



Filed by:

G. Scott Shepherd, Site Development Specialist II - SBA Communications  
134 Flanders Rd., Suite 125, Westborough, MA 01581  
508.251.0720 x 3807 - gshepherd@sbsite.com

November 18, 2020

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

**RE: Notice of Exempt Modification**  
**99 Knowlton Hill Rd., Ashford, CT 06278**  
**Latitude: 41 50 26.8**  
**Longitude: 41 50 26.8**  
**T-Mobile Site #: CT11519D\_L600**

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 147-foot level of the existing 149-foot Monopole Tower at 99 Knowlton Hill Rd., CT. The 147-foot tower is owned by SBA Towers V, LLC. The property is owned by Thomas E. Knowlton. T-Mobile now intends to remove three (3) new L700/L600 MHz antennas and replace with three (3) new L700/L600 MHz antennas. The new antennas would be installed at the 147-foot level of the tower.

**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:

- (3) RFS LNX-6515DS antennas (remove) – (3) RFS APXVAARR24\_43-U-NA20 antennas (replace)

Install New:

- (3) Ericsson Radio 4449 B71+B12 RRU
- (1) Sitepro PRK-1245L (Platform kit)
- (1) Sitepro HRK12-U (Platform Kit)
- (1) 1-5/8" fiber

Existing Equipment to Remain:

- (3) Ericsson KRY 112 489/2 TMA
- 12' Low Profile Platform
- (6) 1-5/8" coax

Entitlements:

- (3) Ericsson KRY 112 489/2 TMA
- (12) 1-5/8" coax
- (2) 1-5/8" fiber

GROUND

Install New:

- Equipment inside existing RBS 6201 Equipment cabinet

This facility was approved by the Council on October 26, 2004 under Docket 291. Approval was given for a monopole no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of the carrier and other entities, both public and private, but not to exceed 150-feet above ground level, including appurtenances. The tower and foundation were to be designed and constructed with the ability to be extended to 180-feet above ground level. A recalculated radio frequency report was to be provided 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 the facility, it was to be brought into compliance. The Certificate Holder was to permit public or private entities to share space on the proposed tower for fair consideration or to provide legal, technical, environmental, or economic reasons precluding such sharing. There was to be space provided on the tower for no compensation for any municipal antennas, provide they were 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. 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 the Town of Ashford's First Selectman, Cathryn E. Silver-Smith, and Building Official James Rupert, as well as to the property owner. (Separate notice is not being sent to 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  
Site Development Specialist II  
SBA COMMUNICATIONS CORPORATION  
134 Flanders Rd., Suite 125  
Westborough, MA 01581  
508.251.0720 x3807 + T  
508.366.2610 + F  
508.868.6000 + C  
gshepherd@sbsite.com

#### Attachments

cc: Cathryn E. Silver-Smith, First Selectman / with attachments  
*Town of Ashford, Town Hall, 5 Town Hall Road, Ashford, CT 06278*  
James Rupert, Building Official / with attachments  
*Town of Ashford, Town Hall, 5 Town Hall Road, Ashford, CT 06278*  
Thomas E. Knowlton / with attachments  
*317 Squaw Hollow Road, Ashford CT 06278 (SBA address on file)*  
*99 Knowlton Hill Rd., Ashford, CT 06278 (Town address on file)*



**EXHIBIT LIST**

Exhibit 1	Check Copy	x To be invoiced at a later date per Covid guidelines.
Exhibit 2	Notification Receipts	x
Exhibit 3	Property Card	x
Exhibit 4	Property Map	x
Exhibit 5	Original Zoning Approval	CSC 10/26/04
Exhibit 6	Construction Drawings	Chappell Engineering 11/9/20
Exhibit 7	Modification Drawings	Geo Structural 6/19/19
Exhibit 8	Structural Analysis	TES 9/6/19
Exhibit 9	EME Report	Transcom Engineering 6/10/19

## EXHIBIT 1

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

# EXHIBIT 2

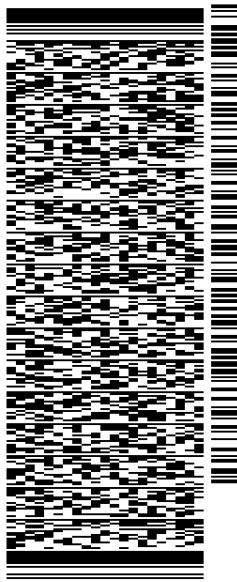
ORIGIN ID:BFBA (508) 614-0389  
RICK WOODS  
SBA COMMUNICATIONS CORPORATION  
134 FLANDERS RD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 18NOV20  
ACTWGT: 1.00 LB  
CAD: 105843304/NET14280  
BILL SENDER

TO MELANIE A. BACHMAN EXEC. DIR  
CONNECTICUT SITING COUNCIL  
TEN FRANKLIN SQUARE

NEW BRITAIN CT 06051

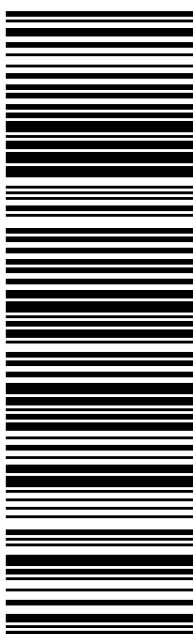
(508) 251-0720 X.3807 REF: 105692009-6089  
INV# DEPT:



TRK# 7721 2086 6693 THU - 19 NOV 10:30A  
0201 PRIORITY OVERNIGHT

EB BDLA

06051  
CT:US BDL



56B,J5/BAB9/B766

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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:BFBA (508) 614-0389  
RICK WOODS  
SBA COMMUNICATIONS CORPORATION  
134 FLANDERS RD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 18NOV20  
ACTWGT: 1.00 LB  
CAD: 105843304/NET4280

BILL SENDER

TO CATHRYN E. SILVER-SMITH, SELECTMAN  
TOWN OF ASHFORD  
5 TOWN HALL RD

ASHFORD CT 06278

(508) 251-0720 X 3807 REF: 105692009-6089  
INV/ DEPT:  
PO:

56B,J5/BAB9/B766

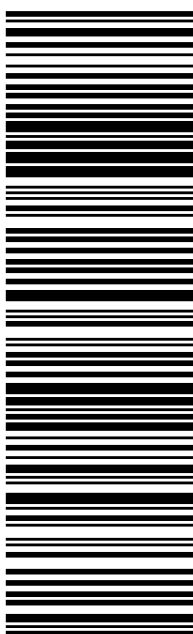


J2020071401uv

TRK# 7721 2093 7163 THU - 19 NOV 4:30P  
0201 PRIORITY OVERNIGHT

EB GONA

06278  
CT:US BDL



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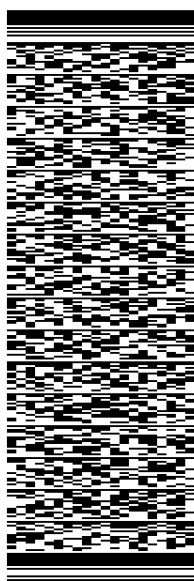
SHIP DATE: 18NOV20  
ACTWGT: 1.00 LB  
CAD: 105843304/NET4280

BILL SENDER

TO  
**JAMES RUPERT, BUILDING OFFICIAL**  
**TOWN OF ASHFORD**  
**5 TOWN HALL RD**

**ASHFORD CT 06278**

(508) 251-0720 X 3807 REF: 1056-92009-6089  
INV/ PO: DEPT:



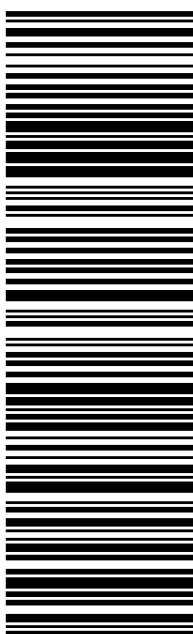
J2020071401uv

56B,J5/BAB9/B766

TRK# 7721 2096 2245  
0201  
THU - 19 NOV 4:30P  
PRIORITY OVERNIGHT

**EB GONA**

06278  
CT:US BDL



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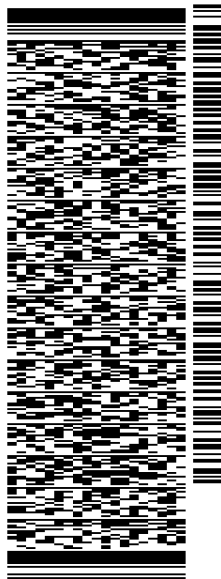
ORIGIN ID:BFBA (508) 614-0389  
RICK WOODS  
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SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 18NOV20  
ACTWGT: 1.00 LB  
CAD: 105843304/NET4280  
BILL SENDER

TO **THOMAS E. KNOWLTON**  
**317 SQUAW HOLLOW RD**

**ASHFORD CT 06278**  
(508) 251-0720 X.3807 REF: 1056-92009-6089  
INV. PO. DEPT.

56B,J5/BAB9/B766



J2020071401uv

TRK# 7721 2100 2631 THU - 19 NOV 4:30P  
0201 PRIORITY OVERNIGHT

**EB GONA** 06278  
CT-US BDL

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# EXHIBIT 3

# 99 KNOWLTON HILL RD

**Location** 99 KNOWLTON HILL RD

**Mblu** 43/ D/ 1.2/ /

**Acct#** 00107500

**Owner** KNOWLTON THOMAS E

**Taxable Status**

**Assessment** \$113,300

**Appraisal** \$161,700

**PID** 1004

**Building Count** 1

**Legal Description**

**Lot Type**

**topoTopo** Clear

**Location** Rural

## Current Value

Appraisal					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2018	\$99,000	\$2,000	\$500	\$60,200	\$161,700
Assessment					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2018	\$69,300	\$1,400	\$400	\$42,200	\$113,300

## Parcel Addresses

Additional Addresses		
Address	City, State Zip	Type
99 KNOWLTON HILL RD		Primary

## Owner of Record

<b>Owner</b>	KNOWLTON THOMAS E	<b>Sale Price</b>	\$0
<b>Co-Owner</b>		<b>Certificate</b>	C
<b>Care Of</b>		<b>Book &amp; Page</b>	140/ 835
<b>Address</b>	99 KNOWLTON HILL RD ASHFORD, CT 06278	<b>Sale Date</b>	12/22/2003
		<b>Qualified</b>	U

## Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
KNOWLTON ROYAL O EST OF ET AL	\$0		105/ 827	01/10/1995

## Building Information

### Building 1 : Section 1

**Year Built:** 1800  
**Living Area:** 2,112  
**Replacement Cost:** \$197,907  
**Building Percent Good:** 50  
**Replacement Cost Less Depreciation:** \$99,000

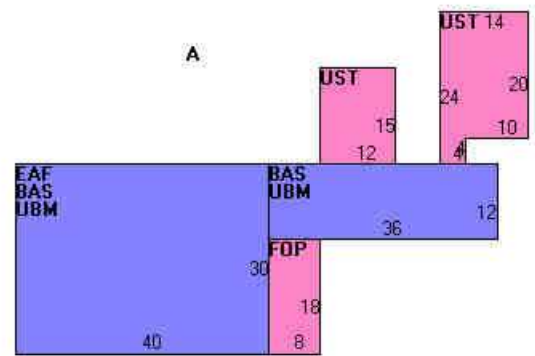
Building Attributes	
Field	Description
Style	Cape Cod
Model	Residential
Grade:	C+
Stories:	1.25
Occupancy	1
Exterior Wall 1	Clapboard
Exterior Wall 2	
Roof Structure:	Gable
Roof Cover	Arch. Shingles
Interior Wall 1	Plastered
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	1
Total Half Baths:	0
Total Xtra Fixtrs:	0
Total Rooms:	8
Bath Style:	Average
Kitchen Style:	Average
Bsmt. Garages	0

### Building Photo



(<http://images.vgsi.com/photos/AshfordCTPhotos//\00\00\07\31>)

### Building Layout



(<http://images.vgsi.com/photos/AshfordCTPhotos//Sketches/100>)

Building Sub-Areas (sq ft)		Legend	
Code	Description	Gross Area	Living Area
BAS	First Floor	1,632	1,632
EAF	Expansion Attic Finished	1,200	480
FOP	Framed Open Porch	144	0
UBM	Unfinished Basement	1,632	0
UST	Utility Storage	476	0
		5,084	2,112

### Extra Features

Extra Features	Legend

Code	Description	Sub Code	Sub Description	Size	Value	Assessed Value	Bldg #	Comment
FPL2	Fireplace 1.5 Sty			1 units	\$2,000	\$1,400	1	

## Parcel Information

**Use Code** 101  
**Description** Single Family  
**Deeded Acres** 2.02

## Land

### Land Use

**Use Code** 101  
**Description** Single Family  
**Zone** RA  
**Neighborhood**  
**Alt Land Appr Category** No

### Land Line Valuation

**Size (Acres)** 2.02  
**Frontage**  
**Depth**  
**Assessed Value** \$42,200  
**Appraised Value** \$60,200

## Outbuildings

Outbuildings								<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Assessed Value	Bldg #	Comment
SHD1	Shed	FR	Frame	180 S.F.	\$500	\$400	1	A

## Valuation History

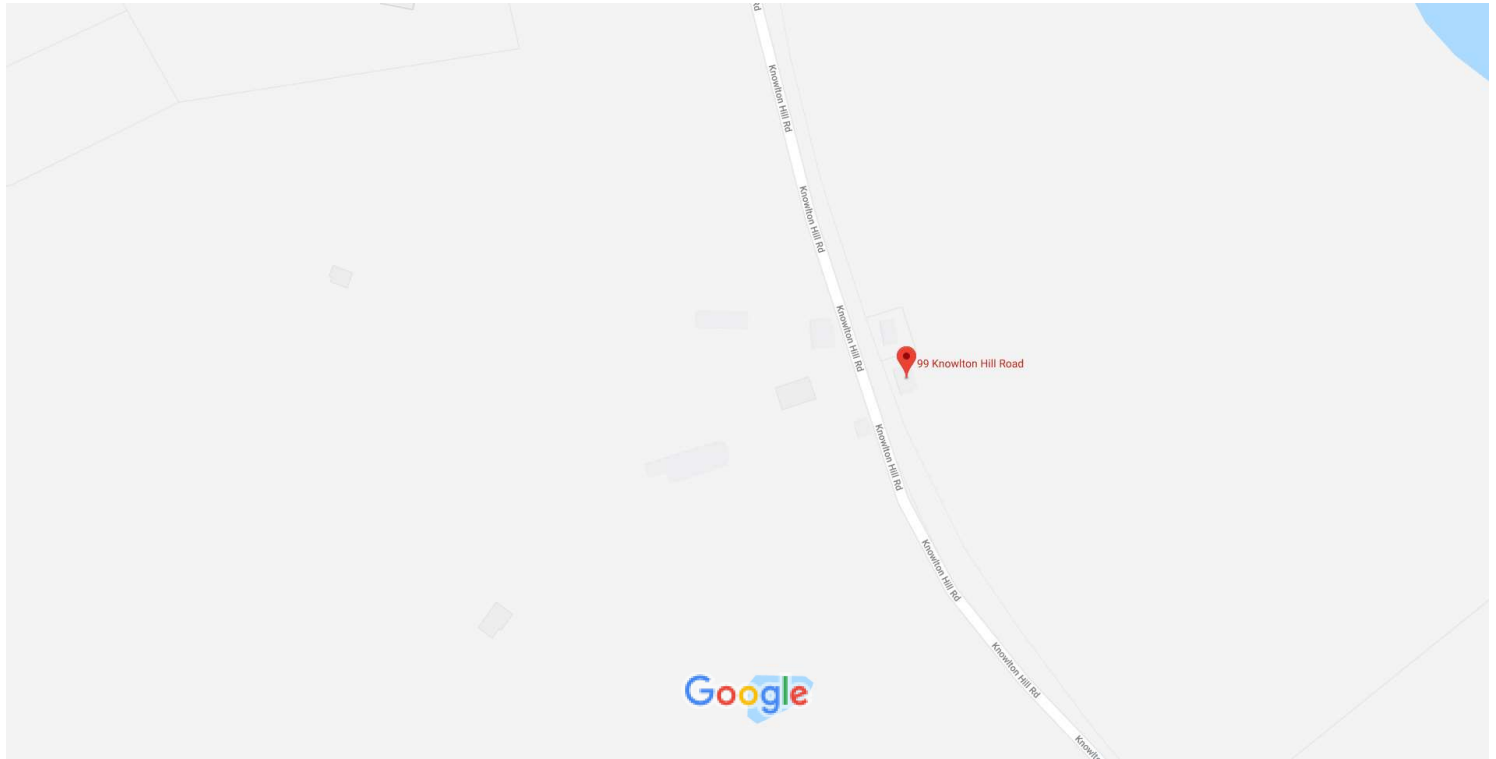
Appraisal					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2018	\$99,000	\$2,000	\$500	\$60,200	\$161,700
2017	\$99,000	\$2,000	\$500	\$60,200	\$161,700
2016	\$99,000	\$2,000	\$500	\$60,200	\$161,700

Assessment					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2018	\$69,300	\$1,400	\$400	\$42,200	\$113,300
2017	\$69,300	\$1,400	\$400	\$42,200	\$113,300
2016	\$69,300	\$1,400	\$400	\$42,200	\$113,300

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# EXHIBIT 4

Google Maps 99 Knowlton Hill Rd



Map data ©2019 100 ft



## 99 Knowlton Hill Rd

Ashford, CT 06278



Directions



Save



Nearby



Send to your phone



Share

### Photos





# EXHIBIT 5

# Connecticut Siting Council

## Decisions

<b>DOCKET NO. 291</b> - National Grid Communications, Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two sites located on Knowlton Hill Road, Ashford, Connecticut	}	Connecticut
	}	Siting
	}	Council
		October 26, 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 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 Tower Ventures II, LLC, hereinafter referred to as the Certificate Holder, at Site A-1, located on parcel 43/E/4, Knowlton Hill Road, Ashford, Connecticut. The Council denies certification of Site A-2, located on parcel 43/E/4, Knowlton Hill Road, Ashford, 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 Omnipoint Communications and other entities, both public and private, but such tower shall not exceed a height of 150 feet above ground level, including appurtenances. The tower and foundation shall be designed and constructed with the ability to be extended to 180 feet above ground level, with such extension subject to Council approval by petition for a declaratory ruling, pursuant to Sections 16-50j-38 through 16-50j-40 of the Regulations of Connecticut State Agencies.
2. 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 served on the Town of Ashford, for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, access road, utility line, and landscaping; and
  - b. 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.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case

modeling of electromagnetic radio frequency power density 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 ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. 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.
5. 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.
6. 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.
7. If the facility does not initially provide wireless services within one year of completion of construction or 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.
8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.
9. 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. Any request for extension of this period shall be filed with the Council not later than sixty days prior to the expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Ashford, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

Pursuant to General Statutes § 16-50p, the Council hereby directs 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 Willimantic Chronicle.

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:

<u><b>Applicant</b></u>	<u><b>Its Representative</b></u>
Tower Ventures II, LLC	David Vivian Senior Vice President Tower Ventures II, LLC 733 Chapin Street, Suite 200F Ludlow, MA 01056

	<p>Benjamin Proto, Esq. 2090 Cutspring Road Stratford, CT 06614</p> <p>Kenneth Ira Spigle, Esq. 170 Westminster Street, Suite 701 Providence, RI 02903</p>
<p><b><u>Intervenor</u></b></p> <p>Omnipoint Communications, Inc.</p>	<p><b><u>Its Representative</u></b></p> <p>Stephen J. Humes, Esq. McCarter &amp; English, LLP CityPlace I 185 Asylum Street Hartford, CT 06103</p>

Content Last Modified on 6/14/2005 9:29:58 AM

# EXHIBIT 6

# CT519/TVI ASHFORD PRIME

99 KNOWLTON HILL ROAD  
ASHFORD, CT 06278  
WINDHAM COUNTY

SITE NO.: CT11519D

SITE TYPE: 150'± MONOPOLE

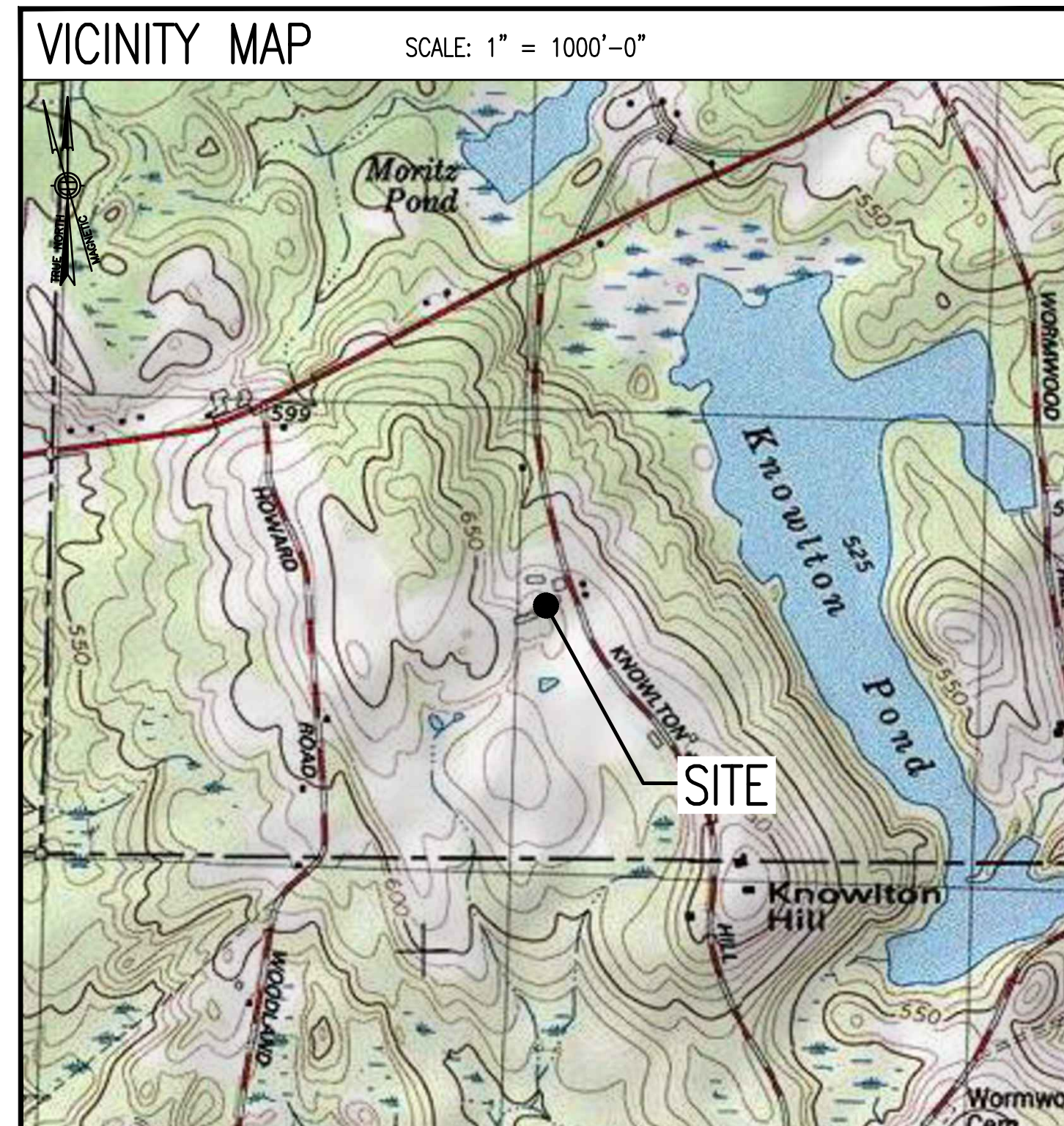
RF DESIGN GUIDELINE: 67D04G OUTDOOR

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
SECTOR D:	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

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.	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.
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.	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.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE OMNIPOT 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.	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.
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.	14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
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.	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.
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.	16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
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.	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.
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.	

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



**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	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLAN	1
A-2	TOWER ELEVATIONS & ANTENNA PLAN	1
A-3	SITE DETAILS	1
E-1	ELECTRIC & GROUNDING DETAILS	1

**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).

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. <ul style="list-style-type: none"> <li>• ADA COMPLIANCE NOT REQUIRED.</li> <li>• POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.</li> <li>• NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.</li> </ul>
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. <ul style="list-style-type: none"> <li>• BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE</li> <li>• ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE</li> <li>• STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.</li> </ul>

PROJECT SUMMARY	
SITE NUMBER:	CT11519D
SBA SITE NUMBER:	CT13614-A
SBA SITE NAME:	KNOWLTON
SITE ADDRESS:	99 KNOWLTON HILL ROAD ASHFORD, CT 06278
PROPERTY OWNER:	KNOWLTON THOMAS E. 317 SQUAW HOLLOW ROAD ASHFORD, CT 06278
TOWER OWNER:	SBA TOWERS V, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	WINDHAM
ZONING DISTRICT:	N/A
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	150'±
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.41.840773° N41°50'26.78" LONGITUDE W.72.207521° W72°12'27.08"

**T-MOBILE  
NORTHEAST LLC**

15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
(508) 286-2700

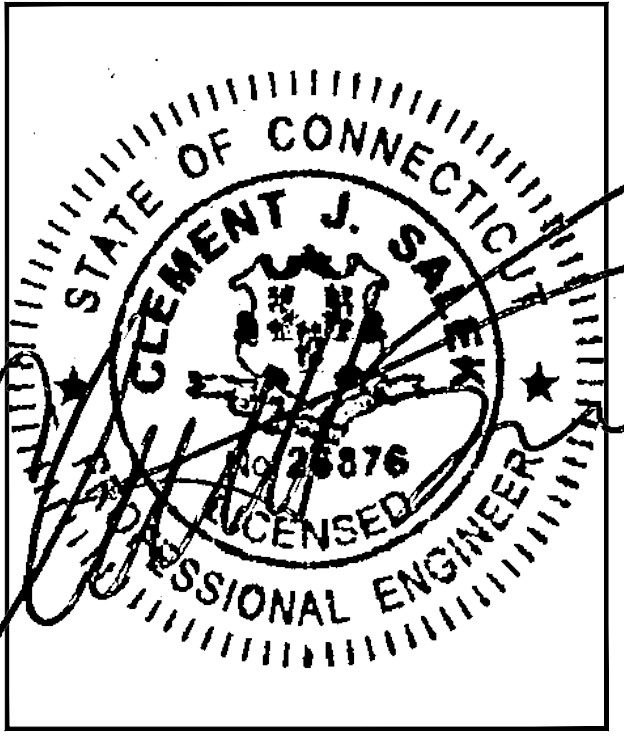
**SBA**

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



CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS			
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1	11/09/20	ISSUED FOR CONSTRUCTION	CMC
0	05/29/19	ISSUED FOR REVIEW	JRV

SITE NUMBER:  
**CT11519D**

SITE ADDRESS:  
99 KNOWLTON HILL ROAD  
ASHFORD, CT 06278

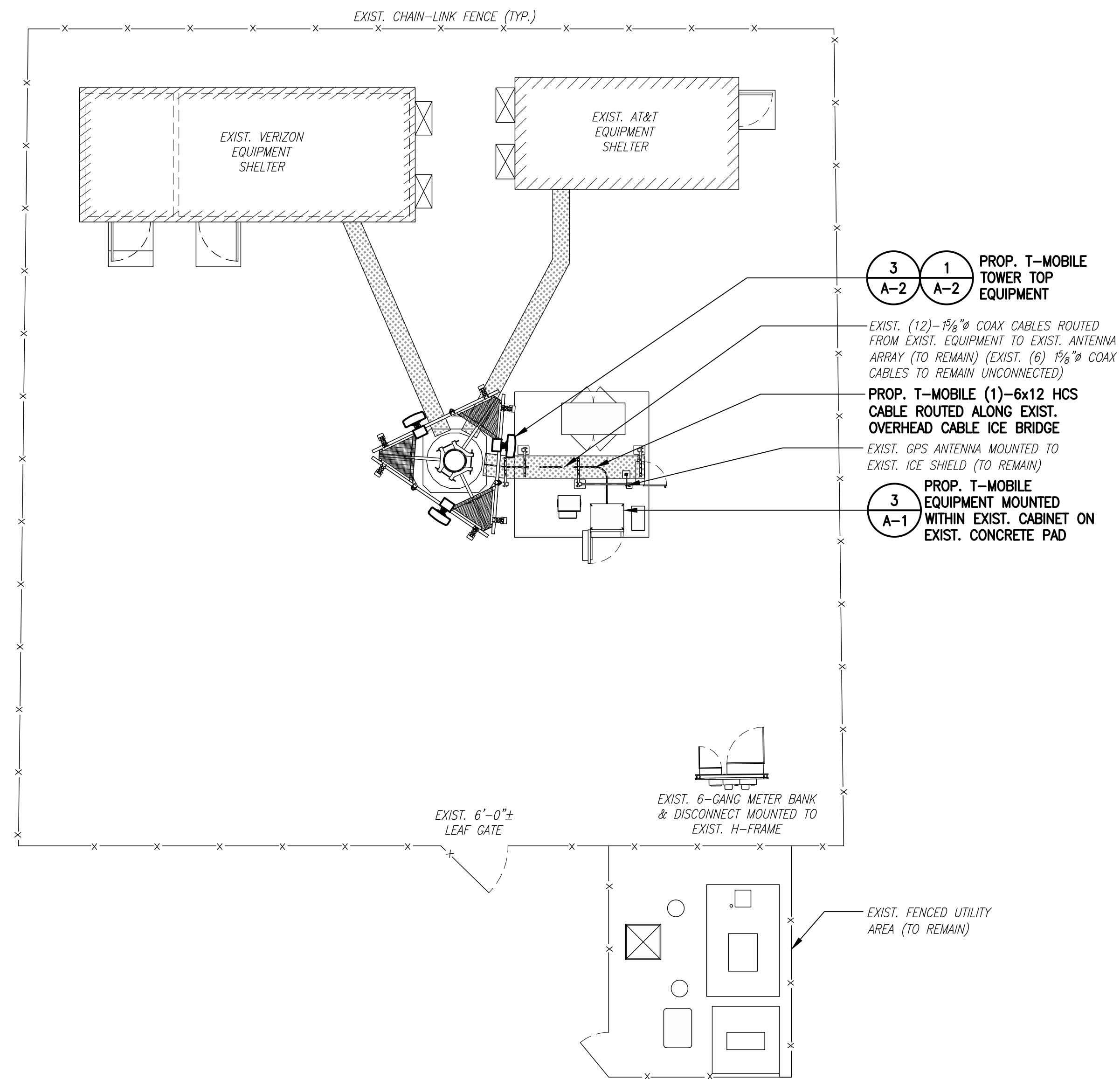
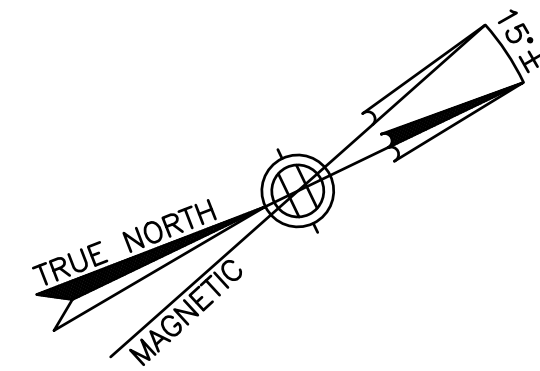
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**TITLE SHEET**

