Filed by:
G. Scott Shepherd, Sr. Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3807 - GShepherd@sbasite.com

December 30, 2020

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

Notice of Exempt Modification
175 South Main Street, Marlborough, CT 06447
Latitude: 41.615961
Longitude: -72.436427
T-Mobile #: CT11253C_L600

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 130-foot level of the existing 170' Monopole at 175 South Main Street in Marlborough, CT. The tower is owned by SBA Towers IV, LLC. The property is owned by Fallow Crossing LLC. T-Mobile intends to remove two (2) antennas and replace with two (2) new L600/L700/1900 MHz antennas. The total number of antennas will remain at nine (9) and will be installed at the 130-foot level of the tower.

The New antennas support 5G services and would be installed at the 130-foot level.

> **Please note:** Per the Connecticut Siting Council Website: CSC COVID 19 Guidelines.
> *In order to prevent the spread of Coronavirus and protect the health and safety of our members and staff, as of March 18, 2020, the Connecticut Siting Council shall convert to full remote operations until March 30, 2020. Please be advised that during this time period, all hard copy filing requirements will be waived in lieu of an electronic filing. Please also be advised that the March 26, 2020 regular meeting shall be held via teleconference. The Council's website is not equipped with an on-line filing fee receipt service. Therefore, filing fees and/or direct cost charges associated with matters received electronically during the above-mentioned time period will be directly invoiced at a later date.*

Planned Modifications:

TOWER

Remove:

- N/A

Remove and Replace:

- (2) RFS APX18-206517S-C-ACU (remove) – (2) RFS APXVAARR24_43-U-NA20 (replace)
- (2) Remec G20045A1 TMA (remove) – (2) Ericsson KRY 112 489/2 TMA (replace)

Install New:

- (2) Ericsson KRY 112 144/1 TMA
- (2) Ericsson Radio 4449 B71+B12 RRU
- (1) 1-5/8" Fiber

Existing Equipment to Remain:

- (7) RFS APX18-206517S-C-A20 antenna
- (4) 1-5/8" Coax

Entitlements:

- (4) 1-5/8" Coax

GROUND

Install New:

- Equipment inside existing 6201 Equipment cabinet

This facility was approved by the Council under Docket 256 on March 4, 2004. Approval was for a monopole tower to accommodate T-Mobile, ATT, Cellco and other public and private entities. It was not to exceed 170' including appurtenances and to hold panel antennas using flush or t-arm configurations. The Certificate Holder was to provide a recalculated RF report when a change in operation caused a change in power density levels. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility was to be brought into compliance with such standards. The Certificate Holder was to permit public or private entities to share space on the proposed tower for fair consideration, or to provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder was to provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas weree compatible with the structural integrity of the tower. And any obsolete antennas were to be removed within 60 days. There were no further post construction stipulations set. On April 18, 2005, Council further approved the use of low profile antenna platforms per letter to Keith E. Coppins, Optasite. The use of platforms for all carriers was later confirmed by Council on June 12, 2018. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §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 Greg Lowrey, First Selectman for the Town of Marlborough, and Peter Hughes, Director of Planning and Development, as well as to the property owner. (Separate notice is not being sent to the tower owner, as it belongs to SBA.)

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 an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

G. Scott Shepherd
Sr. Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3804 + T
508.366.2610 + F
508.868.6000 + C
GShepherd@sbasite.com

Attachments
cc: Greg Lowrey, First Selectman / with attachments
Town of Marlborough, 26 North Main Street, Marlborough, CT 06447
Peter Hughes, Director of Planning & Development / with attachments
Town of Marlborough, 26 North Main Street, Marlborough, CT 06447
Fallow Crossing LLC c/o Donna Daigle / with attachments
11 Valli Drive, East Hampton, CT 06424 (SBA Address on file – Town Property Cards lists SBA Corporate office)

Exhibit List

Exhibit 1	Check Copy	X To Be Invoiced by CSC per Covid 19 Guidelines
Exhibit 2	Notification Receipts	x
Exhibit 3	Property Card	x
Exhibit 4	Property Map	x
Exhibit 5	Original Zoning Approval	CSC Docket No. 256 3/4/14
Exhibit 6	Construction Drawings	Chappell Engineering 12/23/20
Exhibit 7	Structural Analysis	TES dated 7/15/19
Exhibit 8	Mount Analysis	TES dated 7/3/19
Exhibit 9	EME Report	Transcom Engineering 6/19/19

ORIGIN ID:BBFA (508) 251-0720
KRI PELLETIER
SBA NETWORK SERVICES INC
134 FLANDERS RD.
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 30DEC20
ACTWGT: 1.00 LB
CAD: 105843304/INET4280

BILL SENDER

TO **MELANIE A. BACHMAN**
CONNECTICUT SITING COUNCIL
EXECUTIVE DIRECTOR
TEN FRANKLIN SQUARE
NEW BRITAIN CT 06051
(508) 251-0720 X 302

REF: 10-56-92009-6089
INV:
PO:
DEPT:

56BJ2/9196/B766

J202020071401uv

FedEx Express

THU - 31 DEC 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7725 0241 7230**

EB BDLA

06051
BDL
CT-US

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID:BBFA (508) 251-0720
KRI PELLETIER
SBA NETWORK SERVICES INC
134 FLANDERS RD.
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 30DEC20
ACTWGT: 1.00 LB
CAD: 105843304/INET4280

BILL SENDER

TO **GREG LOWREY, FIRST SELECTMAN**
TOWN OF MARLBOROUGH
26 NORTH MAIN ST.

MARLBOROUGH CT 06447
(508) 251-0720 X 3804
INV:
PO:
REF: 10-56-92009-6089
DEPT:

56BJ2/9196/B766

J202020071401uv

FedEx Express

THU - 31 DEC 12:00P
PRIORITY OVERNIGHT

TRK# 0201 **7725 0239 0012**

EB SKKA

06447
BDL
CT-US

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ORIGIN ID:BBFA (508) 251-0720
KRI PELLETIER
SBA NETWORK SERVICES INC
134 FLANDERS RD.
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 30DEC20
ACTWGT: 1.00 LB
CAD: 105843304/INET4280

BILL SENDER

TO **PETER HUGHES**
TOWN OF MARLBOROUGH
DIRECTOR OF PLANNING AND DEV.
26 NORTH MAIN STREET
MARLBOROUGH CT 06447
(508) 251-0720 X 3804

REF: 10-56-92009-6089
INV:
PO:
DEPT:

J202020071401uv

FedEx Express

56BJ2/9196/B766

THU - 31 DEC 12:00P
PRIORITY OVERNIGHT

TRK# 0201 **7725 0239 9031**

EB SKKA

06447
BDL
CT-US

After printing this label:
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KRI PELLETIER
SBA NETWORK SERVICES INC
134 FLANDERS RD.
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 30DEC20
ACTWGT: 1.00 LB
CAD: 105843304/INET4280

BILL SENDER

TO C/O DONNA DAIGLE
FALLOW CROSSING LLC
11 VALLI DRIVE
EAST HAMPTON CT 06424
(508) 251-0720 X 3804

REF: 10-56-92009-6089
INV:
PO:
DEPT:

56BJ2/9196/B766

J202020071401uv

FedEx Express

THU - 31 DEC 12:00P
PRIORITY OVERNIGHT

TRK# 0201 7725 0240 4777

EB SKKA

06424
BDL
CT-US

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EXHIBIT 1

Normally, Exhibit 1 would contain a copy of the check for the filing fee

EXHIBIT 2

EXHIBIT 3

Property Location: 175 SO MAIN ST | **MAP ID:** 9/ 28A/ 28T/ / | **Bldg Name:** | **State Use:** 201

Vision ID: 327 | **Account #** 1286T | **Bldg #:** 1 of 3 | **Sec #:** 1 of 1 | **Card** 1 of 3 | **Print Date:** 05/12/2016 19:24

CURRENT OWNER

FALLOW CROSSING LLC
C/O SBA INFRASTRUCTURE LLC
8051 CONGRESS AVE
ATTENTION: TAX DEPARTMENT
BOCA RATON, FL 33487-1307
Additional Owners:

TOPO.	UTILITIES	STRT./ROAD	LOCATION
2 Above Street		1 Paved	

SUPPLEMENTAL DATA

Other ID:		EXEMPT CO	
Census	5241000	Lake Area	
Dev. Lot	3	Photo Retake	
Dev. Map		CB Letter	
GIS ID: 9/28A/28T		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
Comm Land	2-1	56,800	39,760
Comm Bldg	2-2	57,000	39,900
Comm OB	2-5	658,000	460,600
	Total	771,800	540,260

6079
MARLBOROUGH, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
FALLOW CROSSING LLC	146/ 84	05/08/2002	U	V	0	29
DAIGLE DONNA M	145/ 919	04/26/2002	U		0	29
DAIGLE ALBERT W	119/ 334	08/14/1997	Q		11,500	XX

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2015	2-1	39,760	2014	2-1	41,300	2014	2-1	41,300
2015	2-2	39,900	2014	2-2	40,810	2014	2-2	40,810
2015	2-5	460,600	2014	2-5	460,320	2014	2-5	460,320
	Total:	540,260		Total:	542,430		Total:	542,430

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	654,400
Appraised Land Value (Bldg)	56,800
Special Land Value	0
Total Appraised Parcel Value	771,800
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	**771,800**

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

CRUSHED STONE AREA 60X75 FENCED IN
2008-SPLIT BILL/FENCE
FULLSITE 100X100/FALL DOWN AREA 170 X170
CABINENTS+PAD=SPRINT
12X30 BLDG = VERIZON
11X20 BLDG= CINGULAR
CELL TOWER VALUE = $2000 MONTH LESS
25% EXPENSES = $18,000 CAPPED AT 11% =
$163,600 PER SITE X 4 SITES = $654,400
10/2012 UPDATE-SBA DOES NOT OWN 8' FENCE

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
1598	01/24/2014	BP		0	07/29/2015	100		4 X 8 CONCRETE PAD
956	09/25/2012	BP		0	07/29/2015	100		REPLACE 12 EXISTING
04-582	02/21/2006	NC	New Construct	0	02/21/2006	100	12/20/2006	CO NEW CONST
05-512	11/01/2005		ANTENNA	40,000		100		TELECOMUNICATION

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
07/29/2015			LM	00	Meas. and List
01/19/2006			VA	48	Final Assmt Notice-Reval
11/18/2005			VA	47	1st Assmt Notice-Reval
09/21/2005			AJ	12	Field Review
03/07/2005			TH	99	Vacant Land

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing: Spec Use	Special Pricing: Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
1	201	Comm Land	R	E			0.23	AC	76,000.00	3.2494	5	1.0000	1.00	50	1.00	CELL TOWER SITE			1.00		56,800

Total Card Land Units: 0.23 AC | **Parcel Total Land Area:** 0.23 AC | **Total Land Value:** 56,800

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Model	00		Vacant

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
201	Comm Land	100

COST/MARKET VALUATION

Adj. Base Rate:	0.00
Replace Cost	0
AYB	
Dep Code	
Remodel Rating	
Year Remodeled	
Dep %	
Functional Obslnc	
External Obslnc	
Cost Trend Factor	1
Condition	
% Complete	
Overall % Cond	
Apprais Val	
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
CELL	Cell Tower			L	4	163,600.00	2011		0		100	654,400

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
	Ttl. Gross Liv/Lease Area:	0	0	0		

Property Location: 175 SO MAIN ST | **MAP ID:** 9/ 28A/ 28T/ / | **Bldg Name:** | **State Use:** 201

Vision ID: 327 | **Account #** 1286T | **Bldg #:** 2 of 3 | **Sec #:** 1 of 1 | **Card** 2 of 3 | **Print Date:** 05/12/2016 19:24

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
FALLOW CROSSING LLC	2 Above Street		1 Paved	
C/O SBA INFRASTRUCTURE LLC				
8051 CONGRESS AVE				
ATTENTION: TAX DEPARTMENT				
BOCA RATON, FL 33487-1307				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:		EXEMPT CO	
Census	5241000	Lake Area	
Dev. Lot	3	Photo Retake	
Dev. Map		CB Letter	
GIS ID: 9/28A/28T		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
Comm Land	2-1	56,800	39,760
Comm Bldg	2-2	57,000	39,900
Comm OB	2-5	658,000	460,600
	Total	771,800	540,260

6079
MARLBOROUGH, CT

VISION

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DAIGLE ALBERT W	119/ 334	08/14/1997	Q		11,500	XX

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2015	2-1	39,760	2014	2-1	41,300	2014	2-1	41,300
2015	2-2	39,900	2014	2-2	40,810	2014	2-2	40,810
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	Total:	540,260		Total:	542,430		Total:	542,430

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	34,900
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	0
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	771,800
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	**771,800**

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

VERIZON BLDG

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
07/29/2015			LM	00	Meas. and List
01/19/2006			VA	48	Final Assmt Notice-Reval
11/18/2005			VA	47	1st Assmt Notice-Reval
09/21/2005			AJ	12	Field Review
03/07/2005			TH	99	Vacant Land

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
2	200	Commercial	R				0.00	AC	0.00	1.0000	C	1.0000	1.00		0.00				.00		0

Total Card Land Units: 0.00 AC | Parcel Total Land Area: 0.23 AC | Total Land Value: 0

Property Location: 175 SO MAIN ST **MAP ID:** 9/ 28A/ 28T/ / **Bldg Name:** **State Use:** 201

Vision ID: 327 **Account #** 1286T **Bldg #:** 2 of 3 **Sec #:** 1 of 1 **Card** 2 of 3 **Print Date:** 05/12/2016 19:24

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	91		Support Shed
Model	94		Commercial
Grade	03		Average
Stories	1		
Occupancy	1		
Exterior Wall A	23		Pre-cast Concr
Exterior Wall B			
Roof Structure	01		Flat
Roof Cover	04		T&G/Rubber
Interior Wall A	01		Minimum
Interior Wall B			
Interior Floor A	03		Concrete
Interior Floor B			
Heating Fuel	01		Coal or Wood
Heating Type	01		None
AC Type	03		Central
Bldg Use	200		Commercial
Frame Type	04		Reinforced Cnc
Rooms/Prtns	01		Light
Wall Height	8		
% Comn Wall	0		

CONSTRUCTION DETAIL (CONTINUED)

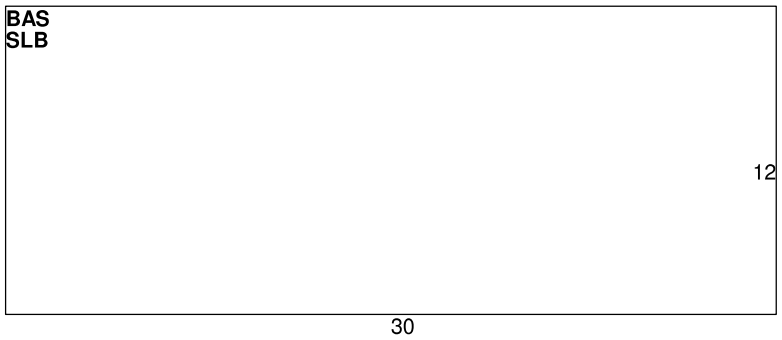
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
200	Commercial	100

COST/MARKET VALUATION

Adj. Base Rate:	106.68
Replace Cost	38,405
AYB	2004
Dep Code	A
Remodel Rating	
Year Remodeled	
Dep %	9
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	91
Apprais Val	34,900
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
BAS	First Floor	360	360	360		38,405
SLB	Slab	0	360	0		0
	Ttl. Gross Liv/Lease Area:	360	720	360		38,405

Property Location: 175 SO MAIN ST | **MAP ID:** 9/ 28A/ 28T/ / | **Bldg Name:** | **State Use:** 201

Vision ID: 327 | **Account #** 1286T | **Bldg #:** 3 of 3 | **Sec #:** 1 of 1 | **Card** 3 of 3 | **Print Date:** 05/12/2016 19:25

CURRENT OWNER

FALLOW CROSSING LLC
C/O SBA INFRASTRUCTURE LLC
8051 CONGRESS AVE
ATTENTION: TAX DEPARTMENT
BOCA RATON, FL 33487-1307
Additional Owners:

TOPO.	UTILITIES	STRT./ROAD	LOCATION
2 Above Street		1 Paved	

SUPPLEMENTAL DATA

Other ID:		EXEMPT CO	
Census	5241000	Lake Area	
Dev. Lot	3	Photo Retake	
Dev. Map		CB Letter	
GIS ID: 9/28A/28T		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
Comm Land	2-1	56,800	39,760
Comm Bldg	2-2	57,000	39,900
Comm OB	2-5	658,000	460,600
	Total	771,800	540,260

6079
MARLBOROUGH, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
FALLOW CROSSING LLC	146/ 84	05/08/2002	U	V	0	29
DAIGLE DONNA M	145/ 919	04/26/2002	U		0	29
DAIGLE ALBERT W	119/ 334	08/14/1997	Q		11,500	XX

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2015	2-1	39,760	2014	2-1	41,300	2014	2-1	41,300
2015	2-2	39,900	2014	2-2	40,810	2014	2-2	40,810
2015	2-5	460,600	2014	2-5	460,320	2014	2-5	460,320
	Total:	540,260		Total:	542,430		Total:	542,430

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	22,100
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	3,600
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	771,800
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	**771,800**

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

CINGULAR BLDG
TOWER 170 FEET HIGH

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
07/29/2015			LM	00	Meas. and List
01/19/2006			VA	48	Final Assmt Notice-Reval
11/18/2005			VA	47	1st Assmt Notice-Reval
09/21/2005			AJ	12	Field Review
03/07/2005			TH	99	Vacant Land

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
3	200	Commercial	R				0.00	AC	0.00	1.0000	C	1.0000	1.00		0.00				.00		0

Total Card Land Units: 0.00 AC | Parcel Total Land Area: 0.23 AC | Total Land Value: 0

Property Location: 175 SO MAIN ST **MAP ID:** 9/ 28A/ 28T/ / **Bldg Name:** **State Use:** 201

Vision ID: 327 **Account #** 1286T **Bldg #:** 3 of 3 **Sec #:** 1 of 1 **Card** 3 of 3 **Print Date:** 05/12/2016 19:25

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	91		Support Shed
Model	94		Commercial
Grade	03		Average
Stories	1		
Occupancy	1		
Exterior Wall A	24		Reinforc Concr
Exterior Wall B			
Roof Structure	01		Flat
Roof Cover	04		T&G/Rubber
Interior Wall A	01		Minimum
Interior Wall B			
Interior Floor A	03		Concrete
Interior Floor B			
Heating Fuel	01		Coal or Wood
Heating Type	01		None
AC Type	03		Central
Bldg Use	200		Commercial
Frame Type	04		Reinforced Cnc
Rooms/Prtns	01		Light
Wall Height	8		
% Comn Wall	0		

CONSTRUCTION DETAIL (CONTINUED)

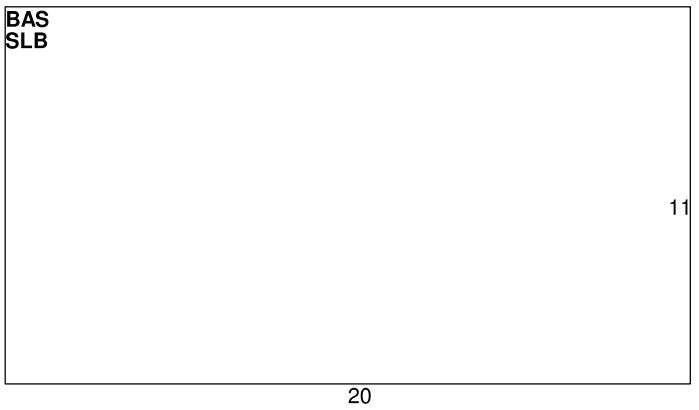
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
200	Commercial	100

COST/MARKET VALUATION

Adj. Base Rate:	110.32
Replace Cost	24,270
AYB	2004
Dep Code	A
Remodel Rating	
Year Remodeled	
Dep %	9
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	91
Apprais Val	22,100
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

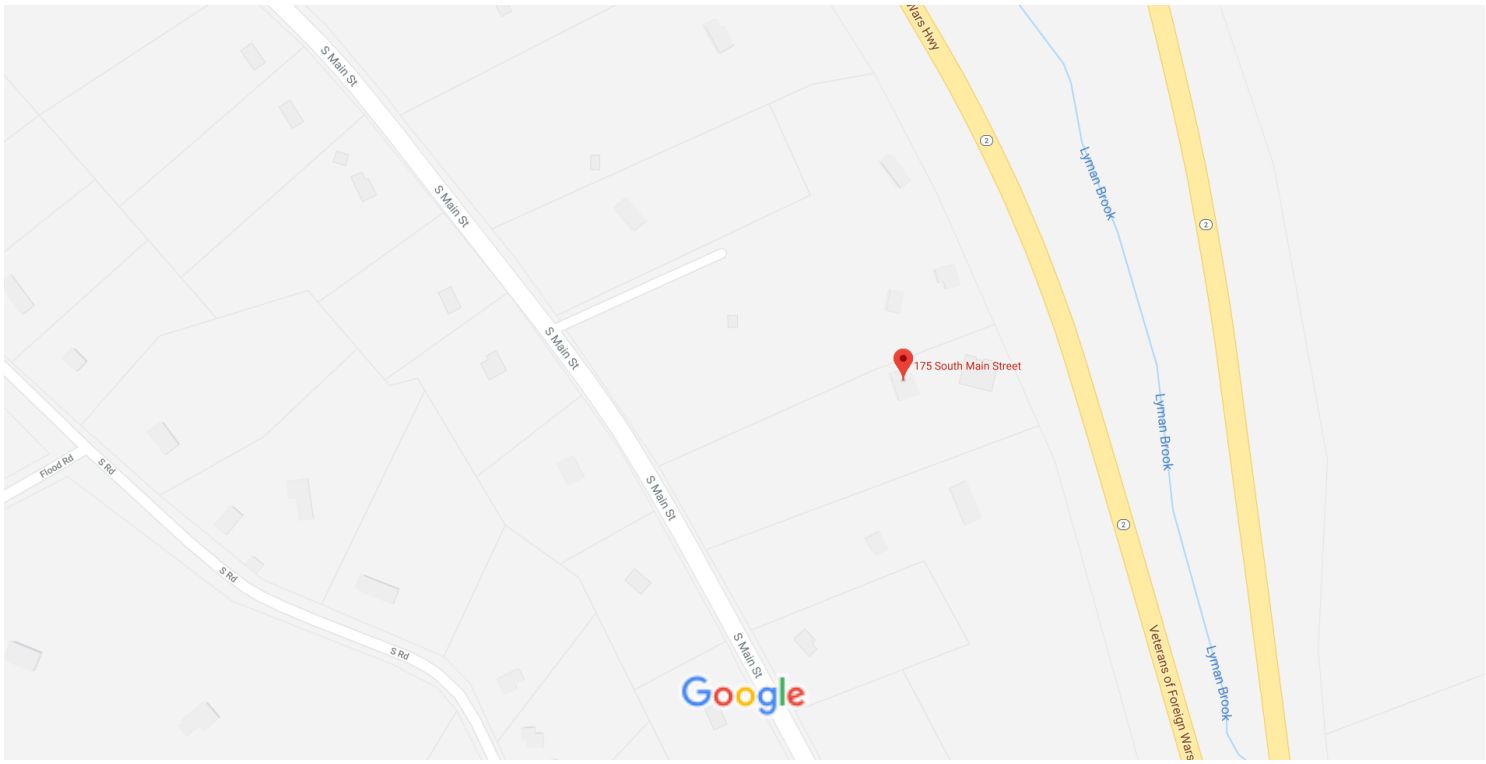
Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
FN3	Fence 6'			L	270	15.00	2005			7	90	3,600

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
BAS	First Floor	220	220	220		24,270
SLB	Slab	0	220	0		0
	Ttl. Gross Liv/Lease Area:	220	440	220		24,270

EXHIBIT 4

Google Maps 175 S Main St



Map data ©2019 100 ft

175 S Main St

Marlborough, CT 06447

Directions Save Nearby Send to your phone Share

Photos

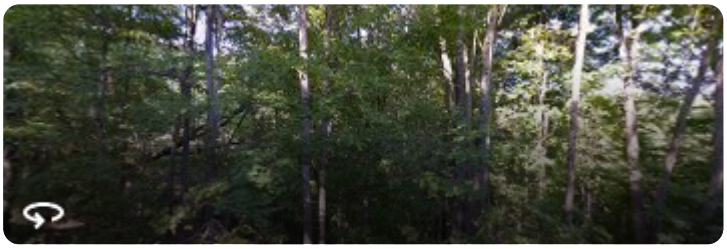


EXHIBIT 5

DOCKET NO. 256 - Sprint Spectrum, L.P. d/b/a Sprint PCS and Global Telecommunications application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 175 South Main Street, Marlborough, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	March 4, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a wireless telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes **§** 16-50k, be issued to Global Telecommunications for the construction, maintenance and operation of a wireless telecommunications facility at 175 South Main Street, Marlborough, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint Spectrum, L.P, AT&T Wireless PCS LLC, Cellco Partnership and other entities, both public and private, but such tower shall not exceed a height of 170 feet above ground level, including appurtenances.

2. The tower site shall be relocated approximately 60 feet to the north.

3. Panel antennas shall be installed on the monopole using a flush or T-arm mounting configuation.

4. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) a detailed site development plan that depicts the location of the access road, compound, tower, utility line, erosion and sedimentation control features, and landscaping;
    b) specifications for the tower, tower foundation, antennas, equipment building, and security fence; and
    c) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

5. The Certificate Holder, prior to the commencement of operation, shall provide the Council worst-case modeling of electromagnetic radio frequency power densities of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and

when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

6. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

8. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

9. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antenna becomes obsolete and ceases to function.

10. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant and the Rivereast News Bulletin.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Sprint Spectrum, L.P. d/b/a Sprint PCS and Global Telecommunications	Thomas J. Regan, Esquire Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402
Intervenor	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Cuddy & Feder LLP 90 Maple Avenue White Plains, NY 10601
Intervenor	**Its Representative**
Cellco Partnership d/b/a Verison Wireless	Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103-3597

CT33XC577

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.ct.gov/csc

Global / Dairyfy / Marlborough

March 9, 2004

Thomas J. Regan, Esq.
Brown Rudnick Berlack Israels LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402

RE: **DOCKET NO. 256** - Sprint Spectrum, L.P. d/b/a Sprint PCS and Global Telecommunications application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 175 South Main Street, Marlborough, Connecticut.

Dear Attorney Regan:

By its Decision and Order dated March 4, 2004, the Connecticut Siting Council (Council) granted a Certificate of Environmental Compatibility and Public Need (Certificate) for for the construction, maintenance and operation of a wireless telecommunications facility at 175 South Main Street, Marlborough, Connecticut to Global Telecommunications.

Enclosed are the Council's Certificate, Findings of Fact, Opinion, and Decision and Order.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/laf

Enclosures (4)

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.ct.gov/csc

CERTIFICATE

OF

ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

DOCKET NO. 256

Pursuant to General Statutes § 16-50k, as amended, the Connecticut Siting Council hereby issues a Certificate of Environmental Compatibility and Public Need to Global Telecommunications for the construction, maintenance and operation of a wireless telecommunications facility at 175 South Main Street, Marlborough, Connecticut. This Certificate is issued in accordance with and subject to the terms and conditions set forth in the Decision and Order of the Council on March 4, 2004.

By order of the Council,

Pamela B. Katz, P.E., Chairman

March 4, 2004

Use of platforms confirmed approved by Melanie Bachman, Executive Director CSC, without requiring 12 antennas per carrier

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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E-Mail: siting.council@po.state.ct.us
www.ct.gov/csc

April 18, 2005

Keith E. Coppins
Vice President Development
Optasite
446 Main Street
Worcester, MA 01608

RE: **DOCKET NO. 256** - Optasite, Inc. Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 175 South Main Street, Marlborough, Connecticut.

Dear Mr. Coppins:

The Council is in receipt of your letter dated April 12, 2005 regarding the installation of low profile antenna platforms at the site that is the subject of the above-referenced proceeding. As you are aware, the Council, under Condition 3 of the Decision and Order associated with this proceeding on March 4, 2004, specified the use of t-arm antenna mounts in the belief that these mounts are less visually obtrusive than a traditional platform. The Council is sensitive to the visual impacts of towers on surrounding communities and makes every effort to mitigate such impacts.

The Council is disappointed that the Decision and Order was not strictly adhered to during construction of this tower. We trust that this oversight was an isolated incident and will not happen again.

Notwithstanding the above, the Council thanks you for acting in an expeditious fashion by providing Council staff with additional specifications detailing the dimensions of each mount so that this matter could be resolved in a timely manner. Moreover, a review of the specifications for the t-arm mounts and low profile platforms indicates the visibility of both types of mounts is essentially the same. Due to the negligible effect on visibility, the Council will allow the use of the low profile platform in this specific case only, provided the antenna platforms are fully utilized. That is to say, each carrier locating on a platform shall have 12 antennas, otherwise t-arm mounts, of a size to accommodate the number of antennas, must be used. In addition, any safety railings that may have been installed as part of the platform assembly shall be removed immediately after each antenna installation is completed.

Again, thank you for bringing this matter to the Council's attention. If I may be of further service to you or you require further information concerning the above, please do not hesitate to contact me.

Sincerely,

S/Derek Phelps.
Executive Director

c: Pamela B. Katz, P.E., Chairman
Robert D. Mercier, Staff
Thomas J. Regan, Esq., Sprint Spectrum L.P.
David Archambault, Global TeleCommunications
Christine Farrell, Omnipoint Communications, Inc.
Kenneth C. Baldwin, Cellco Partnership

CSC
CONNECTICUT SITING COUNCIL

EXHIBIT 6

SPECIAL CONSTRUCTION NOTE (SBA-PROVIDED ANTENNA MOUNT STRUCTURAL MOD SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT THE T-MOBILE RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

CT253/GLOBAL TELECOMM MP

APPROVALS

PROJECT MANAGER:	DATE:	ZONING/SITE ACQ.:	DATE:
CONSTRUCTION:	DATE:	OPERATIONS:	DATE:
RF ENGINEERING:	DATE:	TOWER OWNER:	DATE:

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS BY CERTIFIED CLIMBER
SECTOR B:	ACCESS BY CERTIFIED CLIMBER
SECTOR C:	ACCESS BY CERTIFIED CLIMBER
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

175 SOUTH MAIN STREET
MARLBOROUGH, CT 06447
HARTFORD COUNTY

SITE NO.: CT11253C

SITE TYPE: 170'± MONOPOLE

RF DESIGN GUIDELINE: CUSTOM

SITE NOTES

1. THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY, AND IS NOT FOR HUMAN HABITATION. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
   - ADA COMPLIANCE NOT REQUIRED.
   - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
   - BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE
   - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
   - STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

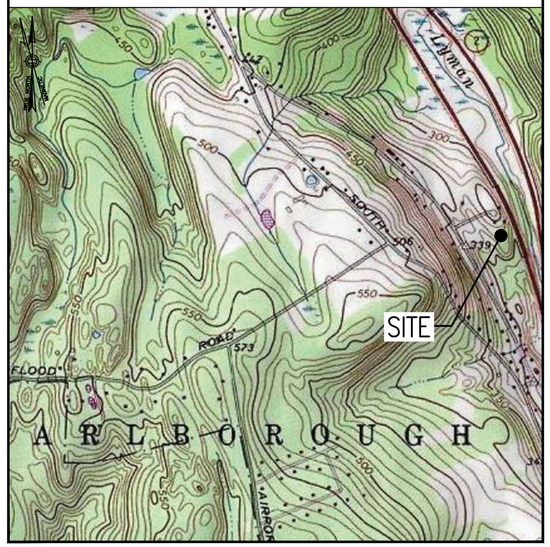
GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE OMNIPOINT REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
15. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK.

