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

December 4, 2020

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

RE: Notice of Exempt Modification
51 Daniel's Avenue, Waterford, CT 06385
Latitude: 41.330263
Longitude: -72.166672
T-Mobile Site #: CTNL808B_L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 160-foot level of the existing 180-foot Monopole Tower at 51 Daniel's Ave., Waterford, CT. The 180-foot tower is owned by SBA Towers II LLC. The property is owned by the Town of Waterford. T-Mobile now intends to remove three (3) L700MHz antennas and replace with three (3) new L700/L600/1900 MHz antennas. The new antennas support 5G services and would be installed at the 160-foot level of the tower.

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

Planned Modifications:

TOWER

Remove:

- N/A

Remove and Replace:

- (3) Commscope LNX-6515DS-VTM antennas (remove) – (3) RFS APXVAARR24_43-U-NA20 antenna (replace)
- (3) Ericsson Double TMA 17/21 TMA (remove) – (3) Ericsson KRY 112 144/1 TMA (replace)
- (3) RFS ATMAA1412D-1A20 TMA (remove) – (3) Ericsson KRY 112 489/2 TMA (replace)

Install New:

- (3) Ericsson Radio 4449 B71+B12 RRU
- (3) Modified T-Frame
- (3) Custom Mount Augmentations
- (3) Stabilizer Kits
- (3) 2.5STD x 8' Pipe mounts
- (2) 1-5/8" fiber

Existing Equipment to Remain:

- (3) RFS APX16DWV-16DWVS antennas
- (3) T-Arm
- (3) Kathrein 782 11056 Bias Ts
- (1) ½" coax
- (1) 1-5/8" fiber
- (12) 1-5/8" coax

Entitlements:

- (4) 1-5/8" coax

GROUND

Install New:

- Equipment inside existing 6102 cabinet

This facility was approved by the Town of Waterford's Planning & Zoning Commission under Special Permit #PZ2008-033 on November 24, 2008. Approval was given for a 180' lattice telecommunications tower with antennas to a total height of 195' and a leasing area of 100' by 100' with a 70' x 70' fenced compound for the tower and equipment and future collocating telecommunication uses. A 30' wide utility and access easement was provided. A 4' high chain link fence was to be installed upon completion of the project. 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 Waterford's First Selectman, Robert J. Brule, and Zoning Official, Jill Pisechko. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

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

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

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

Sincerely,

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

Attachments
cc: Robert J. Brule, First Selectman / with attachments
Town of Waterford, 15 Rope Ferry Road, Waterford, CT 06385
Jill Pisechko, Zoning Official / with attachments
Town of Waterford, 15 Rope Ferry Road, Waterford, CT 06385

EXHIBIT LIST

Exhibit 1	Check Copy	x To be invoiced at a later date Per Covid Guidelines
Exhibit 2	Notification Receipts	x
Exhibit 3	Property Card	x
Exhibit 4	Property Map	x
Exhibit 5	Original Zoning Approval	Town of Waterford's P&Z Commission November 24, 2008, PZ2008-033 Nov. 25, 2008, Town of Waterford approved BP 1/21/2009
Exhibit 6	Construction Drawings	Chappell Engineering 10/20/19
Exhibit 7	Modification Drawings	Geo Structural 7/22/19
Exhibit 8	Structural Analysis	TES 8/27/19
Exhibit 9	Mount Analysis	Geo Structural 7/21/19
Exhibit 10	EME Report	Transcom Engineering 5/30/19

EXHIBIT 1

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

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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EXHIBIT 3

51 DANIELS AVENUE

Location	51 DANIELS AVENUE	**Mblu**	143/ / 1783/ /
Acct#	00153300	**Owner**	WATERFORD TOWN OF
Assessment	$2,924,780	**Appraisal**	$4,178,220
PID	1783	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$2,498,220	$1,680,000	$4,178,220
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$1,748,780	$1,176,000	$2,924,780

Parcel Addreses

Additional Addresses		
Address	**City, State Zip**	**Type**
51 DANIELS AVENUE		Primary

Owner of Record

Owner	WATERFORD TOWN OF	**Sale Price**	$0
Co-Owner	SOUTHWEST SCHOOL	**Certificate**	
		Book & Page	107/ 567
		Sale Date	09/15/1956
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
WATERFORD TOWN OF	$0		107/ 567	00	09/15/1956

Building Information

Building 1 : Section 1

Year Built:	1960
Living Area:	29,626

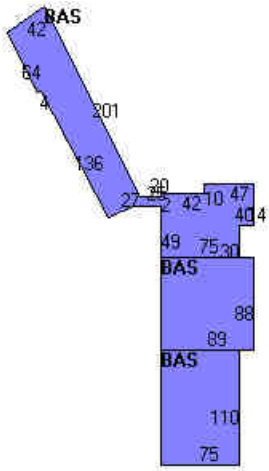
Replacement Cost: $3,608,779
Building Percent Good: 65

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

Building Photo

(http://images.vgsi.com/photos/WaterfordCTPhotos//\00\01\54/

Building Layout



(http://images.vgsi.com/photos/WaterfordCTPhotos//Sketches/1

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	29,626	29,626
		29,626	29,626

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
ELV1	ELEVATOR PASS	1 STOPS	$16,250	1
	RADIO TOWER	5000 UNITS	$40,630	1

Land

Land Use

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

Land Line Valuation

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

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving	AS	Asphalt	42000 S.F.	$78,750	1
SHD1	Shed	FR	Frame	400 S.F.	$6,750	1
SHD1	Shed	FR	Frame	200 S.F.	$3,380	1
SHD1	Shed	FR	Frame	400 S.F.	$6,750	1

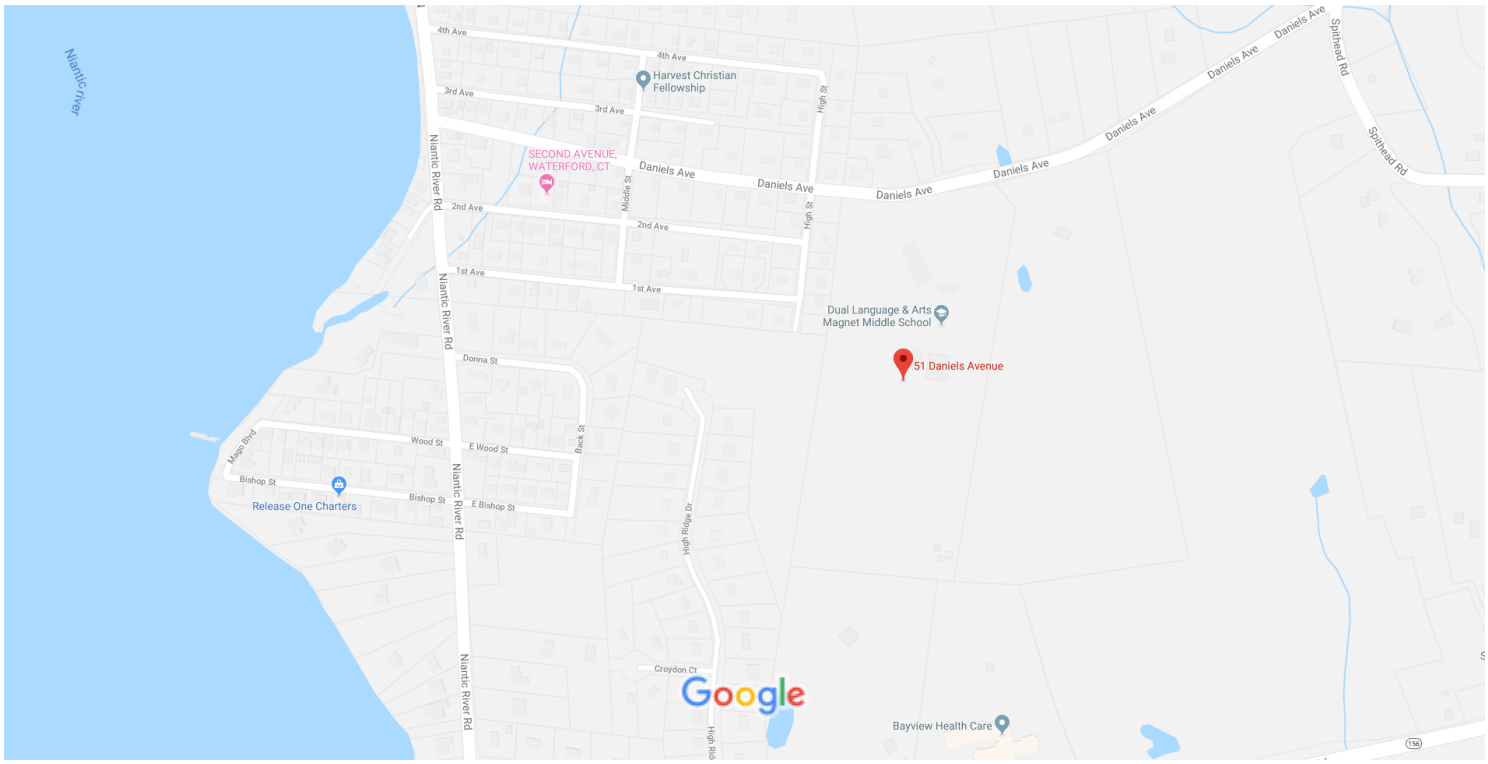
Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$2,294,830	$1,680,000	$3,974,830
2013	$2,294,830	$1,680,000	$3,974,830
2010	$0	$0	$6,099,657

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$1,606,400	$1,176,000	$2,782,400
2013	$1,606,400	$1,176,000	$2,782,400
2010	$0	$0	$4,269,760

EXHIBIT 4

Google Maps 51 Daniels Ave



Map data ©2019 200 ft

51 Daniels Ave

Waterford, CT 06385

Directions Save Nearby Send to your phone Share

8RJM+R4 Waterford, CT

At this location

Dual Language & Arts Magnet Middle School

3.4 ★★★½☆ (27)

Middle school · 51 Daniels Ave

EXHIBIT 5

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

TOWN OF WATERFORD
PLANNING & ZONING COMMISSION

NOTICE OF GRANT OF A SPECIAL PERMIT

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

Owner of Record: Town of Waterford

Address: 51 Daniels Avenue

Description of Premises:

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

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

Applicable Zoning Regulations: Sections 5, 22 & 23.

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

PLANNING & ZONING COMMISSION

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

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

FIFTEEN ROPE FERRY ROAD

Town of Waterford

WATERFORD, CT 06385-2886

October 17, 2008

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

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

Dear Mr. Fisher:

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

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

Sincerely,

Carol Libby

Carol Libby
Recording Secretary
Conservation Commission

Certified Mail #7006 0810 0006 0893 5010

cc: Town of Waterford – 1st Selectman
SBA Network Services, Inc.

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886

November 25, 2008

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

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

Dear Mr. Dupont:

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

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

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

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

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

Sincerely,

Dawn Choisy

Dawn Choisy
Recording Secretary
Planning and Zoning Commission

Enclosure: Minutes
Notice of Action

Certified #7008 0500 0000 7478 7841

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

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

November 25, 2008

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

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

TOWN OF WATERFORD
PLANNING AND ZONING COMMISSION
NOTICE OF ACTION

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

APPROVED WITH CONDITIONS

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

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

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

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

Dated at Waterford, CT this 25th day of November, 2008.

Edwin Maguire, Chairman
Gwendolyn Hughes, Secretary

By: Dawn Choisy, Recording Secretary 444-5813

MINUTES

Planning & Zoning Commission
Waterford Town Hall

November 24, 2008
7:00 PM

Members Present:	G. Hughes, J. Auwood, T. Ward, D. Award (7:02)
Members Absent:	E. Maguire
Alternates Present:	B. Chenard, A. Laben (7:02)
Alternates Absent:	D. Offen
Staff Present:	T. Wagner, M. Wujtewicz, D. Choisy

ITEM #1 CALL TO ORDER/APPOINTMENT OF ALTERNATES
Acting Chairperson Hughes called the meeting to order at 7:00. B. Chenard was appointed to sit for E. Maguire.

ITEM #2 APPROVAL OF MINUTES
MOTION: Motion made by T. Ward, seconded by J. Auwood, to approve the minutes of the November 10, 2008 meeting as written.
VOTE: 4-0

D. Award and A. Laben arrived at the meeting at 7:02.

ITEM #3 RECEIPT OF APPLICATIONS
No new applications were received.

ITEM #4 APPLICATION REVIEWS
#PZ2008-013 – Request of Waterford Board of Education, applicant; Town of Waterford, owner; Jacunski Humes Architects, agent for site plan approval to construct a new elementary school at 6 Goshen Road, R-20 zone, in accordance with Section 4 and 22 of the Zoning Regulations and as shown on plans entitled "Great Neck Elementary School, 165 Great Neck Road, Waterford, Connecticut" dated June 16, 2008.

Al Jacunski of Jacunski Humes Architects, Mark Roming of M.R. Roming and Associates and Jim Velleman of BVH Integrated Services were present for this application.

Documents prepared by M.R. Roming and Associates and BVH Integrated Services responding to Staff's comments were distributed to the Commission. Mr. Roming, Mr. Velleman and Mr. Jacunski reviewed the responses.

T. Wagner stated that there are concerns regarding the noise from the generator. Mr. Jacunski said that the proposed generator in its proximity to the adjacent residential property does not meet the noise ordinance. The proposed generator is oversized, and is being funded by CL&P. There are currently discussions with the Board of Education and the Board of Finance about going with a smaller generator. Mr. Jacunski stated that a noise attenuation package is available for an additional cost and will be discussed with the Board of Education and the Board of Finance.

Acting Chairperson Hughes asked if the generator can be relocated. Mr. Jacunski stated that the site is very tight. Mr. Jacunski replied that the $40,000 cost for attenuation package will be offset by the

Mr. Schuch reviewed the proposed placement of the house and garage. A portion of the garage is in the right-of-way, and if the rights to the area are not extinguished, a modified site plan will be submitted for review, with the garage either eliminated or relocated outside of the right of way.

Mr. Schuch stated that tentative approval has been received from the Health District. The existing right-of-way to the south will be maintained, and a small retaining wall is proposed.

The Commission reviewed the stipulations and conditions included in the draft approval prepared by Staff.

MOTION: Motion made by T. Ward, seconded by B. Chenard, to approve application #PZ2008-030 with the conditions stated in Attachment A.
VOTE: 5-0

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

The Commission reviewed the draft special permit prepared by Staff.

MOTION: Motion made by J. Auwood, seconded by T. Ward, to approve Application #PZ2008-033 with the modifications and revisions stated in Attachment B.
VOTE: 5-0

#PZ2008-038 – Request of Michael Hoelck, applicant; Hoelck's Realty LLC, owner, for modification of an approved site plan at 341 Boston Post Road, R-20 zone, in accordance with Sections 4 and 22 of the Zoning Regulations and as shown on plans entitled "Zoning Location Plan Showing Proposed Roof Addition, Hoelck Realty, LLC" dated October, 2008.

Applicant Michael Hoelck presented this application to the Commission. He stated that this application was for a roof over an existing deck on the building.

T. Wagner reviewed Staff's comments with the Commission. He stated that the florist use on this site was permitted through the issuance of a use variance. He reviewed the options the Commission has in making a determination on this application. Mr. Wagner stated that if the Commission allows the applicant to construct the roof over the deck and use the area as part of his business, revised parking calculations will have to be submitted in order to determine if there is sufficient parking to support the increased square footage of the business use.

Mr. Hoelck stated that one of Staff's comments states that no outdoor seating is to be permitted on the deck. He stated that he has a tenant who likes to sit on the deck. M. Wujtewicz stated that because there is no proposal for any food service, he wanted it to be made clear that there would be no seating on the deck associated with food service.

M. Wujtewicz stated that there appears to be adequate parking spaces for the present uses on the site, but without the calculations, it can't be determined for certain.

Mr. Hoelck stated that he would want to use the deck to display plants. He stated that he would not want to add more parking spaces.

G. Hughes stated that they can't approve the additional square footage without knowing if there is enough existing parking.

T. Wagner asked if any heating, lights or utilities are proposed on the deck. Mr. Hoelck replied that only lights will be installed. He would like to use the area for display.

T. Wagner stated that Staff recommends that the Commission approves the roof over the deck for display only in association with the florist shop with the conditions that the parking calculations be put on the final plan, the label "office/retail building" removed from the plan and replaced with "florist" since that was the use specifically permitted through the issuance of the use variance. A label indicating the existing residential use also is placed on the plan. In addition it shall be noted that any outdoor use of the parking lot including additional retail market must be reviewed and approved by the Commission.

MOTION: Motion made by D. Award, seconded by B. Chenard, to approve Application #PZ2008-038 with the conditions that the parking calculations be put on the plan, the label "office/retail building" be removed from the plan and replaced with "florist" and "single family residential". No outdoor farmers market is approved.
VOTE: 5-0

ITEM #5 ADMINISTRATIVE REVIEW

Pre-application review – Connecticut Humane Society, Old Colchester Road
Kathy Cowles and Eric Roise of the SLAM Collaborative reviewed the proposed improvements to the Connecticut Humane Society facility on Old Colchester Road.

Pre-application review – 22 Miner Lane, Multi-Family Housing
Donald Gerwick, Gregory Laramie, Ken Navarro and Eric Burns reviewed a proposed development for this site, and discussed the possibility of using a private instead of a public road.

ITEM #6 CORRESPONDENCE

ITEM #7 ADJOURNMENT
MOTION: Motion made by T. Ward, seconded by D. Award, to adjourn the meeting at 9:41.
VOTE: 5-0

Respectfully submitted,

Dawn Choisy
Recording Secretary
Planning and Zoning Commission

S:\Permit\PUBLIC\WS\PZAPPS\Minutes\081124pzc.doc

SPECIAL PERMIT – 51 Daniels Avenue Telecommunications Tower

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

HEARING DATE: November 10, 2008

PUBLIC HEARING NOTICE PUBLISHED: New London Day, 10/27 & 11/3/2008

NOTIFICATION OF PROPERTY OWNERS WITHIN 150':

PROJECT DESCRIPTION: Construct 180' lattice tower with antennae to a total height of 195' for the purpose of providing a municipal facility to accommodate the Town's public safety radio system. Project also includes leasing an area 100' by 100' within which will be a 70' x 70' fenced compound for the tower and equipment required to operate the radio system and future collocating telecommunication uses. Improvements are planned to provide vehicular access to the leased area, by way of a 30' wide utility and access easement as detailed on the site plan. Temporary construction easement areas will also be necessary as detailed on the site plan.

FINDINGS: SECTION 23.5

23.5.1 Compliance with the Adopted Land Use Plan and the Zoning Regulations

Sections 5.2.4 Municipal Facilities and 5.2.1 Towers exceeding 40' in height are allowed subject to the issuance of a special permit. The police radio system is considered a necessary municipal improvement as brought forward by the Emergency Management Advisory Council. The tower is one of five locations from which the radio system will operate. The Commission has previously approved the Rogers Hill location and the others involve collocation on existing or reconstructed locations.

The 1998 Plan of Preservation, Conservation and Development, (1998 Plan) Chapter 12 INFRASTRUCTURE, Other Utilities, (p84) Recommends:

"Consider other utility improvements as well" ...

"To encourage economic development and to best meet the needs of local residents and businesses, the Town should encourage a program of continual improvement of: Communications services and capacity."

"The Town should continue to carefully review the evolution of telecommunications technology (such as cellular communications from towers) in order to provide for the reasonable needs of residents and businesses while considering the overall impact on the community."

The Commission finds that the tower as proposed is consistent with the 1998 Plan as a necessary public safety infrastructure project with secondary benefits for users of cellular communications.

23.5.2 ORDERLY DEVELOPMENT:

Access to the site and the location of the tower have been placed to minimize their impact on the current operation of the school and potential adaptive reuse of this site since it is due to close upon completion of the new elementary school project. The leased area has been set back from the property line in accordance with current bulk requirements.

23.5.3 PROPERTY VALUES AND CHARACTER:

The School property, and two open space parcels are adjacent to the site. The millstone station and power transmission lines emanating there from are significant part of the visual landscape. The development of this site for the use intended will not have an impact on property values.

23.5.4 PUBLIC SAFETY:

Adequate access for police and emergency vehicles is provided, to the extent necessary.

23.5.5 TRAFFIC CONSIDERATIONS:

During construction adequate provisions for vehicular access to the site will be provided and separated from the school use. Post construction access will be intermittent and service related. Access at the entrance off of Daniels Ave. is considered adequate for the minimal increase in traffic.

23.5.6 LANDSCAPING AND BUFFERS:

30 feet of the leased area on three sides will be landscaped to minimize the visibility of any of the equipment shelter(s) and fencing within the compound. The design of the tower is consistent with others approved by this commission with the knowledge that they can not be fully screened. Based on the renderings provided the tower height and design is acceptable.

23.5.7 RELATIONSHIP TO UTILITY SYSTEMS, DRAINAGE AND IMPACT ON COMMUNITY FACILITIES.

The project will not require water or sewerage service either public or on site. The majority of the site will be pervious and therefore drainage improvements will be minor. The tower is an essential part of the public safety radio system and as such will have a positive impact on communications necessary to protect the public.

23.5.8 COMPLIANCE WITH THE ZONING REGULATIONS:

The proposed site plan conforms to the requirements of the Zoning Regulations. The development anticipates collocation of telecommunications users which are not subject to Zoning Compliance, but rather the requirements of the CT Siting Council.

MODIFICATIONS & CONDITIONS:

1. Revisions as detailed in 11/5/2008 correspondence from Christopher Fisher, Esq. to sheets Z-3 and Z-8 dated 10/30/08, except as modified herein.
2. Add temporary construction fencing along the western side of the access drive filling in where it is not currently proposed from its current southern terminus to the compound.
3. A permanent 4 foot high chain link fence is to be installed upon completion of the project and removal of the construction fencing.
4. Based on the need of the Town to expedite the construction of the tower, a temporary use permit may be issued in lieu of completion of all site work as determined by the Commission's agent, upon such guarantees that it will be completed as soon as weather permits. Such use may not proceed if the site and access drive are not maintained in compliance with the erosion control plan and regulations.
5. The Tower shall not be considered for co-location until the Town has completed construction and has installed all its antennae and equipment.

COMMISSION ACTION:

The Commission approves application #PZ2008-033 for special permit and site plan approval. All potential adverse impacts have been addressed as modified herein. Approval pursuant to CGS 8-24 is also included in this action.

MODIFICATION, REVISIONS, EXTENSIONS:

All revisions, extensions and modifications to any items, conditions or stipulations in this permit shall be governed by the provisions of section 23.9 of the Waterford Zoning Regulations.

VIOLATIONS:

Any violations of the findings, stipulations or conditions of this permit shall be subject to section 23.8 of the Waterford Zoning Regulations.

LIST OF EXHIBITS:

EXHIBIT A -	Application and support materials.
EXHIBIT B -	Notice of Public Hearing advertised in the Day newspaper on 10/27/08 and 11/3/08
EXHIBIT C -	Notification letter to applicant, along with certificates of mailing.
EXHIBIT D -	Staff and agency condensed comment sheet.
EXHIBIT E -	Plan titled "Southwest School, 51 Daniels Avenue, Waterford, CT 06385" dated 9/13/08.
EXHIBIT F -	Letter dated November 5, 2008 from Christopher B. Fisher, Cuddy & Feder, to the Planning and Zoning Commission addressing Staff and agency comments, with attachments.
EXHIBIT G -	e-mail correspondence from Jonathan Scott regarding the impact of the proposed tower on the view from his future home.
EXHIBIT H -	Map of areas currently covered by communication system.
EXHIBIT I -	Series of photographs submitted by Michael Bonanno

CERTIFICATION:

This is to certify that this Special Permit was approved on November 24, 2008.

Waterford Planning and Zoning Commission

Dawn Choisy

Dawn Choisy

Recording Secretary

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

WATERFORD CONSERVATION COMMISSION
PERMIT #08-041: 51 Daniels Avenue, Waterford, CT

The Conservation Commission hereby authorizes the applicant to conduct regulated activities in designated areas that fall under the jurisdiction of the Inland Wetlands and Watercourses Act, as amended, Section 22a-36 to 22a-45, inclusive, of the Connecticut General Statutes.

This permit is a grant of approval from the Waterford Conservation Commission to conduct the following regulated activities:

1. Excavation and grading adjacent to inland wetlands for construction of a municipal communications tower.

These regulated activities are associated with the proposed installation of a 180 ft. steel communications tower on the southeast portion of property located at 51 Daniels Avenue, Waterford, Connecticut. The proposed activity is shown on a site plans entitled; "SITE NAME: SOUTHWEST SCHOOL, SITE ADDRESS: 51 DANIELS AVENUE, WATERFORD, CT 06385" Sheets T-1, CC-1 thru CC-9, prepared by Dewberry-Goodkind, Inc., dated 8/25/08.

