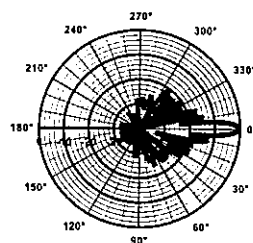
## MOUNTING OPTIONS

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"

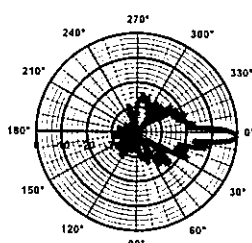
\* Model number shown represents a series of products. See mounting options section for specific model number.



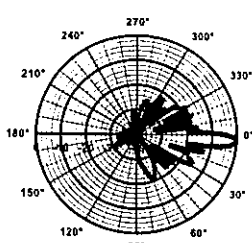
Azimuth



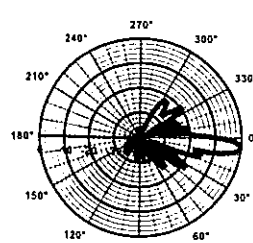
Elevation  
0° Downtilt



Elevation  
2° Downtilt



Elevation  
4° Downtilt

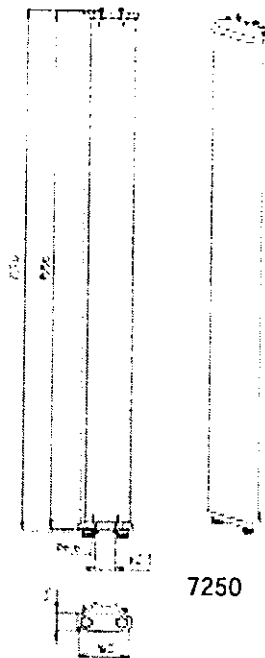


Elevation  
6° Downtilt

Electrical Specifications	7250.03 (+45,-45 )
Polarization	linear dual polarized, slanted $\pm 45^\circ$
Co-polar gain dBd (dBi)	16.5 (18.5)
Isolation between inputs	>30 dB
Cross polar discrimination	>20 dB
Horizontal -3dB beamwidth	65°
Vertical -3dB beamwidth	5.5
Front-to-back ratio, total power	>20 dB
Front to back ratio, co-polar	>23 dB
Electrical Downtilt	2°
Nominal Impedance	50 ohm
VSWR	<1.3:1
Maximum input power	250W
Intermodulation products(2Tx@10 W)	<-110 dBm
First null below the horizon	>-23 dB
First upper side lobe suppression	>19 dB

Mechanical Specifications	7250.03
Connector	N, 7/16
Position	Lower
Height	60.6" (1.54m)
Width	6.5" (.165m)
Depth	2" (.05m)
Weight	15.4 lb (7kg)
wind speed	156 mph (70m/s)
Wind load, frontal @90mph(41.6m/s)	58 lbf. (259N)

