

**PULLMAN**  
**& COMLEY, LLC**  
ATTORNEYS

**CARRIE L. LARSON**  
90 State House Square  
Hartford, CT 06103-3702  
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f (860) 424-4370  
clarson@pullcom.com  
www.pullcom.com

October 25, 2010

**Via Federal Express**

Linda Roberts, Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

ORIGINAL

RECEIVED  
OCT 26 2010

CONNECTICUT  
SITING COUNCIL

**Re: EM-Pocket-143-090616, 1925-1931 East Main Street, Torrington, Connecticut**

Dear Ms. Roberts:

Please be advised that this office represents Youghioghny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"). Pocket received approval for the above-referenced exempt modification July 10, 2009. That approval required that Pocket's coaxial cable be installed internally in the monopole's shaft. The enclosed photograph demonstrates that this requirement has been met. I assume that this information should satisfy the Council's approval for this application. Please let me know if you have any questions.

Respectfully Submitted,



Carrie L. Larson

Enc.

ACTIVE/72572.285/CLARSON/2279011v1



Daniel F. Caruso  
Chairman

# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

Internet: [ct.gov/csc](http://ct.gov/csc)

July 10, 2009

Carrie L. Larson, Esq.  
Pullman & Comley, LLC  
90 State House Square  
Hartford, CT 06103-3702

RE: **EM-POCKET-143-090616** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket Communications notice of intent to modify an existing telecommunications facility located at 1925-1931 East Main Street, Torrington, Connecticut.

Dear Attorney Larson:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- The proposed coax lines shall be installed as recommended in the structural analysis report prepared by Krystyn Wagner and stamped by Christopher Murphy, PE; and
- The Council shall be notified in writing that the coax was installed as specified.

The proposed modifications are to be implemented as specified here and in your notice dated June 15, 2009, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any

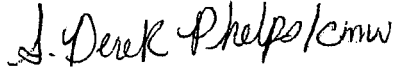


CONNECTICUT SITING COUNCIL  
Affirmative Action / Equal Opportunity Employer

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,



S. Derek Phelps  
Executive Director

SDP/CDM/laf

- c: The Honorable Ryan J. Bingham, Mayor, City of Torrington  
Martin Connor, City Planner, City of Torrington  
SBA Communications, Inc.

**EM-POCKET-143-090616**

**CARRIE L. LARSON**  
90 State House Square  
Hartford, CT 06103-3702  
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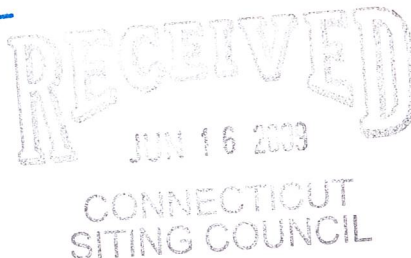
[www.pullcom.com](http://www.pullcom.com)

June 15, 2009

**Via Federal Express**

S. Derek Phelps, Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

ORIGINAL



**Re: Notice of Exempt Modification**  
**SBA Communications, Inc. Telecommunications Facility**  
**1925-1931 East Main Street, Torrington, Connecticut**

Dear Mr. Phelps:

Youghiogheny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"), intends to install antennas and appurtenant equipment at the existing 153-foot monopole facility owned by **SBA Communications, Inc.** and located at **1925-1931 East Main Street, Torrington, Connecticut** ("Facility"). Pocket Communications provides prepaid, flat rate wireless voice and data services to more than a quarter of a million subscribers. Pocket 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. This installation constitutes an exempt modification pursuant to the Public Utility Environmental Standards Act, Connecticut General Statutes Section 16-50g et. seq. (PUESA), and Section 16-50j-72(b)(2) of the Regulations of the Connecticut State Agencies adopted pursuant to PUESA. In accordance with R.C.S.A. Section 16-50j-73, a copy of this notice has been sent to Ryan J. Bingham, Mayor, City of Torrington.

The existing Facility consists of a 153-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound. The coordinates for the Facility are **Lat: 41°-49'-23"** and **Long: 73°-04'-37"**. The tower is located in the southern portion of Torrington, approximately 700 feet north of East Main Street, and roughly 1,000 feet east of Torrington Road (Route 183) (see Site Map, attached as Exhibit A). The tower currently supports AT&T antennas at the ninety-five foot (95') level centerline AGL (above ground level), Verizon antennas at the one hundred twenty-three foot level (123') AGL, T-Mobile antennas at the one hundred thirty-three foot level (133') AGL, Nextel antennas at the one hundred forty-three foot level (143') AGL, and Sprint antennas at the one hundred fifty-three foot level (153') AGL. The tower also currently supports a public safety whip at the one hundred five foot level (105') AGL. Pocket proposes to install three RFS APXV18-206517S-C flush mount antennas on the tower at the eighty-five foot centerline (85') AGL, and a Nortel CDMA Micro BTS 3231



Page 2

cabinet, mounted on an “H-Frame,” contained within a six foot by six foot (6’-0” x 6’-0”) lease area. A small GPS antenna will be mounted to the H-Frame. An ice bridge will run from the lease area to the tower. Utilities will be run via a proposed underground conduit from an existing utility backboard, within the compound (See Design Drawings and Equipment Specifications, attached as Exhibits B and C respectively). To accommodate Pocket’s equipment on a temporary basis, a mobile, EPA approved generator and small microwave dish antenna (approximately 14” by 14”) will be used at the site to provide electricity until permanent power can be established by the utility provider. If needed at all, Pocket anticipates that the temporary generator will be in use for a maximum of eight weeks from the time of approval. The specifications on this proposed temporary generator and microwave dish are included in the Equipment Specifications, attached as Exhibit C. Due to the temporary use and low emissions from the generator, no permit is required from the Department of Environmental Protection. Pocket would propose to refuel the generator every 48 hours.

For the following reasons, the proposed modifications to the East Main Street Facility meet the exempt modification criteria set forth in R.C.S.A. Section 16-50j-72(b)(2):

1. The proposed modification will not increase the height of the tower as Pocket’s antennas will be installed at a center line height of approximately 85 feet.
2. The installation of Pocket’s equipment and shelter will not require an extension of the site boundaries.
3. The proposed modifications will not increase the noise levels at the existing Facility by six decibels or more.
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 standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. The worst-case RF power density calculations for the proposed Pocket antennas would be 53.01% of the FCC standard (see general power density calculations table, attached as Exhibit D).

Also attached, Exhibit E, is a structural analysis confirming that the tower can support the existing and proposed antennas and associated equipment.

For the foregoing reasons, Pocket respectfully submits that the proposed antenna installation and equipment at the Torrington Facility constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Page 3

Respectfully Submitted,



Carrie L. Larson

cc: Ryan J. Bingham, Mayor, City of Torrington  
TEP Incorporated, underlying property owner

