

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

www.ct.gov/csc

December 30, 2009

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

RE: **EM-POCKET-107-091020** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket Communications notice of intent to modify an existing telecommunications facility located at South Orange Center Road, Orange, Connecticut.

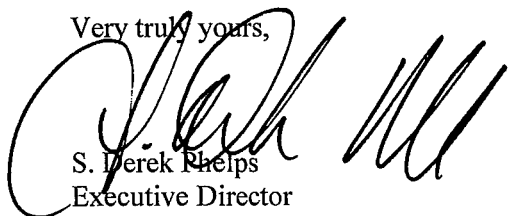
Dear Attorney Larson:

The Connecticut Siting Council (Council) is in receipt of your correspondence identifying the coaxial cable location. The information is not materially different from the exempt modification proposal received on October 19, 2009 and acknowledged on November 16, 2009. However, the new exterior cable configuration may increase wind area. Therefore, the Council hereby acknowledges your revision to the October 19, 2009 notice of exempt modification with the following condition:

- The tower shall not exceed 100 percent of its post-construction structural rating; and
- A signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the tower does not exceed 100 percent of its post-construction structural rating taking into account the revised (exterior) coax configuration.

Thank you for your attention and cooperation.

Very truly yours,



S. Derek Rhelphs
Executive Director

SDP/MP

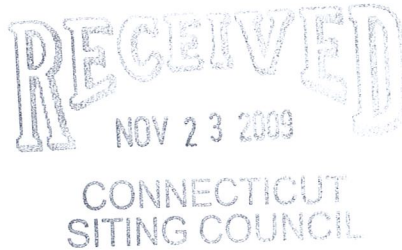
c: The Honorable James M. Zeoli, First Selectman, Town of Orange
Paul Dinice, Zoning Enforcement Officer, Town of Orange

#107

PULLMAN & COMLEY, LLC
ATTORNEYS AT LAW

CARRIE L. LARSON
90 State House Square
Hartford, CT 06103-3702
p (860) 424-4312
f (860) 424-4370

www.pullcom.com



ORIGINAL

November 20, 2009

Via Federal Express

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

**Re: Re: Modification to Notice of Exempt Modification
Town of Orange Telecommunications Facility
South Orange Center Road, Orange, Connecticut**

Dear Mr. Phelps:

On October 19, 2009 Youghioghenny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"), filed a Notice of Exempt Modification for the installation of antennas and appurtenant equipment at the existing 180-foot monopole facility owned by the Town of Orange and located at South Orange Center Road, Orange, Connecticut ("Facility"). The Siting Council has approved the installation per your November 16, 2009 letter. The proposed approved installation calls for the coaxial cables to be run up the inside of the monopole. Per this letter, Pocket seeks your approval for a change in the proposed installation; with the cables to be run on the outside, rather than the inside of the monopole. The cables will be properly banded to the pole, pursuant to current industry practices and procedures. The request comes as a result of the heavy congestion of cables from other carriers within the monopole.

If you should need anything further, please feel free to contact me.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to be "Carrie L. Larson".

Carrie L. Larson

Hartford/72572.302/KSHEATHELM/401300v1



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

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www.ct.gov/csc

November 16, 2009

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

RE: **EM-POCKET-107-091020** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket
Communications notice of intent to modify an existing telecommunications facility located at South
Orange Center Road, Orange, 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.

The proposed modifications are to be implemented as specified here and in your notice dated October 19, 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 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.

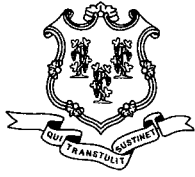
Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/CDM/laf

c: The Honorable James M. Zeoli, First Selectman, Town of Orange
Paul Dinice, Zoning Enforcement Officer, Town of Orange



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CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

www.ct.gov/csc

October 23, 2009

The Honorable James M. Zeoli
First Selectman
Town of Orange
Town Hall
617 Orange Center Road
Orange, CT 06477-2423

RE: **EM-POCKET-107-091020** – Youghiogheny Communications-Northeast, LLC d/b/a Pocket
Communications notice of intent to modify an existing telecommunications facility located at South
Orange Center Road, Orange, Connecticut.

Dear First Selectman Zeoli:

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.

If you have any questions or comments regarding this proposal, please call me or inform the Council by
November 6, 2009.

Thank you for your cooperation and consideration.

Very truly yours,



S. Derek Phelps
Executive Director

SDP/jbw

Enclosure: Notice of Intent

c: Paul Dinice, Zoning Enforcement Officer, Town of Orange

EM-POCKET-107-091020

CARRIE L. LARSON
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p (860) 424-4312
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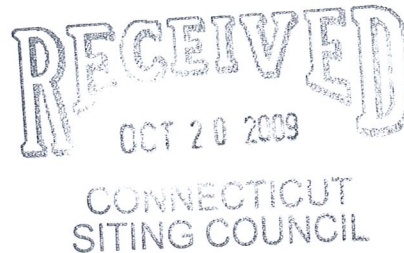
www.pullcom.com

ORIGINAL

October 19, 2009

Via Federal Express

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



**Re: Notice of Exempt Modification
Town of Orange Telecommunications Facility
South Orange Center Road, Orange, Connecticut**

Dear Mr. Phelps:

Youghiogheny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"), intends to install antennas and appurtenant equipment at the existing 180-foot monopole facility owned by the Town of Orange and located at South Orange Center Road, Orange, 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 AWS 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 James Zeoli, First Selectman, Town of Orange.

The existing Facility consists of a 180-foot self-supporting Monopole tower capable of supporting multiple carriers within a fenced compound. The coordinates for the Facility are approximately **Lat: 41°-15'-11" and Long: 73°-00'-39"**. The tower is located in the southeast portion of Orange, approximately 800 feet southeast of Boston Post Road (Route 1) and roughly 2,500 feet to the northwest of Interstate 95 (see Site Map, attached as Exhibit A). The tower currently supports Verizon antennas at the one hundred seventeen foot (117') level centerline AGL (above ground level), Sprint antennas at the one hundred twenty seven foot level (127') AGL, Nextel antennas at the one hundred thirty seven foot level (137') AGL, T-Mobile at the one hundred fifty foot (150') level and AT&T antennas at the one hundred seventy seven foot level (177') AGL. Pocket proposes to install three RFS APXV18-206517-C flush mount antennas on the tower at the one hundred sixty five foot centerline (165') AGL, and a Nortel CDMA Micro BTS 3231 cabinet, mounted on an "H-Frame," contained within a six foot by six

Page 2

foot (6'-0" x 6'-0") lease area. A small GPS antenna will be mounted to the H-Frame. An existing, abandoned ice bridge running from the lease area to the tower will be utilized by Pocket. Utilities will be run via a proposed underground conduit from existing utility sources at the site (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") may be used at the site to provide electricity until permanent power can be established by the utility provider. Pocket anticipates that the temporary generator, if used at all, 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 South Orange Center Road 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 165 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 29.01% 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 Orange Facility constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Page 3

Respectfully Submitted,



Carrie L. Larson

cc: James Zeoli, First Selectman, Town of Orange. The Town is also the underlying property owner.