PCS Dual Polarized 65°



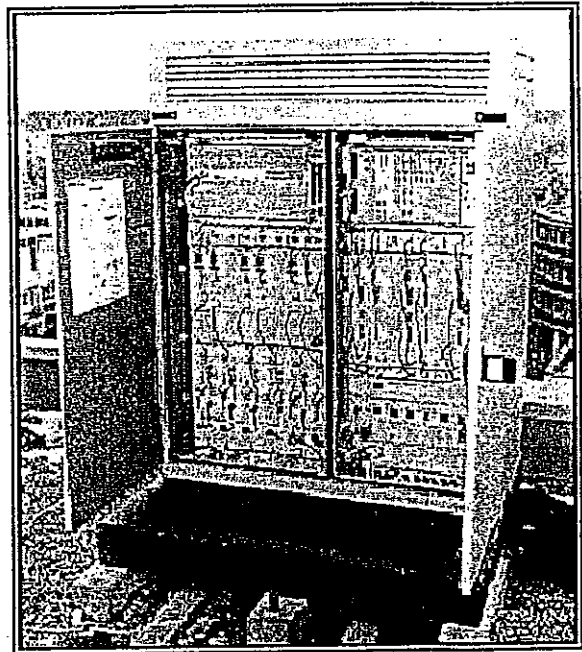
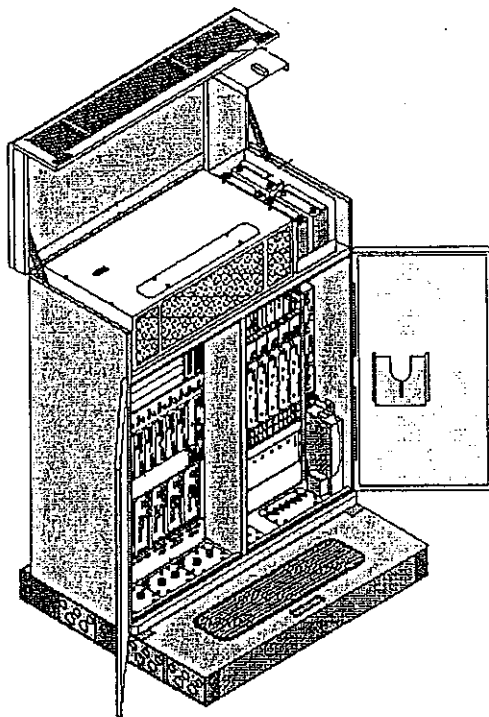
INFORMATION:  
Call 1-888-Allgon 1

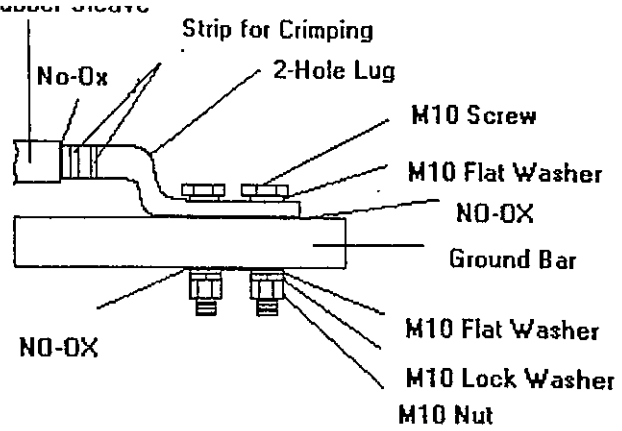
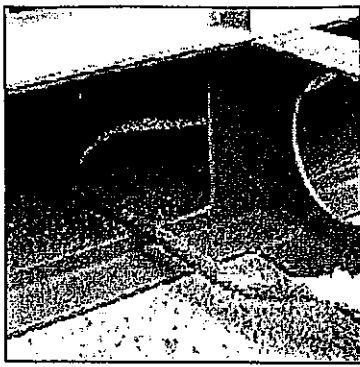