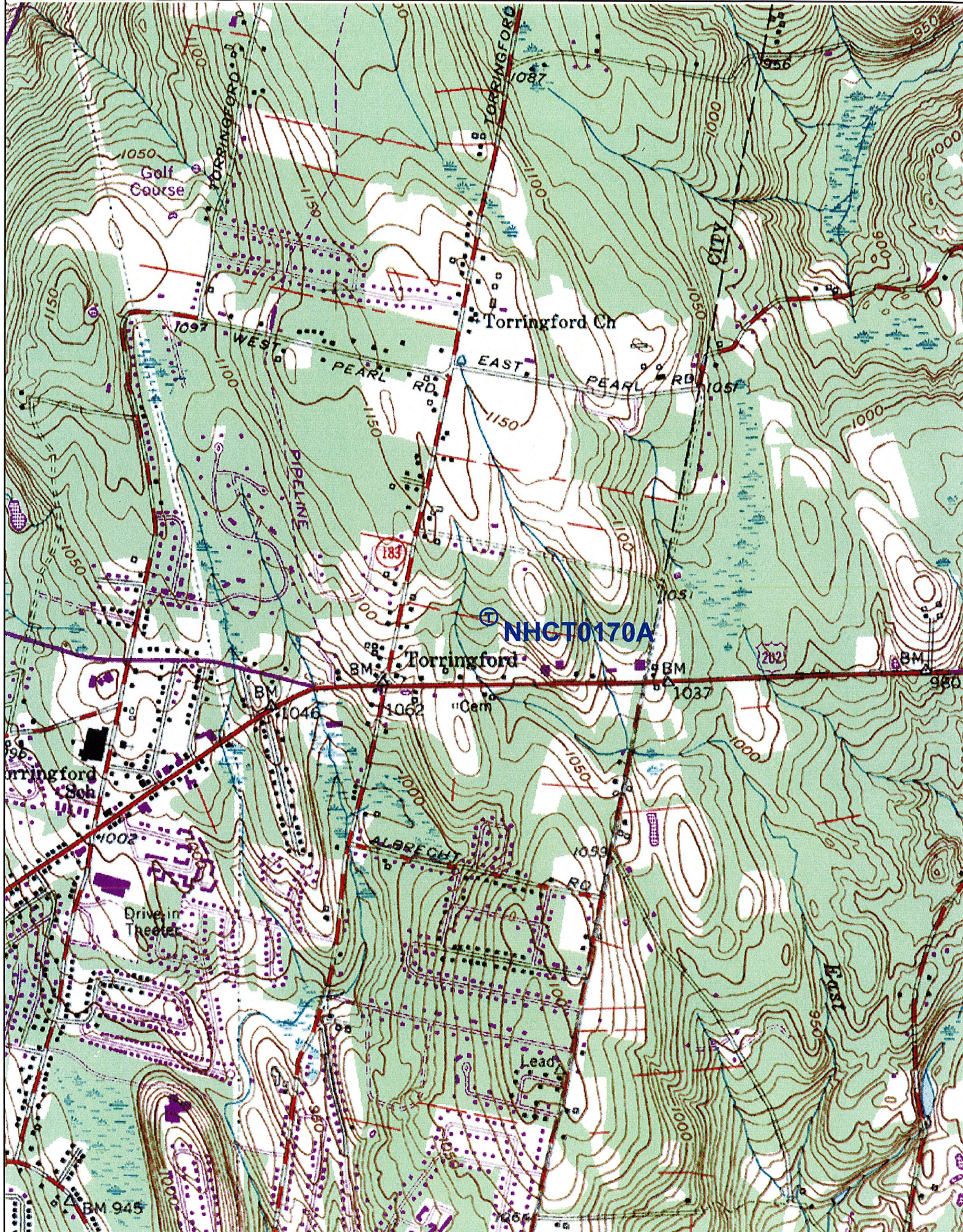
Hartford/72572.2/JTP/374650v1

# **Exhibit A**

## **Site Map**

**Pocket Site NHCT0170A  
1925-1931 East Main Street  
Torrington, Connecticut**





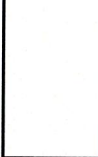


# **Exhibit B**

## **Design Drawings**

**Pocket Site NHCT0170A  
1925-1931 East Main Street  
Torrington, Connecticut**





THIS DRAWING IS THE PROPERTY OF POCKET COMMUNICATIONS, INC. AND IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF POCKET COMMUNICATIONS, INC. ANY UNAUTHORIZED USE OF THIS DRAWING FOR ANY PURPOSES OTHER THAN THAT SPECIFICALLY AUTHORIZED BY POCKET COMMUNICATIONS, INC. IS STRICTLY PROHIBITED.

JOB NO: NHCT0170A  
DRAWN BY: RAL  
CHECKED BY: PUM

REV	DATE	ISSUED FOR REVIEW	DESCRIPTION
A	06/27/09		

NHCT0170A  
TORRINGTON  
MONOPOLE  
1925-1931 EAST MAIN STREET  
TORRINGTON, CT 06793

SHEET TITLE  
TITLE SHEET

SHEET NUMBER  
T-1

**APPLICABLE BUILDING CODES AND STANDARDS**

CONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN. THE LATEST EDITIONS OF THE IBC, IBCS, IBCS CODES AND THE 2004 CITY PUBLIC SERVICE ELECTRICAL SERVICE STANDARDS.

- BUILDING CODE: INTERNATIONAL BUILDING CODE (IBC), 2006.
- ELECTRICAL CODE: NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70, 2005. NATIONAL ELECTRICAL CODE.
- LIGHTNING PROTECTION CODE: NFPA 780, 2005. LIGHTNING PROTECTION CODE.

CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION ASD, NINTH EDITION.
- TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 22-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES.
- TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS.

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 91, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM.

IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT.

IEEE C92.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY C3 AND HIGH SYSTEM EXPOSURE).

TELECORDIA GR-123, GENERAL INSTALLATION REQUIREMENTS.

TELECORDIA GR-1503, COAXIAL CABLE CONNECTIONS.

ANSI T1.311 FOR TELECOMMUNICATIONS - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL METHODS OF CONSTRUCTION OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. IF THERE IS A CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

**PROJECT SUMMARY**

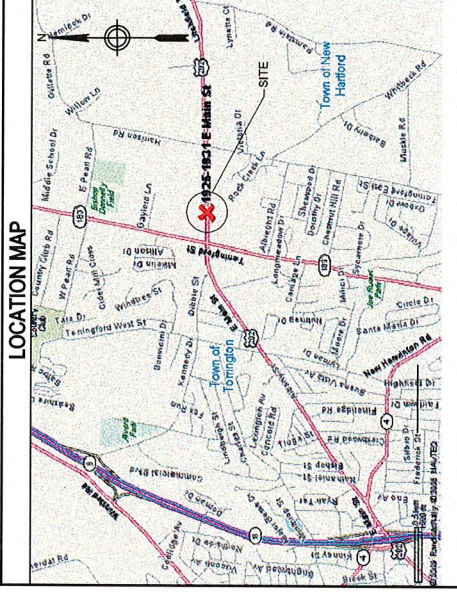
- THIS SITE IS UNMANNED AND IS RESTRICTED TO OUTDOOR EQUIPMENT. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
- POCKET COMMUNICATIONS CERTIFIES THAT THIS TELEPHONE EQUIPMENT FACILITY WILL BE SERVICED ONLY BY POCKET COMMUNICATIONS EMPLOYEES. THE WORK ASSOCIATED WITH ANY EQUIPMENT CANNOT BE PERFORMED BY HANDICAPPED PERSONS. THIS FACILITY WILL BE FREQUENTED ONLY BY SERVICE PERSONNEL FOR REPAIR PURPOSES. THIS FACILITY IS EXEMPT FROM THE AMERICANS WITH DISABILITIES ACT (ADA), APPENDIX B, SECTION 4.11.01(B).
- NO POTABLE WATER IS TO BE SUPPLIED AT THIS LOCATION.
- NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.
- NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.
- POCKET COMMUNICATIONS MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.



**Call Before You Dig**  
CALL BEFORE YOU DIG  
CALL 1-800-4-A-POCKET OR 1-800-427-4455  
FOR MORE INFORMATION



NHCT0170A  
TORRINGTON CT01499-S  
MONOPOLE



**DRIVING DIRECTIONS**

FROM NEW HAVEN: TAKE I-91 NORTH TO I-691 WEST TO ROUTE 8 NORTH. TAKE EXIT 44A TO US-202CT-4. TAKE A RIGHT AT END OF RAMP. AFTER APPROXIMATELY 2 MILES, SITE IS LOCATED ON THE LEFT.

**SITE INFORMATION**

TOWER OWNER: SBA COMMUNICATIONS, INC.  
5800 BROKEN SOUND PKWY NW  
BOCA RATON, FL 33487  
TORRINGTON CT01499-S

SITE NAME: NHCT0170A

SITE NUMBER: 1925-1931 EAST MAIN STREET  
TORRINGTON, CT 06790

SITE ADDRESS: YOUNGSHIRE COMMUNICATIONS  
NORTHEAST LLC  
2919 NW LOOP 410  
SAN ANTONIO, TX 78230

COUNTY: LITCHFIELD

LATITUDE: 41° 48' 22.77"

LONGITUDE: -73° 04' 37.52"

ZONING JURISDICTION: CSC

POWER COMPANY: CL&P  
(860) 379-5582

TELEPHONE COMPANY: AT&T  
(860) 521-6801

DESIGN FIRM: AERIAL SPECTRUM, INC.  
599 NORTH AVENUE, SUITE 8  
WAKEFIELD, MA 01880

**DRAWING INDEX**

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	A
A-1	COMPOUND PLAN	A
A-2	TOWER ELEVATION & RF SYSTEM DESIGN PLAN	A
S-1	EQUIPMENT DETAILS	A
G-1	GROUNDING DETAILS	A
E-1	ELECTRICAL DETAILS	A

**APPROVALS**

REAL ESTATE	RF	OPS/CONSTRUCTION	LEGAL/COMPLIANCE	NET DESIGN
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# **Exhibit C**

## **Equipment Specifications**

**Pocket Site NHCT0170A**

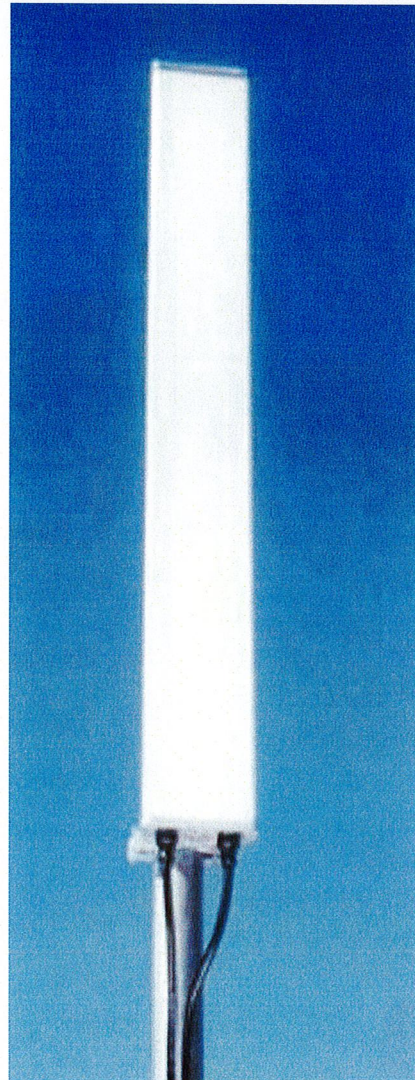
**1925-1931 East Main Street**

**Torrington, Connecticut**



**Product Description**

This variable tilt antenna provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features null fill and a wide downtilt range with optional remote tilt.