AT LEAST 72 HOURS PRIOR TO DIGGING, THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT 811

VICINITY MAP

SCALE: 1" = 1000'-0"



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SHEET INDEX

SHEET NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	2
GN-1	GENERAL NOTES	2
A-1	COMPOUND & EQUIPMENT PLAN	2
A-2	TOWER ELEVATIONS & ANTENNA PLAN	2
A-3	SITE DETAILS	2
E-1	ELECTRIC & GROUNDING DETAILS	2

SPECIAL ZONING NOTE:
BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW, AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, OR ADMINISTRATIVE REVIEW).

PROJECT SUMMARY

SITE NUMBER:	CT11253C
SBA SITE NUMBER:	CT13062-A
SBA SITE NAME:	MARLBOROUGH
SITE ADDRESS:	175 SOUTH MAIN STREET MARLBOROUGH, CT 06447
PROPERTY OWNER:	FALLOW CROSSING LLC C/O SBA INFRASTRUCTURE LLC 8051 CONGRESS AVE ATTENTION: TAX DEPARTMENT BOCA RATON, FL 33487-1307
TOWER OWNER:	SBA TOWERS IV, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	HARTFORD COUNTY
ZONING DISTRICT:	RESIDENTIAL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	170'
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
SBA RSM:	STEPHEN ROTH PHONE: 860-539-4920 EMAIL: SRoth@sbasite.com
ARCHITECT:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
STRUCTURAL ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
SITE CONTROL POINT:	LATITUDE: N.41.61614521° (41°-36'-58.12") LONGITUDE W.-72.4364728° (-72°-26'-11.30")

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25997
LICENSED
PROFESSIONAL CIVIL ENGINEER
12/23/20

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	12/23/20	CONSTRUCTION REVISED	CMC
1	09/11/19	ISSUED FOR CONSTRUCTION	BDJ
0	05/30/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CT11253C

SITE ADDRESS:
175 SOUTH STREET
MARLBOROUGH, CT 06447

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.059

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – T-MOBILE
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T-MOBILE
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.

4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL, STATE AND FEDERAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

5. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER, T1 CABLES AND GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR AND/OR LANDLORD PRIOR TO CONSTRUCTION.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION AND RETURN DISTURBED AREAS TO ORIGINAL CONDITIONS.

13. THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

14. SUBCONTRACTOR SHALL NOTIFY CHAPPELL ENGINEERING ASSOCIATES, LLC 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS AND POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEERING REVIEW.

15. CONSTRUCTION SHALL COMPLY WITH ALL T-MOBILE STANDARDS AND SPECIFICATIONS.

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITES ARE IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. IF THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.

3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.

6. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

7. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

8. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING, OWNER AND/OR LOCAL UTILITIES.

9. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.

10. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

11. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T-MOBILE SPECIFICATION FOR SITE SIGNAGE.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (400PSI) MAY BE USED. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 381 CODE REQUIREMENTS

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF .....1½ IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....¾ IN.
   BEAMS AND COLUMNS .....1½ IN.

5. A CHAMFER ¾" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURERS RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY SIMPSON OR APPROVED EQUAL.

7. CONCRETE CYLINDER TIES ARE NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIERS PLANT.
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.

8. AS AN ALTERNATIVE TO ITEM 7. TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.

9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND T-MOBILE SPECIFICATIONS UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".

2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. PAINTED SURFACES SHALL BE TOUCHED UP.

3. BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (¾"ø) AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE GALVANIZED OR STAINLESS STEEL.

4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ⅝" DIA. ASTM A 307 BOLTS (GALV) UNLESS NOTED OTHERWISE.

5. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL

6. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.

2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.

3. AS AN ALTERNATE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.

4. COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING #1 SIEVE.

5. AS AN ALTERNATE TO ITEMS 2 AND 3, THE SUBGRADE SOILS WITH 5 PASSES OR A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). AND SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUN, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T-MOBILE ANTENNA PLATFORM LOCATION AND UTILITY TRENCHWORK.

2. COORDINATION OF WORK:
SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.

3. CABLE LADDER RACK:
SUBCONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY AND/OR ICE BRIDGE, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.

2. SUBCONTRACTOR SHALL MODIFY OR INSTALL CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.

3. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.

4. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.

5. EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA, AND MATCH INSTALLATION REQUIREMENTS.

6. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, ½ INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC AND OSHA.

7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).

8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.

9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

12. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.

13. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.

14. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY HARGER (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).

15. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

16. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

17. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

18. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

19. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.

20. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.

21. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

22. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.

23. CABINETS, BOXES AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

24. CABINETS, BOXES AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

25. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

26. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

27. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

28. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

29. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

30. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

31. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.

32. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

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STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25997
LICENSED
PROFESSIONAL CIVIL ENGINEER

12/23/20

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

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175 SOUTH STREET
MARLBOROUGH, CT 06447

SHEET TITLE
GENERAL NOTES

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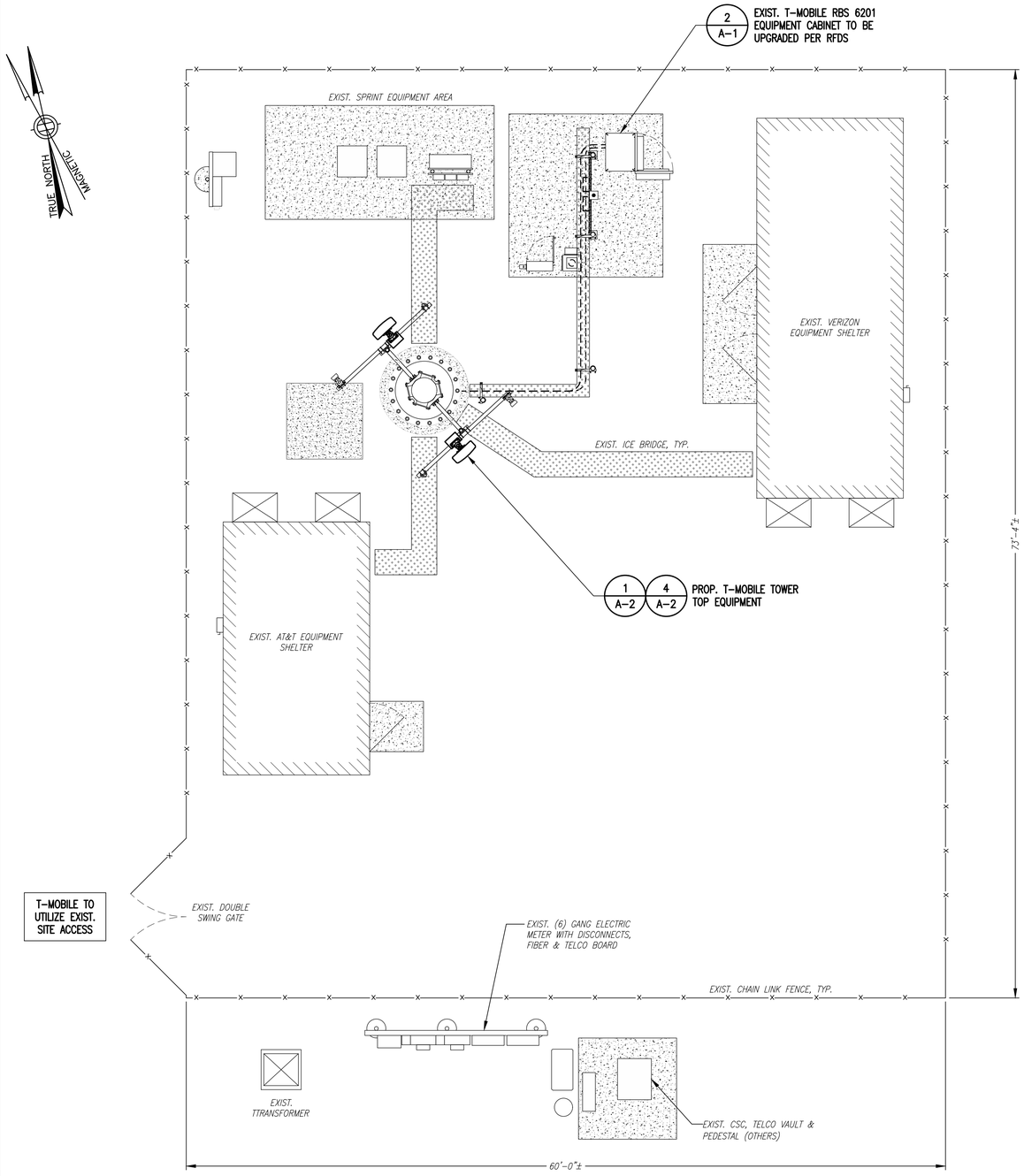
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.



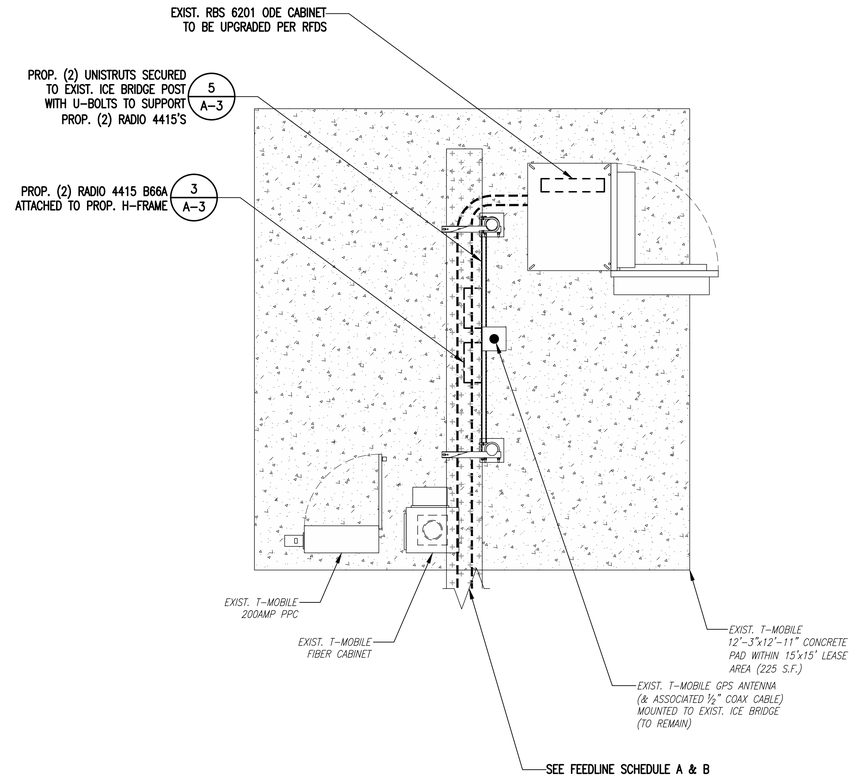
COMPOUND PLAN 1/A-1

SCALE: 1" = 5'-0"

0 5'-0" 10'-0" 15'-0"

FEEDLINE SCHEDULE	FEEDLINES	LOCATION
A	EXISTING TO REMAIN: (4) 1-5/8" COAX CABLES	ROUTED PER TOWER STRUCTURAL ANALYSIS
B	PROPOSED: (4) 1-5/5" COAX CABLES (1) 1-5/8" HCS FIBER CABLE	

NOTE:
EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS, RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.



PROPOSED EQUIPMENT PLAN 2/A-1

SCALE: 1/2" = 1'-0"

0 2'-0" 4'-0" 6'-0"

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COMPOUND & EQUIPMENT PLAN

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A-1

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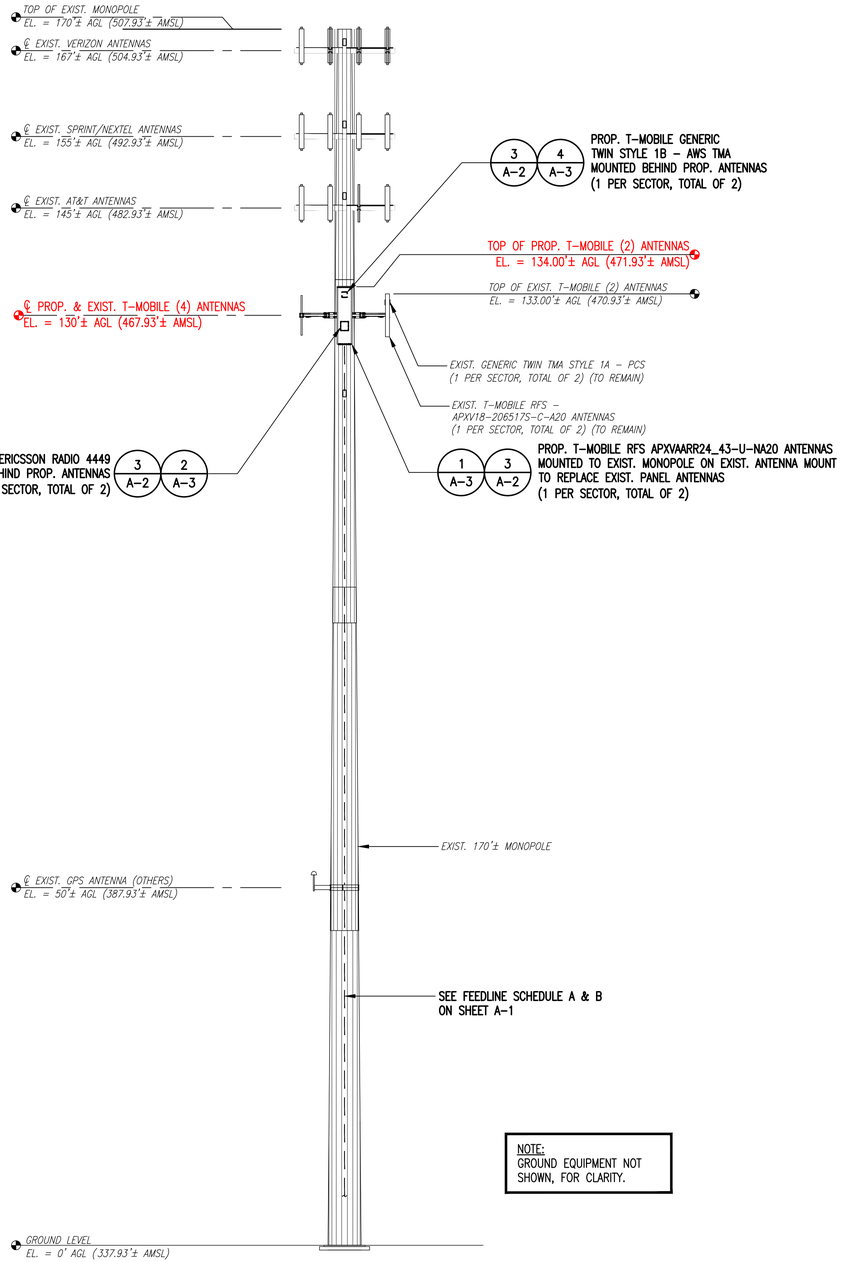
SPECIAL CONSTRUCTION NOTE (SBA-PROVIDED ANTENNA MOUNT STRUCTURAL MOD SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT THE T-MOBILE RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

RAD CENTER NOTE:
T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.

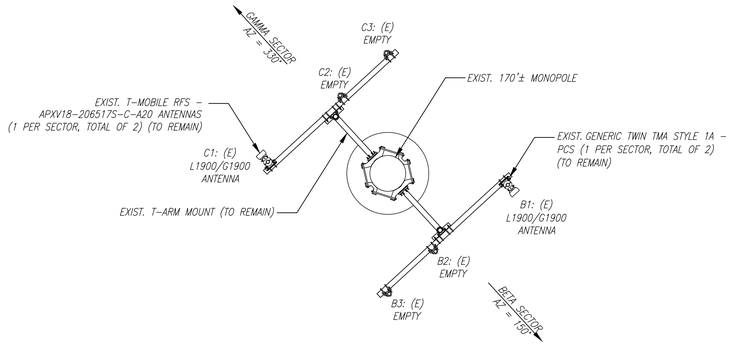


NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

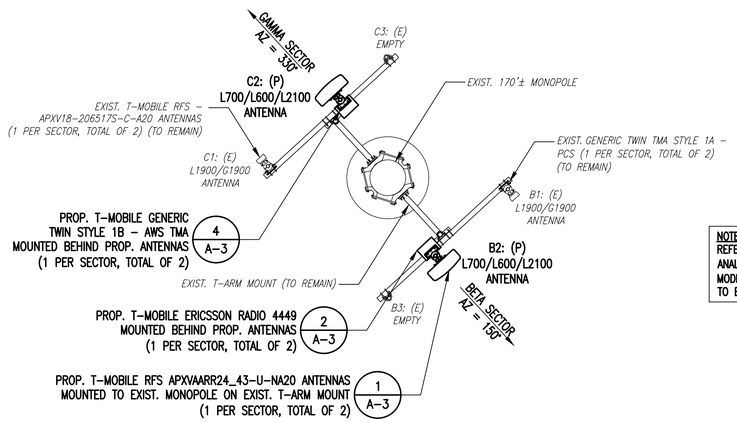
NOTE: ABOVE MEAN SEA LEVEL (AMSL) SOURCE-BING MAP

TOWER ELEVATION
SCALE: 1" = 10'-0"
1 A-2
0 5' 10' 20' 30'

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.



EXISTING ANTENNA PLAN
SCALE: N.T.S.
3 A-2
NORTH



NOTE:
REFER TO STRUCTURAL ANALYSIS (BY OTHERS) FOR MODIFICATIONS/REINFORCEMENT TO EXISTING MOUNTS.

PROPOSED ANTENNA PLAN
SCALE: N.T.S.
4 A-2
NORTH

ANTENNA LEGEND:
EMPTY – EMPTY PIPE
(E) – EXISTING
(P) – INSTALL

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.

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www.chappellengineering.com

STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25997
LICENSED PROFESSIONAL CIVIL ENGINEER
12/23/20

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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0	05/30/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CT11253C

SITE ADDRESS:
175 SOUTH STREET
MARLBOROUGH, CT 06447

SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLAN

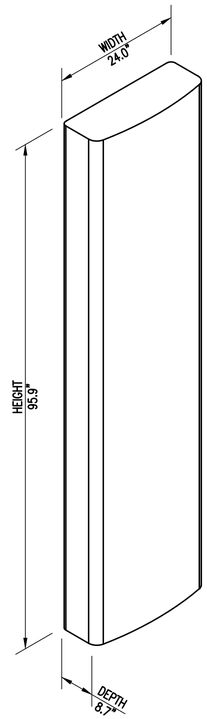
SHEET NUMBER
A-2

1815.059

FINAL ANTENNA CONFIGURATION

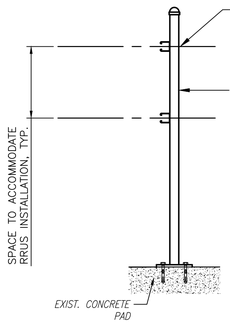
SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	CABLES
BETA	*APXV18-206517S-C-A20*	*130'± AGL*	*150°*	*0°*	*2°*	*L1900/G1900*	*(1) GENERIC TWIN STYLE 1A - PCS*	*(2) 1-5/8" COAXIAL CABLES*
	RFS APXVAARR24_43-U-NA20	130'± AGL	150°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE (SHARED)
						L2100	(1) GENERIC TWIN STYLE 1B - AWS ERICSSON RADIO 4415 B66A (AT CABINET)	(2) 1-5/8" COAXIAL CABLES
GAMMA	*APXV18-206517S-C-A20*	*130'± AGL*	*330°*	*0°*	*2°*	*L1900/G1900*	*(1) GENERIC TWIN STYLE 1A - PCS*	*(2) 1-5/8" COAXIAL CABLES*
	RFS APXVAARR24_43-U-NA20	130'± AGL	330°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE (SHARED)
						L2100	(1) GENERIC TWIN STYLE 1B - AWS ERICSSON RADIO 4415 B66A (AT CABINET)	(2) 1-5/8" COAXIAL CABLES

NOTE: RFDS REV3.1 - 05/23/2019



RFS APXVAARR24_43-NA20 PANEL ANTENNA
DIMENSIONS: 95.9"H x 24.0"W x 8.7"D
WEIGHT: 128.0 LBS
1 PER SECTOR, TOTAL OF 2

ANTENNA DETAILS 1/A-3
SCALE: N.T.S.



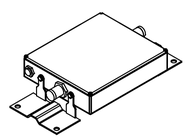
SECTION AT H-FRAME 5/A-3
NTS

ERICSSON RADIO 4449 B12+B71
DIMENSIONS: 14.9"H x 13.2"W x 9.3"D
WEIGHT: 74.0 LBS
1 PER SECTOR, TOTAL OF 2

RRU DETAIL 2/A-3
SCALE: N.T.S.

ERICSSON RADIO 4415 B66A
DIMENSIONS: 16.5"H x 13.42"W x 5.9"D
WEIGHT: 46.0 LBS
1 PER SECTOR, TOTAL OF 2

RRUS DETAIL 3/A-3
SCALE: N.T.S.



TMA 17/21 (KRY 112 144/1)
DIMENSIONS: 7.7"H x 7.5"W x 3.4"D
WEIGHT: 11.0 LBS
1 PER SECTOR, TOTAL OF 2

TMA DETAIL 4/A-3
SCALE: N.T.S.

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CHECKED BY: JMT

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SITE ADDRESS:
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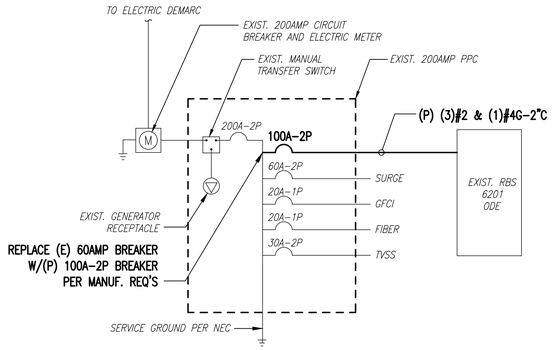
MARLBOROUGH, CT 06447

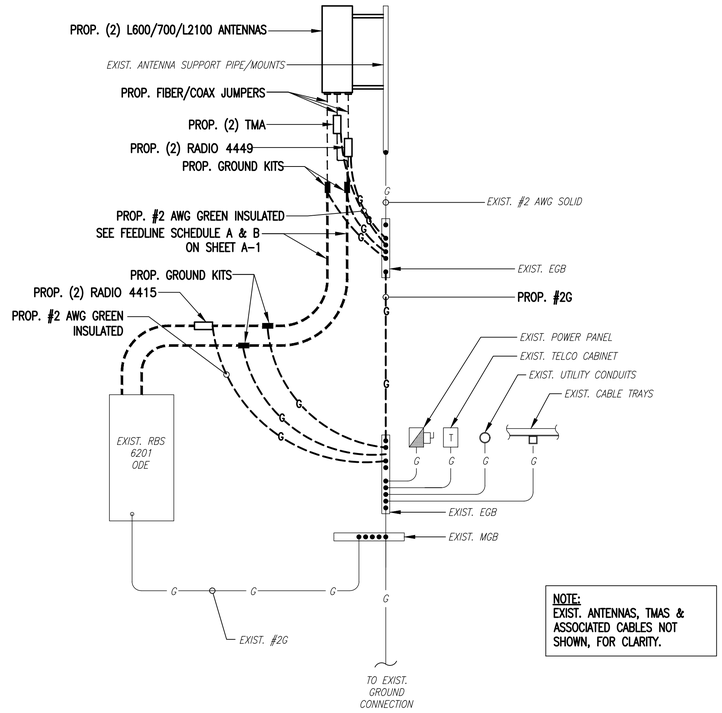
SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-3

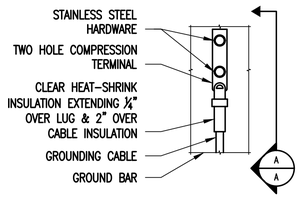
1815.059



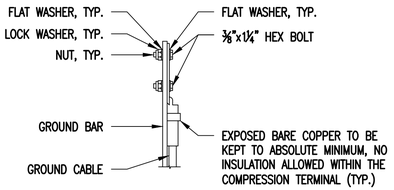
ONE LINE DIAGRAM
SCALE: NOT TO SCALE
1 E-1



GROUNDING RISER DIAGRAM
SCALE: NOT TO SCALE
2 E-1



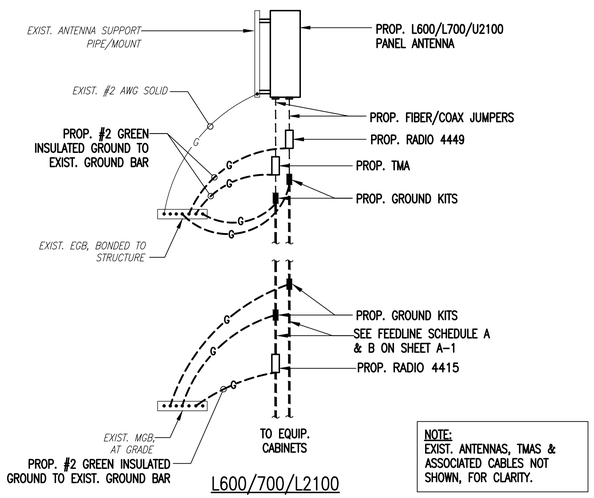
ELEVATION



SECTION A-A

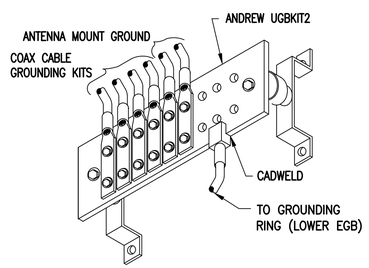
NOTES:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELL DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

TYPICAL GROUND BAR CONNECTIONS DETAIL
SCALE: NOT TO SCALE
3 E-1



L600/700/L2100

COAX CABLE CONNECTION AND GROUNDING DETAIL
SCALE: NOT TO SCALE
4 E-1



GROUND BAR (EGB)
SCALE: NOT TO SCALE
5 E-1

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHNINSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
11. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
12. PPC SUPPLIED BY PROJECT OWNER.
13. GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BTS SITE GROUNDING STANDARDS".
14. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
15. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
16. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
17. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
18. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
19. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
20. CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXIST. TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
21. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMNS MINIMUM RESISTANCE REQUIRED.
22. CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.

