ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

ORIGINAL

June 15, 2009

Michael Perrone
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Cellco Partnership d/b/a Verizon Wireless**
Exempt Modification Approval

Dear Mr. Perrone:

Enclosed you will find a post-modification Structural Analysis Report confirming that the tower and foundation are able to support the existing and proposed antenna configuration. The attached report relates specifically to the following Siting Council filing.

1. EM-VER-097-090203
Newtown – Route 34, Newtown, CT

If you have any questions regarding any of these materials, please do not hesitate to contact me or Rachel Mayo.

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Sandy M. Carter
Brian Ragozzine
Mark Gauger

June 12, 2009

Marco Morales
Crown Castle USA
1200 MacArthur Boulevard, Suite 200
Mahwah, NJ 07430
(201) 236-9032

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
mgubler@verticalstructures.com

Subject: Post Rework Audit Report

Crown Castle Designation	Crown Castle BU Number: 806354 Crown Castle Site Name: BRG 123
Engineering Firm Designation	Vertical Structures Project Number: 2009-004-030
Site Data	Route 34 – Washington Avenue, Newtown, CT, Fairfield County Latitude 41°-24'-45.53", Longitude -73°-16'-12.34". 185' EEI Monopole Tower

Dear Mr. Morales,

Vertical Structures is pleased to present this report on the results of the post rework audit performed on the aforementioned tower. This report has been prepared in accordance with the terms of Crown Castle Purchase Order Number 320538. The purpose of the post rework audit is to verify that all required modifications have been performed in accordance with the document in Table 1.

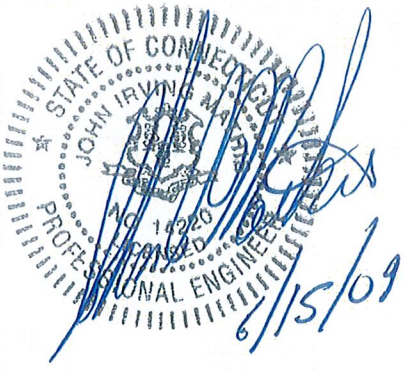
Table 1 – Rework Document

Document	Remarks	Reference	Source
Structural Analysis - Rework Drawings	Vertical Structures, Job No. 2009-004-022 (Original Release)	N/A	Appendix C

Required modifications have been completed in accordance with the document in Table 1. Per the results of our February 4, 2009 structural analysis, the current max stress in the tower is 95.9 percent of capacity.

Vertical Structures appreciates the opportunity of providing our continuing professional services to you and Crown Castle USA. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,



Matt Gubler
Project Manager

APPENDIX A

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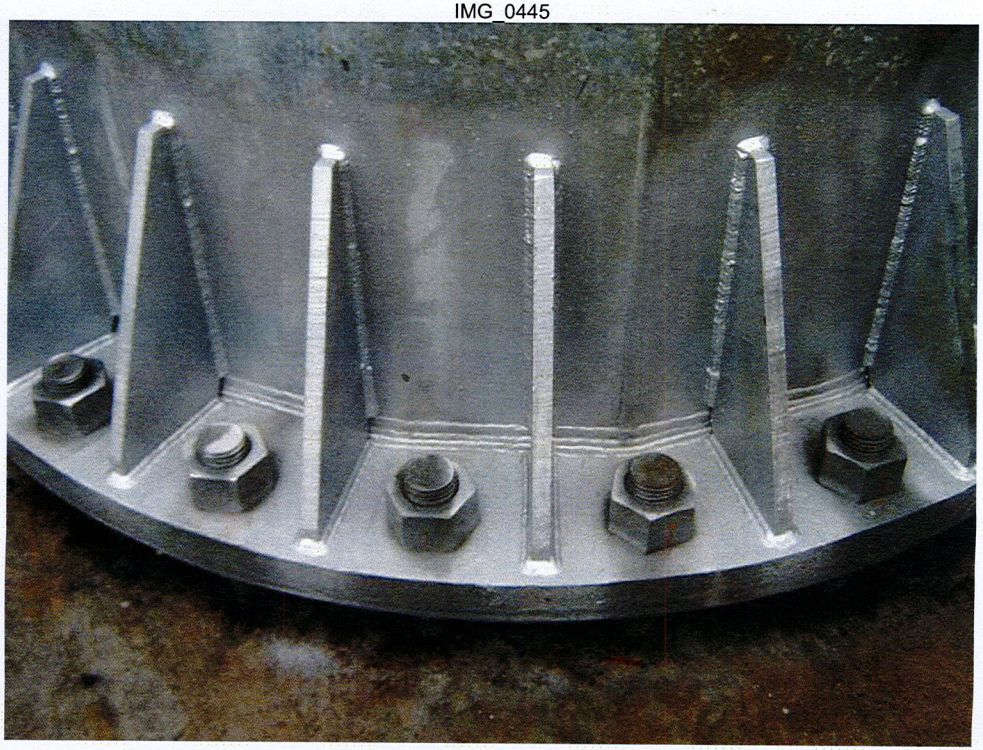
IMG_0445

IMG_0446



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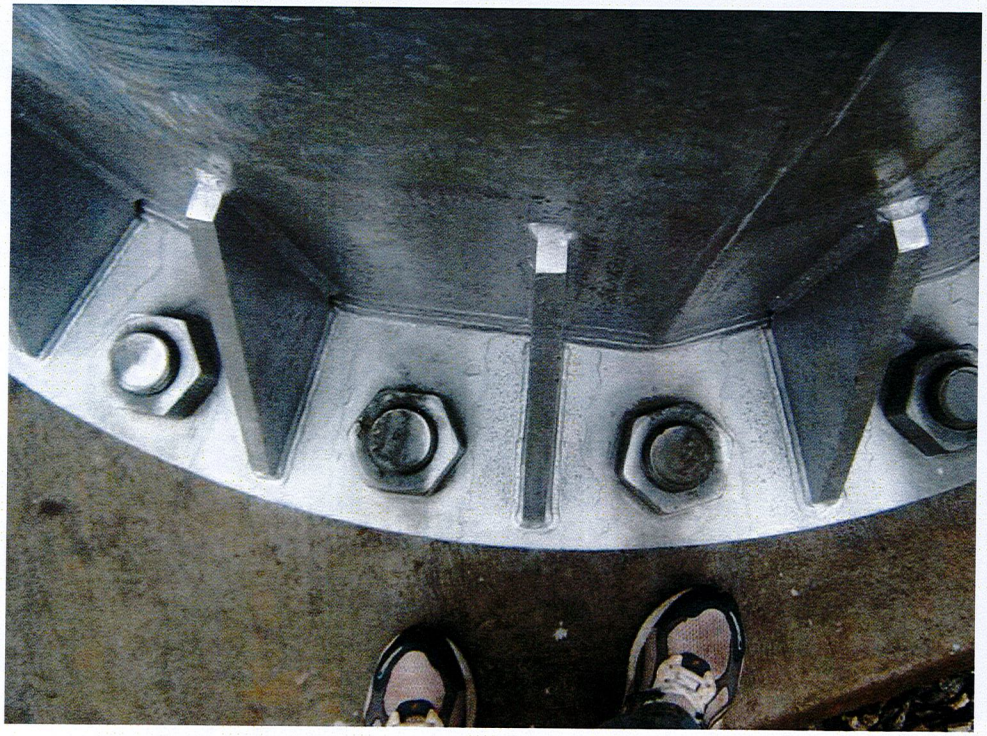

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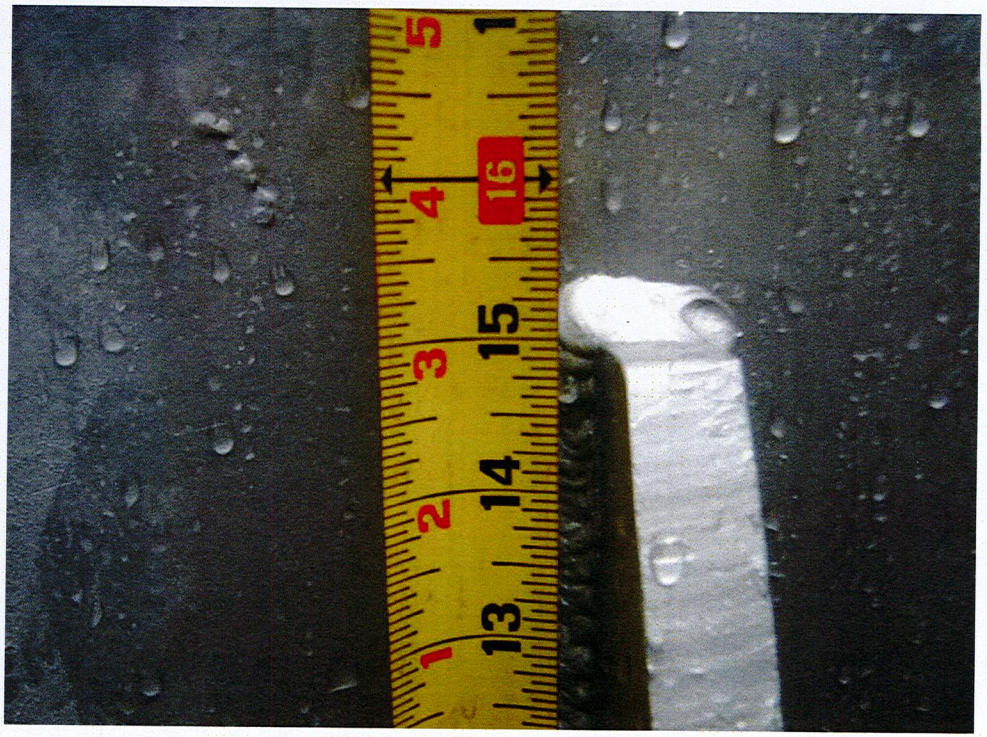

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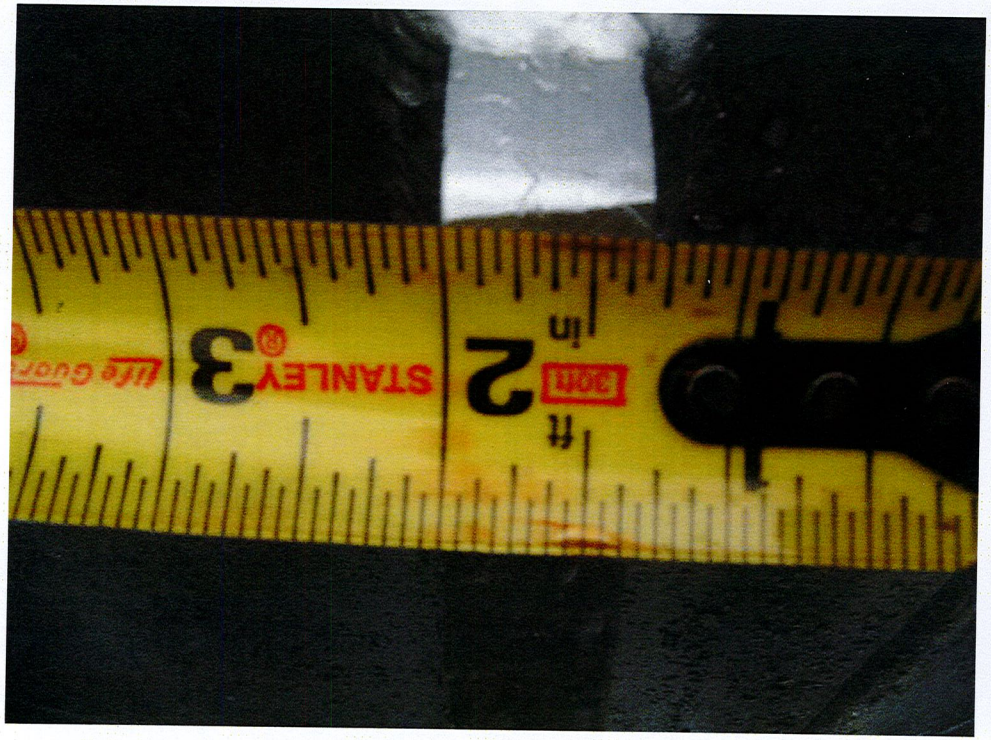

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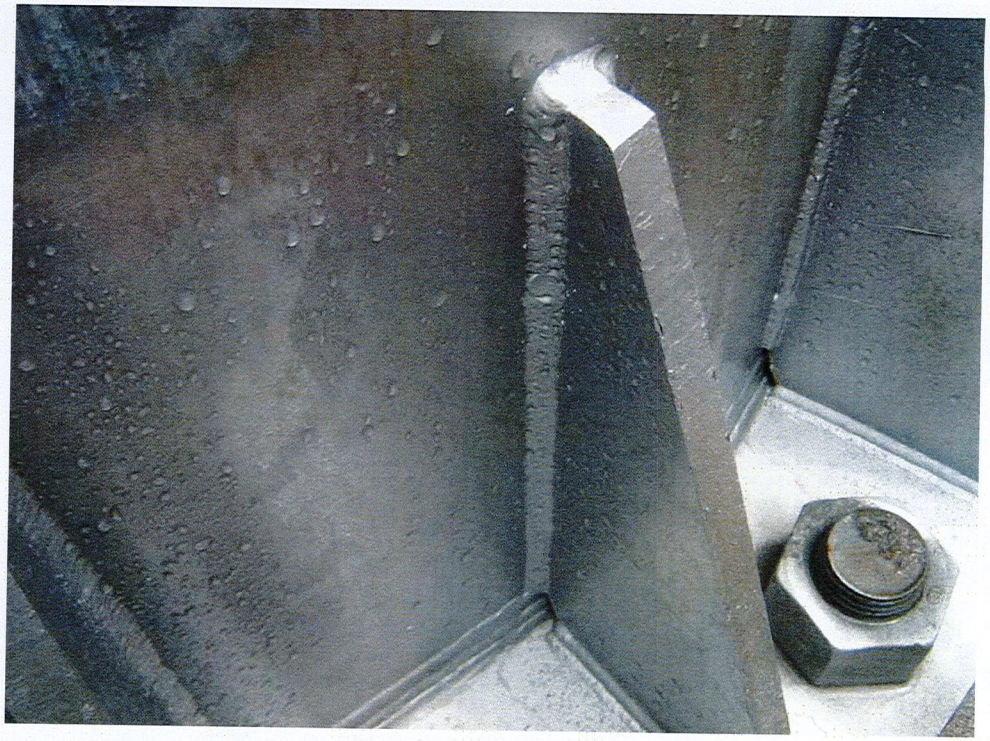

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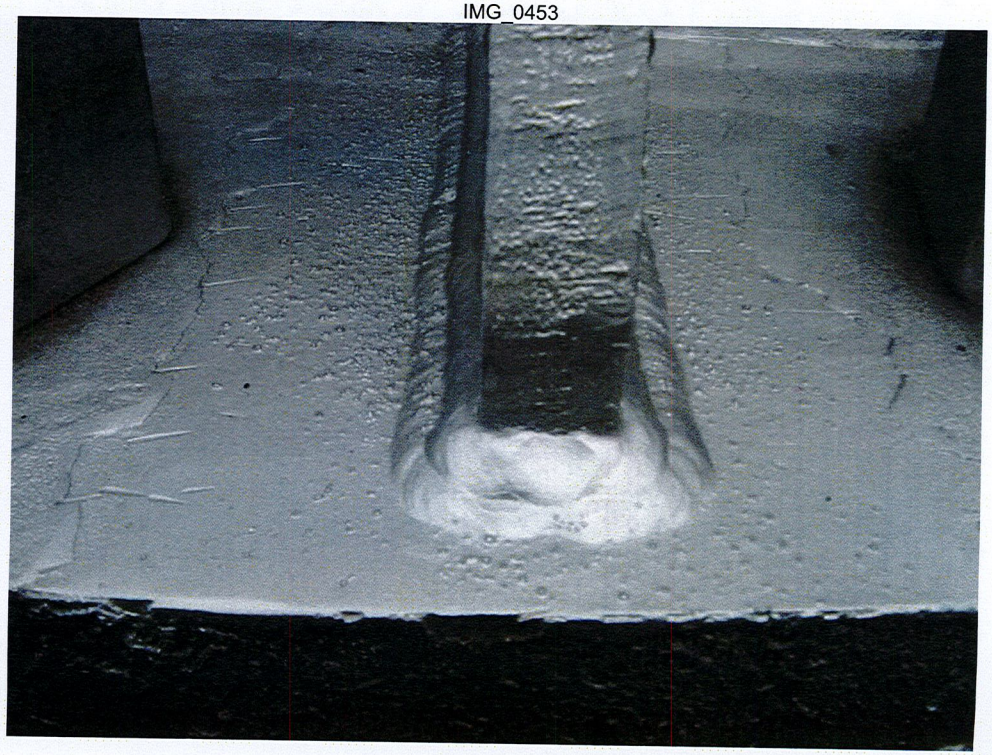

