Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

June 12, 2019

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

RE: Notice of Exempt Modification
246 East Franklin Street, Danielson, CT 06239
Latitude: 41.4630305600
Longitude: -72.2465972300
T-Mobile Site#: CT11315C – Overlay

Dear Ms. Bachman:

T-Mobile currently maintains four (4) antennas at the 137-foot level of the existing 155-foot monopole tower at 246 East Franklin Street, Danielson, CT. The 155-foot tower is owned by SBA. The property is owned by Charles R. Hutchins. T-Mobile now intends to remove two (2) of its existing antennas and add three (3) new 600/700/1900/2100 MHz antennas. The new antennas will be installed at the same 137-foot level of the tower.

Planned Modifications:
Tower:

Remove
(2) DAPA 59212 Panel Antennas
(4) TMAs

Remove and Replace:
N/A

Install New:
(3) RFS APV18-206516S Panel Antennas 600/700/1900/2100 MHz
(3) TMAs

Existing to Remain:
(2) EMS RR90-17-XXDP Panel Antennas
(6) 1-5/8" Coax

Ground:
Install New:
(6) Diplexers
(1) BBU Cabinet

This tower was approved by the Town of Killingly on February 5, 1999. A copy of the approval is enclosed. This modification complies with the approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Town Manager -Mary Calorio, Elected Official, and Ann-Marie L. Aubrey, Director of Planning & Development for the Town of Killingly, as well as the tower owner and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: Mary Calorio – Town of Killingly Town Manager
Ann-Marie L. Aubrey– Town of Killingly Director of Planning & Development
SBA- tower owner
Charles R. Hutchins- property owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 12, 2019 8:58 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11315 CSC PO

A signature is required for package delivery

You have a package coming.

Scheduled Delivery Date: Thursday, 06/13/2019

Sign Now

Change Delivery | Manage Preferences | View Delivery Planner

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424296857084
Ship To:	Charles R. Hutchins 246 E. Franklin Street KILLINGLY, CT 062393806 US

UPS Service:	UPS GROUND
Number of Packages:	1
Package Weight:	1.0 LBS
Scheduled Delivery:	06/13/2019
Signature Required:	A signature is required for package delivery
Reference Number 1:	CT11315 CSC PO

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UPS Privacy Notice

Help and Support Center

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 12, 2019 9:00 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11315C CSC TO

You have a package coming.

Scheduled Delivery Date: Monday, 06/17/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424296047093
Ship To:	SBA Towers 8051 Congress Ave. BOCA RATON, FL 334871307 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/17/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11315C CSC TO

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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 12, 2019 9:04 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11315 CSC EO

You have a package coming.

Scheduled Delivery Date: Thursday, 06/13/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424295257108
Ship To:	Mary Calorio Town of Killingly 172 Main Street Second Floor KILLINGLY, CT 062392822 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/13/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11315 CSC EO

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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 12, 2019 9:05 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11315C CSC ZO

You have a package coming.

Scheduled Delivery Date: Thursday, 06/13/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424299487111
Ship To:	Anne-Marie L. Aubrey Town of Killingly 172 Main Street KILLINGLY, CT 062392822 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/13/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11315C CSC ZO

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tyler clt division

RESIDENTIAL PROPERTY RECORD CARD 2018

TOWN OF KILLINGLY

Situs : 246 E FRANKLIN ST | **Map ID: 002601** | **Class: Single Family Residence** | Card: 1 of 1 | Printed: February 7, 2019

CURRENT OWNER

HUTCHINS CHARLES R
246 E FRANKLIN ST
KILLINGLY CT 06239

GENERAL INFORMATION

Living Units	1
Neighborhood	102
Alternate Id	216-12
Vol / Pg	555/118
District	7
Zoning	RURAL DEVELOPMENT
Class	100

Property Notes

Land Information

Type		Size	Influence Factors	Influence %	Value
Primary	AC	5.5000			57,880
Primary	AC	0.5000			44,000
Waste	AC	1.0000			250
Rear	AC	10.0000			10,000

Total Acres: 17
Spot: Location:

Assessment Information

	Assessed	Appraised	Cost	Income	
Land	78,470	112,100	112,100	0	92,100
Building	173,670	248,100	248,100	0	236,900
Total	252,140	360,200	360,200	0	329,000

Manual Override Reason
Base Date of Value 10/01/2018
Value Flag COST APPROACH **Effective Date of Value** 01/31/2019
MONOPOLE/BLDG/ 127600

Entrance Information

Date	ID	Entry Code	Source
04/02/18	DM	Data Mailer Returned	Data Mailer
11/10/09	MHB	Viewed	Asmt Staff
10/11/06	LA	Ext W/Info	Owner

