



# 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@po.state.ct.us](mailto:siting.council@po.state.ct.us)

Web Site: [www.state.ct.us/csc/index.htm](http://www.state.ct.us/csc/index.htm)

May 8, 2003

Diane W. Whitney  
LeBoeuf, Lamb, Greene & MacRae L.L.P.  
Goodwin Square  
225 Asylum Street, 13<sup>th</sup> Floor  
Hartford, CT 06103

RE: **TS-T-MOBILE-158-030422** - Omnipoint Facilities Network 2, L.L.C., a subsidiary of T-Mobile USA, Inc., request for an order to approve tower sharing at a telecommunications facility located at 880 Post Road East, Westport, Connecticut.

Dear Attorney Whitney:

At a public meeting held May 6, 2003, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures with the conditions that a) a Professional Engineer complete an evaluation of the tower's foundation before the antennas are installed and that a copy of this evaluation be delivered to the Council, and b) all obsolete equipment be removed. 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. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point 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.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated April 22, 2003.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.  
Chairman

PBK/laf

c: Honorable Diane G. Farrell, First Selectman, Town of Westport  
Katherine Barnard, Director, Planning & Zoning, Town of Westport  
Brian Benito, Bureau of Police Support, Telecommunications Section  
Sandy M. Carter, Verizon Wireless  
Michele G. Briggs, Southwestern Bell Mobile Systems  
Christopher B. Fisher, Esq., Cuddy & Feder LLP

LEBOEUF, LAMB, GREENE & MACRAE  
L.L.P.

A LIMITED LIABILITY PARTNERSHIP INCLUDING PROFESSIONAL CORPORATION S

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GOODWIN SQUARE  
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CONNECTICUT  
SITING COUNCIL

April 22, 2003

ORIGINAL

Pamela Katz, Chairman  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

Re: Request by T-Mobile for an Order to Approve the Shared Use of a Tower Facility at 880 Post Road East, Westport, Connecticut

Dear Chairman Katz and Members of the Council:

Please be advised that LeBoeuf, Lamb, Greene & MacRae, L.L.P. represents Omnipoint Facilities Network 2, L.L.C., a subsidiary of T-Mobile USA, Inc. (hereinafter T-Mobile) in the above-referenced matter. T-Mobile is the successor to VoiceStream Wireless Corp. by virtue of a recent corporate name change and nationwide re-branding strategy. Pursuant to Connecticut General Statutes §16-50aa, T-Mobile hereby requests an order from the Connecticut Siting Council ("Council") approving T-Mobile's proposed shared use of an existing State Police tower located at 880 Post Road East, Westport, Connecticut. T-Mobile proposes to install antennas on the existing tower, and the equipment associated with this facility would be located near the base of the tower within the existing compound (see drawing A-1 attached as part of Exhibit B). T-Mobile requests that the Council find that the proposed shared use of the tower satisfies the criteria stated in §16-50aa and issue an order approving the proposed use. The chief elected official of Westport has been notified via First Class Mail.

## **Background**

T-Mobile operates "Wideband PCS" licenses for the 2-Ghz PCS frequencies for the greater New York City area, including Fairfield County, Connecticut. Omnipoint 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.

The tower at 880 Post Road East, Westport, is a one hundred eighty foot (180') self-supporting lattice tower. The coordinates for the site are **41°-08'-15" N** and **73°-20'-06" W**. The tower is located at the corner of Post Road East (Route 1) and the Sherwood Island Connector. The tower is south of Post Road East and east of the Sherwood Island Connector, roughly a mile north of Interstate 95. The tower is owned by the State of Connecticut, Department of Public Safety, Division of State Police. T-Mobile and the owner have agreed to mutually acceptable terms and conditions for the proposed shared use of this tower, and the owner has authorized T-Mobile to act on its behalf to apply for all necessary local, state and federal permits, approvals and authorizations which may be required for the proposed shared use of this facility. The tower is designed and built to hold multiple carrier antennas at multiple elevations above ground level ("AGL"). These elevations are listed on the elevation drawing 1, A-2 attached as part of Exhibit B. Currently there are multiple antennas as well as other communications equipment on the tower. Verizon currently has telecom antennas at the one hundred fifty-five foot (155'-0") centerline AGL. Cingular currently has telecom antennas at the one hundred forty-five foot (145'-0") centerline AGL. AT&T currently has telecom antennas at the one hundred thirty-five foot (135'-0") centerline AGL.

T-Mobile proposes to install an antenna cluster comprised of three (3) sectors, with one (1) antenna per sector for a total of three (3) antennas. The model number for each antenna is EMS DR65-18-02DPL2Q. The antennas would be mounted on the tower legs at the one hundred twenty-five foot (125'-0") centerline AGL. The antenna mounting plan is shown on drawings 1 through 5 on Sheet S-2, attached as part of Exhibit B. The radio transmission equipment associated with these antennas, three (3) Nortel S8000 BTS cabinets, would be located near the base of the tower on a large existing concrete pad within a leased area. The tower and all of the equipment for all existing and proposed carriers is within a large existing compound and an existing communications building to the north of the tower. The compound is currently surrounded by a gated chain link fence, to be replaced with a new proposed eight foot high fabric fence by T-Mobile at the request of the State Police (see sheet A-2, attached as part of Exhibit B). Access to the compound is via a gate on the west side of the compound. Utilities will be run from existing utility sources approved by the owner via underground conduits (shown in drawing E-2, attached as part of Exhibit B).

C.G.S. §16-50aa (c) (1) provides, in pertinent part, that upon written request for approval of a proposed shared use, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such shared use." The shared use of the tower satisfies those criteria as follows:

**A. Technical Feasibility** - The existing tower and compound were designed to accommodate multiple carriers. A structural analysis of the tower with the proposed T-Mobile

installation has been performed and is attached as Exhibit D. The proposed shared use of this tower therefore is technically feasible.

**B. Legal Feasibility** Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the proposed shared use of an existing tower facility such as the facility at Post Road East in Westport. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. C.G.S. § 16-50x(a) vests exclusive jurisdiction over these facilities in the Council, which shall "give such consideration to other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under this statutory authority vested in the Council, an order by the Council approving the shared use would permit the Applicant to obtain a building permit for the proposed installations.

**C. Environmental Feasibility** The proposed shared use would have minimal environmental effects, if any, for the following reasons:

1. The proposed installations (i.e., three (3) sectors with one (1) antennas per sector) would have an insignificant incremental visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing site. In particular, the proposed installations would not increase the height of the existing tower, and would not extend the boundaries of the existing compound area. The tower is designed to accommodate multiple carriers
2. The proposed installations would not increase the noise levels at the existing facility by six decibels or more.
3. Operation of antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the American National Standards Institute ("ANSI"). The "worst-case" exposure calculated for operation of this facility (i.e., calculated at the base of the tower, which represents the closest publicly accessible point within the broadcast field of the antennas) will be 0.064870 mW/cm<sup>2</sup>, which is 6.4870% of the Maximum Permissible Emission (MPE). The combined power density calculations from other carriers is 41.9700% of the MPE. This accounts for a combined power density of 48.457% of the MPE standard. These calculations are attached as Exhibit E.
4. The proposed installations would not require any water or sanitary facilities, or generate air emissions or discharges to water or sanitary facilities, or generate air emissions or discharges to water bodies. After construction is complete (approximately two (2) weeks), the proposed installations would not generate any traffic other than periodic maintenance visits.

The proposed use of this facility would therefore have a minimal environmental effect, if any, and is environmentally feasible.

**D. Economic Feasibility** As previously mentioned, the owner and T-Mobile have entered into a mutual agreement to share the use of the existing tower on terms agreeable to the parties. The proposed tower sharing is therefore economically feasible.

**E. Public Safety Concerns** As stated above, the existing tower is structurally capable of supporting the proposed T-Mobile antennas. The tower stands on a compound accessible from Post Road East. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing tower. In fact, the provision of new or improved phone service through shared use of the existing tower will enhance the safety and welfare of area residents and the public.

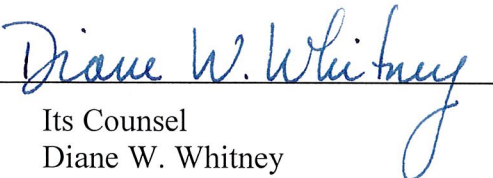
### **Conclusion**

For the reasons discussed above, the proposed shared use of the existing tower facility at Post Road East in Westport, Connecticut satisfies the criteria stated in C.G.S. §16-50aa, and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. T-Mobile therefore respectfully requests that the Council issue an order approving the proposed shared use of this tower.