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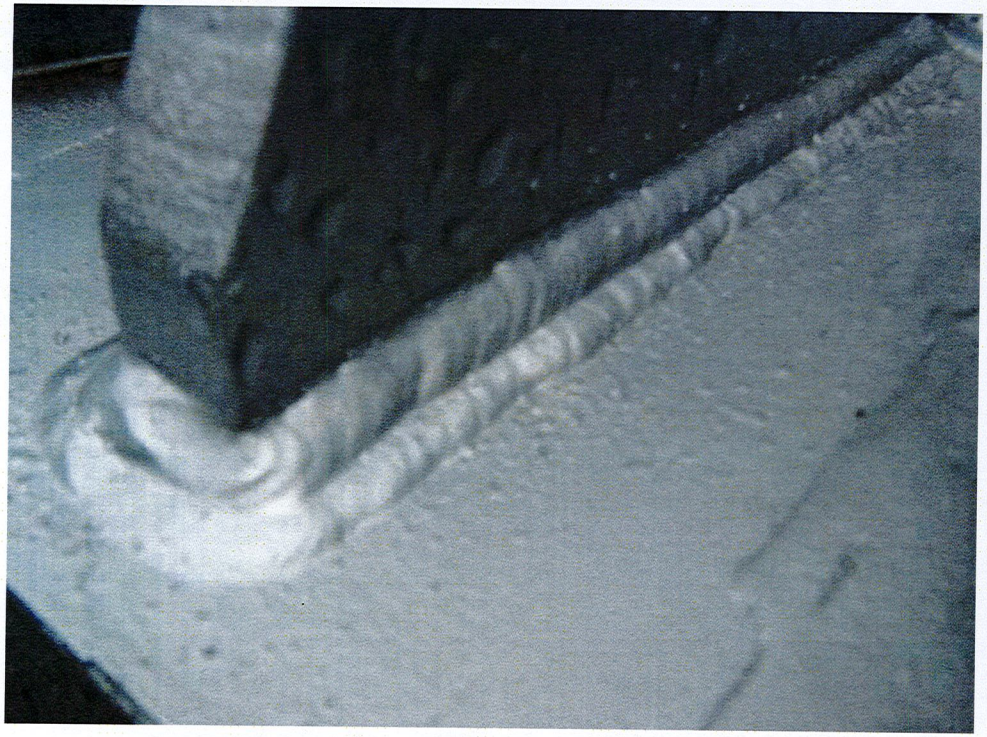

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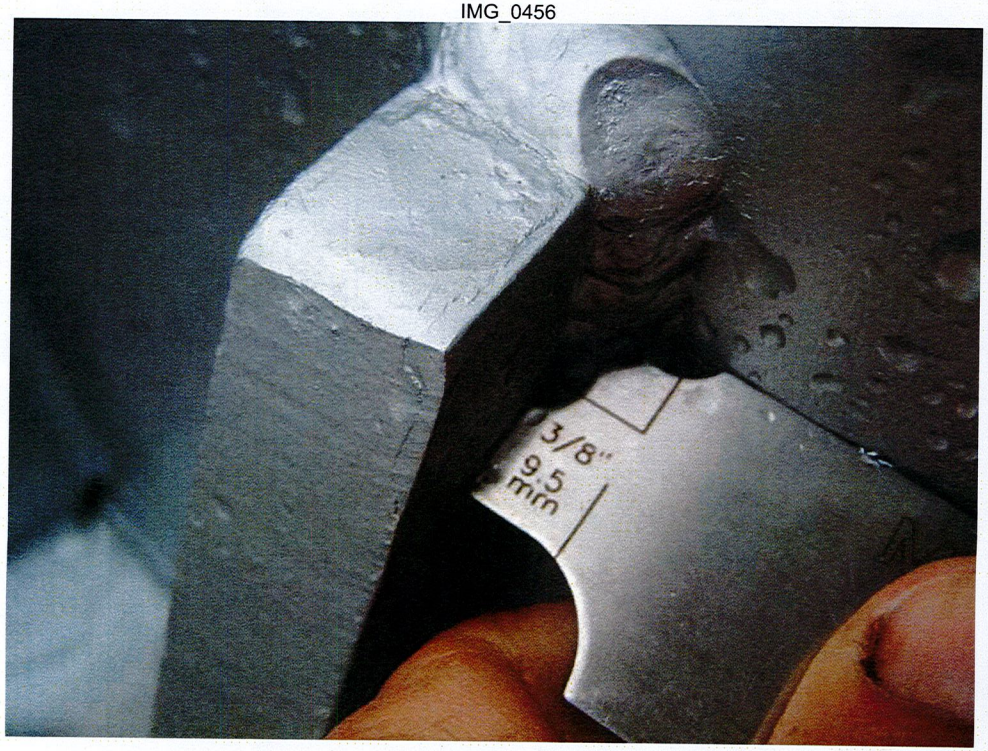

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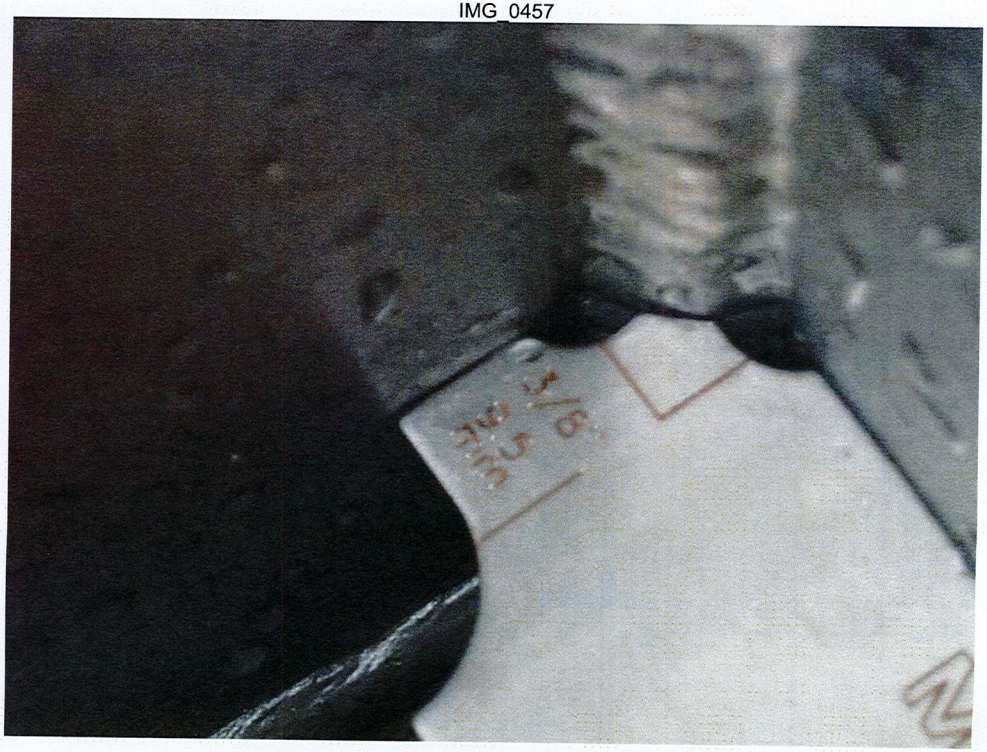

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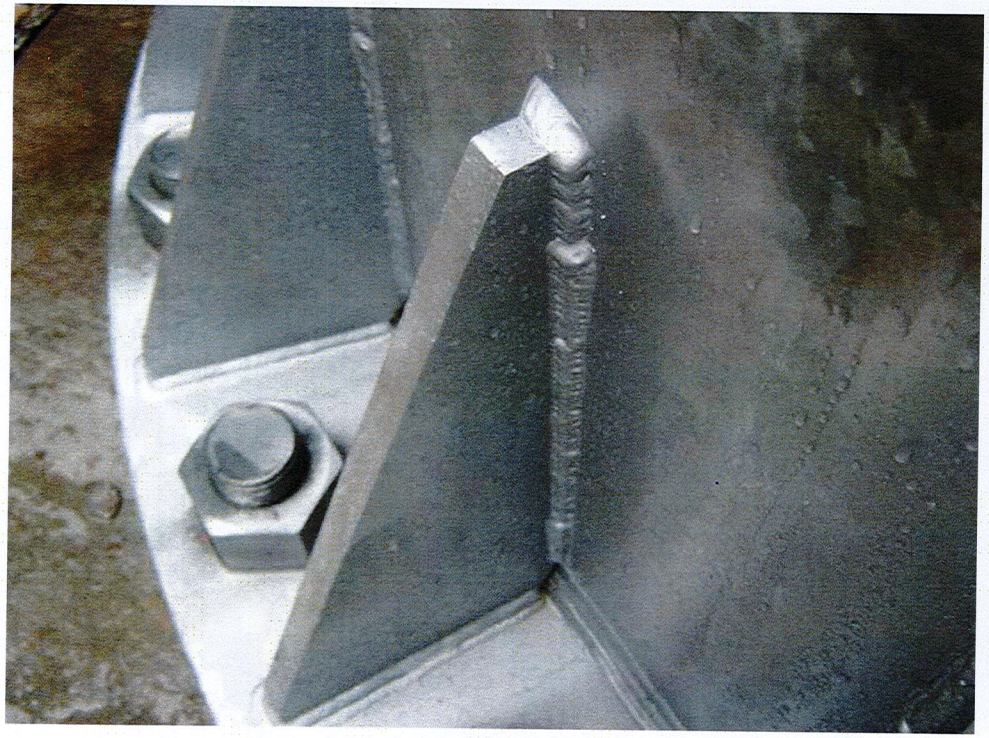

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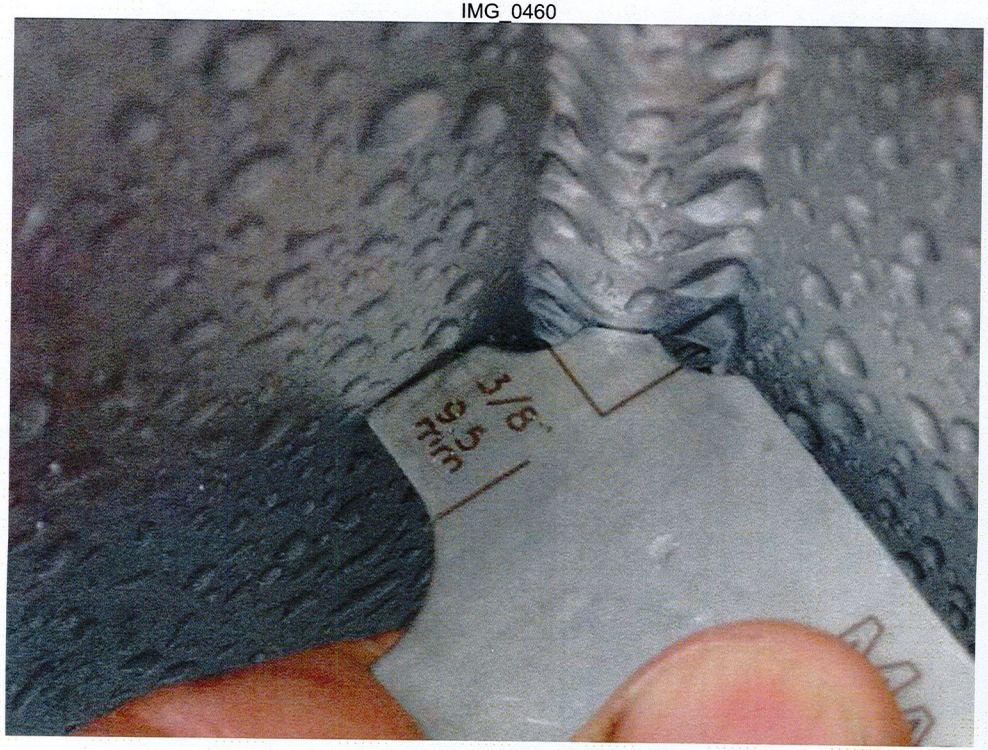

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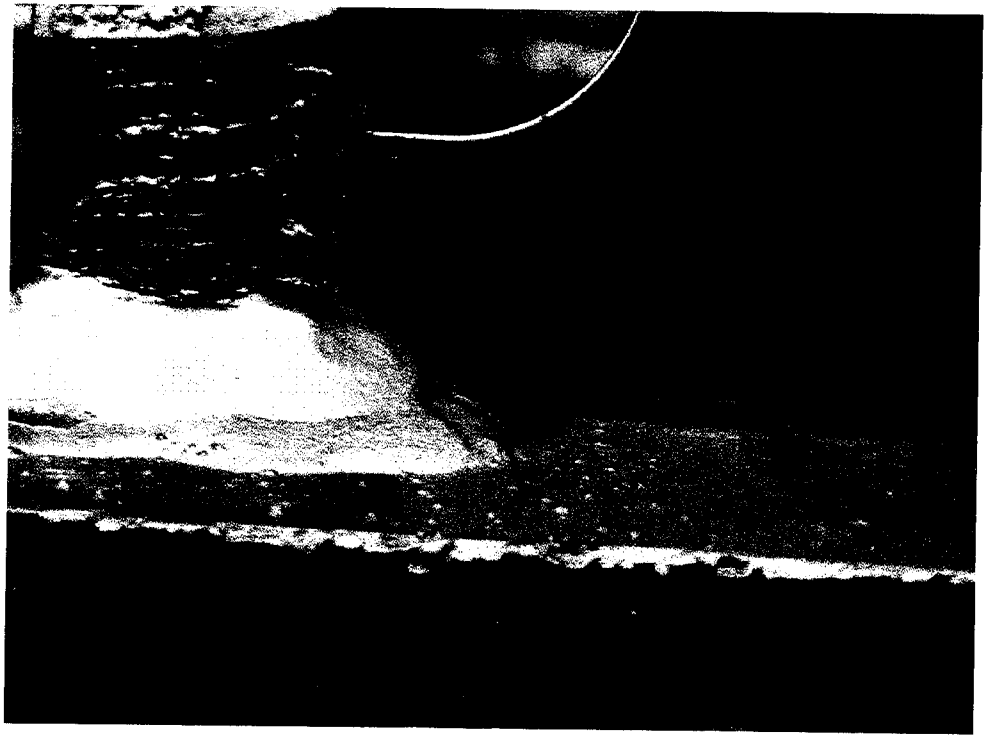

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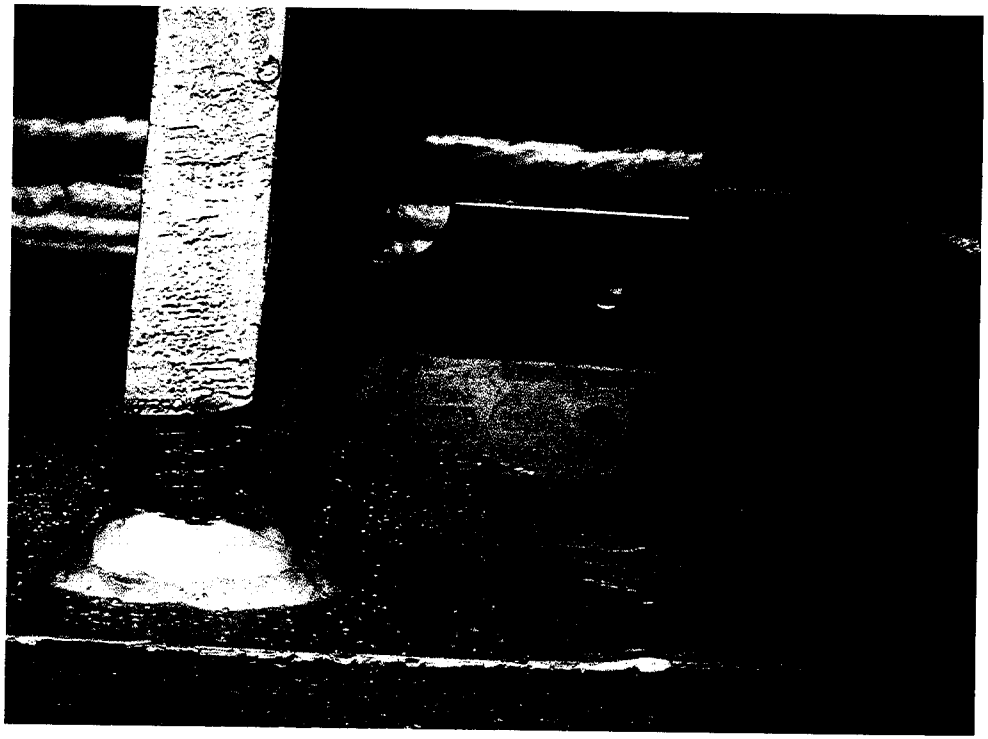

