VERTICAL DEVELOPMENT
20 Commercial St Branford, CT 06405

July 15, 2015

VIA EMAIL AND HAND DELIVERY

Ms. Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: T-Mobile Northeast LLC – Notice of Exempt Modification
Video Lane (800 Booth Hill Road), Trumbull, CT

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile is undertaking modifications to certain existing sites in its Connecticut network in order to implement updated technology. In order to do so, T-Mobile will modify antenna and equipment configurations at a number of existing sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of the Town of Trumbull, and the property owner, Crown Castle.

T-Mobile plans to modify the existing facility at Video Lane (800 Booth Hill Road) owned by Crown Castle (coordinates 41.278989/-73.185111). Attached are drawings depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration with proposed modifications. Also included is a power density calculation reflecting the modification to T-Mobile's operations at the site.

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

1. The height of the overall structure will be unaffected. T-Mobile proposes to replace three (3) existing antennas at a centerline height of 247' AGL.

2. The proposed changes will not extend the site boundaries. T-Mobile does

not propose to replace or install any equipment at grade. Thus, there will be no effect on the site compound or T-Mobile's leased area.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated in the attached power density calculations, T-Mobile's operations at the site will result in a power density of 1.90%; the combined site operations will result in a total power density of 41.70%.

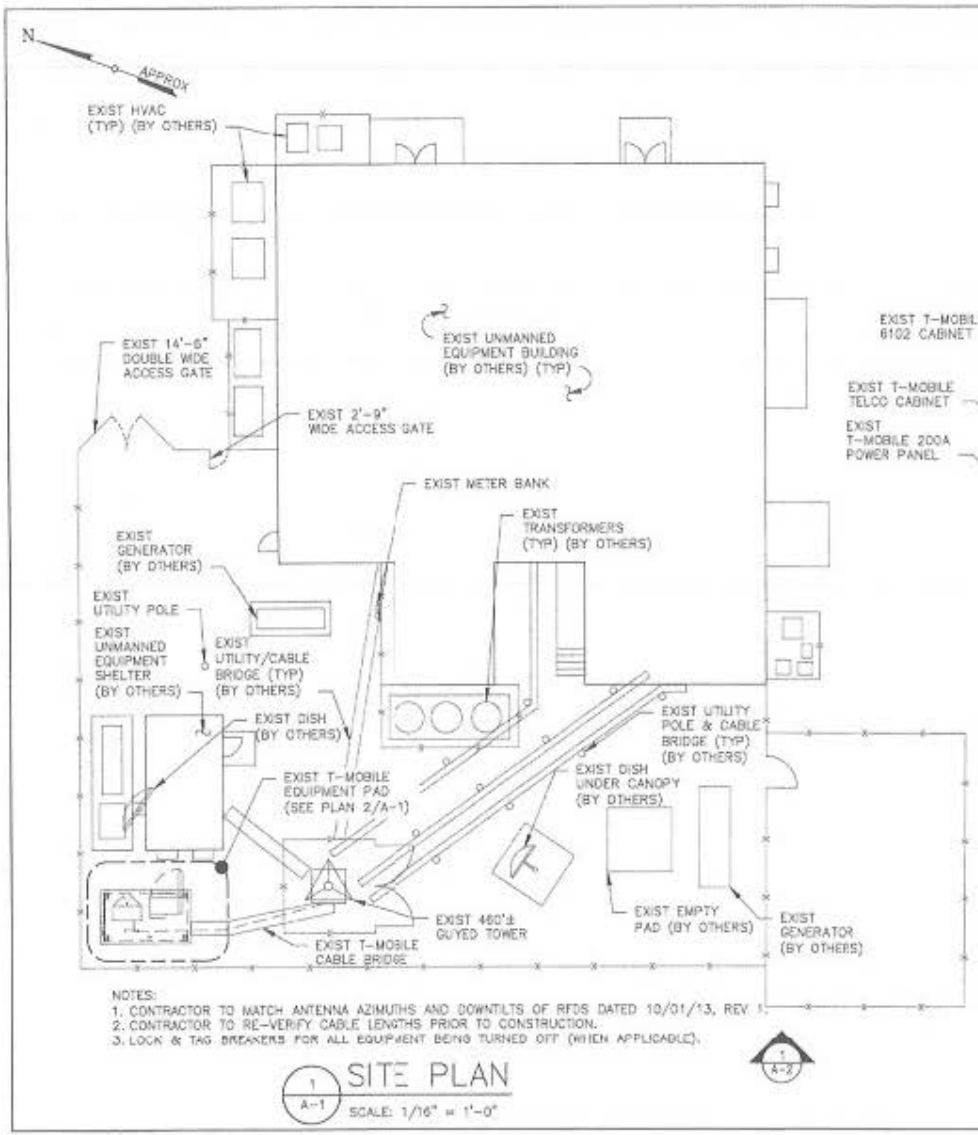
Please feel free to call me with any questions or concerns regarding this matter. Thank you for your consideration.

Respectfully submitted,

By: _____
Eric Dahl, Agent for T-Mobile
edahl@comcast.net
860-227-1975

Attachments

cc: First Selectman Timothy M. Herbst, Town of Trumbull
Crown Castle



TECTONIC
• PLANNING • SURVEYING
• ENGINEERING • CONSTRUCTION MANAGEMENT
TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-0858
Fax: (845) 567-8705

T-Mobile
NORTHEAST LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

APPROVALS

T-MOBILE	
LANDLORD	
RF	
CONSTRUCTION	

PROJECT NUMBER	DESIGNED BY
8648.CT11203B	JG

REV	DATE	REVISION	DRAWN BY
1	06/27/15	FOR COMMENT	MP
2	07/09/15	FOR CONSTRUCTION	MP

DRAWN BY: JMG DATE: 7/9/15

SITE INFORMATION

CT11203B
CT11203B_SHELTON_VIDEOLN
637 VIDEO LANE
SHELTON, CT 06484

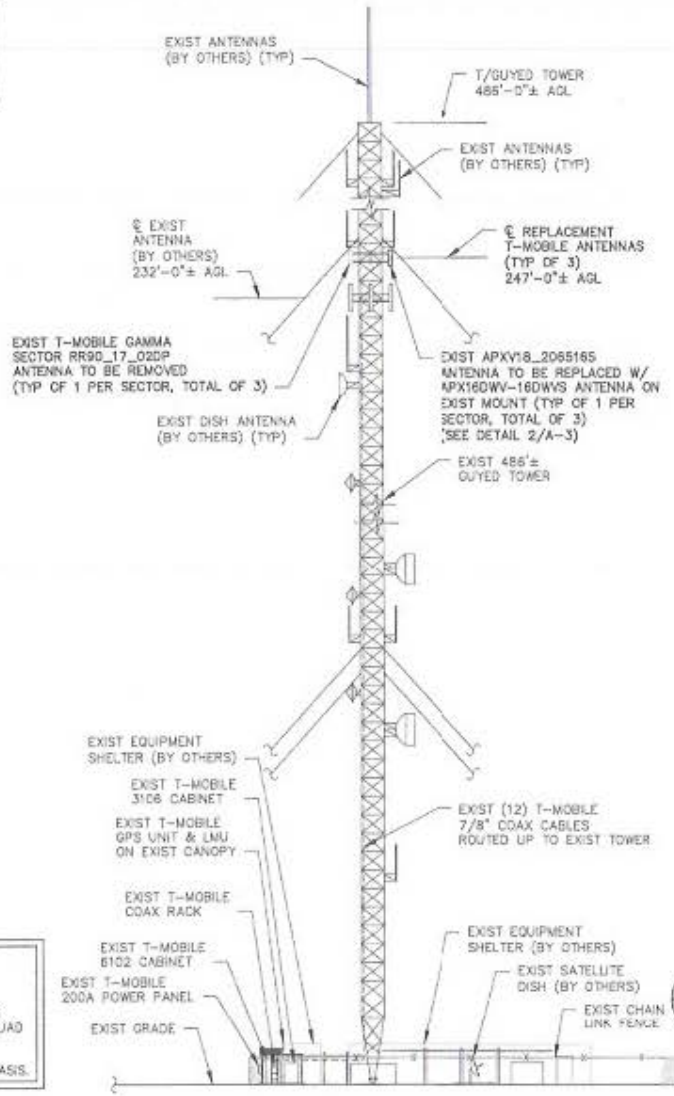
SHEET TITLE

SITE PLAN
& EQUIPMENT PLAN

SHEET NUMBER

A-1

STRUCTURAL NOTE:
THE EXISTING SELF SUPPORT TOWER AND EXISTING MOUNTS SHALL BE STRUCTURALLY ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS)



1 A-2 ELEVATION
SCALE: 1/32" = 1'-0"

ELEVATION NOTE:
ELEVATION OF EXIST GUYED TOWER HAS BEEN ARBITRARILY ASSIGNED AS EL 1008'-0"±. THIS IS APPROXIMATELY 486'-0"± ABOVE GRADE WHICH WAS ESTIMATED AS EL 522'-0"± TAKEN FROM U.S.G.S. QUAD MAP, AND DOES NOT NECESSARILY CORRESPOND TO ACTUAL ELEVATION ABOVE SEA LEVEL. ALL OTHER ELEVATIONS INDICATED WERE DETERMINED ON THIS BASIS.

CONFIGURATION
4B
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & DATA

0 1 2 3
ORIGINAL SIZE IN INCHES

TECTONIC
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T-Mobile
NORTHEAST LLC.
35 GRIFFIN ROAD SOUTH
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APPROVALS
T-MOBILE
LANDLORD
RF
CONSTRUCTION

PROJECT NUMBER	DESIGNED BY
6046.CT11203B	JG

REV	DATE	REVISION	DRAWN BY
1	05/27/15	FOR COMMENT	MP
2	07/09/15	FOR CONSTRUCTION	MP

ISSUED BY	DATE
JMG	7/9/15

SITE INFORMATION
CT11203B
CT11203B_SHELTON_VIDEOLN
637 VIDEO LANE
SHELTON, CT 06484

SHEET TITLE
ELEVATION

SHEET NUMBER
A-2

Date: **July 1, 2015**

Adam Winters
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(980) 209-8238

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: **Structural Modification Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11203
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	873128
	Crown Castle Site Name:	Trumbull
	Crown Castle JDE Job Number:	326953
	Crown Castle Work Order Number:	1080088
	Crown Castle Application Number:	284254 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	25575.34134
Site Data:	**800 Booth Hill Rd., Shelton, Fairfield County, CT 06611** **Latitude *41° 16' 44.26"*, Longitude *-73° 11' 6.40"*** **457 Foot - Guyed Tower**	

Dear Adam Winters,

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Modification Report"** to determine the structural integrity of the above mentioned 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 799167, in accordance with application 284254, revision 0.

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:

LC4.7: Existing + Reserved + Proposed Equipment with Proposed Modifications **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, ASCE 7-05 Minimum Design Loads for Buildings and Other Structures and the 2005 Connecticut State Building Code (2003 International Building Code) with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawings for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* appreciate the opportunity of providing our continuing professional services to you and *Crown Castle*. If you have any questions or need further assistance on this or any other projects please give us a call.

