



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

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

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

*Daniel F. Caruso*  
Chairman

June 2, 2009

Thomas J. Regan, Esq.  
Brown Rudnick LLP  
185 Asylum Street, CityPlace I  
Hartford, CT 06103

RE: **EM-T-MOBILE-077-090507** - T-Mobile USA, Inc. (T-Mobile) notice of intent to modify an existing telecommunications facility located at 93 Lake Street, Manchester, Connecticut.

Dear Attorney Regan:

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

- The proposed coax shall be installed inside the pole's shaft;
- The proposed tower mounted amplifiers shall be installed behind the panel antennas; and
- The Council shall be notified in writing that the coax and tower mounted amplifiers were installed as specified.

The proposed modifications are to be implemented as specified here and in your notice dated May 7, 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.

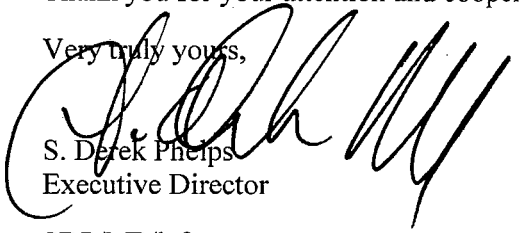
This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies 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.



CONNECTICUT SITING COUNCIL  
Affirmative Action / Equal Opportunity Employer

Thank you for your attention and cooperation.

Very truly yours,

A handwritten signature in black ink, appearing to read 'S. Derek Phelps', written over the typed name and title.

S. Derek Phelps  
Executive Director

SDP/MP/laf

- c: The Honorable Louis A. Spadaccini, Mayor, Town of Manchester
- Scott A. Shanley, General Manager, Town of Manchester
- James Davis, Zoning Enforcement Officer, Town of Manchester
- SBA Network Services, LLC

CONNECTICUT S

ORIGINAL

In re:

T-Mobile USA, Inc. Notice to Make an Exempt Modification to an Existing Facility, 93 Lake Street, Manchester, Connecticut. : EXEMPT MODIFICATION NO. : May 7, 2009

RECEIVED MAY - 7 2009

NOTICE OF EXEMPT MODIFICATION CONNECTICUT SITING COUNCIL

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile USA, Inc.

("T-Mobile") hereby gives notice to the Connecticut Siting Council ("Council") and the Town of Manchester of T-Mobile's intent to make an exempt modification to an existing monopole tower (the "Tower") located at 93 Lake Street in Manchester, Connecticut. Specifically, T-Mobile plans to upgrade its wireless system in Connecticut by implementing its Universal Mobile Telecommunications System ("UMTS"). UMTS is a third-generation ("3G") technology that utilizes a code division multiple access ("CDMA") base to allow for fast and large data transfers. To accomplish this upgrade, T-Mobile must modify its antenna and equipment configurations at many of its existing sites.

Once the UMTS upgrade is complete, T-Mobile will operate on a more unified communication system, allowing international wireless telephones to function world-wide. Furthermore, UMTS will enhance GPS navigation capabilities and provide emergency responders with more advanced tracking capabilities. The proposed UMTS technology is compatible with the existing second-generation ("2G") Global System for Mobile Communication ("GSM") currently on the Tower and the proposed upgrade is expected to enhance the existing 2G system. In order to accomplish the upgrade at this site, T-Mobile plans to add UMTS technology, update GSM technology and install associated equipment at the base of the tower.

Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), T-Mobile's plans do not constitute a modification subject to the Council's review because T-Mobile will not

change the height of the Tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

The Tower is a 107-foot monopole tower located 93 Lake Street in Manchester, Connecticut (41.7892, -72.4822). The Tower is owned by SBA Telecommunications, Inc. and T-Mobile is the only carrier located on the Tower. Currently, T-Mobile has 3 antennas and 3 Tower Mounted Amplifiers (“TMA”)<sup>1</sup> located on the Tower with a centerline of 107 feet. A site plan with Tower specifications is attached.

T-Mobile plans to add 3 UMTS antennas to the Tower. T-Mobile also proposes to remove and replace its 3 existing TMA with 3 new GSM Twin TMA and add 3 UMTS Twin TMA to the Tower. In total, T-Mobile plans to locate 6 TMA on the Tower. The proposed antennas and TMA will have the same centerline as the existing antennas and TMA - 107 feet. To confirm the Tower can support these changes, T-Mobile commissioned FDH Engineering, Inc. to perform a structural analysis of the Tower (attached). According to the structural analysis report, dated April 22, 2009; “... the foundation should have the necessary capacity to support the existing and proposed loads” (Page 3, Structural Analysis Report).

In addition, T-Mobile plans to locate 6, 7/8 inch coax cables under the existing ice bridge. T-Mobile proposes to install the UMTS equipment cabinet on T-Mobile’s existing 26-foot by 22-foot (approximately) concrete pad. Hence, no increase in the size of the concrete pad is necessary. T-Mobile also proposes to run power wiring and telephone wiring inside the existing underground conduit to the existing power protection cabinet. T-Mobile plans to utilize the existing telephone box and the existing meter and disconnect switch.

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<sup>1</sup> The site plan incorrectly indicates that 6 TMA exist on the Tower. Currently, 3 TMA are located on the Tower.

Therefore, excluding brief, minor, construction-related noise during the addition of the antennas and the installation of the equipment cabinet, T-Mobile's changes to the Tower will not increase noise levels at the site.

