T-Mobile

April 17, 2009

EM-T-MOBILE-002-090417

Via Federal Express

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

ORIGINAL

Re: SBA Infrastructure, LLC (formerly known as Optasite)
Telecommunications Facility
1 Deerfield Lane, Ansonia, Connecticut
T-Mobile Site CTNH209A

Dear Mr. Phelps:

Omnipoint Communications, a subsidiary of T-Mobile USA, Inc. ("T-Mobile"), intends to supplement existing antennas with additional new model antennas and supplement existing ground equipment at a 170-foot monopole facility owned by SBA Infrastructure, LLC (formerly known as Optasite) and located at 1 Deerfield Lane, Ansonia, 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 James T. DellaVolpe, Mayor, Town of Ansonia.

The existing Facility consists of a 170-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound. The coordinates for the Facility are **Lat: 41°-21'-2.7" and Long: 73°–2'-57.3".** The tower is located on a former Nike missile site, on the eastern edge of Ansonia, roughly 3,000 feet southwest of Rimmon Road (Route 319) in Woodbridge. The Facility stands roughly one mile to the northeast of the downtown area of Ansonia (see Site Map, attached as Exhibit A).. The tower currently supports Pocket antennas at the one hundred thirty seven foot (137') level centerline AGL (above ground level), AT&T antennas at the one hundred forty seven foot (147') level centerline AGL, and Verizon antennas at the one hundred fifty seven foot level (157') AGL. The current T-Mobile antenna configuration is one antenna per sector, for a total of three antennas. T-Mobile proposes to add three new antennas (one new per sector) to supplement the three existing antennas. The new configuration of antennas will be two antennas per sector for a total of six. T-Mobile proposes to install three new APXV16-DWV antennas on existing mounts (one per sector) to supplement the three existing antennas at the same elevation (167') level centerline AGL. T-Mobile also intends to add a UMTS 3106 BTS equipment cabinet to its current configuration of one existing S12000 equipment cabinet. The two cabinets will both 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 bridge from its current equipment

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

pad to the existing tower. Utilities will be run 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 Deerfield Lane 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 supplement three existing ones, at a center line height of approximately 167 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 18.632% 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 Ansonia Facility constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Respectfully Submitted,

Mark Richard
UMTS Project Manager
Agent for T-Mobile

cc: James T. Della Volpe, Mayor, City of Ansonia
Macabee Properties, LLC, Attn: Joel & Cheryl Gelernter, underlying property owners

