



Northeast Site Solutions  
Denise Sabo  
4 Angela's Way, Burlington CT 06013  
203-435-3640  
denise@northeastsitesolutions.com

June 29, 2022

Members of the Siting Council  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

RE: Exempt Modification Application  
51 Daniels Avenue, Waterford, CT 06385  
Latitude: 41.330263  
Longitude: -72.167222  
Site #: CT09865-S\_CTNL808B\_SBA/T-Mobile

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing tower located at 51 Daniels Avenue, Waterford, CT 06385. T-Mobile currently maintains six (6) antennas at the 160-foot level of the existing 180-foot self-support tower. The property is owned by the Town of Waterford and the tower is owned by SBA. T-Mobile now intends to replace (3) antennas. The new antennas would be installed at the 160-foot level of the tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable.

**T-Mobile Planned Modifications:**

**Remove:**

(3) Coax – 1-5/8”

**Remove and Replace:**

(3) RFS APX16DWV-DWV-S-E-A20 Antennas (REMOVE) - (3) ERICSSON AIR6419 B41 Antennas (REPLACE)

**Install New:**

(3) ERICSSON 4460 B25+B66 RRU

(2) HCS Fiber Cable 1.9”

**Existing to Remain:**

(3) RFS APXVAAR24-43-U-NA20 Antennas

(3) ERICSSON 4449 B71+B85 RRU

(3) Fiber Lines – 1-5/8”

(13) Coax – 1-5/8” \*

(1) 1/2” Coax \*

(6) Ericsson TMAs \*

(3) Kathrein 782 11056 \*

\*Equipment listed for entitlement purposed only



The facility was approved by the Town of Waterford Planning & Zoning Commission on November 24, 2008. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-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-SOj-73, a copy of this letter is being sent to Robert Brule, First Selectman and Abby Piersall, Planning Director for the Town of Waterford, as well as the property owner and the tower owner.

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 modifications 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 modifications 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 telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Denise Sabo  
Mobile: 203-435-3640  
Fax: 413-521-0558  
Office: 4 Angela's Way, Burlington CT 06013  
Email: [denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)



**NSS** **NORTHEAST**  
SITE SOLUTIONS  
*Turnkey Wireless Development*

Attachments

Cc: Robert Brule, First Selectman & Property Owner  
Waterford Town Hall  
15 Rope Ferry Road  
Waterford, CT 06385

Abby Piersall, Planning Director  
Waterford Town Hall  
15 Rope Ferry Road  
Waterford, CT 06385

SBA - Tower Owner

# Exhibit A

## **Original Facility Approval**

FIFTEEN ROPE FERRY ROAD



WATERFORD, CT 06385-2886

**TOWN OF WATERFORD  
PLANNING & ZONING COMMISSION**

**NOTICE OF GRANT OF A SPECIAL PERMIT**

This is to certify that on November 24, 2008, the Waterford Planning & Zoning Commission granted Special Permit #PZ2008-033.

Owner of Record: Town of Waterford

Address: 51 Daniels Avenue

Description of Premises:

As recorded in Volumes 107, Page(s) 567 of the Waterford Land Records.

Nature of Special Permit: Special Permit and site plan approval granted for erection of a telecommunications tower

Applicable Zoning Regulations: Sections 5, 22 & 23.

Permit findings, stipulations and conditions are filed in the office of the Town Clerk as stated in the minutes of the Planning & Zoning Commission meeting of November 24, 2008.

PLANNING & ZONING COMMISSION

By: *Dawn Choisy*  
Dawn Choisy  
Recording Secretary  
Planning & Zoning Commission

This notice is to be recorded on the land records of the Town of Waterford, indexed in the Grantor's Index under the name of the record owner.

FIFTEEN ROPE FERRY ROAD



WATERFORD, CT 06385-2886

October 17, 2008

Christopher B. Fisher, Esq.  
Cuddy & Feder LLP  
445 Hamilton Avenue, 14<sup>th</sup> Floor  
White Plains, NY 10601

RE: Conservation Permit #2008-041  
51 Daniels Avenue – Communications Tower

Dear Mr. Fisher:

At a meeting held on October 16, 2008, the Waterford Conservation Commission approved the above referenced application with conditions.

Please submit two copies of the finalized site plans in accordance with the terms and conditions of the permit (attached). Once submitted, the Chairman will sign the plans and permit and a set will be forwarded to you for your records. If you have any questions, please feel free to call Maureen FitzGerald, Environmental Planner, at 860-444-5813.

Sincerely,

Carol Libby  
Recording Secretary  
Conservation Commission

Certified Mail #7006 0810 0006 0893 5010

cc: Town of Waterford – 1<sup>st</sup> Selectman  
SBA Network Services, Inc.

FIFTEEN ROPE FERRY ROAD  
November 25, 2008



WATERFORD, CT 06385-2886

SBA Towers II, LLC  
c/o SBA Network Services, Inc.  
80 Eastern Boulevard  
Glastonbury, CT 06033

RE: Application #PZ2008-033  
51 Daniels Avenue/Communications Tower

Dear Mr. Dupont:

At a meeting on November 24, 2008, the Town of Waterford Planning and Zoning Commission took the following action in regards to the above referenced application:


**APPROVED WITH CONDITIONS: #PZ2008-033** - Request of the Town of Waterford by its agent SBA Towers II, LLC, applicant; Town of Waterford, owner, Christopher B. Fisher, Esq. agent for special permit and site plan approval to locate a communications tower at 51 Daniels Avenue, R-40 zone, in accordance with Sections 5.2.1, 5.2.2, 22 and 23 of the Zoning Regulations and as shown on plans entitled "Site Name: Southwest School, Site Address: 51 Daniels Avenue, Waterford, CT 06385" dated July 28, 2008 with revisions to September 13, 2008.

Please refer to the attached minutes and special permit for the conditions of the approval.

In order to comply with the record retention schedule required by the State of Connecticut, you are required to file a Notice of Special Permit with the Waterford Town Clerk. This Notice can be filed after the 15 day appeal period expires, which is December 16, 2008. At the time you are ready to file this Notice, please come to the Permitting Office and the original notice and one copy will be given to you. Both of these shall be stamped in at the Clerk's Office, and the copy is to be returned to this office.

Please also submit two sets of check prints incorporating the conditions of the Planning and Zoning Commission and Conservation Commission approvals for Staff review. After this review, you will be notified to submit one mylar and 12 sets of final plans for the Chairmen's signatures.

Sincerely,

  
Dawn Choisy  
Recording Secretary  
Planning and Zoning Commission

Enclosure: Minutes  
Notice of Action

Certified #7008 0500 0000 7478 7841

Cc: Christopher B. Fisher, Esq., w/attachments

FIFTEEN ROPE FERRY ROAD



WATERFORD, CT 06385-2886

November 25, 2008

The Day Publishing Company – Legal Ads  
Eugene O'Neill Drive  
New London, CT 06320

Please prepare the following notice for publication in your newspaper on Monday December 1, 2008 and send a Publisher's Certificate along with your bill, charged to #92962:

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**TOWN OF WATERFORD  
PLANNING AND ZONING COMMISSION  
NOTICE OF ACTION**

At a meeting held on November 24, 2008, the Waterford Planning and Zoning Commission took the following actions:

**APPROVED WITH CONDITIONS**

**#PZ2008-033** - Request of the Town of Waterford by its agent SBA Towers II, LLC, applicant; Town of Waterford, owner, Christopher B. Fisher, Esq. agent for special permit and site plan approval to locate a communications tower at 51 Daniels Avenue, R-40 zone.

**#PZ2008-030** – Request of Jeffrey J. Barclay, applicant Edmund O & Vincent P. DeSantis owners; Boundaries, LLC, agent for Coastal Site Plan review and approval to construct a new single family home on property located at 14 Westcot Road, RU-120 zone.


**#PZ2008-038** – Request of Michael Hoelck, applicant; Hoelck's Realty LLC, owner, for modification of an approved site plan at 341 Boston Post Road, R-20 zone. The approval of this site plan includes fire zones as may be established and enforced pursuant to Chapter 8.08 of the Waterford Code of Ordinances.

Information regarding the above actions is on file in the office of the Planning and Zoning Commission, Waterford, Connecticut.

Dated at Waterford, CT this 25<sup>th</sup> day of November, 2008.

Edwin Maguire, Chairman  
Gwendolyn Hughes, Secretary

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By:  Dawn Choisy, Recording Secretary 444-5813



# Exhibit B

## Property Card

# 51 DANIELS AVENUE

**Location** 51 DANIELS AVENUE

**Mblu** 143 / 1783 /

**Acct#** 00153300

**Owner** WATERFORD TOWN OF

**Assessment** \$2,924,780

**Appraisal** \$4,178,257

**PID** 1783

**Building Count** 1

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$2,498,257	\$1,680,000	\$4,178,257

Assessment			
Valuation Year	Improvements	Land	Total
2017	\$1,748,780	\$1,176,000	\$2,924,780

## Parcel Addresses

Additional Addresses
No Additional Addresses available for this parcel

## Owner of Record

**Owner** WATERFORD TOWN OF

**Co-Owner** SOUTHWEST SCHOOL

**Sale Price** \$0

**Certificate**

**Book & Page** 0107/0567

**Sale Date** 09/15/1956

**Instrument** 00

## Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
WATERFORD TOWN OF	\$0		0107/0567	00	09/15/1956

## Building Information

**Building 1 : Section 1**

**Year Built:** 1960  
**Living Area:** 29,627  
**Replacement Cost:** \$3,608,900  
**Building Percent Good:** 65

**Building Attributes**

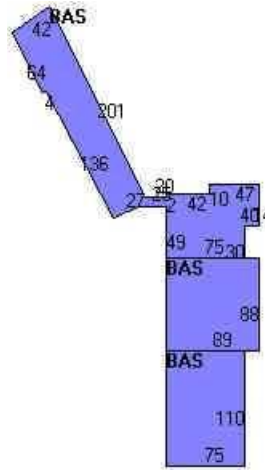
Field	Description
STYLE	School
MODEL	Comm/Ind
Grade	Above Ave
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Brick Veneer
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled
Interior Wall 1	Typical
Interior Wall 2	
Interior Floor 1	Comp Tile
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Hot Water
% Central Air	0
Foundation	Poured Conc
Bldg Use	Exempt Comm
Total Rooms	0
Total Bedrms	0
Total Fixtures	0
% Wet Sprinkler	
% Dry Sprinkler	
1st Floor Use	
Heat/AC	Typical
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
% Finished	100
Class	C
Wall Height	10,00
Usrflid 214	

**Building Photo**



(<http://images.vgsi.com/photos/WaterfordCTPhotos//00\01\54\22.jpg>)

**Building Layout**



([http://images.vgsi.com/photos/WaterfordCTPhotos//Sketches/1783\\_1783.j](http://images.vgsi.com/photos/WaterfordCTPhotos//Sketches/1783_1783.j))

Building Sub-Areas (sq ft)			<u>Legend</u>
Code	Description	Gross Area	Living Area
BAS	First Floor	29,627	29,627
		29,627	29,627

**Extra Features**

Extra Features				Legend
Code	Description	Size	Value	Bldg #
ELV1	ELEVATOR PASS	1.00 STOPS	\$16,250	1
MSC13	RADIO TOWER	5000.00 UNIT	\$32,500	1
GEN	GEN BACKUP DIESEL	1.00 UNITS	\$10,000	1

## Land

### Land Use

**Use Code** 920  
**Description** Exempt Comm  
**Zone** R-40  
**Neighborhood** 800  
**Alt Land Appr** No  
**Category**

### Land Line Valuation

**Size (Acres)** 20  
**Frontage** 0  
**Depth** 0  
**Assessed Value** \$1,176,000  
**Appraised Value** \$1,680,000

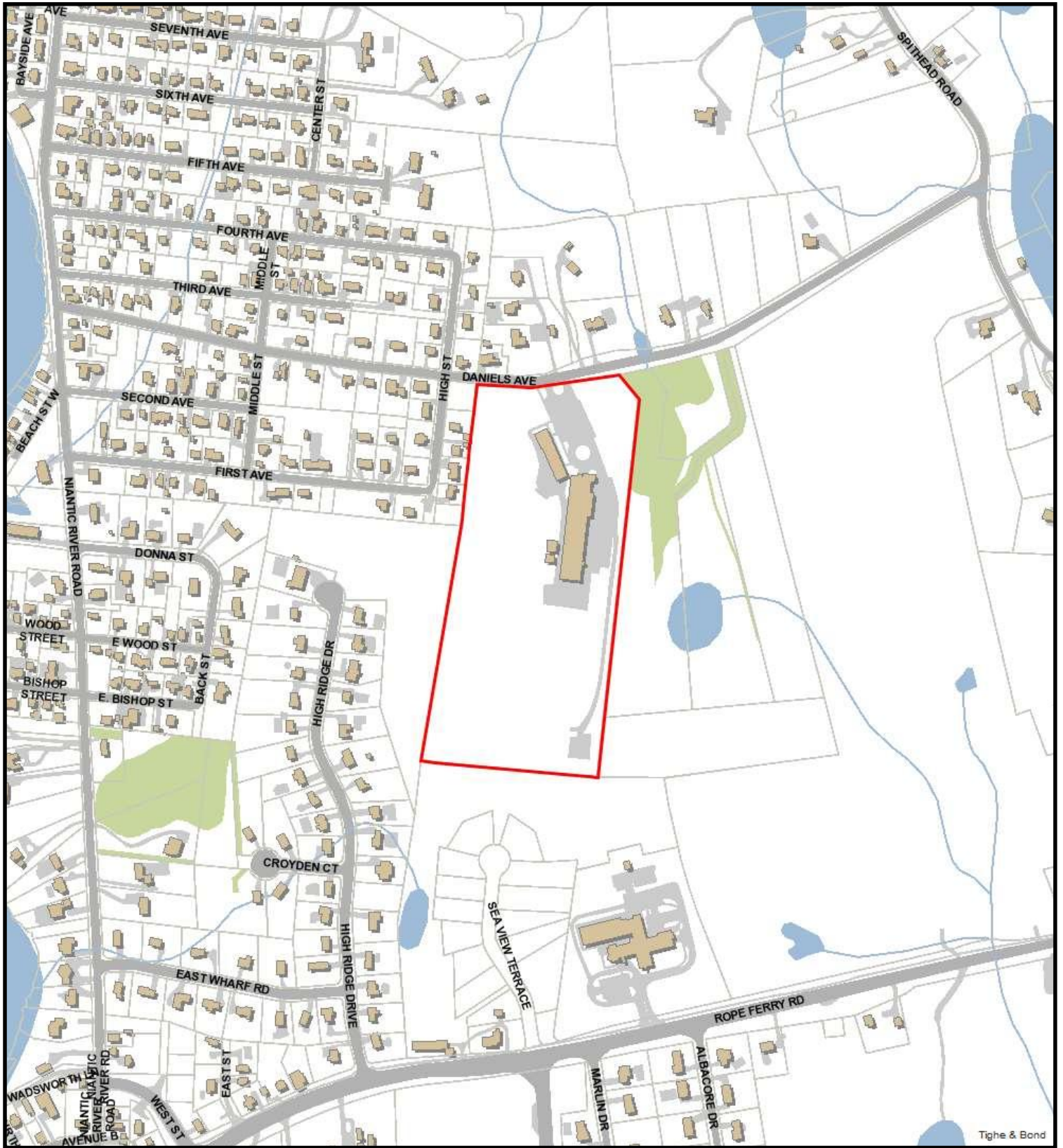
## Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	Paving	AS	Asphalt	42000.00 S.F.	\$78,750	1
SHD1	Shed	FR	Frame	400.00 S.F.	\$6,750	1
SHD1	Shed	FR	Frame	200.00 S.F.	\$3,380	1
SHD1	Shed	FR	Frame	400.00 S.F.	\$6,750	1

## Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$2,498,257	\$1,680,000	\$4,178,257
2020	\$2,498,257	\$1,680,000	\$4,178,257

Assessment			
Valuation Year	Improvements	Land	Total
2021	\$1,748,780	\$1,176,000	\$2,924,780
2020	\$1,748,780	\$1,176,000	\$2,924,780



Tighe & Bond

# 51 Daniels Avenue

3/4/2022 10:38:04 AM

Scale: 1"=500'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.



# Exhibit C

## **Construction Drawings**



# AMTRAK\_WATERFORD2

51 DANIELS AVENUE  
WATERFORD, CT 06385  
NEW LONDON COUNTY

## SITE NO.: CTNL808B

SITE TYPE: 180'± SELF SUPPORT

RF DESIGN GUIDELINE: 67D5D998E HYBRID

### 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

- 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.
- 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.
- THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE OMBUDSMAN 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
- 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.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
- ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK.

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



### VICINITY MAP

SCALE: 1" = 1000'-0"



### DIRECTIONS

FROM COMMERCE WAY GET ON I-495 N FROM SOUTH WASHINGTON ST. TAKE EXIT 33B TO MERGE ONTO I-95 S TOWARD PROVIDENCE, RI. KEEP LEFT TO CONTINUE TOWARD I-95 S. CONTINUE ONTO I-95 S. KEEP RIGHT AT THE FORK TO STAY ON I-95 S. ENTERING CONNECTICUT. TAKE EXIT 81 TOWARD CROSS RD. TAKE CROSS RD AND SPITHEAD RD. TAKE RIGHT ONTO DANIELS AVE. DESTINATION WILL BE ON THE LEFT.

### SCOPE OF WORK

REMOVE:	INSTALL:
• 3 ANTENNAS	• 3 ANTENNAS
• 6 TMAS	• 3 RADIOS
• ALL COAX CABLES	• 2 HYBRID CABLES
• 1 1-1/2" (9x18) HYBRID CABLE	• 1 B160 EQUIPMENT CABINET
	• 1 B160 BATTERY CABINET
	• 1 125A-2P BREAKER
	• 1 25A-1P BREAKER
	• 1 SLACKBOX

### SITE NOTES

- THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY, AND IS NOT FOR HUMAN HABITATION. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
  - ADA COMPLIANCE NOT REQUIRED.
  - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
  - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
- 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.
- NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
  - BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE
  - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
  - STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

### SHEET INDEX

SHEET NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	TOWER ELEVATION & ANTENNA PLANS	1
A-3	SITE DETAILS	1
A-4	ANTENNA & FEEDLINE CHARTS	1
E-1	ELECTRIC & GROUNDING DETAILS	1

### 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.

### PROJECT SUMMARY

SITE NUMBER:	CTNL808B
SITE NAME:	AMTRAK_WATERFORD2
SBA SITE NUMBER:	CT09865-S
SBA SITE NAME:	NIANTIC
SITE ADDRESS:	51 DANIELS AVENUE WATERFORD, CT 06385
PROPERTY OWNER:	TOWN OF WATERFORD/SOUTHWEST SCHOOL DISTRICT 51 DANIELS AVENUE WATERFORD, CT 06385
TOWER OWNER:	SBA TOWERS II, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	NEW LONDON
ZONING DISTRICT:	R-40, RESIDENTIAL DISTRICT
STRUCTURE TYPE:	SELF SUPPORT
STRUCTURE HEIGHT:	180'±
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
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.41.3303° (41°-19'-48.95") LONGITUDE: W.-72.1667° (-72°-10'-0.02")

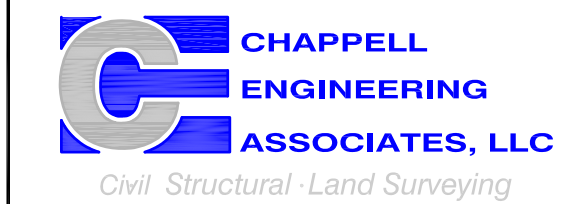
**SPECIAL ZONING NOTE:**  
BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), 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).

..T-Mobile..

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



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



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			
REV.	DATE	DESCRIPTION	BY
1	06/10/22	ISSUED FOR CONSTRUCTION	BDJ
0	03/21/22	ISSUED FOR REVIEW	BDJ

SITE NUMBER:  
**CTNL808B**  
SITE ADDRESS:  
51 DANIELS AVENUE  
WATERFORD, CT 06385

SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T-1**



**GENERAL NOTES:**

- FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR – T-MOBILE  
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)  
OWNER – T-MOBILE  
OEM – ORIGINAL EQUIPMENT MANUFACTURER
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL, STATE AND FEDERAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.
- SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER, T1 CABLES AND GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR AND/OR LANDLORD PRIOR TO CONSTRUCTION.
- THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.
- SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION AND RETURN DISTURBED AREAS TO ORIGINAL CONDITIONS.
- THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- SUBCONTRACTOR SHALL NOTIFY CHAPPELL ENGINEERING ASSOCIATES, LLC 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS AND POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEERING REVIEW.
- CONSTRUCTION SHALL COMPLY WITH ALL T-MOBILE STANDARDS AND SPECIFICATIONS.
- SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- THE EXISTING CELL SITES ARE IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
- IF THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

**SITE WORK GENERAL NOTES:**

- THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING, OWNER AND/OR LOCAL UTILITIES.
- THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
- SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T-MOBILE SPECIFICATION FOR SITE SIGNAGE.

**CONCRETE AND REINFORCING STEEL NOTES:**

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (400PSI) MAY BE USED. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 381 CODE REQUIREMENTS
- REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:  
CONCRETE CAST AGAINST EARTH.....3 IN.  
CONCRETE EXPOSED TO EARTH OR WEATHER:  
#6 AND LARGER .....2 IN.  
#5 AND SMALLER & WWF .....1½ IN.  
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:  
SLAB AND WALL .....¾ IN.  
BEAMS AND COLUMNS .....½ IN.
- A CHAMFER ¾" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY SIMPSON OR APPROVED EQUAL.
- CONCRETE CYLINDER TIES ARE NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (BC1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER:  
(A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIER'S PLANT.  
(B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.  
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
- AS AN ALTERNATIVE TO ITEM 7. TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
- EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

**STRUCTURAL STEEL NOTES:**

- ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND T-MOBILE SPECIFICATIONS UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
- ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. PAINTED SURFACES SHALL BE TOUCHED UP.
- BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (¾") AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE GALVANIZED OR STAINLESS STEEL.
- NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ¾" DIA. ASTM A 307 BOLTS (GALV) UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
- ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

**SOIL COMPACTION NOTES FOR SLAB ON GRADE:**

- EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
- COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
- AS AN ALTERNATE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
- COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING #1 SIEVE.
- AS AN ALTERNATE TO ITEMS 2 AND 3, THE SUBGRADE SOILS WITH 5 PASSES OR A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E), AND SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL AND COMPACTED AS STATED ABOVE.

**COMPACTION EQUIPMENT:**

- HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

**CONSTRUCTION NOTES:**

- FIELD VERIFICATION: SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T-MOBILE ANTENNA PLATFORM LOCATION AND UTILITY TRENCHWORK.
- COORDINATION OF WORK: SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.
- CABLE LADDER RACK: SUBCONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY AND/OR ICE BRIDGE, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

**ELECTRICAL INSTALLATION NOTES:**

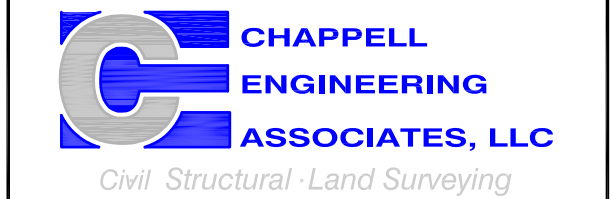
- WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
- SUBCONTRACTOR SHALL MODIFY OR INSTALL CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
- CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
- EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA, AND MATCH INSTALLATION REQUIREMENTS.
- POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, ½ INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC AND OSHA.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOD PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
- PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOD PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#8 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY HARGER (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
- RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- CABINETS, BOXES AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PAINTDUTY TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
- CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.



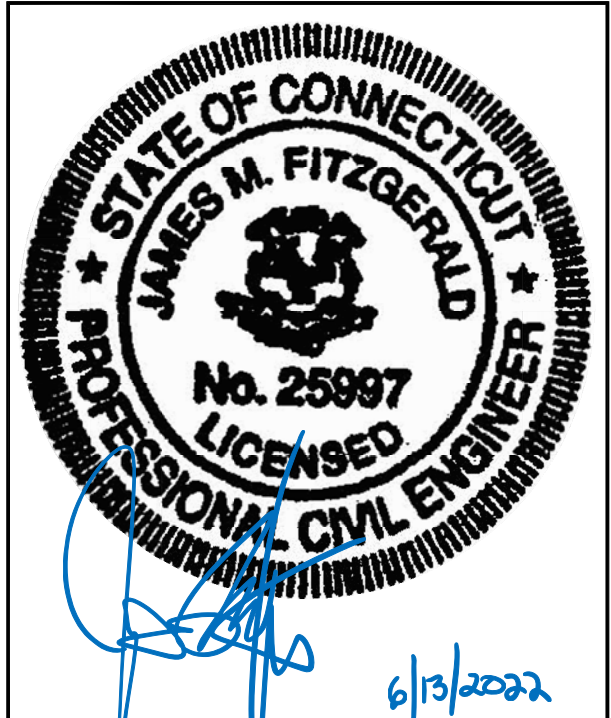
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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	06/10/22	ISSUED FOR CONSTRUCTION	BDJ
0	03/21/22	ISSUED FOR REVIEW	BDJ

SITE NUMBER:  
**CTNL808B**  
  
SITE ADDRESS:  
51 DANIELS AVENUE  
WATERFORD, CT 06385

SHEET TITLE  
  
GENERAL NOTES

SHEET NUMBER  
  
**GN-1**

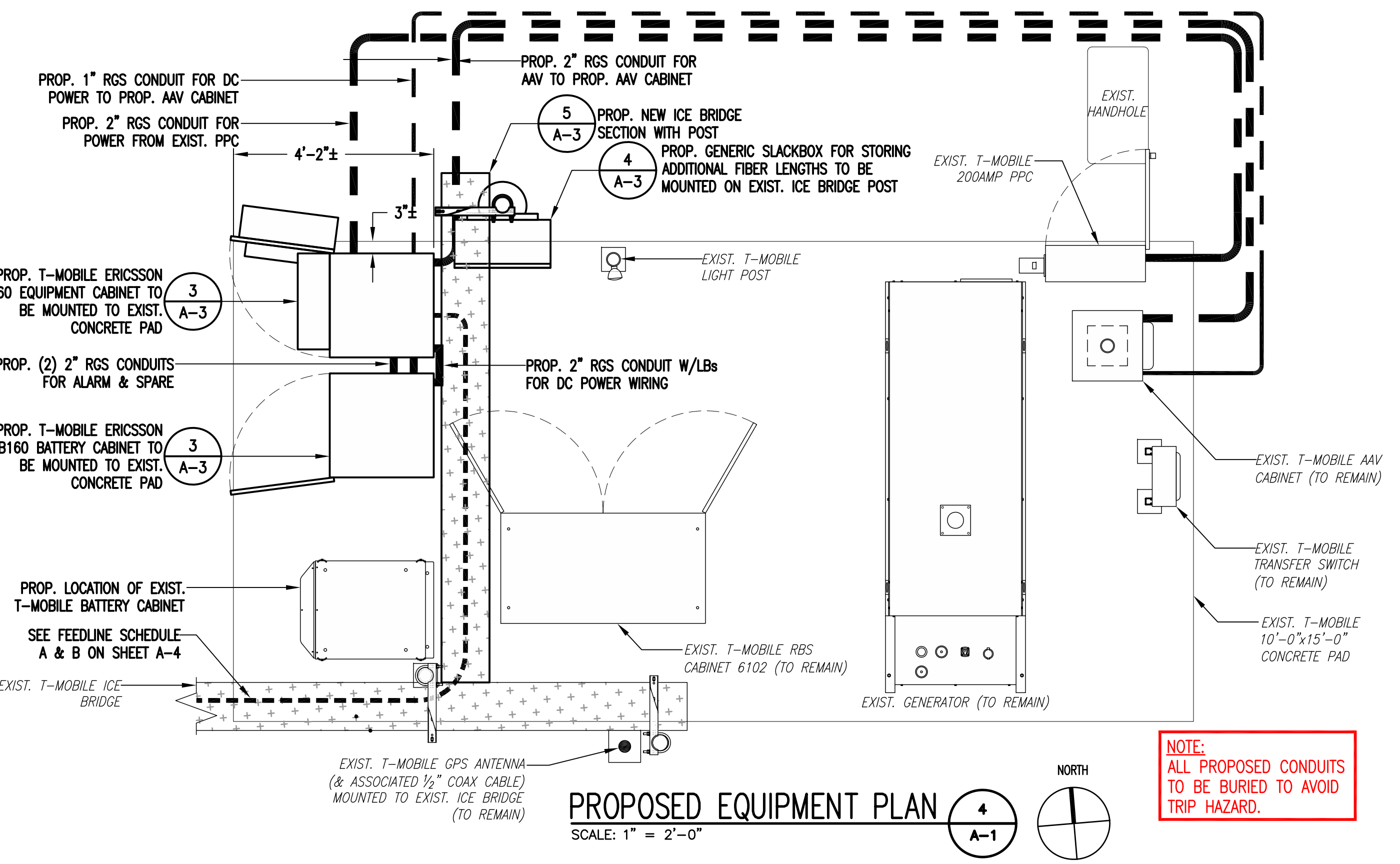
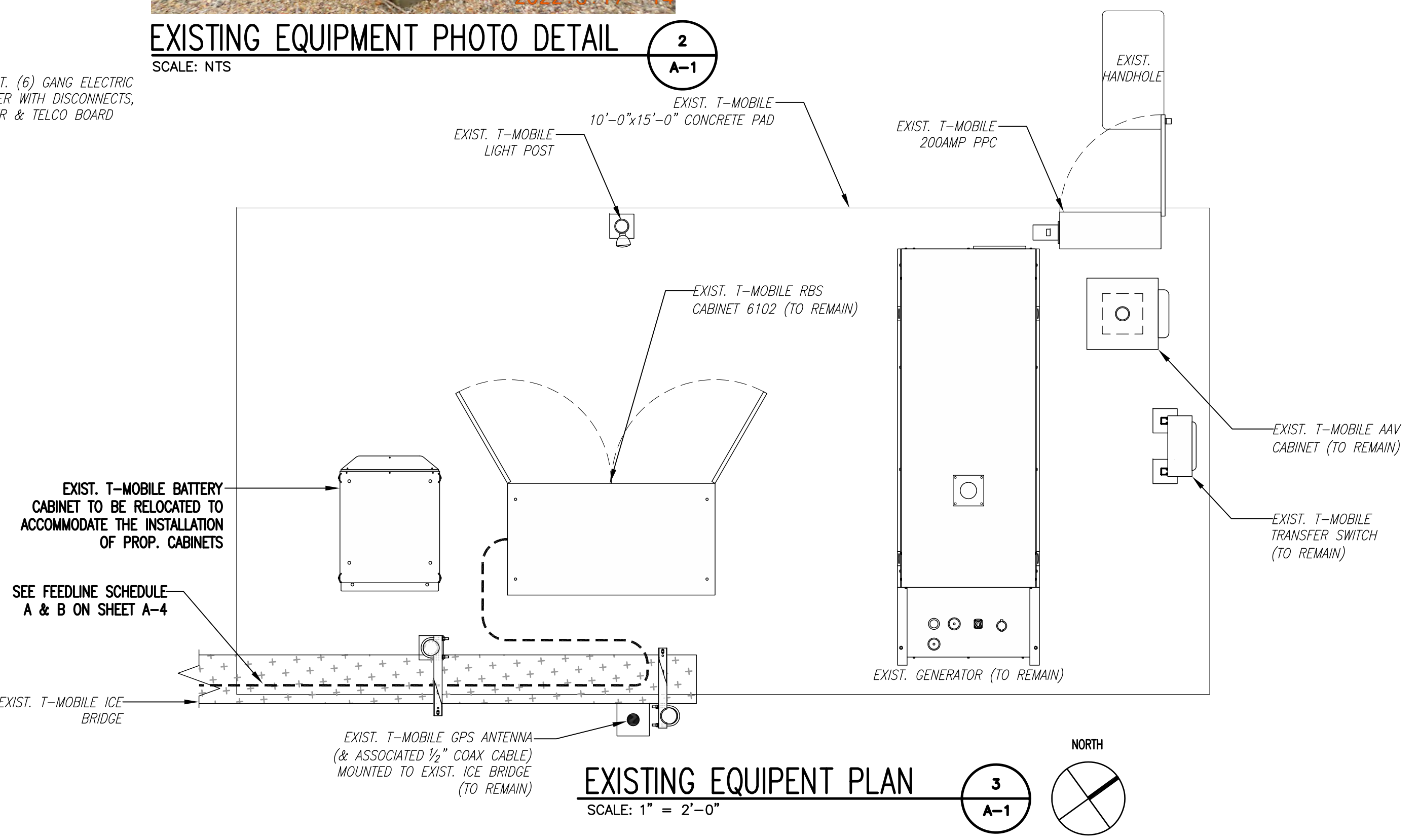
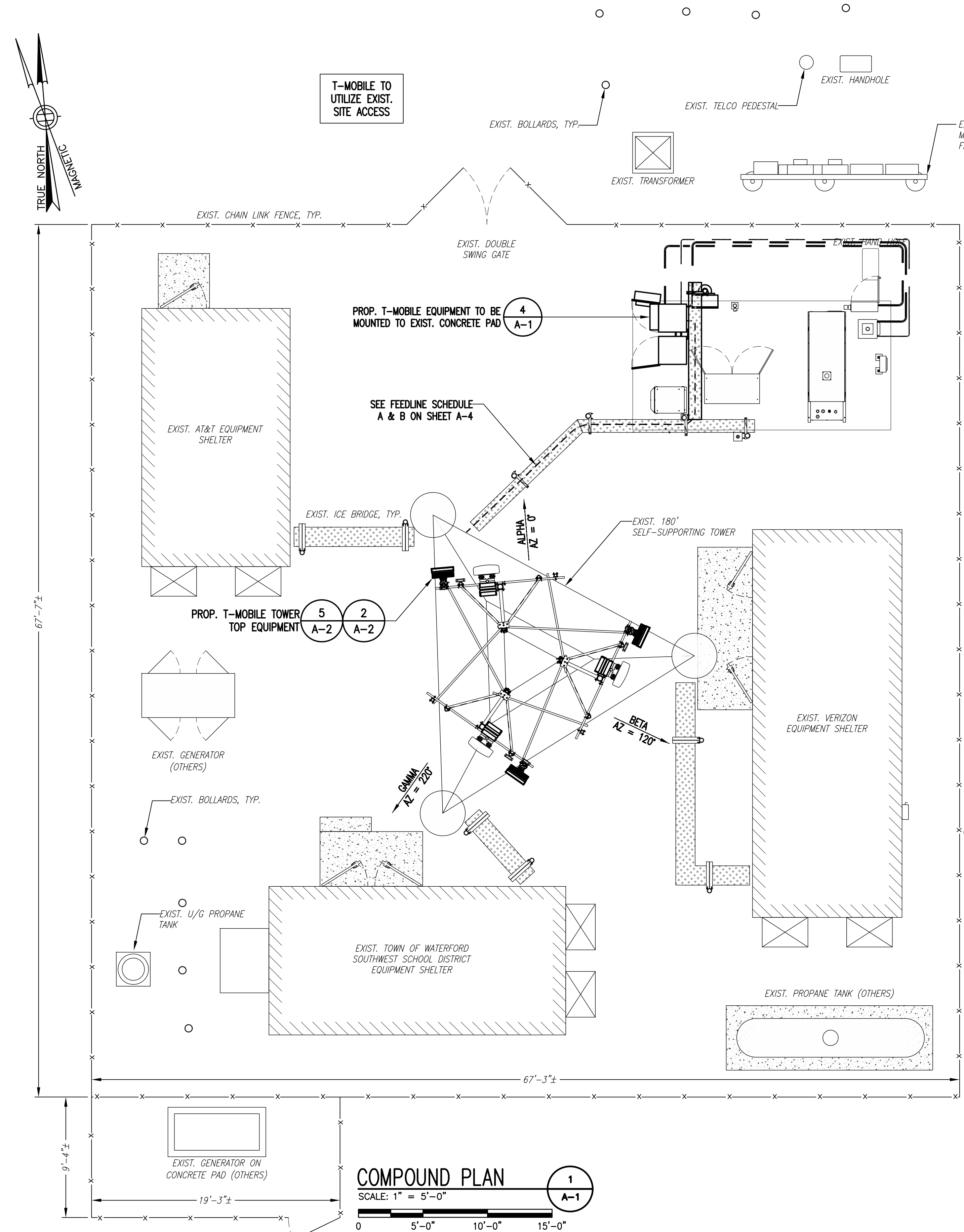


**SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):**  
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR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

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



**EXISTING EQUIPMENT PHOTO DETAIL**  
 SCALE: NTS

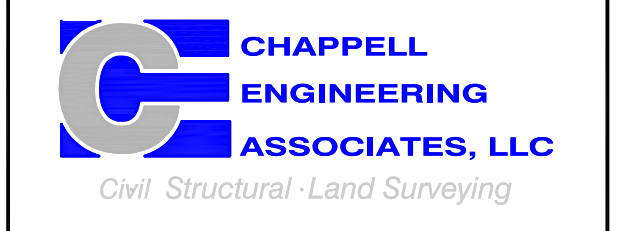


**NOTE:**  
 ALL PROPOSED CONDUITS TO BE BURIED TO AVOID TRIP HAZARD.

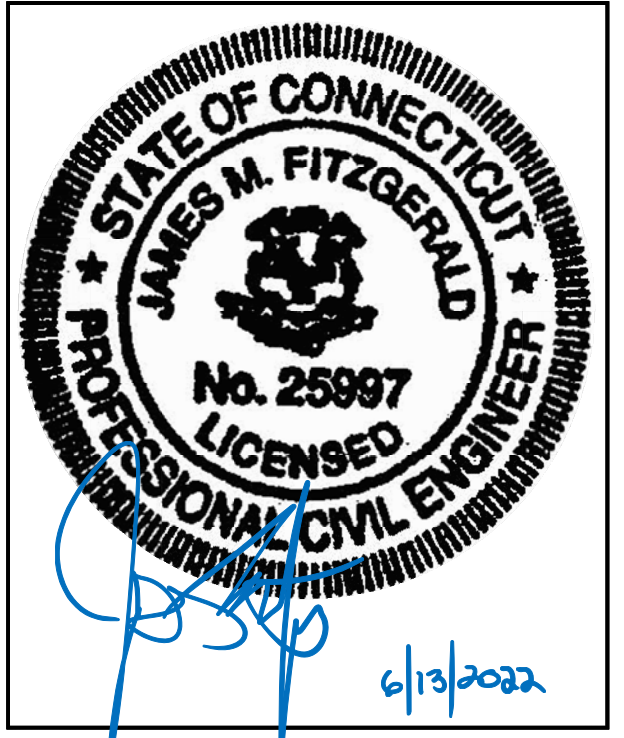
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CHECKED BY: JMT  
 APPROVED BY: JMT

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	06/10/22	ISSUED FOR CONSTRUCTION	BDJ
0	03/21/22	ISSUED FOR REVIEW	BDJ

SITE NUMBER:  
**CTNL808B**  
 SITE ADDRESS:  
 51 DANIELS AVENUE  
 WATERFORD, CT 06385

SHEET TITLE:  
**COMPOUND & EQUIPMENT PLANS**

SHEET NUMBER:  
**A-1**





2022.3.17 14:05

EXISTING ELEVATION PHOTO DETAIL  
SCALE: N.T.S.