Analysis prepared by: Adam Austin, E.I. / JRM

Respectfully submitted by:

William H. Martin, P.E., S.E.

Electronic Copy

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 457-ft guyed tower designed by Blaw Knox, and mapped by Pinnacle Towers in July of 2003. The original design standard and wind speed are unknown. The tower has been modified multiple times in the past to accommodate additional loading. The proposed modifications designed by TEP on March 5, 2015 were considered in this analysis. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch escalating 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)	Note
247.0	247.0	3	RFS/Celwave	APX16DWV-16DWVS-C w/ Mount Pipe	-	-	-

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)	Note
460.0	476.0	1	Dielectric	TFU-20JDAS	1	4-1/16	1
442.0	452.0	1	Decibel	DB420	1	7/8	1
	448.0	1	Antel	BCD-87077	-	-	2
	447.0	1	RFS Celwave	PD10041-1			
	442.0	1	Tower Mounts	Side Arm Mount [SO 306-3]	-	-	1
439.0	445.0	1	Antel	BCD-87077	-	-	2
	439.0	1	Tower Mounts	Side Arm Mount [SO 306-1]			
419.0	419.0	3	ERI	1183-3CP	1	3	1
393.0	393.0	3	Shively Labs	6014-2	1	1-5/8	1
371.0	371.0	1	ERI	SHP-2AE	1	3	1
366.0	374.0	1	Andrew	DB806E-XT	1	1-5/8	2
	366.0	1	Tower Mounts	Side Arm Mount [SO 306-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
344.0	356.0	1	RFS Celwave	455-6	1	1/2	1
	350.0	1	RFS Celwave	AO9009-3	2	1-5/8	2
		1	Antel	BCD-87077	1	1-1/4	1
	344.0	1	Tower Mounts	Side Arm Mount [SO 306-1]			
		2	Tower Mounts	Side Arm Mount [SO 602-1]			
340.0	352.0	1	RFS Celwave	455-6	1	7/8	1
	340.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
333.0	339.0	1	Andrew	PG1N0F-0090-310	1	1-1/4	1
	333.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
		-	-	-	1	1-5/8	2
328.0	328.0	1	Dielectric	TLP-8M	-	-	2
		1	Tower Mounts	Side Arm Mount [SO 305-1]			
		-	-	-	1	3-1/8	1
326.0	326.0	1	Decibel	DB230-2E	-	-	2
		1	Tower Mounts	Side Arm Mount [SO 602-1]			
322.0	326.0	1	Decibel	DB408	1 1	1/2 1-1/4	1
	322.0	1	Radiowaves	SPD3-5.8			
		1	Tower Mounts	Pipe Mount [PM 601-1]			
		1	Tower Mounts	Side Arm Mount [SO 602-1]			
310.0	312.0	3	Shively Labs	6014-2	1	1-5/8	1
284.0	290.0	1	Decibel	DB810M-XC	1	1-1/4	1
	284.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
		1	Decibel	DB212-1	-	-	2
277.0	283.0	1	RFS Celwave	BMR10-A-B1	1	1-5/8	1
		-	-	-	1	7/8	2
269.0	269.0	1	Maxrad	MYA1503K	-	-	2
		1	Tower Mounts	Side Arm Mount [SO 602-1]			
266.0	271.0	1	Decibel	DB810M-XC	1	1-1/4	1
	266.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
		1	Tower Mounts	Side Arm Mount [SO 602-1]	1	7/8	2
264.0	272.0	1	Telewave	ANT150F6	-	-	3
	264.0	1	Tower Mounts	Side Arm Mount [SO 602-1]	1	7/8	1
255.0	263.0	1	Decibel	DB809DK-Y	1	1-1/4	1
	255.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
251.0	256.0	1	Andrew	PG1N0F-0090-310	-	-	2
	251.0	2	Tower Mounts	Side Arm Mount [SO 602-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
247.0	247.0	3	EMS Wireless	RR90-17-02DP w/ Mount Pipe	-	-	4
		3	RFS Celwave	APXV18-206516S-C-A20 w/ Mount Pipe			
		6	RFS Celwave	ATMAP1412D-1A20	12	7/8	1
		1	Tower Mounts	Sector Mount [SM 302-3]			
230.0	232.0	3	Commscope	HBXX-6516DS-VTM w/ Mount Pipe	2	1-5/8	3
		3	Andrew	SBNHH-1D65B w/ Mount Pipe			
		3	Andrew	LNX-8513DS-VTM w/ Mount Pipe			
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2X60-AWS			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
	230.0	1	Tower Mounts	Sector Mount [SM 407-3]	18	7/8	1
214.0	221.0	1	Decibel	DB810T3E-XT	1	7/8	1
	214.0	1	Tower Mounts	Side Arm Mount [SO 307-1]			
		-	-	-	1	7/8	2
209.0	209.0	1	Mark	P-9A72GN-U	1	7/8	1
		1	Tower Mounts	Pipe Mount [PM 601-1]			
200.0	201.0	1	Gabriel Electronics	DFPD1-52 w/ Mount Pipe	1	3/8	1
188.0	188.0	1	Kathrein	RY-900B	-	-	2
186.0	186.0	1	Decibel	DB495-A	-	-	2
175.0	175.0	1	Radiowaves	SPD4-5.2	1	5/8	1
154.0	154.0	1	Andrew	HPX6-65-P3A	2	EW63	1
146.0	146.0	1	Andrew	PL6-65-PXA	1	EW52	1
		1	Tower Mounts	Pipe Mount [PM 601-1]			
136.0	137.0	1	Channelmaster	CM 4228HD	-	-	2
	136.0	1	Tower Mounts	Pipe Mount [PM 601-1]			
	135.0	1	Channelmaster	CM 4228HD			
133.0	142.0	1	Decibel	DB264-A	2	7/8	1
		1	RFS Celwave	220-5			
	133.0	2	Tower Mounts	Side Arm Mount [SO 202-1]			
117.0	117.0	1	Mark	P-9A48GN-U	1	7/8	1
108.0	108.0	1	RFS Celwave	PD666	1	7/8	1
106.0	106.0	1	Kathrein	PR-950	2	3/8	1
		1	Tower Mounts	Pipe Mount [PM 601-1]			
99.0	99.0	1	Decibel	DB2801RA	1 1	7/8 3/8	1
		1	Radiowaves	SPD2-5.8			
		1	Tower Mounts	Pipe Mount [PM 601-1]			
	98.0	1	Radiowaves	PTP 900-13			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
62.0	68.0	1	Mark	P-9A48CN-U	3	7/8	1
	62.0	1	Scala	PR-950			
	54.0	1	Decibel	DB499-C			
48.0	48.0	-	-	-	1	3/8	2
25.0	25.0	1	Tower Mounts	Side Arm Mount [SO 601-1]	2	5/16	2

Notes:
1) Existing equipment
2) Abandoned equipment; considered in this analysis
3) Reserved equipment
4) Existing equipment; to be removed

