STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

June 26, 2002

Stephen J. Humes
LeBoeuf, Lamb, Greene & MacRae
Goodwin Square
225 Asylum Street
Hartford, CT 06103

RE: **EM-VOICESTREAM-025-020611** - Omnipoint Communications, Inc. notice of intent to modify an existing telecommunications facility located on Summit Road, Cheshire, Connecticut.

Dear Attorney Humes:

At a public meeting held on June 25, 2002, 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.

The proposed modifications are to be implemented as specified here and in your notice dated June 11, 2002. 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/laf

c: Honorable Sandra R. Mouris, Council Chairman, Town of Cheshire
Richard A. Pfurr, Town Planner, Town of Cheshire
Robert Stanford, Crown Atlantic Company LLC
Sandy M. Carter, Verizon Wireless
Julie M. Donaldson, Esq., Hurwitz & Sagarin LLC

I:\siting\em\voicestream\cheshire\dc062502.doc

LeBoeuf, Lamb, Greene & MacRae
L.L.P.

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FACSIMILE: (860) 293-3555

WRITER'S DIRECT DIAL:
(860) 293-3744

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June 20, 2002

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

Re: EM-VOICESTREAM-025-020611 - Omnipoint Communications, Inc. Notice of Intent to Modify an Existing Telecommunications Facility Located on Summit Road, Cheshire, Connecticut.

Dear Mr. Chairman:

With respect to the above-referenced pending exempt modification application, Omnipoint Communications, Inc. ("VoiceStream"), a subsidiary of VoiceStream Wireless Corporation respectfully submits this letter to the Connecticut Siting Council ("the Council") to clarify the text of the original application, submitted to the Council on June 11, 2002. In that original application, VoiceStream indicated that: "Provisions have been made for two future cabinets within the building that will not be installed at this time." VoiceStream seeks approval to install those two cabinets at this time as part of the exempt modification project currently before the Council. The cabinets are shown in Drawing 4/Z-1, included in the original application as Exhibit B. The addition of these cabinets will not affect any other aspect of the application. All of VoiceStream's radio frequency power density calculations and structural analyses are correctly based on the addition of twelve antennas to the tower as stated in the June 11, 2002 application. It is necessary for Voicestream to install all three cabinets to serve those twelve antennas. Please feel free to contact me should you have any questions.

Very truly yours,

Stephen J. Humes
Counsel for VoiceStream

cc: Derek Phelps, Executive Director, Connecticut Siting Council
David Martin, Analyst, Connecticut Siting Council
Thomas Stretton, Chairman, Cheshire Town Council
Michael Milone, Cheshire Town Manager

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
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E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

June 12, 2002

Honorable Sandra R. Mouris
Council Chairman
Town of Cheshire
Town Hall
84 South Main Street
Cheshire, CT 06410

RE: **EM-VOICESTREAM-025-020611** - Omnipoint Communications, Inc. notice of intent to modify an existing telecommunications facility located on Summit Road, Cheshire, Connecticut.

Dear Ms. Mouris:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

The Council will consider this item at the next meeting scheduled for June 25, 2002, 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,

S. Derek Phelps
Executive Director

SDP/dsj

Enclosure: Notice of Intent

c: Richard A. Pfurr, Town Planner, Town of Cheshire

EM-VOICESTREAM-025-020611

LEBOEUF, LAMB, G
L.L.P.
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June 11, 2002

RECEIVED
JUN 11 2002
CONNECTICUT
SITING COUNCIL

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

Re: Notice of Exempt Modification
Summit Road, Cheshire, Connecticut

Dear Chairman Gelston and Members of the Council:

Please be advised that LeBoeuf, Lamb, Greene & MacRae, L.L.P. represents Omnipoint Communications, Inc. ("VoiceStream"), a subsidiary of VoiceStream Wireless Corporation in the above-referenced matter.[1] VoiceStream intends to install twelve (12) new antennas on the existing one hundred seventy foot Crown monopole, an existing telecommunications facility, on Summit Road in Cheshire. 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 Cheshire Town Manager Michael Milone, and the Chairman of the Cheshire Town Council, Thomas Stretton.

Background VoiceStream holds the "A block" "Wideband PCS" license for the 2-GHz PCS frequencies for the greater New York City area, including the entire State of Connecticut. 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.

---

[1] The corporate structure of VoiceStream is as follows: Omnipoint Communications, Inc. ("Omnipoint") is a 95.4% subsidiary of Omnipoint PCS, Inc. (hereinafter" OPCS"). OPCS is a wholly owned subsidiary of Omnipoint Finance, LLC (hereinafter, "OF"). OF is a wholly owned subsidiary of Omnipoint Finance Holding, LLC (hereinafter, "OFH"). OFH is a subsidiary of VoiceStream Wireless Corporation (hereinafter "VS"), which owns all of the outstanding common shares of OFH. VS is a wholly owned subsidiary of T-Mobile International AG (hereinafter "T-Mobile"). T-Mobile is a wholly owned subsidiary of Deutsche Telekom AG.

Discussion

The existing facility consists of a one hundred seventy foot (170'-0") Crown monopole (see design drawing 3/Z-1 attached as Exhibit B) and surrounding compound. The coordinates for the site are **41°-32'-11" N** and **72°-57'-26" W**. The tower is over eleven hundred feet (1,100') back (to the west) from Summit Road and approximately eight hundred feet (800') southeast of Interstate 84 in the northwestern portion of Cheshire (see site location map, attached as exhibit A). The site is accessed from a gravel drive off of Summit Road.

Currently, in addition to the VoiceStream proposal, three carriers are proposing to install antennas on the tower: Verizon at the one hundred sixty-eight foot (168') centerline above ground level ("AGL"), AT&T at the one hundred fifty-eight foot (158') centerline AGL and Sprint at the one hundred forty-eight foot(148') centerline AGL. VoiceStream's proposal calls for the placement of twelve new antennas at the one hundred thirty-eight foot (138') centerline AGL on a fourteen foot (14'), galvanized, low profile, triangular platform (see antenna mounting detail on drawing 5/Z-1, attached as Exhibit B). The configuration is a cluster of three sectors with four antennas per sector. A tower elevation is shown in drawing 3/Z-1, attached as Exhibit B. The model number for the VoiceStream antennas is EMS RR90-17-02DP. A structural analysis of the tower has been completed and is attached as Exhibit D. As stated in the structural analysis, the existing tower structure is capable of supporting the proposed VoiceStream installation as well as the equipment of the other three carriers. One new Nortel S8000 equipment cabinet will be installed inside an existing multi-tenant equipment facility building (see detail on drawings 2/Z-1 and 4/Z-1, attached as part of Exhibit B). A new cable bridge will be installed by VoiceStream from the equipment building to the tower (see drawing 4/Z-1). Provisions have been made for two future expansion cabinets within the building that will not be installed at this time. The existing sixty foot six inch by fifty foot (60'-6" x 50') fenced compound will not be altered in any way by the VoiceStream proposal (compound detail shown on drawing 2/Z-1). Utilities are currently in place to the equipment building.

The planned modifications to the Cheshire 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 and will not extend the boundaries of the existing compound area. The enclosed tower drawings confirm that the planned changes will not increase the overall height of the tower or change the dimensions of the compound.

2. The installation of VoiceStream equipment, as reflected on the attached site plan, will not require an extension of the site boundaries. The fence surrounding the existing compound will not be altered in any way.

3. The proposed modification to the facility 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 antennas 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 E.

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

Thank you for your consideration of this matter.

Respectfully submitted,

VOICESTREAM WIRELESS CORPORATION

By: _____

Its Counsel
Stephen J. Humes
Diane W. Whitney

cc: Michael Milone, Cheshire Town Manager
Thomas Stretton, Chairman, Cheshire Town Council

Exhibit A
Site Map
Summit Road
Cheshire, Connecticut

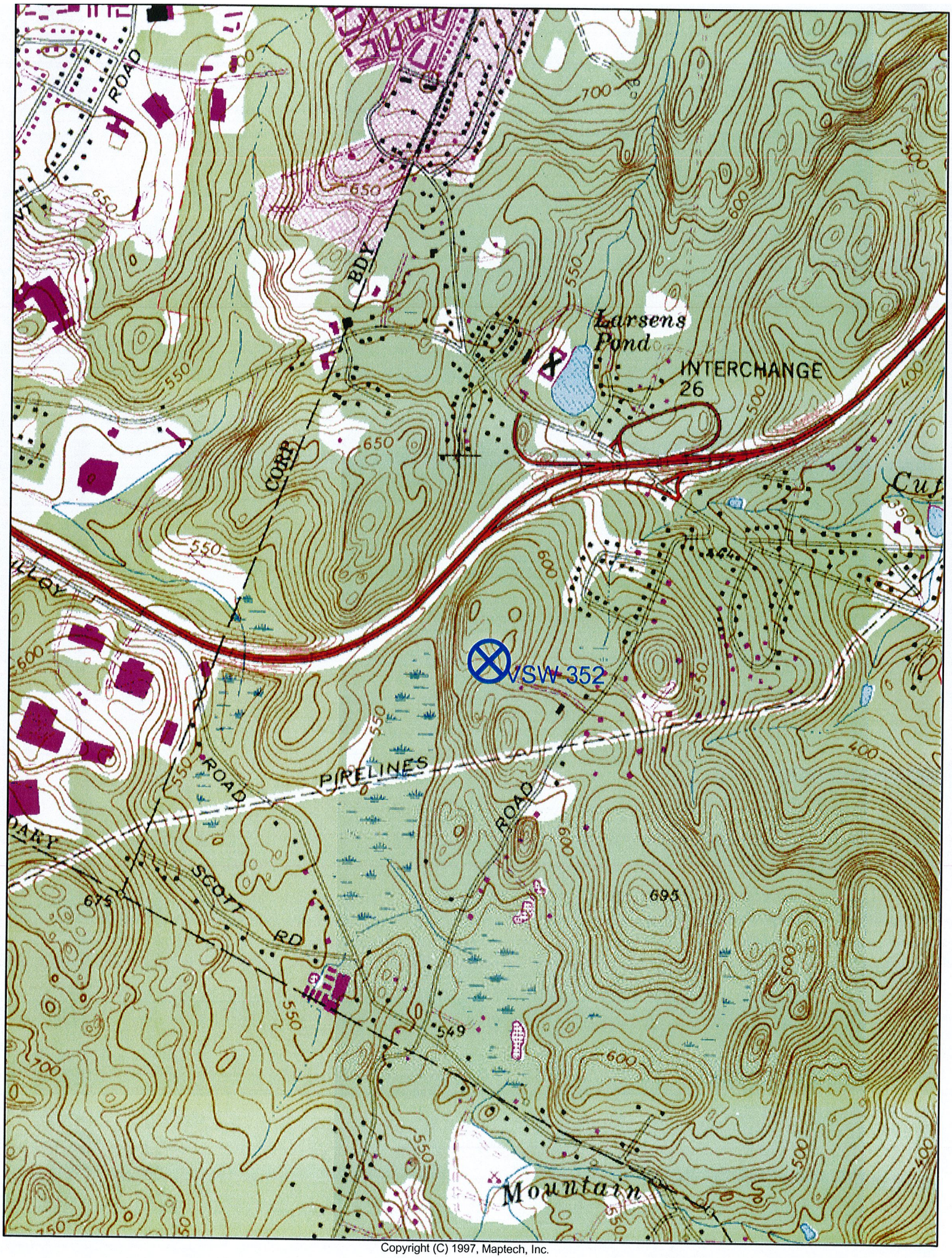
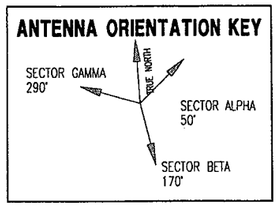