The Conservation Commission has reviewed the application and attaches the following conditions to minimize impacts associated with the regulated activities and further protect the inland wetlands and watercourses on this site:

SPECIAL CONDITIONS:

1. A crushed stone pad shall be provided for the existing dumpster location to reduce erosion and sediment transport.

2. The access driveway shall be graded to provide for sheet-flow of stormwater run-off to the vegetated strip.

3. Discharge from the de-watering controls shall be directed to the west of the tower site.

STANDARD CONDITIONS:

4. The limits of clearing and non-encroachment lines shall be marked on the lot by a licensed surveyor and reviewed by the Commission's agent prior to the start of lot development.

5. The Conservation Commission's agent shall be notified at least 48 hours prior to commencement of any regulated activity.

6. Final stabilization of disturbed soil areas shall be stabilized with the application of loam, seed, required plantings and appropriate erosion control measures.

7. At all times during site work and until soil areas are stabilized, the applicant shall install and maintain erosion and sediment control measures such as fabric filter fence, staked hay bales or other measures deemed necessary by the Commission's agent to prevent erosion and sedimentation impacts to wetlands and watercourses.

8. Erosion control and soil stabilization measures shall comply with the approved plans and the guidelines as established in the Connecticut Guidelines for Soil Erosion and Sediment Control, 2002, CTDEP Bulletin 34.

9. Upon direction of the Commission's agent, erosion and sediment control measures shall be removed by the applicant following stabilization of the site.

All work and all regulated activities conducted pursuant to this authorization shall be consistent with the terms and conditions of this permit. Any structures, excavation, fill, obstructions, encroachments or regulated activities not specifically identified and authorized herein shall constitute a violation of this permit and may result in permit modification, suspension or revocation.

In the event that any additional wetland or watercourse regulated activities are required as a result of other agency permitting to support the proposed facility, the Waterford Conservation Commission reserves the right to reconsider development of this site and may require design modifications to minimize the impact to regulated resources.

In evaluating this application, the Commission has relied on information provided by the applicant. If such information subsequently proves to be false, incomplete and/or inaccurate, this permit shall be modified, suspended or revoked.

This permit shall be valid for a period of 5 years. If the regulated activity is not completed within this time frame, the permit may be held to be invalid by the Conservation Commission and the applicant may be required to petition the Commission for an extension or re-issuance of the permit. The Commission may require the applicant to furnish additional information at that time.

The Conservation Commission renders this Summary Ruling in accordance with the Waterford Inland Wetlands and Watercourses Regulations based on the following considerations:

A. The activity does not involve direct impacts to inland wetlands or watercourses.

B. Short-term impacts from the proposed development will be controlled by installation and maintenance of construction erosion and sediment controls and construction run-off controls.

C. Strict adherence to the terms and conditions imposed with this permit will protect the quality of wetlands and surface waters on this property.

This permit will be strictly enforced. If the Conservation Commission finds that the applicant has not complied with the permit conditions or has exceeded the scope of this permit as set forth herein, or, if the intended use of the general site is not as represented by the application or the plan of record, the Commission may suspend or revoke this permit, direct the Environmental Officer to issue a cease and desist order, require the applicant to modify, extend or revise the site work, or require the applicant to restore the area to its original condition.

Dated at Waterford, Connecticut this 16th day of October, 2008.

By: _____
Chairman, Gary Johnson

BUILDING DEPARTMENT
TOWN OF WATERFORD, CONNECTICUT
Building Permit

Permit Number: B2009-0004

Date: 01/21/2009

Estimated Cost: $260,000.00

Permit Fee: $46.80

Property Address: 0051 DANIELS AVENUE

Type of Building: Commercial

PERMISSION IS HEREBY GRANTED FOR THE FOLLOWING:

DESCRIPTION: INSTALLATION OF A TELECOMMUNICATIONS FACILITY TO INCLUDE A 180' SELF SUPPORT TOWER WITH FOUNDATION, FENCED COMPOUND, ASSOCIATED ELECTRIC & TELEPHONE SERVICES AND TOWN EMERGENCY SERVICES PER PLANS SUBMITTED

Owner: WATERFORD TOWN OF
Address: 15 ROPE FERRY RD
WATERFORD, CT 06385

Telephone: --

Leasee:

Contractor: SBA NETWORK SERVICES
860-659-9101

Telephone:

Address: 80 EASTERN BLVD.
GLASTONBURY, CT 06033

License #:

Building Official

NOTE: The recipient of this permit accepts this permit on the condition that he, as owner, or as representing the owner, agrees to comply with all building and zoning ordinances of the Town of Waterford and the State Statutes of the State of Connecticut regarding the use, occupancy, and type of building to be constructed and agrees that this building is to be located the proper distances from all other zones and is located in a zone in which the building and its use is allowed. PER SECTION 105.5 OF THE CONNECTICUT STATE BUILDING CODE, you have 180 days from the date this permit was issued to start work. If work will not commence within that time period please call the building official, who may for cause extend or reissue the permit. You may have to pay all or part of the building permit fee depending on when your request is received in this office. Full text of the section of the building code is available upon request. PLEASE CALL 860-444-5826, IF YOU HAVE ANY QUESTIONS AND/OR ARE READY FOR REQUIRED INSPECTION(S).

Application Review Comments

Town of Waterford
15 Rope Ferry Road
Waterford, CT
06385
P: (860) 444-5813
F: (860) 444-5879

Location	Application #	Permit Type	Applicant
0051 DANIELS AVENUE	B2009-0004	Building	No Applicant Information

Department	Reviewer	Date Approved	Comment
Environmental Planner	Maureen Fitzgerald	01/21/2009	APPROVED IN ACCORDANCE with Conservation Permit #08-041. Conditions of approval include: 1. Erosion from existing dumpster pad shall be corrected in accordance with the approved site plan. 2. The limits clearing shall be marked on the property by a licensed surveyor and approved by the Environmental planner PRIOR to th Start of Lot Development. 3. Access driveway shall be graded topromote sheetflow of run-off towards vegetated strip. 4. The Environmental planner shall be notified at least 48 hrs. prior to commencement of any REGULATED Activity. 4. Final stablization and planting shall be in accordance with the approved site plan. MF

EXHIBIT 6

AMTRAK_WATERFORD2

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

51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

SITE NO.: CTNL808B

SITE TYPE: 180'± SELF SUPPORT TOWER

RF DESIGN GUIDELINE: 67D04B HYBRID

SITE NOTES

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

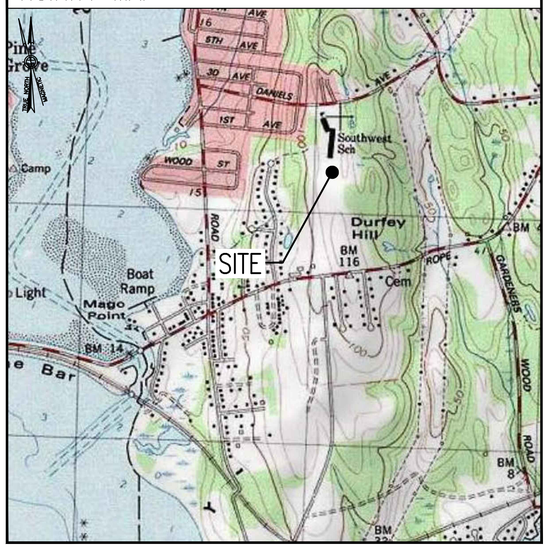
GENERAL NOTES

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

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

VICINITY MAP

SCALE: 1" = 1000'-0"



DO NOT SCALE DRAWINGS

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

SHEET INDEX

SHEET NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	1
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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:	CTNL808B
SBA SITE NUMBER:	CT09865-S
SBA SITE NAME:	NIANTIC
SITE ADDRESS:	51 DANIELS AVENUE WATERFORD, CT 06385
PROPERTY OWNER:	TOWN OF WATERFORD/SOUTHWEST SCHOOL DISTRICT 51 DANIELS AVENUE WATERFORD, CT 06385
TOWER OWNER:	SBA TOWERS II, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	NEW LONDON COUNTY
ZONING DISTRICT:	R-40, RESIDENTIAL DISTRICT
STRUCTURE TYPE:	SELF SUPPORT TOWER
STRUCTURE HEIGHT:	180'
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.41.330480° (41°-19'-49.73") LONGITUDE W.-72.166630° (-72°-09'-59.87")

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
0	10/20/19	ISSUED FOR CONSTRUCTION	BDJ
0	06/11/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CTNL808B

SITE ADDRESS:
51 DANIELS AVENUE
WATERFORD, CT 06385

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.127

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SITE WORK GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

CONCRETE AND REINFORCING STEEL NOTES:

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

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

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

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

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

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

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

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

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

STRUCTURAL STEEL NOTES:

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

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

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

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

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

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

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

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

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

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

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

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

COMPACTION EQUIPMENT:

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

CONSTRUCTION NOTES:

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	10/20/19	ISSUED FOR CONSTRUCTION	BDJ
0	06/11/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CTNL808B

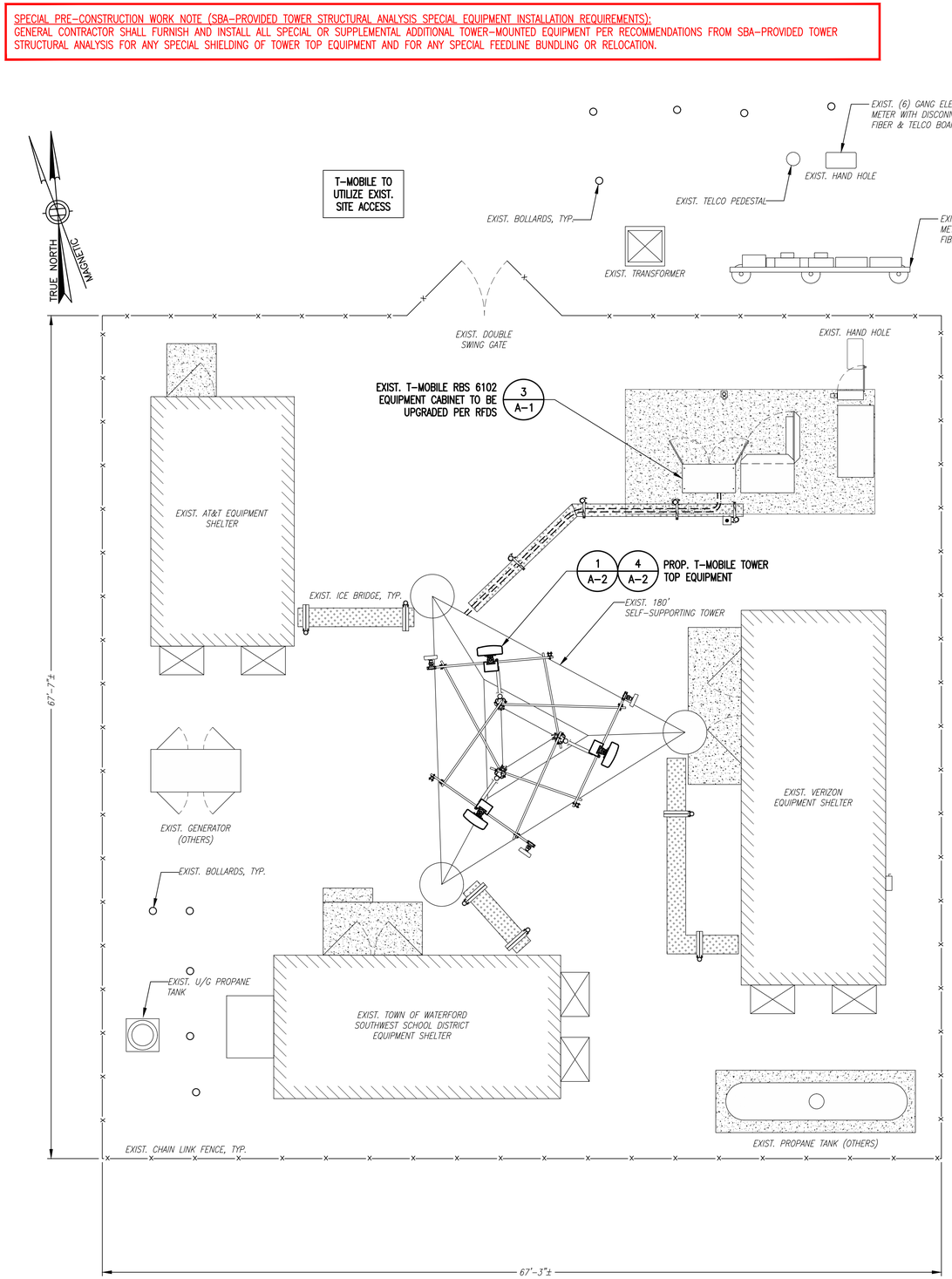
SITE ADDRESS:
51 DANIELS AVENUE
WATERFORD, CT 06385

SHEET TITLE
GENERAL NOTES

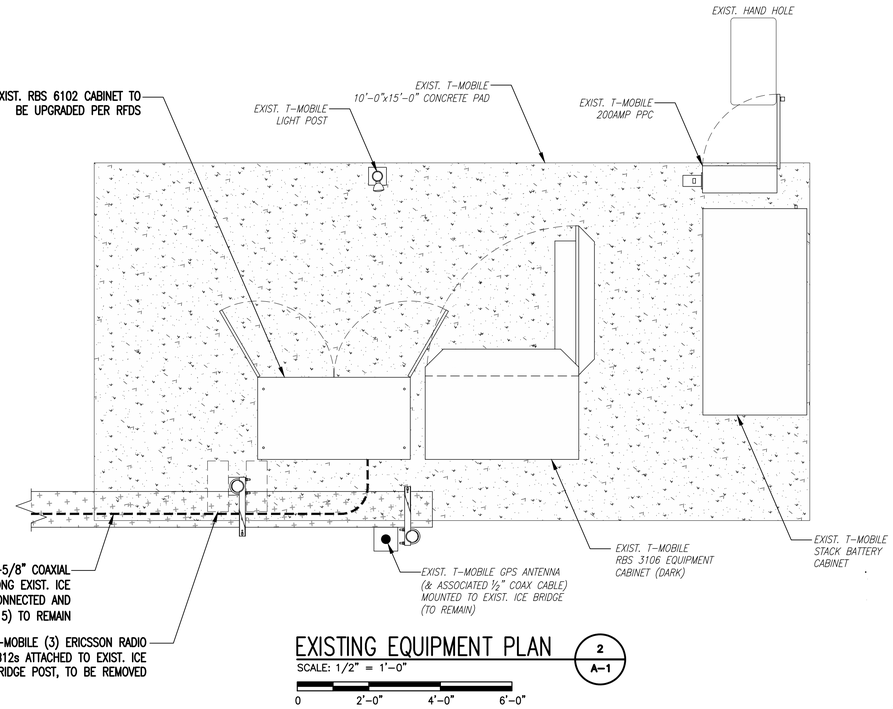
SHEET NUMBER
GN-1

1815.127

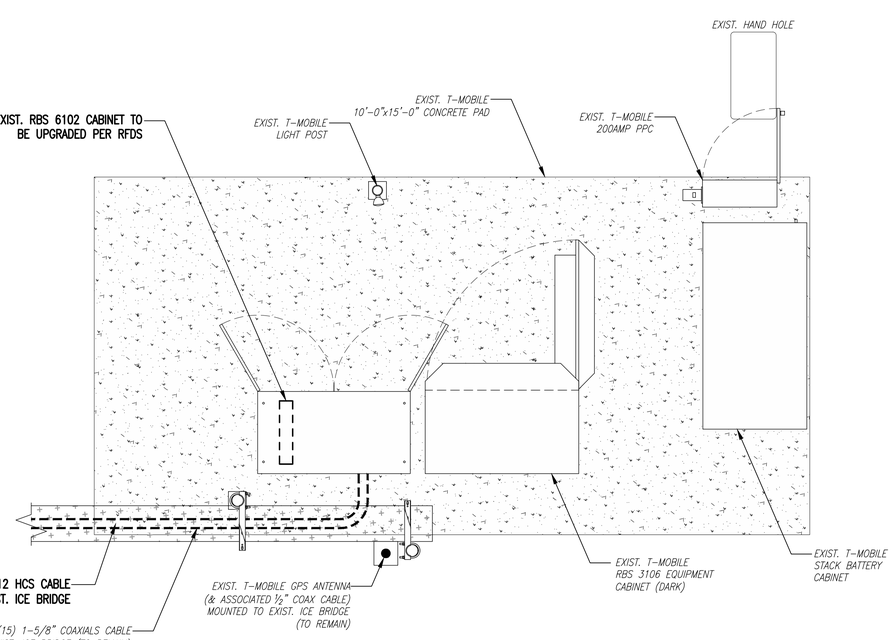
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY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



COMPOUND PLAN 1 / A-1
SCALE: 1" = 5'-0"
0 5'-0" 10'-0" 15'-0"



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



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

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SUBMITTALS

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0	10/20/19	ISSUED FOR CONSTRUCTION	BDJ
0	06/11/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CTNL808B

SITE ADDRESS:
51 DANIELS AVENUE
WATERFORD, CT 06385

SHEET TITLE
COMPOUND & EQUIPMENT PLAN

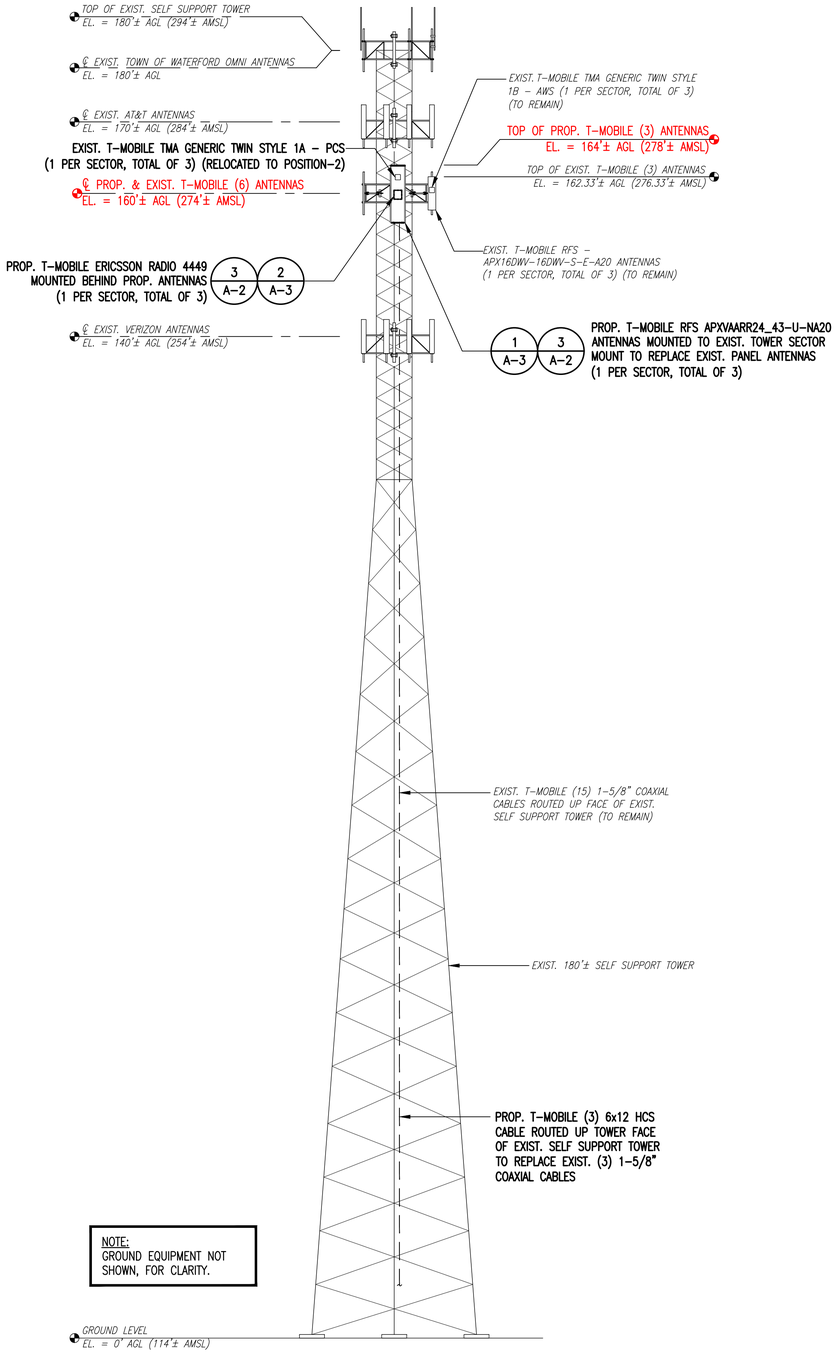
SHEET NUMBER
A-1

1815.127

GENERAL CONTRACTOR TO REMOVE ANY UNLICENSED T-MOBILE ANTENNAS

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.

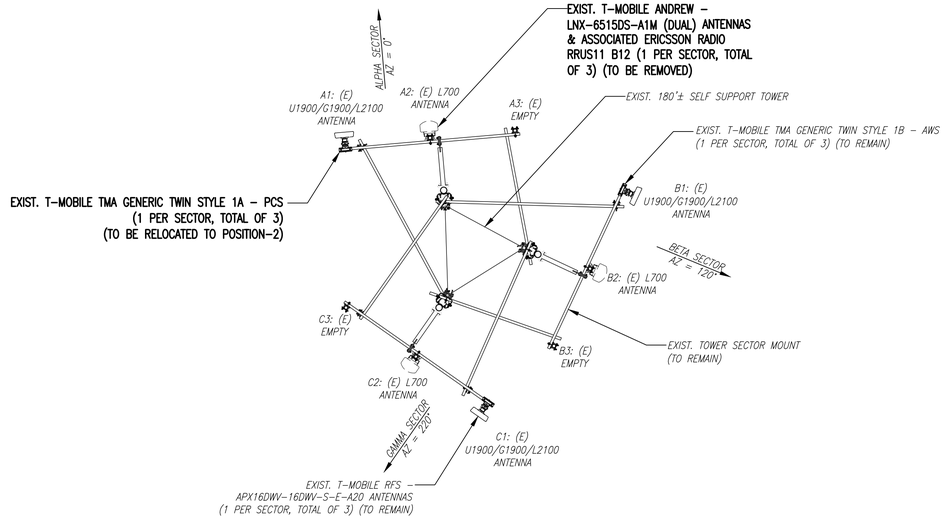
RAD CENTER NOTE:
T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.