Thank you for your consideration of this matter.

Respectfully submitted,

T-MOBILE USA, INC.

By:   
Its Counsel  
Diane W. Whitney  
Stephen J. Humes

Attachments

cc: Westport First Selectwoman, Diane Goss Farrell

**Exhibit A**  
**Site Map**  
**880 Post Road East**  
**Westport, Connecticut**

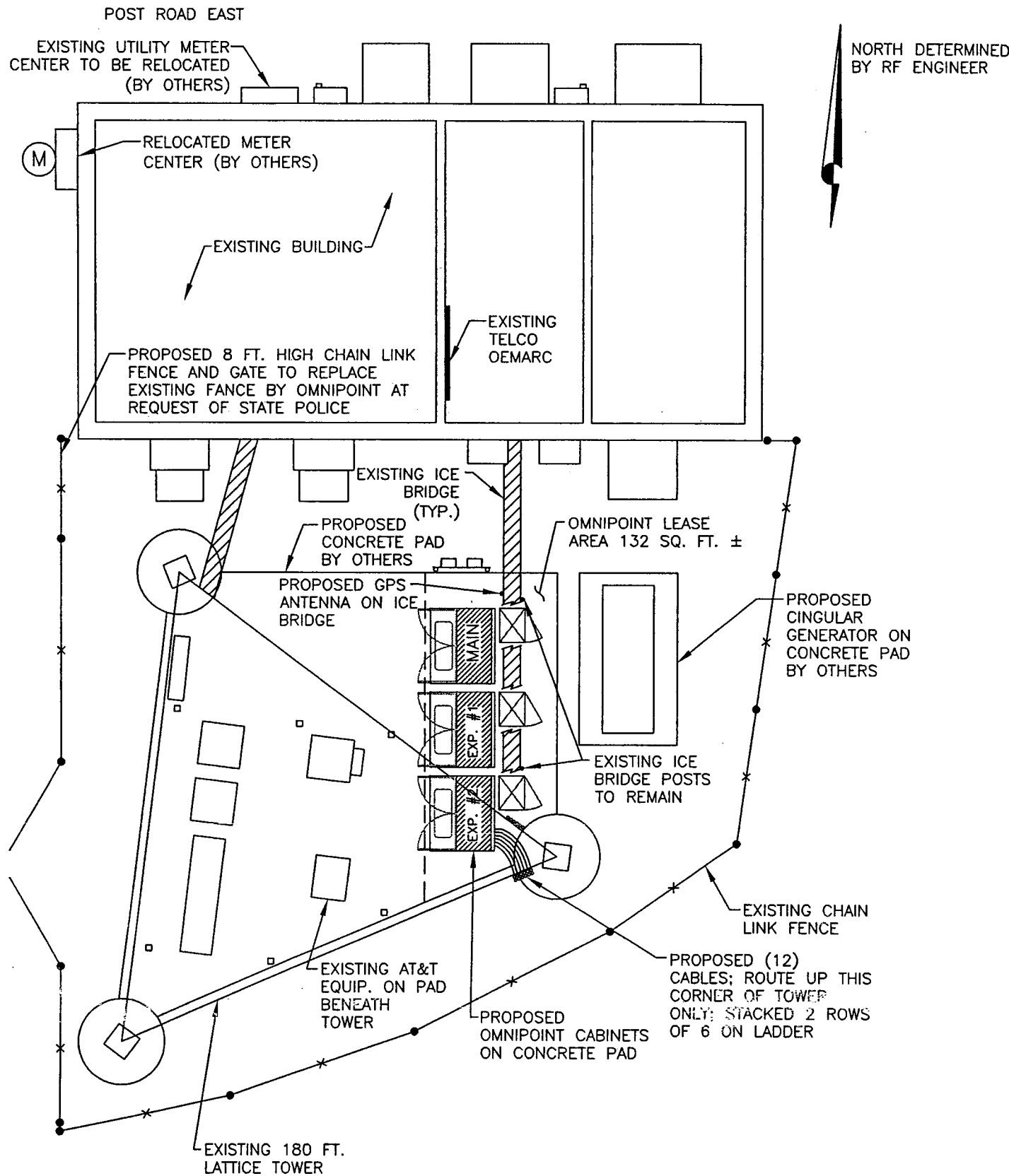


# **Exhibit B**

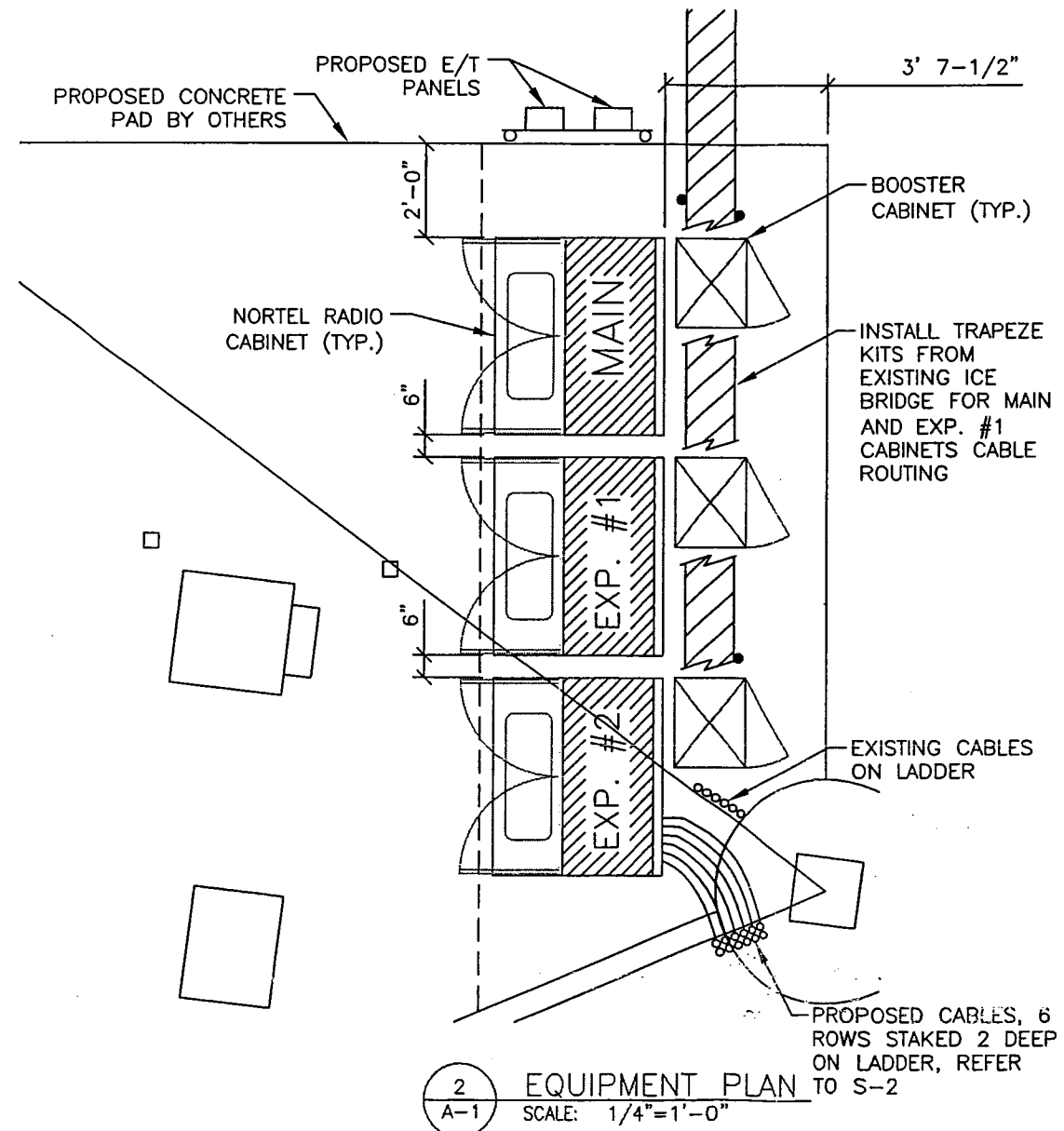
## **Design Drawings**

**880 Post Road East  
Westport, Connecticut**





1 COMPOUND PLAN  
A-1 SCALE: 1/8"=1'-0"



**OMNIPPOINT**  
FACILITIES NETWORK 2, LLC  
76 PROGRESS DRIVE, 2ND FLOOR  
STAMFORD, CT 06902  
203-328-8900

**On Air Engineering**  
201 WALNUT STREET  
TWP. OF WASHINGTON, NJ 07676  
OFFICE: (201) 358-9541  
FAX: (201) 358-9542

LICENSURE

DAVID A. WEINPAHL  
CT LIC. NO. 22144

NO.: DATE: SUBMISSIONS  
1 4-10-03 CLIENT REVIEW

APPROVALS:

PROPERTY OWNER DATE

ZONING DATE

CONSTRUCTION DATE

R.F. ENGINEER DATE

DRAWN BY: CHECKED BY:

MJ

DW

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SITE#

CT-11-612-B

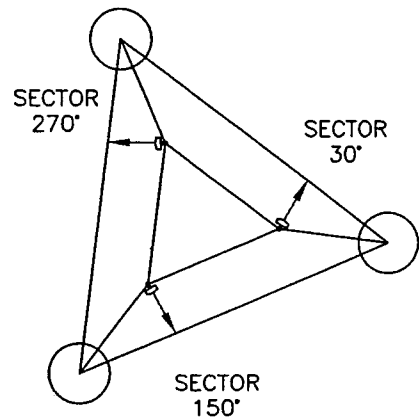
PROJECT INFORMATION:

STATE POLICE TOWER  
880 POST ROAD EAST  
WESTPORT, CT

DRAWING TITLE:

COMPOUND &  
EQUIPMENT PLAN

A-1

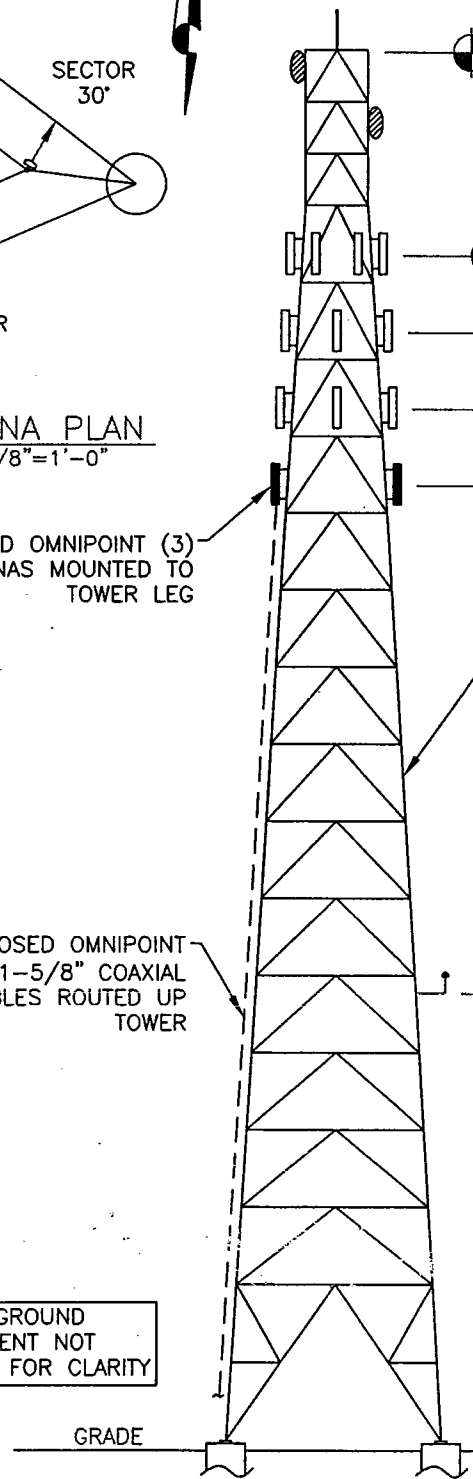


2 ANTENNA PLAN  
SCALE: 1/8"=1'-0"

PROPOSED OMNIPPOINT (3) ANTENNAS MOUNTED TO TOWER LEG

PROPOSED OMNIPPOINT (12) 1-5/8" COAXIAL CABLES ROUTED UP TOWER

NOTE: GROUND EQUIPMENT NOT SHOWN FOR CLARITY



1 ELEVATION  
SCALE: 1"=25'-0"

NORTH DETERMINED BY RF ENGINEER

- TOP OF TOWER 180'-0" ± A.F.G.
- CENTERLINE EXISTING VERIZON ANTENNAS 155'-0" ± A.F.G.
- CENTERLINE EXISTING/FUTURE CINGULAR ANTENNAS 145'-0" ± A.F.G.
- CENTERLINE EXISTING/FUTURE AT&T ANTENNAS 135'-0" ± A.F.G.
- CENTERLINE PROPOSED OMNIPPOINT ANTENNAS 125'-0" ± A.F.G.

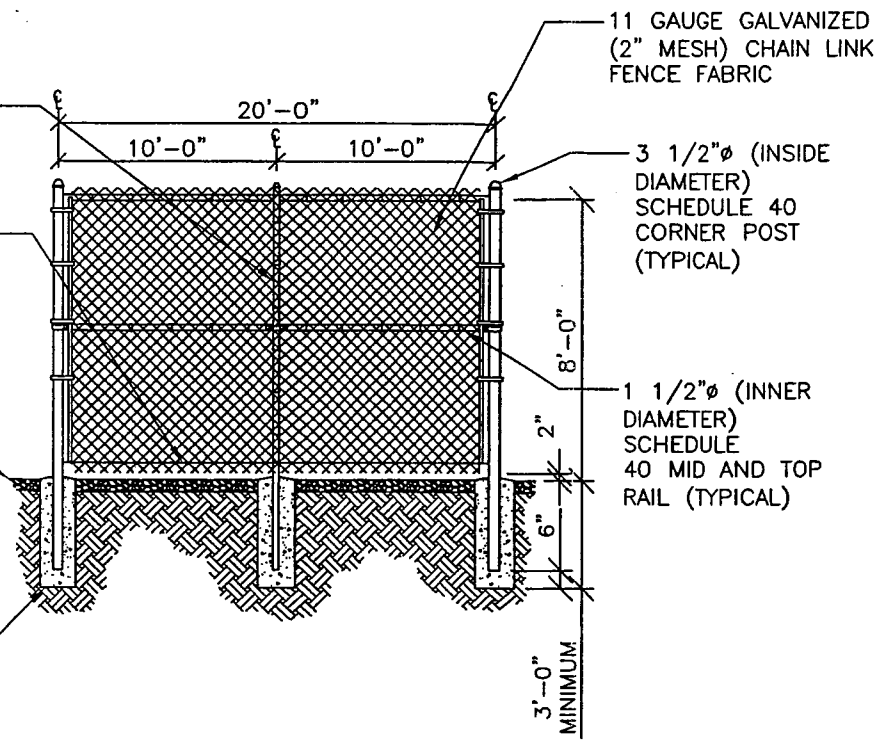
EXISTING 180 FT. LATTICE TOWER

EXISTING GPS ANTENNA 59'-0" ± A.F.G.

2 1/2"Ø SCHEDULE 40 LINE POST WITH 7 1/2" 9 GAUGE STEEL WIRE SPACED 14" ON CENTER (TYPICAL ALL LINE POSTS)

CONTINUOUS 7 GAUGE ALUMINUM COATED STEEL TENSION WIRE. CHAIN LINK FABRIC TO BE SECURED WITH 9 GAUGE HOG RINGS 18" ON CENTER

12"Øx3'-0" DEEP POST FOOTING. FILL WITH 4000 PSI CONCRETE. (TYPICAL)



3 FENCE DETAIL  
SCALE: NTS

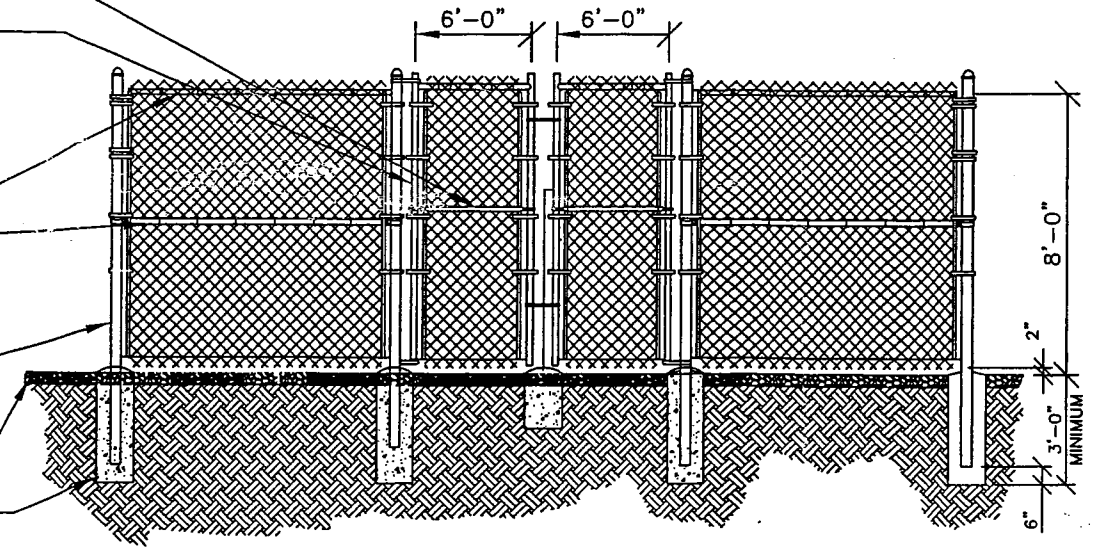
1"Ø SCHEDULE 40 PIPE MID-RAIL BRACE (AT GATE)