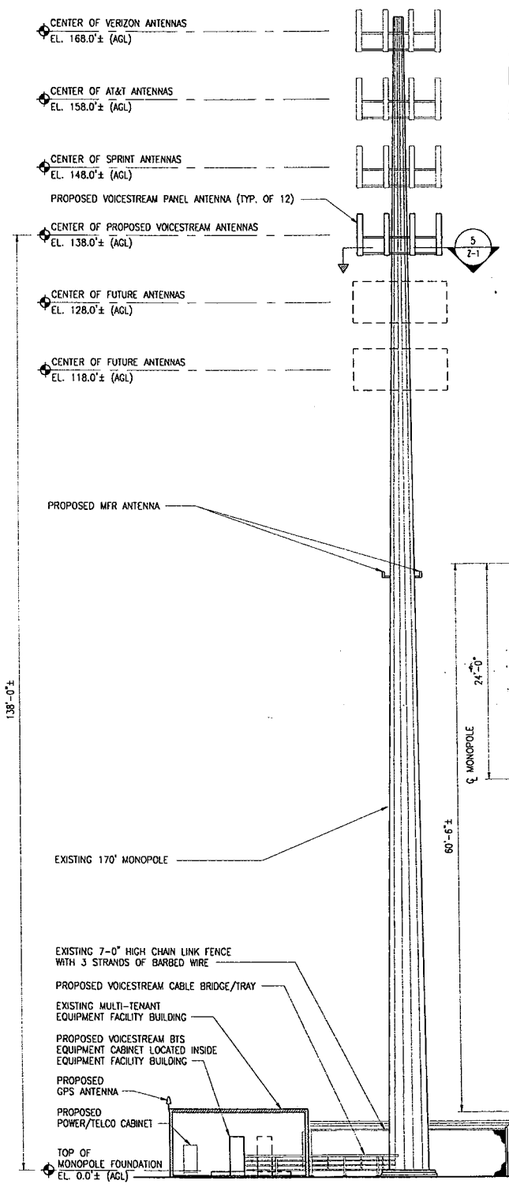
Exhibit B

Design Drawings

Summit Road

Cheshire, Connecticut



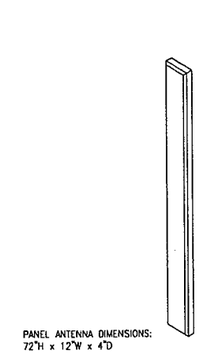


ELEVATION

SCALE: 3/32"=1'-0"

3 / Z-1

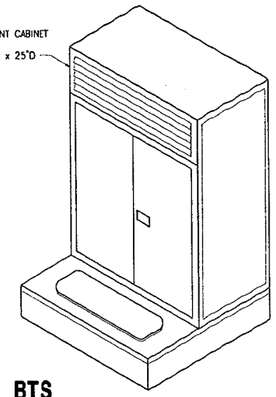
0 5'-4" 10'-8" 21'-4" 32'-0"



PANEL ANTENNA DETAIL

SCALE: NOT TO SCALE

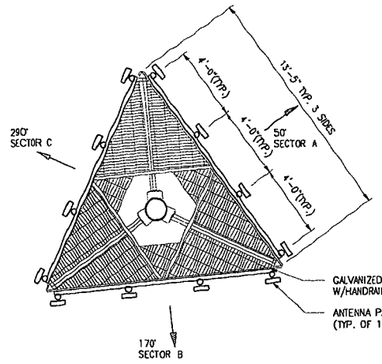
7 / Z-1



BTS EQUIPMENT CABINET

SCALE: NOT TO SCALE

6 / Z-1



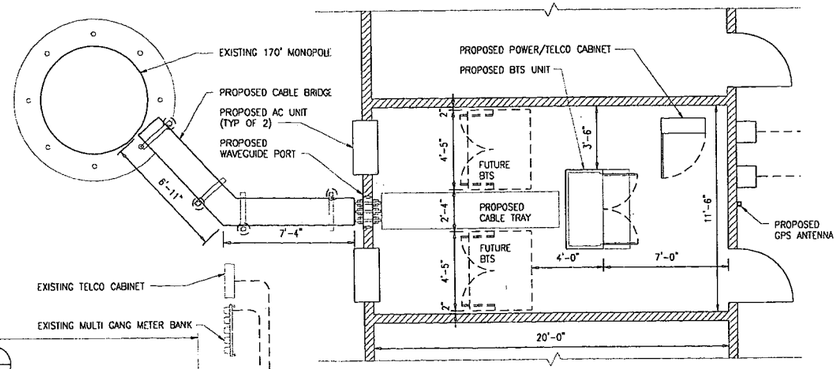
ANTENNA MOUNTING PLAN

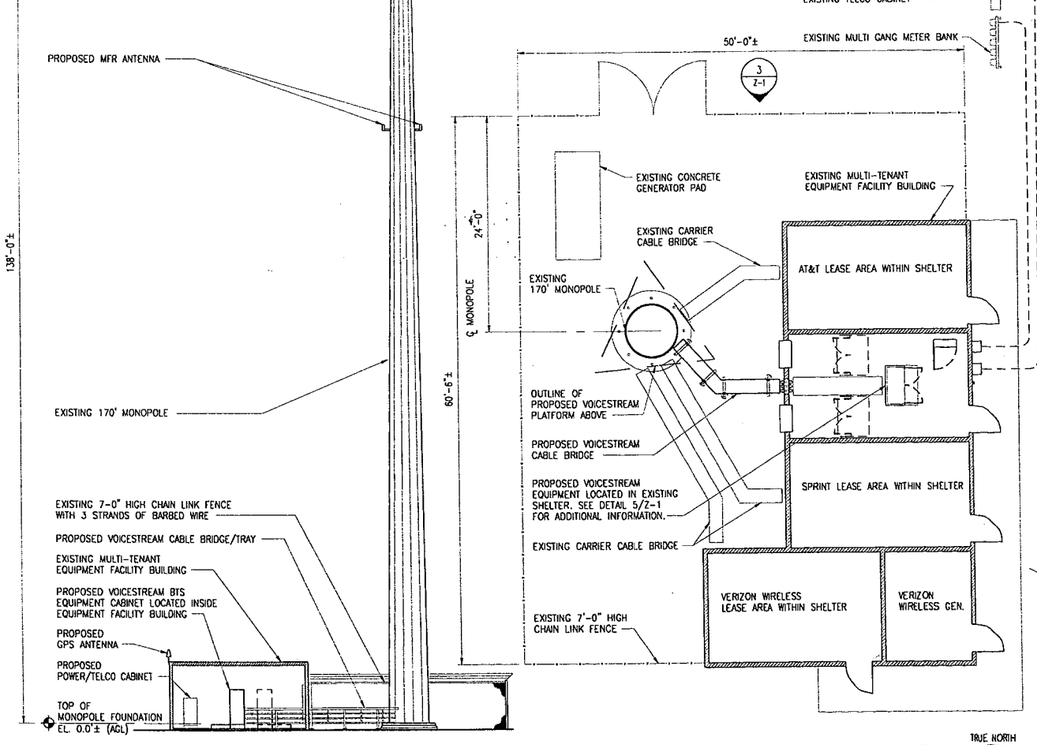
SCALE: 1/4"=1'-0"

5 / Z-1

0 2 4 8 12

TRUE NORTH





COMPOUND PLAN

SCALE: 1/8"=1'-0"

2 / Z-1

0 4 8 16 24

TRUE NORTH

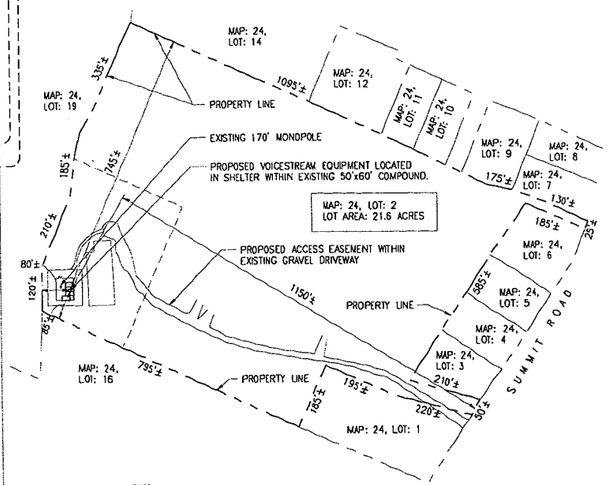
EQUIPMENT PLAN

SCALE: 1/4"=1'-0"

4 / Z-1

0 2 4 8 12

TRUE NORTH



NOTES:

PLOT PLAN BASED ON SITE PLAN BY CLOUGH HARBOUR AND ASSOCIATES, LLP, DATED 8/17/01.

SETBACKS ARE TAKEN FROM PROPOSED EQUIPMENT TO PROPERTY LINES.

PLOT PLAN

SCALE: 1"=200'-0"

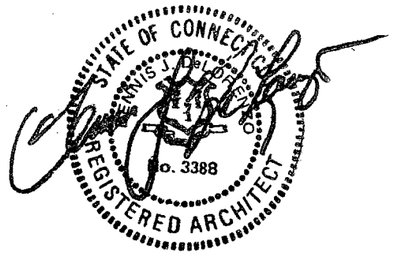
1 / Z-1

0 100 200 400 600

TRUE NORTH

GENERAL NOTES

1. THE TYPE, DIMENSIONS, MOUNTING HARDWARE, AND POSITIONS OF ALL EQUIPMENT FOR THE VOICESTREAM INSTALLATION ARE SHOWN IN ILLUSTRATED FASHION. THESE DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. ACTUAL HARDWARE DETAILS AND FINAL LOCATIONS MAY DIFFER SLIGHTLY FROM WHAT IS SHOWN.
2. THE VOICESTREAM PCS EQUIPMENT CONSISTS OF AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. THE VOICESTREAM BASE TRANSMISSION STATION (BTS) CABINET IS A WEATHER RESISTANT, VANDAL RESISTANT STEEL CABINET CONTAINING RECTIFIERS, AMPLIFIERS, RADIOS, AND OTHER INTEGRATED ELECTRONIC CONTROL EQUIPMENT. THE BTS IS ENVIRONMENTALLY CONTROLLED BY A SELF-CONTAINED AC-POWERED HEATING AND COOLING SYSTEM USING CFC-FREE THERMAL TRANSFER COMPOUNDS. MANUFACTURER'S SPECIFICATIONS INDICATE THAT AT FULL LOAD CONDITIONS, MAXIMUM ACOUSTICAL NOISE LEVELS ARE 50 DB(A) AT A DISTANCE OF 3 METERS (10 FEET) AND 40 DB(A) AT A DISTANCE OF 9 METERS (30 FEET). BATTERY BACKUP FOR EMERGENCY STANDBY POWER IS CONTAINED WITHIN THE SEALED BTS CABINET AND CONSISTS OF FOUR 12-VOLT, CLOSED-CELL DC BATTERIES. THE BATTERIES ARE LEAD-ACID RECHARGEABLE STANDBY INDUSTRIAL POWER CELLS MANUFACTURED TO MEET ENVIRONMENTAL QUALITY AND RUGGEDNESS STANDARDS OF THE INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA). THE BATTERY CHARGING SYSTEM IS COMPUTER CONTROLLED AND THE EQUIPMENT CABINET IS REMOTELY MONITORED AT VOICESTREAM'S EAST PROVIDENCE OFFICE 24 HOURS A DAY, 7 DAYS A WEEK FOR FAULTS AND ALARMS.
4. THE DESIGN OF THE ANTENNA MOUNTING HARDWARE WILL MEET THE ANSI/EIA/TIA-222-F STANDARDS FOR STRUCTURAL STEEL ANTENNA SUPPORTING STRUCTURES AND STATE BUILDING CODE REQUIREMENTS. DETAILED CONSTRUCTION DRAWINGS AND STRUCTURAL CALCULATIONS WILL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED WITH A BUILDING PERMIT APPLICATION FOR REVIEW AND APPROVAL BY THE LOCAL BUILDING CODE ENFORCEMENT OFFICIAL.
5. ONCE THE FACILITY BECOMES FULLY OPERATIONAL, NORMAL AND ROUTINE MAINTENANCE BY VOICESTREAM TECHNICIANS WILL BE PERFORMED ON A MONTHLY BASIS. THEREFORE, THE ESTIMATED VEHICLE TRIP GENERATION RATE IS TWO TRIPS PER MONTH. THE AVERAGE DAILY TRIP GENERATION RATE IS 0.07.
6. PAINT ANTENNAS, MOUNTING HARDWARE, COAXIAL CABLE AND EXPOSED VERTICAL CABLE TRAY TO MATCH EXISTING CONDITIONS.
7. PERMANENT STANDBY EMERGENCY POWER WILL NOT BE UTILIZED BY VOICESTREAM. IF NECESSARY, DURING AN EXTENDED POWER OUTAGE, A PORTABLE EMERGENCY GENERATOR WILL BE USED TO PROVIDE TEMPORARY EMERGENCY BACKUP POWER. THERE IS NO ON-SITE BULK STORAGE OF FLAMMABLE OR COMBUSTIBLE FUELS FOR OPERATING AN EMERGENCY GENERATOR FOR THE VOICESTREAM EQUIPMENT.
8. FCC MANDATE REQUIRES ENHANCED EMERGENCY (E911) POSITION LOCATION EQUIPMENT TO MEET NATIONWIDE STANDARDS FOR WIRELESS COMMUNICATIONS SYSTEMS. IMPLEMENTATION OF E911 STANDARDS REQUIRES VOICESTREAM TO DEPLOY A MINIMUM OF 2 MEASUREMENT FUNCTION RECEIVER (MFR) ANTENNAS AND 1 GLOBAL POSITIONING SYSTEM (GPS) ANTENNA. THIS PLAN DEPICTS A SCHEMATIC DESIGN AND LOCATION OF THE MFR AND GPS ANTENNAS AND MAY BE SUBJECT TO CHANGE. VOICESTREAM RESERVES THE RIGHT TO CHANGE THE LOCATION AND CONFIGURATION OF THE E911 EQUIPMENT WITHOUT ANY UNREASONABLE RESTRICTIONS IMPOSED BY THE LANDLORD.
9. APPLICANT: OMNIPOINT COMMUNICATIONS, INC. 100 FILLEY STREET BLOOMFIELD, CT 06002
10. PROPERTY OWNER: M. JOANNE DIDOMIZIO & THOMAS DIDOMIZIO 1119 SUMMIT ROAD CHESHIRE, CT 06410
11. STRUCTURE OWNER: CROWN ATLANTIC COMPANY, LLC 500 WEST CUMMINGS PARK, SUITE 6500 WOBURN, MA 01801
12. ASSESSOR'S PARCEL NO.: ASSESSOR'S PLAT/MAP: 24, LOT: 2
13. JURISDICTION: TOWN OF CHESHIRE
14. ZONING DISTRICT: RESIDENTIAL R80



