T-Mobile

EM-T-MOBILE-034-090803

August 3, 2009

Via Federal Express

ORIGINAL

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

Re: Notice of Exempt Modification
T-Mobile USA, Inc. Telecommunications Facility
181 Clapboard Ridge Road, Danbury, Connecticut
T-Mobile Site CT11195D

Dear Mr. Phelps:

Omnipoint Communications, a subsidiary of T-Mobile USA, Inc. ("T-Mobile"), intends to replace existing antennas with new antennas, add additional antennas and supplement existing ground equipment at a 85-foot self-supporting flagpole facility owned by T-Mobile USA, Inc. and located at **181 Clapboard Ridge Road, Danbury**, Connecticut, ("Facility"). T-Mobile is licensed by the Federal Communications Commission ("FCC") to provide PCS wireless telecommunications service in the State of Connecticut, which includes the area to be served by the proposed installation. This installation constitutes an exempt modification pursuant to the Public Utility Environmental Standards Act, Connecticut General Statutes Section 16-50g *et. seq.* ("PUESA"), and Section 16-50j-72(b)(2) of the Regulations of the Connecticut State Agencies adopted pursuant to PUESA. In accordance with R.C.S.A. Section 16-50j-73, a copy of this notice has been sent to Mark D. Boughton, Mayor, Town of Danbury.

The existing Facility consists of a 85-foot self-supporting flagpole capable of supporting multiple carriers within a fenced compound. The coordinates for the Facility are **Lat: 41°-26'-01" and Long: 73°–29'-33".** The Facility is located in the central portion of Danbury. The Facility is approximately 600 feet east of Clapboard Ridge Road (Route 110), roughly 2.5 miles east of the New York state line and roughly 3.5 miles north of Interstate 84 (see Site Map, attached as Exhibit A). The flagpole currently supports AT&T antennas at the sixty foot (60') level centerline AGL (above ground level), and Cingular antennas at the seventy foot (70') level centerline AGL. The current T-Mobile antenna configuration is one antenna per sector contained with the flagpole inside a concealment cylinder, for a total of three antennas at the eighty foot level (80') AGL. T-Mobile proposes to replace the three existing antennas with three new APX16DWV-16DVS-A20. T-Mobile also intends to add a UMTS 3106 BTS equipment cabinet to its current configuration of one existing S8000 equipment cabinet. The two cabinets will be mounted on an existing concrete pad, located within the compound. T-Mobile's equipment will be contained within it's existing lease area. T-Mobile intends to run new coaxial cable on its existing ice bridges from its current equipment pad to the existing tower. Utilities will be run

T-Mobile USA, Inc.
Office: (860) 692-7100
Fax: (860) 692-7159
35 Griffin Rd S
Bloomfield, CT 06002

from existing utility sources at the Facility (See Design Drawings and Equipment Specifications, attached as Exhibits B and C respectively).

For the following reasons, the proposed modifications to the Clapboard Ridge 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 T-Mobile seeks to install 3 new antennas to replace three existing ones (total of three), at center line heights of approximately 80 feet.

2. The installation and replacement of T-Mobile's antennas and ground equipment 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 T-Mobile antennas would be 57.4823% 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, T-Mobile respectfully submits that the proposed antenna installation and equipment at the Danbury Facility constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Respectfully Submitted,

Tom Flynn
UMTS Project Manager
Agent for T-Mobile

cc: Mark D. Boughton, Mayor, Town of Danbury
Diocese of Newton, underlying property owners