1 1/2"Ø (INNER DIAMETER) WELDED GATE FRAME (4'-0" WIDE GATE) WITH FORKED LATCH ASSEMBLY AND PADLOCK EYE TO PERMIT OPERATION FROM EITHER SIDE OF GATE

1 1/2"Ø (INNER DIAMETER) SCHEDULE 40 MID AND TOP RAIL (TYPICAL)

3 1/2"Ø (INSIDE DIAMETER) SCHEDULE 40 CORNER POST (TYPICAL)

12"Øx3'-0" DEEP POST FOOTING. FILL WITH 4000 PSI CONCRETE. (TYPICAL)



4 FENCE GATE DETAIL  
SCALE: NTS

**OMNIPPOINT**  
FACILITIES NETWORK 2, LLC  
76 PROGRESS DRIVE, 2ND FLOOR  
STAMFORD, CT 06902  
203-328-8900

**On Air Engineering**  
201 WALNUT STREET  
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OFFICE: (201) 358-9541  
FAX: (201) 358-9542

LICENSURE

DAVID A. WEINPAHL  
CT LIC. NO. 22144

NO.	DATE	SUBMISSIONS
1	4-10-03	CLIENT REVIEW

APPROVALS	
PROPERTY OWNER	DATE
ZONING	DATE
CONSTRUCTION	DATE
R.F. ENGINEER	DATE
DRAWN BY: MJ	CHECKED BY: DW

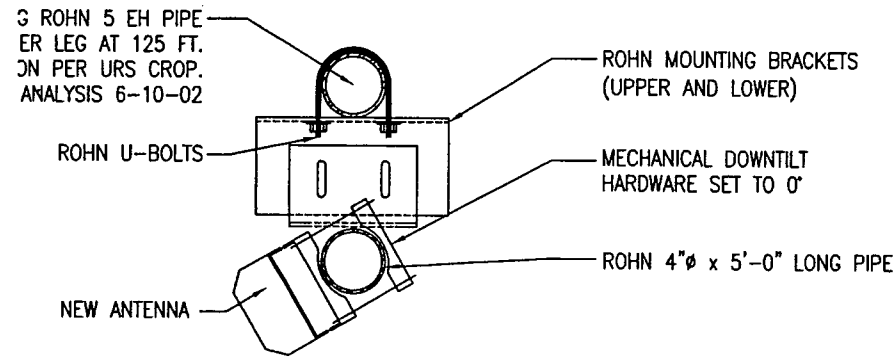
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SITE#  
CT-11-612-B

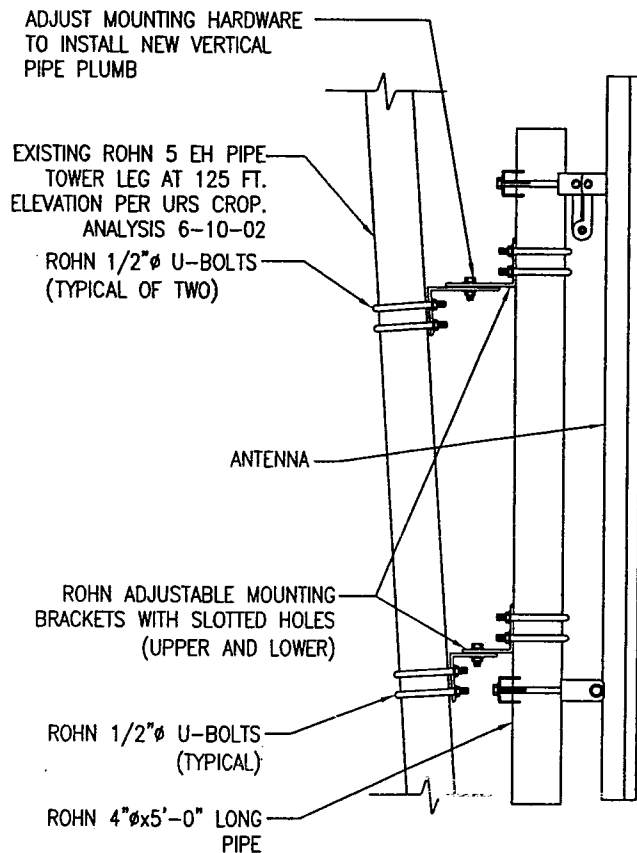
PROJECT INFORMATION:  
STATE POLICE TOWER  
880 POST ROAD EAST  
WESTPORT, CT

DRAWING TITLE:  
ELEVATION, ANTENNA PLAN, & FENCE DETAILS

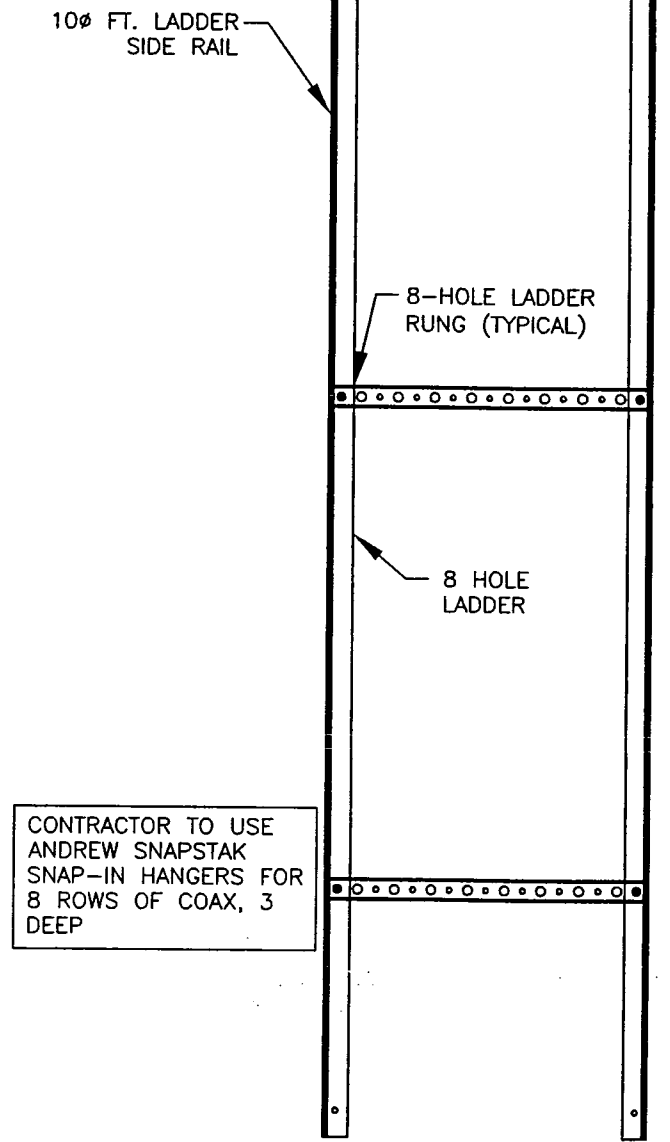
A-2



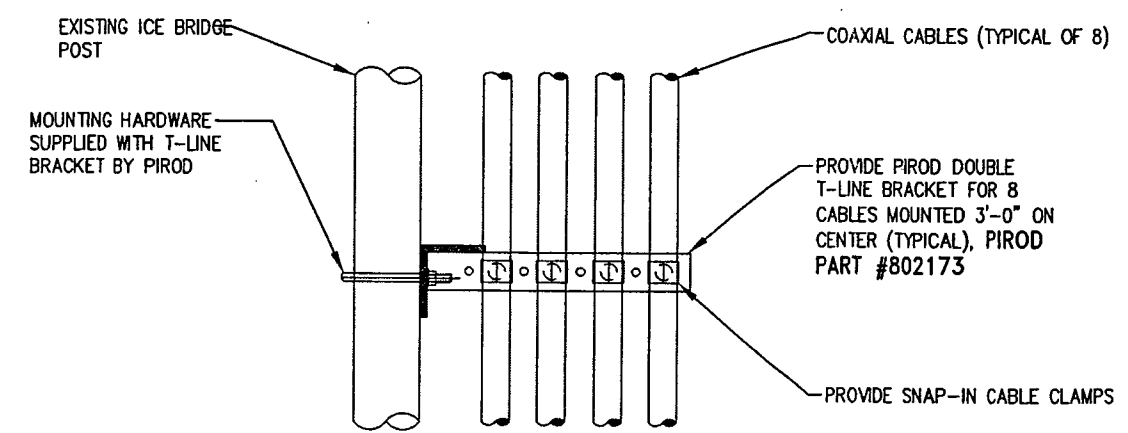
1 ANTENNA MOUNTING PLAN  
S-2 SCALE: 1"=1'-0"