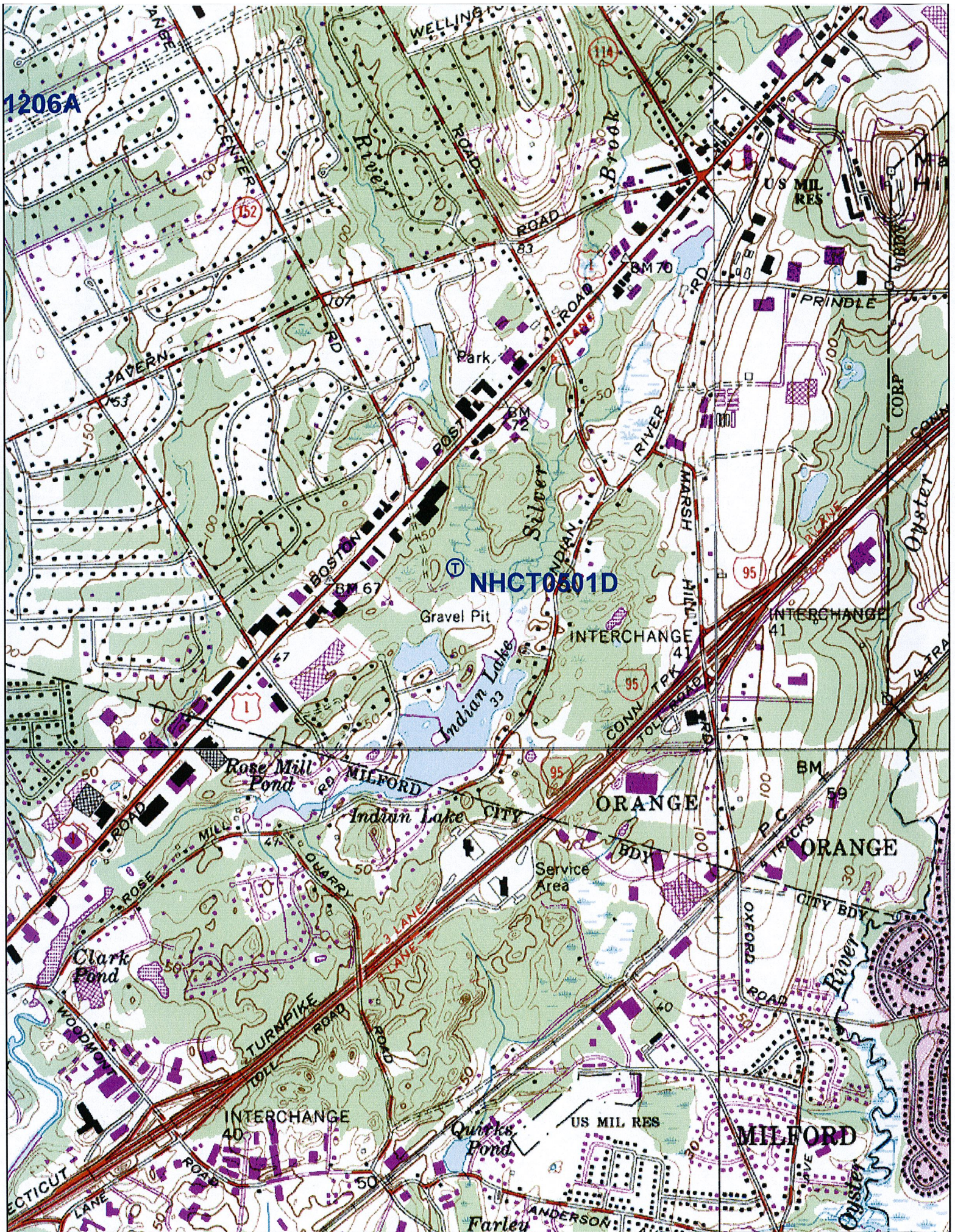
Exhibit A

Topo Map / Aerial Photo

Pocket Site NHCT0501D

South Orange Center Road

Orange, Connecticut



Bing Maps

NHCT0501D
South Center Road, Orange
180' Monopole

 **FREE!** Use **Bing 411** to find movies,
businesses & more: **800-BING-411**

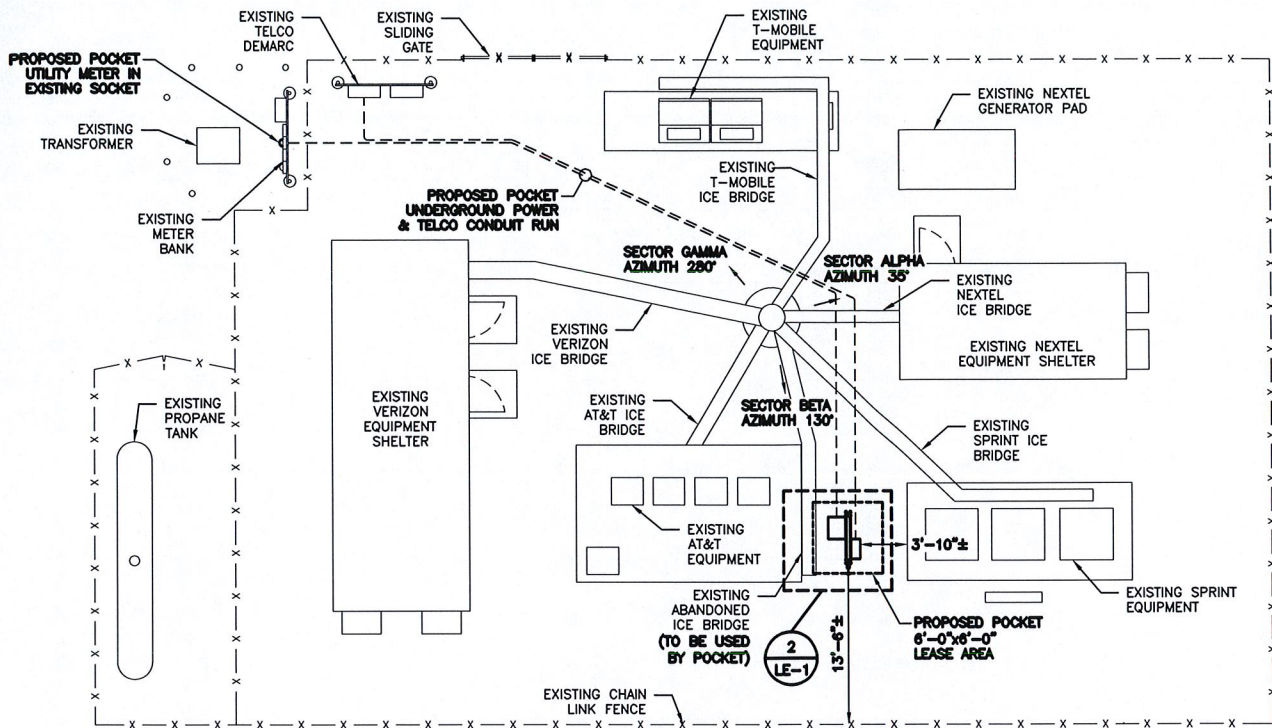


Bird's eye view maps can't be printed, so another map view has been substituted.

Exhibit B

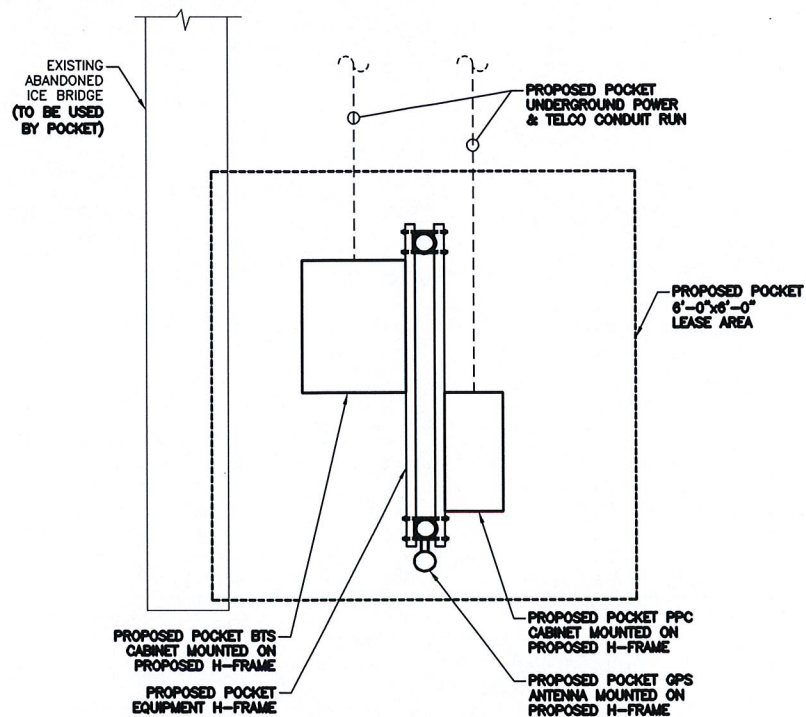
Design Drawings

**Pocket Site NHCT0501D
South Orange Center Road
Orange, Connecticut**



SITE PLAN

SCALE: N.T.S



EQUIPMENT LAYOUT PLAN

SCALE: N.T.S

APPROX. COAX RUN

195'

APPROVALS

SITE OWNER	DATE
CONSTRUCTION MANAGER	DATE
R.F. ENGINEER	DATE
SITE ACQUISITION	DATE

THE ABOVE POWER COMPANY APPROVES AND ACCEPTS THESE PROPOSALS AND AGREES TO PROVIDE THE NECESSARY CONDUIT AND THE NECESSARY PERMITS FOR THE PROPOSED POCKET. THE POWER COMPANY IS NOT RESPONSIBLE FOR ANY DAMAGE TO THE POCKET OR THE EQUIPMENT DURING THE CONSTRUCTION OF THE POCKET OR THE EQUIPMENT. THE POWER COMPANY IS NOT RESPONSIBLE FOR ANY DAMAGE TO THE POCKET OR THE EQUIPMENT DURING THE CONSTRUCTION OF THE POCKET OR THE EQUIPMENT.

MAXTON

BAY STATE
DESIGN

241 Boston Post Road West
Marlborough, MA 01752
Phone: 508-229-4100
Fax: 508-485-5321

Bay State Design, Inc.
Architects • Engineers
241 Boston Post Road West
Marlborough, MA 01752
Phone: 508-229-4100
Fax: 508-485-5321

PREPARED FOR:



Pocket Communications
P.O. Box 5936
San Antonio, TX 78201

SITE NUMBER:

NHCT0501D

SITE NAME:

ORANGE CENTER
TRANSFER STATION

SITE ADDRESS:

617 ORANGE CENTER ROAD
ORANGE, CT 06477

DRAWN BY:

KW

CHECKED BY:

JP

DATE:

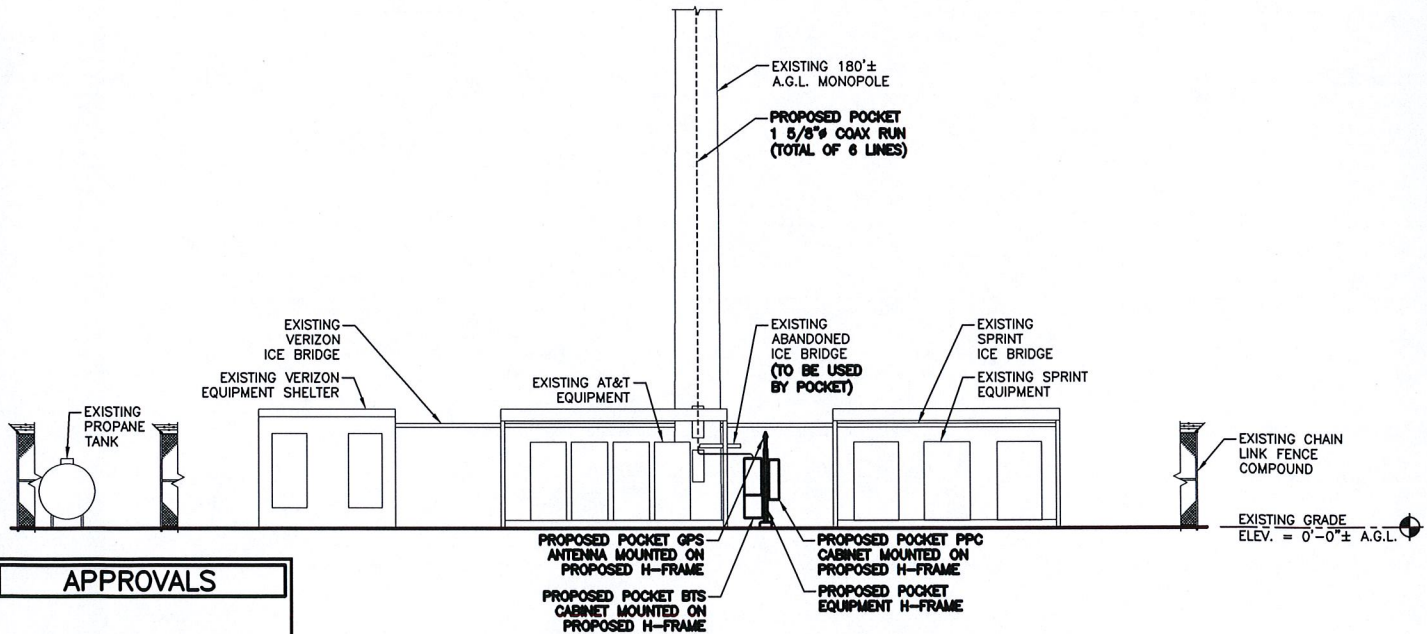
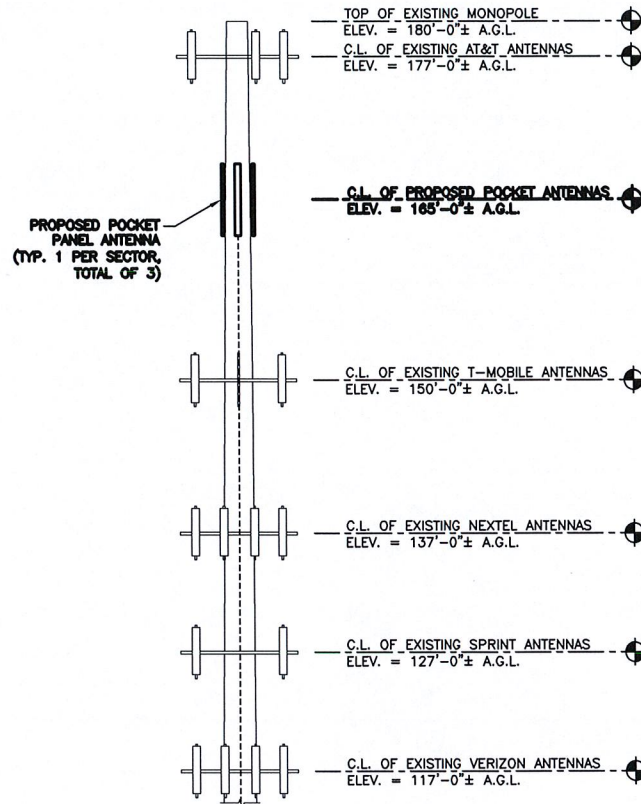
10/07/09

PROJECT NUMBER:

2882.132

SHEET:

LE-1



ELEVATION

SCALE: N.T.S.

1

APPROVALS

SITE OWNER _____ DATE _____

CONSTRUCTION MANAGER _____ DATE _____

R.F. ENGINEER _____ DATE _____

SITE ACQUISITION _____ DATE _____

THE ABOVE ENGINEERING APPROVAL AND ACCEPT THESE DRAWINGS AND SPECIFICATIONS AND AGREE TO PROCEED WITH THE CONSTRUCTION OF THE PROJECT. ALL COMMUNICATIONS AND CHANGES TO THE DRAWINGS SHALL BE MADE BY THE LOCAL ENGINEERING FIRM AND NOT CHANGES OR MODIFICATIONS MADE BY OTHERS.