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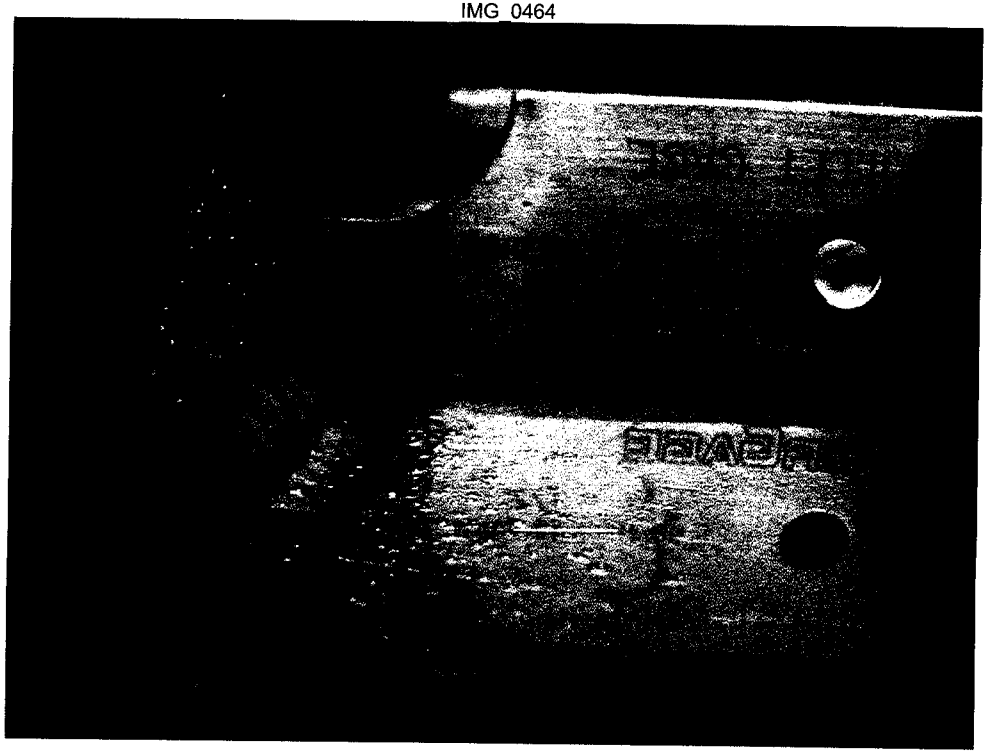

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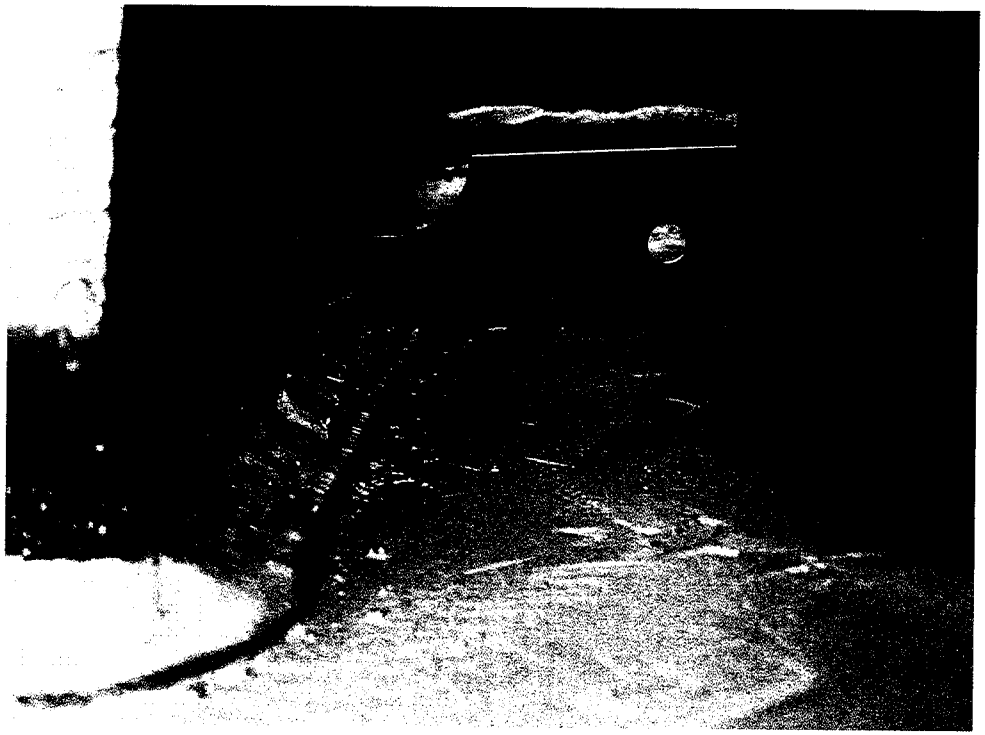


IMG_0469

IMG_0470

APPENDIX B

TEST CERTIFICATE

ARCELORMITTAL PLATE LLC

SHIP TO:
METALS USA PLATES & SHAPES NE
10 TOWER ROAD
SEEKONK MA 02771

PAGE NO: 01 OF 02
FILE NO: 4590-04-01
MILL ORDER NO: 17475-001
MELT NO: T1484
DATE: 07/03/08

SOLD TO:
METALS USA PLATES&SHAPES NE LP
50 CABOT BOULEVARD EAST
LANGHORNE PA 19047

SEND TO: 01-C

High Strength Plate A 572 Gr 50
1 X 6' X 18'
PART NO:

PLATE DIMENSIONS / DESCRIPTION

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
3	1"	72"	240"	RECTANGLE	4901#

CUSTOMER INFORMATION

CUSTOMER PO: SKO-3592

PO\REQ:

SPECIFICATION(S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

AASHT M270-GR50 YR 07 TYPE-2
IMPACTS WAIVED ASTM A709 07 GRADE 50 TYPE-2
(IMPACTS WAIVED) & ASTM A572 07 GRADE 50 TYPE-2
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

HEAT: T1484

CHEMICAL COMPOSITION

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:T1484	.17	1.12	.017	.009	.12	.20	.06	.04	.01

	V	AL	CB
MELT:T1484	.060	.045	.001

TENSILE PROPERTIES

LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
BOT.	TRANS.	551	750	8.00"	24.0

GENERAL INFORMATION

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
TENSILE RESULTS SHOWN ARE FROM ACTUAL MELT AND SLAB SHIPPED
MERCURY OR MERCURY COMPOUNDS ARE NOT USED IN THE
MANUFACTURE OF ARCELORMITTAL PLATE LLC PRODUCTS.

NOTARY

AFFIRMED AND SUBSCRIBED BEFORE ME
THIS DAY OF 07/03/08

Carol L. Slody
NOTARY PUBLIC

NOTARIAL SEAL
CAROL L. SLODY, NOTARY PUBLIC
COATESVILLE, CHESTER CO., PA
MY COMMISSION EXPIRES MAY 27, 2010

WE HEREBY CERTIFY THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

Elinore Zaplitny
SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

Structural Steel Inspection Report

Time Arrived:	1:00PM	UT Time in:	
Time Departed:	3:30PM	UT Time out:	
Weather Cond:	CLOUDY	Couplant: #	

Client:		Project No.:	
Project;	CELL TOWER NEWTOWN CT.	Report No.:	
Inspector:	Edward Perry, CWI 07070301	Date:	05/28/09
Subject:	Field Verification Inspection		

A field inspection was performed at the above-referenced project today. The purpose of this inspection was to verify that completed work was performed utilizing the engineer-approved drawings, the project specifications, and the American Welding Society Structural Welding Code D1.1.

The writer was on site at the above listed project location for the purpose of conducting a visual verification inspection concerning new reinforcing on tower leg supports. The following was noted.

The writer was on site at the above listed project location for the purpose of conducting a visual verification inspection concerning the field welded stiffener plates added to the base of the cell tower located at RTE-34 , in NEWTOWN CT. This inspector reviewed the submitted drawings from Vertical Structures Inc, then conducted a visual inspection of each of the new gusset plate welds. The writer found each new gusset had the required field welds and were completed as detailed on sheet 2 . A total of [24] VS6101 new plates were installed , each of the field welds both vertical and horizontal were visually acceptable per AWS D1-1 section-6 . NOTE; all of the field welds were painted prior to this inspection.

pc:

INDEPENDENT MATERIALS TESTING LABORATORIES, INC.
P.O. BOX 745
57 NORTH WASHINGTON STREET
PLAINVILLE, CT 06062

No discrepancy inspection dates:

_____
__ ____5-28-09_ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____

Steel - Outstanding Non-Conformities
EDWARD PERRY 07070301
Structural Steel & Welding Inspector

PROJECT: CELL TOWER NEWTOWN CT. _____ Location or Piecemark:	Field (F)	Date Inspected & Rejected	Date of Rework	Date Accepted	Awaiting Engineer's Decision	Report No.	Item No.	Comments

This same form to accumulate throughout all steel inspections for this project and a copy forwarded to each steel inspector for continuous tracking of items.

American Welding Society

Certifies that Welding Inspector

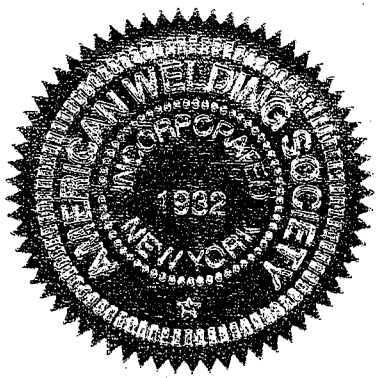
Edward A Perry

has complied with the requirements of AWS QC1,
Standard for AWS Certification of Welding Inspectors

07070301
CERTIFICATE NUMBER

July 01 2010
EXPIRATION DATE

EMPLOYER: REFER TO WALLET CARD FOR
VALIDITY AND EXPIRATION DATE



Gerald Uttrachi
PRESIDENT AWS

Paul R Evans
CHAIR, QUALIFICATION COMMITTEE

Ron K. Wilson
CHAIR, CERTIFICATION COMMITTEE

APPENDIX C

February 4, 2009

John Eigenbrode
Crown Castle USA
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6616

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
caseltyne@verticalstructures.com

Subject: Structural Analysis Report

Carrier Designation	Verizon Wireless Change-Out Carrier Site Number: N/A Carrier Site Name: Newtown CT
Crown Castle Designation	Crown Castle BU Number: 806354 Crown Castle Site Name: BRG 123 Crown Castle JDE Job Number: 113721
Engineering Firm Designation	Vertical Structures Project Number: 2009-004-022
Site Data	Route 34-Washington Avenue, Newtown, CT, Fairfield County Latitude 41°-24'-45.53", Longitude -73°-16'-12.34" 185' EEI Monopole Tower

Dear Mr. Eigenbrode,

Vertical Structures 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 Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 317898, and Application Number 72552, Revision 1. The purpose of the analysis is to determine the suitability of the tower for the following load case:

Load Case 1 (LC1): Proposed Equipment (Table 1) + Existing/Reserved Equipment (Table 2)

Based on our analysis we have determined the tower superstructure and foundation are sufficient for LC1, provided the modifications detailed in Appendix D are completed. This analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon an 85 MPH basic "fastest mile" wind speed, equivalent to a 100 MPH basic "3-second gust" wind speed per 2006 IBC Table Equation 16-34.

Vertical Structures appreciates the opportunity of providing our continuing professional services to you and Crown Castle USA. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Craig Aseltyne, P.E.
Project Engineer

STATE OF CONNECTICUT
JOHN IRVING MA...
NO. 1422...
LICENSED
PROFESSIONAL ENGINEER
2/4/09

TABLE OF CONTENTS

1.) INTRODUCTION

The 185' tall monopole tower was designed and manufactured by EEI for Crown Communications in 1999. The existing structure consists of five (5) 18-sided tapered polygonal tubes joined via slip joint connections and is founded on a 28' square by 3' thick mat buried 6' deep. For the purpose of this analysis, the modifications detailed in Appendix D are considered complete.

ANALYSIS CRITERIA

The BRG 123 monopole tower was analyzed in accordance with the current EIA-222-F publication, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." The proposed, existing and reserved antennas, cables and mounts considered in this analysis are listed in Tables 1 and 2. Applied forces in this study were derived from an 85 MPH basic "fastest mile" wind speed with no ice and a reduced 74 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The tower was originally designed for a 90 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The original design loads are listed in Table 3. All cables are assumed to be routed in accordance with the drawing in Appendix B.

Table 1 – Proposed Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
185	6	Decibel	DB846F65ZAXY				

Table 2 – Existing and Reserved Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
185	6*	Swedcom	ALP 9212-N	EEI	10'-8" L.P. Platform	12	1 5/8
	6	Decibel	DB948F85T2E-M				
	1	Decibel	DB222			1	1/2
175	6	Powerwave Technologies	7770.00	EEI	12' L.P. Platform	12	1 5/8
	6	Powerwave Technologies	LGP2140X TMA				
	6	Powerwave Technologies	LGP13519 Diplexer				
165	6 + 3**	Decibel	DB980H90T2E-M	EEI	12' L.P. Platform	6 + 3**	1 5/8
155	12	Decibel	DB844H90	EEI	12' Platform	12	1 1/4
145	3	EMS Wireless	RR90-17-02DP	EEI	12' L.P. Platform	6	7/8
	6		TMA				
135***	9	Allgon	7184		(3) 12' T-Arms	9	1 5/8
	2		TMA				
100	2		GPS		(2) 2' Sidearms	2	1/2
40	1		GPS		(1) 2' Sidearm	1	1/2

* Indicates equipment to be removed.
** Indicates reserved equipment.
*** Indicates abandoned equipment.

Table 3 – Design Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
185	12	Swedcom	ALP 9212	EEI	10'-8" L.P. Platform		
175	12	Swedcom	ALP 11011	EEI	12' L.P. Platform		
165	9	Decibel	DB 980	EEI	12' L.P. Platform		
155	12	Swedcom	ALP 9011	EEI	12' L.P. Platform		
145	6	EMS Wireless	RR-65-18	EEI	12' L.P. Platform		
	1	Scala	OGB9-900 Omni				
110	1		GPS		(1) Sidearm		
50	1		GPS		(1) Sidearm		

3.) ANALYSIS PROCEDURE

Table 4 – Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Change-Out Revision #1	72552	CCI iSite
Tower Drawing	EEI Drawing No. GS51352	822035	CCI iSite
Foundation Drawing	EEI Drawing No. F4743-185	822037	CCI iSite
Geotechnical Report	Clarence Welti Associates Report Dated 'February 14, 1999'	2297011	CCI iSite
Rework Drawings	Vertical Structures Job No. 2009-004-022	N/A	Appendix D

3.1) Analysis Methods

RISA Tower (Version 5.3), a commercially available analysis software package, 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/TIA/EIA-222-F or the local building code requirements. 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 manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and any referenced drawings.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222-F.

