STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

January 6, 2012

Michael J. Elsier, Site Acquisition Specialist
Nanepashemet Project Management, Inc.
328 West Shore Drive
Marblehead, MA 01945

RE: **TS-METROPCS-008-111219MA** - MetroPCS Massachusetts, LLC d/b/a MetroPCS request for an order to approve tower sharing at an existing telecommunications facility located 719 Amity Road, Bethany, Connecticut.

Dear Mr. Elsier:

At a public meeting held January 5, 2012, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures with the following conditions:

- The proposed modifications described in Appendix D of the the Structural Modification Report prepared by B&T Engineering, dated September 2, 2011 and stamped by Chad Tuttle, be implemented as recommended;
- Prior to antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended bolt replacements have been completed and the tower and foundation will not exceed 100 percent of the post-construction structural rating.Any deviation from the proposed installation as specified in the original tower share request and supporting materials with the Council shall render this decision invalid;
- MetroPCS's installation shall include a battery cabinet for backup power with a capacity for four to eight hours of use;
- Any material changes to the proposed installation as specified in the original tower share request and supporting materials filed with the Council shall require an explicit request for modification to the Council pursuant to Connecticut General Statutes § 16-50aa, including 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;
- Not less than 45 days after completion of the proposed installation, the Council shall be notified in writing that the installation has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council. This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower. Any deviation from this format may result in the Council

implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction. Please be advised that the validity of this action shall expire one year from the date of this letter.

The proposed shared use is to be implemented as specified in your letter dated December 19, 2011, including the placement of all necessary equipment and shelters within the tower compound.

Thank you for your attention and cooperation.

Very truly yours,

Robert Stein
Chairman

RS/CDM/laf

c: The Honorable Derrylyn Gorski, First Selectman, Town of Bethany
Robert H. Brinton, Zoning Enforcement Officer, Town of Bethany
Christopher B. Fisher, Esq., Cuddy & Feder LLP

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December 20, 2011

The Honorable Derrylyn Gorski
First Selectman
Town of Bethany
Town Hall
40 Peck Road
Bethany, CT 06524-3338

RE: **TS-METROPCS-008-111219MA** - MetroPCS Massachusetts, LLC d/b/a MetroPCS request for an order to approve tower sharing at an existing telecommunications facility located 719 Amity Road, Bethany, Connecticut.

Dear Ms. Gorski:

The Connecticut Siting Council (Council) received this request for tower sharing, pursuant to Connecticut General Statutes § 16-50aa.

The Council will consider this item at the next meeting scheduled for January 5, 2012, at 1:00 p.m. in Hearing Room Two, Ten Franklin Square, New Britain, Connecticut.

If you have any questions or comments regarding this proposal, please call me or inform the council by January 4, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Tower Sharing

c: Robert H. Brinton, Zoning Enforcement Officer, Town of Bethany

S:\EM & TS\MetroPCS(MA)\Bethany\Gorski.docx

CSC
CONNECTICUT SITING COUNCIL

TS-METROPCS-008-111219MA

December 19, 2011

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, Connecticut 06051

Re: MetroPCS of Massachusetts (NHC0197D) Tower Sharing Request
719 Amity Rd, Bethany CT

Dear Ms. Roberts:

On behalf of our client, MetroPCS, enclosed please find a tower sharing request (1 Original and 25 Copies) for the existing tower facility referenced above along with a check in the amount of $625. The tower sharing request contains site plans, signed and sealed structural information and MPE calculations. The structural analysis includes a structural modification design to the tower and was performed with the proposed coaxial cables being routed on the outside of the Monopole structure. I'll follow up with the council staff next week to discuss the request further.

Thank you in advance for your consideration of the enclosed.

Very truly yours,

Michael J. Elsier
Site Acquisition Specialist
Nanepashemet Project Management, Inc.
On behalf of MetroPCS, Inc.

Encs.
Exhibit A- Site Plan
Exhibit B- Structural Analysis

cc: Kellie Dunn, MetroPCS
Kate Rugman
AT&T Mobility
Isabel Kearns, Zoning Enforcement Officer Bethany, Connecticut

328 West Shore Drive, Marblehead MA 01945
Phone (781) 424-7726

METROPCS' TOWER SHARING REQUEST FOR AN EXISTING TELECOMMUNICATIONS FACILITY AT 719 AMITY RD, BETHANY, CONNECTICUT

Pursuant to the Connecticut General Statues (C.G.S.) § 16-50aa, Metro PCS, Inc., by and through its agent MetroPCS Massachusetts, LLC ("MetroPCS") hereby requests an order from the Connecticut Siting Council (the "Council") to approve the proposed shared use of an existing communications tower, located at 719 Amity Road in the Town of Bethany (the "719 Amity Road Facility "), and owned by AT&T. MetroPCS and AT&T have agreed to the shared use of the 719 Amity Road Facility as detailed below.

The 719 Amity Road Facility

The 719 Amity Road Facility is located on the Westside of Connecticut Route 63 approximately 1 mile South of the intersection with Connecticut Route 42, on an approximate 138.5 acre parcel of land owned by Town of Bethany. The Facility consists of a one hundred fifty (150) foot high steel Monopole telecommunications tower (the "Tower") located within a 80' x 70' fenced compound and wireless equipment currently being used by AT&T, Verizon, Sprint and the Town of Bethany Fire Department. Associated equipment is located immediately adjacent to the Tower. The current adjacent land uses are general commercial, industrial and residential. A chain link fence surrounds the Tower and equipment areas. The site coordinates are Latitude 41.442713 N and Longitude 72.992456 W.

MetroPCS' Wireless Facility

As shown on the enclosed plans (Exhibit A) prepared by Dewberry-Goodkind, Inc., including a site plan, compound plan, tower elevation and antenna/equipment detail of the 719 Amity Road Facility, MetroPCS proposes shared use of the facility by placing antennas on the Tower and equipment cabinets within the existing fenced compound to provide personal communications services ("PCS"). MetroPCS will install up to six (6) Andrew Model HBX-6516DS-VTM panel antennas, or their functional equivalents, at the 120 foot level of the Tower. A GPS antenna and associated equipment including a battery cabinet, a ppc cabinet, a cdma modcell cabinet and space for a future battery cabinet and future cdma modcell cabinet will be located on a 10 foot x 16 foot concrete pad within the existing fenced compound.

Connecticut General Statues § 16-50aa provides that, upon written request for shared use approval, an order approving such use shall be issued, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns." (C.G.S. § 16-50aa(c)(1)). Further, upon approval of such shared use, it is exclusive and no local zoning or land use approvals are required C.G.S. § 16-50x. Shared use of the 719 Amity Road Facility satisfies the approval criteria set forth in C.G.S. § 16-50aa as follows:

A. Technical Feasibility MetroPCS has confirmed that the Tower upon structural modifications is capable of supporting the addition of MetroPCS' antennas as set forth in a Structural Analysis and Tower Modification Design. (Exhibit B). Upon implementation of the proposed structural modifications the proposed shared use of this Tower is technically feasible.

B. Legal Feasibility Pursuant to C.G.S. § 16-50aa, the Council has been authorized to issue an order approving shared use of the existing 719 Amity Road Facility. (C.G.S. § 16-50aa(c)(1)). Under the authority vested in the Council by C.G.S. § 16-50aa, an order by the Council approving the shared use of a tower would permit the Applicant to obtain a building permit for the proposed installation.

C. Environmental Feasibility The proposed shared use would have a minimal environmental effect, for the following reasons:

   a. The proposed installation would have a de minimis visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing facility;

   b. The proposed installation by MetroPCS would not increase the height of the tower or extend the boundaries of the 719 Amity Road Facility;

   c. The proposed installation would not increase the noise levels at the existing facility boundaries by six (6) decibels or more;

   d. Operation of MetroPCS antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. The "worst case" exposure calculated for the operation of this facility for all carriers would be approximately 31.52% as prepared by Frantz Pierre, RF Engineer, MetroPCS and detailed in the Power Density Calculation section shown on the next page;

   e. The proposed shared use of the 719 Amity Road Facility would not require any water or sanitary facilities, or generate air emissions or discharges to water bodies. Further, the installation will not generate any traffic other than for periodic maintenance visits.

D. Economic Feasibility The Applicant and the Tower owner have agreed to share use of the 719 Amity Road Facility on terms agreeable to both parties. The proposed tower sharing is therefore economically feasible.

E. Public Safety As stated above and evidenced in the power density calculation shown on the next page, the operation of MetroPCS' facility will not increase the cumulative radio frequency electromagnetic radiation power density at the Tower site's boundary to or above the standard adopted by the Connecticut Department of Environmental Protection

as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. Further, the addition of MetroPCS' telecommunications service in the Southington areas through shared use of the 719 Amity Road Facility is expected to enhance the safety and welfare of local residents and travelers through the area resulting in an improvement to public safety in this area of Southington.

Power Density Calculation

The tower currently has four (4) existing carriers: AT&T, Verizon, Sprint and the Town of Bethany Fire Department. The power density for existing conditions is fully documented in the last filing with the Connecticut Siting Council for the 719 Amity Road Facility as 26.07% of the MPE limits.

Calculations for MetroPCS' proposed facility are as follows:

Carrier	Centerline Height	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density	Standard Limits	Percent of Limits
MetroPCS	120'	2140	3	727	0.0545	1.0000	5.45%

When combining the cumulative "worst case" power density levels for the existing facility with MetroPCS' proposed facility, it would result in a total power density of 31.52% which is well within applicable standards.

Conclusion

As delineated above, the proposed shared use of the 719 Amity Road Facility satisfies the criteria set forth in C.G.S. § 16-50aa, and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of towers in the State of Connecticut. MetroPCS therefore requests the Siting Council issue an order approving the proposed shared use of the719 Amity Road Facility.

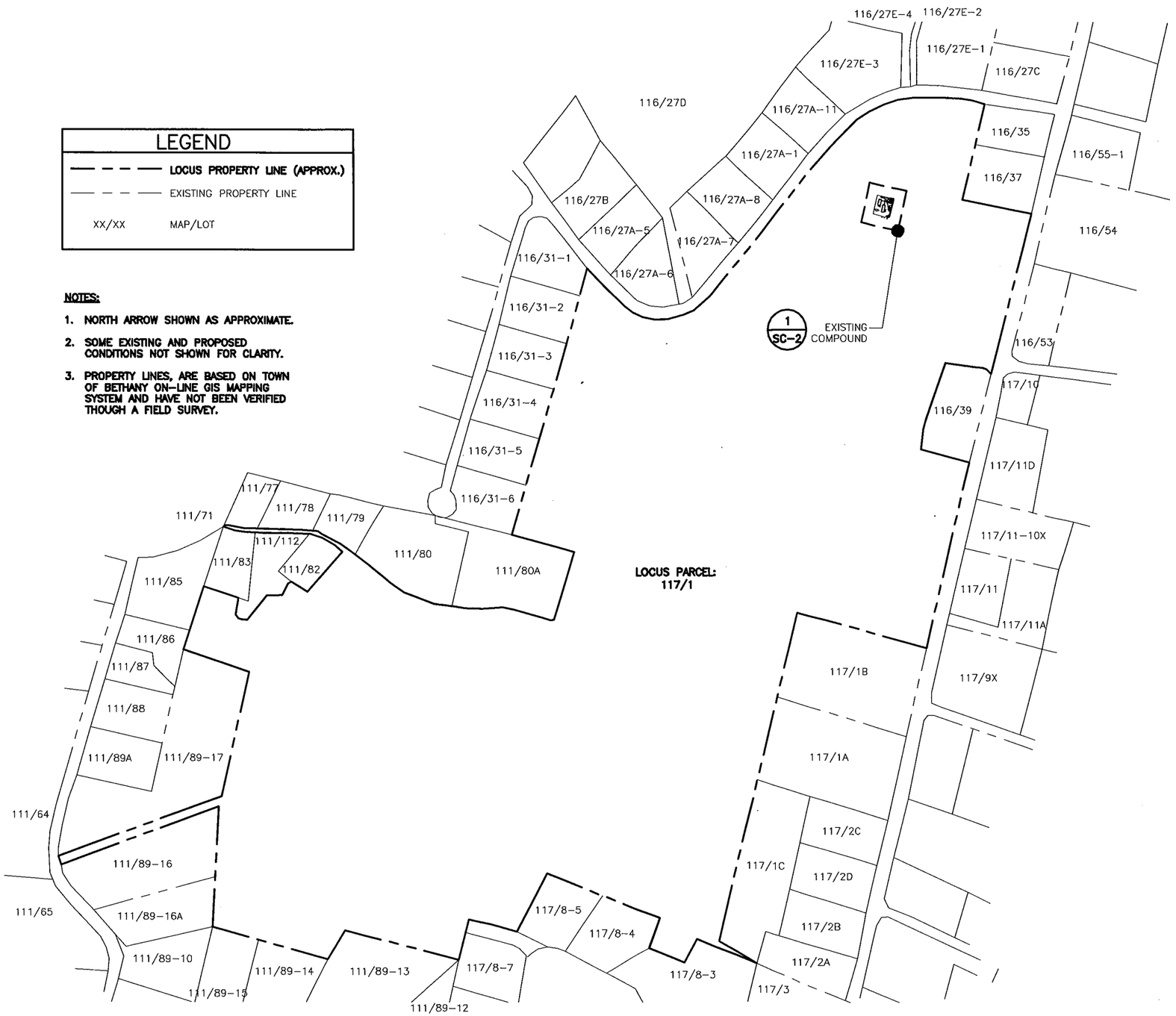
Respectfully submitted,

Michael J. Elsier
Site Acquisition Specialist
Nanepashemet Project Management, Inc.
On behalf of Metro PCS, Inc.

cc: Kellie Dunn, MetroPCS
Kate Rugman, MetroPCS
AT&T
Isabel Kearns, Zoning Enforcement Officer Bethany, CT

Exhibit A

Site Plans



metroPCS.
Unlimit Yourself.