**Features/Benefits**

- Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.
- High Suppression of all Upper Sidelobes (Typically <-20dB).
- Optional remote tilt - can be retrofitted.
- Broadband design.
- Dual polarization.
- Low profile for low visual impact.

**Technical Features**

Frequency Band	3G/UMTS (Single, Broad, Dual and Triple-Band)
Horizontal Pattern	Directional
Antenna Type	Panel Dual Polarized
Electrical Down Tilt Option	Variable

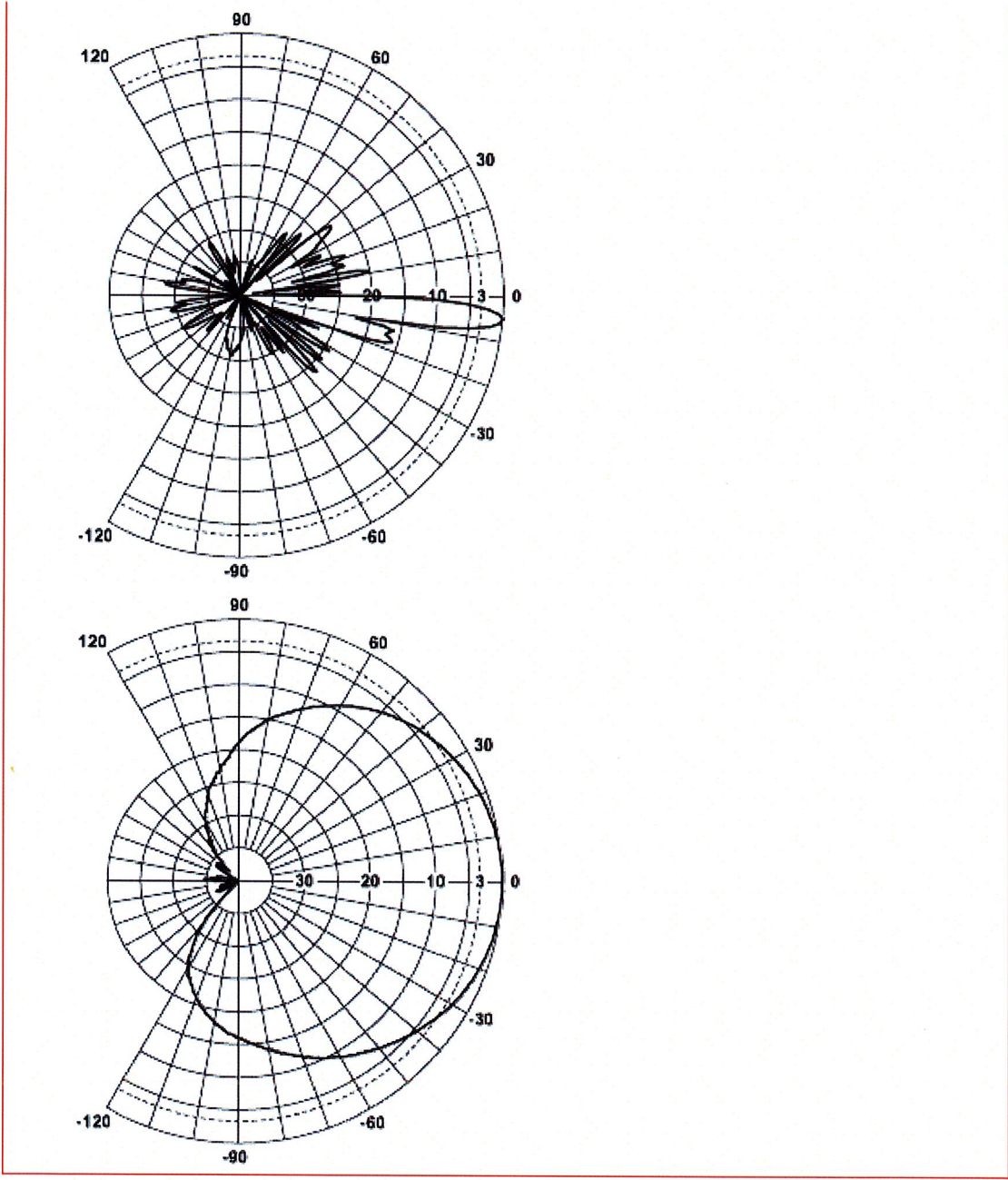




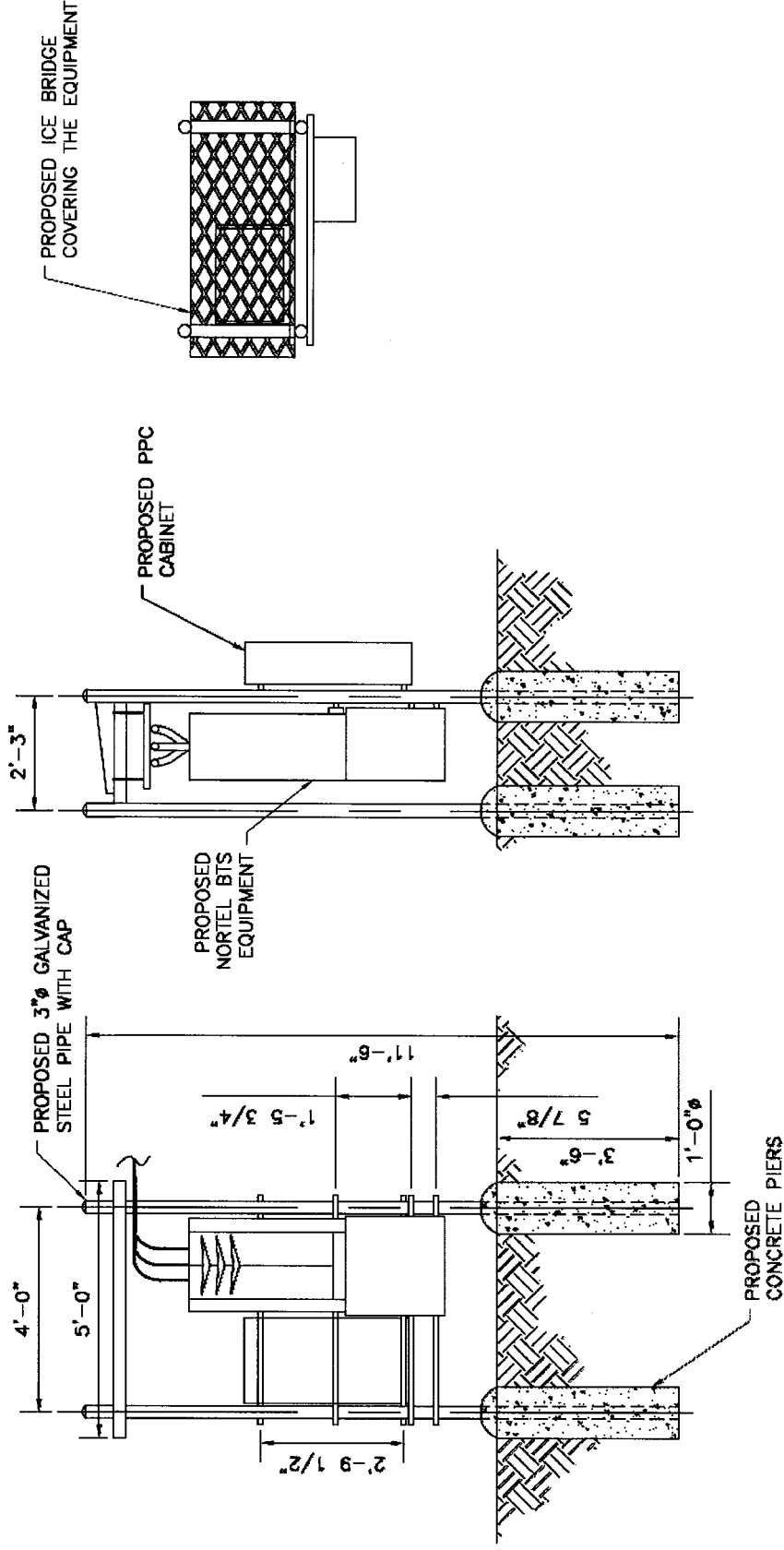
Gain, dBi (dBd)	18.8 (16.7) , 19.0 (16.9)
Frequency Range, MHz	1710-1900, 1900-2170
Connector Type	(2) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt
Electrical Downtilt, deg	0-10
Horizontal Beamwidth, deg	67 , 63
Mounting Hardware	APM40-2
Rated Wind Speed, km/h (mph)	160 (100)
VSWR	< 1.5:1
Vertical Beamwidth, deg	5.0 , 4.6
Upper Sidelobe Suppression, dB	>17 , >18 all (Typically >20)
Polarization	Dual pol +/-45°
Front-To-Back Ratio, dB	>30
Maximum Power Input, W	300
Isolation between Ports, dB	>30
Lightning Protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	>150
7th Order IMP @ 2x46 dBm, dBc	>170
Impedance, Ohms	50
Overall Length, m (ft)	1.85 (6.06)
Mounting Hardware Weight, kg (lb)	3.4 (7.5)
Dimensions - HxWxD, mm (in)	1850 x 175 x 80 (72.0 x 6.8 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	12 (26.4)
Weight w/ Mtg Hardware, kg (lb)	14.8 (32.5)
Radiating Element Material	Brass
Radome Color	Light Grey RAL7035
Radome Material	Fiberglass
Mounting Hardware Material	Diecasted Aluminum
Reflector Material	Aluminum
Max Wind Loading Area, m <sup>2</sup> (ft <sup>2</sup> )	0.31 (3.3)
Survival Wind Speed, km/h (mph)	200 (125)
Maximum Thrust @ Rated Wind, N (lbf)	558 (125)
Front Thrust @ Rated Wind, N (lbf)	558 (125)
Shipping Weight, kg (lb)	18.3 (39.8)
Packing Dimensions, HxWxD, mm (in)	2021 x 260 x 200 (79.5 x 10.2 x 7.8)
Packing Dimensions - HxWxD, m (ft)	2.0 x 0.26 x 0.2 (6.6 x 0.85 x 0.65)