T-Mobile's proposal will not adversely impact the health and safety of the surrounding community or the people working on the Tower. The total radio frequency exposure measured around the Tower will be well below the National Council on Radiation Protection and Measurements' ("NCRP") standard adopted by the Federal Communications Commission ("FCC"). The cumulative, worst-case power density analysis measured at the base of the Tower indicates that T-Mobile's antennas will emit only 8.072% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be well below the FCC mandated radio frequency exposure limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

In conclusion, T-Mobile's proposed plan to add antennas and TMA at this site does not constitute a modification subject to the Council's jurisdiction because T-Mobile will not increase the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

T-Mobile USA, Inc.

By:  \_\_\_\_\_

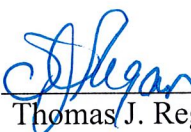
Thomas J. Regan  
Brown Rudnick LLP  
185 Asylum Street, CityPlace I  
Hartford, CT 06103-3402  
Email - tregan@brownrudnick.com  
Phone - 860.509.6522  
Fax - 860.509.6622

**Certificate of Service**

This is to certify that on this 1<sup>st</sup> day of May, 2009, the foregoing Notice of Exempt

Modification was sent, via first class mail, to the following:

Town of Manchester  
Manchester Board of Directors  
Mayor Louis A. Spadaccini  
41 Center Street  
P.O. Box 191  
Manchester, CT 06045

By:  \_\_\_\_\_  
Thomas J. Regan

# 40259358 v1 - 025064/0016



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

**OVERALL SITE PLAN**

N.T.S.

**TRANSCEND WIRELESS, LLC.**

10 INDUSTRIAL AVENUE  
MAHWAH, NJ 07430  
OFFICE: 201-316-2885  
FAX: 201-684-9666

FOR  
**OMNIPOINT COMMUNICATIONS, INC.**

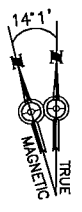
DBA T-MOBILE USA, INC  
35 GRIFIN ROAD SOUTH  
BLOOMFIELD, CT 06002  
OFFICE: (860) 692-7100  
FAX: (860) 692-7159



15 Cypress St., Suite 300  
Newton Centre, MA 02459  
Office: 617-965-0789  
Fax: 617-663-6032

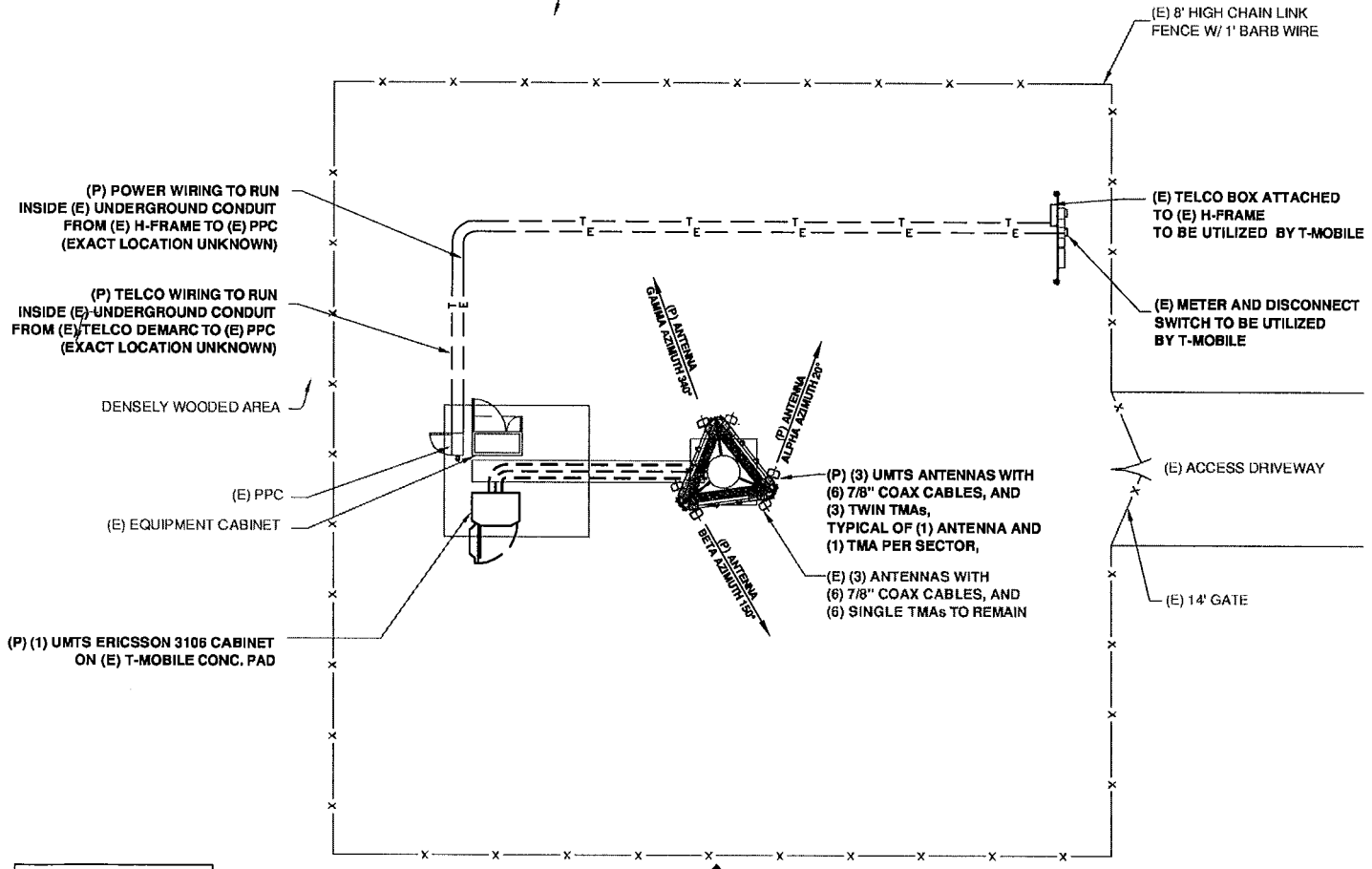
SITE NAME: SBA # CT13529		
SITE NUMBER: CTHA075D		
ADDRESS: 93 LAKE STREET MANCHESTER, CT 06042		
0:	FINAL LE	03-12-09
A:	REVIEW	01-28-09
NUMBER	REVISION	DATE
DRAWN BY: S.B.		DRAWING NO: LB-1