285 BILLERICA ROAD
THIRD FLOOR
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FAX: (978) 244-7240

Dewberry
Dewberry-Goodkind, Inc.
280 SUMMER STREET
10TH FLOOR
BOSTON, MA 02210
PHONE: 617.695.3400
FAX: 617.695.3310

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	07/28/11	CT SITING COUNCIL	SK	MFT	PPB

NOT TO SCALE | DESIGNED BY: MFT | DRAWN BY: SK

APPROVALS

SITE OWNER — DATE

CONSTRUCTION MANAGER — DATE

RF ENGINEER — DATE

SITE ACQUISITION — DATE

CONNECTICUT SITING COUNCIL PLANS

SITE NAME:

NHC0197D AT&T MONOPOLE-BETHANY

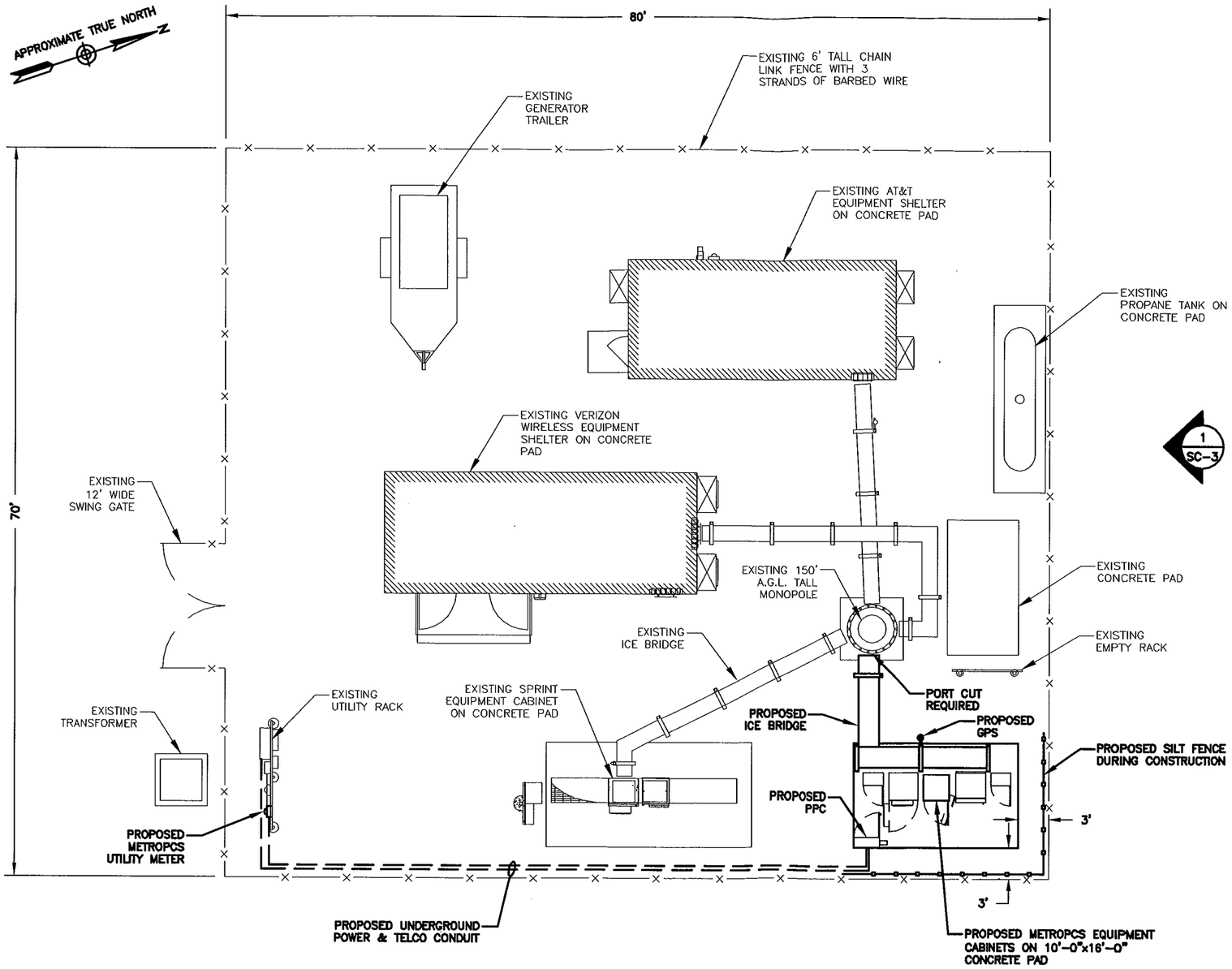
SITE ADDRESS:

719 AMITY ROAD BETHANY, CT 06524

METROPCS LEASE AREA

LEASE AREA: 10'-0"x16'-0" = 160± S.F.
TOTAL: = 160± S.F.

PROJECT NO.	DRAWING NAME	DATE	SHEET NO.	REV
50046016	SC-1	07/26/11	4 OF 4	0



NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED CONDITIONS NOT SHOWN FOR CLARITY.
3. COAX PORT HOLE REQUIRED AT BASE OF MONOPOLE FOR METROPCS COAX.
4. EXISTING SITE PLAN CONDITIONS AS OF 06/06/2011.

DETAILED SITE PLAN 1

SCALE: 1"=15'

0' 15' 30'

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0	07/28/11	CT SITING COUNCIL	SK	MFT	PPB

NOT TO SCALE | DESIGNED BY: MFT | DRAWN BY: SK

APPROVALS

SITE OWNER — DATE

CONSTRUCTION MANAGER — DATE

RF ENGINEER — DATE

SITE ACQUISITION — DATE

CONNECTICUT SITING COUNCIL PLANS

SITE NAME:

NHC0197D AT&T MONOPOLE-BETHANY

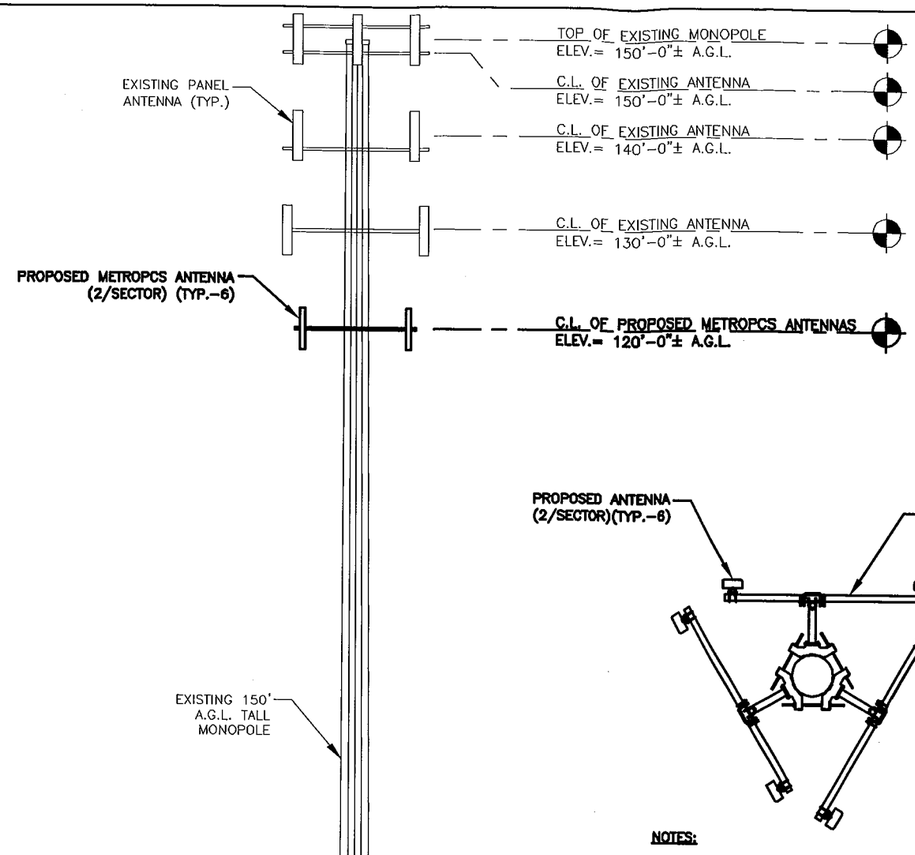
SITE ADDRESS:

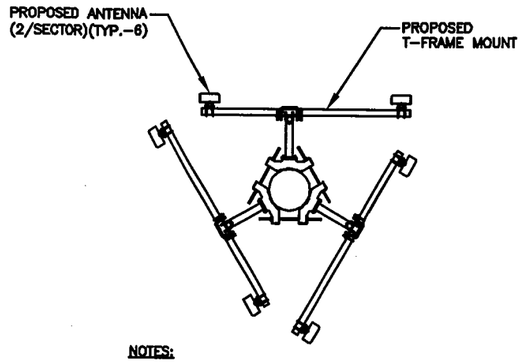
719 AMITY ROAD BETHANY, CT 06524

METROPCS LEASE AREA

LEASE AREA: 10'-0"x16'-0" = 160± S.F.
TOTAL: = 160± S.F.

PROJECT NO.	DRAWING NAME	DATE	SHEET NO.	REV
50046016	SC-2	07/26/11	2 OF 4	0





NOTES:

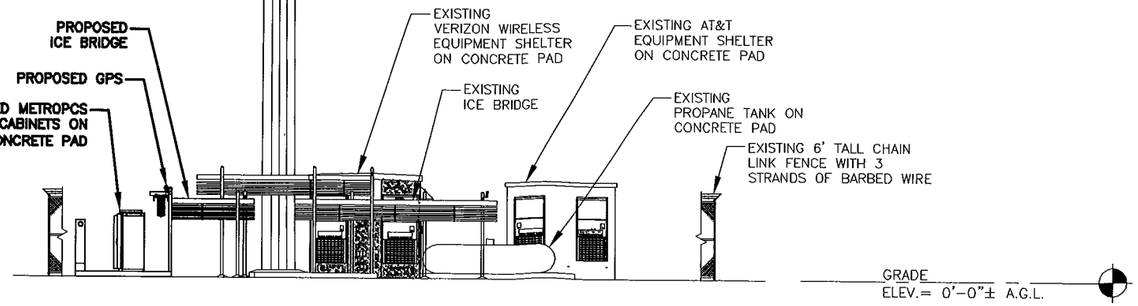
1. ANTENNA MOUNTING FRAME TO BE INSTALLED PER TOWER DESIGN & STRUCTURAL ANALYSIS.

ANTENNA MOUNT 2

SCALE: N.T.S.

NOTES:

1. SOME EXISTING AND PROPOSED CONDITIONS NOT SHOWN FOR CLARITY.
2. A.G.L. – ABOVE GROUND LEVEL
   C.L. – CENTERLINE
3. EXISTING ANTENNA ELEVATIONS BASED ON VISUAL INSPECTION FROM GROUND AND HAVE NOT BEEN VERIFIED THROUGH A MAPPING.
4. ALL ANTENNA & COAX MOUNTING PENDING STRUCTURAL ANALYSIS.



ELEVATION 1

SCALE: 1"=20'

0' 20' 40'

metroPCS.
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NO.	DATE	REVISIONS	BY	CHK	APP'D
0	07/28/11	CT SITING COUNCIL	SK	MFT	PPB

NOT TO SCALE | DESIGNED BY: MFT | DRAWN BY: SK

APPROVALS

SITE OWNER — DATE

CONSTRUCTION MANAGER — DATE

RF ENGINEER — DATE

SITE ACQUISITION — DATE

CONNECTICUT SITING COUNCIL PLANS

SITE NAME:

NHC0197D AT&T MONOPOLE-BETHANY

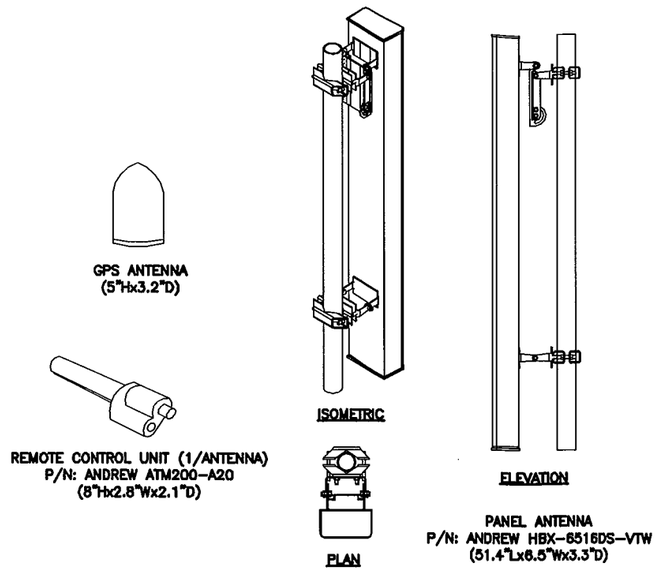
SITE ADDRESS:

719 AMITY ROAD BETHANY, CT 06524

METROPCS LEASE AREA

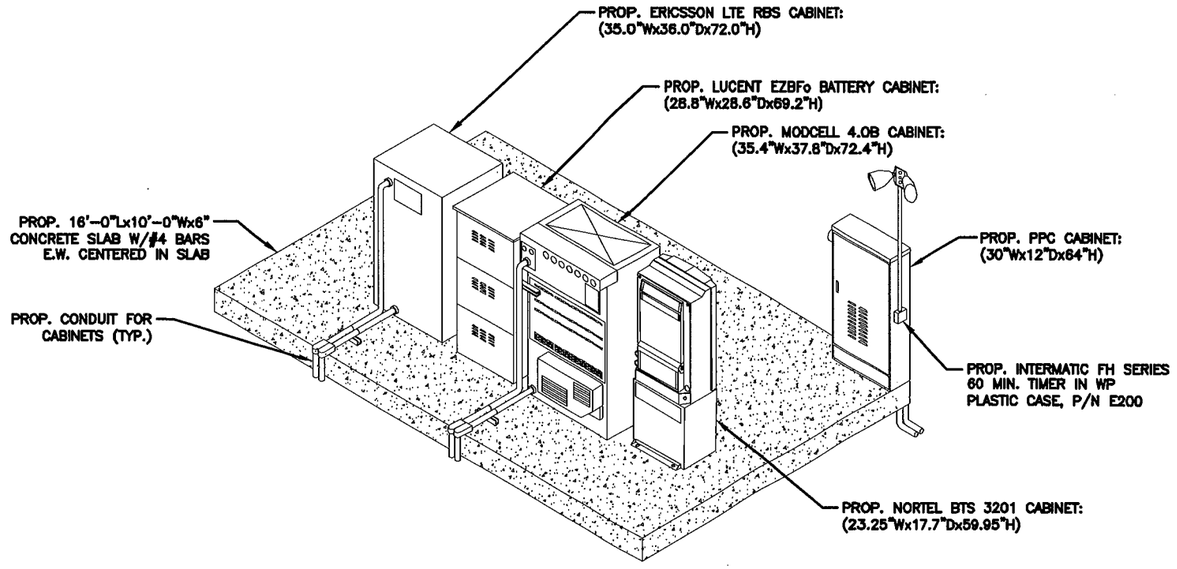
LEASE AREA: 10'-0"x16'-0" = 160± S.F.
TOTAL: = 160± S.F.

