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

August 26, 2019

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

Notice of Exempt Modification
267 Norwich Westerly Road
North Stonington, CT 06359
T-Mobile Site #: CT11312A_L600
41.437066
-71.881488

Dear Ms. Bachman:

T-Mobile currently maintains antennas at the 147-foot level of the existing 150-foot Monopole Tower at 267 Norwich Westerly Road, North Stonington, CT. The tower is owned by SBA Properties, LLC. The property is owned by the North Stonington Volunteer Fire Company. T-Mobile now intends to remove (3) LNX6515 L600/L700MHz Antenna and replace them with (3) APXVAARR24_43U-NA20 Antenna L600/L700 MHz antennas. The new antennas would be installed at the 147-foot level of the tower.

Planned Modifications:

- Please note the enclosed Construction Drawings (Exhibit 6) hereto attached, shows a total of five (5) platforms. However, one platform was empty and has since been removed in accordance with the original zoning approval. I have attached as Exhibit 10 a photograph of the Tower showing only four (4) platforms remaining.

TOWER:

Remove: N/A

Remove and Replace:

- (3) LNX6515 Antenna (Remove) – (3) APXVAARR24_43U-NA20 Antenna 600/700 MHz (Replace)
- (3) Ericsson S11B12 RRUS (Remove) - (3) Ericsson Radio 4449 B71+B12 RRUs (Replace)
- (3) 1-5/8" Coax (Remove) - (3) 1-5/8 Fiber (Replace)

Install New:

- N/A

Existing Equipment to Remain:

- (6) AIR 21 KRC118023-1_B2A-B4P 1900/2100 MHz Antenna
- (3) Ericsson KRY 112 144/1 TMAs
- (9) 1-5/8" Coax

- *(1) 1-5/8 Fiber*

GROUND

Install New:

- Equipment inside existing 6102 cabinet

This facility was approved prior to the Council's jurisdiction, on May 6, 1999, at a Special Meeting of the North Stonington Planning & Zoning Commission. Special Permit 99-031 allowed for a 150' multi-tenant monopole and related equipment on land at the intersection of Route 2 / Rocky Hollow Rd at 267 Norwich-Westerly Rd, aka Route 2. The tower was approved for (4) antenna support platforms each holding no more than twelve panel antennas. Additional support platforms and/or antennas would require an approved site plan modification. As indicated previously, a fifth (5^{th}) empty platform was removed as evidenced by the accompanying photo as Exhibit 10 of the enclosed filing. There were no further post construction stipulations set. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of North Stonington's First Selectman, Michael Urgo, and Planning and Zoning Official, Juliet Lodge, as well as to the property owner, North Stonington Volunteer Fire Co. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

G. Scott Shepherd

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

cc: Michael Urgo, First Selectman / with attachments
Old Town Hall, 40 Main Street, North Stonington, CT 06359
Juliet Lodge, Planning and Zoning Official / with attachments
Old Town Hall, 40 Main Street, North Stonington, CT 06359
North Stonington Volunteer Fire Co. / with attachments
40 Main Street, North Stonington, CT 06359

Exhibit List

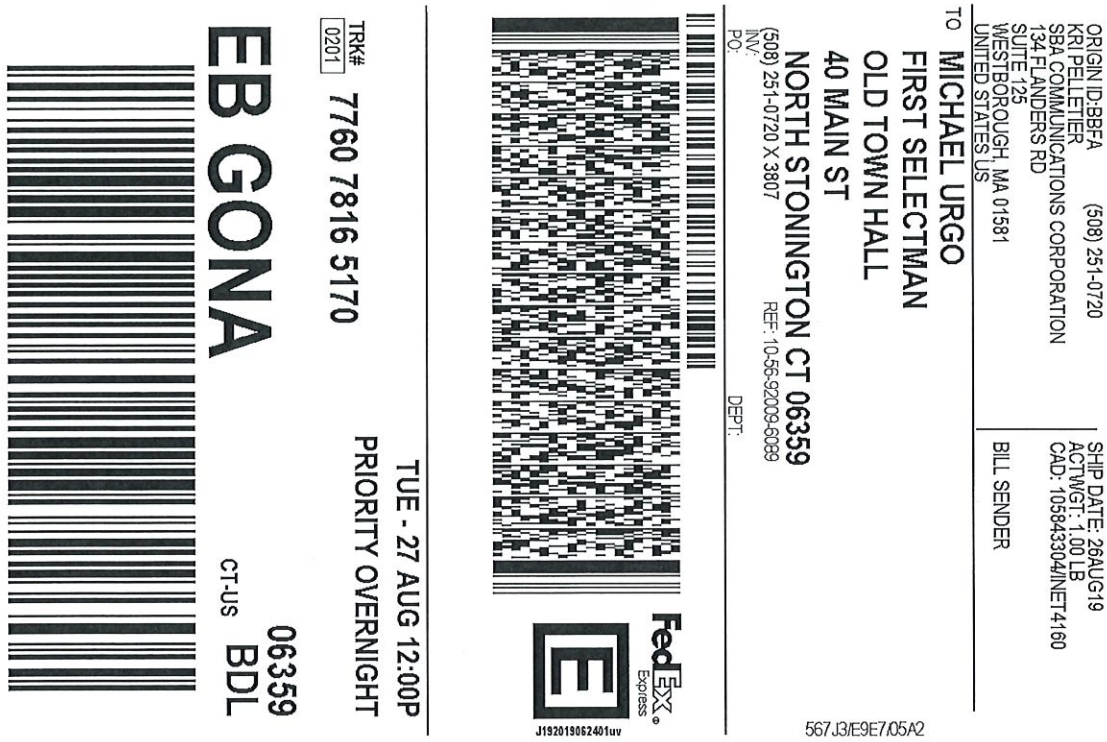
Exhibit 1	Check Copy	x
Exhibit 2	Notification Receipts	x
Exhibit 3	Property Card	x
Exhibit 4	Property Map	x
Exhibit 5	Original Zoning Approval	x
Exhibit 6	Construction Drawings	Chappell dated 8/8/19
Exhibit 7	Structural Analysis	TES dated 7/16/19
Exhibit 8	Post Mod Mount Analysis	Geo Structural dated 6/13/19
Exhibit 9	*(Mount Mod Drawings)*	Geo Structural dated 6/19/19
Exhibit 10	Photo of platforms	8/20/19
Exhibit 11	EME Report	5/22/19

EXHIBIT 1

EXHIBIT 2

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

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



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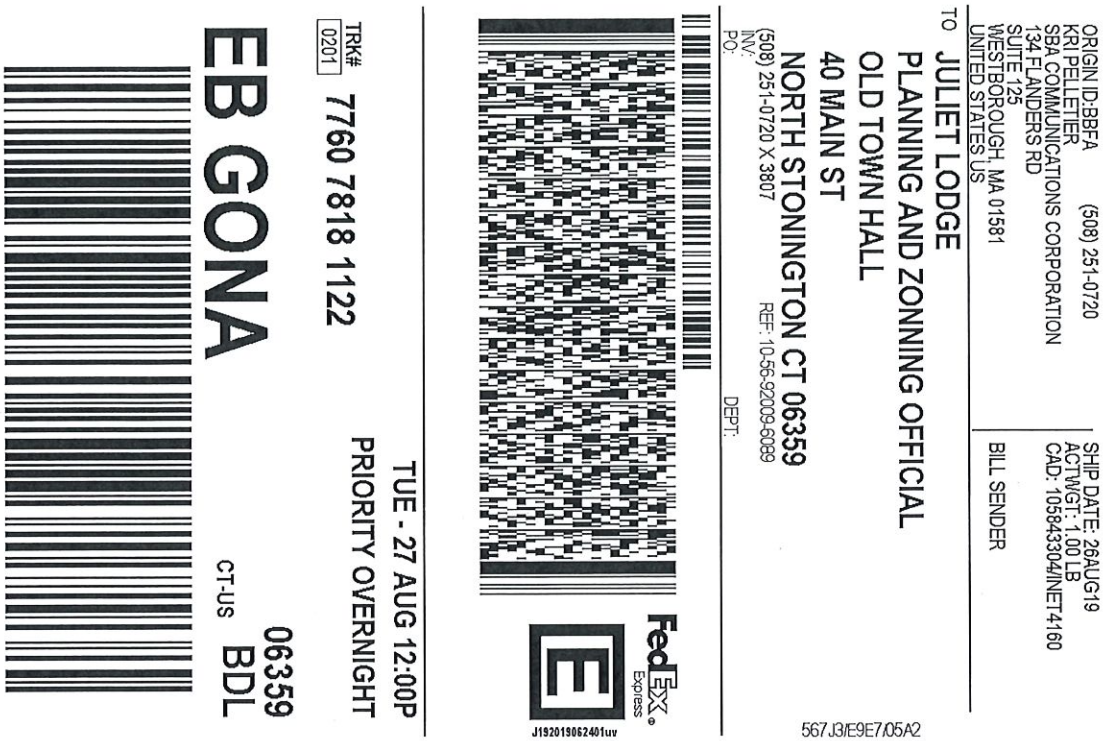

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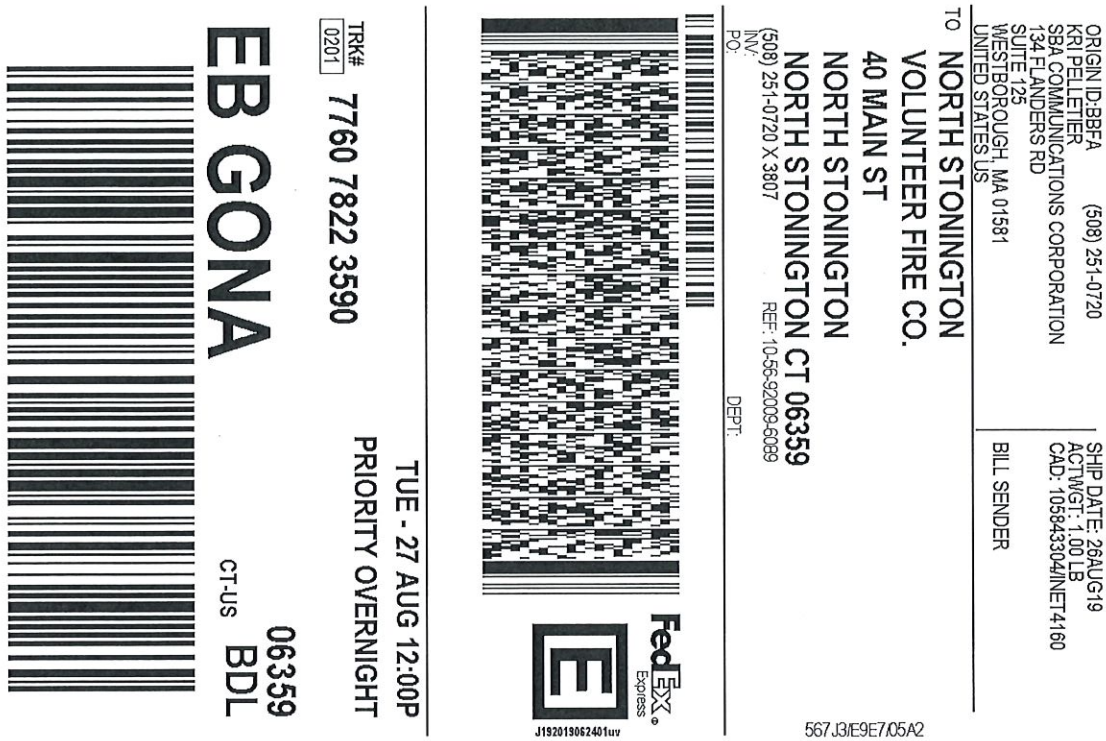

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EXHIBIT 3

Town of North Stonington, CT

Property Listing Report | Map Block Lot 109-3238 | Account I0182600

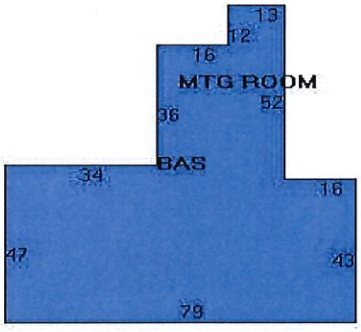
Property Information

Property Location	267 NRWH WSTLY RD
Owner	NO STONINGTON VOL FIRE CO INC
Co-Owner	
Mailing Address	40 MAIN ST NORTH STONINGTON CT 06359-0279
Land Use	9030 MUNICIPAL MDL-94
Land Class	E
Zoning Code	R40
Census Tract	7071
Sub Lot	

Neighborhood	0400
Acreage	2.57
Utilities	Well,Septic
Lot Setting/Desc	Rural Level
Survey Map	
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	1964
Stories	1
Building Style	Other Municip
Building Use	Ind/Comm
Building Condition	Below Average
Floors	Concr-Finished
Total Rooms	

Bedrooms	
Full Bathrooms	2
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Flat
Roof Cover	T&G/Rubber

Exterior Walls	Concr/Cinder
Interior Walls	Minim/Masonry
Heating Type	Hot Water
Heating Fuel	Oil/Gas
AC Type	None
Gross Bldg Area	5749
Total Living Area	4849

Report Created On 5/15/2019

Town of North Stonington, CT

Property Listing Report | Map Block Lot 109-3238 | Account I0182600

Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	305000	213500
Extras	0	0
Outbuildings	14200	9940
Land	100200	70140
Total	419400	293580

Outbuilding and Extra Items

Type	Description
PAVING-ASPHALT	17500.00 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	4849	4849
Basement, Finished	900	0
Total Area	5749	4849

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
NO STONINGTON VOL FIRE CO INC	111/ 760	10/8/1996	0
TOWN OF NORTH STONINGTON	108/ 651	1/25/1996	0
STATE OF CONNECTICUT	26/ 498	12/17/1954	0

Report Created On 5/15/2019

EXHIBIT 4

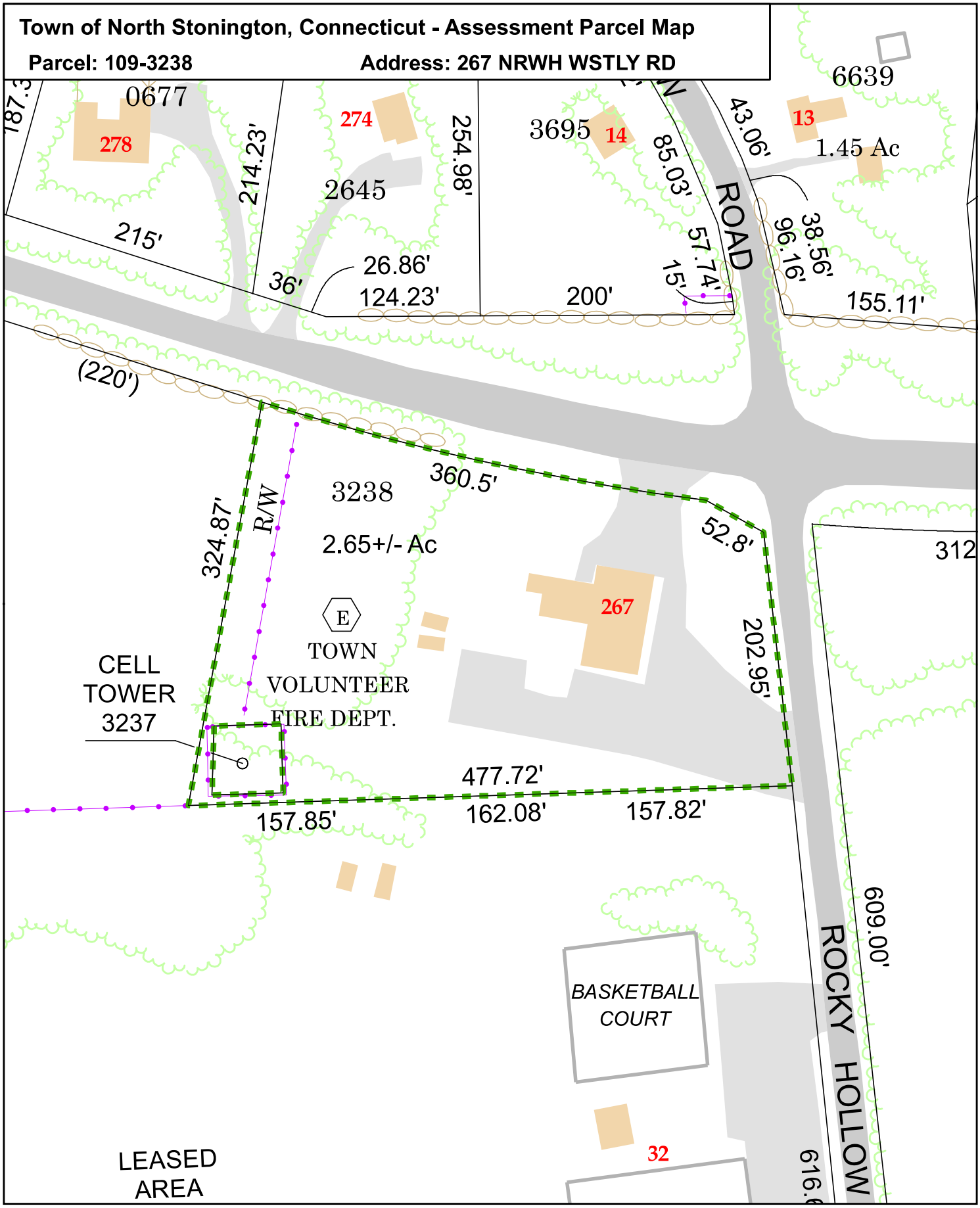

Town of North Stonington, Connecticut - Assessment Parcel Map
Parcel: 109-3238
Address: 267 NRWH WSTLY RD
0677
278
274
2645
254.98'
214.23'
215'
36'
26.86'
124.23'
3695
14
85.03'
43.06'
ROAD
6639
13
1.45 Ac
38.56'
96.16'
57.74'
15'
200'
155.11'
(220')
3238
2.65+/- Ac
360.5'
324.87'
R/W
52.8'
312
267
202.95'
E
TOWN
VOLUNTEER
FIRE DEPT.
CELL
TOWER
3237
477.72'
157.85'
162.08'
157.82'
609.00'
ROCKY HOLLOW
BASKETBALL
COURT
32
LEASED
AREA
N
Approximate Scale: 1:1,200
0 20 40 80 120 160
Feet
Map Produced
November 2018
Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Town of North Stonington and its mapping contractors assume
no legal responsibility for the information contained herein.

EXHIBIT 5

VOL 126 PAGE 741

Town of

NORTH STONINGTON, CT.

PLANNING & ZONING COMMISSION

May 13, 1999

CERTIFIED MAIL
SBA Inc.
125 Shaw Street
Suite 116
New London, Connecticut 06320

NOTICE OF DECISION

At the Special Meeting of the North Stonington Planning & Zoning Commission held on Thursday, May 6, 1999, at the New Town Hall located at 40 Main Street, North Stonington, Connecticut, the Commission acted as follows:

SP#99-031 Application of SBA Inc., of 125 Shaw Street, Suite 116, New London, Connecticut and Sprint Spectrum, LP (Sprint PCS) of 9 Barnes Industrial Road, Wallingford, Connecticut to allow a Special Permit for a 150' multi-tenant monopole and related equipment on land located at the intersection of Route 2/Rocky Hollow Road at 267 Norwich-Westerly Road (a.k.a. Route 2) land is owned by North Stonington Volunteer Fire Co. Inc., Tax map #221, Lot #1.01, was approved with the following conditions applied:

1). Iron Pins shall be set before signing and the proper symbol shall be shown on Sheet S-1, enlarged view.

2). Note shall be amended to the site plan indicating that no more than 4 antenna support platforms each holding no more than 12 panel antennas, are approved; and the installation of additional support platforms and/or antennas shall require an approved site plan modification.

3). Note symbols #8 through #10 on Sheet C-2 shall be removed from the site plan or labeled as "omitted".

4). SE&SC narrative note #17 on Sheet C-4 shall be moved to under note #10 and renumbered.

5). The words "with topsoil added" shall be inserted into note #13 on Sheet C-4 after the word "roughened."

6). A description of the lightening suppression system shall be added to the site plan.

*No further pages were made available

EXHIBIT 6

N. STONINGTON / RT.2

267 NORWICH WESTERLY ROAD
NORTH STONINGTON, CT 06379
NEW LONDON COUNTY

SITE NO.: CT11312A

SITE TYPE: 150'± MONOPOLE

RF DESIGN GUIDELINE: 67D02C 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
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

SITE NOTES

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

GENERAL NOTES

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

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

VICINITY MAP

SCALE: 1" = 1000'-0"

DO NOT SCALE DRAWINGS

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

SHEET INDEX

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

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

PROJECT SUMMARY

SITE NUMBER:	CT11312A
SBA SITE NUMBER:	CT01210-S
SBA SITE NAME:	NORTH STONINGTON
SITE ADDRESS:	267 NORWICH WESTERLY ROAD NORTH STONINGTON, CT 06379
PROPERTY OWNER:	NORTH STONINGTON VOLUNTEER FIRE CO INC. 40 MAIN STREET NORTH STONINGTON, CT 06359-0279
TOWER OWNER:	SBA PROPERTIES, LLC. 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	NEW LONDON COUNTY
ZONING DISTRICT:	R40, HIGH-DENSITY RESIDENTAL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	150'
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
SBA RSM:	STEPHEN ROTH PHONE: 860-539-4920 EMAIL: SRoth@sbasite.com
ARCHITECT:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
STRUCTURAL ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
SITE CONTROL POINT:	LATITUDE: N.41.43711388° (41°-26'-13.61") LONGITUDE W.-71.8814667° (-71°-52'-53.28")

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

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

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

STATE OF CONNECTICUT
CLEMENT J. SAMEK
No. 26876
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	08/08/19	ISSUED FOR CONSTRUCTION	BDJ
0	05/13/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CT11312A

SITE ADDRESS:
267 NORWICH WESTERLY ROAD
NORTH STONINGTON, CT 06379

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.070

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SITE WORK GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

CONCRETE AND REINFORCING STEEL NOTES:

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

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

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

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

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

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

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

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

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

STRUCTURAL STEEL NOTES:

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

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

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

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

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

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

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

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

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

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

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

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

COMPACTION EQUIPMENT:

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

CONSTRUCTION NOTES:

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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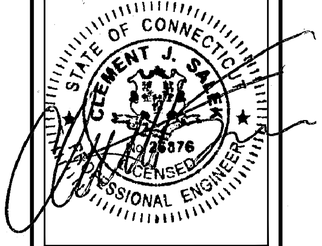


CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	08/08/19	ISSUED FOR CONSTRUCTION	BDJ
0	05/13/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CT11312A

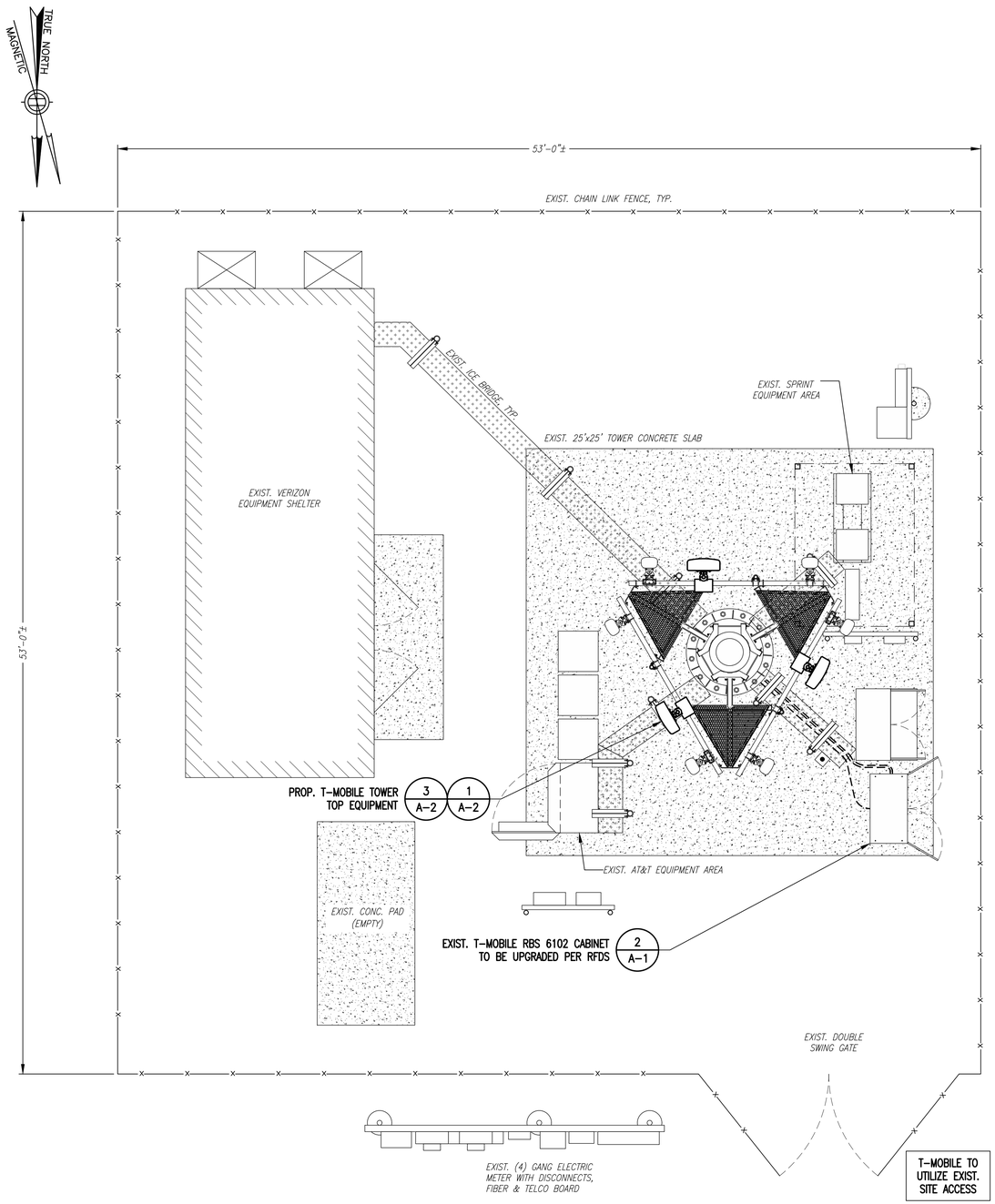
SITE ADDRESS:
267 NORWICH WESTERLY ROAD
NORTH STONINGTON, CT 06379

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

1815.070

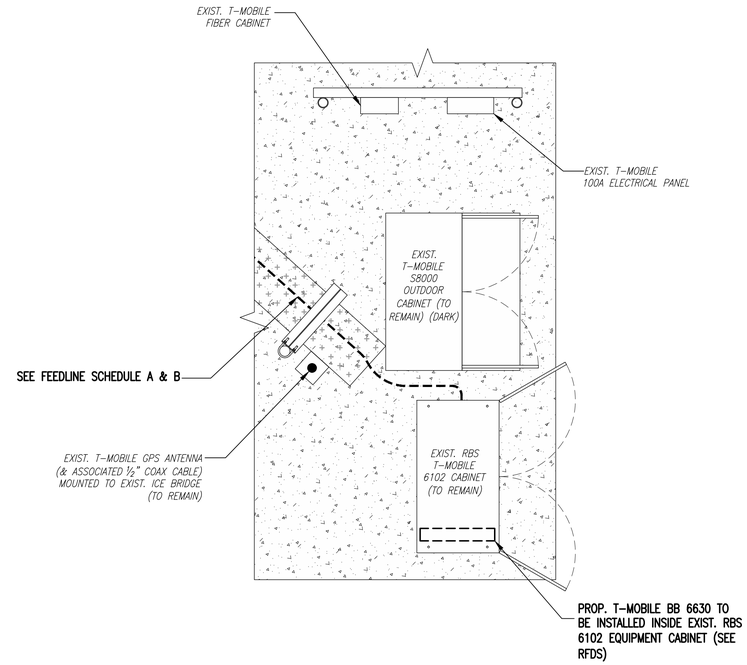
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY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



COMPOUND PLAN 1 A-1
SCALE: 1/4" = 1'-0"
0 4'-0" 8'-0" 12'-0"

FEEDLINE SCHEDULE	FEEDLINES	LOCATION
A	EXISTING TO REMAIN: (1) 1-1/4" HCS FIBER CABLE (9) 1-5/8" COAX CABLES, (6) CONNECTED (3) DISCONNECTED EXISTING TO BE REMOVED: (3) 1-5/8" COAX CABLES	ROUTED PER TOWER STRUCTURAL ANALYSIS
B	PROPOSED: (3) 1-5/8" HCS FIBER	

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



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

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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	08/08/19	ISSUED FOR CONSTRUCTION	BDJ
0	05/13/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CT11312A

SITE ADDRESS:
267 NORWICH WESTERLY ROAD
NORTH STONINGTON, CT 06379

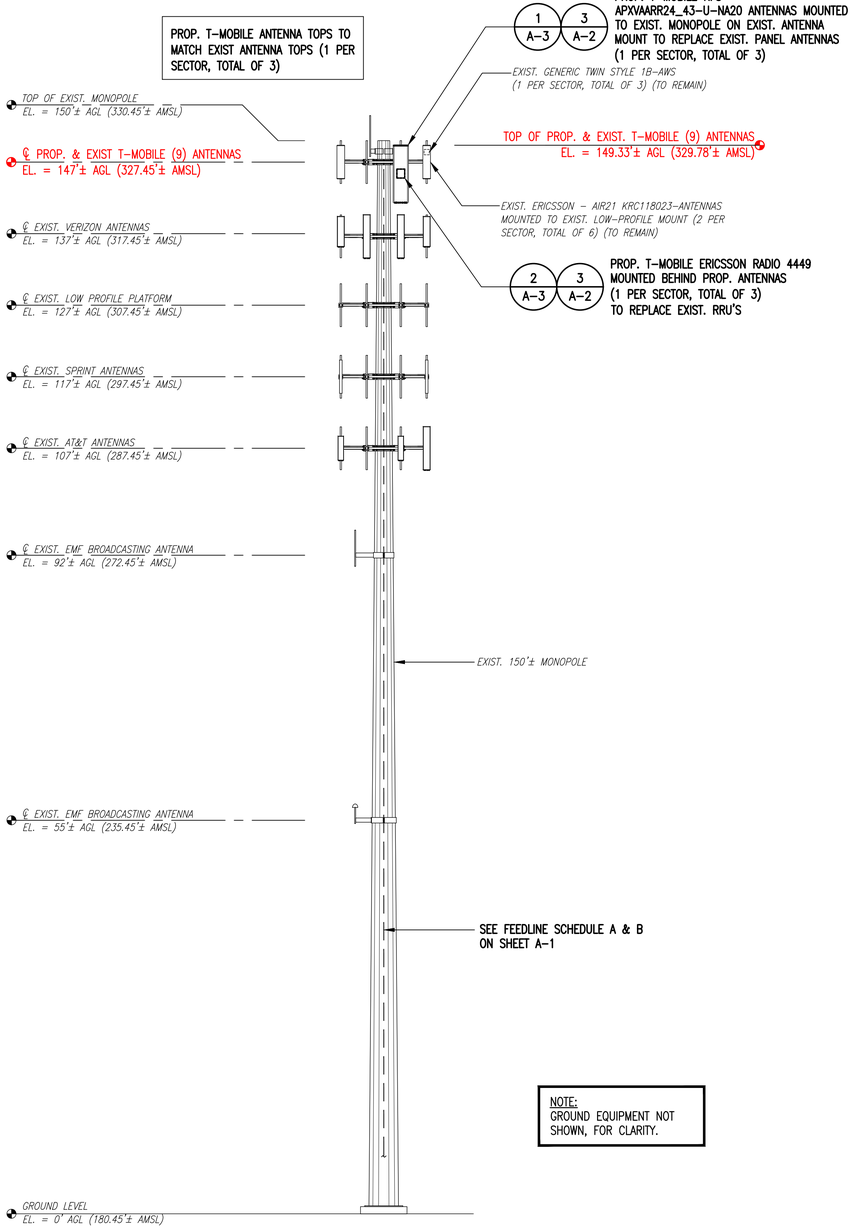
SHEET TITLE
COMPOUND & EQUIPMENT PLAN

SHEET NUMBER
A-1

1815.070

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

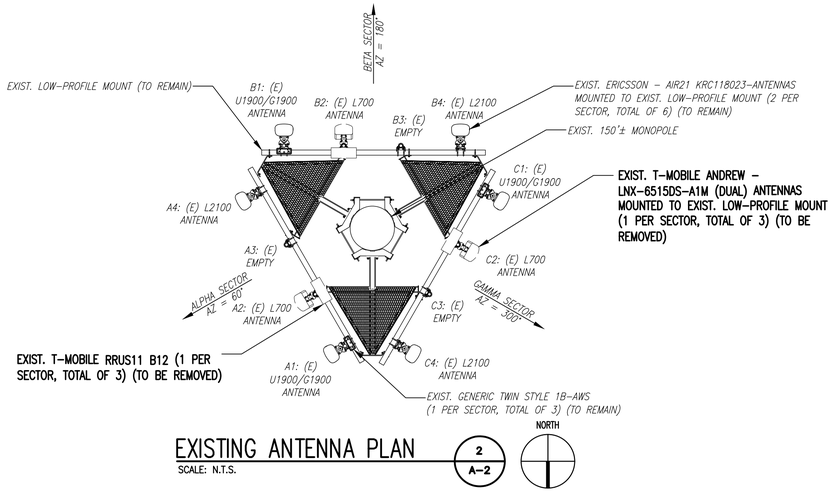
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY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



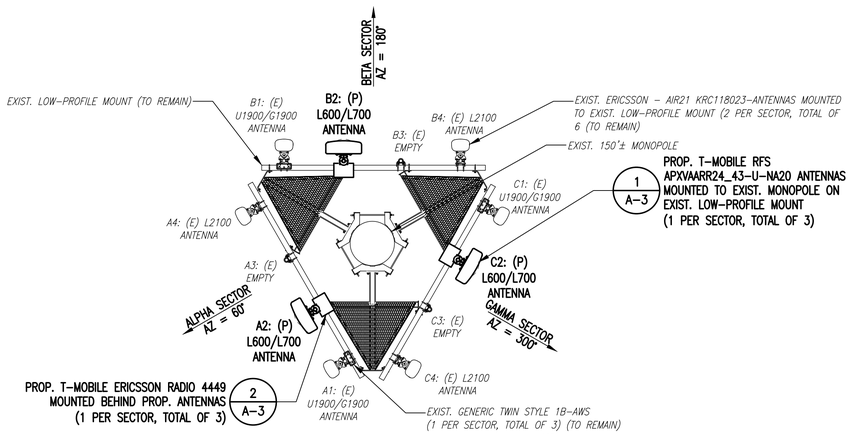
NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

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

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



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



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

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

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

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R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
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(508) 481-7400
www.chappellengineering.com

STATE OF CONNECTICUT
CLEMENT J. GAUDET
No. 26876
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	08/08/19	ISSUED FOR CONSTRUCTION	BDJ
0	05/13/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CT11312A