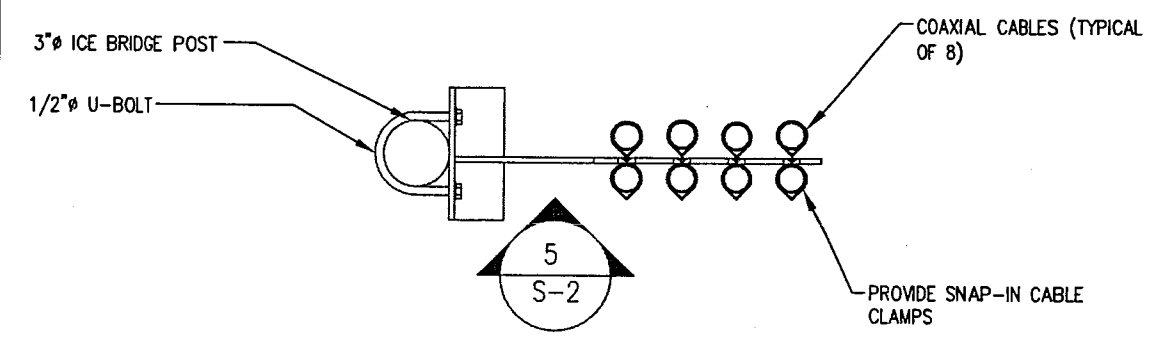
2 ANTENNA MOUNTING ELEVATION  
S-2 SCALE: 1"=1'-0"



3 CABLE LADDER DETAIL  
S-2 SCALE: NTS



5 CABLE ROUTING FROM CABINET - SECTION  
S-2 SCALE: NTS



4 CABLE ROUTING FROM CABINET - PLAN  
S-2 SCALE: NTS

**OMNIPONT**  
FACILITIES NETWORK 2, LLC  
76 PROGRESS DRIVE, 2ND FLOOR  
STAMFORD, CT 06902  
203-328-8900

**On Air Engineering**  
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CT-11-612-B

PROJECT INFORMATION:  
STATE POLICE TOWER  
880 POST ROAD EAST  
WESTPORT, CT

DRAWING TITLE:  
ANTENNA & CABLE ROUTING  
DETAILS

S-2

LICENSURE

DAVID A. WEINPAHL  
 CT LIC. NO. 22144

NO.	DATE	SUBMISSIONS
1	4-10-03	CLIENT REVIEW

NO.	DATE	SUBMISSIONS
1	4-10-03	CLIENT REVIEW

APPROVALS:

PROPERTY OWNER	DATE
ZONING	DATE
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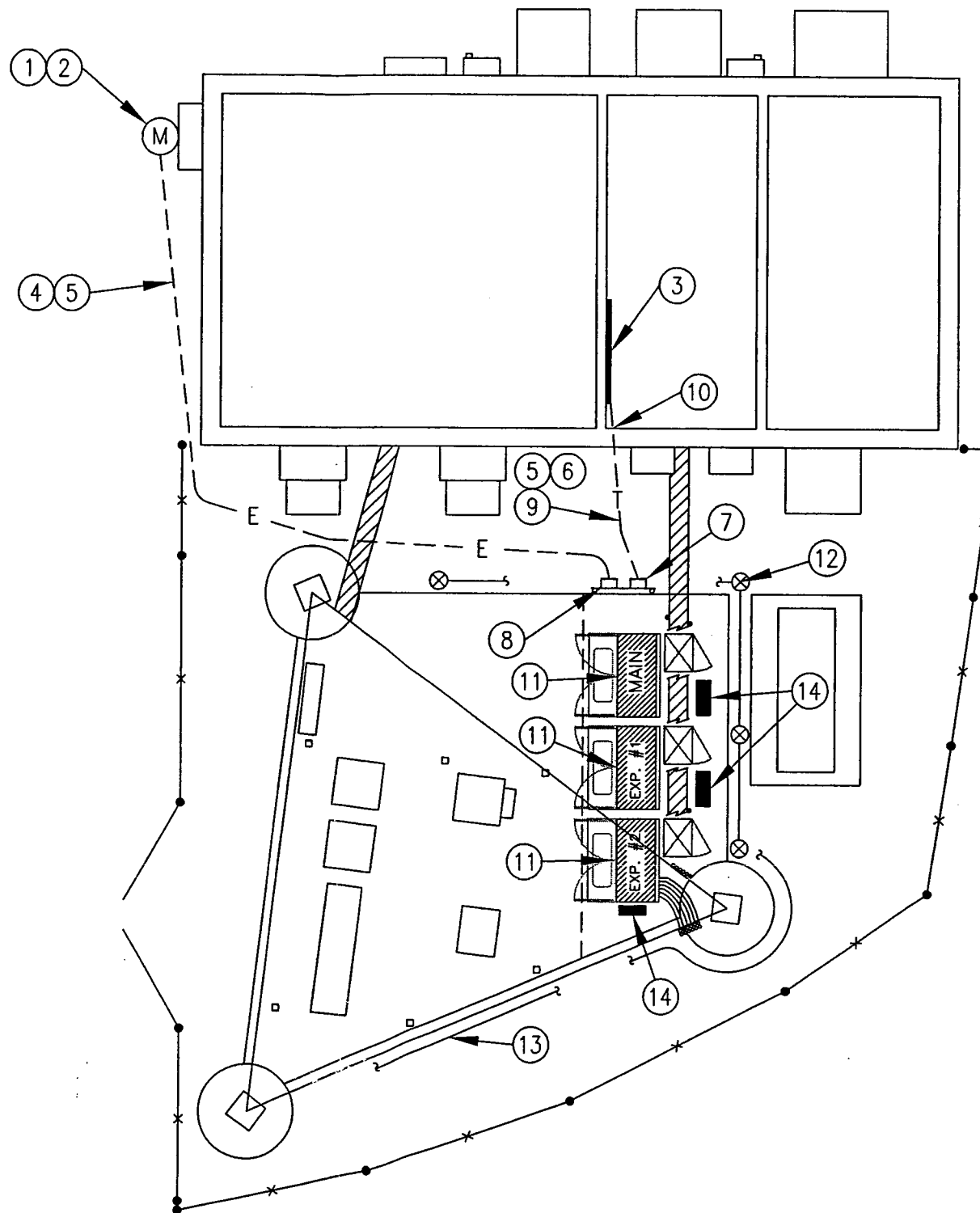
PROJECT INFORMATION:  
 STATE POLICE TOWER  
 880 POST ROAD EAST  
 WESTPORT, CT

DRAWING TITLE:  
 ELECTRICAL PLAN

E-2

NOTES:

- 1 RELOCATED METER CENTER BY OTHERS
- 2 OMNIPPOINT TO UTILIZE 200A BYPASS METER SOCKET
- 3 EXISTING TELCO DEMARC
- 4 (3) 3/0 AWG AND (1) #6 AWG GROUND IN 2" SCH. 40 PVC CONDUIT, APPROX. DISTANCE 40 FT.
- 5 CONDUIT ROUTED UNDERGROUND. HAND DIG ONLY.
- 6 3" SCH. 40 PVC TELCO CONDUIT.
- 7 TELCO HOFFMAN BOX
- 8 PANELBOARD, 225 AMP, 30 CKT SQUARE D TYPE NQOD, NEMA 3R WITH 200A MCB, (3) 60A, 2P CIRCUIT BREAKERS (SEE NOTE ABOVE) AND (3) 20A, 1P CIRCUIT BREAKER FOR BOOSTER CABINETS.
- 9 (3) CAT 5 INDIVIDUALLY SHIELDED TELCO CABLE PER LATEST OMNIPPOINT STANDARD
- 10 3" TELCO EMT CONDUIT INSIDE BUILDING ONLY. PENETRATE WALL AND TRASITION TO STEEL FOR VERTICAL ROUTE ON BLDG. EXTERIOR
- 11 NORTEL S8000 EQUIPMENT CABINET
- 12 NEW GROUND ROD AND RING BY OTHERS
- 13 EXISTING GROUND RING, FIELD LOCATE
- 14 NEW MASTER GROUND BAR (TYP. OF 3), ATTACH TO RING AT 2 LOCATIONS