SHEET NUMBER  
**T-1**



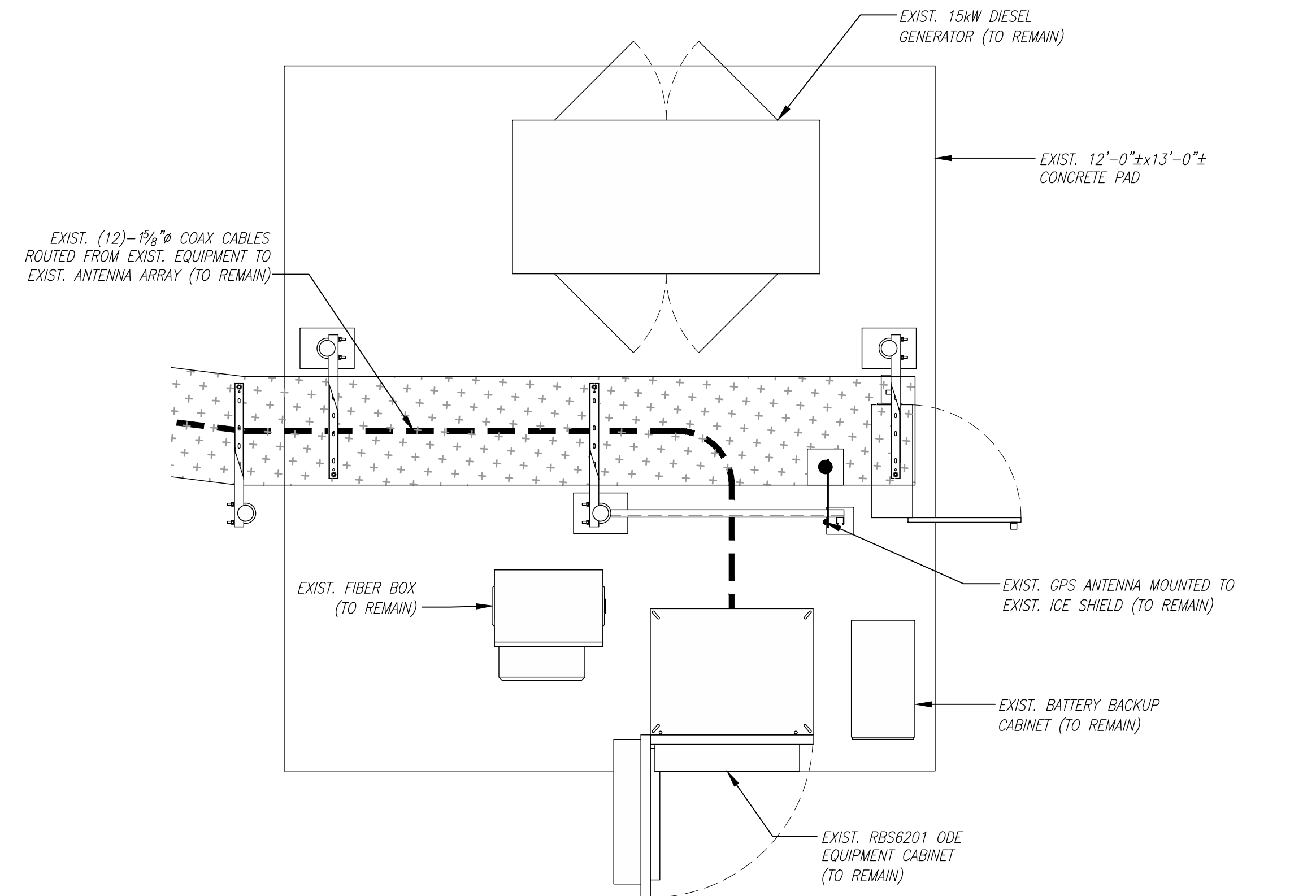


**SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):**  
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR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

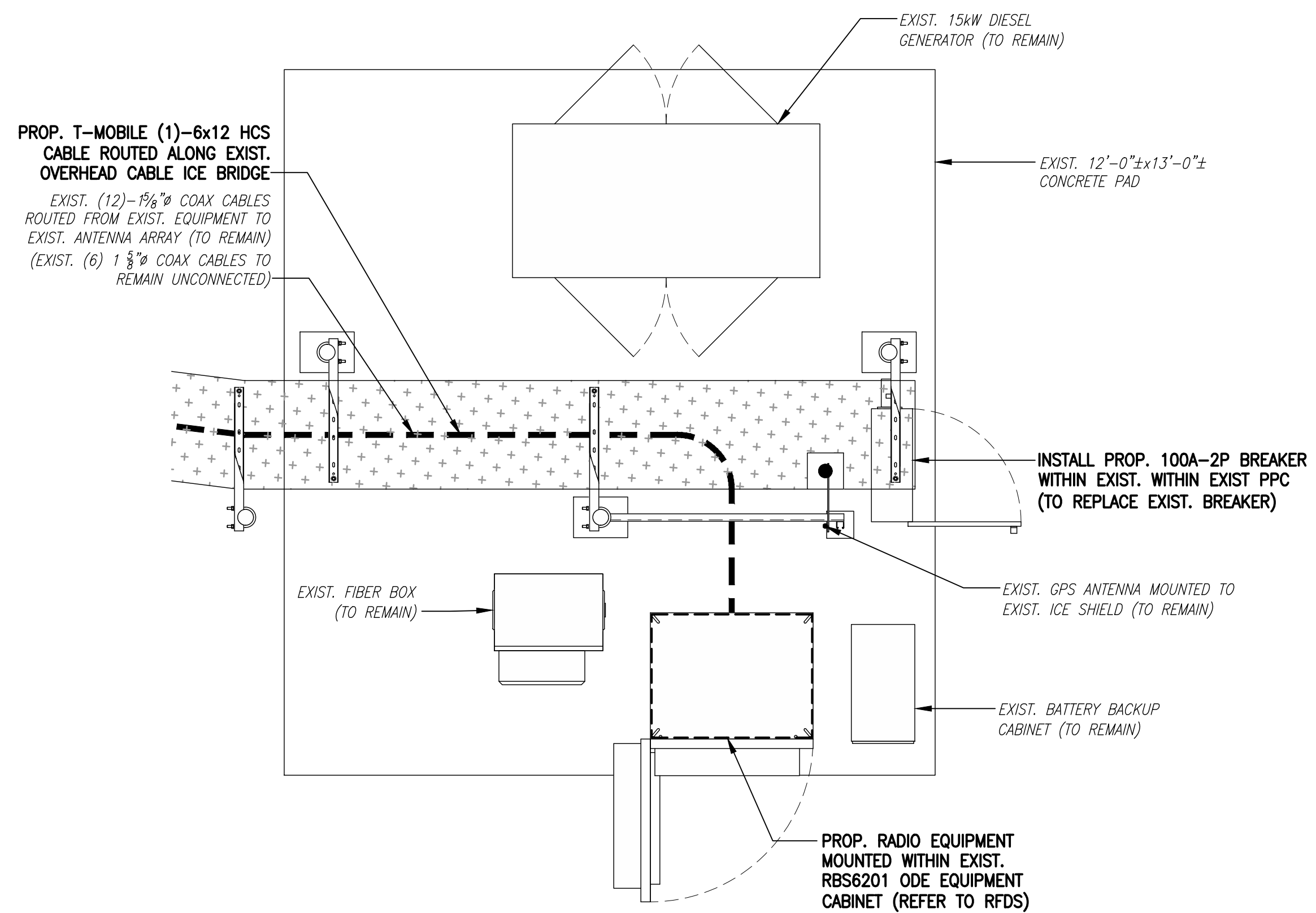


**COMPOUND PLAN** 1  
 SCALE: 1" = 8'-0"  
 0 8'-0" 16'-0" 24'-0"

- 3 1 PROP. T-MOBILE TOWER TOP EQUIPMENT  
A-2 A-2
- EXIST. (12)-1/8" COAX CABLES ROUTED FROM EXIST. EQUIPMENT TO EXIST. ANTENNA ARRAY (TO REMAIN) (EXIST. (6) 1/8" COAX CABLES TO REMAIN UNCONNECTED)
- PROP. T-MOBILE (1)-6x12 HCS CABLE ROUTED ALONG EXIST. OVERHEAD CABLE ICE BRIDGE
- EXIST. GPS ANTENNA MOUNTED TO EXIST. ICE SHIELD (TO REMAIN)
- 3 PROP. T-MOBILE EQUIPMENT MOUNTED WITHIN EXIST. CABINET ON EXIST. CONCRETE PAD  
A-1



**EXISTING EQUIPMENT PLAN** 2  
 SCALE: 1/2" = 1'-0"  
 0 2'-0" 4'-0" 6'-0"



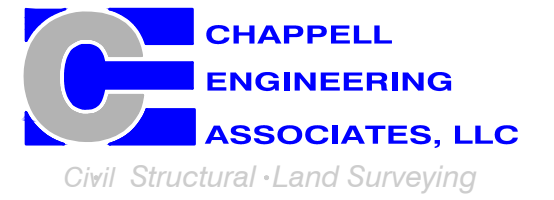
**PROPOSED EQUIPMENT PLAN** 3  
 SCALE: 1/2" = 1'-0"  
 0 2'-0" 4'-0" 6'-0"

**T-MOBILE NORTHEAST LLC**

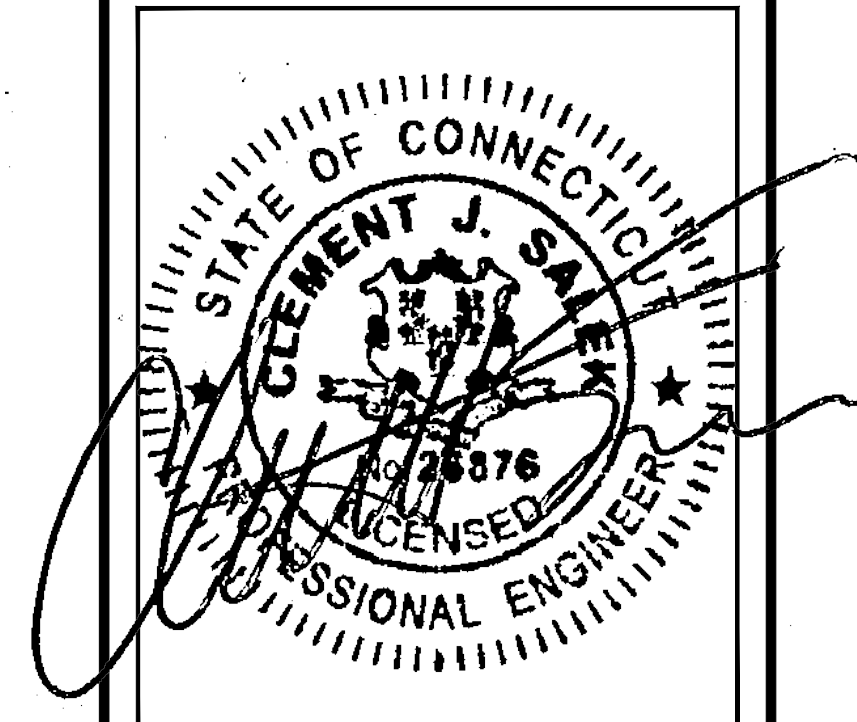
15 COMMERCE WAY, SUITE B  
 NORTON, MA 02766  
 (508) 286-2700



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 134 FLANDERS ROAD, SUITE 125  
 WESTBOROUGH, MA 01581  
 (508) 251-0720



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SITE ADDRESS:  
 99 KNOWLTON HILL ROAD  
 ASHFORD, CT 06278

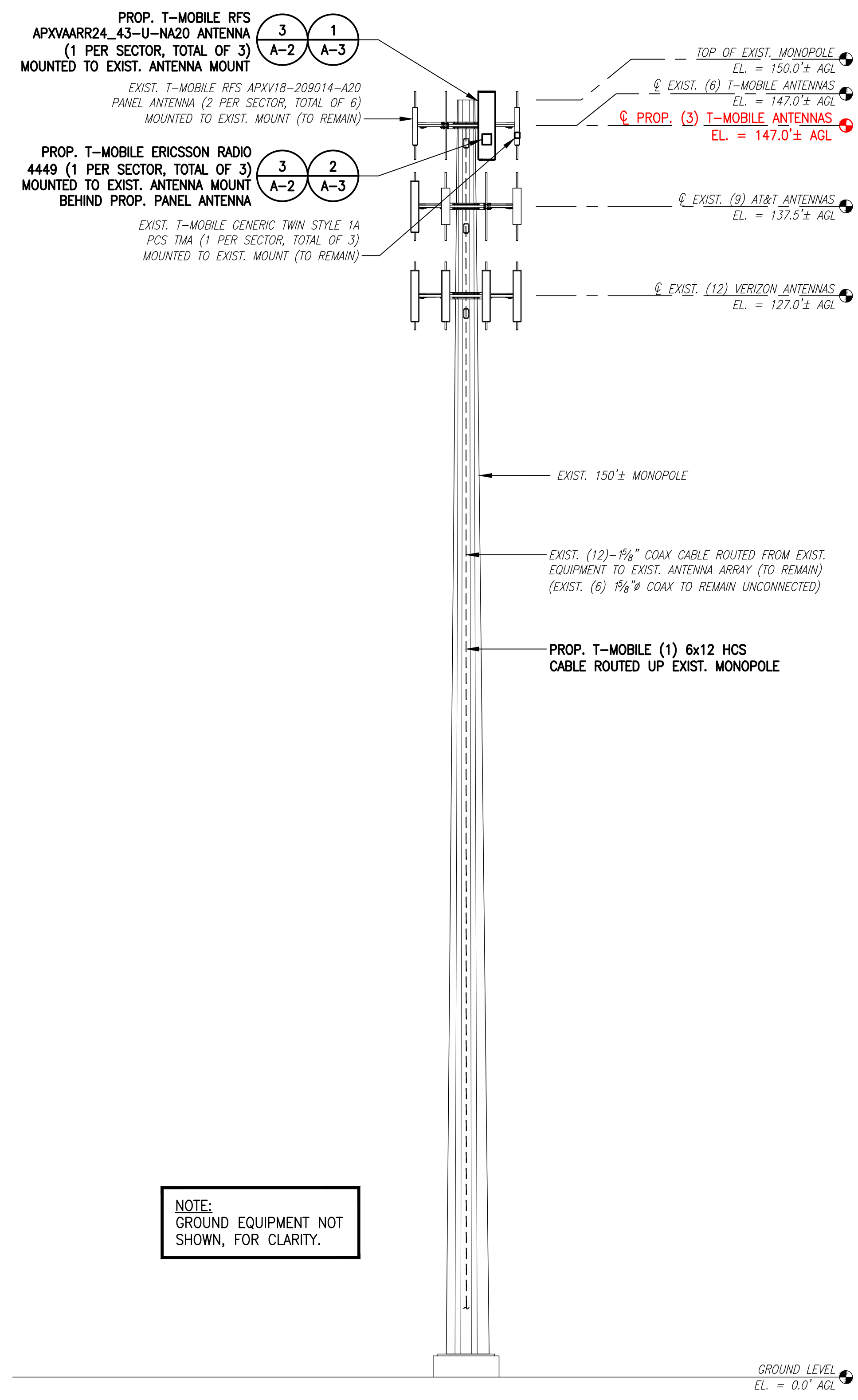
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**COMPOUND & EQUIPMENT PLAN**

SHEET NUMBER  
**A-1**

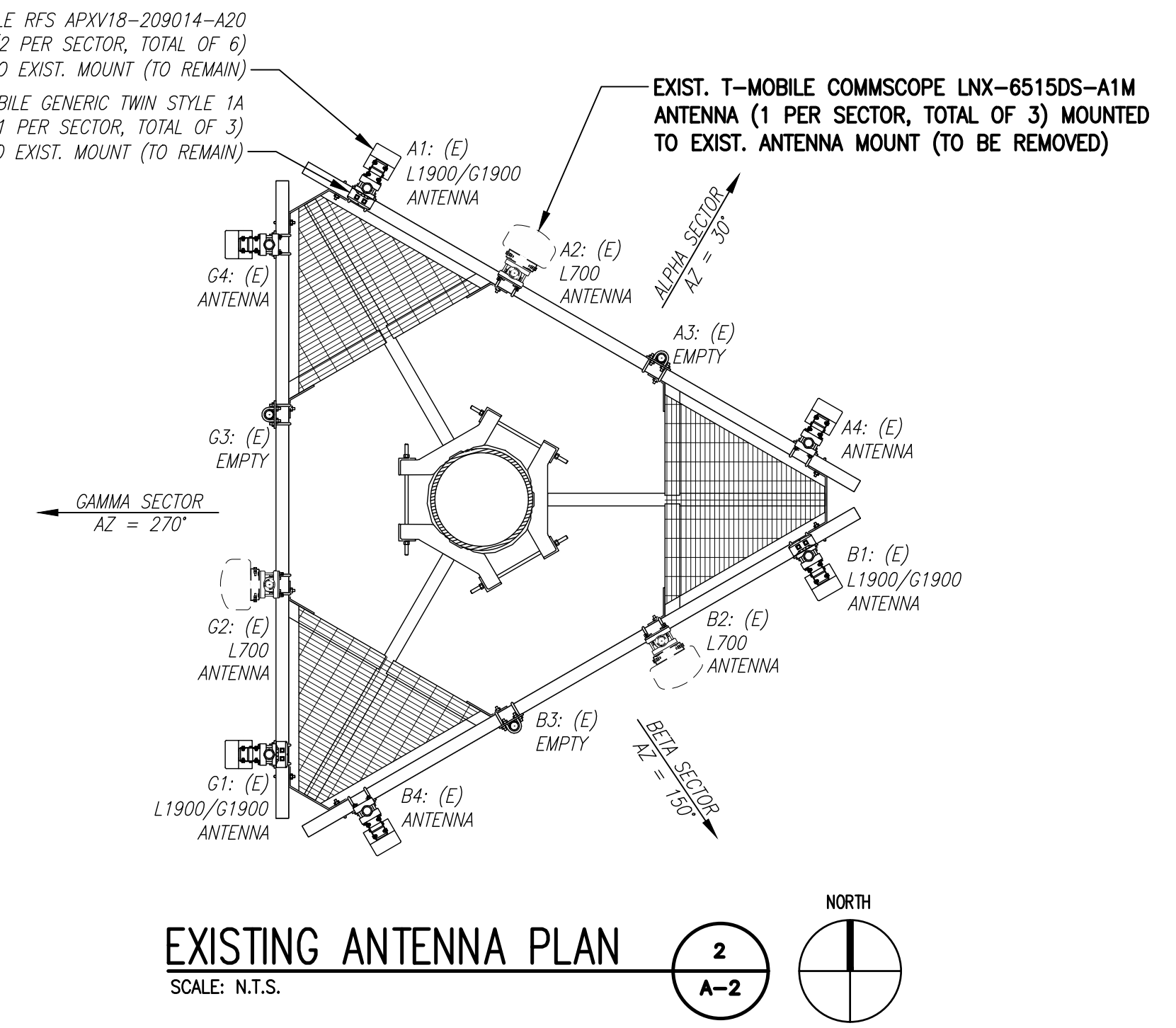
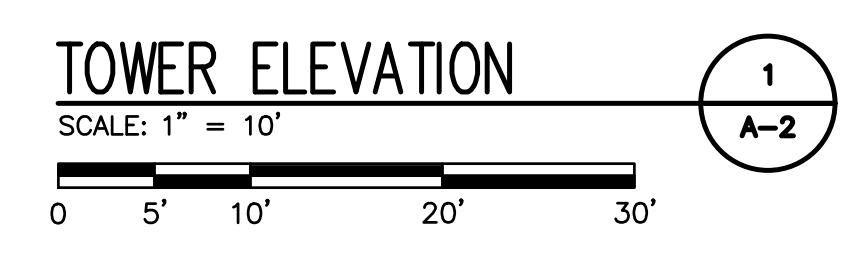
**SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):**  
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR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

**GENERAL CONTRACTOR TO REMOVE ANY EXISTING TMAS THAT ARE NOT SHOWN ON THESE CONSTRUCTION DRAWINGS.**

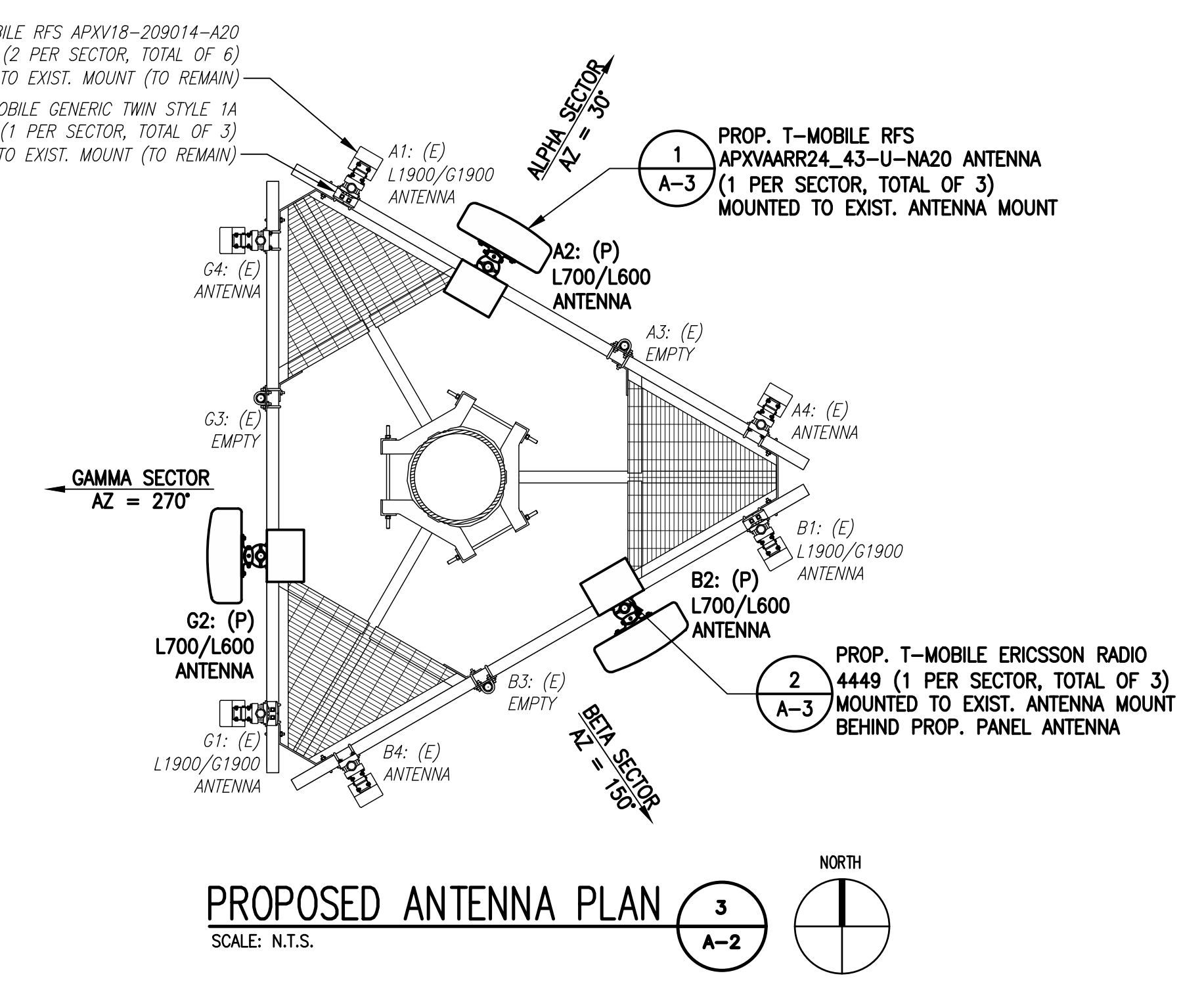
**RAD CENTER NOTE:**  
 T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.



NOTE:  
 GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.



EXISTING ANTENNA PLAN  
 SCALE: N.T.S. Reference marker 2 A-2



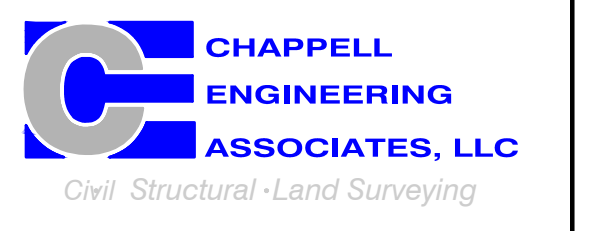
PROPOSED ANTENNA PLAN  
 SCALE: N.T.S. Reference marker 3 A-2

**T-MOBILE NORTHEAST LLC**

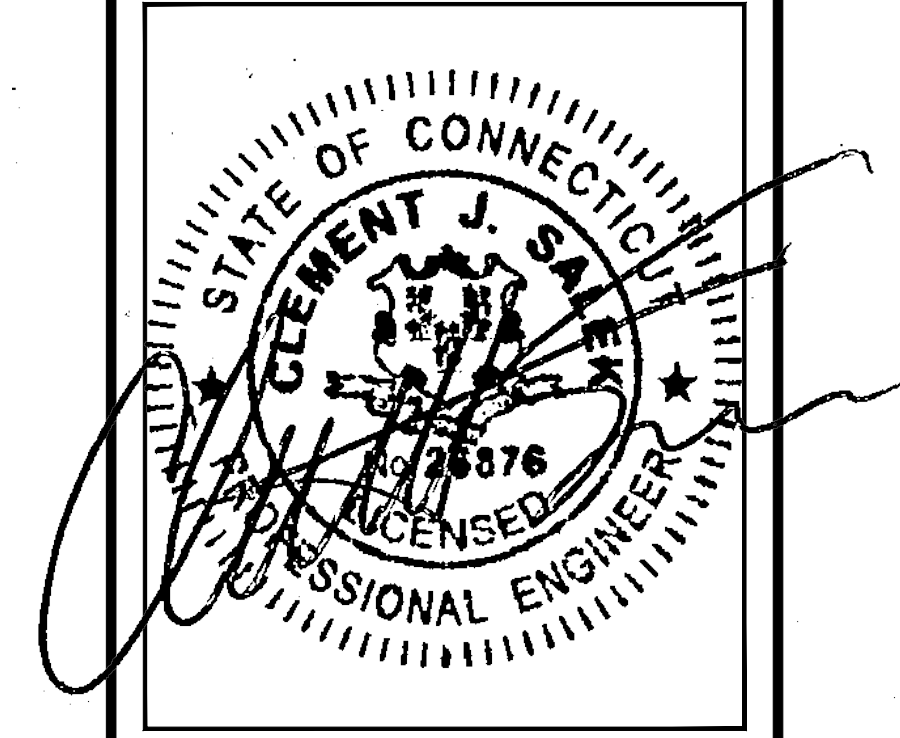
15 COMMERCE WAY, SUITE B  
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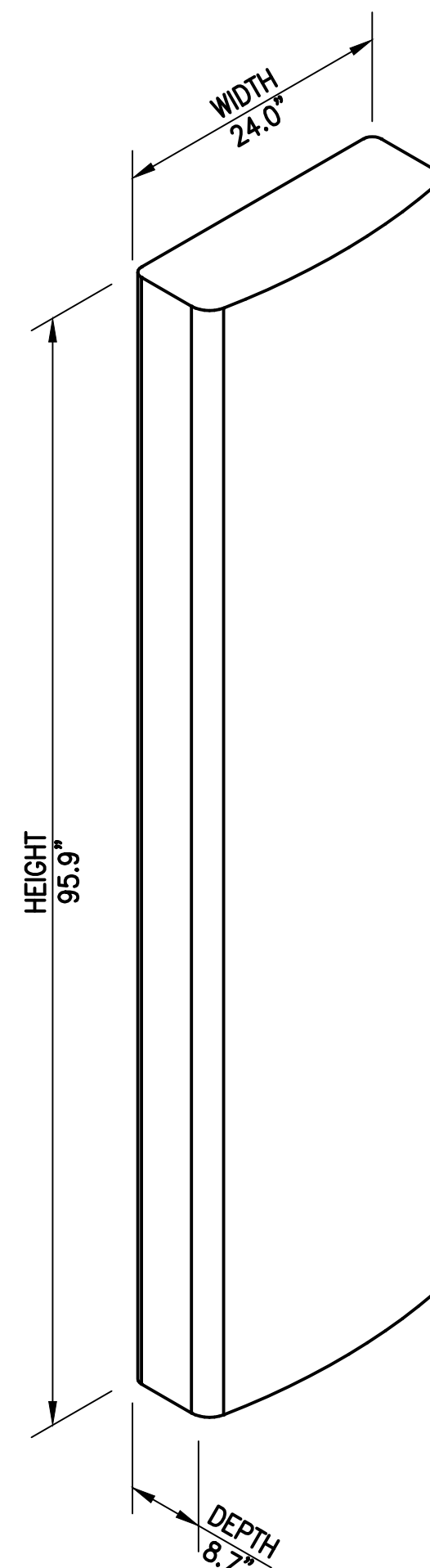
SITE NUMBER:  
**CT11519D**  
 SITE ADDRESS:  
 99 KNOWLTON HILL ROAD  
 ASHFORD, CT 06278

SHEET TITLE  
**TOWER ELEVATIONS & ANTENNA PLAN**

SHEET NUMBER  
**A-2**

FINAL ANTENNA CONFIGURATION								
SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	RADIOS/TMAS	CABLES
ALPHA	RFS APXV18-209014-C-A20	147'± AGL	30°	0°	2°	L1900/G1900	GENERIC TWIN STYLE 1A PCS TMA	(2) 1/8" COAX CABLE
	RFS APXVAARR24_43-U-NA20	147'± AGL	30°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE (SHARED)
	EMPTY	147'± AGL	-	-	-	-	-	-
	RFS APXV18-209014-C-A20	147'± AGL	30°	0°	2°	-	-	-
BETA	RFS APXV18-209014-C-A20	147'± AGL	150°	0°	2°	L1900/G1900	GENERIC TWIN STYLE 1A PCS TMA	(2) 1/8" COAX CABLE
	RFS APXVAARR24_43-U-NA20	147'± AGL	150°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE (SHARED)
	EMPTY	147'± AGL	-	-	-	-	-	-
	RFS APXV18-209014-C-A20	147'± AGL	150°	0°	2°	-	-	-
GAMMA	RFS APXV18-209014-C-A20	147'± AGL	270°	0°	2°	L1900/G1900	GENERIC TWIN STYLE 1A PCS TMA	(2) 1/8" COAX CABLE
	RFS APXVAARR24_43-U-NA20	147'± AGL	270°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE (SHARED)
	EMPTY	147'± AGL	-	-	-	-	-	-
	RFS APXV18-209014-C-A20	147'± AGL	270°	0°	2°	-	-	-

NOTE: EXISTING (6) 1/8" COAX CABLES TO REMAIN UNCONNECTED



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 3

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



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 3

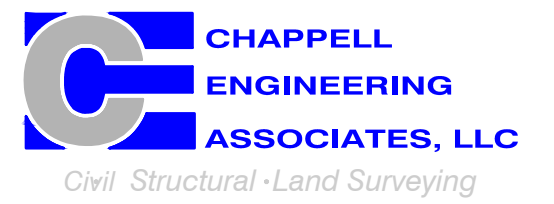
RRU DETAIL 2 A-3  
SCALE: N.T.S.