SITE ADDRESS:
267 NORWICH WESTERLY ROAD
NORTH STONINGTON, CT 06379

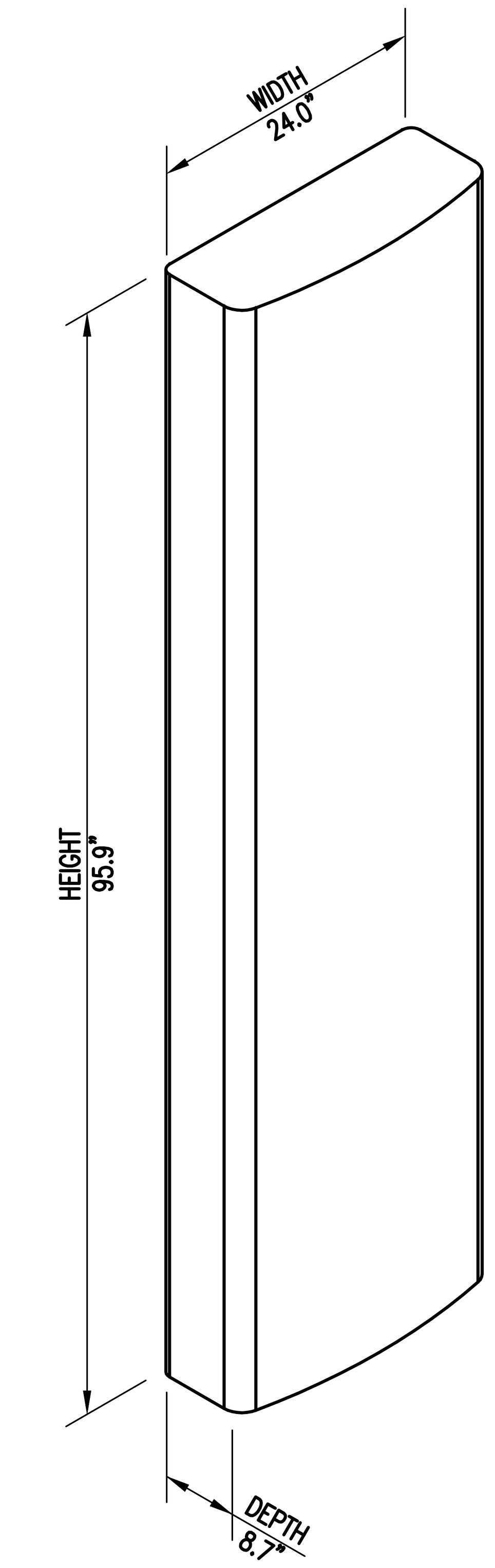
SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLAN

SHEET NUMBER
A-2

1815.070

FINAL ANTENNA CONFIGURATION

SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	CABLES
ALPHA	ERICSSON AIR21 KRC118023-1_B2A_B4P	147'± AGL	60°	0°	2°	U1900/G1900	GENERIC TWIN STYLE 1B-AWS TMA	(2) 1-5/8" COAXIAL CABLES
						–	–	–
	RFS APXVAARR24_43-U-NA20	147'± AGL	60°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE
	EMPTY	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	ERICSSON AIR21 KRC118023-1_B2P_B4A	147'± AGL	60°	0°	2°	L2100	–	(1) 9x18 HCS FIBER CABLE (SHARED)
BETA	ERICSSON AIR21 KRC118023-1_B2A_B4P	147'± AGL	180°	0°	2°	U1900/G1900	GENERIC TWIN STYLE 1B-AWS TMA	(2) 1-5/8" COAXIAL CABLES
						–	–	–
	RFS APXVAARR24_43-U-NA20	147'± AGL	180°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE
	EMPTY	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	ERICSSON AIR21 KRC118023-1_B2P_B4A	147'± AGL	180°	0°	2°	L2100	–	(1) 9x18 HCS FIBER CABLE (SHARED)
GAMMA	ERICSSON AIR21 KRC118023-1_B2A_B4P	147'± AGL	300°	0°	2°	U1900/G1900	GENERIC TWIN STYLE 1B-AWS TMA	(2) 1-5/8" COAXIAL CABLES
						–	–	–
	RFS APXVAARR24_43-U-NA20	147'± AGL	300°	0°	2°	L600/L700	ERICSSON RADIO 4449 B71+B12	(1) 6x12 HCS CABLE
	EMPTY	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	ERICSSON AIR21 KRC118023-1_B2P_B4A	147'± AGL	300°	0°	2°	L2100	–	(1) 9x18 HCS FIBER CABLE (SHARED)



RFS APXVAARR24_43-U-NA20 PANEL ANTENNA
DIMENSIONS: 95.9"H x 24.0"W x 8.7"D
WEIGHT: 128.0 LBS
1 PER SECTOR, TOTAL OF 3

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

ERICSSON RADIO 4449 B12+B71
DIMENSIONS: 14.9"H x 13.2"W x 9.3"D
WEIGHT: 74.0 LBS
1 PER SECTOR, TOTAL OF 3

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

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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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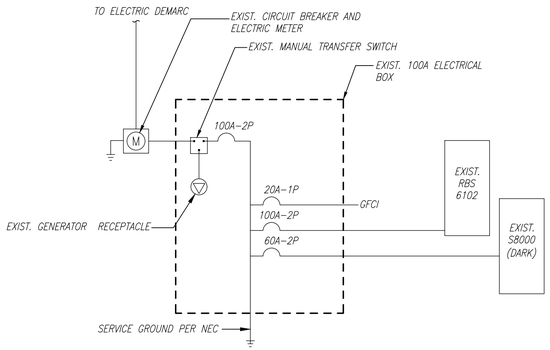
SITE ADDRESS:
267 NORWICH WESTERLY ROAD
NORTH STONINGTON, CT 06379

SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-3

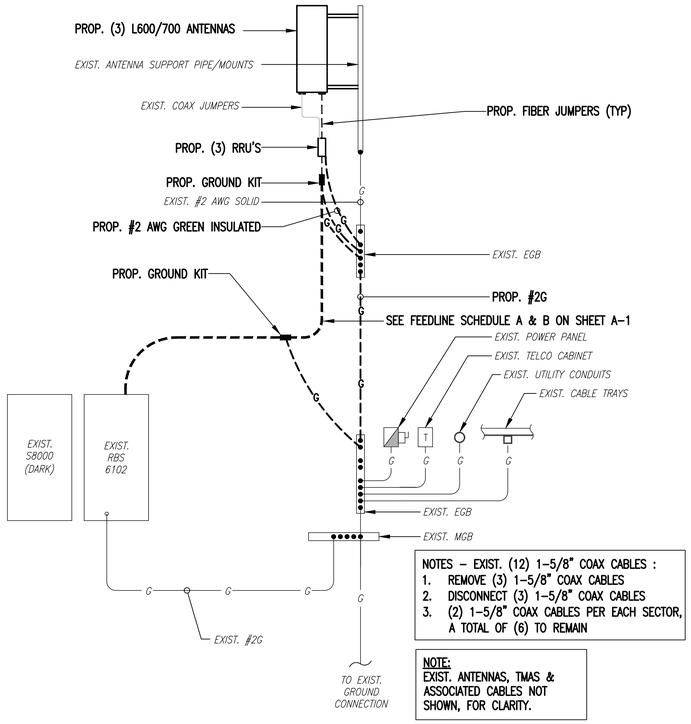
1815.070



ONE LINE DIAGRAM

SCALE: NOT TO SCALE

1 / E–1



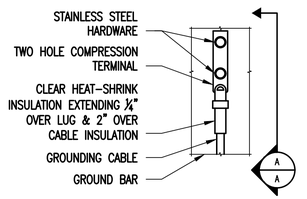
NOTES – EXIST. (12) 1–5/8" COAX CABLES :
1. REMOVE (3) 1–5/8" COAX CABLES
2. DISCONNECT (3) 1–5/8" COAX CABLES
3. (2) 1–5/8" COAX CABLES PER EACH SECTOR, A TOTAL OF (6) TO REMAIN

NOTE:
EXIST. ANTENNAS, TMAS & ASSOCIATED CABLES NOT SHOWN, FOR CLARITY.

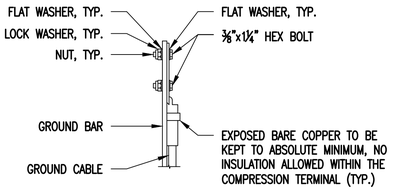
GROUNDING RISER DIAGRAM

SCALE: NOT TO SCALE

2 / E–1



ELEVATION



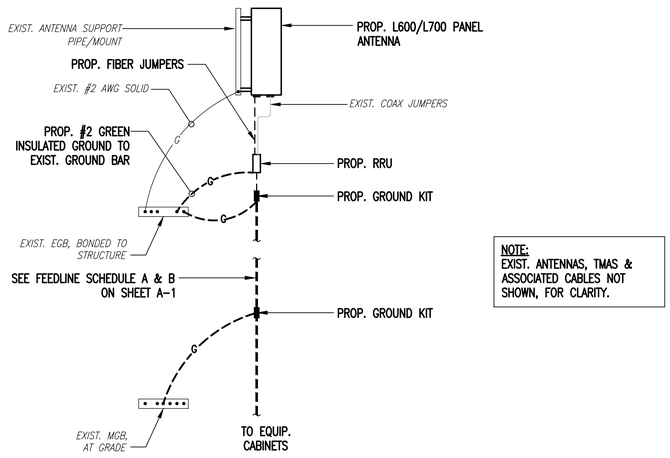
SECTION A–A

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

TYPICAL GROUND BAR CONNECTIONS DETAIL

SCALE: NOT TO SCALE

3 / E–1



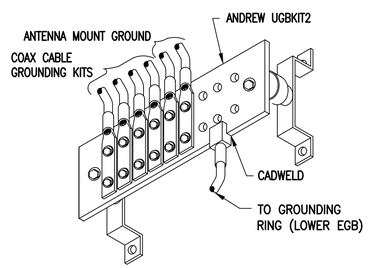
L600/700

NOTE:
EXIST. ANTENNAS, TMAS & ASSOCIATED CABLES NOT SHOWN, FOR CLARITY.

COAX CABLE CONNECTION AND GROUNDING DETAIL

SCALE: NOT TO SCALE

4 / E–1



GROUND BAR (EGB)

SCALE: NOT TO SCALE

5 / E–1

ELECTRICAL AND GROUNDING NOTES

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

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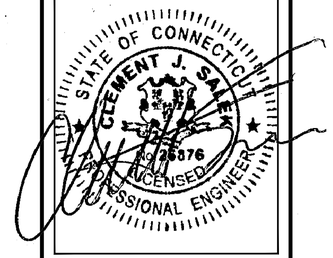

CHECKED BY: JMT

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SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	08/08/19	ISSUED FOR CONSTRUCTION	BDJ
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SITE NUMBER:
CT11312A

SITE ADDRESS:
267 NORWICH WESTERLY ROAD
NORTH STONINGTON, CT 06379

SHEET TITLE
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.070

EXHIBIT 7

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

Structural Analysis Report

Existing 150 ft Valmont Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT01210-S

Customer Site Name: North Stonington

Carrier Name: T-Mobile (App#: 116563, V2)

Carrier Site ID / Name: CT11312A / North Stonington

Site Location: 267 Norwich Westerly Road

N. Stonington, Connecticut

New London County

Latitude: 41.437066

Longitude: -71.881488

Analysis Result:

Max Structural Usage: 89.0% [Pass]

Max Foundation Usage: 99.3% [Pass]

Additional Usage Caused by Mount Modification: +6.0%

Report Prepared By : Dipika Dhungana

Introduction

The purpose of this report is to summarize the analysis results on the 150 ft Valmont Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Monopole original structural design report prepared by Valmont. Dated 08-31-1999. Order No 18771-99.Monopole previous structural report prepared by FDH Engineering, Inc. Dated 03-05-2015. Project No 15BFHB1400.
Foundation Drawing	N/A
Geotechnical Report	Monopole geotechnical report prepared by Jaworski Geotech, Inc. Dated 06-08-1999. Project No 99128G.
Modification Drawings	N/A

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed Vult = 135.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 105.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.162, 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
-	147.0	3	Ericsson AIR 21 B2A/B4P - Panel	Low Profile Platform w/ Hand Rail Kit (Commscope MT-195-14) & Tie-Back Kit (Commscpope VSR-MS-B)	(12) 1 5/8" (1) 1 5/8" Hybrid	T-Mobile
-		3	Ericsson AIR 21 B4A/B2P - Panel			
-		3	Commscope LNX-6515DS-A1M - Panel			
-		3	Ericsson KRY 112 144/1 TMA's			
-		3	Ericsson S11B12			
6	137.0	3	Antel BXA-70063/6CF - Panel	Low Profile Platform	(12) 1 5/8"	Verizon
7		6	Antel LPA-80080/4CF - Panel			
8		3	Rymsa MGD5-800T2 - Panel			
9		6	RFS FD9R6004/2C-3L Diplexers			
10		2	Cleargain 850/1900 TMA's			
11	127.0	-	-	Low Profile Platform	-	-
12	120.0	3	Commscope NNVV-65B-R4 - Panel	Platform w/ Handrail (Sitepro RMQP-496-HK)	(4) 1 1/4" Fiber	Sprint Nextel
13	117.0	3	RFS APXVTM14-C-I20 - Panel			
14		3	ALU 1900 Mhz			
15		6	ALU 800 Mhz			
16		3	ALU TD-RRH8x20-25			
17	107.0	6	Powerwave 7770 - Panel	Low Profile Platform	(12) 1 5/8" (1) 1/2" Fiber cable (2) 3/4" DC power cable	AT&T
18		3	Powerwave P65-17-XLH-RR - Panel			
19		6	Powerwave LGP21903			
20		6	Diplexers			
21		1	Raycap DC6-48-60-18-8F			
22	92.0	1	Jampro JLEP (56")	(1) Standoff	(1) 7/8"	EMF Broadcasting
23	55.0	1	Skyware Global Type 183	(1) Flush Mount	(1) RG6	

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

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	147.0	3	Ericsson AIR 21 B2A/B4P	Low profile mount with handrail kit & tie back kit (1)Commscope MT-195-14 & VSR-MS-B (1)Sitepro PRK-1245L (1)Sitepro PRK-SFS-L	(9) 1 5/8" (4) 1 5/8" Fiber	T-Mobile
2		3	Ericsson AIR 21 B4A/B2P			
3		3	RFS APXVAARR24_43-U-NA20			
4		3	Ericsson KRY 112 144/1			
5		3	Ericsson Radio 4449 B71+B12			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**89.0%**	**77.5%**	**60.9%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	3715.0	33.1
Analysis Reactions	4686.0	44.4
Factored Reactions*	5015.3	44.8
% of Design Reactions	93.4%	99.3%

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

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

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.4191 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

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

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

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

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

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

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

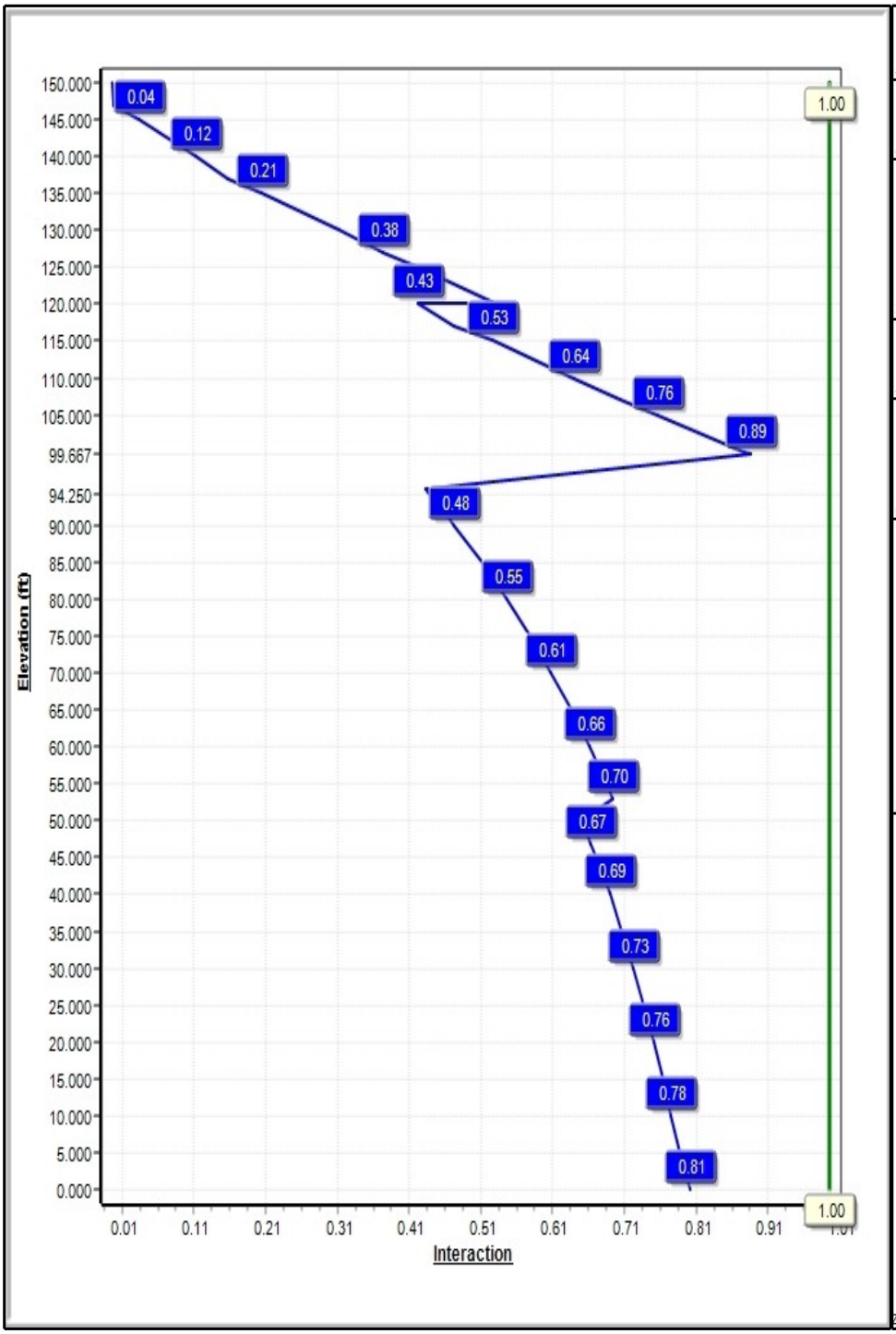
Usage Diagram - Max Ratio 88.99% at 99.7ft

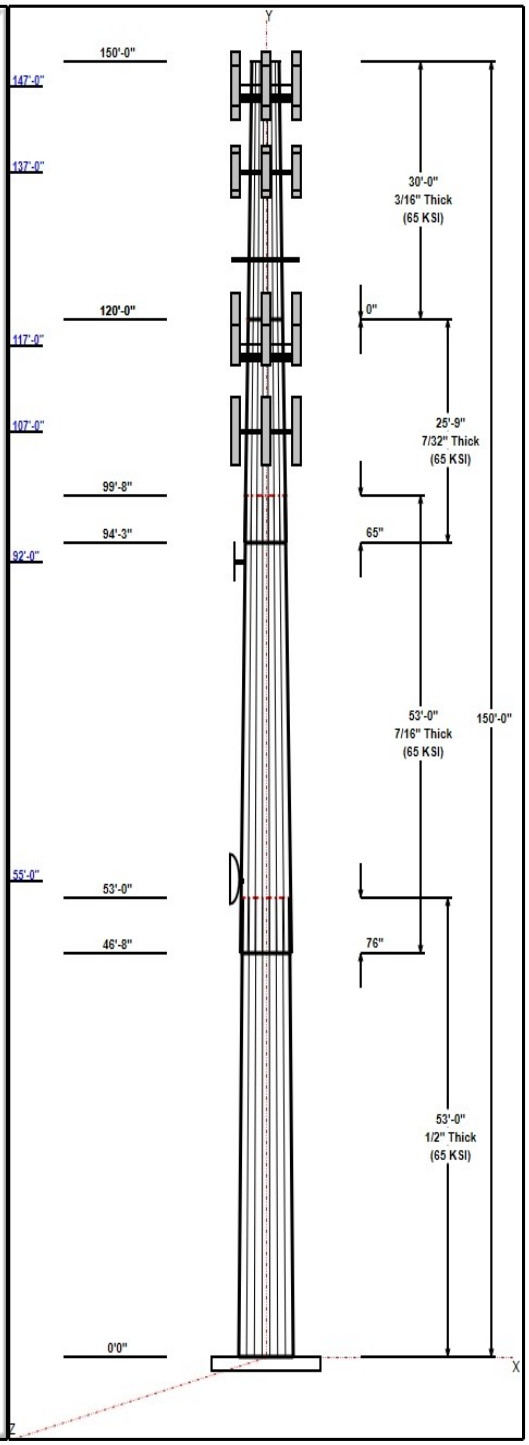
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington	**Exposure:**	C	
Height:	150.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

IES Tower Engineering Solutions

Dead Load Factor:	1.20	**Iterations:**	24
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 105 mph Wind





Structure: CT01210-S-SBA

Type: Tapered
Site Name: North Stonington
Height: 150.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 16 Sided
Taper: 0.18000

7/16/2019

Tower Engineering Solutions

Shaft Properties

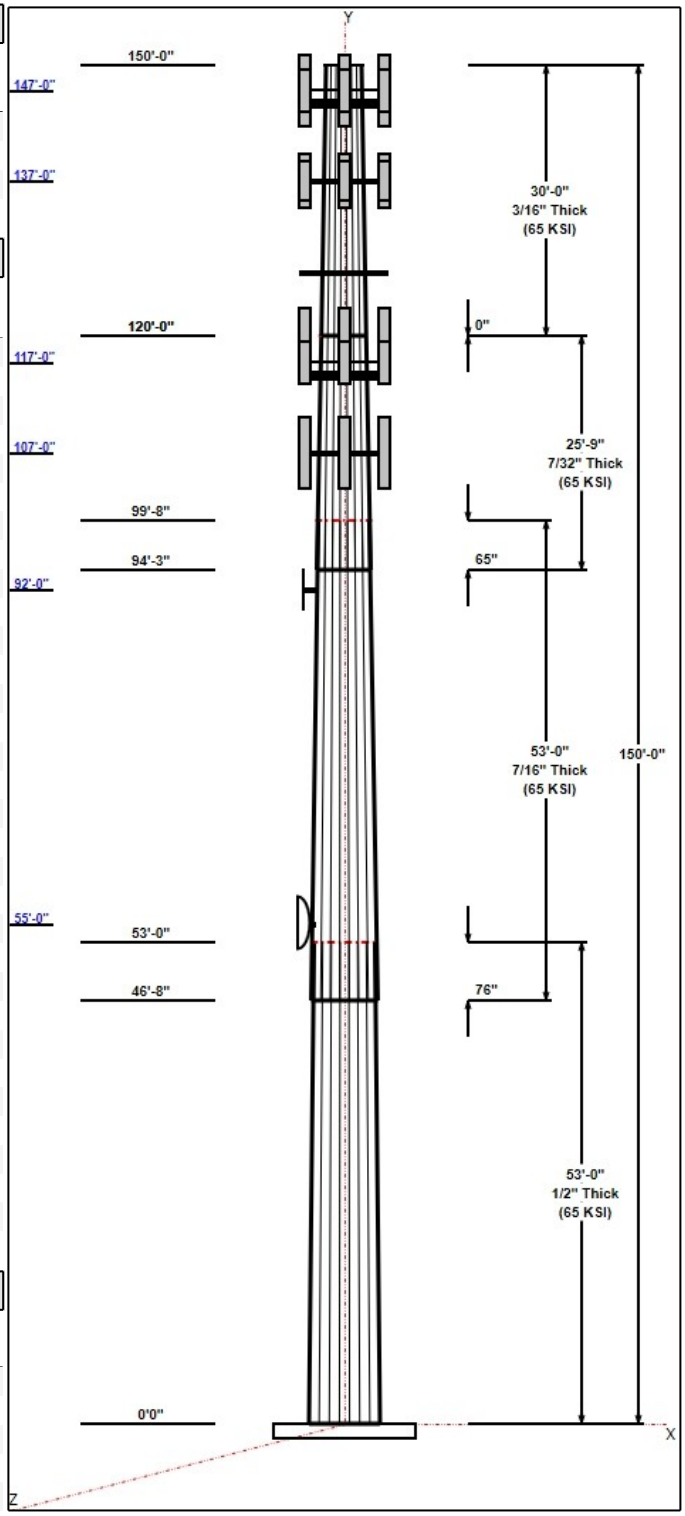
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.00	40.46	50.00	0.500		0.18000	65
2	53.00	32.93	42.47	0.438	Slip	0.18000	65
3	25.75	29.71	34.35	0.219	Slip	0.18000	65
4	30.00	24.31	29.71	0.188	Butt	0.18000	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
150.00	153.50	1	Lightning Rod	---
147.00	147.00	3	Ericsson AIR 21 B2A/B4P	T-Mobile
147.00	147.00	3	Ericsson AIR 21 B4A/B2P	T-Mobile
147.00	147.00	3	APXVAARR24_43-U-NA20	T-Mobile
147.00	147.00	3	Ericsson KRY 112 144/1	T-Mobile
147.00	147.00	3	4449	T-Mobile
147.00	147.00	1	Platform w/ Hand Rails	T-Mobile
147.00	147.00	1	PRK-1245 (kicker kit)	T-Mobile
147.00	147.00	1	(3) SFS-H (V-Braces)	T-Mobile
137.00	137.00	3	Antel BXA-70063/6CF	Verizon
137.00	137.00	6	Antel LPA-80080/4CF	Verizon
137.00	137.00	3	Rymsa MGD5-800T2	Verizon
137.00	137.00	6	RFS FD9R6004/2C-3L	Verizon
137.00	137.00	2	Cleargain 850/1900 TMA's	Verizon
137.00	137.00	1	Low Profile Platform	Verizon
127.00	127.00	1	Low Profile Platform	---
117.00	117.00	3	RFS APXVTM14-C-I20	Sprint Nextel
117.00	120.00	3	Commscope	Sprint Nextel
117.00	117.00	3	ALU 1900 Mhz	Sprint Nextel
117.00	117.00	6	ALU 800 Mhz	Sprint Nextel
117.00	117.00	3	ALU TD-RRH8x20-25	Sprint Nextel
117.00	117.00	1	Sitepro RMQP-496-HK	Sprint Nextel
107.00	107.00	6	Powerwave 7770	AT&T
107.00	107.00	6	Powerwave/LGP21903	AT&T
107.00	107.00	6	Diplexers	AT&T
107.00	107.00	1	Low Profile Platform	AT&T
107.00	107.00	3	Powerwave/P65-17-XLH-R	AT&T
107.00	107.00	1	Raycap/DC6-48-60-18-8F	AT&T
92.00	92.00	1	Jampro JLEP (56")	EMF Broadcasting
92.00	92.00	1	Standoff	EMF Broadcasting
55.00	55.00	1	Flush Mount	EMF Broadcasting
55.00	55.00	1	Skyware Global Type 183	EMF Broadcasting

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
3.00	147.00	Inside	1 5/8" Coax	T-Mobile
3.00	147.00	Inside	1 5/8" Fiber	T-Mobile
3.00	137.00	Inside	1 5/8" Coax	Verizon
3.00	117.00	Inside	1-1/4" Fiber	Sprint Nextel
3.00	107.00	Inside	1 5/8" Coax	AT&T
3.00	107.00	Inside	1/2" Fiber cable	AT&T
3.00	107.00	Inside	3/4" DC power cable	AT&T
3.00	92.00	Inside	7/8" Coax	EMF Broadcasting
3.00	55.00	Inside	RG6	EMF Broadcasting



Anchor Bolts

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

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	64.3	60.0	Polygon

Reactions

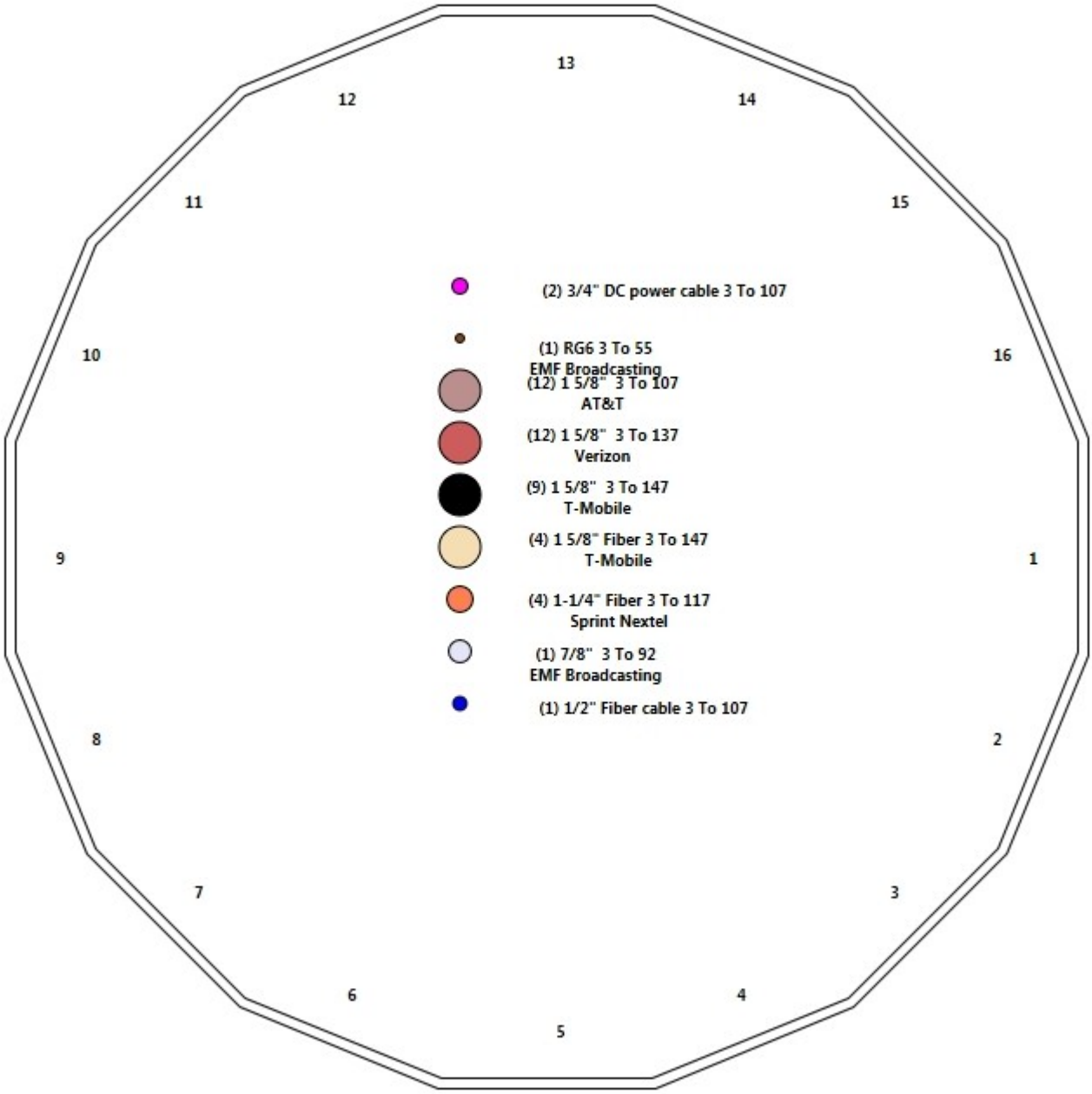
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 105 mph Wind	4686.0	44.4	52.8
0.9D + 1.6W 105 mph Wind	4634.2	44.4	39.6
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1089.4	10.0	78.6
1.2D + 1.0E	114.1	1.0	53.0
0.9D + 1.0E	112.7	1.0	39.7
1.0D + 1.0W 60 mph Wind	951.1	9.1	44.1

Structure: CT01210-S-SBA - Coax Line Placement

Type: Monopole
Site Name: North Stonington
Height: 150.00 (ft)

7/16/2019

Tower Engineering Solutions



Shaft Properties

Structure:	CT01210-S-SBA		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	16	53.000	0.5000	65		0.00	12,867
2	16	53.000	0.4375	65	Slip	76.00	9,380
3	16	25.750	0.2188	65	Slip	65.00	1,945
4	16	30.000	0.1875	65	Flange	0.00	1,638
					Total Shaft Weight:		**25,830**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	50.00	0.00	78.95	24439.41	18.30	100.00	40.46	53.00	63.74	12857.1	14.50	80.92	0.180003
2	42.47	46.67	58.67	13097.52	17.72	97.09	32.93	99.67	45.35	6050.90	13.38	75.28	0.180003
3	34.35	94.25	23.82	3504.31	29.64	157.02	29.71	120.00	20.58	2261.65	25.43	135.8	0.180003
4	29.71	120.0	17.66	1944.73	29.93	158.46	24.31	150.00	14.43	1060.92	24.20	129.6	0.180003

Load Summary

Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	150.00	Lightning Rod	1	35.00	1.05	1.00	66.41	3.424	1.00	0.00	3.50
2	147.00	Ericsson AIR 21 B2A/B4P	3	91.50	6.04	0.85	258.15	7.126	0.85	0.00	0.00
3	147.00	Ericsson AIR 21 B4A/B2P	3	90.30	6.04	0.85	256.95	7.126	0.85	0.00	0.00
4	147.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	544.98	22.136	0.70	0.00	0.00
5	147.00	Ericsson KRY 112 144/1 TMA's	3	11.00	0.35	0.67	21.76	0.755	0.67	0.00	0.00
6	147.00	4449	3	70.00	1.65	0.67	138.07	2.187	0.67	0.00	0.00
7	147.00	Platform w/ Hand Rails (MT-195-14)	1	1600.00	36.00	1.00	3695.61	67.350	1.00	0.00	0.00
8	147.00	PRK-1245 (kicker kit)	1	464.91	9.50	1.00	788.80	19.428	1.00	0.00	0.00
9	147.00	(3) SFS-H (V-Braces)	1	197.00	6.30	1.00	471.49	12.884	1.00	0.00	0.00
10	137.00	Antel BXA-70063/6CF	3	14.90	7.58	0.72	160.19	10.322	0.72	0.00	0.00
11	137.00	Antel LPA-80080/4CF	6	12.00	5.40	0.74	145.25	6.388	0.74	0.00	0.00
12	137.00	Rymsa MGD5-800T2	3	15.40	3.36	0.78	83.32	5.141	0.78	0.00	0.00
13	137.00	RFS FD9R6004/2C-3L	6	3.10	0.36	0.67	11.05	0.799	0.67	0.00	0.00
14	137.00	Cleargain 850/1900 TMA's	2	5.50	0.52	0.67	17.04	1.045	0.67	0.00	0.00
15	137.00	Low Profile Platform	1	1500.00	22.00	1.00	2797.10	39.502	1.00	0.00	0.00
16	127.00	Low Profile Platform (Abandon)	1	1500.00	22.00	1.00	2787.31	39.370	1.00	0.00	0.00
17	117.00	RFS APXVTM14-C-I20	3	56.20	6.34	0.77	211.90	7.424	0.77	0.00	0.00
18	117.00	Commscope NNVV-65B-R4	3	77.40	12.27	0.80	355.95	13.690	0.80	0.00	3.00
19	117.00	ALU 1900 Mhz	3	60.00	2.77	0.67	141.39	4.007	0.67	0.00	0.00
20	117.00	ALU 800 Mhz	6	53.00	2.49	0.67	125.15	3.606	0.67	0.00	0.00
21	117.00	ALU TD-RRH8x20-25	3	70.00	4.05	0.67	177.20	4.842	0.67	0.00	0.00
22	117.00	Sitepro RMQP-496-HK	1	2449.00	48.00	1.00	4950.49	80.686	1.00	0.00	0.00
23	107.00	Powerwave 7770	6	35.00	5.50	0.73	164.70	6.527	0.73	0.00	0.00
24	107.00	Powerwave/LGP21903	6	5.50	0.27	0.67	13.65	0.654	0.67	0.00	0.00
25	107.00	Diplexers	6	5.50	0.27	0.67	13.63	0.654	0.67	0.00	0.00
26	107.00	Low Profile Platform	1	1500.00	22.00	1.00	2765.43	39.075	1.00	0.00	0.00
27	107.00	Powerwave/P65-17-XLH-RR	3	59.00	11.44	0.75	268.41	14.567	0.75	0.00	0.00
28	107.00	Raycap/DC6-48-60-18-8F	1	31.80	0.92	1.00	91.57	1.343	1.00	0.00	0.00
29	92.00	Jampro JLEP (56")	1	51.10	1.40	1.00	139.86	4.684	1.00	0.00	0.00
30	92.00	Standoff	1	40.00	2.50	1.00	116.45	7.903	1.00	0.00	0.00
31	55.00	Flush Mount	1	350.00	2.50	1.00	615.21	4.079	1.00	0.00	0.00
32	55.00	Skyware Global Type 183	1	114.00	45.75	1.00	530.58	49.852	1.00	0.00	0.00
		Totals:	**87**	**12,759.51**			**30,545.75**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
3.00	147.00	(9) 1 5/8" Coax	0.00	Inside
3.00	147.00	(4) 1 5/8" Fiber	0.00	Inside
3.00	137.00	(12) 1 5/8" Coax	0.00	Inside
3.00	117.00	(4) 1-1/4" Fiber	0.00	Inside
3.00	107.00	(12) 1 5/8" Coax	0.00	Inside
3.00	107.00	(1) 1/2" Fiber cable	0.00	Inside
3.00	107.00	(2) 3/4" DC power cable	0.00	Inside
3.00	92.00	(1) 7/8" Coax	0.00	Inside
3.00	55.00	(1) RG6	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)