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JAMES M. FITZGERALD
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LICENSED PROFESSIONAL CIVIL ENGINEER
12/23/20

CHECKED BY: JMT

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SUBMITTALS

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SITE NUMBER:
CT11253C

SITE ADDRESS:
175 SOUTH STREET
MARLBOROUGH, CT 06447

SHEET TITLE
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.059

EXHIBIT 7

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 170 ft TransAmerican Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13062-A

Customer Site Name: Marlborough

Carrier Name: T-Mobile (App#: 116938, V1)

Carrier Site ID / Name: CT11253C / Marlborough

Site Location: 175 South Main Street

Marlborough, Connecticut

Hartford County

Latitude: 41.615961

Longitude: -72.436427

7/15/19

Analysis Result:

Max Structural Usage: 83.8% [Pass]

Max Foundation Usage: 39.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By: Sital Shrestha

Introduction

The purpose of this report is to summarize the analysis results on the 170 ft TransAmerican Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Paul J. Ford and Company, Job #44404-0628 date November 9, 2004
Foundation Drawing	Paul J. Ford and Company, Job #44404-0628 date November 9, 2004
Geotechnical Report	Jaworski Geotech, Inc., Project #04316G dated August 31, 2004
Modification Drawings	N/A

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 127.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 98.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.177, S_1 = 0.062

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	167.0	2	Antel BXA-171063-8BF - Panel	Low Profile Platform	(12) 1 5/8"	Verizon
2		1	Antel BXA-171085-12BF - Panel			
3		2	Antel BXA-70063-6CF - Panel			
4		1	Antel BXA-70080-6CF - Panel			
5		6	RFS FD9R60024/2C-3L Diplexers			
6		4	Antel LPA-80063/4CF - Panel			
7		2	Antel LPA-80080/6CF - Panel			
8	155.0	3	RFS APXVTM14-C-I20 - Panel	Platform w/ Handrail SitePro Modification Kits: (1) HRK14-U (1) PRK-SFS-H-L (1) PRK-1245L	(4) 1 1/4" Fiber	Sprint Nextel
9		3	Commscope NNVV-65B-R4 - Panel			
10		3	ALU 1900 Mhz RRH			
11		6	ALU 800 Mhz RRH			
12		3	ALU TD-RRH8x20-25			
13	145.0	6	Powerwave 7770 - Panel	Low Profile Platform	(12) 1 5/8" (2) DC (1) Fiber	Cingular
14		3	KMW AM-X-CD-17-65-00T - Panel			
15		1	Raycap DC6-48-60-18-8F – Surge Arrestor			
16		6	Powerwave LGP21401 TMA			
17		6	Ericsson RRUS-11 – RRU			
-	130.0	9	RFS APX18-206517S-C-ACU - Panel	(3) T-Arm	(9) 1 1/4"	T-Mobile
-		2	Remec G20045A1 - TMA			
23	50.0	1	GPS	Direct	(1) 1/2"	Sprint Nextel*

* Line is considered outside of pole

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
18	130.0	7	RFS APXV18-206517S-C-A20	(3) T-Arm	(8) 1-5/8" Coax (1) 1-5/8" Fiber	T-Mobile
19		2	RFS APXVAARR24_43-U-NA20			
20		2	Ericsson KRY 112 489/2			
21		2	Ericsson KRY 112 144/1			
22		2	Ericsson Radio 4449 B71+B12			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate	Flange
Max. Usage:	**65.0%**	**64.3%**	**50.2%**	**83.8%**
Pass/Fail	**Pass**	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3770.1	30.1	76.7

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.2107 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-G Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 64.99% at 50.0ft

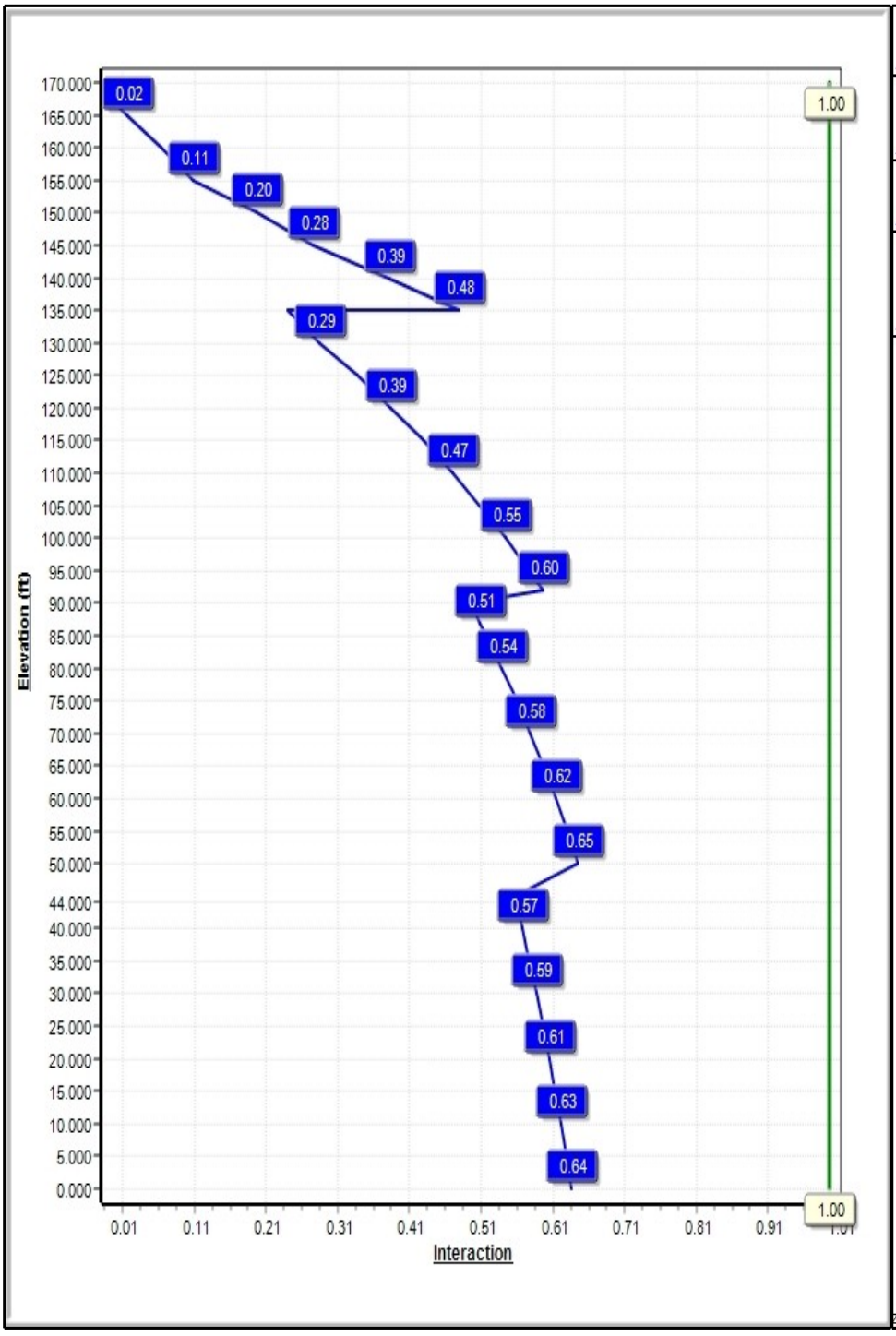
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough	**Exposure:**	B	
Height:	170.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

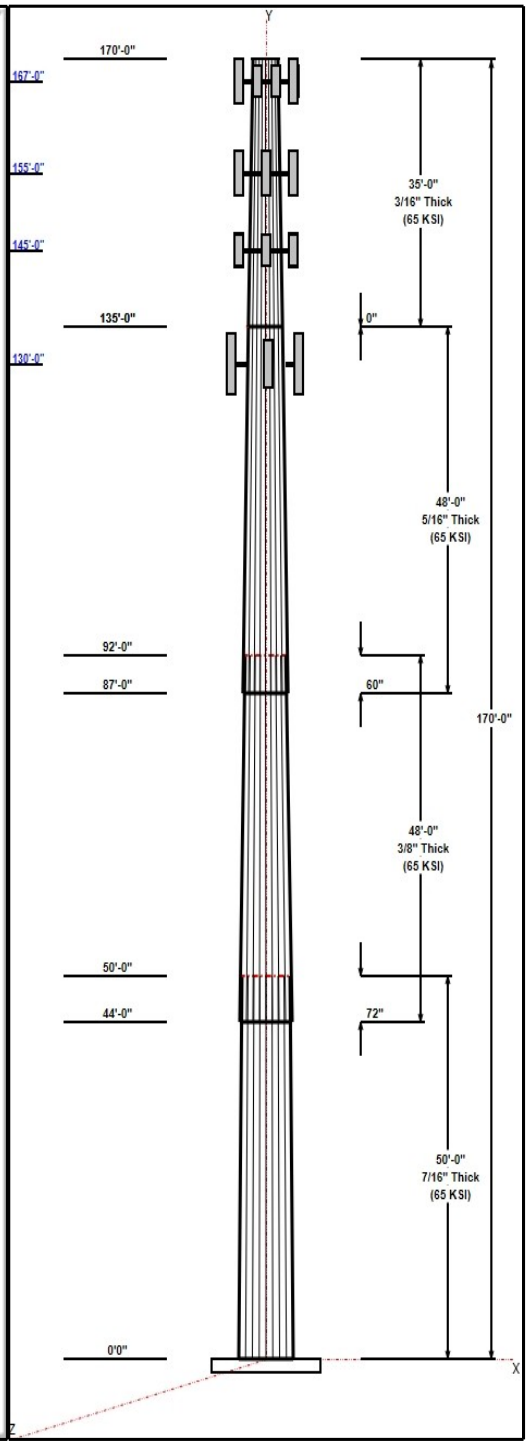
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 98 mph Wind

Iterations: 25





Structure: CT13062-A-SBA

Type: Tapered
Site Name: Marlborough
Height: 170.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.19338

7/15/2019

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	50.00	45.83	55.50	0.438		0.19338	65
2	48.00	38.46	47.74	0.375	Slip	0.19338	65
3	48.00	30.77	40.05	0.313	Slip	0.19338	65
4	35.00	24.00	30.77	0.188	Butt	0.19338	65

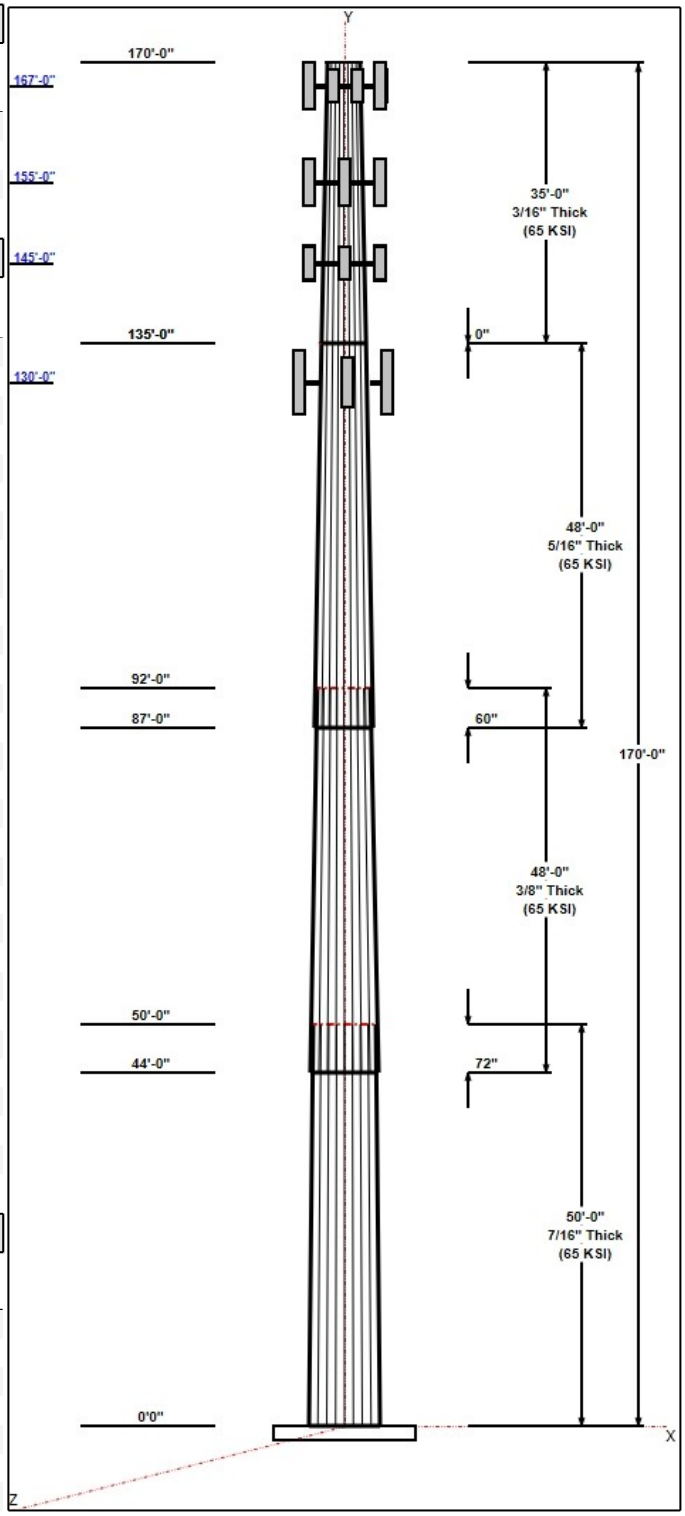
Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
167.00	167.00	2	BXA-70063-6CF	Verizon
167.00	167.00	4	LPA-80063/4CF	Verizon
167.00	167.00	1	BXA-70080-6CF	Verizon
167.00	167.00	2	LPA-80080/6CF	Verizon
167.00	167.00	1	BXA-171085-12BF	Verizon
167.00	167.00	6	FD9R60024/2C-3L	Verizon
167.00	167.00	1	Low Profile Platform-flat	Verizon
167.00	167.00	2	BXA-171063-8BF	Verizon
155.00	155.00	3	APXVTM14-C-I20	Sprint Nextel
155.00	155.00	3	NNVV-65B-R4	Sprint Nextel
155.00	155.00	1	PRK-1245 (kicker kit)	Sprint Nextel
155.00	155.00	1	HRK14	Sprint Nextel
155.00	155.00	1	(3) SFS-H-L (V-Braces)	Sprint Nextel
155.00	155.00	3	1900MHz RRH (65MHz)	Sprint Nextel
155.00	155.00	6	800 MHz RRH	Sprint Nextel
155.00	155.00	3	TD-RRH8x20-25	Sprint Nextel
155.00	155.00	1	Low Profile Platform-flat	Sprint Nextel
145.00	145.00	3	AM-X-CD-17-65-00T-RET	Cingular
145.00	145.00	6	7770.00	Cingular
145.00	145.00	6	LGP21401	Cingular
145.00	145.00	6	RRUS-11	Cingular
145.00	145.00	1	DC6-48-60-18-8F	Cingular
145.00	145.00	1	Low Profile Platform-flat	Cingular
130.00	130.00	3	T-Arm (Flat)	T-Mobile
130.00	130.00	2	APXVAARR24_43-U-NA20	T-Mobile
130.00	130.00	2	KRY 112 144/1	T-Mobile
130.00	130.00	2	Radio 4449 B71+B12	T-Mobile
130.00	130.00	2	Ericsson KRY 112 489/2	T-Mobile
130.00	130.00	7	APX18-206517S-C-ACU	T-Mobile
50.00	50.00	1	GPS	Sprint Nextel

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	167.00	Inside	1 5/8" Coax	Verizon
0.00	155.00	Inside	1 1/4" Fiber	Sprint
0.00	145.00	Inside	1 5/8" Coax	Cingular
0.00	145.00	Inside	DC	Cingular
0.00	145.00	Inside	Fiber	Verizon
0.00	130.00	Inside	1 1/4" Coax	T-Mobile
0.00	130.00	Inside	1 5/8" Fiber	T-Mobile
0.00	110.00	Inside	1 5/8" Coax	Metro PCS
0.00	50.00	Outside	1/2" Coax	Sprint

Anchor Bolts



Qty	Specifications	Grade (ksi)	Arrangement
18	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	69.0	60.0	Round

Reactions

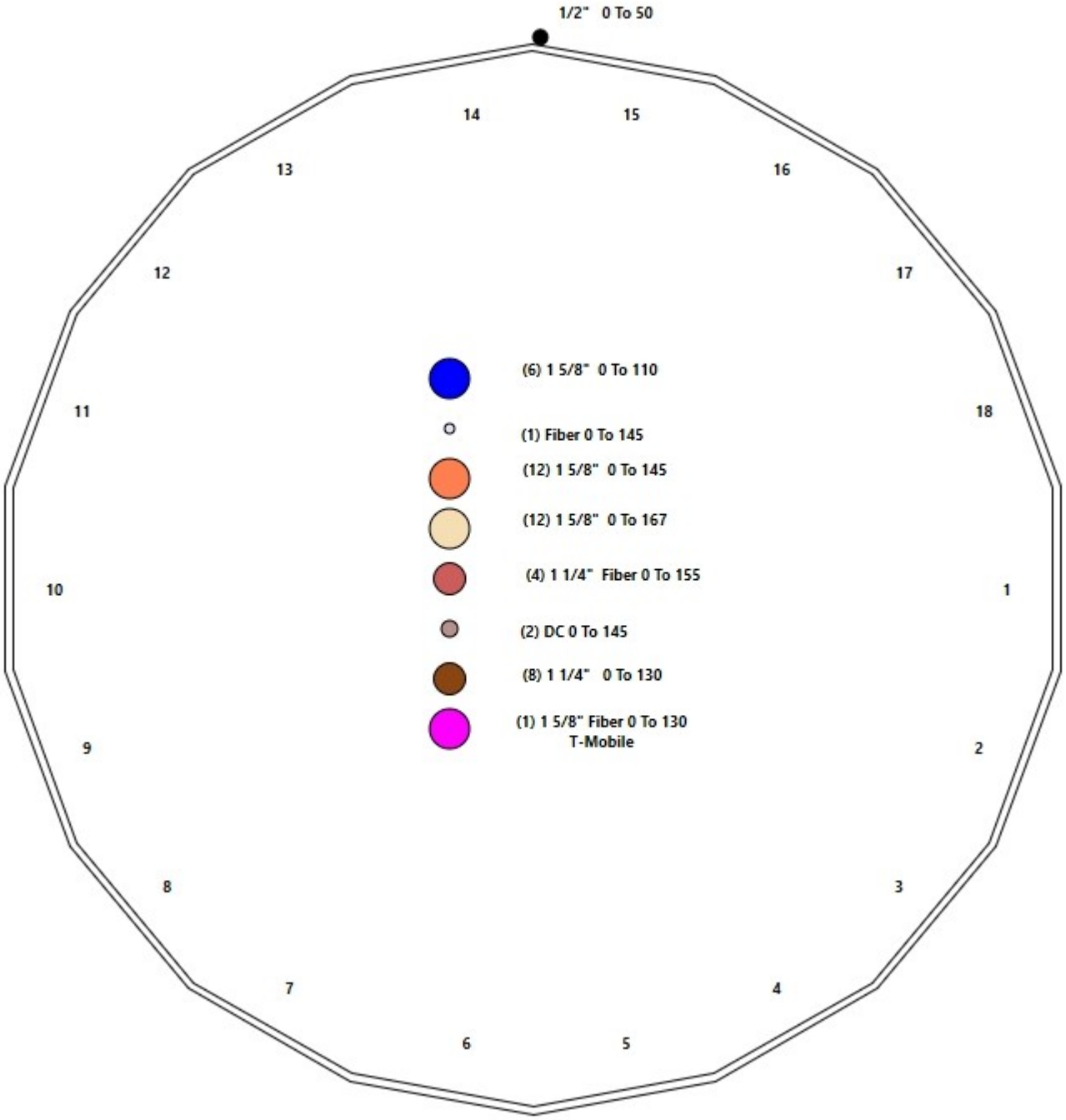
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 98 mph Wind	3770.1	30.1	51.0
0.9D + 1.6W 98 mph Wind	3725.9	30.1	38.2
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1056.7	8.4	76.7
1.2D + 1.0E	198.0	1.6	51.0
0.9D + 1.0E	195.6	1.6	38.3
1.0D + 1.0W 60 mph Wind	877.6	7.0	42.5

Structure: CT13062-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Marlborough
Height: 170.00 (ft)

7/15/2019

Tower Engineering Solutions



Shaft Properties

Structure:	CT13062-A-SBA		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	50.000	0.4375	65		0.00	11,866
2	18	48.000	0.3750	65	Slip	72.00	8,306
3	18	48.000	0.3125	65	Slip	60.00	5,686
4	18	35.000	0.1875	65	Flange	0.00	1,928
					Total Shaft Weight:		**27,785**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	55.50	0.00	76.46	29288.03	20.96	126.86	45.83	50.00	63.03	16409.6	17.06	104.7	0.193382
2	47.74	44.00	56.38	15980.14	21.04	127.31	38.46	92.00	45.33	8306.10	16.67	102.5	0.193382
3	40.05	87.00	39.41	7863.58	21.19	128.16	30.77	135.00	30.21	3540.04	15.95	98.46	0.193382
4	30.77	135.0	18.20	2150.28	27.52	164.10	24.00	170.00	14.17	1015.22	21.16	128.0	0.193382

Load Summary

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

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Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	167.00	BXA-70063-6CF	2	17.00	7.57	0.73	166.90	10.364	0.73	0.00	0.00
2	167.00	LPA-80063/4CF	4	20.00	6.15	1.00	228.86	7.195	1.00	0.00	0.00
3	167.00	BXA-70080-6CF	1	18.00	5.76	0.87	146.05	8.158	0.87	0.00	0.00
4	167.00	LPA-80080/6CF	2	21.00	4.33	1.70	218.46	5.524	1.70	0.00	0.00
5	167.00	BXA-171085-12BF	1	15.00	4.74	0.84	110.96	7.115	0.84	0.00	0.00
6	167.00	FD9R60024/2C-3L	6	3.10	0.36	1.00	11.21	0.808	1.00	0.00	0.00
7	167.00	Low Profile Platform-flat	1	1200.00	25.00	1.00	2258.43	46.169	1.00	0.00	0.00
8	167.00	BXA-171063-8BF	2	10.50	2.94	0.84	76.75	4.616	0.84	0.00	0.00
9	155.00	APXVTM14-C-I20	3	56.20	6.34	0.78	217.24	7.457	0.81	0.00	0.00
10	155.00	NNVV-65B-R4	3	77.40	12.27	0.73	363.90	13.731	0.76	0.00	0.00
11	155.00	PRK-1245 (kicker kit)	1	464.91	9.50	1.00	790.52	19.480	1.00	0.00	0.00
12	155.00	HRK14	1	302.36	8.13	1.00	662.36	16.102	1.00	0.00	0.00
13	155.00	(3) SFS-H-L (V-Braces)	1	230.00	6.70	1.00	552.17	13.739	1.00	0.00	0.00
14	155.00	1900MHz RRH (65MHz)	3	60.00	2.77	0.88	143.71	4.043	0.88	0.00	0.00
15	155.00	800 MHz RRH	6	53.00	2.49	0.92	127.20	3.638	0.92	0.00	0.00
16	155.00	TD-RRH8x20-25	3	70.00	4.05	0.69	180.90	4.866	0.69	0.00	0.00
17	155.00	Low Profile Platform-flat	1	1505.00	25.00	1.00	2822.59	46.011	1.00	0.00	0.00
18	145.00	AM-X-CD-17-65-00T-RET	3	30.80	5.00	0.75	142.42	6.868	0.75	0.00	0.00
19	145.00	7770.00	6	35.00	5.50	0.73	169.61	6.561	0.73	0.00	0.00
20	145.00	LGP21401	6	14.10	1.29	0.75	39.02	2.123	0.75	0.00	0.00
21	145.00	RRUS-11	6	55.00	4.42	0.68	144.65	5.915	0.68	0.00	0.00
22	145.00	DC6-48-60-18-8F	1	31.80	1.47	0.75	93.42	2.168	0.75	0.00	0.00
23	145.00	Low Profile Platform-flat	1	1200.00	25.00	1.00	2243.59	45.872	1.00	0.00	0.00
24	130.00	T-Arm (Flat)	3	400.00	10.00	0.75	675.27	18.602	0.75	0.00	0.00
25	130.00	APXVAARR24_43-U-NA20	2	128.00	20.24	0.70	539.25	22.112	0.70	0.00	0.00
26	130.00	KRY 112 144/1	2	11.00	0.41	1.00	21.63	0.878	1.00	0.00	0.00
27	130.00	Radio 4449 B71+B12	2	71.00	1.97	0.67	123.62	2.510	0.67	0.00	0.00
28	130.00	Ericsson KRY 112 489/2	2	15.40	0.65	1.00	32.77	1.253	1.00	0.00	0.00
29	130.00	APX18-206517S-C-ACU	7	21.00	5.27	0.73	137.98	6.492	0.73	0.00	0.00
30	50.00	GPS	1	10.00	1.00	0.00	36.27	1.638	0.00	0.00	0.00
		Totals:	**83**	**8,796.27**			**22,076.88**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	167.00	(12) 1 5/8" Coax	0.00	Inside
0.00	155.00	(4) 1 1/4" Fiber	0.00	Inside
0.00	145.00	(12) 1 5/8" Coax	0.00	Inside
0.00	145.00	(2) DC	0.00	Inside
0.00	145.00	(1) Fiber	0.00	Inside
0.00	130.00	(8) 1 1/4" Coax	0.00	Inside
0.00	130.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	110.00	(6) 1 5/8" Coax	0.00	Inside
0.00	50.00	(1) 1/2" Coax	0.65	Outside

Shaft Section Properties

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Tower Engineering Solutions

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	55.500	76.458	29288.0	20.96	126.86	76.8	1039.	0.0
5.00		0.4375	54.533	75.116	27772.1	20.57	124.65	77.2	1003.	1289.4
10.00		0.4375	53.566	73.773	26309.3	20.18	122.44	77.7	967.4	1266.6
15.00		0.4375	52.599	72.431	24898.8	19.79	120.23	78.1	932.4	1243.7
20.00		0.4375	51.632	71.088	23539.7	19.40	118.02	78.6	898.0	1220.9
25.00		0.4375	50.665	69.745	22231.0	19.01	115.81	79.0	864.2	1198.1
30.00		0.4375	49.699	68.403	20971.7	18.62	113.60	79.5	831.1	1175.2
35.00		0.4375	48.732	67.060	19760.8	18.23	111.39	80.0	798.7	1152.4
40.00		0.4375	47.765	65.717	18597.5	17.84	109.18	80.4	766.9	1129.5
44.00	Bot - Section 2	0.4375	46.991	64.643	17700.5	17.53	107.41	80.8	741.9	887.2
45.00		0.4375	46.798	64.375	17480.8	17.45	106.97	80.9	735.7	411.0
50.00	Top - Section 1	0.3750	46.581	54.995	14834.3	20.49	124.22	0.0	0.0	2029.3
55.00		0.3750	45.614	53.844	13922.4	20.04	121.64	77.8	601.2	925.9
60.00		0.3750	44.647	52.693	13048.6	19.58	119.06	78.4	575.6	906.3
65.00		0.3750	43.680	51.542	12212.2	19.13	116.48	78.9	550.7	886.7
70.00		0.3750	42.713	50.391	11412.3	18.67	113.90	79.4	526.3	867.1
75.00		0.3750	41.746	49.240	10648.1	18.22	111.32	80.0	502.4	847.6
80.00		0.3750	40.779	48.090	9918.9	17.76	108.75	80.5	479.1	828.0
85.00		0.3750	39.813	46.939	9223.7	17.31	106.17	81.0	456.3	808.4
87.00	Bot - Section 3	0.3750	39.426	46.478	8955.0	17.13	105.14	81.3	447.4	317.9
90.00		0.3750	38.846	45.788	8561.7	16.85	103.59	81.6	434.1	870.4
92.00	Top - Section 2	0.3125	39.084	38.455	7303.4	20.64	125.07	0.0	0.0	573.1
95.00		0.3125	38.504	37.880	6980.5	20.31	123.21	77.5	357.1	389.6
100.00		0.3125	37.537	36.920	6463.6	19.77	120.12	78.1	339.2	636.3
105.00		0.3125	36.570	35.961	5972.9	19.22	117.02	78.8	321.7	620.0
110.00		0.3125	35.603	35.002	5507.6	18.68	113.93	79.4	304.7	603.7
115.00		0.3125	34.636	34.043	5067.2	18.13	110.84	80.1	288.2	587.4
120.00		0.3125	33.669	33.084	4650.9	17.59	107.74	80.7	272.1	571.1
125.00		0.3125	32.702	32.125	4258.1	17.04	104.65	81.4	256.5	554.7
130.00		0.3125	31.735	31.166	3888.0	16.50	101.55	82.0	241.3	538.4
135.00	Top - Section 3	0.3125	30.768	30.207	3540.0	15.95	98.46	82.6	226.6	522.1
135.00	Bot - Section 4	0.1875	30.768	18.199	2150.3	26.58	164.10	69.0	137.6	
140.00		0.1875	29.801	17.623	1952.7	26.62	158.94	70.1	129.1	304.7
145.00		0.1875	28.835	17.048	1767.6	25.71	153.78	71.2	120.7	294.9
150.00		0.1875	27.868	16.473	1594.6	24.80	148.63	72.2	112.7	285.2
155.00		0.1875	26.901	15.897	1433.3	23.89	143.47	73.3	104.9	275.4
160.00		0.1875	25.934	15.322	1283.2	22.98	138.31	74.4	97.5	265.6
165.00		0.1875	24.967	14.746	1144.0	22.07	133.16	75.4	90.2	255.8
167.00		0.1875	24.580	14.516	1091.2	21.70	131.09	75.9	87.4	99.6
170.00		0.1875	24.000	14.171	1015.2	21.16	128.00	76.5	83.3	146.4
										27785.5

Wind Loading - Shaft

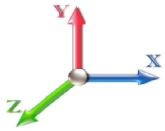
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 98 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	16.350	17.98	385.07	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	16.350	17.98	378.36	0.650	0.000	5.00	23.277	15.13	435.4	0.0	1547.3
10.00		1.00	0.70	16.350	17.98	371.65	0.650	0.000	5.00	22.868	14.86	427.7	0.0	1519.9
15.00		1.00	0.70	16.350	17.98	364.94	0.650	0.000	5.00	22.459	14.60	420.1	0.0	1492.5
20.00		1.00	0.70	16.350	17.98	358.23	0.650	0.000	5.00	22.050	14.33	412.4	0.0	1465.1
25.00		1.00	0.70	16.350	17.98	351.52	0.650	0.000	5.00	21.641	14.07	404.8	0.0	1437.7
30.00		1.00	0.70	16.364	18.00	344.96	0.650	0.000	5.00	21.232	13.80	397.5	0.0	1410.3
35.00		1.00	0.73	17.100	18.81	345.78	0.650	0.000	5.00	20.823	13.53	407.4	0.0	1382.8
40.00		1.00	0.76	17.765	19.54	345.45	0.650	0.000	5.00	20.414	13.27	414.9	0.0	1355.4
44.00	Bot - Section 2	1.00	0.78	18.256	20.08	344.51	0.650	0.000	4.00	16.036	10.42	334.9	0.0	1064.6
45.00		1.00	0.79	18.374	20.21	344.20	0.650	0.000	1.00	4.032	2.62	84.7	0.0	493.1
50.00	Top - Section 1	1.00	0.81	18.935	20.83	342.20	0.650	0.000	5.00	19.913	12.94	431.3	0.0	2435.2
55.00		1.00	0.83	19.458	21.40	345.25	0.650	0.000	5.00	19.504	12.68	434.1	0.0	1111.1
60.00		1.00	0.85	19.948	21.94	342.15	0.650	0.000	5.00	19.094	12.41	435.7	0.0	1087.6
65.00		1.00	0.87	20.409	22.45	338.59	0.650	0.000	5.00	18.685	12.15	436.3	0.0	1064.1
70.00		1.00	0.89	20.846	22.93	334.62	0.650	0.000	5.00	18.276	11.88	435.8	0.0	1040.6
75.00		1.00	0.91	21.261	23.39	330.29	0.650	0.000	5.00	17.867	11.61	434.6	0.0	1017.1
80.00		1.00	0.93	21.656	23.82	325.63	0.650	0.000	5.00	17.458	11.35	432.5	0.0	993.6
85.00		1.00	0.94	22.035	24.24	320.67	0.650	0.000	5.00	17.049	11.08	429.8	0.0	970.1
87.00	Bot - Section 3	1.00	0.95	22.182	24.40	318.61	0.650	0.000	2.00	6.705	4.36	170.1	0.0	381.5
90.00		1.00	0.96	22.398	24.64	315.45	0.650	0.000	3.00	10.094	6.56	258.6	0.0	1044.4
92.00	Top - Section 2	1.00	0.96	22.539	24.79	313.29	0.650	0.000	2.00	6.647	4.32	171.4	0.0	687.7
95.00		1.00	0.97	22.746	25.02	315.10	0.650	0.000	3.00	9.848	6.40	256.3	0.0	467.5
100.00		1.00	0.99	23.082	25.39	309.44	0.650	0.000	5.00	16.086	10.46	424.8	0.0	763.6
105.00		1.00	1.00	23.406	25.75	303.58	0.650	0.000	5.00	15.677	10.19	419.8	0.0	744.0
110.00		1.00	1.02	23.719	26.09	297.52	0.650	0.000	5.00	15.268	9.92	414.3	0.0	724.4
115.00		1.00	1.03	24.022	26.42	291.29	0.650	0.000	5.00	14.859	9.66	408.3	0.0	704.8
120.00		1.00	1.04	24.316	26.75	284.88	0.650	0.000	5.00	14.450	9.39	402.0	0.0	685.3
125.00		1.00	1.05	24.602	27.06	278.32	0.650	0.000	5.00	14.041	9.13	395.2	0.0	665.7
130.00	Appurtenance(s)	1.00	1.07	24.879	27.37	271.61	0.650	0.000	5.00	13.632	8.86	388.0	0.0	646.1
135.00	Top - Section 3	1.00	1.08	25.149	27.66	264.76	0.650	0.000	5.00	13.222	8.59	380.4	0.0	626.5
140.00		1.00	1.09	25.411	27.95	257.77	0.650	0.000	5.00	12.813	8.33	372.5	0.0	365.7
145.00	Appurtenance(s)	1.00	1.10	25.667	28.23	250.66	0.650	0.000	5.00	12.404	8.06	364.2	0.0	353.9
150.00		1.00	1.11	25.917	28.51	243.43	0.650	0.000	5.00	11.995	7.80	355.6	0.0	342.2
155.00	Appurtenance(s)	1.00	1.12	26.161	28.78	236.09	0.650	0.000	5.00	11.586	7.53	346.8	0.0	330.4
160.00		1.00	1.13	26.399	29.04	228.64	0.650	0.000	5.00	11.177	7.27	337.6	0.0	318.7
165.00		1.00	1.14	26.633	29.30	221.08	0.650	0.000	5.00	10.768	7.00	328.1	0.0	306.9
167.00	Appurtenance(s)	1.00	1.14	26.724	29.40	218.03	0.650	0.000	2.00	4.193	2.73	128.2	0.0	119.5
170.00		1.00	1.15	26.861	29.55	213.43	0.650	0.000	3.00	6.166	4.01	189.5	0.0	175.7
								Totals:	**170.00**			**13,721.4**		**33,342.5**