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

4.) ANALYSIS RESULTS

Table 5 – Tower Component Stresses vs. Modified Capacity (LC1)

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	185 - 149.5	Pole	TP36.004x29x0.25	1	-10344.30	1434134.65	34.9	Pass
L2	149.5 - 114.1	Pole	TP42.4605x34.5155x0.3125	2	-19399.90	2114444.50	69.9	Pass
L3	114.1 - 76.68	Pole	TP49.157x40.6932x0.375	3	-28990.10	2937945.21	84.4	Pass
L4	76.68 - 38.26	Pole	TP55.9285x47.105x0.4375	4	-41666.90	3900064.58	87.7	Pass
L5	38.26 - 0	Pole	TP62.5x53.5872x0.5	5	-60752.10	5115214.00	87.0	Pass
							Summary	
						Pole (L4)	87.7	Pass
						RATING =	**87.7**	**Pass**

Notes	Component	% Capacity	Pass/Fail
Additional Component Analysis Summary:			
1	Anchor Bolts (Tension)	77.3	Pass
1	Base Plate & Gussets (Bending)	80.6	Pass
	Foundation (Compared to Design Loads)	95.9	Pass
	Structure Rating =	**95.9**	**Pass**

1) Indicates calculations supporting % capacity are included in Appendix C.

4.1) Required Modifications

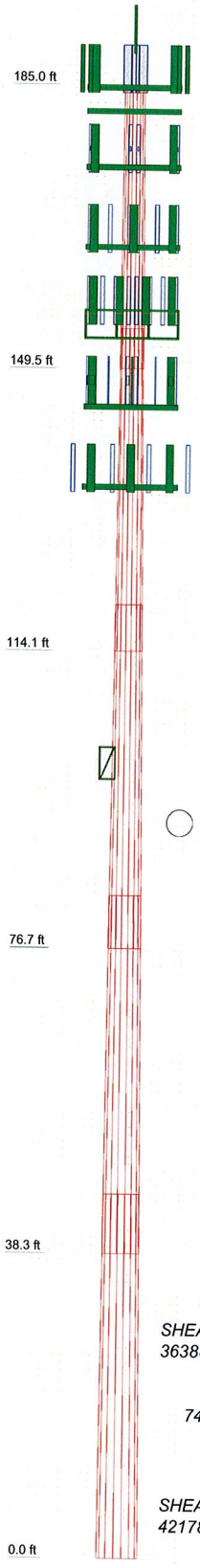
Modification (A) is required to remedy the deficiencies identified in Vertical Structures Job No. 2009-004-021. Required modification drawings are provided in Appendix D.

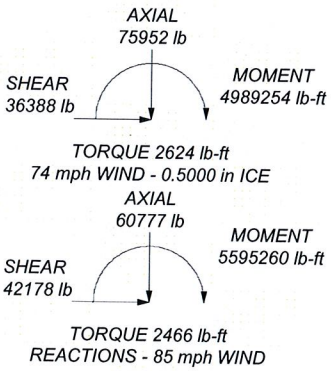
(A) Reinforce the tower base plate.

APPENDIX A

Section	1	2	3	4	5
Length (ft)	35.50	40.41	43.23	45.07	45.75
Number of Sides	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.4375	0.5000
Lap Splice (ft)	5.01	5.81	6.65	7.49	
Top Dia (in)	29.0000	34.5155	40.6932	47.1050	53.5872
Bot Dia (in)	36.0040	42.4605	49.1570	55.9285	62.5000
Grade			A572-65		
Weight (lb)	3091.5	5206.7	7800.2	10878.1	14216.7

Total Weight (lb): 41193.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
EEI 10'-8" Low-Profile Platform (Verizon Wireless)	185	(2) LGP13519 Diplexer	175
Monopole Transition Ladder (VSI) (Verizon Wireless)	185	EEI 12' L.P. Platform	165
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(3) DB980H90T2E-M w/Mount Pipe	165
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	185	(3) DB980H90T2E-M w/Mount Pipe	165
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(3) DB980H90T2E-M w/Mount Pipe	165
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	EEI 12' Platform w/ Rails	155
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	185	(4) DB844H90 w/Mount Pipe	155
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(4) DB844H90 w/Mount Pipe	155
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(4) DB844H90 w/Mount Pipe	155
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	185	EEI 12' L.P. Platform	145
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	RR90-17-02DP w/Mount Pipe	145
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	RR90-17-02DP w/Mount Pipe	145
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	185	RR90-17-02DP w/Mount Pipe	145
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(2) Generic TMA	145
DB222	185	(2) Generic TMA	145
6'x4" Pipe Mount	185	(2) Generic TMA	145
EEI 12' L.P. Platform	175	6' x 2" Antenna Mount Pipe (VSI)	145
(2) 7770.00 w/ mount pipe	175	6' x 2" Antenna Mount Pipe (VSI)	145
(2) 7770.00 w/ mount pipe	175	6' x 2" Antenna Mount Pipe (VSI)	145
(2) 7770.00 w/ mount pipe	175	12' T-Arm Mount	135
(2) LGP2140X	175	12' T-Arm Mount	135
(2) LGP2140X	175	12' T-Arm Mount	135
(2) LGP2140X	175	(3) 7184 w/Mount Pipe	135
(2) LGP13519 Diplexer	175	(3) 7184 w/Mount Pipe	135
(2) LGP13519 Diplexer	175	(3) 7184 w/Mount Pipe	135
		(2) Generic TMA	135
		2' Sidearm (4" Tube) (VSI)	100
		2' Sidearm (4" Tube) (VSI)	100
		Generic GPS (VSI)	100
		Generic GPS (VSI)	100
		2' Sidearm (4" Tube) (VSI)	40
		Generic GPS (VSI)	40

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: 87.7%

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
Phone: (859) 624-8360
FAX: (859) 624-8369

Job: BRG 123, CT BU#806354 (Modified)			
Project: Vertical Structures Job No. 2009-004-022			
Client: Crown Castle	Drawn by: Asel	App'd:	
Code: TIA/EIA-222-F	Date: 02/04/09	Scale: NTS	
Path:		Dwg No. E-1	

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.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

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	185.00-149.50	35.50	5.01	18	29.0000	36.0040	0.2500	1.0000	A572-65 (65 ksi)
L2	149.50-114.10	40.41	5.81	18	34.5155	42.4605	0.3125	1.2500	A572-65 (65 ksi)
L3	114.10-76.68	43.23	6.65	18	40.6932	49.1570	0.3750	1.5000	A572-65 (65 ksi)
L4	76.68-38.26	45.07	7.49	18	47.1050	55.9285	0.4375	1.7500	A572-65 (65 ksi)
L5	38.26-0.00	45.75		18	53.5872	62.5000	0.5000	2.0000	A572-65 (65 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	29.4474	22.8131	2382.3081	10.2063	14.7320	161.7098	4767.7509	11.4087	4.6640	18.656
	36.5594	28.3708	4582.0338	12.6927	18.2900	250.5208	9170.0968	14.1881	5.8967	23.587
L2	36.0482	33.9251	5014.0519	12.1421	17.5339	285.9633	10034.7014	16.9658	5.5247	17.679
	43.1155	41.8055	9382.6455	14.9625	21.5699	434.9872	18777.6370	20.9067	6.9230	22.154
L3	42.4760	47.9887	9855.5116	14.3130	20.6721	476.7532	19723.9914	23.9989	6.5020	17.339
	49.9153	58.0628	17456.3904	17.3176	24.9718	699.0454	34935.7504	29.0369	7.9916	21.311
L4	49.1537	64.8037	17830.6354	16.5670	23.9294	745.1365	35684.7328	32.4080	7.5205	17.19
	56.7913	77.0562	29977.1322	19.6993	28.4117	1055.0990	59993.7092	38.5354	9.0734	20.739
L5	55.8955	84.2493	29997.3526	18.8459	27.2223	1101.9413	60034.1765	42.1327	8.5513	17.103
	63.4642	98.3940	47784.7640	22.0100	31.7500	1505.0319	95632.4044	49.2063	10.1200	20.24

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 185.00-149.50				1	1	1		
L2 149.50-114.10				1	1	1		
L3 114.10-76.68				1	1	1		
L4 76.68-38.26				1	1	1		
L5 38.26-0.00				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 plf
HJ7-50A (1-5/8 AIR) (Verizon Wireless)	C	No	Inside Pole	185.00 - 5.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	185.00 - 5.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
CR 50 1873 (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	177.00 - 5.00	12	No Ice	0.03	0.83
						1/2" Ice	0.05	2.34
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	167.00 - 5.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF6-50A (1-1/4 FOAM)	B	No	Inside Pole	158.00 - 5.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	148.00 - 5.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	137.00 - 5.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82

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 lb
L1	185.00-149.50	A	0.000	0.000	0.000	0.000	5.33
		B	0.000	0.000	0.000	10.890	341.22
		C	0.000	0.000	0.000	0.000	572.19
L2	149.50-114.10	A	0.000	0.000	0.000	0.000	72.43
		B	0.000	0.000	0.000	14.018	632.95
		C	0.000	0.000	0.000	0.000	872.05
L3	114.10-76.68	A	0.000	0.000	0.000	0.000	79.70
		B	0.000	0.000	0.000	14.818	669.07
		C	0.000	0.000	0.000	0.000	1019.32
L4	76.68-38.26	A	0.000	0.000	0.000	0.000	81.83
		B	0.000	0.000	0.000	15.214	686.95
		C	0.000	0.000	0.000	0.000	1046.56
L5	38.26-0.00	A	0.000	0.000	0.000	0.000	70.84
		B	0.000	0.000	0.000	13.171	594.69
		C	0.000	0.000	0.000	0.000	906.00

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 lb
L1	185.00-149.50	A	0.500	0.000	0.000	0.000	0.000	5.33
		B		0.000	0.000	0.000	16.500	841.15
		C		0.000	0.000	0.000	0.000	572.19
L2	149.50-114.10	A	0.500	0.000	0.000	0.000	0.000	72.43
		B		0.000	0.000	0.000	21.240	1276.50
		C		0.000	0.000	0.000	0.000	872.05
L3	114.10-76.68	A	0.500	0.000	0.000	0.000	0.000	79.70
		B		0.000	0.000	0.000	22.452	1349.34
		C		0.000	0.000	0.000	0.000	1019.32
L4	76.68-38.26	A	0.500	0.000	0.000	0.000	0.000	81.83
		B		0.000	0.000	0.000	23.052	1385.40
		C		0.000	0.000	0.000	0.000	1046.56
L5	38.26-0.00	A	0.500	0.000	0.000	0.000	0.000	70.84
		B		0.000	0.000	0.000	19.956	1199.33
		C		0.000	0.000	0.000	0.000	906.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	185.00-149.50	0.3666	0.2117	0.5143	0.2970
L2	149.50-114.10	0.4585	0.2647	0.6440	0.3718
L3	114.10-76.68	0.4658	0.2689	0.6604	0.3813
L4	76.68-38.26	0.4715	0.2722	0.6736	0.3889
L5	38.26-0.00	0.4144	0.2392	0.5981	0.3453

Discrete Tower Loads

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 lb
EEI 10'-8" Low-Profile Platform (Verizon Wireless)	C	None		0.0000	185.00	No Ice	28.00	28.00	1500.00
						1/2" Ice	34.00	34.00	2250.00
Monopole Transition Ladder (VSI) (Verizon Wireless)	B	From Centroid-Leg	3.00 0.00 -3.00	0.0000	185.00	No Ice	6.00	6.00	160.00
						1/2" Ice	8.00	8.00	240.00
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	C	From Centroid-Leg	7.16 1.00 2.00	60.0000	185.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	A	From Centroid-Face	3.08 0.00 2.00	0.0000	185.00	No Ice	2.62	4.92	34.05
						1/2" Ice	3.23	6.01	68.79
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	A	From Centroid-Leg	7.16 -1.00 2.00	-60.0000	185.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	A	From Centroid-Leg	7.16 1.00 2.00	60.0000	185.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	B	From Centroid-Face	3.08 0.00 2.00	0.0000	185.00	No Ice	2.62	4.92	34.05
						1/2" Ice	3.23	6.01	68.79
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	B	From Centroid-Leg	7.16 -1.00 2.00	-60.0000	185.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	B	From Centroid-Leg	7.16 1.00 2.00	60.0000	185.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	C	From Centroid-Face	3.08 0.00 2.00	0.0000	185.00	No Ice	2.62	4.92	34.05
						1/2" Ice	3.23	6.01	68.79
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	C	From Centroid-Leg	7.16 -1.00 2.00	-60.0000	185.00	No Ice	7.27	7.82	46.55
						1/2" Ice	7.88	9.01	111.10
DB222	C	From Centroid-Face	3.08 0.00 7.00	0.0000	185.00	No Ice	1.60	1.60	16.00
						1/2" Ice	2.88	2.88	20.80
6'x4" Pipe Mount	C	From Centroid-Face	3.08 0.00 7.00	0.0000	185.00	No Ice	2.25	2.25	65.00
						1/2" Ice	2.62	2.62	84.10
***									
EEI 12' L.P. Platform	C	None		0.0000	175.00	No Ice	25.00	25.00	1700.00
						1/2" Ice	29.00	29.00	2530.00
(2) 7770.00 w/ mount pipe	A	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice	6.22	4.35	56.90
						1/2" Ice	6.77	5.20	102.99
(2) 7770.00 w/ mount pipe	B	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice	6.22	4.35	56.90
						1/2" Ice	6.77	5.20	102.99
(2) 7770.00 w/ mount pipe	C	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice	6.22	4.35	56.90
						1/2" Ice	6.77	5.20	102.99
(2) LGP2140X	A	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice	1.23	0.37	17.50
						1/2" Ice	1.38	0.48	24.46
(2) LGP2140X	B	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice	1.23	0.37	17.50
						1/2" Ice	1.38	0.48	24.46

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 lb
(2) LGP2140X	C	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	1.23 1.38	0.37 0.48	17.50 24.46
(2) LGP13519 Diplexer	A	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
(2) LGP13519 Diplexer	B	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
(2) LGP13519 Diplexer	C	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
***									
EEI 12' L.P. Platform	C	None		0.0000	165.00	No Ice 1/2" Ice	25.00 29.00	25.00 29.00	1700.00 2530.00
(3) DB980H90T2E-M w/Mount Pipe	A	From Centroid-Face	3.46 0.00 2.00	0.0000	165.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	34.05 69.84
(3) DB980H90T2E-M w/Mount Pipe	B	From Centroid-Face	3.46 0.00 2.00	0.0000	165.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	34.05 69.84
(3) DB980H90T2E-M w/Mount Pipe	C	From Centroid-Face	3.46 0.00 2.00	0.0000	165.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	34.05 69.84
***									
EEI 12' Platform w/ Rails	C	None		0.0000	155.00	No Ice 1/2" Ice	38.50 56.00	38.50 56.00	1900.00 2870.00
(4) DB844H90 w/Mount Pipe	A	From Centroid-Face	3.46 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice	3.58 4.20	5.63 6.73	35.55 77.48
(4) DB844H90 w/Mount Pipe	B	From Centroid-Face	3.46 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice	3.58 4.20	5.63 6.73	35.55 77.48
(4) DB844H90 w/Mount Pipe	C	From Centroid-Face	3.46 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice	3.58 4.20	5.63 6.73	35.55 77.48
***									
EEI 12' L.P. Platform	C	None		0.0000	145.00	No Ice 1/2" Ice	25.00 29.00	25.00 29.00	1700.00 2530.00
RR90-17-02DP w/Mount Pipe	A	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
RR90-17-02DP w/Mount Pipe	B	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
RR90-17-02DP w/Mount Pipe	C	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
(2) Generic TMA	A	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
(2) Generic TMA	B	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
(2) Generic TMA	C	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
6' x 2" Antenna Mount Pipe (VSI)	A	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	23.00 33.83
6' x 2" Antenna Mount Pipe (VSI)	B	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	23.00 33.83
6' x 2" Antenna Mount Pipe (VSI)	C	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	23.00 33.83
***									
12' T-Arm Mount	A	From Centroid-Face	3.60 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice	8.00 9.90	4.00 4.95	200.00 250.00
12' T-Arm Mount	B	From Centroid-Face	3.60 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice	8.00 9.90	4.00 4.95	200.00 250.00
12' T-Arm Mount	C	From Centroid-Face	3.60 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice	8.00 9.90	4.00 4.95	200.00 250.00
(3) 7184 w/Mount Pipe	A	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	3.33 3.94	3.56 4.60	36.75 68.31
(3) 7184 w/Mount Pipe	B	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	3.33 3.94	3.56 4.60	36.75 68.31
(3) 7184 w/Mount Pipe	C	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	3.33 3.94	3.56 4.60	36.75 68.31
(2) Generic TMA	A	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
***									
2' Sidearm (4" Tube) (VSI)	C	From Centroid-Leg	2.86 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	0.30 0.50	1.33 1.67	30.00 40.00
2' Sidearm (4" Tube) (VSI)	C	From Centroid-Face	2.86 0.00 0.00	30.0000	100.00	No Ice 1/2" Ice	0.30 0.50	1.33 1.67	30.00 40.00
2' Sidearm (4" Tube) (VSI)	C	From Centroid-Face	3.32 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice	0.30 0.50	1.33 1.67	30.00 40.00
Generic GPS (VSI)	C	From Centroid-Leg	3.86 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	1.40 1.70	1.40 1.70	25.00 30.00
Generic GPS (VSI)	C	From Centroid-Face	3.86 0.00 0.00	30.0000	100.00	No Ice 1/2" Ice	1.40 1.70	1.40 1.70	25.00 30.00
Generic GPS (VSI)	C	From Centroid-Face	4.32 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice	1.40 1.70	1.40 1.70	25.00 30.00