Shaft Section Properties

Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.5000	50.000	78.953	24439.4	18.30	100.00	81.9	958.8	0.0
5.00		0.5000	49.100	77.517	23130.4	17.94	98.20	82.3	924.1	1331.1
10.00		0.5000	48.200	76.081	21869.0	17.58	96.40	82.5	890.0	1306.7
15.00		0.5000	47.300	74.646	20654.3	17.23	94.60	82.5	856.6	1282.2
20.00		0.5000	46.400	73.210	19485.5	16.87	92.80	82.5	823.8	1257.8
25.00		0.5000	45.500	71.775	18361.6	16.51	91.00	82.5	791.6	1233.4
30.00		0.5000	44.600	70.339	17281.8	16.15	89.20	82.5	760.1	1209.0
35.00		0.5000	43.700	68.904	16245.1	15.79	87.40	82.5	729.2	1184.5
40.00		0.5000	42.800	67.468	15250.8	15.44	85.60	82.5	699.0	1160.1
45.00		0.5000	41.900	66.033	14297.9	15.08	83.80	82.5	669.4	1135.7
46.67	Bot - Section 2	0.5000	41.600	65.554	13989.3	14.96	83.20	82.5	659.6	373.1
50.00		0.5000	41.000	64.597	13385.5	14.72	82.00	82.5	640.4	1398.8
53.00	Top - Section 1	0.4375	41.335	57.077	12060.6	17.20	94.48	0.0	0.0	1241.5
55.00		0.4375	40.975	56.575	11744.9	17.04	93.66	82.5	562.3	386.7
60.00		0.4375	40.075	55.319	10979.8	16.63	91.60	82.5	537.4	951.9
65.00		0.4375	39.175	54.063	10248.7	16.22	89.54	82.5	513.2	930.5
70.00		0.4375	38.275	52.807	9550.9	15.81	87.49	82.5	489.5	909.1
75.00		0.4375	37.375	51.551	8885.4	15.40	85.43	82.5	466.3	887.8
80.00		0.4375	36.475	50.294	8251.6	14.99	83.37	82.5	443.8	866.4
85.00		0.4375	35.575	49.038	7648.7	14.58	81.31	82.5	421.7	845.0
90.00		0.4375	34.675	47.782	7075.8	14.17	79.26	82.5	400.3	823.6
92.00		0.4375	34.315	47.280	6855.0	14.01	78.43	82.5	391.9	323.5
94.25	Bot - Section 3	0.4375	33.910	46.715	6612.0	13.83	77.51	82.5	382.5	359.8
95.00		0.4375	33.775	46.526	6532.4	13.76	77.20	82.5	379.4	179.6
99.67	Top - Section 2	0.2188	33.372	23.135	3212.5	28.75	152.56	0.0	0.0	1101.5
100.00		0.2188	33.312	23.093	3195.1	28.70	152.28	70.1	188.1	26.2
105.00		0.2188	32.412	22.465	2941.4	27.88	148.17	71.0	178.0	387.6
107.00		0.2188	32.052	22.214	2843.8	27.55	146.52	71.4	174.0	152.0
110.00		0.2188	31.512	21.837	2701.5	27.06	144.06	71.9	168.2	224.8
115.00		0.2188	30.612	21.209	2475.1	26.24	139.94	72.9	158.6	366.2
117.00		0.2188	30.252	20.958	2388.2	25.92	138.30	73.2	154.9	143.5
120.00	Top - Section 3	0.2188	29.712	20.581	2261.7	25.43	135.83	73.8	149.3	212.0
120.00	Bot - Section 4	0.1875	29.712	17.659	1944.7	29.66	158.46	68.7	128.4	
125.00		0.1875	28.812	17.121	1772.2	28.97	153.66	69.8	120.7	295.9
127.00		0.1875	28.452	16.906	1706.2	28.59	151.74	70.2	117.6	115.8
130.00		0.1875	27.912	16.583	1610.3	28.02	148.86	70.9	113.2	170.9
135.00		0.1875	27.012	16.044	1458.5	27.06	144.06	71.9	105.9	277.6
137.00		0.1875	26.652	15.829	1400.6	26.68	142.14	72.4	103.1	108.5
140.00		0.1875	26.112	15.506	1316.6	26.11	139.26	73.0	98.9	159.9
145.00		0.1875	25.212	14.968	1184.1	25.16	134.46	74.1	92.1	259.2
147.00		0.1875	24.852	14.752	1133.8	24.77	132.54	74.5	89.5	101.1
150.00		0.1875	24.312	14.429	1060.9	24.20	129.66	75.2	85.6	148.9
										25829.7

Wind Loading - Shaft

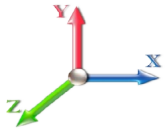
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	22.791	25.07	411.26	0.750	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	22.791	25.07	403.85	0.750	0.000	5.00	21.050	15.79	633.3	0.0	1597.3
10.00		1.00	0.85	22.791	25.07	396.45	0.750	0.000	5.00	20.668	15.50	621.8	0.0	1568.0
15.00		1.00	0.85	22.791	25.07	389.05	0.750	0.000	5.00	20.286	15.21	610.3	0.0	1538.7
20.00		1.00	0.90	24.182	26.60	393.12	0.750	0.000	5.00	19.903	14.93	635.3	0.0	1509.4
25.00		1.00	0.95	25.345	27.88	394.66	0.750	0.000	5.00	19.521	14.64	653.1	0.0	1480.1
30.00		1.00	0.98	26.337	28.97	394.35	0.750	0.000	5.00	19.139	14.35	665.3	0.0	1450.7
35.00		1.00	1.01	27.206	29.93	392.71	0.750	0.000	5.00	18.756	14.07	673.6	0.0	1421.4
40.00		1.00	1.04	27.981	30.78	390.07	0.750	0.000	5.00	18.374	13.78	678.6	0.0	1392.1
45.00		1.00	1.07	28.684	31.55	386.63	0.750	0.000	5.00	17.991	13.49	681.2	0.0	1362.8
46.67	Bot - Section 2	1.00	1.08	28.904	31.79	385.33	0.750	0.000	1.67	5.912	4.43	225.6	0.0	447.8
50.00		1.00	1.09	29.327	32.26	382.54	0.750	0.000	3.33	11.945	8.96	462.4	0.0	1678.6
53.00	Top - Section 1	1.00	1.11	29.689	32.66	379.83	0.750	0.000	3.00	10.605	7.95	415.6	0.0	1489.9
55.00	Appurtenance(s)	1.00	1.12	29.922	32.91	386.16	0.750	0.000	2.00	6.994	5.25	276.2	0.0	464.1
60.00		1.00	1.14	30.475	33.52	381.16	0.750	0.000	5.00	17.216	12.91	692.5	0.0	1142.2
65.00		1.00	1.16	30.993	34.09	375.75	0.750	0.000	5.00	16.834	12.63	688.7	0.0	1116.6
70.00		1.00	1.17	31.480	34.63	369.99	0.750	0.000	5.00	16.451	12.34	683.6	0.0	1091.0
75.00		1.00	1.19	31.941	35.13	363.93	0.750	0.000	5.00	16.069	12.05	677.5	0.0	1065.3
80.00		1.00	1.21	32.377	35.62	357.58	0.750	0.000	5.00	15.687	11.77	670.4	0.0	1039.7
85.00		1.00	1.22	32.793	36.07	350.99	0.750	0.000	5.00	15.304	11.48	662.5	0.0	1014.0
90.00		1.00	1.24	33.190	36.51	344.18	0.750	0.000	5.00	14.922	11.19	653.8	0.0	988.4
92.00	Appurtenance(s)	1.00	1.24	33.344	36.68	341.39	0.750	0.000	2.00	5.862	4.40	258.0	0.0	388.2
94.25	Bot - Section 3	1.00	1.25	33.514	36.87	338.22	0.750	0.000	2.25	6.521	4.89	288.5	0.0	431.8
95.00		1.00	1.25	33.570	36.93	337.16	0.750	0.000	0.75	2.184	1.64	96.8	0.0	215.6
99.67	Top - Section 2	1.00	1.26	33.911	37.30	330.44	0.750	0.000	4.67	13.399	10.05	599.8	0.0	1321.8
100.00		1.00	1.27	33.935	37.33	334.34	0.750	0.000	0.33	0.944	0.71	42.3	0.0	31.5
105.00		1.00	1.28	34.285	37.71	326.98	0.750	0.000	5.00	13.961	10.47	631.8	0.0	465.1
107.00	Appurtenance(s)	1.00	1.28	34.422	37.86	323.99	0.750	0.000	2.00	5.477	4.11	248.9	0.0	182.4
110.00		1.00	1.29	34.623	38.08	319.46	0.750	0.000	3.00	8.101	6.08	370.2	0.0	269.8
115.00		1.00	1.30	34.948	38.44	311.79	0.750	0.000	5.00	13.196	9.90	608.8	0.0	439.4
117.00	Appurtenance(s)	1.00	1.31	35.075	38.58	308.69	0.750	0.000	2.00	5.171	3.88	239.4	0.0	172.2
120.00	Top - Section 3	1.00	1.32	35.263	38.79	303.99	0.750	0.000	3.00	7.642	5.73	355.7	0.0	254.4
125.00		1.00	1.33	35.567	39.12	296.05	0.750	0.000	5.00	12.431	9.32	583.6	0.0	355.1
127.00	Appurtenance(s)	1.00	1.33	35.686	39.25	292.84	0.750	0.000	2.00	4.866	3.65	229.2	0.0	138.9
130.00		1.00	1.34	35.862	39.45	287.99	0.750	0.000	3.00	7.184	5.39	340.1	0.0	205.1
135.00		1.00	1.35	36.148	39.76	279.81	0.750	0.000	5.00	11.667	8.75	556.7	0.0	333.1
137.00	Appurtenance(s)	1.00	1.35	36.260	39.89	276.51	0.750	0.000	2.00	4.560	3.42	218.2	0.0	130.2
140.00		1.00	1.36	36.426	40.07	271.52	0.750	0.000	3.00	6.725	5.04	323.3	0.0	191.9
145.00		1.00	1.37	36.696	40.37	263.14	0.750	0.000	5.00	10.902	8.18	528.1	0.0	311.1
147.00	Appurtenance(s)	1.00	1.37	36.802	40.48	259.75	0.750	0.000	2.00	4.254	3.19	206.6	0.0	121.4
150.00	Appurtenance(s)	1.00	1.38	36.959	40.65	254.65	0.750	0.000	3.00	6.266	4.70	305.7	0.0	178.7
								Totals:	**150.00**			**18,993.0**		**30,995.6**

Discrete Appurtenance Forces

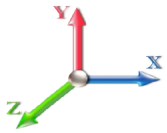
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Lightning Rod	1	37.139	40.852	1.00	1.00	1.05	42.00	0.000	3.500	68.63	0.00	240.21
2	147.00	Ericsson KRY 112 144/1	3	36.802	40.482	0.50	0.75	0.53	39.60	0.000	0.000	34.17	0.00	0.00
3	147.00	Ericsson AIR 21 B2A/B4P	3	36.802	40.482	0.64	0.75	11.55	329.40	0.000	0.000	748.21	0.00	0.00
4	147.00	APXVAARR24_43-U-NA2	3	36.802	40.482	0.52	0.75	31.88	460.80	0.000	0.000	2064.78	0.00	0.00
5	147.00	Ericsson AIR 21 B4A/B2P	3	36.802	40.482	0.64	0.75	11.55	325.08	0.000	0.000	748.21	0.00	0.00
6	147.00	Platform w/ Hand Rails	1	36.802	40.482	1.00	1.00	36.00	1920.00	0.000	0.000	2331.77	0.00	0.00
7	147.00	PRK-1245 (kicker kit)	1	36.802	40.482	1.00	1.00	9.50	557.89	0.000	0.000	615.33	0.00	0.00
8	147.00	(3) SFS-H (V-Braces)	1	36.802	40.482	1.00	1.00	6.30	236.40	0.000	0.000	408.06	0.00	0.00
9	147.00	4449	3	36.802	40.482	0.50	0.75	2.49	252.00	0.000	0.000	161.11	0.00	0.00
10	137.00	Rymsa MGD5-800T2	3	36.260	39.886	0.62	0.80	6.29	55.44	0.000	0.000	401.41	0.00	0.00
11	137.00	Antel BXA-70063/6CF	3	36.260	39.886	0.58	0.80	13.10	53.64	0.000	0.000	835.90	0.00	0.00
12	137.00	Antel LPA-80080/4CF	6	36.260	39.886	0.59	0.80	19.18	86.40	0.000	0.000	1224.07	0.00	0.00
13	137.00	Cleargain 850/1900 TMA's	2	36.260	39.886	0.54	0.80	0.56	13.20	0.000	0.000	35.57	0.00	0.00
14	137.00	RFS FD9R6004/2C-3L	6	36.260	39.886	0.54	0.80	1.16	22.32	0.000	0.000	73.89	0.00	0.00
15	137.00	Low Profile Platform	1	36.260	39.886	1.00	1.00	22.00	1800.00	0.000	0.000	1403.99	0.00	0.00
16	127.00	Low Profile Platform	1	35.686	39.255	1.00	1.00	22.00	1800.00	0.000	0.000	1381.76	0.00	0.00
17	117.00	Sitepro RMQP-496-HK	1	35.075	38.583	1.00	1.00	48.00	2938.80	0.000	0.000	2963.15	0.00	0.00
18	117.00	ALU 800 Mhz	6	35.075	38.583	0.50	0.75	7.51	381.60	0.000	0.000	463.45	0.00	0.00
19	117.00	ALU 1900 Mhz	3	35.075	38.583	0.50	0.75	4.18	216.00	0.000	0.000	257.78	0.00	0.00
20	117.00	Commscope	3	35.263	38.789	0.60	0.75	22.09	278.64	0.000	3.000	1370.71	0.00	4112.12
21	117.00	RFS APXVTM14-C-I20	3	35.075	38.583	0.58	0.75	10.98	202.32	0.000	0.000	678.07	0.00	0.00
22	117.00	ALU TD-RRH8x20-25	3	35.075	38.583	0.50	0.75	6.11	252.00	0.000	0.000	376.90	0.00	0.00
23	107.00	Diplexers	6	34.422	37.864	0.54	0.80	0.87	39.60	0.000	0.000	52.60	0.00	0.00
24	107.00	Powerwave 7770	6	34.422	37.864	0.58	0.80	19.27	252.00	0.000	0.000	1167.54	0.00	0.00
25	107.00	Powerwave/LGP21903	6	34.422	37.864	0.54	0.80	0.87	39.60	0.000	0.000	52.60	0.00	0.00
26	107.00	Low Profile Platform	1	34.422	37.864	1.00	1.00	22.00	1800.00	0.000	0.000	1332.80	0.00	0.00
27	107.00	Powerwave/P65-17-XLH-R	3	34.422	37.864	0.60	0.80	20.59	212.40	0.000	0.000	1247.51	0.00	0.00
28	107.00	Raycap/DC6-48-60-18-8F	1	34.422	37.864	1.00	1.00	0.92	38.16	0.000	0.000	55.74	0.00	0.00
29	92.00	Standoff	1	33.344	36.679	1.00	1.00	2.50	48.00	0.000	0.000	146.71	0.00	0.00
30	92.00	Jampro JLEP (56")	1	33.344	36.679	1.00	1.00	1.40	61.32	0.000	0.000	82.16	0.00	0.00
31	55.00	Skyware Global Type 183	1	29.922	32.914	1.00	1.00	45.75	136.80	0.000	0.000	2409.29	0.00	0.00
32	55.00	Flush Mount	1	29.922	32.914	1.00	1.00	2.50	420.00	0.000	0.000	131.65	0.00	0.00
							Totals:		**15,311.41**			**25,325.52**		

Total Applied Force Summary

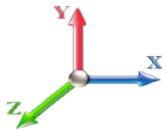
Structure:	CT01210-S-SBA		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

TES Tower Engineering Solutions

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		633.28	1703.12	0.00	0.00
10.00		621.77	1832.56	0.00	0.00
15.00		610.27	1803.25	0.00	0.00
20.00		635.32	1773.94	0.00	0.00
25.00		653.08	1744.63	0.00	0.00
30.00		665.35	1715.33	0.00	0.00
35.00		673.56	1686.02	0.00	0.00
40.00		678.64	1656.71	0.00	0.00
45.00		681.21	1627.40	0.00	0.00
46.67		225.57	535.95	0.00	0.00
50.00		462.40	1854.98	0.00	0.00
53.00		415.61	1648.60	0.00	0.00
55.00	(2) attachments	2817.16	1126.71	0.00	0.00
60.00		692.55	1406.34	0.00	0.00
65.00		688.67	1380.70	0.00	0.00
70.00		683.62	1355.05	0.00	0.00
75.00		677.50	1329.41	0.00	0.00
80.00		670.42	1303.76	0.00	0.00
85.00		662.48	1278.12	0.00	0.00
90.00		653.75	1252.47	0.00	0.00
92.00	(2) attachments	486.88	603.13	0.00	0.00
94.25		288.50	549.23	0.00	0.00
95.00		96.80	254.71	0.00	0.00
99.67		599.77	1565.42	0.00	0.00
100.00		42.30	48.86	0.00	0.00
105.00		631.82	726.05	0.00	0.00
107.00	(23) attachments	4157.66	2668.59	0.00	0.00
110.00		370.24	378.01	0.00	0.00
115.00		608.76	619.76	0.00	0.00
117.00	(19) attachments	6349.49	4513.67	0.00	4112.12
120.00		355.73	348.89	0.00	0.00
125.00		583.63	512.49	0.00	0.00
127.00	(1) attachments	1610.96	2001.92	0.00	0.00
130.00		340.05	299.58	0.00	0.00
135.00		556.68	490.51	0.00	0.00
137.00	(21) attachments	4193.07	2224.13	0.00	0.00
140.00		323.34	241.46	0.00	0.00
145.00		528.08	393.65	0.00	0.00
147.00	(18) attachments	7318.27	4275.55	0.00	0.00
150.00	(1) attachments	374.32	220.74	0.00	240.21
	Totals:	**44,318.53**	**52,951.42**	**0.00**	**4,352.33**

Calculated Forces

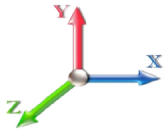
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-52.85	-44.44	0.00	-4685.9	0.00	4685.98	5817.07	2908.54	11858.0	5886.84	0.00	0.000	0.000	0.805
5.00	-50.94	-44.04	0.00	-4463.7	0.00	4463.77	5739.57	2869.78	11485.2	5701.74	0.14	-0.266	0.000	0.792
10.00	-48.91	-43.64	0.00	-4243.5	0.00	4243.55	5652.47	2826.24	11099.3	5510.17	0.57	-0.534	0.000	0.779
15.00	-46.91	-43.23	0.00	-4025.3	0.00	4025.36	5545.82	2772.91	10682.2	5303.14	1.27	-0.803	0.000	0.768
20.00	-44.94	-42.78	0.00	-3809.2	0.00	3809.22	5439.17	2719.58	10273.2	5100.07	2.25	-1.073	0.000	0.755
25.00	-43.01	-42.29	0.00	-3595.3	0.00	3595.34	5332.51	2666.26	9872.18	4900.97	3.52	-1.343	0.000	0.742
30.00	-41.12	-41.78	0.00	-3383.9	0.00	3383.90	5225.86	2612.93	9479.11	4705.83	5.08	-1.613	0.000	0.727
35.00	-39.26	-41.24	0.00	-3175.0	0.00	3175.02	5119.21	2559.60	9094.03	4514.66	6.91	-1.883	0.000	0.711
40.00	-37.44	-40.67	0.00	-2968.8	0.00	2968.85	5012.56	2506.28	8716.92	4327.45	9.03	-2.152	0.000	0.694
45.00	-35.72	-40.04	0.00	-2765.4	0.00	2765.48	4905.90	2452.95	8347.81	4144.20	11.42	-2.420	0.000	0.675
46.67	-35.10	-39.87	0.00	-2698.7	0.00	2698.75	4870.35	2435.18	8226.55	4084.00	12.28	-2.510	0.000	0.668
50.00	-33.15	-39.43	0.00	-2565.8	0.00	2565.83	4799.25	2399.63	7986.68	3964.92	14.10	-2.689	0.000	0.654
53.00	-31.43	-39.00	0.00	-2447.5	0.00	2447.56	4240.56	2120.28	7137.82	3543.51	15.84	-2.849	0.000	0.698
55.00	-30.33	-36.24	0.00	-2369.5	0.00	2369.55	4203.23	2101.62	7012.05	3481.07	17.06	-2.955	0.000	0.688
60.00	-28.79	-35.61	0.00	-2188.3	0.00	2188.37	4109.91	2054.96	6702.51	3327.41	20.30	-3.231	0.000	0.665
65.00	-27.29	-34.97	0.00	-2010.3	0.00	2010.34	4016.59	2008.29	6399.97	3177.21	23.83	-3.503	0.000	0.640
70.00	-25.82	-34.32	0.00	-1835.5	0.00	1835.51	3923.27	1961.63	6104.41	3030.48	27.64	-3.770	0.000	0.613
75.00	-24.39	-33.66	0.00	-1663.9	0.00	1663.92	3829.95	1914.97	5815.84	2887.23	31.73	-4.031	0.000	0.583
80.00	-23.00	-33.00	0.00	-1495.6	0.00	1495.62	3736.63	1868.31	5534.25	2747.44	36.08	-4.284	0.000	0.551
85.00	-21.64	-32.33	0.00	-1330.6	0.00	1330.63	3643.31	1821.65	5259.66	2611.12	40.69	-4.527	0.000	0.516
90.00	-20.36	-31.63	0.00	-1168.9	0.00	1168.99	3549.99	1774.99	4992.05	2478.26	45.56	-4.760	0.000	0.478
92.00	-19.74	-31.13	0.00	-1105.7	0.00	1105.72	3512.66	1756.33	4886.96	2426.09	47.57	-4.851	0.000	0.462
94.25	-19.19	-30.82	0.00	-1035.6	0.00	1035.68	3470.66	1735.33	4770.08	2368.07	49.88	-4.951	0.000	0.443
95.00	-18.88	-30.74	0.00	-1012.5	0.00	1012.57	3456.66	1728.33	4731.43	2348.88	50.66	-4.984	0.000	0.437
99.67	-17.32	-30.03	0.00	-869.13	0.00	869.13	1458.24	729.12	1997.89	991.83	55.62	-5.175	0.000	0.890
100.00	-17.18	-30.04	0.00	-859.11	0.00	859.11	1456.89	728.44	1992.39	989.11	55.98	-5.189	0.000	0.882
105.00	-16.39	-29.41	0.00	-708.91	0.00	708.91	1435.99	717.99	1910.05	948.23	61.60	-5.538	0.000	0.761
107.00	-14.07	-25.05	0.00	-650.08	0.00	650.08	1427.33	713.67	1877.17	931.90	63.95	-5.670	0.000	0.709
110.00	-13.64	-24.70	0.00	-574.93	0.00	574.93	1414.04	707.02	1827.92	907.46	67.56	-5.853	0.000	0.644
115.00	-13.01	-24.07	0.00	-451.42	0.00	451.42	1391.05	695.52	1746.12	866.85	73.83	-6.124	0.000	0.531
117.00	-9.17	-17.29	0.00	-399.16	0.00	399.16	1381.56	690.78	1713.52	850.66	76.42	-6.222	0.000	0.476
120.00	-8.81	-16.93	0.00	-347.28	0.00	347.28	1367.01	683.50	1664.77	826.46	80.36	-6.355	0.000	0.427
120.00	-8.81	-16.93	0.00	-347.28	0.00	347.28	1091.99	545.99	1332.66	661.59	80.36	-6.355	0.000	0.534
125.00	-8.33	-16.31	0.00	-262.65	0.00	262.65	1075.35	537.67	1272.10	631.52	87.11	-6.547	0.000	0.425
127.00	-6.50	-14.49	0.00	-230.04	0.00	230.04	1068.40	534.20	1247.88	619.50	89.87	-6.626	0.000	0.378
130.00	-6.22	-14.13	0.00	-186.57	0.00	186.57	1057.66	528.83	1211.58	601.48	94.06	-6.730	0.000	0.317
135.00	-5.77	-13.53	0.00	-115.92	0.00	115.92	1038.92	519.46	1151.22	571.51	101.17	-6.864	0.000	0.209
137.00	-4.06	-9.10	0.00	-88.87	0.00	88.87	1031.13	515.57	1127.15	559.57	104.05	-6.904	0.000	0.163
140.00	-3.86	-8.75	0.00	-61.57	0.00	61.57	1019.14	509.57	1091.15	541.69	108.39	-6.950	0.000	0.118
145.00	-3.53	-8.18	0.00	-17.80	0.00	17.80	998.31	499.16	1031.47	512.07	115.68	-6.993	0.000	0.039
147.00	-0.17	-0.40	0.00	-1.44	0.00	1.44	989.69	494.84	1007.74	500.29	118.60	-6.997	0.000	0.003
150.00	0.00	-0.37	0.00	-0.24	0.00	0.24	976.44	488.22	972.32	482.70	122.99	-6.998	0.000	0.000

Wind Loading - Shaft

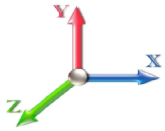
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	22.791	25.07	411.26	0.750	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	22.791	25.07	403.85	0.750	0.000	5.00	21.050	15.79	633.3	0.0	1198.0
10.00		1.00	0.85	22.791	25.07	396.45	0.750	0.000	5.00	20.668	15.50	621.8	0.0	1176.0
15.00		1.00	0.85	22.791	25.07	389.05	0.750	0.000	5.00	20.286	15.21	610.3	0.0	1154.0
20.00		1.00	0.90	24.182	26.60	393.12	0.750	0.000	5.00	19.903	14.93	635.3	0.0	1132.0
25.00		1.00	0.95	25.345	27.88	394.66	0.750	0.000	5.00	19.521	14.64	653.1	0.0	1110.0
30.00		1.00	0.98	26.337	28.97	394.35	0.750	0.000	5.00	19.139	14.35	665.3	0.0	1088.1
35.00		1.00	1.01	27.206	29.93	392.71	0.750	0.000	5.00	18.756	14.07	673.6	0.0	1066.1
40.00		1.00	1.04	27.981	30.78	390.07	0.750	0.000	5.00	18.374	13.78	678.6	0.0	1044.1
45.00		1.00	1.07	28.684	31.55	386.63	0.750	0.000	5.00	17.991	13.49	681.2	0.0	1022.1
46.67	Bot - Section 2	1.00	1.08	28.904	31.79	385.33	0.750	0.000	1.67	5.912	4.43	225.6	0.0	335.8
50.00		1.00	1.09	29.327	32.26	382.54	0.750	0.000	3.33	11.945	8.96	462.4	0.0	1258.9
53.00	Top - Section 1	1.00	1.11	29.689	32.66	379.83	0.750	0.000	3.00	10.605	7.95	415.6	0.0	1117.4
55.00	Appurtenance(s)	1.00	1.12	29.922	32.91	386.16	0.750	0.000	2.00	6.994	5.25	276.2	0.0	348.1
60.00		1.00	1.14	30.475	33.52	381.16	0.750	0.000	5.00	17.216	12.91	692.5	0.0	856.7
65.00		1.00	1.16	30.993	34.09	375.75	0.750	0.000	5.00	16.834	12.63	688.7	0.0	837.5
70.00		1.00	1.17	31.480	34.63	369.99	0.750	0.000	5.00	16.451	12.34	683.6	0.0	818.2
75.00		1.00	1.19	31.941	35.13	363.93	0.750	0.000	5.00	16.069	12.05	677.5	0.0	799.0
80.00		1.00	1.21	32.377	35.62	357.58	0.750	0.000	5.00	15.687	11.77	670.4	0.0	779.8
85.00		1.00	1.22	32.793	36.07	350.99	0.750	0.000	5.00	15.304	11.48	662.5	0.0	760.5
90.00		1.00	1.24	33.190	36.51	344.18	0.750	0.000	5.00	14.922	11.19	653.8	0.0	741.3
92.00	Appurtenance(s)	1.00	1.24	33.344	36.68	341.39	0.750	0.000	2.00	5.862	4.40	258.0	0.0	291.1
94.25	Bot - Section 3	1.00	1.25	33.514	36.87	338.22	0.750	0.000	2.25	6.521	4.89	288.5	0.0	323.8
95.00		1.00	1.25	33.570	36.93	337.16	0.750	0.000	0.75	2.184	1.64	96.8	0.0	161.7
99.67	Top - Section 2	1.00	1.26	33.911	37.30	330.44	0.750	0.000	4.67	13.399	10.05	599.8	0.0	991.4
100.00		1.00	1.27	33.935	37.33	334.34	0.750	0.000	0.33	0.944	0.71	42.3	0.0	23.6
105.00		1.00	1.28	34.285	37.71	326.98	0.750	0.000	5.00	13.961	10.47	631.8	0.0	348.8
107.00	Appurtenance(s)	1.00	1.28	34.422	37.86	323.99	0.750	0.000	2.00	5.477	4.11	248.9	0.0	136.8
110.00		1.00	1.29	34.623	38.08	319.46	0.750	0.000	3.00	8.101	6.08	370.2	0.0	202.4
115.00		1.00	1.30	34.948	38.44	311.79	0.750	0.000	5.00	13.196	9.90	608.8	0.0	329.6
117.00	Appurtenance(s)	1.00	1.31	35.075	38.58	308.69	0.750	0.000	2.00	5.171	3.88	239.4	0.0	129.1
120.00	Top - Section 3	1.00	1.32	35.263	38.79	303.99	0.750	0.000	3.00	7.642	5.73	355.7	0.0	190.8
125.00		1.00	1.33	35.567	39.12	296.05	0.750	0.000	5.00	12.431	9.32	583.6	0.0	266.3
127.00	Appurtenance(s)	1.00	1.33	35.686	39.25	292.84	0.750	0.000	2.00	4.866	3.65	229.2	0.0	104.2
130.00		1.00	1.34	35.862	39.45	287.99	0.750	0.000	3.00	7.184	5.39	340.1	0.0	153.8
135.00		1.00	1.35	36.148	39.76	279.81	0.750	0.000	5.00	11.667	8.75	556.7	0.0	249.8
137.00	Appurtenance(s)	1.00	1.35	36.260	39.89	276.51	0.750	0.000	2.00	4.560	3.42	218.2	0.0	97.6
140.00		1.00	1.36	36.426	40.07	271.52	0.750	0.000	3.00	6.725	5.04	323.3	0.0	143.9
145.00		1.00	1.37	36.696	40.37	263.14	0.750	0.000	5.00	10.902	8.18	528.1	0.0	233.3
147.00	Appurtenance(s)	1.00	1.37	36.802	40.48	259.75	0.750	0.000	2.00	4.254	3.19	206.6	0.0	91.0
150.00	Appurtenance(s)	1.00	1.38	36.959	40.65	254.65	0.750	0.000	3.00	6.266	4.70	305.7	0.0	134.1
								Totals:	**150.00**			**18,993.0**		**23,246.7**