1  
A-2

- TOP OF EXIST. SELF SUPPORT  
EL. = 180'± AGL (294'± AMSL)
- EXIST. TOWN OF WATERFORD OMNI ANTENNAS  
EL. = 180'± AGL
- EXIST. AT&T ANTENNAS  
EL. = 170'± AGL (284'± AMSL)
- EXIST. T-MOBILE TOWER SECTOR MOUNT TO REMAIN  
(1 PER SECTOR, TOTAL OF 3)
- PROP. & EXIST. T-MOBILE (6) ANTENNAS  
EL. = 160'± AGL (274'± AMSL)
- EXIST. VERIZON ANTENNAS  
EL. = 140'± AGL (254'± AMSL)

ALPHA, BETA & GAMMA SECTORS  
EXIST. T-MOBILE ERICSSON RADIO  
4449 MOUNTED BEHIND EXIST.  
ANTENNAS TO REMAIN  
(1 PER SECTOR, TOTAL OF 3)

1 5 ALPHA, BETA & GAMMA SECTORS  
A-3 A-2 PROP. T-MOBILE RADIO 4460 B25+B66 TO BE MOUNTED  
BEHIND PROP. ANTENNA (1 PER SECTOR, TOTAL OF 3)

TOP OF EXIST. T-MOBILE (3) ANTENNAS  
EL. = 164'± AGL (278'± AMSL)

TOP OF EXIST. T-MOBILE (3) ANTENNAS  
EL. = 161.38'± AGL (275.38'± AMSL)

2 5 ALPHA, BETA & GAMMA SECTORS  
A-3 A-2 PROP. T-MOBILE ERICSSON M-MIMO AIR6419 B41  
PANEL ANTENNAS TO BE MOUNTED TO EXIST.  
MOUNTING PIPES SECURED TO EXIST. TOWER  
SECTOR MOUNT (1 PER SECTOR, TOTAL OF 3)

ALPHA, BETA & GAMMA SECTORS  
EXIST. T-MOBILE RFS APXVAALL24\_43-U-NA20  
ANTENNAS MOUNTED TO EXIST. TOWER SECTOR  
MOUNT TO REMAIN  
(1 PER SECTOR, TOTAL OF 3)

EXIST. 180'± SELF SUPPORT

SEE FEEDLINE SCHEDULE  
A & B ON SHEET A-4

NOTE:  
GROUND EQUIPMENT NOT  
SHOWN FOR CLARITY

GROUND LEVEL  
EL. = 0' AGL

TOWER ELEVATION

SCALE: 1" = 10'-0"



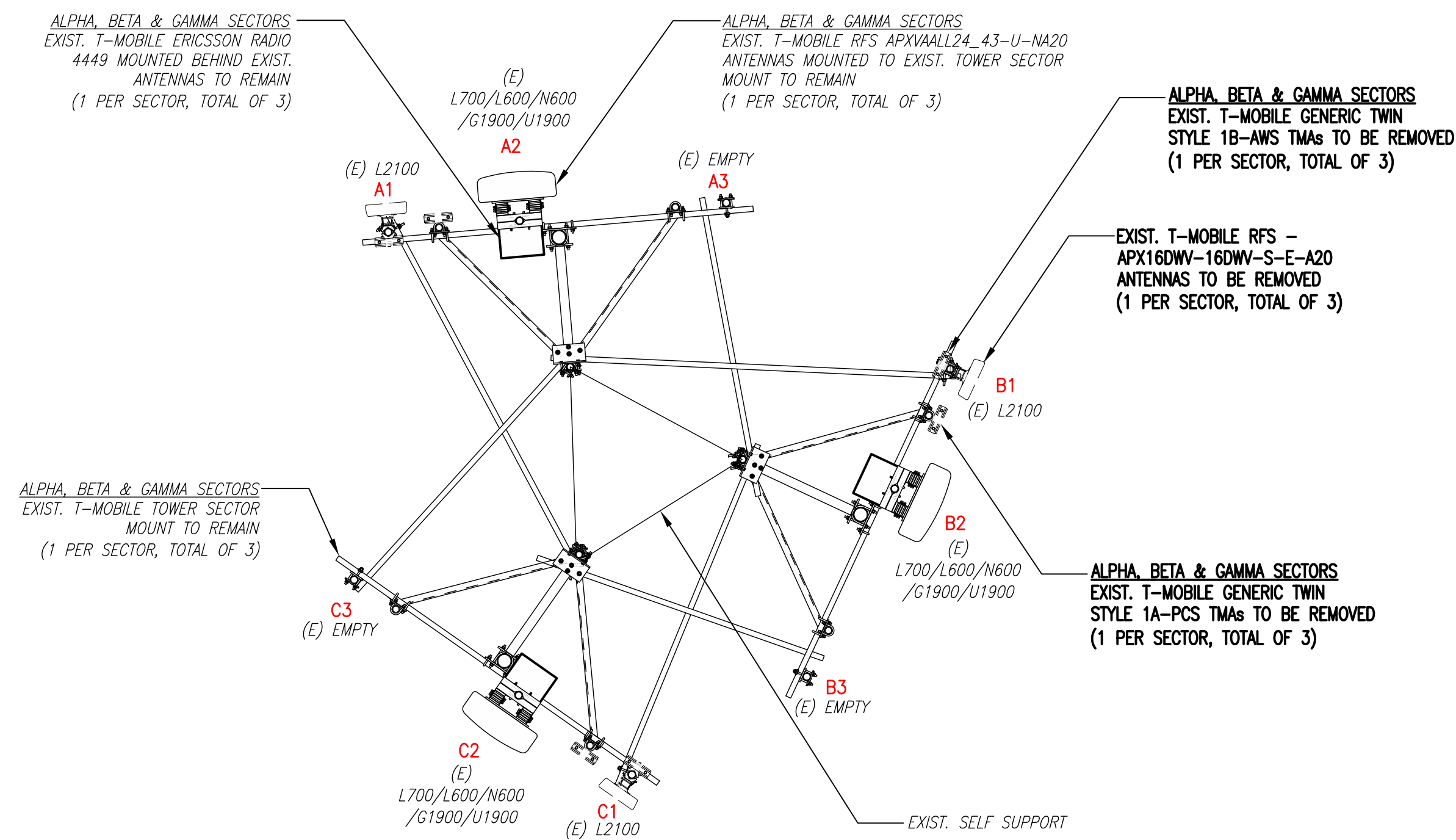
2  
A-2



EXISTING ANTENNA ARRAY

SCALE: N.T.S.

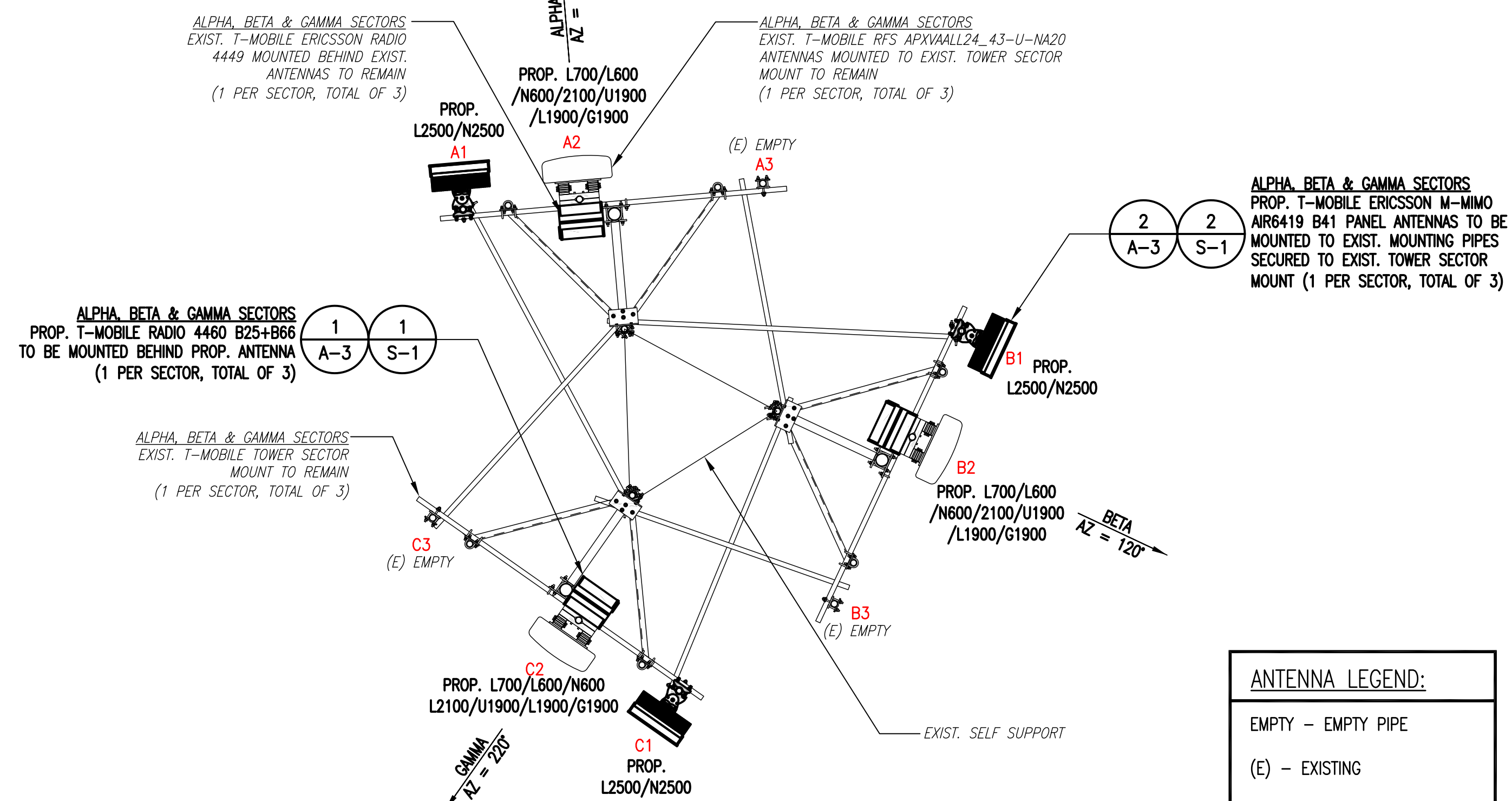
3  
A-2



EXISTING ANTENNA PLAN

SCALE: N.T.S.

4  
A-2



PROPOSED ANTENNA PLAN

SCALE: N.T.S.

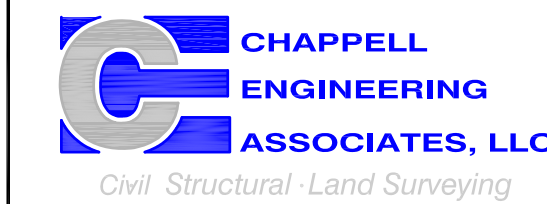
5  
A-2

T-Mobile

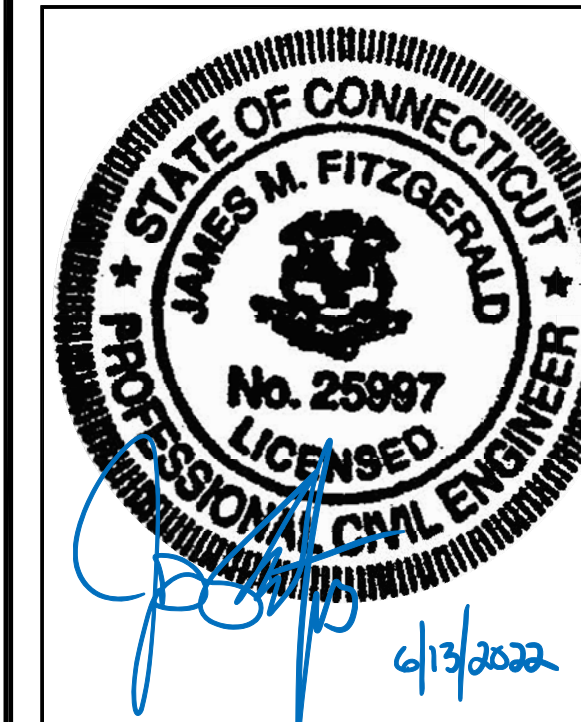
T-MOBILE NORTHEAST LLC  
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700



SBA COMMUNICATIONS CORP.  
134 FLANDERS ROAD, SUITE 125  
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APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	06/10/22	ISSUED FOR CONSTRUCTION	BDJ
0	03/21/22	ISSUED FOR REVIEW	BDJ

SITE NUMBER:

CTNL808B

SITE ADDRESS:  
51 DANIELS AVENUE  
WATERFORD, CT 06385

SHEET TITLE

ELEVATION & ANTENNA PLANS

SHEET NUMBER

A-2

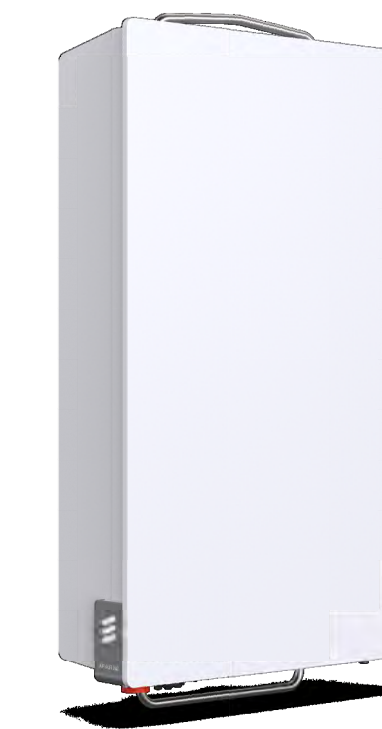




**ERICSSON RADIO 4460 B25+B66**  
 DIMENSIONS: 17.0"H x 15.1"W x 11.9"D  
 WEIGHT: 104.0 lbs  
 QUANTITY: 1 PER SECTOR, TOTAL OF 3

**RADIO DETAIL**  
 SCALE: N.T.S.

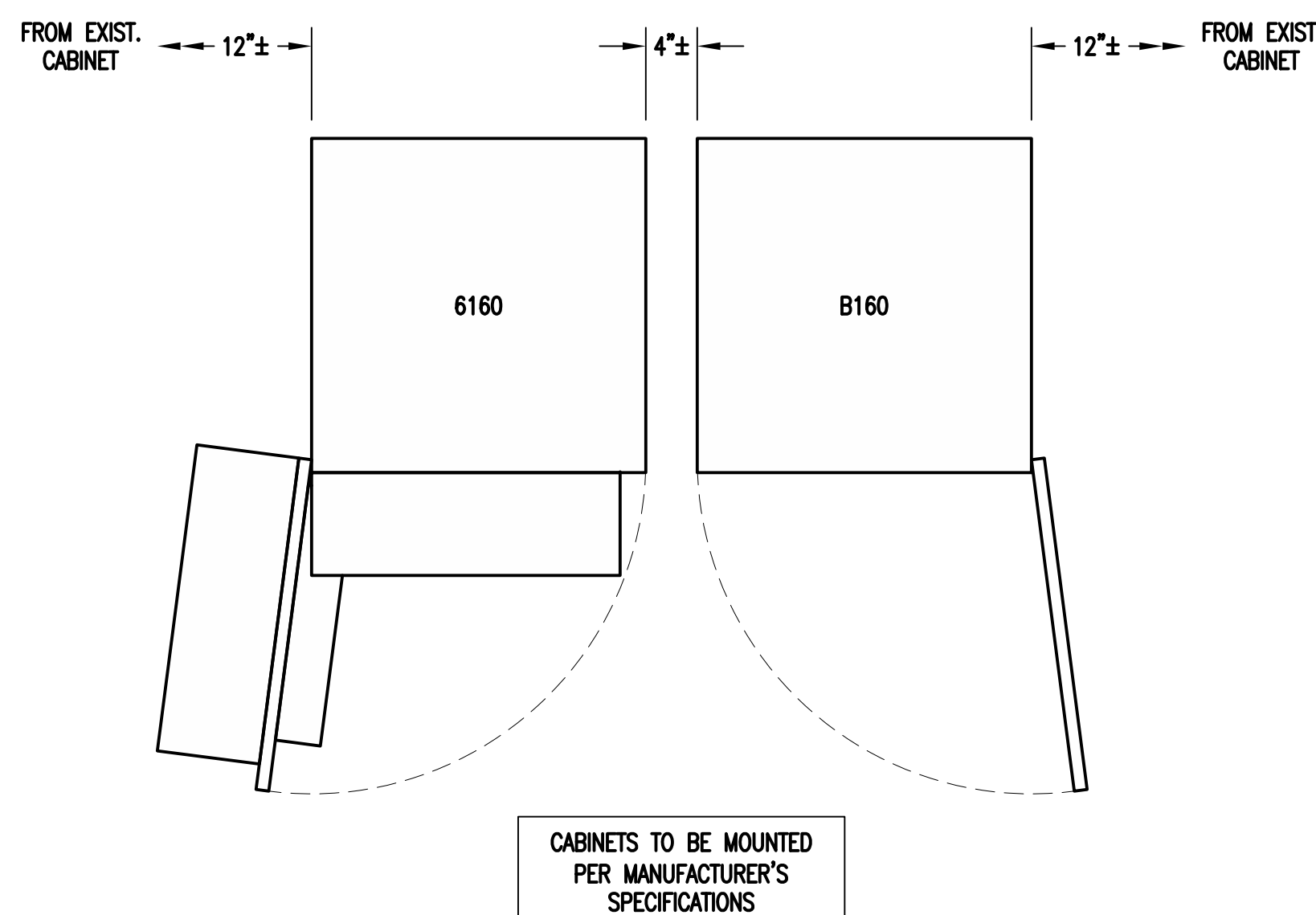
1  
A-3



**ERICSSON M-MIMO AIR6419 B41 ANTENNA**  
 DIMENSIONS: 36.3"H x 20.9"W x 9.0"D  
 WEIGHT: 83.3 lbs  
 QUANTITY: 1 PER SECTOR, TOTAL OF 3

**ANTENNA DETAIL**  
 SCALE: N.T.S.

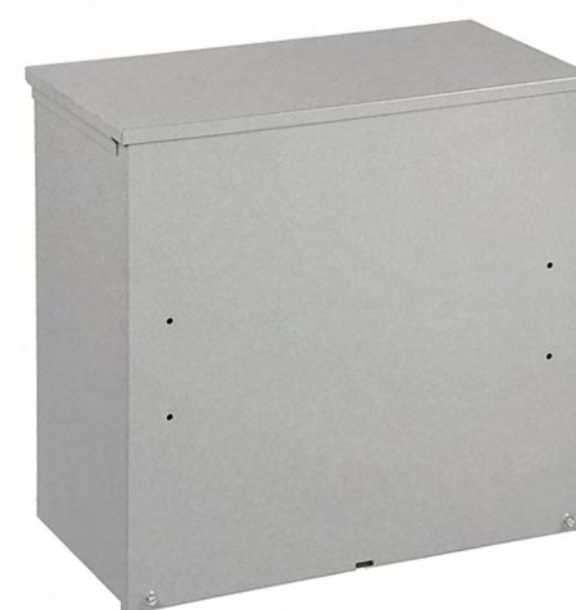
2  
A-3



**ERICSSON 6161 SITE SUPPORT CABINET**    **ERICSSON B160 BATTERY CABINET**  
 DIMENSIONS: 63.25"H x 26.0"W x 34.0"D    DIMENSIONS: 63.25"H x 26.0"W x 26.0"D  
 QUANTITY: TOTAL OF 1    QUANTITY: TOTAL OF 1

**EQUIPMENT DETAIL**  
 SCALE: N.T.S.

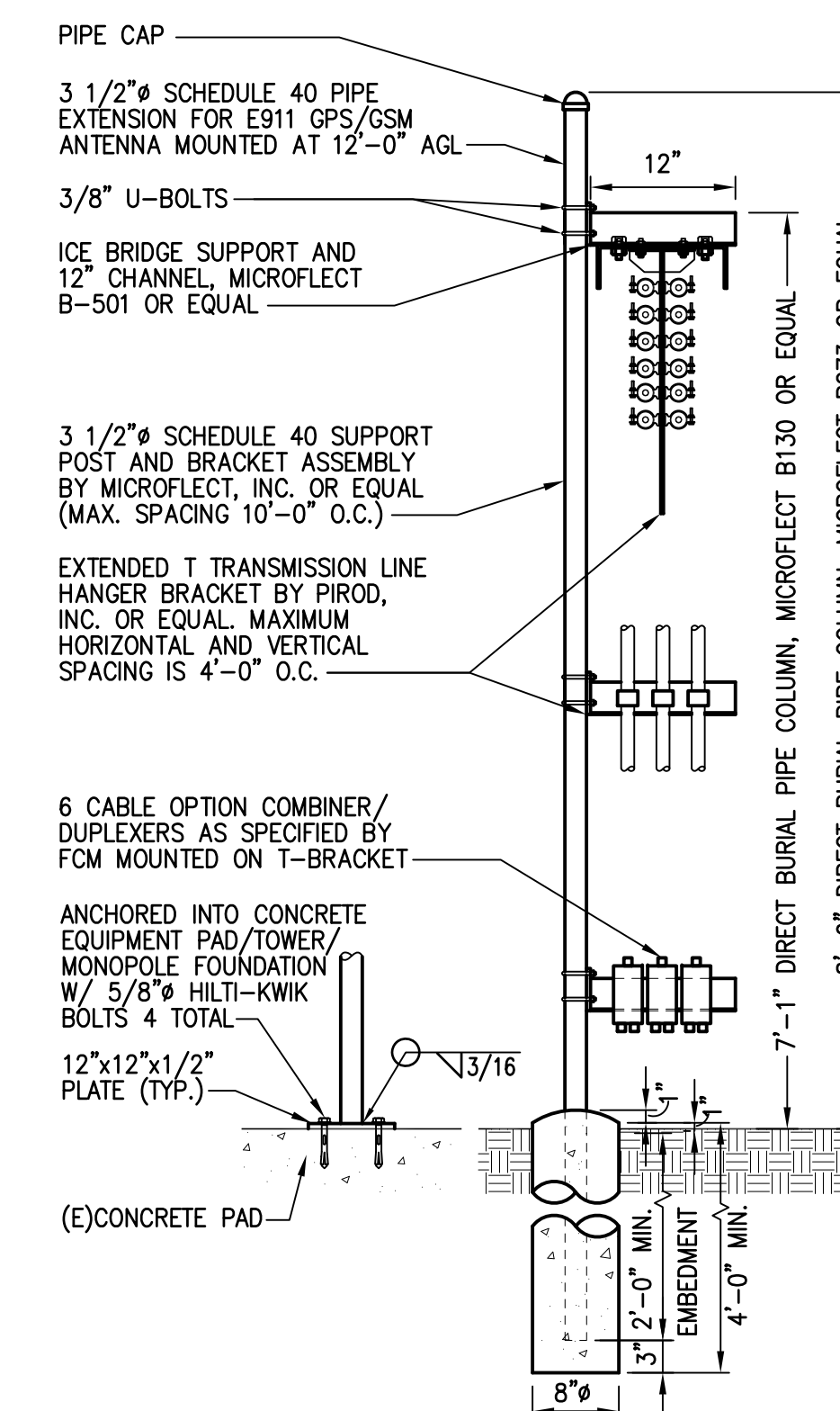
3  
A-3



**SLACKBOX - HOFFMAN 32FH91 NEMA 3R ENCLOSURE**  
 DIMENSIONS: 24.0"H x 24.0"W x 12.0"D  
 QUANTITY: TOTAL OF 1

**SSC DETAILS**  
 SCALE: N.T.S.

4  
A-3



**SECTION AT ICE BRIDGE/CABLE TRAY**  
 SCALE: 3/4"=1'-0"

5  
A-3

**T-Mobile**  
 T-MOBILE NORTHEAST LLC  
 15 COMMERCE WAY, SUITE B  
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 OFFICE: (508) 286-2700

**SBA**  
 SBA COMMUNICATIONS CORP.  
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**CHAPPELL ENGINEERING ASSOCIATES, LLC**  
 Civil Structural Land Surveying  
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 MARLBOROUGH, MA 01752  
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**CTNL808B**  
 SITE ADDRESS:  
 51 DANIELS AVENUE  
 WATERFORD, CT 06385

SHEET TITLE  
**SITE DETAILS**

SHEET NUMBER  
**A-3**

FINAL ANTENNA CONFIGURATION								
SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	SIGNAL CABLES
ALPHA	A1 ERICSSON M-MIMO AIR6419 B41	160'-0"± AGL	0°	0°	2'	L2500/N2500	-	(P) (2) 1-3/4" (6x24) HCS FIBER CABLES (E) (3) 1-5/8" (6x12) HCS FIBER CABLES
	A2 RFS APXVAALL24_43-U-NA20	160'-0"± AGL	0°	0°	2'	L700/L600/N600 L1900/G1900/U1900/L2100	ERICSSON RADIO 4449 B71+B85 ERICSSON RADIO 4460 B25+B66	
	A3 EMPTY							
BETA	B1 ERICSSON M-MIMO AIR6419 B41	160'-0"± AGL	120°	0°	2'	L2500/N2500	-	
	B2 RFS APXVAALL24_43-U-NA20	160'-0"± AGL	120°	0°	2'	L700/L600/N600 L1900/G1900/U1900/L2100	ERICSSON RADIO 4449 B71+B85 ERICSSON RADIO 4460 B25+B66	
	B3 EMPTY							
GAMMA	C1 ERICSSON M-MIMO AIR6419 B41	160'-0"± AGL	220°	0°	2'	L2500/N2500	-	
	C2 RFS APXVAALL24_43-U-NA20	160'-0"± AGL	220°	0°	2'	L700/L600/N600 L1900/G1900/U1900/L2100	ERICSSON RADIO 4449 B71+B85 ERICSSON RADIO 4460 B25+B66	
	C3 EMPTY							

CABLE NOTE: EXISTING T-MOBILE (12) 1-5/8" COAX CABLES & (1) 1-3/4" (9x18) HCS CABLE TO BE CAPPED, WRAPPED AND REMOVED. (1) 1/2" COAX CABLE USED FOR T-MOBILE GPS ANTENNA TO REMAIN. SEE FEEDLINE SCHEDULE A & B BELOW.

NOTE: RFDS REV5 - 02/25/22

FEEDLINE SCHEDULE		
SCHEDULE	FEEDLINES	LOCATION
A	<p>EXISTING TO REMAIN: (3) 1-5/8" (6x12) HCS FIBER CABLES (1) 1/2" COAX CABLE FOR GPS ANTENNA</p> <p>EXISTING TO BE REMOVED: ALL 1-5/8" COAX CABLES &amp; (1) 1-3/4" (9x18) HCS FIBER CABLE</p>	ROUTED PER STRUCTURAL ANALYSIS
B	PROPOSED: (2) 1-3/4" (6x24) HCS FIBER CABLES	

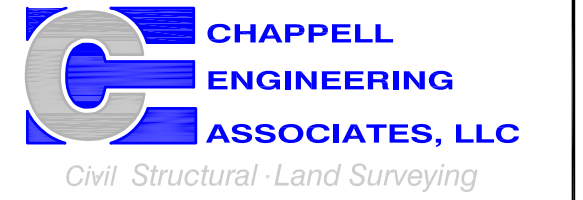
NOTE:  
EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

..T..Mobile..