Hartford/72800.20/JTP/382697v1

Exhibit A

Site Map

T-Mobile Site CT11195D

181 Clapboard Ridge Road

Danbury, Connecticut

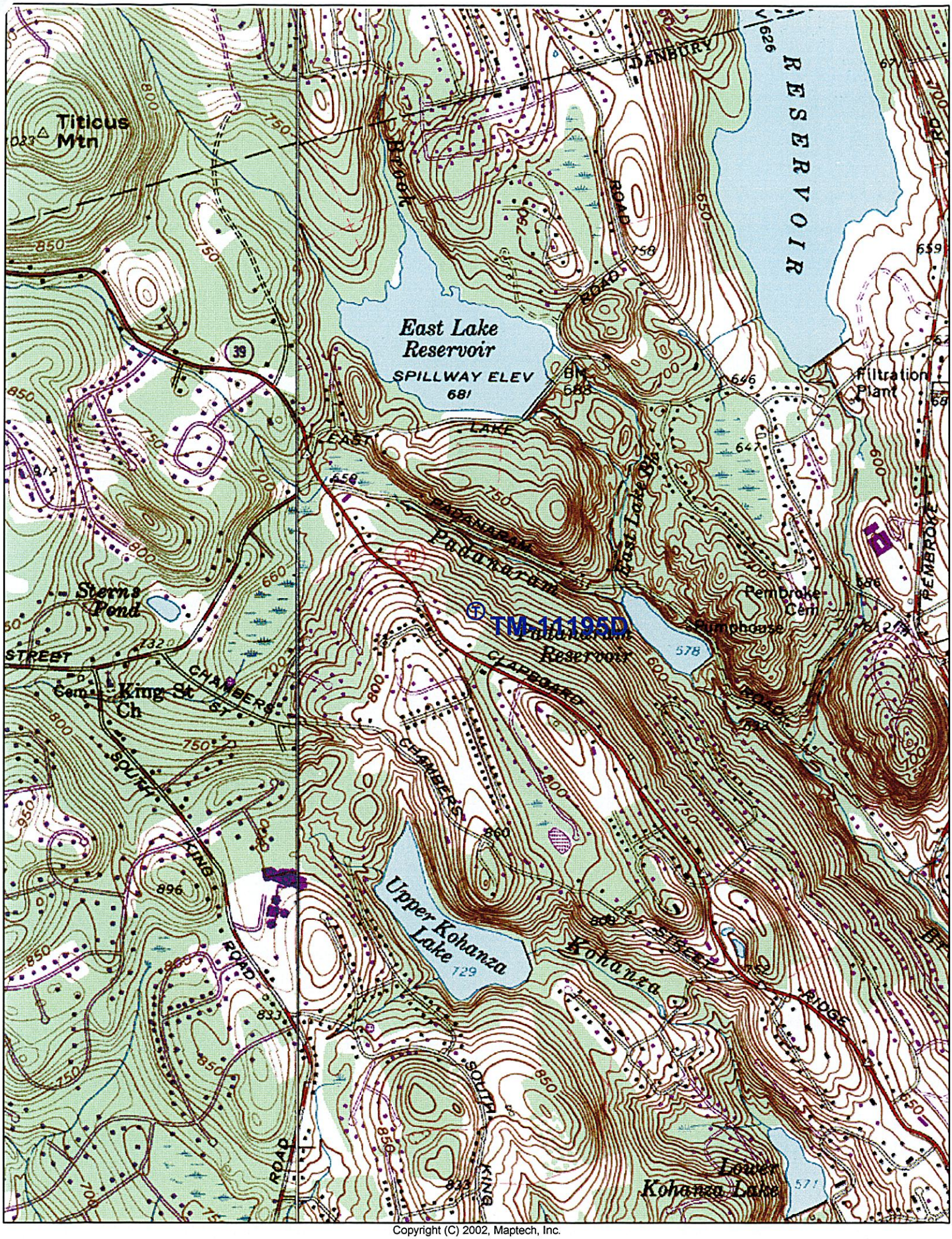


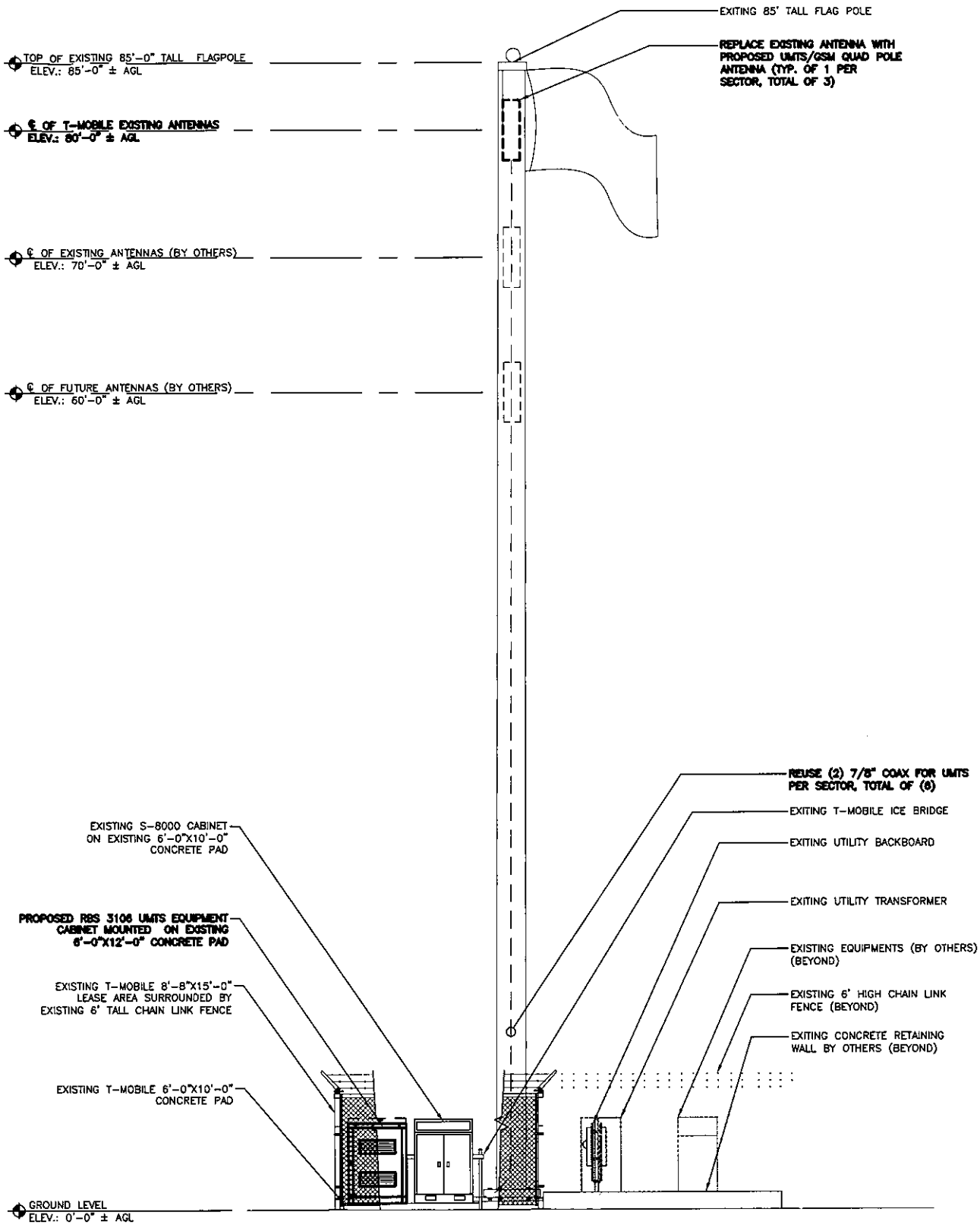