# S8000 BTS

## 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

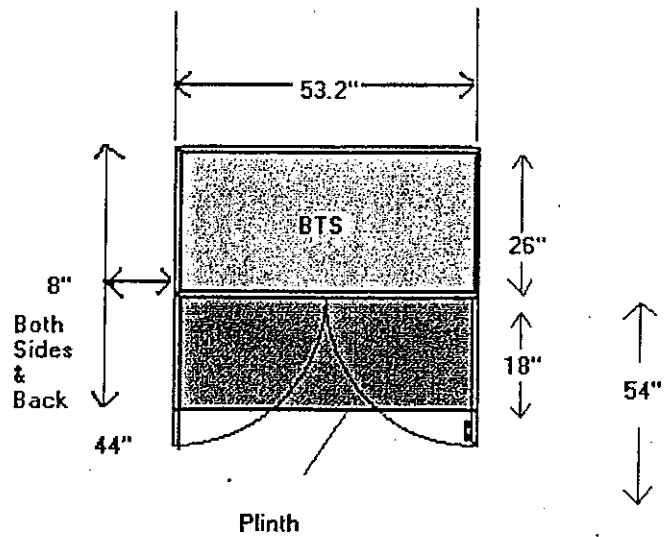
Weight:  
 87 pounds

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

## Floor Characteristics

Minimum Floor Resistance:  
 123 pounds/foot<sup>2</sup>

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

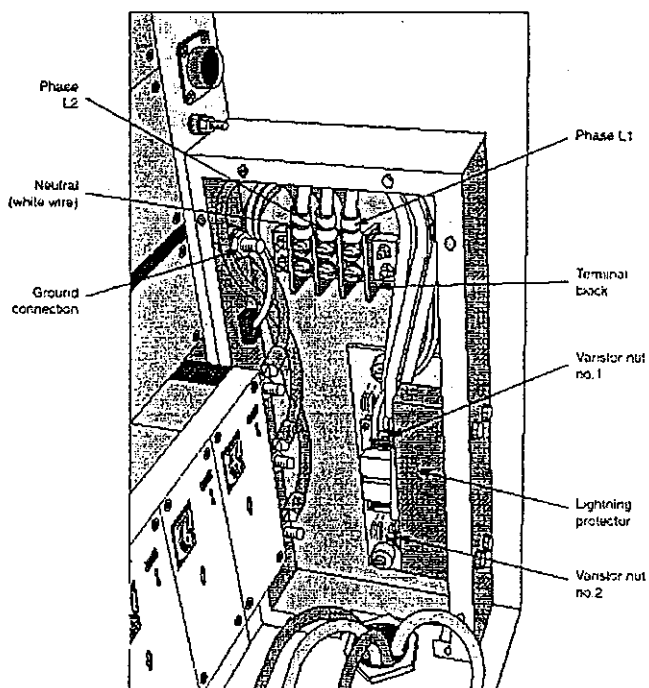
Ground: Yellow/Green 6 gauge

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.



## S2000H

### ■ O1, O2 and S11

### ■ S2000H Main Module

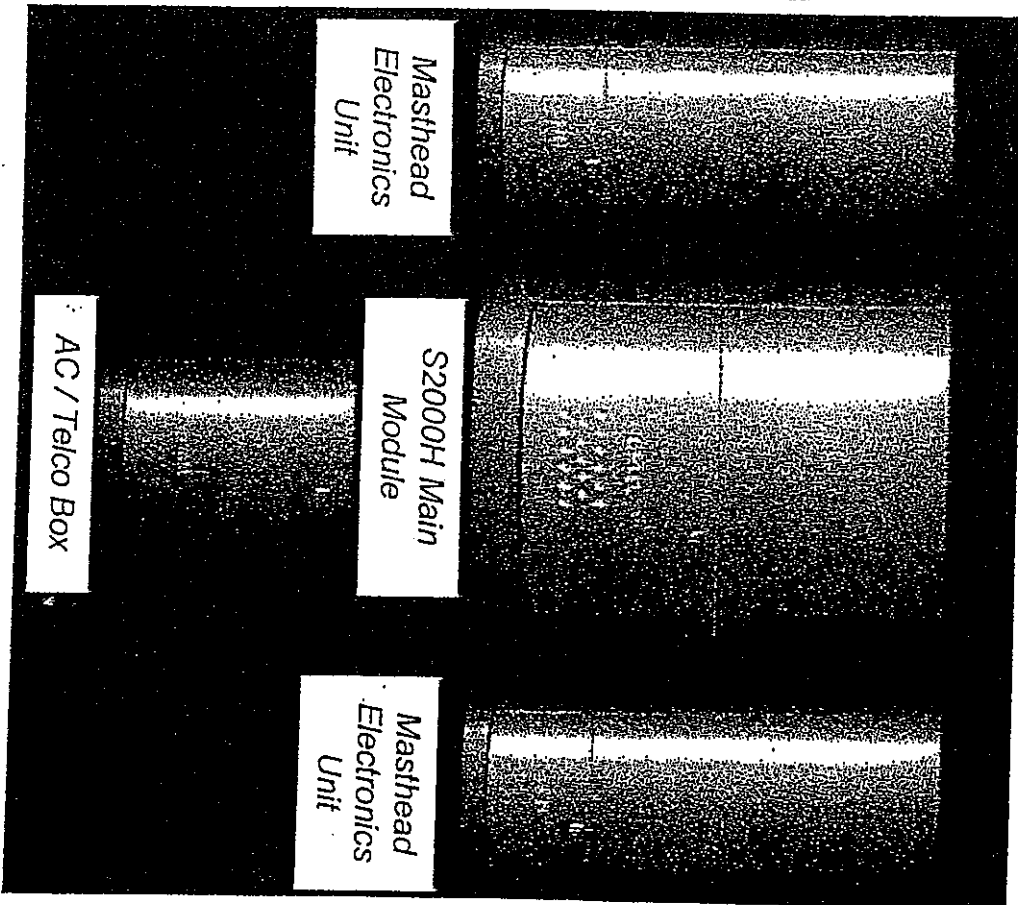
- 29.1" x 21.3" x 7.8" - 100 lbs
- 2 installable modules - less than 50 lbs each