PROJECT NO.	DRAWING NAME	DATE	SHEET NO.	REV
50046016	SC-3	07/26/11	3 OF 4	0



ANTENNA & GPS DETAILS (1)

SCALE: N.T.S.



EQUIPMENT DETAIL (2)

SCALE: N.T.S.

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NO.	DATE	REVISIONS	BY	CHK	APP'D
0	07/28/11	CT SITING COUNCIL	SK	MFT	PPB

NOT TO SCALE | DESIGNED BY: MFT | DRAWN BY: SK

APPROVALS

SITE OWNER _____ DATE _____

CONSTRUCTION MANAGER _____ DATE _____

RF ENGINEER _____ DATE _____

SITE ACQUISITION _____ DATE _____

CONNECTICUT SITING COUNCIL PLANS

SITE NAME:

NHC0197D
AT&T MONOPOLE-BETHANY

SITE ADDRESS:

719 AMITY ROAD
BETHANY, CT 06524

METROPCS LEASE AREA

LEASE AREA: 10'-0"x16'-0" = 160± S.F.
TOTAL: = 160± S.F.

PROJECT NO.	DRAWING NAME	DATE	SHEET NO.	REV
50046016	SC-4	07/26/11	4 OF 4	0

Exhibit B

Structural Analysis

September 2, 2011

Ms. Tamiko Lowry
AT&T Towers
5405 Windward Pkwy
Alpharetta, GA 30004
(770) 708-6122

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
ctuttle@btengineering.com

Subject:	**Structural Modification Report**	
Carrier Designation:	***MetroPCS* Co-Locate**	
	Carrier Site Number:	NHC0197D
	Carrier Site Name:	N/A
AT&T Towers Designation:	**AT&T Site Number:**	61186-A
	AT&T Site Name:	Bethany
Engineering Firm Designation:	**B&T Engineering, Inc. Project Number:**	83154.003
Site Data:	**719 Amity Road, Bethany, CT, New Haven County** **Latitude *41° 26' 33.9"*, Longitude *-72° 59' 32.9"*** **150 Foot - Monopole**	

Dear Ms. Lowry,

B&T Engineering, Inc. is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

Unmodified Tower w/ Existing + Reserved + Proposed Equipment Note: Based on Analysis by B&T Engineering dated 08/04/11.	**Insufficient Capacity** **Tower: 139.5%** **Foundation: 121.6%**
Modified Tower w/ Existing + Reserved + Proposed Equipment Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.	**Sufficient Capacity** **Tower: 98.8%** **Foundation: 68.0%**

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2003 IBC; 2003 IRC (State Building Code, 2005 CT supplement) based upon a wind speed of 85 mph fastest mile.

All proposed equipment and tower modifications in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Kiran K. Maroju, E.I.
Project Engineer

Chad E. Tuttle, P.E.
President

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

9/2/11

RISATower Report - version 5.4.2.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Valmont.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 73.6 mph with 0.5 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Carrier/Note
120	120	3	–	Standoff	6 12	3/8 1 5/8	MetroPCS
		6	Andrew	ATM200-A20			
		6	Andrew	HBX-6516S-VTM			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Carrier/Note
150	156	1	–	12' x 3" Omni	2	1 1/4	City Existing
	150	1	–	10' Yagi			
		1	–	Platform	12	1 5/8	AT&T Existing
		3	CSS	DUO1417-8686			
	150	6	Powerwave	7770.00			
		6	ADC	CG-1900DD			
		3	Ericsson	RRU	9	1/2	AT&T Future
		3	Powerwave	P65-16-XLH-RR			
140	140	1	–	LP Platform	12	1 5/8	Verizon Existing
		3	Decibel	DB854DG65ESX			
		3	Powerwave	P65-15-XL-2			
		3	Rymsa Wireless	MG D3 800T0			
130	130	3	–	T-Arm	12	1 5/8	Sprint Existing
		12	Decibel	DB980F90E-M			
31	**37**	**1**	–	**12' x 3" Omni**	**1**	**1/2**	**To be Removed**
	31	**1**	–	**Side Arm**			

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
Information Not Available						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Data Foundation Information Soil Properties	Previous SA by GPD Associates, Job No. 2010260.49 Rev. 2	Date:1/26/2010	Siterra
Existing/ Future/ Proposed Loading	Previous SA by GPD Associates	Date:1/26/2010	Siterra
	NOC Form	Date:5/20/2011	Siterra
	Site Lease Application	Date:5/20/2011	Siterra

3.1) Analysis Method

RISATower (version 5.4.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) 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 the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) Mount areas and weights are assumed based on photographs provided and are not analyzed for their load carrying capacity.

This analysis may be affected if any assumptions are not valid or have been made in error. B&T Engineering, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary) – Modified Tower

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 120	Pole	TP23.23x17.61x0.219	1	-6.230	842.825	84.8	Pass
L2	120 - 96.58	Pole	TP27.61x23.23x0.41	2	-9.757	1349.116	95.4	Pass
L3	96.58 - 90	Pole	TP28.39x25.963x0.507	3	-12.582	1657.799	97.9	Pass
L4	90 - 60	Pole	TP34x28.39x0.598	4	-20.586	2639.367	90.8	Pass
L5	60 - 47.5	Pole	TP36.34x34x0.577	5	-22.601	2814.829	91.0	Pass
L6	47.5 - 30	Pole	TP38.98x34.156x0.625	6	-31.129	3186.590	98.8	Pass
L7	30 - 0	Pole	TP44.6x38.98x0.655	7	-41.828	3964.115	95.6	Pass
							Summary	
						Pole (L6)	98.8	Pass
						RATING =	**98.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – Modified Tower

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	95.9	Pass
1	Base Plate	Base	55.6	Pass
1	Base Foundation	Base	68.0	Pass

Structure Rating (max from all components) =	**98.8%**

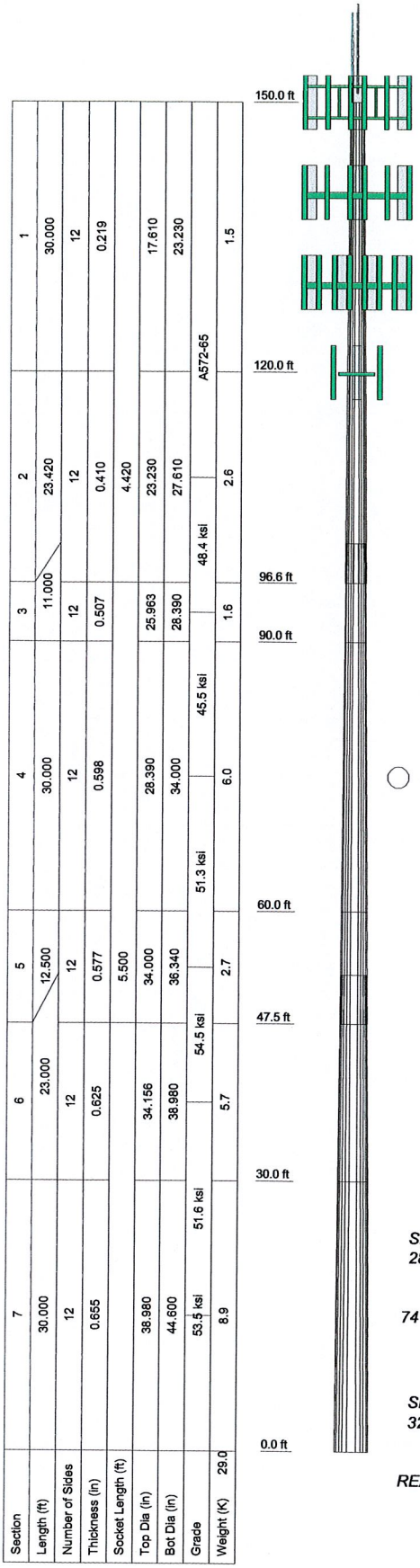
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Capacities up to 100% are considered acceptable based on analysis procedures used.
3) The percent capacities shown above (excluding foundations) include the 1/3 increase in allowable stresses as allowed by TIA/EIA-222-F.

4.1) Recommendations

1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available structural capacity to be effective.

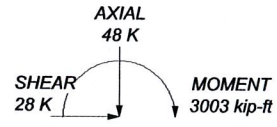
APPENDIX A

RISATOWER OUTPUT

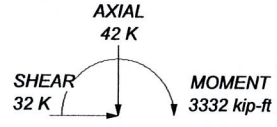


Section	1	2	3	4	5	6	7
Length (ft)	30.000	23.420	11.000	30.000	12.500	23.000	30.000
Number of Sides	12	12	12	12	12	12	12
Thickness (in)	0.219	0.410	0.507	0.598	0.577	0.625	0.655
Socket Length (ft)		4.420		5.500			
Top Dia (in)	17.610	23.230	25.963	28.390	34.000	34.156	38.980
Bot Dia (in)	23.230	27.610	28.390	34.000	36.340	38.980	44.600
Grade	A572-65	48.4 ksi		45.5 ksi	51.3 ksi	54.5 ksi	51.6 ksi / 53.5 ksi
Weight (K)	1.5	2.6	1.6	6.0	2.7	5.7	8.9

Total Weight: 29.0



TORQUE 2 kip-ft
74 mph WIND - 0.500 in ICE



TORQUE 2 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12' x 3" Omni (City-E)	156	6' x 2" Mount Pipe (Verizon-E)	140
10' Yagi (City-E)	155	6' x 2" Mount Pipe (Verizon-E)	140
(2) 7770.00 w/Mount Pipe (ATI-E)	150	6' x 2" Mount Pipe (Verizon-E)	140
(2) 7770.00 w/Mount Pipe (ATI-E)	150	(3) MG D3 800TO w/Mount Pipe (Verizon-E)	140
DUO1417-8686 w/Mount Pipe (ATI-E)	150	(3) DB854DG65ESX w/Mount Pipe (Verizon-E)	140
DUO1417-8686 w/Mount Pipe (ATI-E)	150	(3) P65-15-XLH-RR w/Mount Pipe (Verizon-E)	140
DUO1417-8686 w/Mount Pipe (ATI-E)	150	Platform Mount [LP 303-1] (Verizon-E)	140
(2) CG-1900DD-FULL-DIN (ATI-E)	150	(4) DB980F90E-M w/Mount Pipe (Sprint-E)	130
(2) CG-1900DD-FULL-DIN (ATI-E)	150	(4) DB980F90E-M w/Mount Pipe (Sprint-E)	130
(2) CG-1900DD-FULL-DIN (ATI-E)	150	(4) DB980F90E-M w/Mount Pipe (Sprint-E)	130
P65-16-XLH-RR w/Mount Pipe (ATI-F)	150	T-Arm Mount [TA 602-3] (Sprint-E)	130
P65-16-XLH-RR w/Mount Pipe (ATI-F)	150	(2) HBX-6516DS-VTM w/Mount Pipe (MetroPCS-P)	120
P65-16-XLH-RR w/Mount Pipe (ATI-F)	150	(2) HBX-6516DS-VTM w/Mount Pipe (MetroPCS-P)	120
RRU-11 (ATI-F)	150	(2) HBX-6516DS-VTM w/Mount Pipe (MetroPCS-P)	120
RRU-11 (ATI-F)	150	(2) ATM200-A20 (MetroPCS-P)	120
RRU-11 (ATI-F)	150	(2) ATM200-A20 (MetroPCS-P)	120
Platform Mount [LP 713-1] (ATI-E)	150	(2) ATM200-A20 (MetroPCS-P)	120
Lightning Rod (E)	150	Side Arm Mount [SO 103-3] (MetroPCS-P)	120
(2) 7770.00 w/Mount Pipe (ATI-E)	150		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	54.5 ksi	55 ksi	65 ksi
48.4 ksi	48 ksi	65 ksi	51.6 ksi	52 ksi	65 ksi
45.5 ksi	46 ksi	65 ksi	53.5 ksi	54 ksi	65 ksi
51.3 ksi	51 ksi	65 ksi			