241 Boston Post Road West
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Architects • Engineers
241 Boston Post Road West
Marlborough, MA 01752
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PREPARED FOR:



Pocket Communications
P.O. Box 5936
San Antonio, TX 78201

SITE NUMBER:

NHCT0501D

SITE NAME:

ORANGE CENTER
TRANSFER STATION

SITE ADDRESS:

617 ORANGE CENTER ROAD
ORANGE, CT 06477

DRAWN BY:

KW

CHECKED BY:

JP

DATE:

10/07/09

PROJECT NUMBER:

2882.132

SHEET:

LE-2

Exhibit C

Equipment Specifications

Pocket Site NHCT0501D

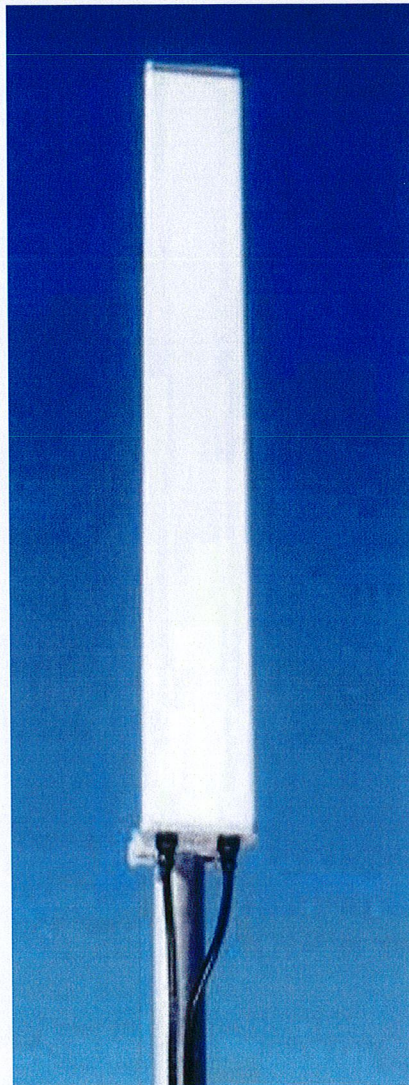
South Orange Center Road

Orange, 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

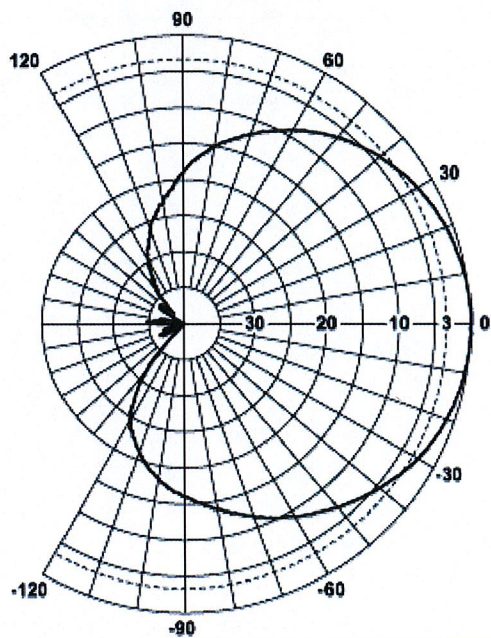
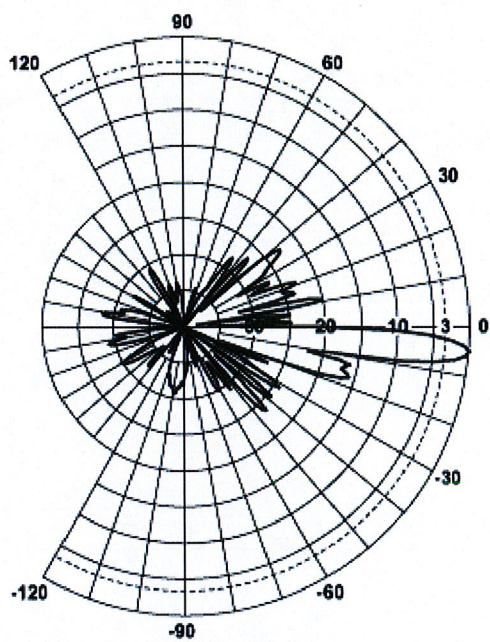
Frequency Band	3G/UMTS (Single, Broad, Dual and Triple-Band)
Horizontal Pattern	Directional
Antenna Type	Panel Dual Polarized
Electrical Down Tilt Option	Variable

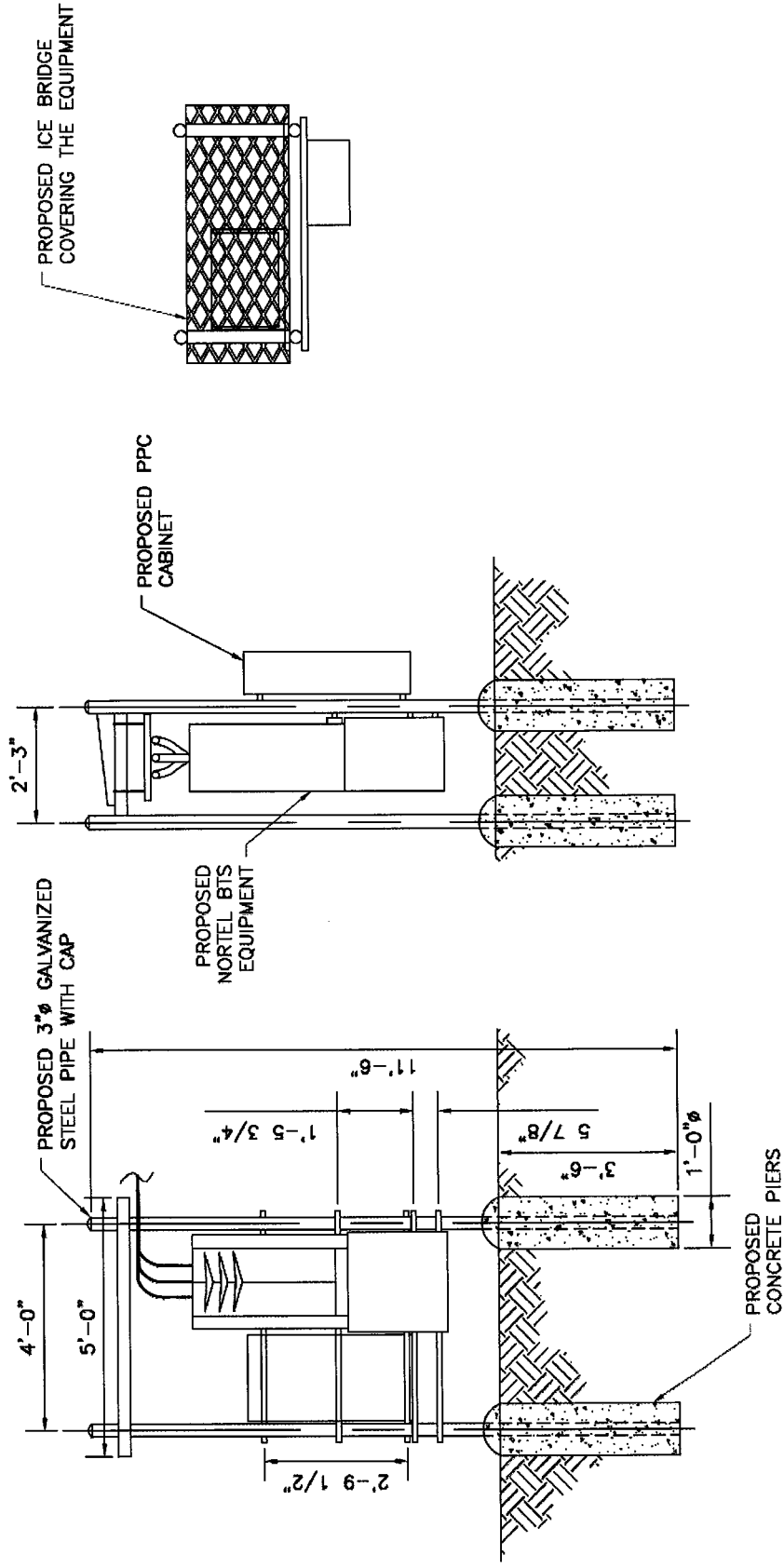


Gain, dBi (dBd)	18.8 (16.7) , 19.0 (16.9)
Frequency Range, MHz	1710-1900, 1900-2170
Connector Type	(2) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt
Electrical Downtilt, deg	0-10
Horizontal Beamwidth, deg	67 , 63
Mounting Hardware	APM40-2
Rated Wind Speed, km/h (mph)	160 (100)
VSWR	< 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 ² (ft ²)	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

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

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

Tech. Specs.

- [MLG15](#)

Literature / Sales

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

WARRANTY

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

Operating Weight lbs (kg)	1823 (827)
Engine	
Type	Interim Tier IV
Brand	Mitsubishi
Aspiration	Natural
Power - Prime @ 1800 rpm hp (kWm)	22.3 (16.6)
Displacement cubic in (L)	107 (1.8)
Cylinders	4
Speed rpm	1800
Fuel Consumption - Prime gph (Lph)	1.30 (4.92)
Capacities	
Fuel Tank gal (L)	56 (212)
Approximate Run Time hrs	43
Coolant qt (L)	11.6 (11.0)
Electrical Distribution	
Battery - 12V	1 - 12V 440 CCA Wet Cell
Main Circuit Breaker Size A	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
Trailer	
Number of Axles	1
Capacity - Axle Rating lbs (kg)	2200 (998)
Tire Size in	15
Brakes	N/A
Hitch	2" Ball
Maximum Tire Pressure psi	50
Options	
Powertrain (Engine/Gen)	• 60/40 Coolant • Heated Fuel Filter • Engine Heater - Lower Radiator Hose • Oil Drain Valve Kit
Controls	• Battery, 720 CCA Gel Cell • Battery, 720 CCA Wet Cell • Battery, 685 CCA Gel Cell • No Battery • Battery Disconnect, Lockable • Battery Charger, 2 Amp • Alternative Outlet Panel Options (Consult factory for details)

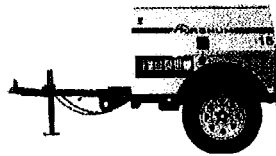
Cabinet/Fuel Tank

- 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

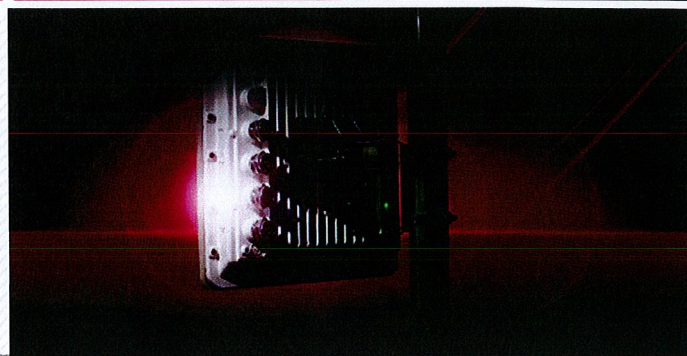
Product Images (click small image to pop-up larger version)



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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 ¹	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 ²		> 30 miles at 99.999% throughput availability		

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

² 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

System

Frequency Bands ¹ (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				
5250-5350 MHz band ²	+13 dBm			
5470-5725 MHz band ²	+13 dBm			
Output Power (min power)	Full power minus 20 dB			
Power Control Step Size	0.5 dB			
Receiver Threshold (BER=10 ⁻⁴)	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 ⁻¹²			
Latency (T1/E1)	1ms, typical			
Maximum Packet Size	All 1916 bytes except GigE 9728 bytes			

EX-5r Series

System (continued)

Link Security	96-bit proprietary encryption 128-bit and 256-bit AES encryption ³
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 35.6 x 35.6 x 9.7 cm	14 x 14 x 2.5 in 35.6 x 35.6 x 6.4 cm	14 x 14 x 3.8 in 35.6 x 35.6 x 9.7 cm	14 x 14 x 2.5 in 35.6 x 35.6 x 6.4 cm	14 x 14 x 3.8 in 35.6 x 35.6 x 9.7 cm	14 x 14 x 2.5 in 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)					
DC Power	Input: 1pps (GPS) 48VDC, <50W					
AC Power Adapter						
Input	100-240VAC, 1.5A					
Output	48VDC, 1.5A, 72W (via power injector)					

¹ Not all frequency bands are authorized or available for use in all countries.