35 Griffin Rd S
Bloomfield, CT 06002

Exhibit A

Site Map

T-Mobile Site CTNH209A

1 Deerfield Lane

Ansonia, Connecticut

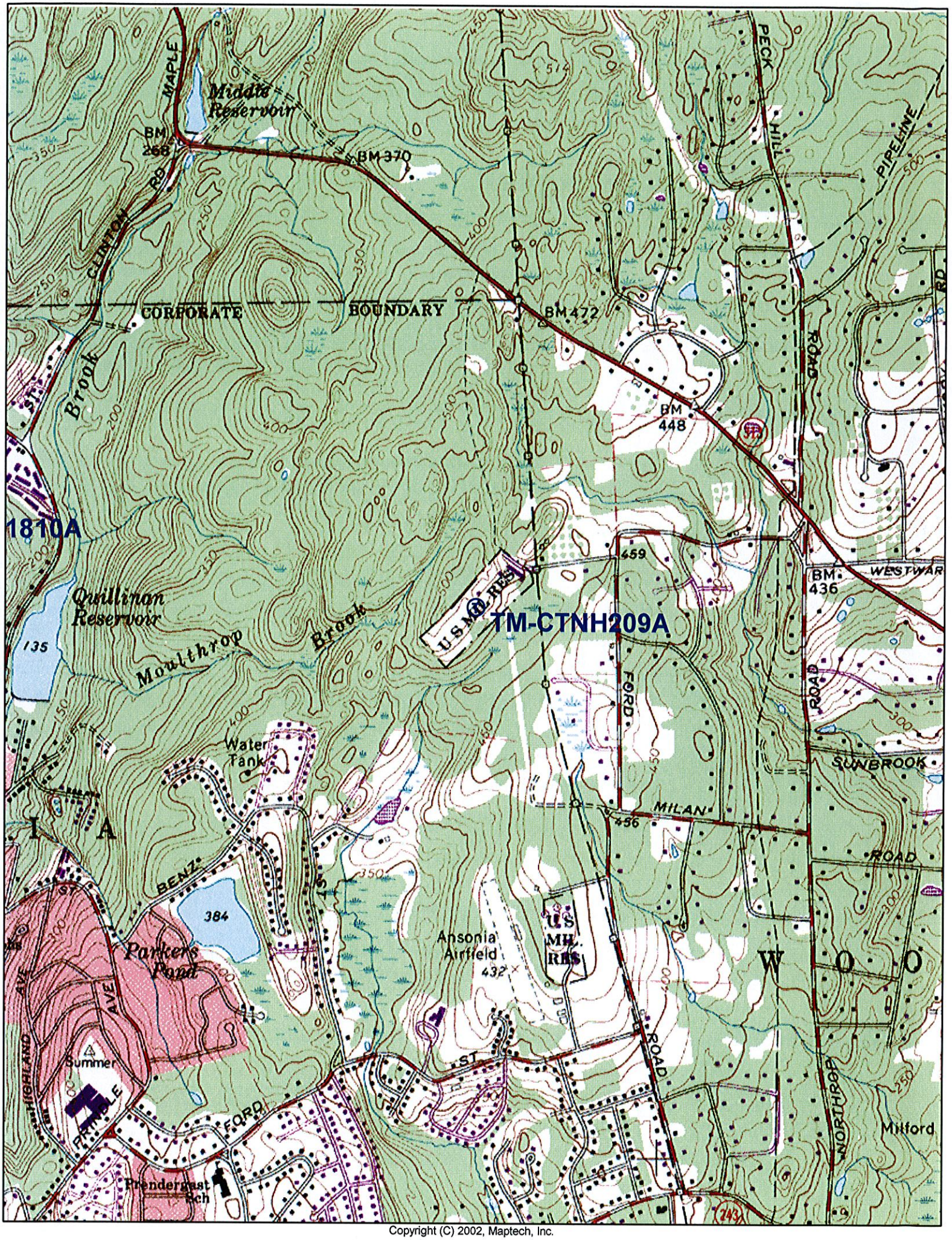


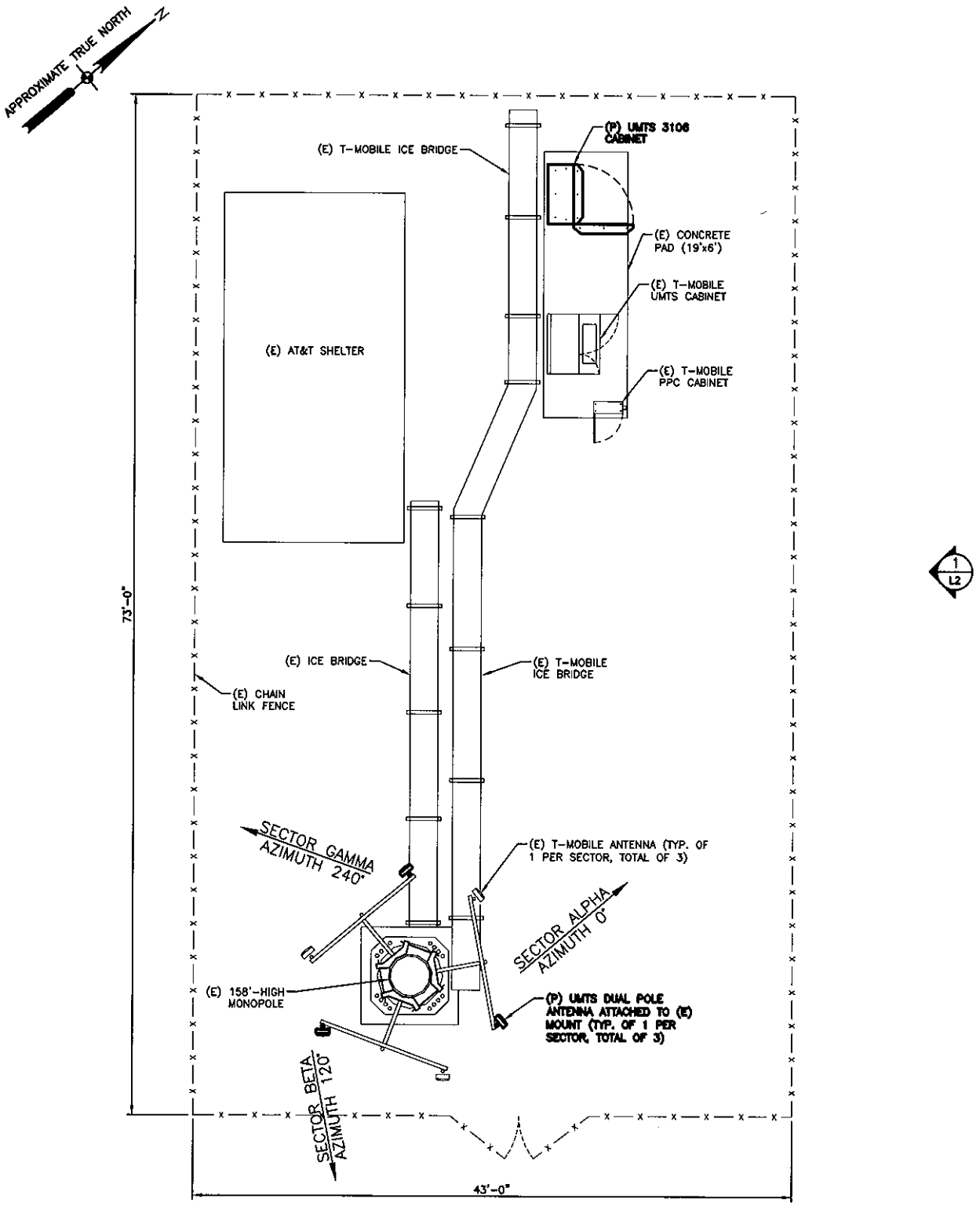
Exhibit B

Design Drawings

T-Mobile Site CTNH209A

1 Deerfield Lane

Ansonia, Connecticut



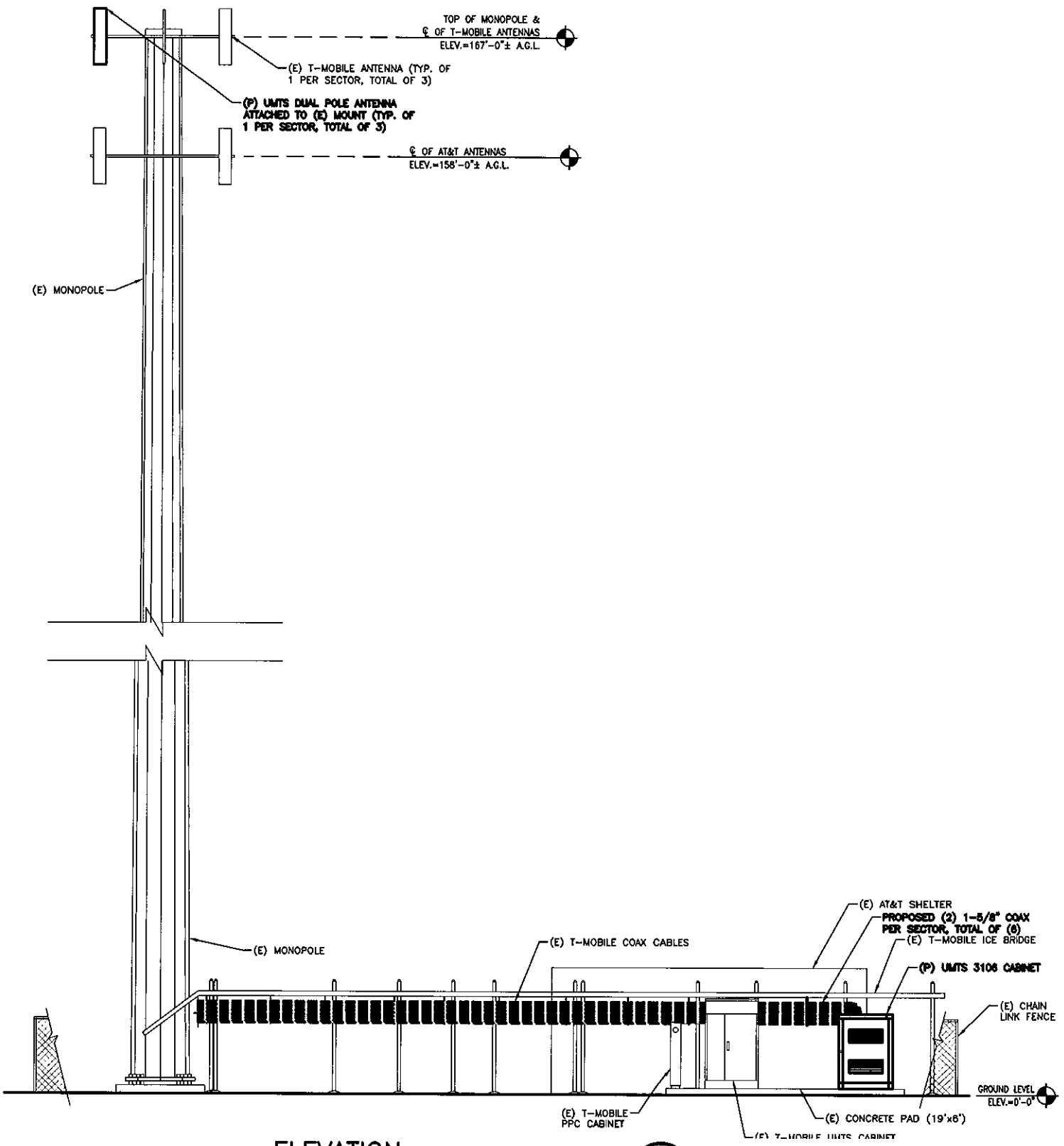
COMPOUND LAYOUT PLAN 1

SCALE: N.T.S.

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

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 936-8393
Fax: (508) 936-8395

PROJECT LOCATION: WOODBRIDGE CTNH209A 1 DEERFIELD LANE ANSONIA, CT 06401	PROJECT MANAGER: KB	DRAWN BY: SC	BSDA PROJ. #: 2898.295