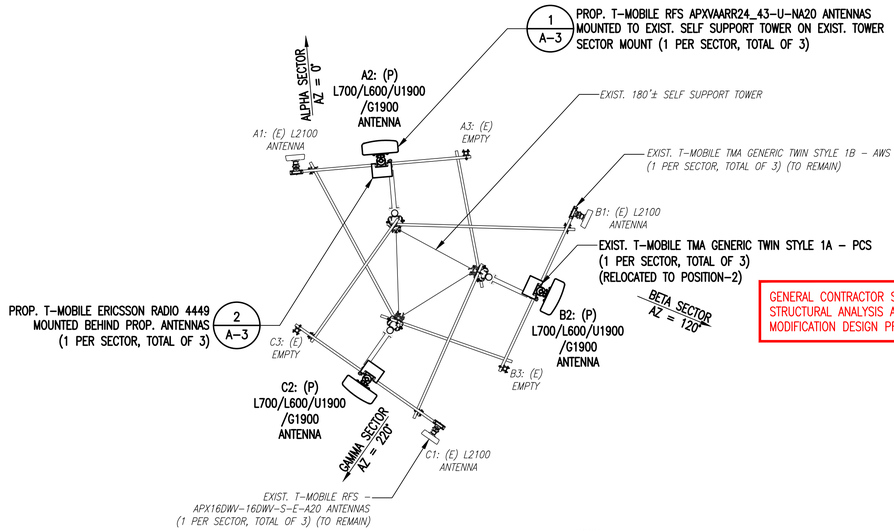
NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

NOTE: ABOVE MEAN SEA LEVEL (AMSL) SOURCE-GOOGLE 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.
NORTH



GENERAL CONTRACTOR SHALL REFER TO MOUNT STRUCTURAL ANALYSIS AND ANY MOUNT MODIFICATION DESIGN PROVIDED BY SBA

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

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

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

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SUBMITTALS

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0	06/11/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CTNL808B

SITE ADDRESS:
51 DANIELS AVENUE
WATERFORD, CT 06385

SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLAN

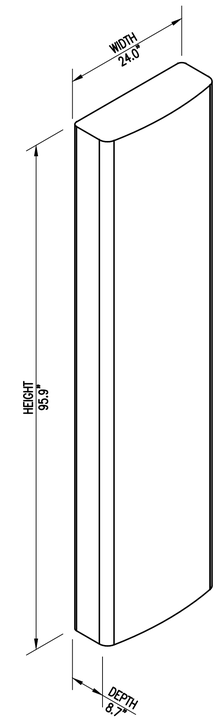
SHEET NUMBER
A-2

1815.127

FINAL ANTENNA CONFIGURATION

SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	CABLES
ALPHA	*RFS – APX16DWV-16DWV-S-E-A20*	*160'± AGL*	*0°*	*0°*	*3°*	*L2100*	*ERICSSON TMA GENERIC TWIN STYLE 1B – AWS*	*(2) 1-5/8" COAXIAL CABLES*
	RFS APXVAARR24_43-U-NA20	**160'± AGL**	**0°**	**0°**	**2°**	**L600/L700**	**ERICSSON RADIO 4449 B71+B12**	**(1) 6x12 HYBRID CABLE TRUNK**
						U1900/G1900	*ERICSSON TMA GENERIC TWIN STYLE 1A – PCS*	*(2) 1-5/8" COAXIAL CABLES*
BETA	*RFS – APX16DWV-16DWV-S-E-A20*	*160'± AGL*	*120°*	*0°*	*3°*	*L2100*	*ERICSSON TMA GENERIC TWIN STYLE 1B – AWS*	*(2) 1-5/8" COAXIAL CABLES*
	RFS APXVAARR24_43-U-NA20	**160'± AGL**	**120°**	**0°**	**2°**	**L600/L700**	**ERICSSON RADIO 4449 B71+B12**	**(1) 6x12 HYBRID CABLE TRUNK**
						U1900/G1900	*ERICSSON TMA GENERIC TWIN STYLE 1A – PCS*	*(2) 1-5/8" COAXIAL CABLES*
GAMMA	*RFS – APX16DWV-16DWV-S-E-A20*	*160'± AGL*	*220°*	*0°*	*3°*	*L2100*	*ERICSSON TMA GENERIC TWIN STYLE 1B – AWS*	*(2) 1-5/8" COAXIAL CABLES*
	RFS APXVAARR24_43-U-NA20	**160'± AGL**	**220°**	**0°**	**2°**	**L600/L700**	**ERICSSON RADIO 4449 B71+B12**	**(1) 6x12 HYBRID CABLE TRUNK**
						U1900/G1900	*ERICSSON TMA GENERIC TWIN STYLE 1A – PCS*	*(2) 1-5/8" COAXIAL CABLES*

NOTE: EXIST. (3) 1-5/8" COAXIAL CABLES TO REMAIN DISCONNECTED.



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

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

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

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

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MARLBOROUGH, MA 01752
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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
0	10/20/19	ISSUED FOR CONSTRUCTION	BDJ
0	06/11/19	ISSUED FOR REVIEW	BDJ

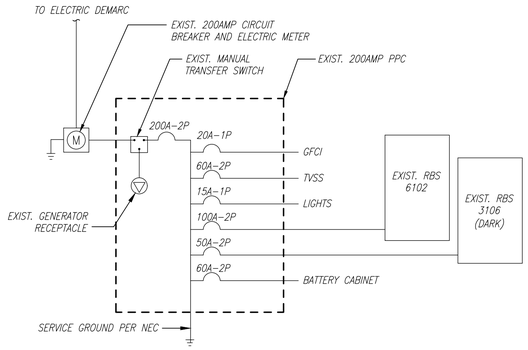
SITE NUMBER:
CTNL808B

SITE ADDRESS:
51 DANIELS AVENUE
WATERFORD, CT 06385

SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-3

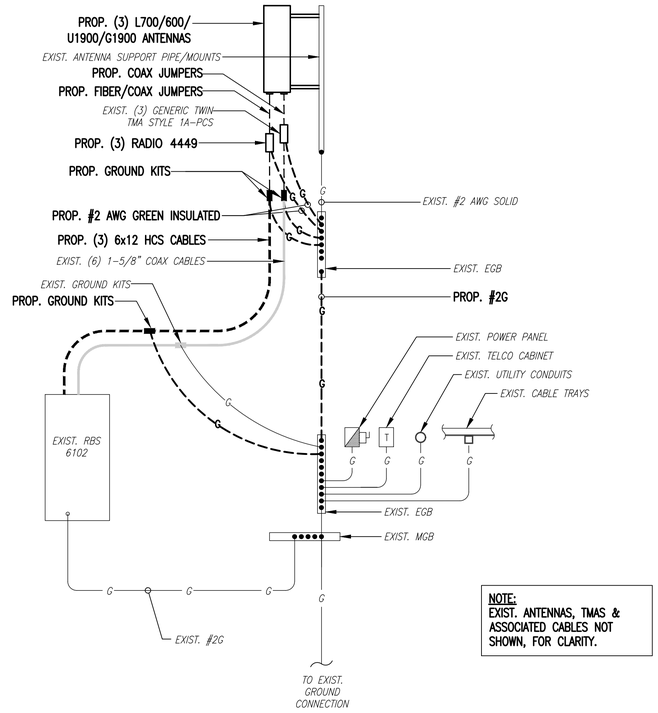
1815.127



ONE LINE DIAGRAM

SCALE: NOT TO SCALE

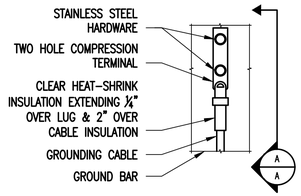
1 E–1



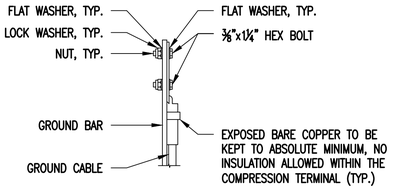
GROUNDING RISER DIAGRAM

SCALE: NOT TO SCALE

2 E–1



ELEVATION



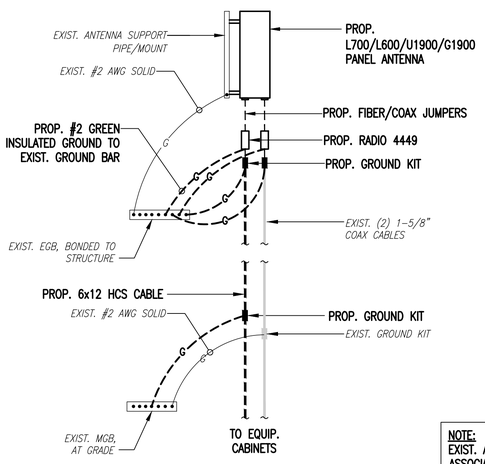
SECTION A–A

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

TYPICAL GROUND BAR CONNECTIONS DETAIL

SCALE: NOT TO SCALE

3 E–1



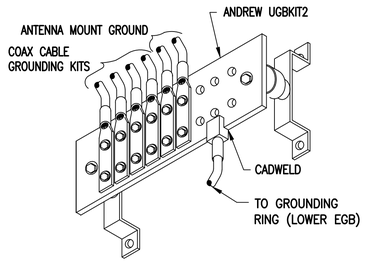
L700/L600/U1900/G1900

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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STATE OF CONNECTICUT · CLEMENT J. SALEK · No. 25876 · LICENSED PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	10/20/19	ISSUED FOR CONSTRUCTION	BDJ
0	06/11/19	ISSUED FOR REVIEW	BDJ

SITE NUMBER:
CTNL808B

SITE ADDRESS:
51 DANIELS AVENUE
WATERFORD, CT 06385

SHEET TITLE
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.127

EXHIBIT 7

T-MOBILE: CTNL808B
SBA: CT09865-S NIANTIC

MOUNT AUGMENTATION @ 160'

SELF SUPPORT TOWER

WATERFORD, CT
NEW LONDON COUNTY

SITE INFORMATION

STRUCTURE TYPE:	SELF SUPPORT
MOUNT TYPE:	(3) T-FRAMES
LATITUDE:	41.330264 (NAD 83)
LONGITUDE:	-72.171384 (NAD 83)
CITY / STATE:	WATERFORD, 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 & DESIGN STANDARD: 2015 IBC / TIA-222 / 2018 CONNECTICUT BUILDING CODE

A&E INFORMATION

GEOSTRUCTURAL

DON GEORGE, SE

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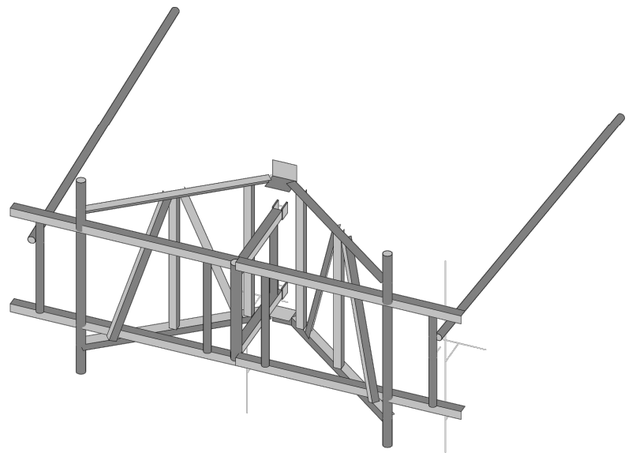
CONTACT@GEOSTRUCTURAL.COM
WWW.GEOSTRUCTURAL.COM

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

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REVISIONS:

0	07/22/19	ISSUE FOR CONSTRUCTION	GGD

CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION:
MOUNT AUGMENTATION
T-MOBILE: CTNL808B
SBA: CT09865-S NIANTIC

WATERFORD, CT

LATITUDE: 41.330264
LONGITUDE: -72.171384

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

T··Mobile·

SBA

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CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No.32155
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION:

MOUNT AUGMENTATION

T-MOBILE: CTNL808B

SBA: CT09865-S NIANTIC

WATERFORD, CT

LATITUDE: 41.330264
LONGITUDE: -72.171384

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.

T-Mobile

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REVISIONS:

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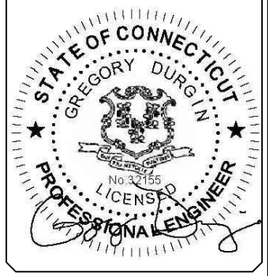


SITE INFORMATION:

MOUNT AUGMENTATION

T-MOBILE: CTNL808B

SBA: CT09865-S NIANTIC

WATERFORD, CT

LATITUDE: 41.330264
LONGITUDE: -72.171384

SHEET TITLE:

INSPECTION NOTES

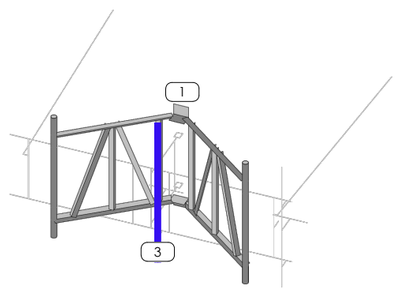
SHEET NUMBER:

S-3

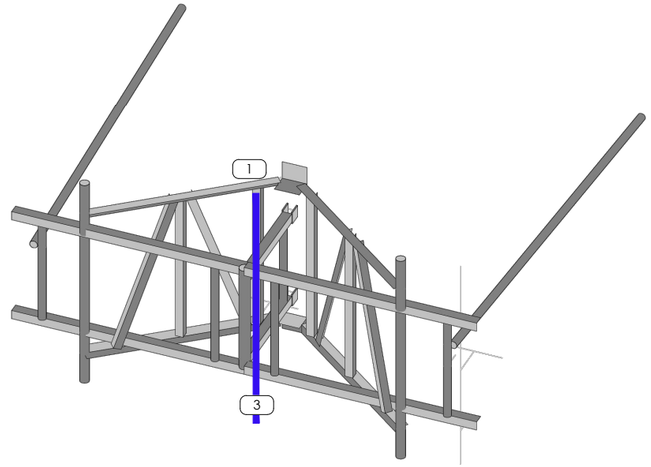
NEW MOUNT AUGMENTATIONS	
1	NEW SITE-BUILT SECTOR FRAME STABILIZER KIT, (1) KIT PER SECTOR, INSTALLED INTEGRAL TO EXISTING MOUNT FRAME. SEE SHEET S5.
2	REINSTALL THE EXISTING STIFF ARMS TO ADJACENT LEGS (INSTEAD OF SAME LEG AS MOUNT), (3) TOTAL.
3	PIPE 2.5STD x 8' MOUNT PIPES FOR THE AARR PANEL MIDDLE POSITION, (3) TOTAL.
AUGMENTATIONS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY NEW EQUIPMENT.	

(3) T-FRAMES @ 160' AUGMENTATION

EXISTING MOUNT



MOUNT AUGMENTATION ISOLATION
SCALE: N.T.S.



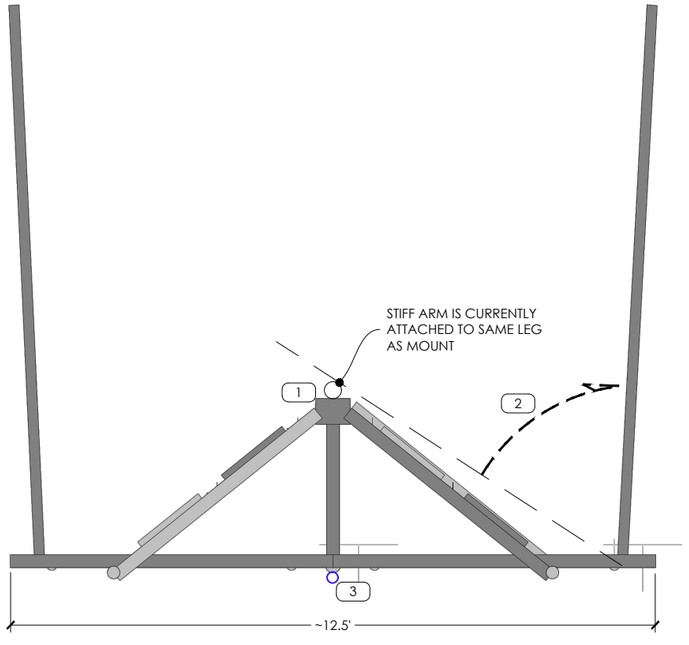
AUGMENTED MOUNT ISOMETRIC
SCALE: N.T.S.

CONSTRUCTION NOTES

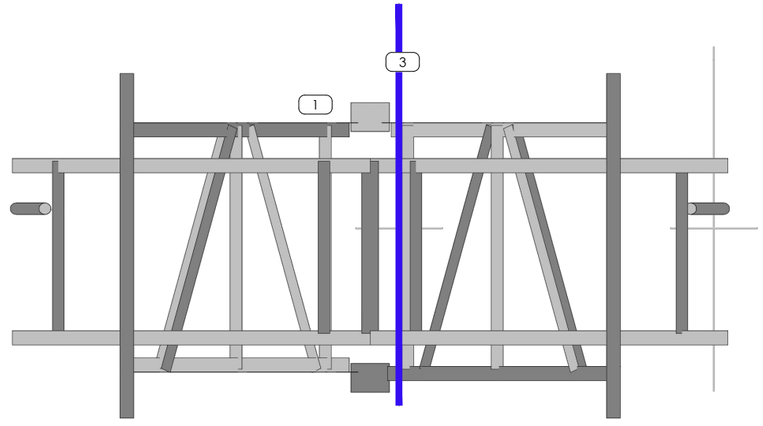
1. SCOPE OF WORK MUST BE COMPLETED AT WIND SPEEDS < 20 MPH.
2. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHOULD FIELD-VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. FIELD CUT MEMBERS AS REQUIRED.
3. CONTRACTOR TO COORDINATE THE TEMPORARY REMOVAL/RELOCATION/REPLACEMENT OF 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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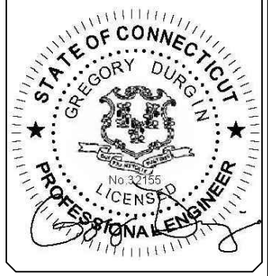


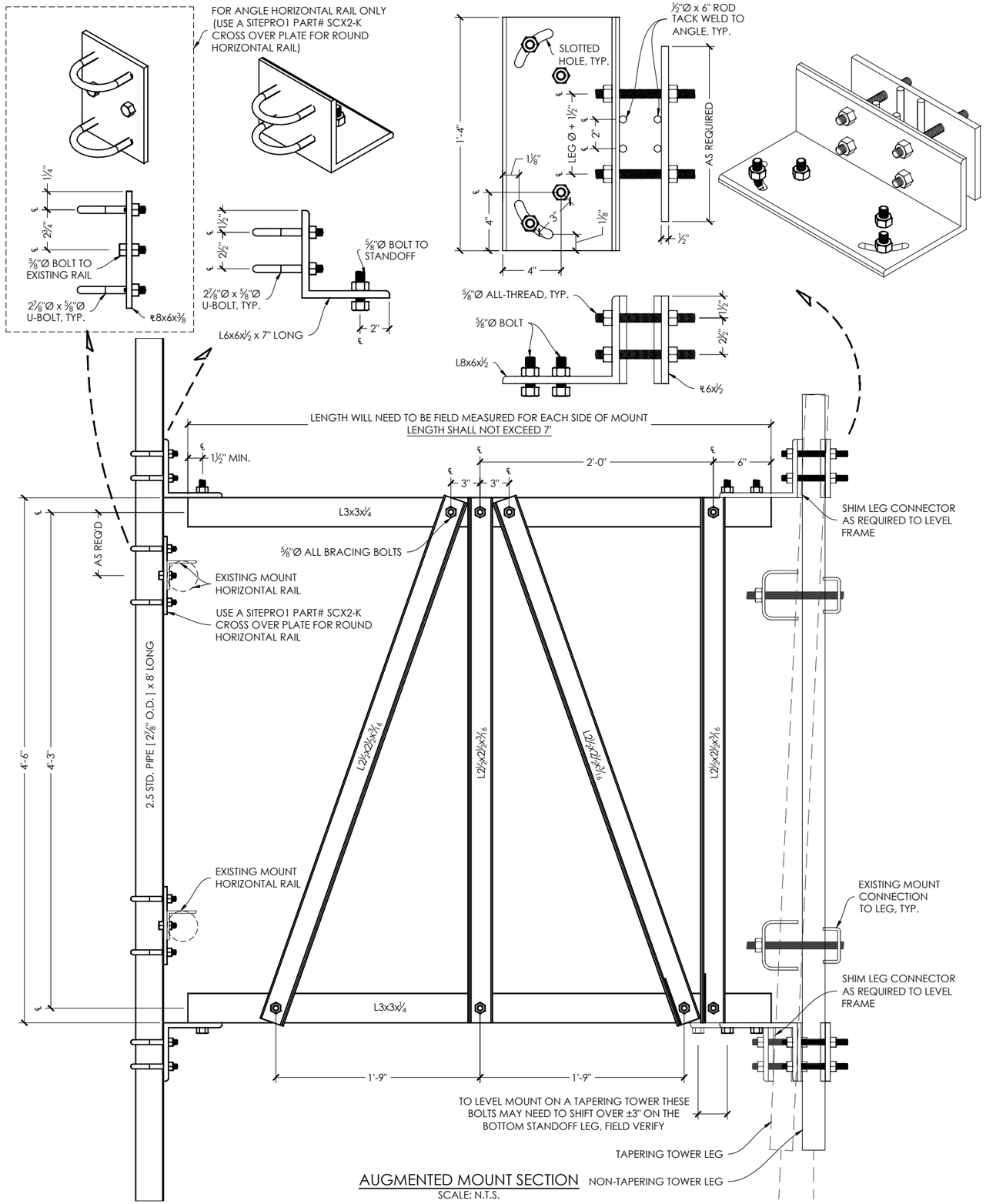
SITE INFORMATION:
MOUNT AUGMENTATION
T-MOBILE: CTNL808B
SBA: CT09865-S NIANTIC

WATERFORD, CT

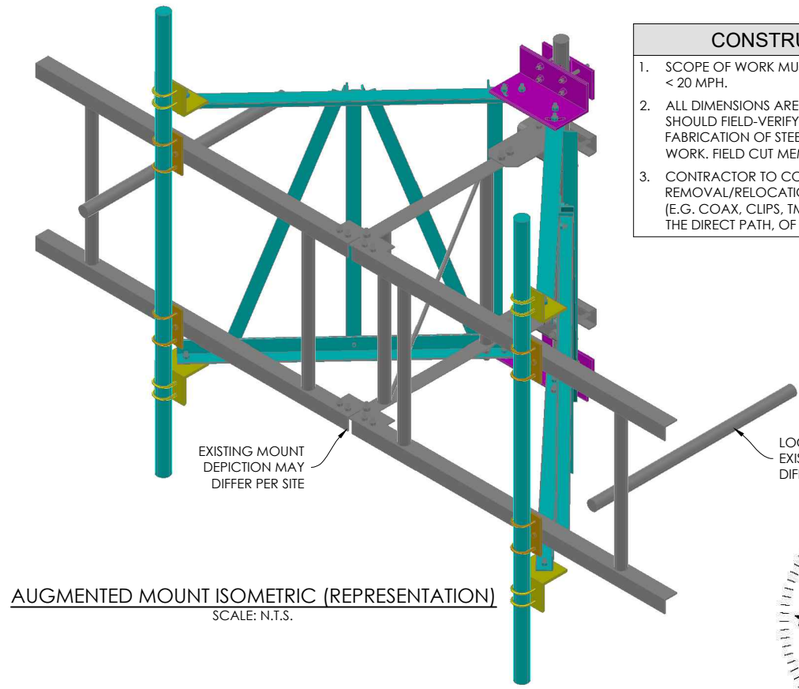
LATITUDE: 41.330264
LONGITUDE: -72.171384

SHEET TITLE:
AUGMENTATIONS, SECTIONS & DETAILS

SHEET NUMBER:
S-4



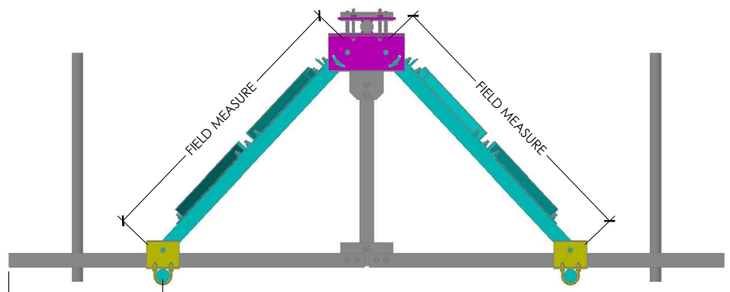
AUGMENTED MOUNT SECTION
SCALE: N.T.S.



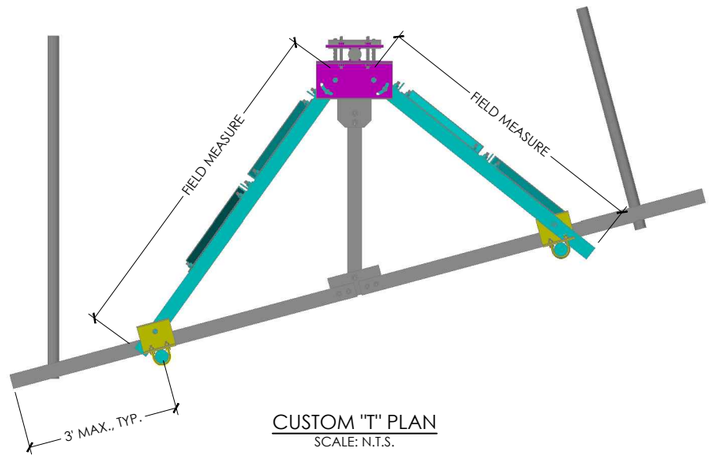
AUGMENTED MOUNT ISOMETRIC (REPRESENTATION)
SCALE: N.T.S.

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.



STANDARD "T" PLAN
SCALE: N.T.S.



CUSTOM "T" PLAN
SCALE: N.T.S.