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

³ 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

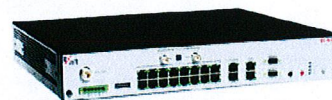
The EX-5i series of all-indoor digital microwave radios is the first family of carrier-class, tri-band TDD radios available in the 5.2 – 5.8 GHz license-exempt bands. The EX-5i line delivers up to 216 Mbps of aggregate user throughput and up to sixteen T1/E1s plus one DS3. Featuring native TDM and native 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 ¹	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 ²		> 30 miles at 99.999% throughput availability			

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

² 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
System		Physical				
Frequency Bands ¹ (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)		Operating Temperature	-40 to +65 °C -40 to +149 °F			
5725-5850 MHz band	+24 dBm QPSK; +21 dBm 16QAM	Full Spec Temperature	-25 to +60 °C -13 to +140 °F			
5250-5350 MHz band ²	+13 dBm	Weight	9.5 lbs / 4.3 kg		12 lbs / 5.5 kg	
5470-5725 MHz band ²	+13 dBm	Environmental	GR-1089-CORE intra-building			
Output Power (min power)	Full power minus 20 dB	Altitude	15,000 ft; 4.6 km			
Power Control Step Size	0.5 dB	Humidity	95% non-condensing			
Receiver Threshold (BER=10 ⁻⁴)	8 MHz 16 MHz 32 MHz 64 MHz ²	Interfaces				
QPSK	-86 -83 -80 -77	RF	N-type(F), impedance 50 ohm			
16QAM	-78 -75 -72 -69	TDM T1/E1 Interfaces	RJ48C/RJ45 (F) (x4)		RJ48C/RJ45 (F) (x16)	
Non-overlapping Channels		T1 Impedance	100 ohms, balanced			
5.250-5.350 GHz	10 5 2 1	T1 Line Code	AMI, B8ZS, selectable per channel			
5.470-5.725 GHz	29 14 7 3	T1 Data Rate	1.544 Mbps			
5.725-5.850 GHz	15 7 3 1	T1 Compliance	ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE			
Maximum RSL (QPSK)	-25 dBm error-free 0 dBm no damage	E1 Impedance	120 ohms, balanced			
Throughput Symmetry Control	5 modes 20/80, 80/20, 35/65, 65/35, 50/50	E1 Line Code	HDB3			
Error Floor	10 ⁻¹²	E1 Data Rate	2.048 Mbps			
Latency (T1/E1)	1ms, typical	E1 Compliance	CEPT-1; G.703; ITU-T-G.703			
Link Security	96-bit proprietary encryption 128-bit and 256-bit AES encryption ³	DS3 Impedance	- BNC (F) (2x) 75 ohms, unbalanced			
VLAN	802.1Q	DS3 Line Code	- B3ZS			
Management	HTTP GUI CLI/Telnet SNMP v1, 2c, v3	DS3 Data Rate	- 44.736 Mbps			
Compliance	FCC 15.247, FCC 15.407 EN 301-893, EN 302-502 EN 60-950, EN 301-489, IC RSS-210	DS3 Compliance	-ANSI T1.102-1993; GR-499-CORE			
System Components		Loopback Modes	Remote Internal; Remote External; Local Line			
Complete Link ⁴	Two terminals, each with AC adapter and accessory kit	Ethernet	RJ45 (F) (x2), auto-MDIX			
Single terminal	One terminal with AC adapter and accessory kit	Interface Speed	10/100BaseT			
Accessory Kit	DC power connector, rack and grounding hardware (spare)	Duplex	Half, Full, Auto			
AC Adapter	AC adapter (spare)	Compliance	802.3			
Exalt Capacity Expansion Kit	For 6 GHz Part 101 links (optional accessory kit)	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			

¹ Not all frequency bands are authorized or available for use in all countries.

² +24 dBm output power. Consult Exalt for availability.

³ Software license key upgrade.

⁴ Two complete links (4 terminals) required for MHS protection along with Exalt MHS kit and

¹ Not all frequency bands are authorized or available for use in all countries.

² +24 dBm output power. Consult Exalt for availability.

³ Software license key upgrade.

⁴ 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).



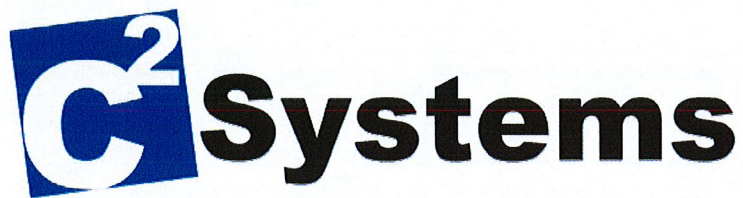
Exhibit D

Power Density Calculations

Pocket Site NHCT0501D

South Orange Center Road

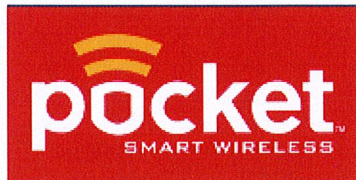
Orange, Connecticut



C Squared Systems, LLC
920 Candia Road
Manchester, NH 03109
Phone: (603) 657 9702
E-mail:

support@csquaredsystems.com

Calculated Radio Frequency Emissions



NHCT0501D

Orange Center Transfer Station

617 South Orange Center Rd

(Aka: South Orange Center Rd.)

Table of Contents

1. Introduction	1
2. FCC Guidelines for Evaluating RF Radiation Exposure Limits	1
3. RF Exposure Prediction Methods	2
4. Calculation Results	3
5. Conclusion	3
6. Statement of Certification	4
Attachment A: References	5
Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)	6

List of Tables

Table 1: Proposed Carrier Information	3
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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 monopole located at the Orange Center Transfer Station, 617 Orange Center Road, Orange, CT 06477.

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.

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).

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.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report. 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.

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, 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. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

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.

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 ²)	Limit	%MPE
Sprint	127	1962.5	11	122	0.0299	1.0000	2.99%
AT&T UMTS	177	1935	1	500	0.0057	1.0000	0.57%
AT&T 800	177	880	6	296	0.0204	0.5867	3.47%
AT&T 1900	177	1900	3	427	0.0147	1.0000	1.47%
Verizon	117	869	9	200	0.0473	0.5793	8.16%
Verizon	117	1900	3	200	0.0158	1.0000	1.58%
Nextel	137	851	12	100	0.0230	0.5673	4.05%
T-Mobile UMTS	150	2.1 GHz	2	645	0.0206	1.0000	2.06%
T-Mobile GSM	150	1945	8	154	0.0197	1.0000	1.97%
Pocket	165	2130-2133.75	3	631	0.0269	1.0000	2.69%
Total							29.01%

Table 1: Proposed Carrier Information

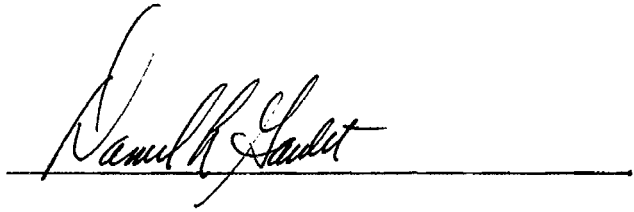
5. Conclusion

The above analysis verifies that emissions from the proposed site configuration 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 and existing 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 monopole is 29.01% 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/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

A handwritten signature in black ink, appearing to read "Daniel I. Goulet", is written over a horizontal line.

Daniel I. Goulet
C Squared Systems, LLC

October 8, 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 ²)	Averaging Time $ E ^2$, $ H ^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

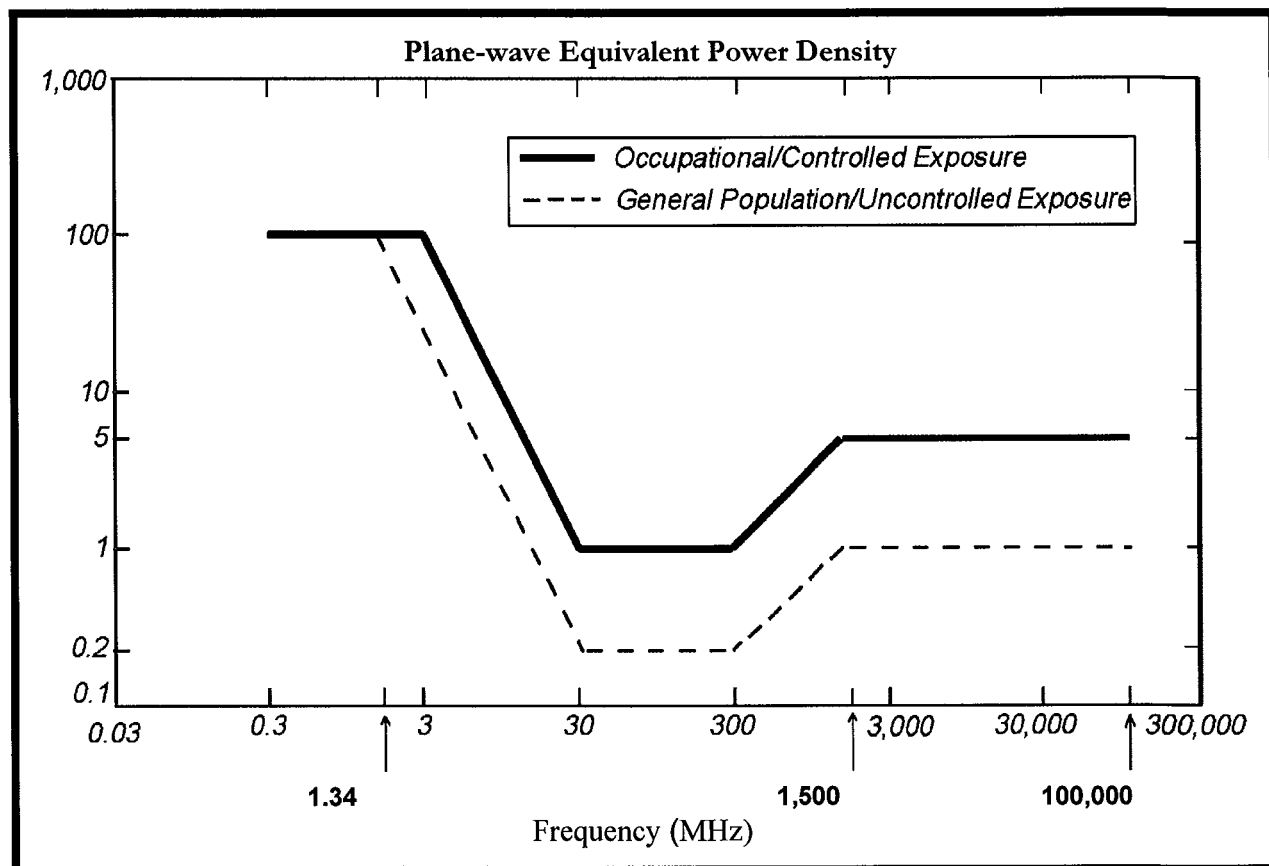
(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time $ E ^2$, $ H ^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	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

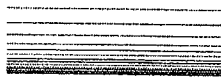
Structural Analysis

Pocket Site NHCT0501D

South Orange Center Road

Orange, Connecticut

BAY STATE
DESIGN



October 7, 2009

Steve Watkins
Site Acquisition Manager
MAXTON Technology Inc.
50 Eastman Street
Easton, MA 02375

Reference: Pocket Communications
NHCT0501D – Orange Transfer Station
180'-0" Monopole
617 Orange Center Road
Orange, CT 06477

Dear Mr. Watkins:

Bay State Design, Inc. has performed a structural analysis for the proposed installation of Pocket Communications wireless equipment on the above referenced monopole.

This analysis accounts for the proposed loading of the following:

- (3) APXV18-206517S-C-ACU antennas flush mounted to the monopole at a height of 165'-0"
- (6) lines of 1 5/8" coax cables will be run inside the monopole

Equipment locations and mounting details will be called out on final Construction Drawings.