APPROVED BY:	REV 1 01/15/09	COMPOUND LAYOUT PLAN	SHEET: L1



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) 936-6365

PROJECT LOCATION: WOODBRIDGE **CTNH209A** 1 DEERFIELD LANE ANSONIA, CT 06401	PROJECT MANAGER: KB	DRAWN BY: SC	BSDA PROJ. #: 2898.295
APPROVED BY:	REV 1 01/15/09	ELEVATION	SHEET: L2

Exhibit C

Equipment Specifications

T-Mobile Site CTNH209A

1 Deerfield Lane

Ansonia, Connecticut

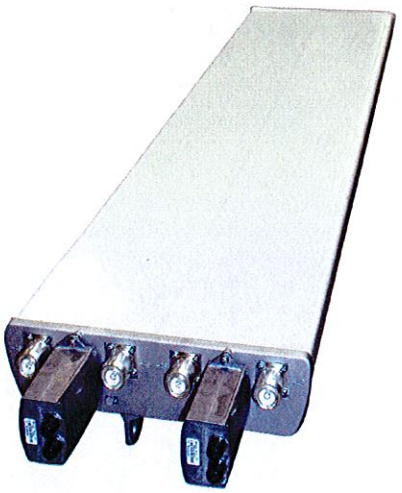
Technical Data Sheet APX16DWV-16DWV-S-E-ACU

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)