VICINITY MAP

SCALE: NOT TO SCALE

TRUE NORTH

VoiceStream
Global Wireless by T-Mobile
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BLOOMFIELD, CT 06002
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FAX: (860)-692-7159

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APPROVALS

LANDLORD _____

LEASING _____

R.F. _____

ZONING _____

CONSTRUCTION _____

A/E _____

PROJECT NO: 02125.11

DRAWN BY: MJE/JJT

CHECKED BY: DJD

SUBMITTALS

2	6/04/02	FOR ZONING REVISED
1	5/15/02	FOR ZONING FINAL
0	5/13/02	FOR ZONING REVIEW

CT11-352C

CHESHIRE

CROWN MONOPOLE
SUMMIT ROAD
CHESHIRE, CT 06410

SHEET TITLE

PLANS, ELEVATIONS, DETAILS AND NOTES

SHEET NUMBER

Z-1

Exhibit C

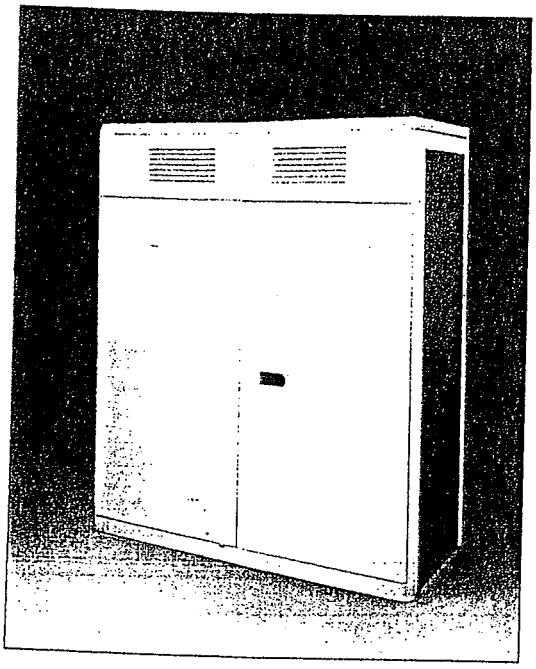
Equipment Specifications
Summit Road

Cheshire, Connecticut

GSM 900 / DCS 1800 / PCS 1900

NORTEL
NORTHERN TELECOM

S8000 Outdoor Base Transceiver Station



Nortel's S8000 Outdoor Base Transceiver Station has been designed to meet the economic and performance requirements of network operators. Based on a highly integrated RF and digital design, the S8000 Outdoor Base Transceiver Station represents a major technology advancement and delivers all the benefits of a compact, modular, high quality and high performance product.

Nortel's S8000 Outdoor BTS: Radio Performance Leadership - Reduced Site Acquisition and Operating Costs

Installation

- The S8000 Outdoor Base Transceiver Station (BTS) offers compact packaging and requires minimal floor space, only .88 sq m (9.5 sq ft.). Front only access keeps total space required, including maintenance access, to only 1.8 sq m (19.4 sq ft) per cabinet.

Transmission

- Integrated drop and insert connection to the Base Station Controller (BSC) and signaling concentration on the A-bis interface provide significant transmission cost reduction.
- Optional integrated digital microwave radio.

Maintenance

- Highly reliable technology, redundant architecture and integrated battery backup ensure high availability service.
- Front access and interconnections, as well as powerful fault detection, help reduce lifetime maintenance costs.

Industry leading performance

- New RF technology and advanced digital processing techniques provide very high receive sensitivity (-108 dBm guaranteed) and improved diversity gain (up to 6 dB). This provides higher resistance to interference, as well as, improved speech quality and cell coverage.
- Nortel's proven experience in frequency hopping, 1*3 frequency reuse, sophisticated microcellular handover algorithms and support of half-rate vocoders enables the operator to maximize use of available spectrum and deploy fewer cell sites.

Fast network deployment

- The S8000 BTS can be shipped fully equipped and tested, which provides fast network roll out to meet operator time to market requirements.

Modular and flexible configuration

- The S8000 supports eight transceivers (TRX) per cabinet in Omni and sectored configurations. The typical one cabinet S222 configuration may be expanded up to S332 or S422 without an additional cabinet.

Technical Data

• Frequency range		900 MHz GSM
		900 MHz GSM extended
		1800 MHz DCS
		1900 MHz PCS
• Receive sensitivity (guaranteed)		-108 dBm
• Dimensions	Height	1600 mm / 5 ft. 3 in.
	Width	1350 mm / 4 ft. 5 in.
	Depth	650 mm / 2 ft. 1 in.
• Weight	Fully equipped	600 kg / 1300 lbs.
• Capacity		8 TRX per cabinet
		up to 3 cabinets
• Configuration	Trisectorial	up to S888
	Omnidirectional	up to O16
• Amplifier output power		30 W (± 1.5 dB)
• Power control	Static	6 steps of 2 dB
	Dynamic	15 steps of 2 dB
• Frequency hopping		RF synthesized
		baseband
• Supported vocoders		Full rate
		Enhanced full rate
		Half rate
• Encryption algorithms		A5/1 A5/2
• Power supply		230V AC 50/60 Hz
• Power back-up		Integrated battery back-up plus optional battery cabinet allows provisioning up to 8 hours back-up time.
• Operating temperature range		-40°C to +50°C
		-40°F to +122°F

Publication Reference S8O.INS.0696
Printed in France

Information subject to change. Northern Telecom reserves the right to make changes, without notice, in equipment design as engineering or manufacturing methods warrant.

NORTEL
NORTHERN TELECOM

For more information,
please contact your local Nortel account representative.

In the USA:
Northern Telecom
2221 Lakeside Boulevard
Richardson TX 75082
USA
Telephone: 1-800-4 NORTEL
1-800-466-7838 or (214) 684-5935
http://www.nortel.com/wireless

In Canada:
Northern Telecom
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Mississauga ON L4W 4M7
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In the Caribbean and Latin America:
Northern Telecom (CALA) Corporation
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In Asia:
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78042 Guyancourt Cedex
France
Telephone (33) (1) 34 52 52 52

Nortel Europe
12-12bis rue Jean Jaurès
92807 Puteaux
France
Telephone (33) (1) 46 96 15 15

3 CABINET DESCRIPTION

3.1 PHYSICAL CHARACTERISTICS

3.1.1 S8000 Outdoor BTS

3.1.1.1 BTS cabinet

Dimensions

The BTS S8000 Outdoor has the following dimensions:

- height: 160 cm (63 in.)
- width: 135 cm (52.8 in.)
- depth: 65 cm (25.6 in.)

Weight

The weight of the cabinet when empty, that is, without its battery, fan units or boards, is 164 kg (361 lb). Depending on the configuration, a fully equipped cabinet weighs approximately 480 kg (1056 lb) with ACU unit or 440 kg (968 lb) with DACS unit.

These weights do not include the plinth.

Operating temperature

To operate correctly, the BTS requires a temperature greater than –40°C (–40°F) and less than +50°C (+122°F).

Consumption

BTS input voltage:

- GSM 900/1800
  - nominal voltage contained between 220V AC and 240V AC
  - minimum voltage: 220 – 10% = 198V AC
  - maximum voltage: 240 + 6% = 254V AC
- GSM 1900 (with DACS)
  - nominal voltage: 208V AC to 240V AC
  - minimum voltage: 208 – 10% = 187V AC
  - maximum voltage: 240 + 6% = 254V AC
- GSM 1900 (with ACU and/or the power system six–rectifier type)
  - nominal voltage: 240V AC
  - minimum voltage: 240 – 10% = 187V AC
  - maximum voltage: 240 + 6% = 254V AC

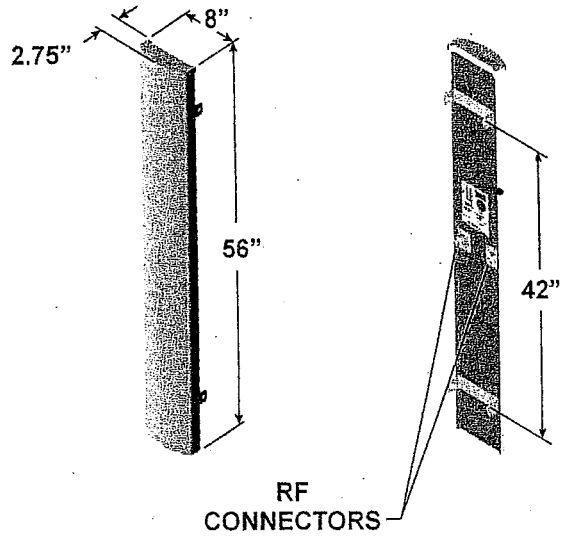
NON - PREMIUM BTS ONLY

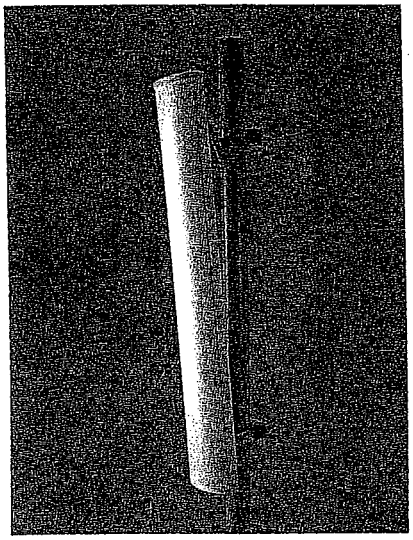
EMS WIRELESS

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)

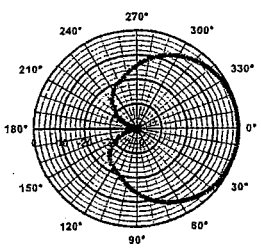
Note: Patent Pending and US Patent number 5, 757, 246.

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.

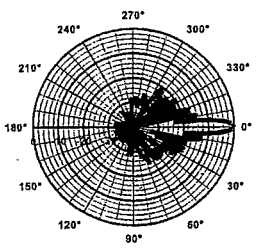
MOUNTING OPTIONS

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"

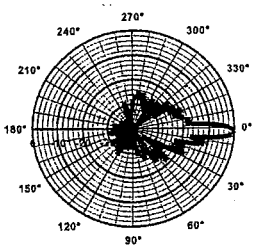
* Model number shown represents a series of products. See mounting options section for specific model number.