Discrete Appurtenance Forces

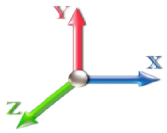
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 98 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	167.00	LPA-80080/6CF	2	26.724	29.397	1.70	1.00	14.72	50.40	0.000	0.000	692.45	0.00	0.00
2	167.00	BXA-70063-6CF	2	26.724	29.397	0.73	1.00	11.05	40.80	0.000	0.000	519.84	0.00	0.00
3	167.00	LPA-80063/4CF	4	26.724	29.397	1.00	1.00	24.60	96.00	0.000	0.000	1157.06	0.00	0.00
4	167.00	BXA-70080-6CF	1	26.724	29.397	0.87	1.00	5.01	21.60	0.000	0.000	235.70	0.00	0.00
5	167.00	Low Profile Platform-flat	1	26.724	29.397	1.00	1.00	25.00	1440.00	0.000	0.000	1175.87	0.00	0.00
6	167.00	BXA-171085-12BF	1	26.724	29.397	0.84	1.00	3.98	18.00	0.000	0.000	187.27	0.00	0.00
7	167.00	FD9R60024/2C-3L	6	26.724	29.397	1.00	1.00	2.16	22.32	0.000	0.000	101.60	0.00	0.00
8	167.00	BXA-171063-8BF	2	26.724	29.397	0.84	1.00	4.94	25.20	0.000	0.000	232.31	0.00	0.00
9	155.00	(3) SFS-H-L (V-Braces)	1	26.161	28.777	1.00	1.00	6.70	276.00	0.000	0.000	308.49	0.00	0.00
10	155.00	HRK14	1	26.161	28.777	1.00	1.00	8.13	362.83	0.000	0.000	374.33	0.00	0.00
11	155.00	PRK-1245 (kicker kit)	1	26.161	28.777	1.00	1.00	9.50	557.89	0.000	0.000	437.41	0.00	0.00
12	155.00	NNVV-65B-R4	3	26.161	28.777	0.55	0.75	20.15	278.64	0.000	0.000	927.93	0.00	0.00
13	155.00	APXVTM14-C-I20	3	26.161	28.777	0.59	0.75	11.13	202.32	0.000	0.000	512.31	0.00	0.00
14	155.00	Low Profile Platform-flat	1	26.161	28.777	1.00	1.00	25.00	1806.00	0.000	0.000	1151.09	0.00	0.00
15	155.00	TD-RRH8x20-25	3	26.161	28.777	0.52	0.75	6.29	252.00	0.000	0.000	289.50	0.00	0.00
16	155.00	800 MHz RRH	6	26.161	28.777	0.69	0.75	10.31	381.60	0.000	0.000	474.64	0.00	0.00
17	155.00	1900MHz RRH (65MHz)	3	26.161	28.777	0.66	0.75	5.48	216.00	0.000	0.000	252.53	0.00	0.00
18	145.00	LGP21401	6	25.667	28.234	0.75	1.00	5.81	101.52	0.000	0.000	262.24	0.00	0.00
19	145.00	7770.00	6	25.667	28.234	0.73	1.00	24.09	252.00	0.000	0.000	1088.25	0.00	0.00
20	145.00	AM-X-CD-17-65-00T-RET	3	25.667	28.234	0.75	1.00	11.25	110.88	0.000	0.000	508.21	0.00	0.00
21	145.00	RRUS-11	6	25.667	28.234	0.68	1.00	18.03	396.00	0.000	0.000	814.66	0.00	0.00
22	145.00	DC6-48-60-18-8F	1	25.667	28.234	0.75	1.00	1.10	38.16	0.000	0.000	49.80	0.00	0.00
23	145.00	Low Profile Platform-flat	1	25.667	28.234	1.00	1.00	25.00	1440.00	0.000	0.000	1129.36	0.00	0.00
24	130.00	APX18-206517S-C-ACU	7	24.879	27.367	0.73	1.00	26.93	176.40	0.000	0.000	1179.16	0.00	0.00
25	130.00	Ericsson KRY 112 489/2	2	24.879	27.367	1.00	1.00	1.30	36.96	0.000	0.000	56.92	0.00	0.00
26	130.00	Radio 4449 B71+B12	2	24.879	27.367	0.67	1.00	2.64	170.40	0.000	0.000	115.59	0.00	0.00
27	130.00	KRY 112 144/1	2	24.879	27.367	1.00	1.00	0.82	26.40	0.000	0.000	35.91	0.00	0.00
28	130.00	APXVAARR24 43-U-NA2	2	24.879	27.367	0.70	1.00	28.34	307.20	0.000	0.000	1240.74	0.00	0.00
29	130.00	T-Arm (Flat)	3	24.879	27.367	0.56	0.75	16.88	1440.00	0.000	0.000	738.90	0.00	0.00
30	50.00	GPS	1	18.935	20.829	0.00	1.00	1.00	12.00	0.000	0.000	33.33	0.00	0.00
							Totals:		**10,555.52**			**16,283.41**		

Total Applied Force Summary

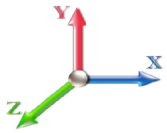
Structure:	CT13062-A-SBA		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 98 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		435.38	1794.76	0.00	0.00
10.00		427.73	1767.35	0.00	0.00
15.00		420.08	1739.94	0.00	0.00
20.00		412.43	1712.52	0.00	0.00
25.00		404.77	1685.11	0.00	0.00
30.00		397.46	1657.70	0.00	0.00
35.00		407.35	1630.29	0.00	0.00
40.00		414.88	1602.88	0.00	0.00
44.00		334.91	1262.56	0.00	0.00
45.00		84.74	542.63	0.00	0.00
50.00	(1) attachments	464.67	2694.61	0.00	0.00
55.00		434.14	1357.54	0.00	0.00
60.00		435.74	1334.04	0.00	0.00
65.00		436.26	1310.55	0.00	0.00
70.00		435.84	1287.05	0.00	0.00
75.00		434.57	1263.55	0.00	0.00
80.00		432.52	1240.06	0.00	0.00
85.00		429.77	1216.56	0.00	0.00
87.00		170.15	480.05	0.00	0.00
90.00		258.62	1192.32	0.00	0.00
92.00		171.39	786.26	0.00	0.00
95.00		256.26	615.44	0.00	0.00
100.00		424.77	1010.06	0.00	0.00
105.00		419.78	990.48	0.00	0.00
110.00		414.29	970.90	0.00	0.00
115.00		408.35	913.88	0.00	0.00
120.00		401.96	894.30	0.00	0.00
125.00		395.16	874.72	0.00	0.00
130.00	(18) attachments	3755.19	3012.50	0.00	0.00
135.00		380.41	797.28	0.00	0.00
140.00		372.49	536.44	0.00	0.00
145.00	(23) attachments	4216.75	2863.26	0.00	0.00
150.00		355.65	432.91	0.00	0.00
155.00	(22) attachments	5074.99	4754.44	0.00	0.00
160.00		337.56	393.57	0.00	0.00
165.00		328.07	381.82	0.00	0.00
167.00	(19) attachments	4430.28	1863.76	0.00	0.00
170.00		189.48	175.71	0.00	0.00
	Totals:	**30,004.86**	**51,039.82**	**0.00**	**0.00**

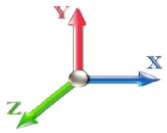
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Load Case: 1.2D + 1.6W 98 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.96
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.96
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.96
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.96
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	16.350	0.00	0.96
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	16.364	0.00	0.96
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	17.100	0.00	0.96
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	17.765	0.00	0.96
44.00	1/2" Coax	Yes	4.00	0.000	0.65	0.22	0.00	0.014	0.000	18.256	0.00	0.77
45.00	1/2" Coax	Yes	1.00	0.000	0.65	0.05	0.00	0.014	0.000	18.374	0.00	0.19
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	18.935	0.00	0.96
									Totals:		**0.0**	**9.6**

Calculated Forces

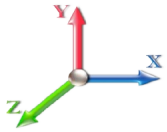
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 98 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-50.99	-30.09	0.00	-3770.0	0.00	3770.09	5281.41	2640.70	11948.3	5983.04	0.00	0.000	0.000	0.640
5.00	-49.10	-29.80	0.00	-3619.6	0.00	3619.66	5219.65	2609.83	11599.6	5808.42	0.10	-0.179	0.000	0.633
10.00	-47.24	-29.52	0.00	-3470.6	0.00	3470.65	5156.79	2578.39	11253.4	5635.08	0.38	-0.361	0.000	0.625
15.00	-45.41	-29.23	0.00	-3323.0	0.00	3323.07	5092.81	2546.41	10909.9	5463.06	0.86	-0.545	0.000	0.617
20.00	-43.61	-28.94	0.00	-3176.9	0.00	3176.92	5027.73	2513.87	10569.1	5292.44	1.53	-0.730	0.000	0.609
25.00	-41.84	-28.65	0.00	-3032.2	0.00	3032.22	4961.55	2480.77	10231.3	5123.29	2.39	-0.918	0.000	0.600
30.00	-40.09	-28.36	0.00	-2888.9	0.00	2888.97	4894.25	2447.13	9896.64	4955.68	3.46	-1.107	0.000	0.591
35.00	-38.38	-28.04	0.00	-2747.1	0.00	2747.19	4825.85	2412.92	9565.10	4789.66	4.72	-1.299	0.000	0.582
40.00	-36.70	-27.70	0.00	-2606.9	0.00	2606.98	4756.34	2378.17	9236.88	4625.31	6.18	-1.491	0.000	0.571
44.00	-35.40	-27.39	0.00	-2496.1	0.00	2496.17	4699.93	2349.97	8976.79	4495.07	7.50	-1.647	0.000	0.563
45.00	-34.81	-27.36	0.00	-2468.7	0.00	2468.78	4685.72	2342.86	8912.13	4462.69	7.85	-1.687	0.000	0.561
50.00	-32.04	-26.93	0.00	-2331.9	0.00	2331.97	3825.89	1912.95	7262.03	3636.41	9.72	-1.883	0.000	0.650
55.00	-30.60	-26.56	0.00	-2197.3	0.00	2197.34	3771.75	1885.87	7008.23	3509.32	11.80	-2.079	0.000	0.634
60.00	-29.18	-26.18	0.00	-2064.5	0.00	2064.57	3716.49	1858.25	6756.75	3383.40	14.09	-2.297	0.000	0.618
65.00	-27.79	-25.79	0.00	-1933.6	0.00	1933.67	3660.13	1830.06	6507.73	3258.70	16.61	-2.515	0.000	0.601
70.00	-26.43	-25.40	0.00	-1804.7	0.00	1804.70	3602.65	1801.33	6261.29	3135.30	19.36	-2.732	0.000	0.583
75.00	-25.10	-25.00	0.00	-1677.7	0.00	1677.70	3544.08	1772.04	6017.58	3013.26	22.34	-2.949	0.000	0.564
80.00	-23.79	-24.59	0.00	-1552.7	0.00	1552.70	3484.39	1742.19	5776.72	2892.65	25.54	-3.165	0.000	0.544
85.00	-22.54	-24.15	0.00	-1429.7	0.00	1429.75	3423.59	1711.80	5538.85	2773.54	28.97	-3.379	0.000	0.522
87.00	-22.02	-23.99	0.00	-1381.4	0.00	1381.45	3398.97	1699.48	5444.57	2726.33	30.40	-3.466	0.000	0.513
90.00	-20.81	-23.70	0.00	-1309.4	0.00	1309.47	3361.69	1680.85	5304.10	2655.99	32.62	-3.594	0.000	0.499
92.00	-19.99	-23.52	0.00	-1262.0	0.00	1262.07	2669.14	1334.57	4251.41	2128.87	34.15	-3.679	0.000	0.601
95.00	-19.32	-23.28	0.00	-1191.5	0.00	1191.52	2642.32	1321.16	4145.22	2075.69	36.50	-3.806	0.000	0.582
100.00	-18.25	-22.86	0.00	-1075.1	0.00	1075.12	2596.75	1298.37	3969.75	1987.83	40.60	-4.036	0.000	0.548
105.00	-17.20	-22.44	0.00	-960.81	0.00	960.81	2550.06	1275.03	3796.28	1900.96	44.95	-4.261	0.000	0.512
110.00	-16.19	-22.01	0.00	-848.62	0.00	848.62	2502.27	1251.14	3624.94	1815.17	49.52	-4.476	0.000	0.474
115.00	-15.23	-21.58	0.00	-738.57	0.00	738.57	2453.37	1226.69	3455.87	1730.50	54.32	-4.681	0.000	0.433
120.00	-14.31	-21.15	0.00	-630.66	0.00	630.66	2403.37	1201.68	3289.20	1647.05	59.32	-4.873	0.000	0.389
125.00	-13.41	-20.72	0.00	-524.89	0.00	524.89	2352.25	1176.13	3125.07	1564.86	64.52	-5.050	0.000	0.341
130.00	-10.70	-16.74	0.00	-421.28	0.00	421.28	2300.03	1150.02	2963.60	1484.00	69.88	-5.208	0.000	0.289
135.00	-9.91	-16.31	0.00	-337.57	0.00	337.57	2244.25	1122.13	2801.87	1403.02	75.41	-5.347	0.000	0.245
135.00	-9.91	-16.31	0.00	-337.57	0.00	337.57	1130.59	565.30	1423.12	712.62	75.41	-5.347	0.000	0.483
140.00	-9.37	-15.91	0.00	-256.01	0.00	256.01	1111.81	555.90	1354.95	678.48	81.07	-5.466	0.000	0.387
145.00	-6.90	-11.46	0.00	-176.44	0.00	176.44	1091.92	545.96	1286.99	644.45	86.87	-5.624	0.000	0.281
150.00	-6.49	-11.07	0.00	-119.16	0.00	119.16	1070.92	535.46	1219.36	610.58	92.82	-5.742	0.000	0.202
155.00	-2.26	-5.54	0.00	-63.80	0.00	63.80	1048.81	524.40	1152.19	576.95	98.87	-5.824	0.000	0.113
160.00	-1.90	-5.17	0.00	-36.08	0.00	36.08	1025.59	512.80	1085.62	543.62	104.99	-5.874	0.000	0.068
165.00	-1.55	-4.80	0.00	-10.23	0.00	10.23	1001.27	500.64	1019.78	510.65	111.15	-5.899	0.000	0.022
167.00	-0.16	-0.21	0.00	-0.62	0.00	0.62	991.23	495.62	993.68	497.58	113.62	-5.902	0.000	0.001
170.00	0.00	-0.19	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	117.32	-5.902	0.000	0.000

Wind Loading - Shaft

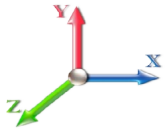
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 98 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	16.350	17.98	385.07	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	16.350	17.98	378.36	0.650	0.000	5.00	23.277	15.13	435.4	0.0	1160.5
10.00		1.00	0.70	16.350	17.98	371.65	0.650	0.000	5.00	22.868	14.86	427.7	0.0	1139.9
15.00		1.00	0.70	16.350	17.98	364.94	0.650	0.000	5.00	22.459	14.60	420.1	0.0	1119.4
20.00		1.00	0.70	16.350	17.98	358.23	0.650	0.000	5.00	22.050	14.33	412.4	0.0	1098.8
25.00		1.00	0.70	16.350	17.98	351.52	0.650	0.000	5.00	21.641	14.07	404.8	0.0	1078.3
30.00		1.00	0.70	16.364	18.00	344.96	0.650	0.000	5.00	21.232	13.80	397.5	0.0	1057.7
35.00		1.00	0.73	17.100	18.81	345.78	0.650	0.000	5.00	20.823	13.53	407.4	0.0	1037.1
40.00		1.00	0.76	17.765	19.54	345.45	0.650	0.000	5.00	20.414	13.27	414.9	0.0	1016.6
44.00	Bot - Section 2	1.00	0.78	18.256	20.08	344.51	0.650	0.000	4.00	16.036	10.42	334.9	0.0	798.5
45.00		1.00	0.79	18.374	20.21	344.20	0.650	0.000	1.00	4.032	2.62	84.7	0.0	369.9
50.00	Top - Section 1	1.00	0.81	18.935	20.83	342.20	0.650	0.000	5.00	19.913	12.94	431.3	0.0	1826.4
55.00		1.00	0.83	19.458	21.40	345.25	0.650	0.000	5.00	19.504	12.68	434.1	0.0	833.3
60.00		1.00	0.85	19.948	21.94	342.15	0.650	0.000	5.00	19.094	12.41	435.7	0.0	815.7
65.00		1.00	0.87	20.409	22.45	338.59	0.650	0.000	5.00	18.685	12.15	436.3	0.0	798.0
70.00		1.00	0.89	20.846	22.93	334.62	0.650	0.000	5.00	18.276	11.88	435.8	0.0	780.4
75.00		1.00	0.91	21.261	23.39	330.29	0.650	0.000	5.00	17.867	11.61	434.6	0.0	762.8
80.00		1.00	0.93	21.656	23.82	325.63	0.650	0.000	5.00	17.458	11.35	432.5	0.0	745.2
85.00		1.00	0.94	22.035	24.24	320.67	0.650	0.000	5.00	17.049	11.08	429.8	0.0	727.6
87.00	Bot - Section 3	1.00	0.95	22.182	24.40	318.61	0.650	0.000	2.00	6.705	4.36	170.1	0.0	286.1
90.00		1.00	0.96	22.398	24.64	315.45	0.650	0.000	3.00	10.094	6.56	258.6	0.0	783.3
92.00	Top - Section 2	1.00	0.96	22.539	24.79	313.29	0.650	0.000	2.00	6.647	4.32	171.4	0.0	515.8
95.00		1.00	0.97	22.746	25.02	315.10	0.650	0.000	3.00	9.848	6.40	256.3	0.0	350.7
100.00		1.00	0.99	23.082	25.39	309.44	0.650	0.000	5.00	16.086	10.46	424.8	0.0	572.7
105.00		1.00	1.00	23.406	25.75	303.58	0.650	0.000	5.00	15.677	10.19	419.8	0.0	558.0
110.00		1.00	1.02	23.719	26.09	297.52	0.650	0.000	5.00	15.268	9.92	414.3	0.0	543.3
115.00		1.00	1.03	24.022	26.42	291.29	0.650	0.000	5.00	14.859	9.66	408.3	0.0	528.6
120.00		1.00	1.04	24.316	26.75	284.88	0.650	0.000	5.00	14.450	9.39	402.0	0.0	513.9
125.00		1.00	1.05	24.602	27.06	278.32	0.650	0.000	5.00	14.041	9.13	395.2	0.0	499.3
130.00	Appurtenance(s)	1.00	1.07	24.879	27.37	271.61	0.650	0.000	5.00	13.632	8.86	388.0	0.0	484.6
135.00	Top - Section 3	1.00	1.08	25.149	27.66	264.76	0.650	0.000	5.00	13.222	8.59	380.4	0.0	469.9
140.00		1.00	1.09	25.411	27.95	257.77	0.650	0.000	5.00	12.813	8.33	372.5	0.0	274.3
145.00	Appurtenance(s)	1.00	1.10	25.667	28.23	250.66	0.650	0.000	5.00	12.404	8.06	364.2	0.0	265.5
150.00		1.00	1.11	25.917	28.51	243.43	0.650	0.000	5.00	11.995	7.80	355.6	0.0	256.6
155.00	Appurtenance(s)	1.00	1.12	26.161	28.78	236.09	0.650	0.000	5.00	11.586	7.53	346.8	0.0	247.8
160.00		1.00	1.13	26.399	29.04	228.64	0.650	0.000	5.00	11.177	7.27	337.6	0.0	239.0
165.00		1.00	1.14	26.633	29.30	221.08	0.650	0.000	5.00	10.768	7.00	328.1	0.0	230.2
167.00	Appurtenance(s)	1.00	1.14	26.724	29.40	218.03	0.650	0.000	2.00	4.193	2.73	128.2	0.0	89.6
170.00		1.00	1.15	26.861	29.55	213.43	0.650	0.000	3.00	6.166	4.01	189.5	0.0	131.8
								Totals:	**170.00**			**13,721.4**		**25,006.9**

Discrete Appurtenance Forces

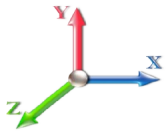
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 98 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	167.00	LPA-80080/6CF	2	26.724	29.397	1.70	1.00	14.72	37.80	0.000	0.000	692.45	0.00	0.00
2	167.00	BXA-70063-6CF	2	26.724	29.397	0.73	1.00	11.05	30.60	0.000	0.000	519.84	0.00	0.00
3	167.00	LPA-80063/4CF	4	26.724	29.397	1.00	1.00	24.60	72.00	0.000	0.000	1157.06	0.00	0.00
4	167.00	BXA-70080-6CF	1	26.724	29.397	0.87	1.00	5.01	16.20	0.000	0.000	235.70	0.00	0.00
5	167.00	Low Profile Platform-flat	1	26.724	29.397	1.00	1.00	25.00	1080.00	0.000	0.000	1175.87	0.00	0.00
6	167.00	BXA-171085-12BF	1	26.724	29.397	0.84	1.00	3.98	13.50	0.000	0.000	187.27	0.00	0.00
7	167.00	FD9R60024/2C-3L	6	26.724	29.397	1.00	1.00	2.16	16.74	0.000	0.000	101.60	0.00	0.00
8	167.00	BXA-171063-8BF	2	26.724	29.397	0.84	1.00	4.94	18.90	0.000	0.000	232.31	0.00	0.00
9	155.00	(3) SFS-H-L (V-Braces)	1	26.161	28.777	1.00	1.00	6.70	207.00	0.000	0.000	308.49	0.00	0.00
10	155.00	HRK14	1	26.161	28.777	1.00	1.00	8.13	272.12	0.000	0.000	374.33	0.00	0.00
11	155.00	PRK-1245 (kicker kit)	1	26.161	28.777	1.00	1.00	9.50	418.42	0.000	0.000	437.41	0.00	0.00
12	155.00	NNVV-65B-R4	3	26.161	28.777	0.55	0.75	20.15	208.98	0.000	0.000	927.93	0.00	0.00
13	155.00	APXVTM14-C-I20	3	26.161	28.777	0.59	0.75	11.13	151.74	0.000	0.000	512.31	0.00	0.00
14	155.00	Low Profile Platform-flat	1	26.161	28.777	1.00	1.00	25.00	1354.50	0.000	0.000	1151.09	0.00	0.00
15	155.00	TD-RRH8x20-25	3	26.161	28.777	0.52	0.75	6.29	189.00	0.000	0.000	289.50	0.00	0.00
16	155.00	800 MHz RRH	6	26.161	28.777	0.69	0.75	10.31	286.20	0.000	0.000	474.64	0.00	0.00
17	155.00	1900MHz RRH (65MHz)	3	26.161	28.777	0.66	0.75	5.48	162.00	0.000	0.000	252.53	0.00	0.00
18	145.00	LGP21401	6	25.667	28.234	0.75	1.00	5.81	76.14	0.000	0.000	262.24	0.00	0.00
19	145.00	7770.00	6	25.667	28.234	0.73	1.00	24.09	189.00	0.000	0.000	1088.25	0.00	0.00
20	145.00	AM-X-CD-17-65-00T-RET	3	25.667	28.234	0.75	1.00	11.25	83.16	0.000	0.000	508.21	0.00	0.00
21	145.00	RRUS-11	6	25.667	28.234	0.68	1.00	18.03	297.00	0.000	0.000	814.66	0.00	0.00
22	145.00	DC6-48-60-18-8F	1	25.667	28.234	0.75	1.00	1.10	28.62	0.000	0.000	49.80	0.00	0.00
23	145.00	Low Profile Platform-flat	1	25.667	28.234	1.00	1.00	25.00	1080.00	0.000	0.000	1129.36	0.00	0.00
24	130.00	APX18-206517S-C-ACU	7	24.879	27.367	0.73	1.00	26.93	132.30	0.000	0.000	1179.16	0.00	0.00
25	130.00	Ericsson KRY 112 489/2	2	24.879	27.367	1.00	1.00	1.30	27.72	0.000	0.000	56.92	0.00	0.00
26	130.00	Radio 4449 B71+B12	2	24.879	27.367	0.67	1.00	2.64	127.80	0.000	0.000	115.59	0.00	0.00
27	130.00	KRY 112 144/1	2	24.879	27.367	1.00	1.00	0.82	19.80	0.000	0.000	35.91	0.00	0.00
28	130.00	APXVAARR24 43-U-NA2	2	24.879	27.367	0.70	1.00	28.34	230.40	0.000	0.000	1240.74	0.00	0.00
29	130.00	T-Arm (Flat)	3	24.879	27.367	0.56	0.75	16.88	1080.00	0.000	0.000	738.90	0.00	0.00
30	50.00	GPS	1	18.935	20.829	0.00	1.00	1.00	9.00	0.000	0.000	33.33	0.00	0.00
							Totals:		**7,916.64**			**16,283.41**		

Total Applied Force Summary

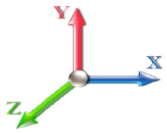
Structure:	CT13062-A-SBA		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 98 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		435.38	1346.07	0.00	0.00
10.00		427.73	1325.51	0.00	0.00
15.00		420.08	1304.95	0.00	0.00
20.00		412.43	1284.39	0.00	0.00
25.00		404.77	1263.83	0.00	0.00
30.00		397.46	1243.27	0.00	0.00
35.00		407.35	1222.72	0.00	0.00
40.00		414.88	1202.16	0.00	0.00
44.00		334.91	946.92	0.00	0.00
45.00		84.74	406.97	0.00	0.00
50.00	(1) attachments	464.67	2020.95	0.00	0.00
55.00		434.14	1018.15	0.00	0.00
60.00		435.74	1000.53	0.00	0.00
65.00		436.26	982.91	0.00	0.00
70.00		435.84	965.29	0.00	0.00
75.00		434.57	947.67	0.00	0.00
80.00		432.52	930.04	0.00	0.00
85.00		429.77	912.42	0.00	0.00
87.00		170.15	360.03	0.00	0.00
90.00		258.62	894.24	0.00	0.00
92.00		171.39	589.70	0.00	0.00
95.00		256.26	461.58	0.00	0.00
100.00		424.77	757.55	0.00	0.00
105.00		419.78	742.86	0.00	0.00
110.00		414.29	728.18	0.00	0.00
115.00		408.35	685.41	0.00	0.00
120.00		401.96	670.73	0.00	0.00
125.00		395.16	656.04	0.00	0.00
130.00	(18) attachments	3755.19	2259.38	0.00	0.00
135.00		380.41	597.96	0.00	0.00
140.00		372.49	402.33	0.00	0.00
145.00	(23) attachments	4216.75	2147.44	0.00	0.00
150.00		355.65	324.68	0.00	0.00
155.00	(22) attachments	5074.99	3565.83	0.00	0.00
160.00		337.56	295.18	0.00	0.00
165.00		328.07	286.37	0.00	0.00
167.00	(19) attachments	4430.28	1397.82	0.00	0.00
170.00		189.48	131.78	0.00	0.00
	Totals:	**30,004.86**	**38,279.86**	**0.00**	**0.00**

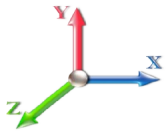
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Load Case: 0.9D + 1.6W 98 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.72
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.72
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.72
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	16.350	0.00	0.72
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	16.350	0.00	0.72
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	16.364	0.00	0.72
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	17.100	0.00	0.72
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	17.765	0.00	0.72
44.00	1/2" Coax	Yes	4.00	0.000	0.65	0.22	0.00	0.014	0.000	18.256	0.00	0.58
45.00	1/2" Coax	Yes	1.00	0.000	0.65	0.05	0.00	0.014	0.000	18.374	0.00	0.14
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	18.935	0.00	0.72
									Totals:		**0.0**	**7.2**