Exhibit B

Design Drawings

T-Mobile Site CT11195D

181 Clapboard Ridge Road

Danbury, Connecticut



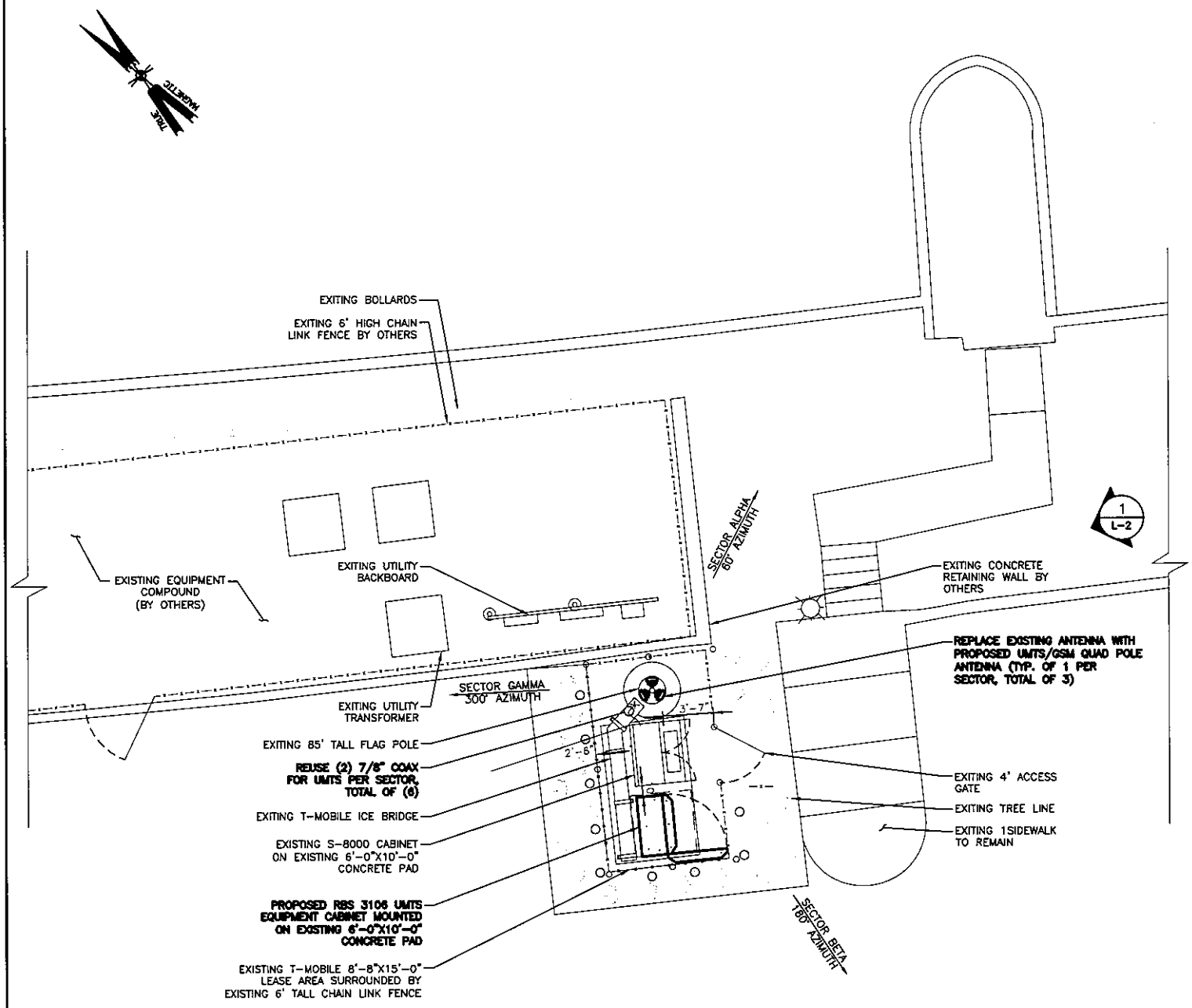
ELEVATION 1

SCALE: N.T.S.