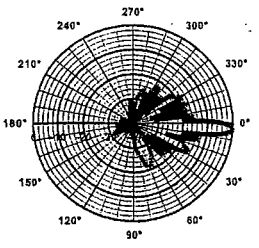
Azimuth



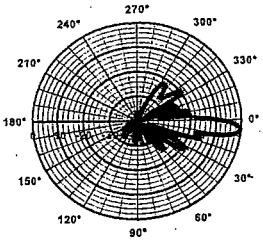
Elevation 0° Downtilt



Elevation 2° Downtilt



Elevation 4° Downtilt



Elevation 6° Downtilt

Exhibit D

Structural Analysis
Summit Road

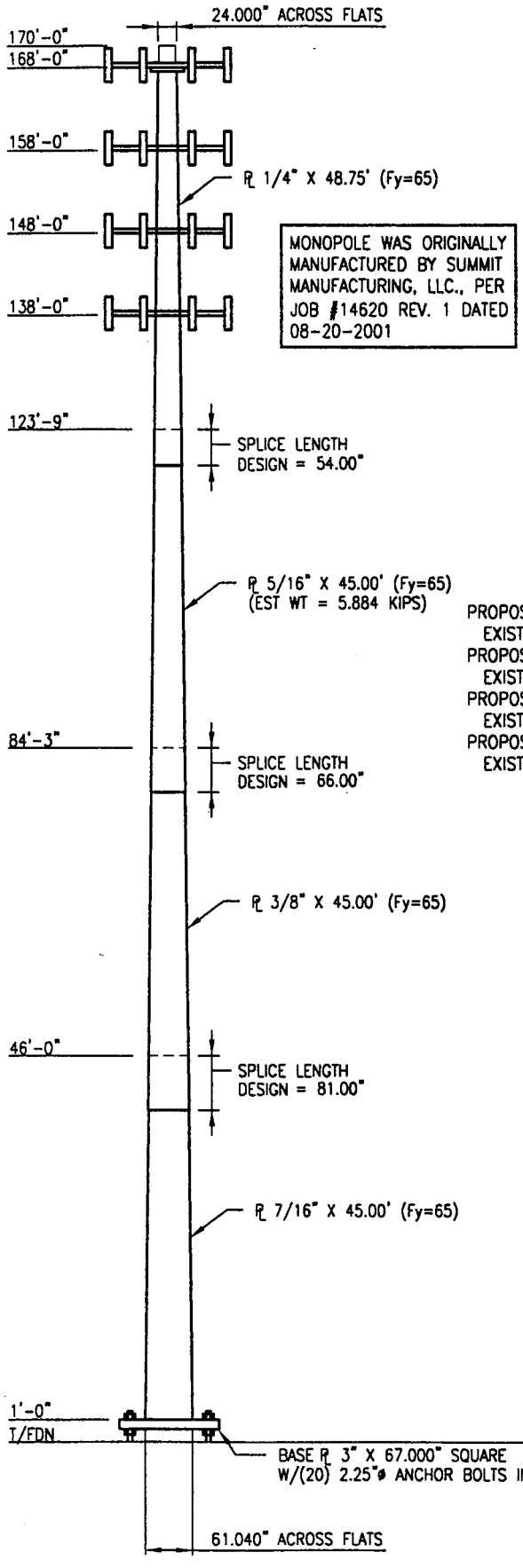
Cheshire, Connecticut

VOICESTREAM WIRELES

100 Filley Street Boomfield, CT 06002
Fax: (860) 692-7159

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street, Suite 500, Columbus, Ohio 43215
(614) 221-6679 Fax: (614) 448-4105 www.PJFweb.com

IF EXISTING CONDITIONS ARE NOT AS REPRESENTED ON THESE SKETCHES, PJF SHOULD BE CONTACTED IMMEDIATELY TO RE-EVALUATE THE STRUCTURAL INTEGRITY OF THE POLE.



MONOPOLE WAS ORIGINALLY MANUFACTURED BY SUMMIT MANUFACTURING, LLC., PER JOB #14620 REV. 1 DATED 08-20-2001

JOB DATA			
Page 1 of 3		Job No.	31202-0013
By	LGL	Design No.	
Chk'd By	RT	Date	05-23-2002
		Rev. No. / Rev. Date	
Pole	EXISTING 170-FT MONOPOLE - NEW HEAVEN CO., CT		
Site	CT-11-352C - CHESHIRE		
Owner	CROWN CASTLE		
Ref. No.	P.J.F. JOB #29201-0692 REV.1, DATED 08-20-2001		
Design	MINIMUM WIND VELOCITY = 85 MPH / 74 MPH + 1/2" RADIAL ICE - ACCORDING TO TIA/EIA-222-F 1996		

LOAD CASES	
CASE 1	90 MPH WITH 1/2" RADIAL ICE WIND W/ SIMULTANEOUS ICE
CASE 2	50 MPH WITH NO ICE OPERATIONAL WIND

MONOPOLE HAS THE CAPACITY TO SUPPORT THE PROPOSED ANTENNA LOADING AND WITHSTAND THE MINIMUM REQUIRED DESIGN WIND VELOCITIES.

POLE SPECIFICATIONS	
Pole Shape Type:	18-SIDED POLYGON
Taper:	0.233024 IN/FT
Shaft Steel:	ASTM A607 GRADE 65
Base PL Steel:	ASTM A572 GRADE 55 (55 KSI)
Anchor Bolts:	2 1/4"ø #18J ASTM A615 GRADE 75

ANTENNA LIST			
	No.	Elev.	Description
	-	TOP	5/8" LIGHTNING ROD
PROPOSED	1-12	TOP	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	TOP	14' LOW PROFILE PLATFORM
PROPOSED	13-24	158.00	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	158.00	14' LOW PROFILE PLATFORM
PROPOSED	25-36	148.00	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	148.00	14' LOW PROFILE PLATFORM
PROPOSED	37-48	138.00	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	138.00	14' LOW PROFILE PLATFORM

STEP BOLTS FULL HEIGHT.
ANTENNA FEED LINES ASSUMED TO RUN INSIDE OF POLE.

STATE OF CONNECTICUT ★ KEVIN P. BALLMAN ★ No. 17891 LICENSED PROFESSIONAL ENGINEER

Elevation	90 MPH WIND Lateral Deflection (Inches)	90 MPH WIND Rotation (sway) (degrees)	50 MPH WIND Lateral Deflection (Inches)	50 MPH WIND Rotation (sway) (degrees)
TOP	98.7	5.215	27.2	1.434

SHAFT SECTION DATA					
Shaft Section	Section Length (feet)	Plate Thickness (in.)	Lap Splice (in.)	Diameter Across Flats (inches) @ Top	@ Bottom
1	48.75	0.2500	54.00	24.000	35.360
2	45.00	0.3125	66.00	33.811	44.297
3	45.00	0.3750	81.00	42.391	52.877
4	45.00	0.4375		50.554	61.040

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

UNFACTORED BASE REACTIONS
MOMENT = 3823 ft-kips
SHEAR = 32.3 kips
AXIAL = 54.5 kips

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VOICESTREAM WIRELES

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STRUCTURAL ENGINEERS
250 East Broad Street, Suite 500, Columbus, Ohio 43215
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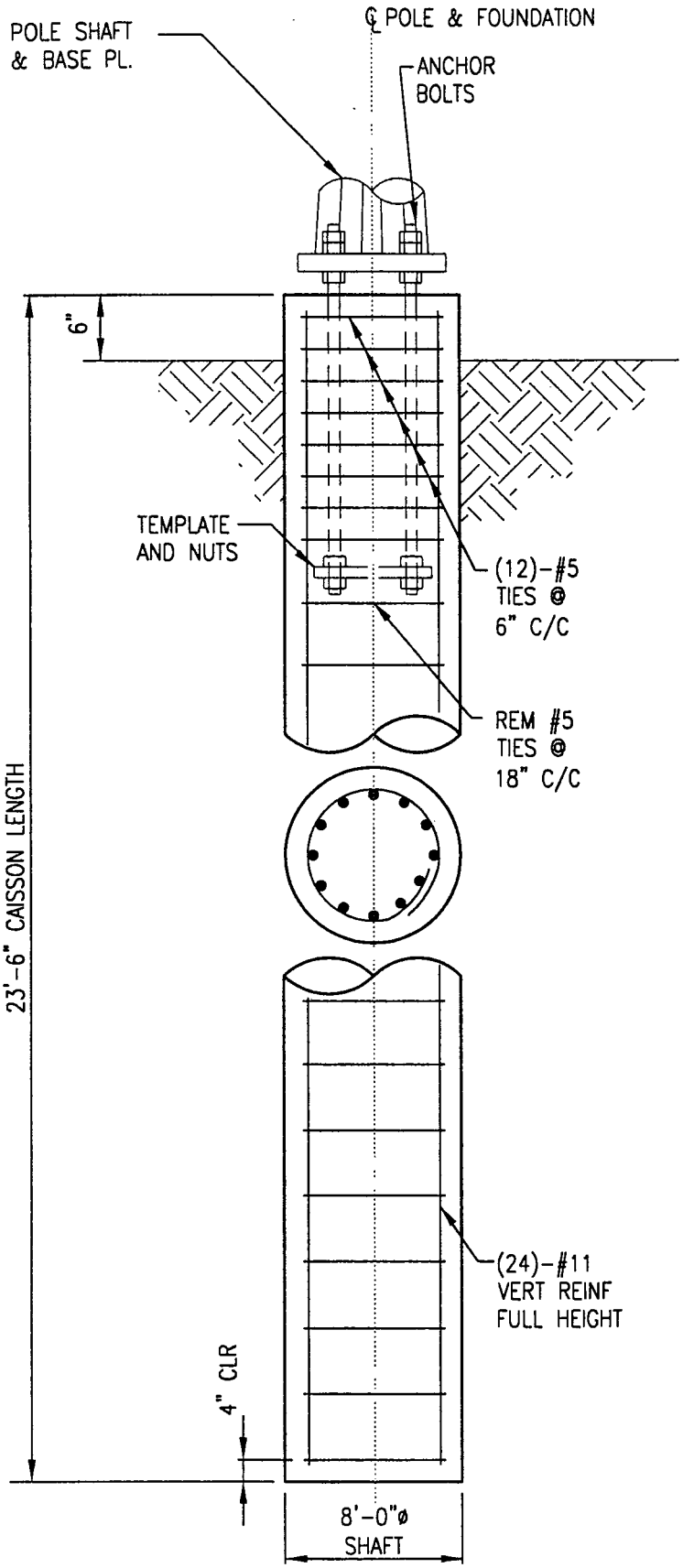

JOB DATA			
Page 2 of 3		Job No.	31202-0013
By	LGL	Design No.	
Chk'd By	RT	Date	05-23-2002
		Rev. No.	Rev. Date
Pole	EXISTING 170-FT MONOPOLE - NEW HEAVEN CO., CT		
Site	CT-11-352C - CHESHIRE		
Owner	CROWN CASTLE		
Ref. No.	P.J.F JOB #29201-0692 REV.1, DATED 08-20-2001		
Design	MINIMUM WIND VELOCITY = 85 MPH / 74 MPH + 1/2" RADIAL ICE-ACCORDING TO TIA/EIA-222-F 1996		

NOTES:

1. ALL CONCRETE ASSUMED TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

2. REINFORCING STEEL ASSUMED TO CONFORM TO THE REQUIREMENTS OF ASTM A-615 (GRADE 60) EXCEPT THAT CAISSON TIES MAY BE ASTM A-615 (GRADE 40).

3. SEE PAGE 1 FOR ANCHOR BOLT QUANTITY, SIZE, LENGTH, AND BOLT CIRCLE.

4. FOUNDATION ANALYSIS IS BASED UPON GEOTECHNICAL EXPLORATION REPORT
PREPARED BY: CLOUGH, HARBOUR & ASSOCIATES, LLP
REPORT NO.: 8961.07.08
DATED: 05-15-2001

5. THE FOUNDATION WAS ANALYZED USING THE FOLLOWING SERVICE LOADS:
MOMENT: 3823 FT-KIPS
SHEAR: 32.3 KIPS
AXIAL: 54.5 KIPS
THE EXISTING FOUNDATION HAS SUFFICIENT CAPACITY TO SUPPORT THE NEW LOADING.

6. ORIGINAL FOUNDATION DESIGN COMPLETED BY PAUL J. FORD & CO., PER PJF JOB #29201-0692 REV.1 DATED 08-20-2001. ANALYSIS ASSUMES THE AS BUILT CONDITION OF THE FOUNDATION IS PER THE ORIGINAL DESIGN DRAWINGS. IF AS BUILT CONDITIONS ARE NOT AS SHOWN ON THIS SKETCH, PAUL J. FORD & CO. SHALL BE NOTIFIED SO THAT THE EXISTING CONDITION OF THE FOUNDATION MAY BE RE-EVALUATED.