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED
PROFESSIONAL ENGINEER

SECTOR FRAME MOUNT AUGMENTATION

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CHECKED BY: DWG

SHEET NUMBER:
S-5

EXHIBIT 8

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

Structural Analysis Report

Existing 180 ft Self Supporting Tower
Customer Name: SBA Communications Corp
Customer Site Number: CT09865-S
Customer Site Name: Niantic
Carrier Name: T-Mobile (App#: 117056, V2)
Carrier Site ID / Name: CTNL808B / Niantic
Site Location: 51 Daniel's Avenue
Waterford, Connecticut
New London County
Latitude: 41.330263
Longitude: -72.166672

8/27/19

Analysis Result:

Max Structural Usage: 76.5% [Pass]
Max Foundation Usage: 66.0% [Pass]
Additional Usage Caused by New Mount/Mount Modification: +1.3%

Report Prepared By : Fabiyaye Arinyedokiari

Introduction

The purpose of this report is to summarize the analysis results on the 180 ft Self Supporting Tower to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Tower Innovations, Project Number 5210 dated 11/05/2008
Foundation Drawing	Tower Innovations, Project Number 5210 dated 11/05/2008
Geotechnical Report	Dr. Clearance Welti, P.E., P.C. Geotechnical Engineering (Ref: Geotechnical Study for proposed Cell Tower at Southwest School 51 Daniels Road, Waterford, CT) dated 10/23/2008
Modification Drawings	Geostructral Mount Modification, Project #T-Mobile:CTNL808B dated July 22, 2019

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 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 = 0.161, S_1 = 0.058

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	180.0	2	Sinclair SC488-HF2LNF Omnis	(2) 6' Standoffs (SitePRO1 HM6)	(2) 1 5/8"	Town of Waterford
2		1	DBSpectra ATS8TMA10 TMA			
3	170.0	3	Powerwave 7770 - Panel	(3) Modified T-Frame (6) Crossover Plate – SitePro1 SCX2-K (3) 2 ½" Pipe Mast	(12) 1 5/8" (2) 1/2" Fiber (6) 3/4" DC (1) 7/16" Fiber	AT&T
4		3	Commscope SBNHH-1D65A - Panel			
5		3	KMW AM-X-CD-14-65-00T - Panel			
6		3	KMW EPBQ-654L8H6-L2 - Panel			
7		6	Powerwave TT19-08BP111-001 TTA - TMA			
8		6	Ericsson RRUS-11 RRU/RRH			
9		6	Ericsson RRUS-32 RRU/RRH			
10		3	Ericsson 4478 RRU/RRH			
11		2	Raycap DC6-48-60-18-8F			
-	160.0	3	RFS APX16DWV-16DWVS	(3) T-Frames	(18) 1-5/8" (1) 1/2" (1) 1-5/8" Fiber	T-Mobile
-		3	Commscope LNX-6515DS-VTM			
-		3	Ericsson Double TMA 17/21			
-		3	RFS ATMAA1412D-1A20			
-		3	Kathrein 782 11056 Bias T			
18	140.0	3	Antel BXA-80063-6CF - Panel	(3) T-Frames	(16) 1 5/8" (2) 1 5/8" Fiber	Verizon
19		3	Antel BXA-70063-6CF-EDIN-0 - Panel			
20		6	Commscope SBNHH-1D65B - Panel			
21		3	Alcatel Lucent B66 RRH4X45 AWS Remote Radio			
22		3	Alcatel Lucent RRH 700 4X30 B13 Remote Radio			
23		2	Rfs Celwave DB-T1-6Z-8AB-0Z ODU			

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

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
12	160.0	3	RFS APX16DWV-16DWV-S-E-A20 - Panel	(3) Modified T-Frame (3) Custom Mount Augmentations (3) Stabilizer Kits (3) 2.5STD x 8' Pipe Mounts	(16) 1 5/8" (3) 1 5/8" Fiber (1) 1/2"	T-Mobile
13		3	RFS APXVAARR24_43-U-NA20 - Panel			
14		3	Ericsson KRY 112 144/1 - TMA			
15		3	Ericsson KRY 112 489/2 – TMA			
16		3	Ericsson Radio 4449 B71+B12 - RRU			
17		3	Kathrein 782 11056 – Bias T			

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

Analysis Results

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

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	**76.5%**	**57.5%**	**32.1%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	410.0	357.3	49.2

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 0.2738 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.

Structure: CT09865-S-SBA

Site Name:	Niantic			**Code:**	EIA/TIA-222-G	8/27/2019
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	105.00	
Height:	180.00 (ft)	**Base Width:**	23.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	5.00	**Operational WS:**	60.00	Page: 1

Tower Engineering Solutions

Section Properties

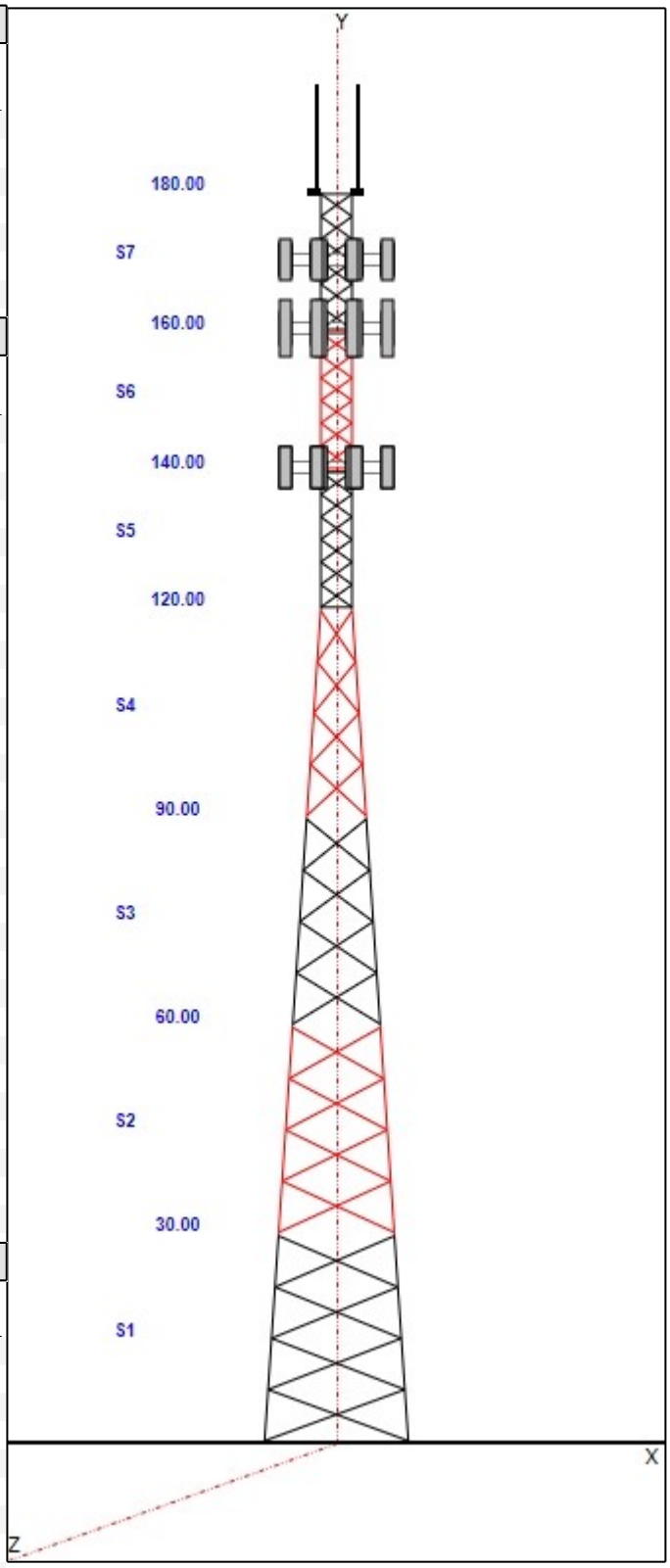
Sect	Leg Members	Diagonal Members	Horizontal Members
1	SOL 4 3/4" SOLID	SAE 4X4X0.3125	
2	SOL 4 3/4" SOLID	SAE 3.5X3.5X0.25	
3	SOL 4 1/2" SOLID	SAE 3X3X0.1875	
4	SOL 4 1/4" SOLID	SAE 2.5X2.5X0.1875	
5	SOL 3 1/2" SOLID	SAE 3X3X0.1875	SOL 1 1/8" SOLID
6	SOL 2 1/2" SOLID	SAE 2.5X2.5X0.1875	SOL 1" SOLID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

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
180.00	187.63	2	SC488-HF2LNF
180.00	180.00	1	ATS8TMA10
180.00	180.00	1	Lightning Rod
180.00	180.00	1	Beacon
180.00	180.00	2	SitePRO1 HM6 6' Standoffs
170.00	170.00	3	Modified T-Frame
170.00	170.00	3	7770
170.00	170.00	3	SBNHH-1D65A
170.00	170.00	3	AM-X-CD-14-65-00T-RET
170.00	170.00	3	EPBQ-654L8H6-L2
170.00	170.00	6	TT19-08BP111-001 TMA-TTA
170.00	170.00	6	RRUS-11 RRU/RRH
170.00	170.00	6	RRUS-32 RRU/RRH
170.00	170.00	3	4478 RRU/RRH
170.00	170.00	2	DC6-48-60-18-8F
160.00	160.00	3	APX16DWV-16DWV-S-E-A20
160.00	160.00	3	APXVAARR24_43-U-NA20
160.00	160.00	3	KRY 112 144/1
160.00	160.00	3	KRY 112 489/2
160.00	160.00	3	Radio 4449 B71+B12
160.00	160.00	3	782 11056
160.00	160.00	3	Modified T-Frame
140.00	140.00	3	T-Frame
140.00	140.00	3	BXA-80063-6CF
140.00	140.00	3	BXA-70063-6CF-EDIN-0
140.00	140.00	6	SBNHH-1D65B
140.00	140.00	3	B66 RRH4X45 AWS
140.00	140.00	3	RRH 700 4X30 B13 Remote
140.00	140.00	2	DB-T1-6Z-8AB-0Z ODU

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	180.00	2	1 5/8" Coax
0.00	180.00	1	W/G Ladder
0.00	170.00	12	1 5/8" Coax
0.00	170.00	2	1/2" Fiber
0.00	170.00	6	3/4" DC
0.00	170.00	1	7/16" Fiber
0.00	170.00	1	W/G Ladder
0.00	160.00	16	1 5/8" Coax
0.00	160.00	3	1 5/8" Fiber
0.00	160.00	1	1/2" Coax



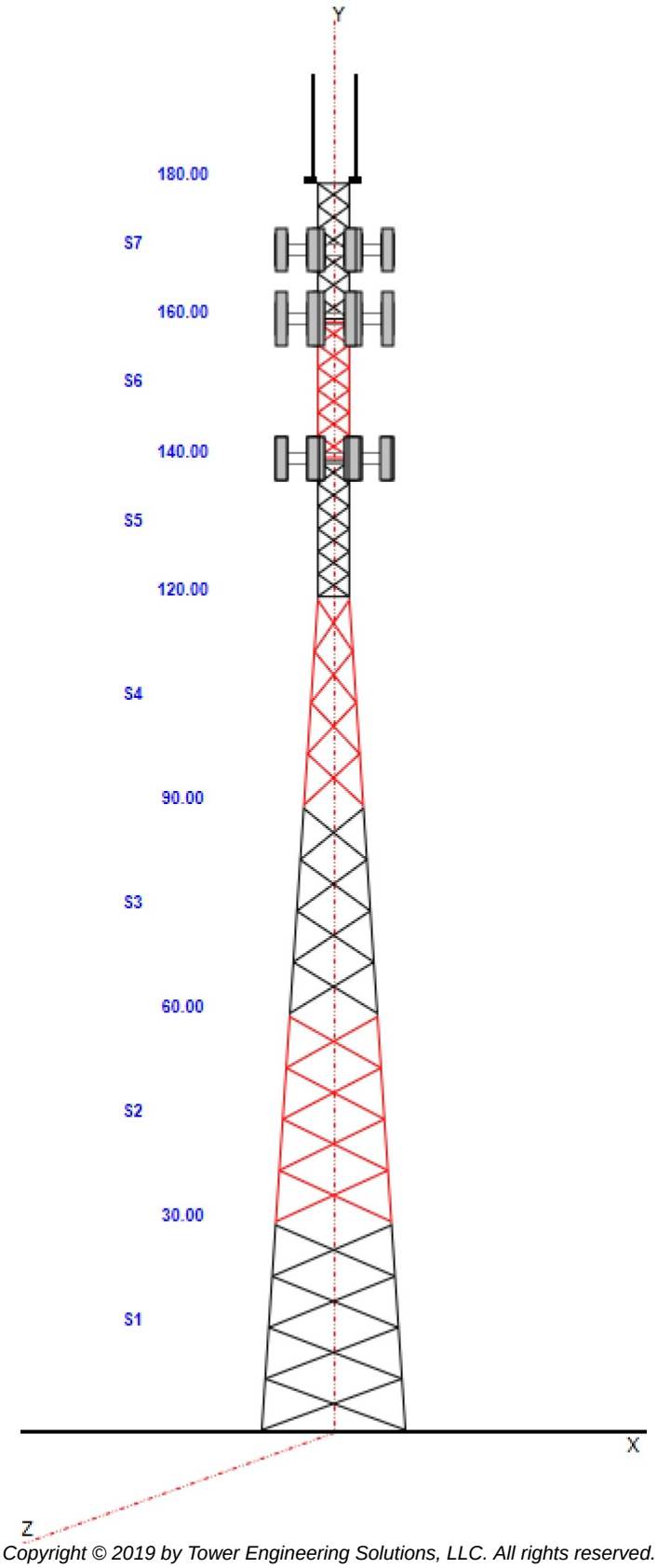
0.00	160.00	1	W/G Ladder
0.00	140.00	16	1 5/8" Coax
0.00	140.00	2	1 5/8" Fiber
0.00	140.00	1	W/G Ladder

Base Reactions

Leg			Overturning	
Max Uplift:	-357.27 (kips	Moment:	7734.54	(ft-kips)
Max Down:	410.03 (kips	Total Down:	65.16	(kips)
Max Shear:	49.18 (kips	Total Shear:	78.52	(kips)

Structure: CT09865-S-SBA

Site Name:	Niantic			**Code:**	EIA/TIA-222-G	8/27/2019
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	105.00	
Height:	180.00 (ft)	**Base Width:**	23.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	5.00	**Operational WS:**	60.00	Page: 3



Structure: CT09865-S-SBA - Coax Line Placement

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

8/27/2019

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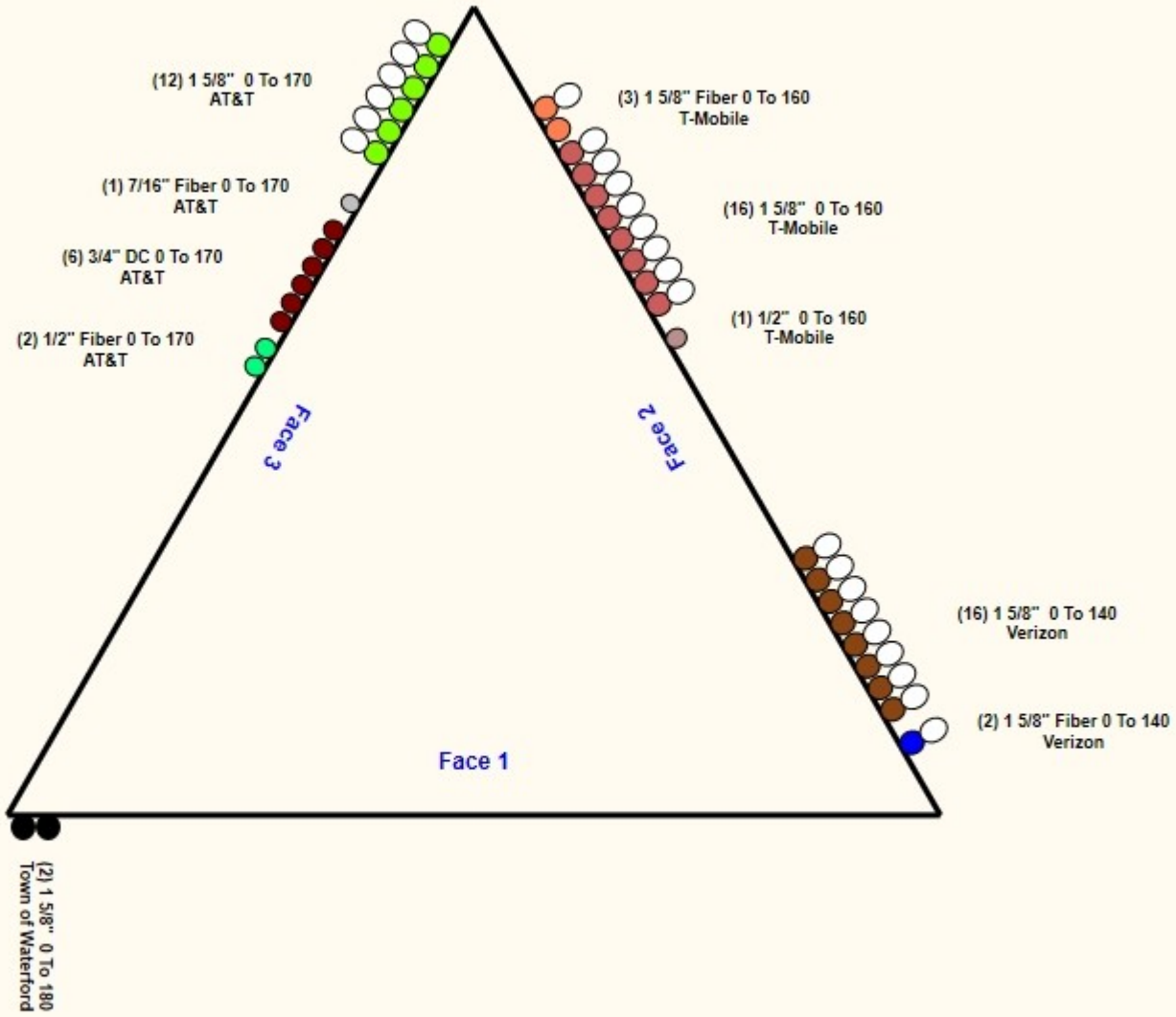


Loading Summary

Structure:	CT09865-S-SBA		**Code:**	EIA/TIA-222-G	8/27/2019
Site Name:	Niantic		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Discrete Appurtenances Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	Ice Weight (lb)	Ice CaAa (sf)	Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
180.00	SC488-HF2LNF	2	30.00	3.810	213.06	9.380	83.000	2.500	2.500	1.00	1.00	7.625
180.00	ATS8TMA10	1	25.00	1.560	82.26	2.255	21.200	9.000	13.200	1.00	1.00	0.000
180.00	Lightning Rod	1	5.00	0.500	26.21	2.267	72.000	1.000	1.000	1.00	1.00	0.000
180.00	Beacon	1	36.00	2.720	170.87	3.681	28.000	17.500	17.500	1.00	1.00	0.000
180.00	SitePRO1 HM6 6' Standoffs	2	120.00	4.500	226.03	9.812	0.000	0.000	0.000	1.00	1.00	0.000
170.00	Modified T-Frame	3	360.00	20.540	868.95	37.092	0.000	0.000	0.000	0.75	0.75	0.000
170.00	7770	3	35.00	5.500	172.27	6.580	55.000	11.000	5.000	0.80	0.73	0.000
170.00	SBNHH-1D65A	3	33.50	5.880	194.26	6.975	55.000	11.900	7.100	0.80	0.83	0.000
170.00	AM-X-CD-14-65-00T-RET	3	36.40	5.000	149.33	6.898	48.000	11.800	5.900	0.80	0.75	0.000
170.00	EPBQ-654L8H6-L2	3	54.90	8.270	266.12	9.594	73.000	12.000	7.400	0.80	0.84	0.000
170.00	TT19-08BP111-001 TMA-TTA	6	16.00	0.640	36.49	1.240	9.900	6.700	5.400	0.80	0.50	0.000
170.00	RRUS-11 RRU/RRH	6	51.00	2.520	124.18	3.161	17.000	17.800	7.200	0.80	0.71	0.000
170.00	RRUS-32 RRU/RRH	6	77.00	3.870	192.32	4.117	29.900	13.300	9.500	0.80	0.67	0.000
170.00	4478 RRU/RRH	3	59.90	1.840	107.49	2.373	16.500	13.400	7.700	0.80	0.67	0.000
170.00	DC6-48-60-18-8F	2	31.80	0.920	94.40	1.364	24.000	11.000	11.000	0.80	0.75	0.000
160.00	APX16DWV-16DWV-S-E-A20	3	40.70	6.460	177.69	7.574	55.900	13.000	3.200	0.80	0.62	0.000
160.00	APXVAARR24_43-U-NA20	3	128.00	20.240	545.93	22.140	95.900	24.000	7.800	0.80	0.70	0.000
160.00	KRY 112 144/1	3	11.00	0.410	21.78	0.885	6.900	6.100	2.700	0.80	0.50	0.000
160.00	KRY 112 489/2	3	15.40	0.650	33.02	1.262	11.000	6.100	3.900	0.80	0.50	0.000
160.00	Radio 4449 B71+B12	3	70.00	1.650	138.25	2.188	15.000	13.200	9.300	0.80	0.85	0.000
160.00	782 11056	3	11.00	0.550	28.64	1.148	11.700	4.800	4.700	0.80	0.50	0.000
160.00	Modified T-Frame	3	517.00	20.600	1238.82	36.994	0.000	0.000	0.000	0.75	0.75	0.000
140.00	T-Frame	3	260.00	10.600	617.85	18.916	0.000	0.000	0.000	0.75	0.75	0.000
140.00	BXA-80063-6CF	3	17.00	7.570	163.19	10.294	71.000	11.200	5.200	0.80	0.73	0.000
140.00	BXA-70063-6CF-EDIN-0	3	17.00	7.570	163.19	10.294	71.000	11.200	5.200	0.80	0.73	0.000
140.00	SBNHH-1D65B	6	40.00	8.160	239.70	9.440	72.600	11.900	7.100	0.80	0.83	0.000
140.00	B66 RRH4X45 AWS	3	56.80	2.540	111.91	3.204	25.800	11.800	7.200	0.80	0.82	0.000
140.00	RRH 700 4X30 B13 Remote	3	57.20	2.160	118.61	2.762	21.600	12.000	9.000	0.80	0.88	0.000
140.00	DB-T1-6Z-8AB-0Z ODU	2	18.90	4.800	160.23	5.660	24.000	24.000	10.000	0.80	0.71	0.000
	Totals:	**89**	**6,913.80**		**20,574.88**						**Number of Appurtenances :**	**29**

Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	180.00	1 5/8" Coax	2	1.98	1.04	100.00	1	Individual NR		N	1.00	1.00	
0.00	180.00	W/G Ladder	1	2.00	6.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	170.00	1 5/8" Coax	12	1.98	1.04	50.00	3	Block		N	1.00	1.00	
0.00	170.00	1/2" Fiber	2	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	3/4" DC	6	0.75	0.40	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	7/16" Fiber	1	0.43	0.15	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	W/G Ladder	1	2.00	6.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	160.00	1 5/8" Coax	16	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	160.00	1 5/8" Fiber	3	2.00	1.10	66.60	2	Block		N	1.00	1.00	
0.00	160.00	1/2" Coax	1	0.65	0.16	100.00	2	Individual NR		N	1.00	1.00	
0.00	160.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	
0.00	140.00	1 5/8" Coax	16	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	140.00	1 5/8" Fiber	2	2.00	1.10	50.00	2	Block		N	1.00	1.00	
0.00	140.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 7	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W Normal Wind - P1 — 1.2D + 1.6W 105 mph Wind at Normal To Face - P1

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	223.50	0.00	14,632.	0.0	5570.84	5534.71	11,105.55
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	223.50	0.00	12,412.	0.0	5264.39	6965.80	12,230.19
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	223.50	0.00	10,244.	0.0	4236.98	7756.68	11,993.66
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	223.50	0.00	9,044.2	0.0	3156.58	8326.07	11,482.64
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	149.00	0.00	5,363.7	0.0	2501.08	5805.98	8,307.07
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.27	0.00	3,422.5	0.0	2225.61	4127.97	6,353.58
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	30.86	0.00	1,741.7	0.0	1900.46	1253.62	3,154.08
														56,861.4	**0.0**			**64,626.77**

Load Case: 1.2D + 1.6W Normal Wind - P2 — 1.2D + 1.6W 105 mph Wind at Normal To Face - P2

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

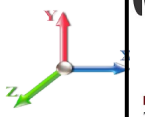
Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	223.50	0.00	14,632.	0.0	3342.50	3320.83	6,663.33
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	223.50	0.00	12,412.	0.0	3158.63	4179.48	7,338.11
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	223.50	0.00	10,244.	0.0	2542.19	4654.01	7,196.20
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	223.50	0.00	9,044.2	0.0	1893.95	4995.64	6,889.59
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	149.00	0.00	5,363.7	0.0	1500.65	3483.59	4,984.24
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.27	0.00	3,422.5	0.0	1335.37	2476.78	3,812.15
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	30.86	0.00	1,741.7	0.0	1900.46	1253.62	3,154.08
														56,861.4	**0.0**			**40,037.69**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 8	