Discrete Appurtenance Forces

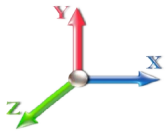
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Lightning Rod	1	37.139	40.852	1.00	1.00	1.05	31.50	0.000	3.500	68.63	0.00	240.21
2	147.00	Ericsson KRY 112 144/1	3	36.802	40.482	0.50	0.75	0.53	29.70	0.000	0.000	34.17	0.00	0.00
3	147.00	Ericsson AIR 21 B2A/B4P	3	36.802	40.482	0.64	0.75	11.55	247.05	0.000	0.000	748.21	0.00	0.00
4	147.00	APXVAARR24_43-U-NA2	3	36.802	40.482	0.52	0.75	31.88	345.60	0.000	0.000	2064.78	0.00	0.00
5	147.00	Ericsson AIR 21 B4A/B2P	3	36.802	40.482	0.64	0.75	11.55	243.81	0.000	0.000	748.21	0.00	0.00
6	147.00	Platform w/ Hand Rails	1	36.802	40.482	1.00	1.00	36.00	1440.00	0.000	0.000	2331.77	0.00	0.00
7	147.00	PRK-1245 (kicker kit)	1	36.802	40.482	1.00	1.00	9.50	418.42	0.000	0.000	615.33	0.00	0.00
8	147.00	(3) SFS-H (V-Braces)	1	36.802	40.482	1.00	1.00	6.30	177.30	0.000	0.000	408.06	0.00	0.00
9	147.00	4449	3	36.802	40.482	0.50	0.75	2.49	189.00	0.000	0.000	161.11	0.00	0.00
10	137.00	Rymsa MGD5-800T2	3	36.260	39.886	0.62	0.80	6.29	41.58	0.000	0.000	401.41	0.00	0.00
11	137.00	Antel BXA-70063/6CF	3	36.260	39.886	0.58	0.80	13.10	40.23	0.000	0.000	835.90	0.00	0.00
12	137.00	Antel LPA-80080/4CF	6	36.260	39.886	0.59	0.80	19.18	64.80	0.000	0.000	1224.07	0.00	0.00
13	137.00	Cleargain 850/1900 TMA's	2	36.260	39.886	0.54	0.80	0.56	9.90	0.000	0.000	35.57	0.00	0.00
14	137.00	RFS FD9R6004/2C-3L	6	36.260	39.886	0.54	0.80	1.16	16.74	0.000	0.000	73.89	0.00	0.00
15	137.00	Low Profile Platform	1	36.260	39.886	1.00	1.00	22.00	1350.00	0.000	0.000	1403.99	0.00	0.00
16	127.00	Low Profile Platform	1	35.686	39.255	1.00	1.00	22.00	1350.00	0.000	0.000	1381.76	0.00	0.00
17	117.00	Sitepro RMQP-496-HK	1	35.075	38.583	1.00	1.00	48.00	2204.10	0.000	0.000	2963.15	0.00	0.00
18	117.00	ALU 800 Mhz	6	35.075	38.583	0.50	0.75	7.51	286.20	0.000	0.000	463.45	0.00	0.00
19	117.00	ALU 1900 Mhz	3	35.075	38.583	0.50	0.75	4.18	162.00	0.000	0.000	257.78	0.00	0.00
20	117.00	Commscope	3	35.263	38.789	0.60	0.75	22.09	208.98	0.000	3.000	1370.71	0.00	4112.12
21	117.00	RFS APXVTM14-C-I20	3	35.075	38.583	0.58	0.75	10.98	151.74	0.000	0.000	678.07	0.00	0.00
22	117.00	ALU TD-RRH8x20-25	3	35.075	38.583	0.50	0.75	6.11	189.00	0.000	0.000	376.90	0.00	0.00
23	107.00	Diplexers	6	34.422	37.864	0.54	0.80	0.87	29.70	0.000	0.000	52.60	0.00	0.00
24	107.00	Powerwave 7770	6	34.422	37.864	0.58	0.80	19.27	189.00	0.000	0.000	1167.54	0.00	0.00
25	107.00	Powerwave/LGP21903	6	34.422	37.864	0.54	0.80	0.87	29.70	0.000	0.000	52.60	0.00	0.00
26	107.00	Low Profile Platform	1	34.422	37.864	1.00	1.00	22.00	1350.00	0.000	0.000	1332.80	0.00	0.00
27	107.00	Powerwave/P65-17-XLH-R	3	34.422	37.864	0.60	0.80	20.59	159.30	0.000	0.000	1247.51	0.00	0.00
28	107.00	Raycap/DC6-48-60-18-8F	1	34.422	37.864	1.00	1.00	0.92	28.62	0.000	0.000	55.74	0.00	0.00
29	92.00	Standoff	1	33.344	36.679	1.00	1.00	2.50	36.00	0.000	0.000	146.71	0.00	0.00
30	92.00	Jampro JLEP (56")	1	33.344	36.679	1.00	1.00	1.40	45.99	0.000	0.000	82.16	0.00	0.00
31	55.00	Skyware Global Type 183	1	29.922	32.914	1.00	1.00	45.75	102.60	0.000	0.000	2409.29	0.00	0.00
32	55.00	Flush Mount	1	29.922	32.914	1.00	1.00	2.50	315.00	0.000	0.000	131.65	0.00	0.00
							Totals:		**11,483.56**			**25,325.52**		

Total Applied Force Summary

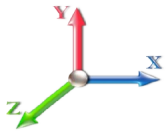
Structure:	CT01210-S-SBA		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		633.28	1277.34	0.00	0.00
10.00		621.77	1374.42	0.00	0.00
15.00		610.27	1352.44	0.00	0.00
20.00		635.32	1330.46	0.00	0.00
25.00		653.08	1308.48	0.00	0.00
30.00		665.35	1286.49	0.00	0.00
35.00		673.56	1264.51	0.00	0.00
40.00		678.64	1242.53	0.00	0.00
45.00		681.21	1220.55	0.00	0.00
46.67		225.57	401.97	0.00	0.00
50.00		462.40	1391.23	0.00	0.00
53.00		415.61	1236.45	0.00	0.00
55.00	(2) attachments	2817.16	845.03	0.00	0.00
60.00		692.55	1054.76	0.00	0.00
65.00		688.67	1035.52	0.00	0.00
70.00		683.62	1016.29	0.00	0.00
75.00		677.50	997.06	0.00	0.00
80.00		670.42	977.82	0.00	0.00
85.00		662.48	958.59	0.00	0.00
90.00		653.75	939.36	0.00	0.00
92.00	(2) attachments	486.88	452.35	0.00	0.00
94.25		288.50	411.92	0.00	0.00
95.00		96.80	191.03	0.00	0.00
99.67		599.77	1174.07	0.00	0.00
100.00		42.30	36.64	0.00	0.00
105.00		631.82	544.54	0.00	0.00
107.00	(23) attachments	4157.66	2001.44	0.00	0.00
110.00		370.24	283.51	0.00	0.00
115.00		608.76	464.82	0.00	0.00
117.00	(19) attachments	6349.49	3385.26	0.00	4112.12
120.00		355.73	261.67	0.00	0.00
125.00		583.63	384.37	0.00	0.00
127.00	(1) attachments	1610.96	1501.44	0.00	0.00
130.00		340.05	224.69	0.00	0.00
135.00		556.68	367.88	0.00	0.00
137.00	(21) attachments	4193.07	1668.09	0.00	0.00
140.00		323.34	181.10	0.00	0.00
145.00		528.08	295.24	0.00	0.00
147.00	(18) attachments	7318.27	3206.67	0.00	0.00
150.00	(1) attachments	374.32	165.55	0.00	240.21
	Totals:	**44,318.53**	**39,713.56**	**0.00**	**4,352.33**

Calculated Forces

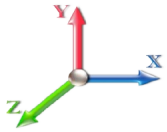
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-39.61	-44.41	0.00	-4634.1	0.00	4634.16	5817.07	2908.54	11858.0	5886.84	0.00	0.000	0.000	0.794
5.00	-38.13	-43.95	0.00	-4412.1	0.00	4412.11	5739.57	2869.78	11485.2	5701.74	0.14	-0.263	0.000	0.781
10.00	-36.56	-43.49	0.00	-4192.3	0.00	4192.36	5652.47	2826.24	11099.3	5510.17	0.56	-0.528	0.000	0.768
15.00	-35.02	-43.03	0.00	-3974.9	0.00	3974.92	5545.82	2772.91	10682.2	5303.14	1.25	-0.793	0.000	0.756
20.00	-33.50	-42.53	0.00	-3759.7	0.00	3759.79	5439.17	2719.58	10273.2	5100.07	2.23	-1.060	0.000	0.744
25.00	-32.01	-42.00	0.00	-3547.1	0.00	3547.16	5332.51	2666.26	9872.18	4900.97	3.48	-1.327	0.000	0.730
30.00	-30.55	-41.44	0.00	-3337.1	0.00	3337.19	5225.86	2612.93	9479.11	4705.83	5.01	-1.593	0.000	0.715
35.00	-29.11	-40.86	0.00	-3130.0	0.00	3130.00	5119.21	2559.60	9094.03	4514.66	6.83	-1.859	0.000	0.699
40.00	-27.71	-40.27	0.00	-2925.6	0.00	2925.68	5012.56	2506.28	8716.92	4327.45	8.92	-2.125	0.000	0.682
45.00	-26.40	-39.62	0.00	-2724.3	0.00	2724.33	4905.90	2452.95	8347.81	4144.20	11.28	-2.388	0.000	0.663
46.67	-25.91	-39.44	0.00	-2658.2	0.00	2658.29	4870.35	2435.18	8226.55	4084.00	12.13	-2.477	0.000	0.656
50.00	-24.43	-38.99	0.00	-2526.8	0.00	2526.83	4799.25	2399.63	7986.68	3964.92	13.92	-2.653	0.000	0.643
53.00	-23.13	-38.57	0.00	-2409.8	0.00	2409.87	4240.56	2120.28	7137.82	3543.51	15.64	-2.810	0.000	0.686
55.00	-22.31	-35.78	0.00	-2332.7	0.00	2332.74	4203.23	2101.62	7012.05	3481.07	16.84	-2.915	0.000	0.676
60.00	-21.12	-35.14	0.00	-2153.8	0.00	2153.82	4109.91	2054.96	6702.51	3327.41	20.04	-3.187	0.000	0.653
65.00	-19.97	-34.48	0.00	-1978.1	0.00	1978.14	4016.59	2008.29	6399.97	3177.21	23.52	-3.455	0.000	0.628
70.00	-18.85	-33.82	0.00	-1805.7	0.00	1805.73	3923.27	1961.63	6104.41	3030.48	27.28	-3.717	0.000	0.601
75.00	-17.75	-33.16	0.00	-1636.6	0.00	1636.62	3829.95	1914.97	5815.84	2887.23	31.31	-3.974	0.000	0.572
80.00	-16.69	-32.49	0.00	-1470.8	0.00	1470.84	3736.63	1868.31	5534.25	2747.44	35.60	-4.222	0.000	0.540
85.00	-15.65	-31.82	0.00	-1308.3	0.00	1308.39	3643.31	1821.65	5259.66	2611.12	40.15	-4.462	0.000	0.506
90.00	-14.68	-31.13	0.00	-1149.2	0.00	1149.29	3549.99	1774.99	4992.05	2478.26	44.94	-4.691	0.000	0.468
92.00	-14.22	-30.64	0.00	-1087.0	0.00	1087.02	3512.66	1756.33	4886.96	2426.09	46.92	-4.780	0.000	0.452
94.25	-13.80	-30.33	0.00	-1018.0	0.00	1018.09	3470.66	1735.33	4770.08	2368.07	49.20	-4.879	0.000	0.434
95.00	-13.56	-30.24	0.00	-995.34	0.00	995.34	3456.66	1728.33	4731.43	2348.88	49.96	-4.911	0.000	0.428
99.67	-12.39	-29.56	0.00	-854.21	0.00	854.21	1458.24	729.12	1997.89	991.83	54.85	-5.099	0.000	0.871
100.00	-12.26	-29.56	0.00	-844.36	0.00	844.36	1456.89	728.44	1992.39	989.11	55.21	-5.113	0.000	0.864
105.00	-11.66	-28.93	0.00	-696.56	0.00	696.56	1435.99	717.99	1910.05	948.23	60.75	-5.456	0.000	0.744
107.00	-10.00	-24.62	0.00	-638.71	0.00	638.71	1427.33	713.67	1877.17	931.90	63.06	-5.585	0.000	0.694
110.00	-9.66	-24.27	0.00	-564.84	0.00	564.84	1414.04	707.02	1827.92	907.46	66.62	-5.765	0.000	0.630
115.00	-9.19	-23.64	0.00	-443.52	0.00	443.52	1391.05	695.52	1746.12	866.85	72.80	-6.031	0.000	0.519
117.00	-6.46	-16.98	0.00	-392.13	0.00	392.13	1381.56	690.78	1713.52	850.66	75.34	-6.127	0.000	0.466
120.00	-6.19	-16.62	0.00	-341.19	0.00	341.19	1367.01	683.50	1664.77	826.46	79.23	-6.258	0.000	0.418
120.00	-6.19	-16.62	0.00	-341.19	0.00	341.19	1091.99	545.99	1332.66	661.59	79.23	-6.258	0.000	0.522
125.00	-5.84	-16.01	0.00	-258.11	0.00	258.11	1075.35	537.67	1272.10	631.52	85.87	-6.447	0.000	0.415
127.00	-4.51	-14.24	0.00	-226.09	0.00	226.09	1068.40	534.20	1247.88	619.50	88.59	-6.525	0.000	0.370
130.00	-4.29	-13.89	0.00	-183.36	0.00	183.36	1057.66	528.83	1211.58	601.48	92.71	-6.627	0.000	0.310
135.00	-3.97	-13.30	0.00	-113.92	0.00	113.92	1038.92	519.46	1151.22	571.51	99.71	-6.758	0.000	0.204
137.00	-2.81	-8.94	0.00	-87.32	0.00	87.32	1031.13	515.57	1127.15	559.57	102.55	-6.798	0.000	0.159
140.00	-2.66	-8.60	0.00	-60.50	0.00	60.50	1019.14	509.57	1091.15	541.69	106.83	-6.843	0.000	0.115
145.00	-2.43	-8.04	0.00	-17.50	0.00	17.50	998.31	499.16	1031.47	512.07	114.00	-6.885	0.000	0.037
147.00	-0.12	-0.39	0.00	-1.41	0.00	1.41	989.69	494.84	1007.74	500.29	116.88	-6.889	0.000	0.003
150.00	0.00	-0.37	0.00	-0.24	0.00	0.24	976.44	488.22	972.32	482.70	121.20	-6.890	0.000	0.000

Wind Loading - Shaft

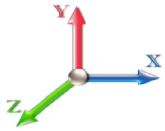
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	22.085	26.50	150.7	395.3	1992.5
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	21.777	26.13	148.6	416.8	1984.8
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	21.441	25.73	146.3	426.6	1965.3
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	21.092	25.31	152.7	431.3	1940.7
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	20.737	24.88	157.3	433.0	1913.1
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	20.377	24.45	160.6	432.8	1883.5
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	20.014	24.02	163.0	431.1	1852.6
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	19.648	23.58	164.6	428.4	1820.5
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	5.00	19.281	23.14	165.5	424.9	1787.7
46.67	Bot - Section 2	1.00	1.08	6.554	7.21	0.00	1.200	1.553	1.67	6.344	7.61	54.9	141.2	588.9
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	3.33	12.813	15.38	112.5	286.2	1964.8
53.00	Top - Section 1	1.00	1.11	6.732	7.41	0.00	1.200	1.573	3.00	11.391	13.67	101.2	255.9	1745.7
55.00	Appurtenance(s)	1.00	1.12	6.785	7.46	0.00	1.200	1.579	2.00	7.520	9.02	67.3	169.8	633.9
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	18.543	22.25	169.1	419.3	1561.6
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	18.171	21.81	168.6	413.7	1530.3
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	17.799	21.36	167.7	407.7	1498.6
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	17.426	20.91	166.6	401.3	1466.6
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	17.052	20.46	165.3	394.7	1434.4
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	16.678	20.01	163.7	387.8	1401.9
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	16.304	19.56	162.0	380.7	1369.1
92.00	Appurtenance(s)	1.00	1.24	7.561	8.32	0.00	1.200	1.662	2.00	6.416	7.70	64.0	151.1	539.3
94.25	Bot - Section 3	1.00	1.25	7.600	8.36	0.00	1.200	1.666	2.25	7.146	8.58	71.7	168.5	600.3
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	0.75	2.393	2.87	24.0	56.7	272.3
99.67	Top - Section 2	1.00	1.26	7.690	8.46	0.00	1.200	1.675	4.67	14.702	17.64	149.2	346.3	1668.1
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	0.33	1.037	1.24	10.5	24.7	56.2
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	15.364	18.44	157.7	362.8	827.9
107.00	Appurtenance(s)	1.00	1.28	7.805	8.59	0.00	1.200	1.687	2.00	6.040	7.25	62.2	143.9	326.3
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	3.00	8.947	10.74	92.7	213.0	482.8
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	14.612	17.53	152.9	346.9	786.4
117.00	Appurtenance(s)	1.00	1.31	7.954	8.75	0.00	1.200	1.702	2.00	5.739	6.89	60.3	137.5	309.7
120.00	Top - Section 3	1.00	1.32	7.996	8.80	0.00	1.200	1.707	3.00	8.496	10.19	89.7	203.3	457.7
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	13.859	16.63	147.5	330.5	685.5
127.00	Appurtenance(s)	1.00	1.33	8.092	8.90	0.00	1.200	1.716	2.00	5.438	6.53	58.1	130.8	269.8
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	3.00	8.044	9.65	86.3	193.2	398.3
135.00		1.00	1.35	8.197	9.02	0.00	1.200	1.727	5.00	13.106	15.73	141.8	313.5	646.6
137.00	Appurtenance(s)	1.00	1.35	8.222	9.04	0.00	1.200	1.729	2.00	5.136	6.16	55.7	124.0	254.2
140.00		1.00	1.36	8.260	9.09	0.00	1.200	1.733	3.00	7.591	9.11	82.8	182.9	374.8
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	5.00	12.351	14.82	135.7	296.1	607.2
147.00	Appurtenance(s)	1.00	1.37	8.345	9.18	0.00	1.200	1.742	2.00	4.834	5.80	53.3	117.0	238.4
150.00	Appurtenance(s)	1.00	1.38	8.381	9.22	0.00	1.200	1.745	3.00	7.139	8.57	79.0	172.3	351.1
								Totals:	**150.00**			**4,683.2**		**42,489.1**

Discrete Appurtenance Forces

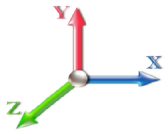
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Lightning Rod	1	8.421	9.264	1.00	1.00	3.42	64.41	0.000	3.500	31.71	0.00	111.00
2	147.00	Ericsson KRY 112 144/1	3	8.345	9.180	0.50	0.75	1.14	62.58	0.000	0.000	10.44	0.00	0.00
3	147.00	Ericsson AIR 21 B2A/B4P	3	8.345	9.180	0.64	0.75	13.63	829.35	0.000	0.000	125.11	0.00	0.00
4	147.00	APXVAARR24_43-U-NA2	3	8.345	9.180	0.52	0.75	34.86	1711.75	0.000	0.000	320.04	0.00	0.00
5	147.00	Ericsson AIR 21 B4A/B2P	3	8.345	9.180	0.64	0.75	13.63	825.03	0.000	0.000	125.11	0.00	0.00
6	147.00	Platform w/ Hand Rails	1	8.345	9.180	1.00	1.00	67.35	3415.60	0.000	0.000	618.25	0.00	0.00
7	147.00	PRK-1245 (kicker kit)	1	8.345	9.180	1.00	1.00	19.43	786.69	0.000	0.000	178.34	0.00	0.00
8	147.00	(3) SFS-H (V-Braces)	1	8.345	9.180	1.00	1.00	12.88	423.89	0.000	0.000	118.27	0.00	0.00
9	147.00	4449	3	8.345	9.180	0.50	0.75	3.30	456.22	0.000	0.000	30.26	0.00	0.00
10	137.00	Rymsa MGD5-800T2	3	8.222	9.044	0.62	0.80	9.62	200.09	0.000	0.000	87.03	0.00	0.00
11	137.00	Antel BXA-70063/6CF	3	8.222	9.044	0.58	0.80	17.84	363.50	0.000	0.000	161.33	0.00	0.00
12	137.00	Antel LPA-80080/4CF	6	8.222	9.044	0.59	0.80	22.69	885.93	0.000	0.000	205.23	0.00	0.00
13	137.00	Cleargain 850/1900 TMA's	2	8.222	9.044	0.54	0.80	1.12	29.67	0.000	0.000	10.13	0.00	0.00
14	137.00	RFS FD9R6004/2C-3L	6	8.222	9.044	0.54	0.80	2.57	56.24	0.000	0.000	23.25	0.00	0.00
15	137.00	Low Profile Platform	1	8.222	9.044	1.00	1.00	39.50	2797.10	0.000	0.000	357.28	0.00	0.00
16	127.00	Low Profile Platform	1	8.092	8.901	1.00	1.00	39.37	2787.31	0.000	0.000	350.44	0.00	0.00
17	117.00	Sitepro RMQP-496-HK	1	7.954	8.749	1.00	1.00	80.69	4650.29	0.000	0.000	705.91	0.00	0.00
18	117.00	ALU 800 Mhz	6	7.954	8.749	0.50	0.75	10.87	687.87	0.000	0.000	95.11	0.00	0.00
19	117.00	ALU 1900 Mhz	3	7.954	8.749	0.50	0.75	6.04	388.46	0.000	0.000	52.85	0.00	0.00
20	117.00	Commscope	3	7.996	8.796	0.60	0.75	24.64	916.89	0.000	3.000	216.75	0.00	650.25
21	117.00	RFS APXVTM14-C-I20	3	7.954	8.749	0.58	0.75	12.86	669.42	0.000	0.000	112.53	0.00	0.00
22	117.00	ALU TD-RRH8x20-25	3	7.954	8.749	0.50	0.75	7.30	573.60	0.000	0.000	63.86	0.00	0.00
23	107.00	Diplexers	6	7.805	8.586	0.54	0.80	2.10	74.00	0.000	0.000	18.07	0.00	0.00
24	107.00	Powerwave 7770	6	7.805	8.586	0.58	0.80	22.87	1030.18	0.000	0.000	196.38	0.00	0.00
25	107.00	Powerwave/LGP21903	6	7.805	8.586	0.54	0.80	2.10	74.09	0.000	0.000	18.07	0.00	0.00
26	107.00	Low Profile Platform	1	7.805	8.586	1.00	1.00	39.07	2765.43	0.000	0.000	335.49	0.00	0.00
27	107.00	Powerwave/P65-17-XLH-R	3	7.805	8.586	0.60	0.80	26.22	654.62	0.000	0.000	225.13	0.00	0.00
28	107.00	Raycap/DC6-48-60-18-8F	1	7.805	8.586	1.00	1.00	1.34	80.23	0.000	0.000	11.53	0.00	0.00
29	92.00	Standoff	1	7.561	8.317	1.00	1.00	7.90	101.45	0.000	0.000	65.73	0.00	0.00
30	92.00	Jampro JLEP (56")	1	7.561	8.317	1.00	1.00	4.68	123.38	0.000	0.000	38.96	0.00	0.00
31	55.00	Skyware Global Type 183	1	6.785	7.463	1.00	1.00	49.85	421.48	0.000	0.000	372.07	0.00	0.00
32	55.00	Flush Mount	1	6.785	7.463	1.00	1.00	4.08	585.21	0.000	0.000	30.44	0.00	0.00
							Totals:		**29,491.96**			**5,311.13**		

Total Applied Force Summary

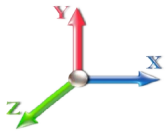
Structure:	CT01210-S-SBA		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 19

TES Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		150.66	2098.37	0.00	0.00
10.00		148.56	2249.34	0.00	0.00
15.00		146.26	2229.86	0.00	0.00
20.00		152.67	2205.24	0.00	0.00
25.00		157.31	2177.65	0.00	0.00
30.00		160.63	2148.10	0.00	0.00
35.00		162.97	2117.14	0.00	0.00
40.00		164.56	2085.12	0.00	0.00
45.00		165.54	2052.25	0.00	0.00
46.67		54.88	677.12	0.00	0.00
50.00		112.48	2141.16	0.00	0.00
53.00		101.23	1904.49	0.00	0.00
55.00	(2) attachments	469.86	1746.41	0.00	0.00
60.00		169.14	1825.66	0.00	0.00
65.00		168.57	1794.38	0.00	0.00
70.00		167.71	1762.72	0.00	0.00
75.00		166.60	1730.75	0.00	0.00
80.00		165.26	1698.48	0.00	0.00
85.00		163.71	1665.95	0.00	0.00
90.00		161.97	1633.19	0.00	0.00
92.00	(2) attachments	168.72	869.76	0.00	0.00
94.25		71.69	717.75	0.00	0.00
95.00		24.04	311.41	0.00	0.00
99.67		149.23	1911.68	0.00	0.00
100.00		10.54	73.56	0.00	0.00
105.00		157.67	1088.84	0.00	0.00
107.00	(23) attachments	866.91	5109.25	0.00	0.00
110.00		92.72	590.98	0.00	0.00
115.00		152.85	966.69	0.00	0.00
117.00	(19) attachments	1307.27	8268.32	0.00	650.25
120.00		89.67	552.15	0.00	0.00
125.00		147.55	842.97	0.00	0.00
127.00	(1) attachments	408.53	3120.07	0.00	0.00
130.00		86.34	492.81	0.00	0.00
135.00		141.80	804.02	0.00	0.00
137.00	(21) attachments	899.99	4649.68	0.00	0.00
140.00		82.77	424.38	0.00	0.00
145.00		135.67	689.74	0.00	0.00
147.00	(18) attachments	1579.07	8782.52	0.00	0.00
150.00	(1) attachments	110.68	415.49	0.00	111.00
	Totals:	**9,994.30**	**78,625.45**	**0.00**	**761.25**

Calculated Forces

Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

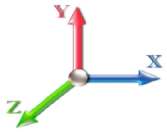
Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00

Iterations 23



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-78.62	-10.04	0.00	-1089.4	0.00	1089.41	5817.07	2908.54	11858.0	5886.84	0.00	0.000	0.000	0.199
5.00	-76.51	-9.97	0.00	-1039.2	0.00	1039.22	5739.57	2869.78	11485.2	5701.74	0.03	-0.062	0.000	0.196
10.00	-74.25	-9.90	0.00	-989.39	0.00	989.39	5652.47	2826.24	11099.3	5510.17	0.13	-0.124	0.000	0.193
15.00	-72.01	-9.82	0.00	-939.90	0.00	939.90	5545.82	2772.91	10682.2	5303.14	0.30	-0.187	0.000	0.190
20.00	-69.80	-9.74	0.00	-890.79	0.00	890.79	5439.17	2719.58	10273.2	5100.07	0.53	-0.250	0.000	0.188
25.00	-67.61	-9.65	0.00	-842.09	0.00	842.09	5332.51	2666.26	9872.18	4900.97	0.82	-0.313	0.000	0.185
30.00	-65.45	-9.55	0.00	-793.86	0.00	793.86	5225.86	2612.93	9479.11	4705.83	1.18	-0.377	0.000	0.181
35.00	-63.32	-9.44	0.00	-746.14	0.00	746.14	5119.21	2559.60	9094.03	4514.66	1.61	-0.440	0.000	0.178
40.00	-61.23	-9.32	0.00	-698.96	0.00	698.96	5012.56	2506.28	8716.92	4327.45	2.11	-0.503	0.000	0.174
45.00	-59.17	-9.18	0.00	-652.34	0.00	652.34	4905.90	2452.95	8347.81	4144.20	2.67	-0.566	0.000	0.169
46.67	-58.49	-9.15	0.00	-637.04	0.00	637.04	4870.35	2435.18	8226.55	4084.00	2.87	-0.588	0.000	0.168
50.00	-56.35	-9.06	0.00	-606.54	0.00	606.54	4799.25	2399.63	7986.68	3964.92	3.30	-0.630	0.000	0.165
53.00	-54.44	-8.96	0.00	-579.37	0.00	579.37	4240.56	2120.28	7137.82	3543.51	3.70	-0.668	0.000	0.176
55.00	-52.69	-8.51	0.00	-561.44	0.00	561.44	4203.23	2101.62	7012.05	3481.07	3.99	-0.693	0.000	0.174
60.00	-50.86	-8.38	0.00	-518.87	0.00	518.87	4109.91	2054.96	6702.51	3327.41	4.75	-0.758	0.000	0.168
65.00	-49.06	-8.24	0.00	-476.97	0.00	476.97	4016.59	2008.29	6399.97	3177.21	5.58	-0.823	0.000	0.162
70.00	-47.29	-8.10	0.00	-435.77	0.00	435.77	3923.27	1961.63	6104.41	3030.48	6.47	-0.886	0.000	0.156
75.00	-45.55	-7.95	0.00	-395.27	0.00	395.27	3829.95	1914.97	5815.84	2887.23	7.44	-0.948	0.000	0.149
80.00	-43.85	-7.80	0.00	-355.51	0.00	355.51	3736.63	1868.31	5534.25	2747.44	8.46	-1.008	0.000	0.141
85.00	-42.18	-7.65	0.00	-316.48	0.00	316.48	3643.31	1821.65	5259.66	2611.12	9.55	-1.066	0.000	0.133
90.00	-40.54	-7.49	0.00	-278.22	0.00	278.22	3549.99	1774.99	4992.05	2478.26	10.70	-1.121	0.000	0.124
92.00	-39.67	-7.32	0.00	-263.25	0.00	263.25	3512.66	1756.33	4886.96	2426.09	11.17	-1.143	0.000	0.120
94.25	-38.95	-7.24	0.00	-246.79	0.00	246.79	3470.66	1735.33	4770.08	2368.07	11.71	-1.167	0.000	0.115
95.00	-38.64	-7.23	0.00	-241.36	0.00	241.36	3456.66	1728.33	4731.43	2348.88	11.90	-1.175	0.000	0.114
99.67	-36.73	-7.05	0.00	-207.63	0.00	207.63	1458.24	729.12	1997.89	991.83	13.07	-1.221	0.000	0.235
100.00	-36.65	-7.07	0.00	-205.28	0.00	205.28	1456.89	728.44	1992.39	989.11	13.16	-1.224	0.000	0.233
105.00	-35.56	-6.93	0.00	-169.92	0.00	169.92	1435.99	717.99	1910.05	948.23	14.48	-1.307	0.000	0.204
107.00	-30.47	-5.96	0.00	-156.07	0.00	156.07	1427.33	713.67	1877.17	931.90	15.04	-1.339	0.000	0.189
110.00	-29.87	-5.88	0.00	-138.19	0.00	138.19	1414.04	707.02	1827.92	907.46	15.89	-1.383	0.000	0.173
115.00	-28.91	-5.73	0.00	-108.78	0.00	108.78	1391.05	695.52	1746.12	866.85	17.38	-1.448	0.000	0.146
117.00	-20.67	-4.22	0.00	-96.68	0.00	96.68	1381.56	690.78	1713.52	850.66	17.99	-1.472	0.000	0.129
120.00	-20.12	-4.13	0.00	-84.02	0.00	84.02	1367.01	683.50	1664.77	826.46	18.93	-1.504	0.000	0.116
120.00	-20.12	-4.13	0.00	-84.02	0.00	84.02	1091.99	545.99	1332.66	661.59	18.93	-1.504	0.000	0.145
125.00	-19.28	-3.97	0.00	-63.37	0.00	63.37	1075.35	537.67	1272.10	631.52	20.53	-1.550	0.000	0.118
127.00	-16.17	-3.48	0.00	-55.42	0.00	55.42	1068.40	534.20	1247.88	619.50	21.18	-1.569	0.000	0.105
130.00	-15.68	-3.39	0.00	-44.97	0.00	44.97	1057.66	528.83	1211.58	601.48	22.18	-1.595	0.000	0.090
135.00	-14.88	-3.23	0.00	-28.01	0.00	28.01	1038.92	519.46	1151.22	571.51	23.86	-1.627	0.000	0.063
137.00	-10.25	-2.20	0.00	-21.55	0.00	21.55	1031.13	515.57	1127.15	559.57	24.55	-1.636	0.000	0.048
140.00	-9.83	-2.11	0.00	-14.94	0.00	14.94	1019.14	509.57	1091.15	541.69	25.58	-1.648	0.000	0.037
145.00	-9.15	-1.96	0.00	-4.39	0.00	4.39	998.31	499.16	1031.47	512.07	27.31	-1.658	0.000	0.018
147.00	-0.41	-0.12	0.00	-0.48	0.00	0.48	989.69	494.84	1007.74	500.29	28.01	-1.659	0.000	0.001
150.00	0.00	-0.11	0.00	-0.11	0.00	0.11	976.44	488.22	972.32	482.70	29.05	-1.659	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT01210-S-SBA		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	21
Gust Response Factor	1.10				**Sds**	0.11		**Ss**	0.16
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.04		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32		**SA**	0.01	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1331.0	0.00	0.03	0.02	17.79	
10.00		1306.6	0.01	0.05	0.03	23.80	
15.00		1282.2	0.02	0.06	0.04	26.20	
20.00		1257.8	0.03	0.07	0.04	27.09	
25.00		1233.3	0.05	0.07	0.04	27.36	
30.00		1208.9	0.08	0.07	0.04	27.48	
35.00		1184.5	0.10	0.07	0.04	27.62	
40.00		1160.1	0.13	0.07	0.03	27.80	
45.00		1135.6	0.17	0.07	0.03	27.88	
46.67	Bot - Section 2	373.13	0.18	0.06	0.03	9.21	
50.00		1398.8	0.21	0.06	0.02	34.67	
53.00	Top - Section 1	1241.5	0.24	0.06	0.02	30.53	
55.00	Appurtenance(s)	850.73	0.25	0.05	0.02	20.61	
60.00		951.87	0.30	0.04	0.01	21.13	
65.00		930.50	0.35	0.03	0.01	16.55	
70.00		909.13	0.41	0.01	0.01	9.33	
75.00		887.76	0.47	-0.01	0.01	-0.08	
80.00		866.39	0.54	-0.03	0.01	-9.71	
85.00		845.02	0.61	-0.06	0.02	-17.26	
90.00		823.65	0.68	-0.08	0.03	-21.60	
92.00	Appurtenance(s)	414.58	0.71	-0.09	0.03	-11.41	
94.25	Bot - Section 3	359.82	0.75	-0.10	0.04	-10.20	
95.00		179.64	0.76	-0.10	0.04	-5.11	
99.67	Top - Section 2	1101.5	0.83	-0.12	0.06	-30.45	
100.00		26.22	0.84	-0.12	0.07	-0.72	
105.00		387.56	0.93	-0.12	0.10	-9.15	
107.00	Appurtenance(s)	2136.8	0.96	-0.12	0.11	-45.51	
110.00		224.84	1.02	-0.11	0.14	-3.83	
115.00		366.19	1.11	-0.06	0.19	-2.86	
117.00	Appurtenance(s)	3701.2	1.15	-0.04	0.22	-12.52	
120.00	Top - Section 3	212.02	1.21	0.01	0.26	0.86	
125.00		295.88	1.31	0.14	0.35	5.51	
127.00	Appurtenance(s)	1615.7	1.35	0.20	0.39	40.71	
130.00		170.93	1.42	0.32	0.45	6.14	
135.00		277.56	1.53	0.58	0.58	15.56	
137.00	Appurtenance(s)	1800.9	1.58	0.71	0.64	116.96	
140.00		159.94	1.65	0.93	0.73	12.66	
145.00		259.24	1.77	1.39	0.92	27.28	
147.00	Appurtenance(s)	3535.4	1.82	1.61	1.00	411.96	
150.00	Appurtenance(s)	183.95	1.89	1.98	1.14	24.72	
	Totals:	**38,589.2**				**857.0**	**Total Wind:** **44,318.5**