TOWER DESIGN NOTES

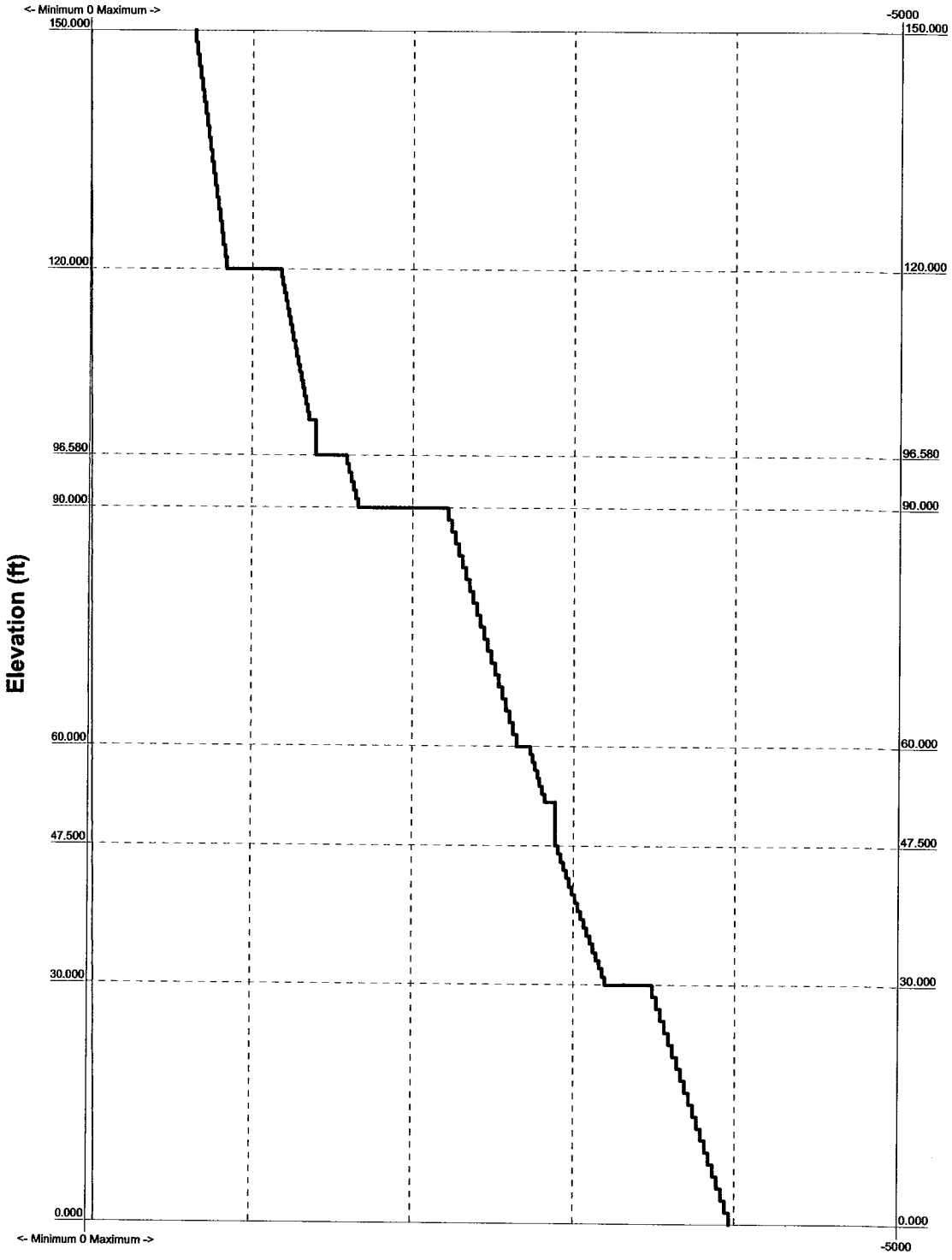
1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.8%

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 83154.003 - BETHANY, CT (Site# 61186-A)		
Project: 150' Valmont Monopole/ MetroPCS Co-Locate		
Client: AT&T Towers	Drawn by: kmaroju	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path: S:\BAT Engineering\Projects\AT&T Towers\83154_61186_Bethany\Engineering\RISA\83154_003_BethanyCT_Modified.eri		Dwg No. E-1

TIA/EIA-222-F - 85 mph/74 mph 0.500 in Ice

Leg Capacity ——— **Leg Compression (K)**



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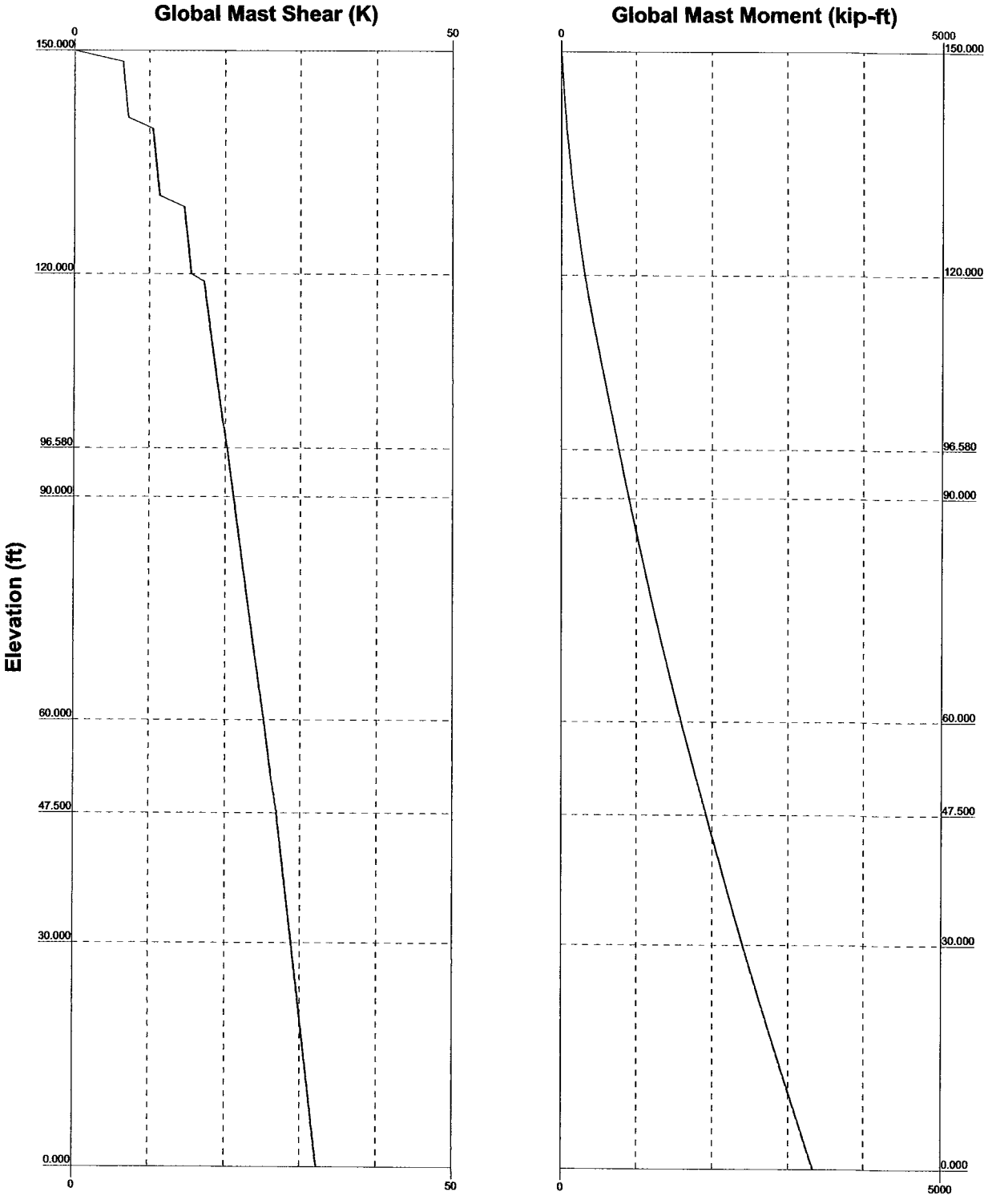
Client: AT&T Towers	Drawn by: kmaroju	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-3

Vx Vz Mx Mz



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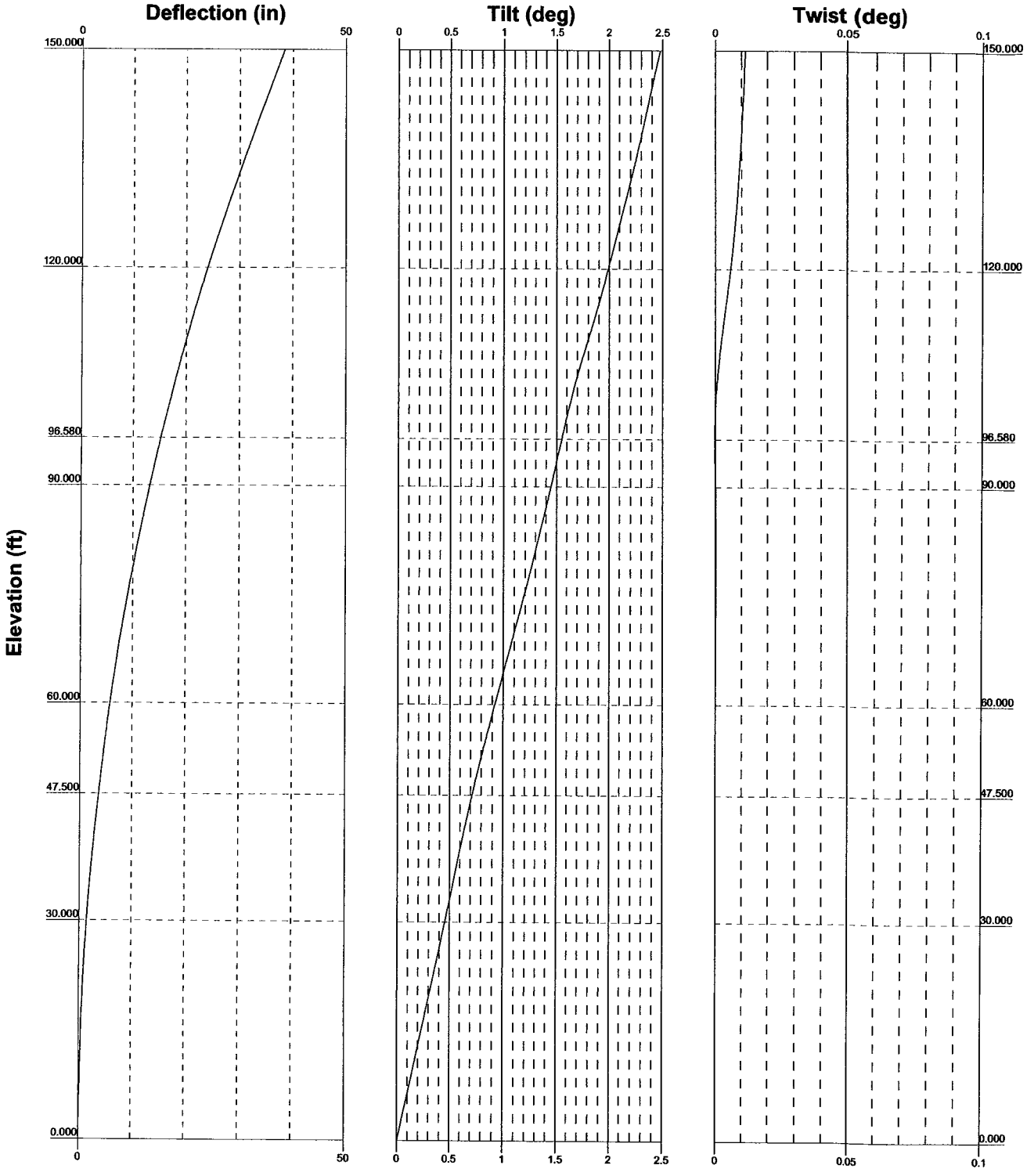
Project: 150' Valmont Monopole/ MetroPCS Co-Locate		
Client: AT&T Towers	Drawn by: kmaroju	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-4