APPROVALS	
Site Owner	Date
Construction Manager	Date
RF Engineer	Date
Site Acquisition	Date
The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.	

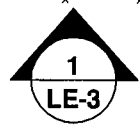


FINAL CONFIGURATION	
CABINETS: 2	(E) (1) CABINET TO REMAIN (P) (1) CABINET TO BE ADDED
ANTENNAS: 6	(E) (3) TO REMAIN (P) (3) TO BE ADDED
TMA: 9	(E) (6) SINGLE TMAs TO REMAIN (P) (3) TWIN TMAs TO BE ADDED
COAX: 12	(E) (6) TO REMAIN (P) (6) TO BE ADDED

DENSELY WOODED AREA



ANTENNA AZIMUTHS:
SECTOR A= 20°
SECTOR B= 150°
SECTOR C= 340°



**SITE PLAN**

SCALE: 1/16" = 1'-0"



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

**TRANSCEND WIRELESS, LLC.**  
 10 INDUSTRIAL AVENUE  
 MAIFWAH, NJ 07439  
 OFFICE: 201-316-2885  
 FAX: 201-684-0866

FOR  
**OMNIPOINT COMMUNICATIONS, INC.**  
 DBA T-MOBILE USA, INC  
 35 GRIFIN ROAD SOUTH  
 BLOOMFIELD, CT 06002  
 OFFICE: (860) 692-7100  
 FAX: (860) 692-7159

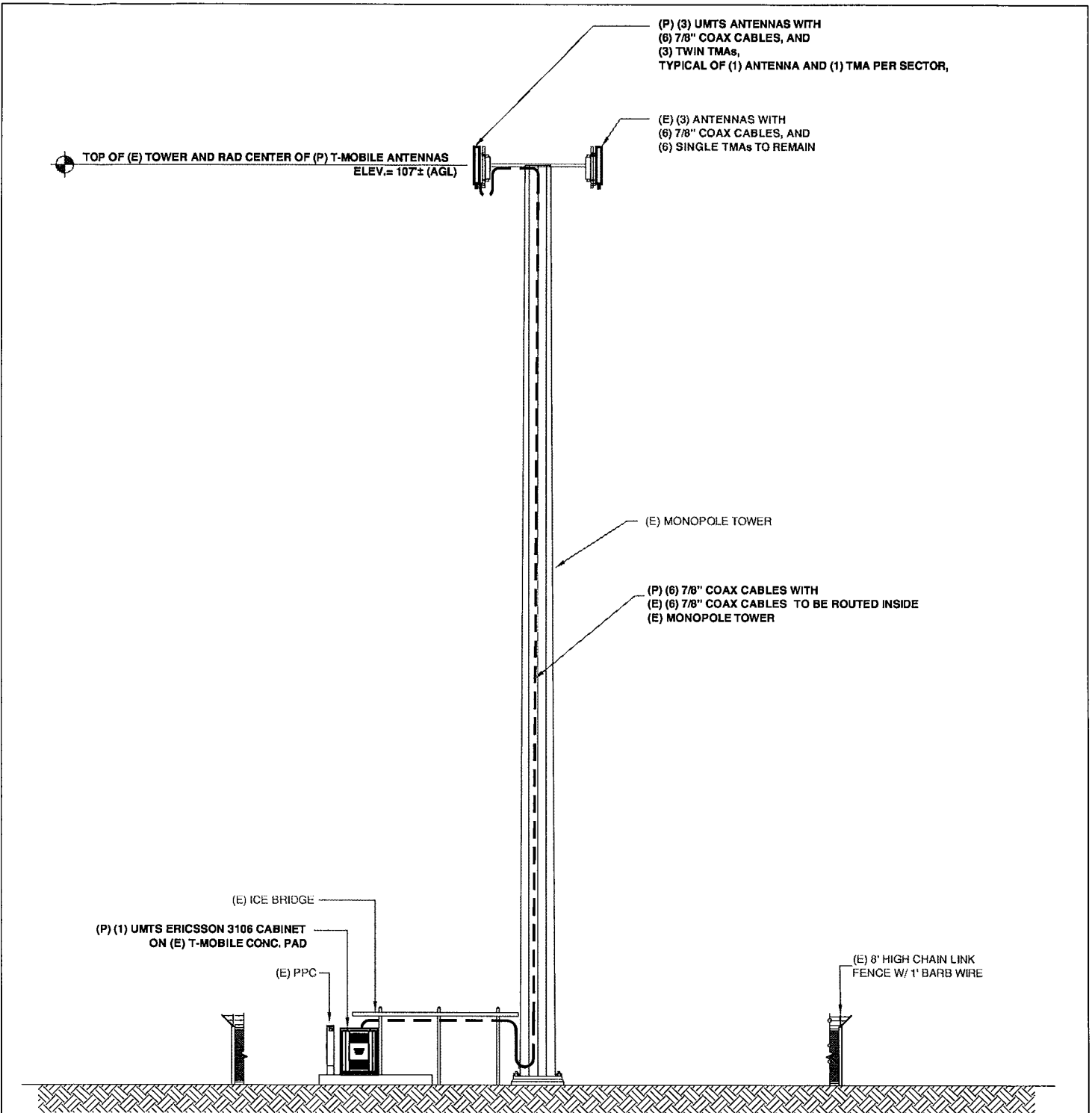
**ATLANTIS GROUP**  
 15 Cypress St., Suite 300  
 Newton Centre, MA 02459  
 Office: 617-965-0789  
 Fax: 617-663-6032