EXISTING CAISSON FOUNDATION

VOICESTREAM WIRELES

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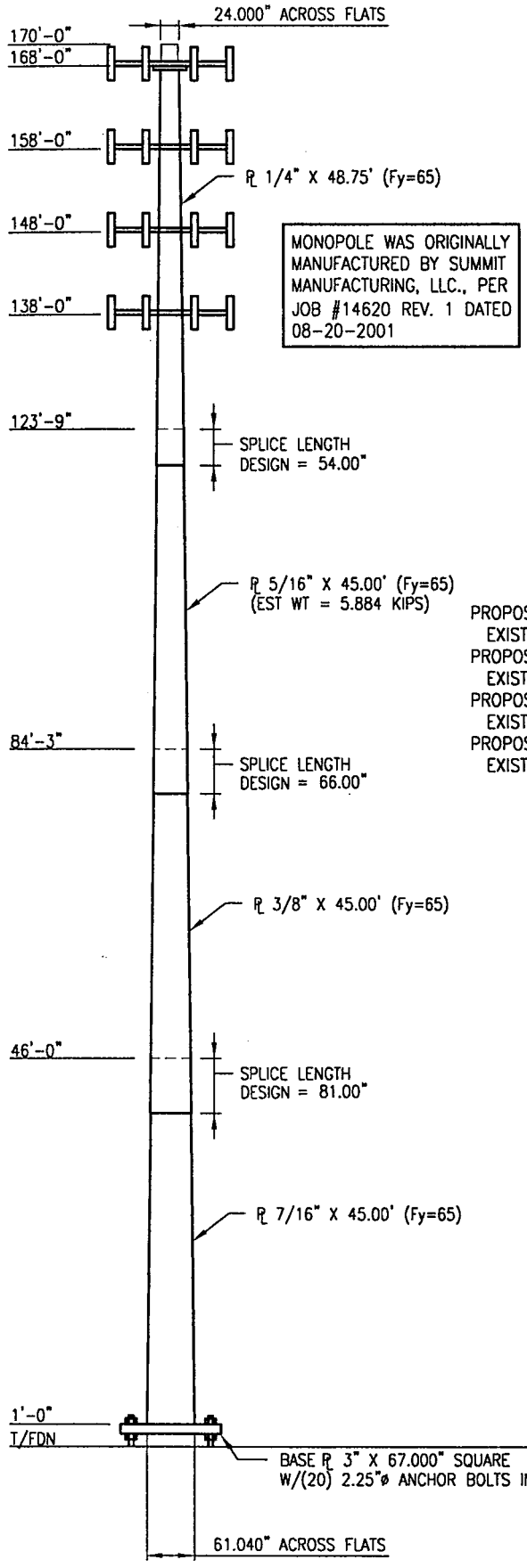
STRUCTURAL ENGINEERS
250 East Broad Street, Suite 500, Columbus, Ohio 43215
(614) 221-6679 Fax: (614) 448-4105 www.PJFweb.com

IF EXISTING CONDITIONS ARE NOT AS REPRESENTED ON THESE SKETCHES, PJF SHOULD BE CONTACTED IMMEDIATELY TO RE-EVALUATE THE STRUCTURAL INTEGRITY OF THE POLE.



MONOPOLE WAS ORIGINALLY MANUFACTURED BY SUMMIT MANUFACTURING, LLC., PER JOB #14620 REV. 1 DATED 08-20-2001

JOB DATA			
Page 1 of 3		Job No.	31202-0013
By	LGL	Design No.	
Chk'd By	RT	Date	05-23-2002
		Rev. No.	Rev. Date
Pole	EXISTING 170-FT MONOPOLE - NEW HEAVEN CO., CT		
Site	CT-11-352C - CHESHIRE		
Owner	CROWN CASTLE		
Ref. No.	P.J.F. JOB #29201-0692 REV.1, DATED 08-20-2001		
Design	MINIMUM WIND VELOCITY = 85 MPH / 74 MPH + 1/2" RADIAL ICE - ACCORDING TO TIA/EIA-222-F 1996		

LOAD CASES	
CASE 1	90 MPH WITH 1/2" RADIAL ICE WIND W/ SIMULTANEOUS ICE
CASE 2	50 MPH WITH NO ICE OPERATIONAL WIND

MONOPOLE HAS THE CAPACITY TO SUPPORT THE PROPOSED ANTENNA LOADING AND WITHSTAND THE MINIMUM REQUIRED DESIGN WIND VELOCITIES.

POLE SPECIFICATIONS	
Pole Shape Type:	18-SIDED POLYGON
Taper:	0.233024 IN/FT
Shaft Steel:	ASTM A607 GRADE 65
Base PL Steel:	ASTM A572 GRADE 55 (55 KSI)
Anchor Bolts:	2 1/4"ø #18J ASTM A615 GRADE 75

ANTENNA LIST			
	No.	Elev.	Description
	-	TOP	5/8" LIGHTNING ROD
PROPOSED	1-12	TOP	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	TOP	14' LOW PROFILE PLATFORM
PROPOSED	13-24	158.00	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	158.00	14' LOW PROFILE PLATFORM
PROPOSED	25-36	148.00	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	148.00	14' LOW PROFILE PLATFORM
PROPOSED	37-48	138.00	(12) EMS RR90-17-02DP PCS PANEL W/ (24) 1-5/8 COAX
EXISTING	-	138.00	14' LOW PROFILE PLATFORM

STEP BOLTS FULL HEIGHT.
ANTENNA FEED LINES ASSUMED TO RUN INSIDE OF POLE.

STATE OF CONNECTICUT
KEVIN P. BRIMAN
No. 17891
LICENSED
PROFESSIONAL ENGINEER

Elevation	90 MPH WIND		50 MPH WIND	
	Lateral Deflection (Inches)	Rotation (sway) (degrees)	Lateral Deflection (Inches)	Rotation (sway) (degrees)
TOP	98.7	5.215	27.2	1.434

SHAFT SECTION DATA					
Shaft Section	Section Length (feet)	Plate Thickness (in.)	Lap Splice (in.)	Diameter Across Flats (inches) @ Top	Diameter Across Flats (inches) @ Bottom
1	48.75	0.2500	54.00	24.000	35.360
2	45.00	0.3125	66.00	33.811	44.297
3	45.00	0.3750	81.00	42.391	52.877
4	45.00	0.4375		50.554	61.040

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

UNFACTORED BASE REACTIONS

MOMENT =	3823 ft-kips
SHEAR =	32.3 kips
AXIAL =	54.5 kips

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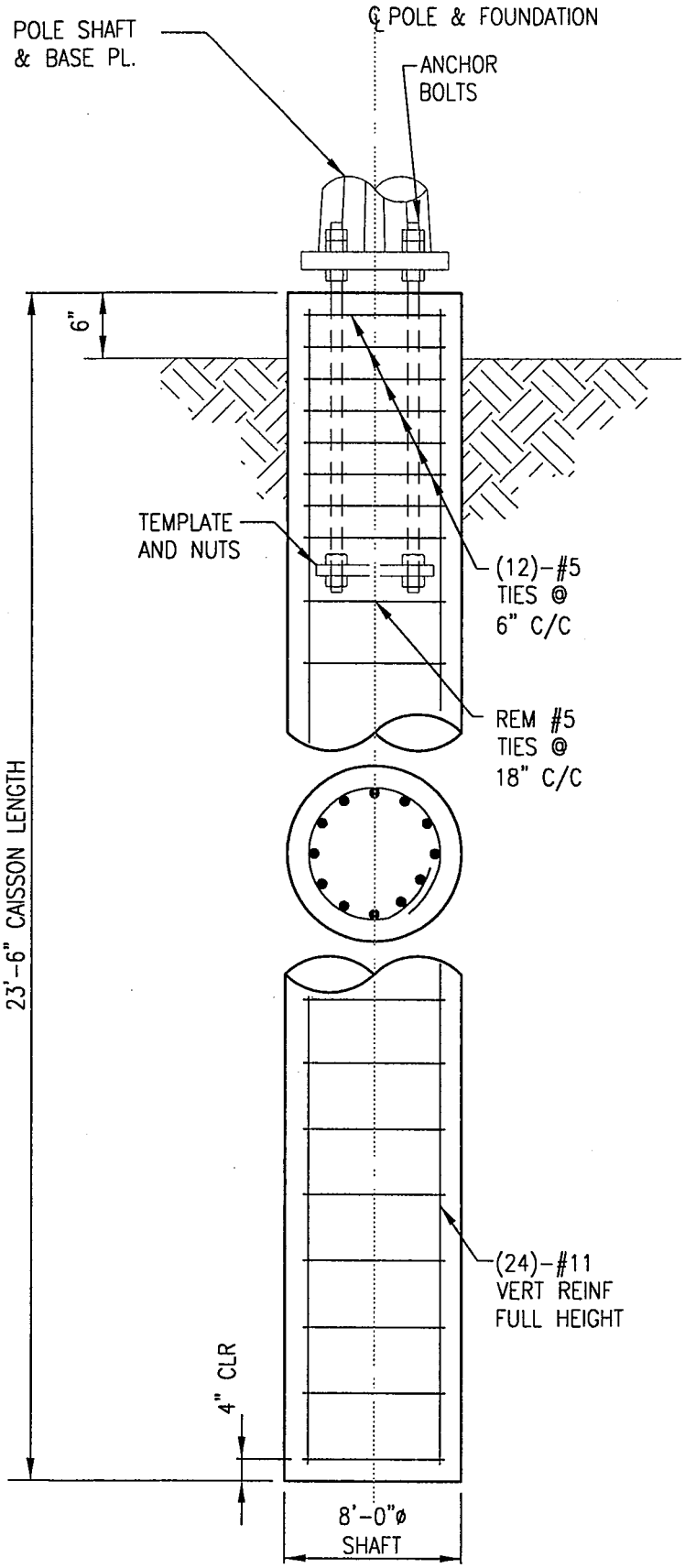

JOB DATA		
Page 2 of 3	Job No.	31202-0013
By LGL	Design No.	
Chk'd By RT	Date	05-23-2002
	Rev. No. Rev. Date	
Pole	EXISTING 170-FT MONOPOLE - NEW HEAVEN CO., CT	
Site	CT-11-352C - CHESHIRE	
Owner	CROWN CASTLE	
Ref. No.	P.J.F JOB #29201-0692 REV.1, DATED 08-20-2001	
Design	MINIMUM WIND VELOCITY = 85 MPH / 74 MPH + 1/2" RADIAL ICE-ACCORDING TO TIA/EIA-222-F 1996	

NOTES:

1. ALL CONCRETE ASSUMED TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

2. REINFORCING STEEL ASSUMED TO CONFORM TO THE REQUIREMENTS OF ASTM A-615 (GRADE 60) EXCEPT THAT CAISSON TIES MAY BE ASTM A-615 (GRADE 40).

3. SEE PAGE 1 FOR ANCHOR BOLT QUANTITY, SIZE, LENGTH, AND BOLT CIRCLE.

4. FOUNDATION ANALYSIS IS BASED UPON GEOTECHNICAL EXPLORATION REPORT
PREPARED BY: CLOUGH, HARBOUR & ASSOCIATES, LLP
REPORT NO.: 8961.07.08
DATED: 05-15-2001

5. THE FOUNDATION WAS ANALYZED USING THE FOLLOWING SERVICE LOADS:
MOMENT: 3823 FT-KIPS
SHEAR: 32.3 KIPS
AXIAL: 54.5 KIPS
THE EXISTING FOUNDATION HAS SUFFICIENT CAPACITY TO SUPPORT THE NEW LOADING.

6. ORIGINAL FOUNDATION DESIGN COMPLETED BY PAUL J. FORD & CO., PER PJF JOB #29201-0692 REV.1 DATED 08-20-2001. ANALYSIS ASSUMES THE AS BUILT CONDITION OF THE FOUNDATION IS PER THE ORIGINAL DESIGN DRAWINGS. IF AS BUILT CONDITIONS ARE NOT AS SHOWN ON THIS SKETCH, PAUL J. FORD & CO. SHALL BE NOTIFIED SO THAT THE EXISTING CONDITION OF THE FOUNDATION MAY BE RE-EVALUATED.

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EXISTING CAISSON FOUNDATION

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250 East Broad Street, Suite 500, Columbus, Ohio 43215
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NOTES:

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

2. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-615 (GRADE 60) EXCEPT THAT PIER TIES MAY BE ASTM A-615 (GRADE 40).