T-MOBILE  
NORTHEAST LLC

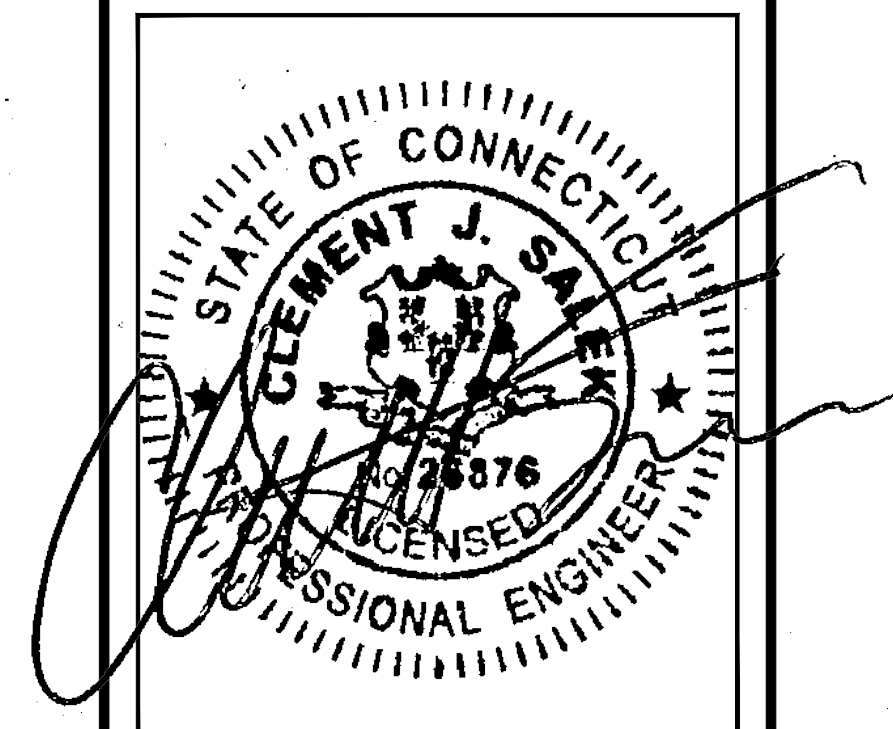
15 COMMERCE WAY, SUITE B  
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**CT11519D**

SITE ADDRESS:  
99 KNOWLTON HILL ROAD  
ASHFORD, CT 06278

SHEET TITLE  
**SITE DETAILS**

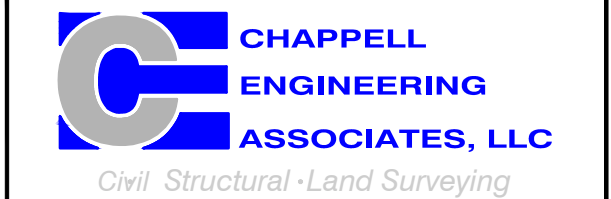
SHEET NUMBER  
**A-3**

**T-MOBILE  
NORTHEAST LLC**

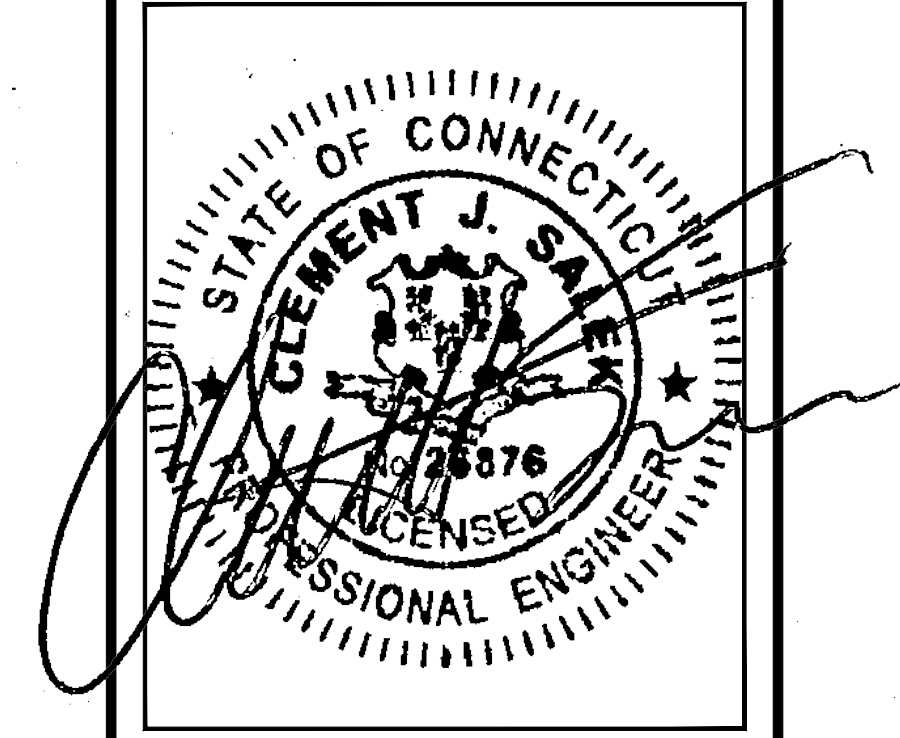
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
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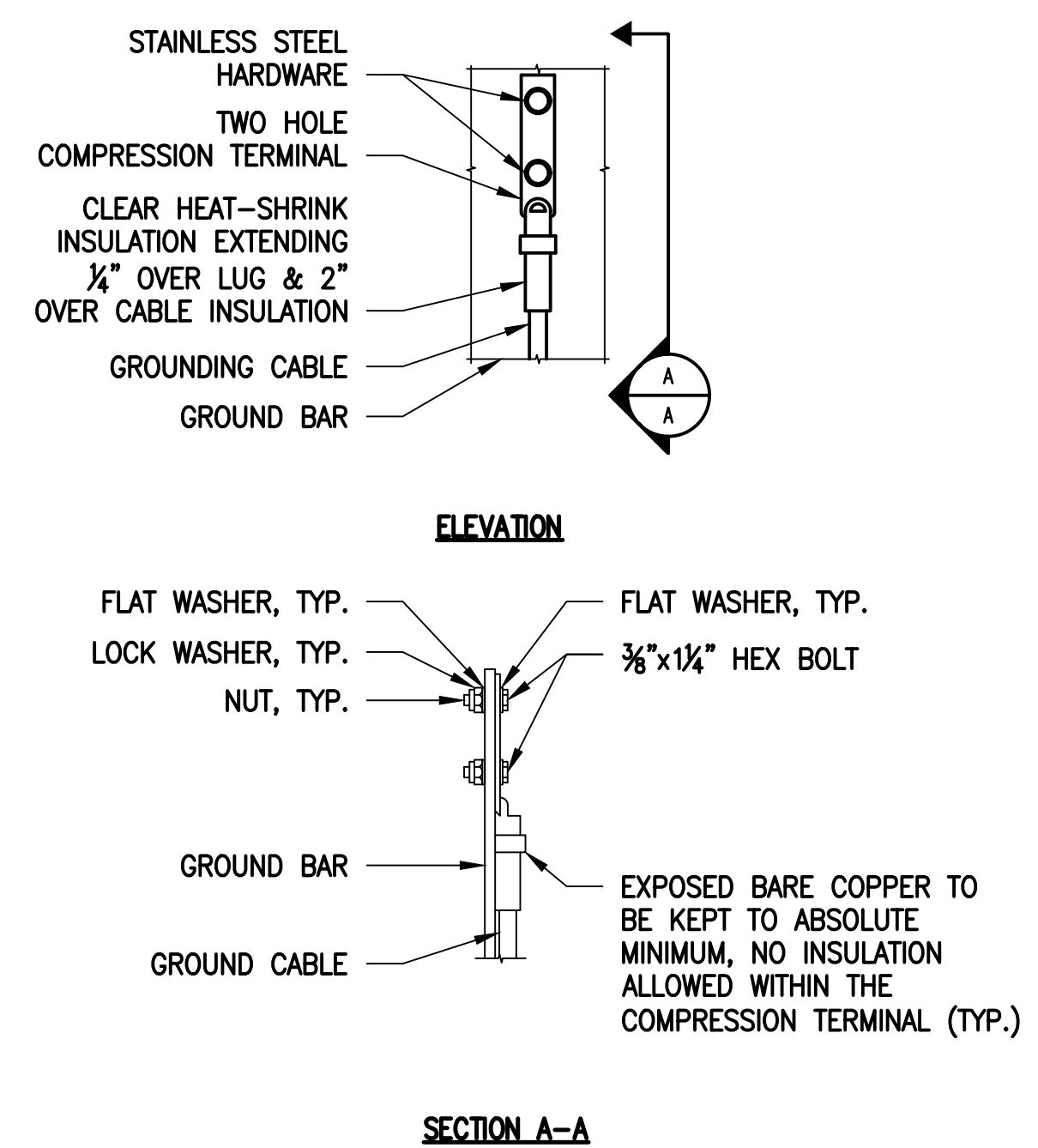
SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	11/09/20	ISSUED FOR CONSTRUCTION	C/MC
0	05/29/19	ISSUED FOR REVIEW	JRV

SITE NUMBER:  
**CT11519D**

SITE ADDRESS:  
99 KNOWLTON HILL ROAD  
ASHFORD, CT 06278

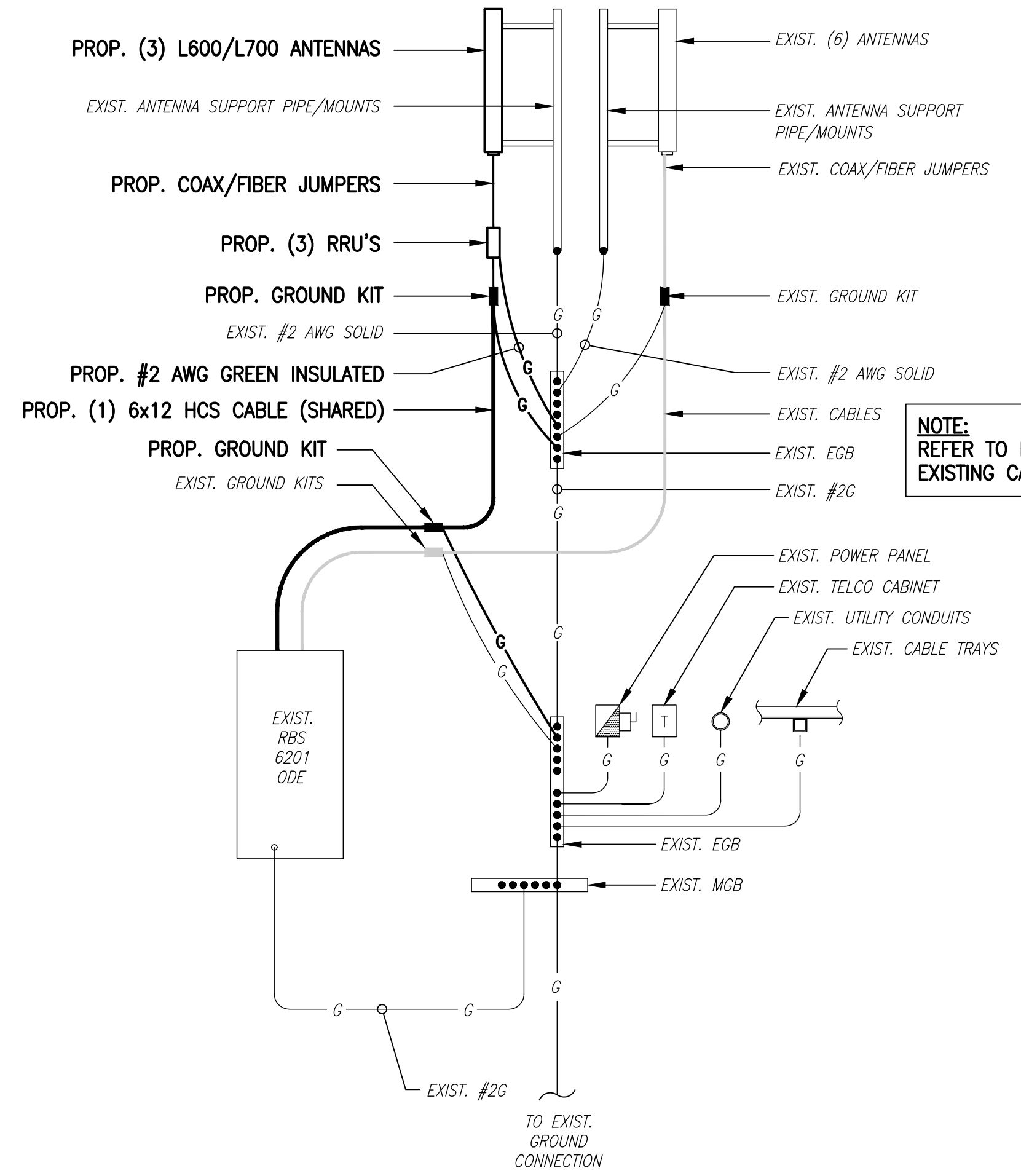
SHEET TITLE  
**ELECTRIC & GROUNDING  
DETAILS**

SHEET NUMBER  
**E-1**

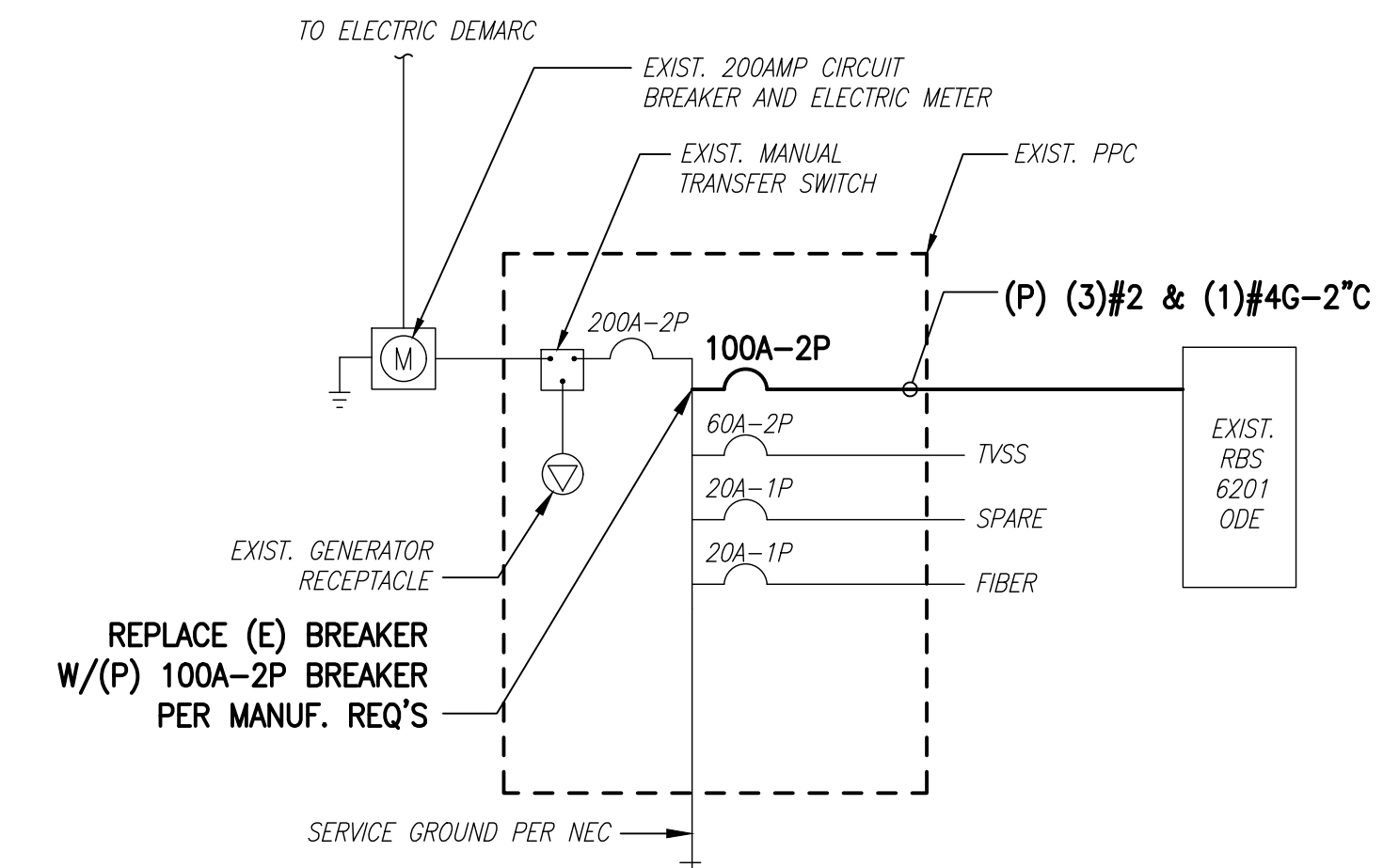


- NOTES:**
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
  - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
  - CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

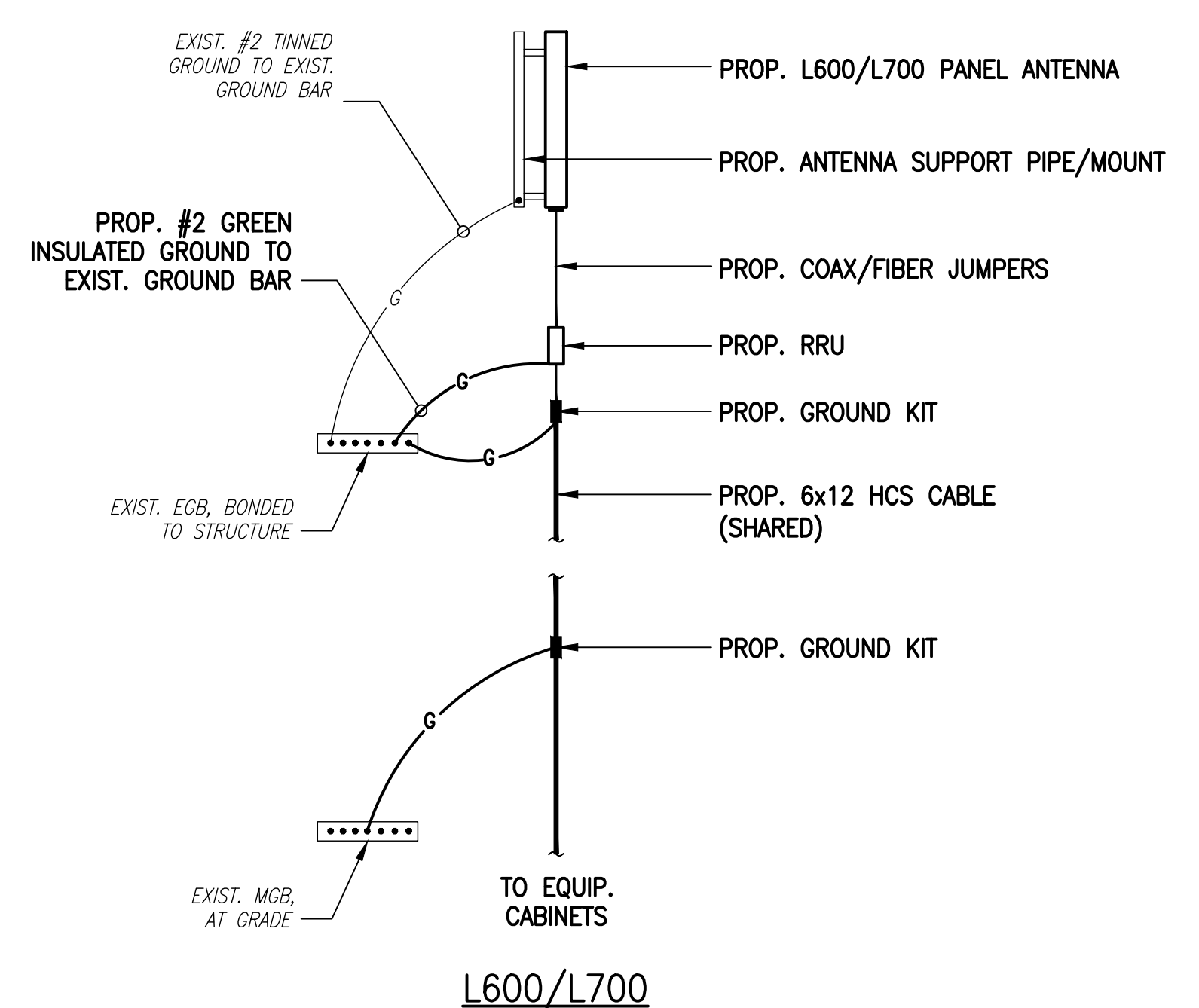
**TYPICAL GROUND BAR  
CONNECTIONS DETAIL** 3  
SCALE: NOT TO SCALE



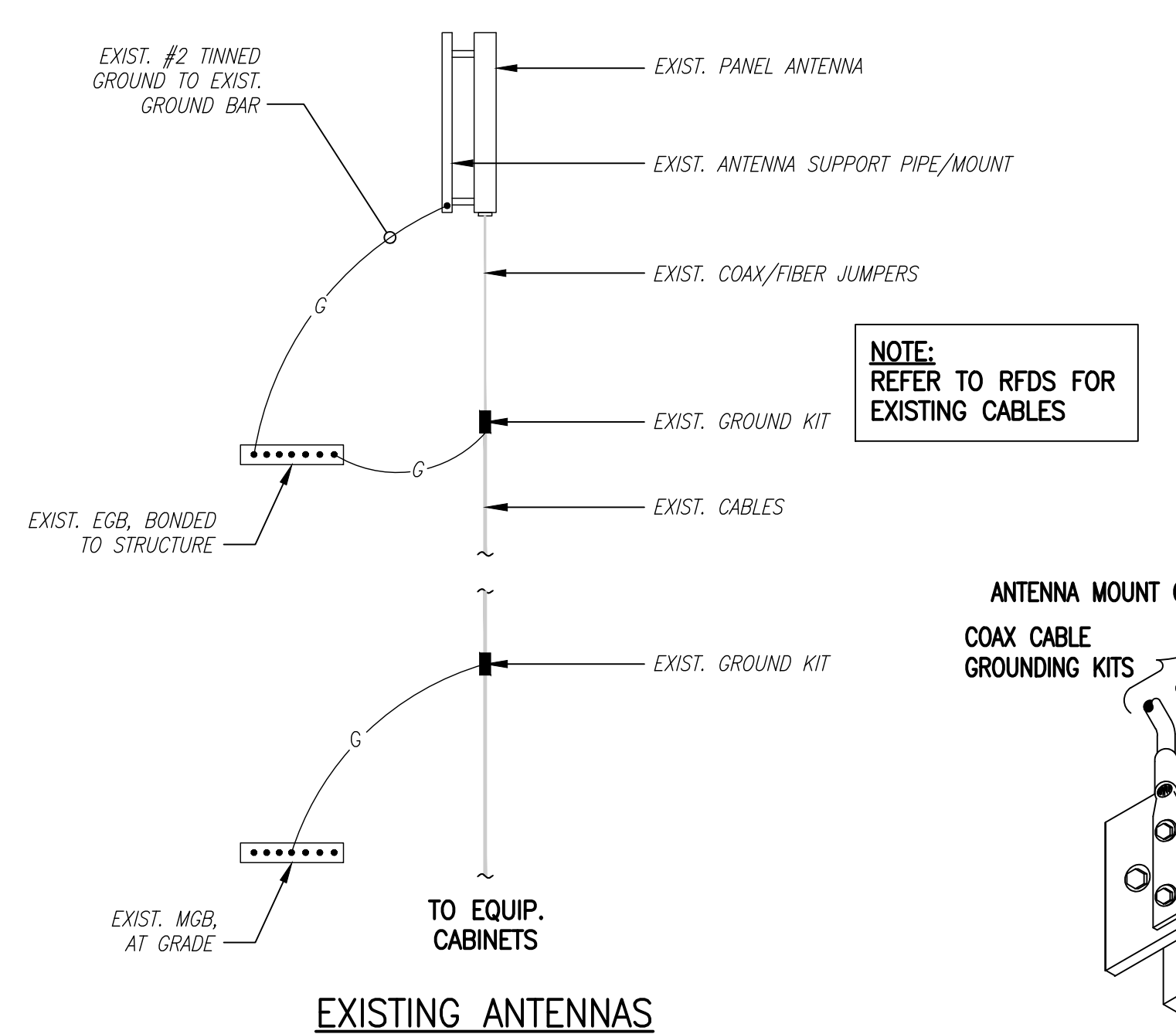
**GROUNDING RISER DIAGRAM** 2  
SCALE: NOT TO SCALE



**ONE LINE DIAGRAM** 1  
SCALE: NOT TO SCALE



**COAX CABLE CONNECTION  
AND GROUNDING DETAIL** 4  
SCALE: NOT TO SCALE



**GROUND BAR (EGB)** 5  
SCALE: NOT TO SCALE

**ELECTRICAL AND GROUNDING NOTES**

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- 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.
- BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THHN, OR THHN/INSULATION.
- 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.
- 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.
- 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.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- PPC SUPPLIED BY PROJECT OWNER.
- 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".
- GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- 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.
- ALL GROUND CONNECTIONS TO BE BURIED HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- 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 8" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- 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.
- CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
- CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.

# EXHIBIT 7

T-MOBILE: CT11519D  
SBA: CT13614-A KNOWLTON

**MOUNT AUGMENTATION @ 147'**

MONOPOLE TOWER

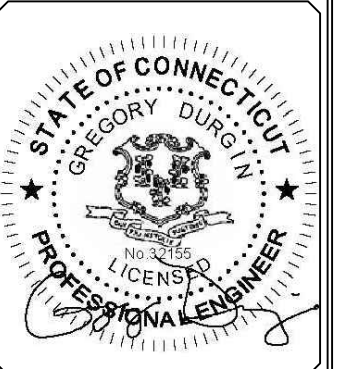
ASHFORD, CT  
WINDHAM COUNTY



REVISIONS:			
0	06/19/19	ISSUE FOR CONSTRUCTION	RWR

CHECKED BY: DWG

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO THE CLIENT NAMES IS STRICTLY PROHIBITED.