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)
Unknown						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Reports	FDH Engineering	1418454	CCISites
Tower Foundation Mapping	Tower Engineering Professionals	1520339	CCISites
Tower Mapping	Pinnacle Towers Inc.	1327906	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	2407618	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	2633757	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	2755396	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	3006419	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	5592838	CCISites
Post-Modification Inspection	Pinnacle Towers Inc.	1956007	CCISites
Post-Modification Inspection	Tower Engineering Professionals	2438393	CCISites
Post-Modification Inspection	Tower Engineering Professionals	3417531	CCISites
Post-Modification Inspection	Tower Engineering Professionals	3442609	CCISites
Previous Structural Analysis	Tower Engineering Professionals	3809860	CCISites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation 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 "Appendix B – Base Level Drawing".
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.
8) Per photos from CCI Sites, the termination and stitch welds of the reinforcing sleeves to the tower legs at 361-ft to 401-ft were assumed to be 3/16" fillet welds by 3" long. The end gaps between the sleeves and the flange were assumed to be 12".
9) The following material grades were assumed:
   a) Leg grade: A7-33
   b) Original Bracing Grade: A7-33
   c) Original Connection bolts: A307
   d) 2L3-1/2x3-1/2x3/8 pull-off: A36
10) TEP could not analyze the base casting. The base casting thickness was not provided. TEP recommends a base casting thickness be obtained prior to modification. TEP assumes the base casting is sufficient for the purposes of this analysis.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	457 - 436	Leg	3	2	-24106	132219	18.2	Pass
T2	436 - 421	Leg	2 3/4	44	-34131	108536	31.4	Pass
T3	421 - 401	Leg	2 3/4	74	-81393	108536	75.0	Pass
T4-T7	401 - 381	Leg	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	Note 1	Note 1	Note 1	82.8	Pass
T8-T11	381 - 361	Leg	3.5" S.R. w/ 3.5 SCH40 Half Pipe	Note 1	Note 1	Note 1	60.1	Pass
T12	361 - 341	Leg	3	191	-103442	164012	63.1	Pass
T13	341 - 321	Leg	3	236	-71829	135863	52.9	Pass
T14	321 - 301	Leg	3	269	-53186	101923	52.2	Pass
T15	301 - 281	Leg	3	302	-79291	135863	58.4	Pass
T16	281 - 261	Leg	3	335	-113028	135863	83.2	Pass
T17	261 - 241	Leg	3	369	-139374	164387	84.8	Pass
T18	241 - 221	Leg	3	414	-109399	135863	80.5	Pass
T19	221 - 201	Leg	3 1/4	447	-83923	124390	67.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T20	201 - 181	Leg	3 1/4	481	-87643	124390	70.5	Pass
T21	181 - 161	Leg	3 1/4	514	-91458	124390	73.5	Pass
T22	161 - 141	Leg	3 1/2	547	-95305	148821	64.0	Pass
T23	141 - 121	Leg	3 1/2	580	-99312	148821	66.7	Pass
T24	121 - 101	Leg	3 1/2	613	-110789	148821	74.4	Pass
T25	101 - 81	Leg	3 1/2	645	-157106	198378	79.2	Pass
T26	81 - 61	Leg	3 1/2	678	-159741	198378	80.5	Pass
T27	61 - 41	Leg	3 1/2	712	-119796	148821	80.5	Pass
T28	41 - 20	Leg	3 1/2	744	-123622	145878	84.7	Pass
T29	20 - 6.70833	Leg	3 1/4	774	-129486	130073	99.5	Pass
T30	6.70833 - 0	Leg	3 1/4	798	-133766	137843	97.0	Pass
T1	457 - 436	Diagonal	L2 1/2x2x1/4	40	-1950	16403	11.9 47.6 (b)	Pass
T2	436 - 421	Diagonal	L2 1/2x2x3/16	53	-2203	12778	17.2	Pass
T3	421 - 401	Diagonal	L2 1/2x2x3/16	86	-6619	12778	51.8 60.2 (b)	Pass
T4	401 - 396	Diagonal	L2 1/2x2x3/16	113	-7009	12778	54.9 63.8 (b)	Pass
T5	396 - 391	Diagonal	L2 1/2x2x3/16	122	-7705	12778	60.3 70.1 (b)	Pass
T6	391 - 386	Diagonal	L2 1/2x2x3/16	134	-9512	12778	74.4	Pass
T7	386 - 381	Diagonal	L2 1/2x2x3/16	146	-7928	12778	62.0 67.1 (b)	Pass
T8	381 - 376	Diagonal	L2 1/2x2x3/16	152	-7493	12778	58.6 81.0 (b)	Pass
T9	376 - 371	Diagonal	L2 1/2x2x3/16	161	-8916	12778	69.8 81.1 (b)	Pass
T10	371 - 366	Diagonal	L2 1/2x2x3/16	176	-7179	12778	56.2 65.3 (b)	Pass
T11	366 - 361	Diagonal	L2 1/2x2x3/16	188	-6891	12778	53.9 62.7 (b)	Pass
T12	361 - 341	Diagonal	L2 1/2x2x3/16	230	-6506	12716	51.2 59.2 (b)	Pass
T13	341 - 321	Diagonal	L2 1/2x2x3/16	266	-4975	12778	38.9 45.3 (b)	Pass
T14	321 - 301	Diagonal	L2 1/2x2x3/16	279	-3195	12778	25.0 61.0 (b)	Pass
T15	301 - 281	Diagonal	L2 1/2x2x3/16	312	-4667	12778	36.5 89.2 (b)	Pass
T16	281 - 261	Diagonal	L2 1/2x2x3/16	345	-6824	12778	53.4 62.1 (b)	Pass
T17	261 - 241	Diagonal	L3x3x1/4	380	-9122	30315	30.1 83.9 (b)	Pass
T18	241 - 221	Diagonal	L3x3x1/4	443	-7957	28608	27.8 72.4 (b)	Pass
T19	221 - 201	Diagonal	L2 1/2x2x3/16	476	-4886	12778	38.2 93.3 (b)	Pass
T20	201 - 181	Diagonal	L2 1/2x2x3/16	509	-3382	12778	26.5 64.6 (b)	Pass
T21	181 - 161	Diagonal	L2 1/2x2x3/16	522	-2312	12778	18.1 44.2 (b)	Pass
T22	161 - 141	Diagonal	L3x3x1/4	554	-5124	28661	17.9 29.8 (b)	Pass
T23	141 - 121	Diagonal	L3x3x1/4	605	-6023	28661	21.0 35.6 (b)	Pass
T24	121 - 101	Diagonal	L2 1/2x2x3/16	632	-4047	12778	31.7 36.8 (b)	Pass
T25	101 - 81	Diagonal	L2 1/2x2x3/16	675	-2080	12778	16.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
							39.7 (b)	
T26	81 - 61	Diagonal	L2 1/2x2x3/16	686	-903	12778	7.1 17.3 (b)	Pass
T27	61 - 41	Diagonal	L2 1/2x2x3/16	719	-2152	12778	16.8 41.1 (b)	Pass
T28	41 - 20	Diagonal	L2 1/2x2x3/16	755	-3486	12584	27.7 72.1 (b)	Pass
T29	20 - 6.70833	Diagonal	L2x2x3/16	779	3693	17930	20.6 70.6 (b)	Pass
T30	6.70833 - 0	Diagonal	L2x2x3/16	806	4179	13451	31.1 91.6 (b)	Pass
T1	457 - 436	Horizontal	L2 1/2x2x1/4	36	973	8147	11.9 18.6 (b)	Pass
T2	436 - 421	Horizontal	L2 1/2x2x1/4	56	1221	27106	4.5 23.3 (b)	Pass
T12	361 - 341	Secondary Horizontal	L2x2x1/4	206	-1792	18022	9.9 22.8 (b)	Pass
T17	261 - 241	Secondary Horizontal	2L3 1/2x3 1/2x3/8x3/8	383	-2414	131047	1.8	Pass
T1	457 - 436	Top Girt	C8x13.75	6	-1	51237	0.2	Pass
T2	436 - 421	Top Girt	L2 1/2x2x1/4	8	786	20334	3.9 15.0 (b)	Pass
T3	421 - 401	Top Girt	L2 1/2x2x1/4	47	572	27106	2.1 10.9 (b)	Pass
T4	401 - 396	Top Girt	L2 1/2x2x1/4	78	-427	10803	4.0 11.0 (b)	Pass
T6	391 - 386	Top Girt	L2 1/2x2x1/4	128	594	27977	2.1	Pass
T10	371 - 366	Top Girt	L2 1/2x2x1/4	172	1128	27977	4.0	Pass
T12	361 - 341	Top Girt	L2 1/2x2x1/4	182	504	27106	1.9 9.6 (b)	Pass
T13	341 - 321	Top Girt	L2 1/2x2x1/4	196	312	27106	1.2 6.0 (b)	Pass
T14	321 - 301	Top Girt	L2 1/2x2x1/4	239	341	27106	1.3 6.5 (b)	Pass
T15	301 - 281	Top Girt	L2 1/2x2x3/16	272	208	15566	1.3 4.0 (b)	Pass
T16	281 - 261	Top Girt	L2 1/2x2x1/4	307	227	20334	1.1 4.3 (b)	Pass
T17	261 - 241	Top Girt	L2 1/2x2x3/16	340	456	15566	2.9 8.7 (b)	Pass
T18	241 - 221	Top Girt	L2 1/2x2x3/16	371	561	15566	3.6 10.7 (b)	Pass
T19	221 - 201	Top Girt	L2 1/2x2x3/16	418	373	15566	2.4 7.1 (b)	Pass
T20	201 - 181	Top Girt	L2 1/2x2x3/16	451	349	15566	2.2 6.7 (b)	Pass
T21	181 - 161	Top Girt	2L3x2x1/4x3/8	483	572	62010	0.9 5.5 (b)	Pass
T22	161 - 141	Top Girt	L2 1/2x2x3/16	517	419	15566	2.7 8.0 (b)	Pass
T23	141 - 121	Top Girt	L2 1/2x2x3/16	550	1178	20749	5.7 22.5 (b)	Pass
T24	121 - 101	Top Girt	L2 1/2x2x3/16	583	-4328	8454	51.2 82.7 (b)	Pass
T25	101 - 81	Top Girt	L2 1/2x2x3/16	615	503	15566	3.2 9.6 (b)	Pass
T26	81 - 61	Top Girt	L2 1/2x2x3/16	648	730	20749	3.5 13.9 (b)	Pass
T27	61 - 41	Top Girt	L2 1/2x2x3/16	681	741	20749	3.6 14.2 (b)	Pass
T28	41 - 20	Top Girt	L2 1/2x2x3/16	714	559	15566	3.6 10.7 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T29	20 - 6.70833	Top Girt	2L2 1/2x2x3/16x1/4	777	9945	31113	32.0 45.2 (b)	Pass
T1	457 - 436	Mid Girt	L2 1/2x2x1/4	13	2384	20334	11.7 45.5 (b)	Pass
T3	421 - 401	Mid Girt	L2 1/2x2x1/4	81	-469	10803	4.3 11.5 (b)	Pass
T12	361 - 341	Mid Girt	L2 1/2x2x1/4	197	295	27106	1.1 5.6 (b)	Pass
T13	341 - 321	Mid Girt	L2 1/2x2x1/4	242	281	27106	1.0 5.4 (b)	Pass
T14	321 - 301	Mid Girt	L2 1/2x2x1/4	275	545	27106	2.0 10.4 (b)	Pass
T15	301 - 281	Mid Girt	L2 1/2x2x3/16	308	207	15566	1.3 4.0 (b)	Pass
T16	281 - 261	Mid Girt	L2 1/2x2x1/4	343	379	27106	1.4 7.2 (b)	Pass
T18	241 - 221	Mid Girt	L2 1/2x2x3/16	420	836	20749	4.0 16.0 (b)	Pass
T19	221 - 201	Mid Girt	L2 1/2x2x3/16	453	492	20749	2.4 9.4 (b)	Pass
T20	201 - 181	Mid Girt	L2 1/2x2x3/16	486	462	20749	2.2 8.8 (b)	Pass
T21	181 - 161	Mid Girt	L2 1/2x2x3/16	519	485	20749	2.3 9.3 (b)	Pass
T22	161 - 141	Mid Girt	L2 1/2x2x3/16	552	497	15566	3.2 9.5 (b)	Pass
T23	141 - 121	Mid Girt	L2 1/2x2x3/16	586	-5403	8454	63.9 70.9 (b)	Pass
T24	121 - 101	Mid Girt	L2 1/2x2x3/16	618	484	15566	3.1 9.2 (b)	Pass
T25	101 - 81	Mid Girt	L2 1/2x2x3/16	651	702	20749	3.4 13.4 (b)	Pass
T26	81 - 61	Mid Girt	L2 1/2x2x3/16	684	735	20749	3.5 14.0 (b)	Pass
T27	61 - 41	Mid Girt	L2 1/2x2x3/16	717	710	20749	3.4 13.6 (b)	Pass
T28	41 - 20	Mid Girt	L2 1/2x2x3/16	747	876	15566	5.6 16.7 (b)	Pass
T1	457 - 436	Guy A@446.5	9/16	838	12673	17500	72.4	Pass
T8	381 - 376	Guy A@381	1 3/8	835	69608	116000	60.0	Pass
T17	261 - 241	Guy A@251	1 1/4	832	51470	96000	53.6	Pass
T23	141 - 121	Guy A@131	11/16	824	15636	25000	62.5	Pass
T1	457 - 436	Guy B@446.5	9/16	837	12918	17500	73.8	Pass
T8	381 - 376	Guy B@381	1 3/8	834	70921	116000	61.1	Pass
T17	261 - 241	Guy B@251	1 1/4	831	52380	96000	54.6	Pass
T23	141 - 121	Guy B@131	11/16	818	16264	25000	65.1	Pass
T1	457 - 436	Guy C@446.5	9/16	836	12546	17500	71.7	Pass
T8	381 - 376	Guy C@381	1 3/8	833	68999	116000	59.5	Pass
T17	261 - 241	Guy C@251	1 1/4	830	51607	96000	53.8	Pass
T23	141 - 121	Guy C@131	11/16	813	15967	25000	63.9	Pass
T8	381 - 376	Top Guy Pull-Off@381	2L3x2x1/4x3/8	142	22350	62816	35.6	Pass
T17	261 - 241	Top Guy Pull-Off@251	2L3 1/2x3 1/2x3/8x3/8	376	20238	143100	14.1	Pass
T23	141 - 121	Torque Arm Top@131	2L3x3x3/16	820	14510	57538	25.2 61.6 (b)	Pass
T23	141 - 121	Torque Arm Bottom@131	2L3x3x3/16	822	-15891	22404	70.9	Pass
							Summary	