**Notes**

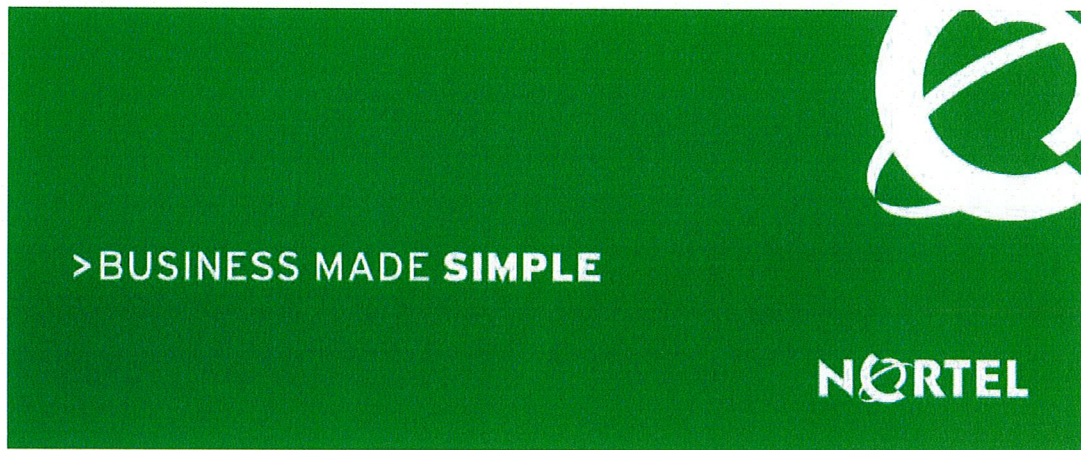
For additional mounting information please click "External Document Link" below.







Pocket/Youghiogheny Communications – Northeast, LLC  
 Rack Detail



## CDMA BTS 3231 AWS 1.7/2.1 GHz (Outdoor/Indoor)

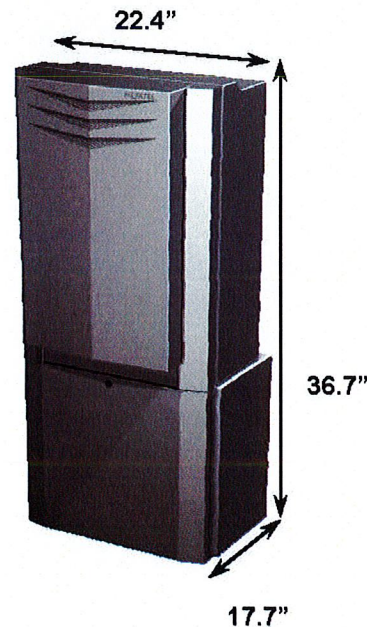
### CDMA BTS 3231

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#### *Industry's Highest Capacity AWS Micro BTS*

The CDMA BTS 3231 is the latest extension to Nortel Networks BTS (Base Transceiver Station) portfolio providing the ideal solution for urban, sub-urban and rural deployments. The CDMA BTS 3231 is a 3-carrier, 3-sector outdoor/indoor BTS operating at the AWS band of 1.7/2.1 GHz supporting IS-95, 1XRTT and 1xEV-DO simultaneously. BTS 3231 provides flexible deployments solutions including floor, rack, and wall mount options. The power consumption of BTS3231 is industry leading consuming only 630W for 3C3S. The BTS 3231 is also very light at 240lbs making it easy

to transport to hard to reach locations such as the top of a high rise building.







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- Employment

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  - Generators
    - Lite
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  - Light Towers
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  - Troubleshooting
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## MLG15 Lite Generator Interim Tier IV EPA Approved Engine

Magnum recognizes environmental responsibility and continues to meet emission regulations with the addition of their Interim Tier IV Generator line. The MLG15 generator is powered by a Mitsubishi diesel engine. Proven power you can trust, while maximizing fuel efficiency and high performance.

**Affordable, Reliable, Mobile**



**More Information**

**Manuals**

- [Operating & Parts](#)

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**Power**

The MLG15 diesel generator provides just the right combination of output, flexibility, ruggedness, efficiency and affordability for on-the-go, smaller-to-midsized, single phase power needs.

**Features****Tough**

- Full tubular steel frame, with lockable enclosure
- Durable, fade resistant, white baked on powder coat finish
- Stainless steel hinges, exterior hardware and pad lockable door latches

**Reliable**

- Key switch to preheat (glow plug), start & stop
- Automatic low oil level / high temp shutdown alerts
- 70A Start limit main breaker
- 2 year - 2,000 hour warranty
- Marathon voltage regulation within +/- 1%

**Ease for Your Users**

- Self-priming 4 cylinder Mitsubishi engine
- External convenience outlets with individual breaker switches
- External emergency stop switch

**Specifications****Output**

3 Phase - Standby <b>kW (kVA)</b>	N/A
Amps <b>480V (208V)</b>	N/A
3 Phase - Prime <b>kW (kVA)</b>	N/A
Amps <b>480V (208V)</b>	N/A
1 Phase - Standby <b>kW (kVA)</b>	14.0 (14.0)
Amps <b>240V</b>	58
1 Phase - Prime <b>kW (kVA)</b>	13.0 (13.0)
Amps <b>240V</b>	54
AC Voltage 1-phase	120, 240
AC Voltage 3-phase	N/A
Frequency <b>Hz</b>	60
Power Factor	1.0 (1 Phase)
Generator - Brand / Type / Insulation	Marathon / Brushless / F
Sound (dB(A) 23 ft @ prime)	68
<b>Size and Weight</b>	
Skid Mounted - L x W x H <b>in (m)</b>	N/A
Dry Weight <b>lbs (kg)</b>	N/A
Operating Weight <b>lbs (kg)</b>	N/A
Trailer Mounted - L x W x H <b>in (m)</b>	105 x 67 x 56 (2.67 x 1.70 x 1.42)
Dry Weight <b>lbs (kg)</b>	1425 (646)

**updated  
parts  
information  
before  
placing a  
parts  
order.**

**Tech. Specs.**

- [MLG15](#)

**Literature / Sales**

- [Generator Lit.](#)
- [Service Kit Lit.](#)
- [Sales Support](#)



- [Warranty Overview](#)
- [Warranty Claim Policy](#)