Tower Engineering Solutions

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

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

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

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect	Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	223.50	0.00	14,632.	0.0	5570.84	5534.71	11,105.55
1	2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	223.50	0.00	12,412.	0.0	5264.39	6965.80	12,230.19
1	3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	223.50	0.00	10,244.	0.0	4236.98	7756.68	11,993.66
1	4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	223.50	0.00	9,044.2	0.0	3156.58	8326.07	11,482.64
1	5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	149.00	0.00	5,363.7	0.0	2501.08	5805.98	8,307.07
1	6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.27	0.00	3,422.5	0.0	2225.61	4127.97	6,353.58
2	7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	30.86	0.00	1,741.7	0.0	1140.28	752.17	1,892.45
															56,861.4	**0.0**			**63,365.14**

Load Case: 1.2D + 1.6W 60° Wind - P1

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

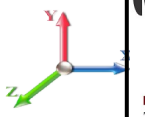
Wind Load Factor: 1.60
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect	Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	223.50	0.00	14,632.	0.0	4658.28	5534.71	10,192.99
1	2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	223.50	0.00	12,412.	0.0	4454.14	6965.80	11,419.94
1	3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	223.50	0.00	10,244.	0.0	3643.91	7756.68	11,400.60
1	4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	223.50	0.00	9,044.2	0.0	2778.46	8326.07	11,104.53
1	5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	149.00	0.00	5,363.7	0.0	2151.75	5805.98	7,957.73
1	6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.27	0.00	3,422.5	0.0	1900.51	4127.97	6,028.49
2	7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	30.86	0.00	1,741.7	0.0	1612.93	1253.62	2,866.55
															56,861.4	**0.0**			**60,970.82**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 9	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W 60° Wind - P2

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

Wind Load Factor: 1.60
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	223.50	0.00	14,632.	0.0	2794.97	3320.83	6,115.79
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	223.50	0.00	12,412.	0.0	2672.49	4179.48	6,851.97
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	223.50	0.00	10,244.	0.0	2186.35	4654.01	6,840.36
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	223.50	0.00	9,044.2	0.0	1667.08	4995.64	6,662.72
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	149.00	0.00	5,363.7	0.0	1291.05	3483.59	4,774.64
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.27	0.00	3,422.5	0.0	1140.31	2476.78	3,617.09
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	30.86	0.00	1,741.7	0.0	1612.93	1253.62	2,866.55
														56,861.4	**0.0**			**37,729.11**

Load Case: 1.2D + 1.6W 60° Wind - P3

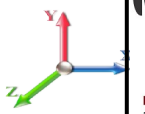
1.2D + 1.6W 105 mph Wind at 60° From Face - P3

Wind Load Factor: 1.60
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	223.50	0.00	14,632.	0.0	4658.28	5534.71	10,192.99
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	223.50	0.00	12,412.	0.0	4454.14	6965.80	11,419.94
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	223.50	0.00	10,244.	0.0	3643.91	7756.68	11,400.60
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	223.50	0.00	9,044.2	0.0	2778.46	8326.07	11,104.53
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	149.00	0.00	5,363.7	0.0	2151.75	5805.98	7,957.73
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.27	0.00	3,422.5	0.0	1900.51	4127.97	6,028.49
2 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	30.86	0.00	1,741.7	0.0	967.76	752.17	1,719.93
														56,861.4	**0.0**			**59,824.20**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 10	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W 90° Wind - P1 — 1.2D + 1.6W 105 mph Wind at 90° From Face - P1

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect	Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	223.50	0.00	14,632.	0.0	4886.42	5534.71	10,421.13
1	2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	223.50	0.00	12,412.	0.0	4656.70	6965.80	11,622.50
1	3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	223.50	0.00	10,244.	0.0	3792.18	7756.68	11,548.86
1	4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	223.50	0.00	9,044.2	0.0	2872.99	8326.07	11,199.06
1	5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	149.00	0.00	5,363.7	0.0	2239.08	5805.98	8,045.06
1	6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.27	0.00	3,422.5	0.0	1981.79	4127.97	6,109.76
2	7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	30.86	0.00	1,741.7	0.0	1684.81	1253.62	2,938.43
															56,861.4	**0.0**			**61,884.81**

Load Case: 1.2D + 1.6W 90° Wind - P2 — 1.2D + 1.6W 105 mph Wind at 90° From Face - P2

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

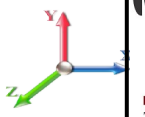
Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect	Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	223.50	0.00	14,632.	0.0	2931.85	3320.83	6,252.68
1	2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	223.50	0.00	12,412.	0.0	2794.02	4179.48	6,973.50
1	3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	223.50	0.00	10,244.	0.0	2275.31	4654.01	6,929.32
1	4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	223.50	0.00	9,044.2	0.0	1723.79	4995.64	6,719.43
1	5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	149.00	0.00	5,363.7	0.0	1343.45	3483.59	4,827.04
1	6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.27	0.00	3,422.5	0.0	1189.07	2476.78	3,665.86
2	7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	30.86	0.00	1,741.7	0.0	1684.81	1253.62	2,938.43
															56,861.4	**0.0**			**38,306.26**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 11	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W 90° Wind - P3 — 1.2D + 1.6W 105 mph Wind at 90° From Face - P3

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	223.50	0.00	14,632.	0.0	4886.42	5534.71	10,421.13
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	223.50	0.00	12,412.	0.0	4656.70	6965.80	11,622.50
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	223.50	0.00	10,244.	0.0	3792.18	7756.68	11,548.86
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	223.50	0.00	9,044.2	0.0	2872.99	8326.07	11,199.06
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	149.00	0.00	5,363.7	0.0	2239.08	5805.98	8,045.06
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.27	0.00	3,422.5	0.0	1981.79	4127.97	6,109.76
2 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	30.86	0.00	1,741.7	0.0	1010.89	752.17	1,763.06
														56,861.4	**0.0**			**60,709.43**

Load Case: 0.9D + 1.6W Normal Wind — 0.9D + 1.6W 105 mph Wind at Normal To Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

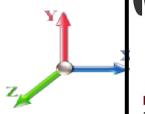
Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	223.50	0.00	10,974.	0.0	5570.84	5534.71	11,105.55
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	223.50	0.00	9,309.5	0.0	5264.39	6965.80	12,230.19
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	223.50	0.00	7,683.4	0.0	4236.98	7756.68	11,993.66
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	223.50	0.00	6,783.1	0.0	3156.58	8326.07	11,482.64
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	149.00	0.00	4,022.8	0.0	2501.08	5805.98	8,307.07
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.27	0.00	2,566.8	0.0	2225.61	4127.97	6,353.58
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	30.86	0.00	1,306.3	0.0	1900.46	1253.62	3,154.08
														42,646.0	**0.0**			**64,626.77**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 12	



IES Tower Engineering Solutions

Load Case: 0.9D + 1.6W 60° Wind — 0.9D + 1.6W 105 mph Wind at 60° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect	Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	223.50	0.00	10,974.	0.0	4658.28	5534.71	10,192.99
1	2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	223.50	0.00	9,309.5	0.0	4454.14	6965.80	11,419.94
1	3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	223.50	0.00	7,683.4	0.0	3643.91	7756.68	11,400.60
1	4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	223.50	0.00	6,783.1	0.0	2778.46	8326.07	11,104.53
1	5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	149.00	0.00	4,022.8	0.0	2151.75	5805.98	7,957.73
1	6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.27	0.00	2,566.8	0.0	1900.51	4127.97	6,028.49
2	7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	30.86	0.00	1,306.3	0.0	1612.93	1253.62	2,866.55
															42,646.0	**0.0**			**60,970.82**

Load Case: 0.9D + 1.6W 90° Wind — 0.9D + 1.6W 105 mph Wind at 90° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

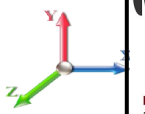
Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect	Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	223.50	0.00	10,974.	0.0	4886.42	5534.71	10,421.13
1	2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	223.50	0.00	9,309.5	0.0	4656.70	6965.80	11,622.50
1	3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	223.50	0.00	7,683.4	0.0	3792.18	7756.68	11,548.86
1	4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	223.50	0.00	6,783.1	0.0	2872.99	8326.07	11,199.06
1	5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	149.00	0.00	4,022.8	0.0	2239.08	5805.98	8,045.06
1	6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.27	0.00	2,566.8	0.0	1981.79	4127.97	6,109.76
2	7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	30.86	0.00	1,306.3	0.0	1684.81	1253.62	2,938.43
															42,646.0	**0.0**			**61,884.81**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 13	



Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

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

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	1.00	1.00	1.39	102.94	283.38	83.18	27,618.	12986.6	1033.93	1372.53	2,406.45
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	1.00	1.00	1.55	84.98	290.63	92.84	25,420.	13007.3	1049.60	1796.58	2,846.18
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	1.00	1.00	1.63	67.60	294.28	97.70	22,523.	12279.2	898.24	2023.09	2,921.33
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	1.00	1.00	1.68	54.21	296.78	101.0	20,589.	11545.1	710.64	2138.67	2,849.31
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	1.00	1.00	1.72	51.65	198.95	68.82	14,059.	8696.2	581.24	1028.98	1,449.00
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	1.00	1.00	1.75	45.76	137.50	69.81	10,266.	6843.7	542.05	883.56	1,425.61
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	1.00	1.00	1.77	40.57	42.64	38.29	5,567.0	3825.3	505.75	373.55	879.30
														126,044.9	**69183.5**			**14,777.18**

Load Case: 1.2D + 1.0Di + 1.0Wi 60° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

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

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	0.80	1.00	1.39	91.40	283.38	83.18	27,618.	12986.6	918.05	1372.53	2,290.58
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	0.80	1.00	1.55	76.83	290.63	92.84	25,420.	13007.3	948.96	1796.58	2,745.54
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	0.80	1.00	1.63	62.19	294.28	97.70	22,523.	12279.2	826.39	2023.09	2,849.48
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	0.80	1.00	1.68	50.87	296.78	101.0	20,589.	11545.1	666.81	2138.67	2,805.48
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	0.80	1.00	1.72	48.24	198.95	68.82	14,059.	8696.2	542.94	1028.98	1,571.93
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	0.80	1.00	1.75	42.89	137.50	69.81	10,266.	6843.7	507.97	883.56	1,391.52
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	0.80	1.00	1.77	38.24	42.64	38.29	5,567.0	3825.3	476.74	373.55	850.29
														126,044.9	**69183.5**			**14,504.82**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 90° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 1.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	0.85	1.00	1.39	94.29	283.38	83.18	27,618.	12986.6	947.02	1372.53	2,319.55
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	0.85	1.00	1.55	78.87	290.63	92.84	25,420.	13007.3	974.12	1796.58	2,770.70
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	0.85	1.00	1.63	63.54	294.28	97.70	22,523.	12279.2	844.36	2023.09	2,867.44
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	0.85	1.00	1.68	51.70	296.78	101.0	20,589.	11545.1	677.77	2138.67	2,816.44
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	0.85	1.00	1.72	49.09	198.95	68.82	14,059.	8696.2	552.52	1028.98	1,581.50
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	0.85	1.00	1.75	43.61	137.50	69.81	10,266.	6843.7	516.49	883.56	1,400.04
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	0.85	1.00	1.77	38.82	42.64	38.29	5,567.0	3825.3	483.99	373.55	857.54
														126,044.9	**69183.5**			**14,613.22**

Load Case: 1.0D + 1.0W Normal Wind — 1.0D + 1.0W 60 mph Wind at Normal To Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

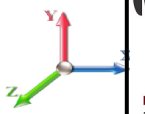
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	71.17	223.50	0.00	12,193.	0.0	1148.88	1129.53	2,278.42
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	54.23	223.50	0.00	10,343.	0.0	1100.49	1421.59	2,522.08
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	39.82	223.50	0.00	8,537.1	0.0	891.46	1583.00	2,474.45
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	28.86	223.50	0.00	7,536.8	0.0	666.16	1699.20	2,365.36
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.49	149.00	0.00	4,469.7	0.0	512.99	1184.89	1,697.88
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	104.27	0.00	2,852.0	0.0	454.21	842.44	1,296.65
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	30.86	0.00	1,451.4	0.0	387.85	255.84	643.69
														47,384.5	**0.0**			**13,278.53**

Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 15	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60° Wind — 1.0D + 1.0W 60 mph Wind at 60° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	59.63	223.50	0.00	12,193.	0.0	962.64	1129.53	2,092.18
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	46.08	223.50	0.00	10,343.	0.0	935.14	1421.59	2,356.73
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	34.42	223.50	0.00	8,537.1	0.0	770.42	1583.00	2,353.42
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	25.52	223.50	0.00	7,536.8	0.0	589.00	1699.20	2,288.19
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	21.08	149.00	0.00	4,469.7	0.0	441.70	1184.89	1,626.59
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	104.27	0.00	2,852.0	0.0	387.86	842.44	1,230.30
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	30.86	0.00	1,451.4	0.0	329.17	255.84	585.01
														47,384.5	**0.0**			**12,532.42**

Load Case: 1.0D + 1.0W 90° Wind — 1.0D + 1.0W 60 mph Wind at 90° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

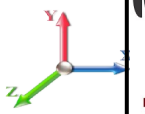
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	62.52	223.50	0.00	12,193.	0.0	1009.20	1129.53	2,138.74
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	48.12	223.50	0.00	10,343.	0.0	976.48	1421.59	2,398.07
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	35.77	223.50	0.00	8,537.1	0.0	800.68	1583.00	2,383.68
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	26.36	223.50	0.00	7,536.8	0.0	608.29	1699.20	2,307.48
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.93	149.00	0.00	4,469.7	0.0	459.52	1184.89	1,644.41
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	104.27	0.00	2,852.0	0.0	404.45	842.44	1,246.89
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	30.86	0.00	1,451.4	0.0	343.84	255.84	599.68
														47,384.5	**0.0**			**12,718.95**

Force/Stress Compression Summary

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 16	



Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	30	SOL - 4 3/4" SOLID	-405.14	1.2D + 1.6W Normal Wind - P1	7.40	100	100	100	74.81	50.00	529.67	76.5	Member X
2	60	SOL - 4 3/4" SOLID	-358.47	1.2D + 1.6W Normal Wind - P1	7.40	100	100	100	74.81	50.00	529.67	67.7	Member X
3	90	SOL - 4 1/2" SOLID	-311.40	1.2D + 1.6W Normal Wind - P1	7.40	100	100	100	78.96	50.00	453.66	68.6	Member X
4	120	SOL - 4 1/4" SOLID	-268.75	1.2D + 1.6W Normal Wind - P1	7.40	100	100	100	83.61	50.00	382.92	70.2	Member X
5	140	SOL - 3 1/2" S0LID	-224.61	1.2D + 1.6W Normal Wind - P1	3.25	100	100	100	44.57	50.00	374.41	60.0	Member X
6	160	SOL - 2 1/2" SOLID	-97.86	1.2D + 1.6W Normal Wind - P1	3.25	100	100	100	62.40	50.00	166.16	58.9	Member X
7	180	SOL - 1 3/4" SOLID	-22.91	1.2D + 1.6W Normal Wind - P1	3.25	100	100	100	89.14	50.00	60.54	37.8	Member X

Splices

		Top Splice					Bottom Splice				
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	30	1.2D + 1.6W Normal Wind - P1	366.35	0.00	0.0			1.2D + 1.6W Normal Wind - P1	412.01	0.00			
2	60	1.2D + 1.6W Normal Wind - P1	318.57	0.00	0.0			1.2D + 1.6W Normal Wind - P1	366.35	0.00		1/4 A325	6
3	90	1.2D + 1.6W Normal Wind - P1	274.64	0.00	0.0			1.2D + 1.6W Normal Wind - P1	318.57	0.00		1/4 A325	6
4	120	1.2D + 1.6W Normal Wind - P1	239.56	0.00	0.0			1.2D + 1.6W Normal Wind - P1	274.64	0.00		1/4 A325	6
5	140	1.2D + 1.6W Normal Wind - P1	106.48	0.00	0.0			1.2D + 1.6W Normal Wind - P1	239.56	0.00		1/8 A325	6
6	160	1.2D + 1.6W Normal Wind - P1	27.79	0.00	0.0			1.2D + 1.6W Normal Wind - P1	106.48	0.00		1/8 A325	6
7	180	1.2D + 1.0Di + 1.0Wi 90° Wind	0.60	0.00	0.0			1.2D + 1.6W Normal Wind - P1	27.79	0.00		7/8 A325	6

HORIZONTAL MEMBERS

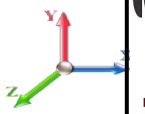
Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	30										0.00	0	0				
2	60										0.00	0	0				
3	90										0.00	0	0				
4	120										0.00	0	0				
5	140	SOL - 1 1/8" SOLID	-3.23	1.2D + 1.6W 60° Wind - P1	5.00	100	100	100	149.31	36.00	10.07	0	0			32	Member X
6	160	SOL - 1" SOLID	-1.63	1.2D + 1.6W 60° Wind - P1	5.00	100	100	100	168.00	36.00	6.29	0	0			26	Member X
7	180	SOL - 7/8" SOLID	-1.09	1.2D + 1.6W Normal Wind - P2	5.00	100	100	100	191.96	36.00	3.69	0	0			30	Member X

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	30	SAE - 4X4X0.3125	-8.64	1.2D + 1.6W 90° Wind - P3	23.59	50	50	50	178.97	36.00	16.93	1	1	24.35	21.7	51	Member Z
2	60	SAE - 3.5X3.5X0.25	-7.83	1.2D + 1.6W 90° Wind - P3	19.37	50	50	50	167.47	36.00	13.61	1	1	24.35	17.4	58	Member Z
3	90	SAE - 3X3X0.1875	-5.83	1.2D + 1.6W 90° Wind - P3	15.31	50	50	50	154.10	36.00	10.37	1	1	17.89	10.7	56	Member Z
4	120	SAE - 2.5X2.5X0.1875	-4.46	1.2D + 1.6W Normal Wind - P3	9.26	50	50	50	114.18	36.00	14.71	1	1	17.89	10.7	41	Bolt Bear
5	140	SAE - 3X3X0.1875	-12.7	1.2D + 1.6W 90° Wind - P1	5.96	50	50	50	54.03	36.00	30.28	0	0			42	Member Z
6	160	SAE - 2.5X2.5X0.1875	-7.72	1.2D + 1.6W 90° Wind - P1	5.96	50	50	50	65.06	36.00	23.39	0	0			33	Member Z
7	180	SAE - 2X2X0.1875	-3.64	1.2D + 1.6W 90° Wind - P1	5.96	50	50	50	81.73	36.00	16.18	0	0			23	Member Z

Force/Stress Tension Summary

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 17	



IES Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	30	SOL - 4 3/4" SOLID	360.23	0.9D + 1.6W 60° Wind	50	797.45	45.2	Member
2	60	SOL - 4 3/4" SOLID	323.75	0.9D + 1.6W 60° Wind	50	797.45	40.6	Member
3	90	SOL - 4 1/2" SOLID	285.36	0.9D + 1.6W 60° Wind	50	715.68	39.9	Member
4	120	SOL - 4 1/4" SOLID	249.09	0.9D + 1.6W 60° Wind	50	638.37	39.0	Member
5	140	SOL - 3 1/2" S0LID	219.25	0.9D + 1.6W 60° Wind	50	432.95	50.6	Member
6	160	SOL - 2 1/2" SOLID	95.00	0.9D + 1.6W 60° Wind	50	220.89	43.0	Member
7	180	SOL - 1 3/4" SOLID	21.99	0.9D + 1.6W 60° Wind	50	108.24	20.3	Member

Splices

		Top Splice					Bottom Splice					
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	30	0.9D + 1.6W 60° Wind	323.27	0.00	0.0			0.9D + 1.6W 60° Wind	360.2	0.00			
2	60	0.9D + 1.6W 60° Wind	284.90	0.00	0.0			0.9D + 1.6W 60° Wind	323.2	457.92	70.6	1 1/4 A325	6
3	90	0.9D + 1.6W 60° Wind	248.71	0.00	0.0			0.9D + 1.6W 60° Wind	284.9	457.92	62.2	1 1/4 A325	6
4	120	0.9D + 1.6W 60° Wind	219.71	0.00	0.0			0.9D + 1.6W 60° Wind	248.7	457.92	54.3	1 1/4 A325	6
5	140	0.9D + 1.6W 60° Wind	94.41	0.00	0.0			0.9D + 1.6W 60° Wind	219.7	360.65	60.9	1 1/8 A325	6
6	160	0.9D + 1.6W 60° Wind	21.20	0.00	0.0			0.9D + 1.6W 60° Wind	94.41	360.65	26.2	1 1/8 A325	6
7	180		0.00	0.00	0.0			0.9D + 1.6W 60° Wind	21.20	249.36	8.5	7/8 A325	6

HORIZONTAL MEMBERS

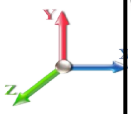
Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	30	-			36	0.00	0	0					
2	60	-			36	0.00	0	0					
3	90	-			36	0.00	0	0					
4	120	-			36	0.00	0	0					
5	140	SOL - 1 1/8" SOLID	2.76	0.9D + 1.6W Normal Wi	36	32.21	0	0				8.6	Member
6	160	SOL - 1" SOLID	1.73	1.2D + 1.6W Normal Wi	36	25.45	0	0				6.8	Member
7	180	SOL - 7/8" SOLID	1.13	1.2D + 1.6W 60° Wind -	36	19.48	0	0				5.8	Member

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	30	SAE - 4X4X0.3125	8.75	1.2D + 1.6W 90° Wind -	36	68.10	1	1	24.35	21.75	21.19	41.3	Blck Shear
2	60	SAE - 3.5X3.5X0.25	7.69	1.2D + 1.6W 90° Wind -	36	46.98	1	1	24.35	17.40	16.95	45.4	Blck Shear
3	90	SAE - 3X3X0.1875	5.64	1.2D + 1.6W 90° Wind -	36	30.21	1	1	17.89	10.77	10.42	54.1	Blck Shear
4	120	SAE - 2.5X2.5X0.1875	3.95	1.2D + 1.6W 60° Wind -	36	24.08	1	1	17.89	10.77	9.40	42.0	Blck Shear
5	140	SAE - 3X3X0.1875	12.51	1.2D + 1.6W 90° Wind -	36	35.32	0	0				35.4	Member
6	160	SAE - 2.5X2.5X0.1875	7.65	1.2D + 1.6W 90° Wind -	36	29.22	0	0				26.2	Member
7	180	SAE - 2X2X0.1875	3.63	1.2D + 1.6W 90° Wind -	36	23.00	0	0				15.8	Member

Seismic Section Forces

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 18	



TES Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Dead Load Factor	1.20	**Sds**	0.171	**Ss**	0.1610	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.092	**S1**	0.0580	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.140	**R**	3.0000	**Vs**	3.0487	**f1**	1.5118

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	15.00	12193.	0.01	0.06	0.03	56.26
2	45.00	10343.	0.12	0.07	0.03	105.29
3	75.00	8537.0	0.33	0.04	0.01	152.99
4	105.00	7536.8	0.64	-0.07	0.02	187.91
5	130.00	5971.5	0.99	-0.11	0.12	209.39
6	150.00	5231.3	1.31	0.14	0.35	301.66
7	170.00	4484.1	1.69	1.07	0.79	466.35

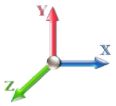
Load Case: 0.9D + 1.0E

Dead Load Factor	0.90	**Sds**	0.171	**Ss**	0.1610	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.092	**S1**	0.0580	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.140	**R**	3.0000	**Vs**	3.0487	**f1**	1.5118

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	15.00	12193.	0.01	0.06	0.03	56.26
2	45.00	10343.	0.12	0.07	0.03	105.29
3	75.00	8537.0	0.33	0.04	0.01	152.99
4	105.00	7536.8	0.64	-0.07	0.02	187.91
5	130.00	5971.5	0.99	-0.11	0.12	209.39
6	150.00	5231.3	1.31	0.14	0.35	301.66
7	170.00	4484.1	1.69	1.07	0.79	466.35

Support Forces Summary

Structure:	CT09865-S-SBA	**Code:**	EIA/TIA-222-G	8/27/2019	
Site Name:	Niantic	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 19	