Calculated Forces

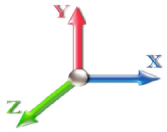
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 98 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-38.23	-30.06	0.00	-3725.9	0.00	3725.94	5281.41	2640.70	11948.3	5983.04	0.00	0.000	0.000	0.630
5.00	-36.79	-29.74	0.00	-3575.6	0.00	3575.63	5219.65	2609.83	11599.6	5808.42	0.10	-0.177	0.000	0.623
10.00	-35.38	-29.42	0.00	-3426.9	0.00	3426.92	5156.79	2578.39	11253.4	5635.08	0.38	-0.357	0.000	0.615
15.00	-33.98	-29.10	0.00	-3279.8	0.00	3279.83	5092.81	2546.41	10909.9	5463.06	0.85	-0.538	0.000	0.607
20.00	-32.61	-28.78	0.00	-3134.3	0.00	3134.35	5027.73	2513.87	10569.1	5292.44	1.51	-0.721	0.000	0.599
25.00	-31.26	-28.45	0.00	-2990.4	0.00	2990.47	4961.55	2480.77	10231.3	5123.29	2.36	-0.906	0.000	0.590
30.00	-29.93	-28.13	0.00	-2848.2	0.00	2848.20	4894.25	2447.13	9896.64	4955.68	3.41	-1.093	0.000	0.581
35.00	-28.63	-27.80	0.00	-2707.5	0.00	2707.54	4825.85	2412.92	9565.10	4789.66	4.66	-1.281	0.000	0.571
40.00	-27.35	-27.43	0.00	-2568.5	0.00	2568.57	4756.34	2378.17	9236.88	4625.31	6.10	-1.471	0.000	0.561
44.00	-26.37	-27.12	0.00	-2458.8	0.00	2458.83	4699.93	2349.97	8976.79	4495.07	7.40	-1.625	0.000	0.553
45.00	-25.91	-27.07	0.00	-2431.7	0.00	2431.72	4685.72	2342.86	8912.13	4462.69	7.75	-1.665	0.000	0.551
50.00	-23.82	-26.63	0.00	-2296.3	0.00	2296.35	3825.89	1912.95	7262.03	3636.41	9.59	-1.857	0.000	0.638
55.00	-22.72	-26.24	0.00	-2163.2	0.00	2163.21	3771.75	1885.87	7008.23	3509.32	11.64	-2.050	0.000	0.623
60.00	-21.64	-25.85	0.00	-2032.0	0.00	2032.01	3716.49	1858.25	6756.75	3383.40	13.90	-2.265	0.000	0.607
65.00	-20.58	-25.45	0.00	-1902.7	0.00	1902.77	3660.13	1830.06	6507.73	3258.70	16.39	-2.479	0.000	0.590
70.00	-19.54	-25.04	0.00	-1775.5	0.00	1775.53	3602.65	1801.33	6261.29	3135.30	19.10	-2.693	0.000	0.572
75.00	-18.53	-24.63	0.00	-1650.3	0.00	1650.32	3544.08	1772.04	6017.58	3013.26	22.03	-2.907	0.000	0.553
80.00	-17.53	-24.22	0.00	-1527.1	0.00	1527.16	3484.39	1742.19	5776.72	2892.65	25.19	-3.119	0.000	0.533
85.00	-16.58	-23.78	0.00	-1406.0	0.00	1406.08	3423.59	1711.80	5538.85	2773.54	28.57	-3.329	0.000	0.512
87.00	-16.19	-23.62	0.00	-1358.5	0.00	1358.53	3398.97	1699.48	5444.57	2726.33	29.98	-3.415	0.000	0.503
90.00	-15.27	-23.33	0.00	-1287.6	0.00	1287.68	3361.69	1680.85	5304.10	2655.99	32.17	-3.541	0.000	0.490
92.00	-14.65	-23.15	0.00	-1241.0	0.00	1241.01	2669.14	1334.57	4251.41	2128.87	33.67	-3.625	0.000	0.589
95.00	-14.14	-22.91	0.00	-1171.5	0.00	1171.56	2642.32	1321.16	4145.22	2075.69	35.98	-3.749	0.000	0.570
100.00	-13.32	-22.49	0.00	-1057.0	0.00	1057.02	2596.75	1298.37	3969.75	1987.83	40.03	-3.976	0.000	0.537
105.00	-12.53	-22.06	0.00	-944.58	0.00	944.58	2550.06	1275.03	3796.28	1900.96	44.31	-4.196	0.000	0.502
110.00	-11.75	-21.64	0.00	-834.27	0.00	834.27	2502.27	1251.14	3624.94	1815.17	48.81	-4.408	0.000	0.465
115.00	-11.03	-21.21	0.00	-726.08	0.00	726.08	2453.37	1226.69	3455.87	1730.50	53.54	-4.609	0.000	0.424
120.00	-10.33	-20.79	0.00	-620.01	0.00	620.01	2403.37	1201.68	3289.20	1647.05	58.46	-4.798	0.000	0.381
125.00	-9.65	-20.37	0.00	-516.06	0.00	516.06	2352.25	1176.13	3125.07	1564.86	63.58	-4.972	0.000	0.334
130.00	-7.69	-16.45	0.00	-414.21	0.00	414.21	2300.03	1150.02	2963.60	1484.00	68.86	-5.127	0.000	0.283
135.00	-7.09	-16.03	0.00	-331.96	0.00	331.96	2244.25	1122.13	2801.87	1403.02	74.30	-5.264	0.000	0.240
135.00	-7.09	-16.03	0.00	-331.96	0.00	331.96	1130.59	565.30	1423.12	712.62	74.30	-5.264	0.000	0.473
140.00	-6.69	-15.64	0.00	-251.80	0.00	251.80	1111.81	555.90	1354.95	678.48	79.87	-5.381	0.000	0.378
145.00	-4.93	-11.25	0.00	-173.60	0.00	173.60	1091.92	545.96	1286.99	644.45	85.59	-5.536	0.000	0.274
150.00	-4.62	-10.87	0.00	-117.35	0.00	117.35	1070.92	535.46	1219.36	610.58	91.44	-5.653	0.000	0.197
155.00	-1.57	-5.47	0.00	-62.99	0.00	62.99	1048.81	524.40	1152.19	576.95	97.40	-5.734	0.000	0.111
160.00	-1.31	-5.11	0.00	-35.64	0.00	35.64	1025.59	512.80	1085.62	543.62	103.43	-5.783	0.000	0.067
165.00	-1.05	-4.75	0.00	-10.11	0.00	10.11	1001.27	500.64	1019.78	510.65	109.49	-5.808	0.000	0.021
167.00	-0.11	-0.20	0.00	-0.61	0.00	0.61	991.23	495.62	993.68	497.58	111.92	-5.811	0.000	0.001
170.00	0.00	-0.19	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	115.56	-5.811	0.000	0.000

Wind Loading - Shaft

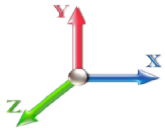
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	4.256	4.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	4.256	4.68	0.00	1.200	1.242	5.00	24.312	29.17	136.6	434.0	1981.3
10.00		1.00	0.70	4.256	4.68	0.00	1.200	1.331	5.00	23.977	28.77	134.7	457.8	1977.7
15.00		1.00	0.70	4.256	4.68	0.00	1.200	1.386	5.00	23.614	28.34	132.7	468.8	1961.3
20.00		1.00	0.70	4.256	4.68	0.00	1.200	1.427	5.00	23.239	27.89	130.6	474.2	1939.3
25.00		1.00	0.70	4.256	4.68	0.00	1.200	1.459	5.00	22.857	27.43	128.4	476.3	1914.0
30.00		1.00	0.70	4.260	4.69	0.00	1.200	1.486	5.00	22.470	26.96	126.3	476.4	1886.6
35.00		1.00	0.73	4.451	4.90	0.00	1.200	1.509	5.00	22.080	26.50	129.7	474.8	1857.7
40.00		1.00	0.76	4.625	5.09	0.00	1.200	1.529	5.00	21.688	26.03	132.4	472.1	1827.6
44.00	Bot - Section 2	1.00	0.78	4.752	5.23	0.00	1.200	1.544	4.00	17.065	20.48	107.0	375.5	1440.1
45.00		1.00	0.79	4.783	5.26	0.00	1.200	1.547	1.00	4.289	5.15	27.1	95.2	588.3
50.00	Top - Section 1	1.00	0.81	4.929	5.42	0.00	1.200	1.564	5.00	21.216	25.46	138.0	471.5	2906.7
55.00		1.00	0.83	5.065	5.57	0.00	1.200	1.579	5.00	20.819	24.98	139.2	466.6	1577.7
60.00		1.00	0.85	5.193	5.71	0.00	1.200	1.592	5.00	20.421	24.51	140.0	461.2	1548.7
65.00		1.00	0.87	5.313	5.84	0.00	1.200	1.605	5.00	20.023	24.03	140.4	455.3	1519.4
70.00		1.00	0.89	5.426	5.97	0.00	1.200	1.617	5.00	19.624	23.55	140.6	449.0	1489.6
75.00		1.00	0.91	5.534	6.09	0.00	1.200	1.628	5.00	19.224	23.07	140.4	442.4	1459.4
80.00		1.00	0.93	5.637	6.20	0.00	1.200	1.639	5.00	18.824	22.59	140.1	435.4	1429.0
85.00		1.00	0.94	5.736	6.31	0.00	1.200	1.649	5.00	18.423	22.11	139.5	428.2	1398.2
87.00	Bot - Section 3	1.00	0.95	5.774	6.35	0.00	1.200	1.653	2.00	7.256	8.71	55.3	170.1	551.5
90.00		1.00	0.96	5.830	6.41	0.00	1.200	1.658	3.00	10.923	13.11	84.1	256.3	1300.7
92.00	Top - Section 2	1.00	0.96	5.867	6.45	0.00	1.200	1.662	2.00	7.201	8.64	55.8	169.6	857.3
95.00		1.00	0.97	5.921	6.51	0.00	1.200	1.667	3.00	10.682	12.82	83.5	251.7	719.2
100.00		1.00	0.99	6.008	6.61	0.00	1.200	1.676	5.00	17.483	20.98	138.7	411.5	1175.1
105.00		1.00	1.00	6.093	6.70	0.00	1.200	1.684	5.00	17.080	20.50	137.4	403.4	1147.4
110.00		1.00	1.02	6.174	6.79	0.00	1.200	1.692	5.00	16.678	20.01	135.9	395.2	1119.6
115.00		1.00	1.03	6.253	6.88	0.00	1.200	1.699	5.00	16.275	19.53	134.3	386.7	1091.5
120.00		1.00	1.04	6.330	6.96	0.00	1.200	1.707	5.00	15.872	19.05	132.6	378.1	1063.3
125.00		1.00	1.05	6.404	7.04	0.00	1.200	1.714	5.00	15.469	18.56	130.8	369.3	1035.0
130.00	Appurtenance(s)	1.00	1.07	6.476	7.12	0.00	1.200	1.720	5.00	15.065	18.08	128.8	360.4	1006.5
135.00	Top - Section 3	1.00	1.08	6.546	7.20	0.00	1.200	1.727	5.00	14.662	17.59	126.7	351.4	977.9
140.00		1.00	1.09	6.615	7.28	0.00	1.200	1.733	5.00	14.258	17.11	124.5	342.2	707.9
145.00	Appurtenance(s)	1.00	1.10	6.681	7.35	0.00	1.200	1.739	5.00	13.854	16.62	122.2	333.0	686.9
150.00		1.00	1.11	6.746	7.42	0.00	1.200	1.745	5.00	13.450	16.14	119.8	323.6	665.8
155.00	Appurtenance(s)	1.00	1.12	6.810	7.49	0.00	1.200	1.751	5.00	13.045	15.65	117.3	314.1	644.5
160.00		1.00	1.13	6.872	7.56	0.00	1.200	1.757	5.00	12.641	15.17	114.7	304.5	623.2
165.00		1.00	1.14	6.933	7.63	0.00	1.200	1.762	5.00	12.236	14.68	112.0	294.8	601.8
167.00	Appurtenance(s)	1.00	1.14	6.957	7.65	0.00	1.200	1.764	2.00	4.781	5.74	43.9	116.4	235.9
170.00		1.00	1.15	6.992	7.69	0.00	1.200	1.767	3.00	7.050	8.46	65.1	171.0	346.7
								Totals:	**170.00**			**4,466.8**		**47,260.4**

Discrete Appurtenance Forces

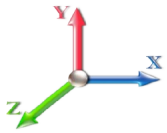
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	167.00	LPA-80080/6CF	2	6.957	7.652	1.70	1.00	18.78	445.32	0.000	0.000	143.73	0.00	0.00
2	167.00	BXA-70063-6CF	2	6.957	7.652	0.73	1.00	15.13	255.59	0.000	0.000	115.79	0.00	0.00
3	167.00	LPA-80063/4CF	4	6.957	7.652	1.00	1.00	28.78	931.43	0.000	0.000	220.23	0.00	0.00
4	167.00	BXA-70080-6CF	1	6.957	7.652	0.87	1.00	7.10	113.35	0.000	0.000	54.31	0.00	0.00
5	167.00	Low Profile Platform-flat	1	6.957	7.652	1.00	1.00	46.17	2198.43	0.000	0.000	353.29	0.00	0.00
6	167.00	BXA-171085-12BF	1	6.957	7.652	0.84	1.00	5.98	86.76	0.000	0.000	45.73	0.00	0.00
7	167.00	FD9R60024/2C-3L	6	6.957	7.652	1.00	1.00	4.85	57.20	0.000	0.000	37.10	0.00	0.00
8	167.00	BXA-171063-8BF	2	6.957	7.652	0.84	1.00	7.76	120.10	0.000	0.000	59.34	0.00	0.00
9	155.00	(3) SFS-H-L (V-Braces)	1	6.810	7.491	1.00	1.00	13.74	497.17	0.000	0.000	102.92	0.00	0.00
10	155.00	HRK14	1	6.810	7.491	1.00	1.00	16.10	1025.20	0.000	0.000	120.62	0.00	0.00
11	155.00	PRK-1245 (kicker kit)	1	6.810	7.491	1.00	1.00	19.48	788.42	0.000	0.000	145.93	0.00	0.00
12	155.00	NNVV-65B-R4	3	6.810	7.491	0.57	0.75	23.48	940.73	0.000	0.000	175.89	0.00	0.00
13	155.00	APXVTM14-C-I20	3	6.810	7.491	0.61	0.75	13.59	685.45	0.000	0.000	101.81	0.00	0.00
14	155.00	Low Profile Platform-flat	1	6.810	7.491	1.00	1.00	46.01	3128.59	0.000	0.000	344.67	0.00	0.00
15	155.00	TD-RRH8x20-25	3	6.810	7.491	0.52	0.75	7.55	584.70	0.000	0.000	56.59	0.00	0.00
16	155.00	800 MHz RRH	6	6.810	7.491	0.69	0.75	15.06	700.22	0.000	0.000	112.81	0.00	0.00
17	155.00	1900MHz RRH (65MHz)	3	6.810	7.491	0.66	0.75	8.00	395.43	0.000	0.000	59.96	0.00	0.00
18	145.00	LGP21401	6	6.681	7.350	0.75	1.00	9.55	208.42	0.000	0.000	70.21	0.00	0.00
19	145.00	7770.00	6	6.681	7.350	0.73	1.00	28.74	1059.67	0.000	0.000	211.22	0.00	0.00
20	145.00	AM-X-CD-17-65-00T-RET	3	6.681	7.350	0.75	1.00	15.45	349.14	0.000	0.000	113.57	0.00	0.00
21	145.00	RRUS-11	6	6.681	7.350	0.68	1.00	24.13	779.73	0.000	0.000	177.35	0.00	0.00
22	145.00	DC6-48-60-18-8F	1	6.681	7.350	0.75	1.00	1.63	82.08	0.000	0.000	11.95	0.00	0.00
23	145.00	Low Profile Platform-flat	1	6.681	7.350	1.00	1.00	45.87	2183.59	0.000	0.000	337.14	0.00	0.00
24	130.00	APX18-206517S-C-ACU	7	6.476	7.124	0.73	1.00	33.17	995.23	0.000	0.000	236.32	0.00	0.00
25	130.00	Ericsson KRY 112 489/2	2	6.476	7.124	1.00	1.00	2.51	61.70	0.000	0.000	17.86	0.00	0.00
26	130.00	Radio 4449 B71+B12	2	6.476	7.124	0.67	1.00	3.36	248.44	0.000	0.000	23.96	0.00	0.00
27	130.00	KRY 112 144/1	2	6.476	7.124	1.00	1.00	1.76	41.46	0.000	0.000	12.51	0.00	0.00
28	130.00	APXVAARR24 43-U-NA2	2	6.476	7.124	0.70	1.00	30.96	1129.70	0.000	0.000	220.53	0.00	0.00
29	130.00	T-Arm (Flat)	3	6.476	7.124	0.56	0.75	31.39	2025.80	0.000	0.000	223.62	0.00	0.00
30	50.00	GPS	1	4.929	5.422	0.00	1.00	1.64	30.27	0.000	0.000	8.88	0.00	0.00
							Totals:		**22,149.31**			**3,915.82**		

Total Applied Force Summary

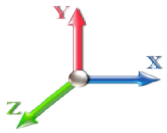
Structure:	CT13062-A-SBA		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 20

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		136.58	2241.48	0.00	0.00
10.00		134.70	2239.50	0.00	0.00
15.00		132.66	2224.16	0.00	0.00
20.00		130.55	2202.94	0.00	0.00
25.00		128.41	2178.33	0.00	0.00
30.00		126.34	2151.47	0.00	0.00
35.00		129.74	2123.01	0.00	0.00
40.00		132.39	2093.34	0.00	0.00
44.00		107.05	1652.93	0.00	0.00
45.00		27.08	641.53	0.00	0.00
50.00	(1) attachments	146.91	3203.46	0.00	0.00
55.00		139.19	1824.16	0.00	0.00
60.00		139.97	1795.23	0.00	0.00
65.00		140.41	1765.84	0.00	0.00
70.00		140.56	1736.05	0.00	0.00
75.00		140.44	1705.91	0.00	0.00
80.00		140.07	1675.45	0.00	0.00
85.00		139.49	1644.71	0.00	0.00
87.00		55.30	650.12	0.00	0.00
90.00		84.06	1448.61	0.00	0.00
92.00		55.77	955.90	0.00	0.00
95.00		83.49	867.11	0.00	0.00
100.00		138.66	1421.61	0.00	0.00
105.00		137.37	1393.92	0.00	0.00
110.00		135.93	1366.06	0.00	0.00
115.00		134.34	1300.58	0.00	0.00
120.00		132.61	1272.38	0.00	0.00
125.00		130.76	1244.04	0.00	0.00
130.00	(18) attachments	863.59	5717.89	0.00	0.00
135.00		126.69	1148.66	0.00	0.00
140.00		124.49	878.67	0.00	0.00
145.00	(23) attachments	1043.62	5520.27	0.00	0.00
150.00		119.77	756.48	0.00	0.00
155.00	(22) attachments	1338.45	9481.16	0.00	0.00
160.00		114.66	698.08	0.00	0.00
165.00		111.97	676.65	0.00	0.00
167.00	(19) attachments	1073.42	4473.99	0.00	0.00
170.00		65.07	346.74	0.00	0.00
	Totals:	**8,382.58**	**76,718.43**	**0.00**	**0.00**

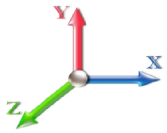
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	1.31	0.00	0.012	0.000	4.256	0.00	13.70
10.00	1/2" Coax	Yes	5.00	0.000	0.65	1.38	0.00	0.012	0.000	4.256	0.00	15.33
15.00	1/2" Coax	Yes	5.00	0.000	0.65	1.43	0.00	0.012	0.000	4.256	0.00	16.38
20.00	1/2" Coax	Yes	5.00	0.000	0.65	1.46	0.00	0.012	0.000	4.256	0.00	17.18
25.00	1/2" Coax	Yes	5.00	0.000	0.65	1.49	0.00	0.013	0.000	4.256	0.00	17.83
30.00	1/2" Coax	Yes	5.00	0.000	0.65	1.51	0.00	0.013	0.000	4.260	0.00	18.38
35.00	1/2" Coax	Yes	5.00	0.000	0.65	1.53	0.00	0.013	0.000	4.451	0.00	18.86
40.00	1/2" Coax	Yes	5.00	0.000	0.65	1.55	0.00	0.013	0.000	4.625	0.00	19.29
44.00	1/2" Coax	Yes	4.00	0.000	0.65	1.25	0.00	0.014	0.000	4.752	0.00	15.68
45.00	1/2" Coax	Yes	1.00	0.000	0.65	0.31	0.00	0.014	0.000	4.783	0.00	3.93
50.00	1/2" Coax	Yes	5.00	0.000	0.65	1.57	0.00	0.014	0.000	4.929	0.00	20.02
										Totals:	**0.0**	**176.6**

Calculated Forces

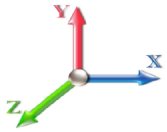
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-76.71	-8.42	0.00	-1056.6	0.00	1056.69	5281.41	2640.70	11948.3	5983.04	0.00	0.000	0.000	0.191
5.00	-74.47	-8.34	0.00	-1014.6	0.00	1014.61	5219.65	2609.83	11599.6	5808.42	0.03	-0.050	0.000	0.189
10.00	-72.22	-8.27	0.00	-972.89	0.00	972.89	5156.79	2578.39	11253.4	5635.08	0.11	-0.101	0.000	0.187
15.00	-69.99	-8.20	0.00	-931.53	0.00	931.53	5092.81	2546.41	10909.9	5463.06	0.24	-0.153	0.000	0.184
20.00	-67.78	-8.12	0.00	-890.55	0.00	890.55	5027.73	2513.87	10569.1	5292.44	0.43	-0.205	0.000	0.182
25.00	-65.59	-8.05	0.00	-849.94	0.00	849.94	4961.55	2480.77	10231.3	5123.29	0.67	-0.257	0.000	0.179
30.00	-63.43	-7.97	0.00	-809.72	0.00	809.72	4894.25	2447.13	9896.64	4955.68	0.97	-0.310	0.000	0.176
35.00	-61.31	-7.88	0.00	-769.88	0.00	769.88	4825.85	2412.92	9565.10	4789.66	1.32	-0.364	0.000	0.173
40.00	-59.21	-7.79	0.00	-730.47	0.00	730.47	4756.34	2378.17	9236.88	4625.31	1.73	-0.418	0.000	0.170
44.00	-57.55	-7.69	0.00	-699.33	0.00	699.33	4699.93	2349.97	8976.79	4495.07	2.10	-0.462	0.000	0.168
45.00	-56.90	-7.69	0.00	-691.63	0.00	691.63	4685.72	2342.86	8912.13	4462.69	2.20	-0.473	0.000	0.167
50.00	-53.70	-7.57	0.00	-653.16	0.00	653.16	3825.89	1912.95	7262.03	3636.41	2.72	-0.528	0.000	0.194
55.00	-51.87	-7.47	0.00	-615.31	0.00	615.31	3771.75	1885.87	7008.23	3509.32	3.31	-0.583	0.000	0.189
60.00	-50.06	-7.36	0.00	-577.98	0.00	577.98	3716.49	1858.25	6756.75	3383.40	3.95	-0.644	0.000	0.184
65.00	-48.29	-7.25	0.00	-541.17	0.00	541.17	3660.13	1830.06	6507.73	3258.70	4.66	-0.705	0.000	0.179
70.00	-46.55	-7.14	0.00	-504.92	0.00	504.92	3602.65	1801.33	6261.29	3135.30	5.43	-0.766	0.000	0.174
75.00	-44.84	-7.02	0.00	-469.23	0.00	469.23	3544.08	1772.04	6017.58	3013.26	6.26	-0.826	0.000	0.168
80.00	-43.16	-6.90	0.00	-434.13	0.00	434.13	3484.39	1742.19	5776.72	2892.65	7.16	-0.887	0.000	0.162
85.00	-41.51	-6.77	0.00	-399.63	0.00	399.63	3423.59	1711.80	5538.85	2773.54	8.12	-0.946	0.000	0.156
87.00	-40.86	-6.72	0.00	-386.10	0.00	386.10	3398.97	1699.48	5444.57	2726.33	8.52	-0.971	0.000	0.154
90.00	-39.41	-6.63	0.00	-365.94	0.00	365.94	3361.69	1680.85	5304.10	2655.99	9.14	-1.006	0.000	0.150
92.00	-38.45	-6.58	0.00	-352.67	0.00	352.67	2669.14	1334.57	4251.41	2128.87	9.57	-1.030	0.000	0.180
95.00	-37.58	-6.51	0.00	-332.93	0.00	332.93	2642.32	1321.16	4145.22	2075.69	10.23	-1.066	0.000	0.175
100.00	-36.15	-6.39	0.00	-300.37	0.00	300.37	2596.75	1298.37	3969.75	1987.83	11.38	-1.130	0.000	0.165
105.00	-34.76	-6.26	0.00	-268.44	0.00	268.44	2550.06	1275.03	3796.28	1900.96	12.60	-1.193	0.000	0.155
110.00	-33.39	-6.13	0.00	-237.14	0.00	237.14	2502.27	1251.14	3624.94	1815.17	13.88	-1.253	0.000	0.144
115.00	-32.08	-6.00	0.00	-206.50	0.00	206.50	2453.37	1226.69	3455.87	1730.50	15.22	-1.310	0.000	0.132
120.00	-30.81	-5.86	0.00	-176.52	0.00	176.52	2403.37	1201.68	3289.20	1647.05	16.62	-1.364	0.000	0.120
125.00	-29.56	-5.72	0.00	-147.22	0.00	147.22	2352.25	1176.13	3125.07	1564.86	18.08	-1.413	0.000	0.107
130.00	-23.87	-4.74	0.00	-118.60	0.00	118.60	2300.03	1150.02	2963.60	1484.00	19.58	-1.458	0.000	0.090
135.00	-22.72	-4.59	0.00	-94.92	0.00	94.92	2244.25	1122.13	2801.87	1403.02	21.13	-1.497	0.000	0.078
135.00	-22.72	-4.59	0.00	-94.92	0.00	94.92	1130.59	565.30	1423.12	712.62	21.13	-1.497	0.000	0.153
140.00	-21.84	-4.46	0.00	-71.95	0.00	71.95	1111.81	555.90	1354.95	678.48	22.72	-1.530	0.000	0.126
145.00	-16.35	-3.28	0.00	-49.65	0.00	49.65	1091.92	545.96	1286.99	644.45	24.35	-1.575	0.000	0.092
150.00	-15.59	-3.15	0.00	-33.26	0.00	33.26	1070.92	535.46	1219.36	610.58	26.01	-1.608	0.000	0.069
155.00	-6.15	-1.54	0.00	-17.53	0.00	17.53	1048.81	524.40	1152.19	576.95	27.71	-1.631	0.000	0.036
160.00	-5.46	-1.41	0.00	-9.82	0.00	9.82	1025.59	512.80	1085.62	543.62	29.43	-1.644	0.000	0.023
165.00	-4.79	-1.28	0.00	-2.78	0.00	2.78	1001.27	500.64	1019.78	510.65	31.15	-1.651	0.000	0.010
167.00	-0.34	-0.08	0.00	-0.23	0.00	0.23	991.23	495.62	993.68	497.58	31.85	-1.652	0.000	0.001
170.00	0.00	-0.07	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	32.88	-1.652	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT13062-A-SBA		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 23

IES Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	22
Gust Response Factor	1.10				**Sds**	0.19		**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.31		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1289.4	0.00	0.03	0.02	23.02	
10.00		1266.5	0.01	0.05	0.03	33.19	
15.00		1243.7	0.01	0.06	0.04	37.99	
20.00		1220.9	0.03	0.07	0.04	40.16	
25.00		1198.0	0.04	0.07	0.04	41.03	
30.00		1175.2	0.06	0.07	0.04	41.32	
35.00		1152.3	0.08	0.07	0.04	41.41	
40.00		1129.5	0.10	0.07	0.04	41.46	
44.00	Bot - Section 2	887.18	0.13	0.07	0.03	33.11	
45.00		410.95	0.13	0.07	0.03	15.39	
50.00	Top - Section 1	2039.3	0.16	0.07	0.03	77.64	
55.00		925.88	0.20	0.06	0.02	35.43	
60.00		906.30	0.24	0.06	0.02	34.13	
65.00		886.72	0.28	0.05	0.01	31.67	
70.00		867.14	0.32	0.04	0.01	27.61	
75.00		847.56	0.37	0.03	0.01	21.57	
80.00		827.98	0.42	0.01	0.01	13.44	
85.00		808.40	0.47	-0.01	0.01	3.67	
87.00	Bot - Section 3	317.88	0.49	-0.01	0.01	-0.19	
90.00		870.36	0.53	-0.03	0.01	-7.33	
92.00	Top - Section 2	573.06	0.55	-0.04	0.01	-7.77	
95.00		389.62	0.59	-0.05	0.01	-8.11	
100.00		636.32	0.65	-0.07	0.02	-19.63	
105.00		620.00	0.72	-0.09	0.03	-23.17	
110.00		603.69	0.79	-0.11	0.05	-24.07	
115.00		587.37	0.86	-0.12	0.07	-22.48	
120.00		571.05	0.94	-0.12	0.10	-18.67	
125.00		554.74	1.02	-0.10	0.14	-12.89	
130.00	Appurtenance(s)	2336.2	1.11	-0.07	0.19	-23.29	
135.00	Top - Section 3	522.10	1.19	0.00	0.25	3.70	
140.00		304.74	1.28	0.10	0.32	8.52	
145.00	Appurtenance(s)	2243.7	1.37	0.24	0.41	118.18	
150.00		285.16	1.47	0.43	0.51	23.18	
155.00	Appurtenance(s)	3886.4	1.57	0.69	0.63	442.79	
160.00		265.58	1.67	1.03	0.78	40.01	
165.00		255.79	1.78	1.45	0.94	48.99	
167.00	Appurtenance(s)	1528.1	1.82	1.65	1.02	319.48	
170.00		146.42	1.89	1.98	1.14	34.65	
	Totals:	**36,581.7**				**1,465.1**	**Total Wind:** **30,004.9**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Iterations 22

Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.31	**SA**	0.03			**Seismic Importance Factor**	1.00

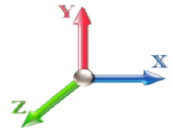
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-51.04	-1.64	0.00	-197.96	0.00	197.96	5281.41	2640.70	11948.3	5983.04		0.00	0.00	0.043
5.00	-49.24	-1.62	0.00	-189.78	0.00	189.78	5219.65	2609.83	11599.6	5808.42		0.01	-0.01	0.042
10.00	-47.48	-1.60	0.00	-181.68	0.00	181.68	5156.79	2578.39	11253.4	5635.08		0.02	-0.02	0.041
15.00	-45.74	-1.56	0.00	-173.70	0.00	173.70	5092.81	2546.41	10909.9	5463.06		0.05	-0.03	0.041
20.00	-44.02	-1.53	0.00	-165.88	0.00	165.88	5027.73	2513.87	10569.1	5292.44		0.08	-0.04	0.040
25.00	-42.34	-1.50	0.00	-158.22	0.00	158.22	4961.55	2480.77	10231.3	5123.29		0.13	-0.05	0.039
30.00	-40.68	-1.46	0.00	-150.75	0.00	150.75	4894.25	2447.13	9896.64	4955.68		0.18	-0.06	0.039
35.00	-39.05	-1.42	0.00	-143.45	0.00	143.45	4825.85	2412.92	9565.10	4789.66		0.25	-0.07	0.038
40.00	-37.45	-1.39	0.00	-136.33	0.00	136.33	4756.34	2378.17	9236.88	4625.31		0.32	-0.08	0.037
44.00	-36.18	-1.35	0.00	-130.78	0.00	130.78	4699.93	2349.97	8976.79	4495.07		0.39	-0.09	0.037
45.00	-35.64	-1.34	0.00	-129.43	0.00	129.43	4685.72	2342.86	8912.13	4462.69		0.41	-0.09	0.037
50.00	-32.95	-1.27	0.00	-122.72	0.00	122.72	3825.89	1912.95	7262.03	3636.41		0.51	-0.10	0.042
55.00	-31.59	-1.23	0.00	-116.39	0.00	116.39	3771.75	1885.87	7008.23	3509.32		0.62	-0.11	0.042
60.00	-30.26	-1.20	0.00	-110.22	0.00	110.22	3716.49	1858.25	6756.75	3383.40		0.74	-0.12	0.041
65.00	-28.94	-1.17	0.00	-104.20	0.00	104.20	3660.13	1830.06	6507.73	3258.70		0.87	-0.13	0.040
70.00	-27.66	-1.15	0.00	-98.33	0.00	98.33	3602.65	1801.33	6261.29	3135.30		1.01	-0.14	0.039
75.00	-26.39	-1.13	0.00	-92.58	0.00	92.58	3544.08	1772.04	6017.58	3013.26		1.17	-0.16	0.038
80.00	-25.15	-1.12	0.00	-86.93	0.00	86.93	3484.39	1742.19	5776.72	2892.65		1.34	-0.17	0.037
85.00	-23.94	-1.12	0.00	-81.33	0.00	81.33	3423.59	1711.80	5538.85	2773.54		1.52	-0.18	0.036
87.00	-23.46	-1.12	0.00	-79.10	0.00	79.10	3398.97	1699.48	5444.57	2726.33		1.60	-0.18	0.036
90.00	-22.26	-1.11	0.00	-75.75	0.00	75.75	3361.69	1680.85	5304.10	2655.99		1.72	-0.19	0.035
92.00	-21.48	-1.11	0.00	-73.53	0.00	73.53	2669.14	1334.57	4251.41	2128.87		1.80	-0.20	0.043
95.00	-20.86	-1.12	0.00	-70.18	0.00	70.18	2642.32	1321.16	4145.22	2075.69		1.93	-0.20	0.042
100.00	-19.85	-1.12	0.00	-64.60	0.00	64.60	2596.75	1298.37	3969.75	1987.83		2.15	-0.22	0.040
105.00	-18.86	-1.12	0.00	-59.02	0.00	59.02	2550.06	1275.03	3796.28	1900.96		2.38	-0.23	0.038
110.00	-17.89	-1.12	0.00	-53.43	0.00	53.43	2502.27	1251.14	3624.94	1815.17		2.63	-0.25	0.037
115.00	-16.98	-1.12	0.00	-47.84	0.00	47.84	2453.37	1226.69	3455.87	1730.50		2.90	-0.26	0.035
120.00	-16.08	-1.12	0.00	-42.26	0.00	42.26	2403.37	1201.68	3289.20	1647.05		3.18	-0.27	0.032
125.00	-15.21	-1.12	0.00	-36.67	0.00	36.67	2352.25	1176.13	3125.07	1564.86		3.47	-0.28	0.030
130.00	-12.19	-1.10	0.00	-31.09	0.00	31.09	2300.03	1150.02	2963.60	1484.00		3.77	-0.29	0.026
135.00	-11.40	-1.10	0.00	-25.58	0.00	25.58	2244.25	1122.13	2801.87	1403.02		4.08	-0.30	0.023
135.00	-11.40	-1.10	0.00	-25.58	0.00	25.58	1130.59	565.30	1423.12	712.62		4.08	-0.30	0.046
140.00	-10.86	-1.09	0.00	-20.09	0.00	20.09	1111.81	555.90	1354.95	678.48		4.41	-0.31	0.039
145.00	-8.00	-0.96	0.00	-14.66	0.00	14.66	1091.92	545.96	1286.99	644.45		4.74	-0.33	0.030
150.00	-7.56	-0.93	0.00	-9.88	0.00	9.88	1070.92	535.46	1219.36	610.58		5.09	-0.34	0.023
155.00	-2.81	-0.46	0.00	-5.23	0.00	5.23	1048.81	524.40	1152.19	576.95		5.45	-0.34	0.012
160.00	-2.42	-0.42	0.00	-2.93	0.00	2.93	1025.59	512.80	1085.62	543.62		5.81	-0.35	0.008
165.00	-2.04	-0.37	0.00	-0.84	0.00	0.84	1001.27	500.64	1019.78	510.65		6.17	-0.35	0.004
167.00	-0.18	-0.04	0.00	-0.11	0.00	0.11	991.23	495.62	993.68	497.58		6.32	-0.35	0.000
170.00	0.00	-0.03	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11		6.54	-0.35	0.000