Operating Weight <b>lbs (kg)</b>	1823 (827)
<b>Engine</b>	
Type	Interim Tier IV
Brand	Mitsubishi
Aspiration	Natural
Power - Prime @ 1800 rpm <b>hp (kWm)</b>	22.3 (16.6)
Displacement <b>cubic in (L)</b>	107 (1.8)
Cylinders	4
Speed <b>rpm</b>	1800
Fuel Consumption - Prime <b>gph (Lph)</b>	1.30 (4.92)
<b>Capacities</b>	
Fuel Tank <b>gal (L)</b>	56 (212)
Approximate Run Time <b>hrs</b>	43
Coolant <b>qt (L)</b>	11.6 (11.0)
<b>Electrical Distribution</b>	
Battery - 12V	1 - 12V 440 CCA Wet Cell
Main Circuit Breaker Size <b>A</b>	70
Voltage Selection	N/A
Voltage Regulation	+/-1%
120V - 20A GFI Duplex Outlets - qty	2
240V - 30A Twist Lock Outlets - qty	2
240V - 50A Twist Lock Outlets - qty	2
<b>Trailer</b>	
Number of Axles	1
Capacity - Axle Rating <b>lbs (kg)</b>	2200 (998)
Tire Size <b>in</b>	15
Brakes	N/A
Hitch	2" Ball
Maximum Tire Pressure <b>psi</b>	50
<b>Options</b>	
Powertrain (Engine/Gen)	<ul style="list-style-type: none"> <li>• 60/40 Coolant</li> <li>• Heated Fuel Filter</li> <li>• Engine Heater - Lower Radiator Hose</li> <li>• Oil Drain Valve Kit</li> </ul>
Controls	<ul style="list-style-type: none"> <li>• Battery, 720 CCA Gel Cell</li> <li>• Battery, 720 CCA Wet Cell</li> <li>• Battery, 685 CCA Gel Cell</li> <li>• No Battery</li> <li>• Battery Disconnect, Lockable</li> <li>• Battery Charger, 2 Amp</li> <li>• Alternative Outlet Panel Options (Consult factory for details)</li> </ul>



Cabinet/Fuel Tank

- Interior Cabinet Light
- Level Indicator
- 56 Gallon Fuel Tank
- Fuel Tank Cap - Vent w/ Lanyard
- Spare Tire & Carrier
- Lift Structure
- Liquid Containment/Quiet Pack

Trailer

- Tube & Sleeve Jack
- Combo Hitch - 2.5" Ring/2" Ball
- 2.5" Ring
- 3" Ring
- 3" Ring (1.625 TH)
- Plug Adapter, 4 Flat to 6 Round
- Plug Adapter, 4 Flat to 7 Pin
- Plug Adapter, 4 Flat to 7 Round Spade
- Outrigger Package

**Product Images (click small image to pop-up larger version)**

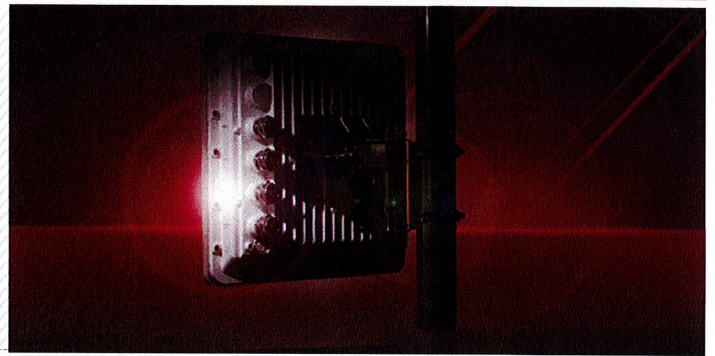


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## EX-5r Series



### All-Outdoor, Carrier-Class, Tri-Band 5 GHz TDD Radio System for Low, Medium and High Capacity Ethernet and TDM Applications

The EX-5r series of all-outdoor digital microwave radios is the first family of carrier-class, tri-band TDD radios available in the 5.2 – 5.8 GHz license-exempt bands. Radios in the EX-5r line support capacities ranging from 27 Mbps to an industry-leading 440 Mbps of aggregate user throughput, from zero to four T1/E1s and both 100BaseT and GbE interfaces. Featuring native TDM and native Ethernet transport and full software configurability and upgradeability, the EX-5r series was designed to meet demanding backhaul requirements of enterprise organizations and service providers seeking the performance benefits of an all-outdoor configuration.

**Carrier-class TDD.** The EX-5r series radios combine native TDM and native Ethernet transport with low, fixed latency to deliver guaranteed throughput and service quality. Capacity can be allocated variably between TDM and Ethernet via software, while the selectable throughput symmetry control feature enables radio capacity to efficiently match asymmetric traffic requirements.

**Industry-leading Spectrum Management.** The EX-5r radios include selectable channel bandwidth and 1 MHz tuning resolution,

yielding up to 54 non-overlapping frequency channels and up to 415 center frequencies of operation. These capabilities, combined with selectable modulation and superior system gain, provide unparalleled interference avoidance and transmission resiliency. A built-in spectrum analyzer is even included to accelerate deployment and simplify troubleshooting.

**ExaltSync Synchronization.** The ExaltSync technology embedded in the EX-5r series radios allows multiple radio systems to be collocated in close proximity without self-interference, minimizing antenna separation and ensuring reuse of scarce spectrum across all collocated systems.

**Security, Management and Data Networking.** The EX-5r radios deliver the highest data and management security available with optional 128- and 256-bit AES encryption and secure SNMP v3 management, together with enhanced fault management and diagnostic features. The 802.1Q VLAN option provides built-in network administration and security flexibility.

EX-5r series radios are available in both integrated antenna and external antenna (connectorized) versions.



Primary Specifications		EX-5r Lite / EX-5r-c Lite	EX-5r v3 / EX-5r-c v2	EX-5r GigE / EX-5r-c GigE
Maximum Capacity <sup>1</sup>	TDM		4xT1/E1	
	Ethernet (Aggregate)	100 Mbps	200 Mbps	440 Mbps
Frequency (GHz)		Tri-band: 5.250-5.350, 5.470-5.725, 5.725-5.850		
Range <sup>2</sup>		> 30 miles at 99.999% throughput availability		

<sup>1</sup> Please refer to the Exalt Throughput and Range Specification document for detailed capacity information.

<sup>2</sup> Distance based upon FCC regulations, average climate and terrain, 6' dish antennas, 3 dB transmission system losses at each end. Longer or shorter distances will apply for alternative antennas, country regulations, transmission system losses, path topologies and radio configurations. See Exalt's link budget and path planning tool to model your scenario.



## Specifications

## EX-5r Series

### System

Frequency Bands <sup>1</sup> (GHz)	5.250-5.350, 5.470-5.725, 5.725-5.850			
Tuning Resolution	1 MHz			
Output Power (full power)	+24 dBm QPSK; +21 dBm 16QAM			
5725-5850 MHz band	+24 dBm QPSK; +21 dBm 16QAM			
5250-5350 MHz band <sup>2</sup>	+13 dBm			
5470-5725 MHz band <sup>2</sup>	+13 dBm			
Output Power (min power)	Full power minus 20 dB			
Power Control Step Size	0.5 dB			
Receiver Threshold (BER=10 <sup>-4</sup> )	8 MHz	16 MHz	32 MHz	64 MHz
QPSK	-86	-83	-80	-77
16QAM	-78	-75	-72	-69
Non-overlapping Channels				
5.250-5.350 GHz	10	5	2	1
5.470-5.725 GHz	29	14	7	3
5.725-5.850 GHz	15	7	3	1
Maximum RSL	-25 dBm error-free 0 dBm no damage			
Throughput Symmetry Control	5 modes 20/80, 80/20, 35/65, 65/35, 50/50			
Error Floor	10 <sup>-12</sup>			
Latency (T1/E1)	1ms, typical			
Maximum Packet Size	All 1916 bytes except GigE 9728 bytes			

### System (continued)

Link Security	96-bit proprietary encryption 128-bit and 256-bit AES encryption <sup>3</sup>
Spectrum Analyzer	Embedded
VLAN	802.1Q
QoS	802.1p (GigE)
Management	HTTP GUI CLI/Telnet SNMP v1, 2c, v3
Compliance	FCC 15.247, FCC 15.407 EN 301-893, EN 302-502 EN 60-950, EN 301-489 IC RSS-210

### System Components

Complete Link	Two terminals, each with AC adapter & accessory kit
Single Terminal	One terminal with AC adapter & accessory kit
Accessory Kit	DC power connector, rack and grounding hardware (spare)
AC Adapter	AC adapter (spare)
Mounting Kits	Available for each product (spare)
ExaltSync GPS Sync Kit	GPS receiver and mounting bracket (optional)

## Specifications

### EX-5r Lite

### EX-5r-c Lite

### EX-5r v3

### EX-5r-c v2

### EX-5r GigE

### EX-5r-c GigE

### Physical

Physical Configuration	Outdoor Unit (ODU)					
Dimensions (H x W x D)	14 x 14 x 3.8 in	14 x 14 x 2.5 in	14 x 14 x 3.8 in	14 x 14 x 2.5 in	14 x 14 x 3.8 in	14 x 14 x 2.5 in
	35.6 x 35.6 x 9.7 cm	35.6 x 35.6 x 6.4 cm	35.6 x 35.6 x 9.7 cm	35.6 x 35.6 x 6.4 cm	35.6 x 35.6 x 9.7 cm	35.6 x 35.6 x 6.4 cm
Antenna	Integrated	2x Type-N (F) Connector	Integrated	2x Type-N (F) Connector	Integrated	2x Type-N (F) Connector
Integrated Antenna						
Gain/3 dB Beamwidth	23 dBi / 9 degrees	-	23 dBi / 9 degrees	-	23 dBi / 9 degrees	-
Operating Temperature	-40 to +65 °C; -40 to +149 °F					
Full Spec Temperature	-40 to +60 °C; -40 to +140 °F					
Weight	14 lbs/6.4 kg	12 lbs/5.5 kg	14 lbs/6.4 kg	12 lbs/5.5 kg	14 lbs/6.4 kg	12 lbs/5.5 kg
Environmental	NEMA 4/IP56					
Altitude	15,000 ft; 4.6 km					
Humidity	100% condensing					