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WATERFORD, CT 06385

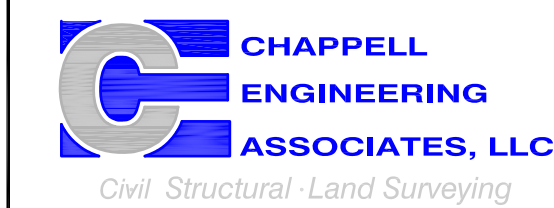
SHEET TITLE  
**ANTENNA & FEEDLINE CHARTS**

SHEET NUMBER  
**A-4**

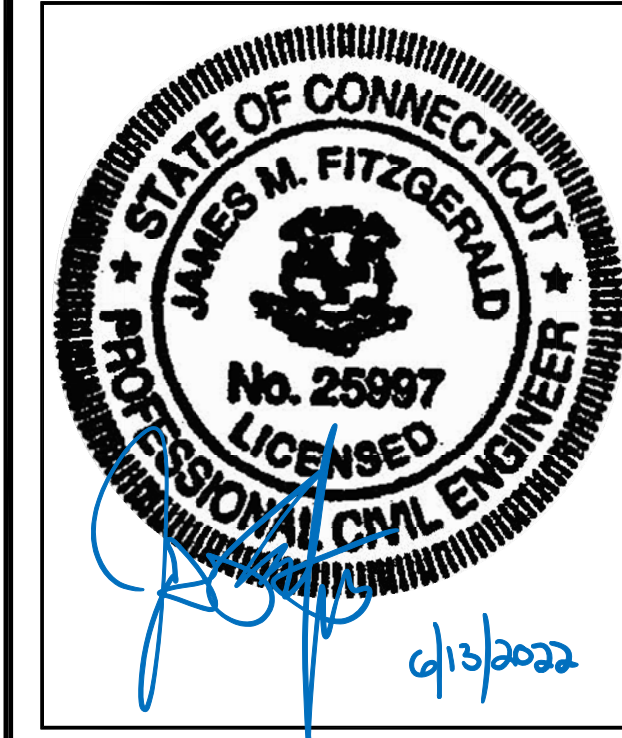




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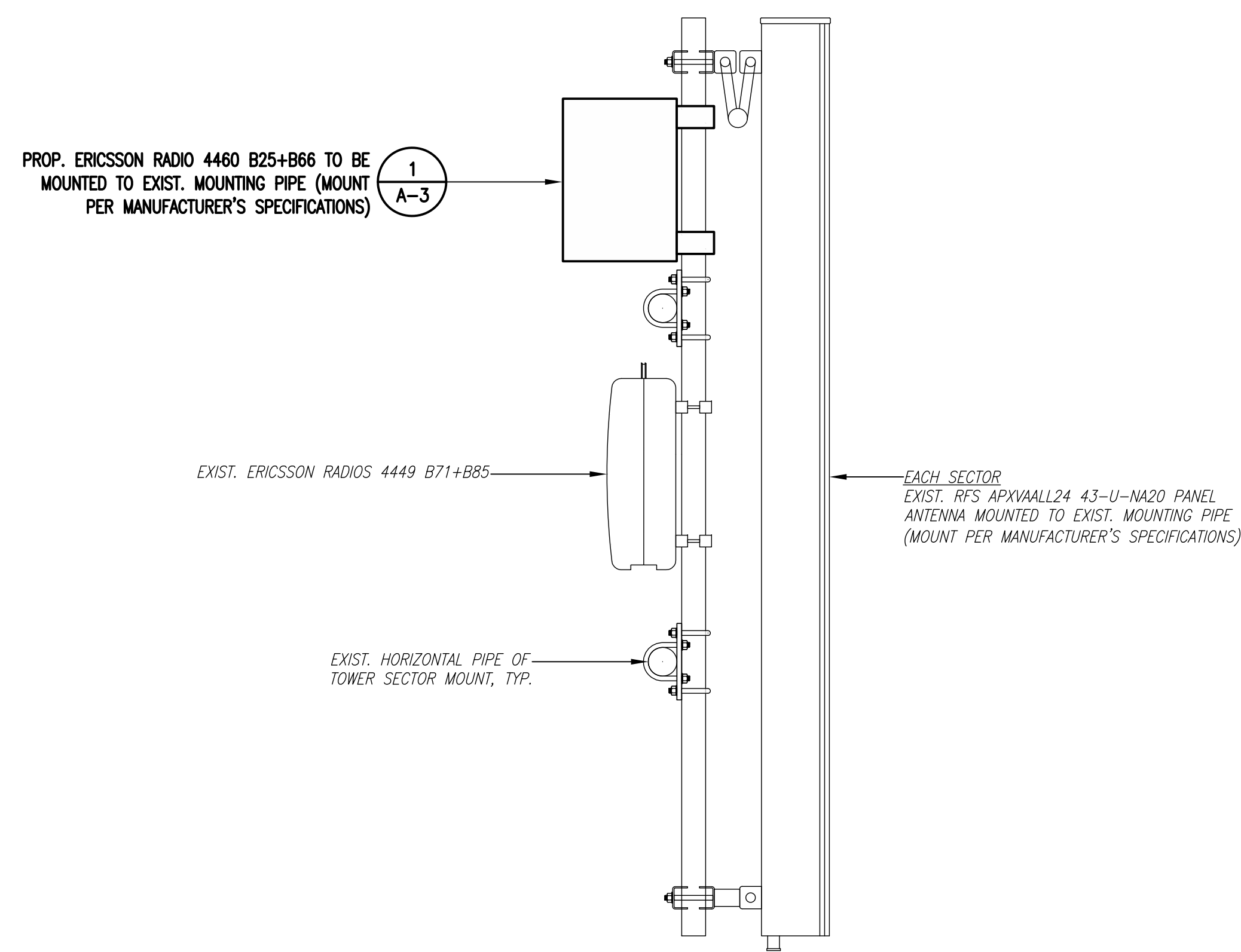
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SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
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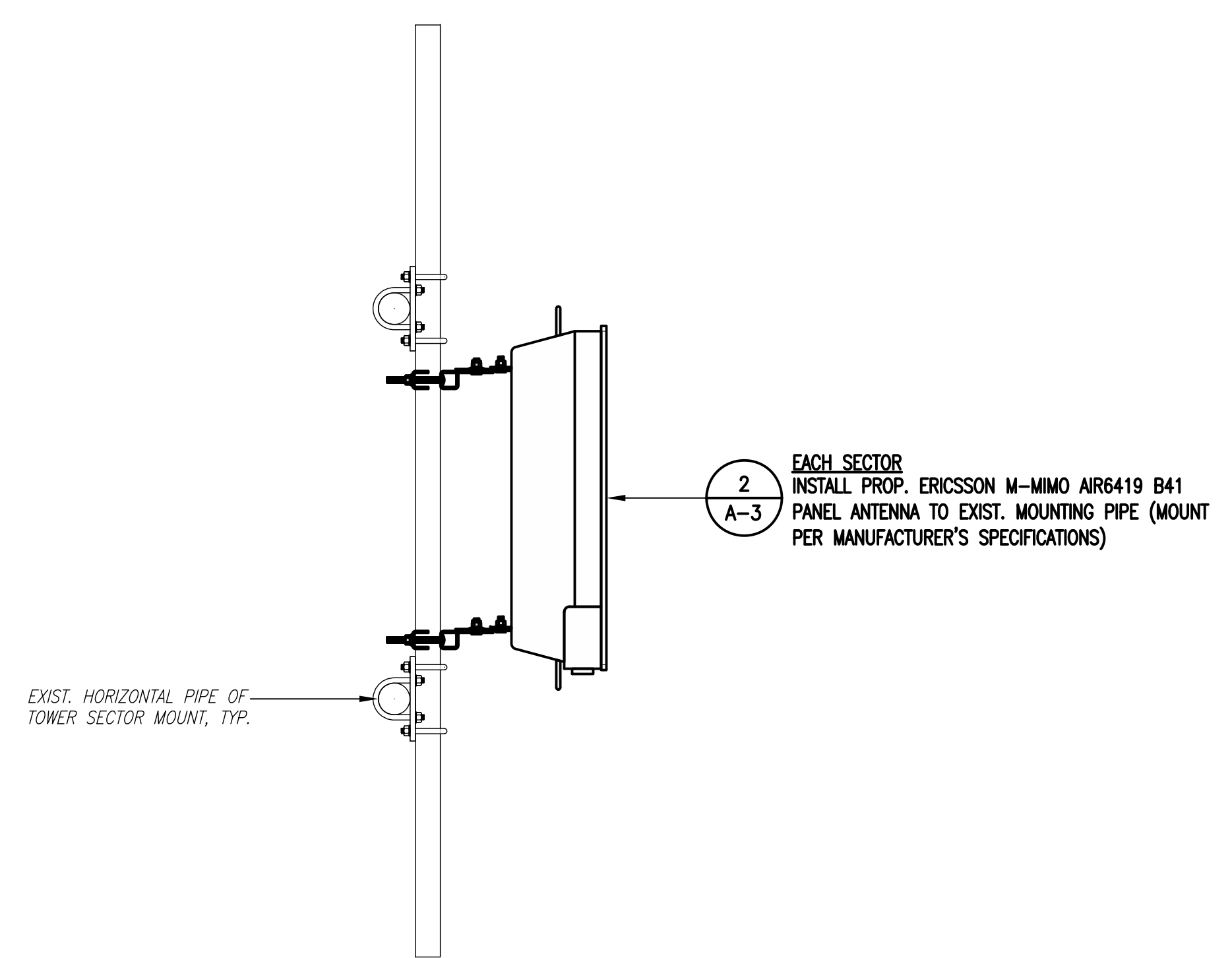
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**CTNL808B**  
SITE ADDRESS:  
51 DANIELS AVENUE  
WATERFORD, CT 06385

SHEET TITLE  
**ANTENNA MOUNTING  
DETAILS**

SHEET NUMBER  
**S-1**



**ANTENNA & RADIO MOUNT DETAIL** 1  
S-1  
SCALE: N.T.S.

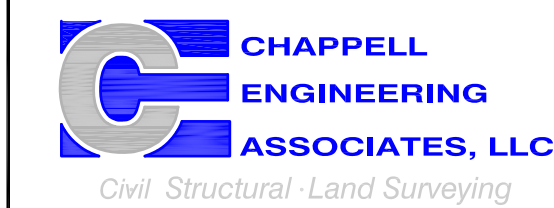


**ANTENNA MOUNT DETAIL** 2  
S-1  
SCALE: N.T.S.

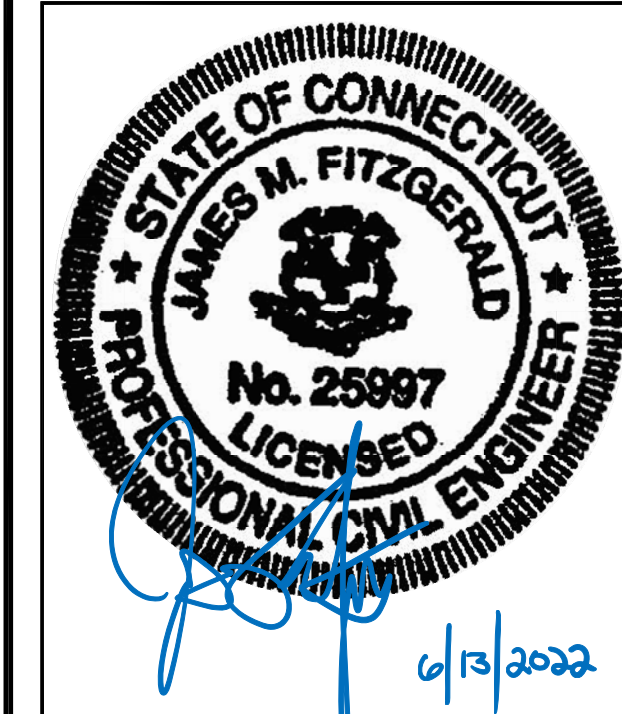




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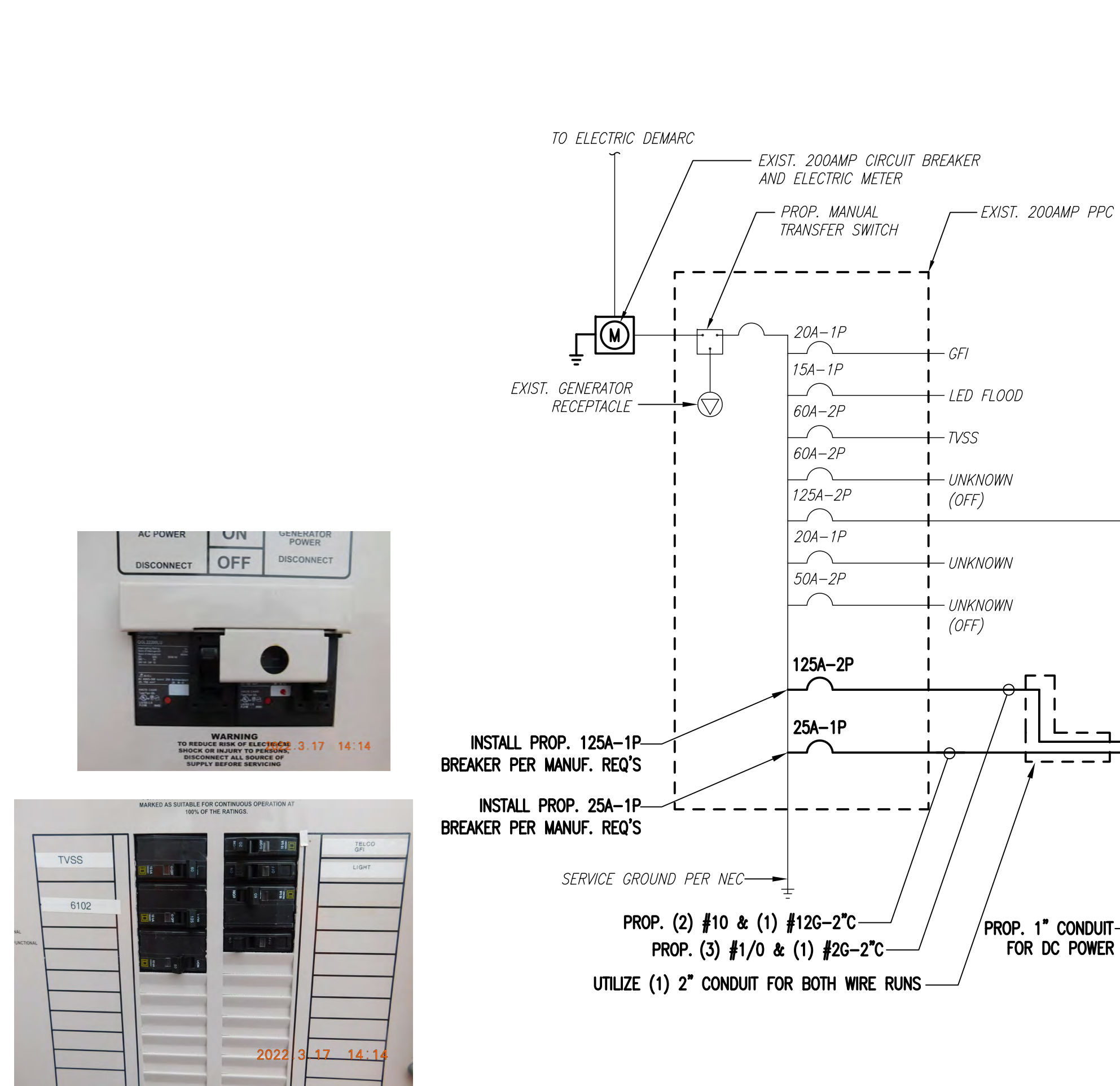
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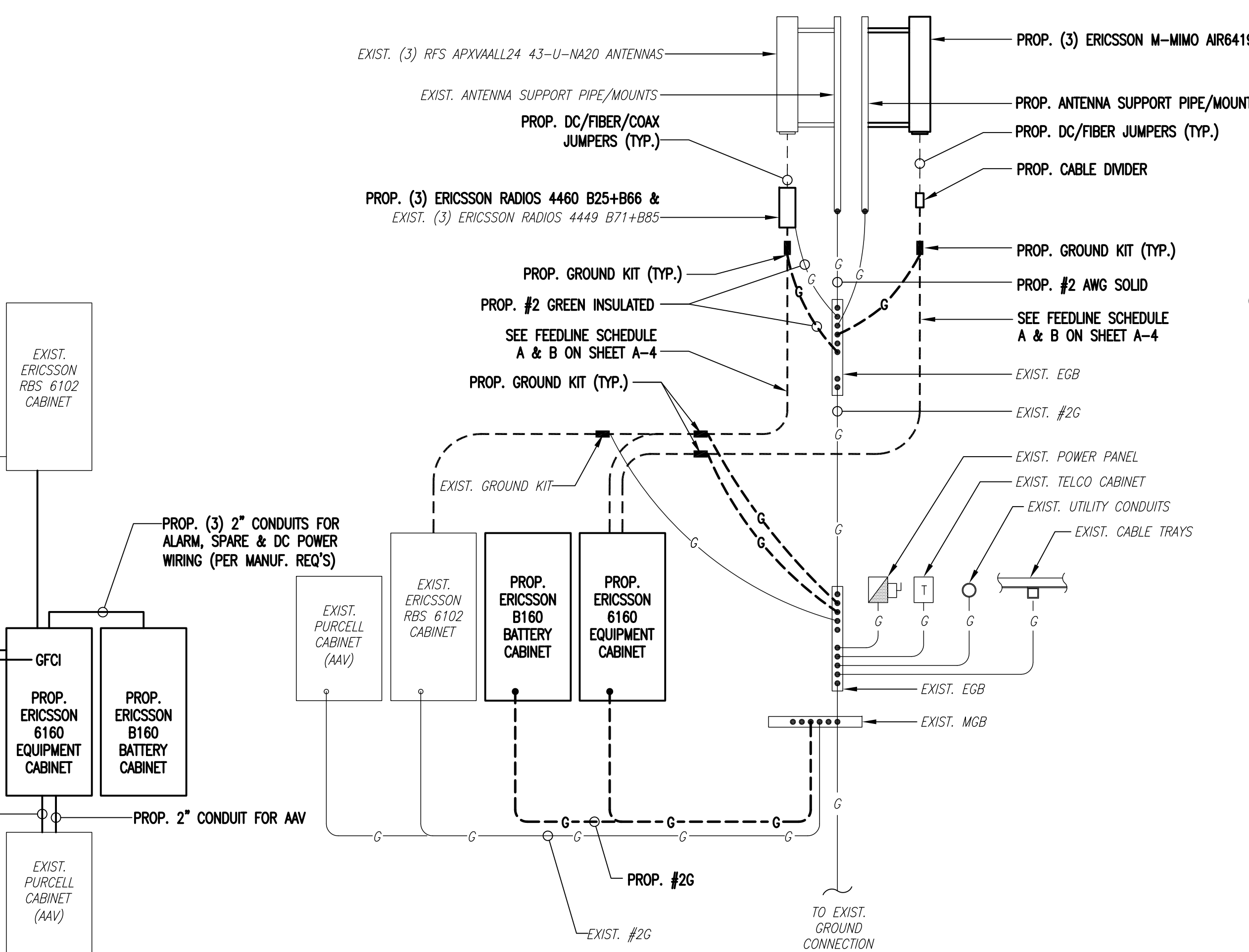
SHEET TITLE  
**ELECTRIC & GROUNDING  
DETAILS**

SHEET NUMBER  
**E-1**

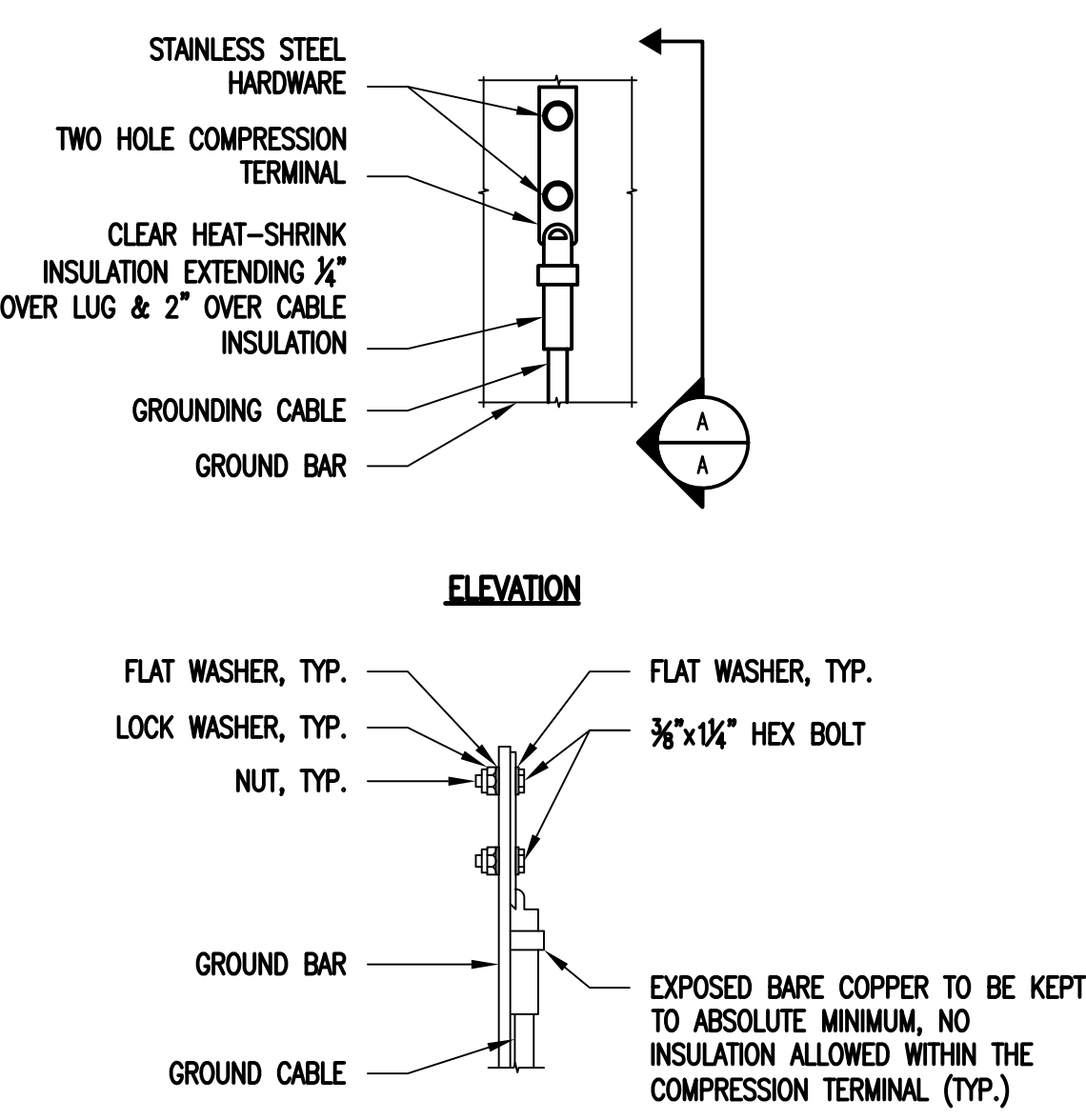


**PPC PHOTO DETAIL**  
SCALE: NOT TO SCALE

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

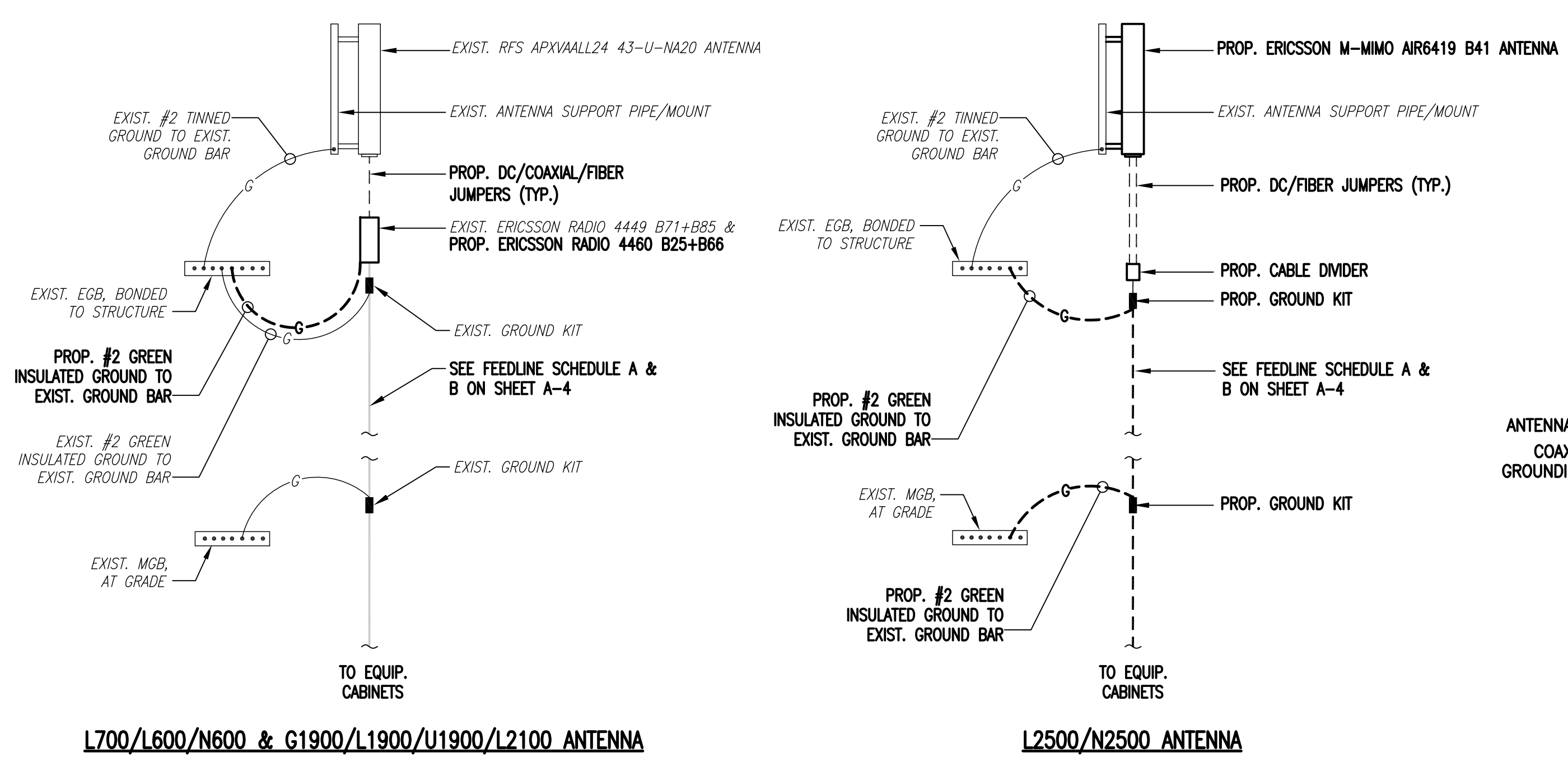


**GROUNDING RISER DIAGRAM**  
SCALE: NOT TO SCALE

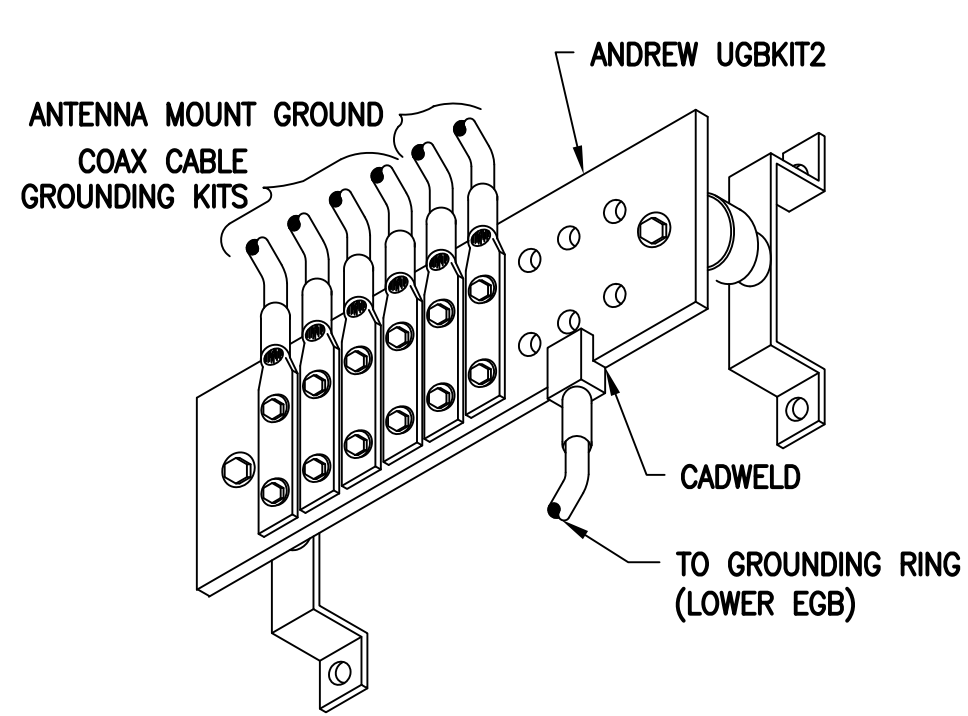


**TYPICAL GROUND BAR CONNECTIONS DETAIL**  
SCALE: NOT TO SCALE

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



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



**GROUND BAR (EGB)**  
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, THWN, 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 BITS 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 BITS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BITS 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 BITS 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 6" 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 OWN 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 D

## **Structural Analysis Report**





**Tower Engineering Solutions**

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

---

**Structural Analysis Report**

**Existing 180 ft Sabre Self Supporting Tower**  
**Customer Name: SBA Communications Corp**  
**Customer Site Number: CT09865-S**  
**Customer Site Name: Niantic**  
**Carrier Name: T-Mobile (App#: 193159-1)**  
**Carrier Site ID / Name: CTNL808B / Niantic**  
**Site Location: 51 Daniel'S Avenue**  
**Waterford, Connecticut**  
**New London County**  
**Latitude: 41.330263**  
**Longitude: -72.166672**

**Analysis Result:**

**Max Structural Usage: 81.0% [Pass]**  
**Max Foundation Usage: 84.0% [Pass]**  
**Additional Usage Caused by New Mount/Mount Modification: N/A**

**Report Prepared By: Samnang Chay**







**Tower Engineering Solutions**

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

---

## **Structural Analysis Report**

**Existing 180 ft Sabre Self Supporting Tower**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT09865-S**

**Customer Site Name: Niantic**

**Carrier Name: T-Mobile (App#: 193159-1)**

**Carrier Site ID / Name: CTNL808B / Niantic**

**Site Location: 51 Daniel'S Avenue**

**Waterford, Connecticut**

**New London County**

**Latitude: 41.330263**

**Longitude: -72.166672**

### **Analysis Result:**

**Max Structural Usage: 81.0% [Pass]**

**Max Foundation Usage: 84.0% [Pass]**

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

**Report Prepared By: Samnang Chay**

## Introduction

The purpose of this report is to summarize the analysis results on the 180 ft Sabre Self Supporting Tower 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>	Tower Innovations, Project Number 5210 dated 11/05/2008
<b>Foundation Drawing</b>	Tower Innovations, Project Number 5210 dated 11/05/2008
<b>Geotechnical Report</b>	Dr. Clearance Welti, P.E., P.C. Geotechnical Engineering (Ref: Geotechnical Study for proposed Cell Tower at Southwest School 51 Daniels Road, Waterford, CT) dated 10/23/2008
<b>Modification Drawings</b>	N/A
<b>Mount Analysis</b>	N/A

## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2. In accordance with this standard, the structure was analyzed using **TESTowers**, 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 $V_{ult} = 135$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 105.0$ mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	TIA-222-G-2 / 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>	$S_5 = 0.161$ , $S_1 = 0.058$

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

## Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	180.0	2	Sinclair SC488-HF2LNF Omnis	(2) 6' Standoffs (SitePRO1 HM6)	(2) 1 5/8"	Town of Waterford
2		1	DBSpectra ATS8TMA10 TMA			
3	171.8	3	Ericsson AIR 6419 B77G - Panel	(3) Modified T-Frame W/ (3) 2.88" Pipe mast & (6) 2" std (2.38" O.D.) diagonal pipe brace	(11) 1 5/8" (1) 1" DC Power (2) 1/2" Fiber (6) 3/4" DC (1) 7/16" Fiber	AT&T
4	170.0	3	Cci DMP65R-BU4DA - Panel			
5		3	KMW EPBQ-654L8H6-L2 - Panel			
6		6	Powerwave TT19-08BP111-001 TMA			
7		6	Ericsson RRUS 32			
8		3	Ericsson RRUS 4478 B14			
9		3	Ericsson 4415 B25 RRU -			
10		3	Ericsson RRUS 4449 B5/B12 -			
11		2	Raycap DC6-48-60-18-8F-OVP			
12		1	Raycap DC9-48-60-24-8C-EV - OVP			
13		168.0	3			
-	160.0	3	RFS APX16DWV-16DWV-S-E-A20	(3) Modified T-Frame (3) Custom Mount Augmentations (3) Stabilizer Kits (3) 2.5STD x 8' Pipe Mounts	(16) 1 5/8" (3) 1 5/8" Fiber (1) 1/2"	T-Mobile
-		3	RFS APXVAARR24_43-U-NA20 Panel			
-		3	Ericsson KRY 112 144/1 TMA			
-		3	Ericsson KRY 112 489/2 TMA			
-		3	Ericsson Radio 4449 B71+B12 RRU			
-		3	Kathrein 782 11056 – Bias T			
21	150.0	3	JMA Wireless MX08FRO665-21 Panel	Commscope MTC3975083 Sector Mount	(1) 1.6" Hybrid	Dish Wireless
22		3	Fujitsu TA08025-B605 RRU			
23		3	Fujitsu TA08025-B604 RRU			
24		1	Raycap RDIDC-9181-PF-48 OVP			
25	140.0	3	Antel BXA-80063-6CF - Panel	(3) T-Frames	(16) 1 5/8" (2) 1 5/8" Fiber	Verizon
26		3	Antel BXA-70063-6CF-EDIN-0 Panel			
27		6	Commscope SBNHH-1D65B Panel			
28		3	Alcatel Lucent B66 RRH4X45 AWS Remote Radio			
29		3	Alcatel Lucent RRH 700 4X30 B13 Remote Radio			
30		2	Rfs Celwave DB-T1-6Z-8AB-OZ ODU			

## 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
14	160.0	3	RFS - APXVAARR24 43-U-NA20 - Panel	(3) Modified T-Frame (3) Custom Mount Augmentations (3) Stabilizer Kits (3) 2.5STD x 8' Pipe Mounts	(13) 1 5/8" (3) 1 5/8" Fiber (1) 1/2" (2) 1.9" Fiber	T-Mobile
15		3	Ericsson - KRY 112 144/1 - TMA/TTA			
16		3	Ericsson - KRY 112 489/2 - TMA/TTA			
17		3	Kathrein 782 11056 - TMA/TTA			
18		3	Ericsson - AIR 6419 B41 - Panel			
19		3	Ericsson - 4449 B71 + B85 - RRU			
20		3	Ericsson - 4460 B25 + B66 - RRU			

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

## Analysis Results

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

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	<b>81.0%</b>	<b>57.7%</b>	<b>35.0%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	433.8	379.3	51.3

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 TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.2929 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 TIA-222 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 ANSI/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.

