

# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

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

October 25, 2005

New Cingular Wireless PCS, LLC  
c/o David Malko  
36 Quarry Road  
Chester, VT 05143

RE: **EM-CING-051-103-135-035-050922** - New Cingular Wireless PCS, LLC. notice of intent to modify existing telecommunications facilities located at 281 Woodhouse Road, Fairfield; 3965 Congress Street, Fairfield; 600 Connecticut Ave., Norwalk; 1590 Newfield Ave, Stamford; and 126 Ledge Road, Darien, Connecticut.

Dear Mr. Malko:

At a public meeting held on October 19, 2005, the Connecticut Siting Council (Council) acknowledged your notice to modify these existing telecommunications facilities, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions for the 600 Connecticut Avenue, Norwalk site:

1. The applicant shall be responsible for the maintenance and replacement of the existing chain link fence enclosure, including the removal of weeds, and provide for the planting of 6 new evergreen trees on the northwest corner of the enclosure.
2. The applicant shall replace several existing plantings as noted on the City of Norwalk site plan dated October 5, 2005.
3. The replacement antennas shall be a color (or painted accordingly) to match the existing structure.
4. A geotechnical consultant shall verify the soil capacity prior to the antenna swap, as recommended in the structural review letter sealed by Oscar Pedraza, P.E. and the results shall be filed with the Council.

The proposed modifications are to be implemented as specified here and in your notice dated September 20, 2005, including the placement of all necessary equipment and shelters within the tower compounds. 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 existing facility sites that would not increase tower heights, extend the boundaries of the tower sites, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power densities measured at the tower site boundaries to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on these towers.

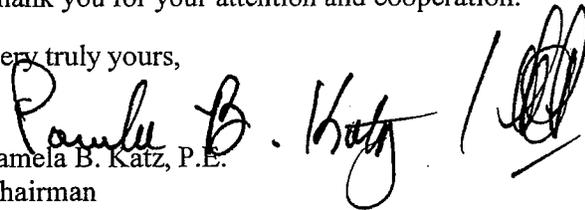
This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to any of these facilities will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure



and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

  
Pamela B. Katz, P.E.  
Chairman

PBK/laf

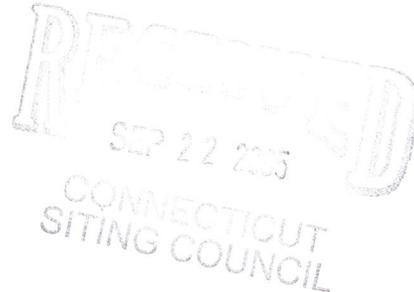
- c: The Honorable Evonne M. Klein, First Selectman, Town of Darien
- John Crary, Town Administrator, Town of Darien
- David J. Keating, Zoning Enforcement Officer, Town of Darien
- The Honorable Kenneth A. Flatto, First Selectman, Town of Fairfield
- Joseph E. Devonshuk, Town Planner, Town of Fairfield
- The Honorable Alex A. Knopp, Mayor, City of Norwalk
- Michael Greene, Director of Planning and Zoning, City of Norwalk
- The Honorable Dannel P. Malloy, Mayor, City of Stamford
- Robert Stein, Planning and Zoning Director, City of Stamford
- Christopher B. Fisher, Esq., Cuddy & Feder LLP
- Kenneth C. Baldwin, Esq., Robinson & Cole LLP
- Christine Farrell, T-Mobile
- Jeffrey W. Barbadora, Crown Atlantic Company LLC
- Melanie Girton, Property Management Dept., Spectrasite Communications



~ ORIGINAL ~

September 20, 2005

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



Re: **Notice of Exempt Modifications to Various Facilities in the  
Town(s) of Fairfield, Norwalk, Stamford and Darien, Connecticut**

Dear Mr. Phelps:

As part of its merger and integration efforts, New Cingular Wireless PCS, LLC ("Cingular" or "the Company") intends to modify instrumentation and/or antenna configurations at five existing facilities located in the Towns of Fairfield, Norwalk, Stamford and Darien, Connecticut. Please accept this letter and attachments as notification, pursuant to R.C.S.A. § 16-50j-73, of construction that constitutes exempt modifications pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of each of the municipalities in which an affected cell is located.

The five sites which are the subject of this filing have been grouped based on their location and proximity and are discussed in more detail below. Additional exempt modification notifications will follow in the near future and will cover similarly grouped facilities within the balance of Fairfield County.

### **General**

The current project involves changes at most of Cingular's cell sites in Fairfield County including over 40 sites under Council jurisdiction. The modifications will allow Cingular to operate its wireless communications services in the 1900 MHz frequency band in addition to its 850 MHz operations. At a typical site, this will be accomplished through the removal of nine (9) existing 850 MHz only antennas and their replacement with six (6) 850/1900 MHz dual-band antennas. Since each of the new, dual-band antennas is fed by two transmission lines, the typical number of such transmission lines at each site will increase from nine to a total of 12. In addition, tower mounted amplifiers, diplexers and small miscellaneous electronics will also be installed on the antenna platforms. The new antennas, transmission lines and tower mounted equipment have been properly reflected in the structural analyses performed for the towers and attached to this filing. A more detailed analysis of each of the five sites follows.

### **Site 1**

**Site 1** is located at 281 Woodhouse Road, Fairfield, CT and is owned by the Crown Castle (Cingular Site #2105). On the property are a 171-foot monopole tower, three equipment shelters and two pad mounted equipment cabinets. In addition to Cingular, the tower currently supports antennas of wireless carriers AT&T Wireless, T-Mobile and Verizon as well as PageNet, XM Radio and Metricom.

Cingular proposes to remove their nine (9) existing single-band antennas and install six (6) Powerwave Model 7770.00 dual-band directional antennas. The new antennas are 55" in height and will be mounted on the same platform as the existing antennas will a center of radiation of 152' above ground level (AGL). Six (6) tower mounted amplifiers and six (6) diplexers along with miscellaneous electronics to provide remote downtilting capabilities will also be installed on the existing antenna platform. Technical specification sheets for the antennas, amplifiers and diplexers are included the General Information section of the attachments to this notice. Additional radio equipment will be located within the Company's existing 20' x 26' equipment shelter at the base of the tower. Since each new antenna requires two feeds from the radio equipment, new transmission lines will be added to the tower bringing the total number of lines to 12. A structural analysis has been performed for the tower taking into account the new antennas, transmission lines and other equipment and is included in the site specific section of the attachments. Site plans, elevations and photographs of the site are also included.

Based on the most recent filing for this site, the "worst-case" predicted RF power density for a point at the base of the tower, *excluding the operations of Cingular and AT&T Wireless*, is calculated to be approximately 34.36% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site. A similar "worst-case" calculation for a point of at the base of the tower indicates that when fully implemented, New Cingular's dual-band operations together with the powering down of the AT&T site would contribute approximately 5.15% of the standard. The calculated "worst-case" power density for the combined operations at the site would therefore be approximately 39.51% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

### **Site 2**

**Site 2** is located at 3965 Congress Street, Fairfield, CT and is owned by the Town of Fairfield (Cingular Site #2128). On the property are a 150-foot monopole tower, various equipment shelters and pad mounted equipment cabinets. In addition to Cingular, the tower currently supports antennas of wireless carriers AT&T Wireless, T-Mobile, Nextel, Sprint and Verizon as well as the Town of Fairfield.

Cingular proposes to remove their nine (9) existing single-band antennas and install six (6) Powerwave Model 7770.00 dual-band directional antennas. The new antennas are 55" in height and will be mounted on the same platform as the existing antennas will a center of radiation of 138' above ground level (AGL). Six (6) tower mounted amplifiers

and six (6) diplexers along with miscellaneous electronics to provide remote downtilting capabilities will also be installed on the existing antenna platform. Technical specification sheets for the antennas, amplifiers and diplexers are included the General Information section of the attachments to this notice. Additional radio equipment will be located within the Company's existing 11' x 26' equipment shelter at the base of the tower. Since each new antenna requires two feeds from the radio equipment, new transmission lines will be added to the tower bringing the total number of lines to 12. A structural analysis has been performed for the tower taking into account the new antennas, transmission lines and other equipment and is included in the site specific section of the attachments. Site plans, elevations and photographs of the site are also included.

Based on the most recent filing for this site, the "worst-case" predicted RF power density for a point at the base of the tower, *excluding the operations of Cingular and AT&T Wireless*, is calculated to be approximately 12.22% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site. A similar "worst-case" calculation for a point of at the base of the tower indicates that when fully implemented, New Cingular's dual-band operations together with the powering down of the AT&T site would contribute approximately 6.37% of the standard. The calculated "worst-case" power density for the combined operations at the site would therefore be approximately 18.59% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

### **Site 3**

**Site 3** is located at 613 Connecticut Ave., Norwalk, CT and is owned by Cingular (Cingular Site #2108). On the property are a 150-foot monopole tower and an equipment shelter. There are no additional wireless carriers at the site.

Cingular proposes to remove their nine (9) existing single-band antennas and install six (6) Powerwave Model 7770.00 dual-band directional antennas. The new antennas are 55" in height and will be mounted on the same platform as the existing antennas will a center of radiation of 155' above ground level (AGL). Six (6) tower mounted amplifiers and six (6) diplexers along with miscellaneous electronics to provide remote downtilting capabilities will also be installed on the existing antenna platform. Technical specification sheets for the antennas, amplifiers and diplexers are included the General Information section of the attachments to this notice. Additional radio equipment will be located within the Company's existing 20' x 20' equipment shelter at the base of the tower. Since each new antenna requires two feeds from the radio equipment, new transmission lines will be added to the tower bringing the total number of lines to 12. A structural analysis has been performed for the tower taking into account the new antennas, transmission lines and other equipment and is included in the site specific section of the attachments. Site plans, elevations and photographs of the site are also included.

A "worst-case" calculation for a point of at the base of the tower indicates that when fully implemented, New Cingular's dual-band operations would contribute

approximately 5.65% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

#### **Site 4**

**Site 4** is located at 1590 Newfield Avenue, Stamford, CT and is owned by Spectrasite (Cingular Site #2109). On the property are a 150-foot monopole tower, various equipment shelters and pad mounted equipment cabinets. In addition to Cingular, the tower currently supports antennas of wireless carriers AT&T Wireless, T-Mobile, Nextel, Sprint and Verizon.

Cingular proposes to remove their nine (9) existing single-band antennas and install six (6) Powerwave Model 7770.00 dual-band directional antennas. The new antennas are 55" in height and will be mounted on the same platform as the existing antennas will a center of radiation of 152' above ground level (AGL). Six (6) tower mounted amplifiers and six (6) diplexers along with miscellaneous electronics to provide remote downtilting capabilities will also be installed on the existing antenna platform. Technical specification sheets for the antennas, amplifiers and diplexers are included the General Information section of the attachments to this notice. Additional radio equipment will be located within the Company's existing 20' x 20' equipment shelter at the base of the tower. Since each new antenna requires two feeds from the radio equipment, new transmission lines will be added to the tower bringing the total number of lines to 12. A structural analysis has been performed for the tower taking into account the new antennas, transmission lines and other equipment and is included in the site specific section of the attachments. Site plans, elevations and photographs of the site are also included.

Based on the most recent filing for this site, the "worst-case" predicted RF power density for a point at the base of the tower, *excluding the operations of Cingular and AT&T Wireless*, is calculated to be approximately 16.07% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site. A similar "worst-case" calculation for a point of at the base of the tower indicates that when fully implemented, New Cingular's dual-band operations together with the powering down of the AT&T site would contribute approximately 6.30% of the standard. The calculated "worst-case" power density for the combined operations at the site would therefore be approximately 22.37% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

#### **Site 5**

**Site 5** is located at 50 Ledge Road, Darien, CT and is owned by Crown Castle (Cingular Site #2104). On the property are a 100-foot monopole tower, two equipment shelters and pad mounted equipment cabinets. In addition to Cingular, the tower currently supports antennas of wireless carriers Nextel, Sprint and Verizon.

Cingular proposes to remove their nine (9) existing single-band antennas and install six (6) Powerwave Model 7770.00 dual-band directional antennas. The new antennas are

55" in height and will be mounted on the same platform as the existing antennas with a center of radiation of 89' above ground level (AGL). Six (6) tower mounted amplifiers and six (6) diplexers along with miscellaneous electronics to provide remote downtilting capabilities will also be installed on the existing antenna platform. Technical specification sheets for the antennas, amplifiers and diplexers are included in the General Information section of the attachments to this notice. Additional radio equipment will be located within the Company's existing 12' x 15' equipment room at the base of the tower. Since each new antenna requires two feeds from the radio equipment, new transmission lines will be added to the tower bringing the total number of lines to 12. A structural analysis has been performed for the tower taking into account the new antennas, transmission lines and other equipment and is included in the site specific section of the attachments. Site plans, elevations and photographs of the site are also included.

Based on the most recent filing for this site, the "worst-case" predicted RF power density for a point at the base of the tower, *excluding the operations of Cingular*, is calculated to be approximately 32.32% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site. A similar "worst-case" calculation for a point at the base of the tower indicates that when fully implemented, New Cingular's dual-band operations would contribute approximately 17.16% of the standard. The calculated "worst-case" power density for the combined operations at the site would therefore be approximately 49.48% of the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

### **Summary**

The proposed changes to the facilities do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facilities will not be significantly changed or altered. Rather, the planned modifications to the facilities fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the heights of the towers. In all cases, the number of antennas will be reduced from nine to six and will result in a reduction in the towers' profiles. The enclosed tower drawings confirm that the planned modifications will not increase the heights or the profiles of the towers. Based on the attached structural analyses, the towers are capable of supporting the reconfigured loads discussed herein.
2. The installation of the proposed equipment, as reflected on the attached site plans, will not require an extension of the site boundaries.
3. The proposed modifications to the facility will not increase the noise levels at the existing facility by six decibels or more.

Mr. S. Derek Phelps  
September 20, 2005  
Page 6

4. As discussed above, the operation of the reconfigured sites will not increase the total radio frequency (RF) power density to a level at or above the applicable standard.

For the foregoing reasons, New Cingular Wireless PCS, LLC respectfully submits that the proposed addition of antennas and equipment at the subject facilities constitute exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

A handwritten signature in blue ink, appearing to read "David S. Malko". The signature is fluid and cursive, with a long horizontal stroke at the end.

David S. Malko, P.E.  
Consultant for New Cingular Wireless

Enclosures

cc: Honorable Kenneth A. Flatto, First Selectman, Town of Fairfield  
Honorable Alex A. Knopp, Mayor, City of Norwalk  
Honorable Dannel P. Malloy, Mayor, City of Stamford  
Honorable Evonne M. Klein, First Selectwoman, Town of Darien

## General Information Attachments

1. Antenna Specifications
2. Tower Mounted Amplifier Specifications
3. Diplexer Specifications

# Dual Broadband Antenna

90° 1.4 m MET Antenna

806-960/1710-2170 MHz

Part Number:  
7770.00

Horizontal Beamwidth: 90°  
Gain: 13.5/16 dBi

Electrical Downtilt: Adjustable  
Connector Type: 7/16 female

The Powerwave dual band dual polarized broadband antenna has individual adjustable electrical downtilt per band (upgradeable to Remote Electrical Tilt (RET)). Four connector ports allow separate tilts on each frequency band and ensure the use of diversity concepts. The phase shifter technology, based on a patented sliding dielectric, minimizes intermodulation distortion and maximizes efficiency. The slant +/- 45° dual polarization system provides the independent fading signals needed for achieving top-quality coverage via diversity concepts. The Powerwave Broadband antenna design is based on a patented stacked aperture-coupled patch technology, which provides high isolation performance and a wide VSWR bandwidth. The antennas have superior radiation patterns due to a unique reflector design which provides a very small variation of the -3dB horizontal beam width over the frequency band as well as a high front-to-back ratio.



## Key Benefits

- Excellent broad- and multi-band capabilities
- Polarization purity makes good diversity gain
- Excellent pattern performance and high gain over frequency
- High passive intermodulation performance
- Light, slim and robust design

# Preliminary

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# Dual Broadband Antenna

806-960/1710-2170 MHz

## Electrical Specifications (Preliminary)

Frequency band (MHz)	806-960		1710-2170
Gain, $\pm 0.5$ dB (dBi)	13.5		16.0
Polarization		Dual linear $\pm 45^\circ$	
Nominal Impedance (Ohm)		50	
VSWR	1.5:1		
VSWR			1.5:1
Isolation between inputs (dB)	30		
Isolation between inputs (dB)			30
Inter band isolation (dB)		40	
Horizontal -3 dB beamwidth	$85 \pm 5^\circ$		$85 \pm 5^\circ$
Tracking, Horizontal plane, $\pm 60^\circ$ (dB)	$< 2.0$		
Tracking, Horizontal plane, $\pm 60^\circ$ (dB)			$< 2.0$
Electrical downtilt range (adjustable)	$0^\circ$ to $10^\circ$		$0^\circ$ to $8^\circ$
Vertical -3 dB beamwidth	$14.3 \pm 2.0^\circ$		$6.6 \pm 1^\circ$
Sidelobe suppression, Vertical 1st upper (dB)	$> 17, 16, 15$ $x=0, 5, 10^\circ$ MET		$> 17, 16, 15$ $x=0, 4, 8^\circ$ MET
Vertical beam squint	$< 0.8^\circ$		$< 0.5^\circ$
First null-fill (dB)	$< -25$		$< -25$
Front-to-back ratio (dB)	$> 25$		$> 27$
Front-to-back ratio, total power (dB)	$> 20$		$> 23$
IM3, 2Tx@43dBm (dBc)	$< -153$		
IM3, 2Tx@43dBm (dBc)			$< -153$
IM7, 2Tx@43dBm (dBc)			$< -160$
Power Handling, Average per input (W)	400		250
Power Handling, Average total (W)	800		500

All specifications are subject to change without notice.  
Contact your Powerwave representative for complete performance data.

## Mechanical Specifications

Connector Type	4 x 7/16 DIN female
Connector Position	Bottom
Dimensions, HxWxD	1408mm x 280mm x 125mm (55"x11"x5")
Weight Including Brackets	15.8 kg (35 lbs)
Wind Load, Frontal, 42m/s Cd=1	435N (98 lbf)
Survival Wind Speed (m/s)	70 (156mph)
Lightning Protection	DC grounded
Radome Material	GRP
Radome Color	Light Gray
Mounting	Pre-mounted Standard Brackets
Packing Size	1550mm x 355mm x 255mm (61"x14"x10")

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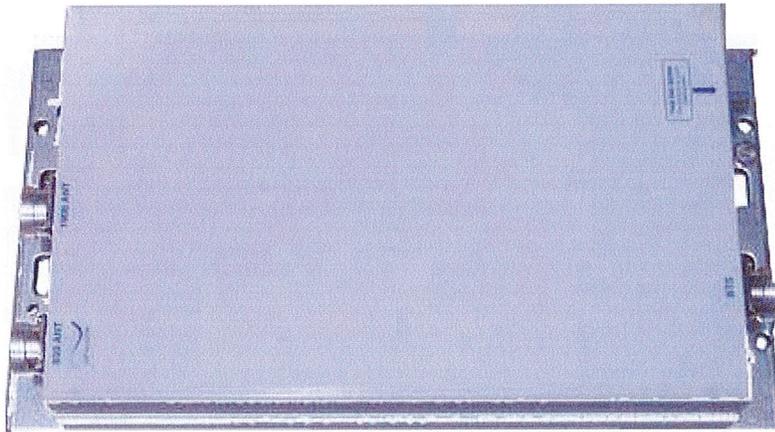
# Tower Mounted Amplifier

LGP21401 TMA-DD-1900 FB with 850 Bypass Tower Mounted Amplifier

800/1900 MHz

Frequency: 1850-1990 MHz Band | IMD Specification: <-118dBm  
Gain: 12 dBd | Return Loss: 18 dB or better

Powerwave's 21401 Series of tower mounted amplifiers are designed for full band coverage of the PCS-1900 band with an 800 MHz cellular band bypass. It has dual duplex capability so you can use one line for RX/TX and transmit through the TMA while amplifying RX on the same line. Deployed in a network it will increase capacity and coverage as well as extend the battery life time for the handsets. The 800 MHz cellular band passes through the TMA without amplification.



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# LGP21401 - Tower Mount Amplifier

800/1900 MHz

Gain	12 dB
Uplink frequency	1850-1910 MHz
Downlink frequency	1930 – 1990 MHz
Return loss	18 dB or better
Noise figure	1.5 dB typical
Intermodulation@2x43dBm carriers	<-118 dBm in receive band
Output 3 <sup>rd</sup> order Intercept Point (OIP3)	>+22 dBm
Rejection 1912 MHz (RX in Filter)	10 dB
Rejection in TX band	80 dB
Alarm functionality	Two levels, individually supervised LNA branches
Power consumption	1.5 W per LNA @12 VDC
Supply voltage	9 - 15 V

## Mechanical Specifications

RF connectors	7/16 DIN female(s)
Dimensions	14"x7"x2.7" (365x176x68mm)
Weight	17.5 lbs (<8kg)
Mounting kit	Mounting kit is included for pole and wall. Other types may be available on request.

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Powerwave Technologies, Inc. is an ISO9001 and TL9000 certified company, is a leading supplier of high performance RF infrastructure products for use in wireless communications networks. Powerwave products are utilized in both cellular and PCS base stations in both digital and analog networks. ©Copyright February 2003, Powerwave Technologies, Inc. All Rights reserved. Powerwave, Powerwave Technologies are and the Powerwave logo are registered trademarks of Powerwave Technologies, Inc.

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# 824-896/1850-1990 MHz Diplexer

Diplexer for 824-896/1850-1990MHz with Configurable DC Transparency

Part Number:  
LGP13519

Frequency Range: 824-894/1850-  
1990 MHz

Return Loss: >20 dB  
Insertion Loss: 0.2 dB / 0.3 dB

824-894/1850-1990

The Powerwave® Diplexer filter DCT is available both as single and double unit. Each diplexer has one port for 824-894 systems, one port for 1850-1990 GSM systems and a common port. It is designed for outdoor use and intended for co-location of base stations to enable sharing of feeder, TMA system and antenna. The unit can be used both at the BTS and for combining frequency bands to a common port and at the antenna end for splitting the frequency bands to separate antennas.



824-894/1850-1990 MHz Diplexer

#### Key Benefits:

- Compact Design
- Inbuilt DC Transparency and Subcarrier Support
- Excellent Power Handling
- Negligible Transmit Band Loss
- Lightning Protected on All Ports

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# 824-894/1850-1990 Diplexer



824-894/1850-1990

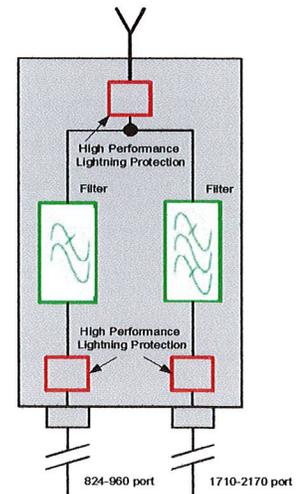
## Electrical Specifications

800-900 Port	Frequency Range, Full Band (MHz)	824-894 MHz
	Insertion Loss (dB)	<0.2 dB
	Return Loss (dB)	>20 dB
	Rejection 1850-1990 MHz	>55 dB
	Rejection 2110-2170 MHz	>55 dB
	Average Power Handling	>500 W
	Peak Power	10 kW
	IM, 2Tx@43dBm (dBc)	<-153
1900 Port	Frequency Range, Full Band (MHz)	1850-1990 MHz
	Insertion Loss (dB)	<0.3 dB
	Return Loss (dB)	>20 dB
	Rejection 824-896 MHz	>54 dB
	Rejection 896-960 MHz	>54 dB
	Average Power Handling	>250 W
	Peak Power	5 kW
	IM, 2Tx@43dBm (dBc)	<-153

All specifications are subject to change without notice. Contact your Powerwave representative for complete performance data.

## Mechanical Specifications

Size, WxHxD (without mounting plate)	4.4" x 6.3" x 3" (112x158x74mm)
Weight	2.4 kg (5.3 lbs)
Color	Off White (NCS 1502-R)
Housing	Aluminum, IP 65
RF-connectors	DIN 7/16 female
Mounting Kit	Hose Clamps in Stainless Steel
Temperature Range	-40 °C to +65 °C
MTBF	30 Million Hours
Safety	EN 60 950, UL 69 950, ETL
Ingress Protection IP 65	EN 60 529
Environmental	ETS 300 019



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## Site Specific Attachments

### Site 1

1. Site Plans
2. Tower Structural Analysis
3. Site Photographs

APPROVALS		
NAME (PRINT)	SIGNATURE	DATE
CINGULAR		
SAI		
SITING COUNCIL COMMITTEE		
OTHER		

DRAWING INDEX	REV
2105 - T1 TITLE SHEET	1
2105 - C1 SITE PLAN	1
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2105 - C4 ANTENNA PLUMBING DIAGRAM-BETA	1
2105 - C5 ANTENNA PLUMBING DIAGRAM-GAMMA	1
2105 - C6 RF DATA INFORMATION	1

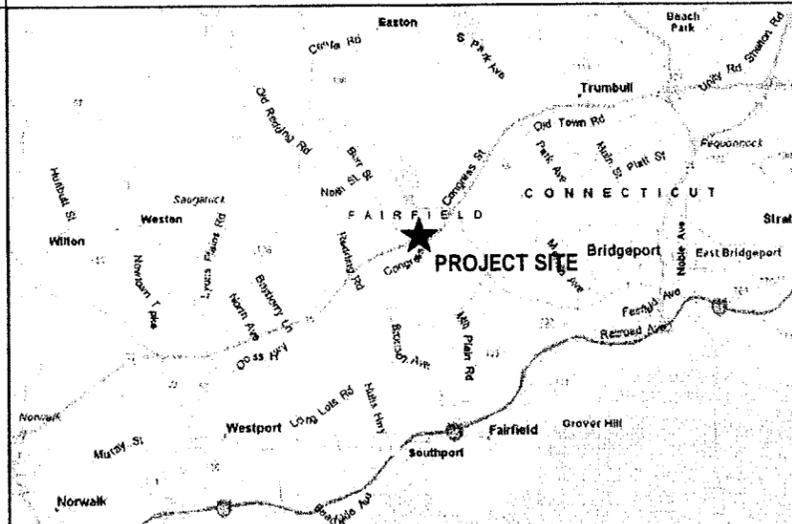
PROJECT INFORMATION	
SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE NUMBER:	2105
SITE NAME:	FAIRFIELD WOODHOUSE
ADDRESS:	281 WOODHOUSE ROAD
CITY, STATE ZIP:	FAIRFIELD, CT 06430
LATITUDE:	41° 11' 45.3"
LONGITUDE:	-73° 16' 52.9"
JURISDICTION:	FAIRFIELD COUNTY
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
SITE TYPE:	MONOPOLE TOWER
RAD CENTER:	152'-0"
OWNER:	CROWN CASTLE BU# 806355



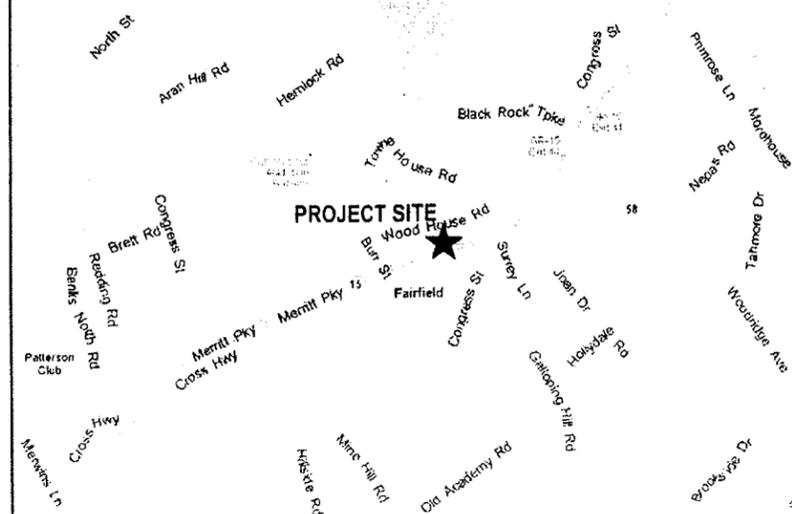
**SITE NUMBER: 2105**  
**SITE NAME: FAIRFIELD WOODHOUSE**

**MAPS & DIRECTIONS**

95 SOUTH TO EXIT 22 (RT 135), TAKE RT 135 NORTH TO A LEFT ONTO RT 58 NORTH (2 MILES), TAKE 58 NORTH TO A LEFT ONTO TANGLEWOOD RD. (3/4 MILE AFTER JUNCTION OF RT 15), TAKE A LEFT AT THE END OF TANGLEWOOD, & A RIGHT AT THE END OF TOWN HOUSE RD. SITE IN REAR OF #281 WOODHOUSE INN.



**VICINITY MAP**



**SITE MAP**

**BLDG. CODES AND STANDARDS**

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:  
INTERNATIONAL BUILDING CODE (IBC), 2003

ELECTRICAL CODE:  
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 - 2002 NATIONAL ELECTRICAL CODE

LIGHTNING PROTECTION CODE:  
NFPA 780 - 2000, LIGHTNING PROTECTION CODE

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:  
 AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE  
 AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION  
 TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:  
 TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM  
 IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS  
 TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.