Seismic Segment Forces (Factored)

Structure:	CT13062-A-SBA		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 25

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	22		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18		
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.31	**SA**	0.03	**S1**	0.06		
						Seismic Importance Factor	1.00		

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1289.4	0.00	0.03	0.02	23.02	
10.00		1266.5	0.01	0.05	0.03	33.19	
15.00		1243.7	0.01	0.06	0.04	37.99	
20.00		1220.9	0.03	0.07	0.04	40.16	
25.00		1198.0	0.04	0.07	0.04	41.03	
30.00		1175.2	0.06	0.07	0.04	41.32	
35.00		1152.3	0.08	0.07	0.04	41.41	
40.00		1129.5	0.10	0.07	0.04	41.46	
44.00	Bot - Section 2	887.18	0.13	0.07	0.03	33.11	
45.00		410.95	0.13	0.07	0.03	15.39	
50.00	Top - Section 1	2039.3	0.16	0.07	0.03	77.64	
55.00		925.88	0.20	0.06	0.02	35.43	
60.00		906.30	0.24	0.06	0.02	34.13	
65.00		886.72	0.28	0.05	0.01	31.67	
70.00		867.14	0.32	0.04	0.01	27.61	
75.00		847.56	0.37	0.03	0.01	21.57	
80.00		827.98	0.42	0.01	0.01	13.44	
85.00		808.40	0.47	-0.01	0.01	3.67	
87.00	Bot - Section 3	317.88	0.49	-0.01	0.01	-0.19	
90.00		870.36	0.53	-0.03	0.01	-7.33	
92.00	Top - Section 2	573.06	0.55	-0.04	0.01	-7.77	
95.00		389.62	0.59	-0.05	0.01	-8.11	
100.00		636.32	0.65	-0.07	0.02	-19.63	
105.00		620.00	0.72	-0.09	0.03	-23.17	
110.00		603.69	0.79	-0.11	0.05	-24.07	
115.00		587.37	0.86	-0.12	0.07	-22.48	
120.00		571.05	0.94	-0.12	0.10	-18.67	
125.00		554.74	1.02	-0.10	0.14	-12.89	
130.00	Appurtenance(s)	2336.2	1.11	-0.07	0.19	-23.29	
135.00	Top - Section 3	522.10	1.19	0.00	0.25	3.70	
140.00		304.74	1.28	0.10	0.32	8.52	
145.00	Appurtenance(s)	2243.7	1.37	0.24	0.41	118.18	
150.00		285.16	1.47	0.43	0.51	23.18	
155.00	Appurtenance(s)	3886.4	1.57	0.69	0.63	442.79	
160.00		265.58	1.67	1.03	0.78	40.01	
165.00		255.79	1.78	1.45	0.94	48.99	
167.00	Appurtenance(s)	1528.1	1.82	1.65	1.02	319.48	
170.00		146.42	1.89	1.98	1.14	34.65	
	Totals:	**36,581.7**				**1,465.1**	**Total Wind:** **30,004.9**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Iterations 22

Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.31	**SA**	0.03			**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-38.28	-1.64	0.00	-195.57	0.00	195.57	5281.41	2640.70	11948.3	5983.04		0.00	0.00	0.040
5.00	-36.93	-1.62	0.00	-187.40	0.00	187.40	5219.65	2609.83	11599.6	5808.42		0.00	-0.01	0.039
10.00	-35.61	-1.59	0.00	-179.31	0.00	179.31	5156.79	2578.39	11253.4	5635.08		0.02	-0.02	0.039
15.00	-34.30	-1.56	0.00	-171.36	0.00	171.36	5092.81	2546.41	10909.9	5463.06		0.04	-0.03	0.038
20.00	-33.02	-1.52	0.00	-163.57	0.00	163.57	5027.73	2513.87	10569.1	5292.44		0.08	-0.04	0.037
25.00	-31.75	-1.49	0.00	-155.96	0.00	155.96	4961.55	2480.77	10231.3	5123.29		0.12	-0.05	0.037
30.00	-30.51	-1.45	0.00	-148.53	0.00	148.53	4894.25	2447.13	9896.64	4955.68		0.18	-0.06	0.036
35.00	-29.29	-1.41	0.00	-141.29	0.00	141.29	4825.85	2412.92	9565.10	4789.66		0.24	-0.07	0.036
40.00	-28.09	-1.37	0.00	-134.23	0.00	134.23	4756.34	2378.17	9236.88	4625.31		0.32	-0.08	0.035
44.00	-27.14	-1.34	0.00	-128.75	0.00	128.75	4699.93	2349.97	8976.79	4495.07		0.39	-0.08	0.034
45.00	-26.73	-1.33	0.00	-127.41	0.00	127.41	4685.72	2342.86	8912.13	4462.69		0.41	-0.09	0.034
50.00	-24.71	-1.25	0.00	-120.77	0.00	120.77	3825.89	1912.95	7262.03	3636.41		0.50	-0.10	0.040
55.00	-23.69	-1.22	0.00	-114.52	0.00	114.52	3771.75	1885.87	7008.23	3509.32		0.61	-0.11	0.039
60.00	-22.69	-1.19	0.00	-108.43	0.00	108.43	3716.49	1858.25	6756.75	3383.40		0.73	-0.12	0.038
65.00	-21.71	-1.16	0.00	-102.50	0.00	102.50	3660.13	1830.06	6507.73	3258.70		0.86	-0.13	0.037
70.00	-20.74	-1.13	0.00	-96.72	0.00	96.72	3602.65	1801.33	6261.29	3135.30		1.00	-0.14	0.037
75.00	-19.79	-1.11	0.00	-91.06	0.00	91.06	3544.08	1772.04	6017.58	3013.26		1.15	-0.15	0.036
80.00	-18.86	-1.10	0.00	-85.51	0.00	85.51	3484.39	1742.19	5776.72	2892.65		1.32	-0.17	0.035
85.00	-17.95	-1.10	0.00	-80.01	0.00	80.01	3423.59	1711.80	5538.85	2773.54		1.50	-0.18	0.034
87.00	-17.59	-1.10	0.00	-77.82	0.00	77.82	3398.97	1699.48	5444.57	2726.33		1.58	-0.18	0.034
90.00	-16.70	-1.09	0.00	-74.53	0.00	74.53	3361.69	1680.85	5304.10	2655.99		1.69	-0.19	0.033
92.00	-16.11	-1.09	0.00	-72.35	0.00	72.35	2669.14	1334.57	4251.41	2128.87		1.77	-0.19	0.040
95.00	-15.65	-1.10	0.00	-69.06	0.00	69.06	2642.32	1321.16	4145.22	2075.69		1.90	-0.20	0.039
100.00	-14.89	-1.10	0.00	-63.58	0.00	63.58	2596.75	1298.37	3969.75	1987.83		2.12	-0.21	0.038
105.00	-14.14	-1.10	0.00	-58.10	0.00	58.10	2550.06	1275.03	3796.28	1900.96		2.35	-0.23	0.036
110.00	-13.42	-1.10	0.00	-52.61	0.00	52.61	2502.27	1251.14	3624.94	1815.17		2.59	-0.24	0.034
115.00	-12.73	-1.10	0.00	-47.13	0.00	47.13	2453.37	1226.69	3455.87	1730.50		2.85	-0.25	0.032
120.00	-12.06	-1.10	0.00	-41.64	0.00	41.64	2403.37	1201.68	3289.20	1647.05		3.13	-0.27	0.030
125.00	-11.40	-1.10	0.00	-36.16	0.00	36.16	2352.25	1176.13	3125.07	1564.86		3.41	-0.28	0.028
130.00	-9.14	-1.09	0.00	-30.68	0.00	30.68	2300.03	1150.02	2963.60	1484.00		3.71	-0.29	0.025
135.00	-8.55	-1.08	0.00	-25.25	0.00	25.25	2244.25	1122.13	2801.87	1403.02		4.02	-0.30	0.022
135.00	-8.55	-1.08	0.00	-25.25	0.00	25.25	1130.59	565.30	1423.12	712.62		4.02	-0.30	0.043
140.00	-8.14	-1.07	0.00	-19.85	0.00	19.85	1111.81	555.90	1354.95	678.48		4.34	-0.31	0.037
145.00	-6.00	-0.94	0.00	-14.49	0.00	14.49	1091.92	545.96	1286.99	644.45		4.67	-0.32	0.028
150.00	-5.67	-0.92	0.00	-9.77	0.00	9.77	1070.92	535.46	1219.36	610.58		5.01	-0.33	0.021
155.00	-2.11	-0.46	0.00	-5.18	0.00	5.18	1048.81	524.40	1152.19	576.95		5.37	-0.34	0.011
160.00	-1.81	-0.41	0.00	-2.90	0.00	2.90	1025.59	512.80	1085.62	543.62		5.72	-0.34	0.007
165.00	-1.53	-0.36	0.00	-0.83	0.00	0.83	1001.27	500.64	1019.78	510.65		6.08	-0.34	0.003
167.00	-0.13	-0.04	0.00	-0.11	0.00	0.11	991.23	495.62	993.68	497.58		6.23	-0.34	0.000
170.00	0.00	-0.03	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11		6.44	-0.34	0.000

Wind Loading - Shaft

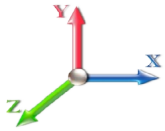
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	6.129	6.74	235.75	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	6.129	6.74	231.65	0.650	0.000	5.00	23.277	15.13	102.0	0.0	1289.4
10.00		1.00	0.70	6.129	6.74	227.54	0.650	0.000	5.00	22.868	14.86	100.2	0.0	1266.6
15.00		1.00	0.70	6.129	6.74	223.43	0.650	0.000	5.00	22.459	14.60	98.4	0.0	1243.7
20.00		1.00	0.70	6.129	6.74	219.33	0.650	0.000	5.00	22.050	14.33	96.6	0.0	1220.9
25.00		1.00	0.70	6.129	6.74	215.22	0.650	0.000	5.00	21.641	14.07	94.8	0.0	1198.1
30.00		1.00	0.70	6.134	6.75	211.20	0.650	0.000	5.00	21.232	13.80	93.1	0.0	1175.2
35.00		1.00	0.73	6.410	7.05	211.70	0.650	0.000	5.00	20.823	13.53	95.4	0.0	1152.4
40.00		1.00	0.76	6.659	7.33	211.50	0.650	0.000	5.00	20.414	13.27	97.2	0.0	1129.5
44.00	Bot - Section 2	1.00	0.78	6.843	7.53	210.93	0.650	0.000	4.00	16.036	10.42	78.5	0.0	887.2
45.00		1.00	0.79	6.887	7.58	210.73	0.650	0.000	1.00	4.032	2.62	19.9	0.0	411.0
50.00	Top - Section 1	1.00	0.81	7.098	7.81	209.51	0.650	0.000	5.00	19.913	12.94	101.1	0.0	2029.3
55.00		1.00	0.83	7.294	8.02	211.38	0.650	0.000	5.00	19.504	12.68	101.7	0.0	925.9
60.00		1.00	0.85	7.477	8.22	209.48	0.650	0.000	5.00	19.094	12.41	102.1	0.0	906.3
65.00		1.00	0.87	7.650	8.42	207.30	0.650	0.000	5.00	18.685	12.15	102.2	0.0	886.7
70.00		1.00	0.89	7.814	8.60	204.87	0.650	0.000	5.00	18.276	11.88	102.1	0.0	867.1
75.00		1.00	0.91	7.969	8.77	202.22	0.650	0.000	5.00	17.867	11.61	101.8	0.0	847.6
80.00		1.00	0.93	8.118	8.93	199.36	0.650	0.000	5.00	17.458	11.35	101.3	0.0	828.0
85.00		1.00	0.94	8.260	9.09	196.33	0.650	0.000	5.00	17.049	11.08	100.7	0.0	808.4
87.00	Bot - Section 3	1.00	0.95	8.315	9.15	195.07	0.650	0.000	2.00	6.705	4.36	39.9	0.0	317.9
90.00		1.00	0.96	8.396	9.24	193.13	0.650	0.000	3.00	10.094	6.56	60.6	0.0	870.4
92.00	Top - Section 2	1.00	0.96	8.448	9.29	191.81	0.650	0.000	2.00	6.647	4.32	40.2	0.0	573.1
95.00		1.00	0.97	8.526	9.38	192.92	0.650	0.000	3.00	9.848	6.40	60.0	0.0	389.6
100.00		1.00	0.99	8.652	9.52	189.45	0.650	0.000	5.00	16.086	10.46	99.5	0.0	636.3
105.00		1.00	1.00	8.774	9.65	185.87	0.650	0.000	5.00	15.677	10.19	98.3	0.0	620.0
110.00		1.00	1.02	8.891	9.78	182.16	0.650	0.000	5.00	15.268	9.92	97.1	0.0	603.7
115.00		1.00	1.03	9.005	9.91	178.34	0.650	0.000	5.00	14.859	9.66	95.7	0.0	587.4
120.00		1.00	1.04	9.115	10.03	174.42	0.650	0.000	5.00	14.450	9.39	94.2	0.0	571.1
125.00		1.00	1.05	9.222	10.14	170.40	0.650	0.000	5.00	14.041	9.13	92.6	0.0	554.7
130.00	Appurtenance(s)	1.00	1.07	9.326	10.26	166.29	0.650	0.000	5.00	13.632	8.86	90.9	0.0	538.4
135.00	Top - Section 3	1.00	1.08	9.427	10.37	162.10	0.650	0.000	5.00	13.222	8.59	89.1	0.0	522.1
140.00		1.00	1.09	9.525	10.48	157.82	0.650	0.000	5.00	12.813	8.33	87.3	0.0	304.7
145.00	Appurtenance(s)	1.00	1.10	9.621	10.58	153.47	0.650	0.000	5.00	12.404	8.06	85.3	0.0	294.9
150.00		1.00	1.11	9.715	10.69	149.04	0.650	0.000	5.00	11.995	7.80	83.3	0.0	285.2
155.00	Appurtenance(s)	1.00	1.12	9.806	10.79	144.54	0.650	0.000	5.00	11.586	7.53	81.2	0.0	275.4
160.00		1.00	1.13	9.896	10.89	139.98	0.650	0.000	5.00	11.177	7.27	79.1	0.0	265.6
165.00		1.00	1.14	9.983	10.98	135.36	0.650	0.000	5.00	10.768	7.00	76.9	0.0	255.8
167.00	Appurtenance(s)	1.00	1.14	10.017	11.02	133.49	0.650	0.000	2.00	4.193	2.73	30.0	0.0	99.6
170.00		1.00	1.15	10.069	11.08	130.67	0.650	0.000	3.00	6.166	4.01	44.4	0.0	146.4
								Totals:	**170.00**			**3,214.6**		**27,785.5**

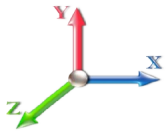
Discrete Appurtenance Forces

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	167.00	LPA-80080/6CF	2	10.017	11.019	1.70	1.00	14.72	42.00	0.000	0.000	162.22	0.00	0.00
2	167.00	BXA-70063-6CF	2	10.017	11.019	0.73	1.00	11.05	34.00	0.000	0.000	121.79	0.00	0.00
3	167.00	LPA-80063/4CF	4	10.017	11.019	1.00	1.00	24.60	80.00	0.000	0.000	271.07	0.00	0.00
4	167.00	BXA-70080-6CF	1	10.017	11.019	0.87	1.00	5.01	18.00	0.000	0.000	55.22	0.00	0.00
5	167.00	Low Profile Platform-flat	1	10.017	11.019	1.00	1.00	25.00	1200.00	0.000	0.000	275.48	0.00	0.00
6	167.00	BXA-171085-12BF	1	10.017	11.019	0.84	1.00	3.98	15.00	0.000	0.000	43.87	0.00	0.00
7	167.00	FD9R60024/2C-3L	6	10.017	11.019	1.00	1.00	2.16	18.60	0.000	0.000	23.80	0.00	0.00
8	167.00	BXA-171063-8BF	2	10.017	11.019	0.84	1.00	4.94	21.00	0.000	0.000	54.43	0.00	0.00
9	155.00	(3) SFS-H-L (V-Braces)	1	9.806	10.787	1.00	1.00	6.70	230.00	0.000	0.000	72.27	0.00	0.00
10	155.00	HRK14	1	9.806	10.787	1.00	1.00	8.13	302.36	0.000	0.000	87.70	0.00	0.00
11	155.00	PRK-1245 (kicker kit)	1	9.806	10.787	1.00	1.00	9.50	464.91	0.000	0.000	102.48	0.00	0.00
12	155.00	NNVV-65B-R4	3	9.806	10.787	0.55	0.75	20.15	232.20	0.000	0.000	217.39	0.00	0.00
13	155.00	APXVTM14-C-I20	3	9.806	10.787	0.59	0.75	11.13	168.60	0.000	0.000	120.02	0.00	0.00
14	155.00	Low Profile Platform-flat	1	9.806	10.787	1.00	1.00	25.00	1505.00	0.000	0.000	269.67	0.00	0.00
15	155.00	TD-RRH8x20-25	3	9.806	10.787	0.52	0.75	6.29	210.00	0.000	0.000	67.82	0.00	0.00
16	155.00	800 MHz RRH	6	9.806	10.787	0.69	0.75	10.31	318.00	0.000	0.000	111.20	0.00	0.00
17	155.00	1900MHz RRH (65MHz)	3	9.806	10.787	0.66	0.75	5.48	180.00	0.000	0.000	59.16	0.00	0.00
18	145.00	LGP21401	6	9.621	10.583	0.75	1.00	5.81	84.60	0.000	0.000	61.44	0.00	0.00
19	145.00	7770.00	6	9.621	10.583	0.73	1.00	24.09	210.00	0.000	0.000	254.95	0.00	0.00
20	145.00	AM-X-CD-17-65-00T-RET	3	9.621	10.583	0.75	1.00	11.25	92.40	0.000	0.000	119.06	0.00	0.00
21	145.00	RRUS-11	6	9.621	10.583	0.68	1.00	18.03	330.00	0.000	0.000	190.86	0.00	0.00
22	145.00	DC6-48-60-18-8F	1	9.621	10.583	0.75	1.00	1.10	31.80	0.000	0.000	11.67	0.00	0.00
23	145.00	Low Profile Platform-flat	1	9.621	10.583	1.00	1.00	25.00	1200.00	0.000	0.000	264.58	0.00	0.00
24	130.00	APX18-206517S-C-ACU	7	9.326	10.258	0.73	1.00	26.93	147.00	0.000	0.000	276.25	0.00	0.00
25	130.00	Ericsson KRY 112 489/2	2	9.326	10.258	1.00	1.00	1.30	30.80	0.000	0.000	13.34	0.00	0.00
26	130.00	Radio 4449 B71+B12	2	9.326	10.258	0.67	1.00	2.64	142.00	0.000	0.000	27.08	0.00	0.00
27	130.00	KRY 112 144/1	2	9.326	10.258	1.00	1.00	0.82	22.00	0.000	0.000	8.41	0.00	0.00
28	130.00	APXVAARR24 43-U-NA2	2	9.326	10.258	0.70	1.00	28.34	256.00	0.000	0.000	290.68	0.00	0.00
29	130.00	T-Arm (Flat)	3	9.326	10.258	0.56	0.75	16.88	1200.00	0.000	0.000	173.11	0.00	0.00
30	50.00	GPS	1	7.098	7.807	0.00	1.00	1.00	10.00	0.000	0.000	7.81	0.00	0.00
							Totals:		**8,796.27**			**3,814.84**		

Total Applied Force Summary

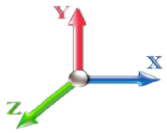
Structure:	CT13062-A-SBA		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		102.00	1495.63	0.00	0.00
10.00		100.21	1472.79	0.00	0.00
15.00		98.41	1449.95	0.00	0.00
20.00		96.62	1427.10	0.00	0.00
25.00		94.83	1404.26	0.00	0.00
30.00		93.12	1381.42	0.00	0.00
35.00		95.43	1358.57	0.00	0.00
40.00		97.20	1335.73	0.00	0.00
44.00		78.46	1052.14	0.00	0.00
45.00		19.85	452.19	0.00	0.00
50.00	(1) attachments	108.86	2245.50	0.00	0.00
55.00		101.71	1131.28	0.00	0.00
60.00		102.08	1111.70	0.00	0.00
65.00		102.21	1092.12	0.00	0.00
70.00		102.11	1072.54	0.00	0.00
75.00		101.81	1052.96	0.00	0.00
80.00		101.33	1033.38	0.00	0.00
85.00		100.68	1013.80	0.00	0.00
87.00		39.86	400.04	0.00	0.00
90.00		60.59	993.60	0.00	0.00
92.00		40.15	655.22	0.00	0.00
95.00		60.04	512.86	0.00	0.00
100.00		99.51	841.72	0.00	0.00
105.00		98.34	825.40	0.00	0.00
110.00		97.06	809.09	0.00	0.00
115.00		95.67	761.57	0.00	0.00
120.00		94.17	745.25	0.00	0.00
125.00		92.58	728.94	0.00	0.00
130.00	(18) attachments	879.76	2510.42	0.00	0.00
135.00		89.12	664.40	0.00	0.00
140.00		87.27	447.04	0.00	0.00
145.00	(23) attachments	987.89	2386.05	0.00	0.00
150.00		83.32	360.76	0.00	0.00
155.00	(22) attachments	1188.96	3962.04	0.00	0.00
160.00		79.08	327.98	0.00	0.00
165.00		76.86	318.19	0.00	0.00
167.00	(19) attachments	1037.92	1553.13	0.00	0.00
170.00		44.39	146.42	0.00	0.00
	Totals:	**7,029.46**	**42,533.18**	**0.00**	**0.00**

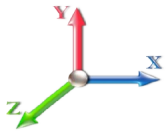
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.129	0.00	0.80
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.129	0.00	0.80
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.129	0.00	0.80
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.129	0.00	0.80
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	6.129	0.00	0.80
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	6.134	0.00	0.80
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	6.410	0.00	0.80
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	6.659	0.00	0.80
44.00	1/2" Coax	Yes	4.00	0.000	0.65	0.22	0.00	0.014	0.000	6.843	0.00	0.64
45.00	1/2" Coax	Yes	1.00	0.000	0.65	0.05	0.00	0.014	0.000	6.887	0.00	0.16
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	7.098	0.00	0.80
									Totals:		**0.0**	**8.0**

Calculated Forces

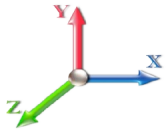
Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-42.53	-7.04	0.00	-877.56	0.00	877.56	5281.41	2640.70	11948.3	5983.04	0.00	0.000	0.000	0.155
5.00	-41.03	-6.97	0.00	-842.34	0.00	842.34	5219.65	2609.83	11599.6	5808.42	0.02	-0.042	0.000	0.153
10.00	-39.55	-6.90	0.00	-807.48	0.00	807.48	5156.79	2578.39	11253.4	5635.08	0.09	-0.084	0.000	0.151
15.00	-38.10	-6.83	0.00	-772.99	0.00	772.99	5092.81	2546.41	10909.9	5463.06	0.20	-0.127	0.000	0.149
20.00	-36.67	-6.75	0.00	-738.85	0.00	738.85	5027.73	2513.87	10569.1	5292.44	0.36	-0.170	0.000	0.147
25.00	-35.26	-6.68	0.00	-705.08	0.00	705.08	4961.55	2480.77	10231.3	5123.29	0.56	-0.214	0.000	0.145
30.00	-33.87	-6.61	0.00	-671.67	0.00	671.67	4894.25	2447.13	9896.64	4955.68	0.80	-0.258	0.000	0.142
35.00	-32.51	-6.53	0.00	-638.63	0.00	638.63	4825.85	2412.92	9565.10	4789.66	1.10	-0.302	0.000	0.140
40.00	-31.17	-6.45	0.00	-605.97	0.00	605.97	4756.34	2378.17	9236.88	4625.31	1.44	-0.347	0.000	0.138
44.00	-30.11	-6.38	0.00	-580.17	0.00	580.17	4699.93	2349.97	8976.79	4495.07	1.74	-0.383	0.000	0.135
45.00	-29.66	-6.37	0.00	-573.79	0.00	573.79	4685.72	2342.86	8912.13	4462.69	1.83	-0.392	0.000	0.135
50.00	-27.41	-6.26	0.00	-541.95	0.00	541.95	3825.89	1912.95	7262.03	3636.41	2.26	-0.438	0.000	0.156
55.00	-26.27	-6.18	0.00	-510.63	0.00	510.63	3771.75	1885.87	7008.23	3509.32	2.74	-0.483	0.000	0.152
60.00	-25.16	-6.09	0.00	-479.76	0.00	479.76	3716.49	1858.25	6756.75	3383.40	3.28	-0.534	0.000	0.149
65.00	-24.06	-5.99	0.00	-449.33	0.00	449.33	3660.13	1830.06	6507.73	3258.70	3.86	-0.585	0.000	0.144
70.00	-22.98	-5.90	0.00	-419.36	0.00	419.36	3602.65	1801.33	6261.29	3135.30	4.50	-0.635	0.000	0.140
75.00	-21.93	-5.81	0.00	-389.85	0.00	389.85	3544.08	1772.04	6017.58	3013.26	5.20	-0.686	0.000	0.136
80.00	-20.89	-5.71	0.00	-360.82	0.00	360.82	3484.39	1742.19	5776.72	2892.65	5.94	-0.736	0.000	0.131
85.00	-19.87	-5.61	0.00	-332.27	0.00	332.27	3423.59	1711.80	5538.85	2773.54	6.74	-0.786	0.000	0.126
87.00	-19.47	-5.57	0.00	-321.05	0.00	321.05	3398.97	1699.48	5444.57	2726.33	7.07	-0.806	0.000	0.123
90.00	-18.48	-5.50	0.00	-304.34	0.00	304.34	3361.69	1680.85	5304.10	2655.99	7.59	-0.835	0.000	0.120
92.00	-17.82	-5.46	0.00	-293.33	0.00	293.33	2669.14	1334.57	4251.41	2128.87	7.94	-0.855	0.000	0.144
95.00	-17.30	-5.41	0.00	-276.94	0.00	276.94	2642.32	1321.16	4145.22	2075.69	8.49	-0.885	0.000	0.140
100.00	-16.46	-5.31	0.00	-249.90	0.00	249.90	2596.75	1298.37	3969.75	1987.83	9.44	-0.938	0.000	0.132
105.00	-15.63	-5.21	0.00	-223.36	0.00	223.36	2550.06	1275.03	3796.28	1900.96	10.46	-0.990	0.000	0.124
110.00	-14.82	-5.11	0.00	-197.30	0.00	197.30	2502.27	1251.14	3624.94	1815.17	11.52	-1.041	0.000	0.115
115.00	-14.06	-5.01	0.00	-171.74	0.00	171.74	2453.37	1226.69	3455.87	1730.50	12.64	-1.088	0.000	0.105
120.00	-13.31	-4.92	0.00	-146.67	0.00	146.67	2403.37	1201.68	3289.20	1647.05	13.80	-1.133	0.000	0.095
125.00	-12.58	-4.82	0.00	-122.09	0.00	122.09	2352.25	1176.13	3125.07	1564.86	15.01	-1.174	0.000	0.083
130.00	-10.08	-3.89	0.00	-98.00	0.00	98.00	2300.03	1150.02	2963.60	1484.00	16.26	-1.211	0.000	0.070
135.00	-9.42	-3.79	0.00	-78.55	0.00	78.55	2244.25	1122.13	2801.87	1403.02	17.54	-1.243	0.000	0.060
135.00	-9.42	-3.79	0.00	-78.55	0.00	78.55	1130.59	565.30	1423.12	712.62	17.54	-1.243	0.000	0.119
140.00	-8.97	-3.70	0.00	-59.58	0.00	59.58	1111.81	555.90	1354.95	678.48	18.86	-1.271	0.000	0.096
145.00	-6.61	-2.66	0.00	-41.08	0.00	41.08	1091.92	545.96	1286.99	644.45	20.21	-1.307	0.000	0.070
150.00	-6.25	-2.57	0.00	-27.76	0.00	27.76	1070.92	535.46	1219.36	610.58	21.60	-1.335	0.000	0.051
155.00	-2.32	-1.29	0.00	-14.89	0.00	14.89	1048.81	524.40	1152.19	576.95	23.01	-1.354	0.000	0.028
160.00	-1.99	-1.21	0.00	-8.42	0.00	8.42	1025.59	512.80	1085.62	543.62	24.43	-1.366	0.000	0.017
165.00	-1.67	-1.12	0.00	-2.39	0.00	2.39	1001.27	500.64	1019.78	510.65	25.87	-1.372	0.000	0.006
167.00	-0.15	-0.05	0.00	-0.14	0.00	0.14	991.23	495.62	993.68	497.58	26.44	-1.372	0.000	0.000
170.00	0.00	-0.04	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	27.30	-1.372	0.000	0.000