### Interfaces

RF	-	2x N-type (F), 50 ohm	-	2x N-type (F), 50 ohm	-	2x N-type (F), 50 ohm
TDM T1/E1 Interfaces	RJ48C/RJ45 (F) (x4)					
T1 Impedance	100 ohms, balanced					
T1 Line Code	AMI, B8ZS, selectable per channel					
T1 Data Rate	1.544 Mbps					
T1 Compliance	ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE					
E1 Impedance	120 ohms, balanced					
E1 Line Code	HDB3					
E1 Data Rate	2.048 Mbps					
E1 Compliance	CEPT-1; G.703; ITU-T-G.703					
Loopback Modes	Remote Internal; Remote External; Local Line					
Ethernet	RJ45 (F)					
Interface Speed	10/100BaseT (POE)					
Duplex	Half, Full, Auto-MDIX					
Compliance	802.3					
ExaltSync Synchronization	RJ45 (F)					
	Input: 1pps (GPS)					
DC Power	48VDC, <50W					
AC Power Adapter						
Input	100-240VAC, 1.5A					
Output	48VDC, 1.5A, 72W (via power injector)					
	48VDC, 2.08A, 100W (via power injector)					

<sup>1</sup> Not all frequency bands are authorized or available for use in all countries.

<sup>2</sup> +24 dBm output power available in EX-5r v3 and EX-5r Lite. Consult Exalt for availability in other models.

<sup>3</sup> Software license key upgrade.

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## EX-5i Series



### All-Indoor, Carrier-Class, Tri-Band 5 GHz TDD Radio Systems for Low, Medium and High Capacity Ethernet and TDM Applications

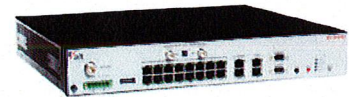
The EX-5i series of all-indoor digital microwave radios is the first family of carrier-class, tri-band TDD radios available in the 5.2 – 5.8 GHz license-exempt bands. The EX-5i line delivers up to 216 Mbps of aggregate user throughput and up to sixteen T1/E1s plus one DS3. Featuring native TDM and native Ethernet transport and full software configurability and upgradeability, the EX-5i series was designed to meet demanding backhaul requirements of enterprise organizations and service providers seeking the accessibility benefits of an all-indoor configuration.

**Carrier-class TDD.** The EX-5i series radios combine native TDM and native Ethernet transport with low, fixed latency to deliver guaranteed throughput and service quality. Capacity can be allocated variably between TDM and Ethernet via software, while the selectable throughput symmetry control feature enables radio capacity to efficiently match asymmetric traffic requirements. Optional 1+1 monitored hot standby (MHS) protection provides full hardware redundancy.

**Industry-leading Spectrum Management.** The EX-5i radios include selectable channel bandwidth and 1 MHz tuning resolution, yielding up to 54 non-overlapping frequency channels and up to 415 center frequencies of operation. These capabilities, combined with selectable modulation and superior system gain, provide unparalleled interference avoidance and transmission resiliency. A built-in spectrum analyzer is even included to accelerate deployment and simplify troubleshooting.

**ExaltSync™ Synchronization.** The ExaltSync technology embedded in the EX-5i series radios allows multiple radio systems to be collocated in close proximity without self-interference, minimizing antenna separation and ensuring reuse of scarce spectrum across all collocated systems.

**Security, Management and Data Networking.** The EX-5i radios deliver the highest data and management security available with optional 128- and 256-bit AES encryption and secure SNMP v3 management, together with enhanced fault management and diagnostic features. The 802.1Q VLAN option provides built-in network administration and security flexibility.



Primary Specifications		EX-5i Lite	EX-5i	EX-5i-16	EX-5i-DS3
Maximum Capacity <sup>1</sup>	TDM	4xT1/E1		16xT1/E1	16xT1/E1; 1xDS3
	Ethernet (Aggregate)	100 Mbps		200 Mbps	
Frequency (GHz)		Tri-band: 5.250-5.350, 5.470-5.725, 5.725-5.850			
Range <sup>2</sup>		> 30 miles at 99.999% throughput availability			

<sup>1</sup> Please refer to the Exalt Throughput and Range Specification document for detailed capacity information.

<sup>2</sup> Distance based upon FCC regulations, average climate and terrain, 6' dish antennas, 3 dB transmission system losses at each end. Longer or shorter distances will apply for alternative antennas, country regulations, transmission system losses, path topologies and radio configurations. See Exalt's path planning tool to model your scenario.



Specifications	EX-5i Series	Specifications	EX-5i Lite	EX-5i	EX-5i-16	EX-5i-DS3
<b>System</b>		<b>Physical</b>				
Frequency Bands <sup>1</sup> (GHz)	5.250-5.350 5.470-5.725 5.725-5.850	Dimensions (H x W x D)	1RU 1.75 x 17 x 14 in 4.5 x 43.2 x 35.6 cm		1.5RU 2.63 x 17 x 14 in 6.7 x 43.2 x 35.6 cm	
Tuning Resolution	1 MHz	Physical Configuration	Single-piece Indoor Unit (IDU)			
Output Power (full power)	5725-5850 MHz band 5250-5350 MHz band <sup>2</sup> 5470-5725 MHz band <sup>2</sup>	Operating Temperature	-40 to +65 °C -40 to +149 °F			
Output Power (min power)	Full power minus 20 dB	Full Spec Temperature	-25 to +60 °C <sup>3</sup> -13 to +140 °F			
Power Control Step Size	0.5 dB	Weight	9.5 lbs / 4.3 kg		12 lbs / 5.5 kg	
Receiver Threshold (BER=10 <sup>-4</sup> )	8 MHz 16 MHz 32 MHz 64 MHz <sup>2</sup>	Environmental	GR-1089-CORE intra-building			
QPSK	-86 -83 -80 -77	Altitude	15,000 ft; 4.6 km			
16QAM	-78 -75 -72 -69	Humidity	95% non-condensing			
Non-overlapping Channels	5.250-5.350 GHz 5.470-5.725 GHz 5.725-5.850 GHz	<b>Interfaces</b>				
Maximum RSL (QPSK)	-25 dBm error-free 0 dBm no damage	RF	N-type(F), impedance 50 ohm			
Throughput Symmetry Control	5 modes 20/80, 80/20, 35/65, 65/35, 50/50	TDM T1/E1 Interfaces	RJ48C/RJ45 (F) (x4)		RJ48C/RJ45 (F) (x16)	
Error Floor	10 <sup>-12</sup>	T1 Impedance	100 ohms, balanced			
Latency (T1/E1)	1ms, typical	T1 Line Code	AMI, B8ZS, selectable per channel			
Link Security	96-bit proprietary encryption 128-bit and 256-bit AES encryption <sup>3</sup>	T1 Data Rate	1.544 Mbps			
VLAN	802.1Q	T1 Compliance	ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE			
Management	HTTP GUI CLI/Telnet SNMP v1, 2c, v3	E1 Impedance	120 ohms, balanced			
Compliance	FCC 15.247, FCC 15.407 EN 301-893, EN 302-502 EN 60-950, EN 301-489, IC RSS-210	E1 Line Code	HDB3			
		E1 Data Rate	2.048 Mbps			
		E1 Compliance	CEPT-1; G.703; ITU-T-G.703			
		DS3 Impedance	- BNC (F) (2x) 75 ohms, unbalanced			
		DS3 Line Code	- B3ZS			
		DS3 Data Rate	- 44.736 Mbps			
		DS3 Compliance	-ANSI T1.102-1993; GR-499-CORE			
		Loopback Modes	Remote Internal; Remote External; Local Line			
		Ethernet	RJ45 (F) (x2), auto-MDIX			
		Interface Speed	10/100BaseT			
		Duplex	Half, Full, Auto			
		Compliance	802.3			
		Console (Serial)	9-pin Sub-D (F)			
		Interface Speed	9600 bps			
		Compliance	EIA-574 (RS-232)			
		Alarm	9-pin Sub-D (F)			
		Inputs (2)	TTL/Closure			
		Outputs (2)	Relay (Form C)			
		ExaltSync	RJ45 (F)			
		Synchronization	Internal Sync 1pps (GPS)			
		DC Power	6-pin barrier strip		6-pin barrier strip	
		Input Voltage	±20-60VDC		±20-60VDC	
		Consumption	<38.5W (48V:<0.8A, 24V:<1.6A)		< 45W (48V: <0.9A, 24V: 1.8A)	
		AC Power Adapter	EIC to NEMA 5-15			
		Input	100-240VAC, 1.5A			
		Output	48VDC, 1.5A, 72W			
<b>System Components</b>						
Complete Link <sup>4</sup>	Two terminals, each with AC adapter and accessory kit					
Single terminal	One terminal with AC adapter and accessory kit					
Accessory Kit	DC power connector, rack and grounding hardware (spare)					
AC Adapter	AC adapter (spare)					
Exalt Capacity Expansion Kit	For 6 GHz Part 101 links (optional accessory kit)					

<sup>1</sup> Not all frequency bands are authorized or available for use in all countries.