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
						Leg (T29)	99.5	Pass
						Diagonal (T19)	93.3	Pass
						Horizontal (T2)	23.3	Pass
						Secondary Horizontal (T12)	22.8	Pass
						Top Girt (T24)	82.7	Pass
						Mid Girt (T23)	70.9	Pass
						Guy A (T1)	72.4	Pass
						Guy B (T1)	73.8	Pass
						Guy C (T1)	71.7	Pass
						Top Guy Pull-Off (T8)	35.6	Pass
						Torque Arm Top (T23)	61.6	Pass
						Torque Arm Bottom (T23)	70.9	Pass
						Bolt Checks	93.5	Pass
						RATING =	**99.5**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Mast Foundation	-	73.2	Pass
1	Guy Anchor Foundation A	-	86.4	Pass
1	Guy Anchor Foundation B	-	87.6	Pass
1	Guy Anchor Foundation C	-	89.6	Pass

Structure Rating (max from all components) =	99.5%

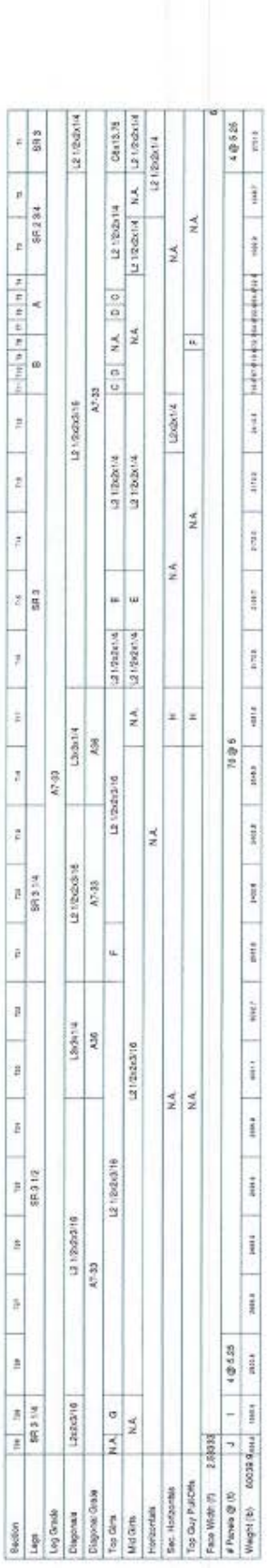
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

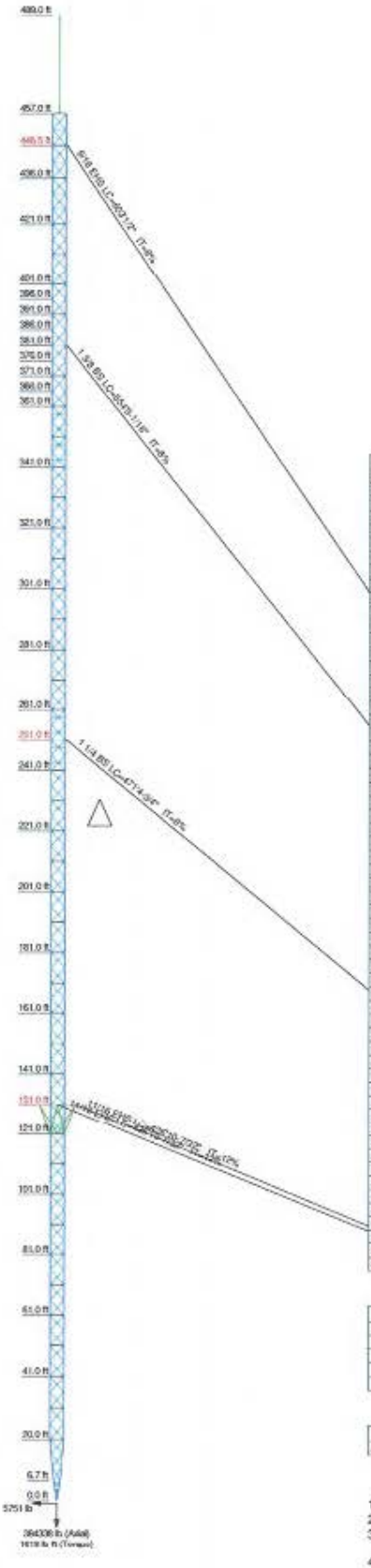
4.1) Recommendations

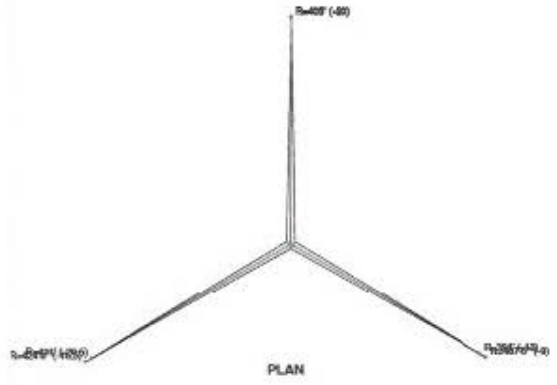
1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The modifications depicted in "Appendix D – Structural Design Drawings" shall be installed and, upon completion, inspected. The tower, its mast and anchor foundations have sufficient capacity to carry the existing, reserved, and proposed loads once the proposed modifications are installed.
3) TEP could not analyze the base casting. The base casting thickness was not provided. TEP recommends a base casting thickness be obtained prior to modification. TEP assumes the base casting is sufficient for the purposes of this analysis.

APPENDIX A

TNXTOWER OUTPUT







DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12" x 3' Beacon	457	2.4" x 5-ft Mount Pipe	247
DB420	442	HBXX-6516DS-VTM w/ Mount Pipe	230
PD10041-1	442	HBXX-6516DS-VTM w/ Mount Pipe	230
BCD-87577	442	HBXX-6516DS-VTM w/ Mount Pipe	230
Side Arm Mount [SO 306-3]	442	SBNHH-1D65B w/ Mount Pipe	230
BCD-87577	439	SBNHH-1D65B w/ Mount Pipe	230
Side Arm Mount [SO 306-1]	439	SBNHH-1D65B w/ Mount Pipe	230
ERI 1383-SCP	419	LNX-6513DS-VTM w/ Mount Pipe	230
6014-2	393	LNX-6514DS-VTM w/ Mount Pipe	230
SHP-2AE	371	LNX-6513DS-VTM w/ Mount Pipe	230
DB806E-XT	366	RRH2560-PCS	230
Side Arm Mount [SO 306-1]	366	RRH2560-PCS	230
BCD-87577	344	RRH2560-PCS	230
495-6	344	RRH2560D-AWS	230
AO3009-3	344	RRH2560D-AWS	230
Side Arm Mount [SO 602-1]	344	RRH2560D-AWS	230
*Side Arm Mount [SO 'XXX-1]	344	DMI-TMAT-RATLIST	990
Side Arm Mount [SO 602-1]	344	2.4" x 6-ft pipe	230
495-6	340	2.4" x 6-ft pipe	230
Side Arm Mount [SO 602-1]	340	2.4" x 6-ft pipe	230
3" x 6" SideLight	333	Sector Mount [SM 407-3]	200
3" x 6" SideLight	333	3" x 6" SideLight	215
3" x 6" SideLight	333	3" x 6" SideLight	215
PG1NDF-0060-310	333	3" x 6" SideLight	215
Side Arm Mount [SO 602-1]	333	DB810TNE-XT	214
TLP-8M	328	Side Arm Mount [SO 307-1]	214
Side Arm Mount [SO 305-1]	328	Pipe Mount [PM 601-1]	209
DB550-2E	326	P-9A72GN-U	209
Side Arm Mount [SO 602-1]	326	DFPD1-62 w/ Mount Pipe	200
DB406	322	HY-9000	188
Side Arm Mount [SO 602-1]	322	DB406-A	186
Pipe Mount [PM 601-1]	322	SPD4-5.2	175
SPD3-5.8	322	HPX6-65-P9A	154
6014-2	310	Pipe Mount [PM 601-1]	148
DB212-1	284	PL8-65-P9A	148
DB810MXC	284	CM-4228	137
Side Arm Mount [SO 602-1]	284	Pipe Mount [PM 601-1]	136
BMR10-A-01	277	Pipe Mount [PM 601-1]	136
MWA1909	269	CM-4228	135
Side Arm Mount [SO 602-1]	269	Side Arm Mount [SO 202-1]	133
DB810MXG	266	Side Arm Mount [SO 202-1]	133
Side Arm Mount [SO 602-1]	266	295-5	133
Side Arm Mount [SO 602-1]	266	DB264-A	133
ANT150H6	264	P-9A48GN-U	117
Side Arm Mount [SO 602-1]	264	3" x 6" SideLight	112
DB809K-Y	256	3" x 6" SideLight	112
Side Arm Mount [SO 602-1]	256	3" x 6" SideLight	112
PG1NDF-0060-310	251	PD606	100
Side Arm Mount [SO 602-1]	251	Pipe Mount [PM 601-1]	100
Side Arm Mount [SO 602-1]	251	PR-950	100
APXV18DWW-16DWVS-C w/ Mount Pipe	247	PSP 600-13 w/ Mount Pipe	99
APXV18DWW-16DWVS-C w/ Mount Pipe	247	Pipe Mount [PM 601-1]	99
APXV18DWW-16DWVS-C w/ Mount Pipe	247	SPD2-5.8	89
(2) ATMAP1412D- IA20	247	2.4" Dia.x 4-ft Mount Pipe	62
(2) ATMAP1412D- IA20	247	Side Arm Mount [SO 202-1]	62
(2) ATMAP1412D- IA20	247	DB809-C	62
Sector Mount [SM 302-3]	247	P-9A69GN-U	62
2.4" x 5-ft Mount Pipe	247	PR-950	62
2.4" x 5-ft Mount Pipe	247	Side Arm Mount [SO 602-1]	25

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	3" S.R. w/ 3.5OD 40 Half Pipe and 3.75 x 5/16 Half Pipe	F	2L2 1/2x2x1/4x3ft
B	3.5" S.R. w/ 3.5 OD 40 Half Pipe	G	2L2 1/2x2x3/16x1/4
C	N.A.	H	2L2 1/2x3 1/2x3/8x3ft
D	L2 1/2x2x1/4	I	3 @ 4.43656
E	L2 1/2x2x3/16	J	3 @ 2.23611

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A7-33	33 ksi	60 ksi	A36	36 ksi	58 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 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. 32' dielectric TFU-33J is included for load transfer only.

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC, 29603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job:	*Trumbull (BU# 873128)*
Project:	*TEP No. 25575.94134*
Client: Crown Castle	Drawn by: awaustin — Appd:
Code: TIA/EIA-222-F	Date: 07/01/15 — Scale: NTS
Path:	Dwg No. E-1

STRUCTURAL DESIGN DRAWINGS

SITE NAME:

TRUMBULL

CROWN CASTLE BU NUMBER:

873128

APPLICATION NUMBER:

284254 REV. 0

SITE ADDRESS:

800 BOOTH HILL ROAD
SHELTON, CT 06611
(FAIRFIELD COUNTY)
N41°16'44.26", W73°11'06.40"

MODIFICATION PROVISIONS

THE MODIFICATIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT COMPLETED BY TOWER ENGINEERING PROFESSIONALS (TEP), JOB#: 25575.341.34 DATED JULY 1, 2015 (REV 0). THIS REPORT IS BASED ON A SPECIFIC ANTENNA LOADING AND COAX CONFIGURATION. SEE THE REPORT FOR THE ANTENNA AND COAX LOADING INFORMATION. ANY OTHER ANTENNA OR COAX CONFIGURATION REQUIRES REVIEW BY TEP. SATISFACTORY COMPLETION OF THE MODIFICATIONS INDICATED ON THESE DRAWINGS WILL RESULT IN THE STRUCTURE MEETING THE REQUIREMENTS OF THE SPECIFICATIONS UNDER WHICH THE STRUCTURAL WAS COMPLETED.