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	185 - 149.5 (1)	TP36.004x29x0.25	35.50	0.00	0.0	39.000	27.5865	-10344.30	1075870.00	0.010
L2	149.5 - 114.1 (2)	TP42.4605x34.5155x0.3125	40.41	0.00	0.0	39.000	40.6725	-19399.90	1586230.00	0.012
L3	114.1 - 76.68 (3)	TP49.157x40.6932x0.375	43.23	0.00	0.0	39.000	56.5131	-28990.10	2204010.00	0.013
L4	76.68 - 38.26 (4)	TP55.9285x47.105x0.4375	45.07	0.00	0.0	39.000	75.0200	-41666.90	2925780.00	0.014
L5	38.26 - 0 (5)	TP62.5x53.5872x0.5	45.75	0.00	0.0	39.000	98.3940	-60752.10	3837370.00	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	185 - 149.5 (1)	TP36.004x29x0.25	350287.50	-17.750	39.000	0.455	0.00	0.000	39.000	0.000
L2	149.5 - 114.1 (2)	TP42.4605x34.5155x0.3125	1230916.67	-35.883	39.000	0.920	0.00	0.000	39.000	0.000
L3	114.1 - 76.68 (3)	TP49.157x40.6932x0.375	2392891.67	-43.370	39.000	1.112	0.00	0.000	39.000	0.000
L4	76.68 - 38.26 (4)	TP55.9285x47.105x0.4375	3751975.00	-45.030	39.000	1.155	0.00	0.000	39.000	0.000
L5	38.26 - 0 (5)	TP62.5x53.5872x0.5	5595258.00	-44.612	39.000	1.144	0.00	0.000	39.000	0.000

Pole Interaction Design Data

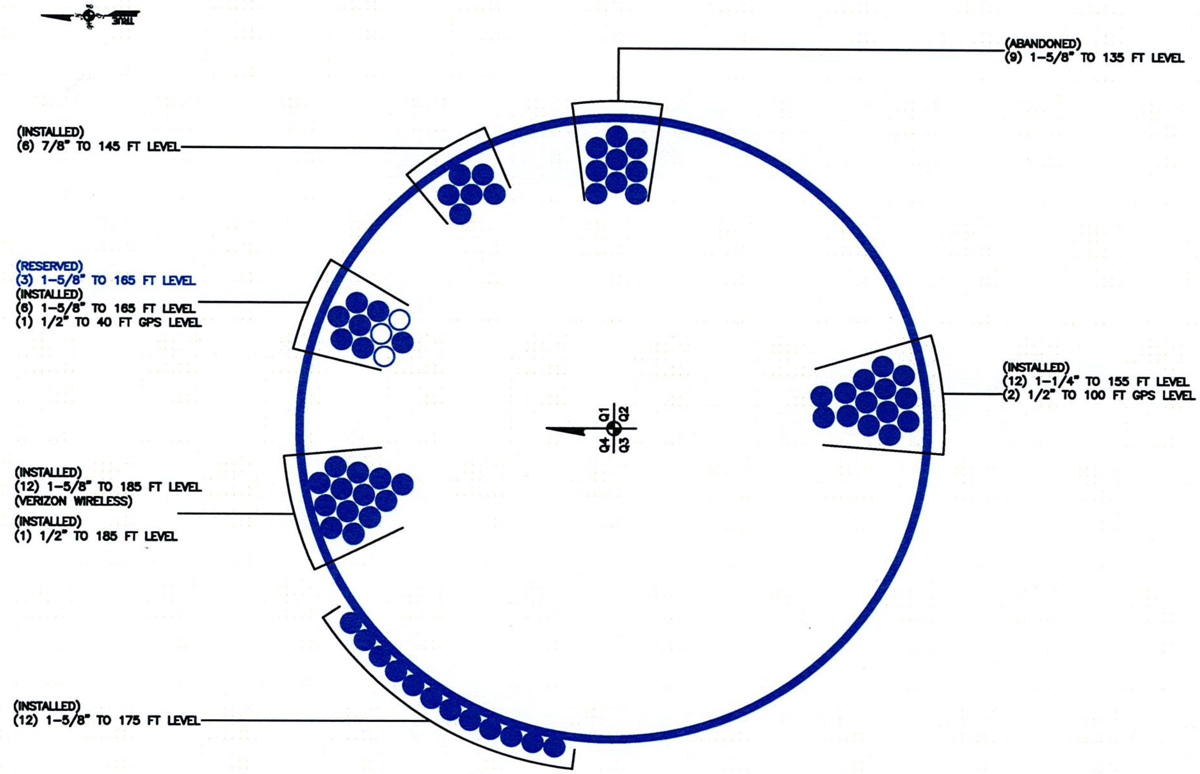
Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	185 - 149.5 (1)	TP36.004x29x0.25	0.010	0.455	0.000	0.465 ✔	1.333	H1-3 ✔
L2	149.5 - 114.1 (2)	TP42.4605x34.5155x0.3125	0.012	0.920	0.000	0.932 ✔	1.333	H1-3 ✔
L3	114.1 - 76.68 (3)	TP49.157x40.6932x0.375	0.013	1.112	0.000	1.125 ✔	1.333	H1-3 ✔
L4	76.68 - 38.26 (4)	TP55.9285x47.105x0.4375	0.014	1.155	0.000	1.169 ✔	1.333	H1-3 ✔
L5	38.26 - 0 (5)	TP62.5x53.5872x0.5	0.016	1.144	0.000	1.160 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	185 - 149.5	Pole	TP36.004x29x0.25	1	-10344.30	1434134.65	34.9	Pass
L2	149.5 - 114.1	Pole	TP42.4605x34.5155x0.3125	2	-19399.90	2114444.50	69.9	Pass
L3	114.1 - 76.68	Pole	TP49.157x40.6932x0.375	3	-28990.10	2937945.21	84.4	Pass
L4	76.68 - 38.26	Pole	TP55.9285x47.105x0.4375	4	-41666.90	3900064.58	87.7	Pass
L5	38.26 - 0	Pole	TP62.5x53.5872x0.5	5	-60752.10	5115214.00	87.0	Pass
							Summary	
						Pole (L4)	87.7	Pass
						RATING =	**87.7**	**Pass**

APPENDIX B



BUSINESS UNIT: 806354 TOWER ID: C_BASELEVEL

LEGEND: FEEDLINES

- ● SOLID BLUE CIRCLE DENOTES EXISTING FEEDLINE
- ○ OPEN RED CIRCLE DENOTES PROPOSED FEEDLINE
- ○ OPEN BLUE CIRCLE DENOTES RESERVED FEEDLINE
- X BLUE "X" DENOTES LOCATION NOT GIVEN

NOTE: ASSUME FEEDLINE ATTACHMENT HEIGHT TO TOWER STEEL AT 8-FEET ABOVE FINISHED GRADE UNLESS OTHERWISE SPECIFIED

CROWN REGION ADDRESS

USA

1	18/07/05	CHANGED PER WORK ORDER # 86317	CDR
2	08/01/07	AS-BUILT INFORMATION ADDED PER WORK ORDER # 132075	ATT
3	08/03/07	AS-BUILT INFORMATION ADDED PER WORK ORDER # 138084	MB

DRAWN BY: CDR
CHECKED BY:
DRAWING DATE: 18/07/05

SITE NUMBER:
SITE NAME:

SITE NAME

BRG 123 943084

BUSINESS UNIT NUMBER

806354

SITE ADDRESS

ROUTE 34 - WASHINGTON AVENUE
NEWTOWN, CT 06482
FAIRFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING

NOT TO SCALE 1

Xref R:\Standards - ...\CAD Standards V6.0\Template\Typical Blocks For Template\TITLE BLOCK STD-VER 5.1.dwg

APPENDIX C

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

Site Data

BU#: *806354*
Site Name: *BRG 123*
App #: *72552*

Reactions		
Moment:	5595.26	ft-kips
Axial:	60.777	kips
Shear:	42.178	kips

Connection Type: *Butt*

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Circle:	73	in

Plate Data		
Diam:	79	in
Thick:	2.5	in
Grade:	60	ksi
Eff. Width:	8.27	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.5	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.375	in
Width:	7	in
Height:	15	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	62.5	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

Maximum Rod Tension:	150.8 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	77.3% **Pass**

Base Plate Results Flexural Check

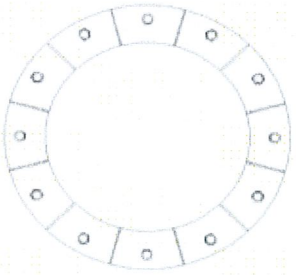
Base Plate Stress:	16.8 ksi
Allowable Plate Stress:	60.0 ksi
Base Plate Stress Ratio:	28.1% **Pass**

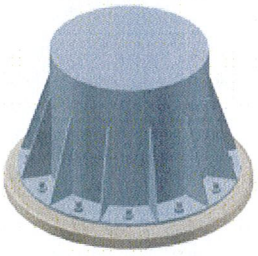
Stiffener Results

Horizontal Weld :	80.6% **Pass**
Vertical Weld:	55.7% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	27.4% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	57.7% **Pass**
Plate Comp. (AISC Bracket):	75.3% **Pass**

Pole Results

Pole Punching Shear Check:	14.0% **Pass**





* 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

APPENDIX D

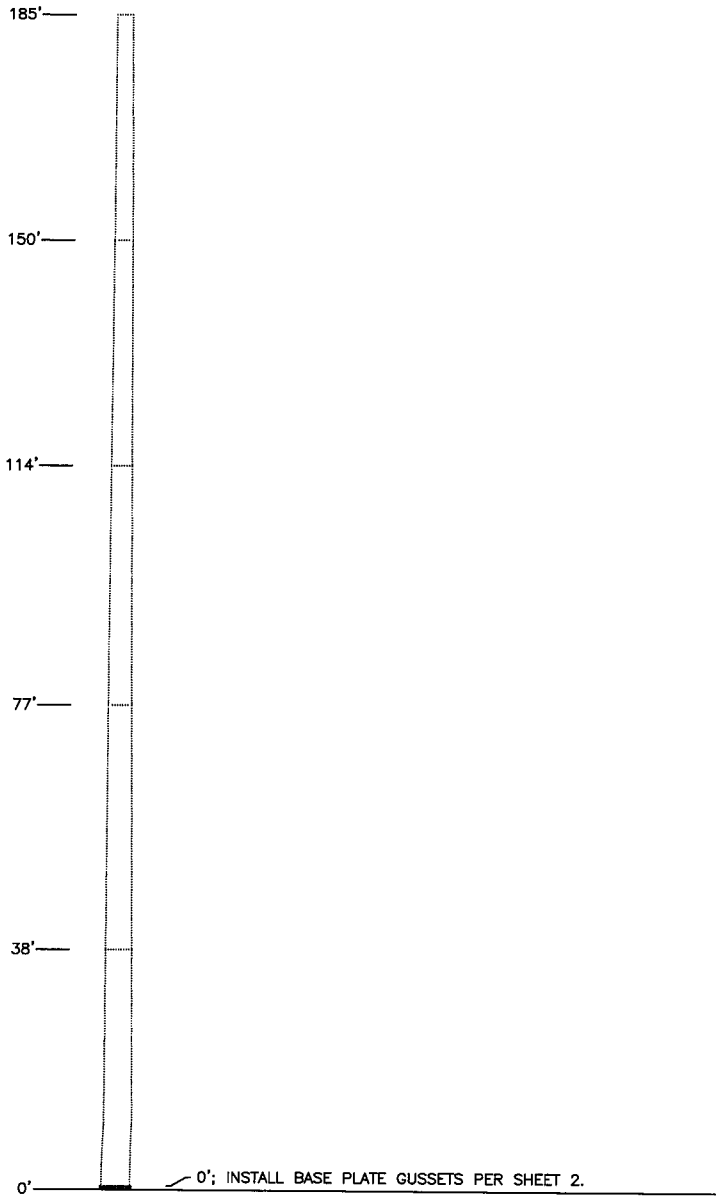


TABLE OF CONTENTS	
SHEET NO.	DESCRIPTION
SHEET 1	MASTER DRAWING INCLUDING NOTES
SHEET 2	BASE PLATE REINFORCEMENT INSTALLATION (0')

STRUCTURAL MODIFICATIONS:

THIS DRAWING DEPICTS THE REWORK REQUIRED TO REMEDY THE DEFICIENCIES FOUND IN THE BRG 123, CT TOWER PER THE REPORT PUBLISHED BY VERTICAL STRUCTURES ON 1-23-09, JOB# 2009-004-021.

A. REINFORCE THE TOWER BASE PLATE.

MATERIAL SPECIFICATION NOTES:

1. PART FABRICATION DETAILS MUST BE APPROVED BY VERTICAL STRUCTURES, INC. BEFORE USE. REVIEW MAY INCLUDE RECEIPT OF MILL CERTIFICATIONS WHEN NECESSARY.
2. NO FIELD FABRICATION OF TOWER REWORK MATERIAL IS ALLOWED. ALL STEEL TO BE SHOP FABRICATED.
3. IT IS THE RESPONSIBILITY OF THE MATERIAL SUPPLIER TO GUARANTEE PROPER FITUP. ALL DIMENSIONS USED IN FABRICATION DETAILS MUST BE FIELD VERIFIED.

TECHNICAL SPECIFICATION NOTES:

1. **CONTRACTOR: CALL VERTICAL STRUCTURES AT (859) 624-8360 TO MAKE SURE YOU HAVE THE LATEST REVISION OF THIS DRAWING.**
2. CONTACT THE ENGINEER CONCERNING ANY CHANGES OR MODIFICATIONS THAT MAY BE REQUIRED DUE TO THE EXISTING CONDITIONS.
3. ALL BOLTS 1/2" OR LESS TO BE INSTALLED WITH H OR 2H NUTS.
4. ALL BOLTS GREATER THAN 1/2" TO BE INSTALLED WITH 2H NUTS.
5. LOCKING MECHANISM FOR BOLTS TO BE PALNUTS OR LOCKWASHERS.
6. ALL U-BOLTS TO BE INSTALLED WITH 2H NUTS AND LOCKWASHERS.
7. ANY HARDWARE REMOVED FROM THE EXISTING TOWER MUST BE REPLACED WITH NEW HARDWARE OF EQUAL SIZE AND QUALITY UNLESS NOTED OTHERWISE.
8. AFTER FIELD MODIFICATIONS OF ANY STEEL MEMBERS, COAT EXPOSED STEEL SURFACES WITH TWO COATS OF SHERWIN WILLIAMS PART #143-0255 ZINC CLAD COATING, CONTAINING 97% ZINC DUST TO RESTORE THE GALVANIZED PROTECTION ON THE MEMBERS. IF REQUIRED, PAINT ALL AREAS AFFECTED OR NEW STEEL WITH MATCHING TOWER PAINT.
9. FINISHING SPECIFICATIONS - ALL MATERIAL TO BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
   A. FABRICATED MATERIAL - ASTM A123.
   B. HARDWARE - ASTM A153.
   C. GUY WIRE - ASTM A475
10. ELEVATIONS SHOWN ARE NOMINAL AND NOT EXACT.