<sup>2</sup> +24 dBm output power. Consult Exalt for availability.

<sup>3</sup> Software license key upgrade.

<sup>4</sup> Two complete links (4 terminals) required for MHS protection along with Exalt MHS kit and protection cabling. Consult your Exalt Sales representatives for MHS availability. (MHS is not available on EX-5i or EX-5i lite).





# **Exhibit D**

## **Power Density Calculations**

**Pocket Site NHCT0170A**

**1925-1931 East Main Street**

**Torrington, Connecticut**



C Squared Systems, LLC  
920 Candia Road  
Manchester, NH 03109  
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## Calculated Radio Frequency Emissions



NHCT0170A

1925-1931 East Main St, Torrington, CT 06790

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## 1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Pocket antennas to be installed on the existing tower at 1925-1931 East Main St, Torrington, CT 06790.

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are much more conservative (higher) than the actual signal levels will be from the finished installation.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\text{mW}/\text{cm}^2$ ). The number of  $\text{mW}/\text{cm}^2$  emitted is called the power density. The general population exposure limit for the cellular band is  $0.567\text{-}0.593 \text{ mW}/\text{cm}^2$ , and the general population exposure limit for the PCS/AWS band is  $1.0 \text{ mW}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Higher exposure limits are permitted under the occupational / controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure (through training), and they must be able to exercise control over their exposure. General population / uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals.

The FCC describes exposure to radio frequency (RF) energy in terms of percentage of maximum permissible exposure (MPE) with 100% being the maximum allowed. Rather than the FCC presenting the user specification in terms of complex power density figures over a specified surface area, this MPE measure is particularly useful, and even more so when considering that power density limits actually vary by frequency because of the different absorptive properties of the human body at different frequencies.

MPE limits are specified as time-averaged exposure limits. This means that exposure can be averaged over 30 minutes for general population / uncontrolled exposure (or 6 minutes for occupational / controlled exposure). However, for the case of exposure of the general public, time averaging is usually not applied because of uncertainties over exact exposure conditions and difficulty in controlling time of exposure. Therefore, the typical conservative approach is to assume that any RF exposure to the general public will be continuous.

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

## 2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit. As shown in these excerpts, each frequency band has different exposure limits, requiring power density to be reported as a percent of Maximum Permissible Exposure (MPE) when dealing with carriers transmitting in different frequency bands.

## 3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left( \frac{1.6^2 \times EIRP}{4\pi \times R^2} \right)$$

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna

V = Vertical Distance from bottom of antenna

1.6 = Ground Reflection Factor

## 4. Calculation Results

Table 1 below outlines the power density information for the site. All information for carriers other than Pocket is based on the current CSC database.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	Effective Radiated Power (ERP) Per Transmitter (Watts)	Power Density (mw/cm <sup>2</sup> )	Limit	%MPE
Sprint	153	1962.5	11	349	0.0590	1.0000	5.90%
Nextel	143	851	9	100	0.0158	0.5673	2.79%
T-Mobile	133	1930	4	294	0.0239	1.0000	2.39%
Verizon	120	875	9	200	0.0449	0.5833	7.70%
Verizon PCS	120	1970	9	485	0.1090	1.0000	10.90%
Town PD	110	No RF Information Available, % MPE Estimated					5.00%
AT&T	95	880	2	296	0.0236	0.5867	4.02%
AT&T	95	1930	2	427	0.0340	1.0000	3.40%
Pocket	85	2130-2133.75	3	631	0.1090	1.0000	10.90%
<b>Total</b>							<b>53.01%</b>

**Table 1: Proposed Carrier Information**



## **5. Conclusion**

The above analysis verifies that emissions from the proposed site will be well below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at the base of the tower is 53.01% of the FCC limit.

As noted in the introduction, obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished installation.

## 6. Statement of Certification

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



---

Daniel I. Goulet  
C Squared Systems, LLC

June 03, 2009  
Date

## **Attachment A: References**

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

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

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



## Attachment B: FCC Limits For Maximum Permissible Exposure (MPE)

### (A) Limits for Occupational/Controlled Exposure

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

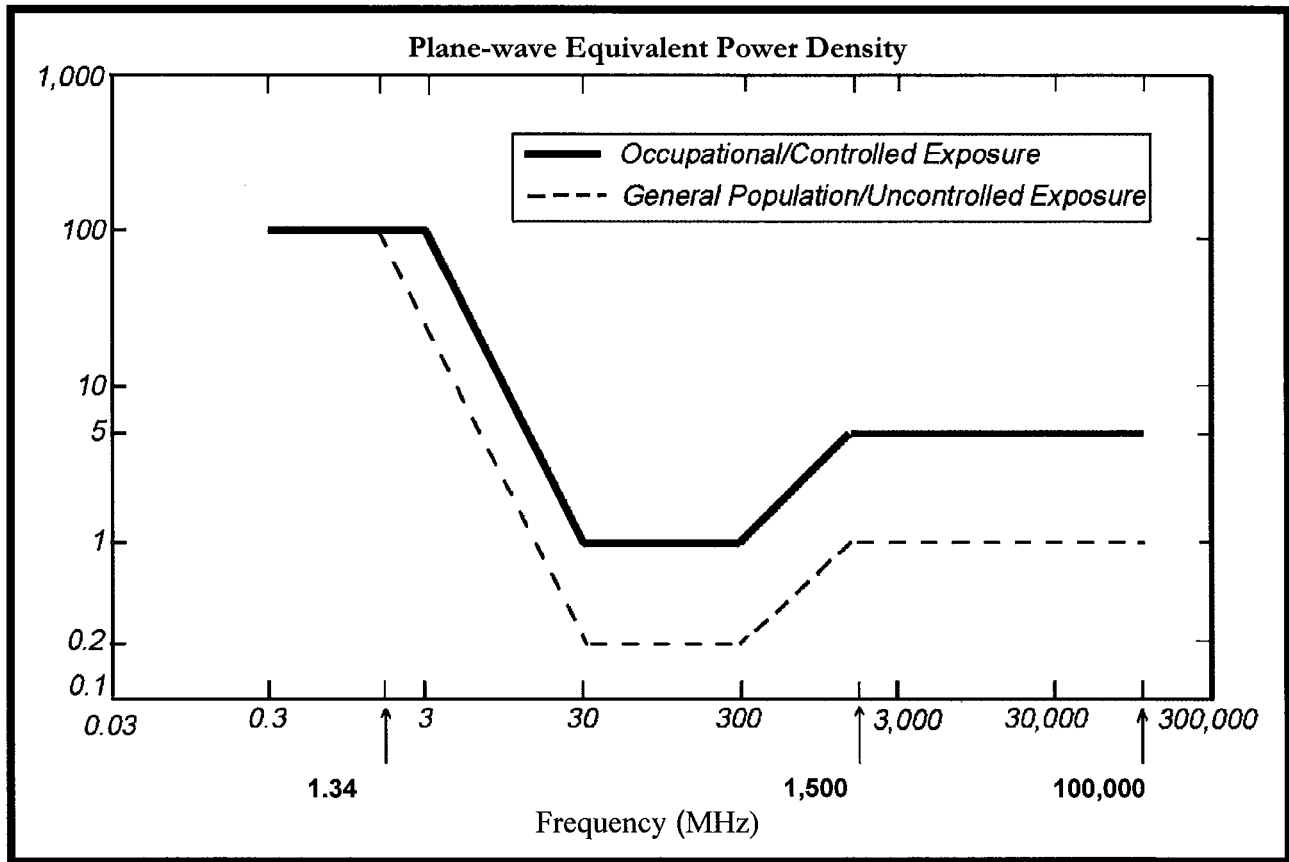
### (B) Limits for General Population/Uncontrolled Exposure

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

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

NOTE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.



• FCC Limits for Maximum Permissible Exposure (MPE)

# **Exhibit E**

## **Structural Analysis**

**Pocket Site NHCT0170A**

**1925-1931 East Main Street**

**Torrington, Connecticut**



**Structural Analysis for  
SBA Network Services, Inc.**

**153' Monopole**

**Site Name: Torrington  
Site ID: CT01499-S**

FDH Project Number 09-05170E S2

Prepared By:

Krystyn Wagner, EI  
Project Engineer

Reviewed By:

Christopher M. Murphy, PE  
Vice President  
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June 9, 2009

*Prepared pursuant to ANSI/TIA-222-G Structural Standards for Antenna Supporting Structures and Antennas*



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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Torrington, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standards for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G*. Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Fred A. Nudd Corporation (Project No. 7783) original design drawings dated August 18, 2000, Vertical Structures, Inc. (Job No. 2003-007-015) structural analysis and modification drawings dated September 9, 2003, and SBA Network Services, Inc.