## Structure: CT09865-S-SBA

<b>Site Name:</b> Niantic	<b>Code:</b> TIA-222-G	4/13/2022
<b>Type:</b> Self Support	<b>Base Shape:</b> Triangle	<b>Basic WS:</b> 105.00
<b>Height:</b> 180.00 (ft)	<b>Base Width:</b> 23.00	<b>Basic Ice WS:</b> 50.00
<b>Base Elev:</b> 0.00 (ft)	<b>Top Width:</b> 5.00	<b>Operational WS:</b> 60.00



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### Section Properties

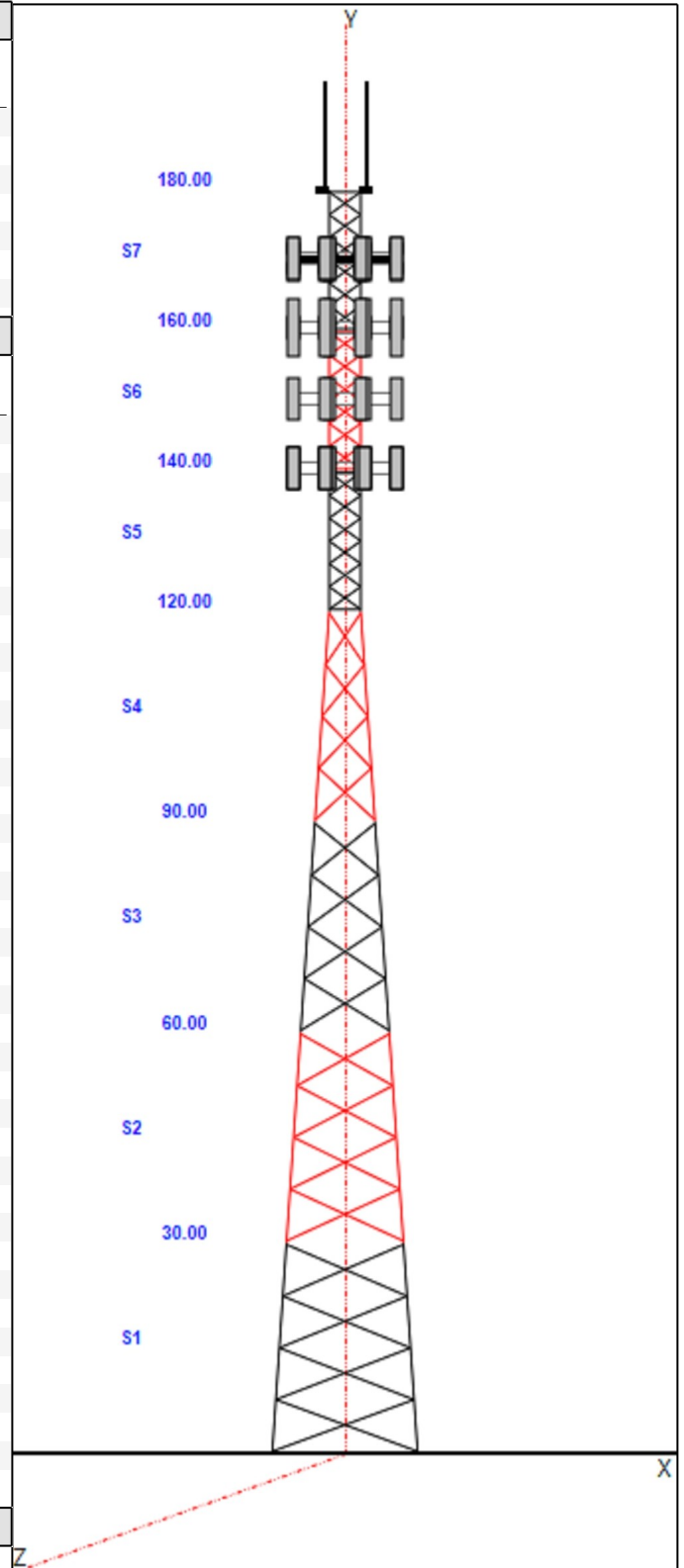
Sect	Leg Members	Diagonal Members	Horizontal Members
1	SOL 4 3/4" SOLID	SAE 4X4X0.3125	
2	SOL 4 3/4" SOLID	SAE 3.5X3.5X0.25	
3	SOL 4 1/2" SOLID	SAE 3X3X0.1875	
4	SOL 4 1/4" SOLID	SAE 2.5X2.5X0.1875	
5	SOL 3 1/2" SOLID	SAE 3X3X0.1875	SOL 1 1/8" SOLID
6	SOL 2 1/2" SOLID	SAE 2.5X2.5X0.1875	SOL 1" SOLID
7	SOL 1 3/4" SOLID	SAE 2X2X0.1875	SOL 7/8" SOLID

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
180.00	187.63	2	SC488-HF2LNF
180.00	180.00	1	ATS8TMA10
180.00	180.00	1	Lightning Rod
180.00	180.00	1	Beacon
180.00	180.00	2	SitePRO1 HM6 6' Standoffs
170.00	170.00	3	EPBQ-654L8H6-L2
170.00	170.00	6	TT19-08BP111-001 TMA-TTA
170.00	170.00	6	RRUS-32 RRU/RRH
170.00	170.00	3	4478 RRU/RRH
170.00	170.00	2	DC6-48-60-18-8F
170.00	170.00	3	Modified T-Frame
170.00	171.80	3	Ericsson AIR 6419 B77G
170.00	170.00	3	Cci DMP65R-BU4DA
170.00	168.00	3	Ericsson AIR 6449 B77D
170.00	170.00	1	(6) 2" Diagonal Pipe braces
170.00	170.00	3	Ericsson 4415 B25 RRU
170.00	170.00	3	Ericsson RRUS 4449 B5/B12
170.00	170.00	1	Raycap DC9-48-60-24-8C-EV
160.00	160.00	3	APXVAARR24_43-U-NA20
160.00	160.00	3	KRY 112 144/1
160.00	160.00	3	KRY 112 489/2
160.00	160.00	3	Kathrein 782 11056
160.00	160.00	3	Modified T-Frame
160.00	160.00	3	AIR 6419 B41
160.00	160.00	3	4449 B71 + B85
160.00	160.00	3	4460 B25 + B66
150.00	150.00	3	MX08FRO665-21
150.00	150.00	1	(3) MTC3975083
150.00	150.00	3	TA08025-B605
150.00	150.00	3	TA08025-B604
150.00	150.00	1	RDIDC-9181-PF-48
140.00	140.00	3	BXA-80063-6CF
140.00	140.00	3	BXA-70063-6CF-EDIN-0
140.00	140.00	6	SBNHH-1D65B
140.00	140.00	3	B66 RRH4X45 AWS
140.00	140.00	3	RRH 700 4X30 B13 Remote
140.00	140.00	2	DB-T1-6Z-8AB-0Z ODU
140.00	140.00	3	T-Frame

### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	180.00	2	1 5/8" Coax



**Structure: CT09865-S-SBA**

<b>Site Name:</b> Niantic	<b>Code:</b> TIA-222-G	4/13/2022
<b>Type:</b> Self Support	<b>Base Shape:</b> Triangle	<b>Basic WS:</b> 105.00
<b>Height:</b> 180.00 (ft)	<b>Base Width:</b> 23.00	<b>Basic Ice WS:</b> 50.00
<b>Base Elev:</b> 0.00 (ft)	<b>Top Width:</b> 5.00	<b>Operational WS:</b> 60.00



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0.00	180.00	1	W/G Ladder
0.00	170.00	11	1 5/8" Coax
0.00	170.00	1	1" DC Power
0.00	170.00	2	1/2" Fiber
0.00	170.00	6	3/4" DC
0.00	170.00	1	7/16" Fiber
0.00	170.00	1	W/G Ladder
0.00	160.00	13	1 5/8" Coax
0.00	160.00	2	1 5/8" Fiber
0.00	160.00	2	1.9" Fiber
0.00	160.00	1	1/2" Coax
0.00	160.00	1	W/G Ladder
0.00	150.00	1	1.6" Hybrid
0.00	140.00	16	1 5/8" Coax
0.00	140.00	2	1 5/8" Fiber
0.00	140.00	1	W/G Ladder

**Base Reactions**

	Leg	Overturning
Max Uplift:	-379.32 (kips)	Moment: 8188.96 (ft-kips)
Max Down:	433.78 (kips)	Total Down: 67.98 (kips)
Max Shear:	51.26 (kips)	Total Shear: 81.50 (kips)



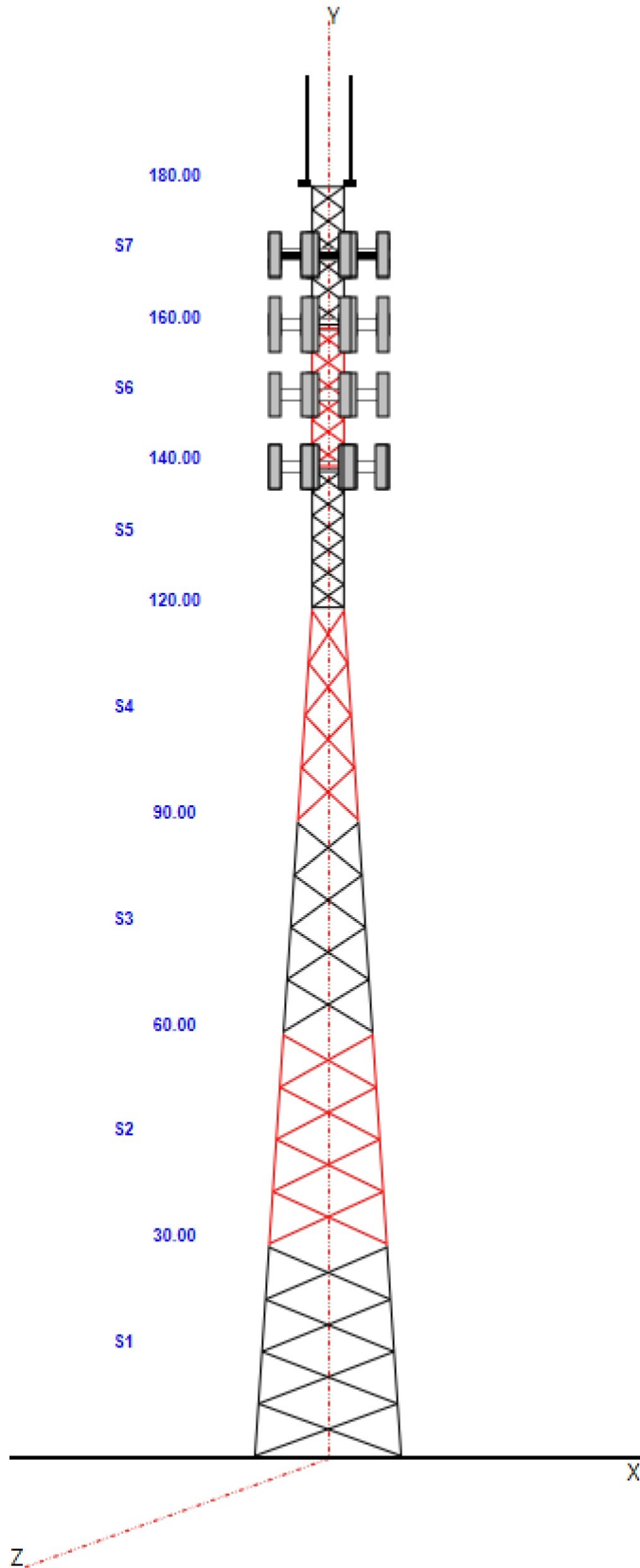
Structure: CT09865-S-SBA

Site Name: Niantic  
Type: Self Support  
Height: 180.00 (ft)  
Base Elev: 0.00 (ft)

Base Shape: Triangle  
Base Width: 23.00  
Top Width: 5.00

Code: TIA-222-G  
Basic WS: 105.00  
Basic Ice WS: 50.00  
Operational WS: 60.00

4/13/2022  
Page: 3



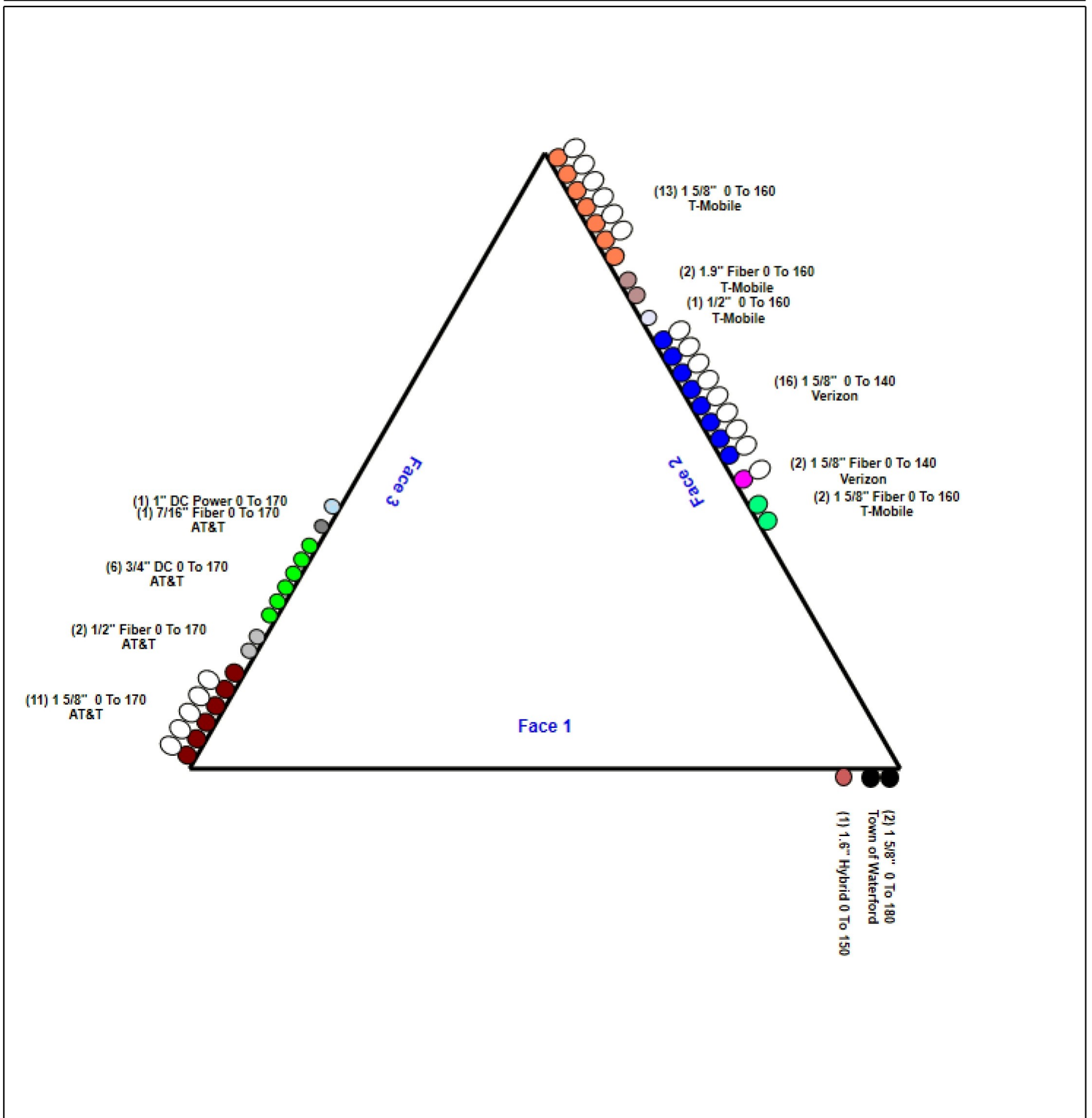
# Structure: CT09865-S-SBA - Coax Line Placement

Type: Self Support  
Site Name: Niantic  
Height: 180.00 (ft)

4/13/2022



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## Loading Summary

<b>Structure:</b> CT09865-S-SBA	<b>Code:</b> TIA-222-G	4/13/2022
<b>Site Name:</b> Niantic	<b>Exposure:</b> C	
<b>Height:</b> 180.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 0.85	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Discrete Appurtenances Properties

Attach Elev (ft)	Description	Qty	No Ice		Ice		Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
			Weight (lb)	CaAa (sf)	Weight (lb)	CaAa (sf)						
180.00	SC488-HF2LNF	2	30.00	3.810	213.06	9.380	183.000	2.500	2.500	1.00	1.00	7.625
180.00	ATS8TMA10	1	25.00	1.560	82.26	2.255	21.200	9.000	13.200	1.00	1.00	0.000
180.00	Lightning Rod	1	5.00	0.500	26.21	2.267	72.000	1.000	1.000	1.00	1.00	0.000
180.00	Beacon	1	36.00	2.720	170.87	3.681	28.000	17.500	17.500	1.00	1.00	0.000
180.00	SitePRO1 HM6 6' Standoffs	2	120.00	4.500	226.03	9.812	0.000	0.000	0.000	1.00	1.00	0.000
170.00	EPBQ-654L8H6-L2	3	54.90	8.270	266.12	9.594	73.000	12.000	7.400	0.80	0.84	0.000
170.00	TT19-08BP111-001 TMA-TTA	6	16.00	0.640	36.49	1.240	9.900	6.700	5.400	0.80	0.50	0.000
170.00	RRUS-32 RRU/RRH	6	77.00	3.870	192.32	4.117	29.900	13.300	9.500	0.80	0.67	0.000
170.00	4478 RRU/RRH	3	59.90	1.840	107.49	2.373	16.500	13.400	7.700	0.80	0.67	0.000
170.00	DC6-48-60-18-8F	2	31.80	0.920	94.40	1.363	24.000	11.000	11.000	0.80	1.00	0.000
170.00	Modified T-Frame	3	360.00	20.540	868.95	37.092	0.000	0.000	0.000	0.75	0.75	0.000
170.00	Ericsson AIR 6419 B77G	3	66.10	3.800	163.52	4.606	28.300	16.100	7.900	0.80	0.76	1.800
170.00	Cci DMP65R-BU4DA	3	67.70	8.000	394.75	9.250	48.000	20.700	7.700	0.80	0.71	0.000
170.00	Ericsson AIR 6449 B77D	3	88.00	4.130	227.60	4.999	30.800	16.100	10.800	0.80	0.85	-2.000
170.00	(6) 2" Diagonal Pipe braces	1	87.60	9.000	174.29	20.451	0.000	0.000	0.000	0.75	1.00	0.000
170.00	Ericsson 4415 B25 RRU	3	49.60	1.860	112.89	2.432	16.500	13.500	6.300	0.80	0.67	0.000
170.00	Ericsson RRUS 4449 B5/B12	3	73.20	1.970	131.67	2.546	17.900	13.200	10.600	0.80	0.67	0.000
170.00	Raycap DC9-48-60-24-8C-EV	1	26.20	1.140	133.52	2.747	31.400	10.200	18.200	1.00	1.00	0.000
160.00	APXVAARR24_43-U-NA20	3	128.00	20.240	545.93	22.140	95.900	24.000	7.800	0.80	0.70	0.000
160.00	KRY 112 144/1	3	11.00	0.410	21.78	0.885	6.900	6.100	2.700	0.80	0.50	0.000
160.00	KRY 112 489/2	3	15.40	0.650	33.02	1.262	11.000	6.100	3.900	0.80	0.50	0.000
160.00	Kathrein 782 11056	3	11.00	0.550	28.64	1.148	11.700	4.800	4.700	0.80	0.50	0.000
160.00	Modified T-Frame	3	517.00	20.600	1238.82	36.994	0.000	0.000	0.000	0.75	0.75	0.000
160.00	AIR 6419 B41	3	83.30	6.530	247.44	7.600	38.300	20.500	7.200	0.80	0.70	0.000
160.00	4449 B71 + B85	3	73.20	1.970	130.94	2.539	17.900	13.200	10.600	0.80	0.90	0.000
160.00	4460 B25 + B66	3	109.00	2.850	180.91	3.525	21.800	15.700	7.500	0.80	0.74	0.000
150.00	MX08FRO665-21	3	64.50	12.490	355.37	13.955	72.000	20.000	8.000	0.80	0.74	0.000
150.00	(3) MTC3975083	1	1056.4	29.450	2088.86	66.456	0.000	0.000	0.000	0.75	1.00	0.000
150.00	TA08025-B605	3	75.00	1.960	127.30	2.521	15.800	15.000	9.100	0.80	0.67	0.000
150.00	TA08025-B604	3	63.90	1.960	114.53	2.521	15.800	15.000	7.900	0.80	0.67	0.000
150.00	RDIDC-9181-PF-48	1	21.85	2.010	74.98	2.578	16.570	14.570	8.460	1.00	1.00	0.000
140.00	BXA-80063-6CF	3	17.00	7.570	163.19	10.294	71.000	11.200	5.200	0.80	0.73	0.000
140.00	BXA-70063-6CF-EDIN-0	3	17.00	7.570	163.19	10.294	71.000	11.200	5.200	0.80	0.73	0.000
140.00	SBNHH-1D65B	6	40.00	8.160	239.70	9.440	72.600	11.900	7.100	0.80	0.83	0.000
140.00	B66 RRH4X45 AWS	3	56.80	2.540	111.91	3.204	25.800	11.800	7.200	0.80	0.82	0.000
140.00	RRH 700 4X30 B13 Remote	3	57.20	2.160	118.61	2.762	21.600	12.000	9.000	0.80	0.88	0.000
140.00	DB-T1-6Z-8AB-0Z ODU	2	18.90	4.800	160.23	5.660	24.000	24.000	10.000	0.80	0.71	0.000
140.00	T-Frame	3	260.00	10.600	617.85	18.916	0.000	0.000	0.000	0.75	0.75	0.000
<b>Totals:</b>		<b>105</b>	<b>9,593.56</b>		<b>26,366.82</b>						<b>Number of Appurtenances :</b>	<b>38</b>

## Loading Summary

<b>Structure:</b> CT09865-S-SBA	<b>Code:</b> TIA-222-G	4/13/2022
<b>Site Name:</b> Niantic	<b>Exposure:</b> C	
<b>Height:</b> 180.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 0.85	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	180.00	1 5/8" Coax	2	1.98	1.04	100.00	1	Individual NR		N	1.00	1.00	
0.00	180.00	W/G Ladder	1	2.00	6.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	170.00	1 5/8" Coax	11	1.98	1.04	50.00	3	Block		N	1.00	1.00	
0.00	170.00	1" DC Power	1	1.00	1.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	1/2" Fiber	2	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	3/4" DC	6	0.75	0.40	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	7/16" Fiber	1	0.43	0.15	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	W/G Ladder	1	2.00	6.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	160.00	1 5/8" Coax	13	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	160.00	1 5/8" Fiber	2	2.00	1.10	75.00	2	Individual IR		N	1.00	1.00	
0.00	160.00	1.9" Fiber	2	1.68	0.50	75.00	2	Individual IR		N	1.00	1.00	
0.00	160.00	1/2" Coax	1	0.65	0.16	100.00	2	Individual NR		N	1.00	1.00	
0.00	160.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	
0.00	150.00	1.6" Hybrid	1	1.60	1.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	140.00	1 5/8" Coax	16	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	140.00	1 5/8" Fiber	2	2.00	1.10	50.00	2	Block		N	1.00	1.00	
0.00	140.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	

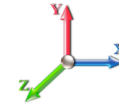
## Section Forces

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

4/13/2022



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**Load Case:** 1.2D + 1.6W Normal Wind - P1

1.2D + 1.6W 105 mph Wind at Normal To Face - P1

<b>Wind Load Factor:</b> 1.60	<b>Wind Importance Factor:</b> 1.00
<b>Dead Load Factor:</b> 1.20	<b>Ice Importance Factor:</b> 1.00
<b>Ice Dead Load Factor:</b> 0.00	

Sect Seq	Wind Height (ft)	qz (psf)	Total Area		Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice Area		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat (sqft)	Round (sqft)								Linear (sqft)	Linear (sqft)					
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	225.95	0.00	14,560.	0.0	5570.84	5546.44	11,117.28
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	225.95	0.00	12,341.	0.0	5264.39	6980.56	12,244.95
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	225.95	0.00	10,173.	0.0	4236.98	7773.12	12,010.10
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	225.95	0.00	8,972.9	0.0	3156.58	8343.71	11,500.29
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	150.63	0.00	5,316.2	0.0	2501.08	5818.29	8,319.37
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.57	0.00	3,362.9	0.0	2225.61	4097.48	6,323.09
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,741.2	0.0	1900.46	1281.32	3,181.78
														<b>56,468.7</b>	<b>0.0</b>	<b>64,696.87</b>		

**Load Case:** 1.2D + 1.6W Normal Wind - P2

1.2D + 1.6W 105 mph Wind at Normal To Face - P2

<b>Wind Load Factor:</b> 1.60	<b>Wind Importance Factor:</b> 1.00
<b>Dead Load Factor:</b> 1.20	<b>Ice Importance Factor:</b> 1.00
<b>Ice Dead Load Factor:</b> 0.00	

Sect Seq	Wind Height (ft)	qz (psf)	Total Area		Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice Area		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat (sqft)	Round (sqft)								Linear (sqft)	Linear (sqft)					
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	225.95	0.00	14,560.	0.0	3342.50	3327.87	6,670.37
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	225.95	0.00	12,341.	0.0	3158.63	4188.34	7,346.97
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	225.95	0.00	10,173.	0.0	2542.19	4663.87	7,206.06
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	225.95	0.00	8,972.9	0.0	1893.95	5006.23	6,900.17
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	150.63	0.00	5,316.2	0.0	1500.65	3490.97	4,991.62
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.57	0.00	3,362.9	0.0	1335.37	2458.49	3,793.86
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,741.2	0.0	1900.46	1281.32	3,181.78
														<b>56,468.7</b>	<b>0.0</b>	<b>40,090.84</b>		

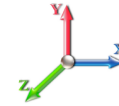
## Section Forces

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

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**Load Case:** 1.2D + 1.6W Normal Wind - P3

1.2D + 1.6W 105 mph Wind at Normal To Face - P3

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.20

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	225.95	0.00	14,560.	0.0	5570.84	5546.44	11,117.28
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	225.95	0.00	12,341.	0.0	5264.39	6980.56	12,244.95
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	225.95	0.00	10,173.	0.0	4236.98	7773.12	12,010.10
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	225.95	0.00	8,972.9	0.0	3156.58	8343.71	11,500.29
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	150.63	0.00	5,316.2	0.0	2501.08	5818.29	8,319.37
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.57	0.00	3,362.9	0.0	2225.61	4097.48	6,323.09
2 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,741.2	0.0	1140.28	768.79	1,909.07
														<b>56,468.7</b>	<b>0.0</b>			<b>63,424.16</b>

**Load Case:** 1.2D + 1.6W 60° Wind - P1

1.2D + 1.6W 105 mph Wind at 60° From Face - P1

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.20

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	225.95	0.00	14,560.	0.0	4658.28	5546.44	10,204.72
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	225.95	0.00	12,341.	0.0	4454.14	6980.56	11,434.71
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	225.95	0.00	10,173.	0.0	3643.91	7773.12	11,417.04
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	225.95	0.00	8,972.9	0.0	2778.46	8343.71	11,122.18
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	150.63	0.00	5,316.2	0.0	2151.75	5818.29	7,970.04
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.57	0.00	3,362.9	0.0	1900.51	4097.48	5,997.99
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,741.2	0.0	1612.93	1281.32	2,894.25
														<b>56,468.7</b>	<b>0.0</b>			<b>61,040.92</b>

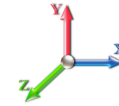
## Section Forces

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

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**Load Case:** 1.2D + 1.6W 60° Wind - P2

1.2D + 1.6W 105 mph Wind at 60° From Face - P2

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.20

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	225.95	0.00	14,560.	0.0	2794.97	3327.87	6,122.83
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	225.95	0.00	12,341.	0.0	2672.49	4188.34	6,860.82
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	225.95	0.00	10,173.	0.0	2186.35	4663.87	6,850.22
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	225.95	0.00	8,972.9	0.0	1667.08	5006.23	6,673.31
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	150.63	0.00	5,316.2	0.0	1291.05	3490.97	4,782.02
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.57	0.00	3,362.9	0.0	1140.31	2458.49	3,598.80
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,741.2	0.0	1612.93	1281.32	2,894.25
														<b>56,468.7</b>	<b>0.0</b>			<b>37,782.25</b>

**Load Case:** 1.2D + 1.6W 60° Wind - P3

1.2D + 1.6W 105 mph Wind at 60° From Face - P3

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.20

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	225.95	0.00	14,560.	0.0	4658.28	5546.44	10,204.72
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	225.95	0.00	12,341.	0.0	4454.14	6980.56	11,434.71
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	225.95	0.00	10,173.	0.0	3643.91	7773.12	11,417.04
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	225.95	0.00	8,972.9	0.0	2778.46	8343.71	11,122.18
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	150.63	0.00	5,316.2	0.0	2151.75	5818.29	7,970.04
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.57	0.00	3,362.9	0.0	1900.51	4097.48	5,997.99
2 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,741.2	0.0	967.76	768.79	1,736.55
														<b>56,468.7</b>	<b>0.0</b>			<b>59,883.22</b>

## Section Forces

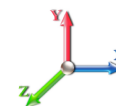
**Structure:** CT09865-S-SBA

**Code:** TIA-222-G

4/13/2022

**Site Name:** Niantic

**Exposure:** C



**Height:** 180.00 (ft)

**Crest Height:** 0.00

**Base Elev:** 0.000 (ft)

**Site Class:** D - Stiff Soil

**Gh:** 0.85

**Topography:** 1

**Struct Class:** II

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**Load Case:** 1.2D + 1.6W 90° Wind - P1

1.2D + 1.6W 105 mph Wind at 90° From Face - P1

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.20

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	225.95	0.00	14,560.	0.0	4886.42	5546.44	10,432.86
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	225.95	0.00	12,341.	0.0	4656.70	6980.56	11,637.27
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	225.95	0.00	10,173.	0.0	3792.18	7773.12	11,565.30
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	225.95	0.00	8,972.9	0.0	2872.99	8343.71	11,216.70
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	150.63	0.00	5,316.2	0.0	2239.08	5818.29	8,057.37
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.57	0.00	3,362.9	0.0	1981.79	4097.48	6,079.27
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,741.2	0.0	1684.81	1281.32	2,966.13
														<b>56,468.7</b>	<b>0.0</b>			<b>61,954.91</b>

**Load Case:** 1.2D + 1.6W 90° Wind - P2

1.2D + 1.6W 105 mph Wind at 90° From Face - P2

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.20

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	225.95	0.00	14,560.	0.0	2931.85	3327.87	6,259.72
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	225.95	0.00	12,341.	0.0	2794.02	4188.34	6,982.36
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	225.95	0.00	10,173.	0.0	2275.31	4663.87	6,939.18
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	225.95	0.00	8,972.9	0.0	1723.79	5006.23	6,730.02
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	150.63	0.00	5,316.2	0.0	1343.45	3490.97	4,834.42
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.57	0.00	3,362.9	0.0	1189.07	2458.49	3,647.56
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,741.2	0.0	1684.81	1281.32	2,966.13
														<b>56,468.7</b>	<b>0.0</b>			<b>38,359.40</b>

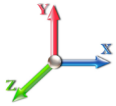


## Section Forces

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

4/13/2022  
  
 Page: 11



**Load Case:** 1.2D + 1.6W 90° Wind - P3

1.2D + 1.6W 105 mph Wind at 90° From Face - P3

**Wind Load Factor:** 1.60  
**Dead Load Factor:** 1.20  
**Ice Dead Load Factor:** 0.00

**Wind Importance Factor:** 1.00  
**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	225.95	0.00	14,560.	0.0	4886.42	5546.44	10,432.86
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	225.95	0.00	12,341.	0.0	4656.70	6980.56	11,637.27
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	225.95	0.00	10,173.	0.0	3792.18	7773.12	11,565.30
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	225.95	0.00	8,972.9	0.0	2872.99	8343.71	11,216.70
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	150.63	0.00	5,316.2	0.0	2239.08	5818.29	8,057.37
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.57	0.00	3,362.9	0.0	1981.79	4097.48	6,079.27
2 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,741.2	0.0	1010.89	768.79	1,779.68
														<b>56,468.7</b>	<b>0.0</b>	<b>60,768.45</b>		

**Load Case:** 0.9D + 1.6W Normal Wind

0.9D + 1.6W 105 mph Wind at Normal To Face

**Wind Load Factor:** 1.60  
**Dead Load Factor:** 0.90  
**Ice Dead Load Factor:** 0.00

**Wind Importance Factor:** 1.00  
**Ice Importance Factor:** 1.00

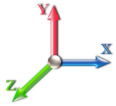
Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	225.95	0.00	10,920.	0.0	5570.84	5546.44	11,117.28
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	225.95	0.00	9,256.0	0.0	5264.39	6980.56	12,244.95
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	225.95	0.00	7,629.9	0.0	4236.98	7773.12	12,010.10
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	225.95	0.00	6,729.7	0.0	3156.58	8343.71	11,500.29
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	150.63	0.00	3,987.1	0.0	2501.08	5818.29	8,319.37
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.57	0.00	2,522.2	0.0	2225.61	4097.48	6,323.09
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,305.9	0.0	1900.46	1281.32	3,181.78
														<b>42,351.6</b>	<b>0.0</b>	<b>64,696.87</b>		

## Section Forces

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

4/13/2022  
  
 Page: 12



**Load Case:** 0.9D + 1.6W 60° Wind

0.9D + 1.6W 105 mph Wind at 60° From Face

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 0.90

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	225.95	0.00	10,920.0	0.0	4658.28	5546.44	10,204.72
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	225.95	0.00	9,256.0	0.0	4454.14	6980.56	11,434.71
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	225.95	0.00	7,629.9	0.0	3643.91	7773.12	11,417.04
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	225.95	0.00	6,729.7	0.0	2778.46	8343.71	11,122.18
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	150.63	0.00	3,987.1	0.0	2151.75	5818.29	7,970.04
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.57	0.00	2,522.2	0.0	1900.51	4097.48	5,997.99
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,305.9	0.0	1612.93	1281.32	2,894.25
														<b>42,351.6</b>	<b>0.0</b>			<b>61,040.92</b>

**Load Case:** 0.9D + 1.6W 90° Wind

0.9D + 1.6W 105 mph Wind at 90° From Face

**Wind Load Factor:** 1.60

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 0.90

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

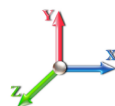
Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	225.95	0.00	10,920.0	0.0	4886.42	5546.44	10,432.86
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	225.95	0.00	9,256.0	0.0	4656.70	6980.56	11,637.27
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	225.95	0.00	7,629.9	0.0	3792.18	7773.12	11,565.30
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	225.95	0.00	6,729.7	0.0	2872.99	8343.71	11,216.70
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	150.63	0.00	3,987.1	0.0	2239.08	5818.29	8,057.37
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.57	0.00	2,522.2	0.0	1981.79	4097.48	6,079.27
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,305.9	0.0	1684.81	1281.32	2,966.13
														<b>42,351.6</b>	<b>0.0</b>			<b>61,954.91</b>

## Section Forces

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

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**Load Case:** 1.2D + 1.0Di + 1.0Wi Normal Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

**Wind Load Factor:** 1.00  
**Dead Load Factor:** 1.20  
**Ice Dead Load Factor:** 1.00

**Wind Importance Factor:** 1.00  
**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Area (sqft)		Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice Area (sqft)		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat Area (sqft)	Round Area (sqft)								Linear Area (sqft)	Linear Area (sqft)					
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	1.00	1.00	1.39	102.94	300.26	97.04	27,108.	12547.9	1033.93	1484.90	2,518.83
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	1.00	1.00	1.55	84.98	308.31	108.3	24,978.	12637.2	1049.60	1946.73	2,996.33
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	1.00	1.00	1.63	67.60	312.37	113.9	22,119.	11946.0	898.24	2192.22	3,090.46
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	1.00	1.00	1.68	54.21	315.15	117.8	20,211.	11238.2	710.64	2312.64	2,937.08
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	1.00	1.00	1.72	51.65	211.31	80.29	13,819.	8503.3	581.24	1110.04	1,691.28
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	1.00	1.00	1.75	45.76	148.62	78.53	9,950.5	6587.5	542.05	961.29	1,503.34
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	1.00	1.00	1.77	40.57	43.47	41.23	5,481.1	3739.9	505.75	388.51	894.25
<b>123,668.7</b>															<b>67200.0</b>	<b>15,631.58</b>		

**Load Case:** 1.2D + 1.0Di + 1.0Wi 60° Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

**Wind Load Factor:** 1.00  
**Dead Load Factor:** 1.20  
**Ice Dead Load Factor:** 1.00

**Wind Importance Factor:** 1.00  
**Ice Importance Factor:** 1.00

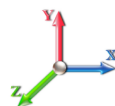
Sect Seq	Wind Height (ft)	qz (psf)	Total Area (sqft)		Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice Area (sqft)		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat Area (sqft)	Round Area (sqft)								Linear Area (sqft)	Linear Area (sqft)					
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	0.80	1.00	1.39	91.40	300.26	97.04	27,108.	12547.9	918.05	1484.90	2,402.95
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	0.80	1.00	1.55	76.83	308.31	108.3	24,978.	12637.2	948.96	1946.73	2,895.69
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	0.80	1.00	1.63	62.19	312.37	113.9	22,119.	11946.0	826.39	2192.22	3,018.62
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	0.80	1.00	1.68	50.87	315.15	117.8	20,211.	11238.2	666.81	2312.64	2,979.46
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	0.80	1.00	1.72	48.24	211.31	80.29	13,819.	8503.3	542.94	1110.04	1,652.99
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	0.80	1.00	1.75	42.89	148.62	78.53	9,950.5	6587.5	507.97	961.29	1,469.26
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	0.80	1.00	1.77	38.24	43.47	41.23	5,481.1	3739.9	476.74	388.51	865.24
<b>123,668.7</b>															<b>67200.0</b>	<b>15,284.21</b>		