CONTRACT ADMINISTRATION NOTES:

1. PER CROWN POLICY, ALL MODIFICATIONS DEPICTED ON THESE DRAWINGS MUST BE INSPECTED BY A CROWN APPROVED ENGINEERING VENDOR. TO EXECUTE THIS SERVICE, VERTICAL STRUCTURES WILL REQUIRE A WRITTEN PURCHASE ORDER AND ONE CALENDAR WEEK PRIOR NOTICE OF AN INSPECTION. THE CONTRACTOR SHALL ALSO GIVE VERIFICATION 24 HOURS IN ADVANCE OF A SCHEDULED REQUEST FOR INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THAT THESE REQUIREMENTS ARE MET.
2. INSPECTIONS OF ABOVE GRADE MODIFICATIONS SHALL BE PERFORMED AT THE CONCLUSION OF THE WORK. BELOW GRADE OR HIDDEN INSTALLATIONS SUCH AS REBAR OR ANCHORS SHALL BE INSPECTED PRIOR TO THE PLACEMENT OF CONCRETE.

WELDING SPECIFICATION NOTES:

1. SURFACES TO BE CLEARED OF GALVANIZATION BEFORE FIELD WELDING ANY MATERIAL.
2. ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CCUSA POLICY "CUTTING AND WELDING SAFETY PLAN" (DOC# ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT. PRIOR TO BIDDING REWORK, CONTRACTOR MUST HAVE IN THEIR POSSESSION AND HAVE READ THIS DOCUMENT. CONSULT CROWN CASTLE FOR COPIES OF THIS DOCUMENT.

ADDITIONAL WELDING NOTE:

A. WELDER TO USE E70XX RODS.

REV.	DESCRIPTION	DATE	BY
A	ORIGINAL RELEASE	2-2-09	SPL

VERTICAL STRUCTURES, INC.
P.O. Box 1496
Richmond, KY 40476
Phone: (859) 624-8360
Fax: (859) 624-8369
Email: engineering@verticalstructures.com

FOR

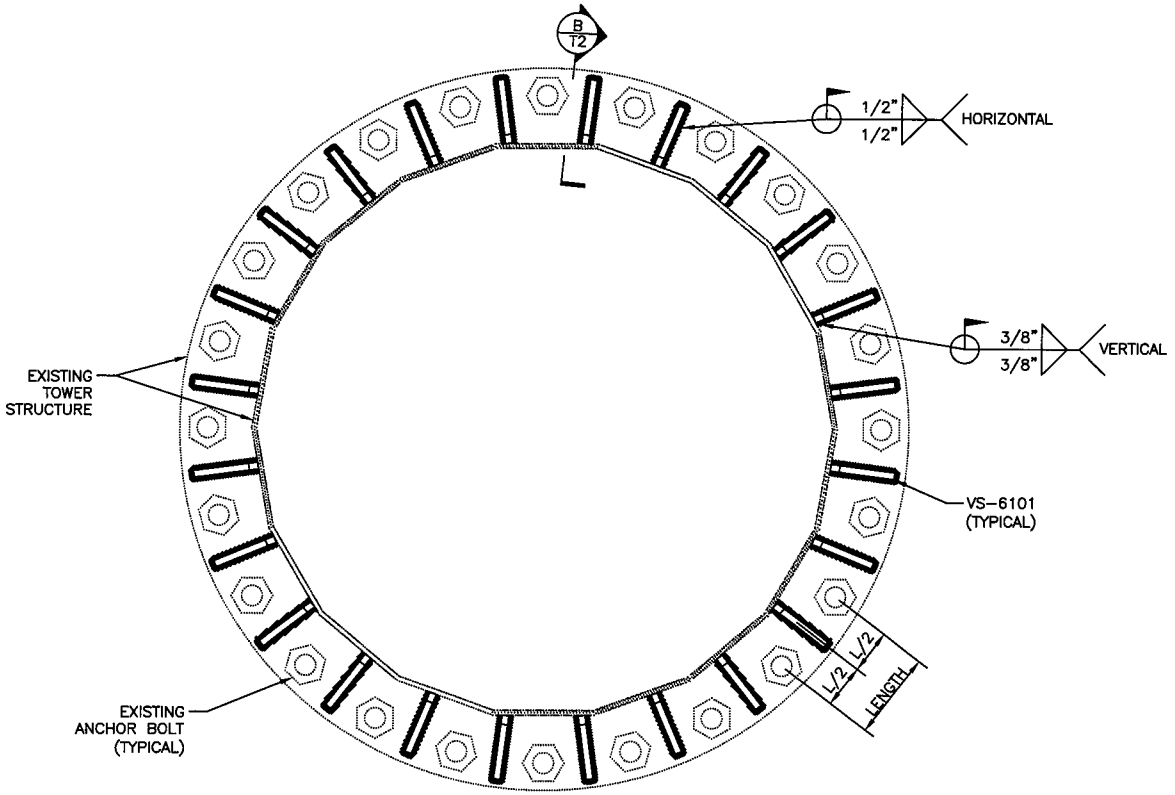
CROWN CASTLE

2009 MODIFICATIONS
TOWER REWORK FOR A
185' EEI MONOPOLE
SITE: BRG 123, CT

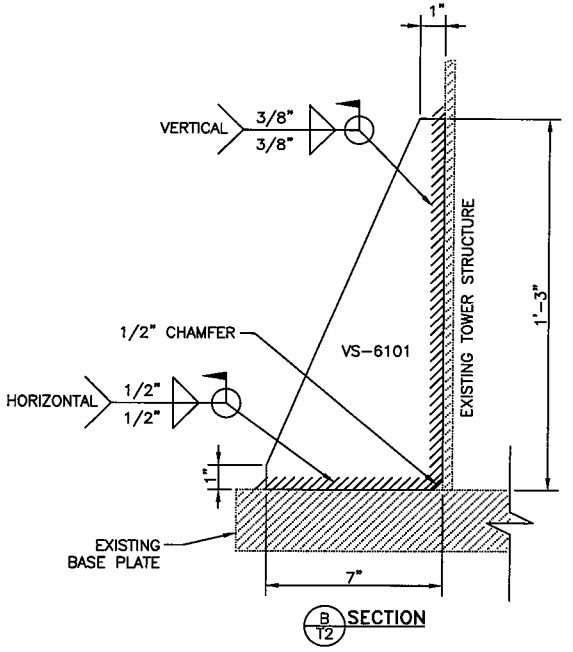
CROWN CASTLE BU# 806354	
DRAFTSPERSON: S. LEMONDS	DATE 2-2-09
CHK'D BY: MJM	DATE
ENGR: ASEL	DATE

SHEET 1 OF 2 | B TA2009004022-T1 | SCALE: NONE

BILL OF MATERIALS			
MARK NO.	QTY.	DESCRIPTION	MATERIAL GRADE
VS-6101	24	BASE PLATE GUSSET, PL 7" X 3/4" X 1'-3"	ASTM A572, GRADE 50



A T2 PLAN VIEW @ BASE PLATE
STEPBOLTS, SAFETY CLIMB, AND PORTS NOT DRAWN FOR CLARITY



B T2 SECTION

REV.	DESCRIPTION	DATE	BY
A	ORIGINAL RELEASE	2-2-09	SPL

VERTICAL STRUCTURES, INC.
P.O. Box 1496
Richmond, KY 40476
Phone: (859) 624-8360
Fax: (859) 624-8369
Email: engineering@verticalstructures.com

FOR

CROWN CASTLE

2009 MODIFICATIONS
TOWER REWORK FOR A
185' EEI MONOPOLE
SITE: BRG 123, CT

CROWN CASTLE BU# 806354			
DRAFTSPERSON: S. LEMONDS	DATE 2-2-09	SHEET 2 OF 2	B TA2009004022-T2
CHK'D BY: MJM	DATE		
ENGR: ASEL	DATE		SCALE: NONE

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

March 25, 2009

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-097-090203** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Route 34, Newtown, Connecticut.

Dear Attorney Baldwin:

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

- The tower base plate shall be reinforced per page 5 of the structural analysis report dated January 23, 2009 and sealed by Chris Sandlin, P.E. prior to the antenna swap;
- A post-construction tower rating of not more than 100 percent shall be achieved; and
- A signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the reinforcements have been properly completed and a post-construction tower rating of not more than 100 percent has been achieved.

The proposed modifications are to be implemented as specified here and in your notice dated February 3, 2009, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/MP/laf

c: The Honorable Joseph E. Borst, First Selectman, Town of Newtown
Gary Frenette, Zoning Enforcement Officer, Town of Newtown
Crown Castle International

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

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

February 10, 2009

The Honorable Joseph E. Borst
First Selectman
Town of Newtown
Town Hall
45 Main Street
Newtown, CT 06470

RE: **EM-VER-097-090203** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at Route 34, Newtown, Connecticut.

Dear Mr. Borst:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by February 24, 2009.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

c: Gary Frenette, Zoning Enforcement Officer, Town of Newtown

ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

EM-VER-097-090203

ORIGINAL

February 3, 2009

Via Hand Delivery

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

Re: **Notice of Exempt Modification – Antenna Swap**
Route 34, Newtown, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains wireless telecommunications antennas at the 185-foot level on the existing 185-foot tower at the above-referenced address. The tower is owned by Crown Castle International ("Crown"). The Council approved Cellco's shared use of the existing facility in Docket No. 89. Cellco now intends to modify its installation by replacing six of its existing antennas with six (6) DB846F65ZAXY antennas at the same 185-foot level on the tower. Attached behind Tab 1 is the specification sheet for the proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification 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 is being sent to Joseph F. Borst, First Selectman of the Town of Newtown. A copy of this letter is also being sent to Carmine V. Renzulli, the owner of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in any increase in the overall height of the existing structures. Cellco's antennas will be located at the 185-foot level on the existing 185-foot tower.

2. The proposed modifications will not involve any modifications to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

Also included is a Structural Analysis Report confirming that the tower, with modifications, can support Cellco's proposed antenna modifications. (See Tab 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Joseph F. Borst, Newtown First Selectman
Carmine V. Renzulli
Sandy M. Carter

ANDREW®

Vertically Polarized Directed Dipole® Panel Antennas

806 - 960 MHz

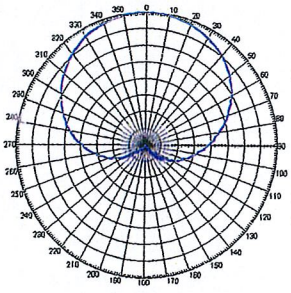
65° HORIZONTAL BEAMWIDTH

HORIZONTAL BEAMWIDTH	65°		65°	65°
FREQUENCY RANGE	806-960 MHz		806-896 MHz	806-896 MHz
	14.5 & 14.8 dBd / 0° Tilt		14.5 dBd / 0° Tilt	14.3 dBd / 5° Tilt
MODEL	DB846F65ZAXY		DB846H65E-SX	846H65T5E-SX
TYPE	Directed Dipole®, No Screen		Directed Dipole®	Directed Dipole®
ELECTRICAL SPECIFICATIONS				
Frequency Range (MHz)	806-896	870-960	806-896	806-896
Gain (dBd/dBi)	14.5 / 16.6	14.8 / 16.9	14.5 / 16.6	14.3 / 16.4
Horizontal Beamwidth (Deg.)	65	60	65	65
Elevation Beamwidth (Deg.)	11	10.5	11	10.5
USLS (dB)	>15	>15	N/A	N/A
Null Fill (dB) – Below Peak	N/A	N/A	N/A	N/A
Beam Tilt (Deg.)	0	0	0	5
VSWR	<1.33:1	<1.33:1	<1.5:1	<1.5:1
Front-To-Back Ratio (dB)	40	40	30	40
Isolation (dB)	N/A	N/A	N/A	N/A
Max. Input Power (Watts)	500	500	500	500
Polarization	Vertical	Vertical	Vertical	Vertical
Connector Location	Back	Back	Back	Back
Connector Type	7-16 DIN - Female	7-16 DIN - Female	7-16 DIN - Female	7-16 DIN - Female
Optional Connectors	N/A	N/A	N/A	N/A
MECHANICAL SPECIFICATIONS				
Length (inch/mm)	72 / 1,829	72 / 1,829	72 / 1,829	72 / 1,829
Width (inch/mm)	10 / 254	10 / 254	20.5 / 521	20.5 / 521
Depth (inch/mm)	8.5 / 216	8.5 / 216	9 / 229	9 / 229
Net Weight (lbs/kg)	21 / 9.5	21 / 9.5	24 / 10.9	24 / 10.9
Max. Flat Plate Area (ft^2/m^2)	1.61 / 0.15	1.61 / 0.15	4.95 / 0.46	4.95 / 0.46
Max. Wind Load at 100 mph (lbf/N)	87 / 386	87 / 386	273 / 1,214	273 / 1,214
Max. Wind Speed (mph/kmh)	125 / 201	125 / 201	125 / 201	125 / 201
Radome Material	ABS, UV Resistant	ABS, UV Resistant	ABS, UV Resistant	ABS, UV Resistant
Reflector Material	Pass. Aluminum	Pass. Aluminum	Pass. Aluminum	Pass. Aluminum
Radiator Material	Aluminum	Aluminum	Brass	Brass
Hardware Material	Galvanized Steel	Galvanized Steel	Galvanized Steel	Galvanized Steel
Color	Light Gray	Light Gray	Light Gray	Light Gray
Std. Mounting Hardware	DB380	DB380	DB380	DB380
Optional Downtilt Kit	DB5083	DB5083	DB5083	DB5083
Optional Special Mounting	DB5084-AZ	DB5084-AZ	DB5084-AZ	DB5084-AZ

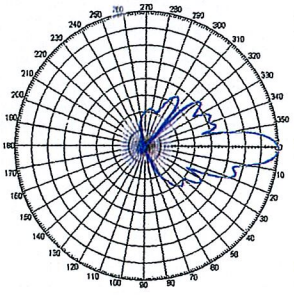
Specifications are subject to change. Please see our website for the latest information.

DB846F65ZAXY

Azimuth Pattern



Elevation Pattern



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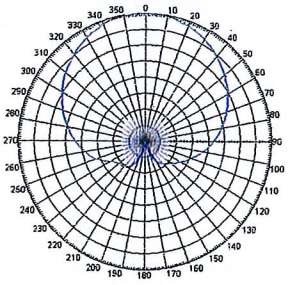

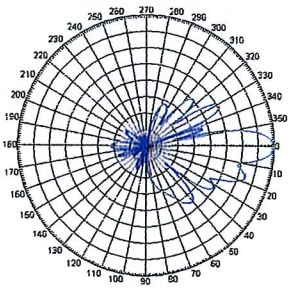

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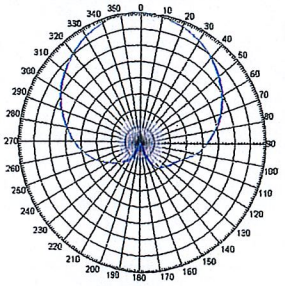

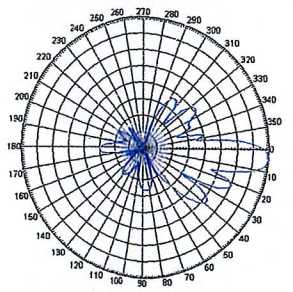

Scale: 10° radials, 5 dB per division

ANDREW CORPORATION PHONE 1-800-676-5342 • (214) 631-0310 FAX 1-800-229-4706 • (214) 631-4706 WWW.ANDREW.COM

	General	Power	Density					
Site Name: Newtown								
Tower Height: Verizon @ 185ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Cingular	10	100	175	0.0117	880	0.5867	2.00%	
*Cingular	4	296	177	0.0136	880	0.5867	2.32%	
*Cingular	1	427	177	0.0049	1930	1.0000	0.49%	
*Sprint			165	0.0105	1962.5	1.0000	1.05%	
*Nextel	9	100	155	0.0135	851	0.5673	2.37%	
*Omnipoint			145	0.0167	1930	1.0000	1.67%	
Verizon	**9**	**356**	**185**	**0.045**	**880**	**0.5866**	**7.67%**	
Verizon	**15**	**223**	**185**	**0.047**	**1900**	**1.0**	**4.70%**	
								22.27%
* Source: Siting Council								

January 23, 2009

Michael McFadden
Crown Castle USA
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Charlotte, NC 28277
(704) 405-6612

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
csandlin@verticalstructures.com

Subject: Structural Analysis Report

Carrier Designation	Verizon Wireless Change-Out Carrier Site Number: N/A Carrier Site Name: Newtown CT
Crown Castle Designation	Crown Castle BU Number: 806354 Crown Castle Site Name: BRG 123 Crown Castle JDE Job Number: 113721
Engineering Firm Designation	Vertical Structures Project Number: 2009-004-021
Site Data	Route 34-Washington Avenue, Newtown, CT, Fairfield County Latitude 41°-24'-45.53", Longitude -73°-16'-12.34" 185' EEI Monopole Tower

Dear Mr. McFadden,

Vertical Structures 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 Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 317172, and Application Number 72552, Revision 1. The purpose of the analysis is to determine the suitability of the tower for the following load case:

Load Case 1 (LC1): Proposed Equipment (Table 1) + Existing/Reserved Equipment (Table 2)

Based on our analysis we have determined the tower superstructure is insufficient for LC1. However, the foundation is adequate. This analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon an 85 MPH basic "fastest mile" wind speed, equivalent to a 100 MPH basic "3-second gust" wind speed per 2006 IBC Table Equation 16-34.