SITE NUMBER:  
2105

SITE NAME:  
FAIRFIELD WOODHOUSE

SITE ADDRESS:  
281 WOODHOUSE ROAD  
FAIRFIELD, CT 06430

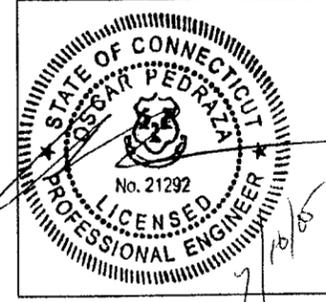
IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR

CHECKED BY: OP

PROJECT NO: 0504108-895171

SUBMITTALS		
NO	DESCRIPTION	BY DATE
1	SITING COMMITTEE CDS	JR 07/15/05

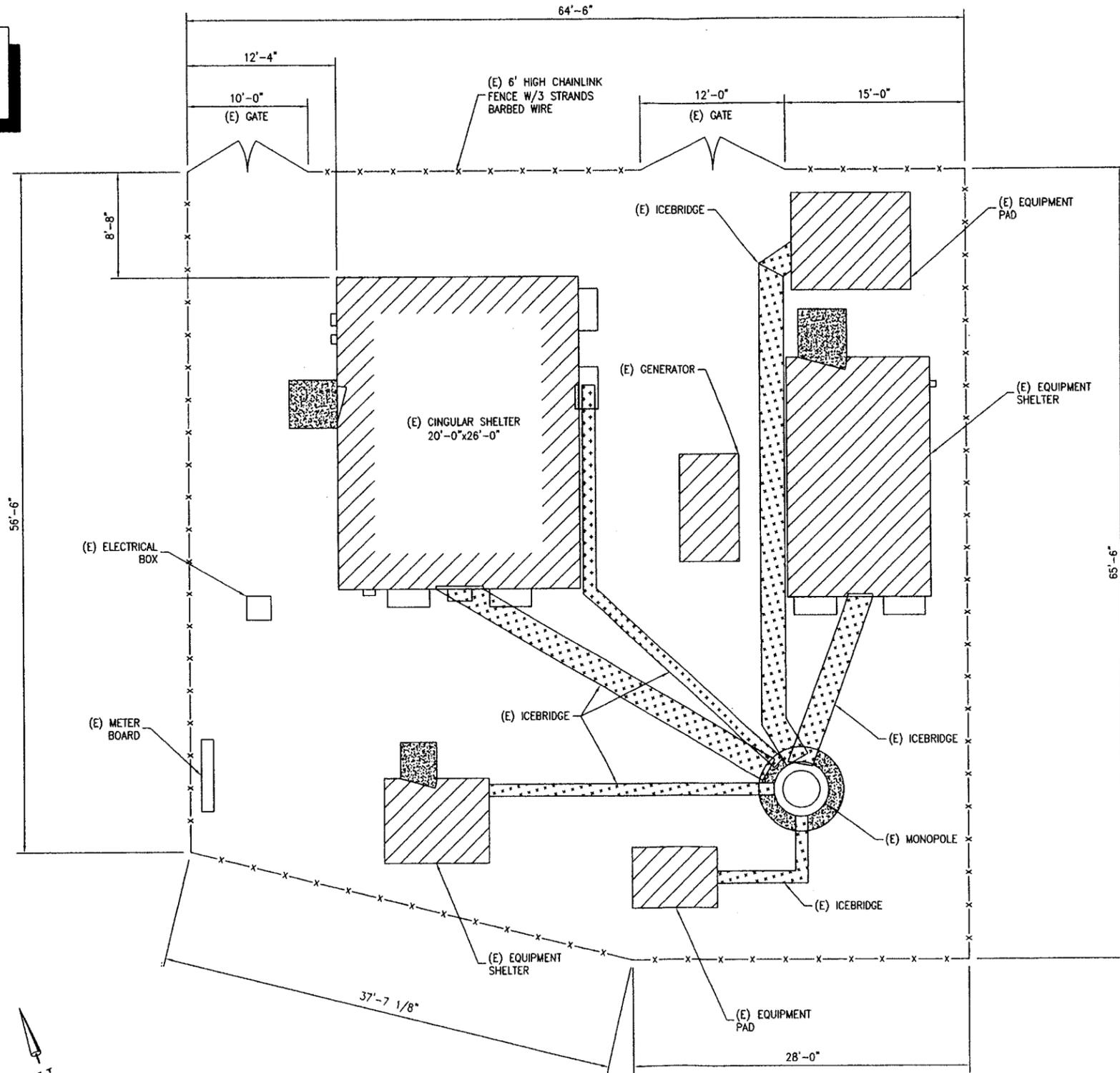


SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T1**

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PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, AND 3 PROPOSED COAXIAL CABLES FOR CINGULAR WIRELESS



**SITE PLAN**  
 SCALE: 11x17 - 1"=10'-0"  
 SCALE: 22x34 - 1"=5'-0"

1  
C1



SITE NUMBER:  
2105  
 SITE NAME:  
FAIRFIELD WOODHOUSE  
 SITE ADDRESS:  
281 WOODHOUSE ROAD  
FAIRFIELD, CT 06430

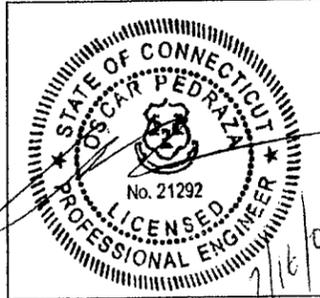
IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR

CHECKED BY: OP

PROJECT NO: 05044106-AB95171

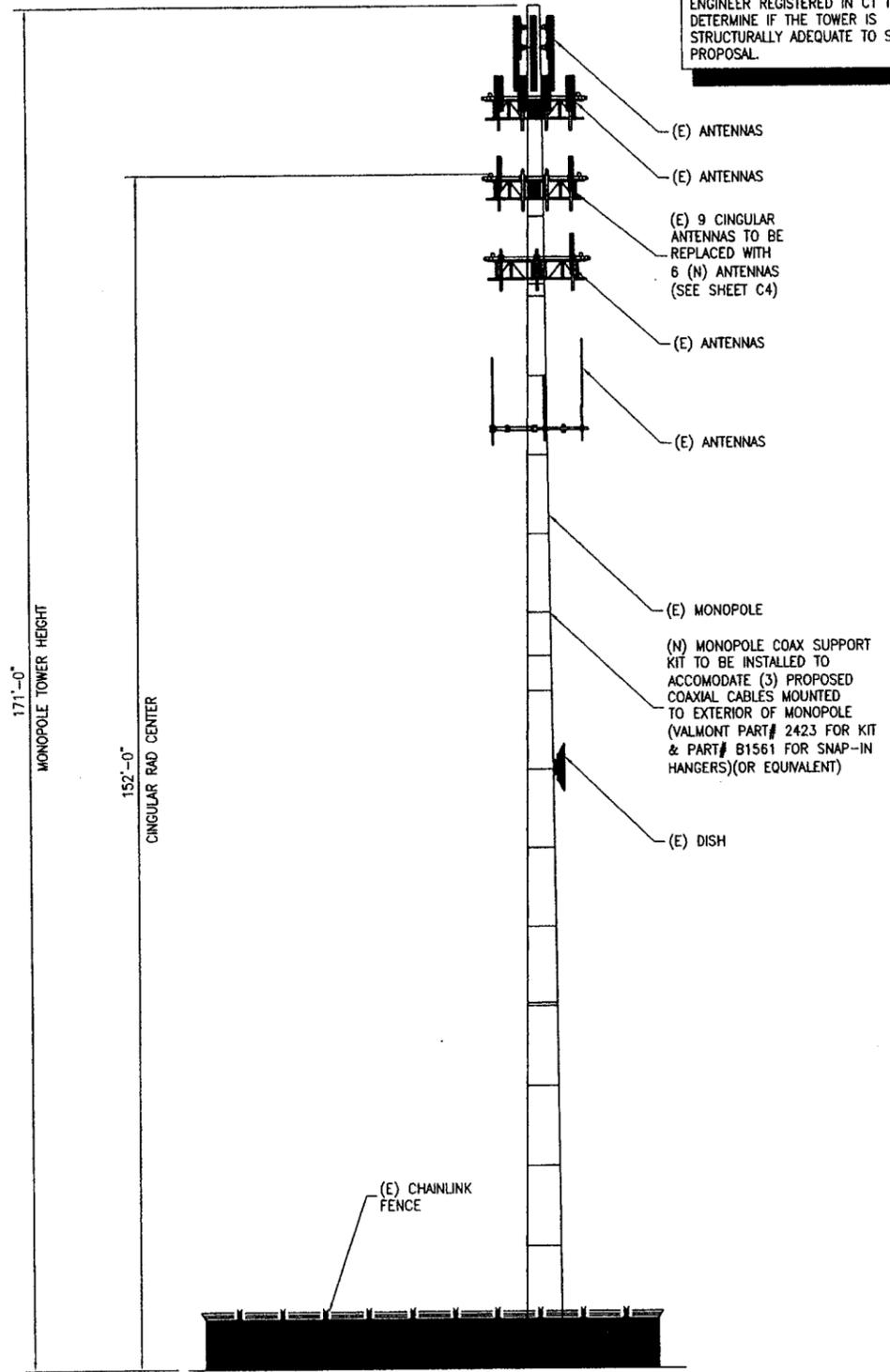
SUBMITTALS		
NO	DESCRIPTION	BY DATE
1	SITING COMMITTEE CDS	JR 07/15/05



SHEET TITLE  
**SITE PLAN**

SHEET NUMBER  
**C1**

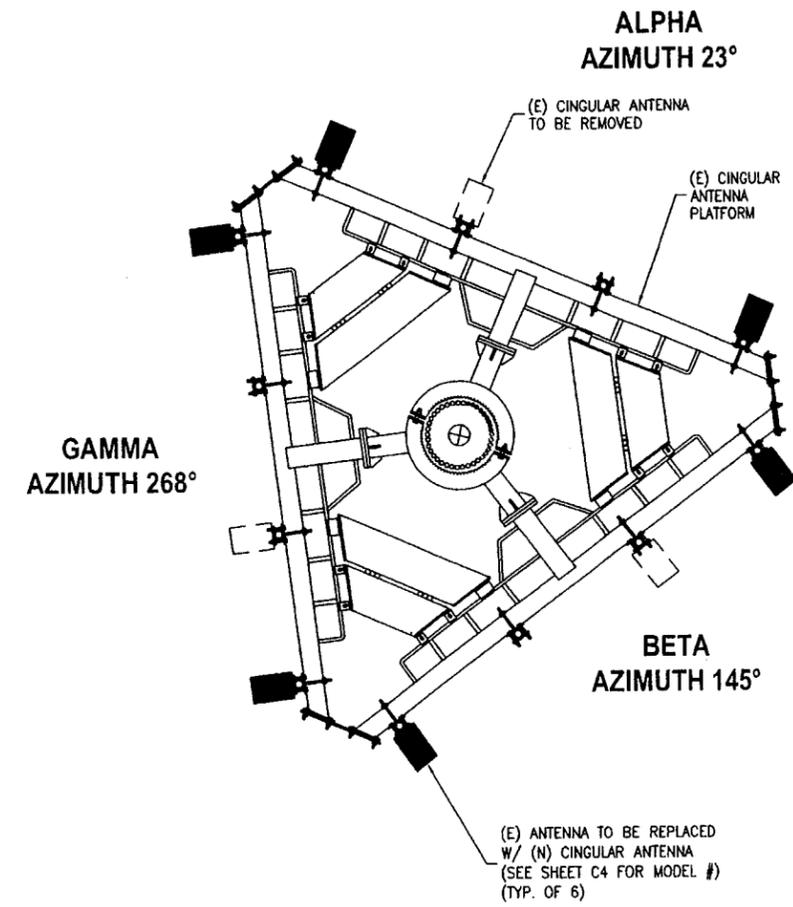
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**SITE ELEVATION**  
 SCALE: 11x17 - 1"=20'-0"  
 SCALE: 22x34 - 1"=10'-0"

1  
C2

PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, AND 3 PROPOSED COAXIAL CABLES FOR CINGULAR WIRELESS



**ANTENNA PLAN VIEW**  
 SCALE: 11x17 - NTS  
 SCALE: 22x34 - NTS

2  
C2

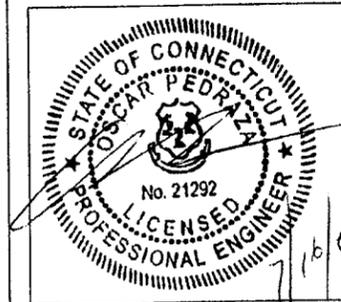


SITE NUMBER: 2105  
 SITE NAME: FAIRFIELD WOODHOUSE  
 SITE ADDRESS: 281 WOODHOUSE ROAD FAIRFIELD, CT 06430

IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR  
 CHECKED BY: DP  
 PROJECT NO: 05044106-AG95171

SUBMITTALS		
NO	DESCRIPTION	BY DATE
1	SITING COMMITTEE CDS	JR 07/15/05



SHEET TITLE  
**SITE ELEVATION & ANT PLAN**

SHEET NUMBER  
**C2**



John Murphy  
Crown Castle International  
500 West Cummings Park, Suite 3400  
Woburn, Massachusetts  
(781) 729-4406

August 9, 2005

**Subject:** Structural Analysis Report

**Carrier Designation** Cingular Co-Location  
Site Name: Fairfield -- Woodhouse Rd.  
Site Number: 2105

**Crown Castle Designation** BU Number: 806355  
Site Name: BRG 126 943086

**GPD Associate Designation** Project Number: 2005278.93

**Site Data** 281 Woodhouse Road, Fairfield, Connecticut 06430  
Latitude 41° 11' 45.3", Longitude 73° 16' 52.9"  
171' EEI Monopole

Dear Mr. Murphy,

GPD is pleased to submit this structural analysis report as a determination of the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the addition of the following proposed loading configuration:

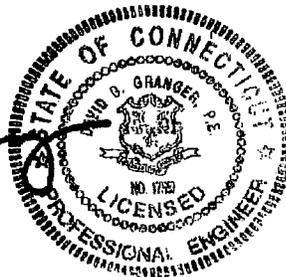
Elev. 150' (6) Powerwave 7770.00 Antennas on a 12' Platform w/ (3) 1-1/4" internal coax  
(6) Powerwave LGP2140x Tower mounted amplifiers mounted behind the antennas

This analysis has been performed in accordance with the TIA/EIA-222-F standard based upon a wind speed condition of 85 mph, and the Connecticut Building Code based on a 115 mph 3 second gust. Based on our analysis we have determined the tower and its foundation are sufficient for the proposed loading.

We at GPD appreciate the opportunity of providing our continuing professional services to you and Crown Castle International. If you have any questions please do not hesitate to call.

Respectfully submitted,

David B. Granger, P.E.  
Connecticut #: 17557



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## EXECUTIVE SUMMARY

The purpose of this analysis was to verify that the existing structure is capable of carrying the proposed loading configuration as specified by Cingular to Crown Castle International. This report was commissioned by Mr. John Murphy of Crown Castle International.

The existing tower is structurally satisfactory for the proposed loading configuration for a basic wind speed of 85 mph with ½" radial ice (25% reduction) in accordance with TIA/EIA-222-F, and a 115 mph 3 second gust in accordance with the Connecticut Building Code. The tower rating/capacity is 87.6%.

Foundation reactions, with the proposed loads, were found to be 53.8% of the original design reactions. If the existing foundation was properly designed for the original reactions, then it is our opinion that the foundation is adequate.

## ANALYSIS CRITERIA

The current requirements of TIA/EIA-222-F and the Connecticut Building Code are for a basic wind speed of 85 mph with ½" of radial ice. A 25% reduction in wind load is allowed when wind and ice are applied simultaneously. TIA/EIA-222-F requires towers within Fairfield County be analyzed with an 85 mph wind speed. The Connecticut Building Code requires structures within the tower's region to be analyzed using a 115 mph 3 second gust. In this case, the 85 mph sustained wind speed controls.

**Table 1 – Proposed Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Type	Number Of Feed Lines	Feed Line Size (Inches)
165	3	EMS Wireless	DR90-17-02DP	Flush	6 (External) 6 (External)	1-5/8 1-5/8
160	6	Decibel	DB948F85T2E-M	12' Platform w/ handrails	6	1-5/8
<b>150</b>	<b>6</b>	<b>Powerwave</b>	<b>7770.00</b>	12' Platform w/ handrails	9	1-1/4
	<b>6</b>	<b>Powerwave</b>	<b>LGP2140x TMA's</b>		3	<b>1-1/4</b>
140	6	EMS Wireless	RR90-17-02DP	12' Platform w/ handrails	18 (External)	1-5/8
	6 (Reserved)	EMS Wireless	RR90-17-02DP		6 (External)	1-5/8
125	1	Sinclair	SRL 420NHD-1	(2) 12' T-Arms	1	7/8
	1 (Reserved)	Sinclair	SRL 420NHD-1		1	7/8

Note: **Bold** indicates a new appurtenance. All coax are internal U.N.O.

**Table 2 – Existing and Reserved Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Type	Number Of Feed Lines	Feed Line Size (Inches)
165	3	EMS Wireless	DR90-17-02DP	Flush	6 (External) 6 (External)	1-5/8 1-5/8
160	6	Decibel	DB948F85T2E-M	12' Platform w/ handrails	6	1-5/8
<b>150</b>	<b>9</b>		Panel	12' Platform w/ handrails	9	1-1/4
140	6	EMS Wireless	RR90-17-02DP	12' Platform w/ handrails	18 (External)	1-5/8
	6 (Reserved)	EMS Wireless	RR90-17-02DP		6 (External)	1-5/8
125	1	Sinclair	SRL 420NHD-1	(2) 12' T-Arms	1	7/8
	1 (Reserved)	Sinclair	SRL 420NHD-1		1	7/8

## TOWER DESCRIPTION

The existing 171' monopole has 18 sides and is evenly tapered from 52.5" (flat-flat) at the base to 19.5" (flat-flat) at 156'. The top section of the monopole is a pipe with a constant round cross-section of 10.75" diameter. It has five major sections connected with slip joints from 0'-138' and a flange connection at 156'. The structure is galvanized and has no tower lighting.

The tower was originally designed for Bell Atlantic/CT by Engineering Endeavors, Incorporated of Mentor, Ohio for an 85 mph wind speed with ½" radial ice (25% reduction) in accordance with EIA/TIA-222-F.

**Table 3 – Original Design**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Type	Number Of Feed Lines	Feed Line Size (Inches)
160	12		ALP 9212	Std. AMPS Platform		
148	12		ALP 11011	Std. AMPS Platform		
138	6		APN 199015	Std. AMPS Platform		
128	12		ALP 9212	Std. AMPS Platform		
118	12		ALP 9212	Std. AMPS Platform		

## ANALYSIS PROCEDURE

**Table 4 – Documents Provided**

Document	Remarks	Reference	Source
Original Tower Drawings	Engineering Endeavors Incorporated Job #: 3761, dated 5/29/98	M. Morel	EI
Tower Extension Drawings	Engineering Endeavors Incorporated Job #: 5755, dated 10/11/99	Doc. ID# 653293	Crown DMZ

### *Analysis Methods*

ERI Tower (Version 3.0.0.16), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/EIA/TIA-222-F and all local building code requirements. Selected output from the analysis is included in Appendix A.

**Assumptions**

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 & 2, and the referenced drawings.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Associates should be allowed to review any new information to determine its effect on the structural integrity of the tower.

**ANALYSIS RESULTS**

**Table 5 – Tower Summary**

Section	Elevation (ft)	Yield Strength (KSI)	Capacity	Results
5	156 - 171	52	4.7%	Pass
4	133 - 156	65	37.9%	Pass
3	87 - 133	65	46.7%	Pass
2	43 - 87	65	49.6%	Pass
1	0 - 43	65	47.6%	Pass
Anchor Bolts		75	47.0%	Pass
Base Plate		60	87.6%	Pass
Foundation		53.8% of original design		Adequate

**Recommended Modifications**

The tower and its foundation are satisfactory for the proposed loading and do not require modifications.

**DISCLAIMER OF WARRANTIES**

The engineering services rendered by GPD ASSOCIATES in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. GPD ASSOCIATES does not analyze the fabrication, including welding, except as included in this report.

The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD Associates, but are beyond the scope of this report.

GPD ASSOCIATES makes no warranties, expressed or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD ASSOCIATES will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD ASSOCIATES pursuant to this report will be limited to the total fee received for preparation of this report.

## **APPENDIX A**

ERI Tower Output File

<b>ERITower</b>  <b>GPD Associates</b> 520 S. Main St., Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2102	<b>Job</b> BRG 126 943086 - BU# 806355	<b>Page</b> 1 of 3
	<b>Project</b> 2005278.93	<b>Date</b> 10:13:40 08/09/05
	<b>Client</b> Crown Castle	<b>Designed by</b> Jcheronis

**Tower Input Data**

There is a pole section.  
This tower is designed using the TIA/EIA-222-F standard.  
The following design criteria apply:  
Tower is located in Fairfield County, Connecticut.  
Basic wind speed of 85 mph.  
Nominal ice thickness of 0.5000 in.  
Ice density of 56 pcf.  
A wind speed of 74 mph is used in combination with ice.  
Temperature drop of 50 °F.  
Deflections calculated using a wind speed of 50 mph.  
User specified elevation for calculation of  $G_h$  is 156.00 ft.  
A non-linear (P-delta) analysis was used.  
Pressures are calculated at each section.  
Stress ratio used in pole design is 1.333.  
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

**Monopole Base Plate Data**

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	20
Embedment length	97.0000 in
$F_u$	4 ksi
Grout space	3.2500 in
Base plate grade	A500M-60
Base plate thickness	2.2500 in
Bolt circle diameter	61.0000 in
Outer diameter	67.0000 in
Inner diameter	47.5000 in
Base plate type	Plain Plate

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	$C_{AA}$		Weight
						No Ice	$f^2/B$	plf
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	167.00 - 8.00	1	No Ice	0.20	0.82
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	158.00 - 8.00	6	1/2" Ice	0.30	2.33
CR 1480 PE	A	No	Inside Pole	148.00 - 8.00	3	No Ice	0.00	0.82
LDF6-50A (1-1/4 FOAM)	A	No	Inside Pole	148.00 - 8.00	3	1/2" Ice	0.00	0.55
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	148.00 - 8.00	9	No Ice	0.00	0.66
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	148.00 - 8.00	9	1/2" Ice	0.00	0.66
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	138.00 - 8.00	3	No Ice	0.20	0.82
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	138.00 - 8.00	3	1/2" Ice	0.30	2.33
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	118.00 - 8.00	2	No Ice	0.00	0.33

<b>ERITower</b>  <b>GPD Associates</b> 520 S. Main St., Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2102	<b>Job</b> BRG 126 943086 - BU# 806355	<b>Page</b> 2 of 3
	<b>Project</b> 2005278.93	<b>Date</b> 10:13:40 08/09/05
	<b>Client</b> Crown Castle	<b>Designed by</b> jcheronis

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub>		Weight
						1/2" Ice	ft <sup>2</sup> /ft	plf
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	167.00 - 8.00	11	No Ice	0.00	0.33
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	138.00 - 8.00	21	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub>		Weight K	
			Horz ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>		
DR90-17-02DP w/Mount Pipe	A	From Centroid-Leg	1.50	0.00	0.0000	167.00	No Ice	10.35	7.15	0.09
							1/2" Ice	11.11	9.25	0.16
DR90-17-02DP w/Mount Pipe	B	From Centroid-Leg	1.50	0.00	0.0000	167.00	No Ice	10.35	7.15	0.09
							1/2" Ice	11.11	9.25	0.16
DR90-17-02DP w/Mount Pipe	C	From Centroid-Leg	1.50	0.00	0.0000	167.00	No Ice	10.35	7.15	0.09
							1/2" Ice	11.11	9.25	0.16
EEI 12' Platform	A	None			0.0000	158.00	No Ice	33.10	33.10	2.27
							1/2" Ice	47.10	47.10	2.70
(2) DB948F85T2E-M w/Mount Pipe	A	From Centroid-Leg	3.50	-2.00	0.0000	158.00	No Ice	2.62	4.92	0.03
							1/2" Ice	3.23	6.01	0.07
(2) DB948F85T2E-M w/Mount Pipe	B	From Centroid-Leg	3.50	-2.00	0.0000	158.00	No Ice	2.62	4.92	0.03
							1/2" Ice	3.23	6.01	0.07
(2) DB948F85T2E-M w/Mount Pipe	C	From Centroid-Leg	3.50	-2.00	0.0000	158.00	No Ice	2.62	4.92	0.03
							1/2" Ice	3.23	6.01	0.07
EEI 12' Platform	A	None			0.0000	148.00	No Ice	33.10	33.10	2.27
							1/2" Ice	47.10	47.10	2.70
(2) 7770.00 w/Mount Pipe	A	From Centroid-Leg	3.50	0.00	-7.0000	148.00	No Ice	6.58	4.94	0.08
							1/2" Ice	7.21	5.86	0.13
(2) 7770.00 w/Mount Pipe	B	From Centroid-Leg	3.50	0.00	-5.0000	148.00	No Ice	6.58	4.94	0.08
							1/2" Ice	7.21	5.86	0.13
(2) 7770.00 w/Mount Pipe	C	From Centroid-Leg	3.50	0.00	-2.0000	148.00	No Ice	6.58	4.94	0.08
							1/2" Ice	7.21	5.86	0.13
(2) LPG2140x	A	From Centroid-Leg	3.50	0.00	-7.0000	148.00	No Ice	0.00	0.37	0.02
							1/2" Ice	0.00	0.48	0.02
(2) LPG2140x	B	From Centroid-Leg	3.50	0.00	-5.0000	148.00	No Ice	0.00	0.37	0.02
							1/2" Ice	0.00	0.48	0.02
(2) LPG2140x	C	From Centroid-Leg	3.50	0.00	-2.0000	148.00	No Ice	0.00	0.37	0.02
							1/2" Ice	0.00	0.48	0.02
EEI 12' Platform	A	None			0.0000	138.00	No Ice	33.10	33.10	2.27
							1/2" Ice	47.10	47.10	2.70
(4) RR90-17-02DP w/Mount Pipe	A	From Centroid-	3.50	0.00	-10.0000	138.00	No Ice	4.91	3.64	0.04
							1/2" Ice	5.57	4.70	0.08

<b>ERITower</b>  <b>GPD Associates</b> 520 S. Main St., Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2102	<b>Job</b> BRG 126 943086 - BU# 806355	<b>Page</b> 3 of 3
	<b>Project</b> 2005278.93	<b>Date</b> 10:13:40 08/09/05
	<b>Client</b> Crown Castle	<b>Designed by</b> jcheronis

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A Front	C <sub>A</sub> A Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(4) RR90-17-02DP w/Mount Pipe	B	Leg	2.00							
		From	3.50		-10.0000	138.00	No Ice	4.91	3.64	0.04
		Centroid-	0.00				1/2" Ice	5.57	4.70	0.08
(4) RR90-17-02DP w/Mount Pipe	C	Leg	2.00							
		From	3.50		-10.0000	138.00	No Ice	4.91	3.64	0.04
		Centroid-	0.00				1/2" Ice	5.57	4.70	0.08
Sabre 12' T-Arm	C	Leg	2.00							
		From	4.00		30.0000	118.00	No Ice	5.80	5.80	0.34
		Centroid-	2.00				1/2" Ice	9.71	9.71	0.41
Sabre 12' T-Arm	A	Leg	0.00							
		From	2.00		60.0000	118.00	No Ice	5.80	5.80	0.34
		Centroid-	5.00				1/2" Ice	9.71	9.71	0.41
18" Standoff (1.5 std)	B	Leg	0.00							
		From	3.00		15.0000	118.00	No Ice	0.38	0.95	0.01
		Centroid-	1.50				1/2" Ice	0.48	1.21	0.02
(2) SRL-420NHD-1	C	Leg	0.00							
		From	5.00		30.0000	118.00	No Ice	1.65	1.65	0.02
		Centroid-	1.50				1/2" Ice	2.54	2.54	0.03
climbing ladder	A	Leg	7.00							
		From	3.50		0.0000	148.00 - 133.00	No Ice	0.29	0.23	0.01
		Centroid-	-5.00				1/2" Ice	0.55	0.35	0.01
		Leg	0.00							

### Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual	Actual	Actual	Actual	Controlling Condition	Ratio
			Allowable Ratio Bolt Tension	Allowable Ratio Bolt Compression	Allowable Ratio Plate Stress	Allowable Ratio Stiffener Stress		
in		in	K	K	ksi	ksi		
2.2500	20	2.2500	81.70	86.07	52.572		Plate	1.17 ✓
			174.90	290.34	45.000			
			0.47	0.30	1.17			

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail	
L1	170.67 - 156	Pole	TP19.49x10.75x0.365	1	-3.46	911.61	4.7	Pass	
L2	156 - 132.67	Pole	TP24.79x19.49x0.1875	2	-10.06	735.38	37.9	Pass	
L3	132.67 - 87.09	Pole	TP34.63x23.5813x0.375	3	-17.92	2052.57	46.7	Pass	
L4	87.09 - 43	Pole	TP43.75x32.7964x0.4375	4	-28.16	3029.76	49.6	Pass	
L5	43 - 0	Pole	TP52.5x41.5316x0.5	5	-43.73	4290.18	47.6	Pass	
							Summary		
							Pole (L4)	49.6	Pass
							Base Plate	87.6	Pass
							<b>RATING =</b>	<b>87.6</b>	<b>Pass</b>

## **APPENDIX B**

### **Tower Elevation Drawing**

Section	1	2	3	4	5
Length (ft)	14.87	23.33	49.25	48.92	49.00
Number of Stubs	1	18	18	18	18
Thickness (in)	0.3650	0.1875	0.2750	0.4375	0.5000
Lap Splice (ft)			3.97	4.83	6.00
Top Dia (in)	10.7500	19.4900	22.5913	32.7964	41.5316
Bot Dia (in)	19.4900	24.7900	34.6900	43.7900	52.5000
Grade		A139-52		A572-65	
Weight (K)	0.8	1.0	5.7	5.7	12.9