SITE NAME: <b>SBA # CT13529</b>		
SITE NUMBER: <b>CTHA075D</b>		
ADDRESS: 93 LAKE STREET MANCHESTER, CT 06042		
0:	FINAL LE	03-12-09
A:	REVIEW	01-28-09
NUMBER	REVISION	DATE
DRAWN BY: S.B.		DRAWING NO.: LE-2

APPROVALS	
Site Owner	_____ Date _____
Construction Manager	_____ Date _____
RF Engineer	_____ Date _____
Site Acquisition	_____ Date _____

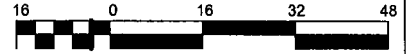
The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.





**SOUTH ELEVATION VIEW**

SCALE: 1/16" = 1'-0"



<p><b>TRANSCEND WIRELESS, LLC.</b> 10 INDUSTRIAL AVENUE MAHWAH, NJ 07430 OFFICE: 201-316-2985 FAX: 201-684-9666</p> <p>FOR <b>OMNIPOINT COMMUNICATIONS, INC.</b> DBA T-MOBILE USA, INC 35 GRIFIN ROAD SOUTH BLOOMFIELD, CT 06002 OFFICE: (860) 692-7100 FAX: (860) 692-7159</p>	<p><b>ATLANTIS GROUP</b> 15 Cypress St., Suite 300 Newton Centre, MA 02459 Office: 617-965-0789 Fax: 617-663-6032</p>	<p>SITE NAME: <b>SBA # CT13529</b></p>	<p>APPROVALS</p>									
		<p>SITE NUMBER: <b>CTHA075D</b></p>	<p>Site Owner _____ Date _____</p>									
<p>ADDRESS: 93 LAKE STREET MANCHESTER, CT 06042</p>		<p>Construction Manager _____ Date _____</p>	<p>RF Engineer _____ Date _____</p>									
<table border="1"> <thead> <tr> <th>NUMBER</th> <th>REVISION</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>0:</td> <td>FINAL LE</td> <td>03-12-09</td> </tr> <tr> <td>A:</td> <td>REVIEW</td> <td>01-28-09</td> </tr> </tbody> </table>		NUMBER	REVISION	DATE	0:	FINAL LE	03-12-09	A:	REVIEW	01-28-09	<p>Site Acquisition _____ Date _____</p>	<p>The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.</p>
NUMBER	REVISION	DATE										
0:	FINAL LE	03-12-09										
A:	REVIEW	01-28-09										
<p>DRAWN BY S.B.</p>	<p>DRAWING NO: LE-3</p>											



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

**109' Monopole**

**Site Name: Manchester 1  
Site ID: CT13529-A**

FDH Project Number 09-04127E S1

Prepared By:

Adrian L. Creech, EI  
Project Engineer

Reviewed By:

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

**FDH Engineering, Inc.**

2730 Rowland Rd.  
Raleigh, NC 27615  
(919)-755-1012  
info@fdh-inc.com



April 22, 2009

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

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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Manchester, 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, member sizes, and soil parameters was obtained from:

- Sabre Communications Corp. (Project No. 09-06160) Structural Design Report dated June 17, 2008
- FDH, Inc. (Job No. 08-10008T) TIA Inspection Report dated October 20, 2008
- Terracon Consulting Engineers & Scientists (Project No. J2085152) Geotechnical Engineering Report dated June 6, 2008
- SBA Network Services, Inc.

The *basic design wind speed* per ANSI/TIA-222-G standards is 100 MPH without ice and 50 mph with 1" radial ice. Ice is considered to increase in thickness with height.

## Conclusions

With the existing and proposed antennas from T-Mobile in place 105.5 ft, the tower meets the requirements of the ANSI/TIA-222-G standards. Furthermore, provided the foundation was designed and constructed to support the original design reactions (See Sabre Job No. 09-06160), the foundation should have the necessary capacity to support the existing and proposed loads. 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 Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing 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 directly behind the proposed panel antennas.

**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 Engineering, Inc. should be contacted to perform a revised analysis.*

**Table 1 – Appurtenance Loading**

**Existing Loading:**

No.	Centerline Elevation (ft)	Coax and Lines <sup>1</sup>	Carrier	Mount Type	Description
1-3	105.5	(6) 7/8" (1) 3/8"	T-Mobile	(1) 14.5' Low Profile Platform	(3) RFS APXV18-209014 (3) Andrew E15S09P94 02 TMAs

<sup>1</sup> Coax is installed inside the pole's shaft, unless otherwise noted.

<sup>2</sup> The loading for T-Mobile at 105.5 ft will be altered. See the proposed loading below.