SITE INFORMATION:  
MOUNT AUGMENTATION  
T-MOBILE: CT11519D  
SBA: CT13614-A  
KNOWLTON  
ASHFORD, CT  
LATITUDE: 41.840773  
LONGITUDE: -72.207521

SHEET TITLE:  
TITLE SHEET

SHEET NUMBER:  
**S-1**

**SITE INFORMATION**

STRUCTURE TYPE: MONOPOLE  
MOUNT TYPE: PLATFORM  
LATITUDE: 41.840773 (NAD 83)  
LONGITUDE: -72.207521 (NAD 83)  
CITY / STATE: ASHFORD, CT  
COUNTY: WINDHAM  
  
COORDINATES ARE FOR NAVIGATIONAL PURPOSES ONLY, NOT TO 1A ACCURACY.

**DO NOT SCALE DRAWINGS**

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR THE LABOR & MATERIALS FOR THE DISCREPANCIES.

**CODE COMPLIANCE**

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.  
  
BUILDING CODE AND DESIGN STANDARD: 2015 IBC / TIA-222 / 2018 CT BUILDING CODE

**A&E INFORMATION**



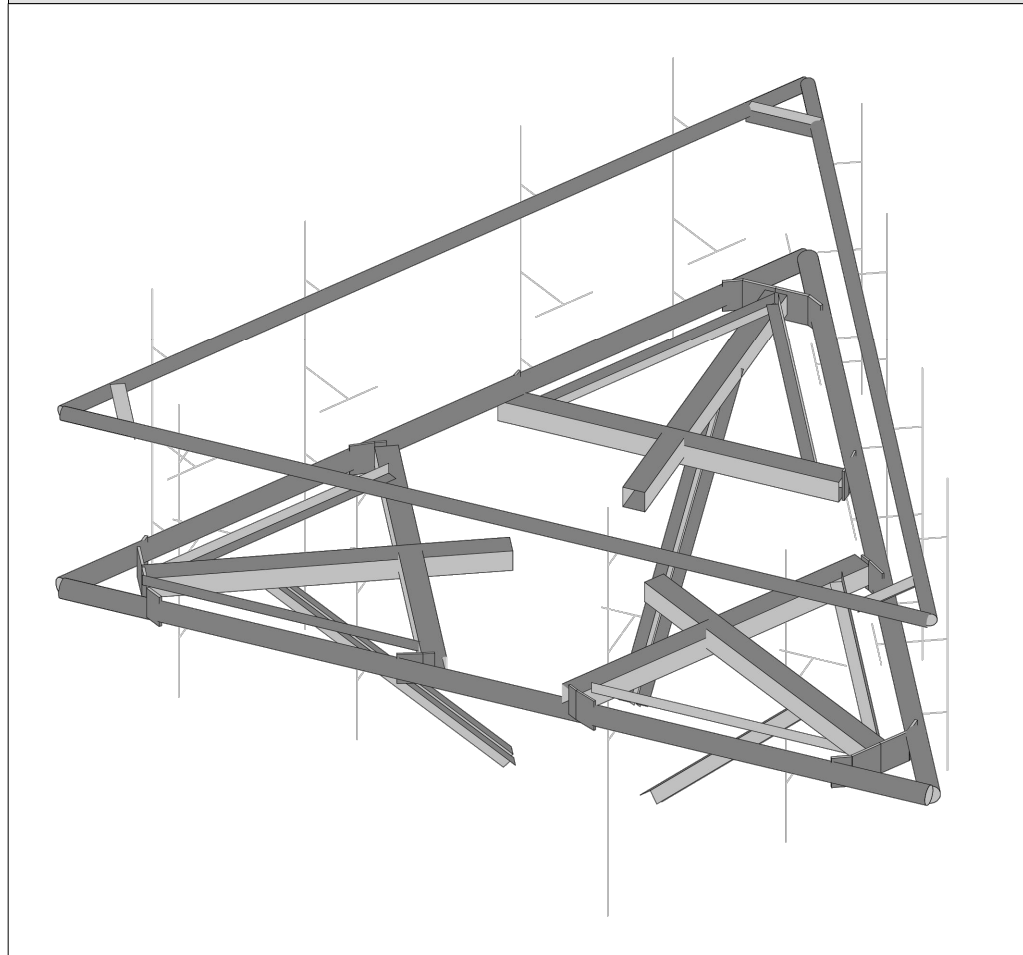
**GENERAL DESIGN NOTES**

1. THIS PLAN HAS BEEN DESIGNED UTILIZING THE CORRESPONDING MOUNT STRUCTURAL ANALYSIS.
2. THESE PLANS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/EIA-222, ASCE 7, AWS, ACI, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE-MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.
3. ALL STRUCTURE INFORMATION OBTAINED IN THE FORM OF INFORMATION PROVIDED BY THE CLIENT. CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED DOCUMENTS. CONTRACTOR SHALL ISSUE A REQUEST FOR INFORMATION (RFI) IN THE EVENT ANY DISCREPANCIES ARE DISCOVERED BETWEEN THESE DOCUMENTS AND THE AS-BUILT CONDITIONS IN THE FIELD IN A SITE VISIT THAT SHALL BE PERFORMED PRIOR TO STARTING FABRICATION OR CONSTRUCTION.
4. ALL MATERIALS UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS.
5. ALL PRODUCT OR MATERIAL SUBSTITUTIONS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER SUITABLE TO DETERMINE IF SUBSTITUTE IS ACCEPTABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
6. PROVIDE STRUCTURAL STEEL SHOP DRAWING(S) TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION (ONLY IF SPECIFICALLY REQUESTED BY ENGINEER).
7. UNLESS NOTED OTHERWISE, ALL NEW MEMBERS AND REINFORCING SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.
8. ANY CONTRACTOR-CAUSED DAMAGE TO PROPERTY OF THE LAND OWNER, PROPERTY OF THE STRUCTURE OWNER, PROPERTY OF THE CUSTOMER, SITE FENCING OR GATES, ANY AND ALL UTILITY AND/OR SERVICE LINES, SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE REPAIRED OR REPLACED AT THE SOLE COST OF THE CONTRACTOR AND SHALL BE ACCOMPLISHED BY THE CONTRACTOR OR SUBCONTRACTOR AS APPROVED BY THE ENGINEER OF RECORD AND LAND OWNER. DAMAGE TO EQUIPMENT OR PROPERTY OF ANY KIND BELONGING TO OTHER COMPANIES (BESIDES THE INDICATED CUSTOMER) SHALL BE ADDRESSED BY THE CONTRACTOR WITH THE COMPANIES THAT OWN THE DAMAGED ITEMS.

**SHEET INDEX**

SHEET	DESCRIPTION
S-1	TITLE SHEET
S-2	NOTES AND SPECIFICATIONS
S-3	INSPECTION NOTES
S-4	AUGMENTATIONS, SECTIONS & DETAILS

**MOUNT AUGMENTATION CONFIGURATION**



**AUGMENTATION SCOPE**

MODIFY ALL SECTORS OF CARRIER'S EXISTING MOUNT INSTALLATION AS REQUIRED (UNLESS NOTED OTHERWISE)

**GENERAL PROJECT NOTES**

1. CONTRACTOR IS RESPONSIBLE FOR ERECTING TEMPORARY BARRICADES AND/OR FENCING TO PROTECT THE SAFETY OF THE PUBLIC DURING CONSTRUCTION. THE CONTRACTOR SHALL REMOVE ALL TEMPORARY BARRIERS AND REPAIR ALL DAMAGE TO PROPERTY ON THE SITE CAUSED BY THIS CONSTRUCTION. THE COST OF REPAIR IS THE CONTRACTOR'S RESPONSIBILITY.
2. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE PRIOR TO ORDERING ANY MATERIALS OR CONDUCTING ANY WORK.
4. THESE PLANS DO NOT ADDRESS THE SAFETY AND STABILITY OF THE STRUCTURE DURING ASSEMBLY AND ERECTION, WHICH ARE THE RESPONSIBILITY OF THE ERECTOR, BASED ON THE MEANS AND METHODS CHOSEN BY THE ERECTOR.

**CONTRACTOR NOTES**

1. PRIOR TO BEGINNING CONSTRUCTION, ALL CONTRACTORS AND SUBCONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW STRUCTURE OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND STRUCTURE/TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGEMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR STRUCTURE OWNER ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM ANY SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO THE STRUCTURE OWNER.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, THE ENGINEER OF RECORD SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. THE CONTRACTOR SHALL SOLICIT AND HIRE THE SERVICES OF A QUALIFIED AUGMENTATION INSPECTOR PRIOR TO BEGINNING CONSTRUCTION. THE AUGMENTATION INSPECTOR MAY BE AN EMPLOYEE OF THE CONTRACTOR'S FIRM, HOWEVER THE INSPECTOR'S ONLY DUTIES SHALL BE INSPECTION, TESTING, AND REPORT CREATION AS REQUIRED ON THE "AUGMENTATION INSPECTION NOTES" SHEET.
4. THE CONTRACTOR SHALL NOTIFY THE TOWER OWNER OF THE PLANNED CONSTRUCTION & INSPECTION SCHEDULE, AS WELL AS ANY CHANGES TO THE SCHEDULE, WITHIN TWO BUSINESS DAYS OF THE COMPLETION OF THE SCHEDULE OR SCHEDULE REVISION BOTH PRIOR TO BEGINNING CONSTRUCTION AND DURING CONSTRUCTION AS THE SCHEDULE CHANGES. THE STRUCTURE OWNER WHEN THE WORK HAS BEEN COMPLETED WITHIN 2 BUSINESS DAYS OF THE COMPLETION OF THE WORK AND ASSOCIATED AUGMENTATION INSPECTIONS & TESTING (WHEN APPLICABLE).
5. IT IS ASSUMED THAT ANY STRUCTURAL AUGMENTATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE STRUCTURE OWNER AND ENGINEER INCLUDING BUT NOT LIMITED TO TOWER CLIMBER AND RESCUE CLIMBER CERTIFICATIONS, ET CETERA.
6. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
7. CONTRACTOR SHALL WORK WITHIN THE LIMITS OF THE STRUCTURE OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.

**STRUCTURAL ERECTION AND BRACING REQUIREMENTS**

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR SHALL PROVIDE SHORING AND BRACING AS REQUIRED DURING CONSTRUCTION TO ENSURE STABILITY. DESIGN AND SEQUENCING OF CONSTRUCTION SHORING AND BRACING IS OUTSIDE THE SCOPE OF THIS WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, GUYING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.

**STRUCTURAL STEEL**

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC STEEL CONSTRUCTION MANUAL AND SECTION 4 OF THE TIA CODE.
2. PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM GRADES UNLESS OTHERWISE NOTED:
  - CHANNELS & ANGLES ..... ASTM A36, (Fy = 36 KSI)
  - PLATES ..... ASTM A36, (Fy = 36 KSI)
  - PIPES ..... ASTM A53 GR.B, (Fy = 35 KSI)
  - HSS ROUND ..... ASTM A500 GR.B, (Fy = 42 KSI)
  - HSS RECTANGULAR ..... ASTM A500 GR.B, (Fy = 46 KSI)
  - W-FLANGE ..... ASTM A992 (Fy = 50 KSI)
  - STRUCTURAL BOLTS ..... ASTM A325
  - U-BOLTS ..... ASTM A307 GR.A
  - NUTS FOR BOLTS ..... ASTM A563 (THREADING TO MATCH BOLT)
  - WASHERS FOR BOLTS ..... ASTM F436
  - SEE TABLE 5-1 OF THE TIA CODE FOR ADDITIONAL SHAPES AND STANDARDS THAT ARE NOT LISTED ABOVE.
3. NON PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS PER THE TIA CODE:
  - THE CARBON EQUIVALENT OF STEEL SHALL NOT EXCEED 0.65 PER SECTION 5.4.2 OF THE TIA CODE
  - ELONGATION OF STEEL SHALL NOT BE LESS THAN 18%
  - TEST REPORTS SHALL BE IN ACCORDANCE WITH ASTM A6 OR A568
  - TOLERANCES SHALL BE IN ACCORDANCE WITH ASTM A6
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH AND COLD GALVANIZED.
5. ALL WELDING WORK SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY. WELDING ELECTRODES SHALL BE E70XX.
6. ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO AISC SPECS AND CODES, LATEST EDITION.
7. UPON REQUEST, THE CONTRACTOR SHALL SUBMIT DETAILED, ENGINEERED, COORDINATED AND CHECKED SHOP DRAWINGS FOR ALL STRUCTURAL STEEL TO THE ENGINEER OF RECORD TO REVIEW FOR COMPLIANCE WITH DESIGN INTENT PRIOR TO THE START OF FABRICATION AND/OR ERECTION. GEOSTRUCTURAL IS ABSOLVED OF ALL LIABILITY ASSOCIATED WITH THE MISINTERPRETATION OF THE CONSTRUCTION DOCUMENTS IF CONTRACTOR CHOOSES NOT TO SUBMIT SHOP DRAWINGS.
8. TORCH-CUTTING OF ANY KIND SHALL NOT BE PERMITTED.
9. ALL BOLT HOLES SHALL BE STANDARD SIZE BOLT HOLES PER AISC 360, UNLESS OTHERWISE NOTED. ALL HOLES SHALL BE SHOP DRILLED OR SUB-PUNCHED AND REAMED. BURNING OF HOLES IS NOT PERMITTED. WHERE SLOTTED OR OVERSIZE HOLES ARE SPECIFIED ON THE DRAWINGS, EXTRA-THICK ASTM F436 PLATE WASHERS SHALL BE USED (3/16" MINIMUM THICKNESS) WITH A DIAMETER SUITABLE TO COVER THE EXTENTS OF THE SLOT OR HOLE. BOLTS SHALL BE HEAVY-HEX WHERE AVAILABLE IN THE SIZE AND GRADE SPECIFIED, OTHERWISE BOLTS SHALL BE HEX HEAD CAP SCREWS.
10. ALL STEEL HARDWARE, INCLUDING ADHESIVE OR EMBEDDED ANCHOR BOLTS AND THEIR ACCESSORIES, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 (EXCEPT BOLTS SMALLER THAN 1/2" SHALL CONFORM TO FE/ZN 3 AT PER ASTM F1941 WHERE HOT-DIP GALVANIZED BOLTS ARE NOT AVAILABLE). ALL STEEL MEMBERS, INCLUDING WELDMENTS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123. REPAIR DAMAGE TO GALVANIZED COATINGS USING ASTM A780 PROCEDURES WITH A ZINC RICH PAINT (SUCH AS ZINC GALVILITE) FOR GALVANIZING DAMAGED BY HANDLING, TRANSPORTING, CUTTING, WELDING, OR BOLTING. DO NOT HEAT SURFACES TO WHICH REPAIR PAINT HAS BEEN APPLIED. CALL OUT HOLES REQUIRED FOR HOT-DIP GALVANIZING ON SHOP DRAWINGS.
11. MEMBERS SHALL BE SHOP-FABRICATED AND WELDED TO THE EXTENT PRACTICABLE IN ORDER TO REDUCE FIELD INSTALLATION COSTS.

**STRUCTURAL BOLTS**

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED GALVANIZED HIGH STRENGTH ASTM A325 OR A490 BOLTS WITH THREADS EXCLUDED FROM SHEAR PLANE.
2. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES, WITH BOLT HEADS FACING DOWN WHERE APPLICABLE.
3. ALL BOLTS AT EVERY CONNECTION SHALL BE INSTALLED SNUG-TIGHT UNTIL THE SECTION IS FULLY COMPACTED AND ALL PLYS ARE JOINED, AND THEN TIGHTENED FURTHER BY AISC - "TURN OF THE NUT" METHOD. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
4. BOLT LENGTHS UP TO AND INCLUDING 4 DIAMETERS SHALL BE TENSIONED 1/3 TURN BEYOND SNUG-TIGHT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE 1 1/2 TURNS BEYOND SNUG-TIGHT.
5. ALL BOLTED CONNECTIONS SHALL USE LOCK WASHERS.
6. MINIMUM EDGE DISTANCE FOR BOLTS SHALL BE 1 1/2" CENTER TO EDGE UNLESS OTHERWISE NOTED.

**NOMINAL HOLE DIMENSIONS:**

BOLT Ø	STANDARD HOLE Ø
1/2"Ø	9/16"Ø
5/8"Ø	11/16"Ø
3/4"Ø	13/16"Ø
7/8"Ø	15/16"Ø
1"Ø	1 1/8"Ø

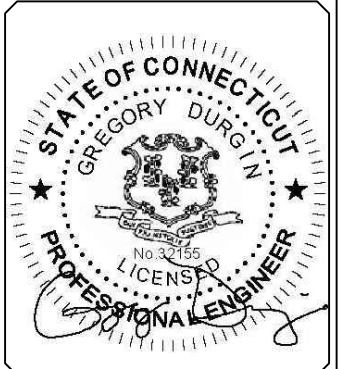


REVISIONS:

NO.	DATE	DESCRIPTION	BY
0	06/19/19	ISSUE FOR CONSTRUCTION	RWR

CHECKED BY: DWG

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SITE INFORMATION:  
**MOUNT AUGMENTATION**  
 T-MOBILE: CT11519D  
 SBA: CT13614-A  
 KNOWLTON  
 ASHFORD, CT  
 LATITUDE: 41.840773  
 LONGITUDE: -72.207521

SHEET TITLE:  
**NOTES AND SPECIFICATIONS**

SHEET NUMBER:  
**S-2**

PRE-CONSTRUCTION INSPECTION CHECKLIST	
CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	AUGMENTATION INSPECTION CHECKLIST
√	APPROVED SHOP DRAWINGS (LATEST REVISION)
√	FABRICATION INSPECTION
	FABRICATOR'S CERTIFIED WELD INSPECTOR (CWI)
	FABRICATOR'S QUALIFIED PERSONNEL FOR WELDING
√	MATERIAL TEST REPORT(S) / MILL CERTIFICATE(S)
	FABRICATOR'S NON-DESTRUCTIVE TESTING (NDT) TECHNICIAN
√	PACKING SLIPS FOR STRUCTURAL MATERIALS

CONSTRUCTION INSPECTION CHECKLIST	
CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	CONSTRUCTION INSPECTIONS
	FOUNDATION INSPECTIONS
	CONCRETE COMPRESSIVE STRENGTH AND SLUMP TESTING RESULTS/CERTIFICATES
	ADHESIVE ANCHOR ROD(S) INSTALLATION INSPECTION
	BASE PLATE GROUT INSPECTION
	THIRD-PARTY CERTIFIED WELD INSPECTION (INCLUDING IBC SPECIAL INSPECTIONS)
	SOIL EXCAVATION — DENSITY TESTING, COMPACTION INSPECTION/VERIFICATION, USE OF SUITABLE FILL
√	GALVANIZING REPAIR MATERIAL PREPARATION, INSPECTION, & PAINT APPLICATION
	GUY WIRE (RE-)TENSION REPORT AND INSPECTION
√	PRIME CONTRACTOR'S AS-BUILT DOCUMENTS (SIGNED & DATED)

POST-CONSTRUCTION INSPECTION CHECKLIST	
CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	AUGMENTATION INSPECTOR'S ISSUE LIST (INCLUDING CORRECTIVE ACTIONS TAKEN) AND/OR REDLINED RECORD DRAWINGS
	POST-INSTALLED ADHESIVE ANCHOR ROD PULL-OUT TESTING
√	PHOTOGRAPHS OF AUGMENTATIONS (INCLUDE PHOTOS OF BOTH SIDES OF WELDED OR BOLTED CONNECTIONS, OF OVERALL AND DETAIL VIEWS OF INSTALLED AUGMENTATIONS, AND BEFORE/AFTER PHOTOS OF ANY ISSUES IDENTIFIED BY THE INSPECTOR)

GENERAL NOTES
1. THE POST-AUGMENTATION INSPECTION IS A VISUAL EXAMINATION OF STRUCTURE AUGMENTATIONS AND A REVIEW OF ANY REQUIRED CONSTRUCTION INSPECTIONS, TESTING, AND OTHER DATA TO VERIFY THAT THE AUGMENTATIONS ARE INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AS DESIGNED BY THE ENGINEER OF RECORD. THE CONTRACT DOCUMENTS INCLUDE THESE AUGMENTATION DRAWINGS, ANY PROJECT SPECIFICATIONS REFERENCED TO IN THE PROJECT NOTES OR OTHERWISE PROVIDED WITH THE DRAWINGS, AND OTHER DOCUMENTS OR DRAWINGS PROVIDED WITH THE AUGMENTATION DRAWINGS WITH THE INTENT THAT THEY BE USED AS A DESIGN AID OR GUIDELINE FOR CONSTRUCTION.
2. THE POST-AUGMENTATION INSPECTION SHALL CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A QUALITATIVE REVIEW OF THE ENGINEERING ASPECTS OF THE DESIGN OR THE DESIGN DRAWINGS. THE AUGMENTATION INSPECTOR IS NOT TAKING OWNERSHIP OF THE AUGMENTATION DESIGN IN THE PERFORMANCE OF THEIR DUTIES. OWNERSHIP OF THE AUGMENTATION DESIGN'S EFFECTIVENESS AND INTENT, LIES WITH THE ENGINEER OF RECORD.
3. TO ENSURE THAT THE REQUIREMENTS OF THE POST-AUGMENTATION INSPECTION ARE MET, IT IS ESSENTIAL THAT COORDINATION BETWEEN THE PRIME CONTRACTOR AND THE AUGMENTATION INSPECTOR BEGIN AS SOON AS THE PROJECT IS FUNDED AND WORK ENTERS THE PLANNING STAGE. THE PRIME CONTRACTOR AND AUGMENTATION INSPECTOR SHALL BE PROACTIVE IN IDENTIFYING CONSTRUCTION ISSUES AND COMMUNICATING THESE ISSUES TO EACH OTHER AND TO THE ENGINEER OF RECORD AND STRUCTURE OWNER AND/OR CUSTOMER, AS REQUIRED.

INSPECTION AND REPORT RECOMMENDATIONS
1. THE FOLLOWING ARE PROVIDED IN THE INTENT OF ENHANCING THE EFFECTIVENESS OF THE AUGMENTATION INSPECTION AND IMPROVING THE EFFICIENCY OF THE PROCESS OF COLLECTING AND COMPILING THE INFORMATION INTO A USABLE REPORT:
1.1. IT IS RECOMMENDED THAT THE PRIME CONTRACTOR PROVIDE THE AUGMENTATION INSPECTOR AT LEAST 5 BUSINESS DAYS NOTICE FOR WHEN THE SITE WILL BE READY FOR THE AUGMENTATION INSPECTION.
1.2. THE PRIME CONTRACTOR AND THE AUGMENTATION INSPECTOR SHALL COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
1.3. THE PRIME CONTRACTOR AND AUGMENTATION INSPECTOR SHALL BOTH BE PRESENT DURING THE INITIAL INSPECTION IN ORDER TO ALLOW FOR THE REMEDIATION OF DEFICIENCIES DURING THE INSPECTION, AS PRACTICABLE. IT MAY BE PREFERABLE TO KEEP WORK CREWS AND THEIR EQUIPMENT ON SITE TO REMEDIATE DEFICIENCIES DURING INSPECTIONS.

INSPECTION RESCHEDULING AND CANCELLATION
1. IF THE PRIME CONTRACTOR AND AUGMENTATION INSPECTOR HAVE AGREED UPON A TIME AND DATE FOR A GIVEN INSPECTION AND EITHER PARTY RESCHEDULES OR CANCELS THE INSPECTION, THE STRUCTURE OWNER SHALL NOT BE RESPONSIBLE FOR COSTS, FEES, LOST DEPOSITS, OR OTHER EXPENSES INCURRED BY THE PRIME CONTRACTOR, THEIR SUBCONTRACTOR(S), OR THE AUGMENTATION INSPECTOR DUE TO THESE SCHEDULING CHANGES. EXCEPTIONS MAY BE MADE IN THE EVENT OF UNCONTROLLABLE SITUATIONS SUCH AS NATURAL DISASTERS, SEVERE WEATHER, OR OTHER CONDITIONS THAT COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

REMEDICATION OF FAILING INSPECTION
1. IN THE EVENT THAT ANY PORTION OF THE AUGMENTATION WORK IS DETERMINED TO BE UNSATISFACTORY BY THE MODIFICATION INSPECTOR, THE PRIME CONTRACTOR SHALL WORK WITH THE AUGMENTATION INSPECTOR TO CREATE A PLAN OF ACTION THAT WILL EITHER:
1.1. REPAIR THE DEFICIENT WORK TO SATISFACTORY CONDITION AND INCLUDE A SUBSEQUENT RE-INSPECTION OF THE WORK TO VERIFY THAT IT IS SATISFACTORY.
1.2. OR, WITH THE PERMISSION OF THE STRUCTURE OWNER AND/OR CUSTOMER, THE PRIME CONTRACTOR MAY WORK WITH THE ENGINEER OF RECORD TO REVIEW THE AS-BUILT CONDITION OF THE AUGMENTATION TO DETERMINE IF IT IS STRUCTURALLY ACCEPTABLE. IF THIS ACTION IS NOT ACCEPTABLE TO ANY PARTY, THE PRIME CONTRACTOR SHALL PROCEED TO REPAIR THE DEFICIENT WORK TO A SATISFACTORY CONDITION.

AUGMENTATION INSPECTOR'S RESPONSIBILITIES
1. THE AUGMENTATION INSPECTOR MAY BE AN EMPLOYEE OF THE CONTRACTOR'S FIRM, HOWEVER THE INSPECTOR'S ONLY DUTIES SHALL BE INSPECTION, TESTING, AND REPORT CREATION.
2. THE AUGMENTATION INSPECTOR SHALL CONTACT THE PRIME CONTRACTOR AS SOON AS THEY HAVE RECEIVED A PURCHASE ORDER OR PAYMENT FOR THIS INSPECTION. THE AUGMENTATION INSPECTOR SHALL REVIEW THE REQUIREMENTS OF THE INSPECTION CHECKLIST, SHALL WORK WITH THE PRIME CONTRACTOR TO DEVELOP A SCHEDULE OF NECESSARY ON-SITE INSPECTIONS, AND SHALL DISCUSS ANY SITE-SPECIFIC INSPECTION REQUIREMENTS OR OTHER CONCERNS.
3. THE AUGMENTATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL PRIME CONTRACTOR INSPECTION AND TEST REPORTS (INCLUDING THOSE OF ASSIGNED SUB-CONTRACTORS), SHALL REVIEW THE REPORTS FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND SHALL CONDUCT THE NECESSARY ON-SITE INSPECTIONS.

PRIME CONTRACTOR'S RESPONSIBILITIES
1. THE PRIME CONTRACTOR SHALL CONTACT THE AUGMENTATION INSPECTOR AS SOON AS THEY HAVE RECEIVED A PURCHASE ORDER OR PAYMENT FOR THE AUGMENTATION INSTALLATION OR PROJECT. THE PRIME CONTRACTOR SHALL REVIEW THE REQUIREMENTS OF THE AUGMENTATION INSPECTION CHECKLIST, SHALL WORK WITH THE AUGMENTATION INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, AND SHALL DISCUSS SPECIFIC INSPECTION AND TESTING REQUIREMENTS WITH THE AUGMENTATION INSPECTOR IN DETAIL TO OBTAIN A FULL UNDERSTANDING OF THE REQUIRED INSPECTIONS AND TESTING.
2. THE PRIME CONTRACTOR SHALL PERFORM AND RECORD THE TESTING AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUGMENTATION INSPECTION CHECKLIST.

PHOTOGRAPHY REQUIREMENTS
1. THE PRIME CONTRACTOR AND AUGMENTATION INSPECTOR SHALL BETWEEN THE EFFORTS OF BOTH PARTIES AND THEIR EMPLOYED PERSONNEL PROVIDE PHOTOGRAPHS WITH THE INSPECTION REPORT TO INCLUDE THE FOLLOWING:
a. GENERAL SITE PHOTOGRAPHS PRE-CONSTRUCTION
b. AUGMENTATION INSTALLATION PHOTOGRAPHS DURING CONSTRUCTION/ERECTION OPERATIONS AND INSPECTIONS
b.1. RAW MATERIALS
b.2. PHOTOS OF DETAILED WORK REQUIRED ON THE DRAWINGS (CONNECTIONS, WELDMENTS, FIELD-FABRICATED MEMBERS, ETC)
b.3. BOLT INSTALLATION AND TORQUE/PRE-TENSION.
b.4. FINAL INSTALLED CONDITION (AFTER DEFICIENT CONDITIONS, IF ANY, ARE REMEDIATED).
b.5. REPAIR OF SURFACE COATINGS (INCLUDING GALVANIZING AND/OR PAINT COATING)
c. POST-AUGMENTATION PHOTOGRAPHS OF THE SITE & WORK.
d. PHOTOGRAPHS OF THE FINAL STATE OF THE SITE AT CONCLUSION OF THE WORK BY THE PRIME CONTRACTOR, ASSOCIATED SUBCONTRACTORS, AND THE AUGMENTATION INSPECTOR.
e. OTHER PHOTOS MAY BE INCLUDED AT PRIME CONTRACTOR & AUGMENTATION INSPECTOR'S DISCRETION.
NOTE: PHOTOS OF AUGMENTATIONS INSTALLED ON THE STRUCTURE ABOVE AN ELEVATION OF 20 FT SHALL REQUIRE PHOTOS TAKEN FROM THE STRUCTURE AS WELL AS OVERALL PHOTOGRAPHS OF THE AUGMENTATIONS TAKEN FROM THE GROUND.