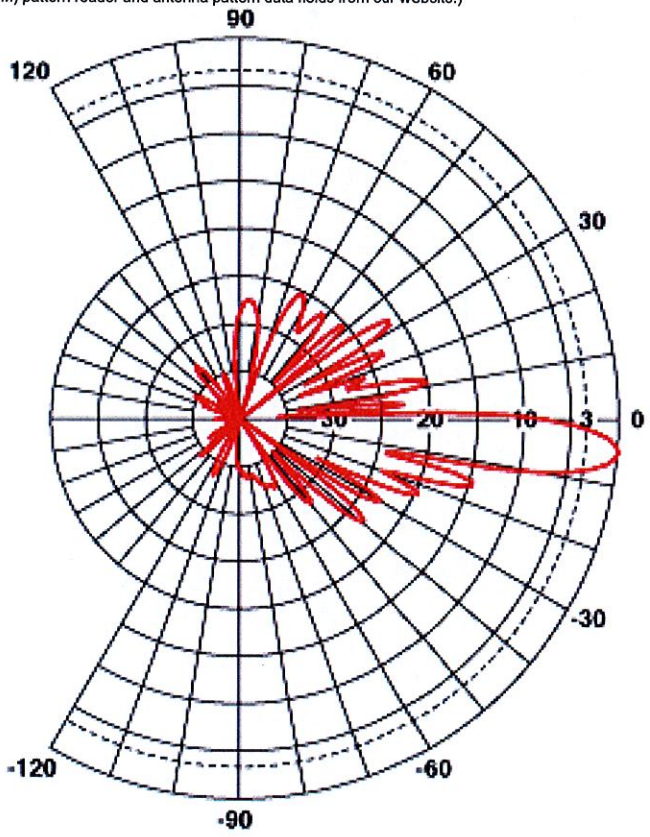
Note

This data is provisional and subject to change.

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

Vertical Pattern

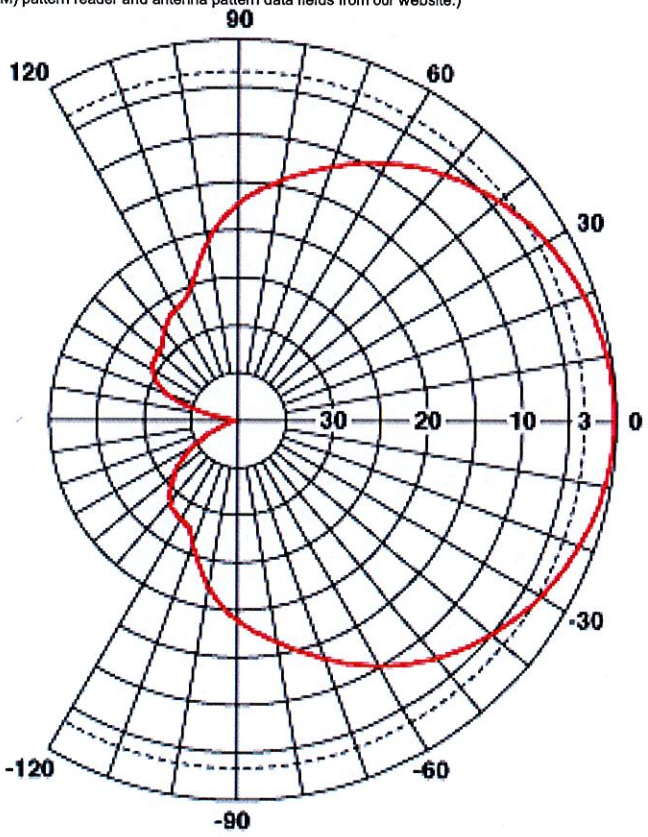
(This is a general representation of the antenna family pattern. For the latest detailed pattern contact Applications Engineering. You may also download the CELplot(TM) pattern reader and antenna pattern data fields from our website.)



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.

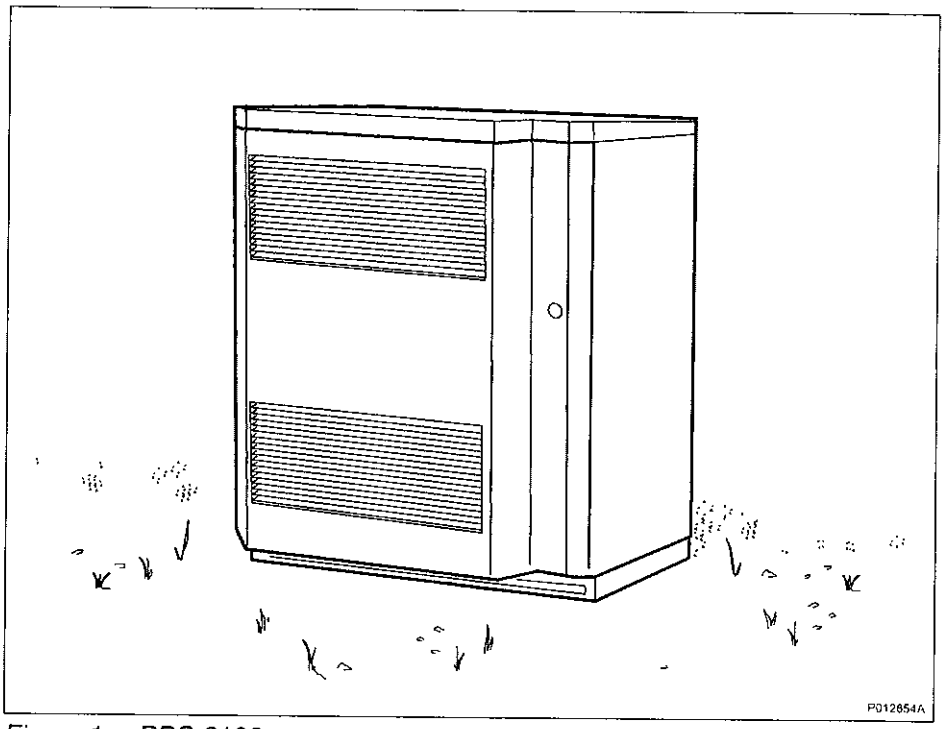


Figure 1 RBS 3106

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.