T··Mobile·
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 936-6363
Fax: (508) 936-6395

PROJECT LOCATION: DANBURY NORTH/RT-37 **CT11195D** 181 CLAPBOARD RIDGE RD. DANBURY, CT 06811	PROJECT MANAGER: KB	DRAWN BY: MK	BSDA PROJ. #: 2898.415
			SHEET: L2
APPROVED BY:	05/29/09 05/12/09	ELEVATION	



COMPOUND LAYOUT PLAN 1

SCALE: NTS

T··Mobile·
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 936-6363
Fax: (508) 936-6365

PROJECT LOCATION: DANBURY NORTH/RT-37 **CT11195D** 181 CLAPBOARD RIDGE RD. DANBURY, CT 06811	PROJECT MANAGER: KB	DRAWN BY: MK	BSDA PROJ. #: 2898.415
APPROVED BY:	05/29/09 05/12/09	COMPOUND LAYOUT PLAN	SHEET: L1

Exhibit C

Equipment Specifications

T-Mobile Site CT11195D

181 Clapboard Ridge Road

Danbury, Connecticut

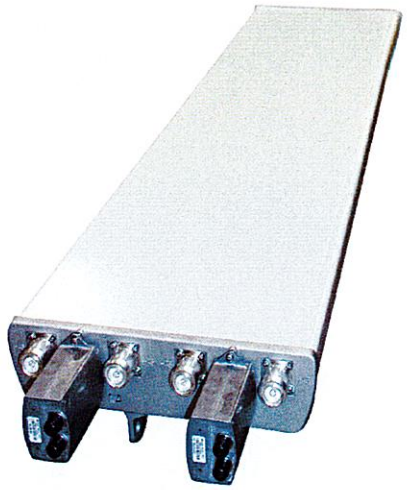
Technical Data Sheet **APX16DWV-16DWV-S-E-ACU**

Optimizer® Panel Dual Polarized Antenna equipped with (2) ACU motors

Product Description

Gathering two X-Polarized antennas in a single radome this pair of variable tilt antenna provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features a wide downtilt range with optional remote tilt.

This antenna is optimized for performance across the entire AWS frequency band (1710-2170 MHz). The antenna comes pre-connected with the antenna control unit (ACU).



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).**
- **Gain difference between UL and DL <1dB.**
- **Two X-Polarised panels in a single radome.**
- **Azimuth horizontal beamwidth difference <7deg between UL and DL (1710-1755 & 2110-2155).**
- **Low profile for low visual impact.**
- **Dual polarization; Broadband design.**

Technical Features

Frequency Band	3G/UMTS
Horizontal Pattern	Directional
Antenna Type	Panel Dual Polarized
Electrical Down Tilt Option	Variable
Gain, dBi (dBd)	18.0 (16.0) Avg. across band
Frequency Range, MHz	1710-2170

Optimizer® Panel Dual Polarized Antenna equipped with (2) ACU motors

Connector Type	(4) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt Kit w/Scissor Kit
Electrical Downtilt, deg	0-10 , 0-10
Horizontal Beamwidth, deg	65 ±5 (65.9 average across band)
Mounting Hardware	APM40-2 + APM40-E2
Rated Wind Speed, km/h (mph)	160 (100)
VSWR	< 1.4:1
Vertical Beamwidth, deg	5.8 to 7.8 across band
1st Upper Sidelobe Suppression, dB	> 18 (typically > 20)
Upper Sidelobe Suppression, dB	> 18 all (typically > 20)
Polarization	Dual pol +/-45°
Front-To-Back Ratio, dB	>28
Maximum Power Input, W	300
Isolation between Ports, dB	> 30
Lightning protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	> 150 (155 Typical)
Overall Length, m (ft)	1.35 (4.42)
Dimensions - HxWxD, mm (in)	1349 x 330 x 80 (53 x 13 x 3.15)
Radiating Element Material	Brass
Radome Material	Fiberglass
Reflector Material	Aluminum
Max Wind Loading Area, m² (ft²)	0.64 (6.6)
Survival Wind Speed, km/h (mph)	200 (125)
Maximum Thrust @ Rated Wind, N (lbf)	787 (177)
Front Thrust @ Rated Wind, N (lbf)	787 (177)
Shipping Weight, kg (lb)	24.1 (52.7)
Packing Dimensions, HxWxD, mm (in)	1550 x 420 x 210 (61 x 16.5 x 8.3)
Weight w/o Mtg Hardware, kg (lb)	18.0 (39.6)