The *basic design wind speed* per *ANSI/TIA-222-G* standards is 100 MPH without ice and 40 MPH with 1" radial ice. Ice is considered to increase in thickness with height.

## Conclusions

With the existing and proposed antennas from Pocket at 85 ft, the tower meets the requirements of the *ANSI/TIA-222-G* standards. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Fred A. Nudd Corporation Project No. 7783), the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH is accurate (i.e., the steel data, tower layout, existing and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

## Recommendations

To ensure the requirements of the *ANSI/TIA-222-G* standards are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax lines should be installed outside the monopole shaft in a single row.

## APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from this layout, FDH should be contacted to perform a revised analysis.*

**Table 1 – Appurtenance Loading**

### Existing Loading:

No.	Centerline Elevation (ft)	Coax and Lines <sup>1</sup>	Carrier	Mount Type	Description
1-6	153	(6) 1-5/8"	Sprint	(1) Low Profile Platform	(6) EMS RR90-17-02DP
7-18	143	(12) 1-1/4"	Nextel	(1) Low Profile Platform	(12) Decibel DB844H90E-XY
19-24	133	(12) 1-5/8"	T-Mobile	(1) Low Profile Platform	(6) EMS RR90-17-02DP
25-36	123	(12) 1-5/8"	Verizon	(1) Low Profile Platform	(6) Antel LPA-80063/6CF (6) Decibel DB950F65E-M
37	110	(1) 1/2"	Torrington PD	(1) Standoff	(1) 10 ft Omni
38-49	95 <sup>2,3</sup>	(12) 1-5/8"	Cingular	(1) Low Profile Platform	(12) CSS DUO-1417-8686-40 (6) TMAs (3) Combiners
50	70	(1) 1/2"	Sprint	Direct	(1) GPS

<sup>1</sup> The existing coax is located inside the pole's shaft, unless otherwise noted.

<sup>2</sup> Currently Cingular had (9) CSS DUO-1417-8686-40 antennas and (9) coax installed at 95 ft. According to information provided by SBA, Cingular may install up to (12) antennas, (6) TMAs, (3) Combiners, and (12) coax. Analysis is performed with total leased loading in place.

<sup>3</sup> Cingular's coax at 95 feet is installed outside the monopole shaft in a single row.

### Proposed Loading:

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Mount Type	Description
1-3	85	(6) 1-5/8"	Pocket	Flush	(3) RFS APXV18-206517S-C



## RESULTS

Based on information obtained from the original design drawings, the yield strength of steel for individual members was as follows:

**Table 2 - Material Strength**

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	50 ksi
Anchor Bolts	Fu = 125 ksi

**Table 3** displays the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Pole Profile** for detailed modeling information.

**Table 3 – Summary of Working Percentage of Structural Components**

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	153 - 150	Pole	TP26.25x24x0.25	1.2	Pass
L2	150 - 110	Pole	TP35.25x26.25x0.25	30.0	Pass
L3	110 - 65	Pole	TP45.375x33.625x0.3125	57.8	Pass
L4	65 - 21	Pole	TP55.275x43.34x0.3125	82.4	Pass
L5	21 - 0	Pole	TP60x52.9791x0.375	72.8	Pass
		Anchor Bolts	(18) 2" $\varnothing$ on a 67" BC	59.3	Pass
		Base Plate	1.5" thick x 73" round	77.3	Pass

**Table 4 – Maximum Base Reactions**

Load Type	Current Analysis (ANSI/TIA-222-G)	Original Design (TIA/EIA-222-F)
Axial	49 k	---
Shear	36 k	31 k
Moment	3,553 k-ft	3,692 k-ft

\* Current analysis reactions are within an allowable factor of 1.35 when the original design reactions are based on an allowable stress design per ANSI/TIA-222-G.



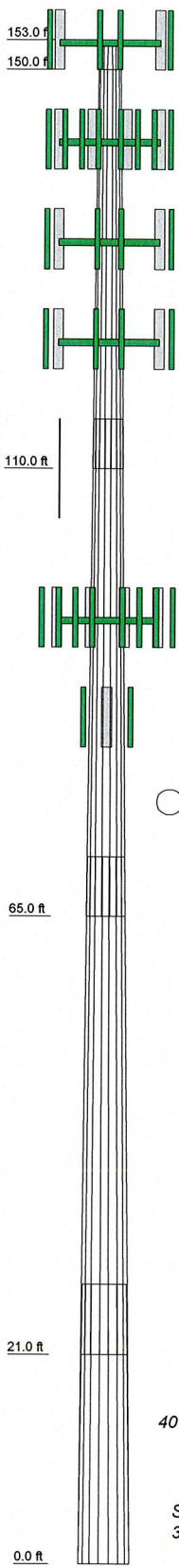
## **GENERAL COMMENTS**

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

## **LIMITATIONS**

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

Section	1	2	3	4	5	
Length (ft)	3.00	40.00	50.00	50.00	28.00	
Number of Sides	18	18	18	18	18	
Thickness (in)	0.2500	0.2500	0.3125	0.3125	0.3750	
Lap Splice (ft)			5.00	6.00	7.00	
Top Dia (in)	24.0000	26.2500	33.6250	43.3400	52.9791	
Bot Dia (in)	26.2500	35.2500	45.3750	55.2750	60.0000	
Grade			A572-65			
Weight (K)	0.2	3.3	6.6	8.3	6.4	24.7



**DESIGNED APPURTENANCE LOADING**

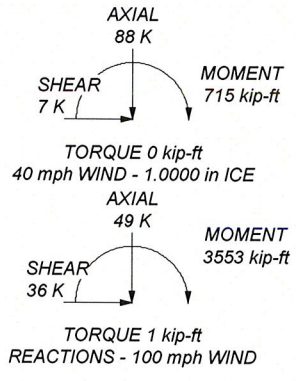
TYPE	ELEVATION	TYPE	ELEVATION
(2) RR90-17-02DP w/Mount Pipe (Sprint)	153	(2) Antel LPA-80063/6CF w/ Mount Pipe (Verizon)	123
(2) RR90-17-02DP w/Mount Pipe (Sprint)	153	(2) Antel LPA-80063/6CF w/ Mount Pipe (Verizon)	123
(2) RR90-17-02DP w/Mount Pipe (Sprint)	153	10' whip (Torrington PD)	105
Low Profile Platform (Sprint)	153	Side Mount Standoff (1) (Torrington PD)	105
(4) DB844H90E-XY w/Mount Pipe (Nextel)	143	(2) TMA (Cingular)	95
(4) DB844H90E-XY w/Mount Pipe (Nextel)	143	Combiner (Cingular)	95
(4) DB844H90E-XY w/Mount Pipe (Nextel)	143	Combiner (Cingular)	95
(4) DB844H90E-XY w/Mount Pipe (Nextel)	143	Combiner (Cingular)	95
Low Profile Platform (Nextel)	143	Low Profile Platform (Cingular)	95
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	133	(4) DUO1417-8686-40 w/Mount Pipe (Cingular)	95
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	133	(4) DUO1417-8686-40 w/Mount Pipe (Cingular)	95
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	133	(2) TMA (Cingular)	95
Low Profile Platform (T-Mobile)	133	(2) TMA (Cingular)	95
(2) DB950F65E-M w/Mount Pipe (Verizon)	123	RFS APXV18-206517S-C w/ Mount Pipe (Pocket)	85
(2) DB950F65E-M w/Mount Pipe (Verizon)	123	RFS APXV18-206517S-C w/ Mount Pipe (Pocket)	85
(2) DB950F65E-M w/Mount Pipe (Verizon)	123	RFS APXV18-206517S-C w/ Mount Pipe (Pocket)	85
Low Profile Platform (Verizon)	123	GPS	70
(2) Antel LPA-80063/6CF w/ Mount Pipe (Verizon)	123		

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. ANCHOR BOLTS: (18) 2" Anchor Bolts on a 67" Bolt Circle, Fu = 125 ksi
7. BASE PLATE: 1.5 in thick x 73 in round, Fy = 50 ksi
8. STIFFENERS: 1' x 6" x 3/4", (2) Stiffeners per bolt. Fy = 50 ksi



<b>FDH Engineering, Inc.</b>		Job: <b>Torrington CT01499-S</b>	
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Raleigh, NC 27615		Client: SBA	Drawn by: Krystyn Wagner
Phone: (919) 755-1012		Code: TIA-222-G	Date: 06/10/09
FAX: (919) 755-1031		Path:	Scale: NTS
		Dwg No: E-1	