170.7 ft

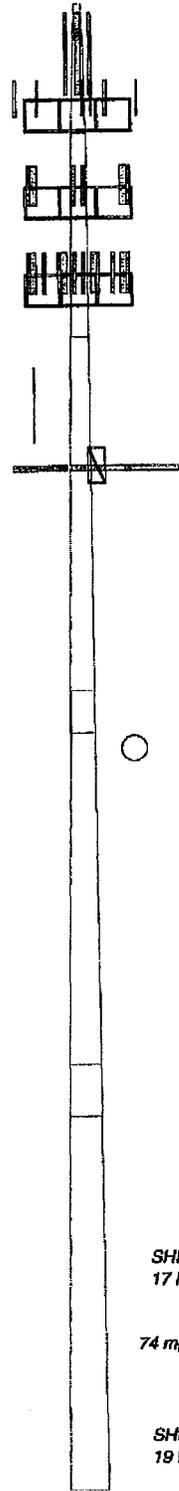
156.0 ft

132.7 ft

87.1 ft

43.0 ft

0.0 ft



**APPURTENANCES**

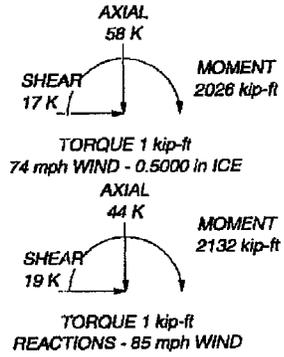
TYPE	ELEVATION	TYPE	ELEVATION
DR90-17-02DP w/Mount Pipe	167	(2) LPG2140x	148
DR90-17-02DP w/Mount Pipe	167	(2) LPG2140x	148
DR90-17-02DP w/Mount Pipe	167	climbing ladder	148 - 133
EEl 12' Platform	158	(4) RR90-17-02DP w/Mount Pipe	138
(2) DB848F85T2E-M w/Mount Pipe	158	(4) RR90-17-02DP w/Mount Pipe	138
(2) DB848F85T2E-M w/Mount Pipe	158	(4) RR90-17-02DP w/Mount Pipe	138
(2) DB848F85T2E-M w/Mount Pipe	158	EEl 12' Platform	138
EEl 12' Platform	148	Sabre 12' T-Arm	118
(2) 7770.00 w/Mount Pipe	148	18' Standoff (1.5 std)	118
(2) 7770.00 w/Mount Pipe	148	(2) SRL-420NH-1	118
(2) 7770.00 w/Mount Pipe	148	Sabre 12' T-Arm	118
(2) LPG2140x	148		

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A139-52	52 ksi	66 ksi	A572-65	65 ksi	80 ksi

**TOWER DESIGN NOTES**

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 87.6%



<p><b>GPD GROUP</b> Consulting Engineers</p>	<p><b>GPD Associates</b> 520 S. Main St., Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 672-2102</p>	<p>Job: <b>BRG 126 943086 - BU# 806355</b></p>
		<p>Project: <b>2005278.93</b></p>
<p>Client: <b>Crown Castle</b></p>	<p>Drawn by: <b>lcheronis</b></p>	<p>Appd:</p>
<p>Code: <b>TIA/EIA-222-F</b></p>	<p>Date: <b>08/09/05</b></p>	<p>Scale: <b>NTS</b></p>
<p>Path: <b>G:\Telecom\2005278\GPD\Mod\BRG_126_943086.dwg</b></p>	<p>Dwg No. <b>E-1</b></p>	

# Feedline Distribution Chart

0' - 170'8-1/32"

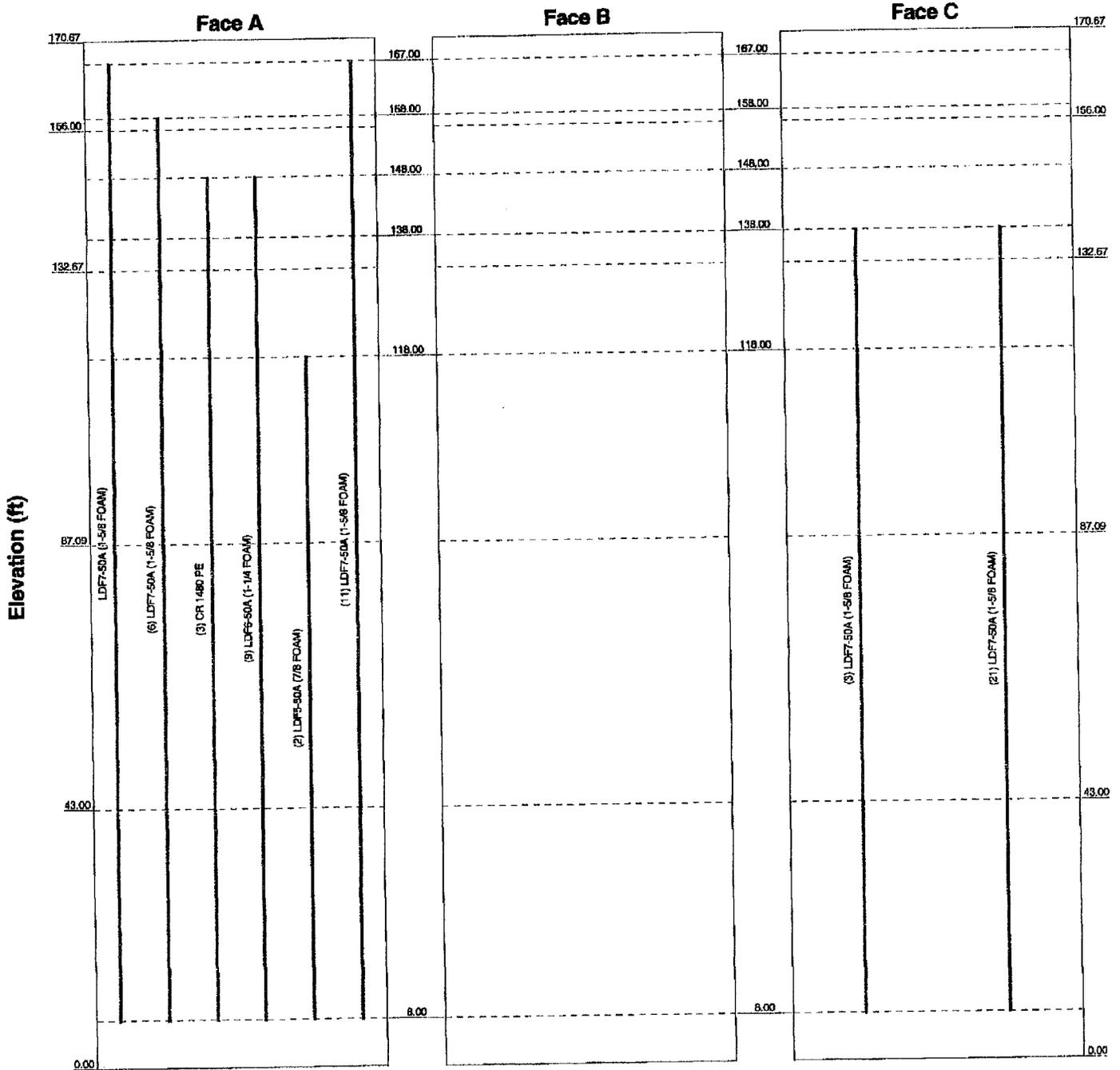
Round \_\_\_\_\_

Flat \_\_\_\_\_

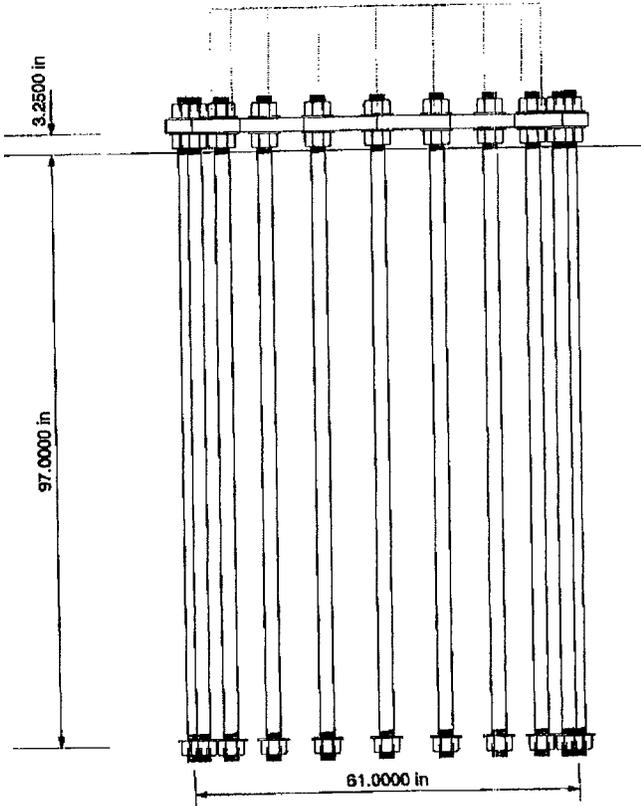
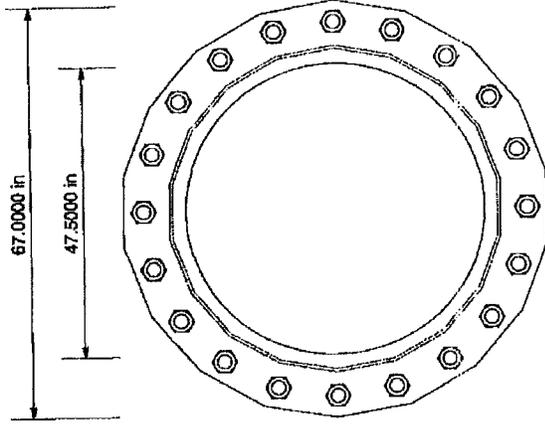
App In Face \_\_\_\_\_

App Out Face \_\_\_\_\_

Truss Leg \_\_\_\_\_



 <b>CPD GROUP</b> Consulting Engineers	<b>GPD Associates</b> 520 S. Main St., Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2102	Job: <b>BRG 126 943086 - BU# 806355</b> Project: <b>2005278-93</b>		
	Client: <b>Crown Castle</b>	Drawn by: <b>Jcheronis</b>	App'd: _____	
	Code: <b>TIA/EIA-222-F</b>	Date: <b>06/09/05</b>	Scale: <b>NTS</b>	
	Path: <small>G:\Telcom\2005278\RES\Mod\BRG 126 943086.dwg</small>		Dwg No. <b>E-7</b>	



**FOUNDATION NOTES**

1. Plate thickness is 2.2500 in.
2. Plate grade is A500M-60.
3. Anchor bolt grade is A615-76.
4. Fc is 4 ksf.

 <b>GPD GROUP</b> Consulting Engineers	<b>GPD Associates</b> 520 S. Main St., Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2102	Job: <b>BRG 126 943086 - BU# 806355</b>
		Project: <b>2005278.93</b>
		Client: <b>Crown Castle</b> Drawn by: <b>jcheronia</b> App'd:
		Coder: <b>TIA/EIA-222-F</b> Date: <b>08/09/05</b> Scale: <b>NTS</b>
		Patr: <b>G:\Telecom\2005278\653\Mod\BRG 126 943086.dwg</b> Dwg No. <b>F-1</b>





# Site Specific Attachments

## Site 2

1. Site Plans
2. Tower Structural Analysis
3. Site Photographs

APPROVALS		
NAME (PRINT)	SIGNATURE	DATE
CINGULAR		
SAI		
SITING COUNCIL COMMITTEE		
OTHER		



**SITE NUMBER: 2128**  
**SITE NAME: FAIRFIELD - FD**



SITE NUMBER:  
2128  
 SITE NAME:  
FAIRFIELD - FD  
 SITE ADDRESS:  
3965 CONGRESS ST  
FAIRFIELD, CT

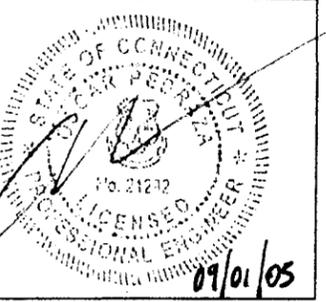
IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: OH

CHECKED BY: OP

PROJECT NO: 0504157-AP05128

SUBMITTALS		
NO	DESCRIPTION	BY DATE
0	SITING COMMITTEE CDS	OH 08/11/05



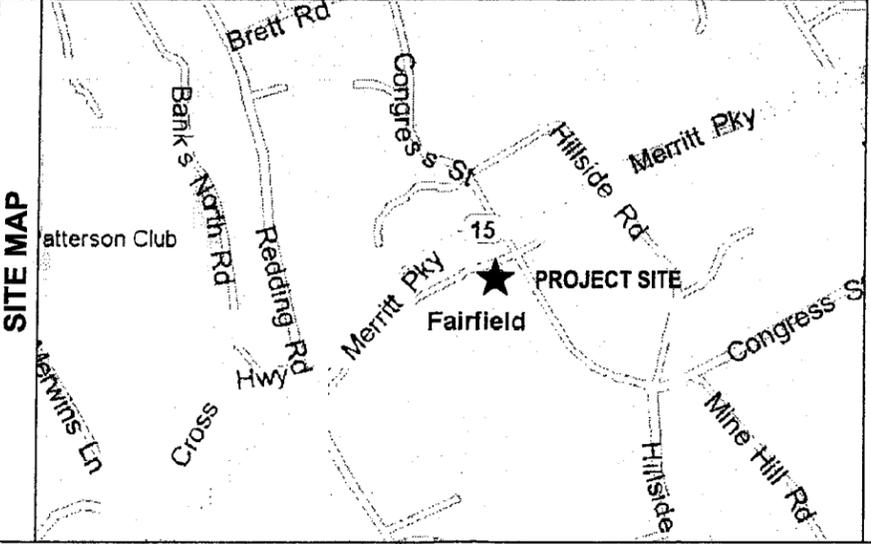
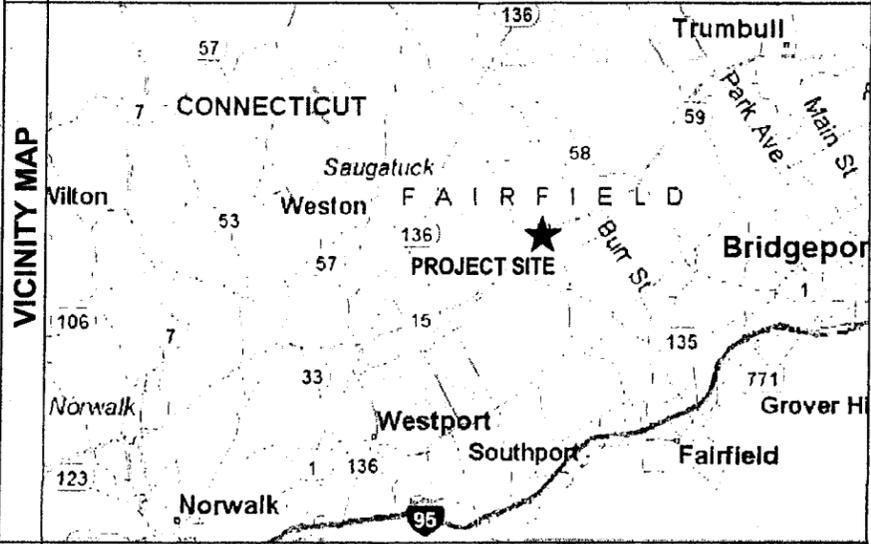
SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T1**

DRAWING INDEX	REV
2128 - T1 TITLE SHEET	0
2128 - C1 EQUIPMENT PLAN	0
2128 - C2 SITE ELEVATION & ANTENNA PLAN	0
2128 - C3 ANTENNA PLUMBING DIAGRAM-ALPHA-BETA-GAMMA	0
2128 - C4 RF DATA INFORMATION	0

**MAPS & DIRECTIONS**

FROM I-95 WEST TAKE EXIT 24 AND TURN RIGHT ONTO CHAMBERS ST. TURN RIGHT ONTO US-1 [KINGS HWY E]. TAKE A LEFT ONTO VILLA AVE. TURN LEFT ONTO SR-58 [TUNKIS HILL RD]. TURN LEFT ONTO CROSS HWY. TOWER SITE IS ON THE LEFT.



**BLDG. CODES AND STANDARDS**

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:  
INTERNATIONAL BUILDING CODE (IBC), 2003

ELECTRICAL CODE:  
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 - 2002 NATIONAL ELECTRICAL CODE

LIGHTNING PROTECTION CODE:  
NFPA 780 - 2000, LIGHTNING PROTECTION CODE

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS.  
 AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE  
 AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION  
 TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:  
 TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM  
 IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C82.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

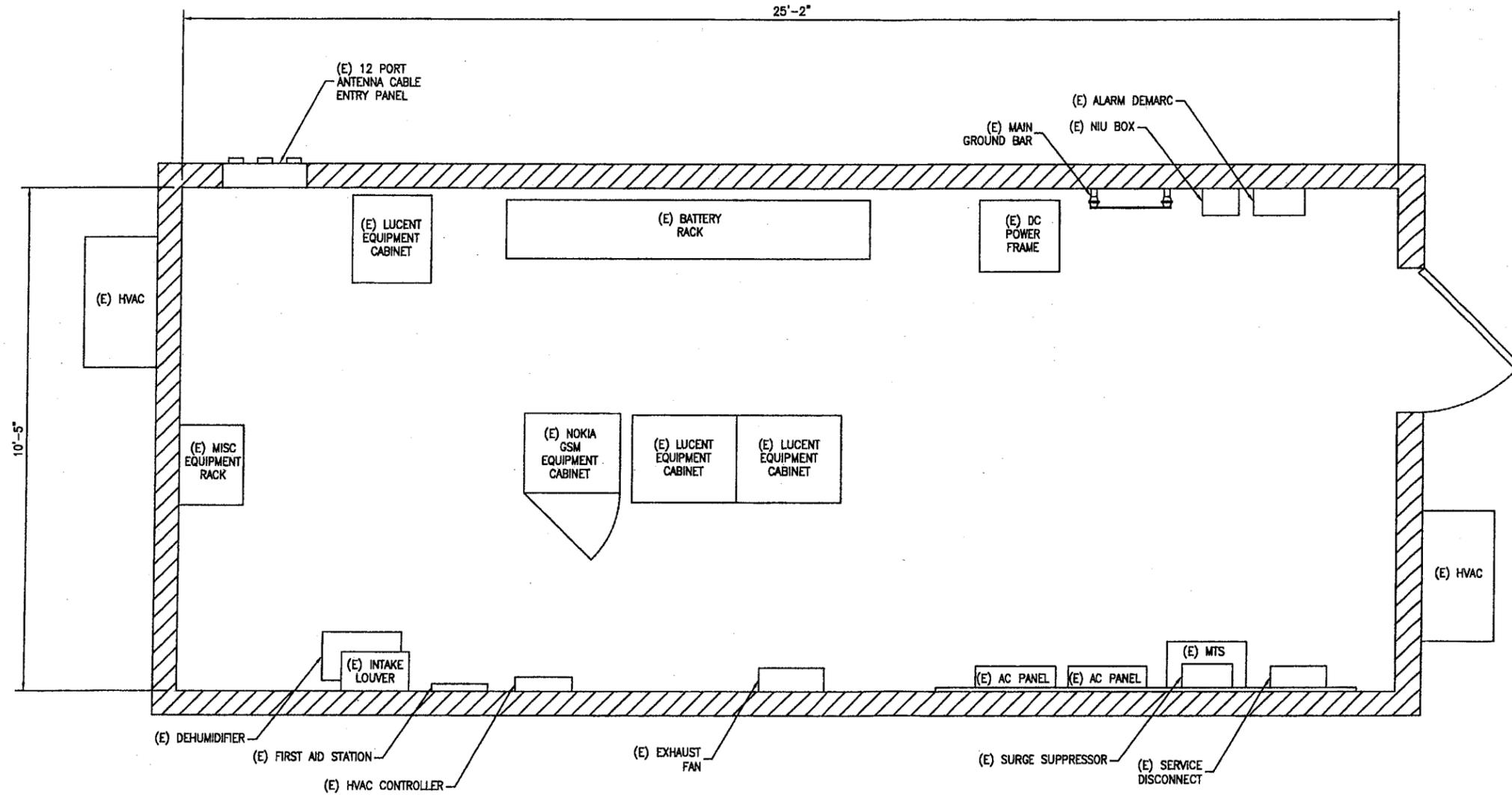
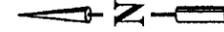
ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

**PROJECT INFORMATION**

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS  
 SITE NUMBER: 2128  
 SITE NAME: FAIRFIELD - FD  
 ADDRESS: 3965 CONGRESS ST  
 CITY, STATE ZIP: FAIRFIELD, CT  
 LATITUDE: 41.188278°  
 LONGITUDE: -73.299489°  
 JURISDICTION: FAIRFIELD COUNTY  
 CURRENT USE: TELECOMMUNICATIONS FACILITY  
 PROPOSED USE: TELECOMMUNICATIONS FACILITY  
 SITE TYPE: MONOPOLE  
 RAD CENTER: 138'-0"  
 OWNER: TOWN OF FAIRFIELD

PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, 9 EXISTING 7/8" COAX REMOVALS TO BE REPLACED WITH 12 PROPOSED 1 1/4" COAXIAL CABLES FOR CINGULAR WIRELESS



**EQUIPMENT PLAN**

SCALE: 11x17 - 3/8"=1'-0"  
SCALE: 22x34 - 3/4"=1'-0"

1  
C1



SITE NUMBER:  
**2128**  
SITE NAME:  
**FAIRFIELD - FD**  
SITE ADDRESS:  
3965 CONGRESS ST  
FAIRFIELD, CT

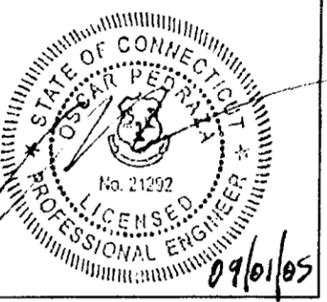
IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: GH

CHECKED BY: OP

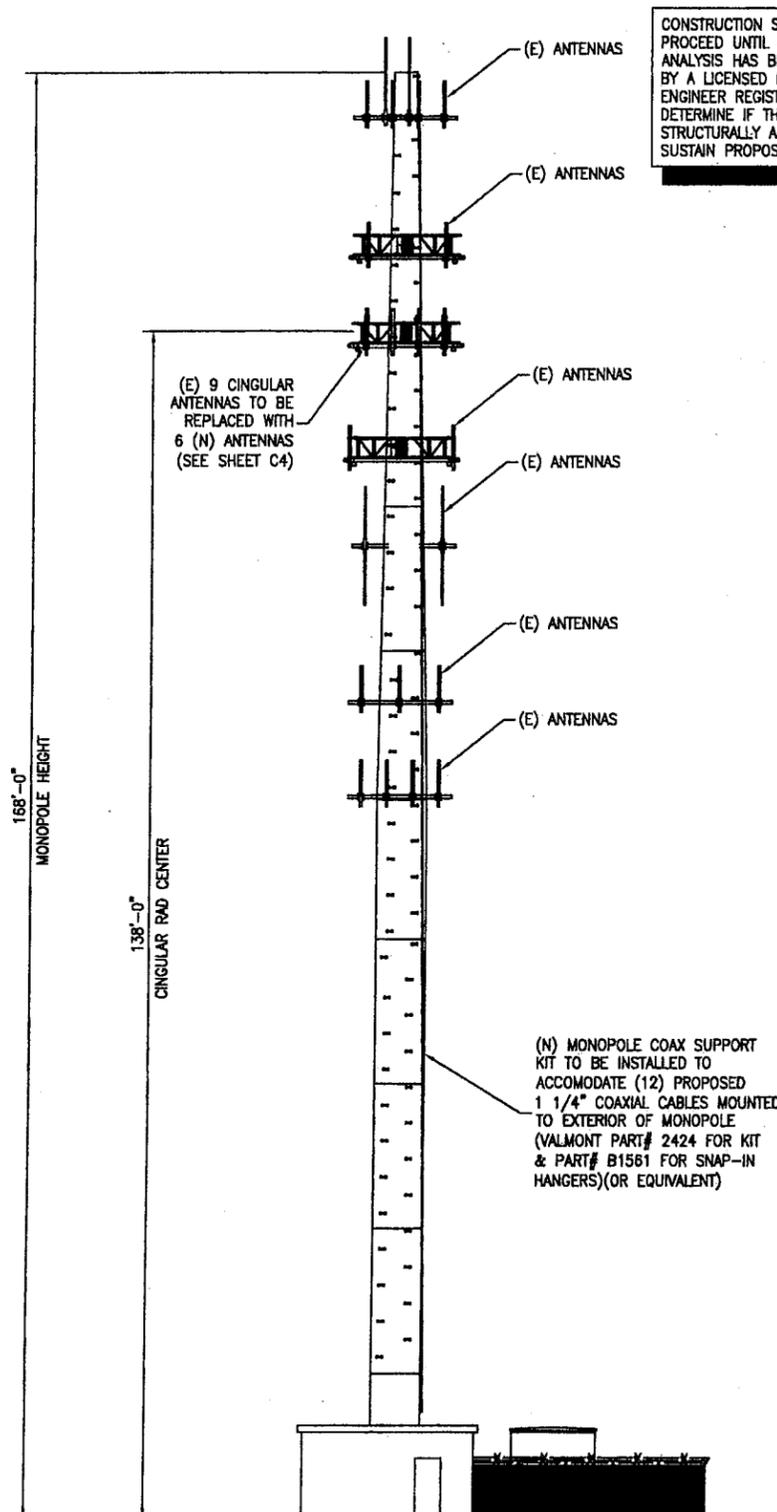
PROJECT NO: 0504A157-ADD5128

SUBMITTALS		
NO	DESCRIPTION	BY DATE
0	SITING COMMITTEE CDS	GH 08/11/05



SHEET TITLE  
**EQUIPMENT PLAN**

SHEET NUMBER  
**C1**



CONSTRUCTION SHALL NOT PROCEED UNTIL A STRUCTURAL ANALYSIS HAS BEEN PERFORMED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN CT TO DETERMINE IF THE TOWER IS STRUCTURALLY ADEQUATE TO SUSTAIN PROPOSAL.