### ■ Masthead Electronics Units (MEU)

- HPA, 2 LNAs and a duplexer
- Remoteable from Main Module: up to 230 feet
- 29.1" x 10.7" x 13.0" - 60 lbs

### ■ AC/Telco Termination box

- breaker, battery backup and lightning protection
- 16" x 12" x 8" - 40 lbs



# **Exhibit C**

## **Structural Analysis**

**Old Route 79**

**Madison, CT**

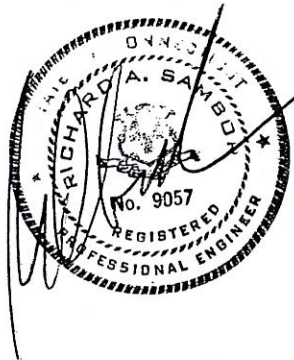
167

Analysis and Evaluation of 148' Proposed  
Monopole for New Antenna Arrangement

Madison Police Station  
Old Route 79  
Madison, Connecticut  
Summit Manufacturing No. 5606

Prepared for

Spectrasite, Inc.  
99 Cherry Hill Road  
Parisppany, New Jersey 07654



Prepared by

URS Greiner Woodward-Clyde, Inc.  
500 Enterprise Drive  
Rocky Hill, CT 06067

F300001804.36

December 1999

**Introduction:**

A structural analysis of this communication monopole was performed by URS Greiner Woodward-Clyde, Inc. (URSGWC) for Spectrasite. The monopole is proposed to be installed and located in Madison, Connecticut.

The structure is a 148' galvanized steel 18-sided polygon tapered shaft with slip joint splice. The structure is self supporting and was manufactured by Summit Manufacturing, Inc..

This analysis was conducted to evaluate twist (rotation) sway (deflection) and stress on monopole and the effect of the forces to the foundation of the monopole, resulting from new antenna arrangement.

The antenna inventory is:

		<u>RAD Center Elevation</u>
12-ALP 9212-N antenna 14' low profile platform with (12) 1-5/8" coax cable within monopole	NEXTEL	@ 148' elevation
12-ALP 9212-N antenna 14' low profile platform with (12) 1-5/8" coax cable within monopole	BAM	@ 140' elevation
12-ALP 9212-N antenna 14' low profile platform with (12) 1-5/8" coax cable within monopole	SNET	@ 130' elevation
12-ALP 9212-N antenna 14' low profile platform with (12) 1-5/8" coax cable within monopole	Omnipoint	@ 120' elevation
(12) Allgon 7184.14 antenna with 14' low profile platform with (12) 1-5/8" coax cable within or along outside along the perimeter and length of monopole.	AT&T	@ 110' elevation
(3) 10' whip antenna with (3) 6' side arms and their required coax cables within the monopole.	Town	@ 100' elevation
(3) 10' whip antenna with (3) 6' side arms and their required coax cables within the monopole.	Town	@ 90' elevation

**Structural Analysis:**

Methodology:

The monopole analysis was done in accordance with TIA/EIA-222-F June 1996, Structural Standard for Steel Antenna Towers and Antenna Supporting Structure; The American Institute of Steel Construction (AISC), Manual of Steel Construction; Allowable Stress Design (ASD).