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

Calculated Forces

Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	21
Gust Response Factor	1.10			**Sds**	0.11			**Ss**	0.16
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.04			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32	**SA**	0.01	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-52.95	-1.04	0.00	-114.07	0.00	114.07	5817.07	2908.54	11858.0	5886.84		0.00	0.00	0.028
5.00	-51.25	-1.03	0.00	-108.87	0.00	108.87	5739.57	2869.78	11485.2	5701.74		0.00	-0.01	0.028
10.00	-49.42	-1.01	0.00	-103.74	0.00	103.74	5652.47	2826.24	11099.3	5510.17		0.01	-0.01	0.028
15.00	-47.61	-0.99	0.00	-98.69	0.00	98.69	5545.82	2772.91	10682.2	5303.14		0.03	-0.02	0.027
20.00	-45.84	-0.97	0.00	-93.75	0.00	93.75	5439.17	2719.58	10273.2	5100.07		0.06	-0.03	0.027
25.00	-44.09	-0.94	0.00	-88.93	0.00	88.93	5332.51	2666.26	9872.18	4900.97		0.09	-0.03	0.026
30.00	-42.38	-0.92	0.00	-84.22	0.00	84.22	5225.86	2612.93	9479.11	4705.83		0.12	-0.04	0.026
35.00	-40.69	-0.89	0.00	-79.62	0.00	79.62	5119.21	2559.60	9094.03	4514.66		0.17	-0.05	0.026
40.00	-39.03	-0.87	0.00	-75.15	0.00	75.15	5012.56	2506.28	8716.92	4327.45		0.22	-0.05	0.025
45.00	-37.41	-0.84	0.00	-70.80	0.00	70.80	4905.90	2452.95	8347.81	4144.20		0.28	-0.06	0.025
46.67	-36.87	-0.84	0.00	-69.40	0.00	69.40	4870.35	2435.18	8226.55	4084.00		0.30	-0.06	0.025
50.00	-35.02	-0.80	0.00	-66.61	0.00	66.61	4799.25	2399.63	7986.68	3964.92		0.35	-0.07	0.024
53.00	-33.37	-0.77	0.00	-64.20	0.00	64.20	4240.56	2120.28	7137.82	3543.51		0.39	-0.07	0.026
55.00	-32.24	-0.75	0.00	-62.66	0.00	62.66	4203.23	2101.62	7012.05	3481.07		0.42	-0.07	0.026
60.00	-30.83	-0.73	0.00	-58.90	0.00	58.90	4109.91	2054.96	6702.51	3327.41		0.50	-0.08	0.025
65.00	-29.45	-0.72	0.00	-55.24	0.00	55.24	4016.59	2008.29	6399.97	3177.21		0.59	-0.09	0.025
70.00	-28.10	-0.71	0.00	-51.64	0.00	51.64	3923.27	1961.63	6104.41	3030.48		0.69	-0.10	0.024
75.00	-26.77	-0.71	0.00	-48.09	0.00	48.09	3829.95	1914.97	5815.84	2887.23		0.79	-0.10	0.024
80.00	-25.47	-0.71	0.00	-44.53	0.00	44.53	3736.63	1868.31	5534.25	2747.44		0.90	-0.11	0.023
85.00	-24.19	-0.71	0.00	-40.97	0.00	40.97	3643.31	1821.65	5259.66	2611.12		1.02	-0.12	0.022
90.00	-22.93	-0.71	0.00	-37.41	0.00	37.41	3549.99	1774.99	4992.05	2478.26		1.15	-0.13	0.022
92.00	-22.33	-0.71	0.00	-35.98	0.00	35.98	3512.66	1756.33	4886.96	2426.09		1.21	-0.13	0.021
94.25	-21.78	-0.71	0.00	-34.38	0.00	34.38	3470.66	1735.33	4770.08	2368.07		1.27	-0.13	0.021
95.00	-21.53	-0.71	0.00	-33.85	0.00	33.85	3456.66	1728.33	4731.43	2348.88		1.29	-0.13	0.021
99.67	-19.96	-0.71	0.00	-30.52	0.00	30.52	1458.24	729.12	1997.89	991.83		1.42	-0.14	0.044
100.00	-19.91	-0.71	0.00	-30.28	0.00	30.28	1456.89	728.44	1992.39	989.11		1.43	-0.14	0.044
105.00	-19.19	-0.71	0.00	-26.72	0.00	26.72	1435.99	717.99	1910.05	948.23		1.58	-0.15	0.042
107.00	-16.52	-0.71	0.00	-25.29	0.00	25.29	1427.33	713.67	1877.17	931.90		1.65	-0.16	0.039
110.00	-16.14	-0.71	0.00	-23.17	0.00	23.17	1414.04	707.02	1827.92	907.46		1.75	-0.16	0.037
115.00	-15.52	-0.71	0.00	-19.62	0.00	19.62	1391.05	695.52	1746.12	866.85		1.93	-0.18	0.034
117.00	-11.01	-0.70	0.00	-18.20	0.00	18.20	1381.56	690.78	1713.52	850.66		2.00	-0.18	0.029
120.00	-10.66	-0.70	0.00	-16.11	0.00	16.11	1367.01	683.50	1664.77	826.46		2.12	-0.19	0.027
120.00	-10.66	-0.70	0.00	-16.11	0.00	16.11	1091.99	545.99	1332.66	661.59		2.12	-0.19	0.034
125.00	-10.15	-0.69	0.00	-12.62	0.00	12.62	1075.35	537.67	1272.10	631.52		2.32	-0.20	0.029
127.00	-8.14	-0.64	0.00	-11.24	0.00	11.24	1068.40	534.20	1247.88	619.50		2.40	-0.20	0.026
130.00	-7.84	-0.64	0.00	-9.31	0.00	9.31	1057.66	528.83	1211.58	601.48		2.53	-0.20	0.023
135.00	-7.35	-0.62	0.00	-6.12	0.00	6.12	1038.92	519.46	1151.22	571.51		2.75	-0.21	0.018
137.00	-5.13	-0.50	0.00	-4.88	0.00	4.88	1031.13	515.57	1127.15	559.57		2.84	-0.21	0.014
140.00	-4.89	-0.48	0.00	-3.40	0.00	3.40	1019.14	509.57	1091.15	541.69		2.97	-0.22	0.011
145.00	-4.49	-0.45	0.00	-0.98	0.00	0.98	998.31	499.16	1031.47	512.07		3.20	-0.22	0.006
147.00	-0.22	-0.03	0.00	-0.08	0.00	0.08	989.69	494.84	1007.74	500.29		3.29	-0.22	0.000
150.00	0.00	-0.02	0.00	0.00	0.00	0.00	976.44	488.22	972.32	482.70		3.43	-0.22	0.000

Seismic Segment Forces (Factored)

Structure:	CT01210-S-SBA		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 23

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	21
Gust Response Factor	1.10				**Sds**	0.11		**Ss**	0.16
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.04		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32		**SA**	0.01	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1331.0	0.00	0.03	0.02	17.79	
10.00		1306.6	0.01	0.05	0.03	23.80	
15.00		1282.2	0.02	0.06	0.04	26.20	
20.00		1257.8	0.03	0.07	0.04	27.09	
25.00		1233.3	0.05	0.07	0.04	27.36	
30.00		1208.9	0.08	0.07	0.04	27.48	
35.00		1184.5	0.10	0.07	0.04	27.62	
40.00		1160.1	0.13	0.07	0.03	27.80	
45.00		1135.6	0.17	0.07	0.03	27.88	
46.67	Bot - Section 2	373.13	0.18	0.06	0.03	9.21	
50.00		1398.8	0.21	0.06	0.02	34.67	
53.00	Top - Section 1	1241.5	0.24	0.06	0.02	30.53	
55.00	Appurtenance(s)	850.73	0.25	0.05	0.02	20.61	
60.00		951.87	0.30	0.04	0.01	21.13	
65.00		930.50	0.35	0.03	0.01	16.55	
70.00		909.13	0.41	0.01	0.01	9.33	
75.00		887.76	0.47	-0.01	0.01	-0.08	
80.00		866.39	0.54	-0.03	0.01	-9.71	
85.00		845.02	0.61	-0.06	0.02	-17.26	
90.00		823.65	0.68	-0.08	0.03	-21.60	
92.00	Appurtenance(s)	414.58	0.71	-0.09	0.03	-11.41	
94.25	Bot - Section 3	359.82	0.75	-0.10	0.04	-10.20	
95.00		179.64	0.76	-0.10	0.04	-5.11	
99.67	Top - Section 2	1101.5	0.83	-0.12	0.06	-30.45	
100.00		26.22	0.84	-0.12	0.07	-0.72	
105.00		387.56	0.93	-0.12	0.10	-9.15	
107.00	Appurtenance(s)	2136.8	0.96	-0.12	0.11	-45.51	
110.00		224.84	1.02	-0.11	0.14	-3.83	
115.00		366.19	1.11	-0.06	0.19	-2.86	
117.00	Appurtenance(s)	3701.2	1.15	-0.04	0.22	-12.52	
120.00	Top - Section 3	212.02	1.21	0.01	0.26	0.86	
125.00		295.88	1.31	0.14	0.35	5.51	
127.00	Appurtenance(s)	1615.7	1.35	0.20	0.39	40.71	
130.00		170.93	1.42	0.32	0.45	6.14	
135.00		277.56	1.53	0.58	0.58	15.56	
137.00	Appurtenance(s)	1800.9	1.58	0.71	0.64	116.96	
140.00		159.94	1.65	0.93	0.73	12.66	
145.00		259.24	1.77	1.39	0.92	27.28	
147.00	Appurtenance(s)	3535.4	1.82	1.61	1.00	411.96	
150.00	Appurtenance(s)	183.95	1.89	1.98	1.14	24.72	
	Totals:	**38,589.2**				**857.0**	**Total Wind:** **44,318.5**

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

Calculated Forces

Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	21
Gust Response Factor	1.10			**Sds**	0.11			**Ss**	0.16
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.04			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32	**SA**	0.01	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-39.71	-1.04	0.00	-112.70	0.00	112.70	5817.07	2908.54	11858.0	5886.84		0.00	0.00	0.026
5.00	-38.44	-1.03	0.00	-107.51	0.00	107.51	5739.57	2869.78	11485.2	5701.74		0.00	-0.01	0.026
10.00	-37.06	-1.01	0.00	-102.38	0.00	102.38	5652.47	2826.24	11099.3	5510.17		0.01	-0.01	0.025
15.00	-35.71	-0.98	0.00	-97.35	0.00	97.35	5545.82	2772.91	10682.2	5303.14		0.03	-0.02	0.025
20.00	-34.38	-0.96	0.00	-92.44	0.00	92.44	5439.17	2719.58	10273.2	5100.07		0.05	-0.03	0.024
25.00	-33.07	-0.93	0.00	-87.64	0.00	87.64	5332.51	2666.26	9872.18	4900.97		0.08	-0.03	0.024
30.00	-31.78	-0.91	0.00	-82.97	0.00	82.97	5225.86	2612.93	9479.11	4705.83		0.12	-0.04	0.024
35.00	-30.52	-0.89	0.00	-78.42	0.00	78.42	5119.21	2559.60	9094.03	4514.66		0.17	-0.05	0.023
40.00	-29.28	-0.86	0.00	-73.99	0.00	73.99	5012.56	2506.28	8716.92	4327.45		0.22	-0.05	0.023
45.00	-28.06	-0.83	0.00	-69.69	0.00	69.69	4905.90	2452.95	8347.81	4144.20		0.28	-0.06	0.023
46.67	-27.65	-0.83	0.00	-68.30	0.00	68.30	4870.35	2435.18	8226.55	4084.00		0.30	-0.06	0.022
50.00	-26.26	-0.79	0.00	-65.55	0.00	65.55	4799.25	2399.63	7986.68	3964.92		0.34	-0.07	0.022
53.00	-25.03	-0.76	0.00	-63.18	0.00	63.18	4240.56	2120.28	7137.82	3543.51		0.39	-0.07	0.024
55.00	-24.18	-0.74	0.00	-61.66	0.00	61.66	4203.23	2101.62	7012.05	3481.07		0.42	-0.07	0.023
60.00	-23.13	-0.72	0.00	-57.95	0.00	57.95	4109.91	2054.96	6702.51	3327.41		0.50	-0.08	0.023
65.00	-22.09	-0.71	0.00	-54.35	0.00	54.35	4016.59	2008.29	6399.97	3177.21		0.58	-0.09	0.023
70.00	-21.07	-0.70	0.00	-50.82	0.00	50.82	3923.27	1961.63	6104.41	3030.48		0.68	-0.09	0.022
75.00	-20.08	-0.70	0.00	-47.33	0.00	47.33	3829.95	1914.97	5815.84	2887.23		0.78	-0.10	0.022
80.00	-19.10	-0.70	0.00	-43.84	0.00	43.84	3736.63	1868.31	5534.25	2747.44		0.89	-0.11	0.021
85.00	-18.14	-0.70	0.00	-40.34	0.00	40.34	3643.31	1821.65	5259.66	2611.12		1.01	-0.12	0.020
90.00	-17.20	-0.70	0.00	-36.84	0.00	36.84	3549.99	1774.99	4992.05	2478.26		1.14	-0.12	0.020
92.00	-16.75	-0.70	0.00	-35.44	0.00	35.44	3512.66	1756.33	4886.96	2426.09		1.19	-0.13	0.019
94.25	-16.34	-0.70	0.00	-33.87	0.00	33.87	3470.66	1735.33	4770.08	2368.07		1.25	-0.13	0.019
95.00	-16.15	-0.70	0.00	-33.35	0.00	33.35	3456.66	1728.33	4731.43	2348.88		1.27	-0.13	0.019
99.67	-14.97	-0.70	0.00	-30.08	0.00	30.08	1458.24	729.12	1997.89	991.83		1.40	-0.14	0.041
100.00	-14.93	-0.70	0.00	-29.85	0.00	29.85	1456.89	728.44	1992.39	989.11		1.41	-0.14	0.040
105.00	-14.39	-0.70	0.00	-26.35	0.00	26.35	1435.99	717.99	1910.05	948.23		1.56	-0.15	0.038
107.00	-12.39	-0.70	0.00	-24.95	0.00	24.95	1427.33	713.67	1877.17	931.90		1.63	-0.16	0.035
110.00	-12.10	-0.70	0.00	-22.86	0.00	22.86	1414.04	707.02	1827.92	907.46		1.73	-0.16	0.034
115.00	-11.64	-0.70	0.00	-19.38	0.00	19.38	1391.05	695.52	1746.12	866.85		1.90	-0.17	0.031
117.00	-8.25	-0.69	0.00	-17.98	0.00	17.98	1381.56	690.78	1713.52	850.66		1.98	-0.18	0.027
120.00	-7.99	-0.69	0.00	-15.92	0.00	15.92	1367.01	683.50	1664.77	826.46		2.09	-0.18	0.025
120.00	-7.99	-0.69	0.00	-15.92	0.00	15.92	1091.99	545.99	1332.66	661.59		2.09	-0.18	0.031
125.00	-7.61	-0.68	0.00	-12.48	0.00	12.48	1075.35	537.67	1272.10	631.52		2.29	-0.19	0.027
127.00	-6.11	-0.64	0.00	-11.12	0.00	11.12	1068.40	534.20	1247.88	619.50		2.37	-0.20	0.024
130.00	-5.88	-0.63	0.00	-9.21	0.00	9.21	1057.66	528.83	1211.58	601.48		2.49	-0.20	0.021
135.00	-5.51	-0.61	0.00	-6.06	0.00	6.06	1038.92	519.46	1151.22	571.51		2.71	-0.21	0.016
137.00	-3.85	-0.49	0.00	-4.83	0.00	4.83	1031.13	515.57	1127.15	559.57		2.80	-0.21	0.012
140.00	-3.67	-0.48	0.00	-3.36	0.00	3.36	1019.14	509.57	1091.15	541.69		2.93	-0.21	0.010
145.00	-3.37	-0.45	0.00	-0.97	0.00	0.97	998.31	499.16	1031.47	512.07		3.15	-0.22	0.005
147.00	-0.17	-0.03	0.00	-0.08	0.00	0.08	989.69	494.84	1007.74	500.29		3.24	-0.22	0.000
150.00	0.00	-0.02	0.00	0.00	0.00	0.00	976.44	488.22	972.32	482.70		3.38	-0.22	0.000

Wind Loading - Shaft

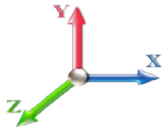
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	235.00	0.750	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	230.77	0.750	0.000	5.00	21.050	15.79	129.2	0.0	1331.1
10.00		1.00	0.85	7.442	8.19	226.54	0.750	0.000	5.00	20.668	15.50	126.9	0.0	1306.7
15.00		1.00	0.85	7.442	8.19	222.31	0.750	0.000	5.00	20.286	15.21	124.5	0.0	1282.2
20.00		1.00	0.90	7.896	8.69	224.64	0.750	0.000	5.00	19.903	14.93	129.7	0.0	1257.8
25.00		1.00	0.95	8.276	9.10	225.52	0.750	0.000	5.00	19.521	14.64	133.3	0.0	1233.4
30.00		1.00	0.98	8.600	9.46	225.34	0.750	0.000	5.00	19.139	14.35	135.8	0.0	1209.0
35.00		1.00	1.01	8.883	9.77	224.41	0.750	0.000	5.00	18.756	14.07	137.5	0.0	1184.5
40.00		1.00	1.04	9.137	10.05	222.90	0.750	0.000	5.00	18.374	13.78	138.5	0.0	1160.1
45.00		1.00	1.07	9.366	10.30	220.93	0.750	0.000	5.00	17.991	13.49	139.0	0.0	1135.7
46.67	Bot - Section 2	1.00	1.08	9.438	10.38	220.19	0.750	0.000	1.67	5.912	4.43	46.0	0.0	373.1
50.00		1.00	1.09	9.576	10.53	218.60	0.750	0.000	3.33	11.945	8.96	94.4	0.0	1398.8
53.00	Top - Section 1	1.00	1.11	9.694	10.66	217.04	0.750	0.000	3.00	10.605	7.95	84.8	0.0	1241.5
55.00	Appurtenance(s)	1.00	1.12	9.770	10.75	220.67	0.750	0.000	2.00	6.994	5.25	56.4	0.0	386.7
60.00		1.00	1.14	9.951	10.95	217.80	0.750	0.000	5.00	17.216	12.91	141.3	0.0	951.9
65.00		1.00	1.16	10.120	11.13	214.71	0.750	0.000	5.00	16.834	12.63	140.5	0.0	930.5
70.00		1.00	1.17	10.279	11.31	211.42	0.750	0.000	5.00	16.451	12.34	139.5	0.0	909.1
75.00		1.00	1.19	10.430	11.47	207.96	0.750	0.000	5.00	16.069	12.05	138.3	0.0	887.8
80.00		1.00	1.21	10.572	11.63	204.33	0.750	0.000	5.00	15.687	11.77	136.8	0.0	866.4
85.00		1.00	1.22	10.708	11.78	200.57	0.750	0.000	5.00	15.304	11.48	135.2	0.0	845.0
90.00		1.00	1.24	10.838	11.92	196.67	0.750	0.000	5.00	14.922	11.19	133.4	0.0	823.6
92.00	Appurtenance(s)	1.00	1.24	10.888	11.98	195.08	0.750	0.000	2.00	5.862	4.40	52.7	0.0	323.5
94.25	Bot - Section 3	1.00	1.25	10.943	12.04	193.27	0.750	0.000	2.25	6.521	4.89	58.9	0.0	359.8
95.00		1.00	1.25	10.962	12.06	192.66	0.750	0.000	0.75	2.184	1.64	19.8	0.0	179.6
99.67	Top - Section 2	1.00	1.26	11.073	12.18	188.82	0.750	0.000	4.67	13.399	10.05	122.4	0.0	1101.5
100.00		1.00	1.27	11.081	12.19	191.05	0.750	0.000	0.33	0.944	0.71	8.6	0.0	26.2
105.00		1.00	1.28	11.195	12.31	186.85	0.750	0.000	5.00	13.961	10.47	128.9	0.0	387.6
107.00	Appurtenance(s)	1.00	1.28	11.240	12.36	185.14	0.750	0.000	2.00	5.477	4.11	50.8	0.0	152.0
110.00		1.00	1.29	11.305	12.44	182.55	0.750	0.000	3.00	8.101	6.08	75.6	0.0	224.8
115.00		1.00	1.30	11.412	12.55	178.17	0.750	0.000	5.00	13.196	9.90	124.2	0.0	366.2
117.00	Appurtenance(s)	1.00	1.31	11.453	12.60	176.39	0.750	0.000	2.00	5.171	3.88	48.9	0.0	143.5
120.00	Top - Section 3	1.00	1.32	11.514	12.67	173.71	0.750	0.000	3.00	7.642	5.73	72.6	0.0	212.0
125.00		1.00	1.33	11.614	12.78	169.17	0.750	0.000	5.00	12.431	9.32	119.1	0.0	295.9
127.00	Appurtenance(s)	1.00	1.33	11.653	12.82	167.34	0.750	0.000	2.00	4.866	3.65	46.8	0.0	115.8
130.00		1.00	1.34	11.710	12.88	164.56	0.750	0.000	3.00	7.184	5.39	69.4	0.0	170.9
135.00		1.00	1.35	11.803	12.98	159.89	0.750	0.000	5.00	11.667	8.75	113.6	0.0	277.6
137.00	Appurtenance(s)	1.00	1.35	11.840	13.02	158.00	0.750	0.000	2.00	4.560	3.42	44.5	0.0	108.5
140.00		1.00	1.36	11.894	13.08	155.16	0.750	0.000	3.00	6.725	5.04	66.0	0.0	159.9
145.00		1.00	1.37	11.982	13.18	150.36	0.750	0.000	5.00	10.902	8.18	107.8	0.0	259.2
147.00	Appurtenance(s)	1.00	1.37	12.017	13.22	148.43	0.750	0.000	2.00	4.254	3.19	42.2	0.0	101.1
150.00	Appurtenance(s)	1.00	1.38	12.068	13.27	145.51	0.750	0.000	3.00	6.266	4.70	62.4	0.0	148.9
								Totals:	**150.00**			**3,876.1**		**25,829.7**

Discrete Appurtenance Forces

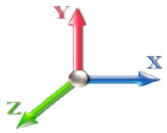
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Lightning Rod	1	12.127	13.340	1.00	1.00	1.05	35.00	0.000	3.500	14.01	0.00	49.02
2	147.00	Ericsson KRY 112 144/1	3	12.017	13.219	0.50	0.75	0.53	33.00	0.000	0.000	6.97	0.00	0.00
3	147.00	Ericsson AIR 21 B2A/B4P	3	12.017	13.219	0.64	0.75	11.55	274.50	0.000	0.000	152.69	0.00	0.00
4	147.00	APXVAARR24_43-U-NA2	3	12.017	13.219	0.52	0.75	31.88	384.00	0.000	0.000	421.38	0.00	0.00
5	147.00	Ericsson AIR 21 B4A/B2P	3	12.017	13.219	0.64	0.75	11.55	270.90	0.000	0.000	152.69	0.00	0.00
6	147.00	Platform w/ Hand Rails	1	12.017	13.219	1.00	1.00	36.00	1600.00	0.000	0.000	475.87	0.00	0.00
7	147.00	PRK-1245 (kicker kit)	1	12.017	13.219	1.00	1.00	9.50	464.91	0.000	0.000	125.58	0.00	0.00
8	147.00	(3) SFS-H (V-Braces)	1	12.017	13.219	1.00	1.00	6.30	197.00	0.000	0.000	83.28	0.00	0.00
9	147.00	4449	3	12.017	13.219	0.50	0.75	2.49	210.00	0.000	0.000	32.88	0.00	0.00
10	137.00	Rymsa MGD5-800T2	3	11.840	13.024	0.62	0.80	6.29	46.20	0.000	0.000	81.92	0.00	0.00
11	137.00	Antel BXA-70063/6CF	3	11.840	13.024	0.58	0.80	13.10	44.70	0.000	0.000	170.59	0.00	0.00
12	137.00	Antel LPA-80080/4CF	6	11.840	13.024	0.59	0.80	19.18	72.00	0.000	0.000	249.81	0.00	0.00
13	137.00	Cleargain 850/1900 TMA's	2	11.840	13.024	0.54	0.80	0.56	11.00	0.000	0.000	7.26	0.00	0.00
14	137.00	RFS FD9R6004/2C-3L	6	11.840	13.024	0.54	0.80	1.16	18.60	0.000	0.000	15.08	0.00	0.00
15	137.00	Low Profile Platform	1	11.840	13.024	1.00	1.00	22.00	1500.00	0.000	0.000	286.53	0.00	0.00
16	127.00	Low Profile Platform	1	11.653	12.818	1.00	1.00	22.00	1500.00	0.000	0.000	281.99	0.00	0.00
17	117.00	Sitepro RMQP-496-HK	1	11.453	12.598	1.00	1.00	48.00	2449.00	0.000	0.000	604.72	0.00	0.00
18	117.00	ALU 800 Mhz	6	11.453	12.598	0.50	0.75	7.51	318.00	0.000	0.000	94.58	0.00	0.00
19	117.00	ALU 1900 Mhz	3	11.453	12.598	0.50	0.75	4.18	180.00	0.000	0.000	52.61	0.00	0.00
20	117.00	Commscope	3	11.514	12.666	0.60	0.75	22.09	232.20	0.000	3.000	279.74	0.00	839.21
21	117.00	RFS APXVTM14-C-I20	3	11.453	12.598	0.58	0.75	10.98	168.60	0.000	0.000	138.38	0.00	0.00
22	117.00	ALU TD-RRH8x20-25	3	11.453	12.598	0.50	0.75	6.11	210.00	0.000	0.000	76.92	0.00	0.00
23	107.00	Diplexers	6	11.240	12.364	0.54	0.80	0.87	33.00	0.000	0.000	10.74	0.00	0.00
24	107.00	Powerwave 7770	6	11.240	12.364	0.58	0.80	19.27	210.00	0.000	0.000	238.27	0.00	0.00
25	107.00	Powerwave/LGP21903	6	11.240	12.364	0.54	0.80	0.87	33.00	0.000	0.000	10.74	0.00	0.00
26	107.00	Low Profile Platform	1	11.240	12.364	1.00	1.00	22.00	1500.00	0.000	0.000	272.00	0.00	0.00
27	107.00	Powerwave/P65-17-XLH-R	3	11.240	12.364	0.60	0.80	20.59	177.00	0.000	0.000	254.59	0.00	0.00
28	107.00	Raycap/DC6-48-60-18-8F	1	11.240	12.364	1.00	1.00	0.92	31.80	0.000	0.000	11.37	0.00	0.00
29	92.00	Standoff	1	10.888	11.977	1.00	1.00	2.50	40.00	0.000	0.000	29.94	0.00	0.00
30	92.00	Jampro JLEP (56")	1	10.888	11.977	1.00	1.00	1.40	51.10	0.000	0.000	16.77	0.00	0.00
31	55.00	Skyware Global Type 183	1	9.770	10.747	1.00	1.00	45.75	114.00	0.000	0.000	491.69	0.00	0.00
32	55.00	Flush Mount	1	9.770	10.747	1.00	1.00	2.50	350.00	0.000	0.000	26.87	0.00	0.00
							Totals:		**12,759.51**			**5,168.47**		

Total Applied Force Summary

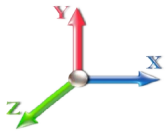
Structure:	CT01210-S-SBA		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 27

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		129.24	1419.27	0.00	0.00
10.00		126.89	1527.13	0.00	0.00
15.00		124.55	1502.71	0.00	0.00
20.00		129.66	1478.29	0.00	0.00
25.00		133.28	1453.86	0.00	0.00
30.00		135.79	1429.44	0.00	0.00
35.00		137.46	1405.01	0.00	0.00
40.00		138.50	1380.59	0.00	0.00
45.00		139.02	1356.17	0.00	0.00
46.67		46.04	446.63	0.00	0.00
50.00		94.37	1545.82	0.00	0.00
53.00		84.82	1373.83	0.00	0.00
55.00	(2) attachments	574.93	938.93	0.00	0.00
60.00		141.34	1171.95	0.00	0.00
65.00		140.55	1150.58	0.00	0.00
70.00		139.51	1129.21	0.00	0.00
75.00		138.26	1107.84	0.00	0.00
80.00		136.82	1086.47	0.00	0.00
85.00		135.20	1065.10	0.00	0.00
90.00		133.42	1043.73	0.00	0.00
92.00	(2) attachments	99.36	502.61	0.00	0.00
94.25		58.88	457.69	0.00	0.00
95.00		19.75	212.26	0.00	0.00
99.67		122.40	1304.52	0.00	0.00
100.00		8.63	40.72	0.00	0.00
105.00		128.94	605.04	0.00	0.00
107.00	(23) attachments	848.50	2223.82	0.00	0.00
110.00		75.56	315.01	0.00	0.00
115.00		124.24	516.47	0.00	0.00
117.00	(19) attachments	1295.81	3761.40	0.00	839.21
120.00		72.60	290.74	0.00	0.00
125.00		119.11	427.08	0.00	0.00
127.00	(1) attachments	328.77	1668.27	0.00	0.00
130.00		69.40	249.65	0.00	0.00
135.00		113.61	408.76	0.00	0.00
137.00	(21) attachments	855.73	1853.44	0.00	0.00
140.00		65.99	201.22	0.00	0.00
145.00		107.77	328.04	0.00	0.00
147.00	(18) attachments	1493.52	3562.96	0.00	0.00
150.00	(1) attachments	76.39	183.95	0.00	49.02
	Totals:	**9,044.60**	**44,126.18**	**0.00**	**888.23**

Calculated Forces

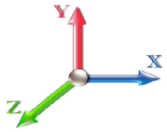
Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-44.12	-9.07	0.00	-951.12	0.00	951.12	5817.07	2908.54	11858.0	5886.84	0.00	0.000	0.000	0.169
5.00	-42.69	-8.98	0.00	-905.79	0.00	905.79	5739.57	2869.78	11485.2	5701.74	0.03	-0.054	0.000	0.166
10.00	-41.16	-8.89	0.00	-860.92	0.00	860.92	5652.47	2826.24	11099.3	5510.17	0.11	-0.108	0.000	0.164
15.00	-39.65	-8.80	0.00	-816.49	0.00	816.49	5545.82	2772.91	10682.2	5303.14	0.26	-0.163	0.000	0.161
20.00	-38.16	-8.70	0.00	-772.51	0.00	772.51	5439.17	2719.58	10273.2	5100.07	0.46	-0.218	0.000	0.158
25.00	-36.70	-8.59	0.00	-729.02	0.00	729.02	5332.51	2666.26	9872.18	4900.97	0.71	-0.272	0.000	0.156
30.00	-35.26	-8.48	0.00	-686.06	0.00	686.06	5225.86	2612.93	9479.11	4705.83	1.03	-0.327	0.000	0.153
35.00	-33.85	-8.37	0.00	-643.64	0.00	643.64	5119.21	2559.60	9094.03	4514.66	1.40	-0.382	0.000	0.149
40.00	-32.46	-8.25	0.00	-601.80	0.00	601.80	5012.56	2506.28	8716.92	4327.45	1.83	-0.437	0.000	0.146
45.00	-31.10	-8.12	0.00	-560.54	0.00	560.54	4905.90	2452.95	8347.81	4144.20	2.32	-0.491	0.000	0.142
46.67	-30.65	-8.09	0.00	-547.00	0.00	547.00	4870.35	2435.18	8226.55	4084.00	2.49	-0.509	0.000	0.140
50.00	-29.10	-8.00	0.00	-520.05	0.00	520.05	4799.25	2399.63	7986.68	3964.92	2.86	-0.545	0.000	0.137
53.00	-27.73	-7.91	0.00	-496.06	0.00	496.06	4240.56	2120.28	7137.82	3543.51	3.21	-0.578	0.000	0.147
55.00	-26.79	-7.34	0.00	-480.24	0.00	480.24	4203.23	2101.62	7012.05	3481.07	3.46	-0.599	0.000	0.144
60.00	-25.61	-7.21	0.00	-443.53	0.00	443.53	4109.91	2054.96	6702.51	3327.41	4.12	-0.655	0.000	0.140
65.00	-24.46	-7.08	0.00	-407.46	0.00	407.46	4016.59	2008.29	6399.97	3177.21	4.83	-0.710	0.000	0.134
70.00	-23.32	-6.95	0.00	-372.04	0.00	372.04	3923.27	1961.63	6104.41	3030.48	5.61	-0.764	0.000	0.129
75.00	-22.21	-6.82	0.00	-337.29	0.00	337.29	3829.95	1914.97	5815.84	2887.23	6.44	-0.817	0.000	0.123
80.00	-21.12	-6.68	0.00	-303.20	0.00	303.20	3736.63	1868.31	5534.25	2747.44	7.32	-0.869	0.000	0.116
85.00	-20.05	-6.55	0.00	-269.78	0.00	269.78	3643.31	1821.65	5259.66	2611.12	8.26	-0.918	0.000	0.109
90.00	-19.01	-6.41	0.00	-237.04	0.00	237.04	3549.99	1774.99	4992.05	2478.26	9.24	-0.965	0.000	0.101
92.00	-18.50	-6.31	0.00	-224.22	0.00	224.22	3512.66	1756.33	4886.96	2426.09	9.65	-0.984	0.000	0.098
94.25	-18.05	-6.24	0.00	-210.03	0.00	210.03	3470.66	1735.33	4770.08	2368.07	10.12	-1.004	0.000	0.094
95.00	-17.83	-6.23	0.00	-205.35	0.00	205.35	3456.66	1728.33	4731.43	2348.88	10.28	-1.011	0.000	0.093
99.67	-16.53	-6.09	0.00	-176.28	0.00	176.28	1458.24	729.12	1997.89	991.83	11.29	-1.049	0.000	0.189
100.00	-16.48	-6.09	0.00	-174.25	0.00	174.25	1456.89	728.44	1992.39	989.11	11.36	-1.052	0.000	0.188
105.00	-15.88	-5.96	0.00	-143.80	0.00	143.80	1435.99	717.99	1910.05	948.23	12.50	-1.123	0.000	0.163
107.00	-13.67	-5.08	0.00	-131.88	0.00	131.88	1427.33	713.67	1877.17	931.90	12.98	-1.150	0.000	0.151
110.00	-13.35	-5.01	0.00	-116.64	0.00	116.64	1414.04	707.02	1827.92	907.46	13.71	-1.187	0.000	0.138
115.00	-12.83	-4.88	0.00	-91.61	0.00	91.61	1391.05	695.52	1746.12	866.85	14.99	-1.242	0.000	0.115
117.00	-9.10	-3.51	0.00	-81.01	0.00	81.01	1381.56	690.78	1713.52	850.66	15.51	-1.262	0.000	0.102
120.00	-8.81	-3.43	0.00	-70.49	0.00	70.49	1367.01	683.50	1664.77	826.46	16.31	-1.289	0.000	0.092
120.00	-8.81	-3.43	0.00	-70.49	0.00	70.49	1091.99	545.99	1332.66	661.59	16.31	-1.289	0.000	0.115
125.00	-8.38	-3.31	0.00	-53.33	0.00	53.33	1075.35	537.67	1272.10	631.52	17.68	-1.328	0.000	0.092
127.00	-6.72	-2.94	0.00	-46.72	0.00	46.72	1068.40	534.20	1247.88	619.50	18.24	-1.344	0.000	0.082
130.00	-6.47	-2.87	0.00	-37.89	0.00	37.89	1057.66	528.83	1211.58	601.48	19.09	-1.365	0.000	0.069
135.00	-6.06	-2.75	0.00	-23.54	0.00	23.54	1038.92	519.46	1151.22	571.51	20.54	-1.392	0.000	0.047
137.00	-4.23	-1.85	0.00	-18.05	0.00	18.05	1031.13	515.57	1127.15	559.57	21.12	-1.400	0.000	0.036
140.00	-4.03	-1.78	0.00	-12.50	0.00	12.50	1019.14	509.57	1091.15	541.69	22.01	-1.409	0.000	0.027
145.00	-3.71	-1.66	0.00	-3.62	0.00	3.62	998.31	499.16	1031.47	512.07	23.49	-1.418	0.000	0.011
147.00	-0.18	-0.08	0.00	-0.29	0.00	0.29	989.69	494.84	1007.74	500.29	24.08	-1.419	0.000	0.001
150.00	0.00	-0.08	0.00	-0.05	0.00	0.05	976.44	488.22	972.32	482.70	24.98	-1.419	0.000	0.000

Final Analysis Summary

Structure:	CT01210-S-SBA	**Code:**	EIA/TIA-222-G	7/16/2019	
Site Name:	North Stonington	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 105 mph Wind	44.4	0.00	52.85	0.00	0.00	4685.98
0.9D + 1.6W 105 mph Wind	44.4	0.00	39.61	0.00	0.00	4634.16
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.0	0.00	78.62	0.00	0.00	1089.41
1.2D + 1.0E	1.0	0.00	52.95	0.00	0.00	114.07
0.9D + 1.0E	1.0	0.00	39.71	0.00	0.00	112.70
1.0D + 1.0W 60 mph Wind	9.1	0.00	44.12	0.00	0.00	951.12

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 105 mph Wind	-17.32	-30.03	0.00	-869.13	0.00	-869.13	1458.24	729.12	1997.89	991.83	99.67	0.890
0.9D + 1.6W 105 mph Wind	-12.39	-29.56	0.00	-854.21	0.00	-854.21	1458.24	729.12	1997.89	991.83	99.67	0.871
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-36.73	-7.05	0.00	-207.63	0.00	-207.63	1458.24	729.12	1997.89	991.83	99.67	0.235
1.2D + 1.0E	-19.96	-0.71	0.00	-30.52	0.00	-30.52	1458.24	729.12	1997.89	991.83	99.67	0.044
0.9D + 1.0E	-14.97	-0.70	0.00	-30.08	0.00	-30.08	1458.24	729.12	1997.89	991.83	99.67	0.041
1.0D + 1.0W 60 mph Wind	-16.53	-6.09	0.00	-176.28	0.00	-176.28	1458.24	729.12	1997.89	991.83	99.67	0.189

Base Plate Summary

Structure:	CT01210-S-SB		**Code:**	EIA/TIA-222-G	7/16/2019
Site Name:	North Stonington		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 30

Tower Engineering Solutions

Reactions

Original Design

Moment (kip-ft):	3715.00
Axial (kip):	47.88
Shear (kip):	33.15

Analysis

Moment (kip-ft):	4685.98
Axial (kip):	78.62
Shear (kip):	44.44
Moment Design %:	126.14

Base Plate

Yield (ksi):	60.00
Width (in):	64.26
Style:	Polygon
Polygon Sides:	16.00
Clip Length (in):	0.00
Effective Len (in):	13.09
Moment (kip-in):	813.48
Allow Stress (ksi):	81.00
Applied Stress (ksi):	0.00
Stress Ratio:	0.61

Anchor Bolts

Bolt Circle:	58.26
Number Bolts:	20.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Radial
Cluster Dist (in):	0.00
Start Angle (deg):	0.00

Compression

Force (kip):	196.97
Allowable (kip):	260.00
Ratio:	0.77

Tension

Force (kip):	189.11
Allowable (kip):	260.00
Ratio:	0.74

EXHIBIT 8

Antenna Mount Structural Analysis

Source: SBA Date: 4.18.2019

SBA Site:	**CT01210-S North Stonington**
T-Mobile Site Number:	**CT11312A**
Project:	**L600 Project**
Prepared For:	**T-Mobile**
Mount Description:	**(1) Platform w/ Handrail** **w/ V-Brace and Kicker Augments**
Site Location:	**267 Norwich Westerly Rd, North Stonington, CT** **New London County** **41.43711388°, -71.8814667°**
Design Codes:	**ANSI/TIA-222-G** **IBC 2015 w/ 2018 CT Building Code**
Analysis Load Case:	**T-Mobile Final Configuration**
Analysis Result:	**Adequate @ 64% - Once Augmented** **See Conclusion**

STATE OF CONNECTICUT
GREGORY DURGIN
No.32155
LICENSED
PROFESSIONAL ENGINEER

Revision 0
June 13, 2019

GeoStructural ▪ P.O. Box 2621, Boise, ID 83701 ▪ Office: (530) 539-4787
Professional Engineers | Tower Technicians | Climbers | sUAS Mapping

1.0 Introduction

An antenna mount structural analysis has been performed on T-Mobile's existing mount assembly with augments located at the CT01210-S North Stonington communications site in New London County, CT considering the final equipment loading configuration listed in Section 3.0.