**Proposed Loading:**

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Mount Type	Description
1-6	105.5	(12) 7/8"	T-Mobile	(1) 14.5' Low Profile Platform	(3) RFS APX18-206513-E (3) RFS APX16PV-16PVL-C (6) OneBase Twin Dual Duplex TMAs

<sup>1</sup> This represents the total loading for T-Mobile at 105.5 ft. According to information provided by SBA, T-Mobile will remove (3) RFS APXV18-209014 antennas, (3) Andrew E15S09P94 02 TMAs, and (1) 3/8" coax and add (3) RFS APX18-206513-E antennas, (3) RFS APX16PV-16PVL-C antennas, (6) OneBase Twin Dual Duplex TMAs, and (6) 7/8" coax for a total loading of (6) antennas, (6) TMAs, and (12) coax at 105.5 ft.

## 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 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	109 - 99	Pole	TP24.21x22.14x0.1875	5.9	Pass
L2	99 - 49	Pole	TP34.18x23.214x0.3125	18.2	Pass
L3	49 - 0	Pole	TP43.7x32.6757x0.375	26.4	Pass
		Anchor Bolts	(12) 2.25" Dia., BC = 50" Dia.	27.0	Pass
		Base Plate	2.75" Tk. x 49" Square	13.5	Pass

**Table 4 – Maximum Base Reactions**

Load Type	Current Analysis (ANSI/TIA-222-G)	Original Design (ANSI/TIA-222-G)
Axial	19 k	41 k
Shear	11 k	27 k
Moment	674 k-ft	2,581 k-ft

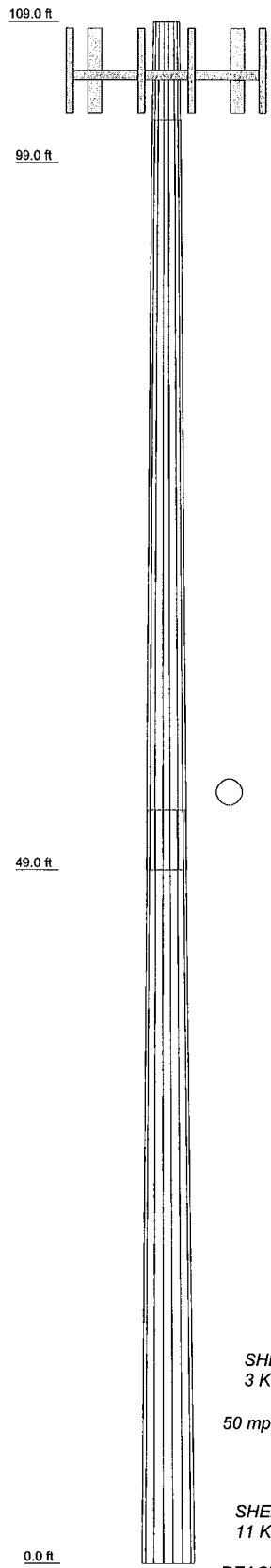
## **GENERAL COMMENTS**

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

## **LIMITATIONS**

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

Section	1	2	3
Length (ft)	10.00	53.00	53.25
Number of Sides	18	18	18
Thickness (in)	0.1875	0.3125	0.3750
Lap Splice (ft)	3.00	4.25	
Top Dia (in)	22.1400	23.2140	32.6757
Bot Dia (in)	24.2100	34.1800	43.7000
Grade		A572-65	
Weight (K)	0.5	5.1	8.2



### DESIGNED APPURTENANCE LOADING

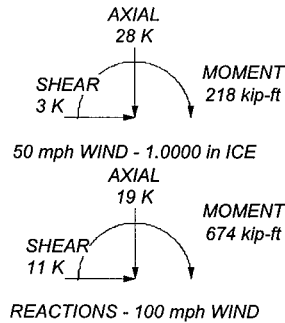
TYPE	ELEVATION	TYPE	ELEVATION
APX16PV-16PVL-C w/ Mount Pipe	105.5	APX18-206513-E w/ Mount Pipe	105.5
APX16PV-16PVL-C w/ Mount Pipe	105.5	(2) OneBase Twin Dual Duplex TMA	105.5
APX16PV-16PVL-C w/ Mount Pipe	105.5	(2) OneBase Twin Dual Duplex TMA	105.5
APX18-206513-E w/ Mount Pipe	105.5	(2) OneBase Twin Dual Duplex TMA	105.5
APX18-206513-E w/ Mount Pipe	105.5	14.5' Low Profile Platform	105.5