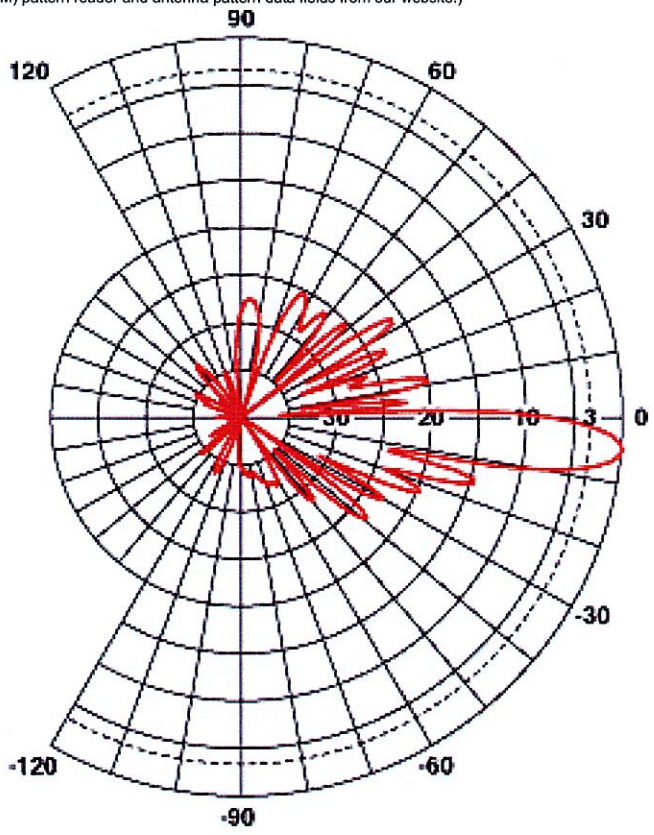
Note

This data is provisional and subject to change.

Optimizer® Panel Dual Polarized Antenna equipped with (2) ACU motors

Vertical Pattern

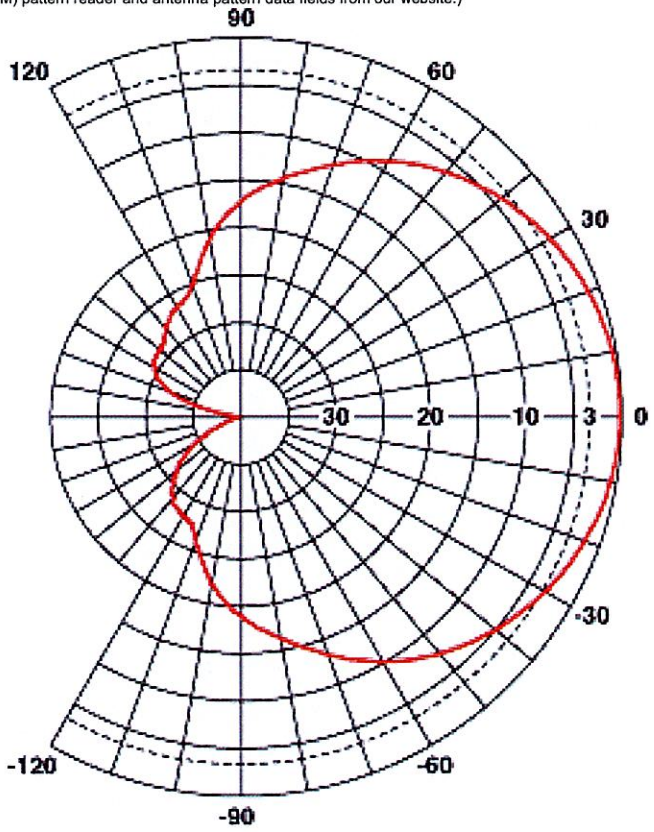
(This is a general representation of the antenna family pattern. For the latest detailed pattern contact Applications Engineering. You may also download the CELplot(TM) pattern reader and antenna pattern data fields from our website.)



Optimizer® Panel Dual Polarized Antenna equipped with (2) ACU motors

Horizontal Pattern

(This is a general representation of the antenna family pattern. For the latest detailed pattern contact Applications Engineering. You may also download the CELplot(TM) pattern reader and antenna pattern data fields from our website.)



2 Product Overview

The RBS 3106 is an outdoor macro RBS, based on the RBS 3000 R3 hardware, and a member of the RBS 3000 family.

The figure below shows the RBS.