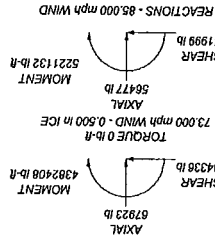
Based on the field survey report and the attached structural calculations completed for this site, it is concluded that the existing structure is adequate to support the loads imposed by the proposed equipment.

Please feel free to contact this office if you have any questions.

Sincerely Yours,

Gordon Govalet, P.E.
Bay State Design, Inc.





- Tower is located in New Haven County, Connecticut.
- Tower designed for a 85,000 mph basic wind in accordance with the TIA/EIA-222-F Standard.
- Tower is also designed for a 73,000 mph basic wind in accordance with the TIA/EIA-222-F Standard.
- Deflections are based upon a 50,000 mph wind.
- TOWER RATING: 97.9%

TOWER DESIGN NOTES

GRADE		Fy	Fu	MATERIAL STRENGTH	
A572-65		60 ksi	80 ksi		
TYPE		ELEVATION		TYPE	
RHS-10-020P (A11)		177		Z da pipe (6' long) (Wind)	
RHS-10-020P (A11)		177		Z da pipe (6' long) (Wind)	
RHS-10-020P (A11)		177		Z da pipe (6' long) (Wind)	
RHS-10-020P (A11)		177		Z da pipe (6' long) (Wind)	
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RHS-10-020P (A11)		177		Z da pipe (6' long) (Wind)	
RHS-10-020P (A11)		177		Z da pipe (6' long) (Wind)	
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RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	1 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Basic wind speed of 85.000 mph.

Nominal ice thickness of 0.500 in.

Ice density of 56.000 pcf.

A wind speed of 73.000 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 50.000 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	180.000-170.58 4	9.416	3.416	18	24.000	26.250	0.188	0.750	A572-65 (65 ksi)
L2	170.584-126.00 0	48.000	4.750	18	25.059	36.525	0.250	1.000	A572-65 (65 ksi)
L3	126.000-82.750	48.000	6.000	18	34.890	46.357	0.313	1.250	A572-65 (65 ksi)
L4	82.750-40.750	48.000	7.250	18	44.299	55.765	0.375	1.500	A572-65 (65 ksi)
L5	40.750-0.000	48.000		18	53.283	64.750	0.438	1.750	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ³	w in	w/t
L1	24.370	14.171	1015.221	8.453	12.192	83.269	2031.778	7.087	3.894	20.768
	26.655	15.510	1331.048	9.252	13.335	99.816	2663.848	7.757	4.290	22.88
L2	26.274	19.686	1530.728	8.807	12.730	120.247	3063.470	9.845	3.970	15.881
	37.088	28.784	4785.272	12.878	18.555	257.901	9576.841	14.395	5.988	23.954
L3	36.581	34.297	5180.684	12.275	17.724	292.293	10368.185	17.152	5.591	17.89
	47.072	45.670	12232.851	16.346	23.549	519.456	24481.798	22.840	7.609	24.348
L4	46.437	52.280	12742.990	15.593	22.504	566.261	25502.748	26.145	7.137	19.031
	56.625	65.928	25554.638	19.663	28.329	902.078	51142.902	32.970	9.155	24.412
L5	55.864	73.383	25891.015	18.760	27.068	956.524	51816.098	36.698	8.608	19.675
	65.749	89.306	46666.863	22.831	32.893	1418.748	93395.131	44.661	10.626	24.288

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	2 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 180.000-170.5				1	1	1		
84 L2				1	1	1		
170.584-126.0								
00 L3				1	1	1		
126.000-82.75								
0 L4				1	1	1		
82.750-40.750								
L5				1	1	1		
40.750-0.000								

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.250 in
Number of bolts	20
Embedment length	42.000 in
f_c	3.000 ksi
Grout space	2.000 in
Base plate grade	A633-60
Base plate thickness	2.750 in
Bolt circle diameter	72.000 in
Outer diameter	77.250 in
Inner diameter	64.750 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		$C_A A_A$ ft ² /ft	Weight plf
1 5/8 (AT&T)	A	No	Inside Pole	177.000 - 5.000	8	No Ice	0.000	1.040
1 5/8 (AT&T)	B	No	Inside Pole	177.000 - 5.000	8	1/2" Ice	0.000	1.040
1 5/8 (AT&T)	C	No	Inside Pole	177.000 - 5.000	8	No Ice	0.000	1.040
1 5/8 (AT&T)	A	No	Inside Pole	177.000 - 5.000	8	1/2" Ice	0.000	1.040
1/2 (AT&T)	A	No	Inside Pole	177.000 - 5.000	1	No Ice	0.000	0.250
1/2 (AT&T)	B	No	Inside Pole	177.000 - 5.000	1	1/2" Ice	0.000	0.250
1/2 (AT&T)	C	No	Inside Pole	177.000 - 5.000	1	No Ice	0.000	0.250
1/2 (AT&T)	A	No	Inside Pole	177.000 - 5.000	1	1/2" Ice	0.000	0.250
1 5/8 (T-Mobile)	A	No	Inside Pole	148.000 - 5.000	8	No Ice	0.000	1.040
1 5/8	B	No	Inside Pole	148.000 - 5.000	8	1/2" Ice	0.000	1.040
						No Ice	0.000	1.040

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	3 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_{AA} ft ² /ft	Weight plf
(T-Mobile) 1 5/8	C	No	Inside Pole	148.000 - 5.000	8	1/2" Ice	0.000	1.040
(T-Mobile) 1 5/8	A	No	Inside Pole	127.000 - 5.000	4	No Ice	0.000	1.040
(Sprint) 1 5/8	B	No	Inside Pole	127.000 - 5.000	4	1/2" Ice	0.000	1.040
(Sprint) 1 5/8	C	No	Inside Pole	127.000 - 5.000	4	No Ice	0.000	1.040
(Sprint) 1 5/8	A	No	Inside Pole	117.000 - 5.000	4	1/2" Ice	0.000	1.040
(Verizon) 1 5/8	B	No	Inside Pole	117.000 - 5.000	4	No Ice	0.000	1.040
(Verizon) 1 5/8	C	No	Inside Pole	117.000 - 5.000	4	1/2" Ice	0.000	1.040
(Verizon) 1 5/8	A	No	Inside Pole	137.000 - 5.000	4	No Ice	0.000	1.040
(Nextel) 1 5/8	B	No	Inside Pole	137.000 - 5.000	4	1/2" Ice	0.000	1.040
(Nextel) 1 5/8	C	No	Inside Pole	137.000 - 5.000	4	No Ice	0.000	1.040
(Nextel) 1 5/8	A	No	Inside Pole	165.000 - 5.000	2	1/2" Ice	0.000	1.040
(Pocket) 1 5/8	B	No	Inside Pole	165.000 - 5.000	2	No Ice	0.000	1.040
(Pocket) 1 5/8	C	No	Inside Pole	165.000 - 5.000	2	1/2" Ice	0.000	1.040
(Pocket)						1/2" Ice	0.000	1.040

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L1	180.000-170.584	A	0.000	0.000	0.000	0.000	54.985
		B	0.000	0.000	0.000	0.000	54.985
		C	0.000	0.000	0.000	0.000	54.985
L2	170.584-126.000	A	0.000	0.000	0.000	0.000	696.165
		B	0.000	0.000	0.000	0.000	696.165
		C	0.000	0.000	0.000	0.000	696.165
L3	126.000-82.750	A	0.000	0.000	0.000	0.000	1322.773
		B	0.000	0.000	0.000	0.000	1322.773
		C	0.000	0.000	0.000	0.000	1322.773
L4	82.750-40.750	A	0.000	0.000	0.000	0.000	1320.900
		B	0.000	0.000	0.000	0.000	1320.900
		C	0.000	0.000	0.000	0.000	1320.900
L5	40.750-0.000	A	0.000	0.000	0.000	0.000	1124.338
		B	0.000	0.000	0.000	0.000	1124.338
		C	0.000	0.000	0.000	0.000	1124.338

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L1	180.000-170.584	A	0.500	0.000	0.000	0.000	0.000	54.985

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	4 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L2	170.584-126.000	B	0.500	0.000	0.000	0.000	0.000	54.985
		C		0.000	0.000	0.000	0.000	54.985
		A		0.000	0.000	0.000	0.000	696.165
L3	126.000-82.750	B	0.500	0.000	0.000	0.000	0.000	696.165
		C		0.000	0.000	0.000	0.000	696.165
		A		0.000	0.000	0.000	0.000	1322.773
L4	82.750-40.750	B	0.500	0.000	0.000	0.000	0.000	1322.773
		C		0.000	0.000	0.000	0.000	1322.773
		A		0.000	0.000	0.000	0.000	1320.900
L5	40.750-0.000	B	0.500	0.000	0.000	0.000	0.000	1320.900
		C		0.000	0.000	0.000	0.000	1320.900
		A		0.000	0.000	0.000	0.000	1124.338
		B		0.000	0.000	0.000	0.000	1124.338
		C		0.000	0.000	0.000	0.000	1124.338

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	180.000-170.584	0.000	0.000	0.000	0.000
L2	170.584-126.000	0.000	0.000	0.000	0.000
L3	126.000-82.750	0.000	0.000	0.000	0.000
L4	82.750-40.750	0.000	0.000	0.000	0.000
L5	40.750-0.000	0.000	0.000	0.000	0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
RR90-17-02DP (AT&T)	A	From Face	2.000	0.000	177.000	No Ice	4.356	18.000
			5.000			1/2" Ice	4.775	40.418
			1.000					
RR90-17-02DP (AT&T)	B	From Face	2.000	0.000	177.000	No Ice	4.356	18.000
			5.000			1/2" Ice	4.775	40.418
			1.000					
RR90-17-02DP (AT&T)	C	From Face	2.000	0.000	177.000	No Ice	4.356	18.000
			5.000			1/2" Ice	4.775	40.418
			1.000					
RR90-17-02DP (AT&T)	A	From Face	2.000	0.000	177.000	No Ice	4.356	18.000
			-5.000			1/2" Ice	4.775	40.418
			1.000					
RR90-17-02DP (AT&T)	B	From Face	2.000	0.000	177.000	No Ice	4.356	18.000
			-5.000			1/2" Ice	4.775	40.418
			1.000					
RR90-17-02DP (AT&T)	C	From Face	2.000	0.000	177.000	No Ice	4.356	18.000
			-5.000			1/2" Ice	4.775	40.418