TIA/EIA-222-F - Service - 50 mph **Maximum Values**



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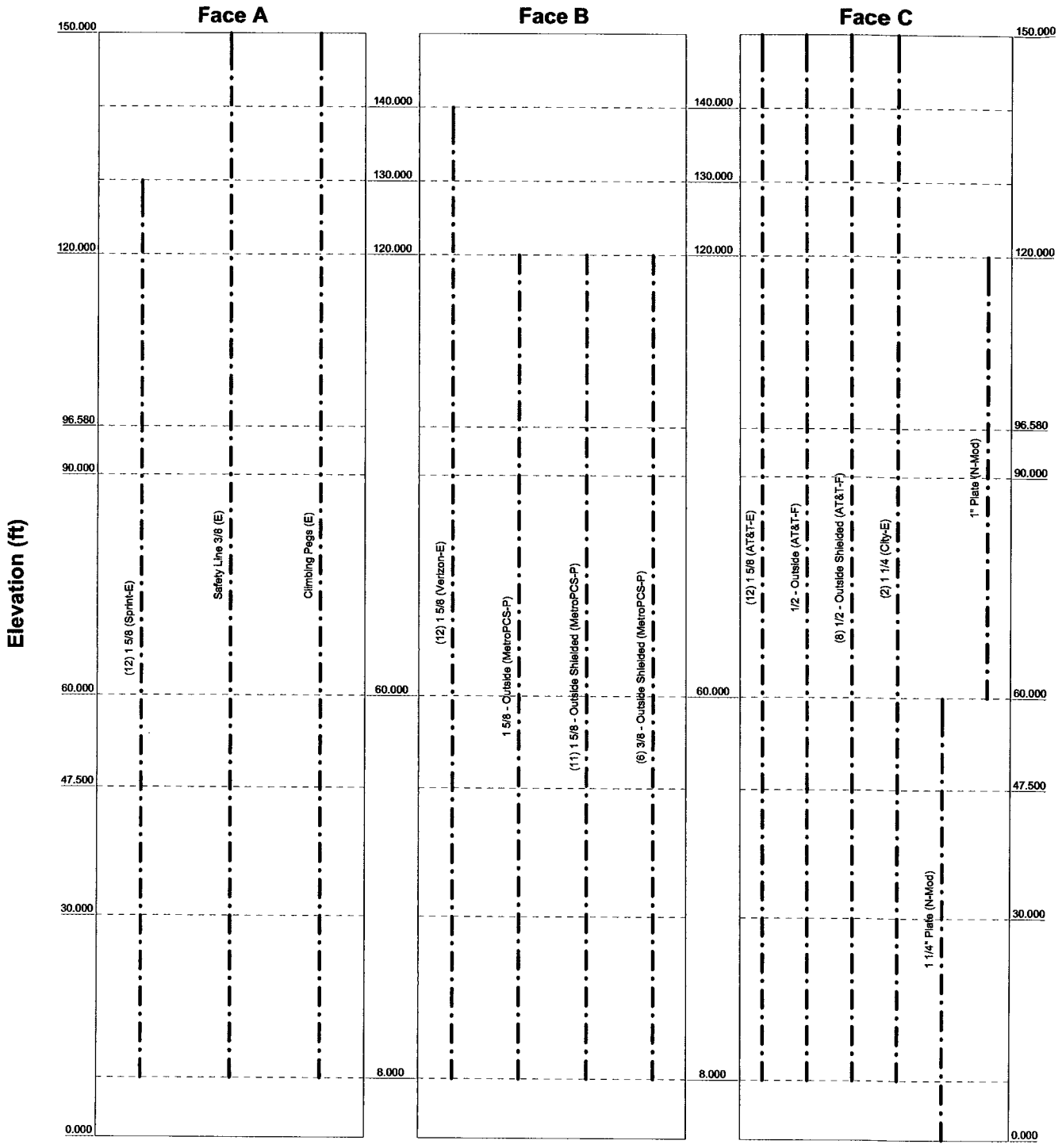
FAX: (918) 295-0265

Job: *83154.003 - BETHANY, CT (Site# 61186-A)*		
Project: *150' Valmont Monopole/ MetroPCS Co-Locate*		
Client: AT&T Towers	Drawn by: kmaroju	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-5

Feedline Distribution Chart

0' - 150'

Round — Flat — App In Face — App Out Face — Truss Leg



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FAX: (918) 295-0265

Job: 83154.003 - BETHANY, CT (Site# 61186-A)		
Project: 150' Valmont Monopole/ MetroPCS Co-Locate		
Client: AT&T Towers	Drawn by: kmaroju	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-7

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 New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.500 in.
Ice density of 56.000 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50.000 °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	150.000-120.000	30.000	0.000	12	17.610	23.230	0.219	0.875	A572-65 (65 ksi)
L2	120.000-96.580	23.420	4.420	12	23.230	27.610	0.410	1.642	48.4 ksi (48 ksi)
L3	96.580-90.000	11.000	0.000	12	25.963	28.390	0.507	2.030	45.5 ksi (46 ksi)
L4	90.000-60.000	30.000	0.000	12	28.390	34.000	0.598	2.392	51.3 ksi (51 ksi)
L5	60.000-47.500	12.500	5.500	12	34.000	36.340	0.577	2.310	54.5 ksi (55 ksi)
L6	47.500-30.000	23.000	0.000	12	34.156	38.980	0.625	2.501	51.6 ksi (52 ksi)
L7	30.000-0.000	30.000		12	38.980	44.600	0.655	2.619	53.5 ksi (54 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.231	12.253	473.018	6.226	9.122	51.855	958.463	6.030	4.133	18.89
	24.049	16.212	1095.739	8.238	12.033	91.060	2220.263	7.979	5.639	25.774
L2	24.049	30.156	2004.349	8.169	12.033	166.569	4061.354	14.842	5.126	12.49
	28.584	35.944	3394.195	9.737	14.302	237.323	6877.558	17.691	6.300	15.35
L3	27.888	41.589	3439.699	9.113	13.449	255.766	6969.763	20.469	5.598	11.033
	29.391	45.555	4520.558	9.982	14.706	307.395	9159.877	22.421	6.249	12.315
L4	29.391	53.524	5276.796	9.950	14.706	358.819	10692.220	26.343	6.006	10.041
	35.199	64.328	9160.710	11.958	17.612	520.140	18562.082	31.660	7.509	12.555

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L5	35.199	62.140	8860.114	11.965	17.612	503.073	17952.992	30.584	7.565	13.101
	37.622	66.491	10854.401	12.803	18.824	576.622	21993.959	32.725	8.192	14.187
L6	36.555	67.502	9686.726	12.004	17.693	547.502	19627.932	33.222	7.478	11.961
	40.355	77.214	14498.396	13.731	20.192	718.040	29377.681	38.002	8.771	14.029
L7	40.355	80.795	15147.496	13.720	20.192	750.187	30692.934	39.765	8.692	13.276
	46.173	92.643	22836.075	15.732	23.103	988.455	46272.079	45.596	10.198	15.577

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.000-120.000				1	1	1		
L2 120.000-96.580				1	1	1		
L3 96.580-90.000				1	1	1		
L4 90.000-60.000				1	1	1		
L5 60.000-47.500				1	1	1		
L6 47.500-30.000				1	1	1		
L7 30.000-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1 5/8 (AT&T-E)	C	No	Inside Pole	150.000 - 8.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
1/2 - Outside (AT&T-F)	C	No	CaAa (Out Of Face)	150.000 - 8.000	1	No Ice	0.058	0.000
						1/2" Ice	0.158	0.001
1/2 - Outside Shielded (AT&T-F)	C	No	Inside Pole	150.000 - 8.000	8	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
*** *** ***								
1 1/4 (City-E)	C	No	Inside Pole	150.000 - 8.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
*								
1 5/8 (Verizon-E)	B	No	Inside Pole	140.000 - 8.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
*								
1 5/8 (Sprint-E)	A	No	Inside Pole	130.000 - 8.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
*								
1 5/8 - Outside (MetroPCS-P)	B	No	CaAa (Out Of Face)	120.000 - 8.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.003
1 5/8 - Outside Shielded (MetroPCS-P)	B	No	Inside Pole	120.000 - 8.000	11	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
3/8 - Outside Shielded (MetroPCS-P)	B	No	Inside Pole	120.000 - 8.000	6	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
*								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
*								
Safety Line 3/8 (E)	A	No	CaAa (Out Of Face)	150.000 - 8.000	1	No Ice	0.037	0.000
						1/2" Ice	0.137	0.001
Climbing Pegs (E)	A	No	CaAa (Out Of Face)	150.000 - 8.000	1	No Ice	0.088	0.000
						1/2" Ice	0.188	0.001
*								
1 1/4" Plate (N-Mod)	C	No	CaAa (Out Of Face)	60.000 - 0.000	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
1" Plate (N-Mod)	C	No	CaAa (Out Of Face)	120.000 - 60.000	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-120.000	A	0.000	0.000	0.000	3.765	0.143
		B	0.000	0.000	0.000	0.000	0.250
		C	0.000	0.000	0.000	1.740	0.481
L2	120.000-96.580	A	0.000	0.000	0.000	2.939	0.307
		B	0.000	0.000	0.000	4.637	0.597
		C	0.000	0.000	0.000	5.262	0.376
L3	96.580-90.000	A	0.000	0.000	0.000	0.826	0.086
		B	0.000	0.000	0.000	1.303	0.168
		C	0.000	0.000	0.000	1.478	0.106
L4	90.000-60.000	A	0.000	0.000	0.000	3.765	0.393
		B	0.000	0.000	0.000	5.940	0.765
		C	0.000	0.000	0.000	6.740	0.481
L5	60.000-47.500	A	0.000	0.000	0.000	1.569	0.164
		B	0.000	0.000	0.000	2.475	0.319
		C	0.000	0.000	0.000	3.329	0.201
L6	47.500-30.000	A	0.000	0.000	0.000	2.196	0.229
		B	0.000	0.000	0.000	3.465	0.446
		C	0.000	0.000	0.000	4.661	0.281
L7	30.000-0.000	A	0.000	0.000	0.000	2.761	0.288
		B	0.000	0.000	0.000	4.356	0.561
		C	0.000	0.000	0.000	7.526	0.353

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-120.000	A	0.500	0.000	0.000	0.000	9.765	0.185
		B		0.000	0.000	0.000	0.000	0.250
		C		0.000	0.000	0.000	4.740	0.501
L2	120.000-96.580	A	0.500	0.000	0.000	0.000	7.623	0.339
		B		0.000	0.000	0.000	6.979	0.633
		C		0.000	0.000	0.000	9.555	0.391
L3	96.580-90.000	A	0.500	0.000	0.000	0.000	2.142	0.095
		B		0.000	0.000	0.000	1.961	0.178
		C		0.000	0.000	0.000	2.685	0.110
L4	90.000-60.000	A	0.500	0.000	0.000	0.000	9.765	0.434
		B		0.000	0.000	0.000	8.940	0.810
		C		0.000	0.000	0.000	12.240	0.501

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L5	60.000-47.500	A	0.500	0.000	0.000	0.000	4.069	0.181
		B		0.000	0.000	0.000	3.725	0.338
		C		0.000	0.000	0.000	5.621	0.209
L6	47.500-30.000	A	0.500	0.000	0.000	0.000	5.696	0.253
		B		0.000	0.000	0.000	5.215	0.473
		C		0.000	0.000	0.000	7.869	0.292
L7	30.000-0.000	A	0.500	0.000	0.000	0.000	7.161	0.318
		B		0.000	0.000	0.000	6.556	0.594
		C		0.000	0.000	0.000	12.226	0.368

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-120.000	-0.068	-0.131	-0.154	-0.277
L2	120.000-96.580	-0.028	0.102	-0.094	0.027
L3	96.580-90.000	-0.028	0.104	-0.096	0.028
L4	90.000-60.000	-0.029	0.106	-0.100	0.029
L5	60.000-47.500	-0.074	0.133	-0.141	0.052
L6	47.500-30.000	-0.075	0.134	-0.143	0.053
L7	30.000-0.000	-0.122	0.139	-0.195	0.089

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod (E)	C	From Leg	0.000 0.000 5.000	0.000	150.000	No Ice 1/2" Ice	0.500 0.750	0.500 0.750	0.100 0.200
*									
(2) 7770.00 w/Mount Pipe (AT&T-E)	C	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	6.218 6.769	4.353 5.198	0.057 0.103
(2) 7770.00 w/Mount Pipe (AT&T-E)	B	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	6.218 6.769	4.353 5.198	0.057 0.103
(2) 7770.00 w/Mount Pipe (AT&T-E)	A	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	6.218 6.769	4.353 5.198	0.057 0.103
DUO1417-8686 w/Mount Pipe (AT&T-E)	C	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	7.246 7.964	5.862 6.964	0.046 0.104
DUO1417-8686 w/Mount Pipe (AT&T-E)	B	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	7.246 7.964	5.862 6.964	0.046 0.104
DUO1417-8686 w/Mount	A	From Leg	3.000	-30.000	150.000	No Ice	7.246	5.862	0.046

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe (AT&T-E)			0.000 0.000			1/2" Ice	7.964	6.964	0.104
(2) CG-1900DD-FULL-DIN (AT&T-E)	C	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	1.285 1.439	0.319 0.417	0.015 0.022
(2) CG-1900DD-FULL-DIN (AT&T-E)	A	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	1.285 1.439	0.319 0.417	0.015 0.022
(2) CG-1900DD-FULL-DIN (AT&T-E)	B	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	1.285 1.439	0.319 0.417	0.015 0.022
P65-16-XLH-RR w/Mount Pipe (AT&T-F)	C	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	8.400 8.949	6.125 7.072	0.075 0.136
P65-16-XLH-RR w/Mount Pipe (AT&T-F)	B	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	8.400 8.949	6.125 7.072	0.075 0.136
P65-16-XLH-RR w/Mount Pipe (AT&T-F)	A	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	8.400 8.949	6.125 7.072	0.075 0.136
RRU-11 (AT&T-F)	C	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	1.912 2.102	1.472 1.645	0.044 0.060
RRU-11 (AT&T-F)	B	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	1.912 2.102	1.472 1.645	0.044 0.060
RRU-11 (AT&T-F)	A	From Leg	3.000 0.000 0.000	-30.000	150.000	No Ice 1/2" Ice	1.912 2.102	1.472 1.645	0.044 0.060
Platform Mount [LP 713-1] (AT&T-E)	C	None		0.000	150.000	No Ice 1/2" Ice	31.270 39.680	31.270 39.680	1.510 1.929
*** *** ***									
12' x 3" Omni (City-E)	A	From Leg	3.000 0.000 0.000	0.000	156.000	No Ice 1/2" Ice	3.600 4.833	3.600 4.833	0.020 0.046
10' Yagi (City-E)	A	From Leg	3.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice	2.000 3.020	2.000 3.020	0.050 0.070
*									
6' x 2" Mount Pipe (Verizon-E)	C	From Leg	3.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice	1.425 1.925	1.425 1.925	0.022 0.033
6' x 2" Mount Pipe (Verizon-E)	B	From Leg	3.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice	1.425 1.925	1.425 1.925	0.022 0.033
6' x 2" Mount Pipe (Verizon-E)	A	From Leg	3.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice	1.425 1.925	1.425 1.925	0.022 0.033
(3) MG D3 800TO w/Mount Pipe (Verizon-E)	C	From Leg	3.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice	3.337 3.676	2.158 2.482	0.018 0.037
(3) DB854DG65ESX w/Mount Pipe (Verizon-E)	B	From Leg	3.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice	6.593 7.302	4.412 5.449	0.044 0.093
(3) P65-15-XLH-RR w/Mount Pipe (Verizon-E)	A	From Leg	3.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice	6.075 6.635	3.903 4.708	0.052 0.096