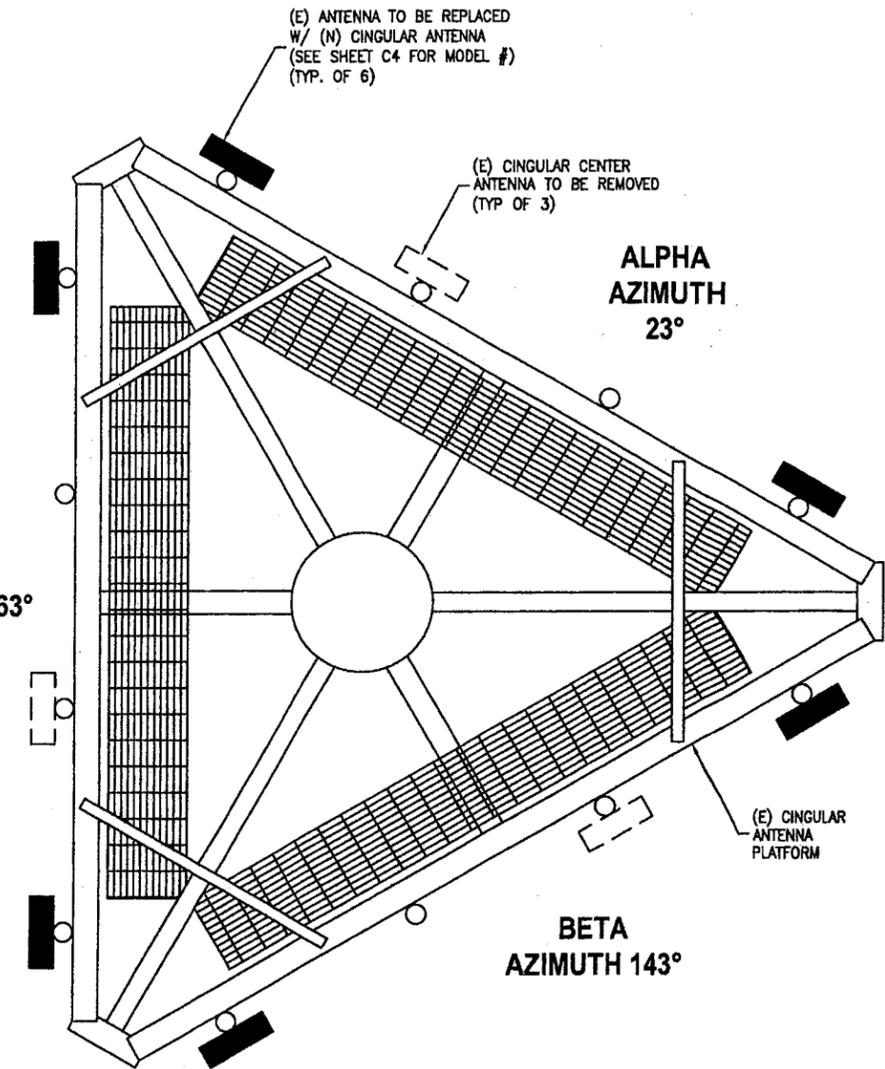
(E) 9 CINGULAR ANTENNAS TO BE REPLACED WITH 6 (N) ANTENNAS (SEE SHEET C4)

(N) MONOPOLE COAX SUPPORT KIT TO BE INSTALLED TO ACCOMMODATE (12) PROPOSED 1 1/4" COAXIAL CABLES MOUNTED TO EXTERIOR OF MONOPOLE (VALMONT PART# 2424 FOR KIT & PART# B15B1 FOR SNAP-IN HANGERS)(OR EQUIVALENT)

**SITE ELEVATION**

SCALE: 11x17 - 1"=20'-0"  
SCALE: 22x34 - 1"=10'-0"

1  
C2



PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, 9 EXISTING 7/8" COAX REMOVALS TO BE REPLACED WITH 12 PROPOSED 1 1/4" COAXIAL CABLES FOR CINGULAR WIRELESS

(E) ANTENNA TO BE REPLACED W/ (N) CINGULAR ANTENNA (SEE SHEET C4 FOR MODEL #) (TYP. OF 6)

(E) CINGULAR CENTER ANTENNA TO BE REMOVED (TYP OF 3)

ALPHA AZIMUTH 23°

GAMMA AZIMUTH 263°

BETA AZIMUTH 143°

(E) CINGULAR ANTENNA PLATFORM

**ANTENNA PLAN VIEW**

SCALE: 11x17 - NTS  
SCALE: 22x34 - NTS

2  
C2



SITE NUMBER: 2128  
SITE NAME: FAIRFIELD - FD  
SITE ADDRESS: 3965 CONGRESS ST FAIRFIELD, CT

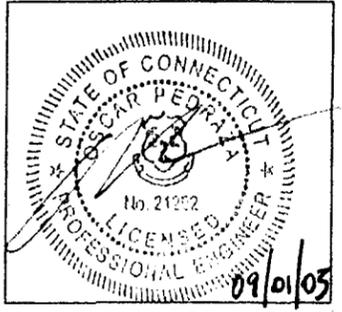
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DRAWN BY: GH

CHECKED BY: DP

PROJECT NO: 05044187-4995128

SUBMITTALS		
NO	DESCRIPTION	BY DATE
0	SITING COMMITTEE COS	GH 08/11/05



SHEET TITLE  
**SITE ELEVATION & ANT PLAN**

SHEET NUMBER  
**C2**



August 23, 2005

George Bullock  
Site Acquisitions, Inc.  
184 Rockingham Road  
Unit A  
Londonderry, NH 03052  
(512) 921-1681

PSG Engineering, Ltd.  
245 Commerce Green Blvd.  
Suite 240  
Sugar Land, TX 77478  
Phone: (281) 343-7099  
Fax: (281) 343-7127

**Subject: Structural Analysis Report**

**Carrier Designation**                      **Cingular Wireless Co-Locate**  
**Carrier Site Number: "2128"**  
**Carrier Site Name: "FAIRFIELD"**

**Engineering Firm Designation**      **PSG Engineering Project Number: 0504A157-A040150**

**Site Data**                                      **3965 Congress Street, Fairfield, CT, Fairfield County**  
**Latitude 41°-11'-17.8", Longitude -73°-17'-58.13".**  
**150 Foot - Monopole Tower**

Dear Mr. Bullock,

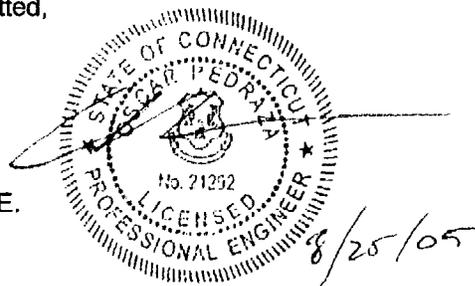
PSG Engineering, Ltd. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the aforementioned tower. This analysis has been performed in accordance with the terms of Site Acquisitions, Inc. Purchase Order Number CT-PSG-007. The purpose of the analysis is to determine the suitability of the tower with the addition of the proposed equipment listed in Table 1 of this report when combined with the existing and reserved equipment on the structure. This analysis has been performed in accordance with the TIA/EIA 222-F standard based upon wind speed condition of 85 mph.

Based on our analysis we have determined the tower and foundation **ARE** sufficient for the proposed loading.

We at PSG Engineering appreciate the opportunity of providing our continuing professional services to you and Site Acquisitions, Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Oscar Pedraza, P.E.  
President



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Output from Computer Programs	

**INTRODUCTION**

This tower was designed by Valmont, Inc. This analysis is based on a previous analysis by Paul J. Ford and Company dated November 16, 1998. The monopole has subsequently reinforced with WT shapes between El. 0' and El. 16'. This reinforcement is included and based on a previous analysis by Alcoa dated January 16, 2003.

**ANALYSIS CRITERIA**

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

The following design criteria apply:

- Basic wind speed of 85 mph.
- Nominal ice thickness of 0.5000 in.
- Ice density of 56 pcf.
- A wind speed of 74 mph is used in combination with ice.
- Deflections calculated using a wind speed of 50 mph.
- Feedline torque is considered.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.333

**Table 1 – Proposed Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (Inches)
138	6	Powerwave Technologies	7770.00	-	3	*7/8 (Partial Internal)
	6		LGP21401			
	6		LGP13519			

\*Note: Coax to run inside pole to handhole at El. 125.5'. Coax to run flush mounted to pole exterior from El. 125.5' to El. 138'

**Table 2 – Installed (I) and Reserved (R) Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (Inches)
148	12 (I)	Swedcom	ALP-E 9011-DIN	Standoff T-Arms (3)	12(I)	1 5/8 (Internal)
	3 (I)	Decibel	DB810KE-XT		3(I)	7/8 (Internal)
***138	***9 (I)	***Decibel	***DB980H	Platform w/Rails (1)	9(I)	**7/8 (Partial Internal)
125	9 (I)	Swedcom	ALP 11011-N	Low Profile Platform (1)	12(I)	1 5/8 (Internal)
113	3 (I)	EMS Wireless	RR65-19-00DP	Platform w/Rails (1)	12(I)	1 5/8 (External)
105	3 (I)	Decibel	ASP-685	Standoff Mounts (2)	4(I)	7/8 (Internal)
	1 (I)	Celwave	PD1142-1			
90	9 (I)	Allgon	7184.14	Standoff T-Arms (3)	9(I)	1 1/4 (Internal)
80	12(I)	Standard	6' Panel Antennas	Low Profile Platform (1)	12(I)	1 5/8 (External)
40	1 (I)	Standard	GPS Antenna	Side Arm Mount (1)	1(I)	1/2 (External)

\*\*Note: Coax is ran inside pole to handhole at El. 125.5'. Coax is ran flush mounted to pole exterior from El. 125.5' to El. 138'

\*\*\*Note: Existing antennas to be removed and replaced with proposed loads. Existing mount and coax lines to remain.

**Table 3 – Original Tower Manufacturer Design Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (Inches)
Not Available						

**ANALYSIS PROCEDURE**

**Table 4 – Documents Provided**

Document	Remarks	Reference	Source
Previous Tower Analysis	Alcoa	AFL Telecommunications Project Number: 1356.052	Site Acquisitions, Inc.
Previous Tower Analysis	Paul J. Ford and Company	PJF Job Number: 31298-044	
Proposed Tower Loading	Cingular Wireless RF Data Sheet	RF Engineer: Francis Malabanan (860.513.7625)	

**Analysis Methods**

ERI Tower (Version 3.0.0.16), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/EIA/TIA 222F or the local building code requirements. Selected output from the analysis is included in Appendix A.

**Assumptions**

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222F.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and PSG Engineering should be allowed to review any new information to determine its effect on the structural integrity of the tower.

**ANALYSIS RESULTS**

**Table 5 – Tower Section Capacity**

Section Number	Elevation (feet)	Percent Capacity Used	Pass / Fail
1	150 – 95.8	58.9	Pass
2	95.8 – 47.8	89.7	Pass
3	47.8 - 16	99.2	Pass
4	16 - 0	77.0	Pass
Base Plate		<b>83.3</b>	Pass
Anchor Bolts		84.0	Pass
Foundation (Based on comparison with original design reactions)		110.0	Pass

\*\*\*Note: Base foundation overstress of 110% is deemed sufficient when based on a comparison with original design reactions.

## APPENDIX A

### Output from Computer Programs



<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 1 of 11
	<b>Project</b> (2128) (FAIRFIELD)	<b>Date</b> 12:56:32 08/25/05
	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

## Tower Input Data

There is a pole section.

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

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-95.83	54.17	5.16	12	23.6100	33.4690	0.2813	1.1252	A572-65 (65 ksi)
L2	95.83-47.82	53.17	6.18	12	31.9673	41.6440	0.3750	1.5000	A572-65 (65 ksi)
L3	47.82-16.00	38.00	0.00	12	39.7693	46.6877	0.4375	1.7500	A572-65 (65 ksi)
L4	16.00-0.00	16.00		12	46.6877	49.6000	0.6000	2.4000	A572-65 (65 ksi)

## Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	24.4429	21.1308	1467.8550	8.3517	12.2300	120.0211	2974.2723	10.3999	5.5736	19.814
	34.6497	30.0610	4226.1316	11.8812	17.3369	243.7645	8563.2885	14.7951	8.2158	29.207
L2	34.0672	38.1477	4859.7704	11.3100	16.5590	293.4813	9847.2124	18.7751	7.5622	20.166
	43.1130	49.8323	10832.9048	14.7743	21.5716	502.1838	21950.4020	24.5260	10.1556	27.082
L3	42.3370	55.4086	10940.8279	14.0808	20.6005	531.0958	22169.0835	27.2704	9.4857	21.682
	48.3347	65.1550	17789.3764	16.5576	24.1842	735.5776	36046.0995	32.0673	11.3398	25.92
L4	48.3347	89.0414	24140.6066	16.4994	24.1842	998.1963	48915.4137	43.8235	10.9043	18.174
	51.3497	94.6680	29012.2434	17.5420	25.6928	1129.1974	58786.6707	46.5927	11.6848	19.475

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in



<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 3 of 11
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	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
<b>***EL. 148' LEVEL***</b>								
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	148.00 - 10.00	3	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	148.00 - 10.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
*								
<b>***EL. 138' LEVEL***</b>								
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	120.50 - 10.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF5-50A (7/8 FOAM)	A	No	CaAa (Out Of Face)	138.00 - 120.50	11	No Ice	0.00	0.33
						1/2" Ice	0.00	1.30
LDF5-50A (7/8 FOAM)	A	No	CaAa (Out Of Face)	138.00 - 120.50	1	No Ice	0.11	0.33
						1/2" Ice	0.21	1.30
*								
<b>***EL. 125' LEVEL***</b>								
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	125.00 - 10.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
*								
<b>***EL. 113' LEVEL***</b>								
LDF5-50A (7/8 FOAM)	B	No	CaAa (Out Of Face)	113.00 - 10.00	11	No Ice	0.00	0.33
						1/2" Ice	0.00	1.30
LDF5-50A (7/8 FOAM)	B	No	CaAa (Out Of Face)	113.00 - 10.00	1	No Ice	0.11	0.33
						1/2" Ice	0.21	1.30
*								
<b>***EL. 105' LEVEL***</b>								
LDF5-50A (7/8 FOAM)	B	No	Inside Pole	105.00 - 10.00	4	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
*								
<b>***EL. 90' LEVEL***</b>								
LDF6-50A (1-1/4 FOAM)	A	No	Inside Pole	90.00 - 10.00	9	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
*								
<b>***EL. 80' LEVEL***</b>								
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	80.00 - 10.00	11	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	80.00 - 10.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
*								
<b>***EL. 40' LEVEL***</b>								
LDF6-50A (1-1/4 FOAM)	A	No	CaAa (Out Of Face)	72.00 - 10.00	1	No Ice	0.16	0.66
						1/2" Ice	0.25	1.91
*								
<b>***TOWER HARDWARE***</b>								
Climbing Ladder (Ar)	C	No	CaAa (Out Of Face)	100.00 - 10.00	1	No Ice	0.04	1.00
						1/2" Ice	0.14	1.53

### Feed Line/Linear Appurtenances Section Areas

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 4 of 11
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Tower Section	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	150.00-95.83	A	0.000	0.000	0.000	1.908	1.02
		B	0.000	0.000	0.000	1.872	0.08
		C	0.000	0.000	0.000	0.156	0.00
L2	95.83-47.82	A	0.000	0.000	0.000	3.748	1.45
		B	0.000	0.000	0.000	5.233	0.25
		C	0.000	0.000	0.000	8.172	0.36
L3	47.82-16.00	A	0.000	0.000	0.000	4.932	0.99
		B	0.000	0.000	0.000	3.468	0.17
		C	0.000	0.000	0.000	7.494	0.34
L4	16.00-0.00	A	0.000	0.000	0.000	0.930	0.19
		B	0.000	0.000	0.000	0.654	0.03
		C	0.000	0.000	0.000	1.413	0.07

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	150.00-95.83	A	0.500	0.000	0.000	0.000	3.658	1.22
		B		0.000	0.000	0.000	3.589	0.28
		C		0.000	0.000	0.000	0.573	0.01
L2	95.83-47.82	A	0.500	0.000	0.000	0.000	6.166	1.48
		B		0.000	0.000	0.000	10.034	0.81
		C		0.000	0.000	0.000	16.191	0.98
L3	47.82-16.00	A	0.500	0.000	0.000	0.000	8.114	1.03
		B		0.000	0.000	0.000	6.651	0.54
		C		0.000	0.000	0.000	13.857	0.94
L4	16.00-0.00	A	0.500	0.000	0.000	0.000	1.530	0.19
		B		0.000	0.000	0.000	1.254	0.10
		C		0.000	0.000	0.000	2.613	0.18

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	150.00-95.83	0.0445	-0.0186	0.0733	-0.0296
L2	95.83-47.82	-0.0773	0.0801	-0.1420	0.1701
L3	47.82-16.00	-0.1445	0.0228	-0.2318	0.0795
L4	16.00-0.00	-0.0578	0.0091	-0.0980	0.0336

### Discrete Tower Loads

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 5 of 11
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	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
***EL. 148' LEVEL***								
(4) ALP-E 9011-DIN w/Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 3.53 1/2" Ice 4.21	5.01 6.07	0.05 0.09
DB810KE-XT	A	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 4.35 1/2" Ice 5.83	4.35 5.83	0.04 0.07
5' Standoff T-Arm (14' face width)	A	From Leg	2.67 0.00 0.00	0.0000	148.00	No Ice 6.90 1/2" Ice 8.70	6.90 8.70	0.20 0.26
(4) ALP-E 9011-DIN w/Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 3.53 1/2" Ice 4.21	5.01 6.07	0.05 0.09
DB810KE-XT	B	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 4.35 1/2" Ice 5.83	4.35 5.83	0.04 0.07
5' Standoff T-Arm (14' face width)	B	From Leg	2.67 0.00 0.00	0.0000	148.00	No Ice 6.90 1/2" Ice 8.70	6.90 8.70	0.20 0.26
(4) ALP-E 9011-DIN w/Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 3.53 1/2" Ice 4.21	5.01 6.07	0.05 0.09
DB810KE-XT	C	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 4.35 1/2" Ice 5.83	4.35 5.83	0.04 0.07
5' Standoff T-Arm (14' face width)	C	From Leg	2.67 0.00 0.00	0.0000	148.00	No Ice 6.90 1/2" Ice 8.70	6.90 8.70	0.20 0.26
* *								
***EL. 138' LEVEL***								
(2) 7770.00 w/Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 5.98 1/2" Ice 6.44	4.12 4.77	0.05 0.10
(2) LGP2140X (TMA)	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1.23 1/2" Ice 1.38	0.37 0.48	0.02 0.02
(2) LGP13519	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 0.34 1/2" Ice 0.42	0.21 0.28	0.01 0.01
(2) 7770.00 w/Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 5.98 1/2" Ice 6.44	4.12 4.77	0.05 0.10
(2) LGP2140X (TMA)	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1.23 1/2" Ice 1.38	0.37 0.48	0.02 0.02
(2) LGP13519	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 0.34 1/2" Ice 0.42	0.21 0.28	0.01 0.01
(2) 7770.00 w/Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 5.98 1/2" Ice 6.44	4.12 4.77	0.05 0.10
(2) LGP2140X (TMA)	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1.23 1/2" Ice 1.38	0.37 0.48	0.02 0.02
(2) LGP13519	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 0.34 1/2" Ice 0.42	0.21 0.28	0.01 0.01

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 6 of 11
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	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
PiROD 13' Platform w/handrails (Monopole)	C	None		0.00	0.0000	138.00	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45
* ***EL. 125' LEVEL***										
(3) ALP 11011-N w/Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	3.91 4.53	6.62 7.75	0.04 0.09	
(3) ALP 11011-N w/Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	3.91 4.53	6.62 7.75	0.04 0.09	
(3) ALP 11011-N w/Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	3.91 4.53	6.62 7.75	0.04 0.09	
PiROD 13' Low Profile Platform (Monopole)	C	None		0.0000	125.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76	
* ***EL. 113' LEVEL***										
RR65-19-00DP w/Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice	6.10 6.67	4.41 5.62	0.05 0.09	
RR65-19-00DP w/Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice	6.10 6.67	4.41 5.62	0.05 0.09	
RR65-19-00DP w/Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice	6.10 6.67	4.41 5.62	0.05 0.09	
PiROD 13' Platform w/handrails (Monopole)	C	None		0.0000	113.00	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45	
* ***EL. 105' LEVEL***										
ASP-685	A	From Leg	4.00 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice	2.10 4.22	2.10 4.22	0.02 0.04	
ASP-685	A	From Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	2.10 4.22	2.10 4.22	0.02 0.04	
60" Standoff - Stub Mount	A	From Leg	2.67 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	7.20 9.30	7.20 9.30	0.23 0.29	
PD1142-1	B	From Leg	4.00 0.00 0.00	0.0000	109.00	No Ice 1/2" Ice	1.32 3.21	1.32 3.21	0.01 0.02	
ASP-685	B	From Leg	4.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	2.10 4.22	2.10 4.22	0.02 0.04	
60" Standoff - Stub Mount	B	From Leg	2.67 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	7.20 9.30	7.20 9.30	0.23 0.29	
* ***EL. 90' LEVEL***										
(3) 7184.14 w/Mount Pipe	A	From Leg	4.00 0.00	0.0000	90.00	No Ice 1/2" Ice	3.50 4.11	3.09 4.14	0.04 0.07	

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	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>A</sub> A <sub>Front</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>Side</sub> ft <sup>2</sup>	Weight K
5' Standoff T-Arm (14' face width)	A	From Leg	0.00 2.67 0.00	0.0000	90.00	No Ice 1/2" Ice	6.90 8.70	6.90 8.70	0.20 0.26
(3) 7184.14 w/Mount Pipe	B	From Leg	0.00 4.00 0.00	0.0000	90.00	No Ice 1/2" Ice	3.50 4.11	3.09 4.14	0.04 0.07
5' Standoff T-Arm (14' face width)	B	From Leg	0.00 2.67 0.00	0.0000	90.00	No Ice 1/2" Ice	6.90 8.70	6.90 8.70	0.20 0.26
(3) 7184.14 w/Mount Pipe	C	From Leg	0.00 4.00 0.00	0.0000	90.00	No Ice 1/2" Ice	3.50 4.11	3.09 4.14	0.04 0.07
5' Standoff T-Arm (14' face width)	C	From Leg	0.00 2.67 0.00	0.0000	90.00	No Ice 1/2" Ice	6.90 8.70	6.90 8.70	0.20 0.26
* *									
***EL. 80' LEVEL***									
(4) 6' Panel Antenna w/Mount Pipe	A	From Leg	0.00 4.00 0.00	0.0000	80.00	No Ice 1/2" Ice	5.87 6.32	4.96 5.89	0.04 0.09
(4) 6' Panel Antenna w/Mount Pipe	B	From Leg	0.00 4.00 0.00	0.0000	80.00	No Ice 1/2" Ice	5.87 6.32	4.96 5.89	0.04 0.09
(4) 6' Panel Antenna w/Mount Pipe	C	From Leg	0.00 4.00 0.00	0.0000	80.00	No Ice 1/2" Ice	5.87 6.32	4.96 5.89	0.04 0.09
PiROD 13' Low Profile Platform (Monopole)	C	None		0.0000	80.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1.30 1.76
* *									
***EL. 40' LEVEL***									
GPS antenna w/ sidearm mount	A	From Leg	0.00 4.00 0.00	0.0000	40.00	No Ice 1/2" Ice	8.00 12.00	8.00 12.00	0.28 0.38
* *									
***TOWER HARDWARE***									
Generic C-2 Lightning Spur	A	None		0.0000	150.00	No Ice 1/2" Ice	4.00 7.00	4.00 7.00	0.00 0.00

## Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+ Wind 0 deg - No Ice
3	Dead+ Wind 30 deg - No Ice
4	Dead+ Wind 60 deg - No Ice

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 8 of 11
	<b>Project</b> (2128) (FAIRFIELD)	<b>Date</b> 12:56:32 08/25/05
	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

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

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 95.83	34.085	28	1.8520	0.0030
L2	100.99 - 47.82	16.241	28	1.4986	0.0026
L3	54 - 16	4.539	28	0.8045	0.0011
L4	16 - 0	0.341	28	0.2038	0.0002

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	DB810KE-XT	28	34.085	1.8520	0.0030	42126
150.00	Generic C-2 Lightning Spur	28	34.085	1.8520	0.0030	42126
148.00	(4) ALP-E 9011-DIN w/Mount Pipe	28	33.311	1.8406	0.0030	42126
138.00	(2) 7770.00 w/Mount Pipe	28	29.458	1.7828	0.0030	17552
125.00	(3) ALP 11011-N w/Mount Pipe	28	24.560	1.7002	0.0029	8424

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 9 of 11
	<b>Project</b> (2128) (FAIRFIELD)	<b>Date</b> 12:56:32 08/25/05
	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
115.00	ASP-685	28	20.950	1.6260	0.0028	6016
113.00	RR65-19-00DP w/Mount Pipe	28	20.250	1.6097	0.0028	5691
109.00	PD1142-1	28	18.876	1.5753	0.0028	5135
105.00	60" Standoff - Stub Mount	28	17.539	1.5384	0.0027	4679
95.00	ASP-685	28	14.384	1.4336	0.0024	4204
90.00	(3) 7184.14 w/Mount Pipe	28	12.912	1.3742	0.0023	4131
80.00	(4) 6' Panel Antenna w/Mount Pipe	28	10.189	1.2410	0.0019	3993
40.00	GPS antenna w/ sidearm mount	27	2.402	0.5286	0.0006	3464

### Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	150 - 95.83	98.116	2	5.3335	0.0102
L2	100.99 - 47.82	46.785	2	4.3169	0.0089
L3	54 - 16	13.084	2	2.3193	0.0036
L4	16 - 0	0.983	2	0.5878	0.0008

### Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
153.00	DB810KE-XT	2	98.116	5.3335	0.0102	14859
150.00	Generic C-2 Lightning Spur	2	98.116	5.3335	0.0102	14859
148.00	(4) ALP-E 9011-DIN w/Mount Pipe	2	95.891	5.3022	0.0102	14859
138.00	(2) 7770.00 w/Mount Pipe	2	84.809	5.1423	0.0102	6190
125.00	(3) ALP 11011-N w/Mount Pipe	2	70.721	4.9096	0.0100	2969
115.00	ASP-685	2	60.336	4.6953	0.0097	2118
113.00	RR65-19-00DP w/Mount Pipe	2	58.322	4.6475	0.0097	2003
109.00	PD1142-1	2	54.369	4.5460	0.0095	1807
105.00	60" Standoff - Stub Mount	2	50.522	4.4362	0.0092	1646
95.00	ASP-685	2	41.440	4.1204	0.0083	1476
90.00	(3) 7184.14 w/Mount Pipe	2	37.204	3.9405	0.0078	1448
80.00	(4) 6' Panel Antenna w/Mount Pipe	2	29.361	3.5420	0.0066	1397
40.00	GPS antenna w/ sidearm mount	2	6.926	1.6037	0.0023	1204

### Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
in		in		ksi	ksi	ksi		
2.7500	16	2.2500	147.04	2.333	49.412		Conc fc	1.11

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 10 of 11
	<b>Project</b> (2128) (FAIRFIELD)	<b>Date</b> 12:56:32 08/25/05
	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
in		in	174.90	2.100	45.000			
			0.84	1.11	1.10			

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P/P <sub>a</sub>
L1	150 - 95.83 (1)	TP33.469x23.61x0.2813	54.17	0.00	0.0	39.000	29.2103	-11.45	1139.20	0.010
L2	95.83 - 47.82 (2)	TP41.644x31.9673x0.375	53.17	0.00	0.0	39.000	48.4742	-23.75	1890.49	0.013
L3	47.82 - 16 (3)	TP46.6877x39.7693x0.4375	38.00	0.00	0.0	39.000	65.1550	-35.52	2541.04	0.014
L4	16 - 0 (4)	TP49.6x46.6877x0.6	16.00	0.00	0.0	39.000	94.6680	-41.19	3692.05	0.011

### Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> /F <sub>by</sub>
L1	150 - 95.83 (1)	TP33.469x23.61x0.2813	579.35	-30.213	39.000	0.775	0.00	0.000	39.000	0.000
L2	95.83 - 47.82 (2)	TP41.644x31.9673x0.375	1826.00	-46.124	39.000	1.183	0.00	0.000	39.000	0.000
L3	47.82 - 16 (3)	TP46.6877x39.7693x0.4375	3127.64	-51.023	39.000	1.308	0.00	0.000	39.000	0.000
L4	16 - 0 (4)	TP49.6x46.6877x0.6	3726.48	-39.601	39.000	1.015	0.00	0.000	39.000	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio P/P <sub>a</sub>	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Ratio f <sub>by</sub> /F <sub>by</sub>	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 95.83 (1)	TP33.469x23.61x0.2813	0.010	0.775	0.000	0.785	1.333	H1-3
L2	95.83 - 47.82 (2)	TP41.644x31.9673x0.375	0.013	1.183	0.000	1.195	1.333	H1-3
L3	47.82 - 16 (3)	TP46.6877x39.7693x0.4375	0.014	1.308	0.000	1.322	1.333	H1-3
L4	16 - 0 (4)	TP49.6x46.6877x0.6	0.011	1.015	0.000	1.027	1.333	H1-3

### Section Capacity Table

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A157-A040150	<b>Page</b> 11 of 11
	<b>Project</b> (2128) (FAIRFIELD)	<b>Date</b> 12:56:32 08/25/05
	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail	
L1	150 - 95.83	Pole	TP33.469x23.61x0.2813	1	-11.45	1518.55	58.9	Pass	
L2	95.83 - 47.82	Pole	TP41.644x31.9673x0.375	2	-23.75	2520.02	89.7	Pass	
L3	47.82 - 16	Pole	TP46.6877x39.7693x0.4375	3	-35.52	3387.21	99.2	Pass	
L4	16 - 0	Pole	TP49.6x46.6877x0.6	4	-41.19	4921.50	77.0	Pass	
							<b>Summary</b>		
							Pole (L3)	99.2	Pass
							Base Plate	83.3	Pass
							<b>RATING =</b>	<b>99.2</b>	<b>Pass</b>





# Site Specific Attachments

## Site 3

1. Site Plans
2. Tower Structural Analysis
3. Site Photographs

APPROVALS		
NAME (PRINT)	SIGNATURE	DATE
CINGULAR		
SAI		
SITING COUNCIL COMMITTEE		
OTHER		



**SITE NUMBER: 2108**  
**SITE NAME: NORWALK WEST**



SITE NUMBER:  
2108  
 SITE NAME:  
NORWALK WEST  
 SITE ADDRESS:  
613 CONNECTICUT AVE  
NORWALK, CT 06854

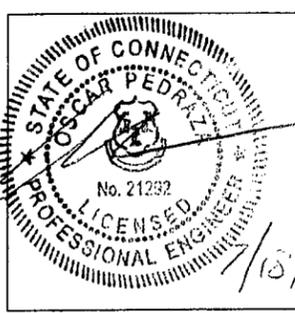
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CHECKED BY: OP

PROJECT NO: 05044111-495156

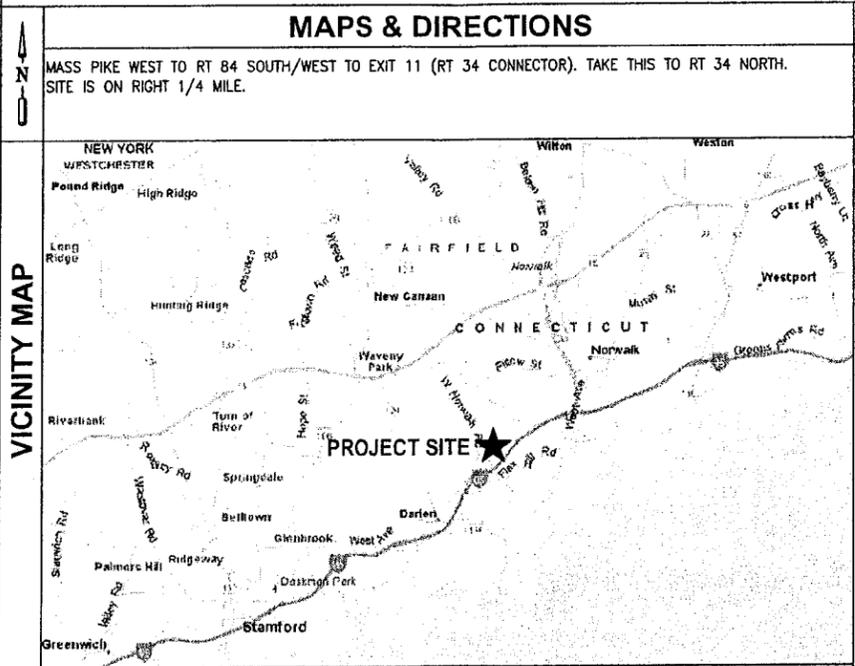
SUBMITTALS		
NO	DESCRIPTION	BY DATE
1	SITING COMMITTEE CDS	JR 07/16/05



SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T1**

DRAWING INDEX	REV
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2108 - C1 SITE PLAN	1
2108 - C2 SITE ELEVATION & ANTENNA PLAN	1
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2108 - C4 ANTENNA PLUMBING DIAGRAM-BETA	1
2108 - C5 ANTENNA PLUMBING DIAGRAM-GAMMA	1
2108 - C6 RF DATA INFORMATION	1



**MAPS & DIRECTIONS**  
 MASS PIKE WEST TO RT 84 SOUTH/WEST TO EXIT 11 (RT 34 CONNECTOR). TAKE THIS TO RT 34 NORTH. SITE IS ON RIGHT 1/4 MILE.