Vertical Structures appreciates the opportunity of providing our continuing professional services to you and Crown Castle USA. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Chris Sandlin, P.E.
Project Engineer

STATE OF CONNECTICUT
JOHN J. SANDLIN
NO. 24220
LICENSED
PROFESSIONAL ENGINEER
1/23/09

TABLE OF CONTENTS

1.) INTRODUCTION

The 185' tall monopole tower was designed and manufactured by EEI for Crown Communications in 1999. The existing structure consists of five (5) 18-sided tapered polygonal tubes joined via slip joint connections and is founded on a 28' square by 3' thick mat buried 6' deep.

ANALYSIS CRITERIA

The BRG 123 monopole tower was analyzed in accordance with the current EIA-222-F publication, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." The proposed, existing and reserved antennas, cables and mounts considered in this analysis are listed in Tables 1 and 2. Applied forces in this study were derived from an 85 MPH basic "fastest mile" wind speed with no ice and a reduced 74 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The tower was originally designed for a 90 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The original design loads are listed in Table 3. All cables are assumed to be routed in accordance with the drawing in Appendix B.

Table 1 – Proposed Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
185	6	Decibel	DB846F65ZAXY				

Table 2 – Existing and Reserved Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
185	6*	Swedcom	ALP 9212-N	EEI	10'-8" L.P. Platform	12	1 5/8
	6	Decibel	DB948F85T2E-M				
	1	Decibel	DB222			1	1/2
175	6	Powerwave Technologies	7770.00	EEI	12' L.P. Platform	12	1 5/8
	6	Powerwave Technologies	LGP2140X TMA				
	6	Powerwave Technologies	LGP13519 Diplexer				
165	6 + 3**	Decibel	DB980H90T2E-M	EEI	12' L.P. Platform	6 + 3**	1 5/8
155	12	Decibel	DB844H90	EEI	12' Platform	12	1 1/4
145	3	EMS Wireless	RR90-17-02DP	EEI	12' L.P. Platform	6	7/8
	6		TMA				
135***	9	Allgon	7184		(3) 12' T-Arms	9	1 5/8
	2		TMA				
100	2		GPS		(2) 2' Sidearms	2	1/2
40	1		GPS		(1) 2' Sidearm	1	1/2

* Indicates equipment to be removed.
** Indicates reserved equipment.
*** Indicates abandoned equipment.

Table 3 – Design Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (Inches)
185	12	Swedcom	ALP 9212	EEI	10'-8" L.P. Platform		
175	12	Swedcom	ALP 11011	EEI	12' L.P. Platform		
165	9	Decibel	DB 980	EEI	12' L.P. Platform		
155	12	Swedcom	ALP 9011	EEI	12' L.P. Platform		
145	6	EMS Wireless	RR-65-18	EEI	12' L.P. Platform		
	1	Scala	OGB9-900 Omni				
110	1		GPS		(1) Sidearm		
50	1		GPS		(1) Sidearm		

3.) ANALYSIS PROCEDURE

Table 4 – Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Change-Out Revision #1	72552	CCI iSite
Tower Drawing	EEI Drawing No. GS51352	822035	CCI iSite
Foundation Drawing	EEI Drawing No. F4743-185	822037	CCI iSite
Geotechnical Report	Clarence Welti Associates Report Dated 'February 14, 1999'	2297011	CCI iSite

3.1) Analysis Methods

RISA Tower (Version 5.3), a commercially available analysis software package, 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/TIA/EIA-222-F or the local building code requirements. 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 manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and any referenced drawings.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222-F.

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

4.) ANALYSIS RESULTS

Table 5 – Tower Component Stresses vs. Capacity (LC1)

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	185 - 149.5	Pole	TP36.004x29x0.25	1	-10344.30	1434134.65	34.9	Pass
L2	149.5 - 114.1	Pole	TP42.4605x34.5155x0.3125	2	-19399.90	2114444.50	69.9	Pass
L3	114.1 - 76.68	Pole	TP49.157x40.6932x0.375	3	-28990.10	2937945.21	84.4	Pass
L4	76.68 - 38.26	Pole	TP55.9285x47.105x0.4375	4	-41666.90	3900064.58	87.7	Pass
L5	38.26 - 0	Pole	TP62.5x53.5872x0.5	5	-60752.10	5115214.00	87.0	Pass
							Summary	
						Pole (L4)	87.7	Pass
						RATING =	**87.7**	**Pass**

Notes	Component	% Capacity	Pass/Fail
Additional Component Analysis Summary:			
1	Anchor Bolts (Tension)	77.3	Pass
1	Base Plate (Bending)	124.5	Fail ✗
	Foundation (Compared to Design Loads)	95.9	Pass
	Structure Rating =	**124.5**	**Fail ✗**

1) Indicates calculations supporting % capacity are included in Appendix C.

4.1) Required Modifications

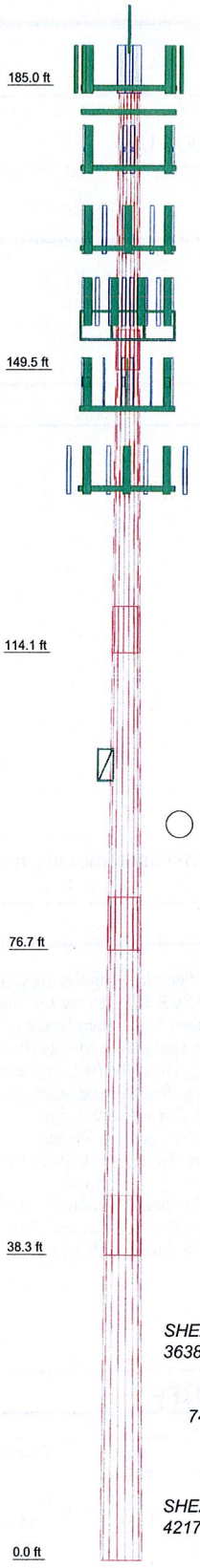
Results indicate that the tower superstructure is insufficient to accommodate LC1. Modification (A) is required to remedy the deficiencies identified in this analysis. If requested, Vertical Structures will supply the construction drawings necessary to make the required modifications.

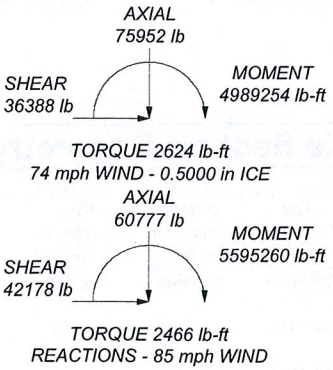
(A) Reinforce the tower base plate.

APPENDIX A

Section	1	2	3	4	5
Length (ft)	35.50	40.41	43.23	45.07	45.75
Number of Sides	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.4375	0.5000
Lap Splice (ft)	5.01	5.81	6.65	7.49	
Top Dia (in)	29.0000	34.5155	40.6932	47.1050	53.5872
Bot Dia (in)	36.0040	42.4605	49.1570	55.9285	62.5000
Grade			A572-65		
Weight (lb)	3091.5	5206.7	7800.2	10878.1	14216.7

Total Weight: 41193.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
EEI 10'-8" Low-Profile Platform (Verizon Wireless)	185	(2) LGP13519 Diplexer	175
		EEI 12' L.P. Platform	165
Monopole Transition Ladder (VSI) (Verizon Wireless)	185	(3) DB980H90T2E-M w/Mount Pipe	165
		(3) DB980H90T2E-M w/Mount Pipe	165
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(3) DB980H90T2E-M w/Mount Pipe	165
		EEI 12' Platform w/ Rails	155
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	185	(4) DB844H90 w/Mount Pipe	155
		(4) DB844H90 w/Mount Pipe	155
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(4) DB844H90 w/Mount Pipe	155
		EEI 12' L.P. Platform	145
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	RR90-17-02DP w/Mount Pipe	145
		RR90-17-02DP w/Mount Pipe	145
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	185	RR90-17-02DP w/Mount Pipe	145
		(2) Generic TMA	145
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	(2) Generic TMA	145
		(2) Generic TMA	145
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	6' x 2" Antenna Mount Pipe (VSI)	145
		6' x 2" Antenna Mount Pipe (VSI)	145
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	185	6' x 2" Antenna Mount Pipe (VSI)	145
		12' T-Arm Mount	135
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	185	12' T-Arm Mount	135
		12' T-Arm Mount	135
DB222	185	(3) 7184 w/Mount Pipe	135
6'x4" Pipe Mount	185	(3) 7184 w/Mount Pipe	135
EEI 12' L.P. Platform	175	(3) 7184 w/Mount Pipe	135
(2) 7770.00 w/ mount pipe	175	(2) Generic TMA	135
(2) 7770.00 w/ mount pipe	175	2' Sidearm (4" Tube) (VSI)	100
(2) 7770.00 w/ mount pipe	175	2' Sidearm (4" Tube) (VSI)	100
(2) LGP2140X	175	Generic GPS (VSI)	100
(2) LGP2140X	175	Generic GPS (VSI)	100
(2) LGP2140X	175	2' Sidearm (4" Tube) (VSI)	40
(2) LGP13519 Diplexer	175	Generic GPS (VSI)	40
(2) LGP13519 Diplexer	175		

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: 87.7%

Vertical Structures
309 Spangler Drive, Suite E
Richmond, KY 40475
Phone: (859) 624-8360
FAX: (859) 624-8369

Job: BRG 123, CT BU#806354			
Project: Vertical Structures Job No. 2009-004-021			
Client: Crown Castle	Drawn by: csandlin	App'd:	
Code: TIA/EIA-222-F	Date: 01/23/09	Scale: NTS	
Path: \\Nas1\csandlin\Open\2009-004-021 BRG 123, CT\RISA\806354.eri		Dwg No. E-1	

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.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

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	185.00-149.50	35.50	5.01	18	29.0000	36.0040	0.2500	1.0000	A572-65 (65 ksi)
L2	149.50-114.10	40.41	5.81	18	34.5155	42.4605	0.3125	1.2500	A572-65 (65 ksi)
L3	114.10-76.68	43.23	6.65	18	40.6932	49.1570	0.3750	1.5000	A572-65 (65 ksi)
L4	76.68-38.26	45.07	7.49	18	47.1050	55.9285	0.4375	1.7500	A572-65 (65 ksi)
L5	38.26-0.00	45.75		18	53.5872	62.5000	0.5000	2.0000	A572-65 (65 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	29.4474	22.8131	2382.3081	10.2063	14.7320	161.7098	4767.7509	11.4087	4.6640	18.656
	36.5594	28.3708	4582.0338	12.6927	18.2900	250.5208	9170.0968	14.1881	5.8967	23.587
L2	36.0482	33.9251	5014.0520	12.1421	17.5339	285.9633	10034.7015	16.9658	5.5247	17.679
	43.1155	41.8055	9382.6455	14.9625	21.5699	434.9872	18777.6370	20.9067	6.9230	22.154
L3	42.4760	47.9887	9855.5118	14.3130	20.6721	476.7532	19723.9918	23.9989	6.5020	17.339
	49.9153	58.0628	17456.3904	17.3176	24.9718	699.0454	34935.7504	29.0369	7.9916	21.311
L4	49.1537	64.8037	17830.6356	16.5670	23.9294	745.1365	35684.7333	32.4080	7.5205	17.19
	56.7913	77.0562	29977.1322	19.6993	28.4117	1055.0990	59993.7092	38.5354	9.0734	20.739
L5	55.8955	84.2493	29997.3528	18.8459	27.2223	1101.9413	60034.1769	42.1327	8.5513	17.103
	63.4642	98.3940	47784.7640	22.0100	31.7500	1505.0319	95632.4044	49.2063	10.1200	20.24

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 185.00-149.50				1	1	1		
L2 149.50-114.10				1	1	1		
L3 114.10-76.68				1	1	1		
L4 76.68-38.26				1	1	1		
L5 38.26-0.00				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 plf
HJ7-50A (1-5/8 AIR) (Verizon Wireless)	C	No	Inside Pole	185.00 - 5.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	185.00 - 5.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
CR 50 1873 (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	177.00 - 5.00	12	No Ice	0.03	0.83
						1/2" Ice	0.05	2.34
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	167.00 - 5.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF6-50A (1-1/4 FOAM)	B	No	Inside Pole	158.00 - 5.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	148.00 - 5.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	137.00 - 5.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82

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 lb
L1	185.00-149.50	A	0.000	0.000	0.000	0.000	5.33
		B	0.000	0.000	0.000	10.890	341.22
		C	0.000	0.000	0.000	0.000	572.19
L2	149.50-114.10	A	0.000	0.000	0.000	0.000	72.43
		B	0.000	0.000	0.000	14.018	632.95
		C	0.000	0.000	0.000	0.000	872.05
L3	114.10-76.68	A	0.000	0.000	0.000	0.000	79.70
		B	0.000	0.000	0.000	14.818	669.07
		C	0.000	0.000	0.000	0.000	1019.32
L4	76.68-38.26	A	0.000	0.000	0.000	0.000	81.83
		B	0.000	0.000	0.000	15.214	686.95
		C	0.000	0.000	0.000	0.000	1046.56
L5	38.26-0.00	A	0.000	0.000	0.000	0.000	70.84
		B	0.000	0.000	0.000	13.171	594.69
		C	0.000	0.000	0.000	0.000	906.00

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 lb
L1	185.00-149.50	A	0.500	0.000	0.000	0.000	0.000	5.33
		B		0.000	0.000	0.000	16.500	841.15
		C		0.000	0.000	0.000	0.000	572.19
L2	149.50-114.10	A	0.500	0.000	0.000	0.000	0.000	72.43
		B		0.000	0.000	0.000	21.240	1276.50
		C		0.000	0.000	0.000	0.000	872.05
L3	114.10-76.68	A	0.500	0.000	0.000	0.000	0.000	79.70
		B		0.000	0.000	0.000	22.452	1349.34
		C		0.000	0.000	0.000	0.000	1019.32
L4	76.68-38.26	A	0.500	0.000	0.000	0.000	0.000	81.83
		B		0.000	0.000	0.000	23.052	1385.40
		C		0.000	0.000	0.000	0.000	1046.56
L5	38.26-0.00	A	0.500	0.000	0.000	0.000	0.000	70.84
		B		0.000	0.000	0.000	19.956	1199.33
		C		0.000	0.000	0.000	0.000	906.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	185.00-149.50	0.3666	0.2117	0.5143	0.2970
L2	149.50-114.10	0.4585	0.2647	0.6440	0.3718
L3	114.10-76.68	0.4658	0.2689	0.6604	0.3813
L4	76.68-38.26	0.4715	0.2722	0.6736	0.3889
L5	38.26-0.00	0.4144	0.2392	0.5981	0.3453