Final Analysis Summary

Structure:	CT13062-A-SBA	**Code:**	EIA/TIA-222-G	7/15/2019	
Site Name:	Marlborough	**Exposure:**	B		
Height:	170.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

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Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 98 mph Wind	30.1	0.00	50.99	0.00	0.00	3770.09
0.9D + 1.6W 98 mph Wind	30.1	0.00	38.23	0.00	0.00	3725.94
1.2D + 1.0Di + 1.0Wi 50 mph Wind	8.4	0.00	76.71	0.00	0.00	1056.69
1.2D + 1.0E	1.6	0.00	51.04	0.00	0.00	197.96
0.9D + 1.0E	1.6	0.00	38.28	0.00	0.00	195.57
1.0D + 1.0W 60 mph Wind	7.0	0.00	42.53	0.00	0.00	877.56

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 98 mph Wind	-32.04	-26.93	0.00	-2331.9	0.00	-2331.9	3825.89	1912.9	7262.03	3636.41	50.00	0.650
0.9D + 1.6W 98 mph Wind	-23.82	-26.63	0.00	-2296.3	0.00	-2296.3	3825.89	1912.9	7262.03	3636.41	50.00	0.638
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-53.70	-7.57	0.00	-653.16	0.00	-653.16	3825.89	1912.9	7262.03	3636.41	50.00	0.194
1.2D + 1.0E	-11.40	-1.10	0.00	-25.58	0.00	-25.58	2244.25	1122.1	2801.87	1403.02	135.00	0.046
0.9D + 1.0E	-8.55	-1.08	0.00	-25.25	0.00	-25.25	2244.25	1122.1	2801.87	1403.02	135.00	0.043
1.0D + 1.0W 60 mph Wind	-27.41	-6.26	0.00	-541.95	0.00	-541.95	3825.89	1912.9	7262.03	3636.41	50.00	0.156

Base Plate Summary

Structure:	CT13062-A-SB		**Code:**	EIA/TIA-222-G	7/15/2019
Site Name:	Marlborough		**Exposure:**	B	
Height:	170.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 33

Tower Engineering Solutions

Reactions		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	60.00	**Bolt Circle:**	63.00
Moment (kip-ft):	4400.00	**Width (in):**	69.00	**Number Bolts:**	18.00
Axial (kip):	39.00	**Style:**	Round	**Bolt Type:**	2.25" 18J
Shear (kip):	36.00	**Polygon Sides:**	0.00	**Bolt Diameter (in):**	2.25
Analysis		**Clip Length (in):**	0.00	**Yield (ksi):**	75.00
Moment (kip-ft):	3770.09	**Effective Len (in):**	11.99	**Ultimate (ksi):**	100.00
Axial (kip):	76.71	**Moment (kip-in):**	614.41	**Arrangement:**	Radial
Shear (kip):	30.09	**Allow Stress (ksi):**	81.00	**Cluster Dist (in):**	0.00
		Applied Stress (ksi):	0.00	**Start Angle (deg):**	0.00
Moment Design %:	85.68	**Stress Ratio:**	0.50	Compression	
				Force (kip):	163.84
				Allowable (kip):	260.00
				Ratio:	0.64
				Tension	
				Force (kip):	155.32
				Allowable (kip):	260.00
				Ratio:	0.61

Monopole Mat Foundation Design

				Date
				7/15/2019
	Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
	Site Name:		**Structure Height (Ft.):**	170
	Site Number:	CT13062-A-SBA	**Engineer Name:**	J. Tibbetts
	Engr. Number:	79583	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

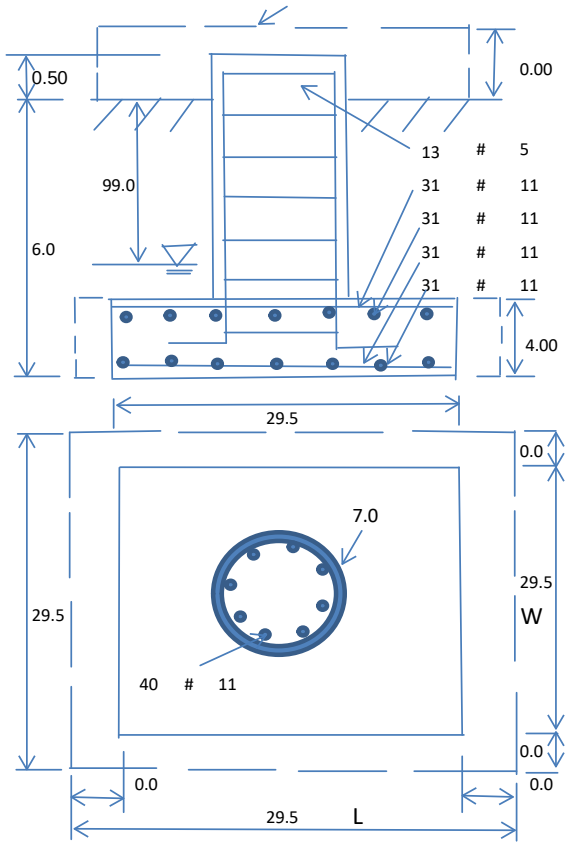
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	76.7	Shear Force (Kips):	30.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3770.1
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	4.00
Length of Pad (ft.):	29.5	Width of Pad (ft.):	29.5
Final Length of pad (ft)	29.5	Final width of pad (ft):	29.5



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	40	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	11	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	31	Qty. of Rebar in Pad (W):	31	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	31	Qty. of Rebar in Pad (W):	31	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	100.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	8000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:			1.00	

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	1663.53	Total Dry Soil Weight (Kips):	166.35
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	166.35	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3577.21	Total Dry Concrete Weight (Kips):	536.58
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	536.58	Total Vertical Load on Base (Kips):	779.63

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1923	<	Allowable Factored Soil Bearing (psf):	6000	0.32	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	10462.8	>	Design Factored Momont (kips-ft):	3966	0.38	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.64	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90		Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65		Wind Load Factor on Concrete Design:	1.00		
					Load/ Capacity Ratio	
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	1.56		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	9819.3	>	Design Factored Moment (Mu, Kips-F	3845.4	0.39	OK!
Calculated Shear Capacity (Kips):	871.9	>	Design Factored Shear (Kips):	30.1	0.03	OK!
Calculated Tension Capacity (Tn, Kips):	3369.6	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7265.6	>	Design Factored Axial Load (Pu Kips):	76.7	0.01	OK!
Moment & Axial Strength Combination:	0.39	OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.011		Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	1288.8	>	One-Way Factored Shear (L-D. Kips):	266.7	0.21	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1288.8	>	One-Way Factored Shear (W-D., Kips)	266.7	0.21	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1194.2	>	One-Way Factored Shear (C-C, Kips):	252.6	0.21	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0031	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0031		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	9293.5	>	Moment at Bottom (L-Dir. K-Ft):	1941.1	0.21	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	9293.5	>	Moment at Bottom (W-Dir. K-Ft):	1941.1	0.21	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	13043.3	>	Moment at Bottom (C-C Dir. K-Ft):	2745.1	0.21	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0031	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0031		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	9293.5	>	Moment at the top (L-Dir K-Ft):	679.3	0.07	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	9293.5	>	Moment at the top (W-Dir K-Ft):	679.3	0.07	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	13043.3	>	Moment at the top (C-C Dir. K-Ft):	634.5	0.05	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	1508.0	k-ft.	Max. factored shear stress v_{u_CD}:		2.2	Psi
Max. factored shear stress v_{u_AB}:	8.6	Psi	Factored shear Strength ϕv_n:		164.3	Psi
Max. factored shear stress v_u:	8.6	Psi	Check Usage of Punching Shear Capacity:		0.05	OK!

EXHIBIT 8

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Antenna Mount Analysis Report

Existing 170-Ft Monopole Tower
Customer Name: SBA Communications Corp
Customer Site Number: CT13062-A
Customer Site Name: Marlborough
Carrier Name: T-Mobile (App#: 116938, V1)
Carrier Site ID / Name: CT11253C / Marlborough
Site Location: 175 South Main Street
Marlborough, Connecticut
Hartford County
Latitude: 41.615961
Longitude: -72.436427

7/3/19

Analysis Result:

Max Structural Usage: 80.6% [Pass]

Report Prepared By: Anita Lama

Introduction

The purpose of this report is to summarize the analysis results on the (3) T-Arm at 130.00' elevation to support the proposed antenna configuration. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Mount Drawings	Mount mapping by Full Metal Tower services dated 4/26/2019
Antenna Loading	SBA Application # 116938, v1 dated 6/19/2019
Modification Drawings	N/A

Analysis Criteria

Basic Wind Speed Used in the Analysis: V_{ULT} =127 mph (3-Sec. Gust) / Equivalent to
V_{ASD} = 98 mph (3-Sec. Gust)
Basic Wind Speed with Ice: 50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed: 60 mph +0" Radial ice
Standard/Codes: ANSI/TIA/EIA 222-G
Exposure Category: B
Structure Class: II
Topographic Category: 1
Crest Height (Ft): 0

The site is a Risk Category II structure per table 1604.5 of the 2012 IBC. This site does not support emergency communication equipment for first responders such as fire departments, police, hospitals, ambulance services or any of the facilities listed for Risk Categories III and IV. The scope of work detailed in this structural analysis does not include items that are a part of emergency service as the 911 or essential facility service of an emergency response system.

Mount Information

(3) T-Arm at 130.00' elevation

Final Antenna Configuration

7	RFS APXV18-206517S-C-A20
2	RFS APXVAARR24_43-U-NA20
2	Ericsson KRY 112 489/2
2	Ericsson KRY 112 144/1
2	Ericsson Radio 4449 B71+B12

Any proposed antennas not currently installed should be mounted such that the centers of the antennas do not exceed 0.5 ft vertically from the center of the T-Arm.

In addition to the proposed equipment loading, a 500 lb serviceability load was also considered in this analysis in accordance with TIA requirements.

Analysis Results

Our calculations have determined that under design wind load the existing mounts will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 80.6%, which occurs in the face horizontal. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

Attachments

1. Mount Photos
2. Antenna Placement Diagram
3. Mount Mapping Information
4. Analysis Calculations

Standard Conditions

1. The loading configuration as analyzed in this report is as provided from the customer. Any deviation from this design shall be communicated to TES to verify deviation will not adversely impact the analysis.

2. The analysis is based on the presumption that the antenna mount members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion. The mount analysis is not a condition assessment of the mount.

4. The mount analysis was performed in accordance with the loading provided, and if applicable the modification required to support the additional loading.

5. If the mount is modified, installation must adhere to the configuration communicated in the modification drawings.

6. The modification drawings are not intended to convey means or methods. These are the responsibility of the installing contractor.

7. Rigging plan review is available if the contractor requires for a construction class IV or other if required. Review fee would apply.

8. The mount modification package was created based upon information provided for the mount loading. The underlying tower is assumed to provide support and sufficient rigidity to support the mount loads as a tower analysis was not part of the mount analysis.

9. TES is not responsible for modifications to climbing facilities unless communicated to TES in writing.


04.26.2019 13:53


04.26.2019 14:03

Structure: CT13062-A-SBA - Marlborough

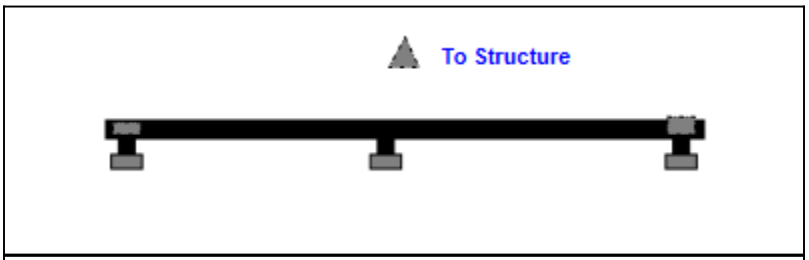
Sector: **A**

Structure Type: Monopole

Mount Elev: 130.00

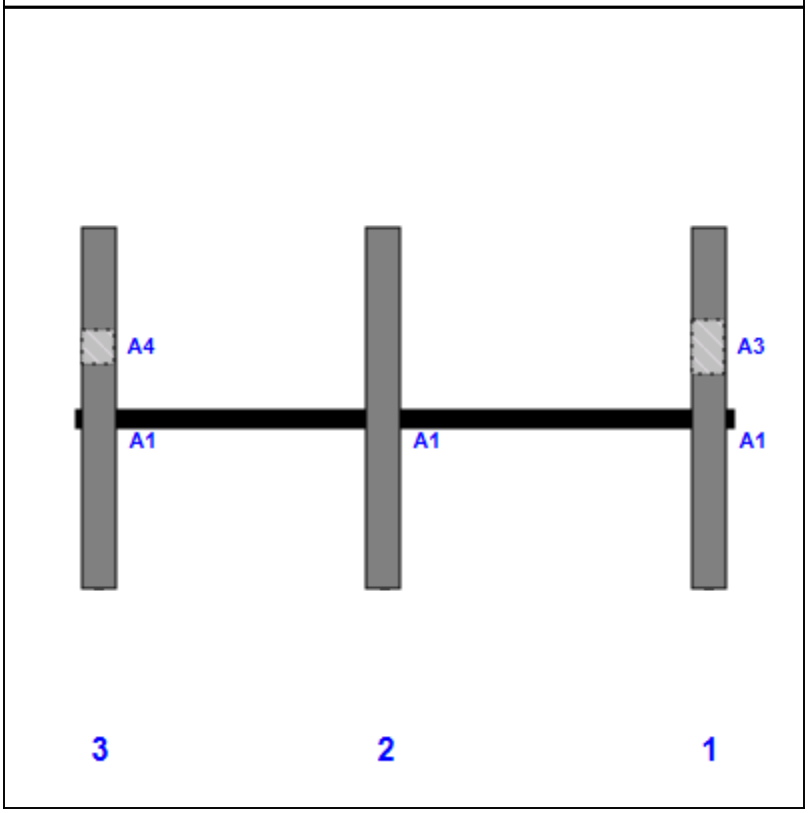
7/3/2019

Plan View



Front View

Looking Toward Structure



Ref #	Model	Height (in)	Width (in)	H Dist From Left	Pipe #	Pipe Pos V	Antenna Pos	Center Ant From Top	Antenna H Offset
A1	APXV18-206517S-C-A20	72.00	6.80	127.00	1	a	Front	36.00	0.00
A3	KRY 112 489/2	11.00	6.10	127.00	1	a	Behind	24.00	0.00
A1	APXV18-206517S-C-A20	72.00	6.80	62.00	2	a	Front	36.00	0.00
A1	APXV18-206517S-C-A20	72.00	6.80	5.00	3	a	Front	36.00	0.00
A4	KRY 112 144/1	6.90	6.10	5.00	3	a	Behind	24.00	0.00

Structure: CT13062-A-SBA - Marlborough

Sector: B

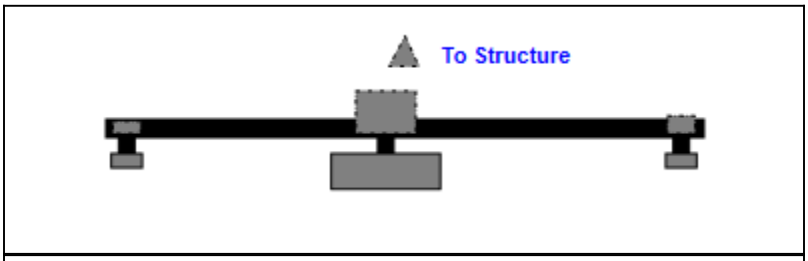
Structure Type: Monopole

Mount Elev: 130.00

7/3/2019

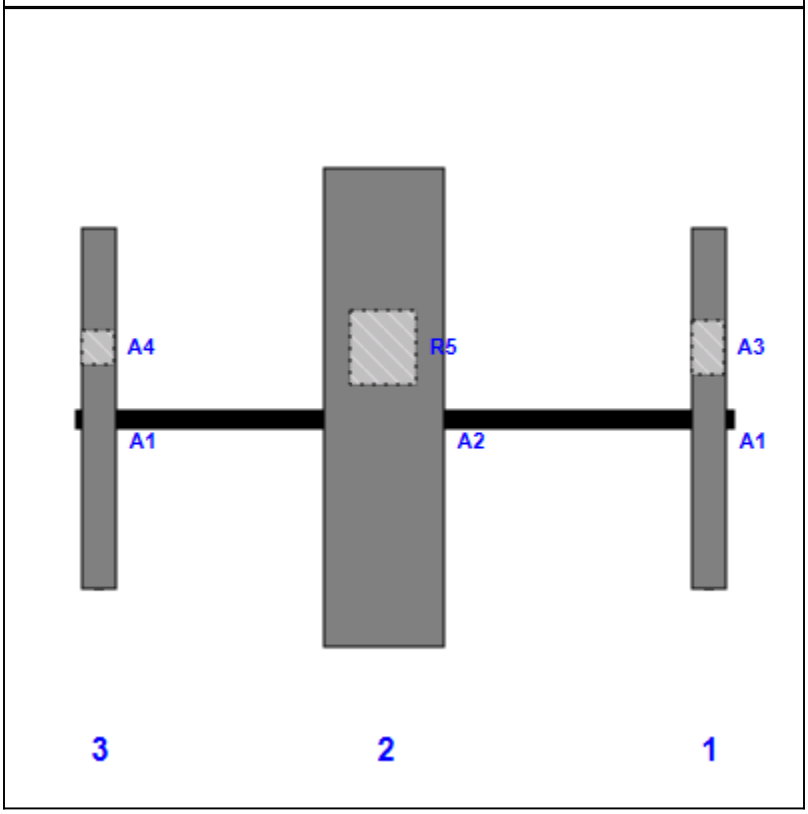
IES Tower Engineering Solutions

Plan View



Front View

Looking Toward Structure



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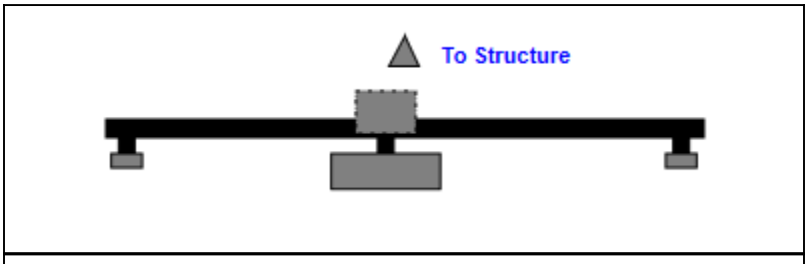
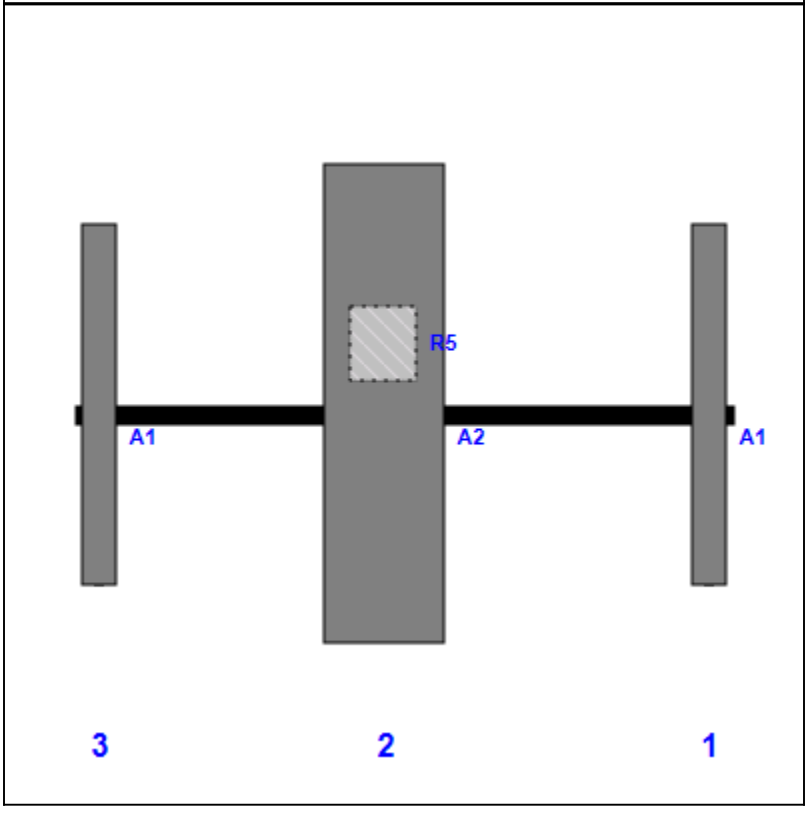
A3	KRY 112 489/2	11.00	6.10	127.00	1	a	Behind	24.00	0.00
A2	APXVAARR24_43-U-NA20	95.90	24.00	62.00	2	a	Front	36.00	0.00
R5	Radio 4449 B71+B12	15.00	13.20	62.00	2	a	Behind	24.00	0.00
A1	APXV18-206517S-C-A20	72.00	6.80	5.00	3	a	Front	36.00	0.00
A4	KRY 112 144/1	6.90	6.10	5.00	3	a	Behind	24.00	0.00

Plan View



Front View

Looking Toward Structure

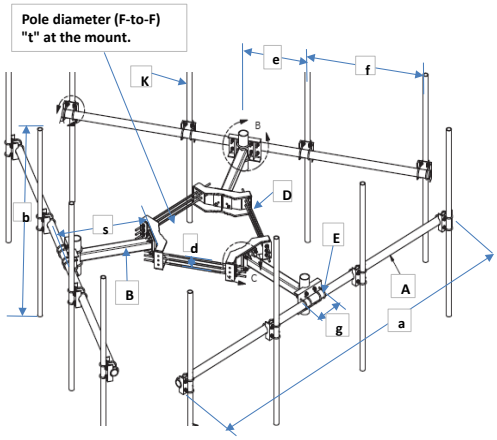


Ref #	Model	Height (in)	Width (in)	H Dist From Left	Pipe #	Pipe Pos V	Antenna Pos	Center Ant From Top	Antenna H Offset
A1	APXV18-206517S-C-A20	72.00	6.80	127.00	1	a	Front	36.00	0.00
A2	APXVAARR24_43-U-NA20	95.90	24.00	62.00	2	a	Front	36.00	0.00
R5	Radio 4449 B71+B12	15.00	13.20	62.00	2	a	Behind	24.00	0.00
A1	APXV18-206517S-C-A20	72.00	6.80	5.00	3	a	Front	36.00	0.00

Antenna Mount Type "MT-Z" Mapping Form (PATENT PENDING)

FCC # 1264681

Tower Owner:	SBA Communications	**Mapping Date:**	4/26/19
Site Name:	Marlborough	**Structure Type:**	Monopole
Site Number or ID:	CT13062-A-SBA	**Structure Height (Ft.):**	171
Mapping Contractor:	Full Metal Tower Services	**Mount Height (Ft.):**	129.4



Geometries (Unit: inches)

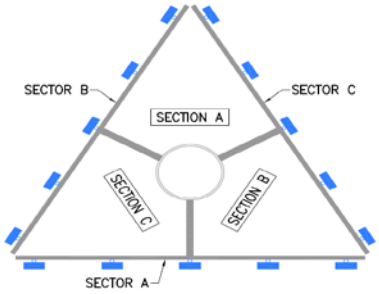
a	132	**e**	18	**j**	N/A	**o**	N/A	**s**	44
b	72	**f**	57	**k**	N/A	**p**	N/A	**t**	25
c	N/A	**g**	12	**m**	N/A	**q**	N/A	**u ***	38
d	6	**h**	N/A	**n**	N/A	**r**	N/A	**v ***	72

Members/Bolts (Unit: inches) — * - See Ant. Layout for "u", "v" and member "K" (pipe)

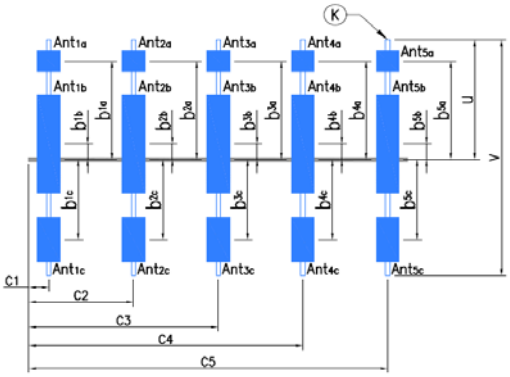
Items	Member	Lx (O.D.)	Ly (I.D.)	T	Items	Member	Lx (O.D.)	Ly (I.D.)	T
A	3.5 OD x 0.216 Pipe	3.5	3.068	0.216	**F**				
B	Tubing 4x4x1/4	4	4	0.25	**G**				
C					**H**				
D	3/4" Bolt	24			**J**				
E	5/8" Bolt	U-Bolt			**K* (pipe)**	2.375 OD x 0.154 Pipe	2.375	2.067	0.154

Distance from top of main platform member to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.)	N/A
Distance from top of main platform member to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.)	N/A

Please enter the infomation below if members can't be found from the drop down lists



Climbing ladder is Located at Section A, at 50° Degree Azimuth

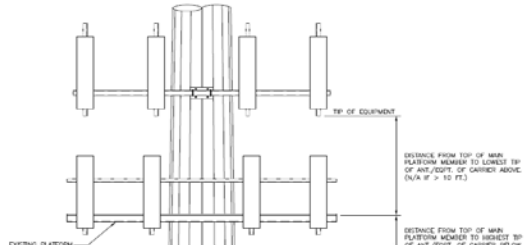


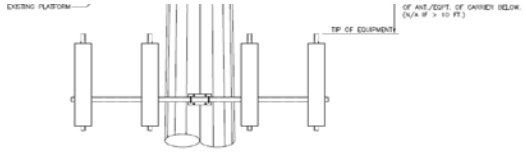
Antenna Layout

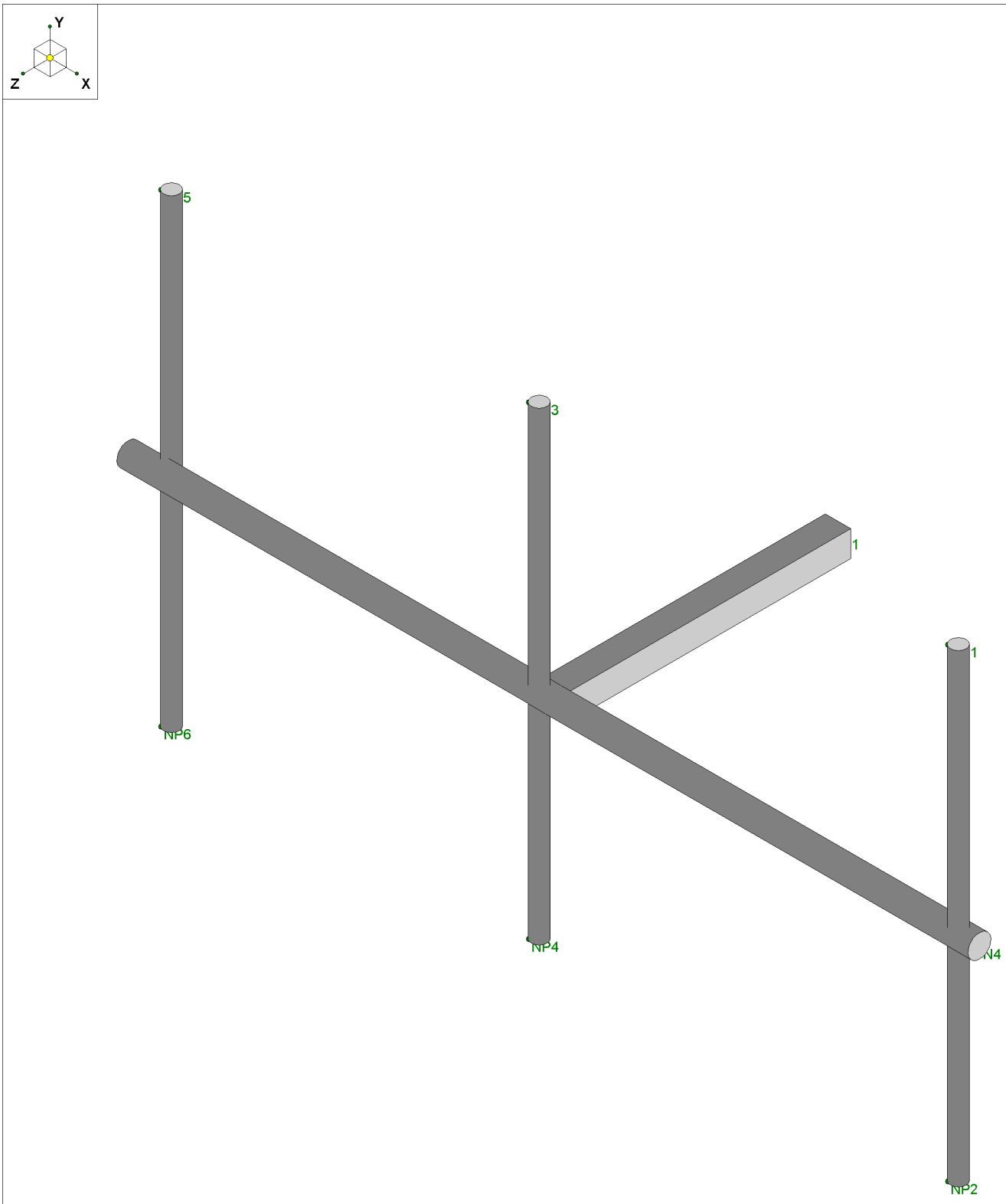
Ants. Items	Enter antenna model. If not labled, enter "Unknown". If no antenna at specified location, enter "N/A". If antennas and the locations are the same on all three sectors, only enter one sector.	Mounting Locations (Unit: inches)							Photos of antennas
	Antenna Models if Known	Width (in.)	Depth (in.)	Height (in.)	Coax Size and Qty	Vertical Distances"b_{1a}, b_{2a}, b_{3a}, b_{1b}...." (In.)	Horiz. offset (Use "-" if Ant. is inside)	Horiz. offset "C_1, C_2, C_3, C_4, C_5" (in.)	Photo Numbers
Sector A									
Ant_{1a}									
Ant_{1b}	Antenna A	7	3.5	73	1/2" (2)	+18"	6	5	
Ant_{1c}	TMA A	7	4	12	1/2" (2)	+16"	N/A	5	
Ant_{2a}									
Ant_{2b}	Empty Mast	N/A	N/A	N/A	N/A	N/A	N/A	70	
Ant_{2c}									
Ant_{3a}									
Ant_{3b}	Empty Mast	N/A	N/A	N/A	N/A	N/A	N/A	127	
Ant_{3c}									
Ant_{4a}									
Ant_{4b}									
Ant_{4c}									
Ant_{5a}									
Ant_{5b}									
Ant_{5c}									
Are Ant same as sector A?	Yes	**Antennas on Sector B are the same as Sector A**							
Are Ant same as sector A/B?	Same As A	**Antennas on Sector C are the same as Sector A**							