## Section Forces

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

4/13/2022  
  
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**Load Case:** 1.2D + 1.0Di + 1.0Wi 90° Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face

**Wind Load Factor:** 1.00

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.20

**Ice Dead Load Factor:** 1.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total		Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat Area (sqft)	Round Area (sqft)								Linear Area (sqft)	Linear Area (sqft)					
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	0.85	1.00	1.39	94.29	300.26	97.04	27,108.	12547.9	947.02	1484.90	2,431.92
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	0.85	1.00	1.55	78.87	308.31	108.3	24,978.	12637.2	974.12	1946.73	2,920.85
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	0.85	1.00	1.63	63.54	312.37	113.9	22,119.	11946.0	844.36	2192.22	3,036.58
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	0.85	1.00	1.68	51.70	315.15	117.8	20,211.	11238.2	677.77	2312.64	2,990.41
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	0.85	1.00	1.72	49.09	211.31	80.29	13,819.	8503.3	552.52	1110.04	1,662.56
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	0.85	1.00	1.75	43.61	148.62	78.53	9,950.5	6587.5	516.49	961.29	1,477.78
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	0.85	1.00	1.77	38.82	43.47	41.23	5,481.1	3739.9	483.99	388.51	872.50
<b>123,668.7</b>															<b>67200.0</b>	<b>15,392.60</b>		

**Load Case:** 1.0D + 1.0W Normal Wind

1.0D + 1.0W 60 mph Wind at Normal To Face

**Wind Load Factor:** 1.00

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.00

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total		Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat Area (sqft)	Round Area (sqft)								Linear Area (sqft)	Linear Area (sqft)					
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	71.17	225.95	0.00	12,134.	0.0	1148.88	1131.93	2,280.81
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	54.23	225.95	0.00	10,284.	0.0	1100.49	1424.60	2,525.10
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	39.82	225.95	0.00	8,477.7	0.0	891.46	1586.35	2,477.81
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	28.86	225.95	0.00	7,477.4	0.0	666.16	1702.80	2,368.96
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.49	150.63	0.00	4,430.1	0.0	512.99	1187.41	1,700.39
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.57	0.00	2,802.4	0.0	454.21	836.22	1,290.43
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,451.0	0.0	387.85	261.49	649.34
<b>47,057.3</b>															<b>0.0</b>	<b>13,292.84</b>		

## Section Forces

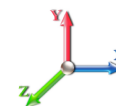
**Structure:** CT09865-S-SBA

**Code:** TIA-222-G

4/13/2022

**Site Name:** Niantic

**Exposure:** C



**Height:** 180.00 (ft)

**Crest Height:** 0.00

**Base Elev:** 0.000 (ft)

**Site Class:** D - Stiff Soil

**Gh:** 0.85

**Topography:** 1

**Struct Class:** II

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**Load Case:** 1.0D + 1.0W 60° Wind

1.0D + 1.0W 60 mph Wind at 60° From Face

**Wind Load Factor:** 1.00

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.00

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	59.63	225.95	0.00	12,134.	0.0	962.64	1131.93	2,094.57
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	46.08	225.95	0.00	10,284.	0.0	935.14	1424.60	2,359.74
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	34.42	225.95	0.00	8,477.7	0.0	770.42	1586.35	2,356.78
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	25.52	225.95	0.00	7,477.4	0.0	589.00	1702.80	2,291.79
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	21.08	150.63	0.00	4,430.1	0.0	441.70	1187.41	1,629.10
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.57	0.00	2,802.4	0.0	387.86	836.22	1,224.08
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,451.0	0.0	329.17	261.49	590.66
														<b>47,057.3</b>	<b>0.0</b>			<b>12,546.73</b>

**Load Case:** 1.0D + 1.0W 90° Wind

1.0D + 1.0W 60 mph Wind at 90° From Face

**Wind Load Factor:** 1.00

**Wind Importance Factor:** 1.00

**Dead Load Factor:** 1.00

**Ice Dead Load Factor:** 0.00

**Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	62.52	225.95	0.00	12,134.	0.0	1009.20	1131.93	2,141.13
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	48.12	225.95	0.00	10,284.	0.0	976.48	1424.60	2,401.08
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	35.77	225.95	0.00	8,477.7	0.0	800.68	1586.35	2,387.03
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	26.36	225.95	0.00	7,477.4	0.0	608.29	1702.80	2,311.09
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.93	150.63	0.00	4,430.1	0.0	459.52	1187.41	1,646.92
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.57	0.00	2,802.4	0.0	404.45	836.22	1,240.67
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,451.0	0.0	343.84	261.49	605.33
														<b>47,057.3</b>	<b>0.0</b>			<b>12,733.26</b>

## Force/Stress Compression Summary

**Structure:** CT09865-S-SBA

**Code:** TIA-222-G

4/13/2022

**Site Name:** Niantic

**Exposure:** C

**Height:** 180.00 (ft)

**Crest Height:** 0.00

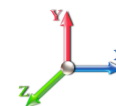
**Base Elev:** 0.000 (ft)

**Site Class:** D - Stiff Soil

**Gh:** 0.85

**Topography:** 1

**Struct Class:** II



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### LEG MEMBERS

Sect	Top Elev	Member	Force		Load Case	Len (ft)	Bracing %			Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls	
			(kips)				X	Y	Z					KL/R
1	30	SOL - 4 3/4" SOLID	-428.97	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	74.81	50.00	529.67	81.0	Member X
2	60	SOL - 4 3/4" SOLID	-382.29	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	74.81	50.00	529.67	72.2	Member X
3	90	SOL - 4 1/2" SOLID	-335.20	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	78.96	50.00	453.66	73.9	Member X
4	120	SOL - 4 1/4" SOLID	-292.49	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	83.61	50.00	382.92	76.4	Member X
5	140	SOL - 3 1/2" SOLID	-246.78	1.2D + 1.6W	Normal Wind - P1	3.25	100	100	100	44.57	50.00	374.41	65.9	Member X
6	160	SOL - 2 1/2" SOLID	-106.36	1.2D + 1.6W	Normal Wind - P1	3.25	100	100	100	62.40	50.00	166.16	64.0	Member X
7	180	SOL - 1 3/4" SOLID	-23.55	1.2D + 1.6W	Normal Wind - P1	3.25	100	100	100	89.14	50.00	60.54	38.9	Member X

### Splices

Sect	Top Elev	Load Case	Top Splice				Bolt Type	Num Bolts	Load Case	Bottom Splice				Bolt Type	Num Bolts
			Force (kips)	Cap (kips)	Use %					Force (kips)	Cap (kips)	Use %			
1	30	1.2D + 1.6W Normal Wind - P1	390.18	0.00	0.0			1.2D + 1.6W Normal Wind - P1	435.86	0.00					
2	60	1.2D + 1.6W Normal Wind - P1	342.38	0.00	0.0			1.2D + 1.6W Normal Wind - P1	390.18	0.00			1/4 A325	6	
3	90	1.2D + 1.6W Normal Wind - P1	298.40	0.00	0.0			1.2D + 1.6W Normal Wind - P1	342.38	0.00			1/4 A325	6	
4	120	1.2D + 1.6W Normal Wind - P1	263.08	0.00	0.0			1.2D + 1.6W Normal Wind - P1	298.40	0.00			1/4 A325	6	
5	140	1.2D + 1.6W Normal Wind - P1	116.20	0.00	0.0			1.2D + 1.6W Normal Wind - P1	263.08	0.00			1/8 A325	6	
6	160	1.2D + 1.6W Normal Wind - P1	28.73	0.00	0.0			1.2D + 1.6W Normal Wind - P1	116.20	0.00			1/8 A325	6	
7	180	1.2D + 1.0Di + 1.0Wi 90° Wind	0.60	0.00	0.0			1.2D + 1.6W Normal Wind - P1	28.73	0.00			7/8 A325	6	

### HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force		Len (ft)	Bracing %			Fy (ksi)	Mem Cap (kips)	Num Bolts	Shear Bear		Use %	Controls	
			(kips)			X	Y	Z				KL/R	Num Holes			Cap (kips)
1	30								0.00	0	0					
2	60								0.00	0	0					
3	90								0.00	0	0					
4	120								0.00	0	0					
5	140	SOL - 1 1/8" SOLID	-3.53	1.2D + 1.6W	60° Wind - P1	5.00	100	100	100	149.31	36.00	10.07	0	0	35	Member X
6	160	SOL - 1" SOLID	-1.66	1.2D + 1.6W	60° Wind - P1	5.00	100	100	100	168.00	36.00	6.29	0	0	26	Member X
7	180	SOL - 7/8" SOLID	-1.15	1.2D + 1.6W	Normal Wind - P2	5.00	100	100	100	191.96	36.00	3.69	0	0	31	Member X

### DIAGONAL MEMBERS

Sect	Top Elev	Member	Force		Len (ft)	Bracing %			Fy (ksi)	Mem Cap (kips)	Num Bolts	Shear Bear		Use %	Controls			
			(kips)			X	Y	Z				KL/R	Num Holes			Cap (kips)		
1	30	SAE - 4X4X0.3125	-8.66	1.2D + 1.6W	90° Wind - P3	23.59	50	50	50	178.97	36.00	16.93	1	1	24.35	21.7	51	Member Z
2	60	SAE - 3.5X3.5X0.25	-7.85	1.2D + 1.6W	90° Wind - P3	19.37	50	50	50	167.47	36.00	13.61	1	1	24.35	17.4	58	Member Z
3	90	SAE - 3X3X0.1875	-5.85	1.2D + 1.6W	90° Wind - P3	15.31	50	50	50	154.10	36.00	10.37	1	1	17.89	10.7	56	Member Z
4	120	SAE - 2.5X2.5X0.1875	-4.66	1.2D + 1.6W	Normal Wind - P3	9.26	50	50	50	114.18	36.00	14.71	1	1	17.89	10.7	43	Bolt Bear
5	140	SAE - 3X3X0.1875	-14.0	1.2D + 1.6W	90° Wind - P1	5.96	50	50	50	54.03	36.00	30.28	0	0			46	Member Z
6	160	SAE - 2.5X2.5X0.1875	-8.95	1.2D + 1.6W	90° Wind - P1	5.96	50	50	50	65.06	36.00	23.39	0	0			38	Member Z
7	180	SAE - 2X2X0.1875	-3.75	1.2D + 1.6W	90° Wind - P1	5.96	50	50	50	81.73	36.00	16.18	0	0			23	Member Z

## Force/Stress Tension Summary

<b>Structure:</b> CT09865-S-SBA	<b>Code:</b> TIA-222-G	4/13/2022
<b>Site Name:</b> Niantic	<b>Exposure:</b> C	
<b>Height:</b> 180.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 0.85	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	30	SOL - 4 3/4" SOLID	382.36	0.9D + 1.6W 60° Wind	50	797.45	47.9	Member
2	60	SOL - 4 3/4" SOLID	345.83	0.9D + 1.6W 60° Wind	50	797.45	43.4	Member
3	90	SOL - 4 1/2" SOLID	307.38	0.9D + 1.6W 60° Wind	50	715.68	43.0	Member
4	120	SOL - 4 1/4" SOLID	271.02	0.9D + 1.6W 60° Wind	50	638.37	42.5	Member
5	140	SOL - 3 1/2" SOLID	240.83	0.9D + 1.6W 60° Wind	50	432.95	55.6	Member
6	160	SOL - 2 1/2" SOLID	102.95	0.9D + 1.6W 60° Wind	50	220.89	46.6	Member
7	180	SOL - 1 3/4" SOLID	22.45	0.9D + 1.6W 60° Wind	50	108.24	20.7	Member

### Splices

Sect	Top Elev	Load Case	Top Splice				Load Case	Bottom Splice					
			Force (kips)	Cap (kips)	Use %	Bolt Type		Num Bolts	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	30	0.9D + 1.6W 60° Wind	345.36	0.00	0.0		0.9D + 1.6W 60° Wind	382.3	0.00				
2	60	0.9D + 1.6W 60° Wind	306.92	0.00	0.0		0.9D + 1.6W 60° Wind	345.3	457.92	75.4	1 1/4	A325	6
3	90	0.9D + 1.6W 60° Wind	270.66	0.00	0.0		0.9D + 1.6W 60° Wind	306.9	457.92	67.0	1 1/4	A325	6
4	120	0.9D + 1.6W 60° Wind	241.36	0.00	0.0		0.9D + 1.6W 60° Wind	270.6	457.92	59.1	1 1/4	A325	6
5	140	0.9D + 1.6W 60° Wind	102.36	0.00	0.0		0.9D + 1.6W 60° Wind	241.3	360.65	66.9	1 1/8	A325	6
6	160	0.9D + 1.6W 60° Wind	21.52	0.00	0.0		0.9D + 1.6W 60° Wind	102.3	360.65	28.4	1 1/8	A325	6
7	180		0.00	0.00	0.0		0.9D + 1.6W 60° Wind	21.52	249.36	8.6	7/8	A325	6

### HORIZONTAL MEMBERS

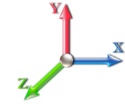
Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	30	-			36	0.00	0	0					
2	60	-			36	0.00	0	0					
3	90	-			36	0.00	0	0					
4	120	-			36	0.00	0	0					
5	140	SOL - 1 1/8" SOLID	2.96	0.9D + 1.6W Normal Wi	36	32.21	0	0				9.2	Member
6	160	SOL - 1" SOLID	1.77	1.2D + 1.6W Normal Wi	36	25.45	0	0				6.9	Member
7	180	SOL - 7/8" SOLID	1.19	1.2D + 1.6W 60° Wind -	36	19.48	0	0				6.1	Member

### DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	30	SAE - 4X4X0.3125	8.75	1.2D + 1.6W 90° Wind -	36	68.10	1	1	24.35	21.75	21.19	41.3	Blck Shear
2	60	SAE - 3.5X3.5X0.25	7.69	1.2D + 1.6W 90° Wind -	36	46.98	1	1	24.35	17.40	16.95	45.4	Blck Shear
3	90	SAE - 3X3X0.1875	5.63	1.2D + 1.6W 90° Wind -	36	30.21	1	1	17.89	10.77	10.42	54.1	Blck Shear
4	120	SAE - 2.5X2.5X0.1875	4.08	1.2D + 1.6W 60° Wind -	36	24.08	1	1	17.89	10.77	9.40	43.4	Blck Shear
5	140	SAE - 3X3X0.1875	13.72	1.2D + 1.6W 90° Wind -	36	35.32	0	0				38.8	Member
6	160	SAE - 2.5X2.5X0.1875	8.88	1.2D + 1.6W 90° Wind -	36	29.22	0	0				30.4	Member
7	180	SAE - 2X2X0.1875	3.73	1.2D + 1.6W 90° Wind -	36	23.00	0	0				16.2	Member

## Seismic Section Forces

<b>Structure:</b> CT09865-S-SBA	<b>Code:</b> TIA-222-G	4/13/2022
<b>Site Name:</b> Niantic	<b>Exposure:</b> C	
<b>Height:</b> 180.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 0.85	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case: 1.2D + 1.0E**

<b>Dead Load Factor</b>	1.20	<b>Sds</b> 0.171	<b>Ss</b> 0.1610	<b>Fa</b> 1.6000	<b>Ke</b> 0.0000
<b>Seismic Load Factor</b>	1.00	<b>Sd1</b> 0.092	<b>S1</b> 0.0580	<b>Fv</b> 2.4000	<b>Kg</b> 0.0000
<b>Seismic Importance Factor</b>	1.00	<b>SA</b> 0.140	<b>R</b> 3.0000	<b>Vs</b> 3.1833	<b>f1</b> 1.5130

Sect #	Elev (ft)	Wz (lb)	Lateral			Fsz (lb)
			a	b	c	
1	15.00	12134.	0.01	0.06	0.03	55.96
2	45.00	10284.	0.12	0.07	0.03	104.69
3	75.00	8477.6	0.33	0.04	0.01	152.01
4	105.00	7477.4	0.64	-0.07	0.02	186.63
5	130.00	5931.9	0.99	-0.11	0.12	208.26
6	150.00	7334.6	1.31	0.14	0.35	423.30
7	170.00	5010.6	1.69	1.07	0.79	521.34

**Load Case: 0.9D + 1.0E**

<b>Dead Load Factor</b>	0.90	<b>Sds</b> 0.171	<b>Ss</b> 0.1610	<b>Fa</b> 1.6000	<b>Ke</b> 0.0000
<b>Seismic Load Factor</b>	1.00	<b>Sd1</b> 0.092	<b>S1</b> 0.0580	<b>Fv</b> 2.4000	<b>Kg</b> 0.0000
<b>Seismic Importance Factor</b>	1.00	<b>SA</b> 0.140	<b>R</b> 3.0000	<b>Vs</b> 3.1833	<b>f1</b> 1.5130

Sect #	Elev (ft)	Wz (lb)	Lateral			Fsz (lb)
			a	b	c	
1	15.00	12134.	0.01	0.06	0.03	55.96
2	45.00	10284.	0.12	0.07	0.03	104.69
3	75.00	8477.6	0.33	0.04	0.01	152.01
4	105.00	7477.4	0.64	-0.07	0.02	186.63
5	130.00	5931.9	0.99	-0.11	0.12	208.26
6	150.00	7334.6	1.31	0.14	0.35	423.30
7	170.00	5010.6	1.69	1.07	0.79	521.34



## Support Forces Summary

**Structure:** CT09865-S-SBA  
**Site Name:** Niantic  
**Height:** 180.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 0.85

**Topography:** 1

**Code:** TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** D - Stiff Soil  
**Struct Class:** II

4/13/2022



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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W Normal Wind - P1	1	0.00	433.78	-51.26	
	1a	17.80	-182.90	-15.12	
	1b	-17.80	-182.90	-15.12	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W Normal Wind - P2	1	0.00	333.99	-37.03	
	1a	12.46	-133.00	-9.93	
	1b	-12.46	-133.00	-9.93	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W Normal Wind - P3	1	0.00	422.78	-50.38	
	1a	17.40	-177.40	-14.92	
	1b	-17.40	-177.40	-14.92	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W 60° Wind - P1	1	-3.85	221.11	-25.50	
	1a	-24.00	220.92	9.42	
	1b	-39.56	-374.04	-22.83	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W 60° Wind - P2	1	-2.19	173.56	-18.78	
	1a	-17.35	173.37	7.49	
	1b	-27.73	-278.94	-16.01	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W 60° Wind - P3	1	-3.88	216.10	-25.10	
	1a	-23.67	215.91	9.19	
	1b	-38.86	-364.03	-22.43	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W 90° Wind - P1	1	-4.56	22.66	-1.81	
	1a	-38.60	369.24	19.69	
	1b	-35.59	-323.92	-17.88	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W 90° Wind - P2	1	-2.59	22.66	-1.85	
	1a	-27.87	285.86	14.61	
	1b	-24.70	-240.54	-12.76	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.6W 90° Wind - P3	1	-4.60	22.66	-1.81	
	1a	-37.99	360.35	19.31	
	1b	-34.98	-315.03	-17.50	
<hr style="border-top: 1px dashed black;"/>					
0.9D + 1.6W Normal Wind	1	0.00	427.71	-50.78	
	1a	18.21	-188.36	-15.36	
	1b	-18.21	-188.36	-15.36	
<hr style="border-top: 1px dashed black;"/>					
0.9D + 1.6W 60° Wind	1	-3.86	215.25	-25.03	
	1a	-23.59	215.05	9.17	
	1b	-39.96	-379.32	-23.07	
<hr style="border-top: 1px dashed black;"/>					
0.9D + 1.6W 90° Wind	1	-4.57	17.00	-1.33	
	1a	-38.19	363.23	19.44	
	1b	-36.00	-329.24	-18.11	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	145.30	-12.86	
	1a	3.55	1.02	-3.16	
	1b	-3.55	1.02	-3.16	
<hr style="border-top: 1px dashed black;"/>					
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-0.93	96.63	-6.93	
	1a	-6.46	96.56	2.66	
	1b	-8.92	-45.86	-5.15	
<hr style="border-top: 1px dashed black;"/>					

1.2D + 1.0Di + 1.0Wi 90° Wind	1	-1.08	49.11	-1.19
	1a	-9.95	131.69	5.12
	1b	-7.90	-33.46	-3.93
1.2D + 1.0E	1	0.00	33.45	3.48
	1a	4.39	17.26	-2.55
	1b	-4.39	17.26	-2.55
0.9D + 1.0E	1	0.00	27.78	3.97
	1a	4.81	11.60	-2.80
	1b	-4.81	11.60	-2.80
1.0D + 1.0W Normal Wind	1	0.00	103.04	-11.74
	1a	2.60	-23.20	-2.49
	1b	-2.60	-23.20	-2.49
1.0D + 1.0W 60° Wind	1	-0.80	59.51	-6.45
	1a	-5.98	59.47	2.53
	1b	-7.06	-62.34	-4.07
1.0D + 1.0W 90° Wind	1	-0.94	18.88	-1.58
	1a	-8.98	89.84	4.64
	1b	-6.24	-52.07	-3.06

## Max Reactions

Leg		Overturning	
Max Uplift:	-379.32 (kips)	Moment:	8188.96 (ft-kips)
Max Down:	433.78 (kips)	Total Down:	67.98 (kips)
Max Shear:	51.26 (kips)	Total Shear:	81.50 (kips)

## Analysis Summary

<b>Structure:</b> CT09865-S-SBA	<b>Code:</b> TIA-222-G	4/13/2022
<b>Site Name:</b> Niantic	<b>Exposure:</b> C	
<b>Height:</b> 180.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 0.85	<b>Topography:</b> 1	<b>Struct Class:</b> II
		<b>Page:</b> 21



### Max Reactions

	Leg	Overturning
Max Uplift:	-379.32 (kips)	Moment: 8188.96 (ft-kips)
Max Down:	433.78 (kips)	Total Down: 67.98 (kips)
Max Shear:	51.26 (kips)	Total Shear: 81.50 (kips)

### Anchor Bolts

Bolt Size (in.): 1.50	Number Bolts: 8
Yield Strength (Ksi): 105.00	Tensile Strength (Ksi): 125.00
Detail Type: A	

**Interaction Ratio: 0.39**

### Max Usages


Max Leg: 81.0% (1.2D + 1.6W Normal Wind - P1 - Sect 1)  
 Max Diag: 57.7% (1.2D + 1.6W 90° Wind - P3 - Sect 2)  
 Max Horiz: 35.0% (1.2D + 1.6W 60° Wind - P1 - Sect 5)

### Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0E - Normal To Face	140.00	0.0278	0.0009	0.0404
	150.00	0.0342	0.0007	0.0387
	160.00	0.0413	0.0006	0.0551
	170.00	0.0488	0.0002	0.0432
	180.00	0.0564	0.0001	0.0473
0.9D + 1.6W 105 mph Wind at 60° From Face	140.00	0.8542	0.1186	1.1038
	150.00	1.0278	0.1471	1.0342
	160.00	1.2150	0.1769	1.3882
	170.00	1.4094	0.2973	1.1239
	180.00	1.6021	0.4164	1.0613
0.9D + 1.6W 105 mph Wind at 90° From Face	140.00	0.8600	-0.0797	1.0973
	150.00	1.0345	-0.0797	1.0419
	160.00	1.2229	-0.0797	1.3776
	170.00	1.4188	-0.0797	1.1422
	180.00	1.6102	-0.0796	0.5166
0.9D + 1.6W 105 mph Wind at Normal To Face	140.00	0.8808	0.0617	1.1417
	150.00	1.0593	-0.0622	1.0664
	160.00	1.2529	-0.0611	1.4349
	170.00	1.4541	0.0618	1.1200
	180.00	1.6574	0.0617	1.9042
1.0D + 1.0W 60 mph Wind at 60° From Face	140.00	0.1747	0.0156	0.2262
	150.00	0.2101	0.0166	0.2113
	160.00	0.2484	0.0176	0.2842
	170.00	0.2883	0.0221	0.2296
	180.00	0.3275	0.0268	0.2142

1.0D + 1.0W 60 mph Wind at 90° From Face	140.00	0.1760	-0.0158	0.2240
	150.00	0.2116	-0.0156	0.2130
	160.00	0.2501	-0.0154	0.2814
	170.00	0.2902	-0.0149	0.2335
	180.00	0.3293	-0.0146	0.1063
1.0D + 1.0W 60 mph Wind at Normal To Face	140.00	0.1803	0.0136	0.2328
	150.00	0.2169	0.0134	0.2181
	160.00	0.2563	0.0132	0.2929
	170.00	0.2975	0.0127	0.2291
	180.00	0.3391	0.0125	0.3890
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	140.00	0.2026	0.0205	0.2616
	150.00	0.2436	0.0229	0.2455
	160.00	0.2882	0.0254	0.3331
	170.00	0.3345	0.0356	0.2686
	180.00	0.3807	0.0456	0.2736
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	140.00	0.2031	-0.0190	0.2580
	150.00	0.2442	-0.0189	0.2463
	160.00	0.2889	-0.0188	0.3283
	170.00	0.3352	-0.0185	0.2719
	180.00	0.3807	-0.0184	0.0554
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	140.00	0.2049	-0.0157	0.2646
	150.00	0.2465	-0.0156	0.2496
	160.00	0.2919	-0.0154	0.3378
	170.00	0.3392	0.0150	0.2650
	180.00	0.3877	0.0148	0.5338
1.2D + 1.0E - Normal To Face	140.00	0.0278	0.0009	0.0404
	150.00	0.0342	0.0007	0.0388
	160.00	0.0414	0.0006	0.0552
	170.00	0.0489	0.0003	0.0433
	180.00	0.0565	0.0001	0.0475
1.2D + 1.6W 105 mph Wind at 60° From Face - P1	140.00	0.8556	0.1191	1.1065
	150.00	1.0296	0.1476	1.0367
	160.00	1.2173	0.1775	1.3920
	170.00	1.4121	0.2982	1.1266
	180.00	1.6053	0.4175	1.0639
1.2D + 1.6W 105 mph Wind at 60° From Face - P2	140.00	0.6946	0.0900	0.9598
	150.00	0.8459	0.1154	0.9055
	160.00	1.0107	0.1421	1.2567
	170.00	1.1829	0.2495	0.9966
	180.00	1.3533	0.3558	0.9576
1.2D + 1.6W 105 mph Wind at 60° From Face - P3	140.00	0.8251	0.1155	1.0537
	150.00	0.9903	0.1422	0.9820
	160.00	1.1677	0.1702	1.3017
	170.00	1.3513	0.2833	1.0613
	180.00	1.5328	0.3951	1.0033
1.2D + 1.6W 105 mph Wind at 90° From Face - P1	140.00	0.8614	-0.0800	1.0999
	150.00	1.0363	-0.0800	1.0444
	160.00	1.2252	-0.0800	1.3814
	170.00	1.4215	-0.0800	1.1449
	180.00	1.6135	-0.0800	0.5196
1.2D + 1.6W 105 mph Wind at 90° From Face - P2	140.00	0.6987	-0.0537	0.9527
	150.00	0.8506	-0.0537	0.9116
	160.00	1.0162	-0.0537	1.2449
	170.00	1.1897	-0.0537	1.0135
	180.00	1.3586	-0.0537	0.3881
1.2D + 1.6W 105 mph Wind at 90° From Face - P3	140.00	0.8303	-0.0798	1.0461
	150.00	0.9961	-0.0798	0.9882
	160.00	1.1744	-0.0798	1.2900
	170.00	1.3592	-0.0798	1.0779
	180.00	1.5392	-0.0797	0.4438

1.2D + 1.6W 105 mph Wind at Normal To Face - P1	140.00	0.8823	0.0619	1.1444
	150.00	1.0612	0.0624	1.0690
	160.00	1.2552	0.0613	1.4388
	170.00	1.4569	0.0620	1.1228
	180.00	1.6607	0.0619	1.9071
-----				
1.2D + 1.6W 105 mph Wind at Normal To Face - P2	140.00	0.7140	-0.0408	0.9899
	150.00	0.8692	-0.0411	0.9317
	160.00	1.0391	-0.0401	1.2971
	170.00	1.2171	-0.0407	0.9868
	180.00	1.3971	-0.0406	1.7709
-----				
1.2D + 1.6W 105 mph Wind at Normal To Face - P3	140.00	0.8489	0.0625	1.0857
	150.00	1.0182	0.0629	1.0090
	160.00	1.2008	0.0620	1.3385
	170.00	1.3901	0.0625	1.0510
	180.00	1.5812	0.0624	1.8259
-----				

	<b>Mat Foundation Design for Self Supporting Tower</b>			Date
				4/13/2022
	Customer Name:	SBA Communications Corp	TIA Standard:	TIA-222-G
	Site Name:		Structure Height (Ft.):	180
	Site Nmber:	CT09865-S-SBA	Engineer Name:	J. Tibbetts
Engr. Number:	127631	Engineer Login ID:		

**Foundation Info Obtained from:**

**Analysis or Design?**

**Number of Tower Legs:**

**Base Reactions (Factored):**

(1). Individual Leg:

Axial Load (Kips):	433.8	Uplift Force (Kips):	379.3
Shear Force (Kips):	51.3		

(2). Tower Base:

Total Vertical Load (Kips):	68.0	Total Shear Force (Kips):	81.5
Moment (Kips-ft):	8189.0		

**Foundation Geometries:**

Leg distance (Center-to-Center ft.):	23.0	Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	Round 3.5	Pier Height A. G. (ft.):	0.50
Tower center to mat center (ft):	0	Depth of Base BG (ft.):	6.5
Length of Pad (ft.):	36	Width of Pad (ft.):	36
Thickness of Pad (ft):	2.00		

**Material Properties and Rebar Info:**

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	7	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	24	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:

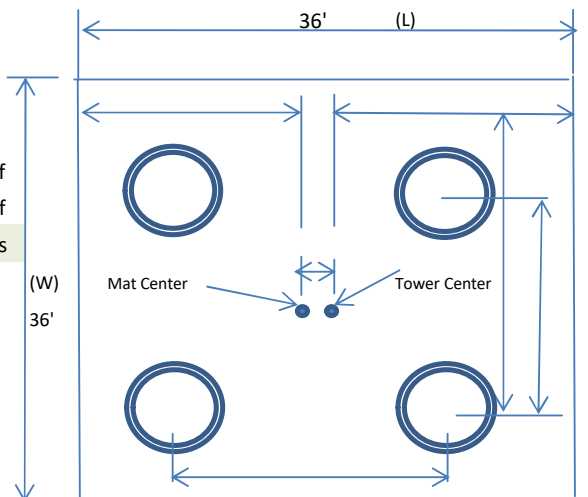
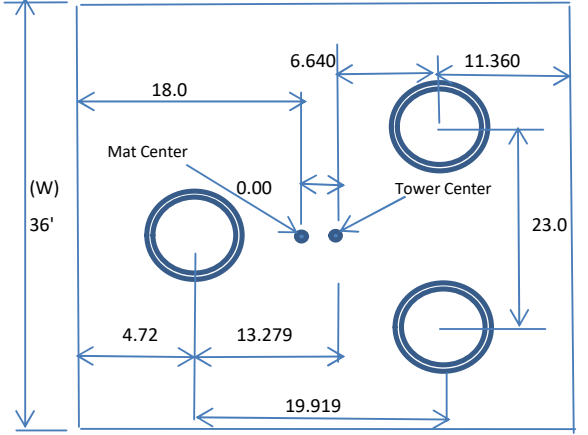
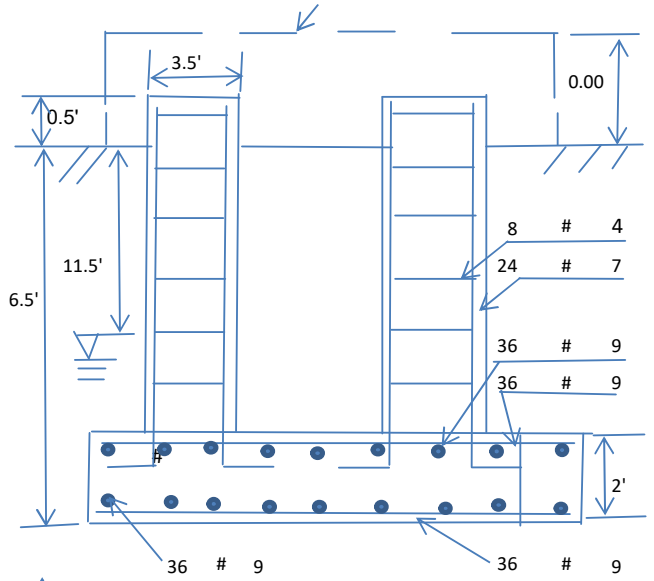
Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36
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Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36
---------------------------	----	---------------------------	----

**Soil Design Parameters:**

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	11.5	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	8000	Consider ties in concrete shear strength:	Yes	
Consider Soil Lateral Resistance ?				



Apply 1.35 for e/w per G/H: 1.35

<b>Foundation Analysis and Design:</b>	Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	5702.11	Total Dry Soil Weight (Kips):	712.76	
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00	
Total Effective Soil Weight (Kips):	712.76	Weight from the Concrete Block at Top (K):	0.00	
Total Dry Concrete Volume (cu. Ft.):	2736.32	Total Dry Concrete Weight (Kips):	410.45	
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00	
Total Effective Concrete Weight (Kips):	410.45	Total Vertical Load on Base (Kips):	1191.21	

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	2010.42	<	Allowable Factored Soil Bearing (psf):	6000	0.34	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	19420.0	>	Design Factored Momont (kips-ft):	8760	0.45	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.22	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			
				Load/ Capacity Ratio		
<b>(1) Concrete Pier:</b>						
Vertical Steel Rebar Area (sq. in./each):	0.60	Tie / Stirrup Area (sq. in./each):	0.20			
Calculated Moment Capacity (Mn,Kips-Ft):	578.5	>	Design Factored Moment (Mu, Kips-Ft):	256.5	0.44	OK!
Calculated Shear Capacity (Kips):	97.4	>	Design Factored Shear (Kips):	51.3	0.53	OK!
Calculated Tension Capacity (Tn, Kips):	777.6	>	Design Factored Tension (Tu Kips):	379.3	0.49	OK!
Calculated Compression Capacity (Pn, Kips):	1818.0	>	Design Factored Axial Load (Pu Kips):	433.8	0.24	OK!
Moment & Tension Strength Combination:	0.44	OK!	Check Tie Spacing (Design/Req'd):	1.00		
Pier Reinforcement Ratio:	0.010	Reinforcement Ratio is satisfied per ACI				

**(2).Concrete Pad:**

One-Way Design Shear Capacity (L or W Direction, Kips):	725.4	>	One-Way Factored Shear (L/W-Dir Kips):	394.9	0.54	OK!
One-Way Design Shear Capacity (Diagonal Dir., Kips):	674.5	>	One-Way Factored Shear (Dia. Dir, Kips)	355.3	0.53	OK!
Lower Steel Pad Reinforcement Ratio (L or W-Direct. ):	0.0041		Lower Steel Reinf. Ratio (Dia. Dir.):	0.0037		
Lower Steel Pad Moment Capacity (L or W-Dir. Kips-ft):	3152.1	>	Moment at Bottom ( L-Direct. K-Ft):	2514.0	0.80	OK!
Lower Steel Pad Moment Capacity (Dia. Direction,K-ft):	3007.3	>	Moment at Bottom ( Dia. Dir. K-Ft):	2538.3	0.84	OK!
Upper Steel Pad Reinforcement Ratio (L or W -Direction):	0.0041		Upper Steel Reinf. Ratio (Dia. Dir.):	0.0037		
Upper Steel Pad Moment Capacity (L or W-Dir., Kips-ft):	3152.1	>	Moment at the top (L-Dir Kips-Ft):	988.6	0.31	OK!
Upper Steel Pad Moment Capacity (Dia. Direction, K-ft):	3007.3	>	Moment at the top (Dia. Dir., K-Ft):	736.2	0.24	OK!
Punching Failure Capacity (Kips):	658.7	>	Punch. Failure Factored Shear (K):	433.8	0.66	OK!