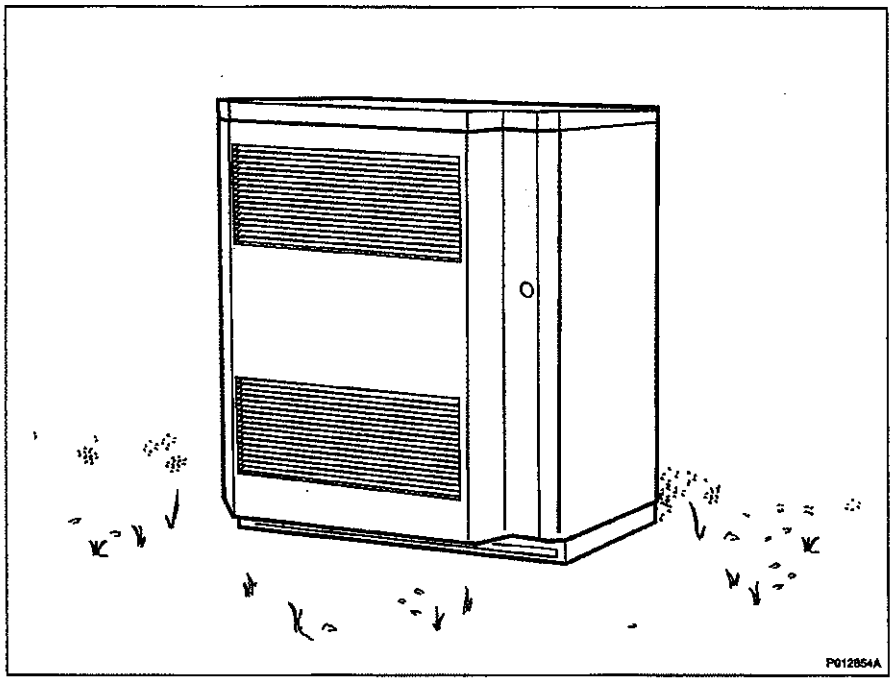


Figure 1 RBS 3106

2.1 Main Features

Not all features are supported by all RBS configurations. For current RBS configurations, see Section 6 on page 21.

The main features of RBS 3106 are the following:

- A complete RBS in a four-subrack cabinet with a standard footprint
- Can be equipped with various Radio Units (RU)
- Can be equipped with transport network interface boards, which support E1, T1, J1, E3, T3, STM-1/OC-3c , STM-1/OC-3, or Ethernet 10/100/1000 Mbps

- Ethernet (optical or electrical) can be used along with the other transmission types in Dual Stack configurations
- Can perform antenna sharing with Global System for Mobile Communications (GSM) and Time-Division Multiple Access (TDMA) systems
- Variable baseband capacity of up to 1536 Channel Elements (CE) uplink and downlink
- Supports High-Speed Downlink Packet Access (HSDPA)–enhanced uplink, up to 180 HS codes
- Power supply: 100 to 250 V AC or −40.0 to −57.6 V DC
- Two-way RX diversity, two-way TX diversity (optional), and four-way RX diversity (optional)
- Can be equipped and configured to support multiple frequency bands
- Can be configured for 1 – 6 sectors, with up to four carriers per sector
- Supports external alarm equipment
- Supports the Global Positioning System (GPS) as a synchronization source
- Supports Ethernet-based site Local Area Networks (LAN) (optional)
- Supports GSM or WCDMA Tower-Mounted Amplifiers (TMA) and Remote Electrical Tilt Units (RETU)

2.2 Optional Equipment

The following equipment is optional and can be ordered separately. It is not necessary for basic RBS functions.

The optional equipment presented in this section is located outside the RBS. Optional equipment located inside the RBS is described in Section 7.2 on page 30.

RBS Base Frame and Battery Base Unit (BBU)

The RBS 3106 is mounted on its installation frame and the frame can be installed to either the ground, an RBS base frame, or a battery base unit.

ASC, TMA, RETU, and RIU

The GSM or WCDMA TMA, the Antenna System Controller (ASC), the RETU, and the RET Interface Unit (RIU), are mast-mounted units placed close to the antenna.

The TMA and the ASC are uplink amplifiers and improve the RX sensitivity.

The RETU enables remote tilt of the antenna system. An ASC or a RIU is required to enable the RBS to communicate with the RETU.

There also exist 3GPP/AISG defined components as ATMA and ARET. These components are supported for P6.

External Battery Backup

Battery backup can be achieved with an external battery cabinet. The external batteries are connected to an optional DC filter (DCF) inside the RBS.

3 Dimensions

This section describes the physical characteristics of the RBS, that is, dimensions, weight, and color.

Table 1 RBS 3106 Dimensions

Unit	Dimensions (mm)
Height (including installation frame)	1626
Width	1300
Depth	710
Depth including door	926

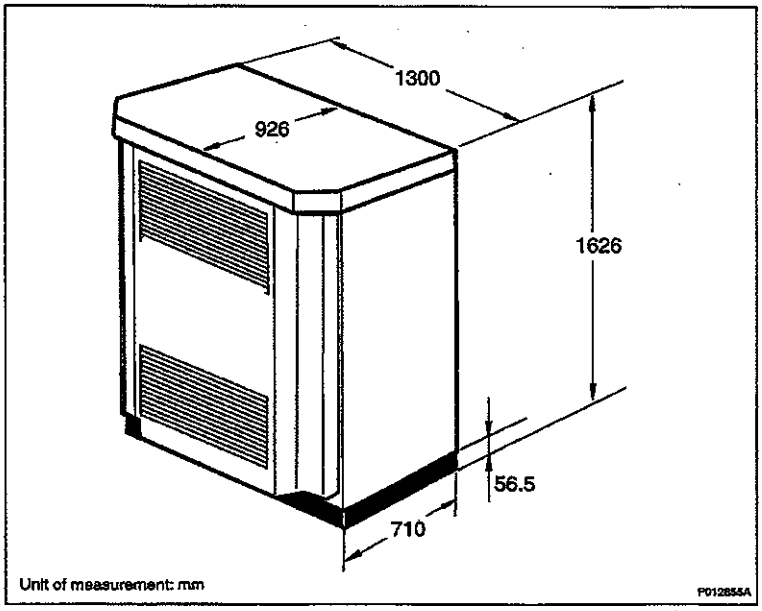


Figure 2 RBS 3106 Dimensions

The various weights of the RBS 3106 are shown in the table below.