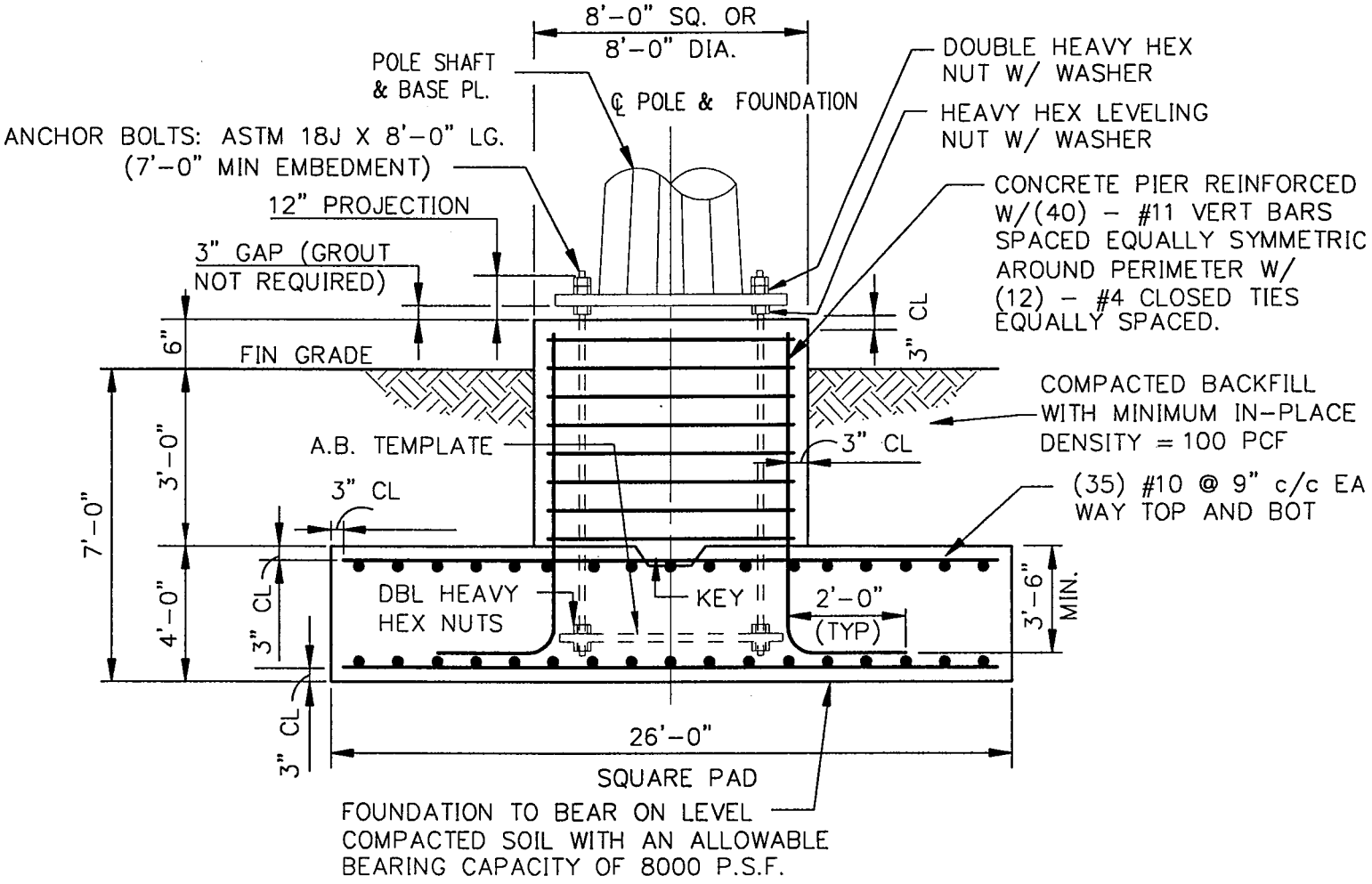
3. SEE PAGE 1 FOR ANCHOR BOLT QUANTITY, SIZE, LENGTH, AND BOLT CIRCLE.

4. CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.

JOB DATA		
Page 3 of 3	Job No.	31202-0013
By LGL	Design No.	
Chk'd By RT	Date	
	Rev. No.	Rev. Date
Pole	EXISTING 170-FT MONOPOLE - NEW HEAVEN CO., CT	
Site	CT-11-352C - CHESHIRE	
Owner	CROWN CASTLE USA	
Ref. No.	P.J.F. JOB #29201-0692 REV.1, DATED 08-20-2001	
Design	MINIMUM WIND VELOCITY = 85 MPH/74 MPH + 1/2" RADIAL ICE - ACCORDING TO TIA/EIA-222-F 1996	

FOUDATION SPECIFICATIONS	
Volume Concrete Required:	109 CUBIC YARDS
Soils Report:	CLOUGH HARBOUR & ASSOCIATES LLP 8961.07.08 06-06-2001

DESIGN CRITERIA	
Moment:	3823 FT-KIPS
Shear:	32.3 KIPS
Axial:	54.5 KIPS



PAD AND PIER FOUNDATION

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 12:12:33 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

S U M M A R Y O F A N A L Y S I S R E S U L T S

Pole Height.....: 167.00 ft
Top Diameter.....: 24.000 in
Bottom Diameter.....: 61.040 in
Pole Shape.....: 18-Sided Polygon
Splice Joint Type.....: Taper shaft - Slip Joint
Shaft Taper.....: 0.233024 (in/ft)
Shaft Steel Weight.....: 30.141 kips

POLE SHAFT PROPERTIES:

Shaft Section Number	Section Length (ft)	Wall Thickness [t] (in)	Steel Yield [Fy] (ksi)	Top Diameter [Dt] (in)	Bottom Diameter [Db] (in)	Slip Joint Overlap (in)
1.	48.750	0.25000	65	24.000	35.360	54.00
2.	45.000	0.31250	65	33.811	44.297	66.00
3.	45.000	0.37500	65	42.391	52.877	81.00
4.	45.000	0.43750	65	50.554	61.040	

POLE SHAFT SECTION MAXIMUM FORCES AND MOMENTS:

Shaft Section Number	Wind Load No.	Wind Speed (mph)	Radial Ice (in)	At Base of Section: Sect. Elev. (ft)	Axial Load (kips)	Horiz. Shear (kips)	Bending Moment (ft-kips)	Max. Ratio Actual/ Allowable [Ftot/Fb]
1.	1	90.0	0.50	123.75	16.517	19.129	567.422	0.5914
2.	1	90.0	0.50	84.25	25.191	23.178	1449.334	0.7616
3.	1	90.0	0.50	46.00	37.962	27.464	2458.369	0.7571
4.	1	90.0	0.50	1.00	54.487	32.280	3822.749	0.7134
>> MAXIMUM BASE REACTIONS :					54.487	32.280	3822.749 <<	

POLE DEFLECTION AND ROTATION AT TOP AND AT HIGHEST MICROWAVE DISH ELEVATION:

Wind Load No.	Wind Speed (mph)	Radial Ice (in)	Location	Elev (ft)	Deflection (in)	Rotation (deg)	Max. Allowable Rotation Limit (deg)
1.	90.0	0.50	Top	168.00	98.662	5.215	
2.	50.0	0.00	Top	168.00	27.227	1.434	

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 12:12:33 pm

Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

Pole Height : 167 ft
Pole Shape : 18-Sided Polygon
Pole Type : Taper shaft - Slip Joint
Pole Taper : 0.233024 (in/ft)

INPUT TUBE PROPERTIES:

Tube Sect No.	Top / Splice Elev (ft)	Bot Tube Elev (ft)	Tube Length (ft)	Wall Thick [t] (in)	Steel [Fy] (ksi)	Top Diam [Dt] (in)	Bot Diam [Db] (in)	Slip Joint Overlap (in)
1.	168.00	119.25	48.750	0.25000	65	24.000	35.360	54.00
2.	123.75	78.75	45.000	0.31250	65	33.811	44.297	66.00
3.	84.25	39.25	45.000	0.37500	65	42.391	52.877	81.00
4.	46.00	1.00	45.000	0.43750	65	50.554	61.040	

TUBE SECTION PROPERTIES:

Tube Sect No.	Section Weight (kips)	Location	Elev (ft)	Diam. Across Flats (in)	Wall Thick [t] (in)	[W/t] Ratio	Diam/ Thick [D/t] Ratio	Area (in^2)	Ix (in^4)
1	3.874	@Top	168.0	24.000	0.2500	15.16	96.00	18.84	1342.6
		@Splice	123.8	34.311		22.44	137.25	27.03	3960.3
		@Bot	119.3	35.360		23.18	141.44	27.86	4337.4
2	5.884	@Top	123.8	33.811	0.3125	17.31	108.20	33.23	4709.3
		@Splice	84.3	43.016		22.51	137.65	42.35	9755.1
		@Bot	78.8	44.297		23.23	141.75	43.63	10660.1
3	8.613	@Top	84.3	42.391	0.3750	18.17	113.04	50.01	11150.1
		@Splice	46.0	51.304		22.36	136.81	60.62	19857.6
		@Bot	39.3	52.877		23.10	141.00	62.49	21754.8
4	11.771	@Top	46.0	50.554	0.4375	18.61	115.55	69.59	22076.5
		@Bot	1.0	61.040		22.84	139.52	84.15	39034.8

Total Shaft Steel Weight = 30.141 kips

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 12:12:33 pm

Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

Segment Properties: (@ Max Segment = 10 ft)

Tube Segmt No.	Segment Feature Location	Segment Elev. (ft)	Diam. Across Flats (in)	Wall Thick [t] (in)	[W/t] Ratio	Diam/ Thick [D/t] Ratio	Area (in^2)	Ix (in^4)
1.	top	168.000	24.000	0.25000	15.16	96.00	18.84	1342.6
2.	<arm [1]>	168.000	24.000	0.25000	15.16	96.00	18.84	1342.6
3.	<arm [2]>	168.000	24.000	0.25000	15.16	96.00	18.84	1342.6
4.	<arm [3]>	168.000	24.000	0.25000	15.16	96.00	18.84	1342.6
5.		160.000	25.864	0.25000	16.48	103.46	20.32	1684.2
6.	<arm [4]>	158.000	26.330	0.25000	16.81	105.32	20.69	1777.8
7.	<arm [5]>	158.000	26.330	0.25000	16.81	105.32	20.69	1777.8
8.		150.000	28.194	0.25000	18.12	112.78	22.17	2187.0
9.	<arm [6]>	148.000	28.660	0.25000	18.45	114.64	22.54	2298.2
10.	<arm [7]>	148.000	28.660	0.25000	18.45	114.64	22.54	2298.2
11.		140.000	30.525	0.25000	19.77	122.10	24.02	2780.9
12.	<arm [8]>	138.000	30.991	0.25000	20.09	123.96	24.39	2911.3
13.	<arm [9]>	138.000	30.991	0.25000	20.09	123.96	24.39	2911.3
14.		130.000	32.855	0.25000	21.41	131.42	25.87	3473.7
15.	top sec(2)	123.750	34.311	0.25000	22.44	137.25	27.03	3960.3
16.		120.000	34.685	0.31250	17.81	110.99	34.09	5087.5
17.	bot sec(1)	119.250	34.860	0.31250	17.91	111.55	34.27	5165.5
18.		110.000	37.015	0.31250	19.12	118.45	36.40	6193.9
19.		100.000	39.346	0.31250	20.44	125.91	38.71	7450.0
20.		90.000	41.676	0.31250	21.75	133.36	41.03	8865.5
21.	top sec(3)	84.250	43.016	0.31250	22.51	137.65	42.35	9755.1
22.		80.000	43.381	0.37500	18.63	115.68	51.19	11957.3
23.	bot sec(2)	78.750	43.672	0.37500	18.77	116.46	51.53	12201.9
24.		70.000	45.711	0.37500	19.73	121.90	53.96	14008.1
25.		60.000	48.042	0.37500	20.83	128.11	56.73	16280.9
26.		50.000	50.372	0.37500	21.92	134.32	59.51	18787.1
27.	top sec(4)	46.000	51.304	0.37500	22.36	136.81	60.62	19857.6
28.		40.000	51.952	0.43750	19.18	118.75	71.53	23976.1
29.	bot sec(3)	39.250	52.127	0.43750	19.25	119.15	71.77	24220.9
30.		30.000	54.282	0.43750	20.11	124.07	74.77	27379.0
31.		20.000	56.613	0.43750	21.05	129.40	78.00	31089.5
32.		10.000	58.943	0.43750	21.99	134.73	81.24	35121.0
33.	base	1.000	61.040	0.43750	22.84	139.52	84.15	39034.8

Total Number of Antennas / Arms = 9

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 12:12:33 pm

Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

ANTENNA AND ARM PROPERTIES AND LOAD DATA:

LOAD CASE 1: WIND VELOCITY = 90.00 mph + 0.50 inches Radial Ice.

Ant Arm No.	Arm Mount. Elev. (ft)	Load Applic. Elev. (ft)	Arm Length (ft)	Ice Load Case	Antenna Area [CaAa] (sf)	Antenna Force [qzGhCaAa] (lbs)	Antenna Weight (lbs)
[1]	168.000	171.000	2.0000	W/ Ice:	0.50	28.04	100.00
	Description: 5/8" Lightning Rod						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.600	W/ Ice:	33.179	56.072	
[2]	168.000	168.000	0.0000	W/ Ice:	43.77	2441.91	492.00
	Description: (12) EMS RR90-17-02DP PCS Panel w/ (24) 1-5/8 Coax						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.592	W/ Ice:	33.012	55.790	
[3]	168.000	168.000	2.0000	W/ Ice:	26.06	1453.88	2100.00
	Description: 14' Low Profile Platform						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.592	W/ Ice:	33.012	55.790	
[4]	158.000	158.000	0.0000	W/ Ice:	43.77	2399.47	492.00
	Description: (12) EMS RR90-17-02DP PCS Panel w/ (24) 1-5/8 Coax						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.564	W/ Ice:	32.438	54.820	
[5]	158.000	158.000	2.0000	W/ Ice:	26.06	1428.61	2100.00
	Description: 14' Low Profile Platform						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.564	W/ Ice:	32.438	54.820	
[6]	148.000	148.000	0.0000	W/ Ice:	43.77	2355.06	492.00
	Description: (12) EMS RR90-17-02DP PCS Panel w/ (24) 1-5/8 Coax						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.535	W/ Ice:	31.837	53.805	
[7]	148.000	148.000	2.0000	W/ Ice:	26.06	1402.17	2100.00
	Description: 14' Low Profile Platform						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.535	W/ Ice:	31.837	53.805	
[8]	138.000	138.000	0.0000	W/ Ice:	43.77	2308.45	492.00
	Description: (12) EMS RR90-17-02DP PCS Panel w/ (24) 1-5/8 Coax						

					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.505	W/ Ice:	31.207	52.741	
[9]	138.000	138.000	2.0000	W/ Ice:	26.06	1374.42	2100.00
	Description: 14' Low Profile Platform						
					[qz]	[qz] [Gh]	
		[Gh]	[Kz]		(psf)	(psf)	
		1.69	1.505	W/ Ice:	31.207	52.741	

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 12:12:33 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT LOADS:

LOAD CASE 1: WIND VELOCITY = 90.00 mph with 0.50 inches Radial Ice.