# **Exhibit C**

## **Equipment Specifications**

**880 Post Road East  
Westport, Connecticut**



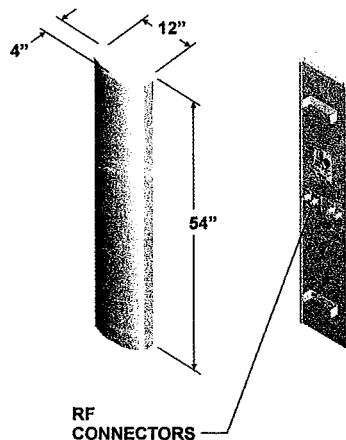
## DR65-18-XXDPL2Q

Dual DualPol<sup>®</sup> Polarization  
1850 MHz - 1990 MHz

OptiRange<sup>™</sup>  
Suppressor<sup>™</sup>

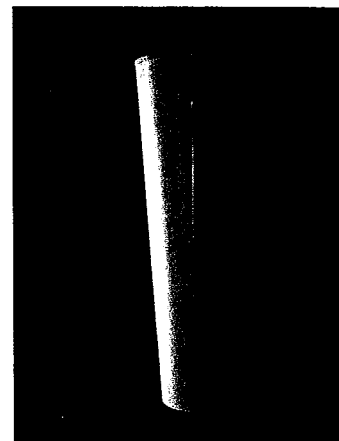
### Electrical Specifications

Azimuth Beamwidth (-3 dB)	65°
Elevation Beamwidth (-3 dB)	6°
Elevation Sidelobes (Upper)	≥ 18 dB
Gain	17.3 dBi (15.2 dBd)
Polarization	Quad Linear, Slant (± 45°)
Port-to-Port Isolation	≥ 30 dB
Front-to-Back Ratio	≥ 35 dB
Electrical Downtilt Options	0°, 2°, 4°, 6°
VSWR	1.35:1 Max
Connectors	4; 7-16 DIN (female)
Power Handling	250 Watts CW
Passive Intermodulation	≤ -150 dBc
Lightning Protection	[2 x 20W (+ 43 dBm)] Chassis Ground



### Mechanical Specifications

Dimensions (L x W x D)	54 in x 12 in x 4 in (137.2 cm x 30.5 cm x 10.2 cm)
Rated Wind Velocity	130 mph (209 km/hr)
Equivalent Flat Plate Area	4.5ft <sup>2</sup> (.42 m <sup>2</sup> )
Front Wind Load @ 100 mph (161 kph)	130 lbs (576 N)
Side Wind Load @ 100 mph (161 kph)	43 lbs (192 N)
Weight	24 lbs (11 kg)

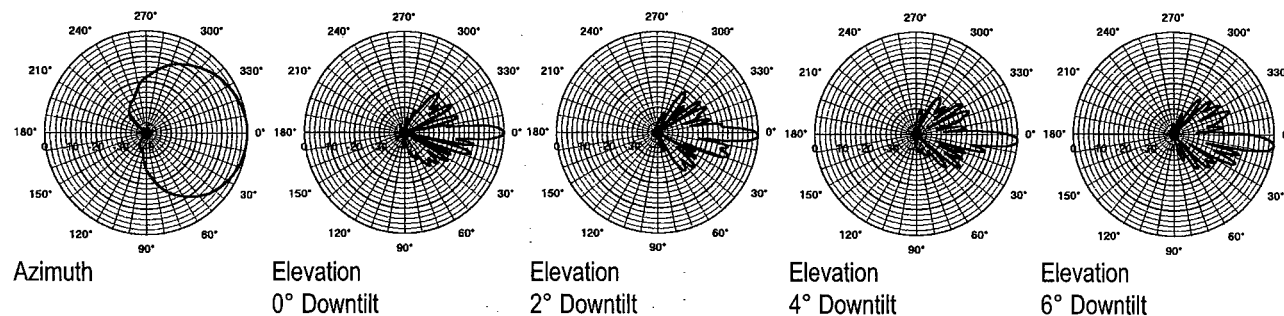


### Mounting Options

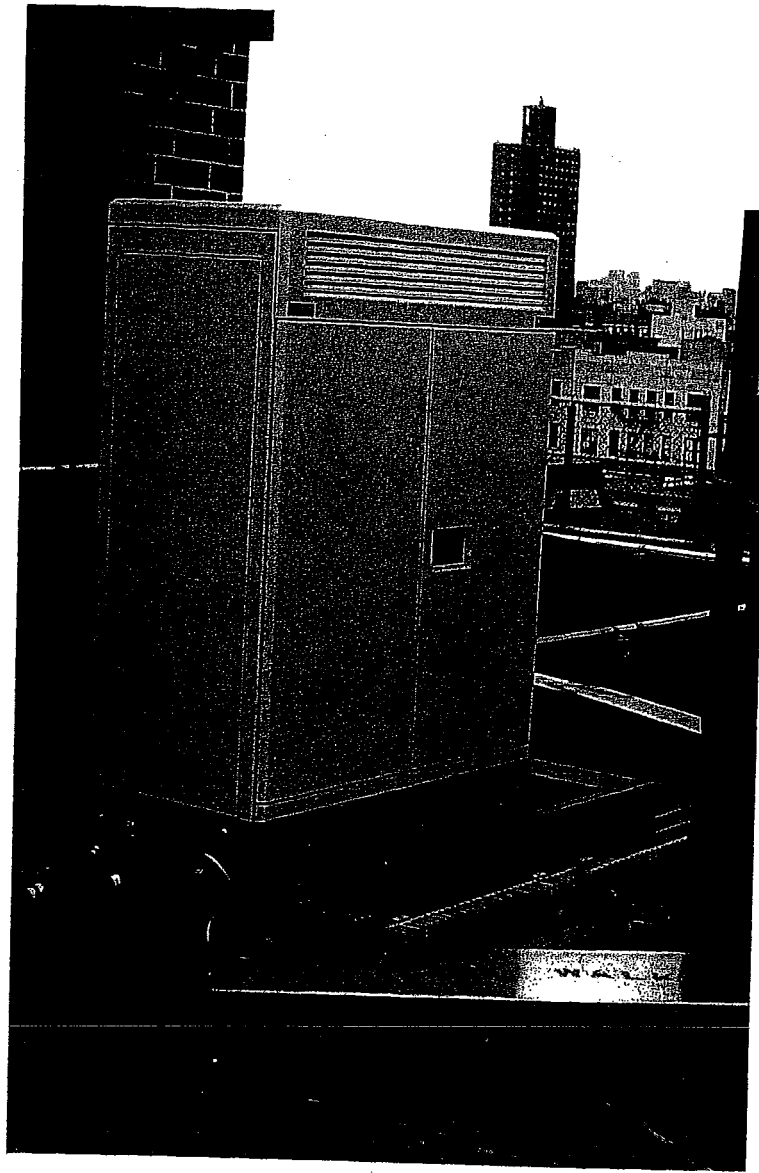
MTG-P00-10, MTG-S02-10, MTG-DXX-20\*, MTG-CXX-10\*, MTG-C02-10, MTG-TXX-10\*

Note: \*Model number shown represents a series of products. See Mounting Options section for specific model number.

### Patterns



Revised 05/14/02



Nortel S8000 with Base  
Mounted on a Spreadbase on Roof

## SITE ACQUISITION TECHNICAL HANDBOOK

### Nortel S8000

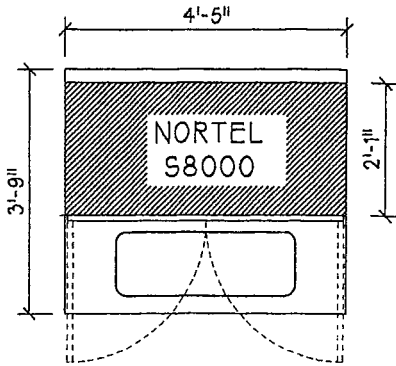
<b>Size:</b>	4'-5" wide x 2'-0" deep x 5'-3" height
<b>Cabinet Base:</b>	4'-5" wide x 3'-9" deep x 6" height
<b>Call Capacity:</b>	56 calls
<b>Weight:</b>	1058 lbs.
<b>Electric Required:</b>	240 V to 220 V

- Always installed with a base.
- Contains alarm system surge suppression, ground bar and telephone box.
- Requires structural analysis by licensed engineers as integrity of roof is in question.
- Mounted to penthouse wall when roof is weak.
- Crane needed to install on rooftops.
- Note clearances on attached diagram.
- Typically six (6) sector antennas or three (3) dual pole antennas are used.