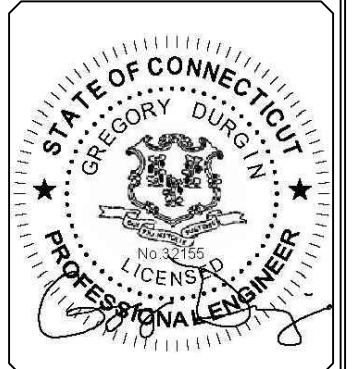
OWNER INSPECTIONS
1. THE STRUCTURE OWNER MAY CONDUCT INSPECTIONS TO VERIFY THE QUALITY AND COMPLETENESS OF THE PREVIOUSLY COMPLETED AUGMENTATION INSPECTION REPORTS FOR THE AUGMENTATION INSTALLATION WORK.
2. INSPECTIONS MAY BE COMPLETED BY A 3RD-PARTY FIRM OF THE STRUCTURE OWNER'S CHOOSING AFTER A AUGMENTATION PROJECT IS COMPLETED AND A PASSING AUGMENTATION INSPECTION REPORT IS ISSUED.



REVISIONS:			
0	06/19/19	ISSUE FOR CONSTRUCTION	RWR

CHECKED BY: DWG

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO THE CLIENT NAMES IS STRICTLY PROHIBITED.



SITE INFORMATION:  
**MOUNT AUGMENTATION**  
 T-MOBILE: CT11519D  
 SBA: CT13614-A  
 KNOWLTON  
 ASHFORD, CT  
 LATITUDE: 41.840773  
 LONGITUDE: -72.207521

SHEET TITLE:  
**INSPECTION NOTES**

SHEET NUMBER:  
**S-3**



**NEW MOUNT AUGMENTATIONS**

- 1. INSTALL PLATFORM REINFORCEMENT KIT; LOCATED 3.5' BELOW THE EXISTING STANDOFF CENTERLINE TO MONOPOLE SHAFT AND ATTACHING TO THE EXISTING STANDOFF MEMBER APPROXIMATELY 3.5' OUT FROM THE COLLAR ATTACHMENT.  
- SITEPRO1 PRK-1245L, (1) TOTAL.
  - 2. INSTALL HANDRAIL KIT; LOCATED 3.0' ABOVE THE EXISTING PLATFORM RAIL AND ATTACHING TO THE MOUNT PIPES.  
- SITEPRO1 HRK12-U OR 14-U, (1) TOTAL. VERIFY REQUIRED SIZE IN FIELD. ATTACH ALL MOUNT PIPES TO NEW HANDRAIL WITH KIT-PROVIDED CROSS-OVER PLATES.
- AUGMENTATIONS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY NEW EQUIPMENT.

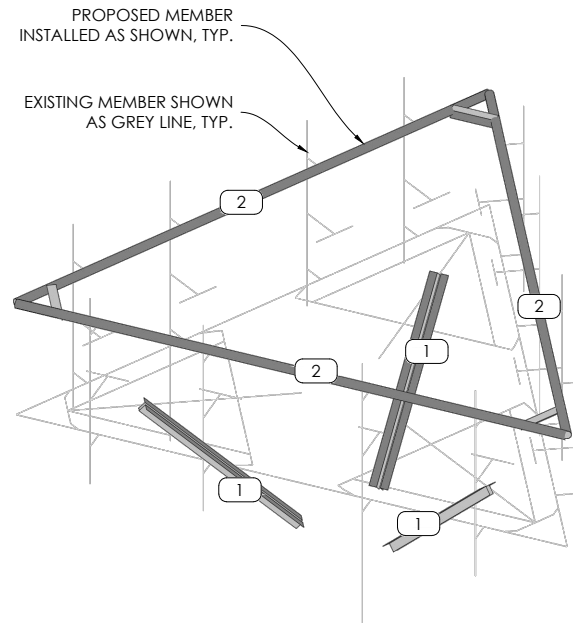
**CONSTRUCTION NOTES**

- 1. SCOPE OF WORK MUST BE COMPLETED AT WIND SPEEDS < 20 MPH.
- 2. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHOULD FIELD-VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. FIELD CUT MEMBERS AS REQUIRED.
- 3. CONTRACTOR TO COORDINATE THE TEMPORARY REMOVAL/RELOCATION/REPLACEMENT OF ELEMENTS (E.G. COAX, CLIPS, TMAs, ETC.) CONNECTED TO, OR IN THE DIRECT PATH, OF NEW AUGMENTATION MEMBERS.



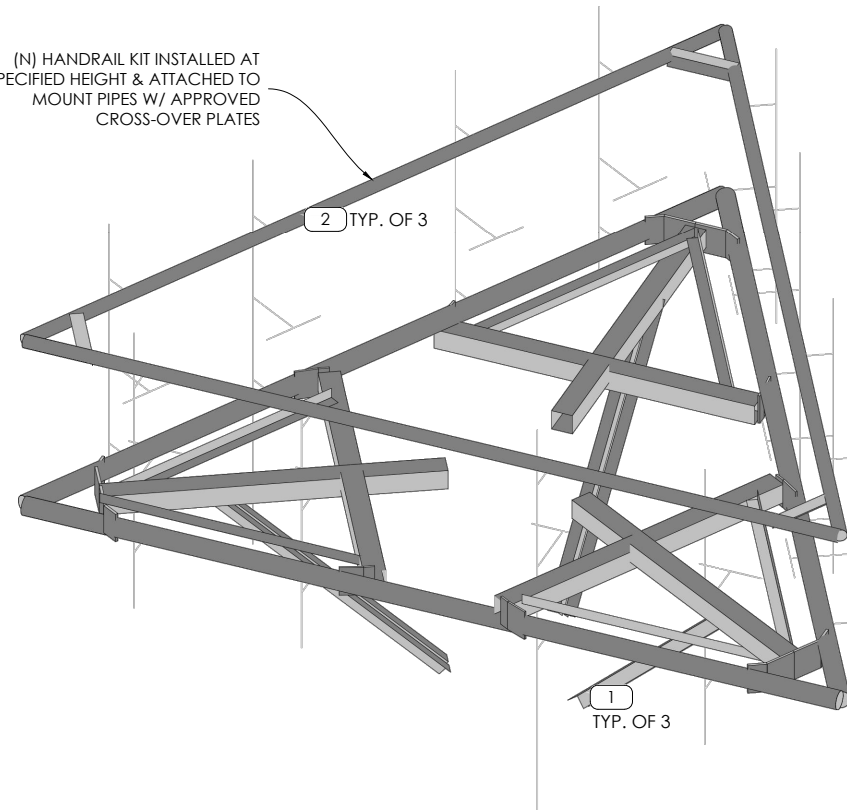
**EXISTING MOUNT**

**PLATFORM @ 147' AUGMENTATION**



**MOUNT AUGMENTATION ISOLATION**  
SCALE: N.T.S.

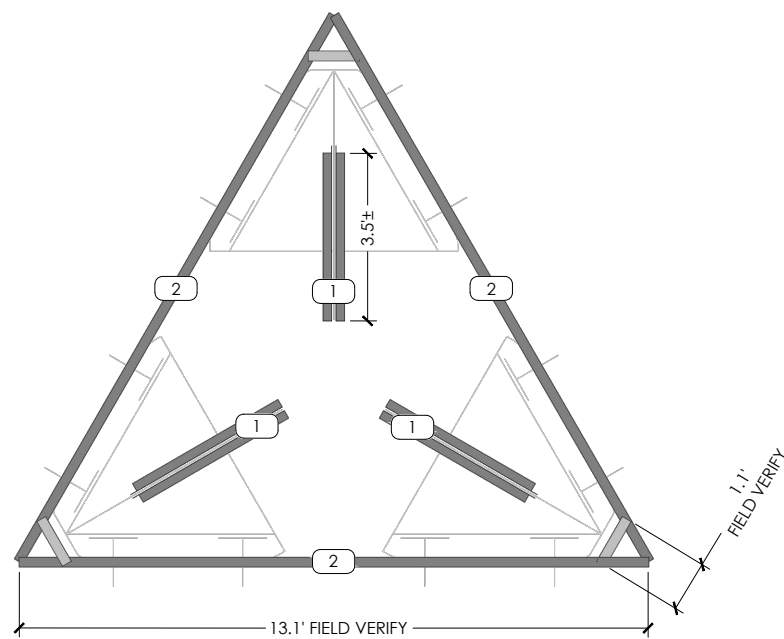
(N) HANDRAIL KIT INSTALLED AT SPECIFIED HEIGHT & ATTACHED TO MOUNT PIPES W/ APPROVED CROSS-OVER PLATES



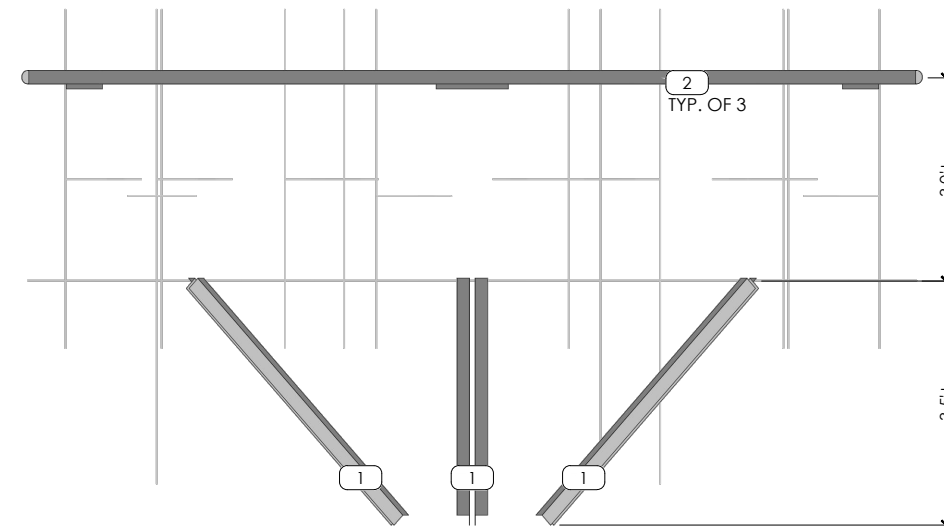
**AUGMENTED MOUNT ISOMETRIC**  
SCALE: N.T.S.

**INSTALLATION NOTES**

- 1. AUGMENTATION MEMBER(S) MAY NEED TO BE FIELD-CUT TO LENGTH TO ACCOMMODATE THIS INSTALLATION. CONTRACTOR TO CUT AND DRILL TO SUIT AS REQUIRED AND APPLY (2) COATS OF COLD-GALV. COMPOUND TO CUT MEMBER ENDS.
- 2. CONTRACTOR TO CHECK ALL EXISTING MEMBER CONNECTION BOLTS, PARTICULARLY STANDOFF TO TOWER BOLTS, FOR PROPER INSTALLATION AND TIGHTNESS.
- 3. COORDINATE PLACEMENT OF NEW AUGMENTATION MEMBERS WITH EXISTING TOWER AND CLIMBING FACILITY ELEMENTS (E.G. STEP PEGS, COAX PORTS, ETC.)
- 4. REFER TO CONSTRUCTION DRAWINGS (BY OTHERS) AND MOUNT STRUCTURAL ANALYSIS FOR APPROVED INSTALLATION LOCATIONS AND QUANTITIES OF APPURTENANCES.



**AUGMENTED MOUNT PLAN**  
SCALE: N.T.S.



**AUGMENTED MOUNT FRONT ELEVATION**  
SCALE: N.T.S.



**GEOSTRUCTURAL**

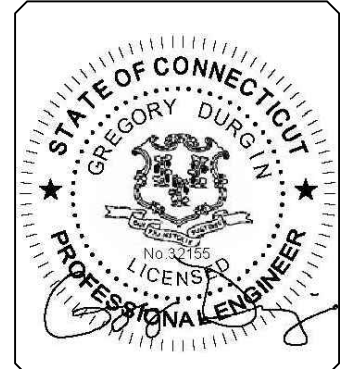
PO BOX 2621, BOISE, ID 83701  
530.539.4787  
CONTACT@GEOSTRUCTURAL.COM  
WWW.GEOSTRUCTURAL.COM

**REVISIONS:**

NO.	DATE	DESCRIPTION	BY
0	06/19/19	ISSUE FOR CONSTRUCTION	RWR

CHECKED BY: DWG

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**SITE INFORMATION:**  
**MOUNT AUGMENTATION**

T-MOBILE: CT11519D  
SBA: CT13614-A  
KNOWLTON

ASHFORD, CT

LATITUDE: 41.840773  
LONGITUDE: -72.207521

SHEET TITLE:

**AUGMENTATIONS  
SECTIONS &  
DETAILS**

SHEET NUMBER:

**S-4**

# EXHIBIT 8



**Tower Engineering Solutions**

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

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**Structural Analysis Report**

**Existing 149 ft Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT13614-A**

**Customer Site Name: Knowlton**

**Carrier Name: T-Mobile (App#: 117023, V2)**

**Carrier Site ID / Name: CT11519D / Knowlton**

**Site Location: 99 Knowlton Hill Rd**

**Ashford, Connecticut**

**Windham County**

**Latitude: 41.840777**

**Longitude: -72.207528**

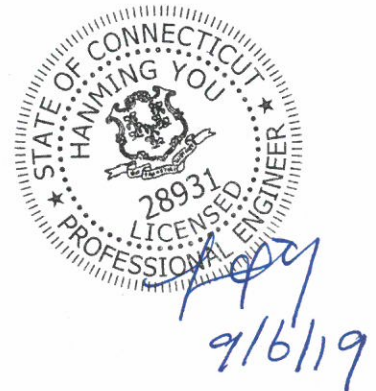
**Analysis Result:**

**Max Structural Usage: 48% [Pass]**

**Max Foundation Usage: 46% [Pass]**

**Additional Usage Caused by Mount Modification: + 2%**

**Report Prepared By: Leonardo Klem**



## Introduction

The purpose of this report is to summarize the analysis results on the 149 ft 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

<b>Tower Drawings</b>	Sabre Job#06-06307 dated 6/29/05. FDH TIA Inspection Report.
<b>Foundation Drawing</b>	Sabre Job#06-06307 dated 6/29/19.
<b>Geotechnical Report</b>	JGI Project#05360G dated 6/28/05.
<b>Modification Drawings</b>	N/A

## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA-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.

<b>Wind Speed Used in the Analysis:</b>	Ultimate Design Wind Speed $V_{ult} = 130$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 101$ mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 1" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
<b>Exposure Category:</b>	C
<b>Structure Class:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Seismic Parameters:</b>	$S_5 = 0.174$ , $S_1 = 0.063$

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
-	147	6	RFS APXV18-209014-02	12' Low Profile Platform	(18) 1 5/8"	T-Mobile
-		3	RFS LNX-6515DS			
-		6	TMA's			
-		3	Kathrein 782 11056			
6	137.5	6	Powerwave 7770 - Panel	14' Low Profile Platform	(12) 1 5/8" (2) 3/4" DC (1) 7/16" Fiber	AT&T
7		3	KMW AM-X-CD-17-65-00T - Panel			
8		6	Powerwave LGP21401			
9		6	Powerwave LGP21903			
10		6	Ericsson RRUS11			
11	127.0	1	Raycap DC2-48-60-18-8F	10' Low Profile Platform	(12) 1 5/8"	Verizon
12		6	Antel LPA-80080/4CF - Panel			
13		6	Antel LPA 185080-8CF - Panel			

## 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
1	147.0	6	RFS APXV18-209014-C-A20 - Panel	12' Low Profile Platform (1) Sitepro PRK-1245L (1) Sitepro HRK12-U	(17) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	RFS APXVAARR24_43-U-NA20 - Panel			
3		6	Ericsson KRY 112 489/2 TMA			
4		3	Ericsson Radio 4449 B71+B12 RRU			
5		3	Kathrein 782 11056 Bias Ts			

All transmission lines are considered running inside of the pole shafts.

## **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
Max. Usage:	<b>48.1%</b>	<b>47.0%</b>	<b>39.0%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	3739.4	28.2
Analysis Reactions	3254.1	31.1
Factored Reactions*	5048.2	38.1
% of Design Reactions	64.5%	81.6%

\* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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-222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.6776 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-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 48.15% at 0.0ft

**Structure:** CT13614-A-SBA  
**Site Name:** Knowlton  
**Height:** 149.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-G  
**Exposure:** C  
**Gh:** 1.1

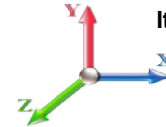
9/6/2019



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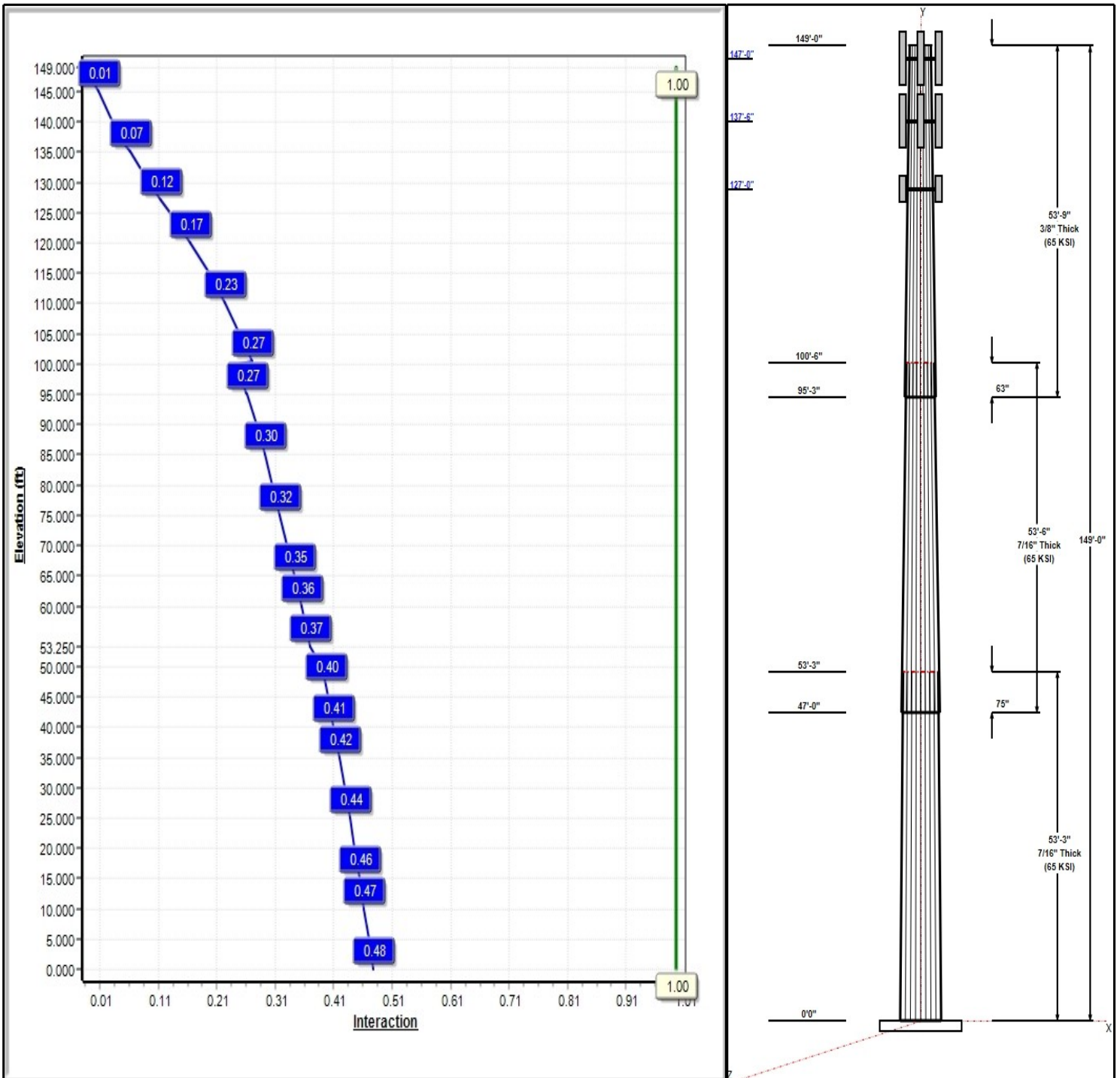
**Dead Load Factor:** 1.20  
**Wind Load Factor:** 1.60

**Load Case : 1.2D + 1.6W 101 mph Wind**



**Iterations:** 21

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## Structure: CT13614-A-SBA

**Type:** Tapered  
**Site Name:** Knowlton  
**Height:** 149.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.24419

9/6/2019

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### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	47.46	60.46	0.438		0.24419	65
2	53.50	36.79	49.86	0.438	Slip	0.24419	65
3	53.75	25.70	38.83	0.375	Slip	0.24419	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
147.00	147.00	6	APXV18-209014-C-A20	T-Mobile
147.00	147.00	3	APXVAARR24_43-U-NA20	T-Mobile
147.00	147.00	1	Low Profile	T-Mobile
147.00	147.00	1	PRK-1245 (kicker kit)	T-Mobile
147.00	147.00	1	HRK12-HD	T-Mobile
147.00	147.00	6	KRY 112 89/4	T-Mobile
147.00	147.00	3	4449	T-Mobile
147.00	147.00	3	782 10662	T-Mobile
137.50	137.50	6	7770.00	AT&T
137.50	137.50	3	AM-X-CD-17-65-00T-RET	AT&T
137.50	137.50	6	LGP21401	AT&T
137.50	137.50	6	LGP21903	AT&T
137.50	137.50	6	RRUS-11	AT&T
137.50	137.50	1	DC2-48-60-8-18F-02	AT&T
137.50	137.50	1	Low Profile Platform-flat	AT&T
127.00	127.00	6	LPA-80080/4CF	Verizon
127.00	127.00	6	LPA-185080/8CF	Verizon
127.00	127.00	1	Low Profile	Verizon

### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	147.00	Inside	1 5/8" Coax	T-Mobile
0.00	147.00	Inside	1 5/8" Fiber	T-Mobile
0.00	137.50	Inside	1 5/8" Coax	AT&T
0.00	137.50	Inside	3/4" DC	AT&T
0.00	137.50	Inside	7/16" Fiber	AT&T
0.00	127.00	Inside	1 5/8" Coax	Verizon

### Anchor Bolts

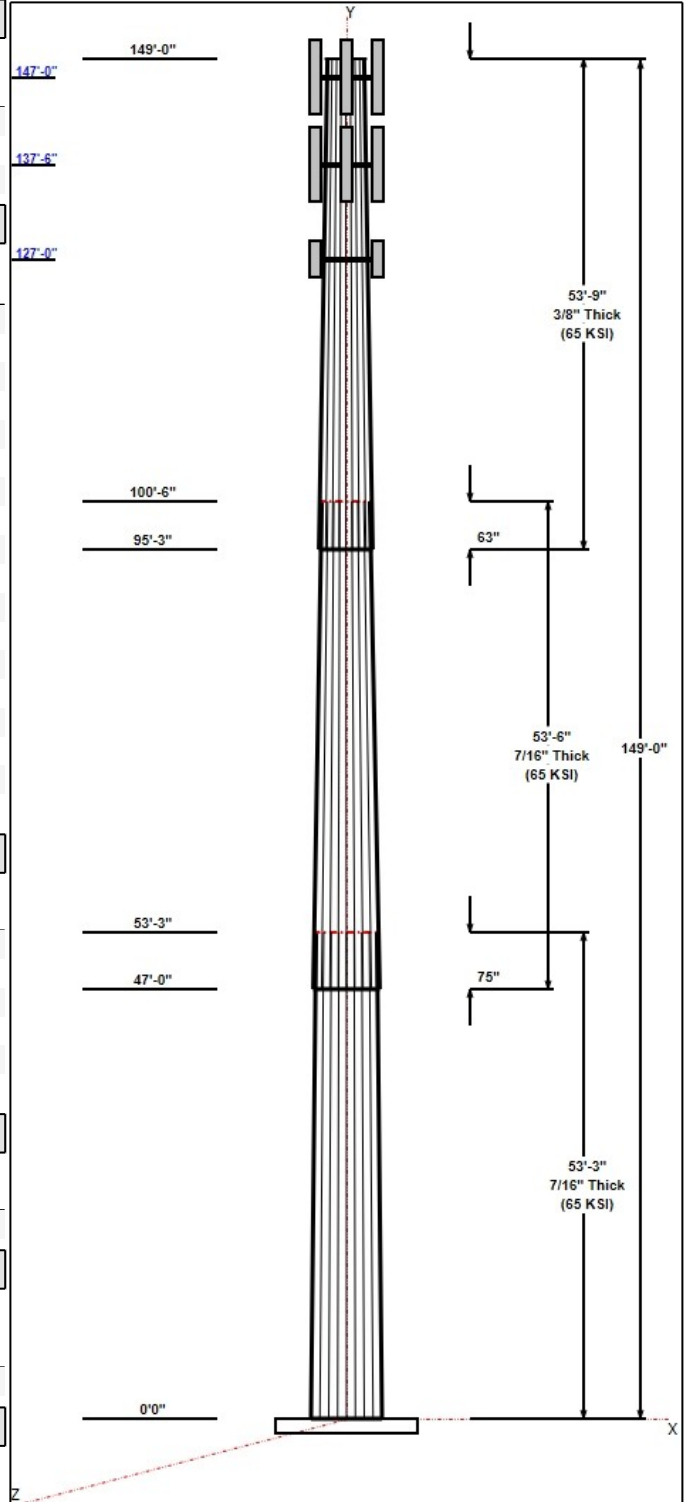
Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Cluster

### Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.0000	68.0	60.0	Clipped

### Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	3254.1	31.1	53.0
0.9D + 1.6W 101 mph Wind	3230.7	31.0	39.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	933.8	8.9	83.2
1.2D + 1.0E	237.0	2.0	53.0
0.9D + 1.0E	235.1	2.0	39.8



**Structure: CT13614-A-SBA**

**Type:** Tapered  
**Site Name:** Knowlton  
**Height:** 149.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.24419

9/6/2019

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1.0D + 1.0W 60 mph Wind

714.5

6.8

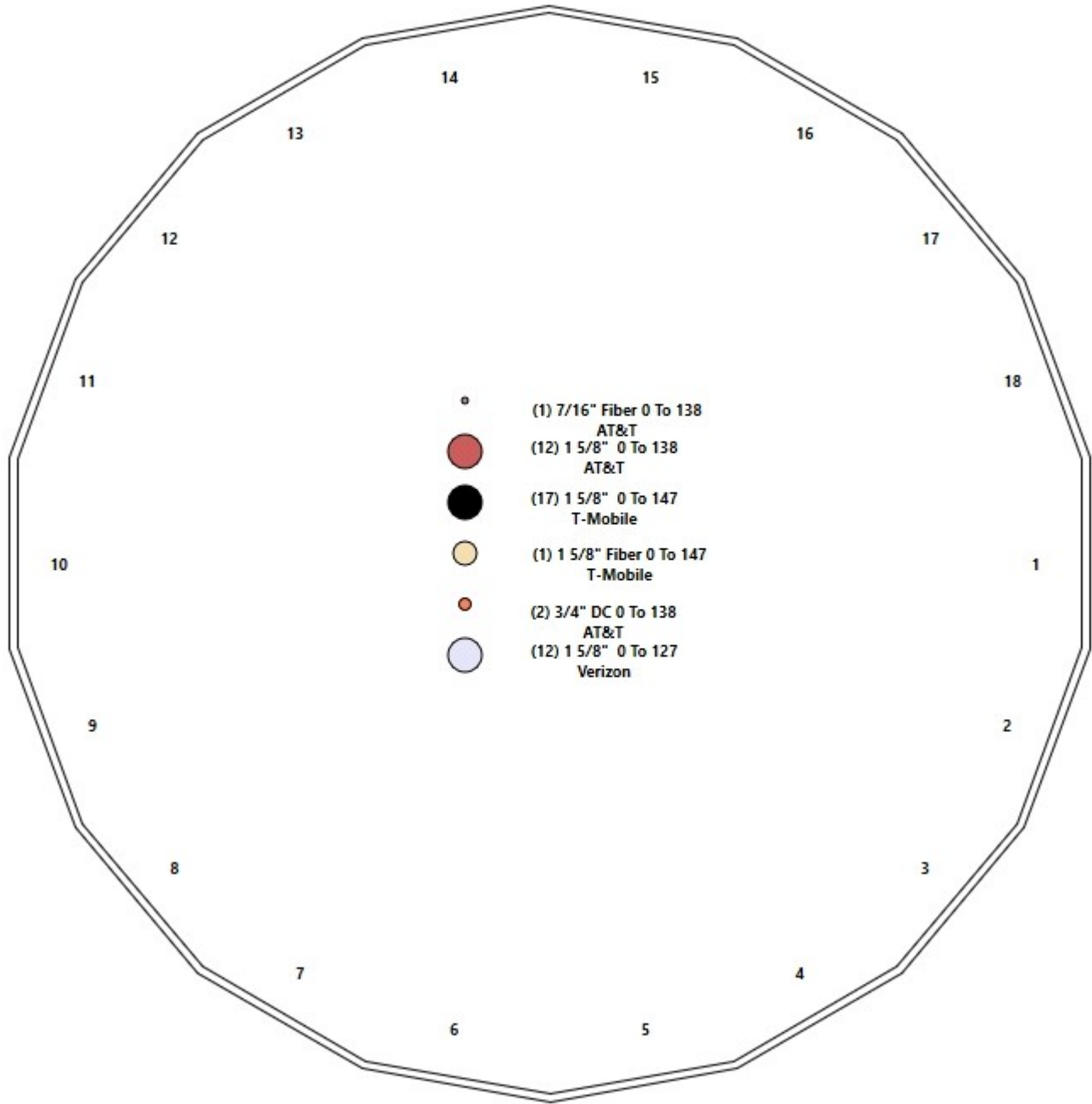
44.2

# Structure: CT13614-A-SBA - Coax Line Placement

**Type:** Monopole  
**Site Name:** Knowlton  
**Height:** 149.00 (ft)

9/6/2019

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## Shaft Properties

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.4375	65		0.00	13,466
2	18	53.500	0.4375	65	Slip	75.00	10,842
3	18	53.750	0.3750	65	Slip	63.00	6,942
<b>Total Shaft Weight:</b>							<b>31,249</b>