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 303-1] (Verizon-E)	C	None		0.000	140.000	No Ice 1/2" Ice	14.660 18.870	14.660 18.870	1.250 1.481
*									
(4) DB980F90E-M w/Mount Pipe (Sprint-E)	C	From Leg	3.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice	4.371 4.959	3.954 5.045	0.034 0.071
(4) DB980F90E-M w/Mount Pipe (Sprint-E)	B	From Leg	3.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice	4.371 4.959	3.954 5.045	0.034 0.071
(4) DB980F90E-M w/Mount Pipe (Sprint-E)	A	From Leg	3.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice	4.371 4.959	3.954 5.045	0.034 0.071
T-Arm Mount [TA 602-3] (Sprint-E)	C	None		0.000	130.000	No Ice 1/2" Ice	11.590 15.440	11.590 15.440	0.774 0.990
*									
*									
(2) HBX-6516DS-VTM w/Mount Pipe (MetroPCS-P)	C	From Leg	2.000 0.000 0.000	30.000	120.000	No Ice 1/2" Ice	3.768 4.244	3.411 4.226	0.032 0.064
(2) HBX-6516DS-VTM w/Mount Pipe (MetroPCS-P)	B	From Leg	2.000 0.000 0.000	20.000	120.000	No Ice 1/2" Ice	3.768 4.244	3.411 4.226	0.032 0.064
(2) HBX-6516DS-VTM w/Mount Pipe (MetroPCS-P)	A	From Leg	2.000 0.000 0.000	30.000	120.000	No Ice 1/2" Ice	3.768 4.244	3.411 4.226	0.032 0.064
(2) ATM200-A20 (MetroPCS-P)	C	From Leg	2.000 0.000 0.000	30.000	120.000	No Ice 1/2" Ice	0.218 0.292	0.163 0.233	0.001 0.002
(2) ATM200-A20 (MetroPCS-P)	B	From Leg	2.000 0.000 0.000	20.000	120.000	No Ice 1/2" Ice	0.218 0.292	0.163 0.233	0.001 0.002
(2) ATM200-A20 (MetroPCS-P)	A	From Leg	2.000 0.000 0.000	30.000	120.000	No Ice 1/2" Ice	0.218 0.292	0.163 0.233	0.001 0.002
Side Arm Mount [SO 103-3] (MetroPCS-P)	C	None		0.000	120.000	No Ice 1/2" Ice	9.500 11.800	9.500 11.800	0.224 0.317
*									

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
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

Comb. No.	Description
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 - 120	38.449	38	2.475	0.011
L2	120 - 96.58	23.964	38	1.990	0.004
L3	101 - 90	16.750	38	1.619	0.002
L4	90 - 60	13.194	38	1.443	0.002
L5	60 - 47.5	5.754	38	0.924	0.001
L6	53 - 30	4.490	38	0.800	0.001
L7	30 - 0	1.399	38	0.452	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.000	12' x 3" Omni	38	38.449	2.475	0.011	12641
155.000	10' Yagi	38	38.449	2.475	0.011	12641
150.000	Lightning Rod	38	38.449	2.475	0.011	12641
140.000	6' x 2" Mount Pipe	38	33.367	2.326	0.008	6320
130.000	(4) DB980F90E-M w/Mount Pipe	38	28.475	2.168	0.006	3159
120.000	(2) HBX-6516DS-VTM w/Mount Pipe	38	23.964	1.990	0.004	2210

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	110.490	13	7.115	0.033
L2	120 - 96.58	68.964	13	5.729	0.011
L3	101 - 90	48.237	13	4.665	0.006
L4	90 - 60	38.009	13	4.158	0.005
L5	60 - 47.5	16.587	13	2.664	0.002
L6	53 - 30	12.946	13	2.306	0.002
L7	30 - 0	4.035	13	1.304	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.000	12' x 3" Omni	13	110.490	7.115	0.033	4527
155.000	10' Yagi	13	110.490	7.115	0.033	4527
150.000	Lightning Rod	13	110.490	7.115	0.033	4527
140.000	6' x 2" Mount Pipe	13	95.928	6.692	0.024	2262
130.000	(4) DB980F90E-M w/Mount Pipe	13	81.905	6.239	0.017	1128
120.000	(2) HBX-6516DS-VTM w/Mount Pipe	13	68.964	5.729	0.011	787

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 120 (1)	TP23.23x17.61x0.219	30.000	0.000	0.0	39.000	16.212	-6.230	632.277	0.010
L2	120 - 96.58 (2)	TP27.61x23.23x0.41	23.420	0.000	0.0	29.040	34.852	-9.757	1012.090	0.010
L3	96.58 - 90 (3)	TP28.39x25.963x0.507	11.000	0.000	0.0	27.300	45.555	-12.582	1243.660	0.010
L4	90 - 60 (4)	TP34x28.39x0.598	30.000	0.000	0.0	30.780	64.328	-20.586	1980.020	0.010
L5	60 - 47.5 (5)	TP36.34x34x0.577	12.500	0.000	0.0	32.700	64.577	-22.601	2111.650	0.011
L6	47.5 - 30 (6)	TP38.98x34.156x0.625	23.000	0.000	0.0	30.960	77.214	-31.129	2390.540	0.013
L7	30 - 0 (7)	TP44.6x38.98x0.655	30.000	0.000	0.0	32.100	92.643	-41.828	2973.830	0.014

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 120 (1)	TP23.23x17.61x0.219	330.959	43.614	39.000	1.118	0.000	0.000	39.000	0.000
L2	120 - 96.58 (2)	TP27.61x23.23x0.41	680.461	36.615	29.040	1.261	0.000	0.000	29.040	0.000
L3	96.58 - 90 (3)	TP28.39x25.963x0.507	905.433	35.346	27.300	1.295	0.000	0.000	27.300	0.000
L4	90 - 60 (4)	TP34x28.39x0.598	1600.917	36.934	30.780	1.200	0.000	0.000	30.780	0.000
L5	60 - 47.5 (5)	TP36.34x34x0.577	1780.592	39.304	32.700	1.202	0.000	0.000	32.700	0.000
L6	47.5 - 30 (6)	TP38.98x34.156x0.625	2414.992	40.360	30.960	1.304	0.000	0.000	30.960	0.000
L7	30 - 0 (7)	TP44.6x38.98x0.655	3331.908	40.450	32.100	1.260	0.000	0.000	32.100	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 120 (1)	TP23.23x17.61x0.219	15.623	0.964	26.000	0.075	1.629	0.101	26.000	0.004
L2	120 - 96.58 (2)	TP27.61x23.23x0.41	19.655	0.564	19.360	0.059	1.592	0.040	19.360	0.002
L3	96.58 - 90 (3)	TP28.39x25.963x0.507	21.210	0.466	18.200	0.052	1.582	0.029	18.200	0.002
L4	90 - 60 (4)	TP34x28.39x0.598	25.241	0.392	20.520	0.039	1.552	0.017	20.520	0.001
L5	60 - 47.5 (5)	TP36.34x34x0.577	26.122	0.405	21.800	0.038	1.541	0.016	21.800	0.001
L6	47.5 - 30 (6)	TP38.98x34.156x0.625	28.942	0.375	20.640	0.037	1.506	0.012	20.640	0.001
L7	30 - 0 (7)	TP44.6x38.98x0.655	32.248	0.348	21.400	0.033	1.448	0.008	21.400	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120 (1)	0.010	1.118	0.000	0.075	0.004	1.130 ✔	1.333	H1-3+VT ✔
L2	120 - 96.58 (2)	0.010	1.261	0.000	0.059	0.002	1.271 ✔	1.333	H1-3+VT ✔
L3	96.58 - 90 (3)	0.010	1.295	0.000	0.052	0.002	1.306 ✔	1.333	H1-3+VT ✔
L4	90 - 60 (4)	0.010	1.200	0.000	0.039	0.001	1.211 ✔	1.333	H1-3+VT ✔
L5	60 - 47.5 (5)	0.011	1.202	0.000	0.038	0.001	1.213 ✔	1.333	H1-3+VT ✔
L6	47.5 - 30 (6)	0.013	1.304	0.000	0.037	0.001	1.317 ✔	1.333	H1-3+VT ✔
L7	30 - 0 (7)	0.014	1.260	0.000	0.033	0.000	1.274 ✔	1.333	H1-3+VT ✔

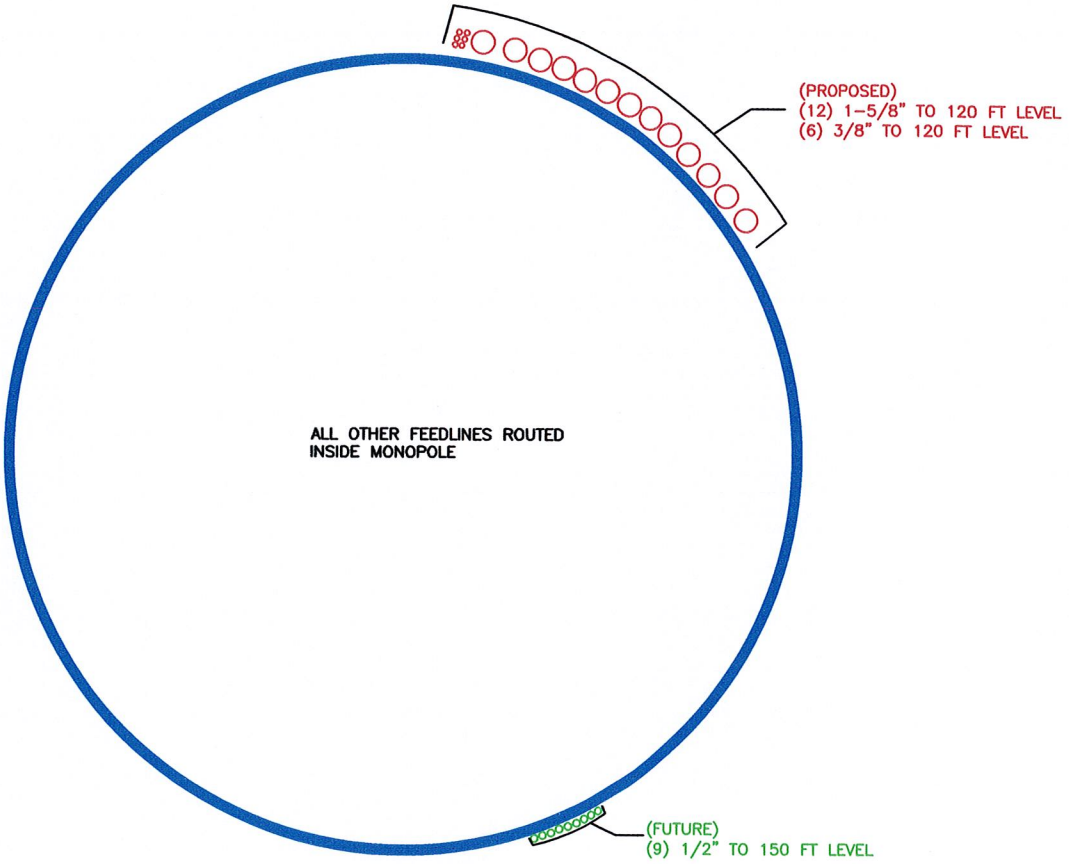
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 120	Pole	TP23.23x17.61x0.219	1	-6.230	842.825	84.8	Pass
L2	120 - 96.58	Pole	TP27.61x23.23x0.41	2	-9.757	1349.116	95.4	Pass
L3	96.58 - 90	Pole	TP28.39x25.963x0.507	3	-12.582	1657.799	97.9	Pass
L4	90 - 60	Pole	TP34x28.39x0.598	4	-20.586	2639.367	90.8	Pass
L5	60 - 47.5	Pole	TP36.34x34x0.577	5	-22.601	2814.829	91.0	Pass
L6	47.5 - 30	Pole	TP38.98x34.156x0.625	6	-31.129	3186.590	98.8	Pass
L7	30 - 0	Pole	TP44.6x38.98x0.655	7	-41.828	3964.115	95.6	Pass
							Summary	
						Pole (L6)	98.8	Pass
						RATING =	**98.8**	**Pass**