CONTRACTOR SHALL FIELD VERIFY ALL: DIMENSIONS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS PRIOR TO: BIDDING ORDERING MATERIALS, AND CONSTRUCTION.

INDEX OF SHEETS

PROJECT TEAM

CC MODIFICATION PROJECT MANAGER:

NAME	CROWN CASTLE
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CITY, STATE, ZIP	CLIFTON PARK, NY 12065
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PHONE	(518) 373-3510
EMAIL	DAN.VADNEY@CROWNCASTLE.COM

CC MODIFICATION CONSTRUCTION MANAGER:

NAME	CROWN CASTLE
CONTACT	JASON D'AMICO
PHONE	(860) 209-0104
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ENGINEERING FIRM PROJECT MANAGER:

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PHONE	(919) 661-6351
EMAIL	SDD@TEPGROUP.NET

ATTENTION

ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

July 1, 2015

REV	DATE	ISSUED FOR:
0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: ARS | CHECKED BY: JAB

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:	REVISION:
T-1	0

TEP #: 25575.341.34

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
NA	EOR APPROVED SHOP DRAWINGS
NA	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	CONTINUOUS FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	GROUT COMP. STRENGTH (ASTM C942)
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	CONTRACTOR'S CERTIFIED WELD INSPECTION
X	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
X	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	NON-TENSION CONTROLLED BOLT INSPECTION. SEE SHEET N-4 FOR DETAILS.
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION:
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL IN FIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PROJECT INFORMATION:

TRUMBULL
BU #: 873128

800 BOOTH HILL ROAD
SHELTON, CT 06611
(FAIRFIELD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
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www.tepgroup.net

SEAL:

July 1, 2015

REV	DATE	ISSUED FOR:
0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: AKB | CHECKED BY: JRM

SHEET TITLE:

MI CHECKLIST AND NOTES

SHEET NUMBER: **N-1**

REVISION: **0**

TEP #: 25575.34.34

GENERAL NOTES:

1. ALL REFERENCES TO THE OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED CROWN CASTLE OR ITS DESIGNATED REPRESENTATIVE.
2. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE OF CONNECTICUT.
3. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 2005 CONNECTICUT STATE BUILDING CODE.
4. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
5. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
6. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND IT'S COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
7. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHOWN ON THE DRAWINGS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. CONTRACTOR SHALL NOT SCALE CONTRACT DRAWINGS IN LIEU OF FIELD VERIFICATIONS. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND THE OWNER'S ENGINEER. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR IS TO PROCEED WITH THE WORK. THE CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE PROCEDURES.
8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
10. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE RESIDENT LEASING AGENT FOR APPROVAL.
11. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
12. IF APPLICABLE, ALL CONCRETE WORK SHALL COMPLY TO LOCAL CODES AND THE ACI 318-05, "BUILDING REQUIREMENTS FOR STRUCTURAL CONCRETE".
13. 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, THE CONTRACTOR MUST NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY OR CITY) ENGINEER.
14. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
15. ALL TOWER DIMENSIONS SHALL BE VERIFIED WITH THE PLANS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED. THE OWNER SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY GOVERNING AGENCY INSPECTORS.
16. ALL TOWER MODIFICATION WORK SHALL BE IN ACCORDANCE WITH TIA-1019-A STANDARD FOR INSTALLATION, ALTERATION AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

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SEAL:

July 1, 2013

REV	DATE	ISSUED FOR:
0	07-01-13	MODIFICATION DRAWINGS

DRAWN BY: AAD | CHECKED BY: JGM

SHEET TITLE:

PROJECT NOTES I

SHEET NUMBER: **N-2**

REVISION: **0**

TEP #: 25875.34.34

STRUCTURAL STEEL NOTES:

1. THE FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN (ASD), 9TH EDITION.
2. UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   STRUCTURAL STEEL:
   - ANGLE: ASTM A36
   - PIPE/TUBE: ASTM A500-50
   - PLATE: ASTM A36 (SELF SUPPORTING AND GUYED TOWERS)
   - PLATE: ASTM A572-65 (MONOPOLE)

   A. ALL BOLTS, ASTM A325 TYPE I GALVANIZED HIGH STRENGTH BOLTS.
   B. ALL U-BOLTS, ASTM A193 GRADE B7
   C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
3. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ASD, 9TH EDITION.
4. HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER.
5. HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM, A153/A153M OR ASTM A653/A653M, G90, AS APPLICABLE. ADDITIONALLY, ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.
6. REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL. AFTER REPAIR, STEEL SHALL BE REPAINTED TO MATCH EXISTING FINISH (IF APPLICABLE).
7. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS.
8. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS FROM THE SHEAR PLANE.
9. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
10. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.

WELDING NOTES:

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2004 "STRUCTURAL WELDING CODE-STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON FIELD WELDS. A LETTER AND REPORT SHALL BE ISSUED TO THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LETTER AND REPORT TO TOWER ENGINEERING PROFESSIONALS.
4. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND GRIND THE SURFACE OF THE ROD TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
5. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH SECTION 3.5.1 AND TABLE 3.2 OF THE AWS D1.1/D1.1M: 2004.
6. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
7. FOR ALL WELDING, USE 70 KSI LOW HYDROGEN ELECTRODES. ELECTRODES SHALL BE APPROPRIATE FOR THE WELDING POSITION REQUIRED TO MAKE THE JOINT.
8. AFTER FINAL INSPECTION, THE AREA OF THE WELDS, THE INSTALLATION AND ALL SURFACES DAMAGED BY WELDING OR GRINDING SHALL RECEIVE A COLD-GALVANIZED COATING. THIS COATING SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% ± PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MILS.
9. FOR MONOPOLE TOWERS FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY ULTRASONIC TESTING (UT) IN ACCORDANCE WITH AWS D1.1.
10. FOR MONOPOLE TOWERS PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MAGNETIC PARTICLE (MT) IN ACCORDANCE WITH AWS D1.1.

BOLT TIGHTENING PROCEDURE:

1. TIGHTEN CONNECTION BOLTS BY AISC - "TURN OF THE NUT" METHOD, USING THE CHART BELOW.

BOLT LENGTHS UP TO AND INCLUDING FOUR DIA.

½"	BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅝"	BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
¾"	BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅞"	BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
1"	BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIA. BUT NOT EXCEEDING EIGHT DIA.

½"	BOLTS 2.25 TO 4.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅝"	BOLTS 2.75 TO 5.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
¾"	BOLTS 3.25 TO 6.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅞"	BOLTS 3.75 TO 7.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
1"	BOLTS 4.25 TO 8.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:
3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

8.2.1 TURN-OF-THE-NUT TIGHTENING

BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS.

4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.

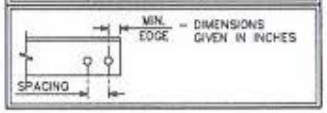
NOMINAL HOLE DIMENSIONS

BOLT DIAMETER	STANDARD HOLE	SHORT SLOT
½	9/16	9/16 X 7/8
⅝	11/16	11/16 X 7/8
¾	13/16	13/16 X 1
⅞	15/16	15/16 X 1⅛
1	1 1/16	1 1/16 X 1 5/16

- DIMENSIONS GIVEN IN INCHES

BOLT EDGE AND SPACING

BOLT DIAMETER	MIN. EDGE	SPACING
½	¾	1½
⅝	1⅛	1⅞
¾	1¼	2¼
⅞	1½	2⅝
1	1¾	3



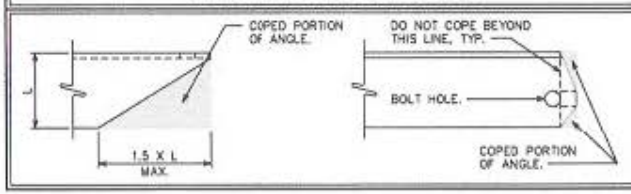
- DIMENSIONS GIVEN IN INCHES

WORKABLE GAGES

LEG	4	3½	3	2½	2	1¼
G	2½	2	1¾	1⅜	1⅛	1

- WORKABLE GAGES GIVEN IN INCHES
- MATCH EXISTING WHEN APPLICABLE

ALLOWABLE ANGLE COPE



PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PROJECT INFORMATION:

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800 BOOTH HILL ROAD
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SEAL:

July 1, 2015

REV	DATE	ISSUED FOR:
0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: ARS | CHECKED BY: JRM

SHEET TITLE:

PROJECT NOTES II

SHEET NUMBER: **N-3**

REVISION: **0**

TEP #: 25575.34134

MODIFICATION SCHEDULE

NO.	MODIFICATION DESCRIPTION	ELEVATION (FT.)	SHEET
1	REINFORCE EXISTING A ANCHOR.	-	S-2, S-3, S-4
2	REPLACE EXISTING GUY WIRE WITH 7/8" EHS GUY WIRE.	131	S-5, S-6, S-7
3	RE-TENSION ALL GUY WIRES AND PERFORM TOWER TWIST AND PLUMB.	-	S-5, S-6, S-7
4	CROWN CASTLE WILL CONTRACT WITH A THIRD PARTY VENDOR TO PERFORM THE MODIFICATION INSPECTION. THE CONTRACTOR SHALL COORDINATE THE INSPECTION WITH THE MODIFICATION INSPECTOR AND CROWN CASTLE PROJECT MANAGER. SEE SHEET N-1 FOR DETAILS.	-	N-1

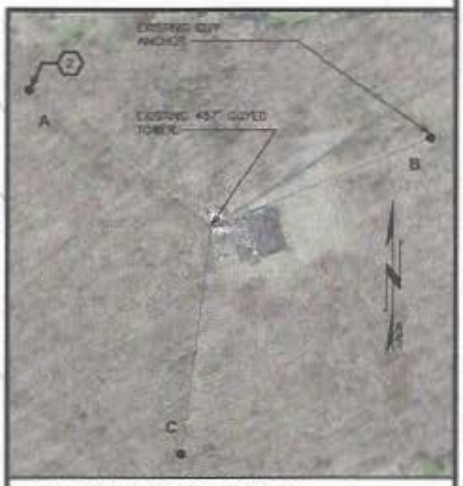
NOTE:

ANTENNAS AND OTHER APPURTENANCES MAY NEED TO BE TEMPORARILY REMOVED OR MOVED DURING THE INSTALLATION OF THE MODIFICATIONS SHOWN ABOVE.