Product/Service Bulletin

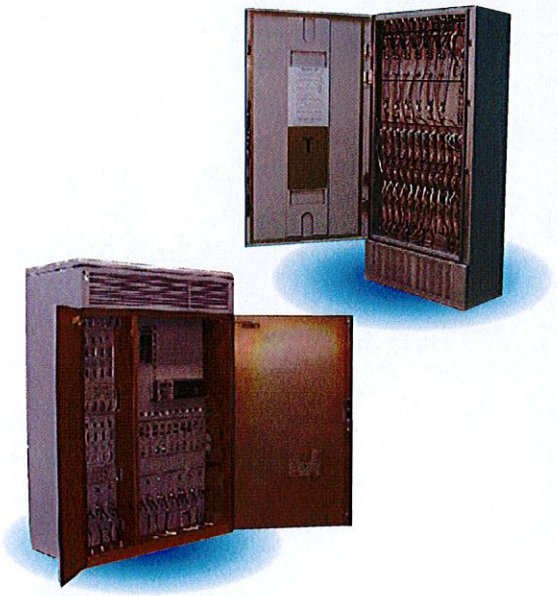
Nortel Networks
Univity GSM S12000 BTS

Indoor & Outdoor versions

As the GSM industry moves into the world of data, pressure has increased on capacity and so network enhancement and development costs are rising. The Univity GSM S12000 BTS – Indoor and Outdoor versions – is a product that meets the needs of a mature GSM market by increasing site capacity and at the same time lowering the risks and the costs of introduction.

The Univity GSM S12000 BTS – Indoor and Outdoor versions – is built on an existing field proven platform, the Univity GSM S8000 BTS, which is known for its quality and robustness. The reuse of a considerable amount of technology lowers the risk and cost for the operators when introducing this new product into their network.

The Univity GSM S12000 BTS – Indoor version is designed for protected sites while the Outdoor version is a fully integrated BTS site with AC power supply and extended temperature range.



In this document the term "the S12000 BTS" stands for "the Univity GSM S12000 BTS - Indoor and Outdoor version" except where mentioned.

The high capacity cell site

Nortel Networks addresses the growing needs of GSM capacity by introducing the S12000 BTS, which is an innovative development of the S8000 BTS. This innovative approach to network expansion and development is aimed at providing high capacity sites installed with low risk, reduced network impact and a lower cost of ownership.

The S12000 BTS is a key component to the delivery of more capacity within a GSM/GPRS network while driving down network costs. The S12000 BTS offers nearly double the capacity of the S8000 BTS, thereby offering a more compact site and improved operational efficiency.

Finally the S12000 BTS supports more users and offers higher speed data access and quality then increasing opportunities of revenues.

Lowering the cost of ownership and network introduction

It is not just the introduction of the evolution of a field proven and reliable technology that reduces the cost of ownership but also the reduced spares holding and training requirements. By the design of the S12000 BTS, Nortel Networks has aimed to reduce the cost of introducing the S12000 BTS into a GSM network. The S12000 BTS brings considerable savings in CAPEX and OPEX to the operator since main modules and skills are usable within both the S8000 BTS and S12000 BTS. The operator does not have to change the network Engineering and Operational procedures on the existing S8000 BTS. Moreover, via the high capacity and the high RF performance of the S12000 BTS, fewer sites are required. Low introduction costs are invaluable when facing the financial pressures of network enhancements such as GPRS or new services such as UMTS. The use of the S12000 BTS puts the operator in a position to make efficient use of all resources and reduce network complexity relieving pressure on investment.

NORTEL NETWORKS™

Modular and flexible

The S12000 BTS supports twelve TRX per cabinet and offers cost effective configurations from 1 to 16 TRX per cell in a tri-sector configuration. A dual band configuration of 6 + 6 TRX can be supported in a single cabinet for all coupling configurations.

The modular design of the S12000 BTS and the possibility to choose between multiple RF-combining options allows the operator to deploy the S12000 BTS solution in a number of different scenarios such as high-capacity solution in cities or alternatively enabling to provide wide coverage with a minimum number of sites in rural area.

High Performance

The Nortel Networks family of BTS holds a high market position for reliability, operability and service quality. The S12000 BTS provides high data services and voice quality, high coverage and building penetration and smooth call handovers. It possesses many advanced RF features to improve spectral usage and optimisation and so increase available capacity. The AMR and EDGE solutions will further enhance spectrum efficiency. These high performance qualities are extremely important with the introduction of GPRS services.

In addition, as for the S8000 BTS, the S12000 BTS supports UMTS co-sitting thanks to specific combiners, allowing a smooth UMTS introduction.

The high radio performance and advanced digital processing of the S12000 BTS provide one of the highest receive sensitivity in the market today, offering –115 dBm guaranteed and without the need for masthead amplifiers (-117dBm typical). The high radio performance enhances the resistance to interference, improving voice quality, data throughput, cell coverage and service availability.

Nortel Networks experience in frequency hopping, fractional re-use, cell tiering and multi-layer management algorithms provide high spectrum efficiency which releases more capacity for a fixed allocation of spectrum.

Growing the business and ensuring success

The Univity GSM S12000 BTS is future ready. The high capacity and flexibility of the S12000 BTS, the introduction of AMR and EDGE, put the operator in a best position to meet the challenges and opportunities of GSM/GPRS. These advantages enable the operator to capture new revenues, improve profitability and gain a better return on investment as the network develops and moves forward.