Design Loads per TIA/EIA-222-F Standard; Gust Factor ..... Gh = 1.69
Pole DL Overload Factor = 1.3
Per TIA/EIA Table 1: Note 3: For all cross sectional shapes,
Force Coefficient [Cf] need not exceed 1.2
for any value of C. (Where C=sqrt(Kz)*V*D.)

Top of Segment Elev. (ft)	Expos Coeff [Kz]	Veloc Press [qz] (psf)	Pole Veloc Coeff [C]	Force Coeff [Cf]	Projected Area Shaft [Ae] (sf)	Segment [Cf Ae] (sf)	Segment Wind Force (lbs)	Shaft Segment Weight (lbs)
168.000	1.592	33.01	227.11	0.650	0.000	0.000	0.00	0.00
168.000	1.592	33.01	227.11	0.650	0.000	0.000	0.00	0.00
168.000	1.592	33.01	227.11	0.650	0.000	0.000	0.00	0.00
168.000	1.592	33.01	227.11	0.650	2.093	1.360	75.90	98.96
160.000	1.570	32.55	243.05	0.650	17.443	11.338	627.60	826.33
158.000	1.564	32.44	246.99	0.650	2.268	1.474	80.95	107.62
158.000	1.564	32.44	246.99	0.650	2.287	1.487	81.50	108.58
150.000	1.541	31.96	262.52	0.650	18.997	12.348	671.28	903.27
148.000	1.535	31.84	266.35	0.650	2.462	1.600	86.27	117.24
148.000	1.535	31.84	266.35	0.650	2.481	1.613	86.78	118.20
140.000	1.511	31.34	281.43	0.650	20.550	13.358	712.33	980.21
138.000	1.505	31.21	285.14	0.650	2.656	1.727	91.25	126.85
138.000	1.505	31.21	285.14	0.650	2.676	1.739	91.72	127.82
130.000	1.480	30.68	299.72	0.650	22.104	14.368	750.53	1057.15
123.750	1.459	30.25	310.82	0.650	17.378	11.296	581.03	1476.89
120.000	1.446	29.99	312.82	0.650	11.070	7.195	366.00	642.05
119.250	1.443	29.93	314.12	0.650	0.748	0.486	24.58	43.39
110.000	1.411	29.25	329.72	0.650	30.903	20.087	1004.17	1795.22
100.000	1.373	28.46	345.73	0.650	32.845	21.349	1039.75	1911.84
90.000	1.332	27.62	360.74	0.650	34.786	22.611	1070.00	2028.46
84.250	1.307	27.10	368.84	0.650	18.115	11.775	544.21	2253.40
80.000	1.288	26.71	369.23	0.650	18.346	11.925	541.99	1257.26
78.750	1.282	26.59	370.88	0.650	3.728	2.423	108.89	255.56
70.000	1.240	25.71	381.72	0.650	34.422	22.374	987.31	2361.76
60.000	1.186	24.60	392.44	0.650	40.091	26.059	1105.52	2754.39
50.000	1.126	23.35	400.89	0.650	42.033	27.321	1104.48	2891.46
46.000	1.100	22.80	403.48	0.650	17.326	11.262	437.90	3249.74
40.000	1.057	21.91	400.50	0.650	25.136	16.338	615.77	1986.35
39.250	1.051	21.79	400.76	0.650	1.107	0.720	26.51	87.54
30.000	1.000	20.74	407.12	0.650	45.292	29.440	1049.41	3582.50
20.000	1.000	20.74	424.59	0.650	47.234	30.702	1075.91	3740.02
10.000	1.000	20.74	442.07	0.650	49.176	31.964	1120.15	3897.54
2.000	1.000	20.74	456.05	0.650	40.739	26.480	927.96	3231.44
						Summation TOTAL =	17087.65	44019.04

---------(END LOAD CASE 1 -- POLE SHAFT LOADS)----------

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Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- AXIAL AND SHEAR FORCES:

LOAD CASE 1: WIND VELOCITY = 90.00 mph with 0.50 inches Radial Ice.

Tube Segment No.	Segment Elevation (ft)	Axial Load (kips)	Cumulative Axial Load (kips)	Horiz. Shear (kips)	Cumulative Horiz. Shear (kips)
1.	168.000	0.000	0.000	0.000	0.000
2.	168.000	0.100	0.100	0.028	0.028
3.	168.000	0.492	0.592	2.442	2.470
4.	168.000	2.199	2.791	1.530	4.000
5.	160.000	0.826	3.617	0.628	4.627
6.	158.000	0.600	4.217	2.480	7.108
7.	158.000	2.209	6.425	1.510	8.618
8.	150.000	0.903	7.329	0.671	9.289
9.	148.000	0.609	7.938	2.441	11.730
10.	148.000	2.218	10.156	1.489	13.219
11.	140.000	0.980	11.136	0.712	13.932
12.	138.000	0.619	11.755	2.400	16.331
13.	138.000	2.228	13.983	1.466	17.798
14.	130.000	1.057	15.040	0.751	18.548
15.	123.750	1.477	16.517	0.581	19.129
16.	120.000	0.642	17.159	0.366	19.495
17.	119.250	0.043	17.203	0.025	19.520
18.	110.000	1.795	18.998	1.004	20.524
19.	100.000	1.912	20.910	1.040	21.564
20.	90.000	2.028	22.938	1.070	22.634
21.	84.250	2.253	25.191	0.544	23.178
22.	80.000	1.257	26.449	0.542	23.720
23.	78.750	0.256	26.704	0.109	23.829
24.	70.000	2.362	29.066	0.987	24.816
25.	60.000	2.754	31.820	1.106	25.922
26.	50.000	2.891	34.712	1.104	27.026
27.	46.000	3.250	37.962	0.438	27.464
28.	40.000	1.986	39.948	0.616	28.080
29.	39.250	0.088	40.036	0.027	28.106
30.	30.000	3.583	43.618	1.049	29.156
31.	20.000	3.740	47.358	1.076	30.232
32.	10.000	3.898	51.256	1.120	31.352
33.	2.000	3.231	54.487	0.928	32.280
Base	1.000		54.487		32.280

---------(END LOAD CASE 1 -- AXIAL AND SHEAR FORCE)----------

PJF_Pole (tm) - Monopole Design Program
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Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- MOMENTS and DEFLECTIONS:

LOAD CASE 1: WIND VELOCITY = 90.00 mph with 0.50 inches Radial Ice.

	[-------- MOMENTS (ft-kips) ---------]				[--DEFLECTIONS (inch)-------]		
Segmnt Elev (ft)	From Ant/ Arm	From Shaft Wind	From P-Delta Effects	Total Moment	No P-Delta Effects	Total W/ P-Delta Effects	Total Rotation (deg)
168.00	0.084	0.000	0.000	0.084	93.489	98.662	5.215
168.00	0.084	0.000	0.000	0.084	93.489	98.662	5.215
168.00	0.084	0.000	0.000	0.084	93.489	98.662	5.215
168.00	0.084	0.000	0.054	0.138	92.455	97.567	5.215
160.00	31.475	2.780	2.348	36.603	84.196	88.820	5.189
158.00	39.322	4.268	2.676	46.267	83.167	87.730	5.175
158.00	39.322	4.268	3.058	46.649	82.141	86.643	5.175
150.00	101.338	13.523	7.955	122.816	73.998	78.020	5.079
148.00	116.841	16.684	8.607	142.132	72.991	76.953	5.046
148.00	116.841	16.684	9.307	142.833	71.990	75.894	5.046
140.00	208.914	32.839	16.654	258.407	64.117	67.559	4.867
138.00	231.933	37.775	17.603	287.310	63.151	66.537	4.812
138.00	231.933	37.775	18.592	288.300	62.197	65.527	4.812
130.00	353.469	61.227	28.062	442.758	54.756	57.655	4.553
123.75	448.419	83.777	35.227	567.422	49.471	52.066	4.311
120.00	505.389	99.125	39.897	644.410	46.307	48.722	4.177
119.25	516.783	102.352	40.211	659.346	46.099	48.502	4.150
110.00	657.309	146.871	52.753	856.933	38.177	40.134	3.798
100.00	809.229	204.842	65.223	1079.293	31.027	32.589	3.395
90.00	961.148	273.351	77.355	1311.854	24.689	25.908	2.977
84.25	1048.502	317.615	83.216	1449.334	21.830	22.897	2.735
80.00	1113.069	352.637	89.196	1554.901	19.175	20.103	2.577
78.75	1132.058	363.303	90.377	1585.739	18.666	19.568	2.531
70.00	1264.989	442.816	100.714	1808.519	14.410	15.093	2.208
60.00	1416.909	544.028	111.411	2072.347	10.369	10.850	1.843
50.00	1568.828	656.299	121.009	2346.137	7.047	7.366	1.484
46.00	1629.596	704.294	124.478	2458.369	5.916	6.182	1.343
40.00	1720.749	779.536	129.344	2629.629	4.477	4.675	1.152
39.25	1732.142	789.202	129.547	2650.891	4.419	4.614	1.129
30.00	1872.668	913.394	136.771	2922.833	2.423	2.528	0.844
20.00	2024.589	1057.836	142.241	3224.665	1.031	1.074	0.545
10.00	2176.509	1213.235	145.643	3535.387	0.229	0.239	0.254
1.00	2313.236	1362.830	146.682	3822.749	0.000	0.000	0.000

---------(END LOAD CASE 1 -- MOMENTS AND DEFLECTIONS)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 12:12:33 pm
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Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- ACTUAL VS. ALLOWABLE STRESSES:

LOAD CASE 1: WIND VELOCITY = 90.00 mph with 0.50 inches Radial Ice.
Note: Per TIA/EIA Sec. 3.1.1.1: Allow a 1/3 stress increase for poles under 700 feet in height. The allowable stresses shown include the factor of 1.333

Segmnt Elev (ft)	[---------- ACTUAL STRESSES ----------] Bending [fb] (ksi)	Axial [fa] (ksi)	Torsion [ft] (ksi)	Shear [fv] (ksi)	Combined [Ftot] (ksi)	Allow. Stress [Fb] (ksi)	Actual/ Allowable [Ftot/Fb] Ratio
168.00	0.009	0.000	0.000	0.000	0.009	52.00	0.0002
168.00	0.009	0.005	0.003	0.003	0.018	52.00	0.0003
168.00	0.009	0.031	0.132	0.262	0.683	52.00	0.0131
168.00	0.015	0.148	0.286	0.423	1.240	52.00	0.0238
160.00	3.425	0.178	0.246	0.454	3.801	52.00	0.0731
158.00	4.175	0.204	0.353	0.685	4.733	52.00	0.0910
158.00	4.209	0.311	0.478	0.831	5.057	52.00	0.0972
150.00	9.647	0.331	0.417	0.836	10.210	52.00	0.1964
148.00	10.799	0.352	0.507	1.038	11.468	52.00	0.2205
148.00	10.852	0.451	0.611	1.170	11.716	52.00	0.2253
140.00	17.281	0.464	0.538	1.157	17.986	52.00	0.3459
138.00	18.633	0.482	0.616	1.336	19.412	52.00	0.3733
138.00	18.698	0.573	0.703	1.456	19.630	52.00	0.3775
130.00	25.514	0.581	0.625	1.431	26.337	52.00	0.5065
123.75	29.951	0.611	0.572	1.412	30.755	52.00	0.5914
120.00	26.767	0.503	0.450	1.141	27.409	52.00	0.5271
119.25	27.110	0.502	0.445	1.137	27.748	52.00	0.5336
110.00	31.201	0.522	0.394	1.125	31.832	52.00	0.6121
100.00	34.728	0.540	0.349	1.111	35.359	52.00	0.6800
90.00	37.572	0.559	0.311	1.101	38.210	52.00	0.7348
84.25	38.937	0.595	0.291	1.092	39.604	52.00	0.7616
80.00	34.369	0.517	0.239	0.925	34.944	52.00	0.6720
78.75	34.579	0.518	0.236	0.923	35.154	52.00	0.6760
70.00	35.956	0.539	0.215	0.918	36.547	52.00	0.7028
60.00	37.256	0.561	0.195	0.912	37.866	52.00	0.7282
50.00	38.325	0.583	0.177	0.906	38.953	52.00	0.7491
46.00	38.696	0.626	0.171	0.904	39.367	52.00	0.7571
40.00	34.715	0.558	0.143	0.783	35.310	52.00	0.6790
39.25	34.759	0.558	0.142	0.781	35.353	52.00	0.6799
30.00	35.306	0.583	0.131	0.778	35.924	52.00	0.6908
20.00	35.775	0.607	0.120	0.773	36.415	52.00	0.7003
10.00	36.149	0.631	0.111	0.770	36.812	52.00	0.7079
1.00	36.420	0.647	0.103	0.765	37.098	52.00	0.7134