### MATERIAL STRENGTH

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

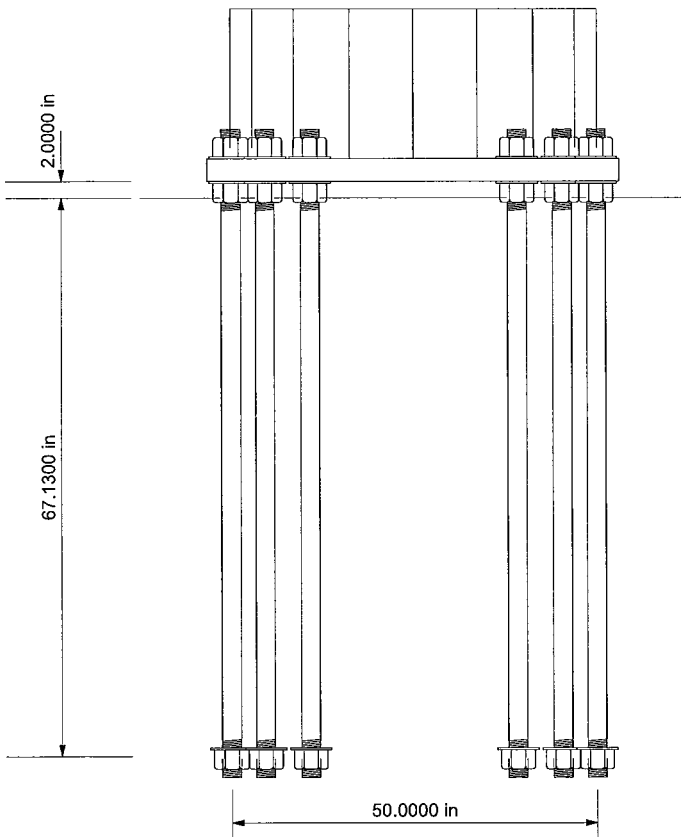
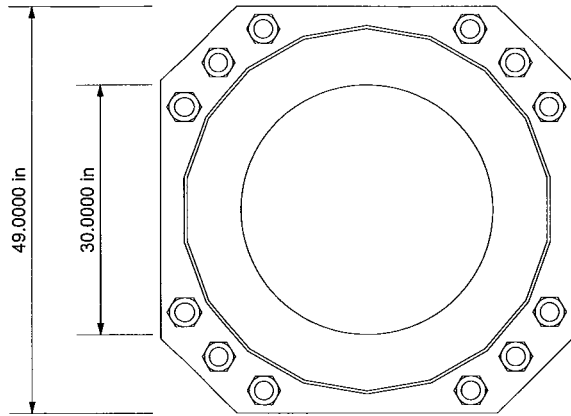
### TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. TOWER RATING: 26.4%



 Tower Analysis	<b>FDH Engineering, Inc.</b> 2730 Rowland Road Raleigh, NC Phone: (919) 755-1012 FAX: (919) 755-1031	<b>Job: Manchester 1 CT13529-A</b> Project: 09-04127E S1 Client: SBA Network Services, Inc. Code: TIA-222-G Path:	Drawn by: ALC Date: 04/24/09 App'd: Scale: NTS Dwg No: E-1
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**FOUNDATION NOTES**

1. Plate thickness is 2.7500 in.
2. Plate grade is A572-60.
3. Anchor bolt grade is A615.
4. fc is 5 ksi.

 <b>FDH</b> ENGINEERING Tower Analysis	<b>FDH Engineering, Inc.</b>		Job: <b>Manchester 1 CT13529-A</b>		
	2730 Rowland Road Raleigh, NC		Project: <b>09-04127E S1</b>		
	Phone: (919) 755-1012		Client: <b>SBA Network Services, Inc.</b>	Drawn by: <b>ALC</b>	App'd:
	FAX: (919) 755-1031		Code: <b>TIA-222-G</b>	Date: <b>04/24/09</b>	Scale: <b>NTS</b>
			Path:	Dwg No. <b>F-1</b>	

## Technical Memo

To: Transcend  
From: Farid Marbough - Radio Frequency Engineer  
cc: Jason Overbey  
Subject: Power Density Report for CTHA075D  
Date: April 29, 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 93 Lake Street, Manchester, 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), (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 APXV18-206513.
- 3) The model number for UMTS antenna is APX16DWV-16DWV.
- 4) GSM antenna center line height is 105.5 ft.
- 4) UMTS antenna center line height is 105.5 ft.
- 5) The maximum transmit power from any GSM sector is 1049.35 Watts Effective Radiated Power (EIRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2593.52 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 93 Lake Street, Manchester, CT, is 0.08073 mW/cm<sup>2</sup>. This value represents 8.073% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm<sup>2</sup>) 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.

**Connecticut Market**



**Worst Case Power Density**

Site: **CTHA075D**  
 Site Address: **93 Lake Street**  
 Town: **Manchester**  
 Tower Height: **110 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	APXV18-206513	Antenna Model	APX16DWV-16DWV
Cable Size	7/8 in.	Cable Size	7/8 in.
Cable Length	120 ft.	Cable Length	120 ft.
Antenna Height	105.5 ft.	Antenna Height	105.5 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	14.9 dBi	Antenna Gain	18.0 dBi
Cable Loss per foot	0.0186 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	2.2320 dB	Total Cable Loss	1.3920 dB
Total Attenuation	6.7320 dB	Total Attenuation	2.8920 dB
Total EIRP per Channel (In Watts)	51.18 dBm 131.17 W	Total EIRP per Channel (In Watts)	61.13 dBm 1296.76 W
Total EIRP per Sector (In Watts)	60.21 dBm 1049.35 W	Total EIRP per Sector (In Watts)	64.14 dBm 2593.52 W
nsg	8.1680	nsg	15.1080
<b>Power Density (S) = 0.023254 mW/cm^2</b>		<b>Power Density (S) = 0.057473 mW/cm^2</b>	
<b>T-Mobile Worst Case % MPE =</b>		<b>8.0727%</b>	

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	
AT&T Wireless	
Nextel	
MetroPCS	
Other Antenna Systems	
<b>Total Excluding T-Mobile</b>	<b>0.0000 %</b>
T-Mobile	8.0727
<b>Total % MPE for Site</b>	<b>8.0727%</b>

THOMAS J. REGAN  
Direct Dial: (860) 509-6522  
tregan@brownrudnick.com

CityPlace I  
185 Asylum  
Street  
Hartford  
Connecticut  
06103  
tel 860.509.6500  
fax 860.509.6501

*Via First Class Mail*

May 19, 2010

**RECEIVED**  
MAY 20 2010  
CONNECTICUT  
SITING COUNCIL

Daniel F. Caruso, Chairman  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

RE: T-Mobile Exempt Modifications Follow-Up Documentation

Dear Chairman Caruso:


Enclosed please find documentation certifying that the conditions contained in the Connecticut Siting Council's letters for the five (5) Exempt Modification sites listed below have been met.