2.0 Analysis Criteria

An elastic three-dimensional model of the mount structure has been analyzed pursuant to the following criteria considering wind forces in 30° increments:

- 2018 Connecticut State Building Code.
- IBC 2015 – International Building Code.
- ANSI/TIA-222-G – Structural Standard for Antenna Supporting Structures and Antennas.
- AISC – Steel Construction Manual.
- ANSI/AWS D1.1 – Structural Welding Code.

Wind w/o ice = 135 mph (3-sec gust Ultimate Wind Speed) Wind w/o ice = 105 mph (3-sec gust Basic Wind Speed) Wind w/ ice = 50 mph (3-sec gust Basic) with 3/4" Design Ice, Escalated with Height
Topographic Category 1; Exposure Category C; Structure Class (Risk Category) II Gust Effect Factor = 1.0; Directionality Factor = 0.95 Site Class D "Stiff Soil"; F_a = 1.6; F_v = 2.4; S_{DS} = 0.173
Maintenance Loads**: Lm = 500 lb @ Worst Case Mount Pipe (Concurrent with 30 mph Wind Speed) Lv = 250 lb @ Worst Case Member Location (Center Span or Cantilever) ** *The mount face horizontal boom rails of T-Arm mount assemblies are not rated for rigging, hoisting or maintenance loading.*

The following documents were provided:

- Mount and Tower Record Documents
  SBA
- Tower Structural Analysis
  FDH, 3/19/14.
- Construction Drawings
  Chappell, L600 Project, Rev-0, 5/13/19.
- Colo Application
  SBA 600 MHz, App # 116563 v1.
- RFDS
  T-Mobile L600 Project, V2.1, CT11312A, 4/25/19.

The results of the analysis are illustrated in Section 4.0. If any of the existing or proposed conditions reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

3.0 Appurtenance Information

Table 3.1 – T-Mobile Final Configuration[1,2,3]

COR	(Quantity) Appurtenance Make/Model	Mount Description
147.0'±	(3) ERICSSON AIR21 B2A/B4P	*(1) Platform w/ Handrail w/ V-Brace and Kicker Augments*
	(3) RFS APXVAARR24_43-U-NA20	
	(3) ERICSSON AIR21 B2P/B4A	
	(3) ERICSSON 4449 B71+B12 RRH	
	(3) Twin Style 1B AWS TMA	

1. *Refer to antenna installation Construction Drawings (by others, when applicable) for additional information regarding final antenna and equipment orientations.*
2. *Panel antennas to be installed as follows:*
   - 2.1. *AIR21 panels to be installed on mount pipes in Positions 1 and 4 similar to existing.*
   - 2.2. *AARR panels to be installed on mount pipes in Positions 2 similar to existing.*
3. *RRH/TMA units to be installed as follows:*
   - 3.1. *TMAs to be installed on mount pipes behind panels in Position 1 similar to existing.*
   - 3.2. *4449 RRHs to be installed on mount pipe behind panels in Position 2.*

4.0 Analysis Results

Table 4.1 – Augmented Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final T-Mobile Configuration	New Handrail V-Brace Assembly	9%	**Adequate Once Augmented[3]**
	Bracing	10%	
	Standoff	26%	
	Bottom Rail	42%	
	Pipe2.0STD Mount Pipes	42%	
	New Pipe2.5STD Mount Pipes	64%	
	New PRK Double Angles	57%	
	Connection Plates	43%	

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.2. 105% is an acceptable allowable stress percentage for mount components.*
3. *Refer to Section 5.0 for information regarding required mount augments.*

Table 4.2 – Structural Component Material Strengths

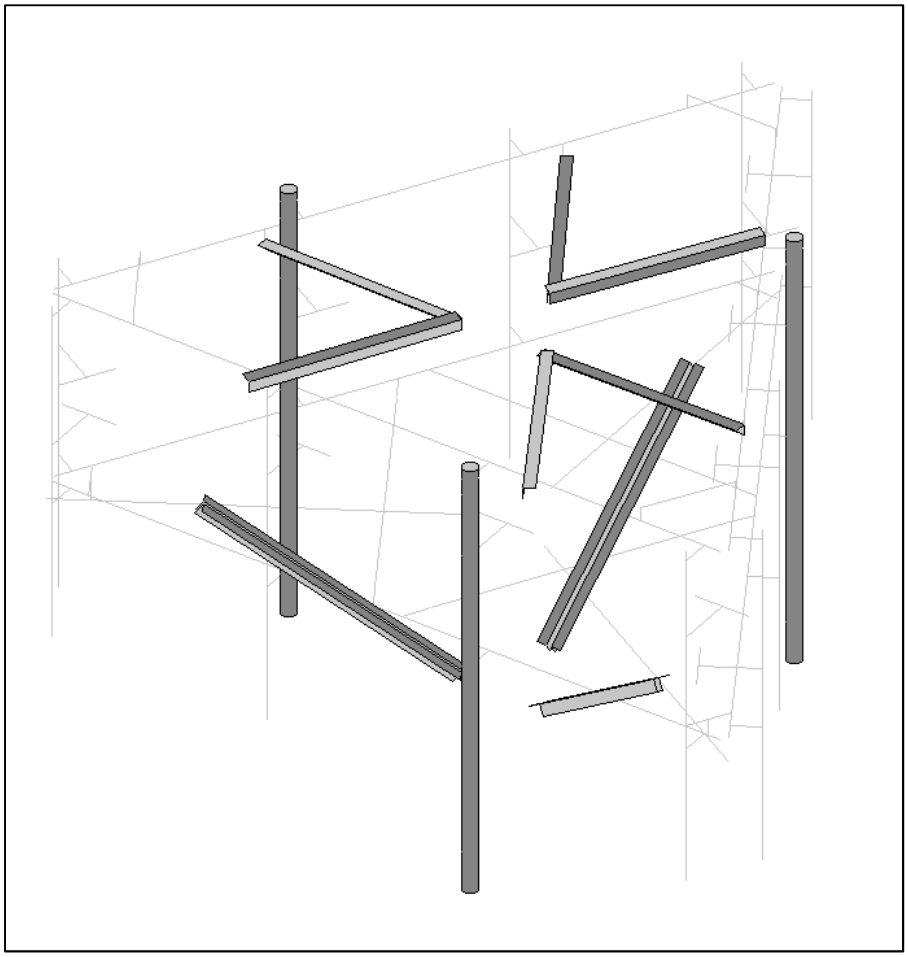
Structural Component	Nominal Strength/Material[1]
Pipe	F_y = 35 ksi (A53, Gr. B)
Tube	F_y = 46 ksi (A500, Gr. B)
Structural Shapes (L, C, W, etc.), Plate / Bar	F_y = 36 ksi (A36)
Uni-Strut	F_y = 33 ksi (A570, Gr. 33)
Connection Bolts	A325
Stainless Steel Bolts	18-8 Stainless, Grade 316/304 F_y = 74 ksi (Yield) & F_u = 29 ksi (Tension)
U-Bolts / Threaded Rod	SAE J429 Grade 2 (Substitution: ASTM A449) F_y = 57 ksi (Yield) & F_u = 74 ksi (Tension)
Welds	E70XX Electrodes

1. *Strengths listed were assumed for this analysis and are based upon ASTM, AISC, RCSC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents when available.*

5.0 Conclusion & Recommendations

Based on T-Mobile's final equipment loading configuration, the mount assemblies do not have sufficient capacity to support the loading considered in this analysis pursuant to the listed standards. Structural modifications (augments) will be required and are briefly summarized below:

- Install Platform Reinforcement Kit; located 3.0' below the existing standoff centerline to monopole shaft and attaching to the existing standoff member approximately 4.0' out from the collar attachment.
    - Sitepro1 PRK-1245L, (1) total.
- Install V-Brace Kit; located approximately 3.0' above the existing mount face rail centerline.
    - Sitepro1 PRK-SFS-L, (1) total. Attach ring mount in kit to monopole shaft and SFS angle gate clamp brackets to new handrail w/ a horiz. spread of approximately 5.2'.
    - Orient PRK-SFS collar and angle braces such that the climbing path in uninterrupted.
- Install (3) Pipe2.5STD x 8'-0" mount pipes at Position 2 mount pipe location (supporting RFS APXVAARR24 panel antenna and 4449 RRH). Attach new Pipe2.5STD mount pipe to existing bottom channel rail w/ (2) new U-bolt assemblies and to existing top handrail pipe w/ New Sitepro1 SCX x -43 cross-over plate assemblies. Remove the existing mount pipe.



Once the recommended augments are successfully implemented, the augmented mount assembly has sufficient capacity to support the loading considered in this analysis pursuant to the listed standards.

Augmentation Requirements:

- Antennas and equipment shall be installed centered vertically on the mount front face bottom rail (limit vertical installation eccentricity) same as existing. This analysis accounts for vertical eccentricities necessary to install all panel antennas at the same relative top tip elevation.
- Panel antennas to be installed as follows:
  - AIR21 panels to be installed on mount pipes in Positions 1 and 4 similar to existing.
  - AARR panels to be installed on mount pipes in Positions 2 similar to existing.
- RRH/TMA units to be installed as follows:
  - TMAs to be installed on mount pipes behind panels in Position 1 similar to existing.
  - 4449 RRHs to be installed on mount pipe behind panels in Position 2.
- In order to obtain a mount structure capable of supporting the currently proposed final loading configuration, upgrade augments must be installed in accordance with GeoStructural's mount augment *recommendations*.

All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study, nor have they been provided a mount mapping to verify existing conditions and the results of this analysis are based solely on the information provided.

This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If any of the existing or proposed conditions (appurtenance loading, member sizes, etc.) reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

Prepared by:

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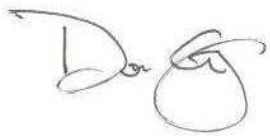
Reviewed and Approved by:



Don George, PE, SE, MLSE
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6.0 Standard Conditions

- All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study to verify existing conditions and the results of this analysis are based solely on the information provided. It has been assumed that the tower, antenna support structure and foundation have been constructed according to the provided existing drawings, previous structural analysis reports, mapping documents, etc.

- The default Structure Classification is Class II in accordance with ANSI/TIA-222-G §A.2.2 & §A.15.3 and has been assumed for this analysis. The owner shall verify this classification conforms with original or desired reliability criteria.

- This analysis assumes that the structure has been properly installed and maintained in accordance with ANSI/TIA-222-G §15.5 and that no physical deterioration has occurred in any of the components of the structure. Damaged, missing, or rusted members were not considered.

- This analysis verifies the adequacy of the main components of the structure. Not all connections, welds, bolts, plates, etc. were individually detailed and analyzed. Where not specifically analyzed, the existing connection plates, welds, bolts, etc. were assumed adequate to develop the full capacity of the main structural members.

- No consideration has been made for unusual or extreme wind events, rime/in-cloud ice loadings, harmonic or nodal vibration, vortex shedding or other similar conditions.

- It is the owner's responsibility to determine the appropriate design wind speed and amount of ice accumulation beyond code minimum values that should be considered in the analysis.

- This analysis report does not constitute a maintenance and condition assessment. No certifications regarding maintenance and condition are expressed or implied. If desired, GeoStructural can provide these services under a subsequent contract.

- This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If desired, GeoStructural can provide these services under a subsequent contract.

7.0 Calculations & Software Output

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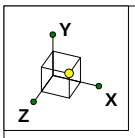

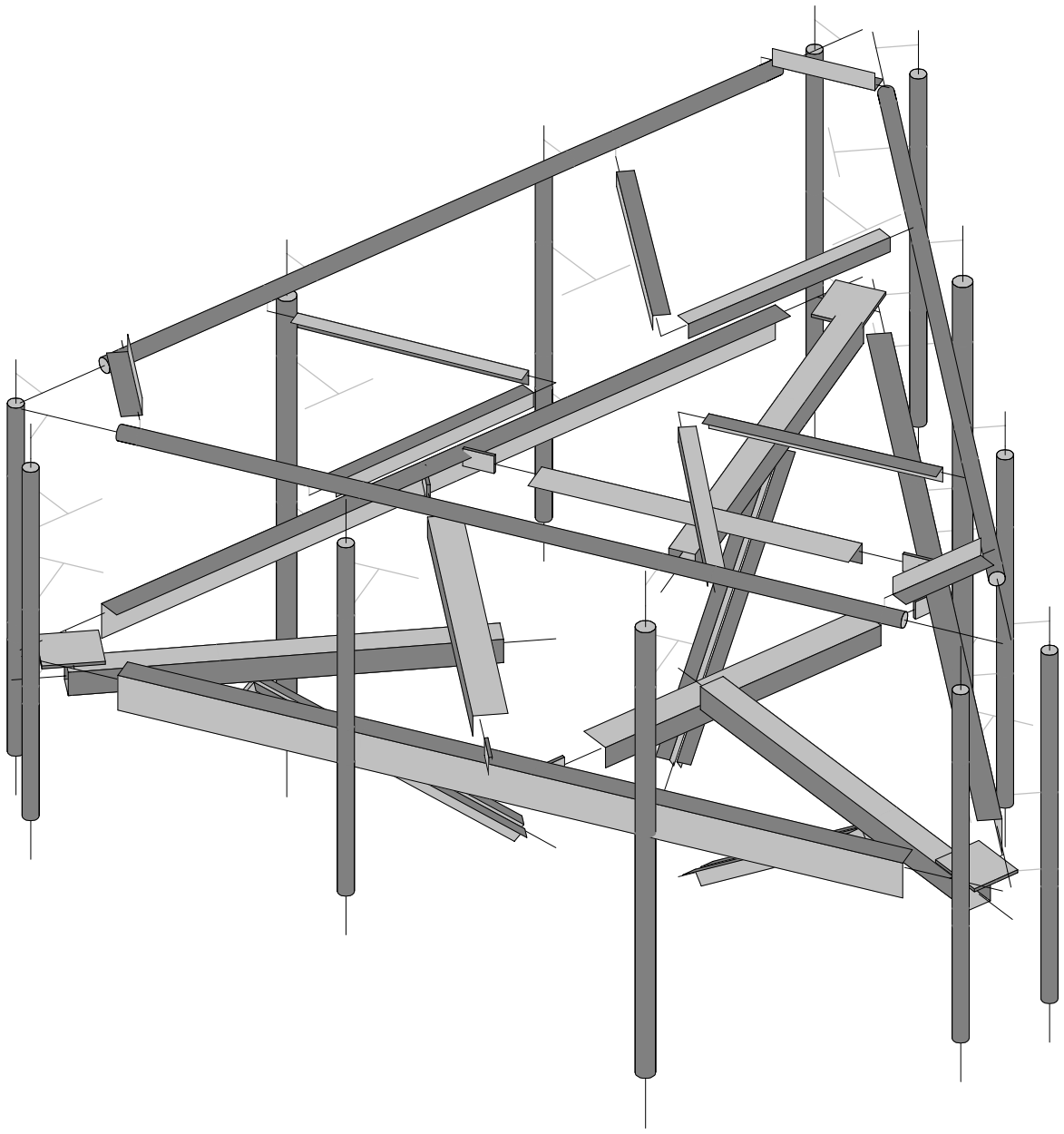

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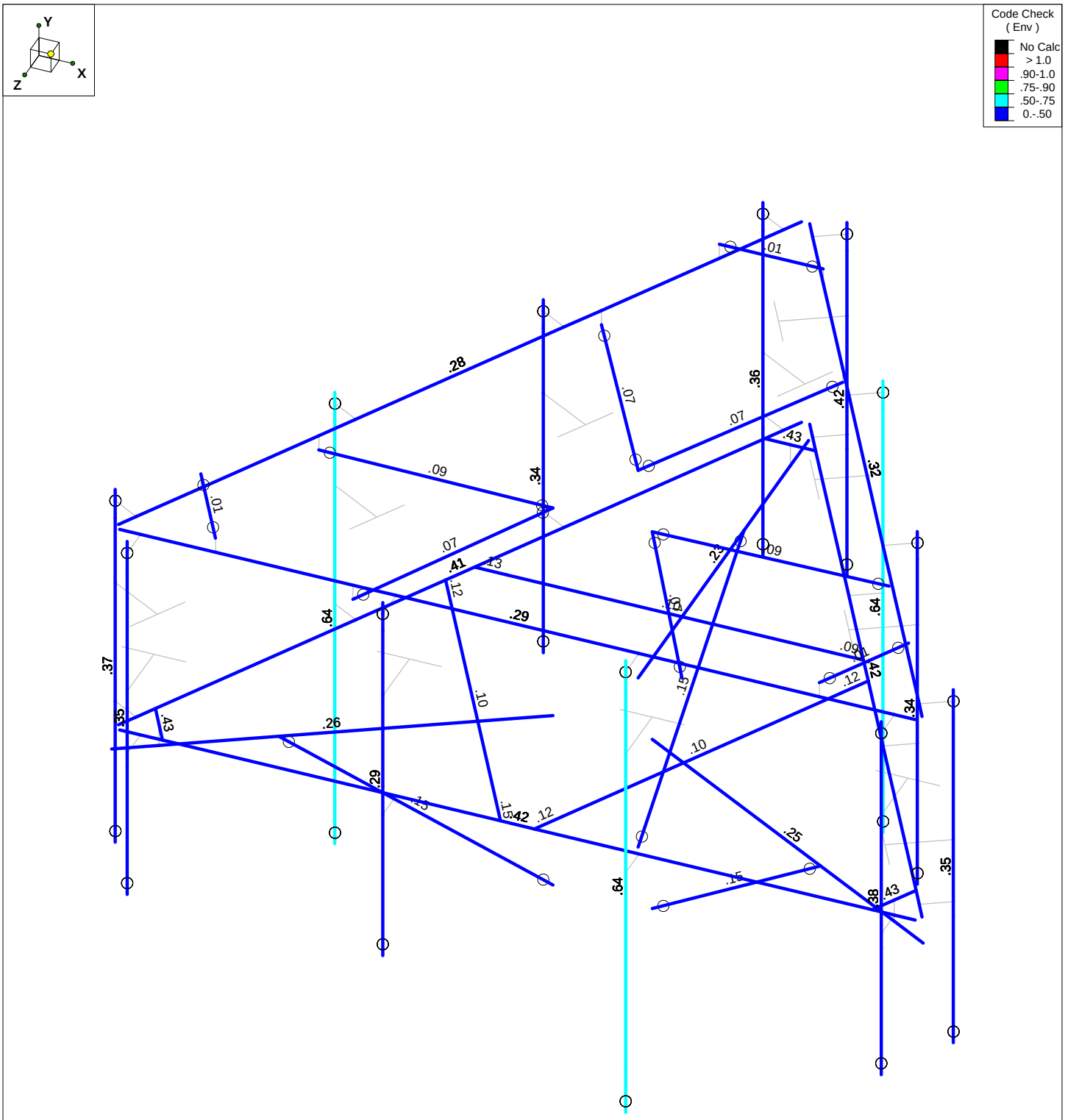

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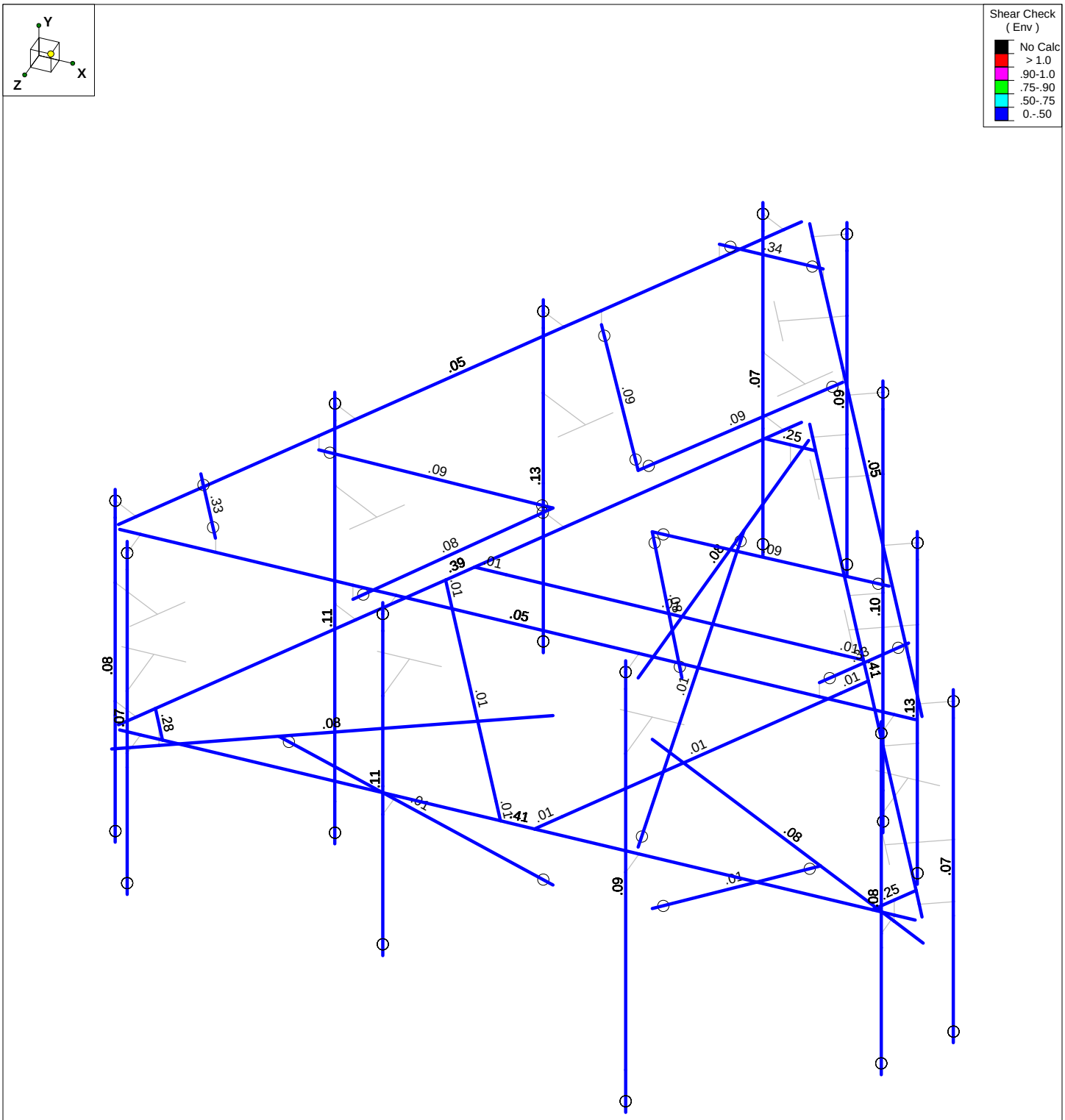

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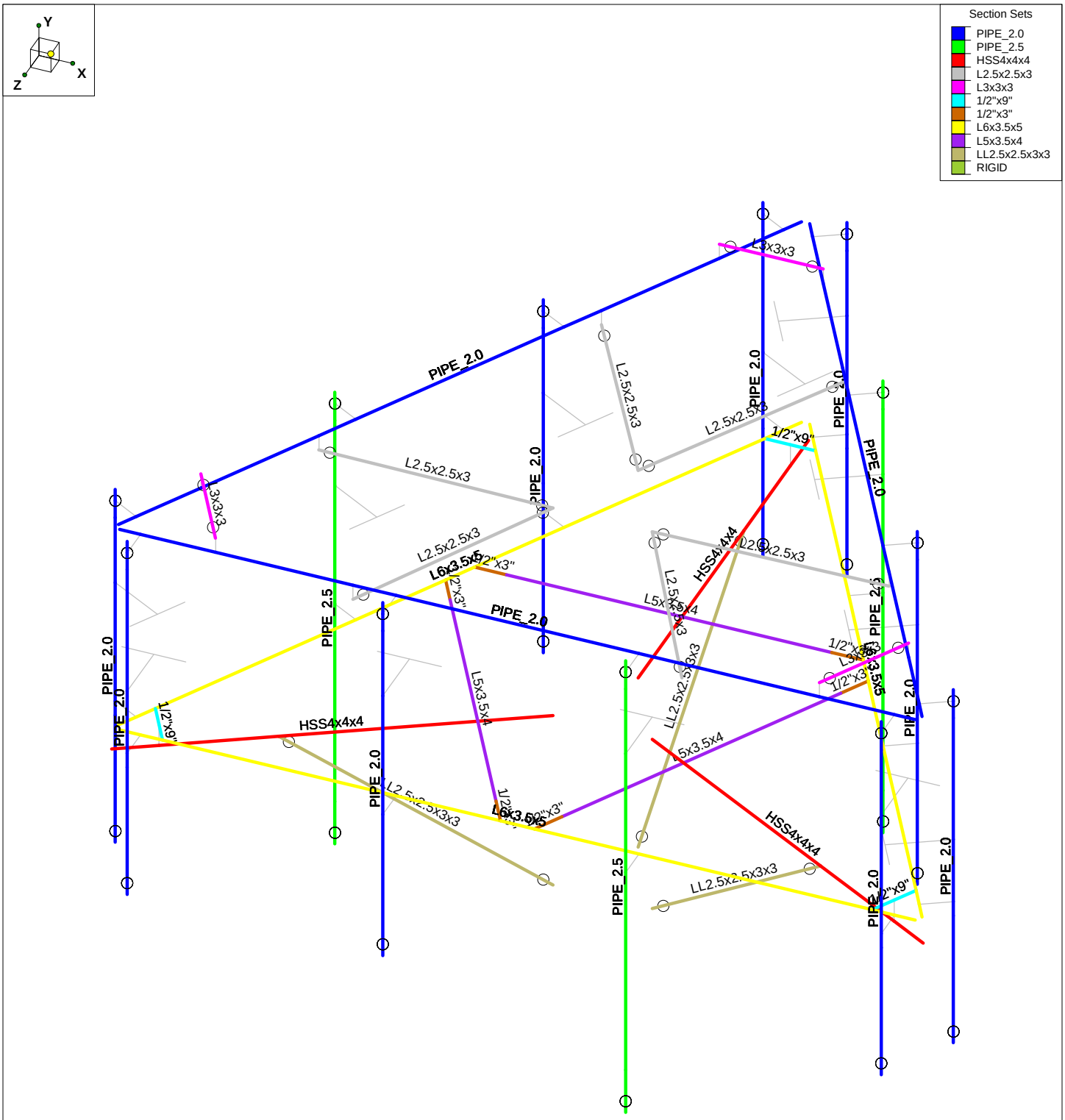

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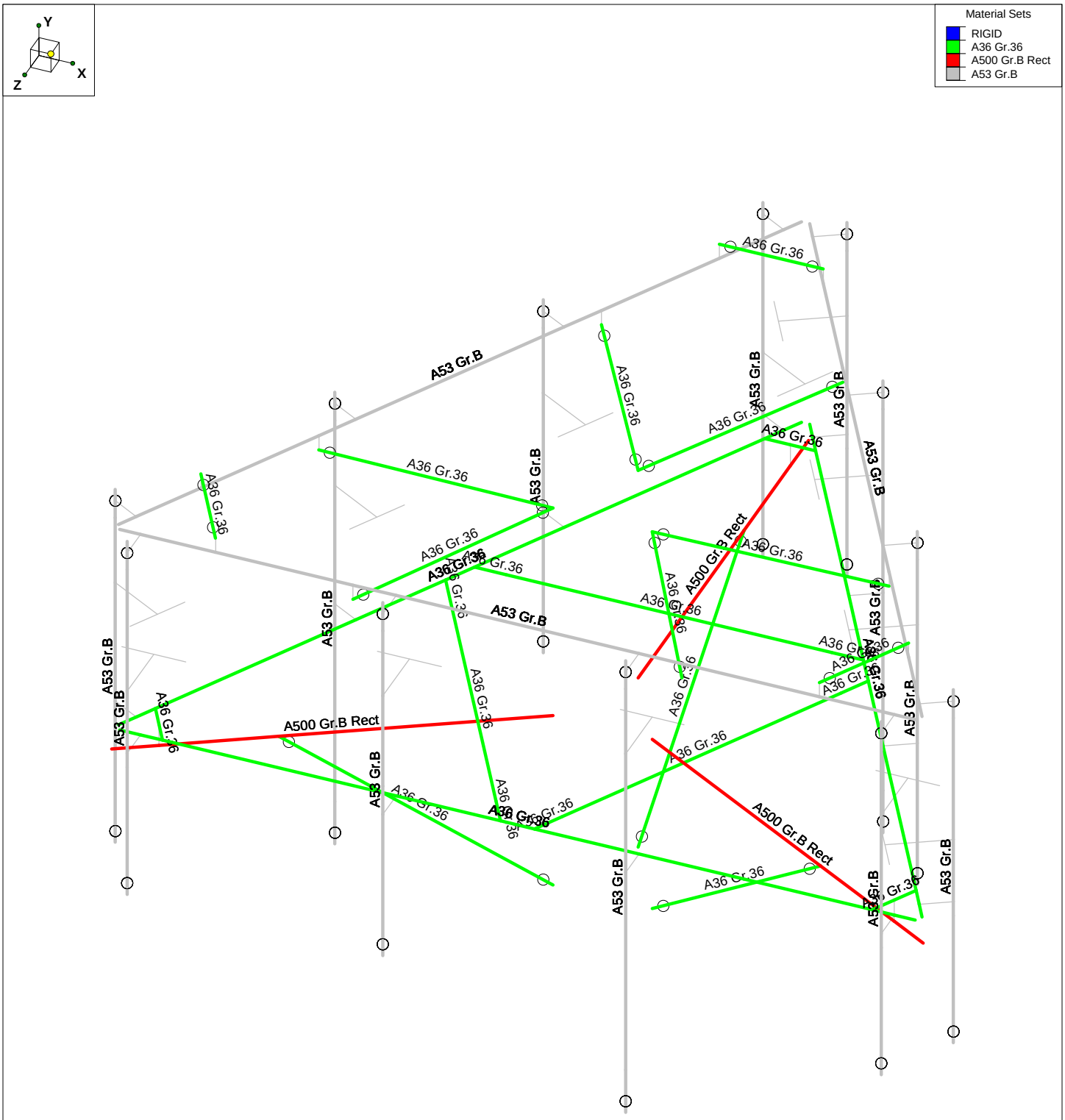