**BLDG. CODES AND STANDARDS**  
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:  
INTERNATIONAL BUILDING CODE (IBC), 2003

ELECTRICAL CODE:  
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 - 2002 NATIONAL ELECTRICAL CODE

LIGHTNING PROTECTION CODE:  
NFPA 780 - 2000, LIGHTNING PROTECTION CODE

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:  
 AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE  
 AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION  
 TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:  
 TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM  
 IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

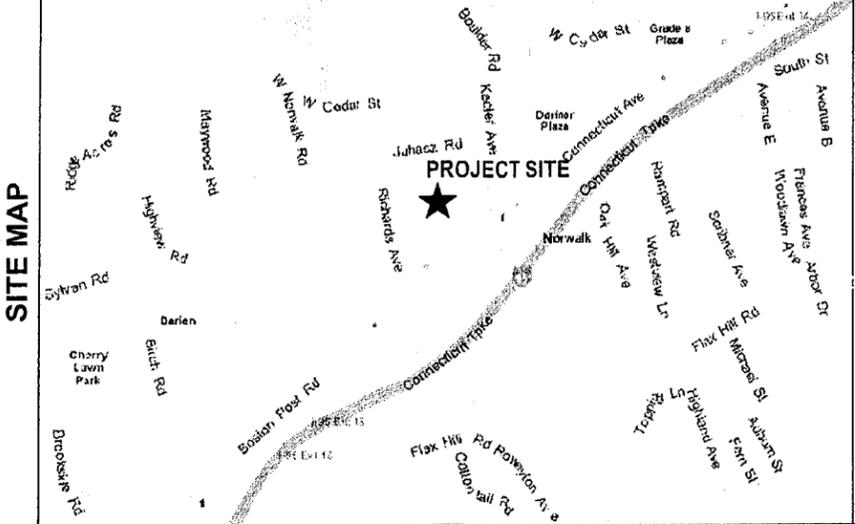
TELCORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS  
 TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

**PROJECT INFORMATION**

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS  
 SITE NUMBER: 2108  
 SITE NAME: NORWALK WEST  
 ADDRESS: 613 CONNECTICUT AVE  
 CITY, STATE ZIP: NORWALK, CT 0684  
 LATITUDE: 41.096972'  
 LONGITUDE: -73.449494'  
 JURISDICTION: FAIRFIELD COUNTY  
 CURRENT USE: TELECOMMUNICATIONS FACILITY  
 PROPOSED USE: TELECOMMUNICATIONS FACILITY  
 SITE TYPE: MONOPOLE TOWER  
 RAD CENTER: 153'-0"  
 OWNER: -

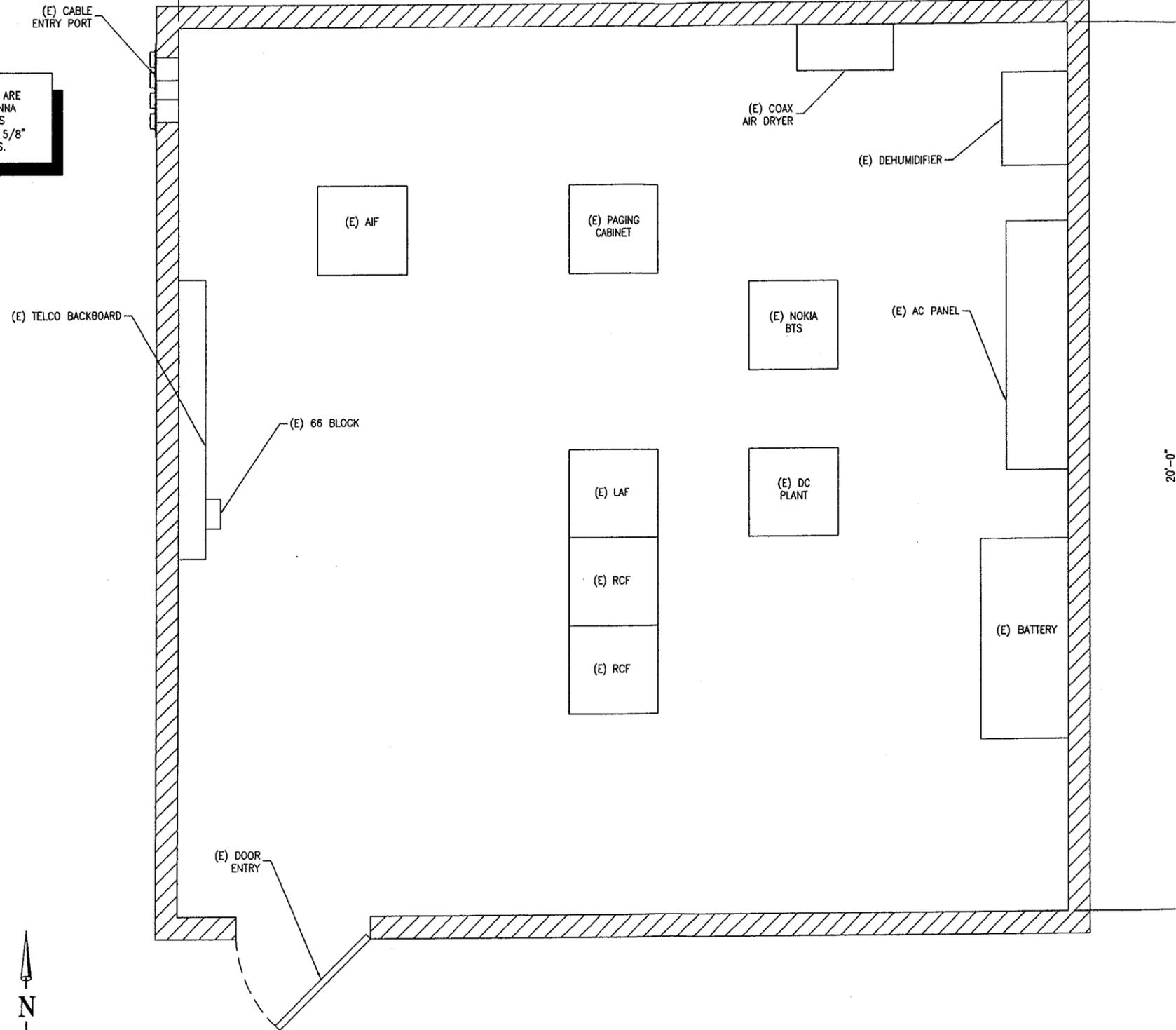


**SITE MAP**

File Info: C:\Cingular\2108\Civil Set.dwg Jul 16, 2005 1:41pm owner

File Info: C:\Cingular\2108\2108 Civil Set.dwg Jul 16, 2005 - 1:42pm owner

PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, 9 EXISTING COAXIAL REMOVALS TO BE REPLACED WITH 12 PROPOSED 1 5/8" COAXIAL CABLES FOR CINGULAR WIRELESS.



**SITE PLAN**

SCALE: 11x17 - 3/8"=1'-0"  
SCALE: 22x34 - 3/4"=1'-0"



SITE NUMBER:  
2108  
SITE NAME:  
NORWALK WEST  
SITE ADDRESS:  
613 CONNECTICUT AVE  
NORWALK, CT 06854

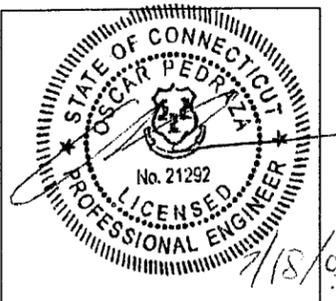
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DRAWN BY: JR

CHECKED BY: OP

PROJECT NO: 0504111-AB95158

SUBMITTALS			
NO	DESCRIPTION	BY	DATE
1	SITING COMMITTEE CDS	JR	07/16/05

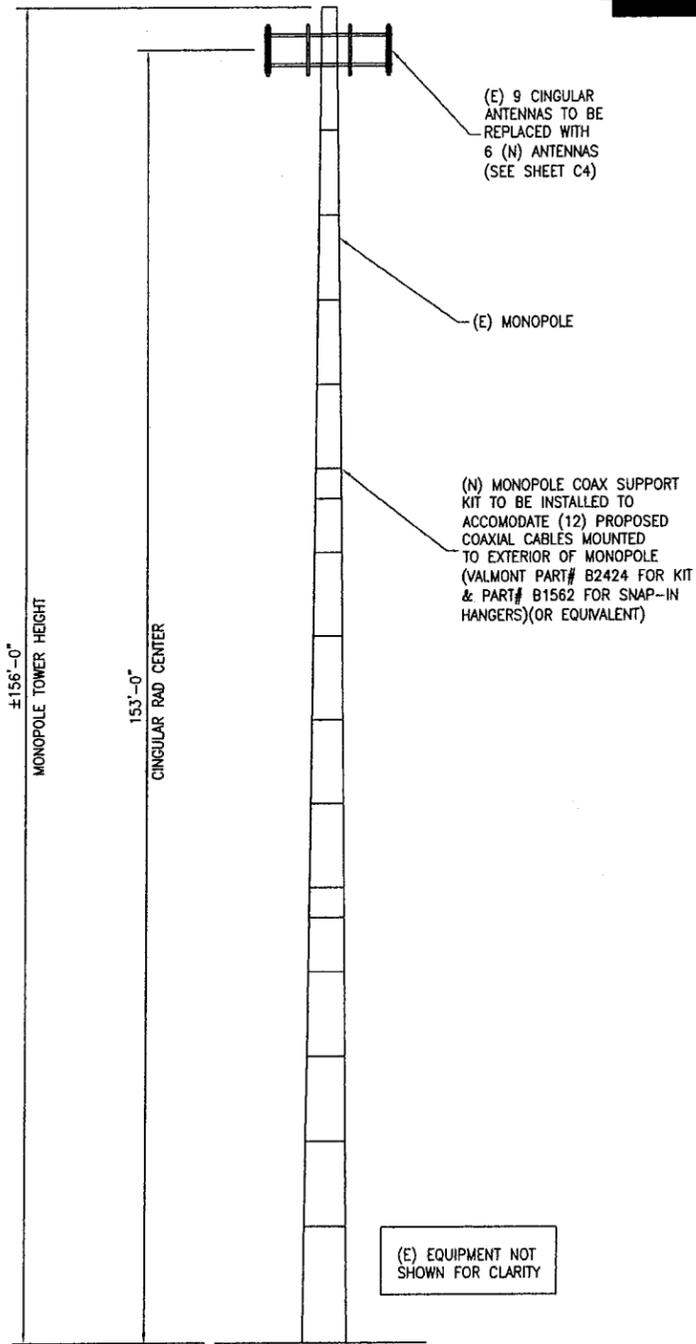


SHEET TITLE  
**SITE PLAN**

SHEET NUMBER  
**C1**

File Info: C:\Cingular\2108\2108 Civil Set.dwg Jul 16, 2005 - 1:42pm owner

CONSTRUCTION SHALL NOT PROCEED UNTIL A STRUCTURAL ANALYSIS HAS BEEN PERFORMED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN CT TO DETERMINE IF THE TOWER IS STRUCTURALLY ADEQUATE TO SUSTAIN PROPOSAL.

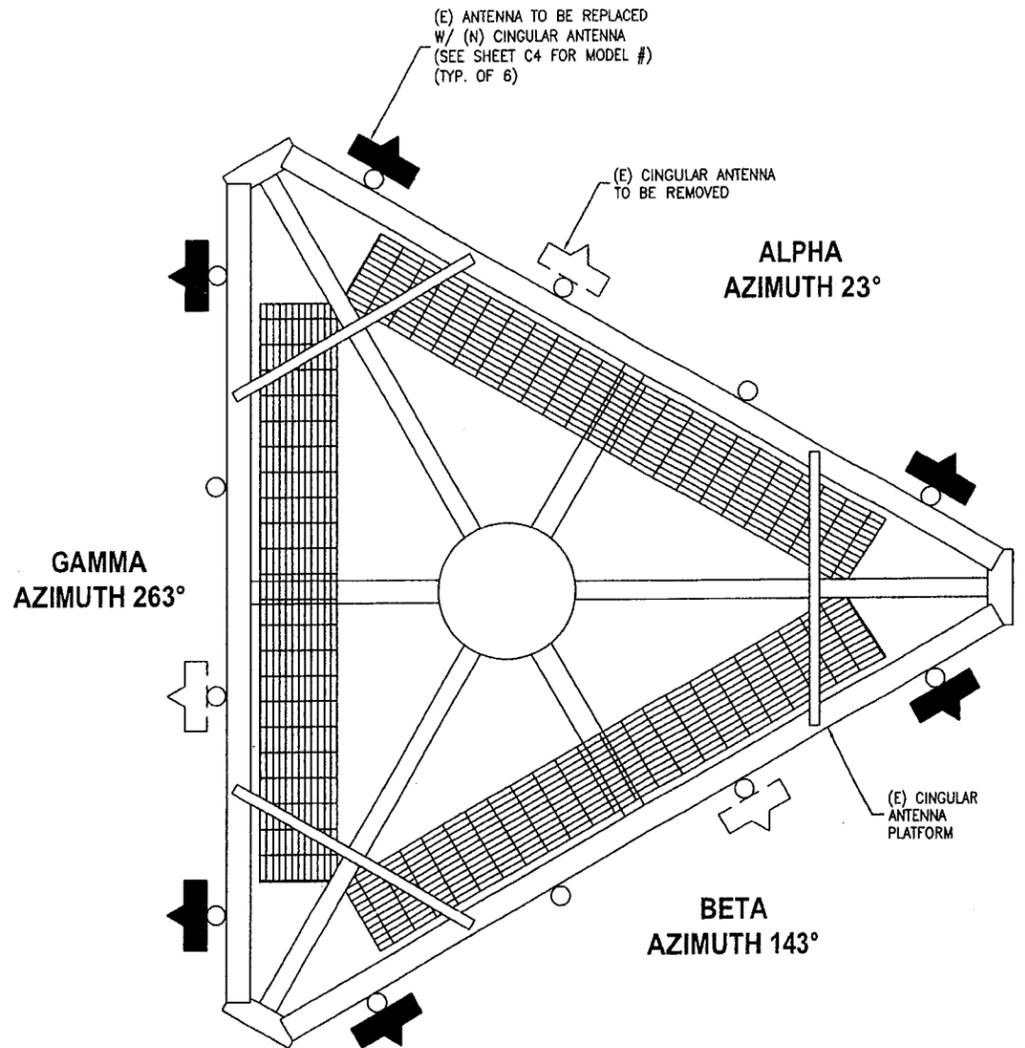


**SITE ELEVATION**

SCALE: 11x17 - 1"=20'-0"  
SCALE: 22x34 - 1"=10'-0"

1  
C2

PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, 9 EXISTING COAXIAL REMOVALS TO BE REPLACED WITH 12 PROPOSED 1 5/8" COAXIAL CABLES FOR CINGULAR WIRELESS.



**ANTENNA PLAN VIEW**

SCALE: 11x17 - NTS  
SCALE: 22x34 - NTS

2  
C2



SITE NUMBER: 2108  
SITE NAME: NORWALK WEST  
SITE ADDRESS: 613 CONNECTICUT AVE NORWALK, CT 06854

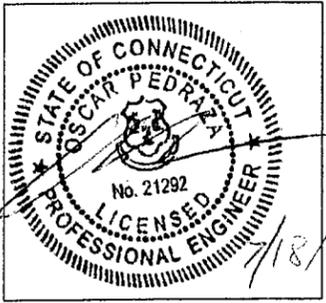
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DRAWN BY: JR

CHECKED BY: OP

PROJECT NO: 0504A111-4895158

SUBMITTALS		
NO	DESCRIPTION	BY DATE
1	SITING COMMITTEE CDS	JR 07/16/05



SHEET TITLE  
**SITE ELEVATION & ANT PLAN**

SHEET NUMBER  
**C2**



September 7, 2005

George Bullock  
Site Acquisitions, Inc.  
184 Rockingham Road  
Unit A  
Londonderry, NH 03052  
(512) 921-1681

PSG Engineering, Ltd.  
245 Commerce Green Blvd.  
Suite 240  
Sugar Land, TX 77478  
Phone: (281) 343-7099  
Fax: (281) 343-7127

**Subject: Structural Analysis Report**

**Carrier Designation**

**Cingular Wireless Co-Locate**  
**Carrier Site Number: "2108"**  
**Carrier Site Name: "NORWALK WEST"**

**Engineering Firm Designation**

**PSG Engineering Project Number: 0504A111-A990156**

**Site Data**

**613 Connecticut Ave., Norwalk, CT, Fairfield County**  
**Latitude 41°-05'-49.09", Longitude -73°-26'-58.17"**  
**150 Foot - Monopole Tower**

Dear Mr. Bullock,

PSG Engineering, Ltd. is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the aforementioned tower. This analysis has been performed in accordance with the terms of Site Acquisitions, Inc. Purchase Order Number CT-PSG-008. The purpose of the analysis is to determine the suitability of the tower with the addition of the proposed equipment listed in Table 1 of this report when combined with the existing and reserved equipment on the structure. This analysis has been performed in accordance with the TIA/EIA 222-F standard based upon wind speed condition of 85 mph.

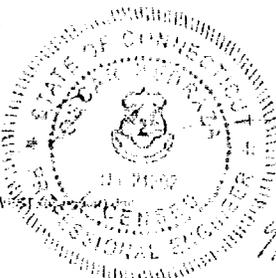
Based on our analysis we have determined the tower and foundation **ARE** sufficient for the proposed loading. PSG was not provided a geotechnical report and therefore the foundation soil capacity was not reviewed. However, based on our analysis the maximum gross bearing pressure calculated of 3208 psf is below the EIA/TIA recommended minimum allowable bearing pressure of 4000 psf and is lower than what is typically encountered in Connecticut, therefore it is my opinion that the soil capacity is sufficient. Based on the above, a geotechnical consultant should be obtained to verify the capacity of the soil prior to any installation.

We at *PSG Engineering* appreciate the opportunity of providing our continuing professional services to you and Site Acquisitions, Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Oscar Pedraza, P.E.  
President

0504A111-A990156 (2108) (NORWALK W)



9/8/05

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**INTRODUCTION**

This tower was designed by ITT Meyer in 1984. Original tower manufacturer drawings were not available at the time of this analysis. This tower structural analysis is based on a previous analysis by SpectraSite Communications Inc. dated October 09, 2002. The foundation analysis is based on the original foundation drawings by Girard & Co. Engineers dated September 14, 1984.

**ANALYSIS CRITERIA**

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

The following design criteria apply:

- Basic wind speed of 85 mph.
- Nominal ice thickness of 0.5000 in.
- Ice density of 56 pcf.
- A wind speed of 74 mph is used in combination with ice.
- Deflections calculated using a wind speed of 50 mph.
- Feedline torque is considered.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.333

**Table 1 – Proposed Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (inches)
153	6	Powerwave Technologies	7770.00	-	12	1 5/8 (Internal)
	6		LGP21401			
	6		LGP13519			

**Table 2 – Installed (I) and Reserved (R) Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (inches)
159	2(I)	Unknown	10' Omni Antennas	Top Mounted Platform w/Handrails (1)	3(I)	1 5/8 (Internal)
157	1(I)	Unknown	4' Yagi Antenna			
*153	*9(I)	*Celwave	*APL-868013-42T4		*9(I)	*7/8 (Internal)

\*Note: Existing panel antennas and associated coax to be removed and replaced with proposed loading. Existing mount will remain.

**Table 3 – Original Tower Manufacturer Design Antenna and Cable Information**

Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount	Number Of Feed Lines	Feed Line Size (inches)
Not Available						

**ANALYSIS PROCEDURE**

**Table 4 – Documents Provided**

Document	Remarks	Reference	Source
Previous Tower Analysis	SpectraSite Communications Inc.	CT-0050	Site Acquisitions, Inc.
Original Foundation Design	Girard & Co. Engineers	Norwalk, Conn Cellular Radio Cell Site	SpectraSite Communications Inc.
Proposed Tower Loading	Cingular Wireless RF Data Sheet	RF Engineer: Francis Malabanan (860.513.7625)	Site Acquisitions, Inc.

**Analysis Methods**

ERI Tower (Version 3.0.0.16), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/EIA/TIA 222F or the local building code requirements. Selected output from the analysis is included in Appendix A.

**Assumptions**

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222F.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and PSG Engineering should be allowed to review any new information to determine its effect on the structural integrity of the tower.

**ANALYSIS RESULTS**

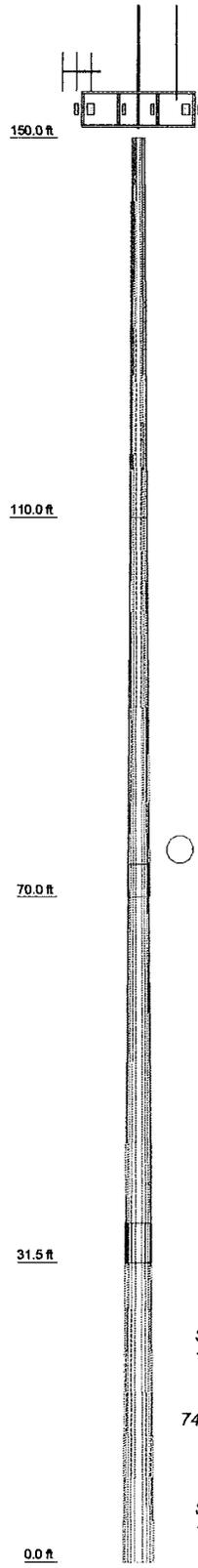
**Table 5 – Tower Section Capacity**

Section Number	Elevation (feet)	Percent Capacity Used	Pass / Fail
1	150 - 110	87.4	Pass
2	110 - 70	94.7	Pass
3	70 - 31.5	95.5	Pass
4	31.5 - 0	92.1	Pass
Base Plate		78.9	Pass
Anchor Bolts		91.4	Pass
Base Foundation		Unknown	

## APPENDIX A

### Output from Computer Programs

Section	Length (ft)	Number of Sides	Thickness (in)	Lap Splice (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	40.00	12	0.1880		15.0000	21.2500	A572-65	1.5
2	40.00	12	0.2500		21.2500	27.6100	A572-65	2.6
3	42.00	12	0.3130	3.50	26.5535	33.1000	A572-65	4.3
4	35.67	12	0.3750	4.17	31.8240	37.3800	A572-65	5.0
								13.4



**APPURTENANCES**

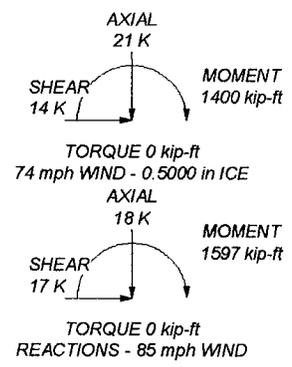
TYPE	ELEVATION	TYPE	ELEVATION
10' Whip	159	(2) 7770.00 w/Mount Pipe	153
10' Whip	159	(2) LGP2140X (TMA)	153
6' Yagi	157	(2) LGP13519	153
(2) 7770.00 w/Mount Pipe	153	(2) LGP13519	153
(2) 7770.00 w/Mount Pipe	153	PIROD 13' Top Mounted Platform w/handrails (Monopole)	153
(2) LGP2140X (TMA)	153	Generic C-2 Lightning Spur	153
(2) LGP13519	153		
(2) LGP2140X (TMA)	153		

**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 95.5%



<b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job: PSG Engineering Project Number: 0504A111-A99015</b> Project: <b>(2108) (NORWALK WEST)</b>
	Client: Site Acquisitions, Inc. Drawn by: Jamal Huwe   App'd:
	Code: TIA/EIA-222-F Date: 09/08/05 Scale: NTS
	Path: C:\Documents and Settings\woodruff\PSG\Desktop\New Job Form\0504A111\1109.dwg   Dwg No. E-1

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A111-A990156	<b>Page</b> 1 of 7
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	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

## Tower Input Data

There is a pole section.

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

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-110.00	40.00	0.00	12	15.0000	21.2500	0.1880	0.7520	A572-65 (65 ksi)
L2	110.00-70.00	40.00	3.50	12	21.2500	27.6100	0.2500	1.0000	A572-65 (65 ksi)
L3	70.00-31.50	42.00	4.17	12	26.5535	33.1000	0.3130	1.2520	A572-65 (65 ksi)
L4	31.50-0.00	35.67		12	31.8240	37.3800	0.3750	1.5000	A572-65 (65 ksi)

## Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	Iv/Q in <sup>2</sup>	w in	w/t
L1	15.5291	8.9666	251.0966	5.3027	7.7700	32.3162	508.7897	4.4131	3.5162	18.703
	21.9996	12.7501	721.9357	7.5402	11.0075	65.5858	1462.8374	6.2752	5.1912	27.613
L2	21.9996	16.9050	951.5678	7.5180	11.0075	86.4472	1928.1342	8.3201	5.0250	20.1
	28.5840	22.0248	2104.4088	9.7949	14.3020	147.1411	4264.1028	10.8399	6.7295	26.918
L3	28.0550	26.4468	2324.3551	9.3941	13.7547	168.9861	4709.7736	13.0163	6.2775	20.056
	34.2676	33.0447	4534.1011	11.7377	17.1458	264.4438	9187.3181	16.2636	8.0320	25.661
L4	33.6191	37.9747	4793.9631	11.2588	16.4848	290.8103	9713.8690	18.6900	7.5238	20.064
	38.6986	44.6835	7810.0590	13.2478	19.3628	403.3530	15825.2970	21.9919	9.0128	24.034

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A111-A990156	<b>Page</b> 2 of 7
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	<b>Client</b> Site Acquisitions, Inc.	<b>Designed by</b> Jamal Huwel

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in
L1 150.00-110.00				1	1	1		
L2 110.00-70.00				1	1	1		
L3 70.00-31.50				1	1	1		
L4 31.50-0.00				1	1	1		

### Monopole Base Plate Data

Base Plate Data	
Base plate is square	√
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	8
Embedment length	60.0000 in
$f_c$	3 ksi
Grout space	2.0000 in
Base plate grade	A572-60
Base plate thickness	2.5000 in
Bolt circle diameter	44.0000 in
Outer diameter	44.0000 in
Inner diameter	30.0000 in
Base plate type	Plain Plate

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	Number Per Row	Clear Spacing	Width or Diameter	Perimeter	Weight
				ft			in	in	in	plf
*										
*										

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		$C_{AA}$	Weight
				ft			ft <sup>2</sup> /ft	plf
***EL. 153' LEVEL***								
CR 50 1873PE (1-5/8 FOAM)	A	No	Inside Pole	150.00 - 10.00	15	No Ice 1/2" Ice	0.00 0.00	0.83 0.83
*								
***TOWER HARDWARE***								
Climbing Ladder (Ar)	C	No	CaAa (Out Of Face)	150.00 - 10.00	1	No Ice 1/2" Ice	0.04 0.14	1.00 1.53

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A111-A990156	<b>Page</b> 3 of 7
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### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	$A_R$	$A_F$	$C_{AA}$ In Face	$C_{AA}$ Out Face	Weight
			ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	150.00-110.00	A	0.000	0.000	0.000	0.000	0.50
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.500	0.04
L2	110.00-70.00	A	0.000	0.000	0.000	0.000	0.50
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.500	0.04
L3	70.00-31.50	A	0.000	0.000	0.000	0.000	0.48
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.444	0.04
L4	31.50-0.00	A	0.000	0.000	0.000	0.000	0.27
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.806	0.02

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness	$A_R$	$A_F$	$C_{AA}$ In Face	$C_{AA}$ Out Face	Weight
			in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	150.00-110.00	A	0.500	0.000	0.000	0.000	0.000	0.50
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.500	0.06
L2	110.00-70.00	A	0.500	0.000	0.000	0.000	0.000	0.50
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.500	0.06
L3	70.00-31.50	A	0.500	0.000	0.000	0.000	0.000	0.48
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.294	0.06
L4	31.50-0.00	A	0.500	0.000	0.000	0.000	0.000	0.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.956	0.03

### Feed Line Center of Pressure

Section	Elevation ft	$CP_X$	$CP_Z$	$CP_X$ Ice	$CP_Z$ Ice
		in	in	in	in
L1	150.00-110.00	-0.0475	0.0274	-0.1558	0.0900
L2	110.00-70.00	-0.0478	0.0276	-0.1611	0.0930
L3	70.00-31.50	-0.0480	0.0277	-0.1642	0.0948
L4	31.50-0.00	-0.0322	0.0186	-0.1124	0.0649