Table 2 RBS 3106 Weights

Unit	Type	Weight (kg)
RBS fully equipped excluding batteries	AC-powered	560
RBS fully equipped including batteries	AC-powered	850

Unit	Type	Weight (kg)
RBS fully equipped including batteries and future expansion of hardware (not yet available)	AC-powered	875
RBS fully equipped	DC-powered	510
Installation frame	AC- and DC-powered	12

The color of RBS 3106 is shown in the table below.

Table 3 RBS 3106 Color

Color	Color Standard
Gray	RAL 7035
Green	NCS 8010–G 10 Y

Exhibit D

Power Density Calculations

T-Mobile Site CT11195D

181 Clapboard Ridge Road

Danbury, Connecticut

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	**CT11195D**
Site Address:	**181 Clapboard Ridge Road**
Town:	**Danbury**
Tower Height:	**80 ft.**
Tower Style:	**Flagpole**

GSM Data		**UMTS Data**	
Base Station TX output	20 W	**Base Station TX output**	40 W
Number of channels	8	**Number of channels**	2
Antenna Model	APX16DWV-16DWV	**Antenna Model**	APX16DWV-16DWV
Cable Size	7/8 in.	**Cable Size**	7/8 in.
Cable Length	100 ft.	**Cable Length**	100 ft.
Antenna Height	80.0 ft.	**Antenna Height**	80.0 ft.
Ground Reflection	1.6	**Ground Reflection**	1.6
Frequency	1945.0 MHz	**Frequency**	2.1 GHz
Jumper & Connector loss	4.50 dB	**Jumper & Connector loss**	1.50 dB
Antenna Gain	18.0 dBi	**Antenna Gain**	18.0 dBi
Cable Loss per foot	0.0186 dB	**Cable Loss per foot**	0.0116 dB
Total Cable Loss	1.8600 dB	**Total Cable Loss**	1.1600 dB
Total Attenuation	6.3600 dB	**Total Attenuation**	2.6600 dB
Total EIRP per Channel	54.65 dBm	**Total EIRP per Channel**	61.36 dBm
(In Watts)	291.76 W	**(In Watts)**	1367.92 W
Total EIRP per Sector	63.68 dBm	**Total EIRP per Sector**	64.37 dBm
(In Watts)	2334.10 W	**(In Watts)**	2735.84 W
nsg	11.6400	**nsg**	15.3400
Power Density (S) =	**0.093514 mW/cm^2**	**Power Density (S) =**	**0.109609 mW/cm^2**

T-Mobile Worst Case % MPE = 20.3123%

Equation Used :

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

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

Co-Location Total

Carrier	**% of Standard**
Verizon	
Cingular	
Sprint/Nextel	
AT&T Wireless	33.3900 %
Pocket	
MetroPCS	
Other Antenna Systems	3.7800 %
Total Excluding T-Mobile	**37.1700 %**
T-Mobile	20.3123
Total % MPE for Site	**57.4823%**

T-Mobile USA Inc.
35 Griffin Rd South, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Maxton
From: Farid Marbouh - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11195D
Date: July 24, 2009

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile antenna installation on a Flagpole at 181 Clapboard Ridge Road, Danbury, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

2. Discussion:

The following assumptions were used in the calculations:

1) The emissions from T-Mobile transmitters are in the (1940-1949.8), (2140-2145), (2110-2120)MHz frequency Band.
2) The antenna array consists of three sectors, with 1 antenna per sector.
3) The model number for GSM antenna is APX16DWV-16DWV.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 80 ft.
4) UMTS antenna center line height is 80 ft.
5) The maximum transmit power from any GSM sector is 2334.1 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2735.84 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
8) The average ground level of the studied area does not change significantly with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile antenna installation on a Flagpole at 181 Clapboard Ridge Road, Danbury, CT, is 0.20312 mW/cm^2. This value represents 20.312% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.
The combined Power Density from other carriers is 37.17%. The combined Power Density for the site is 57.482% of the M.P.E. standard.

Exhibit E

Structural Analysis

T-Mobile Site CT11195D

181 Clapboard Ridge Road

Danbury, Connecticut

BAY STATE
DESIGN

June 12, 2009

Mr. Hans Fiedler
UMTS Development Project Manager
T-Mobile, USA
35 Griffin Rd South
Bloomfield, CT 06002

Ref: T-Mobile Site CT11195D
Danbury North/RT-37
181 Clapborad Ridge Rd
Danbury, CT 06811

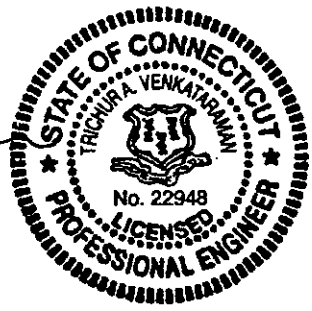
Dear Mr. Fiedler:

As requested, Bay State Design, Inc. performed the analysis for swapping three GSM DR65-18-02DPL2 antennas with three new APX16DWV-16DWVS-A20 antennas GSM/UMTS, and adding one RBS 3106 cabinet on existing concrete pad. The assessment indicates that the existing flagpole *does* meet the structural requirements.