Technical Specifications:		Indoor	Outdoor
Frequency range		900 MHz GSM / 900 MHZ Extended GSM 1800 MHz GSM and Dual Band GSM 900 / 1800 850 MHZ GSM 1900 MHz GSM and Dual Band GSM 850 / 1900	
Receive sensitivity	w/o diversity	-110 dBm garanteed (w/o TMA)	
	with diversity	-115 dBm garanteed (w/o TMA)	
Dimensions	Height	1950 mm	1910 mm
	Width	910 mm	1350 mm
	Depth	450 mm	650 mm
Weight	Empty cabinet	170 kg	200 kg
	Fully equipped	415 kg	570 kg
Capacity	Standard	12 TRX per radio cabinet Up to 3 radio cabinets	
	Future option	Up to 4 radio cabinets	
Configuration	Monoband Trisectorial	Up to S16-16-16 (4 radio cabinets)	
	Dual Band Trisectorial	S222_222 (1 radio cabinet) Mono-BCCH dual band cells	
	Cell Splitting	Cell splitting across radio cabinets	
Amplifier output power	Standard	30W (+/- 0.5 dB) GMSK 30W (+/- 0.5 dB) 8-PSK EDGE	
	Optional	60W (+/- 0.5 dB) GMSK* 45W (+/- 0.5 dB) 8-PSK	
Transmission coupling		All coupling configurations From Duplexers to 4 Ways Hybrid Coupling (H4D)	
Power control	Static	6 steps of 2 dB	
	Dynamic	15 steps of 2 dB	
Space for customer Equipment		NA	6U
Frequency Hopping		RF Synthetised	
Supported vocoders		Full Rate (FR) Enhanced Full Rate (EFR) Adaptive Multi-Rate - Full Rate (AMR FR) Adaptive Multi-Rate - Half Rate (AMR HR)	
Encryption algorithms		A5/1 & A5/2	
Power supply	Nominal	DC -48 V	Single, single-split or tri-phase 230V (50/60Hz) AC Integrated battery backup Optional ancillary battery cabinet
Operational temperature range		-5°C to +45°C	-40°C to +50°C
Max acoustic noise		65 dB(A)	
Backhaul	Standard	6 E1 / T1 links	
	Future option	8 E1 / T1 links	

** Frequency dependant*

In North america, the Caribbean, and Latin America :
Tel : 1-800-4-Nortel
or 1-506-674-5470

In Europe, Middle East, and Africa :
Tel : 00-800-8008-9009*
or +44 (0)20 8920 4618

In Asia :
Tel : 65-287-2877

for more information contact your Nortel Networks account representative, or visit :
www.nortelnetworks.com/contact

* call are not from all European Countries.

www.nortelnetworks.com

NN101082-0702

NORTEL NETWORKS™

Exhibit D

Power Density Calculations

T-Mobile Site CTNH209A

1 Deerfield Lane

Ansonia, Connecticut

T-Mobile

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 CTNH209A
Date: April 7, 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 Monopole at 1 Deerfield Lane, Ansonia, 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 (1935-1944.8), (1980.2-1984.8), (2140-2145), (2110-2120)MHz frequency Band.
2) The antenna array consists of three sectors, with 2 antennas per sector.
3) The model number for GSM antenna is APXV18-209014-C.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 167.5 ft.
4) UMTS antenna center line height is 167.5 ft.
5) The maximum transmit power from any GSM sector is 1486.35 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2094.55 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 Monopole at 1 Deerfield Lane, Ansonia CT, is 0.03012 mW/cm^2. This value represents 3.012% 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 15.62%. The combined Power Density for the site is 18.632% of the M.P.E. standard.

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	**CTNH209A**
Site Address:	**1 Deerfield Lane**
Town:	**Ansonia**
Tower Height:	**169 ft.**
Tower Style:	**Monopole**

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	APXV18-209014-C	**Antenna Model**	APX16DWV-16DWV
Cable Size	1 5/8 in.	**Cable Size**	1 5/8 in.
Cable Length	200 ft.	**Cable Length**	200 ft.
Antenna Height	167.5 ft.	**Antenna Height**	167.5 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	16.5 dBi	**Antenna Gain**	18.0 dBi
Cable Loss per foot	0.0116 dB	**Cable Loss per foot**	0.0116 dB
Total Cable Loss	2.3200 dB	**Total Cable Loss**	2.3200 dB
Total Attenuation	6.8200 dB	**Total Attenuation**	3.8200 dB
Total EIRP per Channel	52.69 dBm	**Total EIRP per Channel**	60.20 dBm
(In Watts)	185.79 W	**(In Watts)**	1047.27 W
Total EIRP per Sector	61.72 dBm	**Total EIRP per Sector**	63.21 dBm
(In Watts)	1486.35 W	**(In Watts)**	2094.55 W
nsg	9.6800	**nsg**	14.1800
Power Density (S) =	**0.012502 mW/cm^2**	**Power Density (S) =**	**0.017618 mW/cm^2**
T-Mobile Worst Case % MPE =		**3.0121%**	

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	6.2300 %
Cingular	5.7600 %
Sprint	
AT&T Wireless	
Nextel	
MetroPCS	
Pocket	3.6300 %
Other Antenna Systems	
Total Excluding T-Mobile	**15.6200 %**
T-Mobile	3.0121
Total % MPE for Site	**18.6321%**

Exhibit E

Structural Analysis

T-Mobile Site CTNH209A

1 Deerfield Lane

Ansonia, Connecticut

Structural Analysis for
SBA Network Services, Inc.

169 ft Monopole

Site Name: Woodbridge
Site ID: CT13071-A

FDH Project Number 09-03182E S1

Prepared By:

Trent T. Snarr, EI
Project Engineer

Reviewed By:

Christopher M. Murphy, PE
Vice President
CT PE License No. 25842

FDH Engineering, Inc.
2730 Rowland Road
Raleigh, NC 27615
(919)-755-1012
info@fdh-inc.com

March 31, 2009

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

TABLE OF CONTENTS

2730 Rowland Road, Raleigh, NC 27615 Ph: (919) 755-1012 Fax: (919) 755-1031 info@fdh-inc.com

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Ansonia, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standards for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G.* Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from:

- Sabre Communications Corporation (Job No. 08-01016) original design drawings dated January 30, 2008
- FDH, Inc. (Project No. 08-07136T) TIA Inspection Report dated September 9, 2008
- JGI Eastern, Inc. (Project No. J2085109) dated January 29, 2008
- SBA Network Services, Inc.