- 
1. EM-T-MOBILE-077-090507 @ 93 Lake Street in Manchester, Connecticut
  2. EM-T-MOBILE-146-090520 @ 60 Industrial Park Road in Vernon, Connecticut
  3. EM-T-MOBILE-132-090515 @ 151 Sand Hill Road in South Windsor, Connecticut
  4. EM-T-MOBILE-007-090406 @ 260 Beckley Road in Berlin, Connecticut.
  5. EM-T-MOBILE-004-090409 @ 10 Redwood Lane in Avon, Connecticut

If you have any questions, please do not hesitate to contact me.

Very truly yours,

**BROWN RUDNICK LLP**

By:   
Thomas J. Regan

Cc: w/encl (Via First Class Mail):  
Louis A. Spadaccini, Mayor, Town of Manchester  
Matthew Streeter, Mayor, Town of South Windsor  
Jason L. McCoy, Mayor, Town of Vernon  
Adam P. Salina, Mayor, Town of Berlin  
John F. Carlson, Chairman Town Council, Town of Avon

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May 3, 2010

Mr. Hans Fiedler  
T-Mobile USA  
35 Griffin Road South  
Bloomfield, CT 06002



RE: T-Mobile – CTHA075D – SBA # CT13529  
93 Lake Street, Manchester, CT

Dear Mr. Fiedler:

The construction has been completed at the subject site. Armor tower performed an inspection of the construction for conformity to the construction drawings by Atlantis Group dated April 27, 2009. Weather conditions at the time of the inspection were 55°F and sunny with light winds.

**Proposed Configuration**

The construction drawings detail the following changes to the existing structure:

- Add (3) APX16DWV-16DWV-A20 @ 107' for T-Mobile on existing antenna mount pipes.
- Add (3) Twin AWS TMA's TMA's mounted behind the proposed antennas on the existing mount pipes.
- Add (1) Ericsson 3106 UMTS cabinet on an existing concrete pad.
- Add (6) 7/8" feed lines inside the monopole shaft.

**Findings/Conclusions**

No significant structural problems were found with the equipment installation. All required equipment was installed and securely fastened. All equipment was grounded.

No conclusions, expressed or implied, shall indicate that Armor Tower has made an evaluation of the original tower design, materials, fabrication, or potential erection deficiencies. In addition, the conclusions expressed herein are based upon the information contained within the aforementioned documents, as well as the results of the site survey and photographic documentation of the site. Any information contrary to that assumed for the purpose of preparing this assessment could alter the findings and conclusions as stated.

We appreciate the opportunity to provide our services to T-Mobile. If you have any questions concerning this analysis, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeff Triezenberg'.

Jeff Triezenberg, P.E.  
ARMOR TOWER, INC.



www.armortower.com

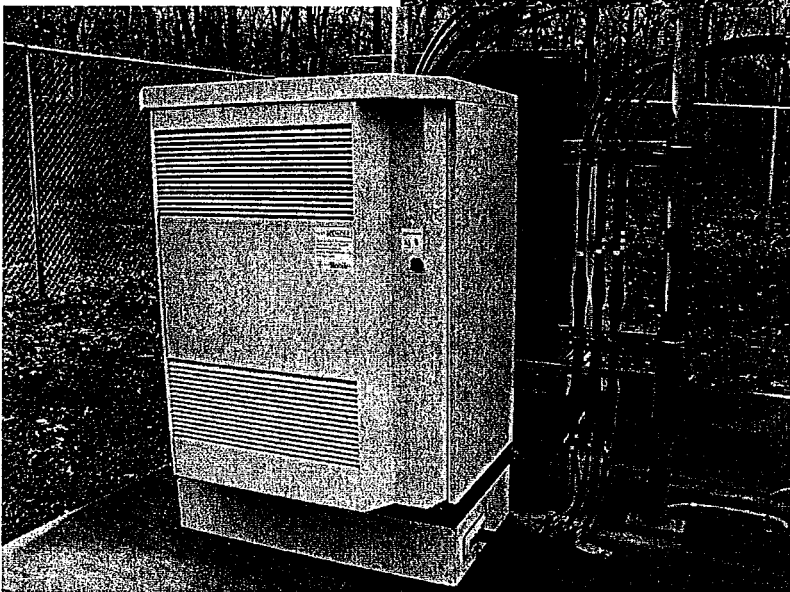
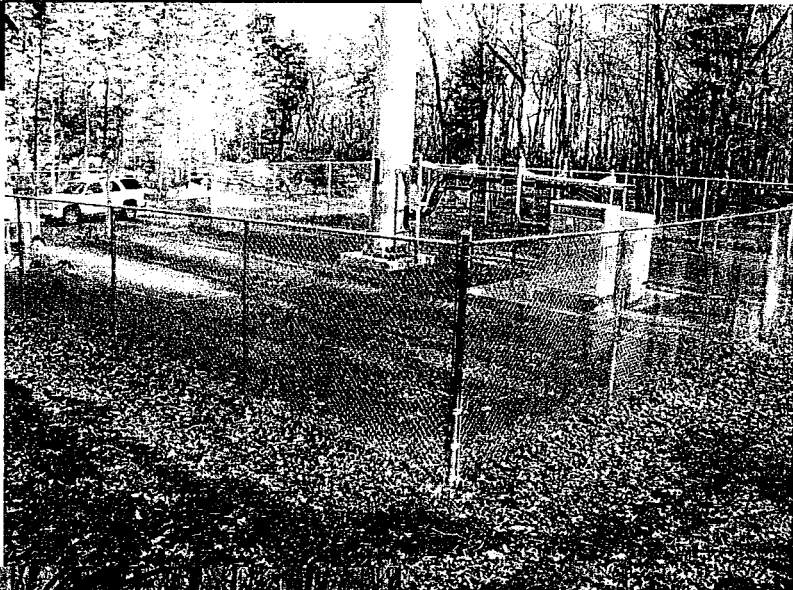
1 North Main Street, Ste 312, Cortland, NY 13045