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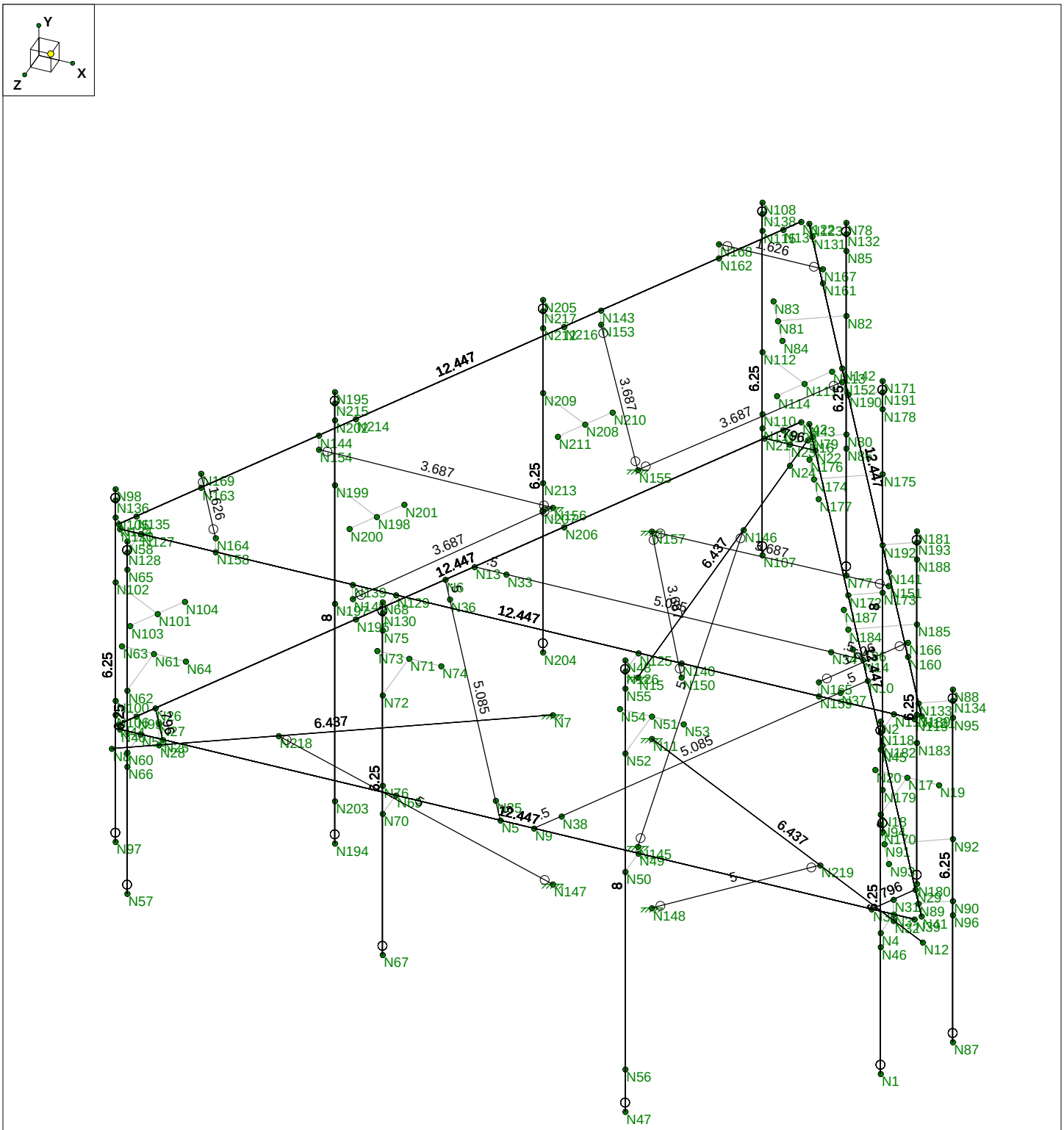

Member Length (ft) Displayed
Envelope Only Solution

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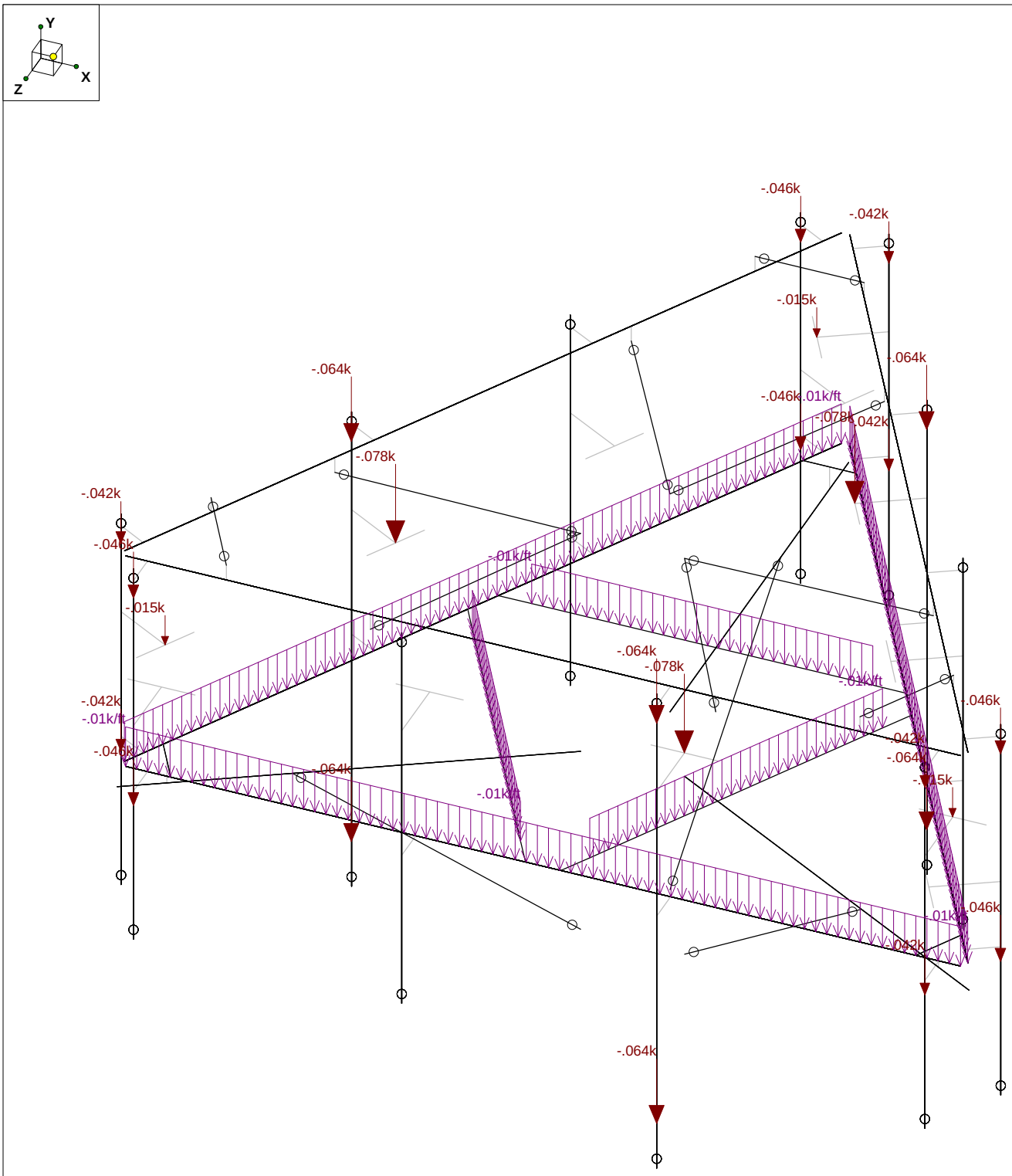

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Envelope Only Solution

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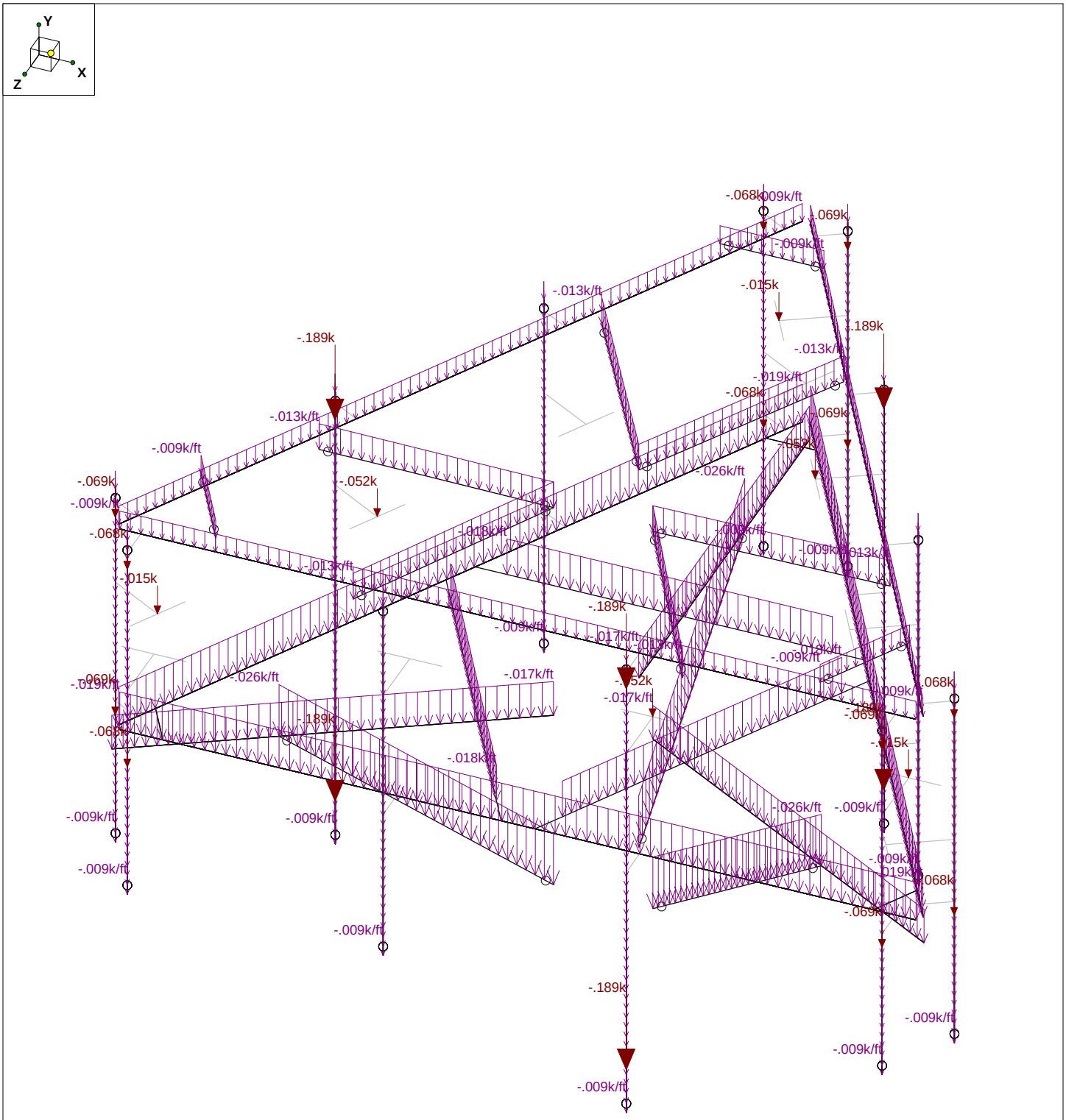

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Envelope Only Solution

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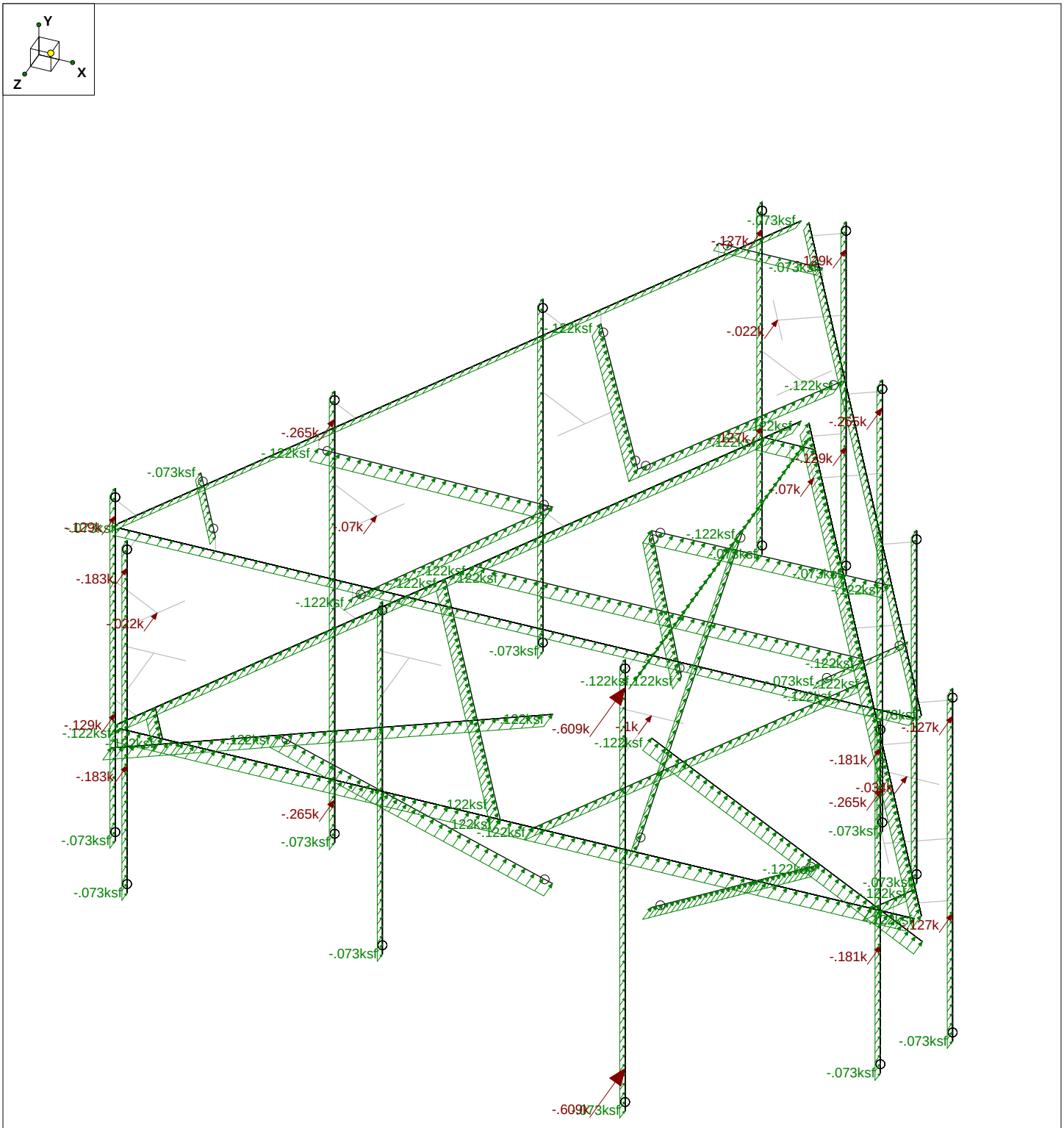

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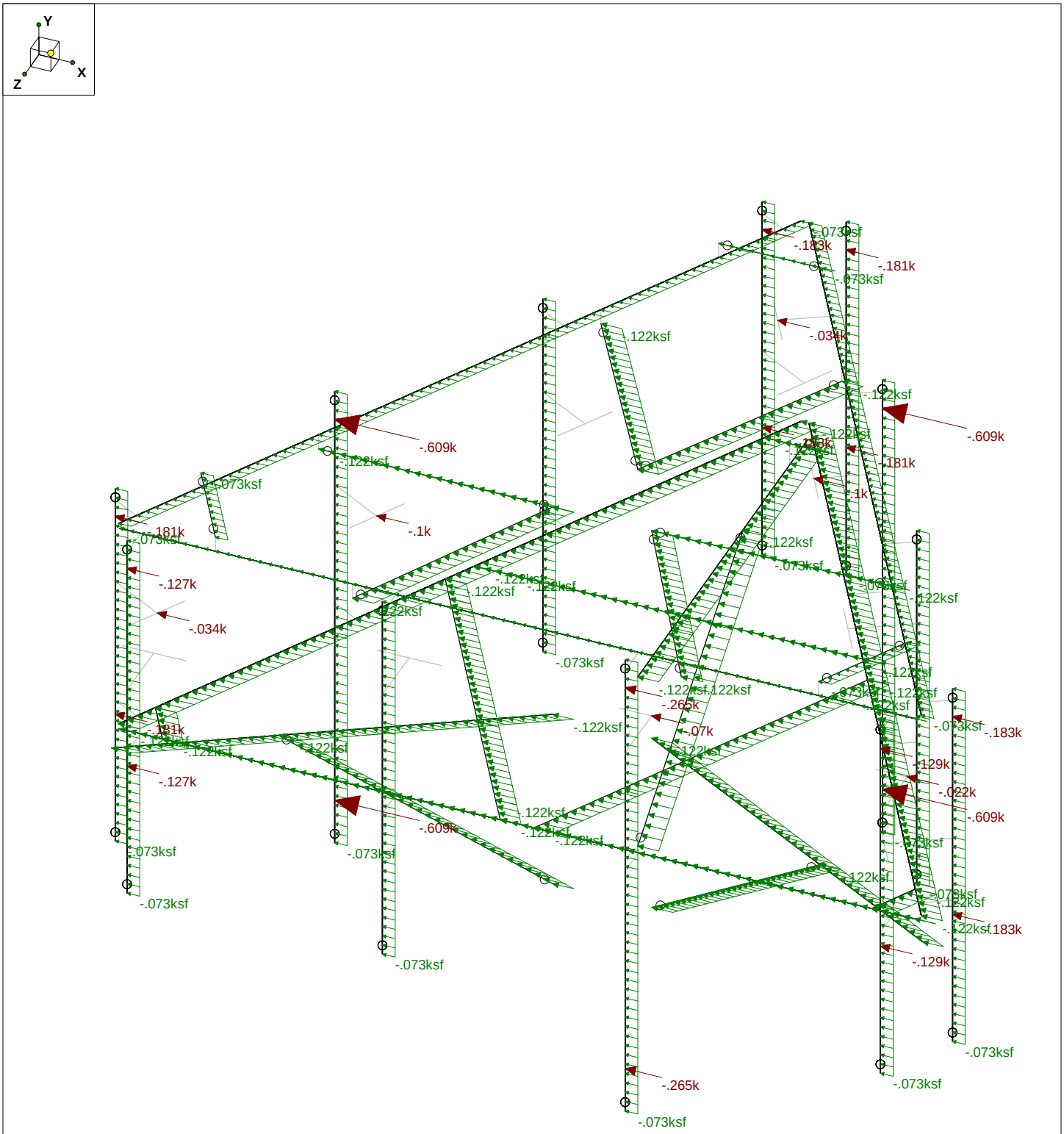

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Envelope Only Solution

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Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	D	DL		-1		25		6		
2	Di	SL				25		39		
3	Lm [500]	LL				1				
4	Lv [250]	LL				2				
5	Woz	WL				25		45		
6	Wox	WL				25		45		
7	Wiz	WL				25		45		
8	Wix	WL				25		45		
9	Ez	EL				25				
10	Ex	EL				25				

Load Combination Design

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1) 1.4D				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
42	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	6) 1.2D+1.5Lv				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE_1.5	PIPE_1.5	Beam	Pipe Def...	A53 Gr.B	Typical	.749	.293	.293	.586
2	PIPE_2.0	PIPE_2.0	Beam	Pipe Def...	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	PIPE_2.5	PIPE_2.5	Beam	Pipe Def...	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	PIPE_3.0	PIPE_3.0	Beam	Pipe Def...	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
5	PIPE_3.5	PIPE_3.5	Beam	Pipe Def...	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
6	PIPE_4.0	PIPE_4.0	Beam	Pipe Def...	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
7	PIPE_2.0X	PIPE_2.0X	Beam	Pipe Def...	A53 Gr.B	Typical	1.4	.827	.827	1.65
8	HSS2x2x3	HSS2x2x3	Beam	Tube Def...	A500 Gr.B Rect	Typical	1.19	.641	.641	1.09
9	HSS3x3x3	HSS3x3x3	Beam	Tube Def...	A500 Gr.B Rect	Typical	1.89	2.46	2.46	4.03

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
10	HSS4x4x3	HSS4x4x3	Beam	Tube Def...	A500 Gr.B Rect	Typical	2.58	6.21	6.21	10
11	HSS4x4x4	HSS4x4x4	Beam	Tube Def...	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
12	HSS5x5x4	HSS5x5x4	Beam	Tube Def...	A500 Gr.B Rect	Typical	4.3	16	16	25.8
13	C3x3.5	C3x3.5	Beam	Channel ...	A36 Gr.36	Typical	1.09	.169	1.57	.023
14	C4x4.5	C4X4.5_HRA	Beam	Channel ...	A36 Gr.36	Typical	1.38	.289	3.65	.032
15	C5x6.7	C5x6.7	Beam	Channel ...	A36 Gr.36	Typical	1.97	.47	7.48	.055
16	L2.5x2.5x3	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical	.901	.535	.535	.011
17	L2.5x2.5x4	L2.5x2.5x4	Beam	None	A36 Gr.36	Typical	1.19	.692	.692	.026
18	L3x3x3	L3x3x3	Beam	None	A36 Gr.36	Typical	1.09	.948	.948	.014
19	L3x3x4	L3x3x4	Beam	None	A36 Gr.36	Typical	1.44	1.23	1.23	.031
20	L3x3x6	L3x3x6	Beam	None	A36 Gr.36	Typical	2.11	1.75	1.75	.101
21	L4x4x4	L4x4x4	Beam	None	A36 Gr.36	Typical	1.93	3	3	.044
22	LL3x3x4x0	LL3x3x4x0	Beam	None	A36 Gr.36	Typical	2.88	4.5	2.46	.063
23	1/2"x6"	1/2"x6"	Beam	Rectangu...	A36 Gr.36	Typical	3	.063	9	.237
24	1/2"x9"	1/2"x9"	Beam	Rectangu...	A36 Gr.36	Typical	4.5	.094	30.375	.362
25	1/2"x3"	1/2"x3"	Beam	Rectangu...	A36 Gr.36	Typical	1.5	.031	1.125	.112
26	L6x3.5x5	L6x3.5x5	Beam	None	A36 Gr.36	Typical	2.89	2.84	10.9	.099
27	L5x3.5x4	L5x3.5x4	Beam	None	A36 Gr.36	Typical	2.07	2.2	5.36	.046
28	LL2.5x2.5x3x3	LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical	1.8	2.46	1.07	.023

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	N7	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N145	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N146						
6	N147	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
7	N148	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
8	N155	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
9	N156	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
10	N157	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
11	N218						
12	N219						

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2		180	PIPE 2.0	Beam	Pipe Default	A53 Gr.B	Typical
2	M2	N3	N4			RIGID	None	None	RIGID	DR1
3	M3	N7	N8		90	HSS4x4x4	Beam	Tube Default	A500 Gr.B...	Typical
4	M4	N11	N12		90	HSS4x4x4	Beam	Tube Default	A500 Gr.B...	Typical
5	M5	N33	N34		90	L5x3.5x4	Beam	None	A36 Gr.36	Typical
6	M6	N15	N16		90	HSS4x4x4	Beam	Tube Default	A500 Gr.B...	Typical
7	M7	N17	N18			RIGID	None	None	RIGID	DR1
8	M8	N20	N19			RIGID	None	None	RIGID	DR1
9	M9	N21	N22		90	1/2"x9"	Beam	Rectangular D...	A36 Gr.36	Typical
10	M10	N23	N24			RIGID	None	None	RIGID	DR1
11	M11	N25	N26		90	1/2"x9"	Beam	Rectangular D...	A36 Gr.36	Typical
12	M12	N27	N28			RIGID	None	None	RIGID	DR1
13	M13	N29	N30		90	1/2"x9"	Beam	Rectangular D...	A36 Gr.36	Typical
14	M14	N31	N32			RIGID	None	None	RIGID	DR1
15	M15	N14	N34			1/2"x3"	Beam	Rectangular D...	A36 Gr.36	Typical
16	M16	N13	N33			1/2"x3"	Beam	Rectangular D...	A36 Gr.36	Typical
17	M17	N35	N36		90	L5x3.5x4	Beam	None	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
18	M18	N6	N36			1/2"x3"	Beam	Rectangular D...	A36 Gr.36	Typical
19	M19	N5	N35			1/2"x3"	Beam	Rectangular D...	A36 Gr.36	Typical
20	M20	N37	N38		90	L5x3.5x4	Beam	None	A36 Gr.36	Typical
21	M21	N9	N38			1/2"x3"	Beam	Rectangular D...	A36 Gr.36	Typical
22	M22	N10	N37			1/2"x3"	Beam	Rectangular D...	A36 Gr.36	Typical
23	M23	N40	N39		180	L6x3.5x5	Beam	None	A36 Gr.36	Typical
24	M24	N41	N43		180	L6x3.5x5	Beam	None	A36 Gr.36	Typical
25	M25	N42	N44		180	L6x3.5x5	Beam	None	A36 Gr.36	Typical
26	M26	N47	N48		180	PIPE_2.5	Beam	Pipe Default	A53 Gr.B	Typical
27	M27	N49	N50			RIGID	None	None	RIGID	DR1
28	M28	N51	N52			RIGID	None	None	RIGID	DR1
29	M29	N54	N53			RIGID	None	None	RIGID	DR1
30	M30	N57	N58		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
31	M31	N59	N60			RIGID	None	None	RIGID	DR1
32	M32	N61	N62			RIGID	None	None	RIGID	DR1
33	M33	N64	N63			RIGID	None	None	RIGID	DR1
34	M34	N67	N68		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
35	M35	N69	N70			RIGID	None	None	RIGID	DR1
36	M36	N71	N72			RIGID	None	None	RIGID	DR1
37	M37	N74	N73			RIGID	None	None	RIGID	DR1
38	M38	N77	N78		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
39	M39	N79	N80			RIGID	None	None	RIGID	DR1
40	M40	N81	N82			RIGID	None	None	RIGID	DR1
41	M41	N84	N83			RIGID	None	None	RIGID	DR1
42	M42	N87	N88		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
43	M43	N89	N90			RIGID	None	None	RIGID	DR1
44	M44	N91	N92			RIGID	None	None	RIGID	DR1
45	M45	N94	N93			RIGID	None	None	RIGID	DR1
46	M46	N97	N98		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
47	M47	N99	N100			RIGID	None	None	RIGID	DR1
48	M48	N101	N102			RIGID	None	None	RIGID	DR1
49	M49	N104	N103			RIGID	None	None	RIGID	DR1
50	M50	N107	N108		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
51	M51	N109	N110			RIGID	None	None	RIGID	DR1
52	M52	N111	N112			RIGID	None	None	RIGID	DR1
53	M53	N114	N113			RIGID	None	None	RIGID	DR1
54	M54	N117	N118			RIGID	None	None	RIGID	DR1
55	M55	N120	N119		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
56	M56	N121	N123		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
57	M57	N122	N124		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
58	M58	N125	N126			RIGID	None	None	RIGID	DR1
59	M59	N127	N128			RIGID	None	None	RIGID	DR1
60	M60	N129	N130			RIGID	None	None	RIGID	DR1
61	M61	N131	N132			RIGID	None	None	RIGID	DR1
62	M62	N133	N134			RIGID	None	None	RIGID	DR1
63	M63	N135	N136			RIGID	None	None	RIGID	DR1
64	M64	N137	N138			RIGID	None	None	RIGID	DR1
65	M65	N146	N145			LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical
66	M66	N154	N156		90	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
67	M67	N149	N156		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
68	M68	N150	N157		90	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
69	M69	N151	N157		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
70	M70	N152	N155		90	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
71	M71	N153	N155		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
72	M72	N139	N149			RIGID	None	None	RIGID	DR1
73	M73	N144	N154			RIGID	None	None	RIGID	DR1
74	M74	N141	N151			RIGID	None	None	RIGID	DR1

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
75	M75	N140	N150			RIGID	None	None	RIGID	DR1
76	M76	N143	N153			RIGID	None	None	RIGID	DR1
77	M77	N142	N152			RIGID	None	None	RIGID	DR1
78	M78	N164	N158			RIGID	None	None	RIGID	DR1
79	M79	N165	N159			RIGID	None	None	RIGID	DR1
80	M80	N166	N160			RIGID	None	None	RIGID	DR1
81	M81	N167	N161			RIGID	None	None	RIGID	DR1
82	M82	N168	N162			RIGID	None	None	RIGID	DR1
83	M83	N169	N163			RIGID	None	None	RIGID	DR1
84	M84	N169	N164			L3x3x3	Beam	None	A36 Gr.36	Typical
85	M85	N165	N166			L3x3x3	Beam	None	A36 Gr.36	Typical
86	M86	N167	N168			L3x3x3	Beam	None	A36 Gr.36	Typical
87	M87	N170	N171		180	PIPE_2.5	Beam	Pipe Default	A53 Gr.B	Typical
88	M88	N172	N173			RIGID	None	None	RIGID	DR1
89	M89	N174	N175			RIGID	None	None	RIGID	DR1
90	M90	N177	N176			RIGID	None	None	RIGID	DR1
91	M91	N180	N181		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
92	M92	N182	N183			RIGID	None	None	RIGID	DR1
93	M93	N184	N185			RIGID	None	None	RIGID	DR1
94	M94	N187	N186			RIGID	None	None	RIGID	DR1
95	M95	N190	N191			RIGID	None	None	RIGID	DR1
96	M96	N192	N193			RIGID	None	None	RIGID	DR1
97	M97	N194	N195		180	PIPE_2.5	Beam	Pipe Default	A53 Gr.B	Typical
98	M98	N196	N197			RIGID	None	None	RIGID	DR1
99	M99	N198	N199			RIGID	None	None	RIGID	DR1
100	M100	N201	N200			RIGID	None	None	RIGID	DR1
101	M101	N204	N205		180	PIPE_2.0	Beam	Pipe Default	A53 Gr.B	Typical
102	M102	N206	N207			RIGID	None	None	RIGID	DR1
103	M103	N208	N209			RIGID	None	None	RIGID	DR1
104	M104	N211	N210			RIGID	None	None	RIGID	DR1
105	M105	N214	N215			RIGID	None	None	RIGID	DR1
106	M106	N216	N217			RIGID	None	None	RIGID	DR1
107	M107	N218	N147			LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical
108	M108	N219	N148			LL2.5x2.5x3x3	Beam	None	A36 Gr.36	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	M1	BenPIN	BenPIN				Yes				None
2	M2						Yes	** NA **			None
3	M3						Yes				None
4	M4						Yes				None
5	M5						Yes				None
6	M6						Yes				None
7	M7						Yes	** NA **			None
8	M8						Yes	** NA **			None
9	M9						Yes				None
10	M10						Yes	** NA **			None
11	M11						Yes				None
12	M12						Yes	** NA **			None
13	M13						Yes				None
14	M14						Yes	** NA **			None
15	M15						Yes				None
16	M16						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	BenPIN	BenPIN				Yes				None
27	M27						Yes	** NA **			None
28	M28						Yes	** NA **			None
29	M29						Yes	** NA **			None
30	M30	BenPIN	BenPIN				Yes				None
31	M31						Yes	** NA **			None
32	M32						Yes	** NA **			None
33	M33						Yes	** NA **			None
34	M34	BenPIN	BenPIN				Yes				None
35	M35						Yes	** NA **			None
36	M36						Yes	** NA **			None
37	M37						Yes	** NA **			None
38	M38	BenPIN	BenPIN				Yes				None
39	M39						Yes	** NA **			None
40	M40						Yes	** NA **			None
41	M41						Yes	** NA **			None
42	M42	BenPIN	BenPIN				Yes				None
43	M43						Yes	** NA **			None
44	M44						Yes	** NA **			None
45	M45						Yes	** NA **			None
46	M46	BenPIN	BenPIN				Yes				None
47	M47						Yes	** NA **			None
48	M48						Yes	** NA **			None
49	M49						Yes	** NA **			None
50	M50	BenPIN	BenPIN				Yes				None
51	M51						Yes	** NA **			None
52	M52						Yes	** NA **			None
53	M53						Yes	** NA **			None
54	M54	BenPIN					Yes	** NA **			None
55	M55						Yes				None
56	M56						Yes				None
57	M57						Yes				None
58	M58	BenPIN					Yes	** NA **			None
59	M59	BenPIN					Yes	** NA **			None
60	M60	BenPIN					Yes	** NA **			None
61	M61	BenPIN					Yes	** NA **			None
62	M62	BenPIN					Yes	** NA **			None
63	M63	BenPIN					Yes	** NA **			None
64	M64	BenPIN					Yes	** NA **			None
65	M65	BenPIN	BenPIN				Yes				None
66	M66	BenPIN	BenPIN				Yes				None
67	M67	BenPIN	BenPIN				Yes				None
68	M68	BenPIN	BenPIN				Yes				None
69	M69	BenPIN	BenPIN				Yes				None
70	M70	BenPIN	BenPIN				Yes				None
71	M71	BenPIN	BenPIN				Yes				None
72	M72						Yes	** NA **			None
73	M73						Yes	** NA **			None
74	M74						Yes	** NA **			None
75	M75						Yes	** NA **			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...
76	M76						Yes	** NA **			None
77	M77						Yes	** NA **			None
78	M78						Yes	** NA **			None
79	M79						Yes	** NA **			None
80	M80						Yes	** NA **			None
81	M81						Yes	** NA **			None
82	M82						Yes	** NA **			None
83	M83						Yes	** NA **			None
84	M84	BenPIN	BenPIN				Yes				None
85	M85	BenPIN	BenPIN				Yes				None
86	M86	BenPIN	BenPIN				Yes				None
87	M87	BenPIN	BenPIN				Yes				None
88	M88						Yes	** NA **			None
89	M89						Yes	** NA **			None
90	M90						Yes	** NA **			None
91	M91	BenPIN	BenPIN				Yes				None
92	M92						Yes	** NA **			None
93	M93						Yes	** NA **			None
94	M94						Yes	** NA **			None
95	M95	BenPIN					Yes	** NA **			None
96	M96	BenPIN					Yes	** NA **			None
97	M97	BenPIN	BenPIN				Yes				None
98	M98						Yes	** NA **			None
99	M99						Yes	** NA **			None
100	M100						Yes	** NA **			None
101	M101	BenPIN	BenPIN				Yes				None
102	M102						Yes	** NA **			None
103	M103						Yes	** NA **			None
104	M104						Yes	** NA **			None
105	M105	BenPIN					Yes	** NA **			None
106	M106	BenPIN					Yes	** NA **			None
107	M107	BenPIN	BenPIN				Yes				None
108	M108	BenPIN	BenPIN				Yes				None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	PIPE_2.0	6.25			Lbyy						Lateral
2	M3	HSS4x4x4	6.437			Lbyy						Lateral
3	M4	HSS4x4x4	6.437			Lbyy						Lateral
4	M5	L5x3.5x4	5.085			Lbyy						Lateral
5	M6	HSS4x4x4	6.437			Lbyy						Lateral
6	M9	1/2"x9"	.796									Lateral
7	M11	1/2"x9"	.796									Lateral
8	M13	1/2"x9"	.796									Lateral
9	M15	1/2"x3"	.5			Lbyy						Lateral
10	M16	1/2"x3"	.5			Lbyy						Lateral
11	M17	L5x3.5x4	5.085			Lbyy						Lateral
12	M18	1/2"x3"	.5			Lbyy						Lateral
13	M19	1/2"x3"	.5			Lbyy						Lateral
14	M20	L5x3.5x4	5.085			Lbyy						Lateral
15	M21	1/2"x3"	.5			Lbyy						Lateral
16	M22	1/2"x3"	.5			Lbyy						Lateral
17	M23	L6x3.5x5	12.447	5.3	5.3	Lbyy						Lateral
18	M24	L6x3.5x5	12.447	5.3	5.3	Lbyy						Lateral
19	M25	L6x3.5x5	12.447	5.3	5.3	Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
20	M26	PIPE_2.5	8			Lbyy						Lateral
21	M30	PIPE_2.0	6.25			Lbyy						Lateral
22	M34	PIPE_2.0	6.25			Lbyy						Lateral
23	M38	PIPE_2.0	6.25			Lbyy						Lateral
24	M42	PIPE_2.0	6.25			Lbyy						Lateral
25	M46	PIPE_2.0	6.25			Lbyy						Lateral
26	M50	PIPE_2.0	6.25			Lbyy						Lateral
27	M55	PIPE_2.0	12.447	5.3	5.3	Lbyy						Lateral
28	M56	PIPE_2.0	12.447	5.3	5.3	Lbyy						Lateral
29	M57	PIPE_2.0	12.447	5.3	5.3	Lbyy						Lateral
30	M65	LL2.5x2.5x3...	5			Lbyy						Lateral
31	M66	L2.5x2.5x3	3.687			Lbyy						Lateral
32	M67	L2.5x2.5x3	3.687			Lbyy						Lateral
33	M68	L2.5x2.5x3	3.687			Lbyy						Lateral
34	M69	L2.5x2.5x3	3.687			Lbyy						Lateral
35	M70	L2.5x2.5x3	3.687			Lbyy						Lateral
36	M71	L2.5x2.5x3	3.687			Lbyy						Lateral
37	M84	L3x3x3	1.626			Lbyy						Lateral
38	M85	L3x3x3	1.626			Lbyy						Lateral
39	M86	L3x3x3	1.626			Lbyy						Lateral
40	M87	PIPE_2.5	8			Lbyy						Lateral
41	M91	PIPE_2.0	6.25			Lbyy						Lateral
42	M97	PIPE_2.5	8			Lbyy						Lateral
43	M101	PIPE_2.0	6.25			Lbyy						Lateral
44	M107	LL2.5x2.5x3...	5			Lbyy						Lateral
45	M108	LL2.5x2.5x3...	5			Lbyy						Lateral