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	60.46	0.00	83.35	37937.15	22.96	138.19	47.46	53.25	65.29	18236.7	17.72	108.4	0.244195
2	49.86	47.00	68.62	21175.81	18.68	113.96	36.79	100.50	50.48	8430.41	13.42	84.10	0.244195
3	38.83	95.25	45.76	8548.31	16.85	103.53	25.70	149.00	30.14	2442.44	10.67	68.53	0.244195

## Load Summary

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	147.00	APXV18-209014-C-A20	6	18.70	3.53	0.96	109.79	5.943	0.96	0.00	0.00
2	147.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	707.71	22.800	0.70	0.00	0.00
3	147.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	3241.69	45.501	1.00	0.00	0.00
4	147.00	PRK-1245 (kicker kit)	1	464.91	9.50	1.00	896.77	22.737	1.00	0.00	0.00
5	147.00	HRK12-HD	1	406.61	9.75	1.00	1048.70	22.430	1.00	0.00	0.00
6	147.00	KRY 112 89/4	6	15.40	0.65	0.67	38.85	1.464	0.67	0.00	0.00
7	147.00	4449	3	70.00	1.65	0.67	168.74	2.392	0.67	0.00	0.00
8	147.00	782 10662	3	2.60	0.28	0.67	11.29	0.814	0.67	0.00	0.00
9	137.50	7770.00	6	35.00	5.50	0.73	226.95	6.938	0.73	0.00	0.00
10	137.50	AM-X-CD-17-65-00T-RET (96")	3	59.50	11.31	0.80	407.26	13.521	0.80	0.00	0.00
11	137.50	LGP21401	6	14.10	1.29	0.67	47.15	2.395	0.67	0.00	0.00
12	137.50	LGP21903	6	5.50	0.27	0.67	16.64	0.796	0.67	0.00	0.00
13	137.50	RRUS-11	6	51.00	2.52	0.67	146.53	3.357	0.67	0.00	0.00
14	137.50	DC2-48-60-8-18F-02	1	14.50	2.92	1.00	98.08	4.526	1.00	0.00	0.00
15	137.50	Low Profile Platform-flat	1	1200.00	25.00	1.00	2584.08	52.681	1.00	0.00	0.00
16	127.00	LPA-80080/4CF ____	6	12.00	2.61	1.70	201.54	3.756	1.70	0.00	0.00
17	127.00	LPA-185080/8CF	6	7.00	2.09	1.22	122.98	3.215	1.22	0.00	0.00
18	127.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	3216.41	45.160	1.00	0.00	0.00
<b>Totals:</b>			<b>66</b>	<b>6,818.52</b>			<b>20,433.26</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	147.00	(17) 1 5/8" Coax	0.00	Inside
0.00	147.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	137.50	(12) 1 5/8" Coax	0.00	Inside
0.00	137.50	(2) 3/4" DC	0.00	Inside
0.00	137.50	(1) 7/16" Fiber	0.00	Inside
0.00	127.00	(12) 1 5/8" Coax	0.00	Inside

## Shaft Section Properties

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in <sup>3</sup> )	Weight (lb)
0.00		0.4375	60.460	83.346	37937.1	22.96	138.19	74.4	1235.	0.0
5.00		0.4375	59.239	81.650	35668.8	22.46	135.40	75.0	1185.	1403.6
10.00		0.4375	58.018	79.955	33492.7	21.97	132.61	75.6	1137.	1374.8
15.00		0.4375	56.797	78.260	31406.9	21.48	129.82	76.1	1089.	1345.9
20.00		0.4375	55.576	76.564	29409.6	20.99	127.03	76.7	1042.	1317.1
25.00		0.4375	54.355	74.869	27498.9	20.50	124.24	77.3	996.5	1288.2
30.00		0.4375	53.134	73.173	25672.7	20.00	121.45	77.9	951.7	1259.4
35.00		0.4375	51.913	71.478	23929.2	19.51	118.66	78.5	907.9	1230.5
40.00		0.4375	50.692	69.782	22266.5	19.02	115.87	79.0	865.2	1201.7
45.00		0.4375	49.471	68.087	20682.7	18.53	113.08	79.6	823.4	1172.8
47.00	Bot - Section 2	0.4375	48.983	67.409	20070.8	18.33	111.96	79.8	807.1	461.1
50.00		0.4375	48.250	66.392	19175.8	18.04	110.29	80.2	782.8	1378.3
53.25	Top - Section 1	0.4375	48.332	66.505	19273.9	18.07	110.47	0.0	0.0	1469.7
55.00		0.4375	47.904	65.911	18762.6	17.90	109.50	80.4	771.4	394.3
60.00		0.4375	46.683	64.216	17351.6	17.40	106.70	80.9	732.1	1107.0
65.00		0.4375	45.462	62.520	16013.2	16.91	103.91	81.5	693.8	1078.1
70.00		0.4375	44.241	60.825	14745.5	16.42	101.12	82.1	656.5	1049.3
75.00		0.4375	43.020	59.130	13546.5	15.93	98.33	82.5	620.2	1020.4
80.00		0.4375	41.799	57.434	12414.4	15.44	95.54	82.5	585.0	991.6
85.00		0.4375	40.578	55.739	11347.1	14.94	92.75	82.5	550.8	962.8
90.00		0.4375	39.357	54.043	10342.9	14.45	89.96	82.5	517.6	933.9
95.00		0.4375	38.137	52.348	9399.7	13.96	87.17	82.5	485.5	905.1
95.25	Bot - Section 3	0.4375	38.075	52.263	9354.1	13.94	87.03	82.5	483.9	44.5
100.00		0.4375	36.916	50.652	8515.6	13.47	84.38	82.5	454.3	1560.3
100.50	Top - Section 2	0.3750	37.543	44.238	7721.4	16.24	100.12	0.0	0.0	161.4
105.00		0.3750	36.445	42.930	7056.6	15.73	97.19	82.5	381.4	667.4
110.00		0.3750	35.224	41.477	6364.0	15.15	93.93	82.5	355.9	718.0
115.00		0.3750	34.003	40.024	5718.3	14.58	90.67	82.5	331.2	693.3
120.00		0.3750	32.782	38.571	5117.7	14.00	87.42	82.5	307.5	668.6
125.00		0.3750	31.561	37.117	4560.8	13.43	84.16	82.5	284.6	643.9
127.00		0.3750	31.072	36.536	4349.9	13.20	82.86	82.5	275.7	250.6
130.00		0.3750	30.340	35.664	4045.8	12.86	80.91	82.5	262.6	368.5
135.00		0.3750	29.119	34.211	3571.1	12.28	77.65	82.5	241.6	594.4
137.50		0.3750	28.508	33.484	3348.4	11.99	76.02	82.5	231.3	287.9
140.00		0.3750	27.898	32.758	3135.1	11.71	74.39	82.5	221.3	281.8
145.00		0.3750	26.677	31.305	2736.1	11.13	71.14	82.5	202.0	545.0
147.00		0.3750	26.188	30.723	2586.5	10.90	69.84	82.5	194.5	211.1
149.00		0.3750	25.700	30.142	2442.4	10.67	68.53	82.5	187.2	207.1

**31249.4**

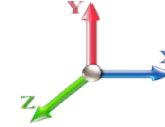
## Wind Loading - Shaft

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 1.2D + 1.6W 101 mph Wind

**Dead Load Factor**    1.20  
**Wind Load Factor**    1.60



**Iterations**    21

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	0.85	21.088	23.20	476.39	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	466.77	0.650	0.000	5.00	25.322	16.46	610.9	0.0	1684.3
10.00		1.00	0.85	21.088	23.20	457.15	0.650	0.000	5.00	24.805	16.12	598.4	0.0	1649.7
15.00		1.00	0.85	21.088	23.20	447.53	0.650	0.000	5.00	24.289	15.79	585.9	0.0	1615.1
20.00		1.00	0.90	22.375	24.61	451.08	0.650	0.000	5.00	23.772	15.45	608.5	0.0	1580.5
25.00		1.00	0.95	23.451	25.80	451.65	0.650	0.000	5.00	23.256	15.12	623.9	0.0	1545.9
30.00		1.00	0.98	24.369	26.81	450.06	0.650	0.000	5.00	22.739	14.78	633.9	0.0	1511.3
35.00		1.00	1.01	25.172	27.69	446.92	0.650	0.000	5.00	22.222	14.44	639.9	0.0	1476.6
40.00		1.00	1.04	25.890	28.48	442.58	0.650	0.000	5.00	21.706	14.11	642.9	0.0	1442.0
45.00		1.00	1.07	26.540	29.19	437.31	0.650	0.000	5.00	21.189	13.77	643.3	0.0	1407.4
47.00	Bot - Section 2	1.00	1.08	26.784	29.46	434.98	0.650	0.000	2.00	8.331	5.42	255.3	0.0	553.3
50.00		1.00	1.09	27.135	29.85	431.27	0.650	0.000	3.00	12.564	8.17	390.0	0.0	1653.9
53.25	Top - Section 1	1.00	1.11	27.497	30.25	427.00	0.650	0.000	3.25	13.401	8.71	421.6	0.0	1763.6
55.00		1.00	1.12	27.685	30.45	432.50	0.650	0.000	1.75	7.125	4.63	225.7	0.0	473.1
60.00		1.00	1.14	28.197	31.02	425.35	0.650	0.000	5.00	20.010	13.01	645.5	0.0	1328.4
65.00		1.00	1.16	28.676	31.54	417.73	0.650	0.000	5.00	19.493	12.67	639.5	0.0	1293.8
70.00		1.00	1.17	29.127	32.04	409.70	0.650	0.000	5.00	18.977	12.33	632.3	0.0	1259.2
75.00		1.00	1.19	29.553	32.51	401.29	0.650	0.000	5.00	18.460	12.00	624.1	0.0	1224.5
80.00		1.00	1.21	29.958	32.95	392.56	0.650	0.000	5.00	17.943	11.66	614.9	0.0	1189.9
85.00		1.00	1.22	30.342	33.38	383.54	0.650	0.000	5.00	17.427	11.33	604.9	0.0	1155.3
90.00		1.00	1.24	30.710	33.78	374.24	0.650	0.000	5.00	16.910	10.99	594.1	0.0	1120.7
95.00		1.00	1.25	31.061	34.17	364.70	0.650	0.000	5.00	16.394	10.66	582.5	0.0	1086.1
95.25	Bot - Section 3	1.00	1.25	31.078	34.19	364.22	0.650	0.000	0.25	0.806	0.52	28.7	0.0	53.4
100.00		1.00	1.27	31.399	34.54	354.94	0.650	0.000	4.75	15.372	9.99	552.2	0.0	1872.3
100.50	Top - Section 2	1.00	1.27	31.432	34.57	353.95	0.650	0.000	0.50	1.591	1.03	57.2	0.0	193.7
105.00		1.00	1.28	31.723	34.89	352.21	0.650	0.000	4.50	14.087	9.16	511.2	0.0	800.9
110.00		1.00	1.29	32.035	35.24	342.08	0.650	0.000	5.00	15.161	9.85	555.6	0.0	861.7
115.00		1.00	1.30	32.336	35.57	331.77	0.650	0.000	5.00	14.645	9.52	541.7	0.0	832.0
120.00		1.00	1.32	32.627	35.89	321.30	0.650	0.000	5.00	14.128	9.18	527.3	0.0	802.3
125.00		1.00	1.33	32.909	36.20	310.66	0.650	0.000	5.00	13.611	8.85	512.4	0.0	772.6
127.00	Appurtenance(s)	1.00	1.33	33.019	36.32	306.37	0.650	0.000	2.00	5.300	3.44	200.2	0.0	300.8
130.00		1.00	1.34	33.182	36.50	299.88	0.650	0.000	3.00	7.795	5.07	295.9	0.0	442.2
135.00		1.00	1.35	33.446	36.79	288.96	0.650	0.000	5.00	12.578	8.18	481.3	0.0	713.3
137.50	Appurtenance(s)	1.00	1.35	33.576	36.93	283.44	0.650	0.000	2.50	6.095	3.96	234.1	0.0	345.5
140.00		1.00	1.36	33.703	37.07	277.90	0.650	0.000	2.50	5.966	3.88	230.0	0.0	338.1
145.00		1.00	1.37	33.953	37.35	266.72	0.650	0.000	5.00	11.545	7.50	448.4	0.0	654.0
147.00	Appurtenance(s)	1.00	1.37	34.051	37.46	262.22	0.650	0.000	2.00	4.473	2.91	174.3	0.0	253.3
149.00		1.00	1.38	34.148	37.56	257.69	0.650	0.000	2.00	4.391	2.85	171.5	0.0	248.5
<b>Totals:</b>									<b>149.00</b>			<b>17,340.3</b>		<b>37,499.3</b>

## Discrete Appurtenance Forces

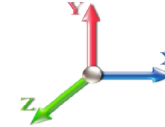
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 1.2D + 1.6W 101 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 21

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	147.00	4449	3	34.051	37.456	0.50	0.75	2.49	252.00	0.000	0.000	149.07	0.00	0.00
2	147.00	KRY 112 89/4	6	34.051	37.456	0.50	0.75	1.96	110.88	0.000	0.000	117.45	0.00	0.00
3	147.00	HRK12-HD	1	34.051	37.456	1.00	1.00	9.75	487.93	0.000	0.000	584.32	0.00	0.00
4	147.00	PRK-1245 (kicker kit)	1	34.051	37.456	1.00	1.00	9.50	557.89	0.000	0.000	569.34	0.00	0.00
5	147.00	Low Profile	1	34.051	37.456	1.00	1.00	22.00	1800.00	0.000	0.000	1318.47	0.00	0.00
6	147.00	APXVAARR24 43-U-NA2	3	34.051	37.456	0.52	0.75	31.88	460.80	0.000	0.000	1910.46	0.00	0.00
7	147.00	APXV18-209014-C-A20	6	34.051	37.456	0.72	0.75	15.25	134.64	0.000	0.000	913.91	0.00	0.00
8	147.00	782 10662	3	34.051	37.456	0.50	0.75	0.42	9.36	0.000	0.000	25.30	0.00	0.00
9	137.50	Low Profile Platform-flat	1	33.576	36.933	1.00	1.00	25.00	1440.00	0.000	0.000	1477.33	0.00	0.00
10	137.50	DC2-48-60-8-18F-02	1	33.576	36.933	1.00	1.00	2.92	17.40	0.000	0.000	172.55	0.00	0.00
11	137.50	RRUS-11	6	33.576	36.933	0.54	0.80	8.10	367.20	0.000	0.000	478.91	0.00	0.00
12	137.50	LGP21903	6	33.576	36.933	0.54	0.80	0.87	39.60	0.000	0.000	51.31	0.00	0.00
13	137.50	LGP21401	6	33.576	36.933	0.54	0.80	4.15	101.52	0.000	0.000	245.16	0.00	0.00
14	137.50	AM-X-CD-17-65-00T-RET	3	33.576	36.933	0.64	0.80	21.72	214.20	0.000	0.000	1283.22	0.00	0.00
15	137.50	7770.00	6	33.576	36.933	0.58	0.80	19.27	252.00	0.000	0.000	1138.85	0.00	0.00
16	127.00	Low Profile	1	33.019	36.321	1.00	1.00	22.00	1800.00	0.000	0.000	1278.49	0.00	0.00
17	127.00	LPA-185080/8CF	6	33.019	36.321	0.98	0.80	12.24	50.40	0.000	0.000	711.25	0.00	0.00
18	127.00	LPA-80080/4CF	6	33.019	36.321	1.36	0.80	21.30	86.40	0.000	0.000	1237.67	0.00	0.00

**Totals:** 8,182.22

**13,663.06**



## Total Applied Force Summary

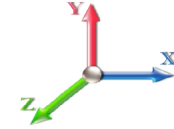
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 1.2D + 1.6W 101 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 21

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		610.87	1949.17	0.00	0.00
10.00		598.41	1914.56	0.00	0.00
15.00		585.95	1879.95	0.00	0.00
20.00		608.49	1845.33	0.00	0.00
25.00		623.90	1810.72	0.00	0.00
30.00		633.91	1776.10	0.00	0.00
35.00		639.94	1741.49	0.00	0.00
40.00		642.89	1706.87	0.00	0.00
45.00		643.35	1672.26	0.00	0.00
47.00		255.27	659.21	0.00	0.00
50.00		390.01	1812.84	0.00	0.00
53.25		421.55	1935.79	0.00	0.00
55.00		225.68	565.80	0.00	0.00
60.00		645.46	1593.22	0.00	0.00
65.00		639.49	1558.61	0.00	0.00
70.00		632.33	1523.99	0.00	0.00
75.00		624.11	1489.38	0.00	0.00
80.00		614.95	1454.76	0.00	0.00
85.00		604.91	1420.15	0.00	0.00
90.00		594.09	1385.53	0.00	0.00
95.00		582.53	1350.92	0.00	0.00
95.25		28.66	66.64	0.00	0.00
100.00		552.17	2123.91	0.00	0.00
100.50		57.21	220.19	0.00	0.00
105.00		511.22	1039.22	0.00	0.00
110.00		555.63	1126.50	0.00	0.00
115.00		541.74	1096.83	0.00	0.00
120.00		527.33	1067.16	0.00	0.00
125.00		512.44	1037.49	0.00	0.00
127.00	(13) attachments	3427.61	2343.49	0.00	0.00
130.00		295.89	556.20	0.00	0.00
135.00		481.28	903.27	0.00	0.00
137.50	(29) attachments	5081.46	2872.43	0.00	0.00
140.00		230.04	392.65	0.00	0.00
145.00		448.44	763.05	0.00	0.00
147.00	(24) attachments	5762.57	4110.42	0.00	0.00
149.00		171.53	248.53	0.00	0.00
	<b>Totals:</b>	<b>31,003.32</b>	<b>53,014.61</b>	<b>0.00</b>	<b>0.00</b>

## Calculated Forces

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

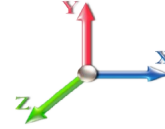


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**Load Case:** 1.2D + 1.6W 101 mph Wind

**Iterations** 21

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



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	-52.98	-31.06	0.00	-3254.1	0.00	3254.12	5580.79	2790.40	13771.9	6896.19	0.00	0.000	0.000	0.481
5.00	-50.97	-30.55	0.00	-3098.8	0.00	3098.83	5509.80	2754.90	13318.1	6668.96	0.06	-0.119	0.000	0.474
10.00	-48.99	-30.05	0.00	-2946.0	0.00	2946.07	5437.04	2718.52	12867.3	6443.24	0.25	-0.240	0.000	0.466
15.00	-47.05	-29.56	0.00	-2795.8	0.00	2795.81	5362.51	2681.26	12419.8	6219.15	0.57	-0.362	0.000	0.458
20.00	-45.15	-29.03	0.00	-2648.0	0.00	2648.03	5286.22	2643.11	11975.8	5996.84	1.02	-0.485	0.000	0.450
25.00	-43.28	-28.49	0.00	-2502.8	0.00	2502.87	5208.16	2604.08	11535.7	5776.42	1.59	-0.609	0.000	0.442
30.00	-41.45	-27.92	0.00	-2360.4	0.00	2360.44	5128.34	2564.17	11099.6	5558.05	2.30	-0.735	0.000	0.433
35.00	-39.66	-27.35	0.00	-2220.8	0.00	2220.83	5046.75	2523.38	10667.8	5341.85	3.14	-0.862	0.000	0.424
40.00	-37.90	-26.76	0.00	-2084.1	0.00	2084.10	4963.39	2481.70	10240.6	5127.96	4.11	-0.990	0.000	0.414
45.00	-36.20	-26.14	0.00	-1950.2	0.00	1950.29	4878.27	2439.14	9818.41	4916.50	5.22	-1.119	0.000	0.404
47.00	-35.52	-25.92	0.00	-1898.0	0.00	1898.00	4843.73	2421.86	9650.93	4832.64	5.70	-1.172	0.000	0.400
50.00	-33.68	-25.54	0.00	-1820.2	0.00	1820.25	4791.38	2395.69	9401.28	4707.63	6.46	-1.251	0.000	0.394
53.25	-31.72	-25.11	0.00	-1737.2	0.00	1737.26	4797.23	2398.61	9428.91	4721.46	7.34	-1.337	0.000	0.375
55.00	-31.13	-24.92	0.00	-1693.3	0.00	1693.32	4766.44	2383.22	9284.05	4648.93	7.84	-1.384	0.000	0.371
60.00	-29.50	-24.29	0.00	-1568.7	0.00	1568.74	4677.28	2338.64	8873.91	4443.55	9.35	-1.507	0.000	0.359
65.00	-27.90	-23.67	0.00	-1447.2	0.00	1447.27	4586.36	2293.18	8469.53	4241.06	11.00	-1.631	0.000	0.347
70.00	-26.35	-23.05	0.00	-1328.9	0.00	1328.91	4493.67	2246.84	8071.16	4041.58	12.77	-1.754	0.000	0.335
75.00	-24.83	-22.43	0.00	-1213.6	0.00	1213.65	4393.03	2196.52	7668.29	3839.84	14.68	-1.877	0.000	0.322
80.00	-23.36	-21.82	0.00	-1101.4	0.00	1101.48	4267.07	2133.53	7232.68	3621.71	16.71	-1.998	0.000	0.310
85.00	-21.91	-21.21	0.00	-992.38	0.00	992.38	4141.11	2070.55	6809.81	3409.96	18.87	-2.118	0.000	0.296
90.00	-20.51	-20.61	0.00	-886.33	0.00	886.33	4015.15	2007.57	6399.67	3204.59	21.15	-2.236	0.000	0.282
95.00	-19.16	-19.99	0.00	-783.31	0.00	783.31	3889.19	1944.59	6002.28	3005.60	23.55	-2.351	0.000	0.266
95.25	-19.08	-19.98	0.00	-778.31	0.00	778.31	3882.89	1941.44	5982.74	2995.82	23.68	-2.357	0.000	0.265
100.00	-16.96	-19.35	0.00	-683.42	0.00	683.42	3763.23	1881.61	5617.62	2812.98	26.08	-2.462	0.000	0.248
100.50	-16.72	-19.30	0.00	-673.75	0.00	673.75	3276.58	1638.29	4993.13	2500.28	26.33	-2.474	0.000	0.275
105.00	-15.67	-18.77	0.00	-586.89	0.00	586.89	3189.50	1594.75	4715.31	2361.16	28.71	-2.569	0.000	0.254
110.00	-14.54	-18.19	0.00	-493.02	0.00	493.02	3081.54	1540.77	4399.90	2203.22	31.46	-2.678	0.000	0.229
115.00	-13.44	-17.62	0.00	-402.06	0.00	402.06	2973.57	1486.79	4095.40	2050.74	34.32	-2.778	0.000	0.201
120.00	-12.38	-17.06	0.00	-313.95	0.00	313.95	2865.60	1432.80	3801.82	1903.74	37.28	-2.867	0.000	0.169
125.00	-11.35	-16.51	0.00	-228.65	0.00	228.65	2757.64	1378.82	3519.16	1762.20	40.33	-2.943	0.000	0.134
127.00	-9.18	-12.97	0.00	-195.63	0.00	195.63	2714.45	1357.23	3409.16	1707.11	41.56	-2.969	0.000	0.118
130.00	-8.63	-12.65	0.00	-156.73	0.00	156.73	2649.67	1324.84	3247.42	1626.12	43.44	-3.004	0.000	0.100
135.00	-7.75	-12.12	0.00	-93.49	0.00	93.49	2541.71	1270.85	2986.60	1495.52	46.61	-3.048	0.000	0.066
137.50	-5.15	-6.90	0.00	-63.18	0.00	63.18	2487.72	1243.86	2860.28	1432.27	48.21	-3.063	0.000	0.046
140.00	-4.77	-6.65	0.00	-45.93	0.00	45.93	2433.74	1216.87	2736.70	1370.38	49.82	-3.075	0.000	0.036
145.00	-4.03	-6.16	0.00	-12.69	0.00	12.69	2325.77	1162.89	2497.71	1250.71	53.05	-3.088	0.000	0.012
147.00	-0.24	-0.18	0.00	-0.37	0.00	0.37	2282.59	1141.29	2405.17	1204.38	54.34	-3.090	0.000	0.000
149.00	0.00	-0.17	0.00	0.00	0.00	0.00	2239.40	1119.70	2314.38	1158.91	55.63	-3.090	0.000	0.000

## Wind Loading - Shaft

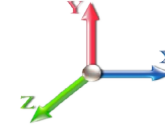
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90  
**Wind Load Factor** 1.60



**Iterations** 21

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	0.85	21.088	23.20	476.39	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	466.77	0.650	0.000	5.00	25.322	16.46	610.9	0.0	1263.3
10.00		1.00	0.85	21.088	23.20	457.15	0.650	0.000	5.00	24.805	16.12	598.4	0.0	1237.3
15.00		1.00	0.85	21.088	23.20	447.53	0.650	0.000	5.00	24.289	15.79	585.9	0.0	1211.3
20.00		1.00	0.90	22.375	24.61	451.08	0.650	0.000	5.00	23.772	15.45	608.5	0.0	1185.4
25.00		1.00	0.95	23.451	25.80	451.65	0.650	0.000	5.00	23.256	15.12	623.9	0.0	1159.4
30.00		1.00	0.98	24.369	26.81	450.06	0.650	0.000	5.00	22.739	14.78	633.9	0.0	1133.4
35.00		1.00	1.01	25.172	27.69	446.92	0.650	0.000	5.00	22.222	14.44	639.9	0.0	1107.5
40.00		1.00	1.04	25.890	28.48	442.58	0.650	0.000	5.00	21.706	14.11	642.9	0.0	1081.5
45.00		1.00	1.07	26.540	29.19	437.31	0.650	0.000	5.00	21.189	13.77	643.3	0.0	1055.6
47.00	Bot - Section 2	1.00	1.08	26.784	29.46	434.98	0.650	0.000	2.00	8.331	5.42	255.3	0.0	415.0
50.00		1.00	1.09	27.135	29.85	431.27	0.650	0.000	3.00	12.564	8.17	390.0	0.0	1240.5
53.25	Top - Section 1	1.00	1.11	27.497	30.25	427.00	0.650	0.000	3.25	13.401	8.71	421.6	0.0	1322.7
55.00		1.00	1.12	27.685	30.45	432.50	0.650	0.000	1.75	7.125	4.63	225.7	0.0	354.8
60.00		1.00	1.14	28.197	31.02	425.35	0.650	0.000	5.00	20.010	13.01	645.5	0.0	996.3
65.00		1.00	1.16	28.676	31.54	417.73	0.650	0.000	5.00	19.493	12.67	639.5	0.0	970.3
70.00		1.00	1.17	29.127	32.04	409.70	0.650	0.000	5.00	18.977	12.33	632.3	0.0	944.4
75.00		1.00	1.19	29.553	32.51	401.29	0.650	0.000	5.00	18.460	12.00	624.1	0.0	918.4
80.00		1.00	1.21	29.958	32.95	392.56	0.650	0.000	5.00	17.943	11.66	614.9	0.0	892.4
85.00		1.00	1.22	30.342	33.38	383.54	0.650	0.000	5.00	17.427	11.33	604.9	0.0	866.5
90.00		1.00	1.24	30.710	33.78	374.24	0.650	0.000	5.00	16.910	10.99	594.1	0.0	840.5
95.00		1.00	1.25	31.061	34.17	364.70	0.650	0.000	5.00	16.394	10.66	582.5	0.0	814.6
95.25	Bot - Section 3	1.00	1.25	31.078	34.19	364.22	0.650	0.000	0.25	0.806	0.52	28.7	0.0	40.0
100.00		1.00	1.27	31.399	34.54	354.94	0.650	0.000	4.75	15.372	9.99	552.2	0.0	1404.2
100.50	Top - Section 2	1.00	1.27	31.432	34.57	353.95	0.650	0.000	0.50	1.591	1.03	57.2	0.0	145.3
105.00		1.00	1.28	31.723	34.89	352.21	0.650	0.000	4.50	14.087	9.16	511.2	0.0	600.6
110.00		1.00	1.29	32.035	35.24	342.08	0.650	0.000	5.00	15.161	9.85	555.6	0.0	646.2
115.00		1.00	1.30	32.336	35.57	331.77	0.650	0.000	5.00	14.645	9.52	541.7	0.0	624.0
120.00		1.00	1.32	32.627	35.89	321.30	0.650	0.000	5.00	14.128	9.18	527.3	0.0	601.7
125.00		1.00	1.33	32.909	36.20	310.66	0.650	0.000	5.00	13.611	8.85	512.4	0.0	579.5
127.00	Appurtenance(s)	1.00	1.33	33.019	36.32	306.37	0.650	0.000	2.00	5.300	3.44	200.2	0.0	225.6
130.00		1.00	1.34	33.182	36.50	299.88	0.650	0.000	3.00	7.795	5.07	295.9	0.0	331.7
135.00		1.00	1.35	33.446	36.79	288.96	0.650	0.000	5.00	12.578	8.18	481.3	0.0	535.0
137.50	Appurtenance(s)	1.00	1.35	33.576	36.93	283.44	0.650	0.000	2.50	6.095	3.96	234.1	0.0	259.1
140.00		1.00	1.36	33.703	37.07	277.90	0.650	0.000	2.50	5.966	3.88	230.0	0.0	253.6
145.00		1.00	1.37	33.953	37.35	266.72	0.650	0.000	5.00	11.545	7.50	448.4	0.0	490.5
147.00	Appurtenance(s)	1.00	1.37	34.051	37.46	262.22	0.650	0.000	2.00	4.473	2.91	174.3	0.0	190.0
149.00		1.00	1.38	34.148	37.56	257.69	0.650	0.000	2.00	4.391	2.85	171.5	0.0	186.4
<b>Totals:</b>									<b>149.00</b>			<b>17,340.3</b>		<b>28,124.5</b>