### Discrete Tower Loads

<b>ERITower</b>  <b>PSG Engineering, Ltd.</b> 8206 Forest Gate Drive Sugar Land, Texas Phone: 281.343.7099 FAX: 281.343.7127	<b>Job</b> PSG Engineering Project Number: 0504A111-A990156	<b>Page</b> 4 of 7
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
<b>***EL. 153' LEVEL***</b>									
(2) 7770.00 w/Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	5.98 6.44	4.12 4.77	0.05 0.10
(2) LGP2140X (TMA)	A	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	1.23 1.38	0.37 0.48	0.02 0.02
(2) LGP13519	A	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	0.34 0.42	0.21 0.28	0.01 0.01
10' Whip	A	From Leg	4.00 0.00 0.00	0.0000	159.00	No Ice 1/2" Ice	2.75 3.78	2.75 3.78	0.03 0.05
(2) 7770.00 w/Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	5.98 6.44	4.12 4.77	0.05 0.10
(2) LGP2140X (TMA)	B	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	1.23 1.38	0.37 0.48	0.02 0.02
(2) LGP13519	B	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	0.34 0.42	0.21 0.28	0.01 0.01
10' Whip	B	From Leg	4.00 0.00 0.00	0.0000	159.00	No Ice 1/2" Ice	2.75 3.78	2.75 3.78	0.03 0.05
(2) 7770.00 w/Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	5.98 6.44	4.12 4.77	0.05 0.10
(2) LGP2140X (TMA)	C	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	1.23 1.38	0.37 0.48	0.02 0.02
(2) LGP13519	C	From Leg	4.00 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice	0.34 0.42	0.21 0.28	0.01 0.01
6' Yagi	C	From Leg	4.00 0.00 0.00	0.0000	157.00	No Ice 1/2" Ice	4.20 4.68	4.20 4.68	0.01 0.03
PiROD 13' Top Mounted Platform w/handrails (Monopole)	C	None		0.0000	153.00	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45
* * ***TOWER HARDWARE***									
Generic C-2 Lightning Spur	A	None		0.0000	153.00	No Ice 1/2" Ice	4.00 7.00	4.00 7.00	0.00 0.00

## Load Combinations

Comb. No.	Description
-----------	-------------

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

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	54.639	30	3.5611	0.0058
L2	110 - 70	28.069	36	2.6069	0.0019
L3	73.5 - 31.5	11.957	36	1.5912	0.0007
L4	35.67 - 0	2.736	35	0.7032	0.0002

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	10' Whip	30	54.639	3.5611	0.0058	12652

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
157.00	6' Yagi	30	54.639	3.5611	0.0058	12652
153.00	(2) 7770.00 w/Mount Pipe	30	54.639	3.5611	0.0058	12652

### Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	150 - 110	156.542	5	10.2110	0.0164
L2	110 - 70	80.599	11	7.4854	0.0053
L3	73.5 - 31.5	34.388	11	4.5751	0.0021
L4	35.67 - 0	7.877	11	2.0241	0.0007

### Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
159.00	10' Whip	5	156.542	10.2110	0.0164	4634
157.00	6' Yagi	5	156.542	10.2110	0.0164	4634
153.00	(2) 7770.00 w/Mount Pipe	5	156.542	10.2110	0.0164	4634

### Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension	Actual Allowable Ratio Bolt Compression	Actual Allowable Ratio Plate Stress	Actual Allowable Ratio Stiffener Stress	Controlling Condition	Ratio
in		in	K	K	ksi	ksi		
2.5000	8	2.2500	212.99	217.39	47.060		Bolt T	1.22
			174.90	290.34	45.000			
			1.22	0.75	1.05			

### Compression Checks

### Pole Design Data

Section No.	Elevation	Size	L	L <sub>u</sub>	KL/r	F <sub>a</sub>	A	Actual P	Allow. P <sub>a</sub>	Ratio P/P <sub>a</sub>
	ft		ft	ft		ksi	in <sup>2</sup>	K	K	

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KL/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P/P <sub>a</sub>
L1	150 - 110 (1)	TP21.25x15x0.188	40.00	0.00	0.0	39.000	12.7501	-3.43	497.25	0.007
L2	110 - 70 (2)	TP27.61x21.25x0.25	40.00	0.00	0.0	39.000	21.5768	-6.41	841.50	0.008
L3	70 - 31.5 (3)	TP33.1x26.5535x0.313	42.00	0.00	0.0	39.000	32.3896	-11.31	1263.20	0.009
L4	31.5 - 0 (4)	TP37.38x31.824x0.375	35.67	0.00	0.0	39.000	44.6835	-17.63	1742.66	0.010

### Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> /F <sub>by</sub>
L1	150 - 110 (1)	TP21.25x15x0.188	246.99	-45.192	39.000	1.159	0.00	0.000	39.000	0.000
L2	110 - 70 (2)	TP27.61x21.25x0.25	575.97	-48.953	39.000	1.255	0.00	0.000	39.000	0.000
L3	70 - 31.5 (3)	TP33.1x26.5535x0.313	1044.02	-49.321	39.000	1.265	0.00	0.000	39.000	0.000
L4	31.5 - 0 (4)	TP37.38x31.824x0.375	1596.83	-47.507	39.000	1.218	0.00	0.000	39.000	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio P/P <sub>a</sub>	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Ratio f <sub>by</sub> /F <sub>by</sub>	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 110 (1)	TP21.25x15x0.188	0.007	1.159	0.000	1.166	1.333	H1-3
L2	110 - 70 (2)	TP27.61x21.25x0.25	0.008	1.255	0.000	1.263	1.333	H1-3
L3	70 - 31.5 (3)	TP33.1x26.5535x0.313	0.009	1.265	0.000	1.274	1.333	H1-3
L4	31.5 - 0 (4)	TP37.38x31.824x0.375	0.010	1.218	0.000	1.228	1.333	H1-3

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
L1	150 - 110	Pole	TP21.25x15x0.188	1	-3.43	662.84	87.4	Pass
L2	110 - 70	Pole	TP27.61x21.25x0.25	2	-6.41	1121.71	94.7	Pass
L3	70 - 31.5	Pole	TP33.1x26.5535x0.313	3	-11.31	1683.85	95.5	Pass
L4	31.5 - 0	Pole	TP37.38x31.824x0.375	4	-17.63	2322.97	92.1	Pass
<b>Summary</b>								
Pole (L3)							95.5	Pass
Base Plate							91.4	Pass
<b>RATING =</b>							<b>95.5</b>	<b>Pass</b>





# Site Specific Attachments

## Site 4

1. Site Plans
2. Tower Structural Analysis
3. Site Photographs

**APPROVALS**

NAME (PRINT)	SIGNATURE	DATE
CINGULAR		
NAME (PRINT)	SIGNATURE	DATE
SAI		
NAME (PRINT)	SIGNATURE	DATE
SITING COUNCIL COMMITTEE		
NAME (PRINT)	SIGNATURE	DATE
OTHER		



**SITE NUMBER: 2109**  
**SITE NAME: STAMFORD NORTH**



SITE NUMBER:  
**2109**  
 SITE NAME:  
**STAMFORD NORTH**  
 SITE ADDRESS:  
 1590 NEWFIELD AVENUE  
 STAMFORD, CT

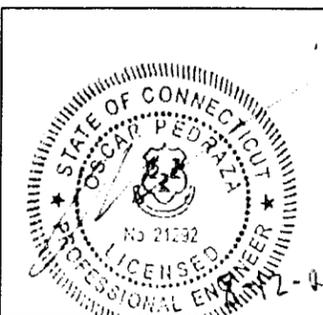
IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR

CHECKED BY: OP

PROJECT NO: 05044152-AB95150

SUBMITTALS			
NO	DESCRIPTION	BY	DATE
0	SITING COMMITTEE CDS	JR	08/10/05



SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T1**

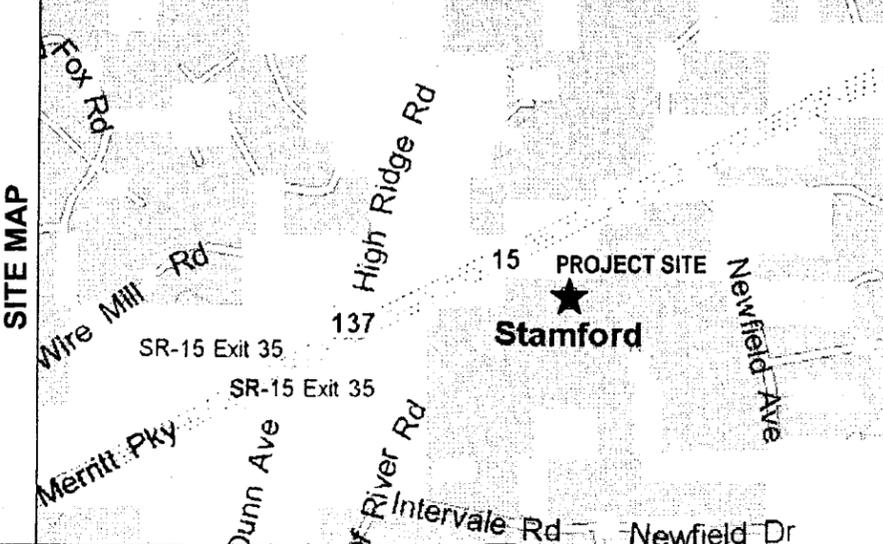
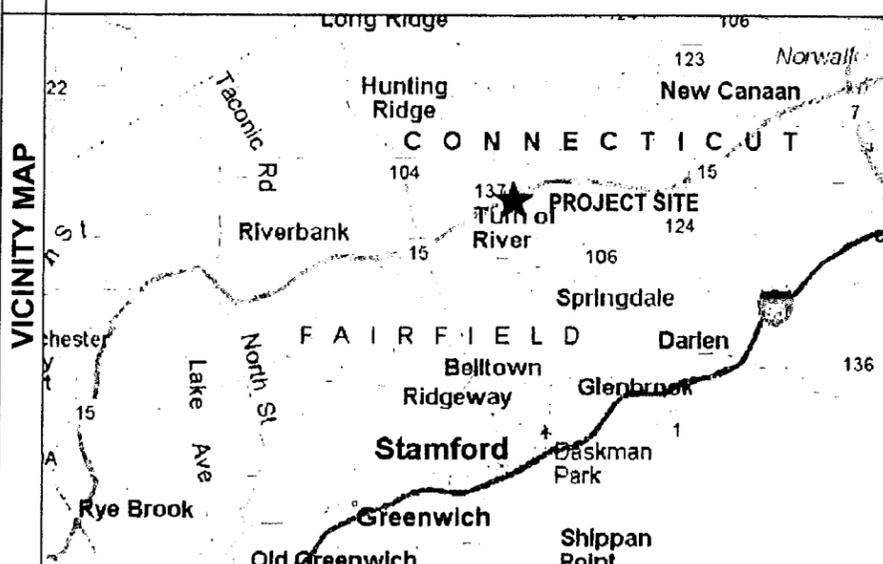
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**REV**

2109 - T1	TITLE SHEET	0
2109 - C1	SITE PLAN	0
2109 - C2	SITE ELEVATION & ANTENNA PLAN	0
2109 - C3	ANTENNA PLUMBING DIAGRAM-ALPHA-BETA-GAMMA	0
2109 - C4	RF DATA INFORMATION	0

**MAPS & DIRECTIONS**

FROM I-95 EAST TAKE EXIT 7 AND TURN ONTO SR-137 [WASHINGTON BLVD] NORTH. TURN RIGHT ONTO HOYT ST. TURN LEFT ONTO STRAWBERRY HILL AVE AND THEN CONTINUE ON NEWFIELD AVE. TURN LEFT ONTO INTERVALE RD E. SITE IS ON THE LEFT.



**BLDG. CODES AND STANDARDS**

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:  
 INTERNATIONAL BUILDING CODE (IBC), 2003

ELECTRICAL CODE:  
 NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 - 2002 NATIONAL ELECTRICAL CODE

LIGHTNING PROTECTION CODE:  
 NFPA 780 - 2000, LIGHTNING PROTECTION CODE

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:  
 AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE  
 AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION  
 TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:  
 TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM  
 IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

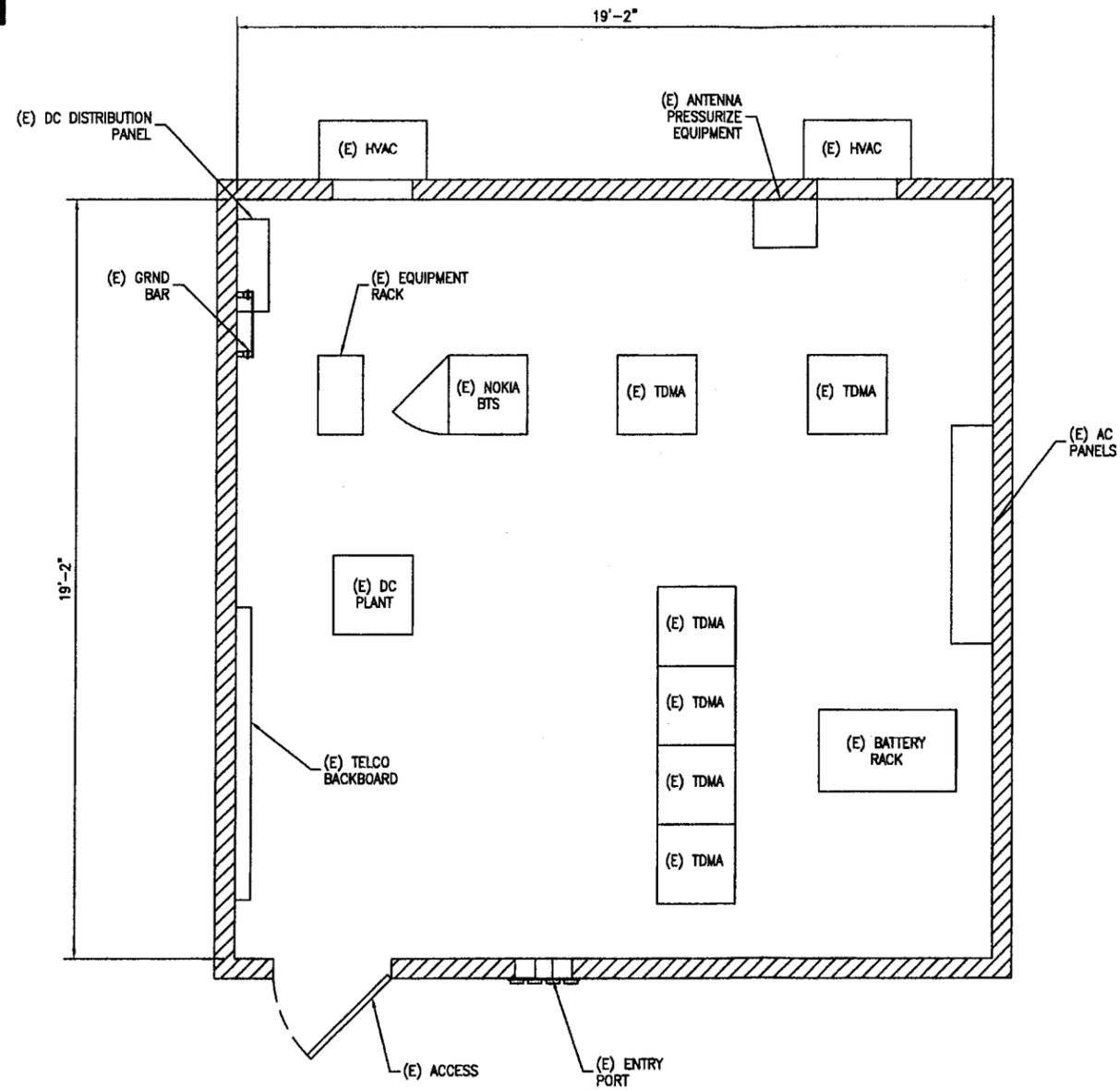
ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

**PROJECT INFORMATION**

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS  
 SITE NUMBER: 2109  
 SITE NAME: STAMFORD NORTH  
 ADDRESS: 1590 NEWFIELD AVENUE  
 CITY, STATE ZIP: STAMFORD, CT  
 LATITUDE: 41.112725°  
 LONGITUDE: -73.538858°  
 JURISDICTION: FAIRFIELD COUNTY  
 CURRENT USE: TELECOMMUNICATIONS FACILITY  
 PROPOSED USE: TELECOMMUNICATIONS FACILITY  
 SITE TYPE: MONOPOLE  
 RAD CENTER: 152'-0"  
 OWNER: SPECTRASITE

PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS & 3 ANTENNA REMOVALS



**SITE PLAN**  
 SCALE: 11x17 - 1/4"=1'-0"  
 SCALE: 22x34 - 1/2"=1'-0"

1  
C1



SITE NUMBER:  
**2109**  
 SITE NAME:  
**STAMFORD NORTH**  
 SITE ADDRESS:  
 1590 NEWFIELD AVENUE  
 STAMFORD, CT

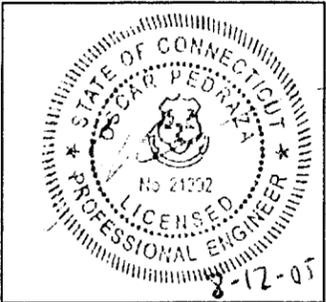
IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR

CHECKED BY: OP

PROJECT NO: 0504A182-AP05150

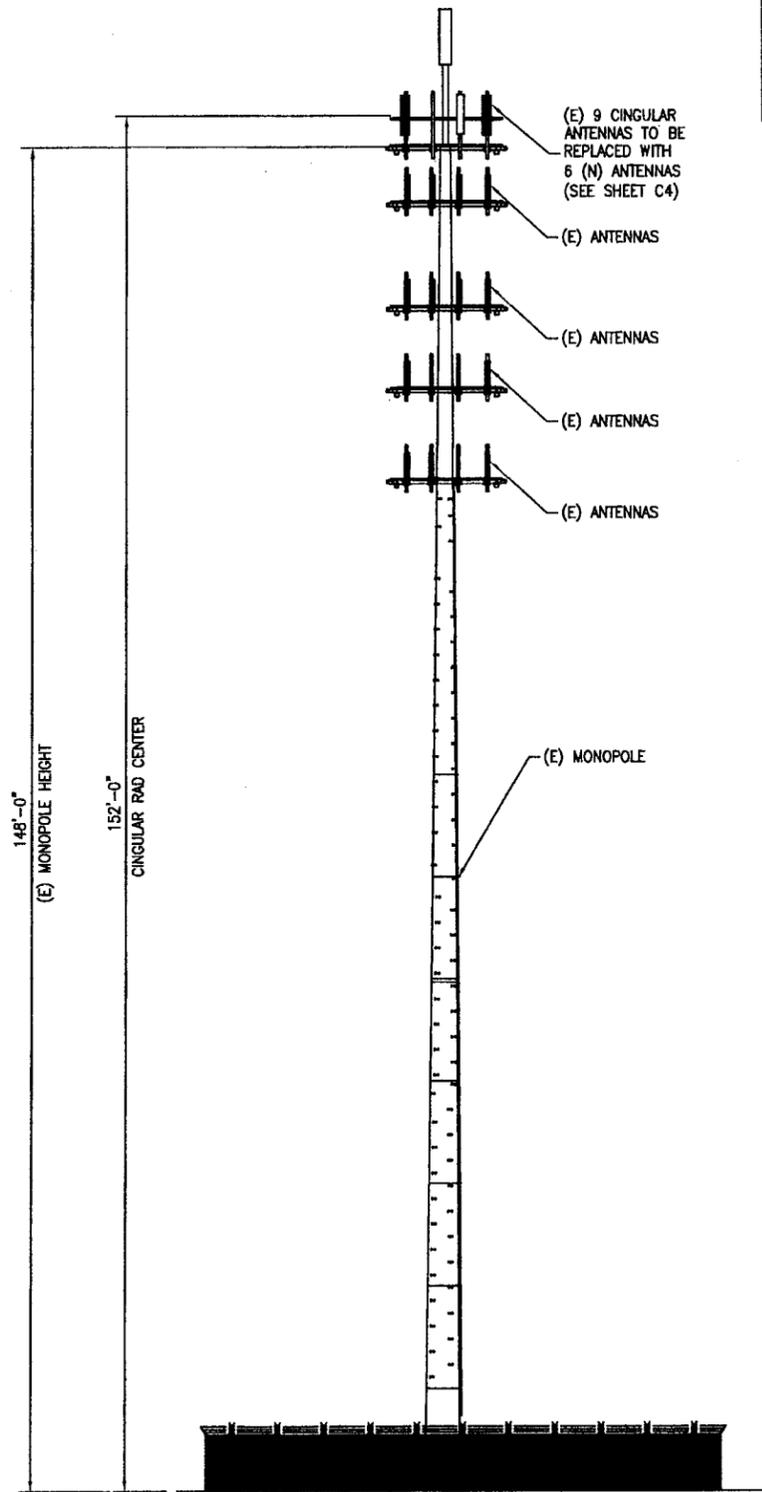
SUBMITTALS		
NO	DESCRIPTION	BY DATE
0	SITING COMMITTEE CDS	JR 08/10/05



SHEET TITLE  
**SITE PLAN**

SHEET NUMBER  
**C1**

File Info: C:\Cingular\2109\2109 Civil Set.dwg Aug 10, 2005 - 11:02am Jross



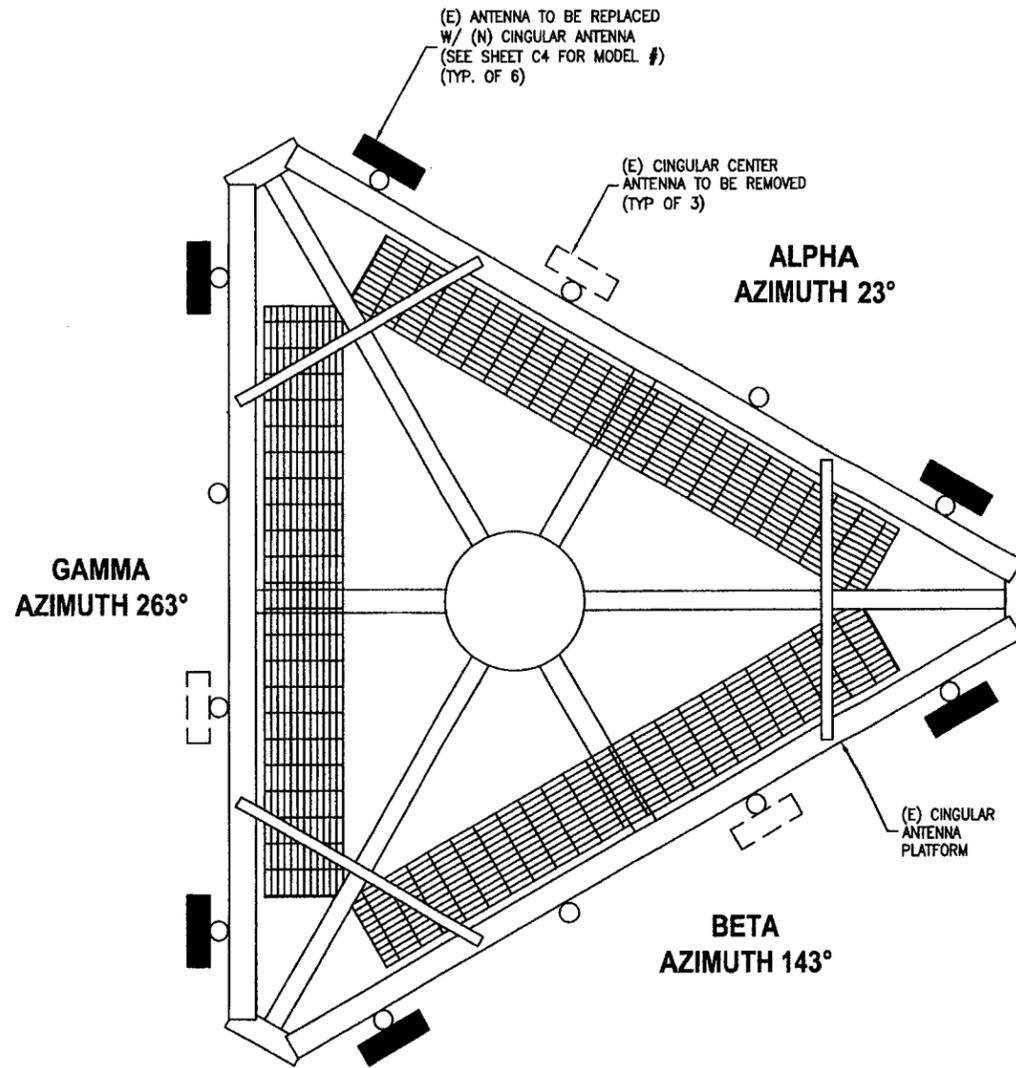
**SITE ELEVATION**

SCALE: 11x17 - NTS  
SCALE: 22x34 - NTS

1  
C2

CONSTRUCTION SHALL NOT PROCEED UNTIL A STRUCTURAL ANALYSIS HAS BEEN PERFORMED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN CT TO DETERMINE IF THE TOWER IS STRUCTURALLY ADEQUATE TO SUSTAIN PROPOSAL.

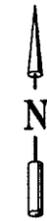
PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS & 3 ANTENNA REMOVALS



**ANTENNA PLAN VIEW**

SCALE: 11x17 - NTS  
SCALE: 22x34 - NTS

2  
C2

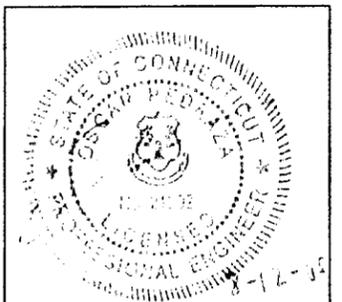


SITE NUMBER:  
**2109**  
SITE NAME:  
**STAMFORD NORTH**  
SITE ADDRESS:  
1590 NEWFIELD AVENUE  
STAMFORD, CT

IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR  
CHECKED BY: OP  
PROJECT NO: 05044152-4995150

SUBMITTALS		
NO	DESCRIPTION	BY DATE
0	SITING COMMITTEE CDS	JR 08/10/05



SHEET TITLE  
**SITE ELEVATION & ANT PLAN**

SHEET NUMBER  
**C2**

Level 1 Structural Evaluation <sup>1</sup>					
Site Number & Name		CT-0051 SMFR - North App ID: 108471		Applicant ID: 2109 Stamford - North	
Site Address		1590 Newfield Ave Stamford, CT			
Tower Description		150 ft Engineered Endeavors Monopole			
Standards & Codes <sup>2</sup>		ANSI/TIA/EIA-222-F (1996) 85 mph (Fairfield County) w/ 0" radial ice		1996 BOCA National Building Code 85 mph w/ 0" radial ice 39 mph w/ 3/4" radial ice	
Table 1: Existing and Proposed Antenna Configuration					
HEIGHT (ft)	ANTENNA MODEL & MOUNT TYPE	CARRIER	COAX SIZE	[I]/[O] <sup>a</sup>	STATUS
160	(3) EMS RR90-17-02DP on Accelerator (Stealth)	T-Mobile	(6) 1-5/8"	I	Existing
152	(12) DECIBEL DB844 on Platform w/ Handrails	Cingular Wireless	(12) 1-1/4"	I	Remove Existing
152	(6) Powerwave 7770.00 (6) Powerwave LGP21401 on Platform w/ Handrails	Cingular Wireless	(12) 1-1/4"	I	Proposed Replacement
143	(6) 4' Panels (6) SWEDCOM SC 9012 on Platform w/ Handrails	Verizon	(6) 1-5/8" (6) 1-5/8"	I	Existing
131.5	(9) DECIBEL DB844H90E-XY (3) DECIBEL DB844H90E-XY on Low Profile Platform	Nextel	(9) 1-1/4" (3) 1-1/4"	I O	Existing
122.5	(6) DECIBEL DB980H90 on Low Profile Platform	Sprint	(6) 1-5/8"	I	Existing
112.5	(9) ALLGON 7184.15 on Low Profile Platform	AT&T	(12) 1-5/8"	I	Existing

<sup>a</sup> [I]/[O] denotes coax installed inside or outside the monopole, respectively.

The subject tower and foundation are ~~designed~~ designed to support the above stated loads in conformance with specified requirements. <sup>3</sup>

Analysis prepared by:  
Raphael Mohamed, P.E.  
Senior Design Engineer  
(919) 465-6629



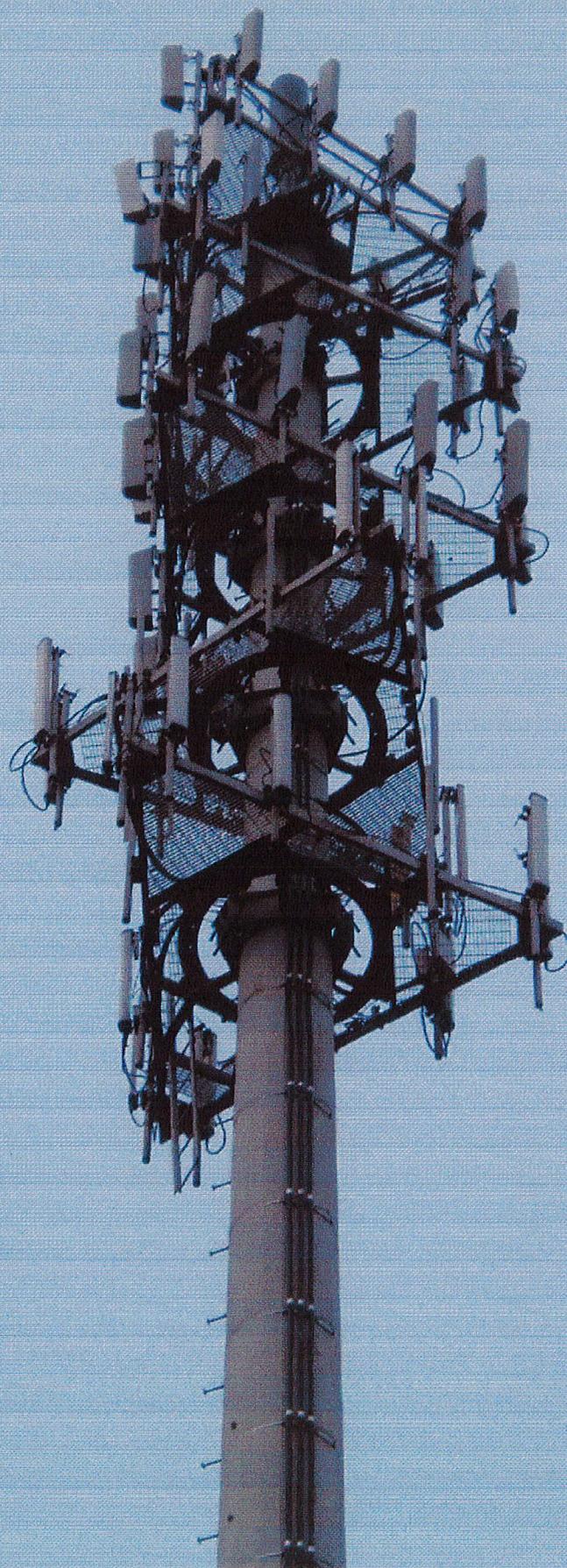
Wm. E. Garrett, P.E.  
Structural Design Manager  
JUL 26 2005

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Connecticut.