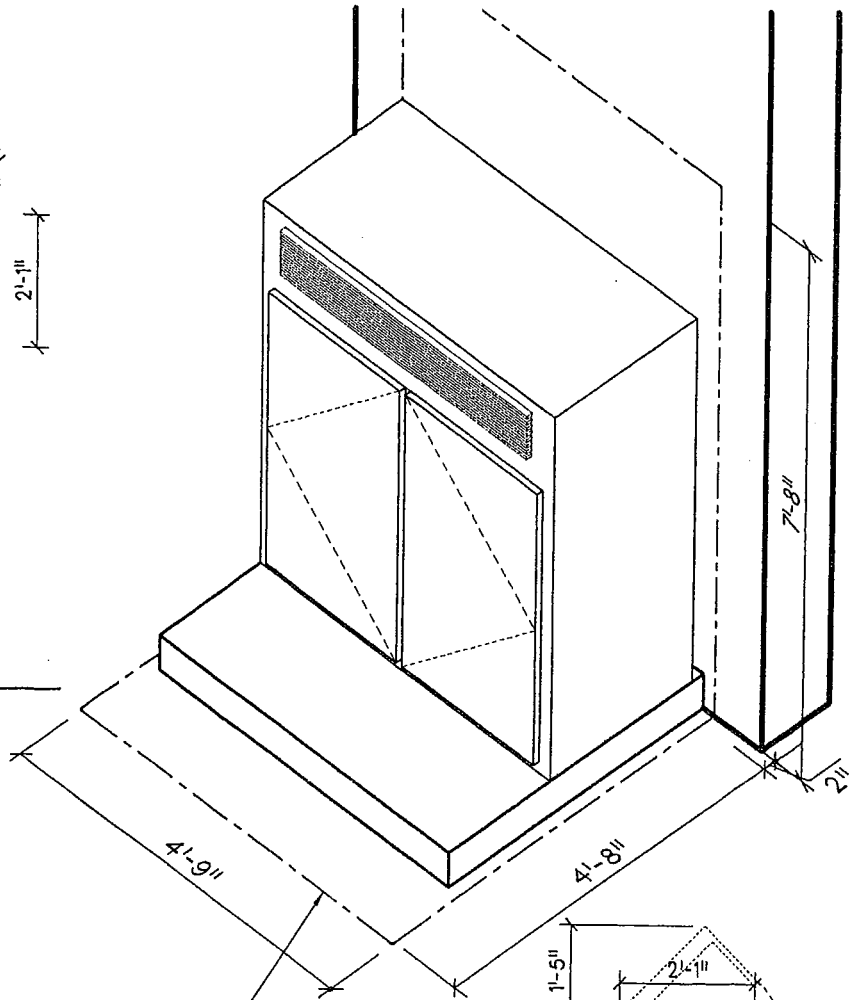
## **SECTION II - THE BASE STATION**

Revised 8/20/97

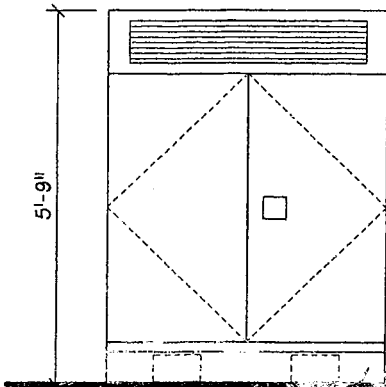




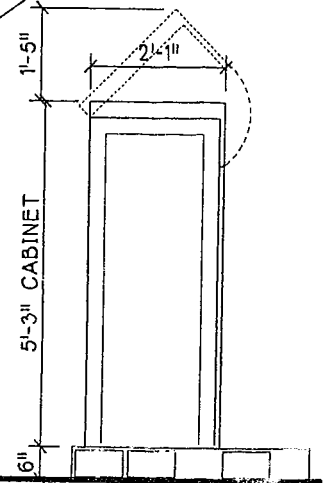
EQUIPMENT PLAN



MINIMUM CLEARANCE LINE



FRONT ELEVATION



SIDE ELEVATION

**NORTEL  
S8000**

WEIGHT = 1058 LBS.



6 North Beers Street, Building 2, Holmdel, NJ 07733  
Tel: 908.739.3200 Fax: 908.739.0440

Drawing Title:  
**SITE AQUISITION**

Client: **OCI**

Project:

Address:

Approved by:  
OWNER/SAC: \_\_\_\_\_ DATE: \_\_\_\_\_

R.F. ENGR.: \_\_\_\_\_ DATE: \_\_\_\_\_

NETWORK: \_\_\_\_\_ DATE: \_\_\_\_\_

Search Area: \_\_\_\_\_  
File ID No: \_\_\_\_\_

P.C.: \_\_\_\_\_  
Chkd. by: \_\_\_\_\_

ARCNET Project No. \_\_\_\_\_

Drawn: \_\_\_\_\_  
Date: \_\_\_\_\_

Revision No. \_\_\_\_\_ Date: \_\_\_\_\_

Drawing No. \_\_\_\_\_

# **Exhibit D**

## **Structural Analysis** **880 Post Road East** **Westport, Connecticut**

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# DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF 180' EXISTING SELF SUPPORTING LATTICE TOWER FOR NEW ANTENNA ARRANGEMENT

Connecticut State Police Tower  
880 Post Road East  
Westport, Connecticut

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*prepared for*



VOICESTREAM WIRELESS  
100 FILLEY STREET  
BLOOMFIELD, CT 06002  
TEL. 860-692-7127

*prepared by*

# URS

URS CORPORATION  
795 BROOK STREET, BUILDING 5  
ROCKY HILL, CT 06067  
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F300002289.01

June 10, 2002

CT11-612A COPY

## **TABLE OF CONTENTS**

- 1. EXECUTIVE SUMMARY**
- 2. INTRODUCTION**
- 3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS**
- 4. FINDINGS AND EVALUATION**
- 5. CONCLUSIONS AND RECOMMENDATIONS**
- 6. DRAWINGS AND DATA**
  - CABLE ORIENTATION**
  - ERI TOWER OUTPUT DATA FOR PROPOSED ANTENNA LOADING**
  - ANCHOR BOLT EVALUATION**

## 1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 180' lattice tower located 880 Post Road East in Westport, Connecticut. The analysis was conducted in accordance with the TIA/EIA-222-F standard for wind velocity of 90 mph concurrent with ½" ice design wind loads. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Analysis Methodology and Loading Condition Section of this report.

The results of the analysis indicate the tower superstructure to be in compliance with the loading conditions and the materials and member sizes for the tower. However, investigation of the tower foundation is needed. The tower is considered not feasible with the TIA/EIA-222-F wind load classification specified above and all the existing and proposed antenna loading including the Connecticut State Police requirements unless the criteria listed in item 4 below has been met.

This analysis is based on:

- 1) Original tower report prepared by Rohn Industries, Incorporated engineering file 26263DL and drawing no. C910693 dated February 1, 1991.
- 2) Antenna inventory as specified in section 2 and 6 of this report.
- 3) The coaxial cable orientation as per SK-1 of this report.
- 4) Foundation and design drawings were not available. This report shall not be implemented unless an evaluation and analysis of the foundation has been completed by a professional engineer licensed in the State of Connecticut stating that the foundation is acceptable to support the new reactions resulting from the proposed antenna arrangements. The foundation evaluation must comply with the Connecticut State Police requirement of a safety factor of 2 for overturning.
- 5) The tower analysis and evaluation is based on the Connecticut State Police requirements for 90 mph wind load concurrent with ½" ice plus the deadload of the structure and ancillary items without any reduction factor.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables.

A maximum twist and sway of 0.521 degree was calculated at the top of the tower which is below the 0.75 degree allowable by the Connecticut State Police.

If you should have any questions, please call.