## Discrete Appurtenance Forces

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

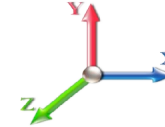


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**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 21

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	147.00	4449	3	34.051	37.456	0.50	0.75	2.49	189.00	0.000	0.000	149.07	0.00	0.00
2	147.00	KRY 112 89/4	6	34.051	37.456	0.50	0.75	1.96	83.16	0.000	0.000	117.45	0.00	0.00
3	147.00	HRK12-HD	1	34.051	37.456	1.00	1.00	9.75	365.95	0.000	0.000	584.32	0.00	0.00
4	147.00	PRK-1245 (kicker kit)	1	34.051	37.456	1.00	1.00	9.50	418.42	0.000	0.000	569.34	0.00	0.00
5	147.00	Low Profile	1	34.051	37.456	1.00	1.00	22.00	1350.00	0.000	0.000	1318.47	0.00	0.00
6	147.00	APXVAARR24 43-U-NA2	3	34.051	37.456	0.52	0.75	31.88	345.60	0.000	0.000	1910.46	0.00	0.00
7	147.00	APXV18-209014-C-A20	6	34.051	37.456	0.72	0.75	15.25	100.98	0.000	0.000	913.91	0.00	0.00
8	147.00	782 10662	3	34.051	37.456	0.50	0.75	0.42	7.02	0.000	0.000	25.30	0.00	0.00
9	137.50	Low Profile Platform-flat	1	33.576	36.933	1.00	1.00	25.00	1080.00	0.000	0.000	1477.33	0.00	0.00
10	137.50	DC2-48-60-8-18F-02	1	33.576	36.933	1.00	1.00	2.92	13.05	0.000	0.000	172.55	0.00	0.00
11	137.50	RRUS-11	6	33.576	36.933	0.54	0.80	8.10	275.40	0.000	0.000	478.91	0.00	0.00
12	137.50	LGP21903	6	33.576	36.933	0.54	0.80	0.87	29.70	0.000	0.000	51.31	0.00	0.00
13	137.50	LGP21401	6	33.576	36.933	0.54	0.80	4.15	76.14	0.000	0.000	245.16	0.00	0.00
14	137.50	AM-X-CD-17-65-00T-RET	3	33.576	36.933	0.64	0.80	21.72	160.65	0.000	0.000	1283.22	0.00	0.00
15	137.50	7770.00	6	33.576	36.933	0.58	0.80	19.27	189.00	0.000	0.000	1138.85	0.00	0.00
16	127.00	Low Profile	1	33.019	36.321	1.00	1.00	22.00	1350.00	0.000	0.000	1278.49	0.00	0.00
17	127.00	LPA-185080/8CF	6	33.019	36.321	0.98	0.80	12.24	37.80	0.000	0.000	711.25	0.00	0.00
18	127.00	LPA-80080/4CF	6	33.019	36.321	1.36	0.80	21.30	64.80	0.000	0.000	1237.67	0.00	0.00

**Totals:** 6,136.67

**13,663.06**

## Total Applied Force Summary

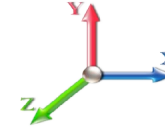
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90  
**Wind Load Factor** 1.60



**Iterations** 21

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		610.87	1461.88	0.00	0.00
10.00		598.41	1435.92	0.00	0.00
15.00		585.95	1409.96	0.00	0.00
20.00		608.49	1384.00	0.00	0.00
25.00		623.90	1358.04	0.00	0.00
30.00		633.91	1332.08	0.00	0.00
35.00		639.94	1306.12	0.00	0.00
40.00		642.89	1280.15	0.00	0.00
45.00		643.35	1254.19	0.00	0.00
47.00		255.27	494.41	0.00	0.00
50.00		390.01	1359.63	0.00	0.00
53.25		421.55	1451.84	0.00	0.00
55.00		225.68	424.35	0.00	0.00
60.00		645.46	1194.91	0.00	0.00
65.00		639.49	1168.95	0.00	0.00
70.00		632.33	1142.99	0.00	0.00
75.00		624.11	1117.03	0.00	0.00
80.00		614.95	1091.07	0.00	0.00
85.00		604.91	1065.11	0.00	0.00
90.00		594.09	1039.15	0.00	0.00
95.00		582.53	1013.19	0.00	0.00
95.25		28.66	49.98	0.00	0.00
100.00		552.17	1592.93	0.00	0.00
100.50		57.21	165.15	0.00	0.00
105.00		511.22	779.41	0.00	0.00
110.00		555.63	844.87	0.00	0.00
115.00		541.74	822.62	0.00	0.00
120.00		527.33	800.37	0.00	0.00
125.00		512.44	778.12	0.00	0.00
127.00	(13) attachments	3427.61	1757.62	0.00	0.00
130.00		295.89	417.15	0.00	0.00
135.00		481.28	677.45	0.00	0.00
137.50	(29) attachments	5081.46	2154.32	0.00	0.00
140.00		230.04	294.49	0.00	0.00
145.00		448.44	572.29	0.00	0.00
147.00	(24) attachments	5762.57	3082.81	0.00	0.00
149.00		171.53	186.40	0.00	0.00
<b>Totals:</b>		<b>31,003.32</b>	<b>39,760.96</b>	<b>0.00</b>	<b>0.00</b>

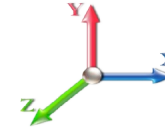
## Calculated Forces

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor**    0.90  
**Wind Load Factor**     1.60



**Iterations**    21

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	-39.73	-31.04	0.00	-3230.6	0.00	3230.67	5580.79	2790.40	13771.9	6896.19	0.00	0.000	0.000	0.476
5.00	-38.20	-30.51	0.00	-3075.4	0.00	3075.45	5509.80	2754.90	13318.1	6668.96	0.06	-0.118	0.000	0.468
10.00	-36.71	-29.99	0.00	-2922.9	0.00	2922.90	5437.04	2718.52	12867.3	6443.24	0.25	-0.238	0.000	0.461
15.00	-35.24	-29.47	0.00	-2772.9	0.00	2772.97	5362.51	2681.26	12419.8	6219.15	0.57	-0.359	0.000	0.453
20.00	-33.80	-28.92	0.00	-2625.6	0.00	2625.64	5286.22	2643.11	11975.8	5996.84	1.01	-0.481	0.000	0.444
25.00	-32.38	-28.35	0.00	-2481.0	0.00	2481.03	5208.16	2604.08	11535.7	5776.42	1.58	-0.605	0.000	0.436
30.00	-31.00	-27.77	0.00	-2339.2	0.00	2339.26	5128.34	2564.17	11099.6	5558.05	2.28	-0.729	0.000	0.427
35.00	-29.64	-27.18	0.00	-2200.4	0.00	2200.40	5046.75	2523.38	10667.8	5341.85	3.11	-0.855	0.000	0.418
40.00	-28.31	-26.58	0.00	-2064.5	0.00	2064.50	4963.39	2481.70	10240.6	5127.96	4.08	-0.982	0.000	0.408
45.00	-27.03	-25.96	0.00	-1931.6	0.00	1931.60	4878.27	2439.14	9818.41	4916.50	5.17	-1.109	0.000	0.399
47.00	-26.51	-25.72	0.00	-1879.6	0.00	1879.69	4843.73	2421.86	9650.93	4832.64	5.65	-1.162	0.000	0.395
50.00	-25.12	-25.34	0.00	-1802.5	0.00	1802.52	4791.38	2395.69	9401.28	4707.63	6.40	-1.240	0.000	0.388
53.25	-23.65	-24.91	0.00	-1720.1	0.00	1720.17	4797.23	2398.61	9428.91	4721.46	7.28	-1.325	0.000	0.369
55.00	-23.20	-24.71	0.00	-1676.5	0.00	1676.58	4766.44	2383.22	9284.05	4648.93	7.77	-1.371	0.000	0.366
60.00	-21.97	-24.08	0.00	-1553.0	0.00	1553.03	4677.28	2338.64	8873.91	4443.55	9.28	-1.494	0.000	0.354
65.00	-20.77	-23.46	0.00	-1432.6	0.00	1432.61	4586.36	2293.18	8469.53	4241.06	10.91	-1.616	0.000	0.342
70.00	-19.59	-22.83	0.00	-1315.3	0.00	1315.34	4493.67	2246.84	8071.16	4041.58	12.67	-1.738	0.000	0.330
75.00	-18.45	-22.21	0.00	-1201.1	0.00	1201.18	4393.03	2196.52	7668.29	3839.84	14.55	-1.860	0.000	0.317
80.00	-17.33	-21.60	0.00	-1090.1	0.00	1090.12	4267.07	2133.53	7232.68	3621.71	16.56	-1.980	0.000	0.305
85.00	-16.25	-20.99	0.00	-982.13	0.00	982.13	4141.11	2070.55	6809.81	3409.96	18.70	-2.099	0.000	0.292
90.00	-15.19	-20.39	0.00	-877.19	0.00	877.19	4015.15	2007.57	6399.67	3204.59	20.96	-2.215	0.000	0.278
95.00	-14.18	-19.78	0.00	-775.26	0.00	775.26	3889.19	1944.59	6002.28	3005.60	23.34	-2.329	0.000	0.262
95.25	-14.11	-19.76	0.00	-770.32	0.00	770.32	3882.89	1941.44	5982.74	2995.82	23.47	-2.335	0.000	0.261
100.00	-12.53	-19.16	0.00	-676.45	0.00	676.45	3763.23	1881.61	5617.62	2812.98	25.84	-2.439	0.000	0.244
100.50	-12.35	-19.10	0.00	-666.87	0.00	666.87	3276.58	1638.29	4993.13	2500.28	26.10	-2.450	0.000	0.271
105.00	-11.56	-18.58	0.00	-580.91	0.00	580.91	3189.50	1594.75	4715.31	2361.16	28.46	-2.545	0.000	0.250
110.00	-10.71	-18.01	0.00	-488.02	0.00	488.02	3081.54	1540.77	4399.90	2203.22	31.18	-2.653	0.000	0.225
115.00	-9.88	-17.44	0.00	-397.99	0.00	397.99	2973.57	1486.79	4095.40	2050.74	34.01	-2.752	0.000	0.198
120.00	-9.08	-16.89	0.00	-310.78	0.00	310.78	2865.60	1432.80	3801.82	1903.74	36.94	-2.840	0.000	0.167
125.00	-8.32	-16.34	0.00	-226.34	0.00	226.34	2757.64	1378.82	3519.16	1762.20	39.96	-2.915	0.000	0.132
127.00	-6.73	-12.84	0.00	-193.65	0.00	193.65	2714.45	1357.23	3409.16	1707.11	41.18	-2.941	0.000	0.116
130.00	-6.32	-12.52	0.00	-155.15	0.00	155.15	2649.67	1324.84	3247.42	1626.12	43.04	-2.975	0.000	0.098
135.00	-5.66	-12.01	0.00	-92.53	0.00	92.53	2541.71	1270.85	2986.60	1495.52	46.18	-3.019	0.000	0.064
137.50	-3.78	-6.82	0.00	-62.51	0.00	62.51	2487.72	1243.86	2860.28	1432.27	47.77	-3.034	0.000	0.045
140.00	-3.50	-6.58	0.00	-45.45	0.00	45.45	2433.74	1216.87	2736.70	1370.38	49.36	-3.046	0.000	0.035
145.00	-2.95	-6.10	0.00	-12.56	0.00	12.56	2325.77	1162.89	2497.71	1250.71	52.56	-3.059	0.000	0.011
147.00	-0.18	-0.18	0.00	-0.36	0.00	0.36	2282.59	1141.29	2405.17	1204.38	53.84	-3.060	0.000	0.000
149.00	0.00	-0.17	0.00	0.00	0.00	0.00	2239.40	1119.70	2314.38	1158.91	55.12	-3.060	0.000	0.000

## Wind Loading - Shaft

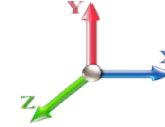
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 21

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	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.656	5.00	26.702	32.04	182.2	631.7	2316.0
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.775	5.00	26.285	31.54	179.3	664.8	2314.5
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.848	5.00	25.829	30.99	176.2	679.0	2294.1
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.902	5.00	25.357	30.43	183.5	684.9	2265.4
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.945	5.00	24.877	29.85	188.7	685.9	2231.8
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.981	5.00	24.390	29.27	192.3	683.8	2195.1
35.00		1.00	1.01	6.169	6.79	0.00	1.200	2.012	5.00	23.899	28.68	194.6	679.5	2156.1
40.00		1.00	1.04	6.345	6.98	0.00	1.200	2.039	5.00	23.405	28.09	196.0	673.3	2115.4
45.00		1.00	1.07	6.504	7.15	0.00	1.200	2.063	5.00	22.908	27.49	196.7	665.8	2073.3
47.00	Bot - Section 2	1.00	1.08	6.564	7.22	0.00	1.200	2.072	2.00	9.022	10.83	78.2	265.0	818.3
50.00		1.00	1.09	6.650	7.32	0.00	1.200	2.085	3.00	13.606	16.33	119.4	401.2	2055.1
53.25	Top - Section 1	1.00	1.11	6.739	7.41	0.00	1.200	2.098	3.25	14.537	17.44	129.3	430.7	2194.3
55.00		1.00	1.12	6.785	7.46	0.00	1.200	2.105	1.75	7.739	9.29	69.3	230.7	703.8
60.00		1.00	1.14	6.910	7.60	0.00	1.200	2.123	5.00	21.779	26.13	198.7	649.0	1977.3
65.00		1.00	1.16	7.028	7.73	0.00	1.200	2.140	5.00	21.277	25.53	197.4	638.0	1931.8
70.00		1.00	1.17	7.138	7.85	0.00	1.200	2.156	5.00	20.773	24.93	195.7	626.5	1885.6
75.00		1.00	1.19	7.243	7.97	0.00	1.200	2.171	5.00	20.269	24.32	193.8	614.4	1838.9
80.00		1.00	1.21	7.342	8.08	0.00	1.200	2.185	5.00	19.764	23.72	191.5	601.9	1791.8
85.00		1.00	1.22	7.436	8.18	0.00	1.200	2.198	5.00	19.259	23.11	189.0	588.9	1744.2
90.00		1.00	1.24	7.526	8.28	0.00	1.200	2.211	5.00	18.753	22.50	186.3	575.5	1696.2
95.00		1.00	1.25	7.612	8.37	0.00	1.200	2.223	5.00	18.246	21.90	183.3	561.8	1647.9
95.25	Bot - Section 3	1.00	1.25	7.617	8.38	0.00	1.200	2.224	0.25	0.899	1.08	9.0	28.1	81.4
100.00		1.00	1.27	7.695	8.46	0.00	1.200	2.234	4.75	17.141	20.57	174.1	530.3	2402.6
100.50	Top - Section 2	1.00	1.27	7.703	8.47	0.00	1.200	2.236	0.50	1.777	2.13	18.1	55.7	249.4
105.00		1.00	1.28	7.774	8.55	0.00	1.200	2.245	4.50	15.771	18.92	161.8	489.5	1290.4
110.00		1.00	1.29	7.851	8.64	0.00	1.200	2.256	5.00	17.041	20.45	176.6	529.4	1391.0
115.00		1.00	1.30	7.925	8.72	0.00	1.200	2.266	5.00	16.533	19.84	172.9	514.5	1346.5
120.00		1.00	1.32	7.996	8.80	0.00	1.200	2.276	5.00	16.024	19.23	169.1	499.4	1301.8
125.00		1.00	1.33	8.065	8.87	0.00	1.200	2.285	5.00	15.516	18.62	165.2	484.1	1256.8
127.00	Appurtenance(s)	1.00	1.33	8.092	8.90	0.00	1.200	2.289	2.00	6.063	7.28	64.8	191.2	491.9
130.00		1.00	1.34	8.132	8.95	0.00	1.200	2.294	3.00	8.942	10.73	96.0	281.2	723.4
135.00		1.00	1.35	8.197	9.02	0.00	1.200	2.303	5.00	14.497	17.40	156.9	452.9	1166.2
137.50	Appurtenance(s)	1.00	1.35	8.229	9.05	0.00	1.200	2.307	2.50	7.057	8.47	76.6	222.5	568.0
140.00		1.00	1.36	8.260	9.09	0.00	1.200	2.311	2.50	6.929	8.31	75.5	218.5	556.6
145.00		1.00	1.37	8.321	9.15	0.00	1.200	2.319	5.00	13.478	16.17	148.0	420.9	1074.9
147.00	Appurtenance(s)	1.00	1.37	8.345	9.18	0.00	1.200	2.322	2.00	5.247	6.30	57.8	165.8	419.0
149.00		1.00	1.38	8.369	9.21	0.00	1.200	2.325	2.00	5.166	6.20	57.1	163.2	411.7
<b>Totals:</b>									<b>149.00</b>			<b>5,401.2</b>		<b>54,978.6</b>

## Discrete Appurtenance Forces

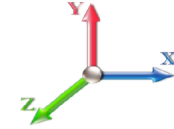
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 21

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	147.00	4449	3	8.345	9.180	0.50	0.75	3.61	548.22	0.000	0.000	33.09	0.00	0.00
2	147.00	KRY 112 89/4	6	8.345	9.180	0.50	0.75	4.42	221.56	0.000	0.000	40.53	0.00	0.00
3	147.00	HRK12-HD	1	8.345	9.180	1.00	1.00	22.43	1536.63	0.000	0.000	205.89	0.00	0.00
4	147.00	PRK-1245 (kicker kit)	1	8.345	9.180	1.00	1.00	22.74	894.66	0.000	0.000	208.72	0.00	0.00
5	147.00	Low Profile	1	8.345	9.180	1.00	1.00	45.50	3241.69	0.000	0.000	417.68	0.00	0.00
6	147.00	APXVAARR24 43-U-NA2	3	8.345	9.180	0.52	0.75	35.91	2199.94	0.000	0.000	329.63	0.00	0.00
7	147.00	APXV18-209014-C-A20	6	8.345	9.180	0.72	0.75	25.68	563.58	0.000	0.000	235.69	0.00	0.00
8	147.00	782 10662	3	8.345	9.180	0.50	0.75	1.23	29.74	0.000	0.000	11.26	0.00	0.00
9	137.50	Low Profile Platform-flat	1	8.229	9.051	1.00	1.00	52.68	2524.08	0.000	0.000	476.84	0.00	0.00
10	137.50	DC2-48-60-8-18F-02	1	8.229	9.051	1.00	1.00	4.53	82.88	0.000	0.000	40.97	0.00	0.00
11	137.50	RRUS-11	6	8.229	9.051	0.54	0.80	10.80	844.37	0.000	0.000	97.72	0.00	0.00
12	137.50	LGP21903	6	8.229	9.051	0.54	0.80	2.56	92.04	0.000	0.000	23.16	0.00	0.00
13	137.50	LGP21401	6	8.229	9.051	0.54	0.80	7.70	257.20	0.000	0.000	69.71	0.00	0.00
14	137.50	AM-X-CD-17-65-00T-RET	3	8.229	9.051	0.64	0.80	25.96	1257.47	0.000	0.000	234.97	0.00	0.00
15	137.50	7770.00	6	8.229	9.051	0.58	0.80	24.31	1403.72	0.000	0.000	220.04	0.00	0.00
16	127.00	Low Profile	1	8.092	8.901	1.00	1.00	45.16	3216.41	0.000	0.000	401.98	0.00	0.00
17	127.00	LPA-185080/8CF	6	8.092	8.901	0.98	0.80	18.83	746.25	0.000	0.000	167.57	0.00	0.00
18	127.00	LPA-80080/4CF	6	8.092	8.901	1.36	0.80	30.65	1223.65	0.000	0.000	272.80	0.00	0.00

**Totals: 20,884.09**

**3,488.27**



## Total Applied Force Summary

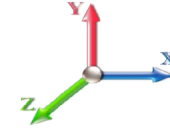
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 21

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		182.15	2580.88	0.00	0.00
10.00		179.31	2579.33	0.00	0.00
15.00		176.20	2558.91	0.00	0.00
20.00		183.54	2530.19	0.00	0.00
25.00		188.72	2496.66	0.00	0.00
30.00		192.27	2459.95	0.00	0.00
35.00		194.61	2420.95	0.00	0.00
40.00		196.02	2380.21	0.00	0.00
45.00		196.68	2338.09	0.00	0.00
47.00		78.17	924.22	0.00	0.00
50.00		119.44	2214.03	0.00	0.00
53.25		129.31	2366.49	0.00	0.00
55.00		69.31	796.53	0.00	0.00
60.00		198.66	2242.18	0.00	0.00
65.00		197.38	2196.63	0.00	0.00
70.00		195.74	2150.48	0.00	0.00
75.00		193.78	2103.79	0.00	0.00
80.00		191.54	2056.62	0.00	0.00
85.00		189.04	2009.03	0.00	0.00
90.00		186.30	1961.04	0.00	0.00
95.00		183.34	1912.70	0.00	0.00
95.25		9.04	94.69	0.00	0.00
100.00		174.11	2654.23	0.00	0.00
100.50		18.07	275.88	0.00	0.00
105.00		161.84	1528.76	0.00	0.00
110.00		176.60	1655.86	0.00	0.00
115.00		172.94	1611.35	0.00	0.00
120.00		169.13	1566.60	0.00	0.00
125.00		165.18	1521.62	0.00	0.00
127.00	(13) attachments	907.12	5784.17	0.00	0.00
130.00		95.98	837.37	0.00	0.00
135.00		156.86	1356.15	0.00	0.00
137.50	(29) attachments	1240.05	7124.75	0.00	0.00
140.00		75.55	611.14	0.00	0.00
145.00		148.04	1183.93	0.00	0.00
147.00	(24) attachments	1540.31	9698.69	0.00	0.00
149.00		57.07	411.69	0.00	0.00
<b>Totals:</b>		<b>8,889.43</b>	<b>83,195.76</b>	<b>0.00</b>	<b>0.00</b>



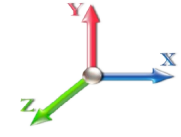
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 1.2D + 1.0E				<b>Iterations</b> 19
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.19	<b>Ss</b> 0.17
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency (f1)</b>	0.46	<b>SA</b> 0.05
				<b>Seismic Importance Factor</b> 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		1403.6	0.00	0.03	0.02	20.16	
10.00		1374.7	0.01	0.05	0.03	29.69	
15.00		1345.9	0.02	0.06	0.04	34.16	
20.00		1317.0	0.03	0.07	0.04	36.13	
25.00		1288.2	0.05	0.07	0.04	36.93	
30.00		1259.3	0.08	0.07	0.04	37.26	
35.00		1230.5	0.10	0.07	0.04	37.44	
40.00		1201.6	0.14	0.07	0.03	37.49	
45.00		1172.8	0.17	0.07	0.03	37.24	
47.00	Bot - Section 2	461.06	0.19	0.06	0.02	14.69	
50.00		1378.2	0.21	0.06	0.02	43.82	
53.25	Top - Section 1	1469.7	0.24	0.06	0.02	46.08	
55.00		394.26	0.26	0.05	0.02	12.19	
60.00		1106.9	0.31	0.04	0.01	31.68	
65.00		1078.1	0.36	0.03	0.01	26.40	
70.00		1049.2	0.42	0.01	0.01	19.15	
75.00		1020.4	0.48	-0.01	0.01	10.24	
80.00		991.60	0.54	-0.03	0.01	0.55	
85.00		962.76	0.62	-0.06	0.02	-8.59	
90.00		933.91	0.69	-0.08	0.03	-15.72	
95.00		905.06	0.77	-0.11	0.05	-19.69	
95.25	Bot - Section 3	44.50	0.77	-0.11	0.05	-0.97	
100.00		1560.2	0.85	-0.12	0.07	-35.29	
100.50	Top - Section 2	161.43	0.86	-0.12	0.07	-3.62	
105.00		667.38	0.94	-0.12	0.10	-12.56	
110.00		718.05	1.03	-0.10	0.15	-7.22	
115.00		693.32	1.13	-0.05	0.20	2.62	
120.00		668.60	1.23	0.03	0.27	15.21	
125.00		643.87	1.33	0.16	0.36	30.18	
127.00	Appurtenance(s)	1864.6	1.37	0.23	0.40	108.12	
130.00		368.52	1.44	0.36	0.47	28.09	
135.00		594.42	1.55	0.64	0.61	65.90	
137.50	Appurtenance(s)	2314.5	1.61	0.81	0.68	301.31	
140.00		281.76	1.67	1.01	0.77	42.51	
145.00		544.97	1.79	1.49	0.96	106.99	
147.00	Appurtenance(s)	3388.9	1.84	1.72	1.05	732.23	
149.00		207.11	1.89	1.98	1.14	49.02	
<b>Totals:</b>		<b>38,067.9</b>				<b>1,889.8</b>	<b>Total Wind: 31,003.3</b>

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



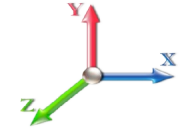
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 0.9D + 1.0E				<b>Iterations</b> 19
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.19	<b>Ss</b> 0.17
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency (f1)</b>	0.46	<b>SA</b> 0.05
				<b>Seismic Importance Factor</b> 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		1403.6	0.00	0.03	0.02	20.16	
10.00		1374.7	0.01	0.05	0.03	29.69	
15.00		1345.9	0.02	0.06	0.04	34.16	
20.00		1317.0	0.03	0.07	0.04	36.13	
25.00		1288.2	0.05	0.07	0.04	36.93	
30.00		1259.3	0.08	0.07	0.04	37.26	
35.00		1230.5	0.10	0.07	0.04	37.44	
40.00		1201.6	0.14	0.07	0.03	37.49	
45.00		1172.8	0.17	0.07	0.03	37.24	
47.00	Bot - Section 2	461.06	0.19	0.06	0.02	14.69	
50.00		1378.2	0.21	0.06	0.02	43.82	
53.25	Top - Section 1	1469.7	0.24	0.06	0.02	46.08	
55.00		394.26	0.26	0.05	0.02	12.19	
60.00		1106.9	0.31	0.04	0.01	31.68	
65.00		1078.1	0.36	0.03	0.01	26.40	
70.00		1049.2	0.42	0.01	0.01	19.15	
75.00		1020.4	0.48	-0.01	0.01	10.24	
80.00		991.60	0.54	-0.03	0.01	0.55	
85.00		962.76	0.62	-0.06	0.02	-8.59	
90.00		933.91	0.69	-0.08	0.03	-15.72	
95.00		905.06	0.77	-0.11	0.05	-19.69	
95.25	Bot - Section 3	44.50	0.77	-0.11	0.05	-0.97	
100.00		1560.2	0.85	-0.12	0.07	-35.29	
100.50	Top - Section 2	161.43	0.86	-0.12	0.07	-3.62	
105.00		667.38	0.94	-0.12	0.10	-12.56	
110.00		718.05	1.03	-0.10	0.15	-7.22	
115.00		693.32	1.13	-0.05	0.20	2.62	
120.00		668.60	1.23	0.03	0.27	15.21	
125.00		643.87	1.33	0.16	0.36	30.18	
127.00	Appurtenance(s)	1864.6	1.37	0.23	0.40	108.12	
130.00		368.52	1.44	0.36	0.47	28.09	
135.00		594.42	1.55	0.64	0.61	65.90	
137.50	Appurtenance(s)	2314.5	1.61	0.81	0.68	301.31	
140.00		281.76	1.67	1.01	0.77	42.51	
145.00		544.97	1.79	1.49	0.96	106.99	
147.00	Appurtenance(s)	3388.9	1.84	1.72	1.05	732.23	
149.00		207.11	1.89	1.98	1.14	49.02	
<b>Totals:</b>		<b>38,067.9</b>				<b>1,889.8</b>	<b>Total Wind: 31,003.3</b>

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



## Wind Loading - Shaft

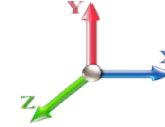
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations** 20