The analysis was conducted by placing one-half inch of radical ice over the entire structure and all appurtenances, then applying a simultaneous wind load at 85 mph. Two analytical methods were used to evaluate the structure: a two-dimensional model using spreadsheet program developed by URSGWC and three-dimensional space frame analysis and design, using STAAD-PRO 3.1 Finite element software. The spreadsheet program was used to generate dead load, ice load, wind on ice and wind load. The maximum bending and axial load were used to calculate stress and movement on monopole which were compared to allowable stresses according to AISC and TIA/EIA. The three load combination was investigated in STADD/PRO Model to determine the stress, sway and rotation.

- Case 1 = 85 mph Wind Load (without ice) + Tower Dead Load
- Case 2 = 0.75 Wind Load (with ice) + Ice Load + Tower Dead Load
- Case 3 = 50 mph Wind + Dead Load (for deflection)

The TIA/EIA standard permits one third increase in allowable stresses for towers and monopoles less than 700 feet tall. For purposes of this analysis, allowable stresses of monopole member were increased by one-third in computing the load capacity.

#### **Evaluation of Monopole:**

Combined axial and bending stresses on the monopole structure were evaluated to determine allowable stresses in accordance with AISC. In all cases, calculated stresses under the proposed loading were less than allowable stresses

#### **Analysis and Evaluation of Foundation:**

Our calculation indicates that the combined axial load, shear and bending moment acting at the top of the foundation are less than the original design loads. The proposed foundation is designed based on the original (higher) foundation reactions.

The original design load is provided in manufacturing drawing. The analysis and design of foundation is included in Appendix A.

#### **Analysis Results:**

Our analysis determined the tower will support the proposed new antenna arrangements under the analysis criteria outlined above.

Our analysis for proposed new antenna arrangement and load condition is provided in Appendix A.

#### **Limitations/Assumptions:**

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are as specified in the original Construction Document.
3. All required members are in place.
4. All bolts are in place and are properly tightened.

5. Tower is installed in plumb condition.
6. All members are galvanized.
7. All tower members are detailed, fabricated, and will be installed as specified in the original Design Documents.
8. Foundations were properly constructed to support original design loads as specified in the original Bid Document.
9. All co-axial cable is installed within the monopole, except as noted.

URSGWC is not responsible for any modifications completed prior to or hereafter which URSGWC is not or was not directly involved. Modifications include but are not limited to:

1. Adding or relocating antennas.
2. Installing antenna mounting gates or side arms.

URSGWC 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 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 URSGWC. URSGWC disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

# **Exhibit D**

## **Power Density Calculations**

**Old Route 79**

**Madison, CT**



Worst Case Power Density for installation on a Nextel Lattice Tower at 8 Meetinghouse Lane Madison, CT

**Region 11 - Connecticut**

**Power Density Calculation - Worst Case**

Base Station TX output	20 W
Number of channels	4
Antenna Model	EMS: RR-90-17/ RV-90-17
Cable Size	1 5/8" <input type="button" value="▼"/>
Cable Length	130.0 ft
Antenna Height	120.0 ft
Ground Reflection	1
Frequency	1930.00 MHz
Jumper & Connector loss	1 dB
Antenna Gain	16.5 dBi
Cable Loss per foot	0.0116 Loss per/ft
Total Cable Loss	1.508 dB
Total Attenuation	2.508 dB
Total EIRP per channel	57.00 dB
(In Watts)	501.45 W
Total EIRP per sector	63.02 dB
(In Watts)	2005.81 W
nsg	13.992
Power Density (S) =	0.030560 mW / cm <sup>2</sup>
% MPE =	3.0560%

Equation Used :

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

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**Worst Case Power Density for installation on a Nextel Lattice Tower at 8 Meetinghouse Lane Madison, CT**

	Applicable ANSI STND	Calculated Worst- Case	Percentage of STND
	mW/cm2	mW/cm2	
BAM	0.583	0.0348	5.97 %
SCLP	0.59	0.0404	6.85 %
Nextel	0.572	0.0144	2.52 %
Town Fire	0.307	0.0032	1.04 %
Town	0.2	0.0036	1.80 %
VoicesStream	1	0.0305	3.05 %
<b>Total</b>			<b>21.23 %</b>