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	5 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
776QNB120EXM (AT&T)	A	From Face	1.000 2.000 0.000 1.000	0.000	177.000	No Ice 1/2" Ice	25.690 26.399	5.575 6.030	110.000 225.852
776QNB120EXM (AT&T)	B	From Face	1.000 2.000 0.000 1.000	0.000	177.000	No Ice 1/2" Ice	25.690 26.399	5.575 6.030	110.000 225.852
776QNB120EXM (AT&T)	C	From Face	1.000 2.000 0.000 1.000	0.000	177.000	No Ice 1/2" Ice	25.690 26.399	5.575 6.030	110.000 225.852
DR65-19-00DPQ (T-Mobile)	A	From Face	1.000 2.000 5.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	B	From Face	1.000 2.000 5.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	C	From Face	1.000 2.000 5.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	A	From Face	1.000 2.000 -5.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	B	From Face	1.000 2.000 -5.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	C	From Face	1.000 2.000 -5.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	A	From Face	1.000 2.000 0.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	B	From Face	1.000 2.000 0.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DR65-19-00DPQ (T-Mobile)	C	From Face	1.000 2.000 0.000 1.000	0.000	148.000	No Ice 1/2" Ice	8.400 8.949	3.533 3.970	25.000 66.773
DB980H65T2E-M (Sprint)	A	From Face	1.000 2.000 5.000 1.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	A	From Face	1.000 2.000 -5.000 1.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	A	From Face	1.000 2.000 3.000 1.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	A	From Face	1.000 2.000 -3.000 1.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	B	From Face	1.000 2.000 5.000 1.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	B	From Face	1.000 2.000 -5.000 1.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	B	From Face	1.000 2.000 3.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	6 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
DB980H65T2E-M (Sprint)	B	From Face	1.000 2.000 -3.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	C	From Face	1.000 2.000 5.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	C	From Face	1.000 2.000 -5.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H65T2E-M (Sprint)	C	From Face	1.000 2.000 3.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB980H90T2E-M (Sprint)	C	From Face	1.000 2.000 -3.000	0.000	127.000	No Ice 1/2" Ice	3.799 4.178	2.194 2.556	8.500 28.624
DB844H90 (Verizon)	A	From Face	1.000 2.000 5.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	A	From Face	1.000 2.000 -5.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	A	From Face	1.000 2.000 3.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	A	From Face	1.000 2.000 -3.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	B	From Face	1.000 2.000 5.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	B	From Face	1.000 2.000 -5.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	B	From Face	1.000 2.000 3.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	B	From Face	1.000 2.000 -3.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	C	From Face	1.000 2.000 5.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	C	From Face	1.000 2.000 -5.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	C	From Face	1.000 2.000 3.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Verizon)	C	From Face	1.000 2.000 -3.000	0.000	117.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
12 ft. Low Profile Platform (A&T)	A	None	1.000	0.000	177.000	No Ice 1/2" Ice	21.000 21.000	25.000 25.000	1300.000 2000.000
PiROD 13' Low Profile Platform (Monopole) (T-Mobile)	A	None		0.000	148.000	No Ice 1/2" Ice	15.700 20.100	15.700 20.100	1300.000 1765.000

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	7 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
12 ft. Low Profile Platform (Sprint)	A	None		0.000	127.000	No Ice	21.000	25.000	1300.000
						1/2" Ice	21.000	25.000	2000.000
12 ft. Low Profile Platform (Verizon)	A	None		0.000	117.000	No Ice	21.000	25.000	1300.000
						1/2" Ice	21.000	25.000	2000.000
2" dia. pipe (6' long) (AT&T)	A	From Face	2.000 5.000 1.000	0.000	177.000	No Ice	2.853	2.853	22.900
						1/2" Ice	3.852	3.852	47.207
2" dia. pipe (6' long) (AT&T)	B	From Face	2.000 5.000 1.000	0.000	177.000	No Ice	2.853	2.853	22.900
						1/2" Ice	3.852	3.852	47.207
2" dia. pipe (6' long) (AT&T)	C	From Face	2.000 5.000 1.000	0.000	177.000	No Ice	2.853	2.853	22.900
						1/2" Ice	3.852	3.852	47.207
2" dia. pipe (6' long) (AT&T)	A	From Face	2.000 -5.000 1.000	0.000	177.000	No Ice	2.853	2.853	22.900
						1/2" Ice	3.852	3.852	47.207
2" dia. pipe (6' long) (AT&T)	B	From Face	2.000 -5.000 1.000	0.000	177.000	No Ice	2.853	2.853	22.900
						1/2" Ice	3.852	3.852	47.207
2" dia. pipe (6' long) (AT&T)	C	From Face	2.000 -5.000 1.000	0.000	177.000	No Ice	2.853	2.853	22.900
						1/2" Ice	3.852	3.852	47.207
2" dia. pipe (7' long) (AT&T)	A	From Face	2.000 0.000 1.000	0.000	177.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (AT&T)	B	From Face	2.000 0.000 1.000	0.000	177.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (AT&T)	C	From Face	2.000 0.000 1.000	0.000	177.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	A	From Face	2.000 5.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	B	From Face	2.000 5.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	C	From Face	2.000 5.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	A	From Face	2.000 -5.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	B	From Face	2.000 -5.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	C	From Face	2.000 -5.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	A	From Face	2.000 0.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	B	From Face	2.000 0.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823
2" dia. pipe (7' long) (T-Mobile)	C	From Face	2.000 0.000 1.000	0.000	148.000	No Ice	3.329	3.329	26.550
						1/2" Ice	4.785	4.785	54.823

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	8 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
2" dia. pipe (6' long) (Sprint)	A	From Face	1.000 2.000 5.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	A	From Face	2.000 -5.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	A	From Face	2.000 3.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	A	From Face	2.000 -3.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	B	From Face	2.000 5.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	B	From Face	2.000 -5.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	B	From Face	2.000 3.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	B	From Face	2.000 -3.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	C	From Face	2.000 5.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	C	From Face	2.000 -5.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	C	From Face	2.000 3.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Sprint)	C	From Face	2.000 -3.000 1.000	0.000	127.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	A	From Face	2.000 5.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	A	From Face	2.000 -5.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	A	From Face	2.000 3.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	A	From Face	2.000 -3.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	B	From Face	2.000 5.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	B	From Face	2.000 -5.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	B	From Face	2.000 3.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207

RISATower

Bay State Design
 241 Boston Post Road West
 Marlborough, MA 01752
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Job	NHCT-0501D	Page	9 of 20
Project	180' Monopole	Date	10:13:31 10/06/09
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
2" dia. pipe (6' long) (Verizon)	B	From Face	1.000 2.000 -3.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	C	From Face	1.000 2.000 5.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	C	From Face	1.000 2.000 -5.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	C	From Face	1.000 2.000 3.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Verizon)	C	From Face	1.000 2.000 -3.000 1.000	0.000	117.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
DB844H90 (Nextel)	A	From Face	1.000 2.000 5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	A	From Face	1.000 2.000 -5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	A	From Face	1.000 2.000 3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	A	From Face	1.000 2.000 -3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	B	From Face	1.000 2.000 5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	B	From Face	1.000 2.000 -5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	B	From Face	1.000 2.000 3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	B	From Face	1.000 2.000 -3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	C	From Face	1.000 2.000 5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	C	From Face	1.000 2.000 -5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	C	From Face	1.000 2.000 3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
DB844H90 (Nextel)	C	From Face	1.000 2.000 -3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.867 3.177	3.967 4.337	10.000 36.266
2" dia. pipe (6' long) (Nextel)	A	From Face	1.000 2.000 5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	A	From Face	1.000 2.000 -5.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207

RISA Tower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	10 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
2" dia. pipe (6' long) (Nextel)	A	From Face	1.000 2.000 3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	A	From Face	2.000 -3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	B	From Face	2.000 5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	B	From Face	2.000 -5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	B	From Face	2.000 3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	B	From Face	2.000 -3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	C	From Face	2.000 5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	C	From Face	2.000 -5.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	C	From Face	2.000 3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
2" dia. pipe (6' long) (Nextel)	C	From Face	2.000 -3.000 1.000	0.000	137.000	No Ice 1/2" Ice	2.853 3.852	2.853 3.852	22.900 47.207
12 ft. Low Profile Platform (Nextel)	A	None		0.000	137.000	No Ice 1/2" Ice	21.000 21.000	25.000 25.000	1300.000 2000.000
APXV18-206517S-C-ACU (Pocket)	A	From Face	1.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice	5.167 5.618	3.038 3.469	32.500 59.099
APXV18-206517S-C-ACU (Pocket)	B	From Face	1.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice	5.167 5.618	3.038 3.469	32.500 59.099
APXV18-206517S-C-ACU (Pocket)	C	From Face	1.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice	5.167 5.618	3.038 3.469	32.500 59.099
1' Side Mount Standoff (Pocket)	A	From Face	1.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice	1.320 1.820	1.320 1.820	44.000 54.000
1' Side Mount Standoff (Pocket)	B	From Face	1.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice	1.320 1.820	1.320 1.820	44.000 54.000
1' Side Mount Standoff (Pocket)	C	From Face	1.000 0.000 0.000	0.000	165.000	No Ice 1/2" Ice	1.320 1.820	1.320 1.820	44.000 54.000

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	11 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Tower Pressures - No Ice

$$G_H = 1.690$$

Section Elevation	z	K _z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
L1 180.000-170.584	175.222	1.611	29.80 2	19.715	A	0.000	19.715	19.715	100.00	0.000	0.000
					B	0.000	19.715		100.00	0.000	0.000
					C	0.000	19.715		100.00	0.000	0.000
L2 170.584-126.000	147.262	1.533	28.32 8	115.918	A	0.000	115.918	115.918	100.00	0.000	0.000
					B	0.000	115.918		100.00	0.000	0.000
					C	0.000	115.918		100.00	0.000	0.000
L3 126.000-82.750	103.791	1.387	25.60 9	148.459	A	0.000	148.459	148.459	100.00	0.000	0.000
					B	0.000	148.459		100.00	0.000	0.000
					C	0.000	148.459		100.00	0.000	0.000
L4 82.750-40.750	61.573	1.195	21.98 5	177.620	A	0.000	177.620	177.620	100.00	0.000	0.000
					B	0.000	177.620		100.00	0.000	0.000
					C	0.000	177.620		100.00	0.000	0.000
L5 40.750-0.000	19.823	1	18.49 6	203.351	A	0.000	203.351	203.351	100.00	0.000	0.000
					B	0.000	203.351		100.00	0.000	0.000
					C	0.000	203.351		100.00	0.000	0.000

Tower Pressure - With Ice

$$G_H = 1.690$$

Section Elevation	z	K _z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
L1 180.000-170.584	175.222	1.611	21.981	0.500	20.499	A	0.000	20.499	20.499	100.00	0.000	0.000
						B	0.000	20.499		100.00	0.000	0.000
						C	0.000	20.499		100.00	0.000	0.000
L2 170.584-126.000	147.262	1.533	20.894	0.500	119.633	A	0.000	119.633	119.633	100.00	0.000	0.000
						B	0.000	119.633		100.00	0.000	0.000
						C	0.000	119.633		100.00	0.000	0.000
L3 126.000-82.750	103.791	1.387	18.889	0.500	152.063	A	0.000	152.063	152.063	100.00	0.000	0.000
						B	0.000	152.063		100.00	0.000	0.000
						C	0.000	152.063		100.00	0.000	0.000
L4 82.750-40.750	61.573	1.195	16.215	0.500	181.120	A	0.000	181.120	181.120	100.00	0.000	0.000
						B	0.000	181.120		100.00	0.000	0.000
						C	0.000	181.120		100.00	0.000	0.000
L5 40.750-0.000	19.823	1	13.642	0.500	206.747	A	0.000	206.747	206.747	100.00	0.000	0.000
						B	0.000	206.747		100.00	0.000	0.000
						C	0.000	206.747		100.00	0.000	0.000

Tower Pressure - Service

$$G_H = 1.690$$

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	12 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Section Elevation	z	K _z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
L1	175.222	1.611	10.31	19.715	A	0.000	19.715	19.715	100.00	0.000	0.000
180.000-170.5					B	0.000	19.715		100.00	0.000	0.000
84					C	0.000	19.715		100.00	0.000	0.000
L2	147.262	1.533	9.802	115.918	A	0.000	115.918	115.918	100.00	0.000	0.000
170.584-126.0					B	0.000	115.918		100.00	0.000	0.000
00					C	0.000	115.918		100.00	0.000	0.000
L3	103.791	1.387	8.861	148.459	A	0.000	148.459	148.459	100.00	0.000	0.000
126.000-82.75					B	0.000	148.459		100.00	0.000	0.000
0					C	0.000	148.459		100.00	0.000	0.000
L4	61.573	1.195	7.607	177.620	A	0.000	177.620	177.620	100.00	0.000	0.000
82.750-40.750					B	0.000	177.620		100.00	0.000	0.000
					C	0.000	177.620		100.00	0.000	0.000
L5	19.823	1	6.400	203.351	A	0.000	203.351	203.351	100.00	0.000	0.000
40.750-0.000					B	0.000	203.351		100.00	0.000	0.000
					C	0.000	203.351		100.00	0.000	0.000