This analysis is based on T-Mobile's RF data sheet Rev 2.0 dated 05/26/09. BSD shall be notified if there any changes.

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

Sincerely yours,



Trichur Venkataraman, P.E.
Bay State Design, Inc.

BAY STATE
DESIGN

Design Calculations

Site Name:	T-Mobile Danbury North/RT-37
Project Number:	CT11195D
Site Address:	181 Clapboard Ridge Road, Danbury, CT 06811
Description:	Equipment Pad, Antenna Mount
Calculated by:	Kenny Wang
Checked by:	Ram Satyaprasad, P.E.
Date:	6/12/2009

Bay State Design, Inc.
Tel. (508) 229-4100

241 Boston Post Road West
Fax (508) 485-5231

Marlborough, MA 01752
www.BayStateDesign.com

BAY STATE DESIGN
Bay State Design, Inc.
Architects • Engineers
241 Boston Post Rd W
Marlborough, MA 01752
Phone: (508) 299-4100
Fax: (508) 485-5321

Project	CT11195D	Job No.	2898.415	Page	1 of 2
	DANBURY, CT	Computed by	KW	Date	6/12/2009
Detail		Checked by		Date	

Reference: 1. Connecticut State Building Code
2. Structural Standard for Antenna Supporting Structures and Antenna (TIA-222-F)
3. Steel Construction Manual by AISC (13th Edition)

Equipment: 1. RBS 3106 (64.0"H X 51.2"W X 28.0"D): 1874 lbs
2. Proposed Antenna (APXV16DWV-16DWVS-A20): 40.7 lbs (55.9"H X 13.3"W X 3.15"D)
3. Proposed Twin TMA (KRY112144): 11 lbs (6.9"H X 6.1"W X 2.8"D)

Basic Wind Speed (fastest mile) V : 85 MPH

Z (height above ground level)= 3.0 ft

$K_z = (Z/33)^{2/7} = 0.50$

Velocity Pressure $q_z = 0.00256 K_z V^2$

$q_z = 9.3$ psf

Gust Response Factor G_R : 1.69

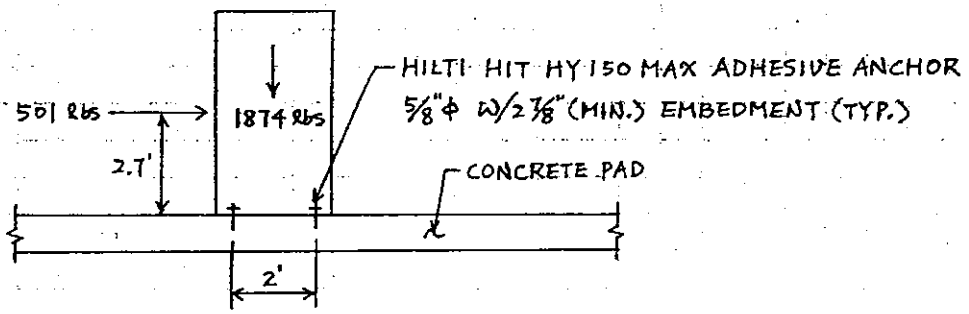
Wind Load = $q_z G_R [C_f A + C_A A]$

BAY STATE DESIGN
Bay State Design, Inc.
Architects • Engineers
241 Boston Post Rd W
Marlborough, MA 01752
Phone: (508) 299-4100
Fax: (508) 485-5321

Project	CT11195D	Job No.	2898.415	Page	2 of 2
	DANBURY, CT	Computed by	KW	Date	6/12/2009
Detail		Checked by		Date	

WIND LOAD @ RBS 3106

$F_A = q_z G_h C_A A = 9.3 \text{ psf} \times 1.69 \times 1.4 \times 64'' \times 51.2''/144 = 501 \text{ lbs}$



SHEAR = 501/4 = 125 lbs/BOLT

TENSION = $501 \times 2.7/2 \times 2$ = 338 lbs/BOLT

HILTI HIT HY150 MAX ADHESIVE ANCHOR
5/8"ϕ w/2 7/8" (MIN.) EMBEDMENT

ALLOWABLE SHEAR = 4095 lbs

ALLOWABLE TENSION = 1940 lbs

PROVIDE (4) - 5/8"ϕ ADHESIVE ANCHORS w/2 7/8"ϕ (MIN.) EMBEDMENT (HILTI HIT HY150 MAX OR EQUAL)

PROPOSED ANTENNAS WILL BE INSTALLED INSIDE THE EXISTING FLAG POLE. WIND LOAD ON THE EXISTING FLAG POLE WILL NOT INCREASE; EXISTING FLAG POLE IS OK.