<sup>1</sup> The existing and proposed loads of Table 1 are compared to the original tower design loads or previous analysis.

<sup>2</sup> The design wind criteria are compared to the current code requirements.

<sup>3</sup> The tower should be re-evaluated as future loads are added or if actual loads are found different from those mentioned in Table 1.





# Site Specific Attachments

## Site 5

1. Site Plans
2. Tower Structural Analysis
3. Site Photographs

**APPROVALS**

NAME (PRINT)	SIGNATURE	DATE
CINGULAR		
NAME (PRINT)	SIGNATURE	DATE
SAI		
NAME (PRINT)	SIGNATURE	DATE
SITING COUNCIL COMMITTEE		
NAME (PRINT)	SIGNATURE	DATE
OTHER		



**SITE NUMBER: 2104**  
**SITE NAME: DARIEN**



SITE NUMBER:  
2104  
 SITE NAME:  
DARIEN  
 SITE ADDRESS:  
50 LEDGE RD  
DARIEN, CT 06820

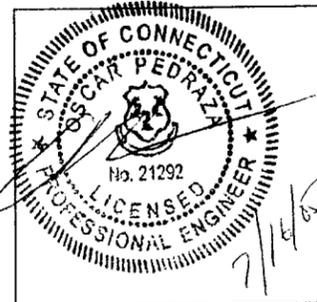
IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR

CHECKED BY: OP

PROJECT NO: 0504A105-4895100

SUBMITTALS		
NO	DESCRIPTION	BY DATE
1	SITING COMMITTEE CDS	JR 07/15/05



SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T1**

**DRAWING INDEX**

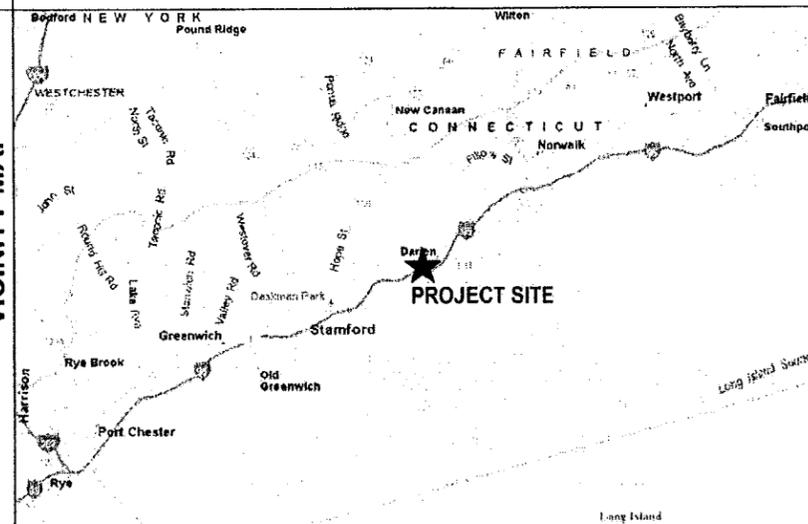
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2104 - C1	SITE PLAN	1
2104 - C2	SITE ELEVATION & ANTENNA PLAN	1
2104 - C3	ANTENNA PLUMBING DIAGRAM-ALPHA	1
2104 - C4	ANTENNA PLUMBING DIAGRAM-BETA	1
2104 - C5	ANTENNA PLUMBING DIAGRAM-GAMMA	1
2104 - C6	RF DATA INFORMATION	1

**REV**

**MAPS & DIRECTIONS**

95 SOUTH TO EXIT 11 (RT 1). TAKE RT 1 NORTH TO FIRST LEFT ONTO LEDGE ST. SITE IS ON RIGHT (1/4 MILE) INSIDE TOWN DUMP.

VICINITY MAP



**BLDG. CODES AND STANDARDS**

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BUILDING CODE:  
INTERNATIONAL BUILDING CODE (IBC), 2003

ELECTRICAL CODE:  
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 - 2002 NATIONAL ELECTRICAL CODE

LIGHTNING PROTECTION CODE:  
NFPA 780 - 2000, LIGHTNING PROTECTION CODE

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 AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION  
 TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:  
 TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM  
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TELCORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

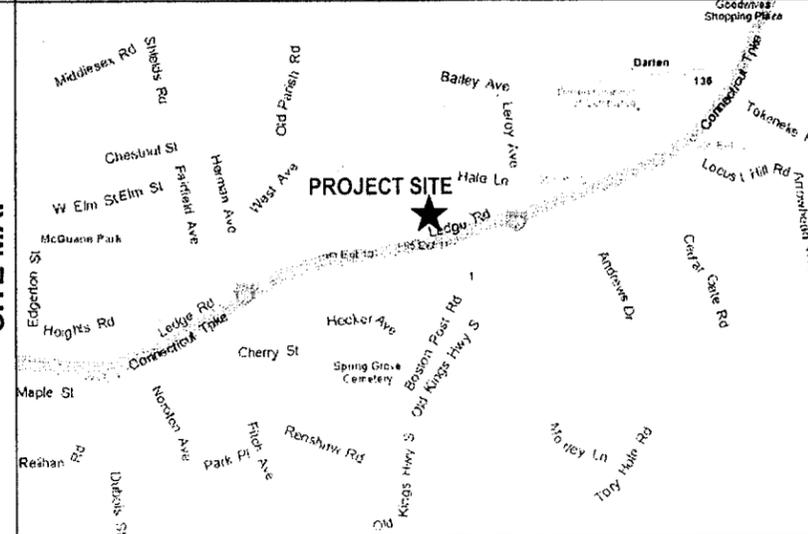
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**PROJECT INFORMATION**

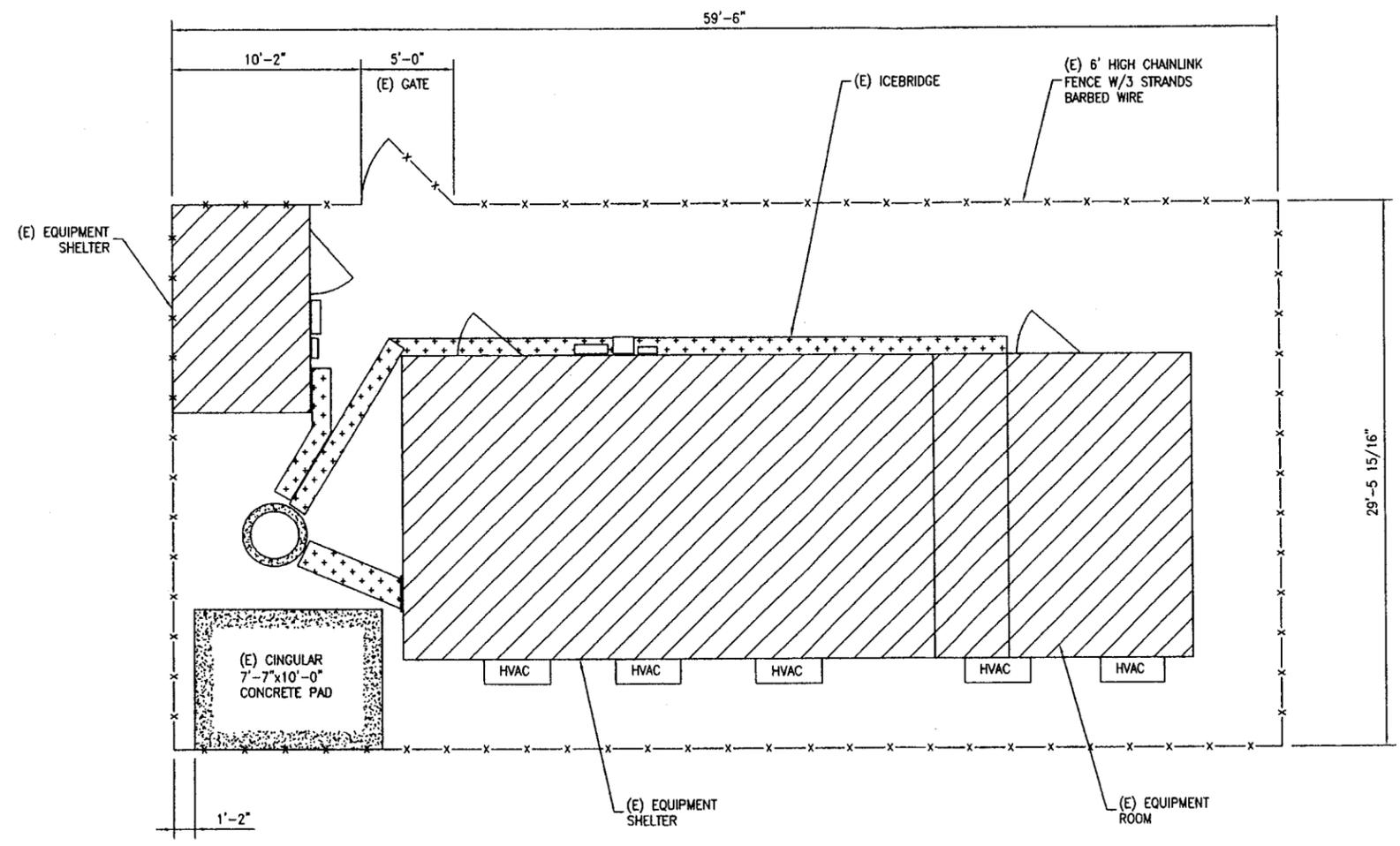
SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS  
 SITE NUMBER: 2104  
 SITE NAME: DARIEN  
 ADDRESS: 50 LEDGE ROAD  
 CITY, STATE ZIP: DARIEN, CT 06831  
 LATITUDE: 41° 04' 20.75"  
 LONGITUDE: -73° 28' 41.4"  
 JURISDICTION: FAIRFIELD COUNTY  
 CURRENT USE: TELECOMMUNICATIONS FACILITY  
 PROPOSED USE: TELECOMMUNICATIONS FACILITY  
 SITE TYPE: MONOPOLE TOWER  
 RAD CENTER: 89'-0"  
 OWNER: CROWN CASTLE BU# 806352

SITE MAP



File Info: C:\Documents and Settings\opedraza\PSG\GLOBAL\Desktop\SAI\072104\2104\_Civil\_Sat.dwg Jul 16, 2005 - 10:26am opedraza

PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, AND 3 PROPOSED COAXIAL CABLES FOR CINGULAR WIRELESS



**SITE PLAN**  
 SCALE: 11x17 - 1/8"=1'-0"  
 SCALE: 22x34 - 1/4"=1'-0"

1  
C1



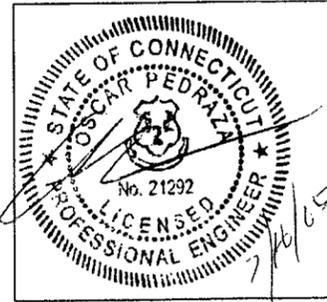
SITE NUMBER:  
2104  
 SITE NAME:  
DARIEN  
 SITE ADDRESS:  
50 LEDGE RD  
DARIEN, CT 06820

IT IS A VIOLATION OF THE PROPRIETARY RIGHTS OF THE WIRELESS CARRIER TO ALTER THIS DOCUMENT UNLESS THEY ARE INSTRUCTED ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

DRAWN BY: JR  
 CHECKED BY: DP  
 PROJECT NO: 0504A105-APR5100

SUBMITTALS

NO	DESCRIPTION	BY	DATE
1	LISTING COMMITTEE CDS	JR	07/15/05

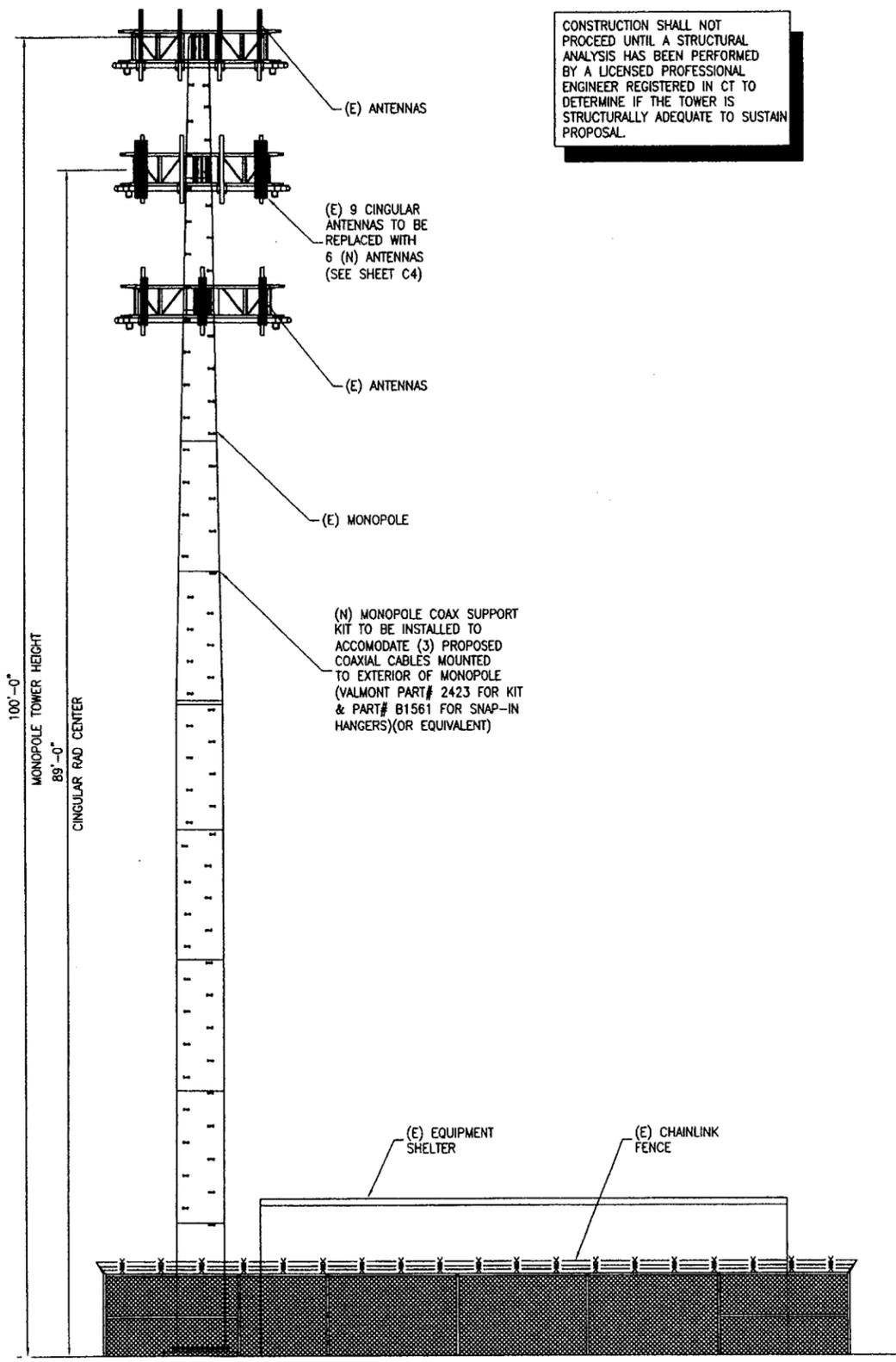


SHEET TITLE  
**SITE PLAN**

SHEET NUMBER  
**C1**

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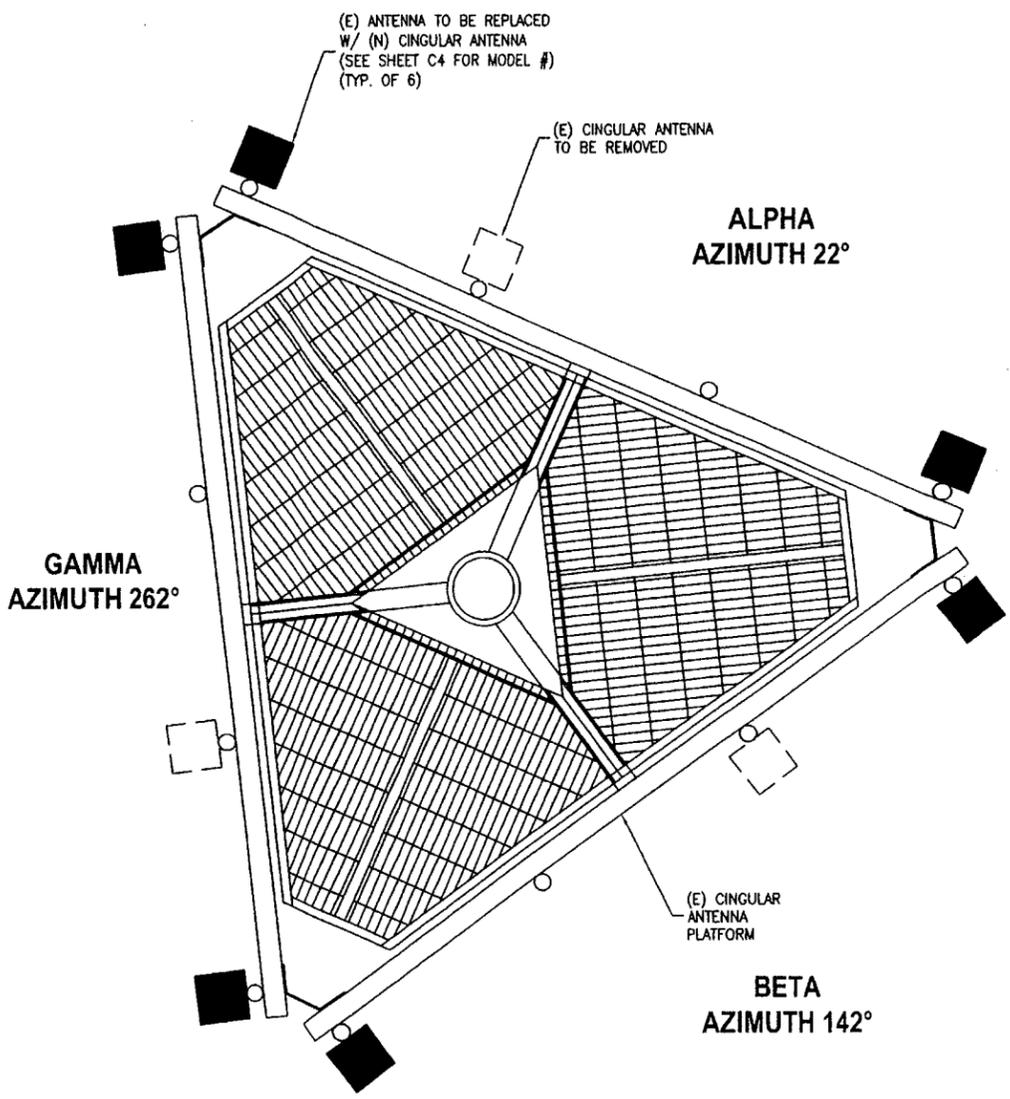
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CONSTRUCTION SHALL NOT PROCEED UNTIL A STRUCTURAL ANALYSIS HAS BEEN PERFORMED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN CT TO DETERMINE IF THE TOWER IS STRUCTURALLY ADEQUATE TO SUSTAIN PROPOSAL.

**SITE ELEVATION**  
 SCALE: 11x17 - 1"=20'-0"  
 SCALE: 22x34 - 1"=10'-0"

1  
C2



PURPOSE OF THESE DESIGN DOCUMENTS ARE FOR 6 ANTENNA REPLACEMENTS, 3 ANTENNA REMOVALS, AND 3 PROPOSED COAXIAL CABLES FOR CINGULAR WIRELESS

**ANTENNA PLAN VIEW**  
 SCALE: 11x17 - NTS  
 SCALE: 22x34 - NTS

2  
C2

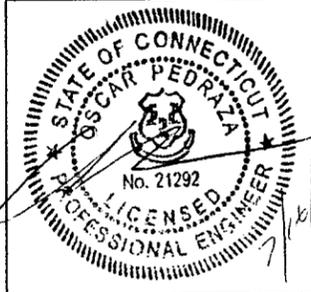


SITE NUMBER:  
2104  
 SITE NAME:  
DARIEN  
 SITE ADDRESS:  
50 LEDGE RD  
DARIEN, CT 06820

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DRAWN BY: JR  
 CHECKED BY: DP  
 PROJECT NO: 0504A105-A995100

SUBMITTALS		
NO	DESCRIPTION	BY DATE
1	SITING COMMITTEE CDS	JR 07/15/05



SHEET TITLE  
**SITE ELEVATION & ANT PLAN**

SHEET NUMBER  
**C2**



John Murphy  
Crown Castle International  
500 West Cummings Park, Suite 3400  
Woburn, Massachusetts 01801  
(781) 729-4406

August 1, 2005

**Subject:** Structural Analysis Report

**Carrier Designation** Cingular Co-Location  
Site Name: Darien  
Site Number: 2104

**Crown Castle Designation** BU Number: 806352  
Site Name: BRG 302 943052

**GPD Associate Designation** Project Number: 2005278.88

**Site Data** 126 Ledge Road, Darien, Connecticut 06820  
Latitude 41° 4' 20.75", Longitude 73° 28' 41.4"  
100' Valmont Monopole w/ 19'-6" Extension

Dear Mr. Murphy,

GPD is pleased to submit this structural analysis report as a determination of the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the addition of the following proposed antenna configuration:

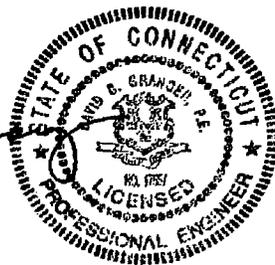
Elev. 90' (6) Powerwave 7770.0 Antennas on a Valmont 13' Platform w/ (3) 1-1/4" internal coax  
(6) Powerwave LPG2104X Tower mounted amplifiers mounted behind the antennas  
(6) Diplexers mounted behind the antennas

This analysis has been performed in accordance with the TIA/EIA-222-F standard based upon a wind speed condition of 85 mph, and the Connecticut Building Code based on a 110 mph 3 second gust. Based on our analysis we have determined the tower and its foundation are sufficient for the proposed loading.

We at GPD appreciate the opportunity of providing our continuing professional services to you and Crown Castle International. If you have any questions please do not hesitate to call.

Respectfully submitted,

David B. Granger, P.E.  
Connecticut #: 17557



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**EXECUTIVE SUMMARY**

The purpose of this analysis was to verify that the existing monopole is structurally capable of carrying the proposed loading configurations as specified by Cingular to Crown Castle International. This report was commissioned by Mr. John Murphy of Crown Castle International.

The existing monopole is structurally satisfactory for the proposed loading configuration for a basic wind speed of 85 mph with 1/2" of radial ice (25% reduction) in accordance with TIA/EIA-222-F. The tower rating/capacity is 99.5%, which is within customary engineering tolerances and is therefore considered satisfactory.

The foundation reactions, with the proposed loading, were found to be 97.9% of the original design reactions. If the existing foundation was properly designed for the original reactions, then it is our opinion that the foundation is adequate.

The 19'-6" monopole extension used in the analysis is reference to the extension design drawings by GPD (Job #: 2005278.78, dated July 26, 2005).

**ANALYSIS CRITERIA**

The current requirements of TIA/EIA-222-F and the Connecticut Building Code are for a basic wind speed of 85 mph with 1/2" of radial ice. A 25% reduction in wind load is allowed when wind and ice are applied simultaneously. TIA/EIA-222-F requires towers within Fairfield County be analyzed with an 85 mph wind speed. The Connecticut Building Code requires structures within the tower's region to be analyzed using a 110 mph 3 second gust. In this case, the 85 mph sustained wind speed controls.

**Table 1 – Proposed Antenna and Cable Information**

120	1 (Reserved)	Decibel	931DG70VTREM	Top	6 (External)	1-5/8
110	3 (Reserved)	EMS Wireless	DR65-18-02DPL2Q	Flush	12 (External)	1-5/8
100	6	Swedcom	ALP 9212-N	13' Platform w/ handrails	6	1-5/8
	6	Decibel	DB948F85T2E-M		6	1-5/8
90	6	<b>Powerwave</b>	7770.00	13' Platform w/ handrails	9	1-5/8
	3	<b>Powerwave</b>	<b>LPG2140X TMA's</b>		3	<b>1-1/4</b>
80	9	Swedcom	ALP-E 9011-DIN	13' Platform w/ handrails	9	1-1/4

Note: **Bold** indicates a new appurtenance. All coax are internal to monopole U.N.O.

**Table 2 – Existing and Reserved Antenna and Cable Information**

Height (ft)	Quantity	Antenna/Cable Type	Model/Spec	Mounting	Platform Size	Clearance
120	1 (Reserved)	Decibel	931DG70VTREM	Top	6 (External)	1-5/8
110	3 (Reserved)	EMS Wireless	DR65-18-02DPL2Q	Flush	12 (External)	1-5/8
100	6	Swedcom	ALP 9212-N	13' Platform w/ handrails	6	1-5/8
	6	Decibel	DB948F85T2E-M		6	1-5/8
90	9	Swedcom	ALP 9212-N	13' Platform w/ handrails	9	1-5/8
	9		TMA's			
80	9	Swedcom	ALP-E 9011-DIN	13' Platform w/ handrails	9	1-1/4

**TOWER DESCRIPTION**

The existing 100' monopole has 12 sides and is evenly tapered from 40.3" (flat-flat) at the base to 18.2" (flat-flat) at the top. It has two major sections connected with slip joints.

The tower was originally designed for Bell Atlantic / Metro Mobile by Valmont Industries, Inc. of Valley, Nebraska for a 90 mph wind speed with 1/2" radial ice in accordance with EIA/TIA-222-E.

**Table 3 – Original Design**

Height (ft)	Quantity	Antenna/Cable Type	Model/Spec	Mounting	Platform Size	Clearance
97	6		8RL410C4R105	Platform		
	2		PD100			
84	6		8RL410C4R105	Platform		
	2					

**ANALYSIS PROCEDURE**

**Table 4 – Documents Provided**

Document	Author/Source	Reference	Notes
Original Tower Drawings	Valmont Industries, Inc. Order #: 10844-92, dated 1/28/93	Doc ID # 217772	Crown DMZ
Extension Design Drawings	GPD Associates Job #: 2005278.78, dated 7/26/05	J. Cheronis	Crown DMZ

**Analysis Methods**

ERI Tower (Version 3.0.0.16), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/EIA/TIA-222-F and all local building code requirements. Selected output from the analysis is included in Appendices A and B.

### Assumptions

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 & 2, and the referenced drawings.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Associates should be allowed to review any new information to determine its effect on the structural integrity of the tower.

### ANALYSIS RESULTS

Table 5 – Tower Summary

Item	Count	Pass	Fail	Remarks
3	100 - 110	65	9.7%	Pass
2	47 - 100	65	99.5%	Pass
1	0 - 47	65	96.9%	Pass
Anchor Bolts	75	84.0%		Pass
Base Plate	60	90.5%		Pass
Foundation	97.9% of original design			Adequate

### Recommended Modifications

The monopole and its foundation are satisfactory for the proposed loading and do not require modifications.

### DISCLAIMER OF WARRANTIES

The engineering services rendered by GPD ASSOCIATES in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. GPD ASSOCIATES does not analyze the fabrication, including welding, except as included in this report.

The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD Associates, but are beyond the scope of this report.

GPD ASSOCIATES makes no warranties, expressed or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD ASSOCIATES will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD ASSOCIATES pursuant to this report will be limited to the total fee received for preparation of this report.