Tower Engineering Solutions

Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal Wind - P1	1	0.00	410.03	-49.18	
	1a	16.99	-172.43	-14.67	
	1b	-16.99	-172.43	-14.67	
1.2D + 1.6W Normal Wind - P2	1	0.00	310.28	-34.95	
	1a	11.65	-122.56	-9.49	
	1b	-11.65	-122.56	-9.49	
1.2D + 1.6W Normal Wind - P3	1	0.00	399.12	-48.30	
	1a	16.59	-166.98	-14.48	
	1b	-16.59	-166.98	-14.48	
1.2D + 1.6W 60° Wind - P1	1	-3.87	208.76	-24.42	
	1a	-23.08	208.56	8.86	
	1b	-37.88	-352.16	-21.87	
1.2D + 1.6W 60° Wind - P2	1	-2.21	161.24	-17.70	
	1a	-16.42	161.03	6.93	
	1b	-26.07	-257.11	-15.05	
1.2D + 1.6W 60° Wind - P3	1	-3.90	203.81	-24.03	
	1a	-22.75	203.60	8.63	
	1b	-37.19	-342.25	-21.47	
1.2D + 1.6W 90° Wind - P1	1	-4.59	21.72	-1.73	
	1a	-37.04	348.53	18.77	
	1b	-34.15	-305.09	-17.04	
1.2D + 1.6W 90° Wind - P2	1	-2.62	21.72	-1.77	
	1a	-26.31	265.19	13.69	
	1b	-23.28	-221.76	-11.92	
1.2D + 1.6W 90° Wind - P3	1	-4.63	21.72	-1.74	
	1a	-36.43	339.73	18.40	
	1b	-33.55	-296.29	-16.66	
0.9D + 1.6W Normal Wind	1	0.00	404.26	-48.72	
	1a	17.38	-177.70	-14.90	
	1b	-17.38	-177.70	-14.90	
0.9D + 1.6W 60° Wind	1	-3.88	203.17	-23.97	
	1a	-22.69	202.96	8.63	
	1b	-38.27	-357.27	-22.09	
0.9D + 1.6W 90° Wind	1	-4.59	16.29	-1.28	
	1a	-36.64	342.81	18.54	
	1b	-34.55	-310.24	-17.26	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	135.01	-11.78	
	1a	3.23	4.65	-2.93	
	1b	-3.23	4.65	-2.93	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-0.88	91.29	-6.37	
	1a	-5.95	91.21	2.42	
	1b	-8.20	-38.20	-4.73	

1.2D + 1.0Di + 1.0Wi 90° Wind	1	-1.03	48.10	-1.09
	1a	-9.16	123.17	4.69
	1b	-7.28	-26.96	-3.60
1.2D + 1.0E	1	0.00	31.15	3.68
	1a	4.41	17.00	-2.57
	1b	-4.41	17.00	-2.57
0.9D + 1.0E	1	0.00	25.72	4.16
	1a	4.82	11.58	-2.80
	1b	-4.82	11.58	-2.80
1.0D + 1.0W Normal Wind	1	0.00	97.61	-11.26
	1a	2.48	-21.66	-2.43
	1b	-2.48	-21.66	-2.43
1.0D + 1.0W 60° Wind	1	-0.80	56.41	-6.17
	1a	-5.74	56.36	2.39
	1b	-6.76	-58.47	-3.90
1.0D + 1.0W 90° Wind	1	-0.94	18.10	-1.51
	1a	-8.61	85.03	4.43
	1b	-6.00	-48.83	-2.92

Max Reactions

Leg			Overturning		
Max Uplift:	-357.27	(kips)	Moment:	7734.54	(ft-kips)
Max Down:	410.03	(kips)	Total Down:	65.16	(kips)
Max Shear:	49.18	(kips)	Total Shear:	78.52	(kips)

Max Reactions

Leg			Overturning		
Max Uplift:	-357.27	(kips)	Moment:	7734.54	(ft-kips)
Max Down:	410.03	(kips)	Total Down:	65.16	(kips)
Max Shear:	49.18	(kips)	Total Shear:	78.52	(kips)

Anchor Bolts

Bolt Size (in.):	1.50	Number Bolts:	8
Yield Strength (Ksi):	105.00	Tensile Strength (Ksi):	125.00
Detail Type:	D	Length:	0.75

Interaction Ratio: 0.45

Max Usages

Max Leg: 76.5% (1.2D + 1.6W Normal Wind - P1 - Sect 1)
Max Diag: 57.5% (1.2D + 1.6W 90° Wind - P3 - Sect 2)
Max Horiz: 32.1% (1.2D + 1.6W 60° Wind - P1 - Sect 5)

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0E - Normal To Face	140.00	0.0240	0.0009	0.0340
	160.00	0.0355	-0.0005	0.0475
	170.00	0.0419	-0.0002	0.0370
	180.00	0.0484	-0.0001	0.0407
0.9D + 1.6W 105 mph Wind at 60° From Face	140.00	0.7924	0.1143	1.0044
	160.00	1.1241	0.1726	1.2949
	170.00	1.3039	0.2926	1.0310
	180.00	1.4820	0.4037	0.9929
0.9D + 1.6W 105 mph Wind at 90° From Face	140.00	0.7983	-0.0763	0.9992
	160.00	1.1320	-0.0762	1.2849
	170.00	1.3133	-0.0762	1.0391
	180.00	1.4901	-0.0762	0.4337
0.9D + 1.6W 105 mph Wind at Normal To Face	140.00	0.8192	0.0601	1.0415
	160.00	1.1623	-0.0594	1.3416
	170.00	1.3490	0.0601	1.0566
	180.00	1.5379	0.0601	1.8204
1.0D + 1.0W 60 mph Wind at 60° From Face	140.00	0.1621	0.0150	0.2057
	160.00	0.2299	0.0170	0.2651
	170.00	0.2667	0.0215	0.2106
	180.00	0.3030	0.0258	0.2004
1.0D + 1.0W 60 mph Wind at 90° From Face	140.00	0.1633	-0.0152	0.2040
	160.00	0.2315	-0.0148	0.2624
	170.00	0.2687	-0.0143	0.2125
	180.00	0.3047	-0.0140	0.0893

1.0D + 1.0W 60 mph Wind at Normal To Face	140.00	0.1677	-0.0129	0.2124
	160.00	0.2378	-0.0125	0.2738
	170.00	0.2760	0.0119	0.2161
	180.00	0.3146	0.0115	0.3720
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	140.00	0.1822	0.0187	0.2320
	160.00	0.2590	0.0233	0.3041
	170.00	0.3008	0.0331	0.2413
	180.00	0.3425	0.0421	0.2578
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	140.00	0.1827	-0.0173	0.2290
	160.00	0.2596	-0.0170	0.2995
	170.00	0.3014	-0.0166	0.2429
	180.00	0.3425	-0.0164	0.0298
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	140.00	0.1828	-0.0142	0.2334
	160.00	0.2605	-0.0138	0.3073
	170.00	0.3031	-0.0133	0.2413
	180.00	0.3469	0.0130	0.5068
1.2D + 1.0E - Normal To Face	140.00	0.0240	0.0009	0.0340
	160.00	0.0355	0.0005	0.0476
	170.00	0.0419	0.0002	0.0370
	180.00	0.0485	0.0001	0.0408
1.2D + 1.6W 105 mph Wind at 60° From Face - P1	140.00	0.7935	0.1147	1.0065
	160.00	1.1259	0.1731	1.2980
	170.00	1.3061	0.2933	1.0331
	180.00	1.4846	0.4046	0.9949
1.2D + 1.6W 105 mph Wind at 60° From Face - P2	140.00	0.6326	0.0854	0.8597
	160.00	0.9193	0.1370	1.1626
	170.00	1.0770	0.2430	0.9030
	180.00	1.2326	0.3412	0.8930
1.2D + 1.6W 105 mph Wind at 60° From Face - P3	140.00	0.7634	0.1110	0.9542
	160.00	1.0769	0.1654	1.2086
	170.00	1.2460	0.2777	0.9684
	180.00	1.4129	0.3815	0.9373
1.2D + 1.6W 105 mph Wind at 90° From Face - P1	140.00	0.7994	-0.0765	1.0012
	160.00	1.1338	-0.0765	1.2879
	170.00	1.3155	-0.0765	1.0412
	180.00	1.4927	-0.0765	0.4361
1.2D + 1.6W 105 mph Wind at 90° From Face - P2	140.00	0.6367	-0.0503	0.8540
	160.00	0.9249	-0.0503	1.1514
	170.00	1.0837	-0.0503	0.9097
	180.00	1.2379	-0.0503	0.3045
1.2D + 1.6W 105 mph Wind at 90° From Face - P3	140.00	0.7685	-0.0763	0.9480
	160.00	1.0836	-0.0763	1.1975
	170.00	1.2538	-0.0763	0.9749
	180.00	1.4193	-0.0763	0.3611
1.2D + 1.6W 105 mph Wind at Normal To Face - P1	140.00	0.8204	0.0603	1.0436
	160.00	1.1642	0.0596	1.3448
	170.00	1.3512	0.0603	1.0589
	180.00	1.5405	0.0602	1.8227
1.2D + 1.6W 105 mph Wind at Normal To Face - P2	140.00	0.6522	0.0390	0.8891
	160.00	0.9481	0.0383	1.2030
	170.00	1.1114	0.0389	0.9228
	180.00	1.2770	-0.0388	1.6865
1.2D + 1.6W 105 mph Wind at Normal To Face - P3	140.00	0.7873	0.0608	0.9855
	160.00	1.1103	0.0602	1.2454
	170.00	1.2851	0.0608	0.9878
	180.00	1.4618	0.0607	1.7423

Last revised on March 27, 2019

Mat Foundation Design for Self Supporting Tower

			Date: 8/27/2019
Customer Name:	**SBA Communications Corp**	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	180
Site Nmber:	CT09865-S-SBA	**Engineer Name:**	. Arinyedokia
Engr. Number:	83953	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Analysis or Design? Analysis

Number of Tower Legs: 3 Legs

Base Reactions (Factored):

(1). Individual Leg:

Axial Load (Kips):	410.0	Uplift Force (Kips):	357.3
Shear Force (Kips):	49.2		

(2). Tower Base:

Total Vertical Load (Kips):	65.2	Total Shear Force (Kips):	78.5
Moment (Kips-ft):	7734.5		

Foundation Geometries:

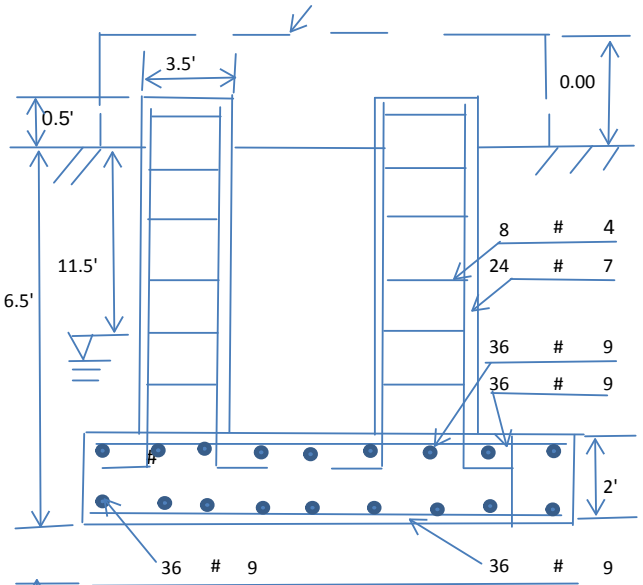
Leg distance (Center-to-Center ft.):		23.0	Mods required -Yes/No ?:	No	
Diameter of Pier (ft.):	Round	3.5	Pier Height A. G. (ft.):	0.50	
Tower center to mat center (ft):		0.00	Depth of Base BG (ft.):	6.5	
Length of Pad (ft.):		36	Width of Pad (ft.):	36	
Thickness of Pad (ft):		2.00			

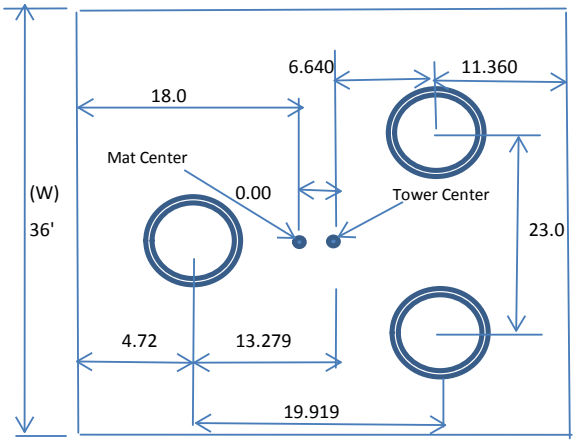
Material Properties and Reabr Info:

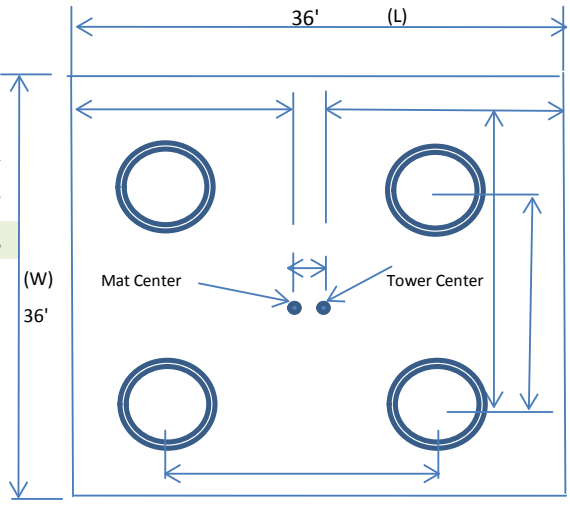
Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	7	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	24	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36	

Soil Design Parameters:

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







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

Total Dry Soil Volume (cu. Ft.):	5702.11	Total Dry Soil Weight (Kips):	712.76
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	712.76	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	2736.32	Total Dry Concrete Weight (Kips):	410.45
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	410.45	Total Vertical Load on Base (Kips):	1188.37

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1677.02	<	Allowable Factored Soil Bearing (psf):	6000	0.28	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	19368.9	>	Design Factored Momont (kips-ft):	8238	0.43	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.35	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):		0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:		1.00		
(1) Concrete Pier:					Load/ Capacity Ratio	
Vertical Steel Rebar Area (sq. in./each):	0.60		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	614.6	>	Design Factored Moment (Mu, Kips-Ft)	245.9	0.40	OK!
Calculated Shear Capacity (Kips):	100.7	>	Design Factored Shear (Kips):	49.2	0.49	OK!
Calculated Tension Capacity (Tn, Kips):	777.6	>	Design Factored Tension (Tu Kips):	357.3	0.46	OK!
Calculated Compression Capacity (Pn, Kips):	1818.0	>	Design Factored Axial Load (Pu Kips):	410.0	0.23	OK!
Moment & Tension Strength Combination:	0.40	OK!	Check Tie Spacing (Design/Req'd):	1		OK!
Pier Reinforcement Ratio:	0.010	Reinforcement Ratio is satisfied per ACI				
(2).Concrete Pad:						
One-Way Design Shear Capacity (L or W Direction, Kips):	725.4	>	One-Way Factored Shear (L/W-Dir Kips	384.9	0.53	OK!
One-Way Design Shear Capacity (Diagonal Dir., Kips):	676.9	>	One-Way Factored Shear (Dia. Dir, Kips	344.1	0.51	OK!
Lower Steel Pad Reinforcement Ratio (L or W-Direct.):	0.0041		Lower Steel Reinf. Ratio (Dia. Dir.):	0.0037		
Lower Steel Pad Moment Capacity (L or W-Dir. Kips-ft):	3152.1	>	Moment at Bottom (L-Direct. K-Ft):	1917.0	0.61	OK!
Lower Steel Pad Moment Capacity (Dia. Direction,K-ft):	3012.0	>	Moment at Bottom (Dia. Dir. K-Ft):	1973.0	0.66	OK!
Upper Steel Pad Reinforcement Ratio (L or W -Direction):	0.0041		Upper Steel Reinf. Ratio (Dia. Dir.):	0.0037		
Upper Steel Pad Moment Capacity (L or W-Dir., Kips-ft):	3152.1	>	Moment at the top (L-Dir Kips-Ft):	932.2	0.30	OK!
Upper Steel Pad Moment Capacity (Dia. Direction, K-ft):	3012.0	>	Moment at the top (Dia. Dir., K-Ft):	696.3	0.23	OK!
Punching Failure Capacity (Kips):	658.7	>	Punch. Failure Factored Shear (K):	410.0	0.62	OK!

EXHIBIT 9

Antenna Mount Structural Analysis

Source: SBA Date: 04.29.2019

SBA Site:	CT09865-S Niantic
T-Mobile Site Number:	CTNL808B
Project:	L600 Project
Prepared For:	T-Mobile
Mount Description:	(3) T-Frames w/ Custom Site-built Augments
Site Location:	51 Daniels Ave, Waterford, CT New London County 41.330264°, -72.171384°
Design Codes:	ANSI/TIA-222-G IBC 2015 w/ 2018 CT Building Code
Analysis Load Case:	T-Mobile Final Configuration
Analysis Result:	**Adequate @ 75%** - Once Augmented See Conclusion

Revision 0
July 21, 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 CT09865-S Niantic 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} = 0.172
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
- Construction Drawings
  Chappell, L600 Project, Rev-0, 6/11/19.
- Colo Application
  SBA 600 MHz, App # 117056 v1.
- RFDS
  T-Mobile L600 Project, V2.1, CTNL808B, 5/14/19.

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
160.0'±	(3) RFS APX16DWV-16DWV-S-E-A20	(3) T-Frames w/ Custom Site-built Augments
	(3) RFS APXVAARR24_43-U-NA20	
	(3) ERICSSON 4449 B71+B12 RRH	
	(3) GENERIC TWIN STYLE 1B-AWS TMA	
	(3) GENERIC TWIN STYLE 1A-PCS 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. *APX16 panels to be installed on mount pipe in Position 1 similar to existing.*
   - 2.2. *AARR panels to be installed on New Pipe2.5STD (2.875" OD Schedule 40) x 8'-0" mount pipe in Position 2 (middle position at t-frame standoff).*
3. *RRH/TMA units to be installed as follows:*
   - 3.1. *TMAs to be installed on mount pipes behind panels in Positions 1 and 2.*
   - 3.2. *4449 RRHs to be installed on mount pipe behind panel 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	Augment Frame Standoff	75%	Adequate Once Augmented[3]
	Augment Frame Bracing	26%	
	Augment Frame Bracket	5%	
	Augment Frame Vert Pipe	16%	
	Standoff	4%	
	Top/Bottom Rail	58%	
	Pipe2.0STD Mount Pipe	20%	
	New Pipe2.5STD Mount Pipe	44%	
	Vert Weld Face Bracing	31%	
	Stiff Arm	17%	

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 New Frame Bracing; A new augment sector frame with angle bracing is to be built around the existing antenna mount frame.

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 rails (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:
  - APX16 panels to be installed on mount pipe in Position 1 similar to existing.
  - AARR panels to be installed on New Pipe2.5STD (2.875" OD Schedule 40) x 8'-0" mount pipe in Position 2 (middle position at t-frame standoff).
- RRH/TMA units to be installed as follows:
  - TMAs to be installed on mount pipes behind panels in Positions 1 and 2.
  - 4449 RRHs to be installed on mount pipe behind panel 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 CDs and 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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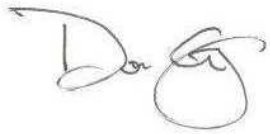
jesse.drennen@geostructural.com

Reviewed and Approved by:



Don George, PE, SE, MLSE
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don.george@geostructural.com

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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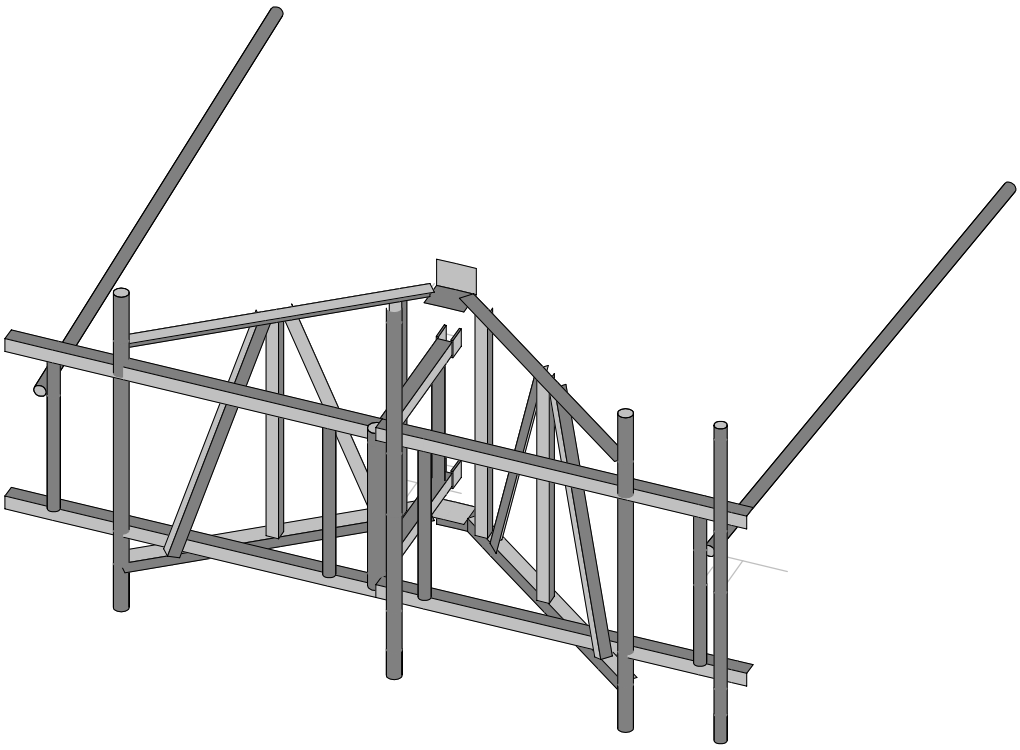

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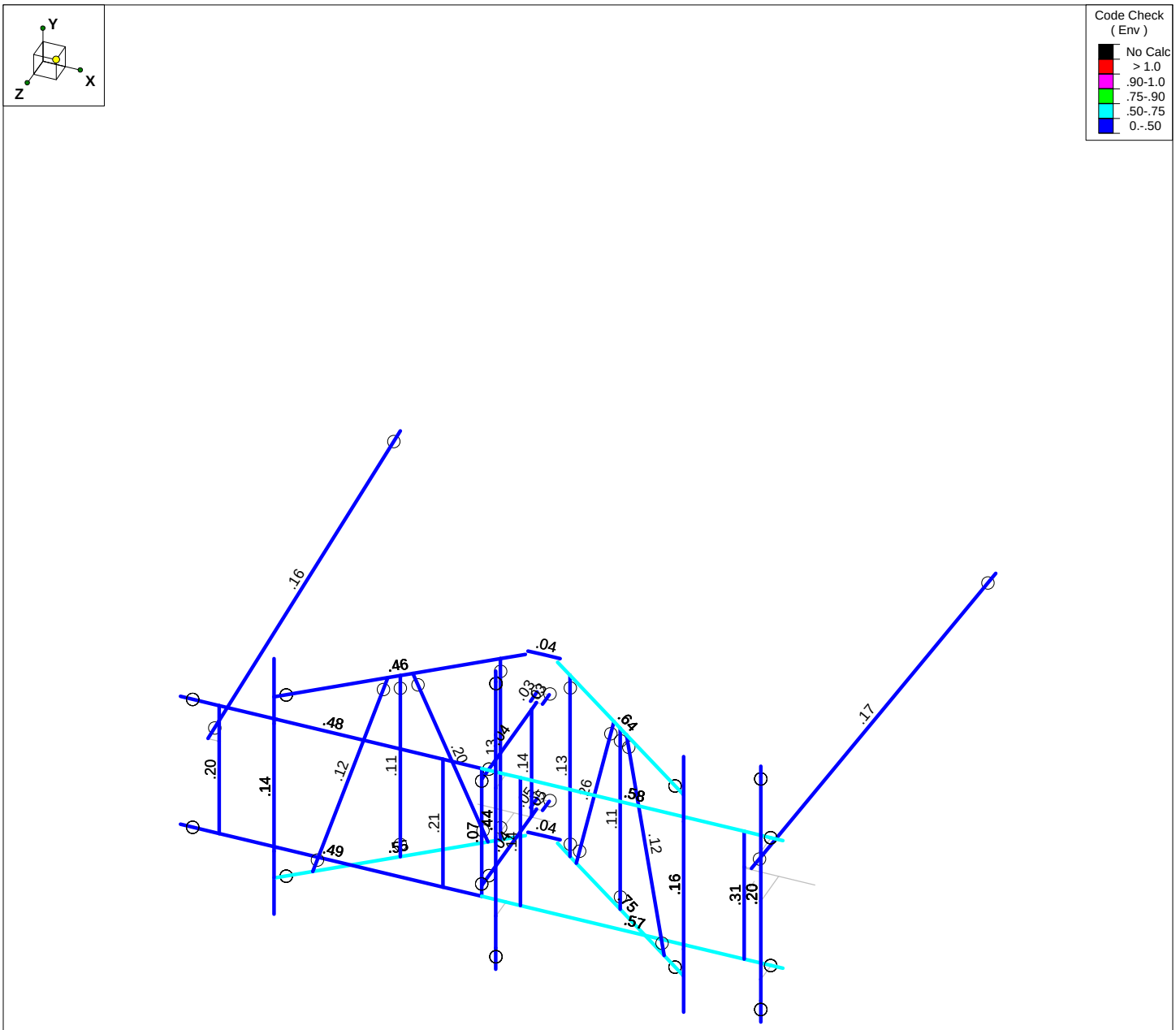