# Exhibit E

## **Mount Analysis**





**Tower Engineering Solutions**

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

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## **Antenna Mount Analysis Report**

**Existing 180 ft Sabre Self Supporting Tower**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT09865-S-SBA**

**Customer Site Name: Niantic**

**Carrier Name: T-Mobile (App#: 193159, V#1)**

**Carrier Site ID / Name: CTNL808B / Niantic**

**Site Location: 51 Daniel'S Avenue**

**Waterford, Connecticut**

**New London County**

**Latitude: 41.330263**

**Longitude: -72.166672**

**Analysis Result:**

**Max Structural Usage: 81.7% [Pass]**

**Report Prepared By: Saroj Dangol**





**Tower Engineering Solutions**

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

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**Latitude: 41.330263**

**Longitude: -72.166672**

### **Analysis Result:**

**Max Structural Usage: 81.7% [Pass]**

**Report Prepared By: Saroj Dangol**

## **Introduction**

The purpose of this report is to summarize the analysis results on the (3) Modified T Frames at 160.00' elevation to support the proposed antenna configuration. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## **Sources of Information**

Mount Drawings	Mount info from MA report prepared by GeoStructural dated 07/21/2019
Antenna Loading	SBA; Application #: 193159, v1; dated 06/06/6022
Modification Drawings	Provided by SBA

## **Analysis Criteria**

Basic Wind Speed Used in the Analysis:  $V_{ULT} = 135$  mph (3-Sec. Gust) / Equivalent to  
 $V_{ASD} = 105$  mph (3-Sec. Gust)

Basic Wind Speed with Ice: 50 mph (3-Sec. Gust) with 0.75" radial ice concurrent

Operational Wind Speed: 60 mph +0" Radial ice

Standard/Codes: ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building

Exposure Category: C

Structure Class: II

Topographic Category: 1

Crest Height (Ft): 0

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

## **Mount Information**

(3) Modified T Frames at 160.00' elevation

## **Final Antenna Configuration**

- 3 Ericsson AIR6419 B41
- 3 RFS APXVAALL24\_43-U-NA20
- 3 Ericsson KRY 112 144/1
- 3 Ericsson KRY 112 489/2
- 3 Ericsson 4449 B71 + B85
- 3 Ericsson 4460 B25 + B66
- 3 Kathrein Scala 782 11056

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

## **Analysis Results**

Our calculations have determined that under design wind load the existing mounts will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 81.7%, which occurs in the front face horizontal. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

## **Attachments**

1. Mount Photos
2. Antenna Placement Diagram
3. Analysis Calculations

## Standard Conditions

1. The loading configuration as analyzed in this report is as provided from the customer. Any deviation from this design shall be communicated to TES to verify deviation will not adversely impact the analysis.
2. The analysis is based on the presumption that the antenna mount members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion. The mount analysis is not a condition assessment of the mount.
4. The mount analysis was performed in accordance with the loading provided, and if applicable the modification required to support the additional loading.
5. If the mount is modified, installation must adhere to the configuration communicated in the modification drawings.
6. The modification drawings are not intended to convey means or methods. These are the responsibility of the installing contractor.
7. Rigging plan review is available if the contractor requires for a construction class IV or other if required. Review fee would apply.
8. The mount modification package was created based upon information provided for the mount loading. The underlying tower is assumed to provide support and sufficient rigidity to support the mount loads as a tower analysis was not part of the mount analysis.
9. TES is not responsible for modifications to climbing facilities unless communicated to TES in writing.



Sector: **A**

6/7/2022

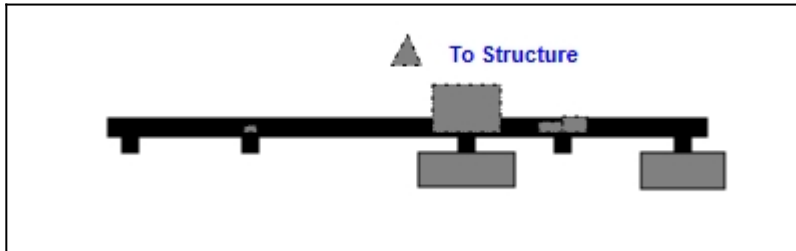
Structure Type: Self Support

Mount Elev: 160.00

Page: 1

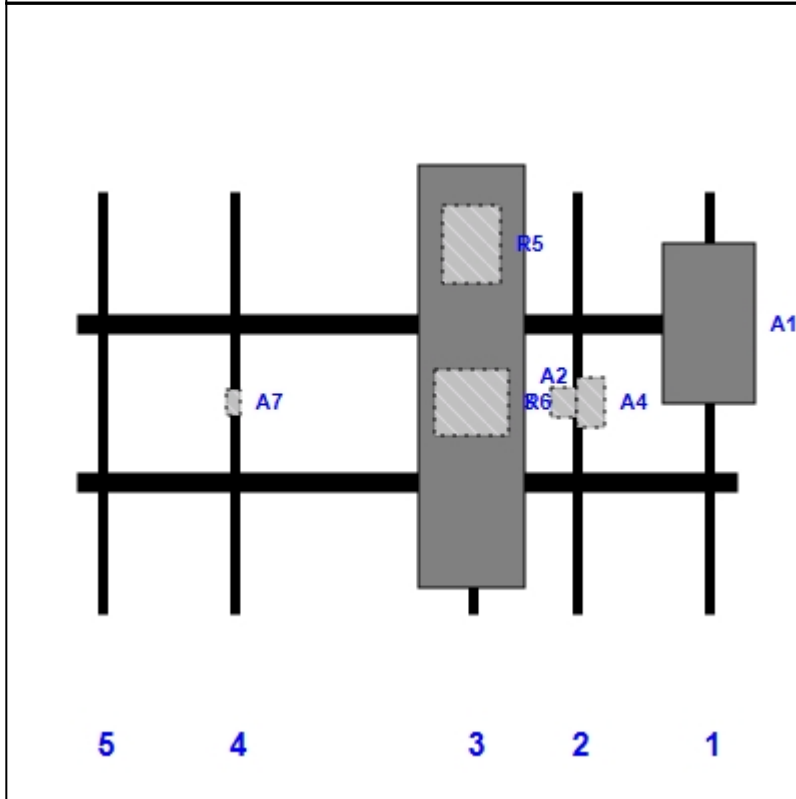


Plan View



Front View

Looking Toward Structure



Ref	Model	Height (in)	Width (in)	H Dist Left	Pipe	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	AIR6419 B41	36.30	20.90	144.00	1	a	Front	30.00		Added	
A3	KRY 112 144/1	6.90	6.10	114.00	2	a	Behind	48.00	-3.00	Leased	
A4	KRY 112 489/2	11.00	6.10	114.00	2	a	Behind	48.00	3.00	Leased	
A2	APXVAALL24_43-U-NA20	95.90	24.00	90.00	3	a	Front	42.00		Added	
R5	4449 B71 + B85	17.90	13.10	90.00	3	a	Behind	12.00		Added	
R6	4460 B25 + B66	15.10	17.00	90.00	3	a	Behind	48.00		Added	
A7	782 11056	5.50	3.20	36.00	4	a	Behind	48.00		Leased	

Sector: **B**

6/7/2022

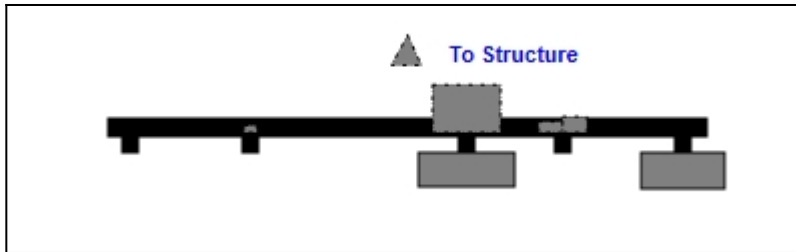
Structure Type: Self Support

Mount Elev: 160.00

Page: 2

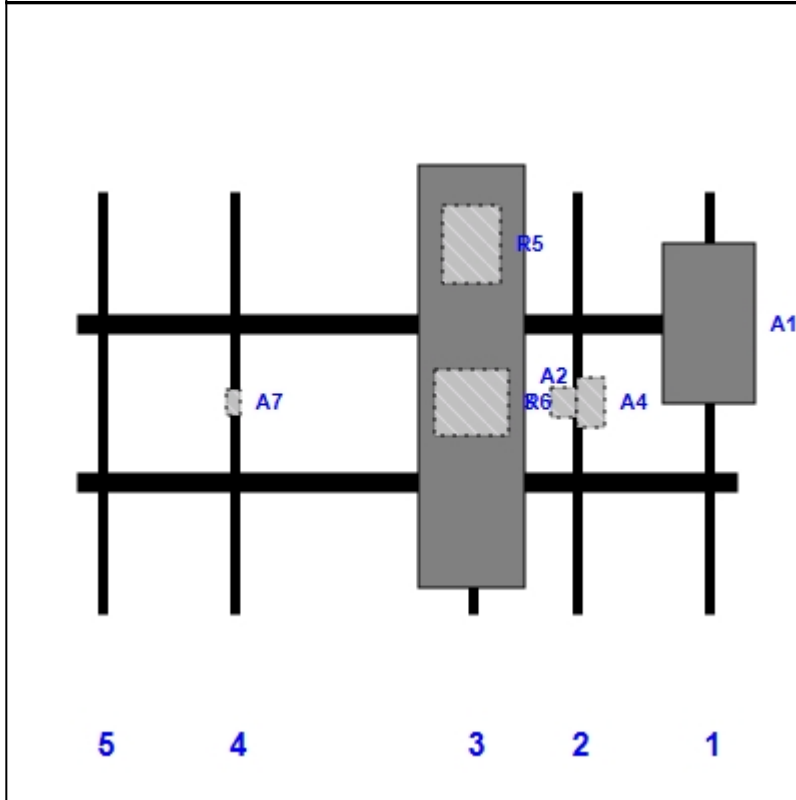


Plan View



Front View

Looking Toward Structure



Ref	Model	Height (in)	Width (in)	H Dist Left	Pipe	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	AIR6419 B41	36.30	20.90	144.00	1	a	Front	30.00		Added	
A3	KRY 112 144/1	6.90	6.10	114.00	2	a	Behind	48.00	-3.00	Leased	
A4	KRY 112 489/2	11.00	6.10	114.00	2	a	Behind	48.00	3.00	Leased	
A2	APXVAALL24_43-U-NA20	95.90	24.00	90.00	3	a	Front	42.00		Added	
R5	4449 B71 + B85	17.90	13.10	90.00	3	a	Behind	12.00		Added	
R6	4460 B25 + B66	15.10	17.00	90.00	3	a	Behind	48.00		Added	
A7	782 11056	5.50	3.20	36.00	4	a	Behind	48.00		Leased	



Sector: **C**

6/7/2022

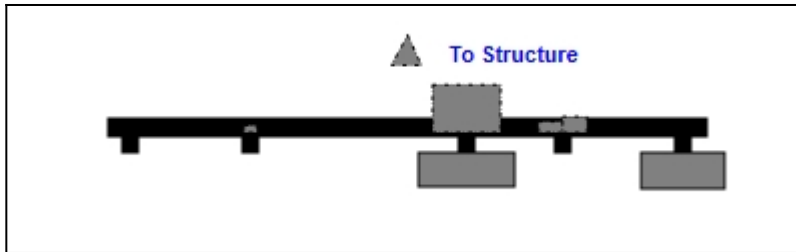
Structure Type: Self Support

Mount Elev: 160.00

Page: 3

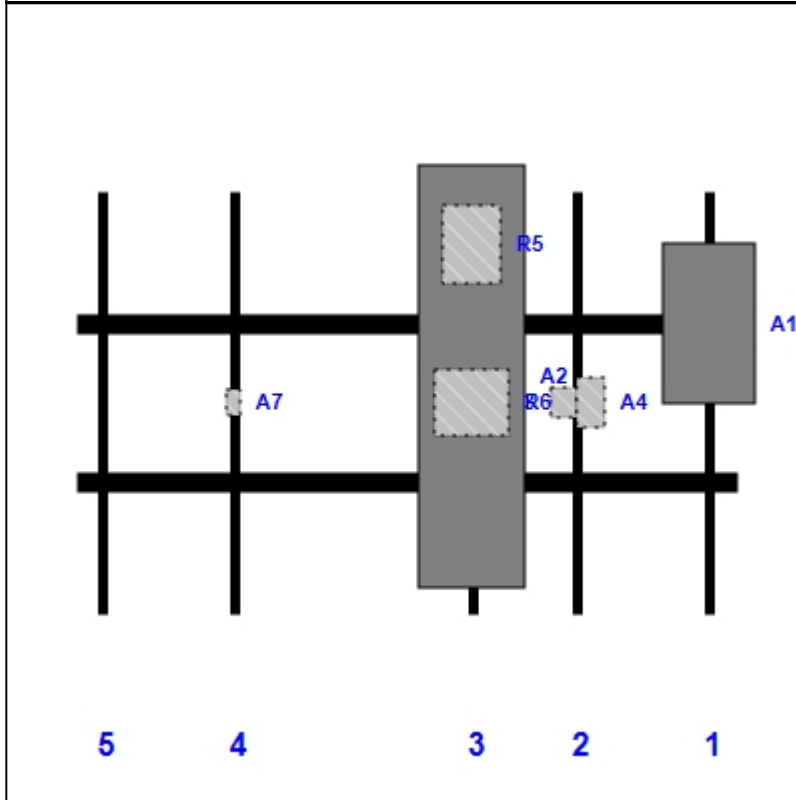


Plan View

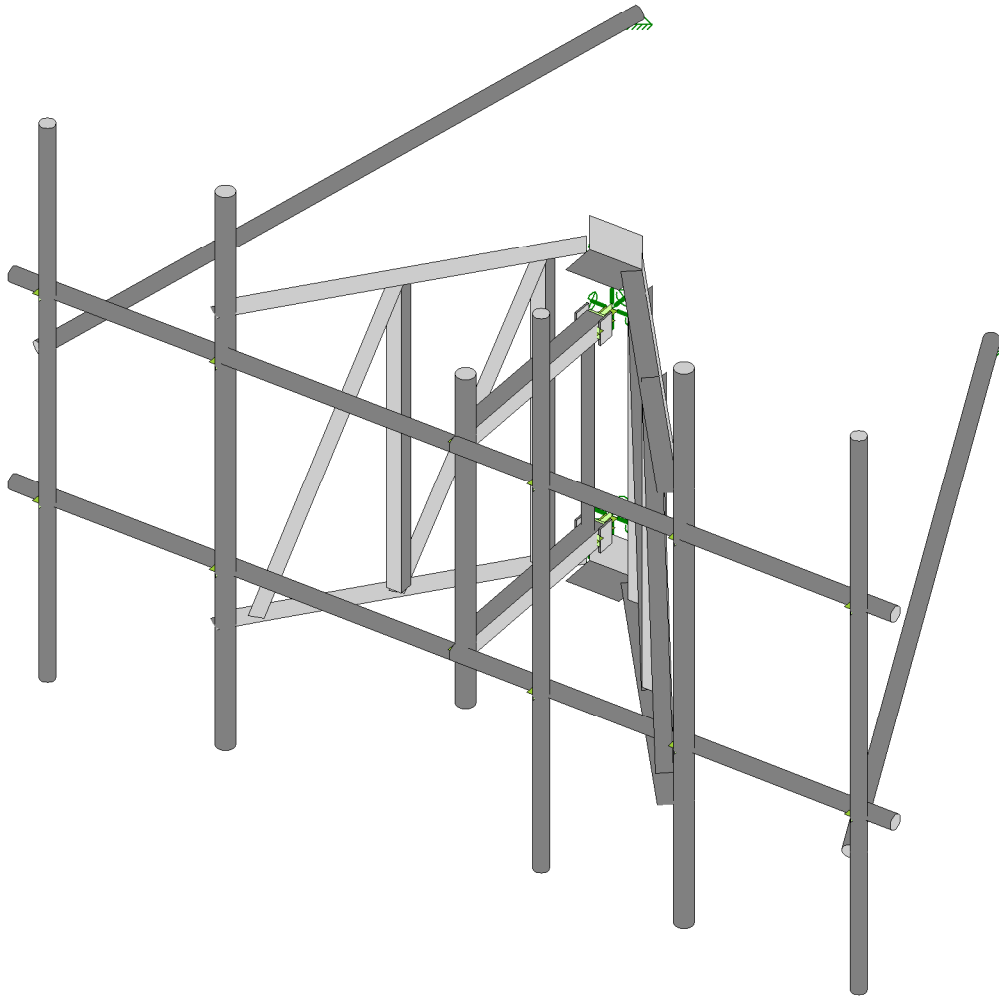
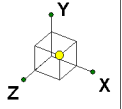


Front View

Looking Toward Structure



Ref	Model	Height (in)	Width (in)	H Dist Left	Pipe	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	AIR6419 B41	36.30	20.90	144.00	1	a	Front	30.00		Added	
A3	KRY 112 144/1	6.90	6.10	114.00	2	a	Behind	48.00	-3.00	Leased	
A4	KRY 112 489/2	11.00	6.10	114.00	2	a	Behind	48.00	3.00	Leased	
A2	APXVAALL24_43-U-NA20	95.90	24.00	90.00	3	a	Front	42.00		Added	
R5	4449 B71 + B85	17.90	13.10	90.00	3	a	Behind	12.00		Added	
R6	4460 B25 + B66	15.10	17.00	90.00	3	a	Behind	48.00		Added	
A7	782 11056	5.50	3.20	36.00	4	a	Behind	48.00		Leased	



Tower Engineering Solutio...

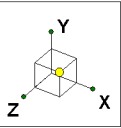
CT09865-S-SBA\_MT\_LOT\_Loads Only\_Sector A\_G

SK - 1

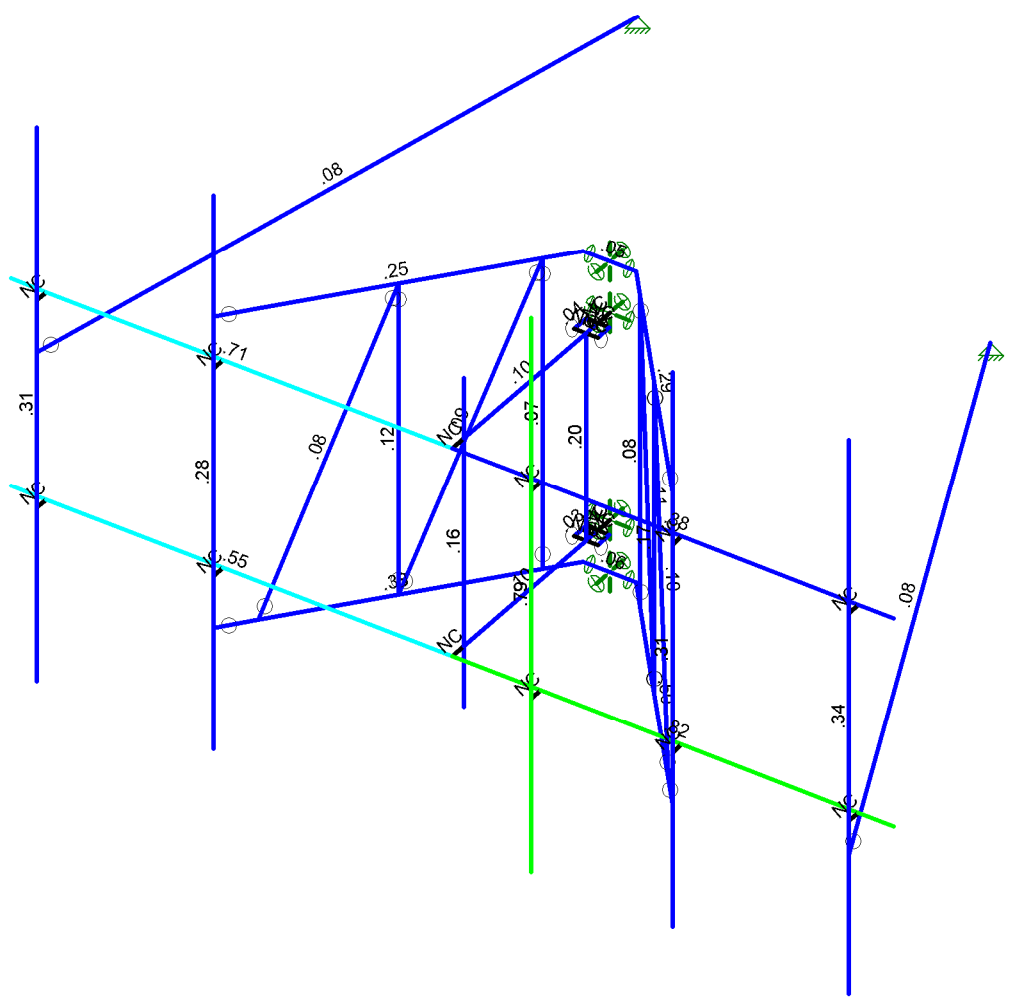
June 7, 2022 at 11:28 AM

TES Project No. 130153

CT09865-S-SBA\_130153\_G\_RISA\_...

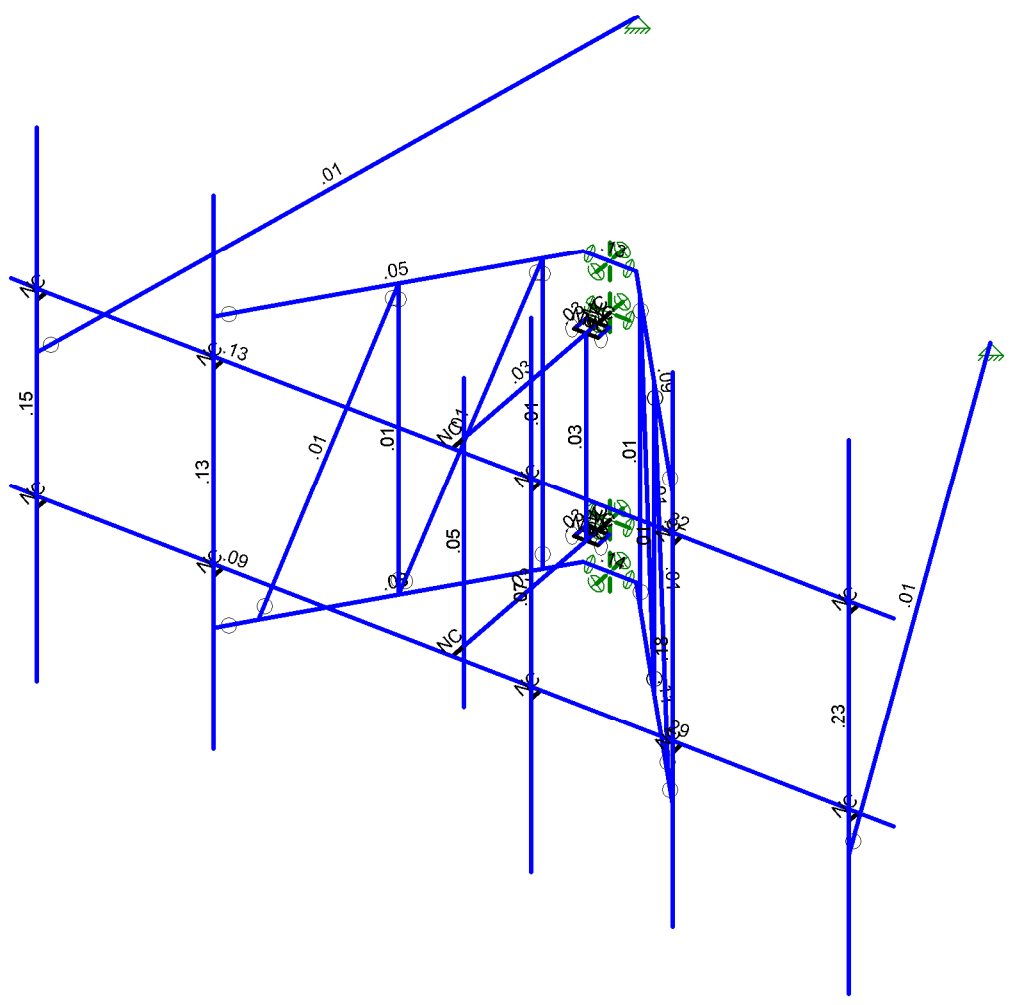
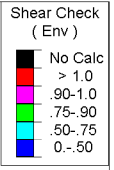
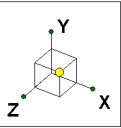


Code Check (Env)	
Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-90
Cyan	.50-.75
Blue	0-.50



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

Tower Engineering Solutio...		SK - 2
	CT09865-S-SBA_MT_LOT_Loads Only_Sector A_G	June 7, 2022 at 11:28 AM
TES Project No. 130153		CT09865-S-SBA_130153_G_RISA_...



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

Tower Engineering Solutio...		SK - 3
	CT09865-S-SBA_MT_LOT_Loads Only_Sector A_G	June 7, 2022 at 11:29 AM
TES Project No. 130153		CT09865-S-SBA_130153_G_RISA_...



Company : Tower Engineering Solutions, LLC  
 Designer :  
 Job Number : TES Project No. 130153  
 Model Name : CT09865-S-SBA\_MT\_LOT\_Loads Only\_Sector A\_G

June 7, 2022  
 11:29 AM  
 Checked By: \_\_\_\_\_

### Basic Load Cases

BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...)	Surface(P...
1 Antenna D	None					9		
2 Antenna Di	None					9		
3 Antenna W Front	None					9		
4 Antenna Wi Front	None					9		
5 Antenna W Side	None					9		
6 Antenna Wi Side	None					9		
7 Service Lm1	None					1		
8 Service Lm2	None					1		
9 Structure D	None		-1					
10 Structure Di	None						33	
11 Structure W Front	None						33	
12 Structure Wi Front	None						33	
13 Structure W Side	None						33	
14 Structure Wi Side	None						33	

### Load Combinations

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

### Joint Coordinates and Temperatures

Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1 N9	0	3	3.334	0	
2 N10	0	0	3.334	0	
3 N11	-6.25	3	3.334	0	
4 N12	-6.25	0	3.334	0	
5 N13	6.25	3	3.334	0	
6 N14	6.25	0	3.334	0	
7 NP3	-5.75	5.5	3.534	0	
8 NP4	-5.75	-2.5	3.534	0	
9 N28	-5.75	0	3.334	0	
10 N36	-2.5	3.75	-4.33	0	
11 N35	2.5	1	-4.33	0	
12 N21	0	3	3.084	0	
13 N22	0	0	3.084	0	
14 N23	0	3.875	3.084	0	
15 N24	0	-.875	3.084	0	
16 N20	0	3	.334	0	
17 N21A	0	0	.334	0	
18 N22A	0	3	.5	0	
19 N23A	0	0	.5	0	



Company : Tower Engineering Solutions, LLC  
 Designer :  
 Job Number : TES Project No. 130153  
 Model Name : CT09865-S-SBA\_MT\_LOT\_Loads Only\_Sector A\_G

June 7, 2022  
 11:29 AM  
 Checked By: \_\_\_\_\_

**Joint Coordinates and Temperatures (Continued)**

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
20	N23B	-.166	3	.5	0	
21	N24A	-.166	0	.5	0	
22	N27A	.166	3	.5	0	
23	N28A	.166	0	.5	0	
24	N27B	-.166	3	.25	0	
25	N28B	-.166	0	.25	0	
26	N29	.166	3	.25	0	
27	N30	.166	0	.25	0	
28	N31	0	3	.25	0	
29	N32	0	0	.25	0	
30	N33A	0	3	0	0	
31	N34A	0	0	0	0	
32	N35A	-5.75	3	3.334	0	
33	N35B	-5.75	0	3.534	0	
34	N36A	-5.75	3	3.534	0	
35	N37	5.75	5.5	3.534	0	
36	N38	5.75	-2.5	3.534	0	
37	N39	5.75	0	3.334	0	
38	N40	5.75	3	3.334	0	
39	N41	5.75	0	3.534	0	
40	N42	5.75	3	3.534	0	
41	N49	-5.75	2.25	3.534	0	
42	N50	5.75	-.5	3.534	0	
43	N49A	-3.25	5.5	3.534	0	
44	N50A	-3.25	-2.5	3.534	0	
45	N51	-3.25	0	3.334	0	
46	N52	-3.25	3	3.334	0	
47	N53	-3.25	0	3.534	0	
48	N54	-3.25	3	3.534	0	
49	N49B	3.25	5.5	3.534	0	
50	N50B	3.25	-2.5	3.534	0	
51	N51A	3.25	0	3.334	0	
52	N52A	3.25	3	3.334	0	
53	N53A	3.25	0	3.534	0	
54	N54A	3.25	3	3.534	0	
55	N55	0	3.75	0	0	
56	N56	-3.25	3.75	3.534	0	
57	N57	3.25	3.75	3.534	0	
58	N58	0	-.75	0	0	
59	N59	-3.25	-.75	3.534	0	
60	N60	3.25	-.75	3.534	0	
61	N61	-.375	3.75	0	0	
62	N62	-.375	-.75	0	0	
63	N65	.375	3.75	0	0	
64	N66	.375	-.75	0	0	
65	N65A	-1.8125	3.75	1.767	0	
66	N66A	1.8125	3.75	1.767	0	
67	N67	-1.8125	-.75	1.767	0	
68	N68	1.8125	-.75	1.767	0	
69	N69	-0.690536	3.75	0.387862	0	
70	N70	0.690536	3.75	0.387862	0	
71	N71	-0.690536	-.75	0.387862	0	
72	N72	0.690536	-.75	0.387862	0	
73	N73	-2.899287	3.75	3.102898	0	
74	N74	2.899287	3.75	3.102898	0	
75	N75	-2.899287	-.75	3.102898	0	
76	N76	2.899287	-.75	3.102898	0	



### Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
77	N77	1.25	5.5	3.534	0	
78	N78	1.25	-2.5	3.534	0	
79	N79	1.25	0	3.334	0	
80	N80	1.25	3	3.334	0	
81	N81	1.25	0	3.534	0	
82	N82	1.25	3	3.534	0	

### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Front Face Horizo...	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Mount Pipe	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Standoff Horizontal	HSS3X3X3	Beam	Tube	A500 Gr.B...	Typical	1.89	2.46	2.46	4.03
4	Mast Pipe	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
5	Standoff Vertical	PIPE 1.5	Beam	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586
6	Tie Back	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	Connection Plate	PL3/8x4	Beam	RECT	A36 Gr.36	Typical	1.5	.018	2	.066
8	Standoff V Arm	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
9	Standoff V Veritcal	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011
10	Standoff V Diagonal	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011
11	Tower Leg Conne...	L6X6X6	Beam	Single Angle	A36 Gr.36	Typical	4.38	15.4	15.4	.218

### Hot Rolled Steel Properties

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

### Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	MP5A	NP3	NP4			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
2	AM1	N49	N36			Tie Back	Beam	Pipe	A53 Gr.B	Typical
3	AM2	N11	N9			Front Face Ho...	Beam	Pipe	A53 Gr.B	Typical
4	AM3	N9	N13			Front Face Ho...	Beam	Pipe	A53 Gr.B	Typical
5	AM4	N12	N10			Front Face Ho...	Beam	Pipe	A53 Gr.B	Typical
6	AM5	N10	N14			Front Face Ho...	Beam	Pipe	A53 Gr.B	Typical
7	M16	N50	N35			Tie Back	Beam	Pipe	A53 Gr.B	Typical
8	M11	N21	N9			RIGID	Beam	None	RIGID	DR1
9	M12	N22	N10			RIGID	Beam	None	RIGID	DR1
10	M13	N23	N24			Mast Pipe	Beam	Pipe	A53 Gr.B	Typical
11	M11A	N23B	N22A			RIGID	Beam	None	RIGID	DR1
12	M12A	N27A	N22A			RIGID	Beam	None	RIGID	DR1
13	M13A	N24A	N23A			RIGID	Beam	None	RIGID	DR1
14	M14	N28A	N23A			RIGID	Beam	None	RIGID	DR1
15	M15	N20	N21			Standoff Horiz...	Beam	Tube	A500 Gr.B...	Typical
16	M16A	N21A	N22			Standoff Horiz...	Beam	Tube	A500 Gr.B...	Typical
17	M17	N27B	N23B			Connection Pl...	Beam	RECT	A36 Gr.36	Typical
18	M18	N29	N27A			Connection Pl...	Beam	RECT	A36 Gr.36	Typical
19	M19	N28B	N24A			Connection Pl...	Beam	RECT	A36 Gr.36	Typical