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N7	max	5.839	18	.676	24	4.151	12	.65	5	1.189	12	1.095	6
2		min	-6.911	12	-1.123	6	-3.576	18	-.364	23	-1.18	18	-.689	24
3	N11	max	6.697	4	.674	16	4.429	4	.541	11	2.043	10	.717	16
4		min	-5.632	22	-1.121	10	-3.839	22	-.339	17	-2.04	16	-1.173	10
5	N15	max	.883	5	.64	20	6.343	14	.727	20	2.946	11	.423	11
6		min	-.874	23	-1.091	2	-7.554	8	-1.225	2	-2.933	17	-.377	17
7	N145	max	.059	17	3.774	26	.179	20	0	74	0	22	0	4
8		min	-.059	23	-.177	20	-4.912	26	0	1	0	4	0	22
9	N147	max	.183	24	3.779	30	2.459	30	0	4	0	22	0	22
10		min	-4.257	30	-.218	24	-.107	24	0	22	0	4	0	4
11	N148	max	4.256	34	3.779	34	2.46	34	0	23	0	23	0	23
12		min	-.18	16	-.216	16	-.106	16	0	5	0	5	0	5
13	N155	max	.361	5	.062	34	.1	34	.005	8	0	74	.015	11
14		min	-.361	11	.01	65	-.004	16	-.005	14	0	1	-.015	5
15	N156	max	.174	3	.062	26	.268	15	.013	15	0	74	.008	20
16		min	-.129	21	.01	69	-.294	9	-.013	9	0	1	-.008	2
17	N157	max	.093	19	.062	30	.296	25	.013	25	0	74	.008	2
18		min	-.138	13	.01	73	-.322	7	-.013	7	0	1	-.007	20
19	Totals:	max	9.949	5	8.963	35	9.305	14						
20		min	-9.949	23	2.679	66	-9.305	8						

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

	Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M87	PIPE_2.5	.644	4.25	11	.102	4.25		3	30.038	50.715	3.596	3.596	1....	H1-1b
2	M26	PIPE_2.5	.643	4.25	8	.087	4.25		11	30.038	50.715	3.596	3.596	3....	H1-1b
3	M97	PIPE_2.5	.641	4.25	11	.106	4.25		6	30.038	50.715	3.596	3.596	1....	H1-1b
4	M11	1/2"x9"	.429	.398	28	.276	.398	y	5	110.855	145.8	1.519	27.338	1....	H1-1b
5	M13	1/2"x9"	.429	.398	32	.248	.398	y	11	110.855	145.8	1.519	27.338	1....	H1-1b
6	M9	1/2"x9"	.428	.398	36	.248	.398	y	13	110.855	145.8	1.519	27.338	1....	H1-1b
7	M23	L6x3.5x5	.418	8.169	7	.413	11.799	z	13	57.349	93.636	3.395	10.561	2....	H2-1
8	M38	PIPE_2.0	.416	2.539	4	.092	2.539		4	20.114	32.13	1.872	1.872	2....	H1-1b
9	M24	L6x3.5x5	.415	11.669	5	.407	11.799	z	5	57.349	93.636	2.866	8.491	1	H2-1
10	M25	L6x3.5x5	.415	8.169	34	.393	11.799	z	9	57.349	93.636	3.395	9.482	1....	H2-1
11	M1	PIPE_2.0	.383	2.539	12	.080	2.539		12	20.114	32.13	1.872	1.872	2....	H1-1b
12	M46	PIPE_2.0	.366	2.539	8	.078	2.539		7	20.114	32.13	1.872	1.872	1....	H1-1b
13	M50	PIPE_2.0	.364	2.539	12	.070	2.539		37	20.114	32.13	1.872	1.872	1....	H1-1b
14	M42	PIPE_2.0	.354	2.539	9	.070	2.539		33	20.114	32.13	1.872	1.872	2....	H1-1b
15	M30	PIPE_2.0	.347	2.539	5	.070	2.539		29	20.114	32.13	1.872	1.872	2....	H1-1b
16	M101	PIPE_2.0	.342	2.539	13	.130	2.539		13	20.114	32.13	1.872	1.872	2....	H1-1b
17	M91	PIPE_2.0	.339	2.539	9	.126	2.539		9	20.114	32.13	1.872	1.872	2....	H1-1b
18	M56	PIPE_2.0	.321	8.169	4	.051	8.687		3	22.943	32.13	1.872	1.872	3....	H1-1b
19	M34	PIPE_2.0	.288	2.539	5	.108	2.539		5	20.114	32.13	1.872	1.872	2....	H1-1b
20	M55	PIPE_2.0	.286	8.169	13	.048	8.687		11	22.943	32.13	1.872	1.872	2....	H1-1b
21	M57	PIPE_2.0	.277	8.039	11	.049	4.408		13	22.943	32.13	1.872	1.872	3....	H1-1b
22	M3	HSS4x4x4	.262	3.956	6	.078	4.023	z	28	117.309	139.518	16.181	16.181	1....	H1-1b
23	M4	HSS4x4x4	.254	5.699	3	.079	4.023	z	33	117.309	139.518	16.181	16.181	2....	H1-1b
24	M6	HSS4x4x4	.232	5.699	7	.080	4.023	z	36	117.309	139.518	16.181	16.181	2....	H1-1b
25	M19	1/2"x3"	.149	0	12	.008	0	y	36	44.374	48.6	.506	3.038	2....	H1-1b
26	M107	LL2.5x2.5x3x3	.148	5	30	.010	5	z	4	41.904	58.32	3.954	2.55	1....	H1-1b*
27	M108	LL2.5x2.5x3x3	.148	5	34	.009	0	z	6	41.904	58.32	3.954	2.55	1....	H1-1b*
28	M65	LL2.5x2.5x3x3	.148	5	26	.005	0	z	5	41.904	58.32	3.954	2.55	1	H1-1b*
29	M16	1/2"x3"	.125	0	9	.008	0	y	34	44.374	48.6	.506	3.038	2....	H1-1b
30	M18	1/2"x3"	.122	.5	5	.008	0	y	36	44.372	48.6	.506	3.038	1....	H1-1b
31	M22	1/2"x3"	.118	0	4	.008	0	y	26	44.374	48.6	.506	3.038	2....	H1-1b
32	M21	1/2"x3"	.116	0	18	.008	0	y	26	44.372	48.6	.506	3.038	1....	H1-1b
33	M5	L5x3.5x4	.102	2.595	8	.008	0	z	34	41.093	67.068	2.629	7.23	1....	H2-1
34	M17	L5x3.5x4	.096	2.648	12	.008	0	z	36	41.093	67.068	2.629	7.241	1....	H2-1
35	M20	L5x3.5x4	.096	2.595	4	.008	0	z	37	41.093	67.068	2.629	7.239	1....	H2-1
36	M15	1/2"x3"	.093	0	9	.007	0	y	33	44.372	48.6	.506	3.038	1....	H1-1b
37	M66	L2.5x2.5x3	.087	1.843	8	.090	0	y	10	18.557	29.192	.873	1.782	1....	H2-1
38	M69	L2.5x2.5x3	.087	1.844	8	.090	0	z	6	18.554	29.192	.873	1.782	1....	H2-1
39	M70	L2.5x2.5x3	.073	1.843	4	.090	3.687	y	6	18.557	29.192	.873	1.782	1....	H2-1
40	M68	L2.5x2.5x3	.072	1.843	12	.079	3.687	y	2	18.557	29.192	.873	1.782	1....	H2-1
41	M71	L2.5x2.5x3	.072	1.844	12	.091	0	z	10	18.554	29.192	.873	1.782	1....	H2-1
42	M67	L2.5x2.5x3	.071	1.844	4	.080	3.687	z	2	18.554	29.192	.873	1.782	1....	H2-1
43	M86	L3x3x3	.011	.813	20	.340	1.626	y	5	30.525	35.316	1.32	2.828	1....	H2-1
44	M84	L3x3x3	.011	.813	24	.326	1.626	y	9	30.525	35.316	1.32	2.828	1....	H2-1
45	M85	L3x3x3	.011	.813	16	.328	0	y	13	30.525	35.316	1.32	2.828	1....	H2-1

Envelope Plate/Shell Principal Stresses

Plate	Surf...	Sigma1 [ksi]	LC	Sigma2 [ksi]	LC	Tau Max [ksi]	LC	Angle [rad]	LC	Von Mises [ksi]	LC
No Data to Print ...											

EXHIBIT 9

T-MOBILE: CT11312A
SBA: CT01210-S NORTH STONINGTON

MOUNT AUGMENTATION @ 147'

MONOPOLE TOWER

NORTH STONINGTON, CT
NEW LONDON COUNTY

SITE INFORMATION

STRUCTURE TYPE:	MONOPOLE
MOUNT TYPE:	PLATFORM W/ HANDRAIL
LATITUDE:	41.4371139 (NAD 83)
LONGITUDE:	-71.881467 (NAD 83)
CITY / STATE:	NORTH STONINGTON, CT
COUNTY:	NEW LONDON

COORDINATES ARE FOR NAVIGATIONAL PURPOSES ONLY, NOT TO 1A ACCURACY.

DO NOT SCALE DRAWINGS

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

CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE AND DESIGN STANDARD: 2015 IBC / TIA-222 / 2018 CT BUILDING CODE

A&E INFORMATION

GEOSTRUCTURAL

DON GEORGE, SE

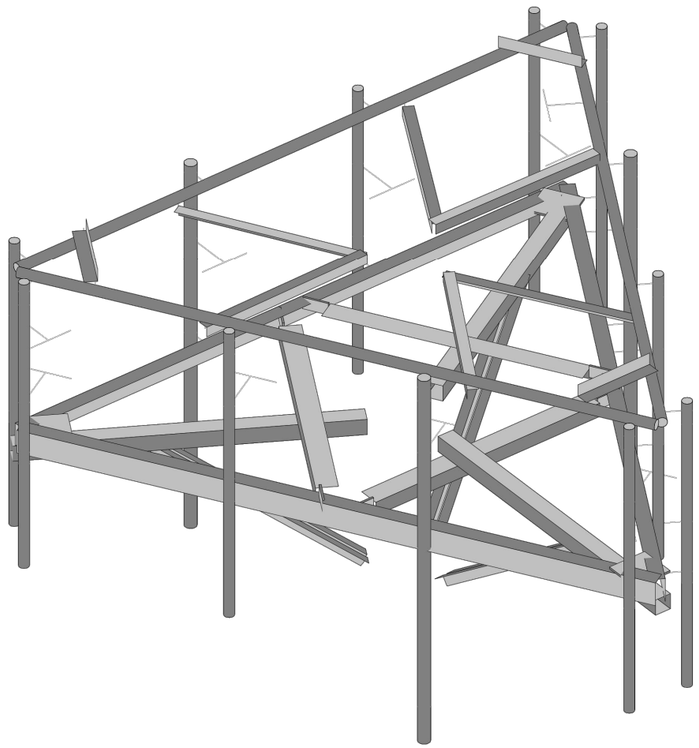
PO BOX 2621, BOISE, ID 83701
530.539.4787
CONTACT@GEOSTRUCTURAL.COM
WWW.GEOSTRUCTURAL.COM

GENERAL DESIGN NOTES

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

SHEET INDEX

MOUNT AUGMENTATION CONFIGURATION



AUGMENTATION SCOPE

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

T-Mobile

SBA

GEOSTRUCTURAL

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

REVISIONS:

0	06/19/19	ISSUE FOR CONSTRUCTION	RWR

CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION:
MOUNT AUGMENTATION

T-MOBILE: CT11312A
SBA: CT01210-S NORTH STONINGTON

NORTH STONINGTON, CT

LATITUDE: 41.4371139
LONGITUDE: -71.881467

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
S-1

GENERAL PROJECT NOTES

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

CONTRACTOR NOTES

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

STRUCTURAL ERECTION AND BRACING REQUIREMENTS

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

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC STEEL CONSTRUCTION MANUAL AND SECTION 4 OF THE TIA CODE.
2. PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM GRADES UNLESS OTHERWISE NOTED:
   - CHANNELS & ANGLES ..... ASTM A36, (Fy = 36 KSI)
   - PLATES ..... ASTM A36, (Fy = 36 KSI)
   - PIPES ..... ASTM A53 GR.B, (Fy = 35 KSI)
   - HSS ROUND ..... ASTM A500 GR.B, (Fy = 42 KSI)
   - HSS RECTANGULAR ..... ASTM A500 GR.B, (Fy = 46 KSI)
   - W-FLANGE ..... ASTM A992 (Fy = 50 KSI)
   - STRUCTURAL BOLTS ..... ASTM A325
   - U-BOLTS ..... ASTM A307 GR.A
   - NUTS FOR BOLTS ..... ASTM A563 (THREADING TO MATCH BOLT)
   - WASHERS FOR BOLTS ..... ASTM F436
   - SEE TABLE 5-1 OF THE TIA CODE FOR ADDITIONAL SHAPES AND STANDARDS THAT ARE NOT LISTED ABOVE.
3. NON PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS PER THE TIA CODE:
   - THE CARBON EQUIVALENT OF STEEL SHALL NOT EXCEED 0.65 PER SECTION 5.4.2 OF THE TIA CODE
   - ELONGATION OF STEEL SHALL NOT BE LESS THAN 18%
   - TEST REPORTS SHALL BE IN ACCORDANCE WITH ASTM A6 OR A568
   - TOLERANCES SHALL BE IN ACCORDANCE WITH ASTM A6
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH AND COLD GALVANIZED.
5. ALL WELDING WORK SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY. WELDING ELECTRODES SHALL BE E70XX.
6. ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO AISC SPECS AND CODES, LATEST EDITION.
7. UPON REQUEST, THE CONTRACTOR SHALL SUBMIT DETAILED, ENGINEERED, COORDINATED AND CHECKED SHOP DRAWINGS FOR ALL STRUCTURAL STEEL TO THE ENGINEER OF RECORD TO REVIEW FOR COMPLIANCE WITH DESIGN INTENT PRIOR TO THE START OF FABRICATION AND/OR ERECTION. GEOSTRUCTURAL IS ABSOLVED OF ALL LIABILITY ASSOCIATED WIT THE MISINTERPRETATION OF THE CONSTRUCTION DOCUMENTS IF CONTRACTOR CHOOSES NOT TO SUBMIT SHOP DRAWINGS.
8. TORCH-CUTTING OF ANY KIND SHALL NOT BE PERMITTED.
9. ALL BOLT HOLES SHALL BE STANDARD SIZE BOLT HOLES PER AISC 360, UNLESS OTHERWISE NOTED. ALL HOLES SHALL BE SHOP DRILLED OR SUB-PUNCHED AND REAMED. BURNING OF HOLES IS NOT PERMITTED. WHERE SLOTTED OR OVERSIZE HOLES ARE SPECIFIED ON THE DRAWINGS, EXTRA-THICK ASTM F436 PLATE WASHERS SHALL BE USED (3/16" MINIMUM THICKNESS) WITH A DIAMETER SUITABLE TO COVER THE EXTENTS OF THE SLOT OR HOLE. BOLTS SHALL BE HEAVY-HEX WHERE AVAILABLE IN THE SIZE AND GRADE SPECIFIED, OTHERWISE BOLTS SHALL BE HEX HEAD CAP SCREWS.
10. ALL STEEL HARDWARE, INCLUDING ADHESIVE OR EMBEDDED ANCHOR BOLTS AND THEIR ACCESSORIES, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 (EXCEPT BOLTS SMALLER THAN ½" SHALL CONFORM TO FE/ZN 3 AT PER ASTM F1941 WHERE HOT-DIP GALVANIZED BOLTS ARE NOT AVAILABLE). ALL STEEL MEMBERS, INCLUDING WELDMENTS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123. REPAIR DAMAGE TO GALVANIZED COATINGS USING ASTM A780 PROCEDURES WITH A ZINC RICH PAINT (SUCH AS ZINC GALVILITE) FOR GALVANIZING DAMAGED BY HANDLING, TRANSPORTING, CUTTING, WELDING, OR BOLTING. DO NOT HEAT SURFACES TO WHICH REPAIR PAINT HAS BEEN APPLIED. CALL OUT HOLES REQUIRED FOR HOT-DIP GALVANIZING ON SHOP DRAWINGS.
11. MEMBERS SHALL BE SHOP-FABRICATED AND WELDED TO THE EXTENT PRACTICABLE IN ORDER TO REDUCE FIELD INSTALLATION COSTS.

STRUCTURAL BOLTS

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED GALVANIZED HIGH STRENGTH ASTM A325 OR A490 BOLTS WITH THREADS EXCLUDED FROM SHEAR PLANE.
2. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES, WITH BOLT HEADS FACING DOWN WHERE APPLICABLE.
3. ALL BOLTS AT EVERY CONNECTION SHALL BE INSTALLED SNUG-TIGHT UNTIL THE SECTION IS FULLY COMPACTED AND ALL PLIES ARE JOINED, AND THEN TIGHTENED FURTHER BY AISC - "TURN OF THE NUT" METHOD. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
4. BOLT LENGTHS UP TO AND INCLUDING 4 DIAMETERS SHALL BE TENSIONED 1/3 TURN BEYOND SNUG-TIGHT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE 1½ TURNS BEYOND SNUG-TIGHT.
5. ALL BOLTED CONNECTIONS SHALL USE LOCK WASHERS.
6. MINIMUM EDGE DISTANCE FOR BOLTS SHALL BE 1½" CENTER TO EDGE UNLESS OTHERWISE NOTED.

NOMINAL HOLE DIMENSIONS:

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

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REVISIONS:

0	06/19/19	ISSUE FOR CONSTRUCTION	RWR

CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION:

MOUNT AUGMENTATION

T-MOBILE: CT11312A
SBA: CT01210-S NORTH STONINGTON

NORTH STONINGTON, CT

LATITUDE: 41.4371139
LONGITUDE: -71.881467

SHEET TITLE:

NOTES AND SPECIFICATIONS

SHEET NUMBER:

S-2

PRE-CONSTRUCTION INSPECTION CHECKLIST

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

CONSTRUCTION INSPECTION CHECKLIST

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

POST-CONSTRUCTION INSPECTION CHECKLIST

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

GENERAL NOTES

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

INSPECTION AND REPORT RECOMMENDATIONS

1. THE FOLLOWING ARE PROVIDED IN THE INTENT OF ENHANCING THE EFFECTIVENESS OF THE AUGMENTATION INSPECTION AND IMPROVING THE EFFICIENCY OF THE PROCESS OF COLLECTING AND COMPILING THE INFORMATION INTO A USABLE REPORT:

1.1. IT IS RECOMMENDED THAT THE PRIME CONTRACTOR PROVIDE THE AUGMENTATION INSPECTOR AT LEAST 5 BUSINESS DAYS NOTICE FOR WHEN THE SITE WILL BE READY FOR THE AUGMENTATION INSPECTION.

1.2. THE PRIME CONTRACTOR AND THE AUGMENTATION INSPECTOR SHALL COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.

1.3. THE PRIME CONTRACTOR AND AUGMENTATION INSPECTOR SHALL BOTH BE PRESENT DURING THE INITIAL INSPECTION IN ORDER TO ALLOW FOR THE REMEDIATION OF DEFICIENCIES DURING THE INSPECTION, AS PRACTICABLE. IT MAY BE PREFERABLE TO KEEP WORK CREWS AND THEIR EQUIPMENT ON SITE TO REMEDIATE DEFICIENCIES DURING INSPECTIONS.

INSPECTION RESCHEDULING AND CANCELLATION

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

REMEDIATION OF FAILING INSPECTION

1. IN THE EVENT THAT ANY PORTION OF THE AUGMENTATION WORK IS DETERMINED TO BE UNSATISFACTORY BY THE MODIFICATION INSPECTOR, THE PRIME CONTRACTOR SHALL WORK WITH THE AUGMENTATION INSPECTOR TO CREATE A PLAN OF ACTION THAT WILL EITHER:

1.1. REPAIR THE DEFICIENT WORK TO SATISFACTORY CONDITION AND INCLUDE A SUBSEQUENT RE-INSPECTION OF THE WORK TO VERIFY THAT IT IS SATISFACTORY.

1.2. OR, WITH THE PERMISSION OF THE STRUCTURE OWNER AND/OR CUSTOMER, THE PRIME CONTRACTOR MAY WORK WITH THE ENGINEER OF RECORD TO REVIEW THE AS-BUILT CONDITION OF THE AUGMENTATION TO DETERMINE IF IT IS STRUCTURALLY ACCEPTABLE. IF THIS ACTION IS NOT ACCEPTABLE TO ANY PARTY, THE PRIME CONTRACTOR SHALL PROCEED TO REPAIR THE DEFICIENT WORK TO A SATISFACTORY CONDITION.

AUGMENTATION INSPECTOR'S RESPONSIBILITIES

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

PRIME CONTRACTOR'S RESPONSIBILITIES

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

PHOTOGRAPHY REQUIREMENTS

1. THE PRIME CONTRACTOR AND AUGMENTATION INSPECTOR SHALL BETWEEN THE EFFORTS OF BOTH PARTIES AND THEIR EMPLOYED PERSONNEL PROVIDE PHOTOGRAPHS WITH THE INSPECTION REPORT TO INCLUDE THE FOLLOWING:

a. GENERAL SITE PHOTOGRAPHS PRE-CONSTRUCTION

b. AUGMENTATION INSTALLATION PHOTOGRAPHS DURING CONSTRUCTION/ERECTION OPERATIONS AND INSPECTIONS

b.1. RAW MATERIALS

b.2. PHOTOS OF DETAILED WORK REQUIRED ON THE DRAWINGS (CONNECTIONS, WELDMENTS, FIELD-FABRICATED MEMBERS, ETC)

b.3. BOLT INSTALLATION AND TORQUE/PRETENSION.

b.4. FINAL INSTALLED CONDITION (AFTER DEFICIENT CONDITIONS, IF ANY, ARE REMEDIATED).

b.5. REPAIR OF SURFACE COATINGS (INCLUDING GALVANIZING AND/OR PAINT COATING)

c. POST-AUGMENTATION PHOTOGRAPHS OF THE SITE & WORK.

d. PHOTOGRAPHS OF THE FINAL STATE OF THE SITE AT CONCLUSION OF THE WORK BY THE PRIME CONTRACTOR, ASSOCIATED SUBCONTRACTORS, AND THE AUGMENTATION INSPECTOR.

e. OTHER PHOTOS MAY BE INCLUDED AT PRIME CONTRACTOR & AUGMENTATION INSPECTOR'S DISCRETION.

NOTE: PHOTOS OF AUGMENTATIONS INSTALLED ON THE STRUCTURE ABOVE AN ELEVATION OF 20 FT SHALL REQUIRE PHOTOS TAKEN FROM THE STRUCTURE AS WELL AS OVERALL PHOTOGRAPHS OF THE AUGMENTATIONS TAKEN FROM THE GROUND.

OWNER INSPECTIONS

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

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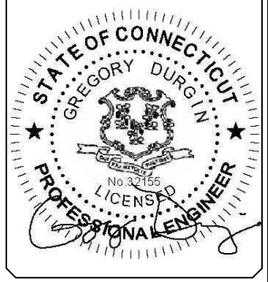


SITE INFORMATION:

MOUNT AUGMENTATION

T-MOBILE: CT11312A
SBA: CT01210-S NORTH STONINGTON

NORTH STONINGTON, CT

LATITUDE: 41.4371139
LONGITUDE: -71.881467

SHEET TITLE:

INSPECTION NOTES

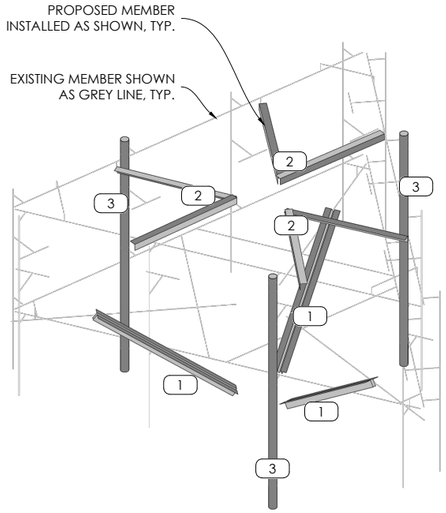
SHEET NUMBER:

S-3

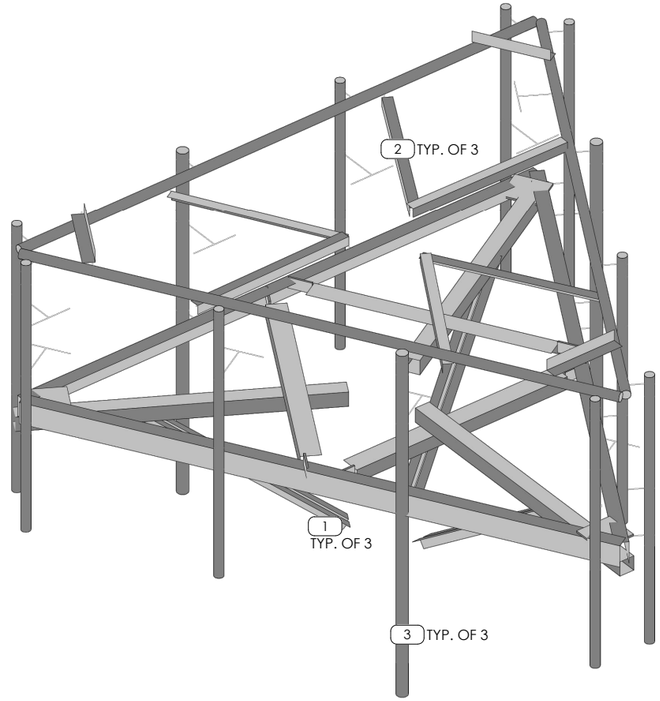
NEW MOUNT AUGMENTATIONS	
1	INSTALL PLATFORM REINFORCEMENT KIT; LOCATED 3.0' BELOW THE EXISTING STANDOFF CENTERLINE TO MONOPOLE SHAFT AND ATTACHING TO THE EXISTING STANDOFF MEMBER APPROXIMATELY 4.0' OUT FROM THE COLLAR ATTACHMENT. - SITEPRO1 PRK-1245L, (1) TOTAL.
2	INSTALL V-BRACE KIT; LOCATED APPROXIMATELY 3.0' ABOVE THE EXISTING MOUNT FACE RAIL CENTERLINE. - SITEPRO1 PRK-SFS-L, (1) TOTAL. ATTACH RING MOUNT IN KIT TO MONOPOLE SHAFT AND SFS ANGLE GATE CLAMP BRACKETS TO EXISTING HANDRAIL W/ A HORIZ. SPREAD OF APPROXIMATELY 5.2'. - ORIENT PRK-SFS COLLAR SUCH THAT THE SAFETY CLIMB IS UNAFFECTED.
3	INSTALL (3) PIPE2.5STD x 8'-0" MOUNT PIPES AT POSITION 2 MOUNT PIPE LOCATION (SUPPORTING RFS APXVAARR24 PANEL ANTENNA AND 4449 RRH). ATTACH NEW PIPE2.5STD MOUNT PIPE TO EXISTING BOTTOM CHANNEL RAIL W/ (2) NEW U-BOLT ASSEMBLIES AND TO EXISTING TOP HANDRAIL PIPE W/ NEW SITEPRO1 SCX x -43 CROSS-OVER PLATE ASSEMBLIES. REMOVE THE EXISTING MOUNT PIPE.
AUGMENTATIONS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY NEW EQUIPMENT.	

EXISTING MOUNT

PLATFORM W/ HANDRAIL @ 147' AUGMENTATION



MOUNT AUGMENTATION ISOLATION
SCALE: N.T.S.



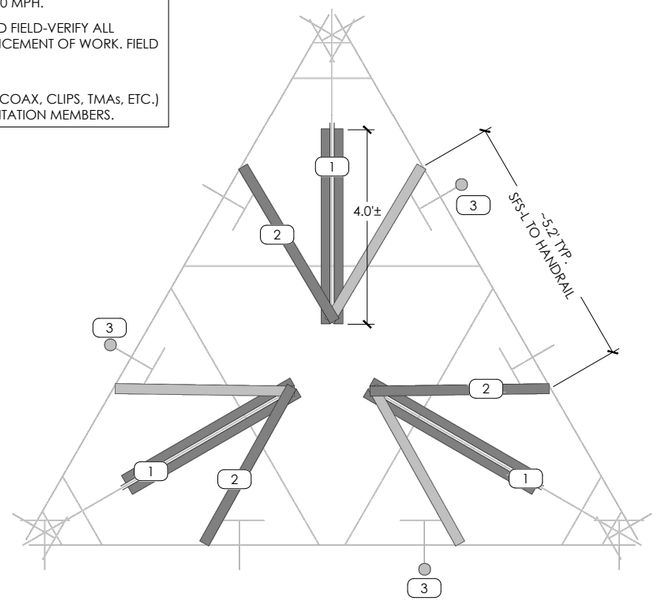
AUGMENTED MOUNT ISOMETRIC
SCALE: N.T.S.

CONSTRUCTION NOTES

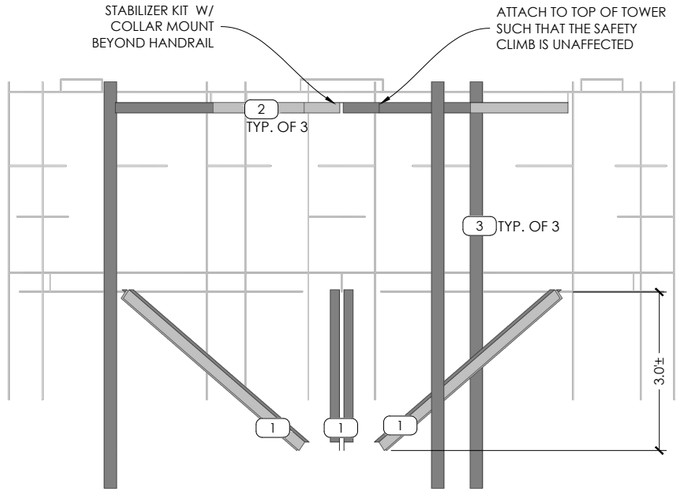
1. SCOPE OF WORK MUST BE COMPLETED AT WIND SPEEDS < 20 MPH.
2. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHOULD FIELD-VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. FIELD CUT MEMBERS AS REQUIRED.
3. CONTRACTOR TO COORDINATE THE TEMPORARY REMOVAL/RELOCATION/REPLACEMENT OF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

INSTALLATION NOTES

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



AUGMENTED MOUNT PLAN
SCALE: N.T.S.



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

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STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION:
MOUNT AUGMENTATION

T-MOBILE: CT11312A
SBA: CT01210-S NORTH STONINGTON

NORTH STONINGTON, CT

LATITUDE: 41.4371139
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SHEET TITLE:
AUGMENTATIONS SECTIONS & DETAILS

SHEET NUMBER:
S-4

EXHIBIT 10

Aug 20, 2019 at 5:28:18 PM
267 Norwich Westerly Rd
North Stonington CT 06359
United States

EXHIBIT 11

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11312A

N. Stonington/ RT 2
267 Norwich Westerly Road
North Stonington, CT 06359

May 22, 2019

Transcom Engineering Project Number: 737001-0053

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**12.09 %**

May 22, 2019

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

Emissions Analysis for Site: **CT11312A – N. Stonington/ RT 2**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **267 Norwich Westerly Road, North Stonington, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **267 Norwich Westerly Road, North Stonington, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

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

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

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	1900 MHz (PCS)	1	40
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	2	60
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Ericsson AIR21 B2A/B4P	147
A	2	Ericsson AIR21 B4A/B2P	147
A	3	RFS APXVAARR24_43-U-NA20	147
B	1	Ericsson AIR21 B2A/B4P	147
B	2	Ericsson AIR21 B4A/B2P	147
B	3	RFS APXVAARR24_43-U-NA20	147
C	1	Ericsson AIR21 B2A/B4P	147
C	2	Ericsson AIR21 B4A/B2P	147
C	3	RFS APXVAARR24_43-U-NA20	147

Table 2: Antenna Data

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

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Ericsson AIR21 B2A/B4P	1900 MHz (PCS)	15.9	2	55	2,139.75	0.39
Antenna A2	Ericsson AIR21 B4A/B2P	2100 MHz (AWS)	15.9	2	120	4,668.54	0.84
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.04
						Sector A Composite MPE%	**2.27**
Antenna B1	Ericsson AIR21 B2A/B4P	1900 MHz (PCS)	15.9	2	55	2,139.75	0.39
Antenna B2	Ericsson AIR21 B4A/B2P	2100 MHz (AWS)	15.9	2	120	4,668.54	0.84
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.04
						Sector B Composite MPE%	**2.27**
Antenna C1	Ericsson AIR21 B2A/B4P	1900 MHz (PCS)	15.9	2	55	2,139.75	0.39
Antenna C2	Ericsson AIR21 B4A/B2P	2100 MHz (AWS)	15.9	2	120	4,668.54	0.84
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.04
						Sector C Composite MPE%	**2.27**

Table 3: T-MOBILE Emissions Levels

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

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**2.27 %**
Sprint	4.22 %
AT&T	3.37 %
Verizon Wireless	2.23 %
Site Total MPE %:	**12.09 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	2.27 %
T-MOBILE Sector B Total:	2.27 %
T-MOBILE Sector C Total:	2.27 %
Site Total:	12.09 %

Table 5: Site MPE Summary

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

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) UMTS	1	1,556.18	147	2.81	1900 MHz (PCS)	1000	0.28%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	147	1.06	1900 MHz (PCS)	1000	0.11%
T-Mobile 2100 MHz (AWS) LTE	2	2,334.27	147	8.44	2100 MHz (AWS)	1000	0.84%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	147	2.85	600 MHz	400	0.71%
T-Mobile 700 MHz LTE	2	432.54	147	1.56	700 MHz	467	0.33%
						Total:	**2.27%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	2.27 %
Sector B:	2.27 %
Sector C:	2.27 %
T-MOBILE Maximum Total (per sector):	2.27 %
Site Total:	12.09 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **12.09 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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