---------(END LOAD CASE 1 -- ACTUAL VS. ALLOWABLE STRESSES)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 12:12:33 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

M O N O P O L E B A S E P L A T E D E S I G N D E T A I L S

Shaft Shape .....:	18 Sided Polygon	Stress Increase ...:	1.333 Factor
Base Dia, DF ....:	61.040 Inches	Base Plate Shape ..:	Square
PT-to-PT, DP ....:	61.982 Inches		
Min Bolt Circle .:	68.232 Inches	Use Bolt Circle ...:	68.000 Inches

---

Base Reactions :	DESIGN	USER
Moment .....:	3822.75 Ft-Kips	3822.75 Ft-Kips
Axial Load .....:	54.49 Kips	54.49 Kips

Anchor Bolt Details :	DESIGN	USER
Number of Bolts .....:	16	20
Bolt Diameter .....:	2.250 Inches	2.250 Inches
Bolt Type .....:	#18J ASTM A615	#18J ASTM A615
Y-Distance .....:	9	12
Mom. of Inertia .....:	9311.21 In^4	11560.00 In^4
Bolt Tension, T .....:	168.08 Kips	134.92 Kips
Allowable Tension ...:	194.81 Kips	194.81 Kips
Bolt Compression, C .:	171.48 Kips	137.64 Kips

Base Plate Details :	DESIGN	USER
Plate Moment, MPL ...:	2466.61 In-Kips	2395.02 In-Kips
Bend Plane, W .....:	31.26 Inches	33.71 Inches
Plate Thickness, t ..:	2.934 Inches	3.000 Inches
Plate Width .....:	65.266 Inches	67.000 Inches
Plate Steel .....:	ASTM A572 GRADE 55 (55 KSI)	ASTM A572 GRADE 55 (55 KSI)
Gross Weight .....:	3544.20 Lbs	3819.00 Lbs
Net Weight .....:	2608.70 Lbs	2847.40 Lbs
Allowable Stress ....:	54.99 Ksi	54.99 Ksi
Actual Stress .....:	54.99 Ksi	47.36 Ksi
Act./Allow Ratio ....:	1.00	0.86

B A S E P L A T E D E S I G N S U M M A R Y

USE FOLLOWING SPECIFICATIONS:

Plate Thickness .....:	3.000 Inches	Number of Bolts ..:	20
Plate Width/Diameter :	67.000 Inches (Square)	Bolt Circle .....:	68.00 Inches
Plate Weight .....:	3.819 Kips	Bolt Diameter ....:	2.25 Inches
		Bolt Type .....:	#18J ASTM A615

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Thu May 23, 2002 - 1:20:02 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 31202-0013 Design No: Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C - Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner..... : Crown Castle Client: VoiceStream Wireless
Status..... : Final Design Revision: Rev. Date :

S U M M A R Y O F C U R R E N T C A I S S O N D E S I G N

Diameter (ft) .....:	8.00	Compression (kips):	54.49	Friction S.F .....:	2.00
Min. Depth (ft) ...:	21.00	Horizontal (kips) :	32.28	Lateral S.F .....:	2.00
Depth Used (ft) ...:	23.00	Uplift (kips) ....:	0.00	Concrete S.F .....:	1.30
Rebar Area (in^2) .:	37.44	Moment (Ft-kips) .:	3822.8	Concrete F'c (psi) :	3000.0
Rebar Used .....:	(24)#11	Full Cohesion (ft):	24.00	Steel Cover (in) ..:	4.00
Water at (ft) .....:	99.00	Rock at (ft) .....:	13.00		

SOIL PROFILE :

Soil Layer	Layer Thickness (ft)	Unit Weight (pcf)	Ult. Skin Friction (psf)	Allowable Bearing (psf)	Friction Angle- Phi (deg)	Passive Coeff.- KP	Cohesion (c) (psf)
1	3.00	100.00	0.00	0.00	0.00	1.000	0.00
2	10.50	135.00	0.00	3000.00	35.00	3.690	0.00
3	20.00	135.00	0.00	40000.00	35.00	3.690	0.00

LATERAL / MOMENT CAPACITY (CHECK) :	Min Design	Actual Design
Caisson Diameter (ft) .....:	8.00	8.00
Height Above Grade (ft) .....:	0.50	0.50
Depth Below Grade (ft) .....:	21.00	23.00
Concrete Volume (CY) .....:	40.03	43.75
Applied Moment From Loads (Working), Mwork(Ft-kip):	4334.39	4379.58
Resisting Moment From Soil (Ult), Mult(Ft-kip) ...:	9279.45	12394.65
Moment S.F. (Mult / Mwork) .....:	2.14	2.83
Applied Horizontal Load (Working), Hwork (Kips) ..:	32.28	32.28
Horizontal Soil Resistance (Ultimate), Hult (Kips):	64.71	68.51
Horizontal S.F. (Hult / Hwork) .....:	2.00	2.12
Center of Rotation (from grade) (ft) .....:	15.35	16.75
Inflection Point (Max Design Moment Location (ft) :	4.80	4.90
Maximum Factored Design Moment for Reinf. (Ft-kip):	5552.36	5552.36
Area Steel Required From Loads (in^2) .....:	27.60	27.60
ACI Minimum Steel (0.5%) (in^2) .....:	36.19	36.19
Area Reinf. Steel Provided (in^2) .....:	37.44	37.44

UPLIFT CAPACITY CHECK :		
Actual Uplift on Caisson (Kips) .....:	0.00	0.00
Allowable Uplift Capacity (Kips) .....:	129.69	141.75

COMPRESSION CAPACITY CHECK :		
Actual Compression on Caisson (Kips) .....:	54.49	54.49
Total Compression (Includes Concrete Wt.) (Kips) .:	111.04	116.07
Allowable Compression Capacity (Kips) .....:	2010.62	2010.62

CAISSON DESIGN:
USE: 8.00 ft Diameter X 23.50 ft Long (Concrete Volume = 43.75 CY)
Reinf: (24)#11 Vert, w/Closed Ties: (12)#5 @6.0", remaining ties @18.0" (ASTM A615)

```
PJF_Pole (tm) - Monopole Design Program
                Windows Version 3.04.0000       Thu May 23, 2002 - 1:25:02 pm
                (c) 1993 to 2000  PAUL J. FORD AND COMPANY, Columbus, Ohio
--------------------------------------------------------------------------------
Job No......: 31202-0013          Design No:                    Engineer : LGL
Description : 170-Ft Monopole - New Heaven Co., CT - CT-11-352C -  Cheshire
Design..... : 90 mph + Simultaneous 1/2" radial ice
Owner...... : Crown Castle                    Client: VoiceStream Wireless
Status..... : Final Design                    Revision:      Rev. Date :
--------------------------------------------------------------------------------
          S U M M A R Y   O F   S P R E A D   F O O T I N G   D E SI G N
--------------------------------------------------------------------------------
INPUT :
TOWER LOADS :
   Pole Weight                 :    54.50 kips   (pole, antenna, ice, mounts, etc.)
   Overturning Moment          :  3822.75 ft-kip (at Top of Pier)
   Total Horizontal Load       :    32.28 kips   (at Top of Pier)
   Overturning Safety Factor   :     1.50

CONCRETE :
   Concrete Strength           :  3000.00 psi at 28 Days
   Reinforced Steel Strength   : 60000.00 psi (ASTM A615 grade 60)

SOIL :                            Water Table Below Bottom Of Footing
   Soil Density                :   100.00 pcf (dry)
   Allowable Soil Bearing      :  8000.00 psf

FOOTING SIZE :
   Width          :    26.00 ft          Length         :    26.00 ft
   Thickness      :     4.00 ft          Depth          :     7.00 ft Below Grade
   Pier Size      :     8.00 ft square    Pier           :     0.50 ft Above Grade
   Concrete Density           :   150.00 pcf
--------------------------------------------------------------------------------
OUTPUT :
   Volume of Concrete          :  2928.00 ft^3  (108.44 Cubic Yards)
   Weight of Tower             :    54.50 kips
   Weight of Concrete          :   439.20 kips  (2928.00 ft^3 x 0.150 k/ft^3)
   Weight of Soil              :   183.60 kips  (1836.00 ft^3 x 0.10 k/ft^3)
                                 ---------
   Total Weight                :   677.30 kips

   Overturning Moment          :  3822.75 ft-k + (32.28 k x 7.50 ft) = 4064.85 ft-kips
   Resisting Moment            :   677.30 k x 26.00 ft/2 = 8804.90 ft-kips

   Safety Factor = Mresist / O.T.M. = 8804.90 / 4064.85 = 2.17 > 1.50 O.K.

   Ultimate Overturning Moment:  4064.85 ft-k x 1.50 = 6097.28 ft-kips
   Ultimate Net Soil Bearing  :  3644.19 psf
   Gross Soil Bearing         :  3515.09 psf (Includes Soil Overburden)
   Soil Overburden            :   700.00 psf (Soil Overburden)
   Net soil Bearing           :  2815.09 psf < 8000.00 psf O.K.

   Bending Moment in Pier     :  3822.75 ft-k + (32.28 k x 3.50 ft) = 3935.73 ft-kips
   Area of Steel Required     :    44.22 in^2 (32 no. 11 Bars)    (0.5 % = 46.08 in^2)

   Bending Moment in Footing  :  4403.59 ft-kips
   Footing Reinforcing        :     1.15 in^2/ft = 31 no. 9 bars @ 10.39 in. o.c.
                                 (0.18 % = 1.04 in^2/ft)

   Bending Shear in Footing   :   557.62 kips
   Allowable Bending Shear    :   972.10 kips  O.K.
```

Exhibit E

Power Density Calculations
Summit Road

Cheshire, Connecticut

VOICESTREAM WIRELESS CORPORATION
100 Filley St, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Karina Hansen
From: Jeetendra Ghare - Radio Frequency Engineer
cc: Mike Fulton
Subject: Power Density Report for CT11352C
Date: June 7, 2002

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the Voicestream Wireless Corporation PCS antenna installation on a Monopole at Summit Road, Cheshire, CT. This study incorporates the most conservative consideration 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 Voicestream Wireless transmitters are in the 1935-1945 MHz frequency band.
2) The antenna cluster consists of three sectors, with 4 antennas per sector.
3) The model number for each antenna is EMS RR90-17-02DP.
4) The antenna center line height is 138 ft.
5) The maximum transmit power from each sector is 3147.31 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
7) 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.
8) 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 worst case assumptions, the power density calculation from the VoiceStream Wireless Corporation PCS antenna installation on a Monopole at Summit Road, Cheshire, CT, is 0.03963 mW/cm^2. This value represents 3.963% of the Maximum Permissible Emission (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for VoiceStream Wireless will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.
The combined Power Density from other carriers is 12.73%. The combined Power Density for the site is 16.693% of the M.P.E.

New England Market
Connecticut
Worst Case Power Density

VoiceStream Global Wireless by T-Mobile

Site:	**CT11352C**
Site Address:	**Summit Road**
Town:	**Cheshire**
Tower Height:	**190 ft.**
Tower Style:	**Monopole**
Base Station TX output	17 W
Number of channels	8
Antenna Model	EMS RR90-17-02DP
Cable Size	1 5/8 in.
Cable Length	160 ft.
Antenna Height	138.0 ft.
Ground Reflection	1.6
Frequency	1935.0 MHz
Jumper & Connector loss	1.00 dB
Antenna Gain	16.5 dBi
Cable Loss per foot	0.0116 dB
Total Cable Loss	1.8560 dB
Total Attenuation	2.8560 dB
Total EIRP per Channel	55.95 dBm
(In Watts)	393.41 W
Total EIRP per Sector	64.98 dBm
(In Watts)	3147.31 W
nsg	13.6440
Power Density (S) =	**0.039629 mW/cm^2**
Voicestream Worst Case % MPE =	**3.9629%**

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

Co-Location Total

Carrier	% of Standard
Verizon	4.05
Sprint PCS	8.68
Total Excluding Voicestream	**12.73**
Voicestream	3.9629
Total % MPE for Site	**16.6929%**


EM-VOICESTREAM-025-020611
1119 Summit Road
Cheshire 6/19/02