**Member Primary Data (Continued)**

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
20	M20	N30	N28A			Connection Pl...	Beam	RECT	A36 Gr.36	Typical
21	M21	N27B	N29			RIGID	Beam	None	RIGID	DR1
22	M22	N28B	N30			RIGID	Beam	None	RIGID	DR1
23	M23	N33A	N31			RIGID	Beam	None	RIGID	DR1
24	M24	N34A	N32			RIGID	Beam	None	RIGID	DR1
25	M25	N35A	N36A			RIGID	Beam	None	RIGID	DR1
26	M26	N28	N35B			RIGID	Beam	None	RIGID	DR1
27	MP1A	N37	N38			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
28	M28	N40	N42			RIGID	Beam	None	RIGID	DR1
29	M29	N39	N41			RIGID	Beam	None	RIGID	DR1
30	MP4A	N49A	N50A			Mast Pipe	Beam	Pipe	A53 Gr.B	Typical
31	M34	N52	N54			RIGID	Beam	None	RIGID	DR1
32	M35	N51	N53			RIGID	Beam	None	RIGID	DR1
33	MP2A	N49B	N50B			Mast Pipe	Beam	Pipe	A53 Gr.B	Typical
34	M34A	N52A	N54A			RIGID	Beam	None	RIGID	DR1
35	M35A	N51A	N53A			RIGID	Beam	None	RIGID	DR1
36	M36	N61	N65			Tower Leg Co...	Beam	Single Angle	A36 Gr.36	Typical
37	M37	N62	N66			Tower Leg Co...	Beam	Single Angle	A36 Gr.36	Typical
38	M38	N61	N56			Standoff V Arm	Beam	Single Angle	A36 Gr.36	Typical
39	M39	N65	N57			Standoff V Arm	Beam	Single Angle	A36 Gr.36	Typical
40	M40	N62	N59			Standoff V Arm	Beam	Single Angle	A36 Gr.36	Typical
41	M41	N66	N60			Standoff V Arm	Beam	Single Angle	A36 Gr.36	Typical
42	M42	N69	N71			Standoff V Ver...	Beam	Single Angle	A36 Gr.36	Typical
43	M43	N65A	N67			Standoff V Ver...	Beam	Single Angle	A36 Gr.36	Typical
44	M44	N70	N72			Standoff V Ver...	Beam	Single Angle	A36 Gr.36	Typical
45	M45	N66A	N68			Standoff V Ver...	Beam	Single Angle	A36 Gr.36	Typical
46	M46	N69	N67			Standoff V Dia...	Beam	Single Angle	A36 Gr.36	Typical
47	M47	N65A	N75			Standoff V Dia...	Beam	Single Angle	A36 Gr.36	Typical
48	M48	N70	N68			Standoff V Dia...	Beam	Single Angle	A36 Gr.36	Typical
49	M49	N66A	N76			Standoff V Dia...	Beam	Single Angle	A36 Gr.36	Typical
50	MP3A	N77	N78			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
51	M51	N80	N82			RIGID	Beam	None	RIGID	DR1
52	M52	N79	N81			RIGID	Beam	None	RIGID	DR1
53	M53	N22A	N23A			Standoff Vertical	Beam	Pipe	A53 Gr.B	Typical

**Member Advanced Data**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	MP5A						Yes		-z		None
2	AM1	BenPIN					Yes				None
3	AM2						Yes				None
4	AM3						Yes				None
5	AM4						Yes				None
6	AM5						Yes				None
7	M16	BenPIN					Yes				None
8	M11						Yes				None
9	M12						Yes				None
10	M13						Yes				None
11	M11A		OOOXOO				Yes				None
12	M12A		OOOXOO				Yes				None
13	M13A		OOOXOO				Yes				None
14	M14		OOOXOO				Yes				None
15	M15						Yes				None
16	M16A						Yes				None
17	M17						Yes				None
18	M18						Yes				None





**Member Advanced Data (Continued)**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
19	M19						Yes				None
20	M20						Yes				None
21	M21						Yes				None
22	M22						Yes				None
23	M23						Yes				None
24	M24						Yes				None
25	M25						Yes				None
26	M26						Yes				None
27	MP1A						Yes		-z		None
28	M28						Yes				None
29	M29						Yes				None
30	MP4A						Yes		-z		None
31	M34						Yes				None
32	M35						Yes				None
33	MP2A						Yes		-z		None
34	M34A						Yes				None
35	M35A						Yes				None
36	M36						Yes				None
37	M37						Yes				None
38	M38		BenPIN				Yes				None
39	M39		BenPIN				Yes				None
40	M40		BenPIN				Yes				None
41	M41		BenPIN				Yes				None
42	M42	BenPIN	BenPIN				Yes				None
43	M43	BenPIN	BenPIN				Yes				None
44	M44	BenPIN	BenPIN				Yes				None
45	M45	BenPIN	BenPIN				Yes				None
46	M46	BenPIN	BenPIN				Yes				None
47	M47	BenPIN	BenPIN				Yes				None
48	M48	BenPIN	BenPIN				Yes				None
49	M49	BenPIN	BenPIN				Yes				None
50	MP3A						Yes		-z		None
51	M51						Yes				None
52	M52						Yes				None
53	M53						Yes				None

**Hot Rolled Steel Design Parameters**

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torq...	Kyy	Kzz	Cb	Function
1	MP5A	Mount Pipe	8			Lbyy			2.1	2.1		Lateral
2	AM1	Tie Back	8.64			Lbyy			1	1		Lateral
3	AM2	Front Face ...	6.25			Lbyy			2.1	2.1		Gravity
4	AM3	Front Face ...	6.25			Lbyy			2.1	2.1		Gravity
5	AM4	Front Face ...	6.25			Lbyy			2.1	2.1		Gravity
6	AM5	Front Face ...	6.25			Lbyy			2.1	2.1		Gravity
7	M16	Tie Back	8.64			Lbyy			1	1		Lateral
8	M13	Mast Pipe	4.75			Lbyy						Lateral
9	M15	Standoff Ho...	2.75			Lbyy						Lateral
10	M16A	Standoff Ho...	2.75			Lbyy						Lateral
11	M17	Connection ...	.25			Lbyy						Lateral
12	M18	Connection ...	.25			Lbyy						Lateral
13	M19	Connection ...	.25			Lbyy						Lateral
14	M20	Connection ...	.25			Lbyy						Lateral
15	MP1A	Mount Pipe	8			Lbyy			2.1	2.1		Lateral
16	MP4A	Mast Pipe	8			Lbyy			2.1	2.1		Lateral
17	MP2A	Mast Pipe	8			Lbyy			2.1	2.1		Lateral



### Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torg...	Kyy	Kzz	Cb	Function
18	M36	Tower Leg ...	.75			Lbyy						Lateral
19	M37	Tower Leg ...	.75			Lbyy						Lateral
20	M38	Standoff V ...	4.556			Lbyy						Lateral
21	M39	Standoff V ...	4.556			Lbyy						Lateral
22	M40	Standoff V ...	4.556			Lbyy						Lateral
23	M41	Standoff V ...	4.556			Lbyy						Lateral
24	M42	Standoff V ...	4.5			Lbyy						Lateral
25	M43	Standoff V ...	4.5			Lbyy						Lateral
26	M44	Standoff V ...	4.5			Lbyy						Lateral
27	M45	Standoff V ...	4.5			Lbyy						Lateral
28	M46	Standoff V ...	4.838			Lbyy						Lateral
29	M47	Standoff V ...	4.818			Lbyy						Lateral
30	M48	Standoff V ...	4.838			Lbyy						Lateral
31	M49	Standoff V ...	4.818			Lbyy						Lateral
32	MP3A	Mount Plpe	8			Lbyy			2.1	2.1		Lateral
33	M53	Standoff Ve...	3			Lbyy						Lateral

### Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N36	Reaction	Reaction	Reaction			
2	N35	Reaction	Reaction	Reaction			
3	N33A	Reaction	Reaction	Reaction	Reaction		Reaction
4	N34A	Reaction	Reaction	Reaction	Reaction		Reaction
5	N55	Reaction	Reaction	Reaction	Reaction		Reaction
6	N58	Reaction	Reaction	Reaction	Reaction		Reaction
7	N61						
8	N62						
9	N65						
10	N66						

### Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N36	max	303.161	3	179.612	3	842.464	4	0	11	0	11	0	11
2		min	-310.18	4	-143.693	4	-851.498	3	0	1	0	1	0	1
3	N35	max	237.998	3	148.375	4	671.137	3	0	11	0	11	0	11
4		min	-235.915	4	-111.122	3	-685.628	4	0	1	0	1	0	1
5	N33A	max	102.919	1	358.083	8	291.23	1	-.04	3	0	11	.165	1
6		min	-108.383	2	80.117	3	-713.179	2	-.178	8	0	1	-.096	2
7	N34A	max	108.387	1	358.904	8	578.42	5	-.025	3	0	11	.144	10
8		min	-89.396	2	50.418	3	-78.256	2	-.178	8	0	1	-.083	9
9	N55	max	1762.438	4	1802.546	7	971.005	1	.011	3	0	11	.424	10
10		min	-2169.015	3	493.583	4	-2141.939	2	-.198	8	0	1	-.224	9
11	N58	max	1504.093	4	962.693	5	1973.755	5	-.003	3	0	11	.292	10
12		min	-1084.831	3	281.48	3	-133.754	2	-.192	8	0	1	-.188	9
13	Totals:	max	2605.311	4	3534.606	8	3415.324	1						
14		min	-2605.312	3	1240.644	3	-3415.323	2						

### Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC
1	MP5A	1	max	0	11	.018	9	.006	4	0	10	0	11	0	11
2			min	0	9	-.008	10	-.011	7	0	9	0	1	0	1
3		2	max	26.062	7	21.659	4	21.65	1	0	10	.022	1	.022	3



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
4		min	8.33	9	-21.66	3	-21.652	2	0	9	-.022	2	-.022	4	
5	3	max	46.064	1	19.895	4	271.375	3	.128	3	.303	4	.048	4	
6		min	-395.857	9	-351	9	-261.544	4	-.123	4	-.304	3	-.046	3	
7	4	max	-8.33	3	21.658	3	21.659	2	0	9	.022	1	.022	3	
8		min	-26.062	8	-21.658	4	-21.658	1	0	10	-.022	2	-.022	4	
9	5	max	0	3	.008	10	.028	4	0	9	0	11	0	11	
10		min	0	9	-.025	9	-.026	3	0	10	0	1	0	1	
11	AM1	1	max	947.24	4	56.534	5	40.054	4	0	11	0	11	11	
12		min	-946.564	3	14.611	2	-40.054	3	0	1	0	1	0	1	
13	2	max	937.527	4	28.267	5	20.027	4	0	11	.065	4	-.024	2	
14		min	-939.974	3	7.306	2	-20.027	3	0	1	-.065	3	-.092	5	
15	3	max	927.814	4	0	11	0	11	0	11	.087	4	-.032	2	
16		min	-933.385	3	0	1	0	1	0	1	-.087	3	-.122	5	
17	4	max	918.102	4	-7.306	2	20.027	3	0	11	.065	4	-.024	2	
18		min	-926.796	3	-28.267	5	-20.027	4	0	1	-.065	3	-.092	5	
19	5	max	908.389	4	-14.611	2	40.054	3	0	11	0	11	0	11	
20		min	-920.207	3	-56.534	5	-40.054	4	0	1	0	1	0	1	
21	AM2	1	max	0	11	0	11	0	11	0	11	0	11	11	
22		min	0	1	0	1	0	1	0	1	0	1	0	1	
23	2	max	373.25	3	138.884	3	578.224	4	.105	4	.404	4	.039	2	
24		min	-420.277	4	-430.359	9	-582.706	3	-.101	3	-.42	3	-.038	1	
25	3	max	434.965	2	113.821	9	487.082	3	.119	3	1.206	4	.236	9	
26		min	-593.783	9	-61.061	10	-471.097	4	-.138	4	-1.233	3	-.097	10	
27	4	max	434.965	2	107.314	9	487.082	3	.119	3	.47	4	.063	9	
28		min	-593.783	9	-67.569	10	-471.097	4	-.138	4	-.472	3	-.052	2	
29	5	max	434.965	2	100.806	9	487.082	3	.119	3	.289	3	.114	10	
30		min	-593.783	9	-74.077	10	-471.097	4	-.138	4	-.267	4	-.173	2	
31	AM3	1	max	503.173	2	491.075	4	543.66	1	.422	1	.334	2	.204	1
32		min	-538.378	1	-290.173	3	-586.27	2	-.392	2	-.299	1	-.119	2	
33	2	max	556.129	2	214.182	2	266.546	2	.2	2	.31	3	.116	2	
34		min	-620.984	1	-420.403	1	-236.971	1	-.154	1	-.336	4	-.251	1	
35	3	max	556.129	2	207.675	2	283.463	2	.2	2	.642	3	.411	1	
36		min	-620.984	1	-426.911	1	-253.889	1	-.154	1	-.624	4	-.213	2	
37	4	max	113.213	4	486.936	10	235.384	1	.229	1	.253	3	.079	3	
38		min	-381.457	10	42.233	4	-256.208	2	-.249	2	-.267	4	-.07	4	
39	5	max	0	11	0	11	0	11	0	11	0	11	0	11	
40		min	0	1	0	1	0	1	0	1	0	1	0	1	
41	AM4	1	max	0	11	0	11	0	11	0	11	0	11	11	
42		min	0	1	0	1	0	1	0	1	0	1	0	1	
43	2	max	350.462	9	3.54	2	261.41	4	.093	4	.382	4	.066	9	
44		min	-63.203	4	-379.093	9	-271.577	3	-.093	3	-.386	3	-.023	2	
45	3	max	503.934	9	179.64	4	345.626	3	.07	4	.911	4	.303	4	
46		min	-283.383	1	-109.363	3	-342.209	4	-.088	3	-.916	3	-.201	3	
47	4	max	503.934	9	173.132	4	345.626	3	.07	4	.376	4	.061	2	
48		min	-283.383	1	-115.871	3	-342.209	4	-.088	3	-.376	3	-.061	1	
49	5	max	503.934	9	166.625	4	345.626	3	.07	4	.164	3	.161	3	
50		min	-283.383	1	-122.378	3	-342.209	4	-.088	3	-.159	4	-.238	4	
51	AM5	1	max	376.88	10	601.051	2	468.453	1	.234	2	.272	2	.312	2
52		min	-56.83	1	-404.882	1	-437.322	2	-.214	1	-.289	1	-.233	1	
53	2	max	470.403	10	30.077	4	346.816	3	.194	1	.442	3	.124	1	
54		min	-322.137	4	-321.638	7	-392.128	4	-.164	2	-.429	4	-.262	2	
55	3	max	470.403	10	23.569	4	346.816	3	.194	1	.984	3	.402	3	
56		min	-322.137	4	-341.999	7	-392.128	4	-.164	2	-1.042	4	-.193	4	
57	4	max	427.157	4	427.809	10	635.978	4	.351	3	.328	3	.078	4	
58		min	-323.291	3	-9.169	4	-598.48	3	-.369	4	-.334	4	-.069	3	
59	5	max	0	11	0	11	0	11	0	11	0	11	0	11	
60		min	0	1	0	1	0	1	0	1	0	1	0	1	



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
61	M16	1	max	758.501	3	56.534	5	40.054	4	0	11	0	11	0	11
62			min	-764.879	4	14.611	2	-40.054	3	0	1	0	1	0	1
63		2	max	748.788	3	28.267	5	20.027	4	0	11	.065	4	-.024	2
64			min	-758.29	4	7.306	2	-20.027	3	0	1	-.065	3	-.092	5
65		3	max	739.075	3	0	11	0	11	0	11	.087	4	-.032	2
66			min	-751.701	4	0	1	0	1	0	1	-.087	3	-.122	5
67		4	max	729.363	3	-7.306	2	20.027	3	0	11	.065	4	-.024	2
68			min	-745.112	4	-28.267	5	-20.027	4	0	1	-.065	3	-.092	5
69		5	max	719.65	3	-14.611	2	40.054	3	0	11	0	11	0	11
70			min	-738.523	4	-56.534	5	-40.054	4	0	1	0	1	0	1
71	M11	1	max	334.241	1	509.935	4	181.244	10	.244	9	.403	2	.23	2
72			min	-398.302	2	-346.958	3	-212.991	9	-.09	10	-.381	1	-.239	1
73		2	max	334.241	1	509.935	4	181.244	10	.244	9	.399	2	.247	2
74			min	-398.302	2	-346.958	3	-212.991	9	-.09	10	-.38	1	-.265	1
75		3	max	334.241	1	509.935	4	181.244	10	.244	9	.395	2	.264	2
76			min	-398.302	2	-346.958	3	-212.991	9	-.09	10	-.379	1	-.292	1
77		4	max	334.241	1	509.935	4	181.244	10	.244	9	.391	2	.281	2
78			min	-398.302	2	-346.958	3	-212.991	9	-.09	10	-.377	1	-.319	1
79		5	max	334.241	1	509.935	4	181.244	10	.244	9	.39	4	.298	2
80			min	-398.302	2	-346.958	3	-212.991	9	-.09	10	-.376	1	-.346	1
81	M12	1	max	324.049	1	480.513	2	333.865	4	.444	2	.284	4	.096	1
82			min	-304.892	2	-324.323	1	-286.309	3	-.293	1	-.311	3	-.097	2
83		2	max	324.049	1	480.513	2	333.865	4	.444	2	.305	4	.116	1
84			min	-304.892	2	-324.323	1	-286.309	3	-.293	1	-.329	3	-.127	2
85		3	max	324.049	1	480.513	2	333.865	4	.444	2	.325	4	.136	1
86			min	-304.892	2	-324.323	1	-286.309	3	-.293	1	-.347	3	-.157	2
87		4	max	324.049	1	480.513	2	333.865	4	.444	2	.346	4	.156	1
88			min	-304.892	2	-324.323	1	-286.309	3	-.293	1	-.365	3	-.187	2
89		5	max	324.049	1	480.513	2	333.865	4	.444	2	.367	4	.177	1
90			min	-304.892	2	-324.323	1	-286.309	3	-.293	1	-.383	3	-.217	2
91	M13	1	max	0	11	.002	2	0	1	0	11	0	11	0	11
92			min	0	1	-.007	5	-.009	6	0	1	0	1	0	1
93		2	max	379.991	4	190.744	9	368.316	6	.086	9	-.018	1	.238	9
94			min	-391.672	3	-165.75	10	38.014	1	-.116	10	-.439	8	-.183	10
95		3	max	387.798	4	190.744	9	368.106	8	.086	9	.036	1	.115	1
96			min	-383.865	3	-165.75	10	53.039	3	-.116	10	-.035	2	-.113	2
97		4	max	395.605	4	190.744	9	368.106	8	.086	9	.436	8	.247	1
98			min	-376.058	3	-165.75	10	53.039	3	-.116	10	.079	3	-.317	2
99		5	max	0	11	.006	7	.009	8	0	11	0	11	0	11
100			min	0	1	-.002	9	0	3	0	1	0	1	0	1
101	M11A	1	max	50.743	1	337.25	2	36.703	4	0	11	.007	2	.002	1
102			min	-54.924	2	-419.366	10	-303.165	7	0	1	-.006	1	-.001	2
103		2	max	50.743	1	337.25	2	36.703	4	0	11	.006	4	.019	10
104			min	-54.924	2	-419.366	10	-303.165	7	0	1	-.013	3	-.015	2
105		3	max	50.743	1	337.25	2	36.703	4	0	11	.007	4	.037	10
106			min	-54.924	2	-419.366	10	-303.165	7	0	1	-.025	7	-.029	2
107		4	max	50.743	1	337.25	2	36.703	4	0	11	.009	4	.054	10
108			min	-54.924	2	-419.366	10	-303.165	7	0	1	-.038	7	-.043	2
109		5	max	50.743	1	337.25	2	36.703	4	0	11	.01	4	.072	10
110			min	-54.924	2	-419.366	10	-303.165	7	0	1	-.05	7	-.057	2
111	M12A	1	max	53.455	2	551.73	1	483.043	2	0	11	.007	2	.001	2
112			min	-52.17	1	-226.087	2	-259.771	1	0	1	-.006	1	-.002	1
113		2	max	53.455	2	551.73	1	483.043	2	0	11	.027	2	.011	2
114			min	-52.17	1	-226.087	2	-259.771	1	0	1	-.017	1	-.025	1
115		3	max	53.455	2	551.73	1	483.043	2	0	11	.047	2	.02	2
116			min	-52.17	1	-226.087	2	-259.771	1	0	1	-.028	1	-.048	1
117		4	max	53.455	2	551.73	1	483.043	2	0	11	.067	2	.029	2



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...]	LC	y-y Mome...	LC	z-z Mom...	LC	
118		min	-52.17	1	-226.087	2	-259.771	1	0	1	-.039	1	-.071	1	
119	5	max	53.455	2	551.73	1	483.043	2	0	11	.087	2	.039	2	
120		min	-52.17	1	-226.087	2	-259.771	1	0	1	-.049	1	-.094	1	
121	M13A	1	max	53.56	1	321.145	9	266.011	8	0	11	.006	2	.002	10
122		min	-45.231	2	-366.226	10	-37.436	3	0	1	-.007	1	-.001	9	
123	2	max	53.56	1	321.145	9	266.011	8	0	11	.013	4	.017	10	
124		min	-45.231	2	-366.226	10	-37.436	3	0	1	-.007	3	-.014	9	
125	3	max	53.56	1	321.145	9	266.011	8	0	11	.022	8	.032	10	
126		min	-45.231	2	-366.226	10	-37.436	3	0	1	-.008	3	-.028	9	
127	4	max	53.56	1	321.145	9	266.011	8	0	11	.033	8	.047	10	
128		min	-45.231	2	-366.226	10	-37.436	3	0	1	-.01	3	-.041	9	
129	5	max	53.56	1	321.145	9	266.011	8	0	11	.044	8	.063	10	
130		min	-45.231	2	-366.226	10	-37.436	3	0	1	-.011	3	-.054	9	
131	M14	1	max	44.163	2	480.202	10	140.036	2	0	11	.006	2	.001	9
132		min	-54.825	1	-168.248	9	-347.255	1	0	1	-.007	1	-.002	10	
133	2	max	44.163	2	480.202	10	140.036	2	0	11	.011	2	.008	9	
134		min	-54.825	1	-168.248	9	-347.255	1	0	1	-.021	1	-.022	10	
135	3	max	44.163	2	480.202	10	140.036	2	0	11	.017	2	.015	9	
136		min	-54.825	1	-168.248	9	-347.255	1	0	1	-.036	1	-.042	10	
137	4	max	44.163	2	480.202	10	140.036	2	0	11	.023	2	.022	9	
138		min	-54.825	1	-168.248	9	-347.255	1	0	1	-.05	1	-.062	10	
139	5	max	44.163	2	480.202	10	140.036	2	0	11	.029	2	.029	9	
140		min	-54.825	1	-168.248	9	-347.255	1	0	1	-.064	1	-.081	10	
141	M15	1	max	0	11	0	11	0	11	0	11	0	11	0	11
142		min	0	1	0	1	0	1	0	1	0	1	0	1	1
143	2	max	311.79	1	317.657	8	107.652	2	.156	1	.12	2	.059	6	
144		min	-630.235	2	69.546	3	-93.856	1	-.09	2	-.114	1	-.021	1	
145	3	max	311.79	1	303.016	8	109.985	4	.156	1	.194	2	-.004	2	
146		min	-630.235	2	63.84	3	-93.875	3	-.09	2	-.179	1	-.163	5	
147	4	max	311.79	1	288.374	8	125.656	4	.156	1	.268	2	-.062	2	
148		min	-630.235	2	58.134	3	-109.545	3	-.09	2	-.243	1	-.361	8	
149	5	max	311.79	1	273.733	8	141.327	4	.156	1	.342	2	-.116	2	
150		min	-630.235	2	52.427	3	-125.216	3	-.09	2	-.308	1	-.555	8	
151	M16A	1	max	0	11	0	11	0	11	0	11	0	11	0	11
152		min	0	1	0	1	0	1	0	1	0	1	0	1	1
153	2	max	433.845	5	320.431	8	105.647	4	.126	10	.086	2	.055	5	
154		min	-135.215	2	34.18	3	-120.709	3	-.07	9	-.097	1	.006	2	
155	3	max	433.845	5	305.789	8	121.318	4	.126	10	.152	2	.007	1	
156		min	-135.215	2	28.474	3	-136.379	3	-.07	9	-.175	1	-.162	6	
157	4	max	433.845	5	291.148	8	136.988	4	.126	10	.238	4	-.014	1	
158		min	-135.215	2	22.767	3	-152.05	3	-.07	9	-.267	3	-.366	8	
159	5	max	433.845	5	276.506	8	152.659	4	.126	10	.338	4	-.031	1	
160		min	-135.215	2	17.061	3	-167.721	3	-.07	9	-.377	3	-.562	8	
161	M17	1	max	36.233	4	338.768	2	56.26	2	.002	1	.006	1	.085	2
162		min	-303.158	7	-417.829	10	-50.546	1	-.001	2	-.007	2	-.105	10	
163	2	max	36.233	4	338.385	2	56.26	2	.002	1	.003	1	.063	2	
164		min	-303.158	7	-418.212	10	-50.546	1	-.001	2	-.003	2	-.079	10	
165	3	max	36.233	4	338.002	2	56.26	2	.002	1	0	2	.042	2	
166		min	-303.158	7	-418.595	10	-50.546	1	-.001	2	0	1	-.052	10	
167	4	max	36.233	4	337.619	2	56.26	2	.002	1	.004	2	.021	2	
168		min	-303.158	7	-418.978	10	-50.546	1	-.001	2	-.003	1	-.026	10	
169	5	max	36.233	4	337.236	2	56.26	2	.002	1	.007	2	0	11	
170		min	-303.158	7	-419.361	10	-50.546	1	-.001	2	-.006	1	0	1	
171	M18	1	max	259.439	1	553.276	1	56.26	2	.002	1	.006	1	.138	1
172		min	-483.359	2	-224.544	2	-50.546	1	-.001	2	-.007	2	-.056	2	
173	2	max	259.439	1	552.893	1	56.26	2	.002	1	.003	1	.104	1	
174		min	-483.359	2	-224.927	2	-50.546	1	-.001	2	-.003	2	-.042	2	





**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
175	3	max	259.439	1	552.51	1	56.26	2	.002	1	0	2	.069	1	
176		min	-483.359	2	-225.309	2	-50.546	1	-.001	2	0	1	-.028	2	
177	4	max	259.439	1	552.127	1	56.26	2	.002	1	.004	2	.034	1	
178		min	-483.359	2	-225.692	2	-50.546	1	-.001	2	-.003	1	-.014	2	
179	5	max	259.439	1	551.744	1	56.26	2	.002	1	.007	2	0	11	
180		min	-483.359	2	-226.075	2	-50.546	1	-.001	2	-.006	1	0	1	
181	M19	1	max	266.01	8	322.683	9	44.905	2	.002	10	.007	1	.08	9
182		min	-37.932	3	-364.698	10	-52.987	1	-.001	9	-.006	2	-.091	10	
183	2	max	266.01	8	322.3	9	44.905	2	.002	10	.003	1	.06	9	
184		min	-37.932	3	-365.081	10	-52.987	1	-.001	9	-.003	2	-.069	10	
185	3	max	266.01	8	321.917	9	44.905	2	.002	10	0	2	.04	9	
186		min	-37.932	3	-365.464	10	-52.987	1	-.001	9	0	1	-.046	10	
187	4	max	266.01	8	321.534	9	44.905	2	.002	10	.003	2	.02	9	
188		min	-37.932	3	-365.847	10	-52.987	1	-.001	9	-.003	1	-.023	10	
189	5	max	266.01	8	321.151	9	44.905	2	.002	10	.006	2	0	11	
190		min	-37.932	3	-366.229	10	-52.987	1	-.001	9	-.007	1	0	1	
191	M20	1	max	346.959	1	481.739	10	44.905	2	.002	10	.007	1	.12	10
192		min	-140.273	2	-166.721	9	-52.987	1	-.001	9	-.006	2	-.042	9	
193	2	max	346.959	1	481.356	10	44.905	2	.002	10	.003	1	.09	10	
194		min	-140.273	2	-167.103	9	-52.987	1	-.001	9	-.003	2	-.031	9	
195	3	max	346.959	1	480.973	10	44.905	2	.002	10	0	2	.06	10	
196		min	-140.273	2	-167.486	9	-52.987	1	-.001	9	0	1	-.021	9	
197	4	max	346.959	1	480.59	10	44.905	2	.002	10	.003	2	.03	10	
198		min	-140.273	2	-167.869	9	-52.987	1	-.001	9	-.003	1	-.011	9	
199	5	max	346.959	1	480.208	10	44.905	2	.002	10	.006	2	0	11	
200		min	-140.273	2	-168.252	9	-52.987	1	-.001	9	-.007	1	0	1	
201	M21	1	max	54.924	2	417.834	10	303.171	7	.085	2	.007	2	.001	2
202		min	-50.747	1	-338.778	2	-36.605	4	-.105	10	-.006	1	-.002	1	
203	2	max	54.924	2	417.834	10	303.171	7	.085	2	.027	6	.029	2	
204		min	-50.747	1	-338.778	2	-36.605	4	-.105	10	-.009	1	-.037	10	
205	3	max	54.924	2	553.256	1	259.771	1	.085	2	.073	2	.094	1	
206		min	-6.762	9	-278.904	9	-483.044	2	-.138	1	-.037	1	.032	11	
207	4	max	52.174	1	553.256	1	259.771	1	.056	2	.033	2	.048	1	
208		min	-53.453	2	-224.558	2	-483.044	2	-.138	1	-.015	1	-.02	2	
209	5	max	52.174	1	553.256	1	259.771	1	.056	2	.006	1	.002	1	
210		min	-53.453	2	-224.558	2	-483.044	2	-.138	1	-.007	2	-.001	2	
211	M22	1	max	45.233	2	364.696	10	37.527	3	.08	9	.006	2	.001	9
212		min	-53.56	1	-322.676	9	-266.005	8	-.091	10	-.007	1	-.002	10	
213	2	max	45.233	2	364.696	10	37.527	3	.08	9	0	2	.028	9	
214		min	-53.56	1	-322.676	9	-266.005	8	-.091	10	-.023	5	-.032	10	
215	3	max	54.827	1	481.733	10	347.255	1	.08	9	.018	2	.082	10	
216		min	-4.112	11	-322.676	9	-207.941	4	-.12	10	-.053	5	.006	1	
217	4	max	54.827	1	481.733	10	347.255	1	.042	9	.006	2	.042	10	
218		min	-44.162	2	-166.717	9	-140.036	2	-.12	10	-.025	5	-.015	9	
219	5	max	54.827	1	481.733	10	347.255	1	.042	9	.007	1	.002	10	
220		min	-44.162	2	-166.717	9	-140.036	2	-.12	10	-.006	2	-.001	9	
221	M23	1	max	291.23	1	358.083	8	112.593	2	.165	1	0	4	.178	8
222		min	-713.179	2	80.117	3	-101.064	1	-.096	2	0	3	.04	3	
223	2	max	291.23	1	358.083	8	112.593	2	.165	1	.007	2	.156	8	
224		min	-713.179	2	80.117	3	-101.064	1	-.096	2	-.006	1	.035	3	
225	3	max	291.23	1	358.083	8	112.593	2	.165	1	.014	2	.133	8	
226		min	-713.179	2	80.117	3	-101.064	1	-.096	2	-.013	1	.03	3	
227	4	max	291.23	1	358.083	8	112.593	2	.165	1	.021	2	.111	8	
228		min	-713.179	2	80.117	3	-101.064	1	-.096	2	-.019	1	.025	3	
229	5	max	291.23	1	358.083	8	112.593	2	.165	1	.028	2	.088	8	
230		min	-713.179	2	80.117	3	-101.064	1	-.096	2	-.025	1	.02	3	
231	M24	1	max	578.42	5	358.904	8	89.817	2	.144	10	0	11	.178	8



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
232		min	-78.256	2	50.418	3	-105.928	1	-.083	9	0	3	.025	3	
233	2	max	578.42	5	358.904	8	89.817	2	.144	10	.006	2	.156	8	
234		min	-78.256	2	50.418	3	-105.928	1	-.083	9	-.007	1	.022	3	
235	3	max	578.42	5	358.904	8	89.817	2	.144	10	.011	2	.134	8	
236		min	-78.256	2	50.418	3	-105.928	1	-.083	9	-.013	1	.019	3	
237	4	max	578.42	5	358.904	8	89.817	2	.144	10	.017	2	.111	8	
238		min	-78.256	2	50.418	3	-105.928	1	-.083	9	-.02	1	.015	3	
239	5	max	578.42	5	358.904	8	89.817	2	.144	10	.022	2	.089	8	
240		min	-78.256	2	50.418	3	-105.928	1	-.083	9	-.026	1	.012	3	
241	M25	1	max	580.2	3	425.477	9	367.791	3	.476	9	.21	4	.105	4
242		min	-580.917	4	-144.195	3	-425.525	4	-.134	3	-.2	3	-.101	3	
243	2	max	580.2	3	425.477	9	367.791	3	.476	9	.189	4	.095	4	
244		min	-580.917	4	-144.195	3	-425.525	4	-.134	3	-.181	3	-.094	3	
245	3	max	580.2	3	425.477	9	367.791	3	.476	9	.168	4	.085	4	
246		min	-580.917	4	-144.195	3	-425.525	4	-.134	3	-.163	3	-.087	3	
247	4	max	580.2	3	425.477	9	367.791	3	.476	9	.147	4	.075	4	
248		min	-580.917	4	-144.195	3	-425.525	4	-.134	3	-.144	3	-.079	3	
249	5	max	580.2	3	425.477	9	367.791	3	.476	9	.125	4	.065	4	
250		min	-580.917	4	-144.195	3	-425.525	4	-.134	3	-.126	3	-.072	3	
251	M26	1	max	271.301	3	91.347	5	350.469	9	.569	9	.097	3	.093	4
252		min	-261.566	4	-379.319	9	-64.659	4	.017	2	-.104	4	-.093	3	
253	2	max	271.301	3	91.347	5	350.469	9	.569	9	.102	3	.093	4	
254		min	-261.566	4	-379.319	9	-64.659	4	.017	2	-.107	4	-.095	3	
255	3	max	271.301	3	91.347	5	350.469	9	.569	9	.107	3	.092	4	
256		min	-261.566	4	-379.319	9	-64.659	4	.017	2	-.11	4	-.097	3	
257	4	max	271.301	3	91.347	5	350.469	9	.569	9	.112	3	.091	4	
258		min	-261.566	4	-379.319	9	-64.659	4	.017	2	-.114	4	-.098	3	
259	5	max	271.301	3	91.347	5	350.469	9	.569	9	.117	3	.091	4	
260		min	-261.566	4	-379.319	9	-64.659	4	.017	2	-.117	4	-.1	3	
261	MP1A	1	max	0	11	.079	4	.295	1	0	7	0	11	0	11
262		min	0	10	-.2	7	-.296	2	0	4	0	1	0	1	
263	2	max	162.474	8	87.314	4	166.008	1	0	7	.166	1	.087	3	
264		min	58.31	10	-87.349	3	-166.009	2	0	4	-.166	2	-.087	4	
265	3	max	122.707	8	382.298	10	112.405	1	.257	2	.076	2	.01	1	
266		min	-365.991	10	44.737	3	-92.203	2	-.259	1	-.075	10	-.044	10	
267	4	max	104.058	4	346.597	3	669.708	3	.032	4	.022	1	.022	3	
268		min	-155.439	3	-344.197	4	-686.612	4	-.032	3	-.022	2	-.022	4	
269	5	max	0	11	.026	5	.041	4	0	9	0	11	0	11	
270		min	0	10	-.003	9	-.039	3	0	5	0	1	0	1	
271	M28	1	max	218.903	1	482.615	10	381.447	10	-.045	3	.242	1	.249	2
272		min	-239.685	2	36.204	4	-113.252	4	-.53	10	-.272	2	-.229	1	
273	2	max	218.903	1	482.615	10	381.447	10	-.045	3	.245	1	.247	2	
274		min	-239.685	2	36.204	4	-113.252	4	-.53	10	-.27	2	-.234	1	
275	3	max	218.903	1	482.615	10	381.447	10	-.045	3	.248	1	.245	2	
276		min	-239.685	2	36.204	4	-113.252	4	-.53	10	-.267	2	-.239	1	
277	4	max	218.903	1	482.615	10	381.447	10	-.045	3	.251	1	.243	2	
278		min	-239.685	2	36.204	4	-113.252	4	-.53	10	-.265	2	-.244	1	
279	5	max	218.903	1	482.615	10	381.447	10	-.045	3	.254	1	.241	2	
280		min	-239.685	2	36.204	4	-113.252	4	-.53	10	-.262	2	-.25	1	
281	M29	1	max	633.774	4	243.635	7	327.132	3	.09	4	.342	4	.369	4
282		min	-599.93	3	-331.147	10	-422.82	4	-.618	10	-.308	3	-.351	3	
283	2	max	633.774	4	243.635	7	327.132	3	.09	4	.32	4	.369	4	
284		min	-599.93	3	-331.147	10	-422.82	4	-.618	10	-.291	3	-.36	3	
285	3	max	633.774	4	243.635	7	327.132	3	.09	4	.299	4	.37	4	
286		min	-599.93	3	-331.147	10	-422.82	4	-.618	10	-.275	3	-.368	3	
287	4	max	633.774	4	243.635	7	327.132	3	.09	4	.278	4	.37	4	
288		min	-599.93	3	-331.147	10	-422.82	4	-.618	10	-.262	1	-.377	3	