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	0.85	7.442	8.19	283.01	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	277.29	0.650	0.000	5.00	25.322	16.46	134.7	0.0	1403.6
10.00		1.00	0.85	7.442	8.19	271.58	0.650	0.000	5.00	24.805	16.12	132.0	0.0	1374.8
15.00		1.00	0.85	7.442	8.19	265.86	0.650	0.000	5.00	24.289	15.79	129.2	0.0	1345.9
20.00		1.00	0.90	7.896	8.69	267.97	0.650	0.000	5.00	23.772	15.45	134.2	0.0	1317.1
25.00		1.00	0.95	8.276	9.10	268.31	0.650	0.000	5.00	23.256	15.12	137.6	0.0	1288.2
30.00		1.00	0.98	8.600	9.46	267.36	0.650	0.000	5.00	22.739	14.78	139.8	0.0	1259.4
35.00		1.00	1.01	8.883	9.77	265.49	0.650	0.000	5.00	22.222	14.44	141.2	0.0	1230.5
40.00		1.00	1.04	9.137	10.05	262.92	0.650	0.000	5.00	21.706	14.11	141.8	0.0	1201.7
45.00		1.00	1.07	9.366	10.30	259.79	0.650	0.000	5.00	21.189	13.77	141.9	0.0	1172.8
47.00	Bot - Section 2	1.00	1.08	9.452	10.40	258.40	0.650	0.000	2.00	8.331	5.42	56.3	0.0	461.1
50.00		1.00	1.09	9.576	10.53	256.20	0.650	0.000	3.00	12.564	8.17	86.0	0.0	1378.3
53.25	Top - Section 1	1.00	1.11	9.704	10.67	253.66	0.650	0.000	3.25	13.401	8.71	93.0	0.0	1469.7
55.00		1.00	1.12	9.770	10.75	256.93	0.650	0.000	1.75	7.125	4.63	49.8	0.0	394.3
60.00		1.00	1.14	9.951	10.95	252.68	0.650	0.000	5.00	20.010	13.01	142.4	0.0	1107.0
65.00		1.00	1.16	10.120	11.13	248.16	0.650	0.000	5.00	19.493	12.67	141.0	0.0	1078.1
70.00		1.00	1.17	10.279	11.31	243.38	0.650	0.000	5.00	18.977	12.33	139.5	0.0	1049.3
75.00		1.00	1.19	10.430	11.47	238.39	0.650	0.000	5.00	18.460	12.00	137.7	0.0	1020.4
80.00		1.00	1.21	10.572	11.63	233.21	0.650	0.000	5.00	17.943	11.66	135.6	0.0	991.6
85.00		1.00	1.22	10.708	11.78	227.84	0.650	0.000	5.00	17.427	11.33	133.4	0.0	962.8
90.00		1.00	1.24	10.838	11.92	222.32	0.650	0.000	5.00	16.910	10.99	131.0	0.0	933.9
95.00		1.00	1.25	10.962	12.06	216.65	0.650	0.000	5.00	16.394	10.66	128.5	0.0	905.1
95.25	Bot - Section 3	1.00	1.25	10.968	12.06	216.37	0.650	0.000	0.25	0.806	0.52	6.3	0.0	44.5
100.00		1.00	1.27	11.081	12.19	210.85	0.650	0.000	4.75	15.372	9.99	121.8	0.0	1560.3
100.50	Top - Section 2	1.00	1.27	11.092	12.20	210.27	0.650	0.000	0.50	1.591	1.03	12.6	0.0	161.4
105.00		1.00	1.28	11.195	12.31	209.23	0.650	0.000	4.50	14.087	9.16	112.8	0.0	667.4
110.00		1.00	1.29	11.305	12.44	203.22	0.650	0.000	5.00	15.161	9.85	122.6	0.0	718.0
115.00		1.00	1.30	11.412	12.55	197.09	0.650	0.000	5.00	14.645	9.52	119.5	0.0	693.3
120.00		1.00	1.32	11.514	12.67	190.87	0.650	0.000	5.00	14.128	9.18	116.3	0.0	668.6
125.00		1.00	1.33	11.614	12.78	184.55	0.650	0.000	5.00	13.611	8.85	113.0	0.0	643.9
127.00	Appurtenance(s)	1.00	1.33	11.653	12.82	182.00	0.650	0.000	2.00	5.300	3.44	44.2	0.0	250.6
130.00		1.00	1.34	11.710	12.88	178.15	0.650	0.000	3.00	7.795	5.07	65.3	0.0	368.5
135.00		1.00	1.35	11.803	12.98	171.66	0.650	0.000	5.00	12.578	8.18	106.2	0.0	594.4
137.50	Appurtenance(s)	1.00	1.35	11.849	13.03	168.38	0.650	0.000	2.50	6.095	3.96	51.6	0.0	287.9
140.00		1.00	1.36	11.894	13.08	165.09	0.650	0.000	2.50	5.966	3.88	50.7	0.0	281.8
145.00		1.00	1.37	11.982	13.18	158.45	0.650	0.000	5.00	11.545	7.50	98.9	0.0	545.0
147.00	Appurtenance(s)	1.00	1.37	12.017	13.22	155.77	0.650	0.000	2.00	4.473	2.91	38.4	0.0	211.1
149.00		1.00	1.38	12.051	13.26	153.09	0.650	0.000	2.00	4.391	2.85	37.8	0.0	207.1
								<b>Totals:</b>	<b>149.00</b>			<b>3,824.7</b>	<b>31,249.4</b>	

## Discrete Appurtenance Forces

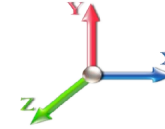
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations** 20

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	147.00	4449	3	12.017	13.219	0.50	0.75	2.49	210.00	0.000	0.000	32.88	0.00	0.00
2	147.00	KRY 112 89/4	6	12.017	13.219	0.50	0.75	1.96	92.40	0.000	0.000	25.91	0.00	0.00
3	147.00	HRK12-HD	1	12.017	13.219	1.00	1.00	9.75	406.61	0.000	0.000	128.88	0.00	0.00
4	147.00	PRK-1245 (kicker kit)	1	12.017	13.219	1.00	1.00	9.50	464.91	0.000	0.000	125.58	0.00	0.00
5	147.00	Low Profile	1	12.017	13.219	1.00	1.00	22.00	1500.00	0.000	0.000	290.81	0.00	0.00
6	147.00	APXVAARR24 43-U-NA2	3	12.017	13.219	0.52	0.75	31.88	384.00	0.000	0.000	421.38	0.00	0.00
7	147.00	APXV18-209014-C-A20	6	12.017	13.219	0.72	0.75	15.25	112.20	0.000	0.000	201.58	0.00	0.00
8	147.00	782 10662	3	12.017	13.219	0.50	0.75	0.42	7.80	0.000	0.000	5.58	0.00	0.00
9	137.50	Low Profile Platform-flat	1	11.849	13.034	1.00	1.00	25.00	1200.00	0.000	0.000	325.85	0.00	0.00
10	137.50	DC2-48-60-8-18F-02	1	11.849	13.034	1.00	1.00	2.92	14.50	0.000	0.000	38.06	0.00	0.00
11	137.50	RRUS-11	6	11.849	13.034	0.54	0.80	8.10	306.00	0.000	0.000	105.63	0.00	0.00
12	137.50	LGP21903	6	11.849	13.034	0.54	0.80	0.87	33.00	0.000	0.000	11.32	0.00	0.00
13	137.50	LGP21401	6	11.849	13.034	0.54	0.80	4.15	84.60	0.000	0.000	54.07	0.00	0.00
14	137.50	AM-X-CD-17-65-00T-RET	3	11.849	13.034	0.64	0.80	21.72	178.50	0.000	0.000	283.04	0.00	0.00
15	137.50	7770.00	6	11.849	13.034	0.58	0.80	19.27	210.00	0.000	0.000	251.19	0.00	0.00
16	127.00	Low Profile	1	11.653	12.818	1.00	1.00	22.00	1500.00	0.000	0.000	281.99	0.00	0.00
17	127.00	LPA-185080/8CF	6	11.653	12.818	0.98	0.80	12.24	42.00	0.000	0.000	156.88	0.00	0.00
18	127.00	LPA-80080/4CF	6	11.653	12.818	1.36	0.80	21.30	72.00	0.000	0.000	272.99	0.00	0.00

**Totals: 6,818.52**

**3,013.62**



## Total Applied Force Summary

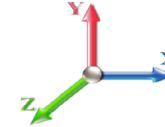
<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations** 20

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		134.74	1624.31	0.00	0.00
10.00		131.99	1595.47	0.00	0.00
15.00		129.24	1566.62	0.00	0.00
20.00		134.21	1537.78	0.00	0.00
25.00		137.61	1508.93	0.00	0.00
30.00		139.82	1480.08	0.00	0.00
35.00		141.15	1451.24	0.00	0.00
40.00		141.80	1422.39	0.00	0.00
45.00		141.90	1393.55	0.00	0.00
47.00		56.30	549.34	0.00	0.00
50.00		86.02	1510.70	0.00	0.00
53.25		92.98	1613.16	0.00	0.00
55.00		49.78	471.50	0.00	0.00
60.00		142.37	1327.68	0.00	0.00
65.00		141.05	1298.84	0.00	0.00
70.00		139.47	1269.99	0.00	0.00
75.00		137.66	1241.15	0.00	0.00
80.00		135.64	1212.30	0.00	0.00
85.00		133.42	1183.46	0.00	0.00
90.00		131.04	1154.61	0.00	0.00
95.00		128.49	1125.76	0.00	0.00
95.25		6.32	55.53	0.00	0.00
100.00		121.79	1769.92	0.00	0.00
100.50		12.62	183.50	0.00	0.00
105.00		112.76	866.01	0.00	0.00
110.00		122.55	938.75	0.00	0.00
115.00		119.49	914.02	0.00	0.00
120.00		116.31	889.30	0.00	0.00
125.00		113.03	864.57	0.00	0.00
127.00	(13) attachments	756.02	1952.91	0.00	0.00
130.00		65.26	463.50	0.00	0.00
135.00		106.15	752.72	0.00	0.00
137.50	(29) attachments	1120.80	2393.69	0.00	0.00
140.00		50.74	327.21	0.00	0.00
145.00		98.91	635.87	0.00	0.00
147.00	(24) attachments	1271.03	3425.35	0.00	0.00
149.00		37.83	207.11	0.00	0.00
<b>Totals:</b>		<b>6,838.30</b>	<b>44,178.84</b>	<b>0.00</b>	<b>0.00</b>

## Calculated Forces

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

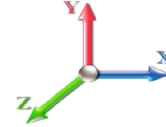


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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Iterations** 20

**Dead Load Factor** 1.00  
**Wind Load 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	-44.18	-6.85	0.00	-714.53	0.00	714.53	5580.79	2790.40	13771.9	6896.19	0.00	0.000	0.000	0.112
5.00	-42.55	-6.73	0.00	-680.29	0.00	680.29	5509.80	2754.90	13318.1	6668.96	0.01	-0.026	0.000	0.110
10.00	-40.95	-6.62	0.00	-646.63	0.00	646.63	5437.04	2718.52	12867.3	6443.24	0.06	-0.053	0.000	0.108
15.00	-39.38	-6.51	0.00	-613.54	0.00	613.54	5362.51	2681.26	12419.8	6219.15	0.13	-0.079	0.000	0.106
20.00	-37.84	-6.39	0.00	-581.02	0.00	581.02	5286.22	2643.11	11975.8	5996.84	0.22	-0.106	0.000	0.104
25.00	-36.33	-6.26	0.00	-549.08	0.00	549.08	5208.16	2604.08	11535.7	5776.42	0.35	-0.134	0.000	0.102
30.00	-34.85	-6.14	0.00	-517.77	0.00	517.77	5128.34	2564.17	11099.6	5558.05	0.50	-0.161	0.000	0.100
35.00	-33.39	-6.01	0.00	-487.08	0.00	487.08	5046.75	2523.38	10667.8	5341.85	0.69	-0.189	0.000	0.098
40.00	-31.97	-5.88	0.00	-457.05	0.00	457.05	4963.39	2481.70	10240.6	5127.96	0.90	-0.217	0.000	0.096
45.00	-30.57	-5.74	0.00	-427.67	0.00	427.67	4878.27	2439.14	9818.41	4916.50	1.14	-0.246	0.000	0.093
47.00	-30.02	-5.69	0.00	-416.19	0.00	416.19	4843.73	2421.86	9650.93	4832.64	1.25	-0.257	0.000	0.092
50.00	-28.51	-5.60	0.00	-399.12	0.00	399.12	4791.38	2395.69	9401.28	4707.63	1.42	-0.274	0.000	0.091
53.25	-26.90	-5.51	0.00	-380.91	0.00	380.91	4797.23	2398.61	9428.91	4721.46	1.61	-0.293	0.000	0.086
55.00	-26.42	-5.47	0.00	-371.27	0.00	371.27	4766.44	2383.22	9284.05	4648.93	1.72	-0.304	0.000	0.085
60.00	-25.09	-5.33	0.00	-343.94	0.00	343.94	4677.28	2338.64	8873.91	4443.55	2.05	-0.331	0.000	0.083
65.00	-23.79	-5.19	0.00	-317.29	0.00	317.29	4586.36	2293.18	8469.53	4241.06	2.41	-0.358	0.000	0.080
70.00	-22.52	-5.05	0.00	-291.34	0.00	291.34	4493.67	2246.84	8071.16	4041.58	2.80	-0.385	0.000	0.077
75.00	-21.28	-4.92	0.00	-266.07	0.00	266.07	4393.03	2196.52	7668.29	3839.84	3.22	-0.412	0.000	0.074
80.00	-20.07	-4.78	0.00	-241.48	0.00	241.48	4267.07	2133.53	7232.68	3621.71	3.67	-0.438	0.000	0.071
85.00	-18.88	-4.65	0.00	-217.57	0.00	217.57	4141.11	2070.55	6809.81	3409.96	4.14	-0.465	0.000	0.068
90.00	-17.73	-4.52	0.00	-194.33	0.00	194.33	4015.15	2007.57	6399.67	3204.59	4.64	-0.490	0.000	0.065
95.00	-16.60	-4.38	0.00	-171.76	0.00	171.76	3889.19	1944.59	6002.28	3005.60	5.17	-0.516	0.000	0.061
95.25	-16.54	-4.38	0.00	-170.66	0.00	170.66	3882.89	1941.44	5982.74	2995.82	5.19	-0.517	0.000	0.061
100.00	-14.78	-4.24	0.00	-149.87	0.00	149.87	3763.23	1881.61	5617.62	2812.98	5.72	-0.540	0.000	0.057
100.50	-14.59	-4.23	0.00	-147.75	0.00	147.75	3276.58	1638.29	4993.13	2500.28	5.78	-0.543	0.000	0.064
105.00	-13.72	-4.12	0.00	-128.70	0.00	128.70	3189.50	1594.75	4715.31	2361.16	6.30	-0.564	0.000	0.059
110.00	-12.79	-3.99	0.00	-108.13	0.00	108.13	3081.54	1540.77	4399.90	2203.22	6.90	-0.587	0.000	0.053
115.00	-11.87	-3.86	0.00	-88.18	0.00	88.18	2973.57	1486.79	4095.40	2050.74	7.53	-0.609	0.000	0.047
120.00	-10.98	-3.74	0.00	-68.86	0.00	68.86	2865.60	1432.80	3801.82	1903.74	8.18	-0.629	0.000	0.040
125.00	-10.12	-3.62	0.00	-50.15	0.00	50.15	2757.64	1378.82	3519.16	1762.20	8.85	-0.645	0.000	0.032
127.00	-8.17	-2.84	0.00	-42.91	0.00	42.91	2714.45	1357.23	3409.16	1707.11	9.12	-0.651	0.000	0.028
130.00	-7.71	-2.77	0.00	-34.38	0.00	34.38	2649.67	1324.84	3247.42	1626.12	9.53	-0.659	0.000	0.024
135.00	-6.96	-2.66	0.00	-20.50	0.00	20.50	2541.71	1270.85	2986.60	1495.52	10.23	-0.668	0.000	0.016
137.50	-4.58	-1.51	0.00	-13.85	0.00	13.85	2487.72	1243.86	2860.28	1432.27	10.58	-0.672	0.000	0.012
140.00	-4.25	-1.46	0.00	-10.07	0.00	10.07	2433.74	1216.87	2736.70	1370.38	10.93	-0.674	0.000	0.009
145.00	-3.62	-1.35	0.00	-2.78	0.00	2.78	2325.77	1162.89	2497.71	1250.71	11.64	-0.677	0.000	0.004
147.00	-0.21	-0.04	0.00	-0.08	0.00	0.08	2282.59	1141.29	2405.17	1204.38	11.92	-0.678	0.000	0.000
149.00	0.00	-0.04	0.00	0.00	0.00	0.00	2239.40	1119.70	2314.38	1158.91	12.21	-0.678	0.000	0.000

## Final Analysis Summary

<b>Structure:</b> CT13614-A-SBA	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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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 101 mph Wind	31.1	0.00	52.98	0.00	0.00	3254.12
0.9D + 1.6W 101 mph Wind	31.0	0.00	39.73	0.00	0.00	3230.67
1.2D + 1.0Di + 1.0Wi 50 mph Wind	8.9	0.00	83.19	0.00	0.00	933.78
1.2D + 1.0E	2.0	0.00	53.01	0.00	0.00	236.96
0.9D + 1.0E	2.0	0.00	39.76	0.00	0.00	235.13
1.0D + 1.0W 60 mph Wind	6.8	0.00	44.18	0.00	0.00	714.53

### 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 101 mph Wind	-52.98	-31.06	0.00	-3254.1	0.00	-3254.1	5580.79	2790.4	13771.9	6896.19	0.00	0.481
0.9D + 1.6W 101 mph Wind	-39.73	-31.04	0.00	-3230.6	0.00	-3230.6	5580.79	2790.4	13771.9	6896.19	0.00	0.476
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-83.19	-8.91	0.00	-933.78	0.00	-933.78	5580.79	2790.4	13771.9	6896.19	0.00	0.150
1.2D + 1.0E	-53.01	-2.00	0.00	-236.96	0.00	-236.96	5580.79	2790.4	13771.9	6896.19	0.00	0.044
0.9D + 1.0E	-39.76	-2.00	0.00	-235.13	0.00	-235.13	5580.79	2790.4	13771.9	6896.19	0.00	0.041
1.0D + 1.0W 60 mph Wind	-44.18	-6.85	0.00	-714.53	0.00	-714.53	5580.79	2790.4	13771.9	6896.19	0.00	0.112

## Base Plate Summary

<b>Structure:</b> CT13614-A-SB	<b>Code:</b> EIA/TIA-222-G	9/6/2019
<b>Site Name:</b> Knowlton	<b>Exposure:</b> C	
<b>Height:</b> 149.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II
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Reactions	Base Plate	Anchor Bolts
Original Design	<b>Yield (ksi):</b> 60.00	<b>Bolt Circle:</b> 68.00
<b>Moment (kip-ft):</b> 3739.40	<b>Width (in):</b> 68.00	<b>Number Bolts:</b> 20.00
<b>Axial (kip):</b> 55.50	<b>Style:</b> Clipped	<b>Bolt Type:</b> 2.25" 18J
<b>Shear (kip):</b> 28.20	<b>Polygon Sides:</b> 4.00	<b>Bolt Diameter (in):</b> 2.25
Analysis	<b>Clip Length (in):</b> 14.00	<b>Yield (ksi):</b> 75.00
<b>Moment (kip-ft):</b> 3254.12	<b>Effective Len (in):</b> 9.47	<b>Ultimate (ksi):</b> 100.00
<b>Axial (kip):</b> 83.19	<b>Moment (kip-in):</b> 448.67	<b>Arrangement:</b> Clustered
<b>Shear (kip):</b> 31.06	<b>Allow Stress (ksi):</b> 81.00	<b>Cluster Dist (in):</b> 6.00
	<b>Applied Stress (ksi):</b> 0.00	<b>Start Angle (deg):</b> 45.00
<b>Moment Design %:</b> 87.02	<b>Stress Ratio:</b> 0.39	<b>Compression</b>
		<b>Force (kip):</b> 119.01
		<b>Allowable (kip):</b> 260.00
		<b>Ratio:</b> 0.47
		<b>Tension</b>
		<b>Force (kip):</b> 110.69
		<b>Allowable (kip):</b> 260.00
		<b>Ratio:</b> 0.44



# Monopole Mat Foundation Design

Date

9/6/2019

<b>Customer Name:</b>	T-Mobile	<b>EIA/TIA Standard:</b>	EIA-222-G
<b>Site Name:</b>		<b>Structure Height (Ft.):</b>	149
<b>Site Number:</b>	CT13614-A-SBA	<b>Engineer Name:</b>	L. Klem
<b>Engr. Number:</b>	80544	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations
Monopole
Analysis

**Structure Type:**

**Analysis or Design?**

**Base Reactions (Factored):**

Axial Load (Kips):	53.0	Shear Force (Kips):	31.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3254.1

Allowable overstress %: 5.0%

**Foundation Geometries:**

Diameter of Pier (ft.):	8.0	Mods required -Yes/No ?:	No
Pier Height A. G. (ft.):	1.00	Depth of Base BG (ft.):	5.5
Length of Pad (ft.):	27.5	Thickness of Pad (ft.):	2.00
		Width of Pad (ft.):	27.5

Final Length of pad (ft)	27.5	Final width of pad (ft):	27.5
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**Material Properties and Rebar Info:**

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	38	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	10	
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):	47	Qty. of Rebar in Pad (W):	47
Rebar at the top of the concrete pad:			
Qty. of Rebar in Pad (L):	47	Qty. of Rebar in Pad (W):	47

Apply 1.35 factor for e/w Per G: 1.35

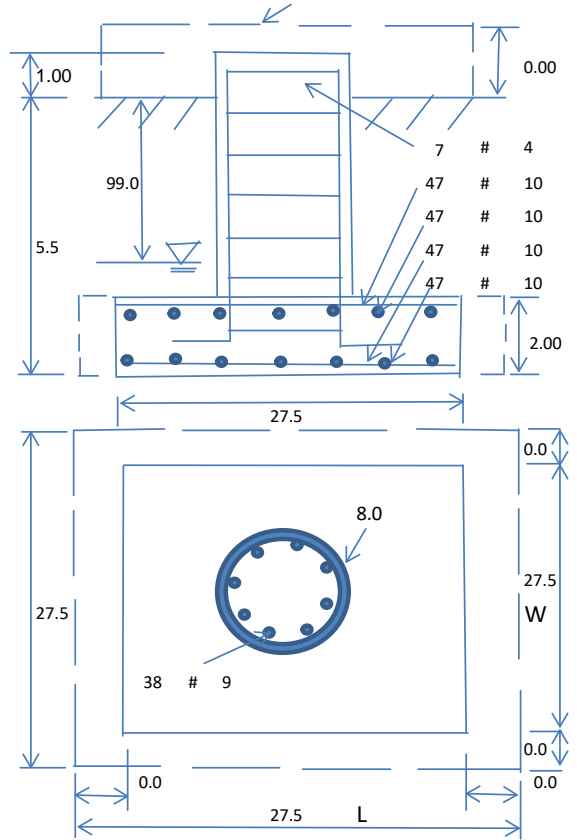
**Soil Design Parameters:**

Soil Unit Weight (pcf):	120.0	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:
Ultimate Bearing Pressure (psf):	21000	Ultimate Skin Friction:	425	Psf	Angle from Bottm of Pad:
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	Yes		Angle from Bottm of Pad:
Consider soil hor. resist. for OTM.:	Yes	Reduction factor on the maximum soil bearing pressure:	1.00		

<b>Foundation Analysis and Design:</b>	Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):		2470.95	Total Dry Soil Weight (Kips):	296.51
Total Buoyant Soil Volume (cu. Ft.):		0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):		296.51	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):		1738.69	Total Dry Concrete Weight (Kips):	260.80
Total Buoyant Concrete Volume (cu. Ft.):		0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):		260.80	Total Vertical Load on Base (Kips):	610.30

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	1546	<	Allowable Factored Soil Bearing (psf):	15750	0.10	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	7625.3	>	Design Factored Momont (kips-ft):	3354	0.44	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.27					OK!



**Check the capacities of Reinforcing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

**(1) Concrete Pier:**

					Load/ Capacity Ratio	
Vertical Steel Rebar Area (sq. in./each):	1.00	Tie / Stirrup Area (sq. in./each):	0.20			
Calculated Moment Capacity (Mn,Kips-Ft):	7455.7	> Design Factored Moment (Mu, Kips-F	3394.1	0.46	OK!	
Calculated Shear Capacity (Kips):	840.3	> Design Factored Shear (Kips):	31.1	0.04	OK!	
Calculated Tension Capacity (Tn, Kips):	2052.0	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!	
Calculated Compression Capacity (Pn, Kips):	12730.0	> Design Factored Axial Load (Pu Kips):	53.0	0.00	OK!	
Moment & Axial Strength Combination:	0.46	OK! Check Tie Spacing (Design/Required):	1		OK!	
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI				

**(2).Concrete Pad:**

One-Way Design Shear Capacity (L-Direction, Kips):	637.9	> One-Way Factored Shear (L-D. Kips):	221.6	0.35	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	637.9	> One-Way Factored Shear (W-D., Kips)	221.6	0.35	OK!
One-Way Design Shear Capacity (Corner-Corner, Kips):	637.8	> One-Way Factored Shear (C-C, Kips):	213.1	0.33	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0089	OK! Lower Steel Pad Reinf. Ratio (W-Direc	0.0089		
Lower Steel Pad Moment Capacity (L-Direction, Kips-ft):	5044.1	> Moment at Bottom ( L-Dir. K-Ft):	1204.4	0.24	OK!
Lower Steel Pad Moment Capacity (W-Direction, Kips-ft):	5044.1	> Moment at Bottom ( W-Dir. K-Ft):	1204.4	0.24	OK!
Lower Steel Pad Moment Capacity (Corner-Corner, K-ft):	6976.5	> Moment at Bottom ( C-C Dir. K-Ft):	1703.3	0.24	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0089	OK! Upper Steel Reinf. Ratio (W-Dir. ):	0.0089		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	5044.1	> Moment at the top ( L-Dir K-Ft):	496.8	0.10	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	5044.1	> Moment at the top ( W-Dir K-Ft):	496.8	0.10	OK!
Upper Steel Pad Moment Capacity (Corner-Corner, K-ft):	6976.5	> Moment at the top ( C-C Dir. K-Ft):	466.8	0.07	OK!

**(3).Check Punching Shear Capacity due to Moment in the Pier:**

Moment transferred by punching shear:	1301.6	k-ft.	Max. factored shear stress $v_{u,CD}$ :	0.5	Psi
Max. factored shear stress $v_{u,AB}$ :	12.6	Psi	Factored shear Strength $\phi v_n$ :	189.7	Psi
Max. factored shear stress $v_u$ :	12.6	Psi	Check Usage of Punching Shear Capacity:	0.07	OK!

# EXHIBIT 9

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## Radio Frequency Emissions Analysis Report

**T-MOBILE** Existing Facility

**Site ID: CT11519D**

CT519/TVI Ashford - Prime  
99 Knowlton Hill Rd  
Ashford, CT 06278

**June 10, 2019**

**Transcom Engineering Project Number: 737001-0084**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>5.54 %</b>



# Transcom Engineering, Inc.

Wireless Network Design and Deployment

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June 10, 2019

T-MOBILE

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

## Emissions Analysis for Site: **CT11519D – CT519/TVI Ashford - Prime**

Transcom Engineering, Inc (“Transcom”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **99 Knowlton Hill Rd, Ashford, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 600 MHz & 700 MHz bands are approximately  $400 \mu\text{W}/\text{cm}^2$  and  $467 \mu\text{W}/\text{cm}^2$  respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is  $1000 \mu\text{W}/\text{cm}^2$ . 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.

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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.

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## CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **99 Knowlton Hill Rd, Ashford, 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*

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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)
A	1	RFS APXV18-209014-C-A20	167
A	2	RFS APXVAARR24_43-U-NA20	167
A	3	RFS APXV18-209014-C-A20 (Dormant)	167
B	1	RFS APXV18-209014-C-A20	167
B	2	RFS APXVAARR24_43-U-NA20	167
B	3	RFS APXV18-209014-C-A20 (Dormant)	167
C	1	RFS APXV18-209014-C-A20	167
C	2	RFS APXVAARR24_43-U-NA20	167
C	3	RFS APXV18-209014-C-A20 (Dormant)	167

*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 **2.06 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **200 feet** of **1-5/8"** coax.

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## 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 A1	RFS APXV18-209014-C-A20	1900 MHz (PCS)	14.35	5	175	2,965.09	0.42
Antenna A2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.81
Antenna A3	RFS APXV18-209014-C-A20	Dormant	N/A	0	0	0.00	0.00
Sector A Composite MPE%							<b>1.23</b>
Antenna B1	RFS APXV18-209014-C-A20	1900 MHz (PCS)	14.35	5	175	2,965.09	0.42
Antenna B2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.81
Antenna B3	RFS APXV18-209014-C-A20	Dormant	N/A	0	0	0.00	0.00
Sector B Composite MPE%							<b>1.23</b>
Antenna C1	RFS APXV18-209014-C-A20	1900 MHz (PCS)	14.35	5	175	2,965.09	0.42
Antenna C2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.81
Antenna C3	RFS APXV18-209014-C-A20	Dormant	N/A	0	0	0.00	0.00
Sector C Composite MPE%							<b>1.23</b>

*Table 3: T-MOBILE Emissions Levels*

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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, all three sectors have the same configuration yielding the same results on all three sectors. *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	<b>1.23 %</b>
AT&T	2.07 %
Verizon Wireless	2.24 %
<b>Site Total MPE %:</b>	<b>5.54 %</b>

*Table 4: All Carrier MPE Contributions*

T-MOBILE Sector A Total:	1.23 %
T-MOBILE Sector B Total:	1.23 %
T-MOBILE Sector C Total:	1.23 %
Site Total:	5.54 %

*Table 5: Site MPE Summary*

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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, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	677.74	167	3.76	1900 MHz (PCS)	1000	0.38%
T-Mobile 1900 MHz (PCS) GSM	1	254.15	167	0.35	1900 MHz (PCS)	1000	0.04%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	167	2.19	600 MHz	400	0.55%
T-Mobile 700 MHz LTE	2	432.54	167	1.20	700 MHz	467	0.26%
						<b>Total:</b>	<b>1.23%</b>

*Table 6: T-MOBILE Maximum Sector MPE Power Values*

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## 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 A:	1.23 %
Sector B:	1.23 %
Sector C:	1.23 %
T-MOBILE Maximum Total (per sector):	1.23 %
Site Total:	5.54 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **5.54 %** 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.



Scott Heffernan  
RF Engineering Director  
**Transcom Engineering, Inc**

PO Box 1048  
Sterling, MA 01564