Force Totals

Load Case	Vertical Forces	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M _x lb-ft	Sum of Overturning Moments, M _y lb-ft	Sum of Torques lb-ft
Leg Weight	33904.594					
Bracing Weight	0.000					
Total Member Self-Weight	33904.594			0.000	0.000	
Total Weight	56476.974			0.000	0.000	
Wind 0 deg - No Ice		0.000	-41998.776	-5067865.848	0.000	0.000
Wind 30 deg - No Ice		20999.388	-36372.007	-4388900.567	-2533932.924	0.000
Wind 60 deg - No Ice		36372.007	-20999.388	-2533932.924	-4388900.567	0.000
Wind 90 deg - No Ice		41998.776	0.000	0.000	-5067865.848	0.000
Wind 120 deg - No Ice		36372.007	20999.388	2533932.924	-4388900.567	0.000
Wind 150 deg - No Ice		20999.388	36372.007	4388900.567	-2533932.924	0.000
Wind 180 deg - No Ice		0.000	41998.776	5067865.848	0.000	0.000
Wind 210 deg - No Ice		-20999.388	36372.007	4388900.567	2533932.924	0.000
Wind 240 deg - No Ice		-36372.007	20999.388	2533932.924	4388900.567	0.000
Wind 270 deg - No Ice		-41998.776	0.000	0.000	5067865.848	0.000
Wind 300 deg - No Ice		-36372.007	-20999.388	-2533932.924	4388900.567	0.000
Wind 330 deg - No Ice		-20999.388	-36372.007	-4388900.567	2533932.924	0.000
Member Ice	4981.000					
Total Weight Ice	67922.847			0.000	0.000	
Wind 0 deg - Ice		0.000	-34335.662	-4205955.406	0.000	0.000
Wind 30 deg - Ice		17167.831	-29735.555	-3642464.229	-2102977.703	0.000
Wind 60 deg - Ice		29735.555	-17167.831	-2102977.703	-3642464.229	0.000
Wind 90 deg - Ice		34335.662	0.000	0.000	-4205955.406	0.000
Wind 120 deg - Ice		29735.555	17167.831	2102977.703	-3642464.229	0.000
Wind 150 deg - Ice		17167.831	29735.555	3642464.229	-2102977.703	0.000
Wind 180 deg - Ice		0.000	34335.662	4205955.406	0.000	0.000
Wind 210 deg - Ice		-17167.831	29735.555	3642464.229	2102977.703	0.000
Wind 240 deg - Ice		-29735.555	17167.831	2102977.703	3642464.229	0.000
Wind 270 deg - Ice		-34335.662	0.000	0.000	4205955.406	0.000
Wind 300 deg - Ice		-29735.555	-17167.831	-2102977.703	3642464.229	0.000
Wind 330 deg - Ice		-17167.831	-29735.555	-3642464.229	2102977.703	0.000
Total Weight	56476.974			0.000	0.000	
Wind 0 deg - Service		0.000	-14532.448	-1753586.799	0.000	0.000
Wind 30 deg - Service		7266.224	-12585.469	-1518650.715	-876793.399	0.000
Wind 60 deg - Service		12585.469	-7266.224	-876793.399	-1518650.715	0.000
Wind 90 deg - Service		14532.448	0.000	0.000	-1753586.799	0.000

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-3321	Job	NHCT-0501D	Page	13 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 120 deg - Service		12585.469	7266.224	876793.399	-1518650.715	0.000
Wind 150 deg - Service		7266.224	12585.469	1518650.715	-876793.399	0.000
Wind 180 deg - Service		0.000	14532.448	1753586.799	0.000	0.000
Wind 210 deg - Service		-7266.224	12585.469	1518650.715	876793.399	0.000
Wind 240 deg - Service		-12585.469	7266.224	876793.399	1518650.715	0.000
Wind 270 deg - Service		-14532.448	0.000	0.000	1753586.799	0.000
Wind 300 deg - Service		-12585.469	-7266.224	-876793.399	1518650.715	0.000
Wind 330 deg - Service		-7266.224	-12585.469	-1518650.715	876793.399	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	14 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	180 - 170.584	Pole	Max Tension	5	0.004	0.000	0.000
			Max. Compression	14	-3864.308	0.000	-0.000
			Max. Mx	5	-1729.177	-24403.700	-0.000
			Max. My	2	-1729.177	0.000	24403.700
			Max. Vy	5	6570.512	-24403.700	-0.000
			Max. Vx	2	-6570.512	0.000	24403.700
			Max. Torque	26			0.000
L2	170.584 - 126	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-16489.278	0.000	-0.000
			Max. Mx	5	-9958.747	-539570.13	-0.000
						3	
			Max. My	8	-9958.747	0.000	-539570.13
						3	
			Max. Vy	5	20972.709	-539570.13	-0.000
L3	126 - 82.75	Pole				3	
			Max. Vx	8	20972.709	0.000	-539570.13
						3	
			Max. Torque	26			0.011
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-33160.827	0.000	-0.000
			Max. Mx	5	-22901.782	-1817812.5	-0.000
L4	82.75 - 40.75	Pole				45	
			Max. My	8	-22901.782	0.000	-1817812.5
						45	
			Max. Vy	5	34255.711	-1817812.5	-0.000
						45	
			Max. Vx	8	34255.711	0.000	-1817812.5
						45	
L5	40.75 - 0	Pole	Max. Torque	26			0.028
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-47211.994	0.000	-0.000
			Max. Mx	5	-36512.644	-3295039.1	-0.000
						12	
			Max. My	8	-36512.644	0.000	-3295039.1
						12	
			Max. Vy	5	38115.465	-3295039.1	-0.000
						12	
			Max. Vx	8	38115.465	0.000	-3295039.1
						12	
			Max. Torque	26			0.039
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-67922.847	0.000	-0.000
			Max. Mx	5	-56451.789	-5221125.4	0.000
						63	
			Max. My	2	-56451.789	0.000	5221125.46
						3	
			Max. Vy	5	42032.632	-5221125.4	0.000
						63	
			Max. Vx	2	-42032.632	0.000	5221125.46
						3	
			Max. Torque	26			0.044

Maximum Reactions

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	15 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	21	67922.847	0.000	-34335.683
	Max. H _x	11	56476.975	41998.786	-0.000
	Max. H _z	2	56476.975	0.000	41998.786
	Max. M _x	2	5221125.463	0.000	41998.786
	Max. M _z	5	5221125.463	-41998.786	-0.000
	Max. Torsion	26	0.044	17167.840	29735.573
	Min. Vert	1	56476.974	0.000	-0.000
	Min. H _x	5	56476.975	-41998.786	-0.000
	Min. H _z	8	56476.975	0.000	-41998.786
	Min. M _x	8	-5221125.463	0.000	-41998.786
	Min. M _z	11	-5221125.463	41998.786	-0.000
	Min. Torsion	16	-0.044	-17167.840	29735.573

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	56476.974	0.000	0.000	0.000	0.000	0.000
Dead+Wind 0 deg - No Ice	56476.975	0.000	-41998.786	-5221125.463	0.000	0.000
Dead+Wind 30 deg - No Ice	56476.974	20999.388	-36372.007	-4521632.898	-2610565.994	0.029
Dead+Wind 60 deg - No Ice	56476.974	36372.007	-20999.388	-2610565.994	-4521632.898	-0.029
Dead+Wind 90 deg - No Ice	56476.975	41998.786	0.000	0.000	-5221125.463	0.000
Dead+Wind 120 deg - No Ice	56476.974	36372.007	20999.388	2610565.994	-4521632.898	0.029
Dead+Wind 150 deg - No Ice	56476.974	20999.388	36372.007	4521632.898	-2610565.994	-0.029
Dead+Wind 180 deg - No Ice	56476.975	0.000	41998.786	5221125.463	0.000	0.000
Dead+Wind 210 deg - No Ice	56476.974	-20999.388	36372.007	4521632.898	2610565.994	0.029
Dead+Wind 240 deg - No Ice	56476.974	-36372.007	20999.388	2610565.994	4521632.898	-0.029
Dead+Wind 270 deg - No Ice	56476.975	-41998.786	0.000	0.000	5221125.463	0.000
Dead+Wind 300 deg - No Ice	56476.974	-36372.007	-20999.388	-2610565.994	4521632.898	0.029
Dead+Wind 330 deg - No Ice	56476.974	-20999.388	-36372.007	-4521632.898	2610565.994	-0.029
Dead+Ice+Temp	67922.847	0.000	0.000	0.000	0.000	0.000
Dead+Wind 0 deg+Ice+Temp	67922.847	0.000	-34335.683	-4382408.182	0.000	0.000
Dead+Wind 30 deg+Ice+Temp	67922.847	17167.840	-29735.573	-3795276.861	-2191204.175	0.044
Dead+Wind 60 deg+Ice+Temp	67922.847	29735.573	-17167.840	-2191204.175	-3795276.861	-0.044
Dead+Wind 90 deg+Ice+Temp	67922.847	34335.683	0.000	0.000	-4382408.182	0.000
Dead+Wind 120 deg+Ice+Temp	67922.847	29735.573	17167.840	2191204.175	-3795276.861	0.044
Dead+Wind 150 deg+Ice+Temp	67922.847	17167.840	29735.573	3795276.861	-2191204.175	-0.044
Dead+Wind 180 deg+Ice+Temp	67922.847	0.000	34335.683	4382408.182	0.000	0.000
Dead+Wind 210 deg+Ice+Temp	67922.847	-17167.840	29735.573	3795276.861	2191204.175	0.044
Dead+Wind 240 deg+Ice+Temp	67922.847	-29735.573	17167.840	2191204.175	3795276.861	-0.044
Dead+Wind 270 deg+Ice+Temp	67922.847	-34335.683	0.000	0.000	4382408.182	0.000
Dead+Wind 300 deg+Ice+Temp	67922.847	-29735.573	-17167.840	-2191204.175	3795276.861	0.044
Dead+Wind 330 deg+Ice+Temp	67922.847	-17167.840	-29735.573	-3795276.861	2191204.175	-0.044
Dead+Wind 0 deg - Service	56476.974	0.000	-14532.453	-1808703.247	0.000	0.000
Dead+Wind 30 deg - Service	56476.974	7266.226	-12585.473	-1566382.978	-904351.657	0.010
Dead+Wind 60 deg - Service	56476.974	12585.473	-7266.226	-904351.657	-1566382.978	-0.010
Dead+Wind 90 deg - Service	56476.974	14532.453	0.000	0.000	-1808703.247	0.000
Dead+Wind 120 deg - Service	56476.974	12585.473	7266.226	904351.657	-1566382.978	0.010
Dead+Wind 150 deg - Service	56476.974	7266.226	12585.473	1566382.978	-904351.657	-0.010
Dead+Wind 180 deg - Service	56476.974	0.000	14532.453	1808703.247	0.000	0.000
Dead+Wind 210 deg - Service	56476.974	-7266.226	12585.473	1566382.978	904351.657	0.010
Dead+Wind 240 deg - Service	56476.974	-12585.473	7266.226	904351.657	1566382.978	-0.010
Dead+Wind 270 deg - Service	56476.974	-14532.453	0.000	0.000	1808703.247	0.000
Dead+Wind 300 deg - Service	56476.974	-12585.473	-7266.226	-904351.657	1566382.978	0.010
Dead+Wind 330 deg - Service	56476.974	-7266.226	-12585.473	-1566382.978	904351.657	-0.010