**APPENDIX A**  
**ERI Tower Output File**

<b>ERITower</b>  <b>GPD Associates</b> 2647 Waterfront Parkway East Drive, Suite 150 Indianapolis, Indiana 46214 Phone: (317) 299-2996 FAX: (317) 293-1331	<b>Job</b> BRG 302 943052 BU#: 806352	<b>Page</b> 1 of 4
	<b>Project</b> 2004078.29	<b>Date</b> 14:50:01 08/01/05
	<b>Client</b> Crown Castle International	<b>Designed by</b> dwilken

### Tower Input Data

There is a pole section.  
 This tower is designed using the TIA/EIA-222-F standard.  
 The following design criteria apply:  
 Tower is located in Fairfield County, Connecticut.  
 Basic wind speed of 85 mph.  
 Nominal ice thickness of 0.5000 in.  
 Ice density of 56 pcf.  
 A wind speed of 74 mph is used in combination with ice.  
 Temperature drop of 50 °F.  
 Deflections calculated using a wind speed of 50 mph.  
 A non-linear (P-delta) analysis was used.  
 Pressures are calculated at each section.  
 Stress ratio used in pole design is 1.333.  
 Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

### Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	12
Embedment length	102.0000 in
$f_c$	3 ksi
Grout space	3.0000 in
Base plate grade	A633-60
Base plate thickness	2.5000 in
Bolt circle diameter	48.2200 in
Outer diameter	54.2200 in
Inner diameter	24.0000 in
Base plate type	Plain Plate

<b>ERITower</b>  <b>GPD Associates</b> 2647 Waterfront Parkway East Drive, Suite 150 Indianapolis, Indiana 46214 Phone: (317) 299-2996 FAX: (317) 293-1331	<b>Job</b> BRG 302 943052 BU#: 806352	<b>Page</b> 2 of 4
	<b>Project</b> 2004078.29	<b>Date</b> 14:50:01 08/01/05
	<b>Client</b> Crown Castle International	<b>Designed by</b> dwilken

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>s</sub>		Weight plf
						ft <sup>2</sup> /ft	plf	
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	80.00 - 8.00	9	No Ice 1/2" Ice	0.00 0.00	0.66 0.66
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	90.00 - 8.00	9	No Ice 1/2" Ice	0.00 0.00	0.82 0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	98.00 - 8.00	12	No Ice 1/2" Ice	0.00 0.00	0.82 0.82
FLC 158-50J (1 5/8 FOAM)	A	No	CaAa (Out Of Face)	110.00 - 8.00	2	No Ice 1/2" Ice	0.20 0.30	0.92 2.46
FLC 158-50J (1 5/8 FOAM)	A	No	CaAa (Out Of Face)	110.00 - 8.00	10	No Ice 1/2" Ice	0.00 0.00	0.92 2.46
FLC 158-50J (1 5/8 FOAM)	B	No	CaAa (Out Of Face)	105.00 - 8.00	6	No Ice 1/2" Ice	0.00 0.00	0.92 2.46
CR 1480 PE (1 1/4 FOAM)	B	No	Inside Pole	90.00 - 8.00	3	No Ice 1/2" Ice	0.00 0.00	0.55 0.55
FLC 158-50J (1 5/8 FOAM)	B	No	Inside Pole	117.00 - 105.00	6	No Ice 1/2" Ice	0.00 0.00	0.92 0.92

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>s</sub>		Weight K
			Horz ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>	
(3) ALP-E 9011-DIN	A	From Leg	4.00	0.0000	80.00	No Ice	2.72	3.34	0.02
				0.00		1/2" Ice	3.04	3.68	0.04
				0.00					
(3) ALP-E 9011-DIN	B	From Leg	4.00	0.0000	80.00	No Ice	2.72	3.34	0.02
				0.00		1/2" Ice	3.04	3.68	0.04
				0.00					
(3) ALP-E 9011-DIN	C	From Leg	4.00	0.0000	80.00	No Ice	2.72	3.34	0.02
				0.00		1/2" Ice	3.04	3.68	0.04
				0.00					
Valmont 13' Platform w/Rails	C	None	0.0000	80.00	No Ice	53.00	53.00	2.00	
					1/2" Ice	68.00	68.00	3.00	
(2) 7770.00 w/Mount Pipe	A	From Leg	4.00	22.0000	90.00	No Ice	6.58	4.94	0.08
				0.00		1/2" Ice	7.21	5.86	0.13
				0.00					
(2) 7770.00 w/Mount Pipe	B	From Leg	4.00	22.0000	90.00	No Ice	6.58	4.94	0.08
				0.00		1/2" Ice	7.21	5.86	0.13
				0.00					
(2) 7770.00 w/Mount Pipe	C	From Leg	4.00	22.0000	90.00	No Ice	6.58	4.94	0.08
				0.00		1/2" Ice	7.21	5.86	0.13
				0.00					
Valmont 13' Platform w/Rails	C	None	0.0000	90.00	No Ice	53.00	53.00	2.00	
					1/2" Ice	68.00	68.00	3.00	
(2) ALP 9212-N	A	From Leg	4.00	30.0000	100.00	No Ice	5.78	5.78	0.02
				0.00		1/2" Ice	6.20	6.20	0.06
				0.00					
(2) ALP 9212-N	B	From Leg	4.00	30.0000	100.00	No Ice	5.78	5.78	0.02

<b>ERITower</b>  <b>GPD Associates</b> 2647 Waterfront Parkway East Drive, Suite 150 Indianapolis, Indiana 46214 Phone: (317) 299-2996 FAX: (317) 293-1331	Job	BRG 302 943052 BU#: 806352	Page	3 of 4
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	Client	Crown Castle International	Designed by	dwilken

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAA Front	CAA Side	Weight
			Horz	Lateral					
			Vert		°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
			ft	ft					
			0.00			1/2" Ice	6.20	6.20	0.06
			0.00						
(2) ALP 9212-N	C	From Leg	4.00		30.0000	No Ice	5.78	5.78	0.02
			0.00			1/2" Ice	6.20	6.20	0.06
			0.00						
Valmont 13' Platform w/Rails	C	None			0.0000	No Ice	53.00	53.00	2.00
						1/2" Ice	68.00	68.00	3.00
(2) LPG2140x	A	From Leg	4.00		23.0000	No Ice	0.00	0.37	0.02
			-6.50			1/2" Ice	0.00	0.48	0.02
			0.00						
(2) LPG2140x	B	From Leg	4.00		23.0000	No Ice	0.00	0.37	0.02
			-6.50			1/2" Ice	0.00	0.48	0.02
			0.00						
(2) LPG2140x	C	From Leg	4.00		23.0000	No Ice	0.00	0.37	0.02
			-6.50			1/2" Ice	0.00	0.48	0.02
			0.00						
931DG70VTREM	C	None			0.0000	No Ice	2.28	2.28	0.03
						1/2" Ice	2.60	2.60	0.05
(2) DB948F85T2E-M	A	From Leg	4.00		30.0000	No Ice	1.92	3.26	0.01
			0.00			1/2" Ice	2.22	3.62	0.03
			0.00						
(2) DB948F85T2E-M	B	From Leg	4.00		30.0000	No Ice	1.92	3.26	0.01
			0.00			1/2" Ice	2.22	3.62	0.03
			0.00						
(2) DB948F85T2E-M	C	From Leg	4.00		30.0000	No Ice	1.92	3.26	0.01
			0.00			1/2" Ice	2.22	3.62	0.03
			0.00						
DR65-18-02DPL2Q w/Mount Pipe	A	From Face	0.00		0.0000	No Ice	6.89	4.09	0.05
			0.00			1/2" Ice	7.59	5.15	0.10
			0.00						
DR65-18-02DPL2Q w/Mount Pipe	B	From Face	0.00		-10.0000	No Ice	6.89	4.09	0.05
			0.00			1/2" Ice	7.59	5.15	0.10
			0.00						
DR65-18-02DPL2Q w/Mount Pipe	C	From Face	0.00		-10.0000	No Ice	6.89	4.09	0.05
			0.00			1/2" Ice	7.59	5.15	0.10
			0.00						
(2) Diplexer	A	From Leg	4.00		22.0000	No Ice	0.00	0.35	0.01
			6.50			1/2" Ice	0.00	0.45	0.01
			0.00						
(2) Diplexer	B	From Leg	4.00		22.0000	No Ice	0.00	0.35	0.01
			6.50			1/2" Ice	0.00	0.45	0.01
			0.00						
(2) Diplexer	C	From Leg	4.00		22.0000	No Ice	0.00	0.35	0.01
			6.50			1/2" Ice	0.00	0.45	0.01
			0.00						

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	Project	2004078.29	Date	14:50:01 08/01/05
	Client	Crown Castle International	Designed by	dwilken

### Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Bolt Compression K	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
in		in						
2.5000	12	2.2500	146.97	150.59	54.262		Plate	1.21 ✓
			174.90	290.34	45.000			
			0.84	0.52	1.21			

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass/Fail	
L1	117 - 97.5	Pole	TP19.15x14.75x0.1875	1	-0.76	577.47	9.7	Pass	
L2	97.5 - 47.4167	Pole	TP30.09x18.2109x0.25	2	-11.91	1205.46	99.5	Pass	
L3	47.4167 - 0	Pole	TP40.3x28.5546x0.3438	3	-21.74	2299.21	96.9	Pass	
							Summary		
							Pole (L2)	99.5	Pass
							Base Plate	90.5	Pass
							RATING =	99.5	Pass

**APPENDIX B**

**Tower Elevation Drawing**

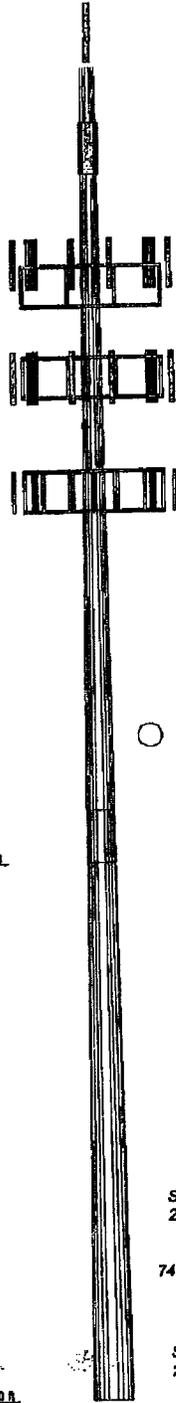
Section	1	2	3
Length (ft)	19.50	52.38	52.00
Number of Sides	12	12	12
Thickness (ft)	0.1875	0.2500	0.3438
Lap Splice (ft)	2.50	4.38	28.5246
Top Dia (in)	14.7500	18.2108	40.3000
Bot Dia (in)	19.1500	30.0800	40.3000
Grade		A572-65	
Weight (lb)	0.7	3.4	6.7

117.0 ft

97.6 ft

47.4 ft

0.0 ft



**APPURTENANCES**

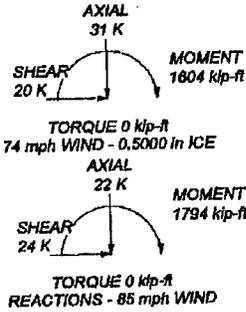
TYPE	ELEVATION	TYPE	ELEVATION
B31DG70VIREM	120	(2) LPG2140x	90
DR86-18-02DPL2Q w/Mount Pipe	110	(2) LPG2140x	90
DR86-18-02DPL2Q w/Mount Pipe	110	Valmont 13' Platform w/Rails	90
DR86-18-02DPL2Q w/Mount Pipe	110	(2) 7770.00 w/Mount Pipe	90
(2) ALP 9212-N	100	(2) 7770.00 w/Mount Pipe	90
(2) ALP 9212-N	100	(2) Diplexor	90
(2) ALP 9212-N	100	(2) Diplexor	90
(2) DB948FB6T2E-M	100	(2) Diplexor	90
(2) DB948FB6T2E-M	100	Valmont 13' Platform w/Rails	90
(2) DB948FB6T2E-M	100	(3) ALP-E 9011-DIN	90
Valmont 13' Platform w/Rails	90	(3) ALP-E 9011-DIN	90
(2) 7770.00 w/Mount Pipe	90	(3) ALP-E 9011-DIN	90
(2) LPG2140x	90		

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	85 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.5%

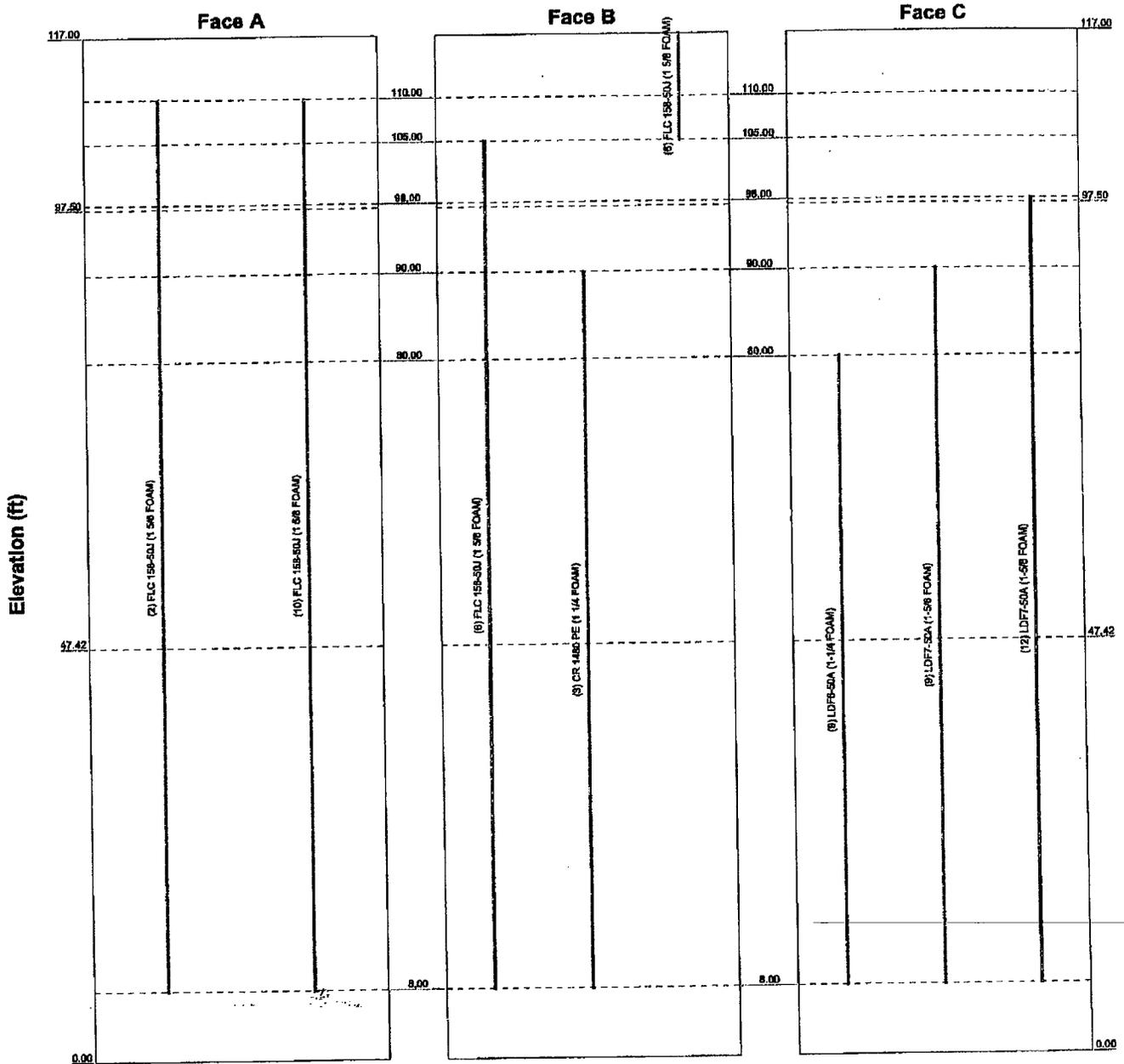


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	<p>Project: <b>2004078.20</b></p>
	<p>Client: <b>Crown Castle International</b> Drawn by: <b>dwilker</b> App'd:</p>
	<p>Code: <b>TIA/EIA-222-F</b> Date: <b>08/01/05</b> Scale: <b>NTS</b></p>
<p>Path: <b>H:\GAYE\W\Wsd\BRG 302 943052.dwg</b> Dwg No. <b>E-1</b></p>	

# Feedline Distribution Chart

## 0' - 117'

\_\_\_\_\_ Round \_\_\_\_\_ Flat \_\_\_\_\_ App In Face \_\_\_\_\_ App Out Face \_\_\_\_\_ Truss Leg

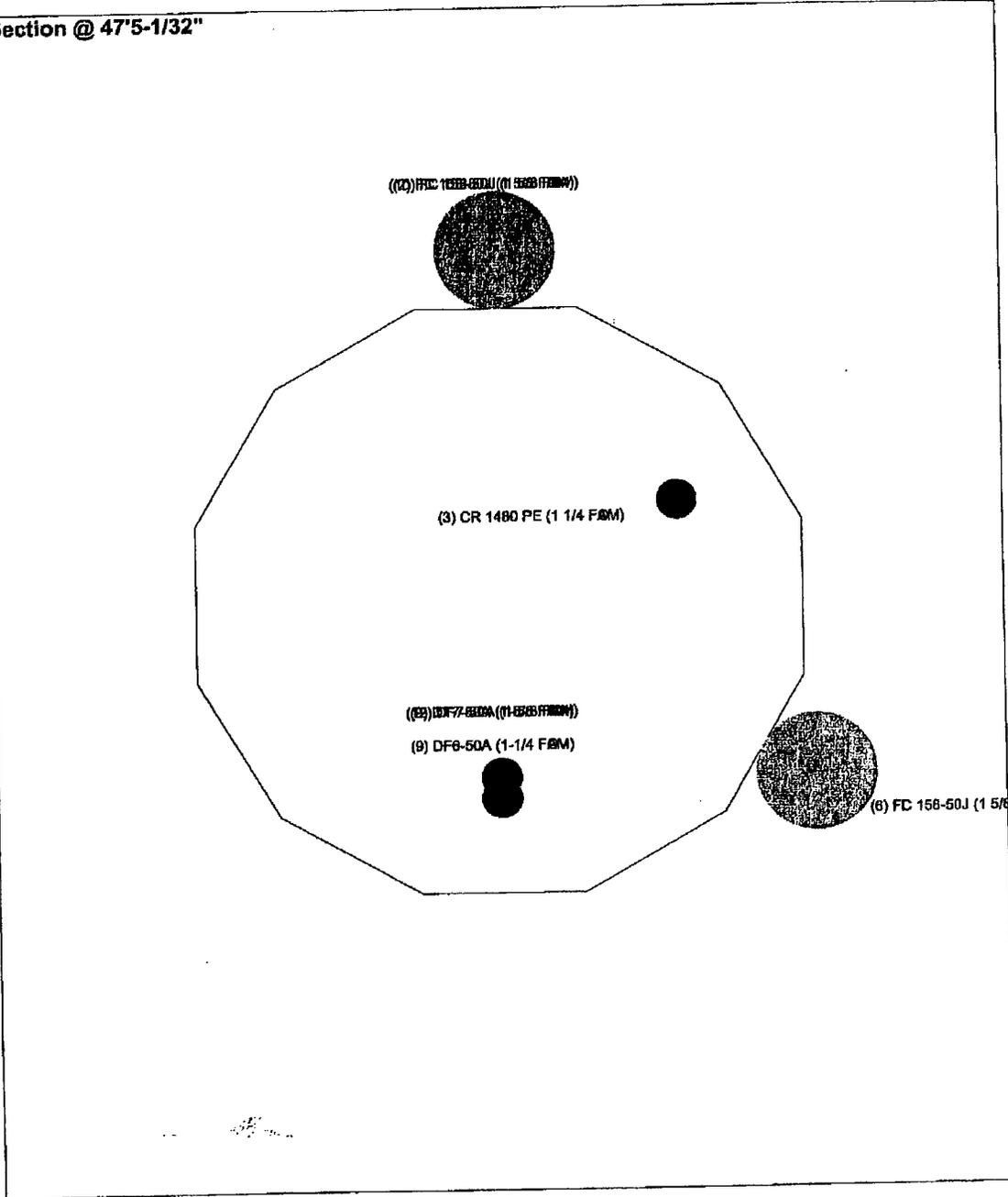


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	<b>Project: 2004078.29</b>		
	Client: Crown Castle International	Drawn by: dwilken	Appr:
	Code: TIA/EIA-222-F	Date: 08/01/05	Scale: NTS
	Path: I:\p\AVR\68\Media\BRG 302 943052.dwg	Dwg No. E-7	

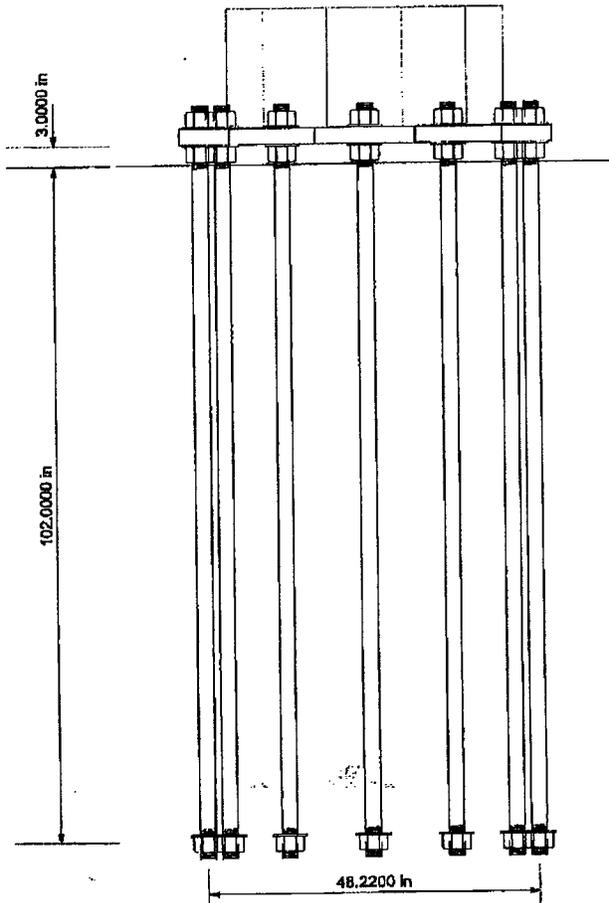
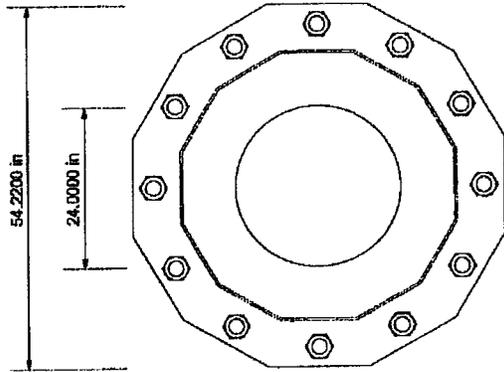
**Feedline Plan  
47°5-1/32"**

Round \_\_\_\_\_ Flat \_\_\_\_\_ App In Face \_\_\_\_\_ App Q Face \_\_\_\_\_

**Section @ 47°5-1/32"**



 <p><b>GPD Associates</b> 2647 Waterfront Parkway East Drive, Suite 150 Indianapolis, Indiana 46214 Phone: (317) 299-2996 FAX: (317) 293-1331</p>	<b>Job: BRG 302 943052 BU#: 806352</b>		
	Project: 2004078.29		
	Client: Crown Castle International	Drawn by: chwilker	App'd:
	Code: TIA/EIA-222-F	Date: 08/01/05	Scale: NTS
	Path: R:\DAVE\WORK\BRG 302 943052.dwg		
Dwg No. E-			



**FOUNDATION NOTES**

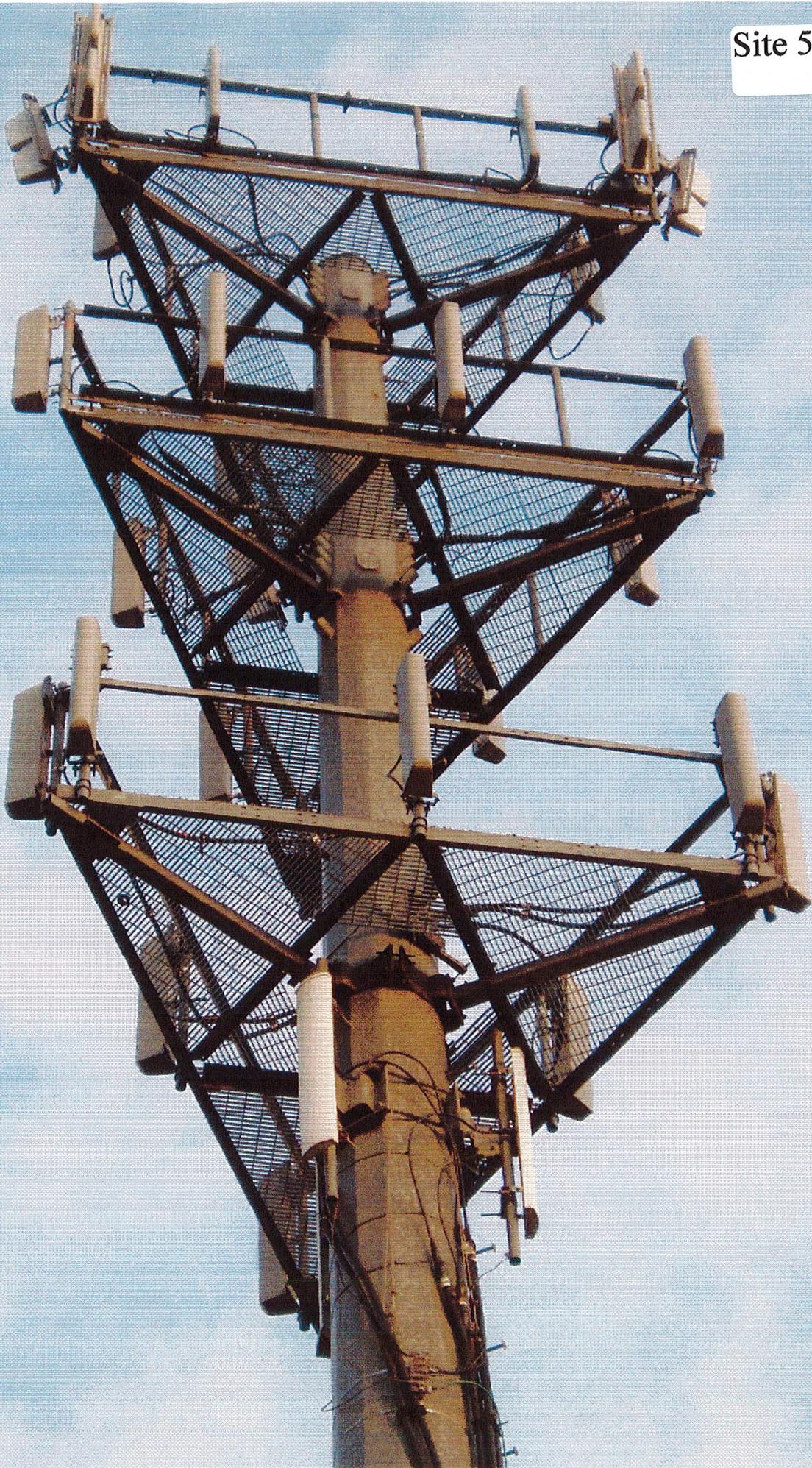
1. Plate thickness is 2.5000 in.
2. Plate grade is A633-60.
3. Anchor bolt grade is A615-75.
4.  $f_c$  is 3 ksi.

 <b>GPD Associates</b> 2647 Waterfront Parkway East Drive, Suite 150 Indianapolis, Indiana 46214 Phone: (317) 299-2998 FAX: (317) 293-1331	<b>Job: BRG 302 943052 BU#: 806352</b>		
	Project: 2004078.29		
	Client: Crown Castle International	Drawn by: dwillkat	App'd:
	Code: TLAVEIA-222-F	Date: 08/01/05	Scale: NT
Path: K:\04VEIA\222-F\BRG 302 943052.dwg	Dwg No. F-		

Site 5



Site 5





September 20, 2005

Honorable Kenneth A. Flatto, First Selectman  
Town of Fairfield  
Sullivan Independence Hall  
725 Old Post Road  
Fairfield, CT 06824

**Re: Notice of Exempt Modifications to Various Facilities in the  
Town(s) of Fairfield, Norwalk, Stamford and Darien, Connecticut**

Dear Mr. Flatto,

As part of its merger and integration efforts, New Cingular Wireless PCS, LLC ("Cingular" or "the Company") intends to modify instrumentation and/or antenna configurations at certain wireless telecommunications facilities. As required by the Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review the Company's proposal. Please accept this letter and attachments as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter fully describes Cingular's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 301-6378 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

David S. Malko, P.E.  
Consultant for New Cingular Wireless

Enclosure

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September 20, 2005

Honorable Alex A. Knopp, Mayor  
Office of Mayor & City Clerk  
City of Norwalk  
125 East Avenue  
P.O. Box 5125  
Norwalk, CT 06856-5125

**Re: Notice of Exempt Modifications to Various Facilities in the  
Town(s) of Fairfield, Norwalk, Stamford and Darien, Connecticut**

Dear Mr. Knopp,

As part of its merger and integration efforts, New Cingular Wireless PCS, LLC ("Cingular" or "the Company") intends to modify instrumentation and/or antenna configurations at certain wireless telecommunications facilities. As required by the Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review the Company's proposal. Please accept this letter and attachments as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

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Sincerely,

David S. Malko, P.E.  
Consultant for New Cingular Wireless

Enclosure

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September 20, 2005

Honorable Evonne M. Klein, First Selectwoman  
Town of Darien  
Office of the First Selectwoman, Room 202  
Town Hall  
2 Renshaw Road  
Darien, CT 06820

Re: **Notice of Exempt Modifications to Various Facilities in the  
Town(s) of Fairfield, Norwalk, Stamford and Darien, Connecticut**

Dear Ms Klein,

As part of its merger and integration efforts, New Cingular Wireless PCS, LLC ("Cingular" or "the Company") intends to modify instrumentation and/or antenna configurations at certain wireless telecommunications facilities. As required by the Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review the Company's proposal. Please accept this letter and attachments as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

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Sincerely,

David S. Malko, P.E.  
Consultant for New Cingular Wireless

Enclosure

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