The *basic design wind speed* per *ANSI/TIA-222-G* standards is 110 MPH without ice and 50 MPH with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the current and proposed antennas from T-Mobile in place at 167.5 ft, the tower meets the requirements of the *ANSI/TIA-222-G* standards. Furthermore, provided the foundation was constructed per the original design drawings (see Sabre Job No. 08-01016), the foundation should be adequate to support both the proposed and existing loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

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

Recommendations

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

1. The proposed coax should be installed inside the pole's shaft.
2. The proposed TMAs should be installed behind the proposed and existing antennas.

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APPURTENANCE LISTING

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

Table 1 – Appurtenance Loading

Existing Loading:

No.	Centerline Elevation (ft)	Coax and Lines[1]	Carrier	Mounts	Description
1-3	167.5[2]	(6) 1-5/8"	T-Mobile	(3) 4' T-Arms	(3) RFS APXV18-209014 (3) Remec S20057A1 TMAs
4-18	157[3]	(18) 1-5/8" (1) ½"	Verizon	(1) 13' Low Profile Platform (assumed)	(4) Decibel DB846F65ZAXY (2) Decibel DB846H80E-SX (6) Antel LPA-185063/12CF (3) Antel BXA-70063/6CF (1) GPS
19-24	148	(12) 1-5/8"	AT&T	(3) T-Arms	(6) Powerwave 7770 (6) Powerwave LGP21401 TMAs (6) Powerwave LGP13519 Diplexers
25-27	137	(6) 1-5/8"	Pocket	Flush	(3) RFS APXV18-206517S-C

1 Coax installed inside the pole's shaft unless otherwise noted.
2 The loading for T-Mobile at 167.5' will be altered. See the proposed loading below.
3 Currently Verizon has no loading installed at 157'. According to information provided by SBA, Verizon may install up to (15) antennas, (1) GPS, and (19) coax at 157'. Analysis performed with the total leased loading in place.

Proposed Loading:

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Mounts	Description
1-9	167.5[1]	(18) 1-5/8"	T-Mobile	(3) 4' T-Arms	(3) RFS APXV18-209014 (6) RFS APX16DWV-16DWV-A20 (3) Andrew ATMAA1214 TMAs (6) Ericsson KRY1271/201 TMAs

1 This represents the total loading for T-Mobile at 167.5'. According to information provided by SBA, T-Mobile will remove (3) Remec S20057A1 TMAs and install (6) RFS APX16DWV-16DWV-A20 antennas, (3) Andrew ATMAA1412 TMAs, (6) Ericsson KRY1271/201 TMAs, and (12) 1-5/8" coax for a total loading of (9) antennas, (9) TMAs, and (18) coax at 167.5'.

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RESULTS

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

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi

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

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

See the **Appendix** for detailed modeling information.

Table 3 – Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	169 - 139	Pole	TP30x24x0.1875	40.3	Pass
L2	139 - 89.25	Pole	TP39.58x28.875x0.25	87.8	Pass
L3	89.25 - 40.75	Pole	TP48.78x38.0795x0.375	81.0	Pass
L4	40.75 - 0	Pole	TP56.18x46.7799x0.4375	80.3	Pass
			Anchor Bolts	OK	Pass
			Base Plate	OK	Pass

Table 4 – Maximum Base Reactions

Base Reactions	Current Analysis *(ANSI/TIA-222-G)*	Original Design *(ANSI/TIA-222-G)*
Axial	49 k	60 k
Shear	35 k	44 k
Moment	4,010 k-ft	4,977 k-ft