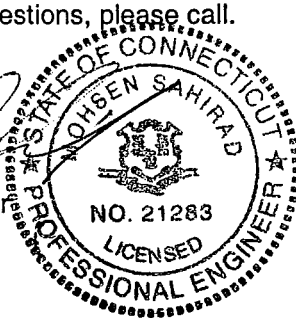
Sincerely,

**URS Corporation AES**

Mohsen Sahirad, P.E.  
Senior Structural Engineer

MS/rmn

cc: Ross Kronenthal – Voicestream Wireless  
Alitz Abadijian – URS  
Doug Roberts – URS  
Naish Artaiz – URS  
CF/Book



## 2. INTRODUCTION

The subject tower is located on 880 Post Road East in Westport, Connecticut. The structure is a self supporting 180' steel triangular tapered lattice tower manufactured by Rohn Industries, Incorporated.

The tower is constructed of pipe legs, diagonal angle braces, horizontal braces, and inner horizontals. The tower sections are all bolted together. The width of the face is 8'-6 1/2" at the top and 27'-8 1/8" at the bottom. The tower geometry and structural member sizes were taken from Rohn Industries, Incorporated engineering file 26263DL and drawing no. C910693 dated February 1, 1991.

The existing structure supports several communication antennas. The antenna and mount configuration as specified below:

Antenna Type	Mount	Elevation	Cable
(2) PD1142	Standoff	180'	(2) 7/8" coax cable
PA6-85	Leg mounted	177'	(1) EW63
PAR6-105	Leg mounted	177'	(1) 7/8" coax cable
P6-F9	Leg mounted	169'	(1) 7/8" coax cable
(2) OGT9-806	Standoff	160'	(2) 1 5/8" coax cable
(2) AP11-850	Standoff	160'	(2) 1 5/8" coax cable
DB222	Leg mounted	160'	(1) 7/8" coax cable
DB536	Standoff	160'	(1) 7/8" coax cable
(12) ALP9212	T-Frame	155'	(12) 1 5/8" coax cable
(9) Allgon 7184	T-Frame	145'	(9) 1 5/8" coax cable
(9) ALP110-11	T-Frame	135'	(9) 1 5/8" coax cable
(3) D65-18-XXDPL2Q	Leg mounted	125'	(12) 1 5/8" coax cable
GPS	Standoff	125'	(1) 7/8" coax cable

The coaxial cable orientation as per SK-1 of this report.

This structural analysis of the communications tower was performed by URS Corporation, AES (URS) for Voicestream Wireless. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate twist (rotation), sway (deflection) and stress on the tower, and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

## 3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

### Methodology:

The tower analysis was done in accordance with TIA/EIA-222-F June 1996, Structural Standard for Steel Antenna Towers and Antenna Supporting Structure; The American Institute of Steel Construction (AISC), Manual of Steel Construction; Allowable Stress Design (ASD).

The analysis was conducted by placing one-half inch of radial ice over the entire structure and all appurtenances, then applying a simultaneous wind load at 90 mph concurrent with 1/2" radial ice.

Condition 1 = Wind Load 90 mph (with 1/2" radial ice) + Tower Dead Load

The TIA/EIA standard permits one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For purposes of this analysis, allowable stresses of tower members were increased by one-third in computing the load capacity; in addition, the appropriate "k" factors were assigned to each member.

#### 4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The analysis indicates that the tower legs, diagonals, horizontal, and inner horizontal members have sufficient capacity to carry the loads applied.

The tower base reactions are as follows:

Original Design Tower Reactions	
Compression (kips)	319.9
Uplift (kips)	276.7
Total Shear (kips)	61.5
Moment (kips-ft)	7010.3

Proposed Tower Reactions	
Compression (kips)	364
Uplift (kips)	324
Total Shear (kips)	83
Moment (kips-ft)	8283

For detailed proposed tower reactions, see drawing no. E-1 in section 6 of this report.

The analysis indicates that the reactions of the tower base are above the Original Design prepared by Rohn Industries, Incorporated. The information available at this time is not sufficient to evaluate the tower foundation. This report shall not be implemented unless an evaluation and analysis of the foundation has been completed by a professional engineer licensed in the State of Connecticut stating that the foundation is acceptable to support the new reactions resulting from the proposed antenna arrangements.

#### 5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate the structure to be in compliance with the loading conditions and the materials and member sizes for the tower. However, investigation of the tower foundation is needed. The tower is considered not feasible with the TIA/EIA-222-F wind load classification specified above and all the existing and proposed antenna loading.

A maximum twist and sway of 0.521 degree was calculated at the top of the tower which is below the 0.75 degree allowable by the Connecticut State Police.

##### Limitations/Assumptions:

This report is based on the following:

- A. Tower is properly installed and maintained.
- B. All members were as specified in the original Construction Documents and are in good condition.
- C. All required members are in place.
- D. All bolts are in place and are properly tightened.

- E. Tower is in plumb condition.
- F. All members are galvanized.
- G. All tower members were properly designed, detailed, fabricated, installed, and have been properly maintained since erection.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

- A. Adding antennas
- B. Adding cables
- C. Adding mounts

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.



# **Exhibit E**

## **Power Density Calculations**

**880 Post Road East**

**Westport, Connecticut**

## Technical Memo

To: Dennis Brown  
From: Chetan Dhaduk - Radio Frequency Engineer  
cc: Roni Zola  
Subject: Power Density Report for CT11612B  
Date: April 21, 2003

### 1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile USA, Inc. PCS antenna installation on a New Monopole at 800 Post road East, Westport, 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 Wireless transmitters are in the 1930-1950 MHz frequency band.
- 2) The antenna array consists of three sectors, with 1 antennas per sector.
- 3) The model number for each antenna is DR65-18-02DPL2Q.
- 4) The antenna center line height is 125 ft.
- 5) The maximum transmit power from any sector is 4187.16 Watts Effective Radiated Power (EiRP) assuming 8 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 USA, Inc. PCS antenna installation on a New Monopole at 800 Post road East, Westport, CT, is 0.06487 mW/cm<sup>2</sup>. This value represents 6.487% of the Maximum Permissible Emission (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 USA 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 41.97%. The combined Power Density for the site is 48.457% of the M.P.E. standard.

## New York Market



### Connecticut

#### Worst Case Power Density

<b>Site:</b>	<b>CT11612B</b>
<b>Site Address:</b>	<b>800 Post road East</b>
<b>Town:</b>	<b>Westport</b>
<b>Tower Height:</b>	<b>180 ft.</b>
<b>Tower Style:</b>	<b>New Monopole</b>
<b>Base Station TX output</b>	20 W
<b>Number of channels</b>	8
<b>Antenna Model</b>	DR65-18-02DPL2Q
<b>Cable Size</b>	1 5/8 in.
<b>Cable Length</b>	160 ft.
<b>Antenna Height</b>	125.0 ft.
<b>Ground Reflection</b>	1.6
<b>Frequency</b>	1935.0 MHz
<b>Jumper &amp; Connector loss</b>	1.27 dB
<b>Antenna Gain</b>	17.3 dBi
<b>Cable Loss per foot</b>	0.0116 dB
<b>Total Cable Loss</b>	1.8560 dB
<b>Total Attenuation</b>	3.1220 dB
<b>Total EIRP per Channel</b>	57.19 dBm
<b>(In Watts)</b>	523.40 W
<b>Total EIRP per Sector</b>	66.22 dBm
<b>(In Watts)</b>	4187.16 W
<b>nsg</b>	14.1780
<b>Power Density (S) =</b>	<b>0.064870 mW/cm<sup>2</sup></b>
<b>T-Mobile Worst Case % MPE =</b>	<b>6.4870%</b>
<b>Equation Used :</b>	$S = \frac{(1000)(grf)^2 (Power)^{10}}{4\pi (R)^2}$ <small>Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997</small>

Co-Location Total	
Carrier	% of Standard
Verizon	30.5900 %
Cingular	5.5200 %
Sprint PCS	
AT&T Wireless	3.9300 %
Nextel	
State Police	1.9300 %
<b>Total Excluding T-Mobile</b>	<b>41.9700 %</b>
T-Mobile	6.4870
<b>Total % MPE for Site</b>	<b>48.4570%</b>

Relative Gain Power Density	
<b>Antenna Relative Gain Factor</b>	0.0 dBi
<b>Total Attenuation</b>	3.1220 dB
<b>Total EIRP per Channel</b>	57.19 dBm
<b>(In Watts)</b>	523.40 W
<b>Total EIRP per Sector</b>	66.22 dBm
<b>(In Watts)</b>	4187.16 W
<b>nsg</b>	14.1780
<b>Power Density (S) =</b>	<b>0.064870 mW/cm<sup>2</sup></b>
<b>T-Mobile Relative Gain % MPE =</b>	<b>6.4870%</b>