Program Version 5.4.2.0 - 6/17/2010 File: 83154_003_BethanyCT_Modified.eri

APPENDIX B

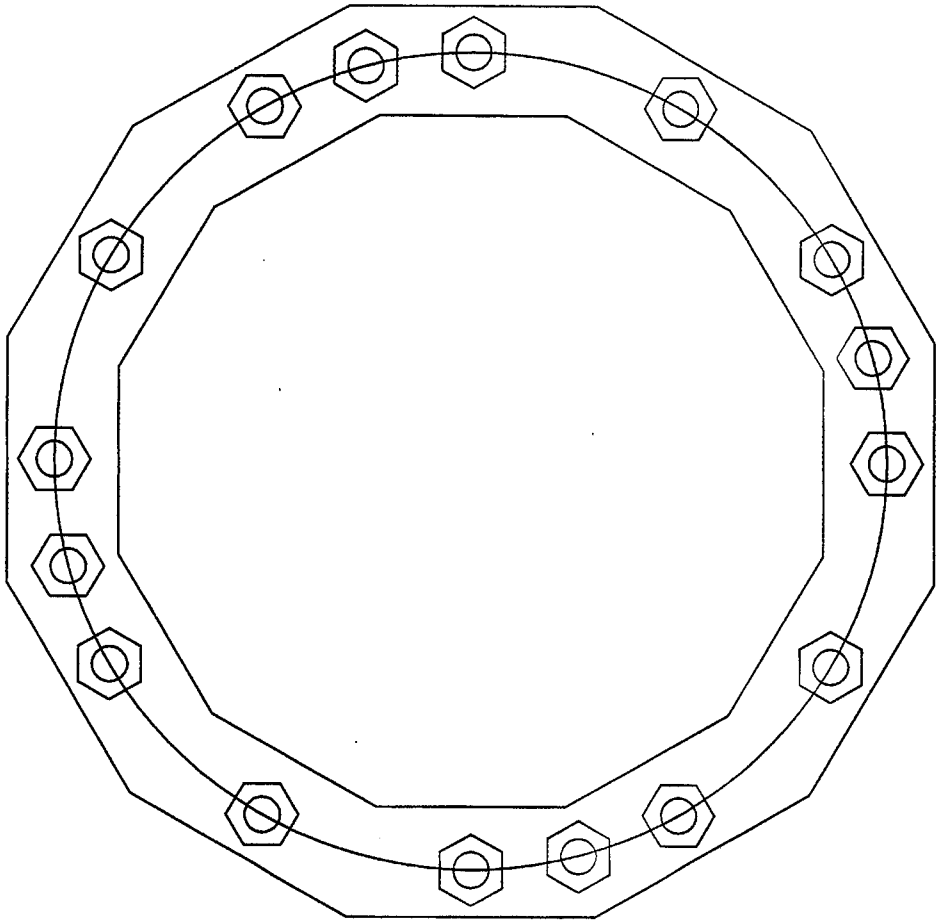
BASE LEVEL DRAWING



PROJECT NUMBER: 83154

APPENDIX C

ADDITIONAL CALCULATIONS



---------- REGIONS ----------

Area:	63.6173
Perimeter:	113.0973
Bounding box:	X: -27.4650 -- 27.4650
	Y: -27.4650 -- 27.4650
Centroid:	X: 0.0000
	Y: 0.0000
Moments of inertia:	X: 22088.8134
	Y: 22088.8134
Product of inertia:	XY: 0.0000
Radii of gyration:	X: 18.6337
	Y: 18.6337

Principal moments and X-Y directions about centroid:
I: 22088.8134 along [0.3827 0.9239]
J: 22088.8134 along [-0.9239 0.3827]

$$T_{actual} = \frac{3{,}332 \text{ k-ft} * 52.68/2 \text{ in}}{22088.8134 \text{ in}^4} * 3.98 \text{ in}^2$$

$$= 187.8 \text{ K.}$$

$$T_{allow} = 0.33 * 125 \text{ Ksi} * 3.98 \text{ in}^2 * 1.33$$

$$= 218.3 \text{ K.}$$

UNITY = 86 %

$$M = \frac{187.8 \text{ K.} * 52.68 \text{ in.}}{12}$$

$$= 824.4 \text{ k-ft}$$ (Moment taken by the new anchor rods)

$$M_{remain} = 3332 - 824.4$$

$$= 2{,}507.6 \text{ k-ft}$$ (Moment taken by the existing anchor rods)

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

Job #: *83154*
Site Name: *Bethany, CT*
Site #: *61186-A*

Pole Manufacturer:	*Other*

Reactions		
Moment:	2507.6	ft-kips
Axial:	42	kips
Shear:	32	kips

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	52.68	in

Plate Data		
Diam:	58.67	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	11.95	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	5	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	44.6	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

Maximum Rod Tension:	186.9 Kips	Rigid
Allowable Tension:	195.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	95.9% **Pass**	Fty*ASIF

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	33.3 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	55.6% **Pass**	Y.L. Length: 28.04

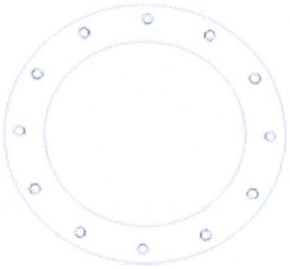
n/a

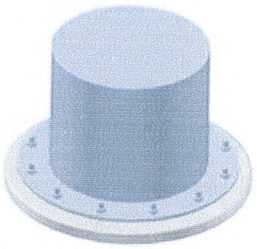
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Analysis Date: 9/2/2011

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

Job#: *83154*
Site Name: *Bethany, CT*
Site #: *61186-A*

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	7.75	ft
Pad Thickness, T:	7	ft
Pad Width=Length, L:	25	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	4.5	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	15.90	ft^2
Pier Height:	1.25	ft
Soil (above pad) Height:	0.75	ft

Soil Parameters		
Unit Weight, γ:	100.0	pcf
Ultimate Bearing Capacity, qn:	8.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	6.00	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	43.2	kips
Pad Force Location Above D:	2.54	ft
ϕ(Passive Pressure Moment):	109.69	ft-kips
Factored O.T. M(WL), "1.6W":	4854.6	ft-kips
Factored OT (MW-Msoil), M1	4744.91	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	0.43	ft
Sum of Soil Wedges Wt:	1.10	kips
Soil Wedges ecc, K1:	5.97	ft
Ftg+Soil above Pad wt:	704.9	kips
Unfactored (Total ftg-soil Wt):	706.02	kips
1.2D. **No Soil Wedges.**	896.30	kips
0.9D. **With Soil Wedges**	673.21	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	42	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	32	kips
Unfactored WL Moment, M:	3332	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	50.4	kips
0.90	0.9D+1.6W, Pu:	37.8	kips
1.35	Vu:	43.2	kips
	Mu:	4498.2	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	896.30	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	4744.91	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	5.29	ft
Orthogonal qu=	2.65	ksf
qu/ϕ*qn Ratio=	**44.15%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	3.74	ft
Diagonal qu=	2.92	ksf
qu/ϕ*qn Ratio=	**48.70%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

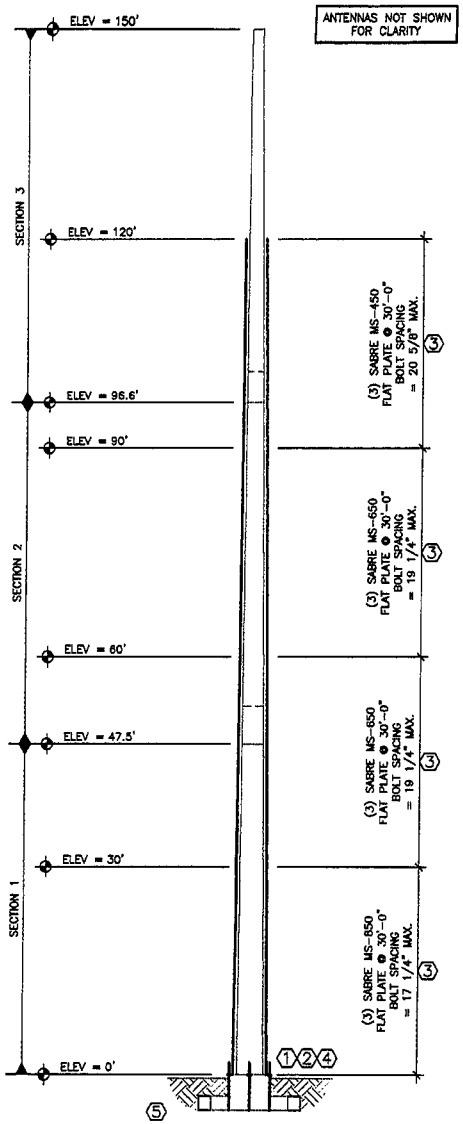
(**w/ Soil Wedges**) [Reaction+Conc+Soil]	673.21	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	4738.98	ft-kips

Orthogonal ecc3 = M2/P2 =	7.04	ft
Ortho Non Bearing Length,NBL=	14.08	ft
Orthogonal qu=	2.47	ksf
Diagonal qu=	2.97	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	3332.00		
M Orthogonal:	4935.96	**67.50%**	**Pass**
M Diagonal:	4901.99	**67.97%**	**Pass**

APPENDIX D

MODIFICATION DRAWINGS



1 TOWER ELEVATION
SCALE: N.T.S.

MODIFICATIONS BASED ON FAILING ANALYSIS FROM B&T ENGINEERING DATED 08/04/11 AND ACCOMPANIED BY PASSING ANALYSIS FROM B&T ENGINEERING DATED 09/02/11.

EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER
1	12	0.375"	44.600"	34.687"
2	12	0.313"	36.340"	26.343"
3	12	0.219"	27.610"	17.610"

TOWER MODIFICATIONS:

1. CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
2. THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S1.
3. INSTALL NEW SABRE REINFORCING ELEMENTS RE: SHEET S2.
4. INSTALL NEW ANCHOR RODS RE: SHEET S3.
5. MODIFY FOUNDATION RE: SHEET S4.

* CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF COLD GALVANIZING COMPOUND SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
1.4 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 ALL FIELD CONNECTIONS SHALL BE MADE WITH A325X BOLTS, U.N.O.
1.6 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

FABRICATION

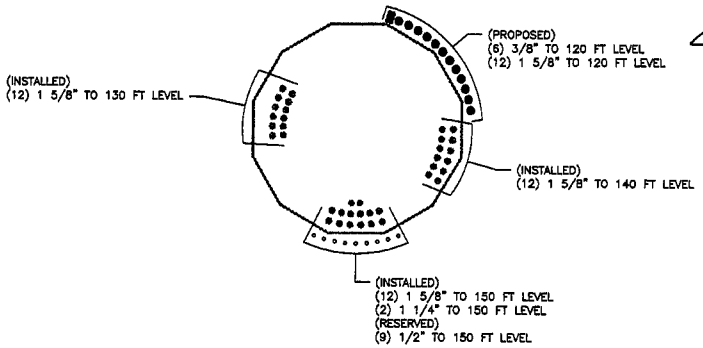
2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E70 SERIES.
2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B&T ENGINEERING 2 WEEKS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.



2 TX LINE DISTRIBUTION DIAGRAM
SCALE: N.T.S.

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Tulsa, OK 74119
PH: (918) 587-4630

at&t

ISSUED FOR:

REV	DATE	DESCRIPTION
0	09/02/11	ISSUED FOR CONSTRUCTION

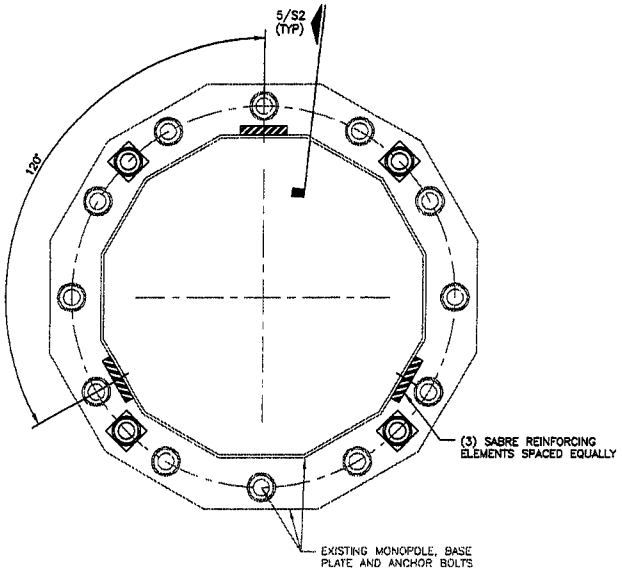
PROJECT NO: 83154.003
DRAWN BY: CRC
CHECKED BY: KMM/SSV

STATE OF CONNECTICUT ★ CHAD TUTTLE No. 23924 LICENSED ★ PROFESSIONAL ENGINEER
9/2/11

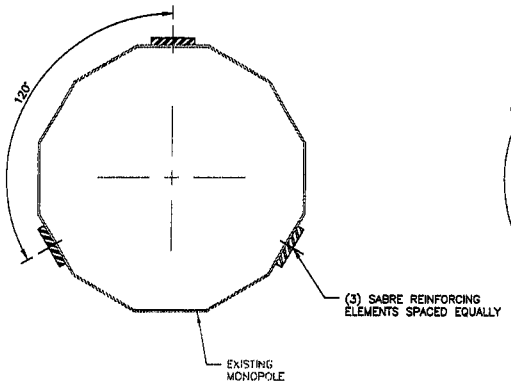
BETHANY
61186-A
719 AMITY ROAD
BETHANY, CT
EXISTING 150' MONOPOLE

SHEET TITLE
TOWER ELEV., SCHEDULES, TX LINE DIST. DIAGRAM AND GENERAL NOTES

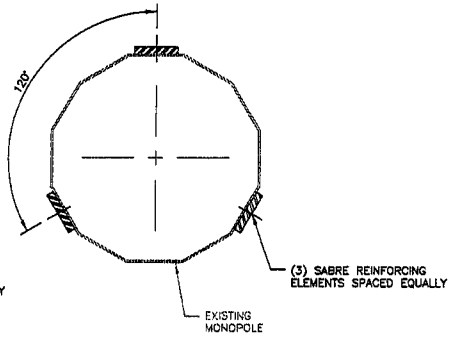
SHEET NUMBER: S1
REVISION: 0



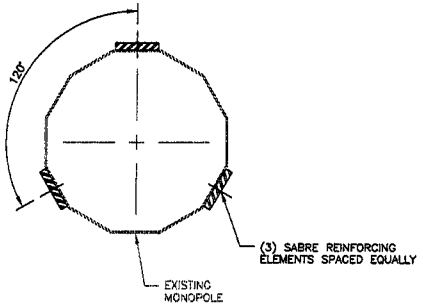
1 TOWER SECTION (0'-30')
SCALE: N.T.S.