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	16 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.000	-56476.974	0.000	0.000	56476.974	-0.000	0.000%
2	0.000	-56476.974	-41998.776	0.000	56476.975	41998.786	0.000%
3	20999.388	-56476.974	-36372.007	-20999.388	56476.974	36372.007	0.000%
4	36372.007	-56476.974	-20999.388	-36372.007	56476.974	20999.388	0.000%
5	41998.776	-56476.974	0.000	-41998.786	56476.975	-0.000	0.000%
6	36372.007	-56476.974	20999.388	-36372.007	56476.974	-20999.388	0.000%
7	20999.388	-56476.974	36372.007	-20999.388	56476.974	-36372.007	0.000%
8	0.000	-56476.974	41998.776	0.000	56476.975	-41998.786	0.000%
9	-20999.388	-56476.974	36372.007	20999.388	56476.974	-36372.007	0.000%
10	-36372.007	-56476.974	20999.388	36372.007	56476.974	-20999.388	0.000%
11	-41998.776	-56476.974	0.000	41998.786	56476.975	-0.000	0.000%
12	-36372.007	-56476.974	-20999.388	36372.007	56476.974	20999.388	0.000%
13	-20999.388	-56476.974	-36372.007	20999.388	56476.974	36372.007	0.000%
14	0.000	-67922.847	0.000	0.000	67922.847	-0.000	0.000%
15	0.000	-67922.847	-34335.662	0.000	67922.847	34335.683	0.000%
16	17167.831	-67922.847	-29735.555	-17167.840	67922.847	29735.573	0.000%
17	29735.555	-67922.847	-17167.831	-29735.573	67922.847	17167.840	0.000%
18	34335.662	-67922.847	0.000	-34335.683	67922.847	-0.000	0.000%
19	29735.555	-67922.847	17167.831	-29735.573	67922.847	-17167.840	0.000%
20	17167.831	-67922.847	29735.555	-17167.840	67922.847	-29735.573	0.000%
21	0.000	-67922.847	34335.662	0.000	67922.847	-34335.683	0.000%
22	-17167.831	-67922.847	29735.555	17167.840	67922.847	-29735.573	0.000%
23	-29735.555	-67922.847	17167.831	29735.573	67922.847	-17167.840	0.000%
24	-34335.662	-67922.847	0.000	34335.683	67922.847	-0.000	0.000%
25	-29735.555	-67922.847	-17167.831	29735.573	67922.847	17167.840	0.000%
26	-17167.831	-67922.847	-29735.555	17167.840	67922.847	29735.573	0.000%
27	0.000	-56476.974	-14532.448	0.000	56476.974	14532.453	0.000%
28	7266.224	-56476.974	-12585.469	-7266.226	56476.974	12585.473	0.000%
29	12585.469	-56476.974	-7266.224	-12585.473	56476.974	7266.226	0.000%
30	14532.448	-56476.974	0.000	-14532.453	56476.974	-0.000	0.000%
31	12585.469	-56476.974	7266.224	-12585.473	56476.974	-7266.226	0.000%
32	7266.224	-56476.974	12585.469	-7266.226	56476.974	-12585.473	0.000%
33	0.000	-56476.974	14532.448	0.000	56476.974	-14532.453	0.000%
34	-7266.224	-56476.974	12585.469	7266.226	56476.974	-12585.473	0.000%
35	-12585.469	-56476.974	7266.224	12585.473	56476.974	-7266.226	0.000%
36	-14532.448	-56476.974	0.000	14532.453	56476.974	-0.000	0.000%
37	-12585.469	-56476.974	-7266.224	12585.473	56476.974	7266.226	0.000%
38	-7266.224	-56476.974	-12585.469	7266.226	56476.974	12585.473	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00012818
3	Yes	5	0.00000001	0.00045437
4	Yes	5	0.00000001	0.00045437
5	Yes	4	0.00000001	0.00012818
6	Yes	5	0.00000001	0.00045437
7	Yes	5	0.00000001	0.00045437
8	Yes	4	0.00000001	0.00012818

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	17 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

9	Yes	5	0.00000001	0.00045437
10	Yes	5	0.00000001	0.00045437
11	Yes	4	0.00000001	0.00012818
12	Yes	5	0.00000001	0.00045437
13	Yes	5	0.00000001	0.00045437
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00021958
16	Yes	5	0.00000001	0.00093082
17	Yes	5	0.00000001	0.00093082
18	Yes	5	0.00000001	0.00021958
19	Yes	5	0.00000001	0.00093082
20	Yes	5	0.00000001	0.00093082
21	Yes	5	0.00000001	0.00021958
22	Yes	5	0.00000001	0.00093082
23	Yes	5	0.00000001	0.00093082
24	Yes	5	0.00000001	0.00021958
25	Yes	5	0.00000001	0.00093082
26	Yes	5	0.00000001	0.00093082
27	Yes	4	0.00000001	0.00006263
28	Yes	4	0.00000001	0.00094672
29	Yes	4	0.00000001	0.00094672
30	Yes	4	0.00000001	0.00006263
31	Yes	4	0.00000001	0.00094672
32	Yes	4	0.00000001	0.00094672
33	Yes	4	0.00000001	0.00006263
34	Yes	4	0.00000001	0.00094672
35	Yes	4	0.00000001	0.00094672
36	Yes	4	0.00000001	0.00006263
37	Yes	4	0.00000001	0.00094672
38	Yes	4	0.00000001	0.00094672

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 170.584	40.637	27	1.933	0.000
L2	174 - 126	38.209	27	1.929	0.000
L3	130.75 - 82.75	21.783	27	1.623	0.000
L4	88.75 - 40.75	9.684	27	1.065	0.000
L5	48 - 0	2.759	27	0.525	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	RR90-17-02DP	27	39.422	1.932	0.000	19124
165.000	APXV18-206517S-C-ACU	27	34.600	1.904	0.000	13914
148.000	DR65-19-00DPQ	27	27.999	1.794	0.000	7396
137.000	DB844H90	27	23.965	1.690	0.000	5683
127.000	DB980H65T2E-M	27	20.517	1.580	0.000	4946
117.000	DB844H90	27	17.313	1.460	0.000	4688

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	18 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 170.584	117.102	5	5.573	0.000
L2	174 - 126	110.112	5	5.563	0.000
L3	130.75 - 82.75	62.807	5	4.680	0.000
L4	88.75 - 40.75	27.938	5	3.073	0.000
L5	48 - 0	7.963	5	1.514	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	RR90-17-02DP	5	113.604	5.570	0.000	6756
165.000	APXV18-206517S-C-ACU	5	99.719	5.491	0.000	4911
148.000	DR65-19-00DPQ	5	80.713	5.178	0.000	2605
137.000	DB844H90	5	69.093	4.877	0.000	1999
127.000	DB980H65T2E-M	5	59.162	4.555	0.000	1737
117.000	DB844H90	5	49.929	4.198	0.000	1643

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
2.750	20	2.250	171215.142	176860.321	50.011		Bolt T	1.30
			131210.581	217809.564	45.000			✓
			1.30	0.81	1.11			

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
L1	180 - 170.584 (1)	TP26.25x24x0.188	9.416	180.000	241.0	2.571	15.025	-3418.960	38627.602	0.089
L2	170.584 - 126 (2)	TP36.525x25.059x0.25	48.000	180.000	173.1	4.981	27.884	-9958.680	138888.000	0.072

RISATower Bay State Design 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	19 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
L3	126 - 82.75 (3)	TP46.357x34.89x0.313	48.000	180.000	136.4	8.028	44.249	-22901.699	355212.000	0.064
L4	82.75 - 40.75 (4)	TP55.765x44.299x0.375	48.000	180.000	113.4	11.614	63.867	-36512.602	741728.000	0.049
L5	40.75 - 0 (5)	TP64.75x53.283x0.438	48.000	180.000	94.6	16.684	89.306	-56451.801	1489950.00	0.038
0										

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x lb-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y lb-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	180 - 170.584 (1)	TP26.25x24x0.188	20644.9 17	-2.646	39.000	0.068	0.000	0.000	39.000	0.000
L2	170.584 - 126 (2)	TP36.525x25.059x0.25	539571. 667	-26.759	39.000	0.686	0.000	0.000	39.000	0.000
L3	126 - 82.75 (3)	TP46.357x34.89x0.313	1817816 .667	-44.745	39.000	1.147	0.000	0.000	39.000	0.000
L4	82.75 - 40.75 (4)	TP55.765x44.299x0.375	3295041 .667	-46.718	39.000	1.198	0.000	0.000	39.000	0.000
L5	40.75 - 0 (5)	TP64.75x53.283x0.438	5221133 .333	-44.161	39.000	1.132	0.000	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 170.584 (1)	TP26.25x24x0.188	0.089	0.068	0.000	0.156	1.333	H1-3 ✓
L2	170.584 - 126 (2)	TP36.525x25.059x0.25	0.072	0.686	0.000	0.758	1.333	H1-3 ✓
L3	126 - 82.75 (3)	TP46.357x34.89x0.313	0.064	1.147	0.000	1.212	1.333	H1-3 ✓
L4	82.75 - 40.75 (4)	TP55.765x44.299x0.375	0.049	1.198	0.000	1.247	1.333	H1-3 ✓
L5	40.75 - 0 (5)	TP64.75x53.283x0.438	0.038	1.132	0.000	1.170	1.333	H1-3 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
L1	180 - 170.584	Pole	TP26.25x24x0.188	1	-3418.960	51490.591	11.7	Pass
L2	170.584 - 126	Pole	TP36.525x25.059x0.25	2	-9958.680	185137.696	56.9	Pass
L3	126 - 82.75	Pole	TP46.357x34.89x0.313	3	-22901.699	473497.576	90.9	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.299x0.375	4	-36512.602	988723.383	93.6	Pass
L5	40.75 - 0	Pole	TP64.75x53.283x0.438	5	-56451.801	1986103.26	87.8	Pass

<i>RISA Tower</i> <i>Bay State Design</i> 241 Boston Post Road West Marlborough, MA 01752 Phone: (508) 229-4100 FAX: (508) 485-5321	Job	NHCT-0501D	Page	20 of 20
	Project	180' Monopole	Date	10:13:31 10/06/09
	Client	Pocket	Designed by	AAP

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
						Summary		
						Pole (L4)	93.6	Pass
						Base Plate	97.9	Pass
						RATING =	97.9	Pass

Program Version 5.3.1.0 - 10/3/2008 File:N:\ap\NHCT-0501D\LATEST of NHCT-0501D.eri

Project NHCT-05010
Orange CT
Detail _____

Job No. 2082.132
Computed by RAA
Checked by _____

Page 1 of _____
Date 10-06-09
Date _____

Foundation Design

Reactions at the top of the foundation as per the Risk Tower Analysis dated 010-06-09 has as follows:

$$P_{vert.} = 250.48 \text{ k}$$

$$P_{horiz.} = 42.0 \text{ k}$$

$$M = 5,221.13 \text{ k}$$

Unfactored
Reactions

8'-0" ϕ Foundation

Reactions at the Bottom of Foundation

$$P_{DL} = 0.15 \times 32.50 \times 50.24 \approx 245 \text{ k} \downarrow$$

$$P_{water} = 0.0624 \times 24' \times 50.24 \approx 75 \text{ k} \uparrow$$

$$\Sigma P_{DL} = 170 \text{ k} \downarrow$$

$$A_{foundation} = \frac{\pi \phi^2}{4} = 50.25 \text{ ft}^2$$

(DL of Exist.
Foundation)

$$\Sigma P_{DL} = 227.0 \text{ k} \downarrow$$

$$P_{horiz.} = 42.0 \text{ k}$$

$$M = 5,221.13 + 42 \times 32.50 \approx 6,586.13 \text{ k ft}$$

Project NHCT0501D

Detail Orange CT

Job No. 2882.132

Computed by ARP

Checked by _____

Page 2 of _____

Date 10-06-09

Date _____

From the original design of the foundation

Resisting Moment from Soil (Ultimate)

$$M = 18,979.69 \text{ K-ft}$$

Actual Design Moment, $M = 4650.12 \text{ K-ft}$

$$SF = \frac{18,979.69}{4650.12} = 4.08 \leftarrow (\text{Original Design})$$

Now, will calculate safety factor of the foundation based on the reactions of the current tower analysis.

$$SF = \frac{18,979.69}{6,586.13} = 2.88 > 2.0 \quad \text{OK}$$

$\uparrow$ from previous pg

Existing foundation reinforced with 28#11 Vertical Rebars, foundation on by inspection