GUY ANCHOR RADII

GUY PATH	GUY ANCHOR RING	
	INNER 1	INNER 2
"A" ANCHOR	405' (-20')	403' (-20')
"B" ANCHOR	394' (-13')	407.5' (-9')
"C" ANCHOR	411' (-20.5')	424.5' (-16.6')

(#) REPRESENT RELATIVE ELEVATIONS. MAST = 0' (REF)



GUY ANCHOR PLAN VIEW

SCALE: N.T.S.

TOWER ELEVATION

SCALE: 1" = 40'

0 40 80

SCALE IN FEET

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SEAL:

REV	DATE	ISSUED FOR
0	07-01-11	MODIFICATION DRAWINGS

DRAWN BY: AAS | CHECKED BY: JSH

SHEET TITLE:

TOWER ELEVATION AND MODIFICATION SCHEDULE

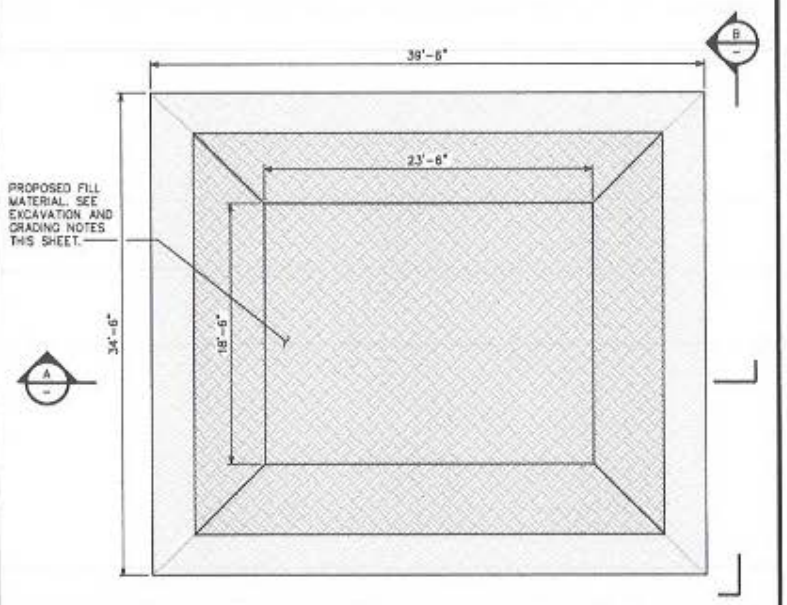
SHEET NUMBER:

S-1

REVISION:

0

TEP Project: 873128.34



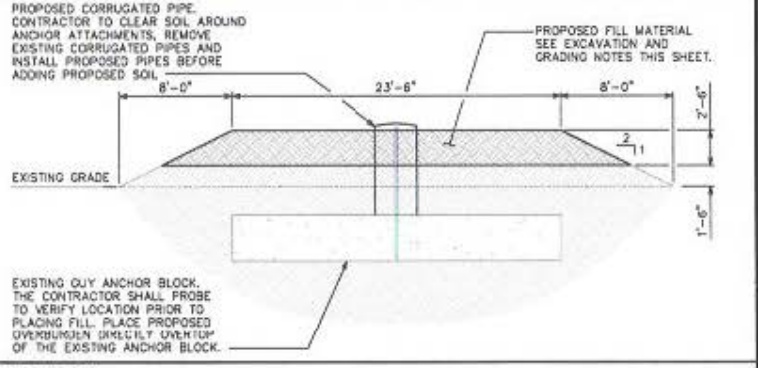
GUY ANCHOR PLAN VIEW (A PATH)

SCALE: 1/8" = 1'-0"

0 8 16
SCALE IN FEET

EXCAVATION & GRADING NOTES:

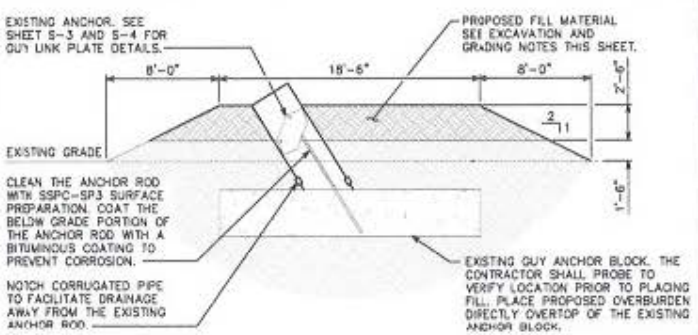
1. ALL CUT AND FILL SLOPES SHALL BE 2:1 MAXIMUM, UNLESS OTHERWISE NOTED.
2. BACKFILLING SHALL:
   A. USE APPROVED MATERIALS CONSISTING OF EARTH, LOAM, SANDY CLAY, SAND, AND GRAVEL OR SOFT SHALE. SOIL SHALL HAVING AT LEAST = 110 PCF, ϕ = 30°.
   B. BE FREE FROM CLODS OR STONES OVER 2½" MAXIMUM DIMENSIONS.
   C. BE PLACED IN LAYERS OF 6" MAXIMUM AND COMPACTED.
3. SITE FILL MATERIAL AND BACKFILL SHALL BE PLACED IN LAYERS, MAXIMUM 6" DEEP BEFORE COMPACTION. EACH LAYER SHALL BE SPRINKLED IF REQUIRED AND COMPACTED BY HAND OR MACHINE TAMPERS TO 90% OF MAXIMUM DRY DENSITY, AT THE OPTIMUM MOISTURE CONTENT ± 5% AS DETERMINED BY ASTM DESIGNATION D-698, UNLESS OTHERWISE APPROVED.
4. REPLACE EXISTING GRAVEL SURFACING ON AREAS FROM WHICH GRAVEL SURFACING SHALL BE REPLACED TO MATCH EXISTING ADJACENT GRAVEL SURFACING AND SHALL BE OF THE SAME THICKNESS. SURFACES OF GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES. EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED IF INJURIOUS AMOUNTS OF EARTH, ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ALL ADDITIONAL GRAVEL RESURFACING MATERIAL AS REQUIRED. BEFORE GRAVEL SURFACING IS REPLACED, SUBGRADE SHALL BE GRADED TO CONFORM TO REQUIRED SUBGRADE ELEVATIONS, AND LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED. DEPRESSIONS IN THE SUBGRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING SHALL NOT BE USED FOR FILLING DEPRESSIONS IN THE SUBGRADE.
5. PROTECT EXISTING GRAVEL SURFACING AND SUBGRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE. USE PLANKING OR OTHER SUITABLE MATERIALS DESIGNED TO SPREAD EQUIPMENT LOADS. REPAIR DAMAGE TO EXISTING GRAVEL SURFACING OR SUBGRADE WHERE SUCH DAMAGE IS DUE TO THE CONTRACTOR'S OPERATIONS. DAMAGED GRAVEL SURFACING SHALL BE RESTORED TO MATCH THE ADJACENT UNDAMAGED GRAVEL SURFACING AND SHALL BE OF THE SAME THICKNESS.
6. ENSURE ANCHOR HEAD IS NOT BURIED BY PROPOSED SOIL OVERLAY, CONTRACTOR SHALL PROVIDE CORRUGATED HALF PIPE AND SWALE IF NECESSARY.
7. EXISTING FENCE TO BE ADJUSTED OUTSIDE EXTENTS OF PROPOSED SOIL OVERLAY.



SECTION A

SCALE: 1/8" = 1'-0"

0 8 16
SCALE IN FEET



SECTION B

SCALE: 1/8" = 1'-0"

0 8 16
SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PROJECT INFORMATION:

TRUMBULL
BU #: 873128

800 BOOTH HILL ROAD
SHELTON, CT 06611
(FAIRFIELD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

July 1, 2015

REV	DATE	ISSUED FOR:
0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: MJH | CHECKED BY: JRM

SHEET TITLE:

GUY ANCHOR REINFORCEMENT DETAILS I

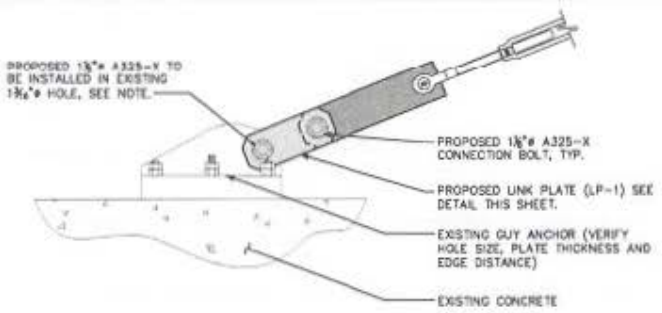
SHEET NUMBER: **S-2**

REVISION: 0

TEP # 25575.34.134

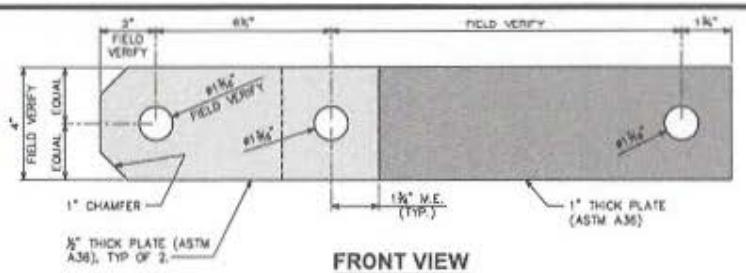
NOTE:

FIELD VERIFY EXISTING GUY ANCHOR PIN HOLE SIZE AND MINIMUM EDGE DISTANCE. CONTACT TEP IF DISCREPANCIES ARE ENCOUNTERED.

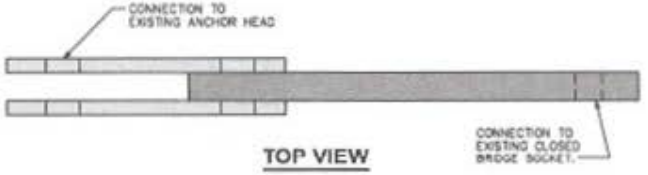


PARTIAL ELEVATION - GUY ANCHOR 1

SCALE: N.T.S.



FRONT VIEW



TOP VIEW

LP-1 DETAIL

SCALE: N.T.S.

PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 01
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PROJECT INFORMATION:

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BU #: 873128

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SEAL:

REV	DATE	ISSUED FOR:
0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: JAB | CHECKED BY: JRM

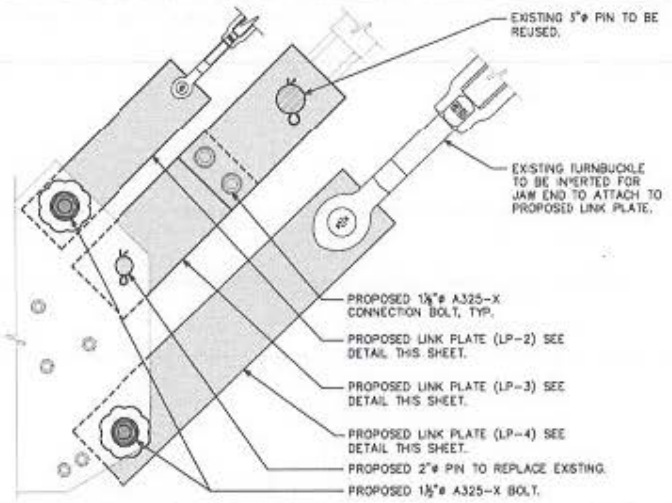
SHEET TITLE:

GUY ANCHOR REINFORCEMENT DETAILS II

SHEET NUMBER: **S-3**

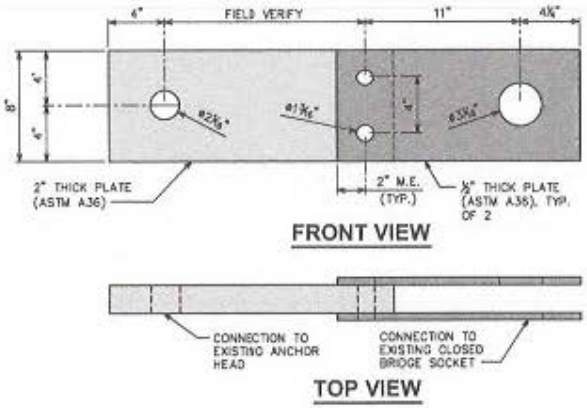
REVISION: **0**

TEP #: 25573.34.24



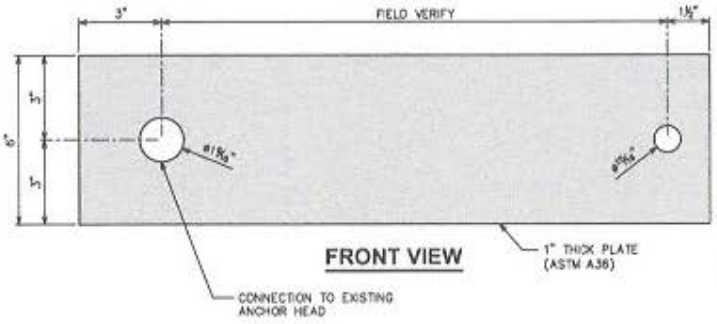
PARTIAL ELEVATION - GUY ANCHOR A

SCALE: N.T.S.



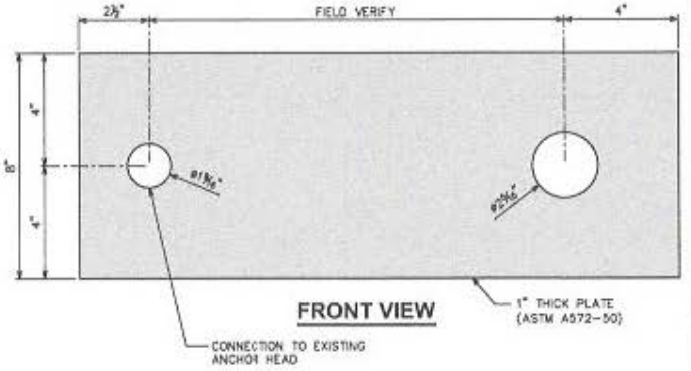
LP-3 DETAIL

SCALE: N.T.S.



LP-2 DETAIL

SCALE: N.T.S.



LP-4 DETAIL

SCALE: N.T.S.

PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PROJECT INFORMATION:

TRUMBULL
BU #: 873128

800 BOOTH HILL ROAD
SHELTON, CT 06611
(FAIRFIELD COUNTY)

PLANS PREPARED BY:

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326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

July 1, 2015

REV	DATE	ISSUED FOR:
0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: JAS | CHECKED BY: JRM

SHEET TITLE:

GUY ANCHOR REINFORCEMENT DETAILS III

SHEET NUMBER: **S-4**

REVISION: 0

TEP #: 25373.34.34

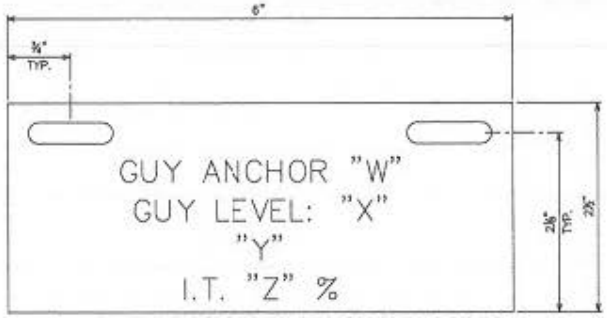
INSTALLING GUYS AND PLUMBING TOWER:

1. THE TOWER IS DESIGNED FOR INITIAL TENSION AS SPECIFIED IN THE ERECTION DRAWINGS. IT IS IMPORTANT THAT THE GUYS BE TENSIONED ACCURATELY TO ASSURE THE STIFFNESS OF THE TOWER.
2. UNEVEN TERRAIN, TEMPERATURE, PLUMBNESS OF TOWER AND WIND ARE FACTORS WHICH AFFECT GUY TENSIONS. IF THE TOWER SITE IS LEVEL AND ANCHOR DISTANCES ARE EQUAL, THE TENSIONS IN ALL THREE GUYS AT A LEVEL WILL BE EQUAL WHEN THE TOWER IS PLUMB. IF THE TERRAIN OF THE TOWER SITE IS UNEVEN, THE GUYS ARE NOT PERFECTLY SYMMETRICAL AND TENSIONS IN GUYS VARY IN THE THREE DIRECTIONS. INITIAL GUY TENSIONS, SHOWN ON THIS SHEET, ARE BASED ON THE RELATIVE ELEVATION SHOWN. THE TOWER SHOULD BE PLUMBED WITH THE SPECIFIED TENSIONS.
3. WIND LOAD ON TOWER AND GUYS CHANGES THE TENSION IN ALL GUYS; THEREFORE, PLUMB THE TOWER IN CALM WEATHER ONLY.
4. WHEN INSTALLING GUYS, ALL THREE PERMANENT GUYS SHOULD BE FASTENED TO THE TOWER FIRST. THEN ALL GUYS SHOULD BE PULLED TO THE ANCHORS SIMULTANEOUSLY.
5. THE ONLY SATISFACTORY WAY OF PLUMBING A TOWER OR OF CHECKING ALIGNMENT OF A TOWER AT A LATER DATE IS WITH THE USE OF THREE (FOUR IF THE TOWER IS FOUR LEGGED) TRANSITS. A TRANSIT IS TO BE SET UP ON EACH LEG AZIMUTH AT THE BASE OF THE TOWER. THE CORRESPONDING TOWER LEG AT THE BASE OF THE TOWER IS USED TO SET THE VERTICAL BASELINE. THE DEFLECTION AT EACH POINT OF INTEREST ON THE TOWER IS MEASURED FROM THIS VERTICAL BASELINE. TWIST & PLUMB TOLERANCES ARE AS SPECIFIED IN THE TIA STANDARD. SEE THE CORRESPONDING STRUCTURAL ANALYSIS FOR THE REVISION ON THE STANDARD REFERENCED.

GUY HARDWARE

GUY WIRE SIZE	TURNBUCKLE		SHACKLE		THIMBLE		END SLEEVE		BIG GRIP	
	SIZE	QTY.	SIZE	QTY.	SIZE	QTY.	SIZE	QTY.	SIZE	QTY.
3/16" EHS	3/8"	–	3/8"	–	5/16"	–	3/16"	–	3/8"	–
1/4" EHS	1/2"	–	5/8"	–	5/8"	–	1/4"	–	1/4"	–
5/16" EHS	5/8"	–	1/2"	–	3/16"	–	5/16"	–	5/16"	–
3/8" EHS	5/8"	–	1/2"	–	1/2"	–	3/8"	–	1/8"	–
7/16" EHS	3/4"	–	5/8"	–	5/16"	–	7/16"	–	7/16"	–
1/2" EHS	5/8"	–	5/8"	–	5/8"	–	1/2"	–	1/2"	–
9/16" EHS	5/8"	–	3/4"	–	5/8"	–	9/16"	–	9/16"	–
5/8" EHS	1"	–	3/4"	–	3/4"	–	5/8"	–	5/8"	–
7/16" EHS	1"	6*	5/8"	6	5/8"	12	7/16"	12	7/16"	12
3/4" EHS	1 1/4"	–	7/8"	–	7/8"	–	3/4"	–	3/4"	–
7/8" EHS	1 1/2"	–	1"	–	1"	–	7/8"	–	7/8"	–
1" BS	1 3/4"	–	1 1/4"	–	–	–	1"	–	1"	–

NOTE:
CONTRACTOR MAY REUSE EXISTING TURNBUCKLES IF THEY ARE IN GOOD CONDITION.



STAINLESS STEEL TENSION PLACARD

MATERIAL: 12 Ga STAINLESS STEEL

TEXT: 1/4" HIGH, CENTERED HORIZONTALLY AND EQUALLY SPACED VERTICALLY ON PLATE

GUY WIRE TENSION PLACARD TEXT CHART

"W"	"X"	"Y"	"Z"	QUANTITY
A,B,C	131'	11/16" EHS	12	3
A,B,C	251'	1 1/4" BS	8	3
A,B,C	381'	1 3/8" BS	8	3
A,B,C	446.5'	9/16" EHS	8	3

1. EACH TENSION PLACARD INCLUDES (2) STAINLESS STEEL HOSE CLAMPS TO FIT GUY WIRE.
2. INSTALL PLACARD TO THE GUY WIRE OR GUY WIRE TURNBUCKLE.
3. ONLY (1) REQUIRED PER SET OF GUY WIRES AT EACH TORQUE ARM LEVEL.
4. A RUBBERIZED PLACARD AND BLACK ULTRA-VIOLET RESISTANT TIE WRAPS ARE CONSIDERED AN APPROVED ALTERNATIVE TO THE STAINLESS STEEL PLACARDS AND STAINLESS STEEL HOSE CLAMPS.

PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PROJECT INFORMATION:

TRUMBULL
BU #: 873128

800 BOOTH HILL ROAD
SHELTON, CT 06611
(FAIRFIELD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

July 1, 2013

REV	DATE	ISSUED FOR:
0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: AR5 | CHECKED BY: JRM

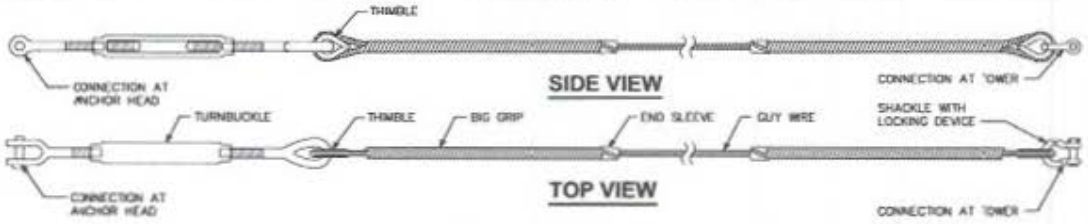
SHEET TITLE:

GUY INSTALLATION DETAILS I

SHEET NUMBER: **S-5**

REVISION: 0

TEP #: 23575.34.34



GUY WIRE PROPERTIES

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
131	EHS	A	11/16	6.00	12%	19000	0.994	425.97	403.00	0.0000	-20.00	100%
		B	11/16	6.00	12%	19000	0.994	426.45	407.50	0.0000	-9.00	100%
		C	11/16	6.00	12%	19000	0.994	444.96	424.50	0.0000	-16.50	100%
251	BS	A	1 1/4	15.36	8%	24000	3.280	484.23	405.00	0.0000	-20.00	100%
		B	1 1/4	15.36	8%	24000	3.280	471.19	394.00	0.0000	-13.00	100%
		C	1 1/4	15.36	8%	24000	3.280	489.49	411.00	0.0000	-20.50	100%
381	BS	A	1 3/8	18.56	8%	24000	3.970	567.23	405.00	0.0000	-20.00	100%
		B	1 3/8	18.56	8%	24000	3.970	554.51	394.00	0.0000	-13.00	100%
		C	1 3/8	18.56	8%	24000	3.970	571.85	411.00	0.0000	-20.50	100%
446.5	EHS	A	9/16	2.80	8%	21000	0.671	615.28	405.00	0.0000	-20.00	100%
		B	9/16	2.80	8%	21000	0.671	602.80	394.00	0.0000	-13.00	100%
		C	9/16	2.80	8%	21000	0.671	619.59	411.00	0.0000	-20.50	100%

GUY TENSIONING INFORMATION

Guy Elevation ft		H ft	V ft	Temperature at Time Of Tensioning: 0 F Initial Tension K	0 F Intercept ft	20 F Initial Tension K	20 F Intercept ft	40 F Initial Tension K	40 F Intercept ft	60 F Initial Tension K	60 F Intercept ft	80 F Initial Tension K	80 F Intercept ft	100 F Initial Tension K	100 F Intercept ft	120 F Initial Tension K	120 F Intercept ft
131	A	398.24	151.00	7.504	11.91	6.988	12.79	6.480	13.78	6.000	14.87	5.547	16.07	5.123	17.38	4.732	18.80
	B	403.24	140.00	7.529	11.91	6.998	12.80	6.487	13.80	6.000	14.91	5.541	16.14	5.113	17.48	4.718	18.92
	C	420.24	147.50	7.499	13.01	6.978	13.97	6.477	15.04	6.000	16.23	5.552	17.52	5.134	18.93	4.751	20.44
251	A	401.54	271.00	19.121	19.67	17.766	21.13	16.511	22.70	15.360	24.38	14.311	26.19	13.357	27.89	12.548	29.73
	B	390.54	284.00	19.201	18.56	17.819	19.97	16.537	21.48	15.360	23.09	14.289	24.77	13.321	26.52	12.454	28.32
	C	407.54	273.50	19.107	20.11	17.756	21.61	16.506	23.21	15.360	24.90	14.319	26.86	13.380	28.48	12.537	30.33
381	A	401.54	401.00	21.808	28.28	20.660	29.79	19.577	31.38	18.560	33.04	17.610	34.75	16.726	36.52	15.906	38.32
	B	390.54	394.00	21.845	26.99	20.686	28.46	19.590	29.99	18.560	31.60	17.597	33.26	16.700	34.97	15.868	36.73
	C	407.54	401.50	21.815	28.73	20.663	30.28	19.578	31.89	18.560	33.58	17.610	35.32	16.727	37.11	15.909	38.93
446.5	A	401.54	466.50	3.176	38.15	3.044	39.73	2.919	41.36	2.800	43.02	2.682	44.83	2.578	46.55	2.480	48.39
	B	390.54	459.50	3.179	36.60	3.046	38.13	2.920	39.71	2.800	41.33	2.680	43.09	2.574	44.77	2.475	46.48
	C	407.54	467.00	3.177	38.67	3.044	40.28	2.919	41.93	2.800	43.63	2.682	45.46	2.578	47.20	2.480	48.96

1. THE CONTRACTOR SHALL CLEARLY LABEL ALL GUY WIRES AT GUY ANCHORS INDICATING THE PERCENT BREAKING STRENGTH THE GUY WIRES ARE TENSIONED. SEE SHEET S-5 FOR PREFERRED LABELING PROCEDURE.
2. SEE SHEET S-5 FOR THE NECESSARY GUY HARDWARE TO COMPLETE THE INSTALLATION. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING, FABRICATION, & ERECTION OF ANY MATERIALS. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY GUYING THE TOWER DURING MODIFICATION WORK.
3. SEE SHEET S-7 FOR TYPICAL GUY GROUNDING DETAILS.
4. GIVEN LENGTHS (L_{GU}) ARE ACTUAL GUY WIRE LENGTHS. CONTRACTOR IS RESPONSIBLE FOR DETERMINING AMOUNT OF GUY WIRE TO ORDER.
5. THE MAXIMUM DEVIATION FROM THE DESIGN INITIAL TENSION SHALL BE ±10% FOR GUYS UP TO AND INCLUDING 1" DIAMETER AND ±5% FOR GUYS GREATER THAN 1" DIAMETER, OF THE SPECIFIED DESIGN INITIAL TENSION AT AN ANCHORAGE, CORRECTED FOR THE AMBIENT TEMPERATURE.

PLANS PREPARED FOR:
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 01
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3010

PROJECT INFORMATION:
TRUMBULL
BU #: 873128
800 BOOTH HILL ROAD
SHELTON, CT 06611
(FAIRFIELD COUNTY)

PLANS PREPARED BY:
TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.towerpro.net

SEAL:
WILLIAM H. HARTMAN
PROFESSIONAL ENGINEER
LICENSED
STATE OF CONNECTICUT
JULY 2017

REV	DATE	ISSUED FOR
0	07-07-17	MODIFICATION DRAWINGS

DRAWN BY: AKD | CHECKED BY: JRM

SHEET TITLE:
GUY INSTALLATION DETAILS II

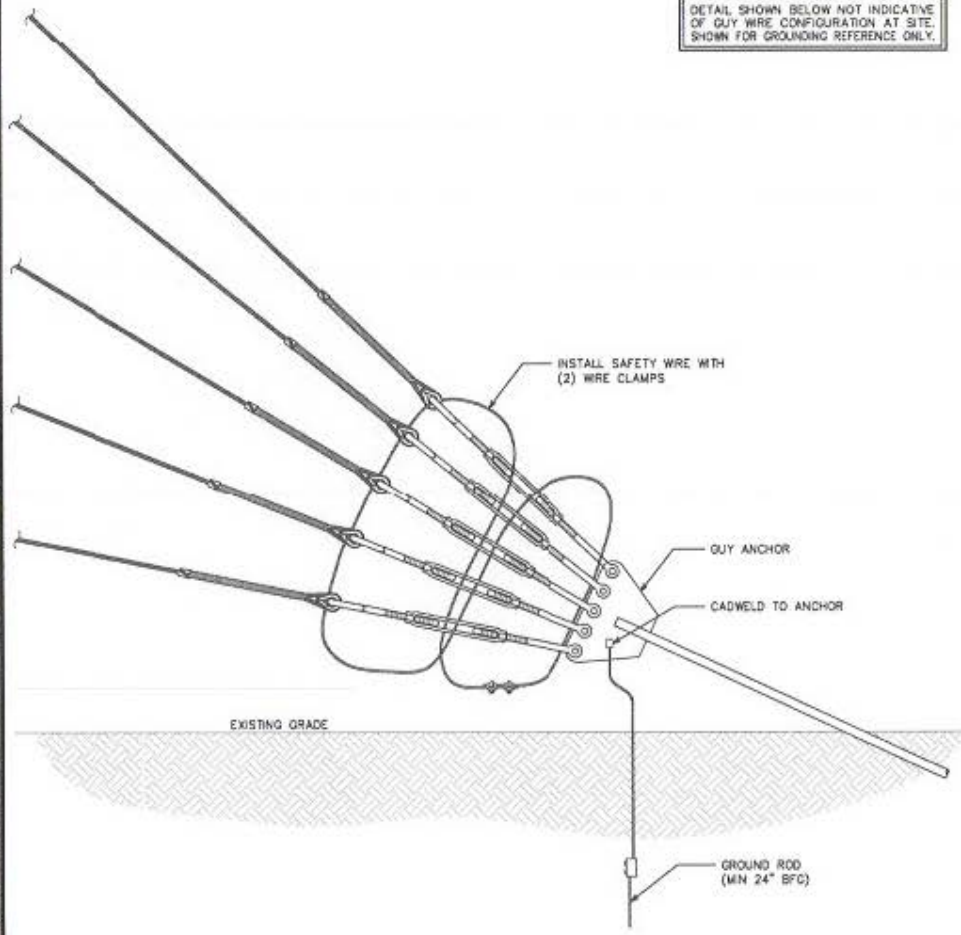
SHEET NUMBER: S-6
REVISION: 0
TEP #: 0197534.34

GUY ANCHOR CONFIGURATION (A PATH)

GUY ANCHOR CONFIGURATION (B & C PATH)

ATTENTION

DETAIL SHOWN BELOW NOT INDICATIVE OF GUY WIRE CONFIGURATION AT SITE. SHOWN FOR GROUNDING REFERENCE ONLY.



GUY ANCHOR GROUNDING DETAILS

SCALE: N.T.S.

PLANS PREPARED FOR:

CROWN CASTLE

3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (518) 373-3510

PROJECT INFORMATION:

TRUMBULL
BU #: 873128

800 BOOTH HILL ROAD
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SEAL:

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0	07-01-15	MODIFICATION DRAWINGS

DRAWN BY: MJH | CHECKED BY: JRM

SHEET TITLE:

GUY ANCHOR GROUNDING DETAILS

SHEET NUMBER: **S-7**

REVISION: 0

TEP#: 25575.34.34

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11203B

Shelton_Video Ln
637 Video Lane
Shelton, CT 06484

July 15, 2015

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	41.70 %

21 B Street Burlington, MA 01803 Tel: (781) 273.2500 Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

July 15, 2015

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11203B – Shelton_Video Ln**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **637 Video Lane, Shelton, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for both the PCS and AWS bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **637 Video Lane, Shelton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-C-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-C-A20** has a maximum gain of **16.3 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is **247 feet** above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWVS-C-A20	Make / Model:	RFS APX16DWV-16DWVS-C-A20	Make / Model:	RFS APX16DWV-16DWVS-C-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	247	Height (AGL):	247	Height (AGL):	247
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	10,237.91	ERP (W):	10,237.91	ERP (W):	10,237.91
Antenna A1 MPE%	0.63	Antenna B1 MPE%	0.63	Antenna C1 MPE%	0.63

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**1.90**
Prior Measurements	25.40 %
Verizon Wireless	9.50 %
Marcus	1.43 %
Light Squared	3.47 %
Site Total MPE %:	**41.70 %**

T-Mobile Sector 1 Total:	0.63 %
T-Mobile Sector 2 Total:	0.63 %
T-Mobile Sector 3 Total:	0.63 %
Site Total:	41.70 %

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Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	0.63 %
Sector 2:	0.63 %
Sector 3 :	0.63 %
T-Mobile Total:	1.90 %
Site Total:	41.70 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **41.70%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

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