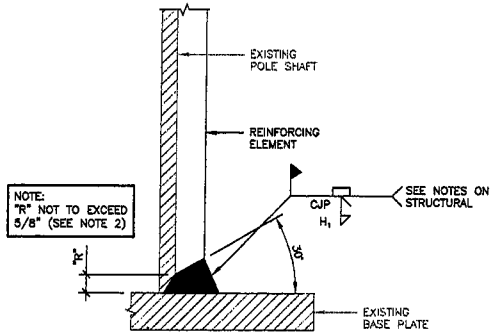
2 TOWER SECTION (30'-60')
SCALE: N.T.S.



3 TOWER SECTION (60'-90')
SCALE: N.T.S.



4 TOWER SECTION (90'-120')
SCALE: N.T.S.



5 WELD DETAIL
SCALE: N.T.S.

WELD DETAIL NOTES:

1. ALL WELDS SHALL BE IN ACCORDANCE WITH AWS D1.1 AND SHALL BE INSTALLED BY AWS CERTIFIED WELDERS.
2. THE EXISTING SHAFT TO BASE PLATE WELD CONNECTION SERVES AS A BACKING ELEMENT FOR THE CJP FIELD WELD AS SHOWN IN THE DETAIL. THIS EXISTING WELD SURFACE SHALL BE PROPERLY PREPARED FOR FIELD WELDING ACCORDING TO AWS D1.1.
3. THE WELD DETAILS AND DIMENSIONS REGARDING THE ROOT OPENING GROOVE ANGLE AND REINFORCING FILLET WELD SIZE SHALL BE BASED ON PREQUALIFIED WELDED JOINTS. THE CJP WELD SHALL USE JOINT DESIGNATION TC-U4a. IF NECESSARY, THE EXISTING WELD AT THE BASE OF THE TOWER CAN BE GROUND DOWN TO SATISFY THE MAXIMUM AS FIT-UP ROOT OPENING OF 5/8".
4. ALL FIELD WELDS SHALL BE INSPECTED BY A CERTIFIED WELD INSPECTOR (CWI) ACCORDING TO AWS D1.1.

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STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED PROFESSIONAL ENGINEER
9/2/11

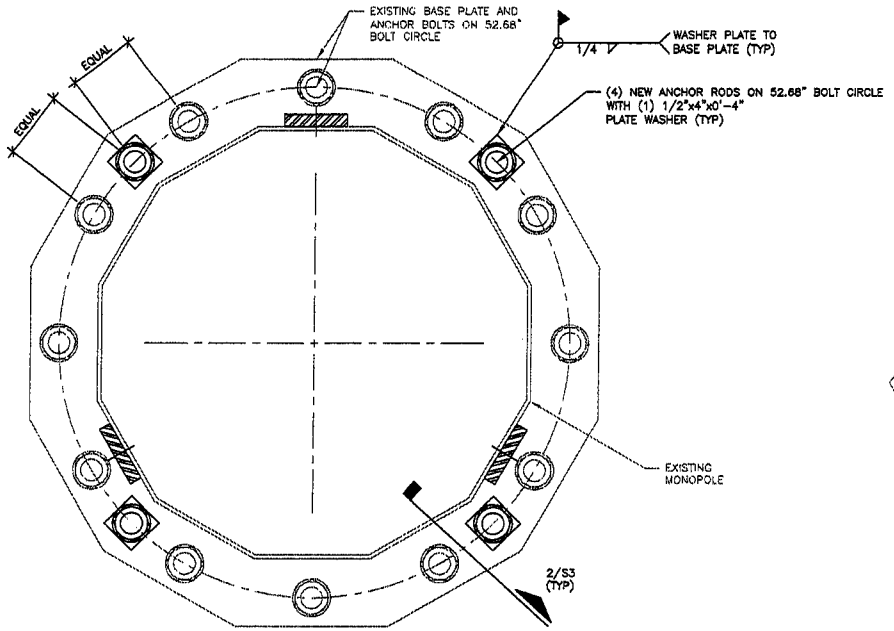
BETHANY
61186-A
719 AMITY ROAD
BETHANY, CT
EXISTING 150' MONOPOLE

SHEET TITLE
TOWER SECTIONS
0'-120'

SHEET NUMBER:	REVISION:
S2	0

NOTE TO CONTRACTOR:

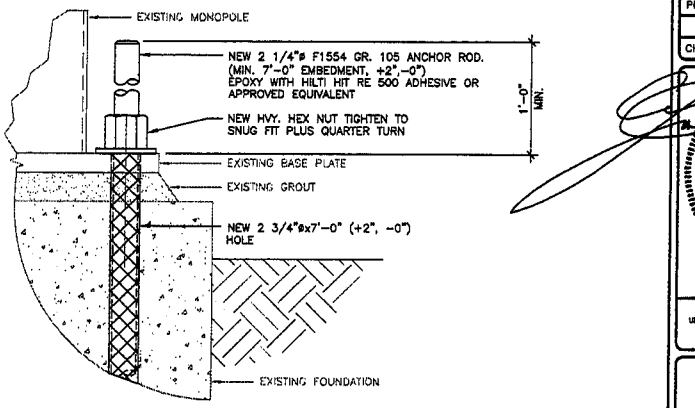
1. ANTENNAS AND OTHER APPURTENANCES MAY NEED TO BE TEMPORARILY REMOVED OR MOVED DURING MODIFICATION.
2. CONTACT SABRE TOWERS AND POLES MODIFICATION DEPARTMENT SUPPLY AND INSTALL PRICING OF MODIFICATION FLAT PLATE.
   CONTACT: MJBURNETT@SABRECOM.COM
3. SABRE'S SCOPE OF WORK TO INCLUDE TOWER MAPPING TO IDENTIFY ANY POSSIBLE OBSTRUCTIONS IN THE AREA OF MODIFICATIONS. DETERMINATION OF FINAL MODIFICATION ARRANGEMENT BASED ON FIELD CONDITIONS AND MATERIAL SUPPLY.
4. PRE-MODIFICATION POLE MAPPING IS REQUIRED TO COMPLETE FABRICATION DRAWINGS. THE RESULTS OF THIS MAPPING MAY CHANGE THE PROPOSED BILL OF MATERIALS DUE TO OBSTRUCTIONS OR UNKNOWN SITE CONDITIONS.



1 ANCHOR ROD MODIFICATION
SCALE: N.T.S.

TAKE ALL MEASURES NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING DRILLING OPERATIONS. NOTIFY B&T ENGINEERING IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.

NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ALL NEW ANCHOR RODS SHALL BE PULL TESTED FOR 334 KIPS.



2 ANCHOR ROD DETAIL
SCALE: N.T.S.

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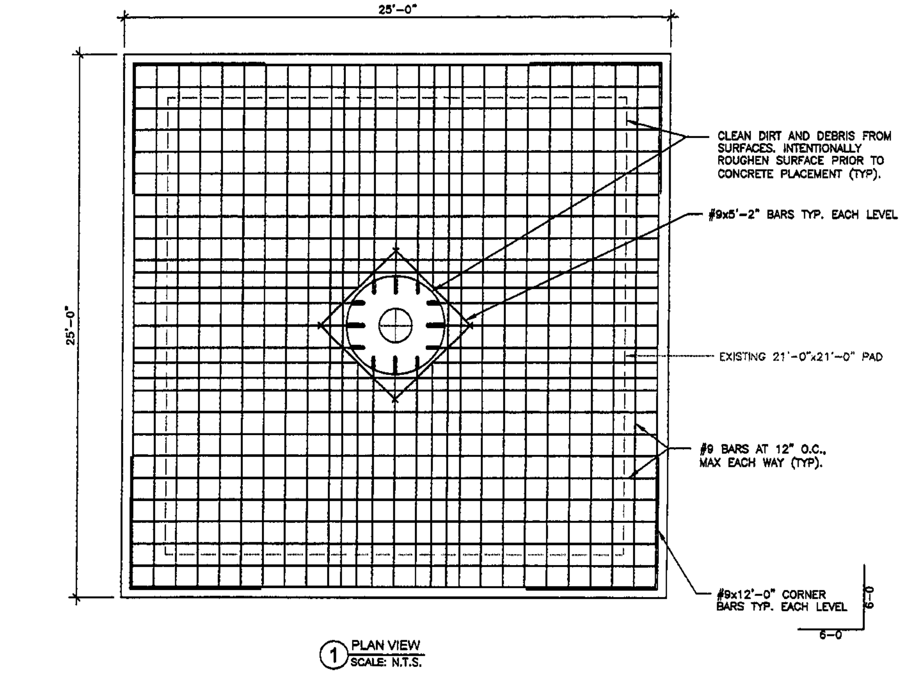
PROJECT NO:	83154.003
DRAWN BY:	CRC
CHECKED BY:	KMM/SSV

STATE OF CONNECTICUT ★ CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER ★
9/2/11

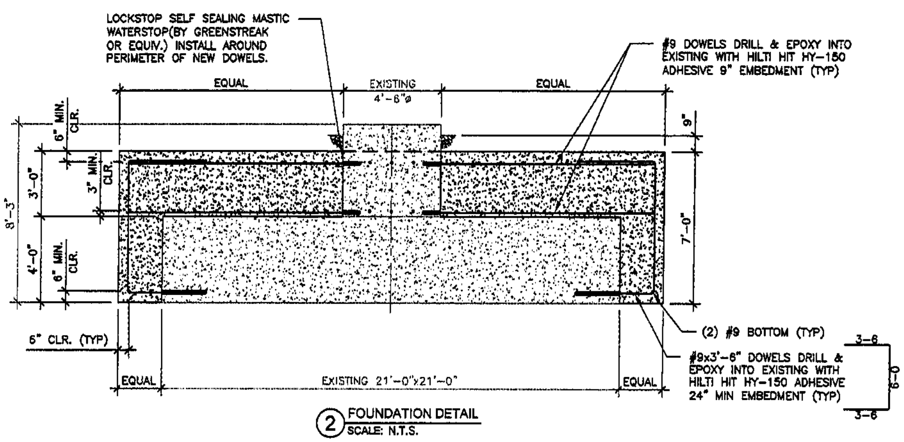
BETHANY
61186-A
719 AMITY ROAD
BETHANY, CT
EXISTING 150' MONOPOLE

SHEET TITLE
ANCHOR ROD DETAIL

SHEET NUMBER:	REVISION:
S3	0



1 PLAN VIEW
SCALE: N.T.S.



2 FOUNDATION DETAIL
SCALE: N.T.S.

CONTRACTOR NOTES:

1. B&T ENGINEERING RECOMMENDS THAT THE CONTRACTOR WALK THIS SITE PRIOR TO BIDDING.
2. EXISTING SLAB AND FENCING WILL BE DAMAGED DURING INSTALLATION OF FOUNDATION MODIFICATIONS, CONSTRUCTION PRICE SHALL INCLUDE REPLACEMENT OR REPAIR OF THE DAMAGED ITEMS.

CONCRETE NOTES:

1. ALL DETAILING, FABRICATION AND PLACING OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE ACI DETAILING MANUAL SP-66 (LATEST REVISION).
2. REINFORCING BARS SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM SPECIFICATION A615, EXCEPT TIES WHICH MAY BE ASTM A615 (GRADE 40). USE CLASS B LAP SPLICES.
3. ALL REINFORCING BARS SHALL BE TIED WITH TIE WIRE AT ALL REINFORCING BAR INTERSECTIONS. THE CONTRACTOR SHALL SUPPORT THE REINFORCING BAR MAT WITH CONTINUOUS STEEL CHAIRS SPACED NO MORE THAN FOUR FEET O.C.
4. ALL WATER SHALL BE REMOVED FROM THE BOTTOM OF THE EXCAVATION BEFORE COMPACTING FILL AND PLACING CONCRETE.
5. CONCRETE SHALL BE NORMAL WEIGHT AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
6. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED SOIL WHERE POSSIBLE. FORMS, WHEN REQUIRED SHALL BE REMOVED PRIOR TO BACKFILLING.
7. BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM UNIT WEIGHT OF 100 PCF OR THE UNIT WEIGHT SPECIFIED IN THE GEOTECH REPORT.
8. FOR THE LESSOR OF 28 C.Y. OR ONE DAY'S PLACEMENT, A MINIMUM OF 4 CONCRETE CYLINDERS SHALL BE TAKEN. CONCRETE SHALL BE TESTED AS REQUIRED BY OWNER'S PROJECT MANAGER.
9. CONTRACTOR SHALL NOT UNDERCUT EXISTING FOUNDATION.

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STATE OF CONNECTICUT ★ CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER ★
9/2/11

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

BETHANY
61186-A
719 AMITY ROAD
BETHANY, CT
EXISTING 150' MONOPOLE

SHEET TITLE
FOUNDATION MODIFICATION

SHEET NUMBER: S4
REVISION: 0