Azimuth (Degree) of Each Sector and Climbing Information

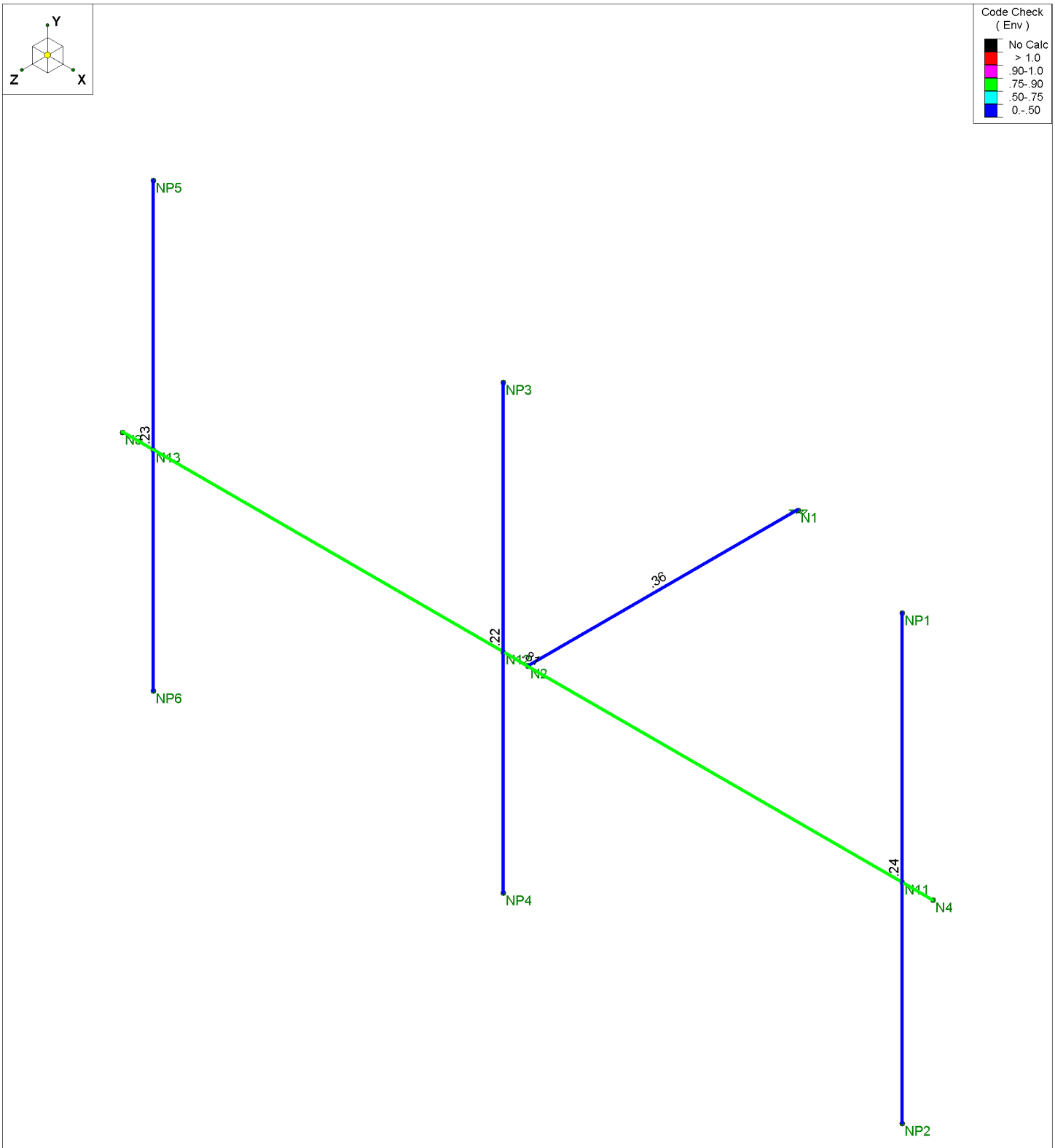
Sector A:	340°	Deg	
Sector B:	160°	Deg	
Sector C:	N/A	Deg	
Climbing	50°	Deg	Located at Section A
Climbing Facility	Corrosion Type:		No corrosion observed
	Access:		Climbing path was unobstructed.
	Condition:		N/A




EXISTING PLATFORM
OF ANT./EQPT. OF CARRIER BELOW.
(N/A IF > 10 FT.)
TIP OF EQUIPMENT

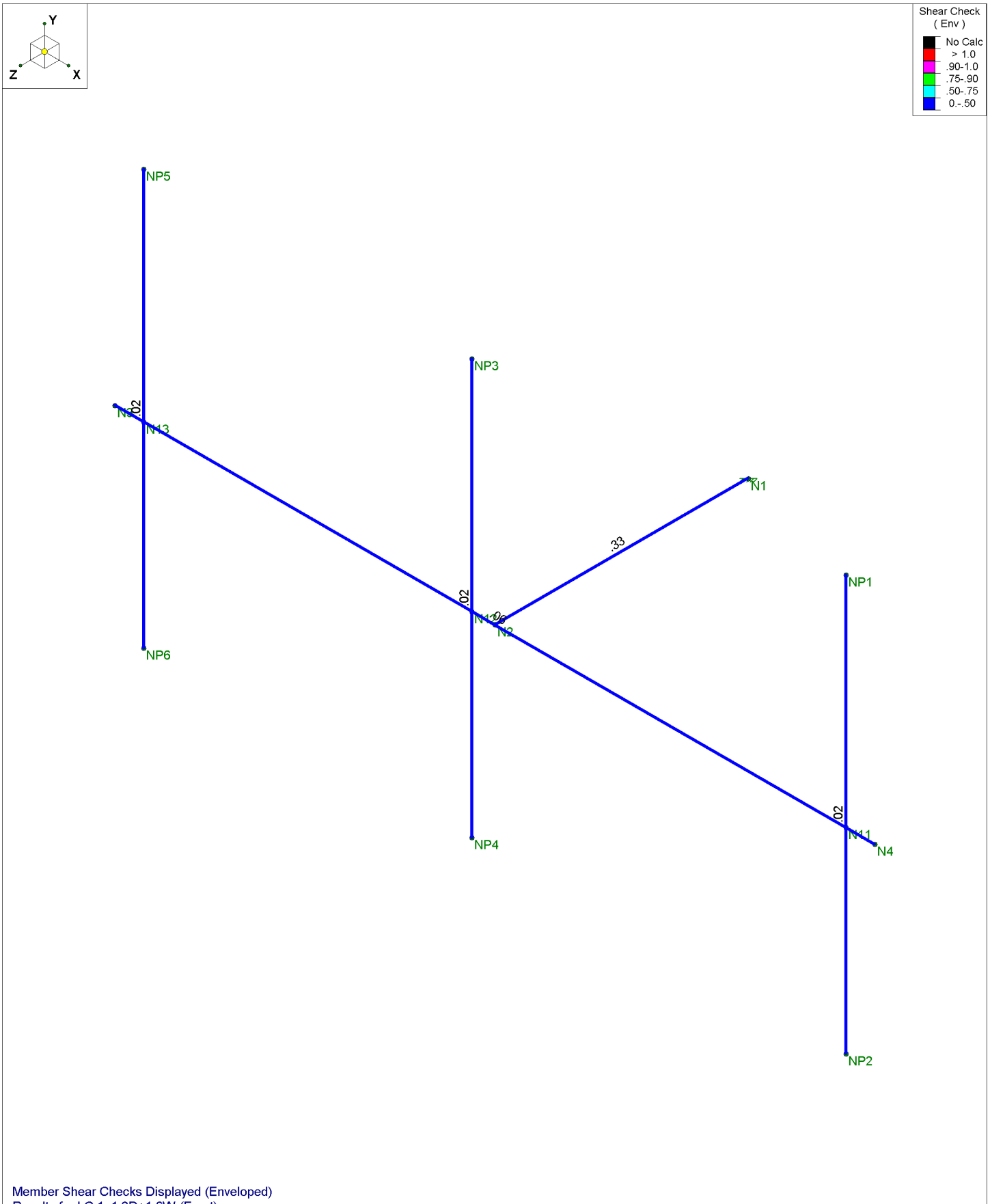


Tower Engineering Solutio...	CT13062-A-SBA_MT-Z_Loads Only_Sector A_G	SK - 1
		July 3, 2019 at 9:53 AM
TES Project No. 79558		CT13062-A-SBA_79558_G_RISA_L...



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT13062-A-SBA_MT-Z_Loads Only_Sector A_G	SK - 2
		July 3, 2019 at 9:53 AM
TES Project No. 79558		CT13062-A-SBA_79558_G_RISA_L...



Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT13062-A-SBA_MT-Z_Loads Only_Sector A_G	SK - 3
		July 3, 2019 at 9:55 AM
TES Project No. 79558		CT13062-A-SBA_79558_G_RISA_L...

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Antenna D	None					8			
2	Antenna Di	None					8			
3	Antenna W Front	None					8			
4	Antenna Wi Front	None					8			
5	Antenna W Side	None					8			
6	Antenna Wi Side	None					8			
7	Service Lm1	None					1			
8	Service Lm2	None					1			
9	Structure D	None		-1						
10	Structure Di	None						5		
11	Structure W Front	None						5		
12	Structure Wi Front	None						5		
13	Structure W Side	None						5		
14	Structure Wi Side	None						5		

Load Combinations

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	3	1.6	11	1.6														
2	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	3	-1.6	11	-1.6														
3	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	5	1.6	13	1.6														
4	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	5	-1.6	13	-1.6														
5	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	1	12	1										
6	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	-1	12	-1										
7	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	1	14	1										
8	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	-1	14	-1										
9	1.2D+1.5L...	Yes	Y		1	1.2	9	1.2	7	1.5	3	.16	11	.16												
10	1.2D+1.5L...	Yes	Y		1	1.2	9	1.2	8	1.5	3	.16	11	.16												
11	1.4D	Yes	Y		1	1.4	9	1.4																		

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	0	3.666667	0	
3	N3	-5.5	0	3.666667	0	
4	N4	5.5	0	3.666667	0	
5	NP1	5.083333	3.166667	3.666667	0	
6	NP2	5.083333	-2.833333	3.666667	0	
7	NP3	-0.333333	3.166667	3.666667	0	
8	NP4	-0.333333	-2.833333	3.666667	0	
9	NP5	-5.083333	3.166667	3.666667	0	
10	NP6	-5.083333	-2.833333	3.666667	0	
11	N11	5.083333	0	3.666667	0	
12	N12	-0.333333	0	3.666667	0	
13	N13	-5.083333	0	3.666667	0	

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	xxxxx	HSS16x0....	Beam	None	A572 Gr.50	Typical	19.9	606	606	1210

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF	4CU5.25X03...	Beam	CU	A570 Gr.33	Typical	4.854	13.238	12.817	.228

Aluminum Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	AL1A	AACS14X13.9	Beam	AA Channel	3003-H14	Typical	11.8	44.7	401	1.19

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A570 Gr.33	29500	11346	.3	.65	.49	33	52
2	A607 C1 Gr.55	29500	11346	.3	.65	.49	55	70

Aluminum Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (...	Density[...	Table B.4	kt	Ftu[ksi]	Fty[ksi]	Fcy[ksi]	Fsu[ksi]	Ct
1	3003-H14	10100	3787.5	.33	1.3	.173	Table B...	1	19	16	13	12	141
2	6061-T6	10100	3787.5	.33	1.3	.173	Table B...	1	38	35	35	24	141
3	6063-T5	10100	3787.5	.33	1.3	.173	Table B...	1	22	16	16	13	141
4	6063-T6	10100	3787.5	.33	1.3	.173	Table B...	1	30	25	25	19	141
5	5052-H34	10200	3787.5	.33	1.3	.173	Table B...	1	34	26	24	20	141
6	6061-T6 W	10100	3787.5	.33	1.3	.173	Table B...	1	24	15	15	15	141

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N3	N4			PIPE_3.0	Beam	Pipe	A53 Gr.B	DR1
2	M2	N1	N2			HSS4x4x4	Beam	Square Tube	A500 Gr.B...	DR1
3	MP1A	NP1	NP2			PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
4	MP2A	NP3	NP4			PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1
5	MP3A	NP5	NP6			PIPE_2.0	Beam	Pipe	A53 Gr.B	DR1

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M1						Yes			None
2	M2						Yes			None
3	MP1A						Yes	-z		None
4	MP2A						Yes	-z		None
5	MP3A						Yes	-z		None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	PIPE_3.0	11			Lbyy						Gravity
2	M2	HSS4x4x4	3.667			Lbyy						Gravity
3	MP1A	PIPE_2.0	6			Lbyy						Gravity
4	MP2A	PIPE_2.0	6			Lbyy						Gravity
5	MP3A	PIPE_2.0	6			Lbyy						Gravity

Cold Formed Steel Design Parameters

Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp t...	Lcomp ...	L-torque...	Kyy	Kzz	Cm-...	Cm-...	Cb	R	a[ft]	y sw..	z sw...
No Data to Print ...																

Aluminum Design Parameters

Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
No Data to Print ...											

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
No Data to Print ...			

Member Point Loads (BLC 1 : Antenna D)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Y	-13.2	0
2	MP1A	Y	-13.2	6
3	MP2A	Y	-13.2	0
4	MP2A	Y	-13.2	6
5	MP3A	Y	-13.2	0
6	MP3A	Y	-13.2	6
7	MP1A	Y	-15.4	2
8	MP3A	Y	-11	2

Member Point Loads (BLC 2 : Antenna Di)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Y	-84.053	0
2	MP1A	Y	-84.053	6
3	MP2A	Y	-84.053	0
4	MP2A	Y	-84.053	6

Member Point Loads (BLC 2 : Antenna Di) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
5	MP3A	Y	-84.053	0
6	MP3A	Y	-84.053	6
7	MP1A	Y	-37.345	2
8	MP3A	Y	-25.315	2

Member Point Loads (BLC 3 : Antenna W Front)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Z	-70.743	0
2	MP1A	Z	-70.743	6
3	MP2A	Z	-70.743	0
4	MP2A	Z	-70.743	6
5	MP3A	Z	-70.743	0
6	MP3A	Z	-70.743	6
7	MP1A	Z	-17.788	2
8	MP3A	Z	-11.22	2

Member Point Loads (BLC 4 : Antenna Wi Front)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Z	-24.319	0
2	MP1A	Z	-24.319	6
3	MP2A	Z	-24.319	0
4	MP2A	Z	-24.319	6
5	MP3A	Z	-24.319	0
6	MP3A	Z	-24.319	6
7	MP1A	Z	-7.429	2
8	MP3A	Z	-5.293	2

Member Point Loads (BLC 5 : Antenna W Side)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	X	41.164	0
2	MP1A	X	41.164	6
3	MP2A	X	41.164	0
4	MP2A	X	41.164	6
5	MP3A	X	41.164	0
6	MP3A	X	41.164	6
7	MP1A	X	9.9	2
8	MP3A	X	4.257	2

Member Point Loads (BLC 6 : Antenna Wi Side)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	X	16.104	0
2	MP1A	X	16.104	6
3	MP2A	X	16.104	0
4	MP2A	X	16.104	6
5	MP3A	X	16.104	0
6	MP3A	X	16.104	6
7	MP1A	X	5.643	2
8	MP3A	X	3.36	2

Member Point Loads (BLC 7 : Service Lm1)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	M1	Y	-500	0

Member Point Loads (BLC 8 : Service Lm2)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	M1	Y	-500	%50

Member Distributed Loads (BLC 10 : Structure Di)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-16.237	-16.237	0	%100
2	M2	Y	-22.458	-22.458	0	%100
3	MP1A	Y	-13.085	-13.085	0	%100
4	MP2A	Y	-13.085	-13.085	0	%100
5	MP3A	Y	-13.085	-13.085	0	%100

Member Distributed Loads (BLC 11 : Structure W Front)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	-9.578	-9.578	0	%100
2	M2	PZ	-18.244	-18.244	0	%100
3	MP1A	PZ	-6.5	-6.5	0	%100
4	MP2A	PZ	-6.5	-6.5	0	%100
5	MP3A	PZ	-6.5	-6.5	0	%100

Member Distributed Loads (BLC 12 : Structure Wi Front)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	-5.762	-5.762	0	%100
2	M2	PZ	-8.017	-8.017	0	%100
3	MP1A	PZ	-4.96	-4.96	0	%100
4	MP2A	PZ	-4.96	-4.96	0	%100
5	MP3A	PZ	-4.96	-4.96	0	%100

Member Distributed Loads (BLC 13 : Structure W Side)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	9.578	9.578	0	%100
2	M2	PX	18.244	18.244	0	%100
3	MP1A	PX	6.5	6.5	0	%100
4	MP2A	PX	6.5	6.5	0	%100
5	MP3A	PX	6.5	6.5	0	%100

Member Distributed Loads (BLC 14 : Structure Wi Side)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	5.762	5.762	0	%100
2	M2	PX	8.017	8.017	0	%100
3	MP1A	PX	4.96	4.96	0	%100
4	MP2A	PX	4.96	4.96	0	%100
5	MP3A	PX	4.96	4.96	0	%100

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
No Data to Print ...						

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	712.049	4	1412.394	5	1081.313	1	-.993	1	2.435	4	.129	3
2		min	-712.049	3	348.934	2	-1081.313	2	-5.022	6	-2.435	3	-4.119	9
3	Totals:	max	712.049	4	1412.394	5	1081.313	1						
4		min	-712.049	3	348.934	2	-1081.313	2						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	0	1	0	1	0	1	0	1	0	1
2			min	0	1	-750	9	0	1	0	1	0	1	0	1
3		2	max	200.933	3	-92.699	4	348.871	2	.073	2	.774	2	2.259	9
4			min	-200.933	4	-843.114	9	-348.871	1	-.066	1	-.774	1	.155	3
5		3	max	395.054	3	-172.794	4	679.788	2	.124	2	1.887	2	4.628	9
6			min	-395.054	4	-923.029	9	-679.788	1	-.112	1	-1.887	1	.51	10
7		4	max	209.961	4	427.414	8	359.379	1	.078	1	.798	2	.949	7
8			min	-209.961	3	97.947	3	-359.379	2	-.086	2	-.798	1	.157	4
9		5	max	0	1	0	1	0	1	0	1	0	1	0	1
10			min	0	1	0	1	0	1	0	1	0	1	0	1
11	M2	1	max	1081.313	1	1413.592	5	712.049	3	.129	3	2.435	4	5.022	6
12			min	-1081.313	2	347.679	2	-712.049	4	-4.119	9	-2.435	3	.993	1
13		2	max	1081.313	1	1379.438	5	685.29	3	.129	3	1.795	4	3.744	6
14			min	-1081.313	2	334.112	2	-685.29	4	-4.119	9	-1.795	3	.679	1
15		3	max	1081.313	1	1345.285	5	658.532	3	.129	3	1.179	4	2.497	6
16			min	-1081.313	2	320.545	2	-658.532	4	-4.119	9	-1.179	3	.377	1
17		4	max	1081.313	1	1311.132	5	631.773	3	.129	3	.588	4	1.282	6
18			min	-1081.313	2	306.979	2	-631.773	4	-4.119	9	-.588	3	.088	1
19		5	max	1081.313	1	1276.978	5	605.015	3	.129	3	.043	1	.211	2
20			min	-1081.313	2	293.412	2	-605.015	4	-4.119	9	-.043	2	-.189	1
21	MP1A	1	max	99.893	8	65.892	4	113.299	1	.007	3	.01	6	0	1
22			min	15.84	10	-66.027	3	-113.387	2	-.007	4	.002	10	0	1
23		2	max	125.767	8	81.491	4	128.898	1	.007	3	.183	1	.111	3
24			min	22.087	10	-81.626	3	-128.986	2	-.007	4	-.18	2	-.111	4
25		3	max	207.467	8	112.93	4	172.958	1	.007	3	.417	1	.261	3
26			min	46.815	10	-113.064	3	-173.047	2	-.007	4	-.414	2	-.26	4
27		4	max	-22.087	9	81.492	3	128.791	2	.007	4	.18	1	.111	3
28			min	-125.768	7	-81.399	4	-128.73	1	-.007	3	-.183	2	-.11	4
29		5	max	-15.839	9	65.893	3	113.192	2	.007	4	-.002	9	0	4
30			min	-99.893	7	-65.8	4	-113.131	1	-.007	3	-.01	6	0	3
31	MP2A	1	max	99.893	7	65.926	4	113.246	1	.007	3	.01	7	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mome...	LC
32			min	15.84	10	-65.915	3	-113.306	2	-.007	4	.002	10	0	1
33		2	max	125.767	7	81.525	4	128.845	1	.007	3	.183	1	.111	3
34			min	22.087	10	-81.514	3	-128.905	2	-.007	4	-.18	2	-.111	4
35		3	max	151.642	7	97.124	4	144.444	1	.007	3	.388	1	.245	3
36			min	28.335	10	-97.113	3	-144.504	2	-.007	4	-.385	2	-.245	4
37		4	max	-22.088	1	81.431	3	128.771	2	.007	4	.18	1	.11	3
38			min	-125.767	6	-81.442	4	-128.713	1	-.007	3	-.183	2	-.11	4
39		5	max	-15.84	1	65.832	3	113.172	2	.007	4	-.002	2	0	4
40			min	-99.893	6	-65.843	4	-113.114	1	-.007	3	-.01	5	0	3
41	MP3A	1	max	99.893	5	66.005	4	113.286	1	.007	3	.01	8	0	1
42			min	15.84	3	-65.891	3	-113.366	2	-.007	4	.002	9	0	1
43		2	max	125.767	5	81.604	4	128.885	1	.007	3	.183	1	.111	3
44			min	22.087	3	-81.49	3	-128.965	2	-.007	4	-.18	2	-.111	4
45		3	max	190.157	5	104.015	4	162.436	1	.007	3	.406	1	.251	3
46			min	41.535	3	-103.901	3	-162.517	2	-.007	4	-.403	2	-.252	4
47		4	max	-22.088	3	81.401	3	128.788	2	.007	4	.18	1	.11	3
48			min	-125.768	8	-81.486	4	-128.728	1	-.007	3	-.183	2	-.111	4
49		5	max	-15.84	3	65.802	3	113.189	2	.007	4	-.002	1	0	4
50			min	-99.893	8	-65.887	4	-113.129	1	-.007	3	-.01	6	0	3

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [...	phi*Pnt [lb]	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M1	PIPE_3.0	.806	5.5	9	.060	5.5		2	34117.489	65205	5.749	5.749	1...	H1-1b
2	M2	HSS4x4x4	.355	0	7	.330	0	y	9	131884.6...	139518	16.181	16.181	1...	H1-1b
3	MP1A	PIPE_2.0	.235	3.125	1	.018	3.125		2	20866.733	32130	1.872	1.872	1...	H1-1b
4	MP2A	PIPE_2.0	.218	3.125	1	.015	3.125		2	20866.733	32130	1.872	1.872	1...	H1-1b
5	MP3A	PIPE_2.0	.229	3.125	1	.017	3.125		2	20866.733	32130	1.872	1.872	1...	H1-1b

Envelope AISI S100-10: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	Cb	Cmyy	Cmzz	Eqn
No Data to Print ...																

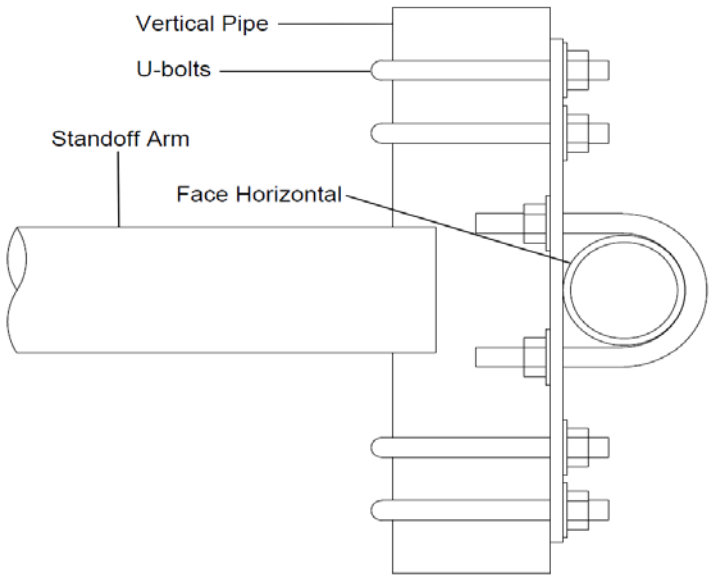
Envelope AA ADM1-10: ASD - Building Aluminum Code Checks

Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Pnc/O...	Pnt/Om...	Mny/O...	Mnz/O...	Vny/O...	Vnz/O...	Cb	Eqn
No Data to Print ...																

	U-bolt Connection Rotation and Sliding Check		Date
			7/3/2019
Customer:		TIA Standard:	ANSI/TIA-222-G
Carrier:		Mount Elev. [ft]:	
Site Name:		Engineer Name:	
Site Number:		TES Project #:	

NOTE: The calculations shown below are for a single representative load combination for example purposes. The results for all load combinations are presented in the Results Summary Table.

RISA Member Label =	M2	
I or J End?	J	
Load Combination # =	6	
Applied Shear (Sliding), V_{US} =	1.275	[Kips]
Applied Torsional Moment, T_{UR} =	0.015	[Kip-Ft]
Applied Tension, T_{UT} =	0.311	[Kips]
# of U-bolts =	2	
Diameter of U-bolts =	0.625	[Inches]
U-bolt Fy =	36	[KSI]
U-bolt Fu =	58	[KSI]
Diameter of Vertical Pipe =	4.5	[Inches]



Typical Connection Detail

Check Bolt Tension:

Total U-bolt Tension, T_{UT} =	0.311	[Kips]
U-bolt Tension Capacity, ϕR_{NT} =	37.552	[Kips]
Max Usage =	0.8%	PASS

Check Sliding:

Applied Shear (Sliding), V_{US} =	1.275	[Kips]
Assumed Pretension Stress =	20	[KSI]
U-bolt Pretension Per Leg, T_P =	6.14	[Kips]
Nominal Sliding Strength, R_{NS} =	7.270	[Kips]
Max Usage =	17.5%	PASS

Check Rotation:

Applied Torsional Moment, T_{UR} =	0.015	[Kip-Ft]
Nominal Torsional Strength, R_{NR} =	1.36	[Kip-Ft]
Max Usage =	1.1%	PASS

Check Interaction Equation:

$$\left(\frac{V_{us}}{\phi_u R_{ns}}\right)^2 + \left(\frac{T_{ur}}{\phi_u R_{nr}}\right)^2 \leq 1.0$$

ϕ_U =	1.0	
Interaction Ratio =	0.031	PASS
Max Usage =	17.6%	PASS

	U-bolt Connection Rotation and Sliding Check		Date
			7/3/2019
Customer:		TIA Standard:	ANSI/TIA-222-G
Carrier:		Mount Elev. [ft]:	
Site Name:		Engineer Name:	
Site Number:		TES Project #:	

Results Summary Table

Member Label	Member End	Load Combo #	Tension T_{UT} [K]	Shear V_{US} [K]	Torsion T_{UR} [Kip-Ft]	Bolt Tension Check	Sliding Check	Rotation Check	Interaction Check
M2	J	1	0.0000	0.2954	0.0430	0.0%	4.0%	3.1%	5.1%
M2	J	2	1.0813	0.2934	0.0430	2.9%	4.2%	3.3%	5.3%
M2	J	3	0.0000	0.2947	0.0210	0.0%	4.0%	1.5%	4.3%
M2	J	4	0.0000	0.2947	0.0210	0.0%	4.0%	1.5%	4.3%
M2	J	5	0.0000	1.2770	0.0150	0.0%	17.3%	1.1%	17.4%
M2	J	6	0.3113	1.2745	0.0150	0.8%	17.5%	1.1%	17.6%
M2	J	7	0.0000	1.2758	0.0100	0.0%	17.3%	0.7%	17.3%
M2	J	8	0.0000	1.2758	0.0100	0.0%	17.3%	0.7%	17.3%
M2	J	9	0.0000	1.0450	0.0040	0.0%	14.2%	0.3%	14.2%
M2	J	10	0.0000	1.0450	0.0040	0.0%	14.2%	0.3%	14.2%
M2	J	11	0.0000	0.3438	0.0000	0.0%	4.7%	0.0%	4.7%

EXHIBIT 9

Transcom Engineering, Inc.

Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11253C

CT253_Global Telecomm MP
175 South Main St
Marlborough, CT 06447

June 19, 2019

Transcom Engineering Project Number: 737001-0181

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**8.83 %**

June 19, 2019

T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CT11253C – CT253_Global Telecomm MP**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **175 South Main St, Marlborough, 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 population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (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 performed for the proposed upgrades to the T-MOBILE antenna facility located at **175 South Main St, Marlborough, 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 for directional panel antennas, 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
B	1	RFS APXV18-206517S-C-A20	130
B	2	RFS APXVAARR24_43-U-NA20	130
C	1	RFS APXV18-206517S-C-A20	130
C	2	RFS APXVAARR24_43-U-NA20	130

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **1900 MHz (PCS)** radios are ground mounted the following cable loss values were used. For each ground mounted **1900 MHz (PCS)** radio there was **1.65 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **160 feet** of **1-5/8”** coax.

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna B1	RFS APXV18-206517S-C-A20	1900 MHz (PCS)	16.65	5	175	5,533.99	1.29
Antenna B2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.35
						Sector B Composite MPE%	**2.64**
Antenna C1	RFS APXV18-206517S-C-A20	1900 MHz (PCS)	16.65	5	175	5,533.99	1.29
Antenna C2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.35
						Sector C Composite MPE%	**2.64**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, both sectors have the same configuration yielding the same results on each sector. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**2.64 %**
Sprint	2.47 %
Verizon Wireless	1.43 %
MetroPCS	0.63 %
AT&T	1.66 %
Site Total MPE %:	**8.83 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector B Total:	2.64 %
T-MOBILE Sector C Total:	2.64 %
Site Total:	8.83 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, both sectors have the same configuration yielding the same results on each sector.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	1,264.91	130	11.83	1900 MHz (PCS)	1000	1.18%
T-Mobile 1900 MHz (PCS) GSM	1	474.34	130	1.11	1900 MHz (PCS)	1000	0.11%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	130	3.69	600 MHz	400	0.92%
T-Mobile 700 MHz LTE	2	432.54	130	2.02	700 MHz	467	0.43%
						Total:	**2.64%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population 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 population exposure to RF Emissions are shown here:

T-MOBILE Sector	Power Density Value (%)
Sector B:	2.64 %
Sector C:	2.64 %
T-MOBILE Maximum Total (per sector):	2.64 %
Site Total:	8.83 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.83 %** of the allowable FCC established general population 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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