Discrete Tower Loads

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 lb
EEI 10'-8" Low-Profile Platform (Verizon Wireless)	C	None		0.0000	185.00	No Ice 1/2" Ice	28.00 34.00	28.00 34.00	1500.00 2250.00
Monopole Transition Ladder (VSI) (Verizon Wireless)	B	From Centroid-Leg	3.00 0.00 -3.00	0.0000	185.00	No Ice 1/2" Ice	6.00 8.00	6.00 8.00	160.00 240.00
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	C	From Centroid-Leg	7.16 1.00 2.00	60.0000	185.00	No Ice 1/2" Ice	7.27 7.88	7.82 9.01	46.55 111.10
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	A	From Centroid-Face	3.08 0.00 2.00	0.0000	185.00	No Ice 1/2" Ice	2.62 3.23	4.92 6.01	34.05 68.79
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	A	From Centroid-Leg	7.16 -1.00 2.00	-60.0000	185.00	No Ice 1/2" Ice	7.27 7.88	7.82 9.01	46.55 111.10
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	A	From Centroid-Leg	7.16 1.00 2.00	60.0000	185.00	No Ice 1/2" Ice	7.27 7.88	7.82 9.01	46.55 111.10
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	B	From Centroid-Face	3.08 0.00 2.00	0.0000	185.00	No Ice 1/2" Ice	2.62 3.23	4.92 6.01	34.05 68.79
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	B	From Centroid-Leg	7.16 -1.00 2.00	-60.0000	185.00	No Ice 1/2" Ice	7.27 7.88	7.82 9.01	46.55 111.10
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	B	From Centroid-Leg	7.16 1.00 2.00	60.0000	185.00	No Ice 1/2" Ice	7.27 7.88	7.82 9.01	46.55 111.10
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	C	From Centroid-Face	3.08 0.00 2.00	0.0000	185.00	No Ice 1/2" Ice	2.62 3.23	4.92 6.01	34.05 68.79
DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	C	From Centroid-Leg	7.16 -1.00 2.00	-60.0000	185.00	No Ice 1/2" Ice	7.27 7.88	7.82 9.01	46.55 111.10
DB222	C	From Centroid-Face	3.08 0.00 7.00	0.0000	185.00	No Ice 1/2" Ice	1.60 2.88	1.60 2.88	16.00 20.80
6'x4" Pipe Mount	C	From Centroid-Face	3.08 0.00 7.00	0.0000	185.00	No Ice 1/2" Ice	2.25 2.62	2.25 2.62	65.00 84.10
***									
EEI 12' L.P. Platform	C	None		0.0000	175.00	No Ice 1/2" Ice	25.00 29.00	25.00 29.00	1700.00 2530.00
(2) 7770.00 w/ mount pipe	A	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	6.22 6.77	4.35 5.20	56.90 102.99
(2) 7770.00 w/ mount pipe	B	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	6.22 6.77	4.35 5.20	56.90 102.99
(2) 7770.00 w/ mount pipe	C	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	6.22 6.77	4.35 5.20	56.90 102.99
(2) LGP2140X	A	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	1.23 1.38	0.37 0.48	17.50 24.46
(2) LGP2140X	B	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	1.23 1.38	0.37 0.48	17.50 24.46

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 lb
(2) LGP2140X	C	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	1.23 1.38	0.37 0.48	17.50 24.46
(2) LGP13519 Diplexer	A	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
(2) LGP13519 Diplexer	B	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
(2) LGP13519 Diplexer	C	From Centroid-Face	3.46 0.00 2.00	-7.0000	175.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
***									
EEI 12' L.P. Platform	C	None		0.0000	165.00	No Ice 1/2" Ice	25.00 29.00	25.00 29.00	1700.00 2530.00
(3) DB980H90T2E-M w/Mount Pipe	A	From Centroid-Face	3.46 0.00 2.00	0.0000	165.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	34.05 69.84
(3) DB980H90T2E-M w/Mount Pipe	B	From Centroid-Face	3.46 0.00 2.00	0.0000	165.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	34.05 69.84
(3) DB980H90T2E-M w/Mount Pipe	C	From Centroid-Face	3.46 0.00 2.00	0.0000	165.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	34.05 69.84
***									
EEI 12' Platform w/ Rails	C	None		0.0000	155.00	No Ice 1/2" Ice	38.50 56.00	38.50 56.00	1900.00 2870.00
(4) DB844H90 w/Mount Pipe	A	From Centroid-Face	3.46 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice	3.58 4.20	5.63 6.73	35.55 77.48
(4) DB844H90 w/Mount Pipe	B	From Centroid-Face	3.46 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice	3.58 4.20	5.63 6.73	35.55 77.48
(4) DB844H90 w/Mount Pipe	C	From Centroid-Face	3.46 0.00 3.00	0.0000	155.00	No Ice 1/2" Ice	3.58 4.20	5.63 6.73	35.55 77.48
***									
EEI 12' L.P. Platform	C	None		0.0000	145.00	No Ice 1/2" Ice	25.00 29.00	25.00 29.00	1700.00 2530.00
RR90-17-02DP w/Mount Pipe	A	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
RR90-17-02DP w/Mount Pipe	B	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
RR90-17-02DP w/Mount Pipe	C	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
(2) Generic TMA	A	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
(2) Generic TMA	B	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
(2) Generic TMA	C	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36

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 lb
6' x 2" Antenna Mount Pipe (VSI)	A	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	23.00 33.83
6' x 2" Antenna Mount Pipe (VSI)	B	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	23.00 33.83
6' x 2" Antenna Mount Pipe (VSI)	C	From Centroid-Face	3.46 0.00 3.00	0.0000	145.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	23.00 33.83
***									
12' T-Arm Mount	A	From Centroid-Face	3.60 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice	8.00 9.90	4.00 4.95	200.00 250.00
12' T-Arm Mount	B	From Centroid-Face	3.60 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice	8.00 9.90	4.00 4.95	200.00 250.00
12' T-Arm Mount	C	From Centroid-Face	3.60 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice	8.00 9.90	4.00 4.95	200.00 250.00
(3) 7184 w/Mount Pipe	A	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	3.33 3.94	3.56 4.60	36.75 68.31
(3) 7184 w/Mount Pipe	B	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	3.33 3.94	3.56 4.60	36.75 68.31
(3) 7184 w/Mount Pipe	C	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	3.33 3.94	3.56 4.60	36.75 68.31
(2) Generic TMA	A	From Centroid-Face	5.60 0.00 2.00	0.0000	135.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
***									
2' Sidearm (4" Tube) (VSI)	C	From Centroid-Leg	2.86 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	0.30 0.50	1.33 1.67	30.00 40.00
2' Sidearm (4" Tube) (VSI)	C	From Centroid-Face	2.86 0.00 0.00	30.0000	100.00	No Ice 1/2" Ice	0.30 0.50	1.33 1.67	30.00 40.00
2' Sidearm (4" Tube) (VSI)	C	From Centroid-Face	3.32 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice	0.30 0.50	1.33 1.67	30.00 40.00
Generic GPS (VSI)	C	From Centroid-Leg	3.86 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	1.40 1.70	1.40 1.70	25.00 30.00
Generic GPS (VSI)	C	From Centroid-Face	3.86 0.00 0.00	30.0000	100.00	No Ice 1/2" Ice	1.40 1.70	1.40 1.70	25.00 30.00
Generic GPS (VSI)	C	From Centroid-Face	4.32 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice	1.40 1.70	1.40 1.70	25.00 30.00

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	185 - 149.5 (1)	TP36.004x29x0.25	35.50	0.00	0.0	39.000	27.5865	-10344.30	1075870.00	0.010
L2	149.5 - 114.1 (2)	TP42.4605x34.5155x0.3125	40.41	0.00	0.0	39.000	40.6725	-19399.90	1586230.00	0.012
L3	114.1 - 76.68 (3)	TP49.157x40.6932x0.375	43.23	0.00	0.0	39.000	56.5131	-28990.10	2204010.00	0.013
L4	76.68 - 38.26 (4)	TP55.9285x47.105x0.4375	45.07	0.00	0.0	39.000	75.0200	-41666.90	2925780.00	0.014
L5	38.26 - 0 (5)	TP62.5x53.5872x0.5	45.75	0.00	0.0	39.000	98.3940	-60752.10	3837370.00	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	185 - 149.5 (1)	TP36.004x29x0.25	350287.50	-17.750	39.000	0.455	0.00	0.000	39.000	0.000
L2	149.5 - 114.1 (2)	TP42.4605x34.5155x0.3125	1230916.67	-35.883	39.000	0.920	0.00	0.000	39.000	0.000
L3	114.1 - 76.68 (3)	TP49.157x40.6932x0.375	2392891.67	-43.370	39.000	1.112	0.00	0.000	39.000	0.000
L4	76.68 - 38.26 (4)	TP55.9285x47.105x0.4375	3751975.00	-45.030	39.000	1.155	0.00	0.000	39.000	0.000
L5	38.26 - 0 (5)	TP62.5x53.5872x0.5	5595258.00	-44.612	39.000	1.144	0.00	0.000	39.000	0.000

Pole Interaction Design Data

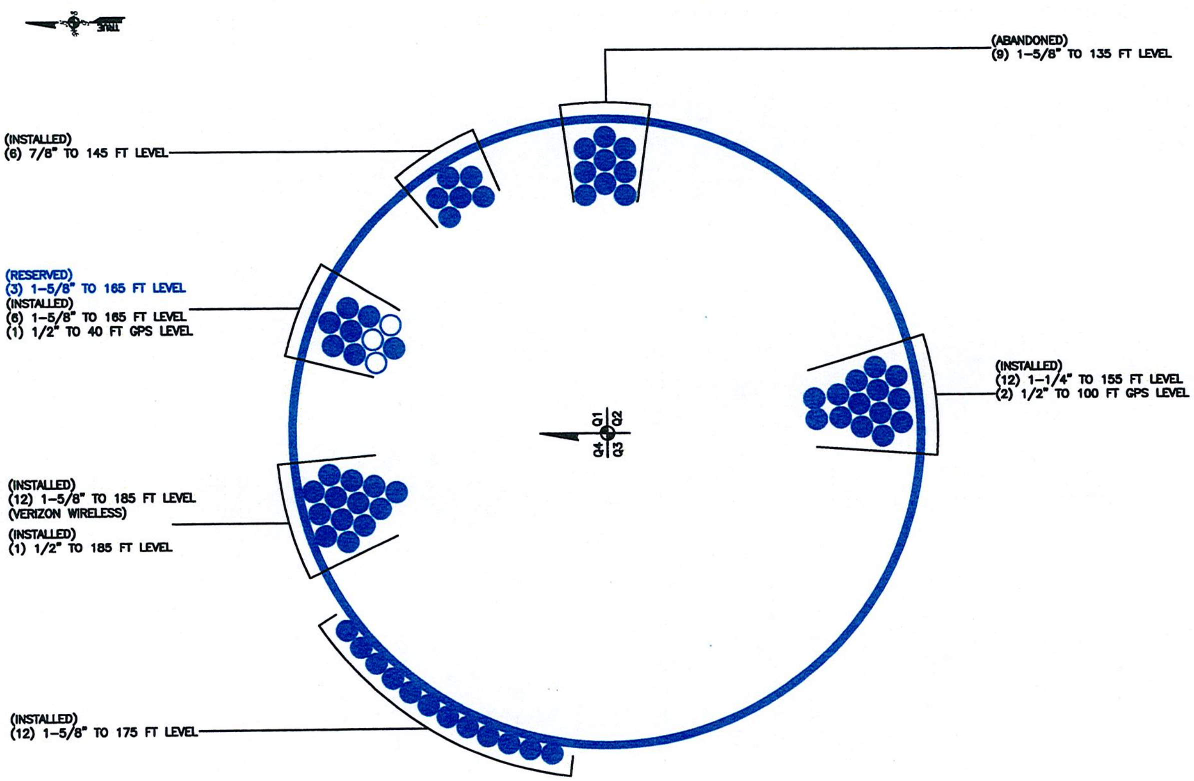
Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	185 - 149.5 (1)	TP36.004x29x0.25	0.010	0.455	0.000	0.465 ✔	1.333	H1-3 ✔
L2	149.5 - 114.1 (2)	TP42.4605x34.5155x0.3125	0.012	0.920	0.000	0.932 ✔	1.333	H1-3 ✔
L3	114.1 - 76.68 (3)	TP49.157x40.6932x0.375	0.013	1.112	0.000	1.125 ✔	1.333	H1-3 ✔
L4	76.68 - 38.26 (4)	TP55.9285x47.105x0.4375	0.014	1.155	0.000	1.169 ✔	1.333	H1-3 ✔
L5	38.26 - 0 (5)	TP62.5x53.5872x0.5	0.016	1.144	0.000	1.160 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	185 - 149.5	Pole	TP36.004x29x0.25	1	-10344.30	1434134.65	34.9	Pass
L2	149.5 - 114.1	Pole	TP42.4605x34.5155x0.3125	2	-19399.90	2114444.50	69.9	Pass
L3	114.1 - 76.68	Pole	TP49.157x40.6932x0.375	3	-28990.10	2937945.21	84.4	Pass
L4	76.68 - 38.26	Pole	TP55.9285x47.105x0.4375	4	-41666.90	3900064.58	87.7	Pass
L5	38.26 - 0	Pole	TP62.5x53.5872x0.5	5	-60752.10	5115214.00	87.0	Pass
							Summary	
						Pole (L4)	87.7	Pass
						RATING =	**87.7**	**Pass**

APPENDIX B



BUSINESS UNIT: 806354 TOWER ID: C_BASELEVEL

LEGEND: FEEDLINES

- ● SOLID BLUE CIRCLE DENOTES EXISTING FEEDLINE
- ○ OPEN RED CIRCLE DENOTES PROPOSED FEEDLINE
- ○ OPEN BLUE CIRCLE DENOTES RESERVED FEEDLINE
- X BLUE "X" DENOTES LOCATION NOT GIVEN

NOTE: ASSUME FEEDLINE ATTACHMENT HEIGHT TO TOWER STEEL AT 8-FEET ABOVE FINISHED GRADE UNLESS OTHERWISE SPECIFIED

CROWN REGION ADDRESS

USA

1	18/07/05	CHANGED PER WORK ORDER # 68317	CDR
2	06/01/07	AS-BUILT INFORMATION ADDED PER WORK ORDER # 132070	ATF
3	06/03/07	AS-BUILT INFORMATION ADDED PER WORK ORDER # 138094	MB

DRAWN BY: CDR
CHECKED BY:
DRAWING DATE: 18/07/05

SITE NUMBER:
SITE NAME:

SITE NAME

BRG 123 943084

BUSINESS UNIT NUMBER

806354

SITE ADDRESS

ROUTE 34 - WASHINGTON AVENUE
NEWTOWN, CT 06482
FAIRFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING

NOT TO SCALE 1

Xref R:\Standards\...\CAD Standards V5.0\Templates\Typical Blocks For Templates\TITLE BLOCK STD-VER 5.1.dwg

APPENDIX C

Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

Site Data

BU#: *806354*
Site Name: *BRG 123, CT*
App #: *72552*

Reactions		
Moment:	5595.26	ft-kips
Axial:	60.777	kips
Shear:	42.178	kips

Connection Type: *Butt*

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Circle:	73	in

Plate Data		
Diam:	79	in
Thick:	2.5	in
Grade:	60	ksi
Eff. Width:	8.27	in

Pole Data		
Diam:	62.5	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

Maximum Rod Tension:	150.8 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	77.3% **Pass**

Base Plate Results

Base Plate Stress:	74.7 ksi
Allowable Plate Stress:	60.0 ksi
Base Plate Stress Ratio:	124.5% **Fail**

General Power Density

Site Name: Newtown, CT
Tower Height: 185 (Cellular) and (PCS)' to Rad Center (Verizon Platform)

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
Verizon Cellular	880	9	322	2898	185	0.0305	0.5866	5.19%
Verizon PCS	1900	15	204	3060	185	0.0322	1.0	3.22%

Total Percentage of Maximum Permissible Exposure 8.41%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case scenario, maximum values used.