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
289	5	max	633.774	4	243.635	7	327.132	3	.09	4	.262	2	.371	4	
290		min	-599.93	3	-331.147	10	-422.82	4	-618	10	-.254	1	-.386	3	
291	MP4A	1	max	0	.014	9	.029	4	0	8	0	11	0	11	
292		min	0	1	-.009	8	-.031	3	0	9	0	1	0	1	
293		2	max	54.364	3	800.891	3	1015.517	4	.099	4	.248	4	.182	4
294		min	-50.455	9	-801.325	4	-1040.514	3	-.099	3	-.254	3	-.182	3	
295		3	max	516.788	9	76.323	2	32.352	3	.136	3	.531	4	.13	4
296		min	-3.458	1	-232.131	9	-39.05	9	-141	4	-.525	3	-.126	3	
297		4	max	1022.584	9	451.127	4	651.351	3	.053	3	.209	4	.103	2
298		min	-40.492	3	-415.842	3	-634.02	4	-.057	4	-.166	3	-.101	1	
299		5	max	0	.012	7	.022	4	0	9	0	11	0	11	
300		min	0	9	-.011	9	-.02	3	0	7	0	1	0	1	
301	M34	1	max	1047.455	4	64.63	1	842.526	4	.363	4	.094	1	.22	3
302		min	-1072.571	3	-551.904	9	-851.322	3	-.356	3	-.08	2	-.244	4	
303		2	max	1047.455	4	64.63	1	842.526	4	.363	4	.065	1	.217	3
304		min	-1072.571	3	-551.904	9	-851.322	3	-.356	3	-.053	2	-.233	4	
305		3	max	1047.455	4	64.63	1	842.526	4	.363	4	.055	4	.214	3
306		min	-1072.571	3	-551.904	9	-851.322	3	-.356	3	-.048	3	-.223	4	
307		4	max	1047.455	4	64.63	1	842.526	4	.363	4	.097	4	.211	3
308		min	-1072.571	3	-551.904	9	-851.322	3	-.356	3	-.091	3	-.212	4	
309		5	max	1047.455	4	64.63	1	842.526	4	.363	4	.139	4	.208	3
310		min	-1072.571	3	-551.904	9	-851.322	3	-.356	3	-.134	3	-.202	4	
311	M35	1	max	600.739	4	63.21	3	350.115	4	.389	9	.183	3	.019	10
312		min	-619.141	3	-492.551	9	-318.414	1	-.31	4	-.196	4	-.038	5	
313		2	max	600.739	4	63.21	3	350.115	4	.389	9	.167	3	.038	9
314		min	-619.141	3	-492.551	9	-318.414	1	-.31	4	-.179	4	-.036	1	
315		3	max	600.739	4	63.21	3	350.115	4	.389	9	.152	3	.063	9
316		min	-619.141	3	-492.551	9	-318.414	1	-.31	4	-.161	4	-.036	1	
317		4	max	600.739	4	63.21	3	350.115	4	.389	9	.136	3	.087	9
318		min	-619.141	3	-492.551	9	-318.414	1	-.31	4	-.144	4	-.036	1	
319		5	max	600.739	4	63.21	3	350.115	4	.389	9	.12	3	.112	9
320		min	-619.141	3	-492.551	9	-318.414	1	-.31	4	-.126	4	-.035	1	
321	MP2A	1	max	0	.011	2	.022	3	0	10	0	11	0	11	
322		min	0	1	-.017	10	-.02	4	0	2	0	1	0	1	
323		2	max	13.499	2	519.511	2	587.789	2	.058	1	.128	2	.119	1
324		min	-16.144	10	-482.459	1	-558.904	1	-.062	2	-.124	1	-.129	2	
325		3	max	771.684	10	217.901	10	19.516	1	.315	2	.327	3	.158	4
326		min	-95.617	2	-87.257	2	-61.231	10	-.315	1	-.298	4	-.16	3	
327		4	max	1406.86	10	708.49	4	999.805	4	.084	3	.334	3	.157	4
328		min	109.794	4	-675.614	3	-943.206	3	-.088	4	-.235	4	-.149	3	
329		5	max	0	.02	3	.012	7	0	4	0	11	0	11	
330		min	0	7	-.018	4	-.011	4	0	3	0	1	0	1	
331	M34A	1	max	560.013	2	154.984	2	561.663	1	.275	1	.312	3	.383	1
332		min	-503.006	1	-743.001	10	-609.725	2	-.35	10	-.306	4	-.449	2	
333		2	max	560.013	2	154.984	2	561.663	1	.275	1	.306	3	.41	1
334		min	-503.006	1	-743.001	10	-609.725	2	-.35	10	-.302	4	-.457	2	
335		3	max	560.013	2	154.984	2	561.663	1	.275	1	.3	3	.438	1
336		min	-503.006	1	-743.001	10	-609.725	2	-.35	10	-.299	4	-.464	2	
337		4	max	560.013	2	154.984	2	561.663	1	.275	1	.293	3	.465	1
338		min	-503.006	1	-743.001	10	-609.725	2	-.35	10	-.296	4	-.472	2	
339		5	max	560.013	2	154.984	2	561.663	1	.275	1	.306	1	.492	1
340		min	-503.006	1	-743.001	10	-609.725	2	-.35	10	-.305	2	-.48	2	
341	M35A	1	max	943.481	3	25.869	4	751.505	4	.25	3	.256	2	.337	3
342		min	-1028.809	4	-626.116	7	-704.583	3	-.412	10	-.267	1	-.385	4	
343		2	max	943.481	3	25.869	4	751.505	4	.25	3	.268	2	.359	3
344		min	-1028.809	4	-626.116	7	-704.583	3	-.412	10	-.277	1	-.387	4	
345		3	max	943.481	3	25.869	4	751.505	4	.25	3	.28	2	.38	3





**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...]	LC	y-y Mome...	LC	z-z Mom...	LC	
346		min	-1028.809	4	-626.116	7	-704.583	3	-.412	10	-.286	1	-.388	4	
347	4	max	943.481	3	25.869	4	751.505	4	.25	3	.293	2	.402	3	
348		min	-1028.809	4	-626.116	7	-704.583	3	-.412	10	-.296	1	-.389	4	
349	5	max	943.481	3	25.869	4	751.505	4	.25	3	.308	4	.424	3	
350		min	-1028.809	4	-626.116	7	-704.583	3	-.412	10	-.306	1	-.39	4	
351	M36	1	max	1080.991	3	-75.223	3	1404.991	4	.098	9	.261	3	.221	3
352		min	-1394.961	4	-687.084	8	-1027.124	3	-.033	3	-.226	4	-.14	4	
353	2	max	1080.991	3	-78.577	3	1404.991	4	.098	9	.163	2	.311	6	
354		min	-1394.961	4	-693.961	8	-1027.124	3	-.033	3	-.139	1	-.105	1	
355	3	max	478.613	1	1174.114	7	1404.991	4	.098	9	.299	2	.632	6	
356		min	-1394.961	4	-596.009	9	-1284.125	6	-.124	8	-.407	1	-.195	1	
357	4	max	367.476	4	1167.237	7	185.434	1	-.021	3	.189	2	.32	6	
358		min	-1145.657	7	112.825	4	-1282.488	6	-.124	8	-.302	1	-.096	1	
359	5	max	367.476	4	1160.359	7	176.886	1	-.021	3	.192	4	.263	4	
360		min	-1145.657	7	109.472	4	-1280.851	6	-.124	8	-.305	3	-.278	3	
361	M37	1	max	785.639	9	121.255	10	280.781	2	.074	8	.146	3	.147	9
362		min	-419.958	4	-632.262	9	-925.602	9	-.025	3	-.231	4	-.154	4	
363	2	max	785.639	9	117.901	10	289.329	2	.074	8	.063	3	.108	9	
364		min	-419.958	4	-635.615	9	-926.457	9	-.025	3	-.273	8	-.173	10	
365	3	max	1188.892	8	647.184	5	1371.539	8	.067	9	.018	2	.132	2	
366		min	288.202	2	-638.969	9	-927.311	9	-.118	8	-.514	5	-.221	1	
367	4	max	1188.892	8	640.307	5	1371.539	8	-.015	9	.055	2	.134	2	
368		min	-385.997	3	116.548	2	-262.758	3	-.118	8	-.26	5	-.084	1	
369	5	max	1188.892	8	633.43	5	1371.539	8	-.015	9	.14	4	.212	10	
370		min	-385.997	3	113.194	2	-262.758	3	-.118	8	-.126	3	-.092	3	
371	M38	1	max	1487.768	3	685.601	8	199.762	3	.002	3	.116	4	.25	4
372		min	-1958.639	4	74.754	3	-182.939	4	-.002	9	-.21	3	-.272	3	
373	2	max	1433.841	3	20.908	1	117.418	3	.002	3	.105	9	.06	4	
374		min	-1627.182	4	-181.424	9	-98.098	4	-.002	9	-.058	3	-.186	7	
375	3	max	1421.132	3	-5.268	3	101.796	3	.002	3	.028	3	.157	9	
376		min	-1614.474	4	-194.431	6	-82.476	4	-.002	9	-.086	8	-.106	10	
377	4	max	1341.583	3	70.377	9	41.364	10	.002	3	.023	3	.076	9	
378		min	-1322.84	4	-35.134	3	-27.304	9	-.002	9	-.043	4	-.059	1	
379	5	max	1328.875	3	63.708	9	47.608	1	.002	3	0	11	0	11	
380		min	-1310.131	4	-42.191	3	-29.208	2	-.002	9	0	1	0	1	
381	M39	1	max	345.105	4	1156.536	7	215.901	3	.002	10	.171	4	.284	4
382		min	-1712.065	7	109.769	4	-196.851	4	0	4	-.312	3	-.271	3	
383	2	max	462.269	1	1.36	4	132.296	3	.002	10	.098	8	.123	4	
384		min	-1008.497	2	-309.738	7	-113.158	4	0	4	-.031	3	-.32	10	
385	3	max	783.772	1	-5.337	4	116.674	3	.003	10	.003	4	.093	9	
386		min	-995.788	2	-328.504	7	-97.536	4	0	4	-.15	10	-.034	10	
387	4	max	771.063	1	57.68	5	57.223	10	.003	10	-.001	9	.044	9	
388		min	-816.854	2	6.105	2	-26.143	9	0	4	-.072	10	-.019	10	
389	5	max	758.354	1	38.973	5	56.216	10	.003	10	0	11	0	11	
390		min	-804.145	2	-.671	2	-27.186	9	0	4	0	1	0	1	
391	M40	1	max	1213.873	9	633.925	9	140.173	3	0	10	.136	10	.253	4
392		min	-465.258	4	-121.241	10	-158.081	4	-.002	9	-.169	9	-.155	3	
393	2	max	1209.256	9	23.207	1	91.546	3	0	10	.114	8	.162	10	
394		min	-425.568	4	-51.786	9	-109.154	4	-.002	9	-.035	3	-.223	9	
395	3	max	1207.985	9	41.062	10	75.924	3	0	10	.041	2	.117	10	
396		min	-621.229	4	-407.529	9	-45.184	1	-.002	9	-.016	1	-.155	9	
397	4	max	813.5	3	34.365	10	36.804	9	0	10	.03	3	.205	9	
398		min	-608.52	4	-414.226	9	-43.487	10	-.002	9	-.267	9	-.033	1	
399	5	max	784.39	3	1036.038	9	57.788	1	0	10	0	11	0	11	
400		min	-791.522	4	-27.535	3	-76.883	2	-.001	9	0	1	0	1	
401	M41	1	max	1815.507	8	636.728	5	131.381	3	.002	10	.122	4	.248	10
402		min	-444.25	3	113.403	2	-151.009	4	0	2	-.135	3	-.083	3	



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
403	2	max	1805.33	8	8.386	2	83.029	3	.002	10	.161	10	.068	10	
404		min	-404.572	3	-63.602	5	-103.487	4	0	2	.006	9	-.115	9	
405	3	max	1802.263	8	1.689	2	21.75	9	.002	10	.105	10	.056	10	
406		min	-796.821	3	-474.358	10	-87.865	4	0	2	-.008	4	-.063	9	
407	4	max	1348.772	4	-41.766	4	20.716	9	.002	10	-.048	4	.401	10	
408		min	-784.112	3	-481.055	10	-49.172	10	0	2	-.319	10	.014	4	
409	5	max	1238.882	4	1420.754	10	47.535	4	.002	10	0	11	0	11	
410		min	-1171.833	3	123.811	4	-66.161	3	0	2	0	1	0	1	
411	M42	1	max	661.174	9	42.739	3	42.739	2	0	2	0	11	0	11
412		min	-153.71	10	-42.739	4	-42.739	1	0	1	0	1	0	1	
413	2	max	665.313	9	21.369	3	21.369	2	0	2	.025	3	.025	2	
414		min	-149.571	10	-21.369	4	-21.369	1	0	1	-.025	4	-.025	1	
415	3	max	669.452	9	0	11	0	11	0	2	.034	3	.034	2	
416		min	-145.432	10	0	1	0	1	0	1	-.034	4	-.034	1	
417	4	max	673.591	9	21.369	4	21.369	1	0	2	.025	3	.025	2	
418		min	-141.293	10	-21.369	3	-21.369	2	0	1	-.025	4	-.025	1	
419	5	max	677.73	9	42.739	4	42.739	1	0	2	0	11	0	11	
420		min	-137.154	10	-42.739	3	-42.739	2	0	1	0	1	0	1	
421	M43	1	max	1739.597	9	42.739	3	42.739	2	0	9	0	11	0	11
422		min	-44.341	3	-42.739	4	-42.739	1	0	10	0	1	0	1	
423	2	max	1743.736	9	21.369	3	21.369	2	0	9	.025	3	.025	2	
424		min	-40.202	3	-21.369	4	-21.369	1	0	10	-.025	4	-.025	1	
425	3	max	1747.875	9	0	11	0	11	0	9	.034	3	.034	2	
426		min	-36.063	3	0	1	0	1	0	10	-.034	4	-.034	1	
427	4	max	1752.014	9	21.369	4	21.369	1	0	9	.025	3	.025	2	
428		min	-31.924	3	-21.369	3	-21.369	2	0	10	-.025	4	-.025	1	
429	5	max	1756.153	9	42.739	4	42.739	1	0	9	0	11	0	11	
430		min	-27.785	3	-42.739	3	-42.739	2	0	10	0	1	0	1	
431	M44	1	max	620.875	5	42.739	3	42.739	2	0	2	0	11	0	11
432		min	81.621	2	-42.739	4	-42.739	1	0	1	0	1	0	1	
433	2	max	635.399	5	21.369	3	21.369	2	0	2	.025	3	.025	2	
434		min	85.76	2	-21.369	4	-21.369	1	0	1	-.025	4	-.025	1	
435	3	max	649.922	5	0	11	0	11	0	2	.034	3	.034	2	
436		min	89.899	2	0	1	0	1	0	1	-.034	4	-.034	1	
437	4	max	664.446	5	21.369	4	21.369	1	0	2	.025	3	.025	2	
438		min	94.038	2	-21.369	3	-21.369	2	0	1	-.025	4	-.025	1	
439	5	max	678.969	5	42.739	4	42.739	1	0	2	0	11	0	11	
440		min	98.177	2	-42.739	3	-42.739	2	0	1	0	1	0	1	
441	M45	1	max	2321.977	7	42.739	3	42.739	2	0	4	0	11	0	11
442		min	212.934	4	-42.739	4	-42.739	1	0	10	0	1	0	1	
443	2	max	2336.501	7	21.369	3	21.369	2	0	4	.025	3	.025	2	
444		min	217.073	4	-21.369	4	-21.369	1	0	10	-.025	4	-.025	1	
445	3	max	2351.024	7	0	11	0	11	0	4	.034	3	.034	2	
446		min	221.212	4	0	1	0	1	0	10	-.034	4	-.034	1	
447	4	max	2365.547	7	21.369	4	21.369	1	0	4	.025	3	.025	2	
448		min	225.351	4	-21.369	3	-21.369	2	0	10	-.025	4	-.025	1	
449	5	max	2380.071	7	42.739	4	42.739	1	0	4	0	11	0	11	
450		min	229.49	4	-42.739	3	-42.739	2	0	10	0	1	0	1	
451	M46	1	max	-35.002	1	35.049	1	34.676	3	0	2	0	11	0	11
452		min	-1529.587	9	-28.508	2	-34.676	4	0	10	0	1	0	1	
453	2	max	-36.956	3	17.524	1	17.338	3	0	2	.041	3	.036	2	
454		min	-1526.076	9	-14.254	2	-17.338	4	0	10	-.037	4	-.04	1	
455	3	max	-37.999	3	0	11	0	11	0	2	.055	3	.048	2	
456		min	-1522.564	9	0	1	0	1	0	10	-.049	4	-.054	1	
457	4	max	-39.043	3	14.254	2	17.338	4	0	2	.041	3	.036	2	
458		min	-1519.053	9	-17.524	1	-17.338	3	0	10	-.037	4	-.04	1	
459	5	max	-40.087	3	28.508	2	34.676	4	0	2	0	11	0	11	



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...]	LC	y-y Mome...	LC	z-z Mom...	LC	
460		min	-1515.542	9	-35.049	1	-34.676	3	0	10	0	1	0	1	
461	M47	1	max	34.607	3	35.022	1	34.584	3	0	9	0	11	0	11
462		min	-1576.523	9	-28.686	2	-34.584	4	0	10	0	1	0	1	
463		2	max	33.718	3	17.511	1	17.292	3	0	9	.041	3	.036	2
464		min	-1572.993	9	-14.343	2	-17.292	4	0	10	-.037	4	-.04	1	
465		3	max	32.829	3	0	11	0	11	0	9	.055	3	.048	2
466		min	-1569.464	9	0	1	0	1	0	10	-.049	4	-.053	1	
467		4	max	31.94	3	14.343	2	17.292	4	0	9	.041	3	.036	2
468		min	-1565.934	9	-17.511	1	-17.292	3	0	10	-.037	4	-.04	1	
469		5	max	31.051	3	28.686	2	34.584	4	0	9	0	11	0	11
470		min	-1562.405	9	-35.022	1	-34.584	3	0	10	0	1	0	1	
471	M48	1	max	-223.116	4	35.049	1	34.676	3	0	2	0	11	0	11
472		min	-2218.484	7	-28.508	2	-34.676	4	0	10	0	1	0	1	
473		2	max	-224.16	4	17.524	1	17.338	3	0	2	.04	1	.037	3
474		min	-2202.607	7	-14.254	2	-17.338	4	0	10	-.036	2	-.041	4	
475		3	max	-225.204	4	0	11	0	11	0	2	.054	1	.049	3
476		min	-2186.729	7	0	1	0	1	0	10	-.048	2	-.055	4	
477		4	max	-226.248	4	14.254	2	17.338	4	0	2	.04	1	.037	3
478		min	-2170.852	7	-17.524	1	-17.338	3	0	10	-.036	2	-.041	4	
479		5	max	-227.291	4	28.508	2	34.676	4	0	2	0	11	0	11
480		min	-2154.975	7	-35.049	1	-34.676	3	0	10	0	1	0	1	
481	M49	1	max	-191.454	4	35.022	1	34.584	3	0	4	0	11	0	11
482		min	-2059.773	10	-28.686	2	-34.584	4	0	3	0	1	0	1	
483		2	max	-192.343	4	17.511	1	17.292	3	0	4	.04	1	.037	3
484		min	-2056.243	10	-14.343	2	-17.292	4	0	3	-.036	2	-.041	4	
485		3	max	-193.232	4	0	11	0	11	0	4	.053	1	.049	3
486		min	-2052.714	10	0	1	0	1	0	3	-.048	2	-.055	4	
487		4	max	-194.121	4	14.343	2	17.292	4	0	4	.04	1	.037	3
488		min	-2049.184	10	-17.511	1	-17.292	3	0	3	-.036	2	-.041	4	
489		5	max	-195.01	4	28.686	2	34.584	4	0	4	0	11	0	11
490		min	-2045.655	10	-35.022	1	-34.584	3	0	3	0	1	0	1	
491	MP3A	1	max	289.09	7	199.926	4	463.358	1	0	3	0	1	0	11
492		min	73.68	10	-199.952	3	-463.414	2	0	4	0	2	0	1	
493		2	max	487.302	7	293.663	4	574.821	1	0	3	1.038	1	.494	3
494		min	172.01	10	-293.689	3	-574.877	2	0	4	-1.038	2	-.494	4	
495		3	max	721.782	2	92.188	9	111.202	6	.027	9	.242	1	.047	3
496		min	-504.949	1	-93.476	10	-40.218	1	-.043	10	-.237	2	-.045	4	
497		4	max	-82.01	1	220.628	3	482.713	2	0	3	.482	1	.221	3
498		min	-315.153	8	-220.622	4	-482.688	1	0	8	-.482	2	-.221	4	
499		5	max	0	9	.098	8	.318	1	0	3	0	11	0	11
500		min	0	8	-.089	3	-.293	2	0	8	0	1	0	1	
501	M51	1	max	764.42	1	805.857	1	320.693	3	.574	3	.091	4	.592	2
502		min	-835.03	2	-421.647	2	-347.312	4	-.534	4	-.079	3	-.577	1	
503		2	max	764.42	1	805.857	1	320.693	3	.574	3	.073	4	.613	2
504		min	-835.03	2	-421.647	2	-347.312	4	-.534	4	-.063	3	-.617	1	
505		3	max	764.42	1	805.857	1	320.693	3	.574	3	.061	10	.634	2
506		min	-835.03	2	-421.647	2	-347.312	4	-.534	4	-.047	3	-.657	1	
507		4	max	764.42	1	805.857	1	320.693	3	.574	3	.057	10	.655	2
508		min	-835.03	2	-421.647	2	-347.312	4	-.534	4	-.041	9	-.697	1	
509		5	max	764.42	1	805.857	1	320.693	3	.574	3	.052	10	.676	2
510		min	-835.03	2	-421.647	2	-347.312	4	-.534	4	-.036	9	-.738	1	
511	M52	1	max	464.661	1	813.151	2	304.351	3	.224	4	.096	4	.408	1
512		min	-394.043	2	-413.119	1	-277.767	4	-.18	3	-.108	3	-.399	2	
513		2	max	464.661	1	813.151	2	304.351	3	.224	4	.082	4	.429	1
514		min	-394.043	2	-413.119	1	-277.767	4	-.18	3	-.092	3	-.439	2	
515		3	max	464.661	1	813.151	2	304.351	3	.224	4	.069	4	.449	1
516		min	-394.043	2	-413.119	1	-277.767	4	-.18	3	-.077	3	-.48	2	



**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-...	LC	y-y Mome...	LC	z-z Mom...	LC	
517	4	max	464.661	1	813.151	2	304.351	3	.224	4	.055	4	.47	1	
518		min	-394.043	2	-413.119	1	-277.767	4	-.18	3	-.062	3	-.521	2	
519	5	max	464.661	1	813.151	2	304.351	3	.224	4	.041	4	.491	1	
520		min	-394.043	2	-413.119	1	-277.767	4	-.18	3	-.052	10	-.561	2	
521	M53	1	max	2.936	1	8.776	9	150.858	6	.017	9	-.036	3	.013	9
522		min	-16.973	6	-12.21	10	20.56	1	-.026	10	-.224	8	-.018	10	
523	2	max	5.23	1	8.776	9	149.092	8	.017	9	-.018	3	.007	9	
524		min	-9.585	2	-12.21	10	23.023	3	-.026	10	-.112	8	-.009	10	
525	3	max	7.523	1	8.776	9	149.092	8	.017	9	.007	2	.003	4	
526		min	-7.291	2	-12.21	10	23.023	3	-.026	10	-.008	1	-.003	3	
527	4	max	9.817	1	12.213	4	149.092	8	.017	9	.112	8	.009	10	
528		min	-4.997	2	-14.298	3	23.023	3	-.026	10	.016	3	-.006	9	
529	5	max	17.79	5	18.709	4	149.092	8	.017	9	.224	8	.018	10	
530		min	-2.704	2	-20.794	3	23.023	3	-.026	10	.033	3	-.015	4	

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

Member	Shape	Code Check	Loc...	LC	Shea...	Loc.....	LC	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
1	AM5 PIPE_2.0	.817	3.255	4	.288	5.729	4	5710.1...	32130	1.872	1.872	H3-6
2	MP3A PIPE_2.0	.794	2.5	2	.072	2.5	1	3485.1...	32130	1.872	1.872	H1-1b
3	AM2 PIPE_2.0	.712	2.995	3	.132	6.25	4	5710.1...	32130	1.872	1.872	H1-1b
4	AM4 PIPE_2.0	.551	3.06	4	.091	6.25	3	5710.1...	32130	1.872	1.872	H1-1b
5	M41 L3X3X4	.499	3.986	10	.106	4.034	y 10	29460...	46656	1.688	3.756	H2-1
6	AM3 PIPE_2.0	.385	1.237	2	.324	0	1	5710.1...	32130	1.872	1.872	H3-6
7	M40 L3X3X4	.375	3.986	9	.077	4.034	y 9	29460...	46656	1.688	3.694	H2-1
8	MP1A PIPE_2.0	.335	5.5	10	.228	5.5	4	3485.1...	32130	1.872	1.872	H1-1b
9	MP2A PIPE_2.5	.311	5.5	3	.178	5.5	4	8059.8...	50715	3.596	3.596	H1-1b
10	MP5A PIPE_2.0	.311	5.5	9	.146	3.25	3	3485.1...	32130	1.872	1.872	H1-1b
11	M39 L3X3X4	.288	0	3	.087	0	y 10	29460...	46656	1.688	3.756	H2-1
12	MP4A PIPE_2.5	.276	2.5	4	.129	2.5	4	8059.8...	50715	3.596	3.596	H1-1b
13	M38 L3X3X4	.247	0	3	.050	0	y 8	29460...	46656	1.688	3.756	H2-1
14	M53 PIPE_1.5	.203	3	8	.034	3	10	19913...	23593.5	1.105	1.105	H1-1b
15	M45 L2.5x2.5x3	.172	2.391	7	.009	0	y 3	14992...	29192.4	.873	1.706	H2-1
16	M13 PIPE_2.5	.160	3.859	8	.050	3.859	10	42164...	50715	3.596	3.596	H1-1b
17	M43 L2.5x2.5x3	.122	2.344	9	.007	0	z 1	14992...	29192.4	.873	1.706	H2-1
18	M48 L2.5x2.5x3	.107	2.369	5	.006	4.838	y 1	13545...	29192.4	.873	1.676	H2-1
19	M49 L2.5x2.5x3	.103	2.409	1	.007	4.818	z 4	13630...	29192.4	.873	1.678	H2-1
20	M15 HSS3X3X3	.103	2.75	8	.033	.172	y 1	73963...	78246	6.796	6.796	H1-1b
21	M16A HSS3X3X3	.102	2.75	4	.031	.172	y 6	73963...	78246	6.796	6.796	H1-1b
22	M46 L2.5x2.5x3	.087	2.419	4	.005	4.838	y 1	13545...	29192.4	.873	1.676	H2-1
23	AM1 PIPE_2.0	.085	4.32	4	.006	0	7	13127...	32130	1.872	1.872	H1-1b
24	M47 L2.5x2.5x3	.084	2.409	4	.007	0	z 3	13630...	29192.4	.873	1.678	H2-1
25	M44 L2.5x2.5x3	.082	2.25	1	.008	0	z 2	14992...	29192.4	.873	1.706	H2-1
26	M16 PIPE_2.0	.077	4.32	3	.006	8.64	8	13127...	32130	1.872	1.872	H1-1b
27	M42 L2.5x2.5x3	.073	2.25	4	.007	4.5	z 2	14992...	29192.4	.873	1.706	H2-1
28	M37 L6X6X6	.062	.375	5	.136	.391	z 8	12900...	141912	10.965	22.86	H2-1
29	M36 L6X6X6	.054	.375	2	.135	.375	z 6	12900...	141912	10.965	22.86	H2-1
30	M18 PL3/8x4	.053	0	1	.036	0	y 1	46674...	48600	.38	4.05	H1-1b
31	M17 PL3/8x4	.043	0	1	.029	.25	y 1	46674...	48600	.38	4.05	H1-1b
32	M20 PL3/8x4	.037	0	7	.031	0	y 10	46674...	48600	.38	4.05	H1-1b
33	M19 PL3/8x4	.028	0	3	.025	.25	y 10	46674...	48600	.38	4.05	H1-1b

# Exhibit F

## **Power Density/RF Emissions Report**

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

T-Mobile Existing Facility

Site ID: CTNL808B

Amtrak\_Waterford2  
51 Daniels Avenue  
Waterford, Connecticut 06385

**May 6, 2022**

**EBI Project Number: 6222002982**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>28.12%</b>

May 6, 2022

T-Mobile

Attn: Jason Overbey, RF Manager  
35 Griffin Road South  
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTNL808B - Amtrak\_Waterford2

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **51 Daniels Avenue in Waterford, Connecticut** 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.

Public 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 and 700 MHz frequency 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), 2100 MHz (AWS) and 11 GHz frequency 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.



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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 51 Daniels Avenue in Waterford, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 6) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.



- 7) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 8) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.
- 9) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.
- 10) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 11) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.
- 12) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 13) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 14) The antennas used in this modeling are the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna

manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

- 15) The antenna mounting height centerline of the proposed antennas is 160 feet above ground level (AGL).
- 16) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 17) All calculations were done with respect to uncontrolled / general population threshold limits.

## T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts
ERP (W):	31,011.95	ERP (W):	31,011.95	ERP (W):	31,011.95
Antenna AI MPE %:	4.70%	Antenna BI MPE %:	4.70%	Antenna CI MPE %:	4.70%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Channel Count:	15	Channel Count:	15	Channel Count:	15
Total TX Power (W):	620.00 Watts	Total TX Power (W):	620.00 Watts	Total TX Power (W):	620.00 Watts
ERP (W):	20,255.72	ERP (W):	20,255.72	ERP (W):	20,255.72
Antenna A2 MPE %:	3.92%	Antenna B2 MPE %:	3.92%	Antenna C2 MPE %:	3.92%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	8.62%
Dish	1.14%
Verizon	3.86%
AT&T	14.5%
<b>Site Total MPE % :</b>	<b>28.12%</b>

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	8.62%
T-Mobile Sector B Total:	8.62%
T-Mobile Sector C Total:	8.62%
Site Total MPE % :	28.12%

T-Mobile Maximum MPE Power Values (Sector A)							
T-Mobile Frequency Band / Technology (Sector A)	# 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 2500 MHz LTE IC & 2C Traffic	1	9619.47	160.0	14.58	2500 MHz LTE IC & 2C Traffic	1000	1.46%
T-Mobile 2500 MHz LTE IC & 2C Broadcast	1	717.84	160.0	1.09	2500 MHz LTE IC & 2C Broadcast	1000	0.11%
T-Mobile 2500 MHz NR Traffic	1	19238.94	160.0	29.16	2500 MHz NR Traffic	1000	2.92%
T-Mobile 2500 MHz NR Broadcast	1	1435.69	160.0	2.18	2500 MHz NR Broadcast	1000	0.22%
T-Mobile 600 MHz LTE	2	591.73	160.0	1.79	600 MHz LTE	400	0.45%
T-Mobile 600 MHz LTE	1	1577.94	160.0	2.39	600 MHz LTE	400	0.60%
T-Mobile 700 MHz LTE	2	648.82	160.0	1.97	700 MHz LTE	467	0.42%
T-Mobile 1900 MHz GSM	4	1101.85	160.0	6.68	1900 MHz GSM	1000	0.67%
T-Mobile 1900 MHz UMTS	2	1101.85	160.0	3.34	1900 MHz UMTS	1000	0.33%
T-Mobile 1900 MHz LTE	2	2203.69	160.0	6.68	1900 MHz LTE	1000	0.67%
T-Mobile 2100 MHz LTE	2	2589.11	160.0	7.85	2100 MHz LTE	1000	0.78%
						<b>Total:</b>	<b>8.62%</b>

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

## 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:	8.62%
Sector B:	8.62%
Sector C:	8.62%
T-Mobile Maximum MPE % (Sector A):	8.62%
Site Total:	28.12%
Site Compliance Status:	<b>COMPLIANT</b>


The anticipated composite MPE value for this site assuming all carriers present is **28.12%** 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.

# Exhibit G

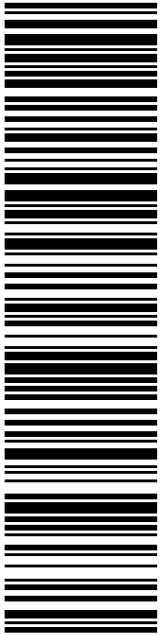
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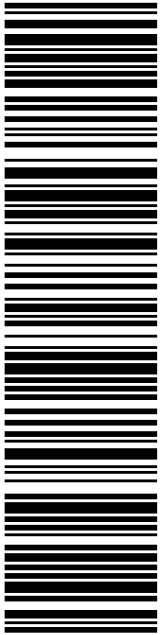


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15 ROPE FERRY RD  
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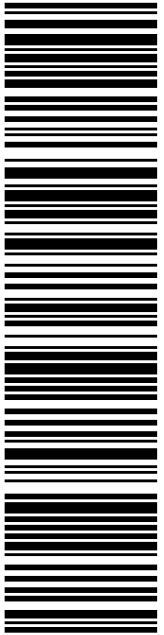
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Prepaid Mail Waterford, CT 06385 Weight: 0 lb 9.60 oz Acceptance Date: Tue 07/05/2022 Tracking #: 9405 5036 9930 0285 6691 51	1		\$0.00
Prepaid Mail Waterford, CT 06385 Weight: 0 lb 9.60 oz Acceptance Date: Tue 07/05/2022 Tracking #: 9405 5036 9930 0285 6691 44	1		\$0.00

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