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GENERAL COMMENTS

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

LIMITATIONS

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

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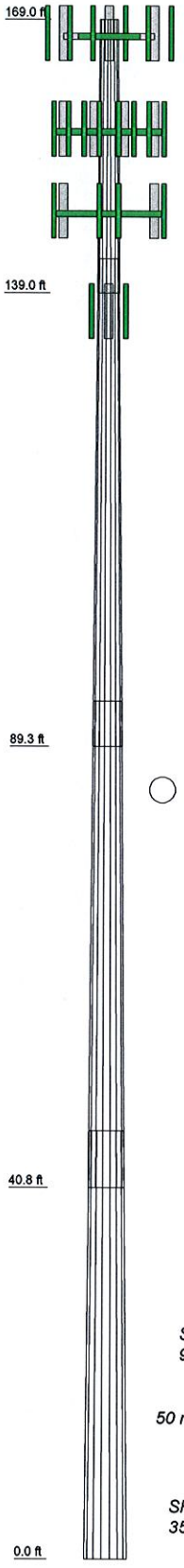
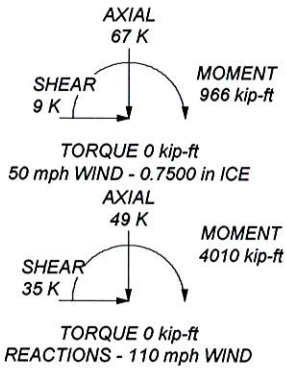
Section	1	2	3	4
Length (ft)	30.00	53.50	53.50	47.00
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.2500	0.3750	0.4375
Lap Splice (ft)	3.75	5.00	6.25	
Top Dia (in)	24.0000	28.8750	38.0795	46.7799
Bot Dia (in)	30.0000	39.5800	48.7800	56.1800
Grade	A572-65			
Weight (K)	1.6	4.9	9.3	11.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXV18-209014-C w/ mount pipe (T-Mobile)	167.5	(2) LPA-185063/12CF w/ mount pipe (Verizon)	157
APXV18-209014-C w/ mount pipe (T-Mobile)	167.5	(2) LPA-185063/12CF w/ mount pipe (Verizon)	157
APXV18-209014-C w/ mount pipe (T-Mobile)	167.5	BXA-70063/6CF w/ mount pipe (Verizon)	157
ATMAA1412 TMA (T-Mobile)	167.5	BXA-70063/6CF w/ mount pipe (Verizon)	157
ATMAA1412 TMA (T-Mobile)	167.5		
ATMAA1412 TMA (T-Mobile)	167.5	BXA-70063/6CF w/ mount pipe (Verizon)	157
4' T-Arm	167.5		
4' T-Arm	167.5	13' Low Profile Platform	157
4' T-Arm	167.5	GPS (Verizon)	157
(2) APX16DWV-16DWVS-A20 w/ mount pipe (T-Mobile)	167.5	(2) 7770.00 w/ mount pipe (ATT)	148
		(2) 7770.00 w/ mount pipe (ATT)	148
(2) APX16DWV-16DWVS-A20 w/ mount pipe (T-Mobile)	167.5	(2) 7770.00 w/ mount pipe (ATT)	148
		(2) LGP 21401 TMA (ATT)	148
(2) APX16DWV-16DWVS-A20 w/ mount pipe (T-Mobile)	167.5	(2) LGP 21401 TMA (ATT)	148
		(2) LGP 21401 TMA (ATT)	148
(2) KRY1271/201 TMA (T-Mobile)	167.5	(2) LGP 13519 Diplexer (ATT)	148
(2) KRY1271/201 TMA (T-Mobile)	167.5	(2) LGP 13519 Diplexer (ATT)	148
(2) KRY1271/201 TMA (T-Mobile)	167.5	(2) LGP 13519 Diplexer (ATT)	148
(2) DB846F65ZAXY w/Mount Pipe (Verizon)	157	(3) T-Arms	148
(2) DB846F65ZAXY w/Mount Pipe (Verizon)	157	APXV18-206517 w/ mount pipe (Pocket)	137
(2) DB846H80E-SX w/Mount Pipe (Verizon)	157	APXV18-206517 w/ mount pipe (Pocket)	137
(2) LPA-185063/12CF w/ mount pipe (Verizon)	157	APXV18-206517 w/ mount pipe (Pocket)	137

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. TOWER RATING: 87.8%

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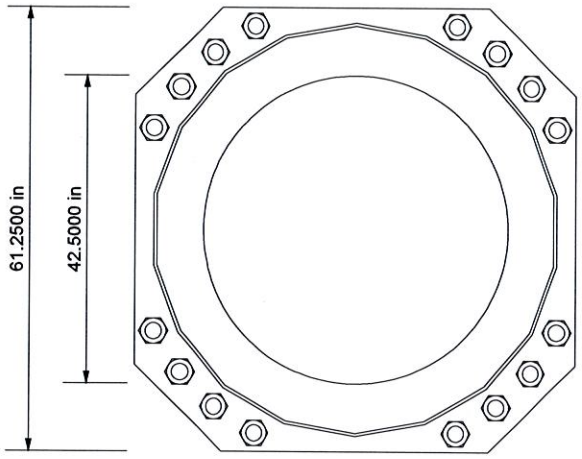
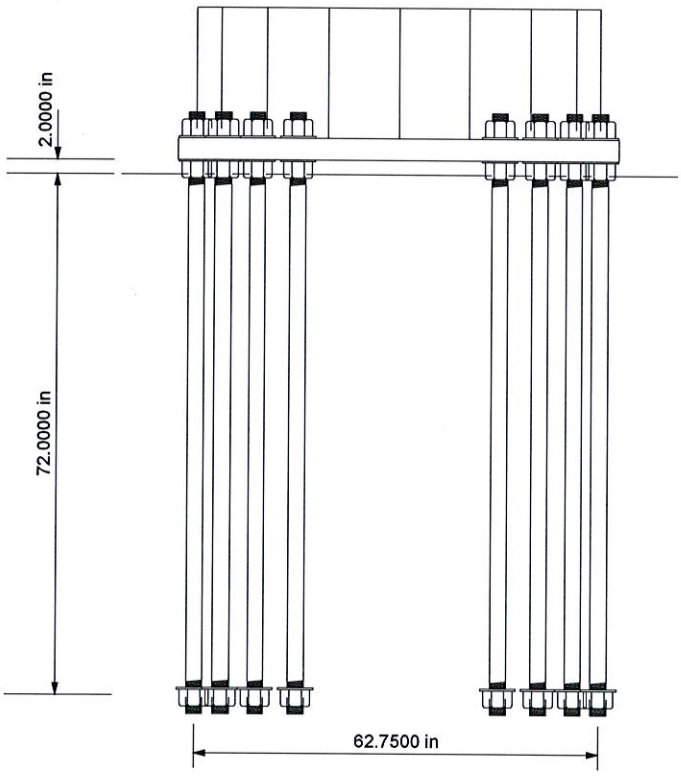
Tower Analysis

Job: Woodbridge, CT13071-A		
Project: 09-03182E S1		
Client: SBA	Drawn by: TTS	App'd:
Code: TIA-222-G	Date: 03/31/09	Scale: NTS
Path:		Dwg No. E-1





FOUNDATION NOTES

1. Plate thickness is 3.0000 in.
2. Plate grade is A633-60.
3. Anchor bolt grade is A615-75.
4. f'c is 4 ksi.

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Tower Analysis

Job: *Woodbridge, CT13071-A*		
Project: *09-03182E S1*		
Client: SBA	Drawn by: TTS	App'd:
Code: TIA-222-G	Date: 03/31/09	Scale: NTS
Path:		Dwg No. F-1