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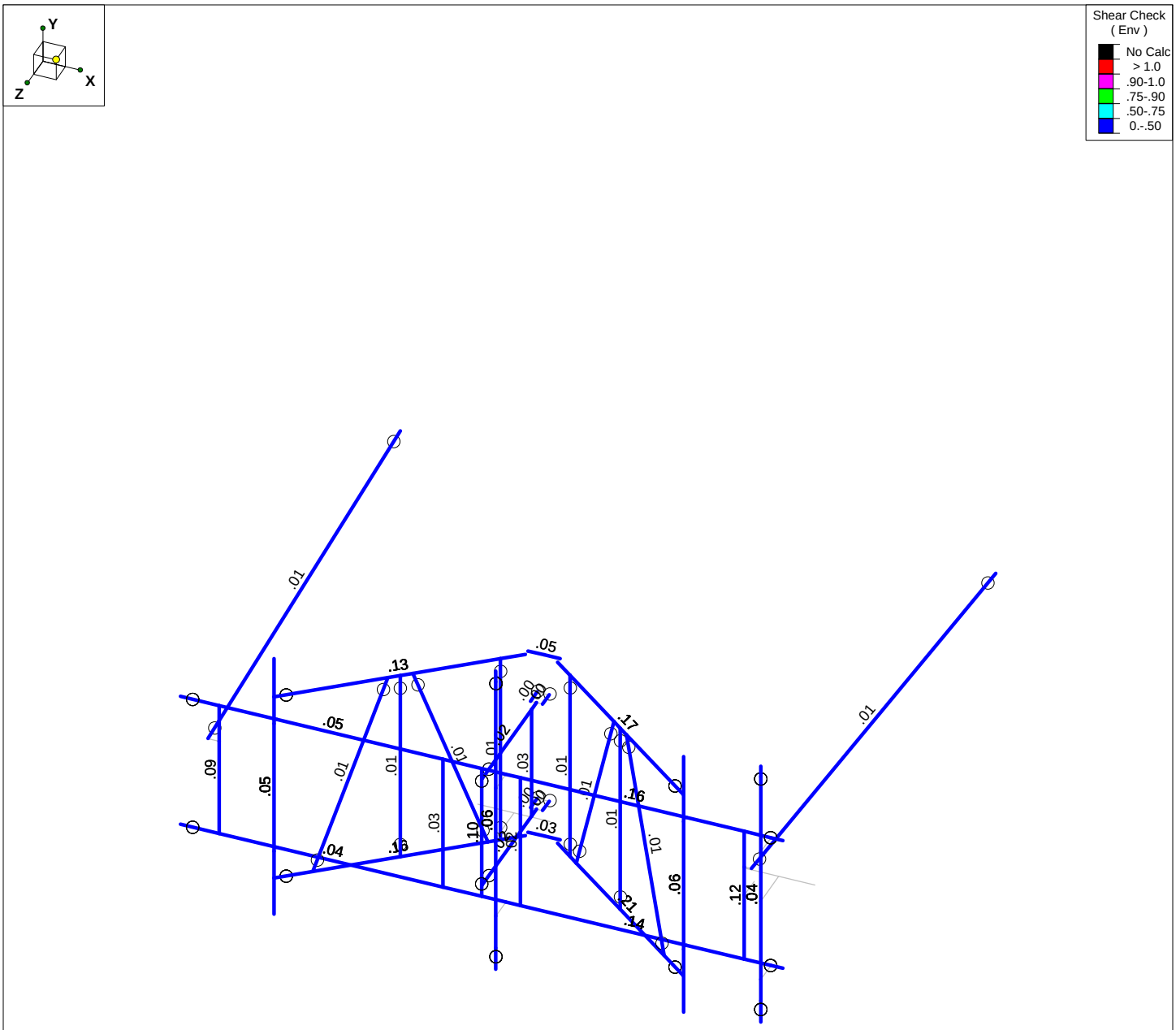

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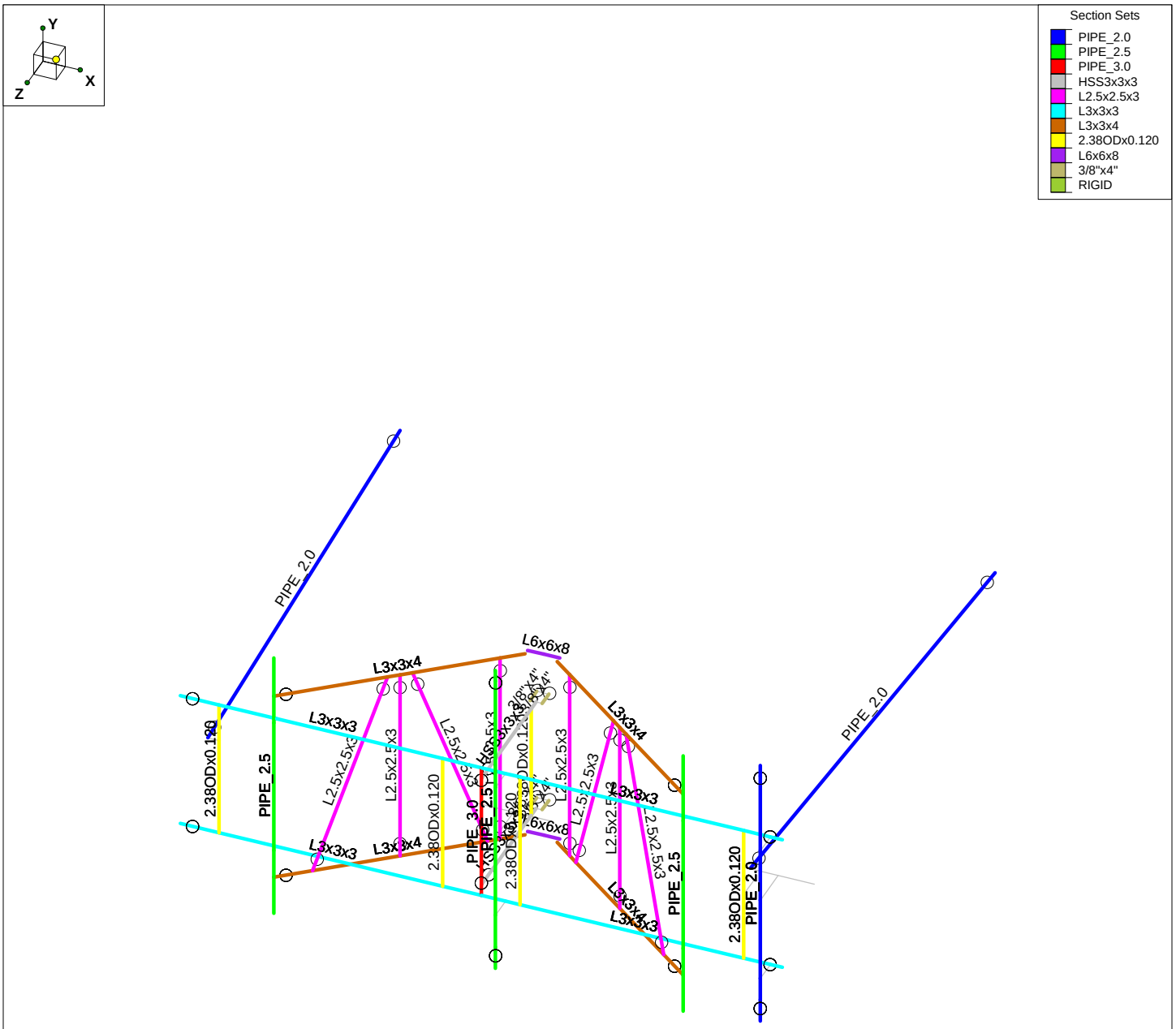

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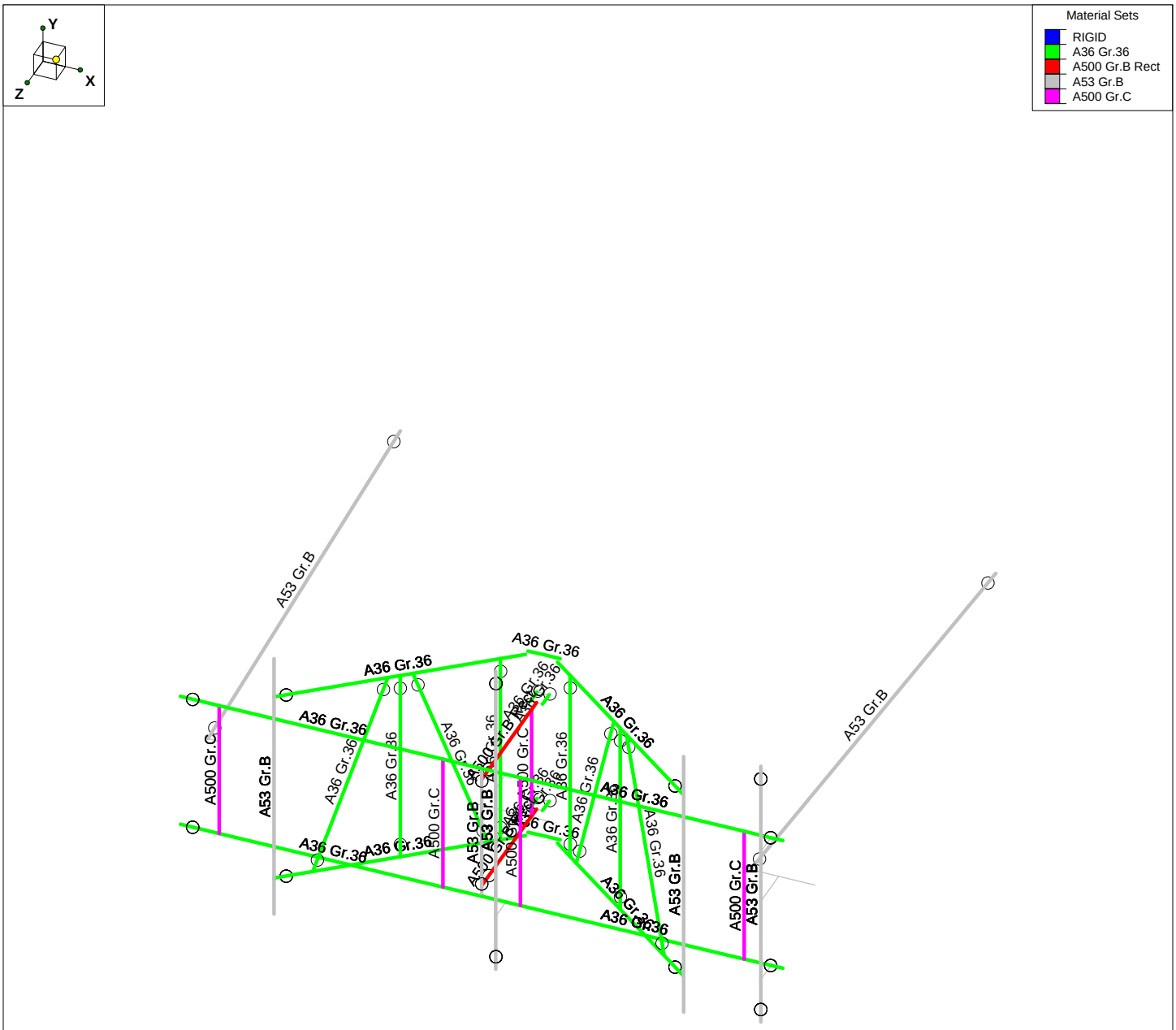

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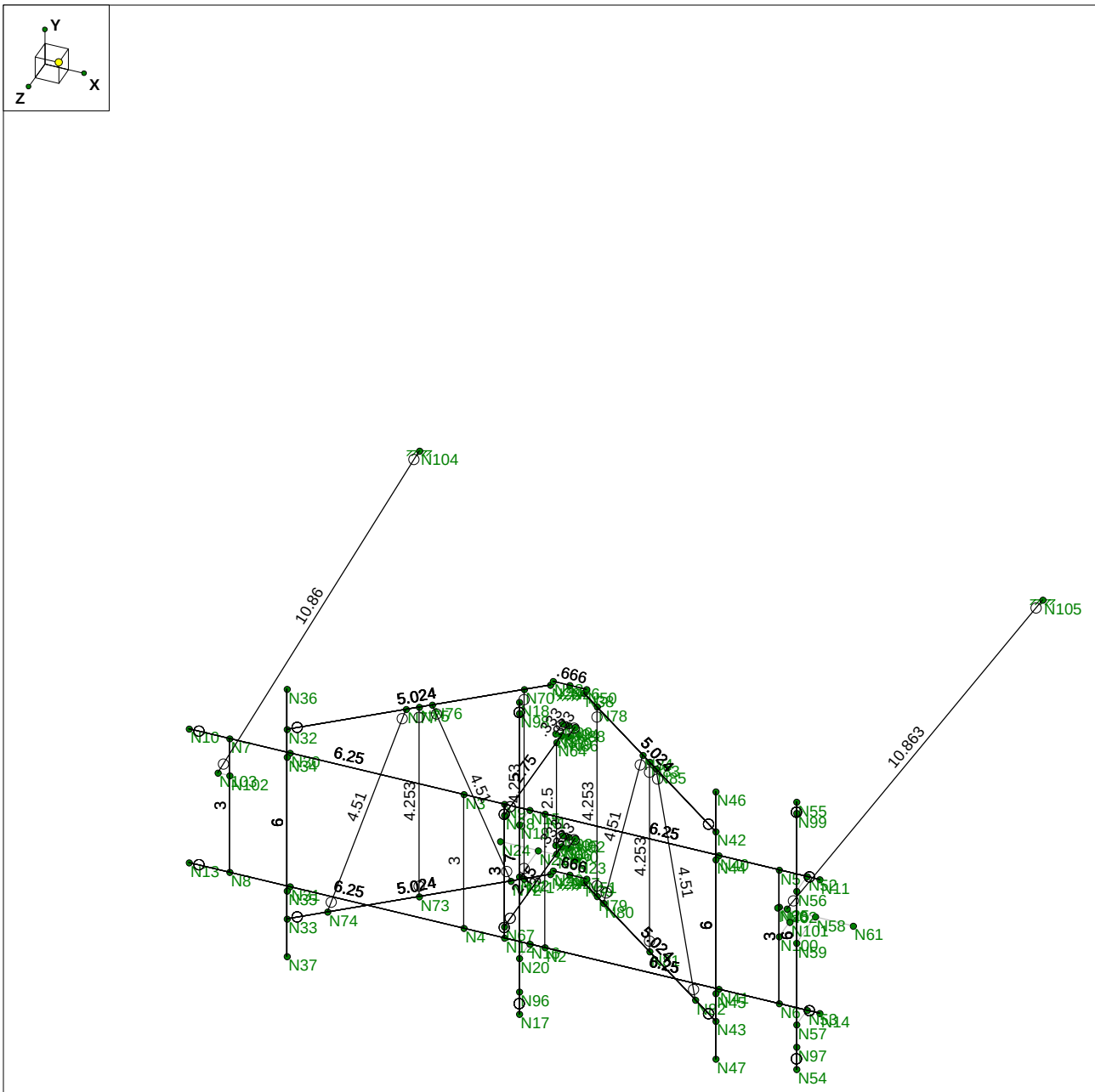

Member Length (ft) Displayed
Envelope Only Solution

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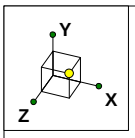

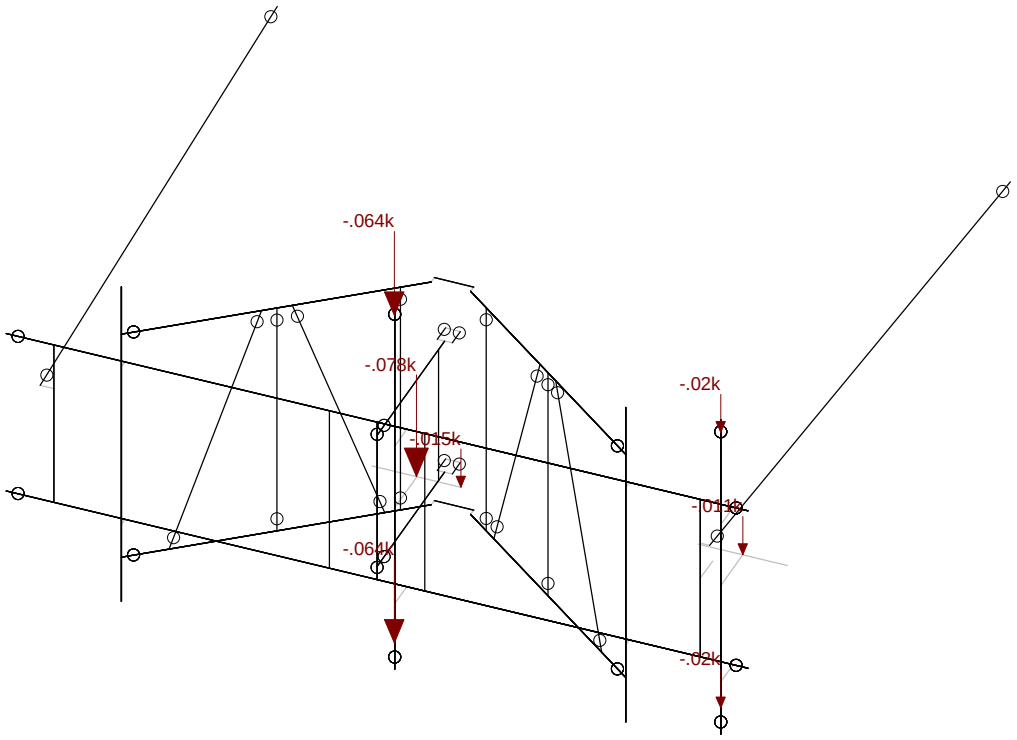

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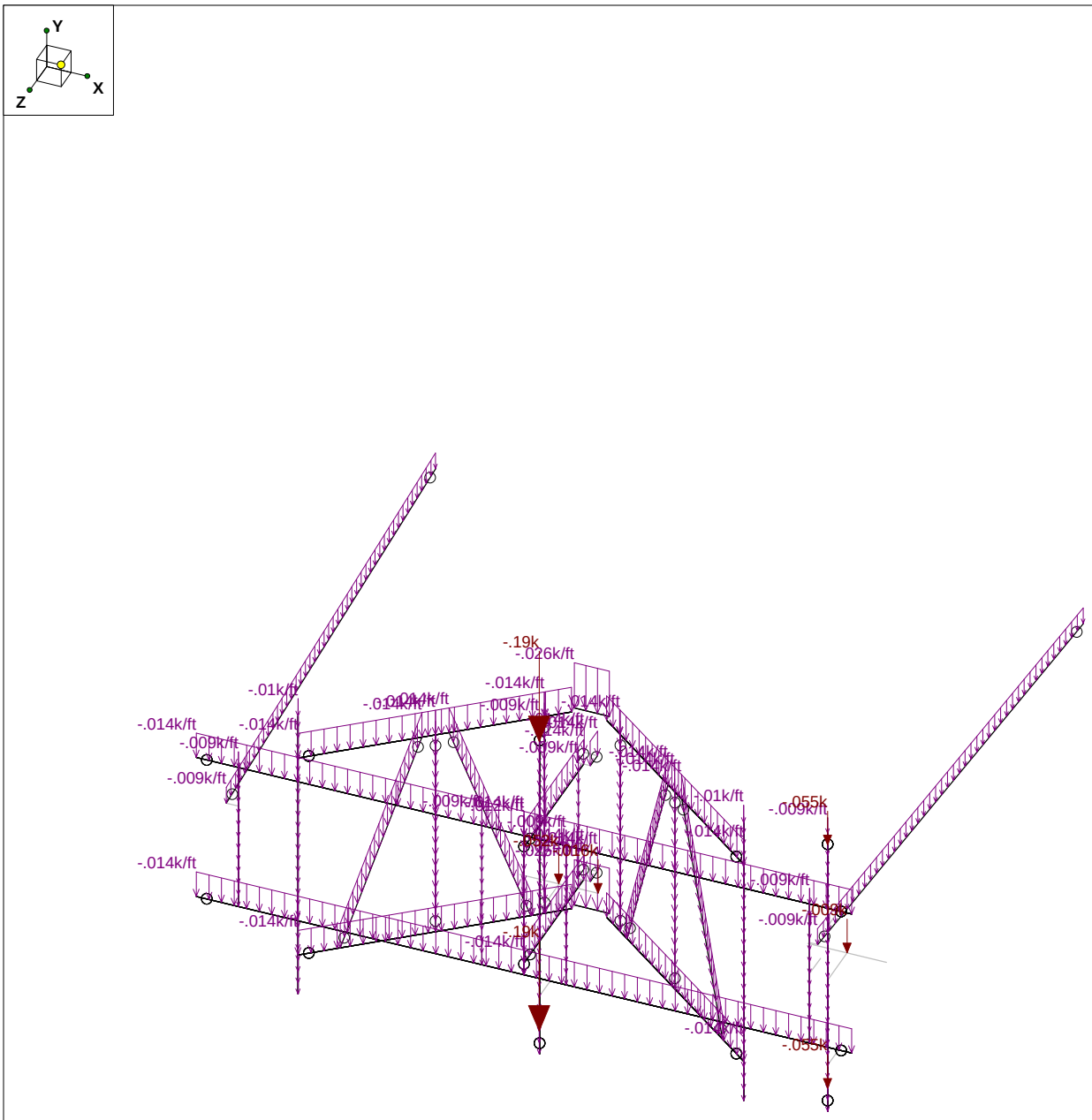

Loads: BLC 2, Di
Envelope Only Solution

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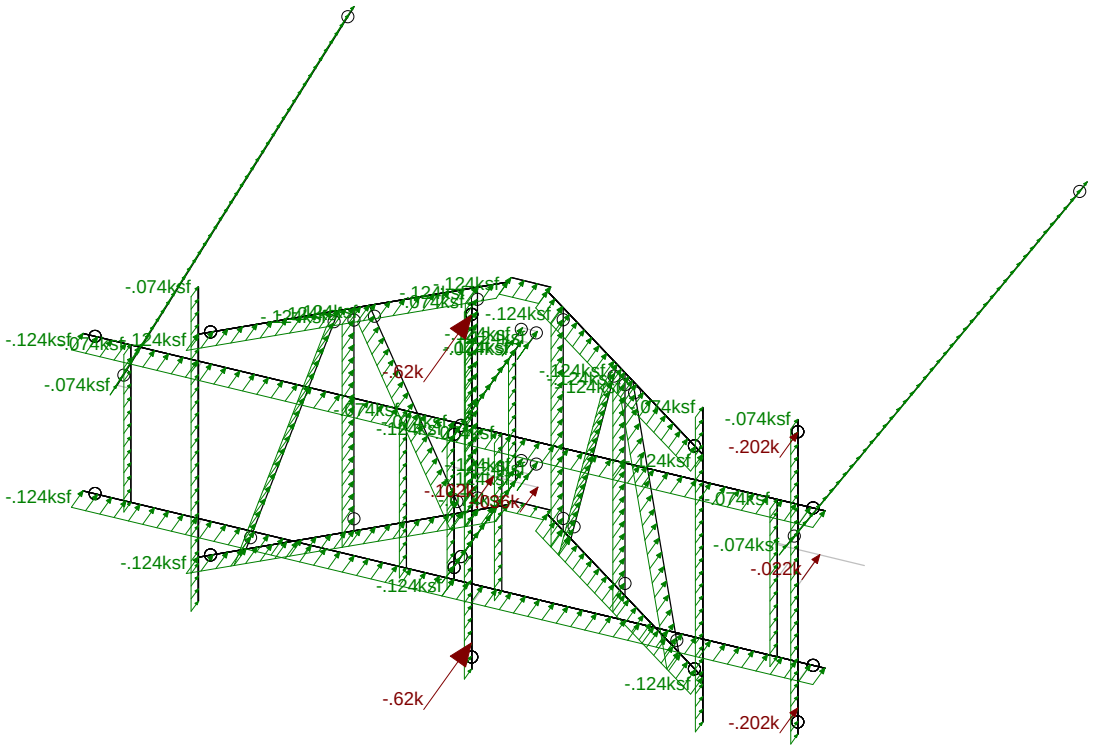