607.591.5381 Fax: 866.870.0840

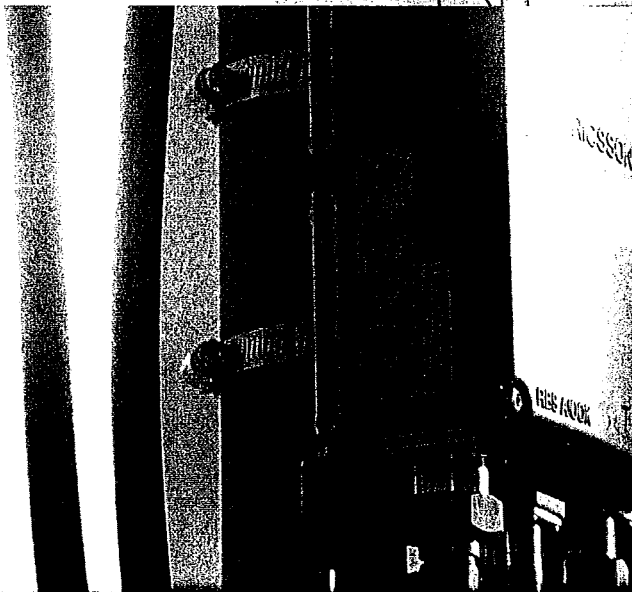
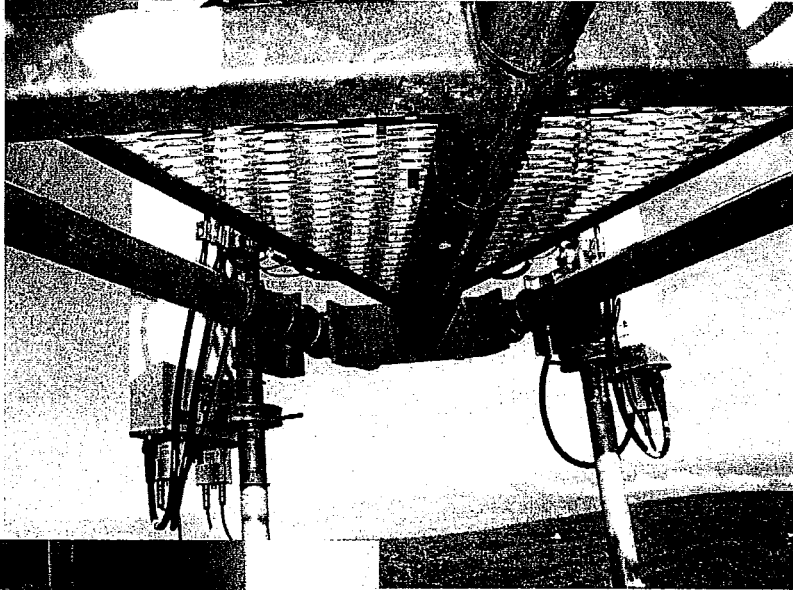
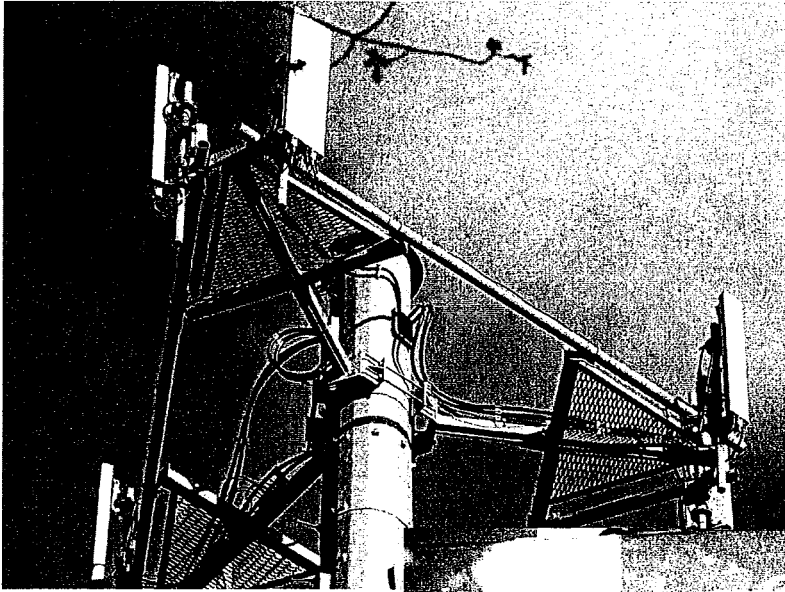


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1 North Main Street, Ste 312, Cortland, NY 13045

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