Loads: BLC 5, Woz
Envelope Only Solution

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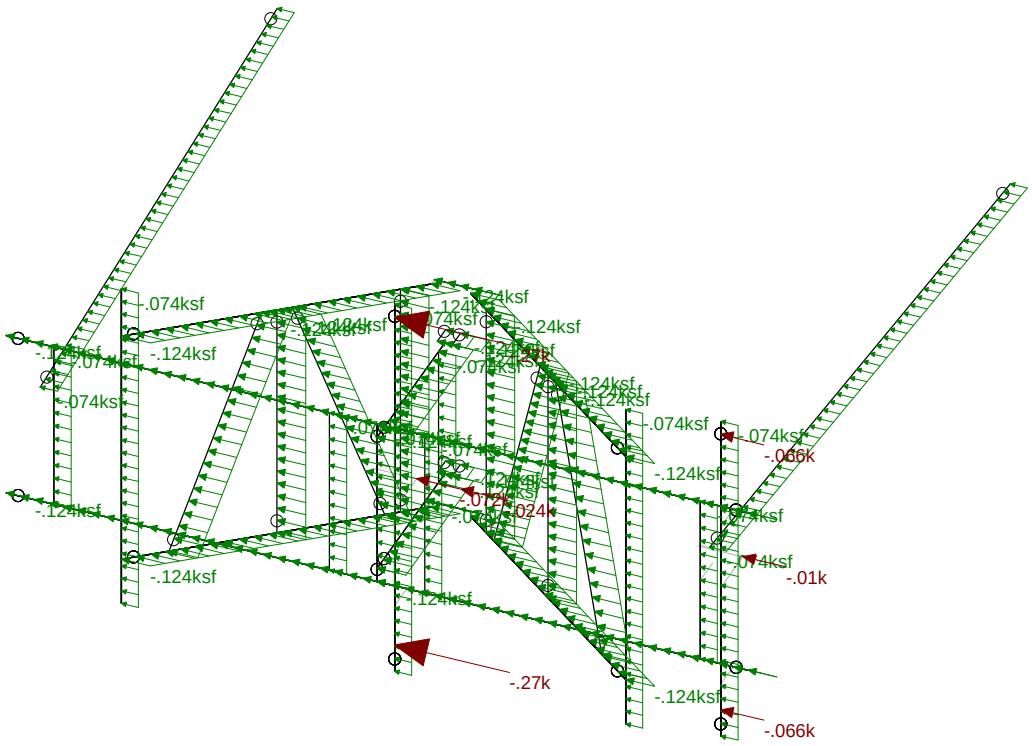

Loads: BLC 6, Wox
Envelope Only Solution

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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		8				
2	Di	SL				8		36		
3	Lm [500]	LL				1				
4	Lv [250]	LL				2				
5	Woz	WL				8		36		
6	Wox	WL				8		36		
7	Wiz	WL				8		36		
8	Wix	WL				8		36		
9	Ez	EL				8				
10	Ex	EL				8				

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
7	A500 Gr.C	29000	11154	.3	.65	.49	46	1.4	62	1.3

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	None	A53 Gr.B	Typical	.749	.293	.293	.586
2	PIPE_2.0	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	PIPE_2.5	PIPE_2.5	Beam	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	PIPE_3.0	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
5	PIPE_3.5	PIPE_3.5	Beam	None	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
6	PIPE_4.0	PIPE_4.0	Beam	None	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
7	PIPE_5.0	PIPE_5.0	Beam	None	A53 Gr.B	Typical	4.01	14.3	14.3	28.6
8	HSS2x2x3	HSS2x2x3	Beam	None	A500 Gr.B Rect	Typical	1.19	.641	.641	1.09

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
9	HSS3x3x3	HSS3x3x3	Beam	None	A500 Gr.B Rect	Typical	1.89	2.46	2.46	4.03
10	HSS4x4x3	HSS4x4x3	Beam	None	A500 Gr.B Rect	Typical	2.58	6.21	6.21	10
11	HSS4x4x4	HSS4x4x4	Beam	None	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
12	HSS5x5x4	HSS5x5x4	Beam	None	A500 Gr.B Rect	Typical	4.3	16	16	25.8
13	C3x3.5	C3x3.5	Beam	None	A36 Gr.36	Typical	1.09	.169	1.57	.023
14	C4x4.5	C4x4.5	Beam	None	A36 Gr.36	Typical	1.38	.289	3.65	.032
15	C5x6.7	C5x6.7	Beam	None	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	L3.5x3.5x4	L3.5x3.5x4	Beam	None	A36 Gr.36	Typical	1.7	2	2	.039
22	L4x4x4	L4x4x4	Beam	None	A36 Gr.36	Typical	1.93	3	3	.044
23	1/2"x6"	1/2"x6"	Beam	None	A36 Gr.36	Typical	3	.063	9	.237
24	2.38ODx0.120	2.38ODx0.120	Beam	None	A500 Gr.C	Typical	.852	.545	.545	1.091
25	SR 0.75	SR 0.75	Beam	None	A36 Gr.36	Typical	.442	.016	.016	.031
26	C5.5x3.75x3/16	C5.5x3.75x3/16	Beam	None	A36 Gr.36	Typical	2.367	3.462	12.029	.027
27	L6x6x8	L6x6x8	Beam	None	A36 Gr.36	Typical	5.77	19.9	19.9	.501
28	5/16"x7	5/16"x7	Beam	None	A36 Gr.36	Typical	2.188	.018	8.932	.069
29	3/8"x4"	3/8"x4"	Beam	None	A36 Gr.36	Typical	1.5	.018	2	.066

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	N26	Reaction	Reaction	Reaction			
2	N27	Reaction	Reaction	Reaction			
3	N28						
4	N29						
5	N38						
6	N39						
7	N48						
8	N49						
9	N50						
10	N51						
11	N66						
12	N69						
13	N86						
14	N87						
15	N88						
16	N89						
17	N90						
18	N91						
19	N92						
20	N93						
21	N94	Reaction	Reaction	Reaction			
22	N95	Reaction	Reaction	Reaction			
23	N104	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
24	N105	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			2.38ODx0.120	Beam	None	A500 Gr.C	Typical
2	M2	N3	N4			2.38ODx0.120	Beam	None	A500 Gr.C	Typical
3	M3	N5	N6			2.38ODx0.120	Beam	None	A500 Gr.C	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
4	M4	N7	N8			2.38ODx0.120	Beam	None	A500 Gr.C	Typical
5	M5	N10	N9		180	L3x3x3	Beam	None	A36 Gr.36	Typical
6	M6	N13	N12		180	L3x3x3	Beam	None	A36 Gr.36	Typical
7	M7	N18	N17			PIPE_2.5	Beam	None	A53 Gr.B	Typical
8	M8	N19	N15			RIGID	None	None	RIGID	Typical
9	M9	N20	N16			RIGID	None	None	RIGID	Typical
10	M10	N22	N21			RIGID	None	None	RIGID	Typical
11	M11	N24	N23			RIGID	None	None	RIGID	Typical
12	M12	N9	N11		180	L3x3x3	Beam	None	A36 Gr.36	Typical
13	M13	N12	N14		180	L3x3x3	Beam	None	A36 Gr.36	Typical
14	M14	N36	N37			PIPE_2.5	Beam	None	A53 Gr.B	Typical
15	M15	N30	N34			RIGID	None	None	RIGID	Typical
16	M16	N31	N35			RIGID	None	None	RIGID	Typical
17	M17	N32	N28		90	L3x3x4	Beam	None	A36 Gr.36	Typical
18	M18	N33	N29			L3x3x4	Beam	None	A36 Gr.36	Typical
19	M19	N46	N47			PIPE_2.5	Beam	None	A53 Gr.B	Typical
20	M20	N40	N44			RIGID	None	None	RIGID	Typical
21	M21	N41	N45			RIGID	None	None	RIGID	Typical
22	M22	N42	N38		180	L3x3x4	Beam	None	A36 Gr.36	Typical
23	M23	N43	N39		90	L3x3x4	Beam	None	A36 Gr.36	Typical
24	M24	N48	N50			L6x6x8	Beam	None	A36 Gr.36	Typical
25	M25	N49	N51		90	L6x6x8	Beam	None	A36 Gr.36	Typical
26	M26	N28	N48		180	RIGID	None	None	RIGID	Typical
27	M27	N50	N38		180	RIGID	None	None	RIGID	Typical
28	M28	N49	N29		180	RIGID	None	None	RIGID	Typical
29	M29	N51	N39		180	RIGID	None	None	RIGID	Typical
30	M30	N55	N54			PIPE_2.0	Beam	None	A53 Gr.B	Typical
31	M31	N56	N52			RIGID	None	None	RIGID	Typical
32	M32	N57	N53			RIGID	None	None	RIGID	Typical
33	M33	N59	N58			RIGID	None	None	RIGID	Typical
34	M34	N61	N60			RIGID	None	None	RIGID	Typical
35	M35	N62	N105			PIPE_2.0	Beam	None	A53 Gr.B	Typical
36	M36	N62	N25			RIGID	None	None	RIGID	Typical
37	M37	N64	N65			2.38ODx0.120	Beam	None	A500 Gr.C	Typical
38	M38	N66	N67		180	HSS3x3x3	Beam	None	A500 Gr.B...	Typical
39	M39	N69	N68		180	HSS3x3x3	Beam	None	A500 Gr.B...	Typical
40	M40	N9	N12			PIPE_3.0	Beam	None	A53 Gr.B	Typical
41	M41	N77	N74		90	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
42	M42	N75	N73			L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
43	M43	N76	N72		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
44	M44	N70	N71			L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
45	M45	N85	N82		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
46	M46	N83	N81			L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
47	M47	N84	N80		90	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
48	M48	N78	N79			L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
49	M49	N87	N86			RIGID	None	None	RIGID	Typical
50	M50	N89	N87			3/8"x4"	Beam	None	A36 Gr.36	Typical
51	M51	N88	N86			3/8"x4"	Beam	None	A36 Gr.36	Typical
52	M52	N91	N90			RIGID	None	None	RIGID	Typical
53	M53	N93	N91			3/8"x4"	Beam	None	A36 Gr.36	Typical
54	M54	N92	N90			3/8"x4"	Beam	None	A36 Gr.36	Typical
55	M55	N89	N88			RIGID	None	None	RIGID	Typical
56	M56	N93	N92			RIGID	None	None	RIGID	Typical
57	M57	N100	N101			RIGID	None	None	RIGID	Typical
58	M58	N103	N104			PIPE_2.0	Beam	None	A53 Gr.B	Typical
59	M59	N103	N102			RIGID	None	None	RIGID	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						Yes				None
2	M2						Yes				None
3	M3						Yes				None
4	M4						Yes				None
5	M5	BenPIN					Yes				None
6	M6	BenPIN					Yes				None
7	M7	BenPIN	BenPIN				Yes				None
8	M8						Yes	** NA **			None
9	M9						Yes	** NA **			None
10	M10						Yes	** NA **			None
11	M11						Yes	** NA **			None
12	M12		BenPIN				Yes				None
13	M13		BenPIN				Yes				None
14	M14						Yes				None
15	M15	OOOXOX					Yes	** NA **			None
16	M16	OOOXOX					Yes	** NA **			None
17	M17	BenPIN					Yes				None
18	M18	BenPIN					Yes				None
19	M19						Yes				None
20	M20	OOOXOX					Yes	** NA **			None
21	M21	OOOXOX					Yes	** NA **			None
22	M22	BenPIN					Yes				None
23	M23	BenPIN					Yes				None
24	M24						Yes				None
25	M25						Yes				None
26	M26						Yes	** NA **			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						Yes	** NA **			None
35	M35	BenPIN	BenPIN				Yes				None
36	M36						Yes	** NA **			None
37	M37						Yes				None
38	M38		BenPIN				Yes				None
39	M39		BenPIN				Yes				None
40	M40	BenPIN	BenPIN				Yes				None
41	M41	BenPIN	BenPIN				Yes				None
42	M42	BenPIN	BenPIN				Yes				None
43	M43	BenPIN	BenPIN				Yes				None
44	M44	BenPIN	BenPIN				Yes				None
45	M45	BenPIN	BenPIN				Yes				None
46	M46	BenPIN	BenPIN				Yes				None
47	M47	BenPIN	BenPIN				Yes				None
48	M48	BenPIN	BenPIN				Yes				None
49	M49						Yes	** NA **			None
50	M50		BenPIN				Yes				None
51	M51		BenPIN				Yes				None
52	M52						Yes	** NA **			None
53	M53		BenPIN				Yes				None
54	M54		BenPIN				Yes				None
55	M55						Yes	** NA **			None
56	M56						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...
57	M57						Yes	** NA **			None
58	M58	BenPIN	BenPIN				Yes				None
59	M59						Yes	** NA **			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	2.38ODx0.1...	3			Lbyy						Lateral
2	M2	2.38ODx0.1...	3			Lbyy						Lateral
3	M3	2.38ODx0.1...	3			Lbyy						Lateral
4	M4	2.38ODx0.1...	3			Lbyy						Lateral
5	M5	L3x3x3	6.25			Lbyy						Lateral
6	M6	L3x3x3	6.25			Lbyy						Lateral
7	M7	PIPE_2.5	7			Lbyy						Lateral
8	M12	L3x3x3	6.25			Lbyy						Lateral
9	M13	L3x3x3	6.25			Lbyy						Lateral
10	M14	PIPE_2.5	6			Lbyy						Lateral
11	M17	L3x3x4	5.024			Lbyy						Lateral
12	M18	L3x3x4	5.024			Lbyy						Lateral
13	M19	PIPE_2.5	6			Lbyy						Lateral
14	M22	L3x3x4	5.024			Lbyy						Lateral
15	M23	L3x3x4	5.024			Lbyy						Lateral
16	M24	L6x6x8	.666			Lbyy						Lateral
17	M25	L6x6x8	.666			Lbyy						Lateral
18	M30	PIPE_2.0	6			Lbyy						Lateral
19	M35	PIPE_2.0	10.863			Lbyy						Lateral
20	M37	2.38ODx0.1...	2.5			Lbyy						Lateral
21	M38	HSS3x3x3	2.75			Lbyy						Lateral
22	M39	HSS3x3x3	2.75			Lbyy						Lateral
23	M40	PIPE_3.0	3			Lbyy						Lateral
24	M41	L2.5x2.5x3	4.51			Lbyy						Lateral
25	M42	L2.5x2.5x3	4.253			Lbyy						Lateral
26	M43	L2.5x2.5x3	4.51			Lbyy						Lateral
27	M44	L2.5x2.5x3	4.253			Lbyy						Lateral
28	M45	L2.5x2.5x3	4.51			Lbyy						Lateral
29	M46	L2.5x2.5x3	4.253			Lbyy						Lateral
30	M47	L2.5x2.5x3	4.51			Lbyy						Lateral
31	M48	L2.5x2.5x3	4.253			Lbyy						Lateral
32	M50	3/8"x4"	.333			Lbyy						Lateral
33	M51	3/8"x4"	.333			Lbyy						Lateral
34	M53	3/8"x4"	.333			Lbyy						Lateral
35	M54	3/8"x4"	.333			Lbyy						Lateral
36	M58	PIPE_2.0	10.86			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	N26	max	1.646	17	2.719	26	.296	14	0	74	0	74	0	74
2		min	-1.918	11	.481	14	-2.583	32	0	1	0	1	0	1
3	N27	max	1.496	5	.734	26	1.969	26	0	74	0	74	0	74
4		min	-1.223	23	-.069	20	-.708	20	0	1	0	1	0	1
5	N94	max	.035	18	.047	8	1.731	2	0	74	0	74	0	74
6		min	-.063	47	-.104	2	-1.447	20	0	1	0	1	0	1
7	N95	max	.125	5	.014	8	.433	14	0	74	0	74	0	74
8		min	-.111	23	-.023	2	-.397	20	0	1	0	1	0	1
9	N104	max	.11	5	.071	35	.676	5	0	41	0	74	.011	41

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
10		min	-.108	23	.016	66	-.607	23	0	23	0	1	-.008	23
11	N105	max	.123	18	.072	31	1.099	13	0	22	0	74	.01	40
12		min	-.125	12	.016	73	-1.021	19	0	40	0	1	-.007	22
13	Totals:	max	3.488	5	3.501	26	4.927	14						
14		min	-3.488	23	.781	70	-4.927	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	M23	L3x3x4	.746	.785	27	.210	4.501	z	27	26.674	46.656	1.688	3.64	1....	H2-1
2	M22	L3x3x4	.642	4.501	37	.169	2.512	y	27	26.674	46.656	1.688	3.756	2....	H2-1
3	M12	L3x3x3	.579	.846	27	.160	.781	y	13	14.668	35.316	1.32	2.653	2....	H2-1
4	M13	L3x3x3	.574	.846	27	.137	.781	y	7	14.668	35.316	1.32	2.676	2....	H2-1
5	M18	L3x3x4	.554	.785	26	.165	4.501	y	37	26.674	46.656	1.688	3.626	1....	H2-1
6	M6	L3x3x3	.485	5.404	37	.036	2.018	y	28	14.668	35.316	1.32	2.671	2....	H2-1
7	M5	L3x3x3	.483	5.404	37	.047	.846	z	5	14.668	35.316	1.32	2.649	2....	H2-1
8	M17	L3x3x4	.458	4.501	27	.134	2.512	z	26	26.674	46.656	1.688	3.756	2....	H2-1
9	M7	PIPE_2.5	.442	2.698	8	.057	2.771		6	33.962	50.715	3.596	3.596	1....	H1-1b
10	M3	2.38ODx0.120	.306	.844	13	.115	.813		13	30.782	35.273	2.117	2.117	2....	H1-1b
11	M47	L2.5x2.5x3	.259	2.349	35	.010	4.51	z	10	14.944	29.192	.873	1.703	1....	H2-1
12	M2	2.38ODx0.120	.209	3	36	.032	0		37	30.782	35.273	2.117	2.117	2....	H1-1b
13	M4	2.38ODx0.120	.201	.844	5	.093	3		5	30.782	35.273	2.117	2.117	2....	H1-1b
14	M43	L2.5x2.5x3	.200	2.349	29	.010	4.51	z	4	14.944	29.192	.873	1.703	1....	H2-1
15	M30	PIPE_2.0	.197	1.938	8	.043	5		10	20.867	32.13	1.872	1.872	1....	H1-1b
16	M35	PIPE_2.0	.170	5.432	12	.014	10.863		5	8.335	32.13	1.872	1.872	1....	H1-1b
17	M58	PIPE_2.0	.161	5.43	5	.014	0		5	8.341	32.13	1.872	1.872	1....	H1-1b
18	M19	PIPE_2.5	.159	1.563	11	.058	.938		11	37.773	50.715	3.596	3.596	1....	H1-1b
19	M14	PIPE_2.5	.140	1.563	5	.052	.938		6	37.773	50.715	3.596	3.596	1....	H1-1b
20	M37	2.38ODx0.120	.138	0	26	.029	0		27	32.089	35.273	2.117	2.117	2....	H1-1b
21	M1	2.38ODx0.120	.135	0	29	.020	0		28	30.782	35.273	2.117	2.117	2....	H1-1b
22	M48	L2.5x2.5x3	.135	2.127	9	.011	0	y	5	16.062	29.192	.873	1.727	1....	H2-1
23	M44	L2.5x2.5x3	.128	2.127	9	.011	0	y	11	16.062	29.192	.873	1.727	1....	H2-1
24	M45	L2.5x2.5x3	.122	2.255	13	.009	0	z	7	14.944	29.192	.873	1.703	1....	H2-1
25	M41	L2.5x2.5x3	.117	2.255	3	.010	0	z	36	14.944	29.192	.873	1.703	1....	H2-1
26	M42	L2.5x2.5x3	.112	2.127	9	.011	0	y	5	16.062	29.192	.873	1.727	1....	H2-1
27	M46	L2.5x2.5x3	.110	2.127	9	.012	0	y	5	16.062	29.192	.873	1.727	1....	H2-1
28	M40	PIPE_3.0	.068	.25	2	.097	.219		2	62.137	65.205	5.749	5.749	2....	H1-1b
29	M54	3/8"x4"	.051	0	5	.002	0	z	5	45.236	48.6	.38	4.05	1....	H1-1b
30	M53	3/8"x4"	.050	0	5	.002	0	z	5	45.236	48.6	.38	4.05	1....	H1-1b
31	M38	HSS3x3x3	.044	.258	26	.015	2.75	y	40	73.964	78.246	6.796	6.796	1....	H1-1b
32	M39	HSS3x3x3	.042	.258	26	.015	2.75	y	40	73.964	78.246	6.796	6.796	1....	H1-1b
33	M24	L6x6x8	.039	.333	8	.048	.333	z	45	186.497	186.948	13.777	30.323	1....	H2-1
34	M25	L6x6x8	.038	.333	2	.027	.333	y	39	186.497	186.948	13.777	30.323	1....	H2-1
35	M50	3/8"x4"	.029	0	48	.001	0	z	47	45.236	48.6	.38	4.05	1....	H1-1b
36	M51	3/8"x4"	.028	0	46	.001	0	z	47	45.236	48.6	.38	4.05	1....	H1-1b

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 10

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CTNL808B

Amtrak_Waterford2
51 Daniels Ave
Waterford, CT 06385

May 30, 2019

Transcom Engineering Project Number: 737001-0071

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**7.78 %**

Transcom Engineering, Inc.

Wireless Network Design and Deployment

May 30, 2019

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

Emissions Analysis for Site: **CTNL808B – Amtrak_Waterford2**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **51 Daniels Ave, Waterford, 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 **51 Daniels Ave, Waterford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

Table 1: Channel Data Table

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

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APX16DWV-16DWV-S-E-ACU	160
A	2	RFS APXVAARR24_43-U-NA20	160
B	1	RFS APX16DWV-16DWV-S-E-ACU	160
B	2	RFS APXVAARR24_43-U-NA20	160
C	1	RFS APX16DWV-16DWV-S-E-ACU	160
C	2	RFS APXVAARR24_43-U-NA20	160

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **1900 MHz (PCS)** & **2100 MHz (AWS)** radios are ground mounted the following cable loss values were used. For each ground mounted **1900 MHz (PCS)** radio there was **1.85 dB** of cable loss calculated into the system gains / losses for this site. For each ground mounted **2100 MHz (AWS)** radio there was **1.91 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **180 feet** of **1-5/8”** coax.

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APX16DWV-16DWV-S-E-ACU	2100 MHz (AWS)	15.9	2	120	3,007.33	0.46
Antenna A2	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 600 MHz / 700 MHz	15.65 / 12.95 / 13.35	6	175	3,762.38	1.08
						Sector A Composite MPE%	**1.54**
Antenna B1	RFS APX16DWV-16DWV-S-E-ACU	2100 MHz (AWS)	15.9	2	120	3,007.33	0.46
Antenna B2	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 600 MHz / 700 MHz	15.65 / 12.95 / 13.35	6	175		1.08
						Sector B Composite MPE%	**1.54**
Antenna C1	RFS APX16DWV-16DWV-S-E-ACU	2100 MHz (AWS)	15.9	2	120	3,007.33	0.46
Antenna C2	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 600 MHz / 700 MHz	15.65 / 12.95 / 13.35	6	175	3,762.38	1.08
						Sector C Composite MPE%	**1.54**

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	**1.54 %**
Verizon Wireless	3.86 %
AT&T	2.38 %
Site Total MPE %:	**7.78 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	1.54 %
T-MOBILE Sector B Total:	1.54 %
T-MOBILE Sector C Total:	1.54 %
Site Total:	7.78 %

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 2100 MHz (AWS) LTE	2	1,503.67	160	4.56	2100 MHz (AWS)	1000	0.46%
T-Mobile 1900 MHz (PCS) UMTS	1	959.53	160	1.45	1900 MHz (PCS)	1000	0.15%
T-Mobile 1900 MHz (PCS) GSM	1	359.82	160	0.55	1900 MHz (PCS)	1000	0.05%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	160	2.39	600 MHz	400	0.60%
T-Mobile 700 MHz LTE	2	432.54	160	1.31	700 MHz	467	0.28%
						Total:	**1.54%**

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:	1.54 %
Sector B:	1.54 %
Sector C:	1.54 %
T-MOBILE Maximum Total (per sector):	1.54 %
Site Total:	7.78 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.78 %** 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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