Permit Information

Date Issued	Number	Price	Purpose		% Complete
04/06/18	25925	15,000	81 CELE	Adding 3 Antennas	995
05/11/17	25284	40,000	97 BPP	Telecom -Modify Existing At&T Ant	995
08/03/15	23794	15,000	97 BPP	Repl Existing Antennaes & Add 3 I	995
12/11/14	23346	15,000	97 BPP	Repl Old Panel/Antennae Models \	995
10/06/14	23221	49,000	74 CRER	Nvc Maint Work - Add Steel Plates	997

Sales/Ownership History

Transfer Date	Price	Type	Validity	Deed Reference	Deed Type	Grantee

tyler clt division

RESIDENTIAL PROPERTY RECORD CARD 2018

TOWN OF KILLINGLY

Situs : 246 E FRANKLIN ST | **Parcel Id: 002601** | **Class: Single Family Residence** | Card: 1 of 1 | Printed: February 7, 2019

Dwelling Information

Style	Ranch	**Year Built**	1960
Story height	1	**Eff Year Built**	
Attic	None	**Year Remodeled**	
Exterior Walls	Frame	**Amenities**	Wood Stove
Masonry Trim	x		
Color	Brown	**In-law Apt**	No

Basement

Basement	Full	**# Car Bsmt Gar**	3
FBLA Size	x	**FBLA Type**	
Rec Rm Size	x	**Rec Rm Type**	

Heating & Cooling

Heat Type	Basic
Fuel Type	Oil
System Type	Hot Water

Fireplaces

Stacks	1
Openings	1
Pre-Fab	

Room Detail

Bedrooms	4	**Full Baths**	2
Family Rooms		**Half Baths**	
Kitchens	1	**Extra Fixtures**	1
Total Rooms	9		
Kitchen Type	Typical	**Bath Type**	Typical
Kitchen Remod	No	**Bath Remod**	No

Adjustments

Int vs Ext	Same	**Unfinished Area**	1180
Cathedral Ceiling	x	**Unheated Area**	1180

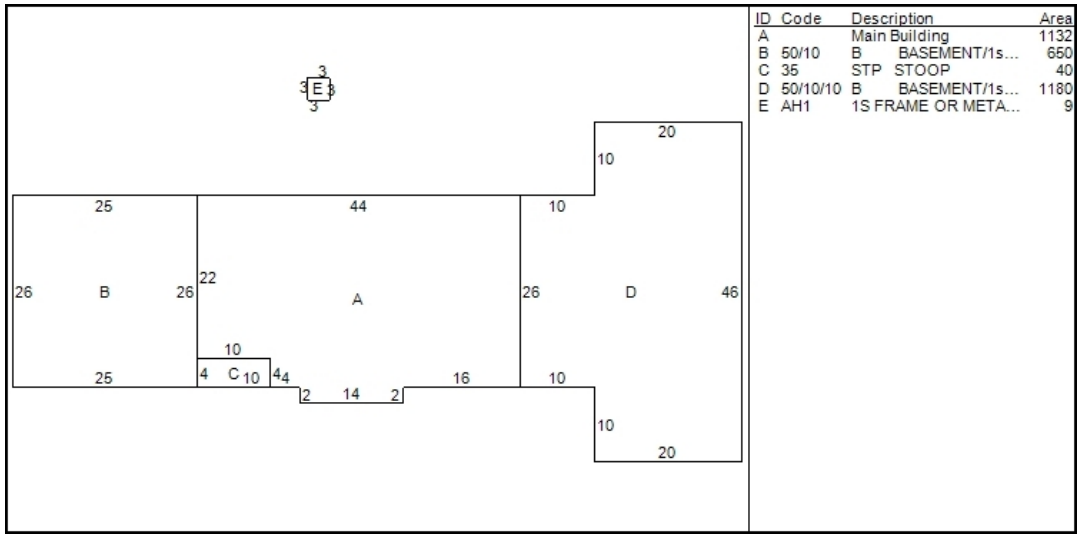
Grade & Depreciation

Grade	C	**Market Adj**	
Condition	Poor Condition	**Functional**	
CDU	POOR	**Economic**	
Cost & Design	0	**% Good Ovr**	
% Complete			

Dwelling Computations

Base Price	154,054	**% Good**	39
Plumbing	4,400	**% Good Override**	
Basement	0	**Functional**	
Heating	0	**Economic**	
Attic	0	**% Complete**	
Other Features	-20,000	**C&D Factor**	
		Adj Factor	1
Subtotal	138,450	**Additions**	64,900
Ground Floor Area	1,132		
Total Living Area	4,142	**Dwelling Value**	118,900

Building Notes



ID	Code	Description	Area
A		Main Building	1132
B	50/10	B BASEMENT/1s...	650
C	35	STP STOOP	40
D	50/10/10	B BASEMENT/1s...	1180
E	AH1	1S FRAME OR META...	9

Outbuilding Data

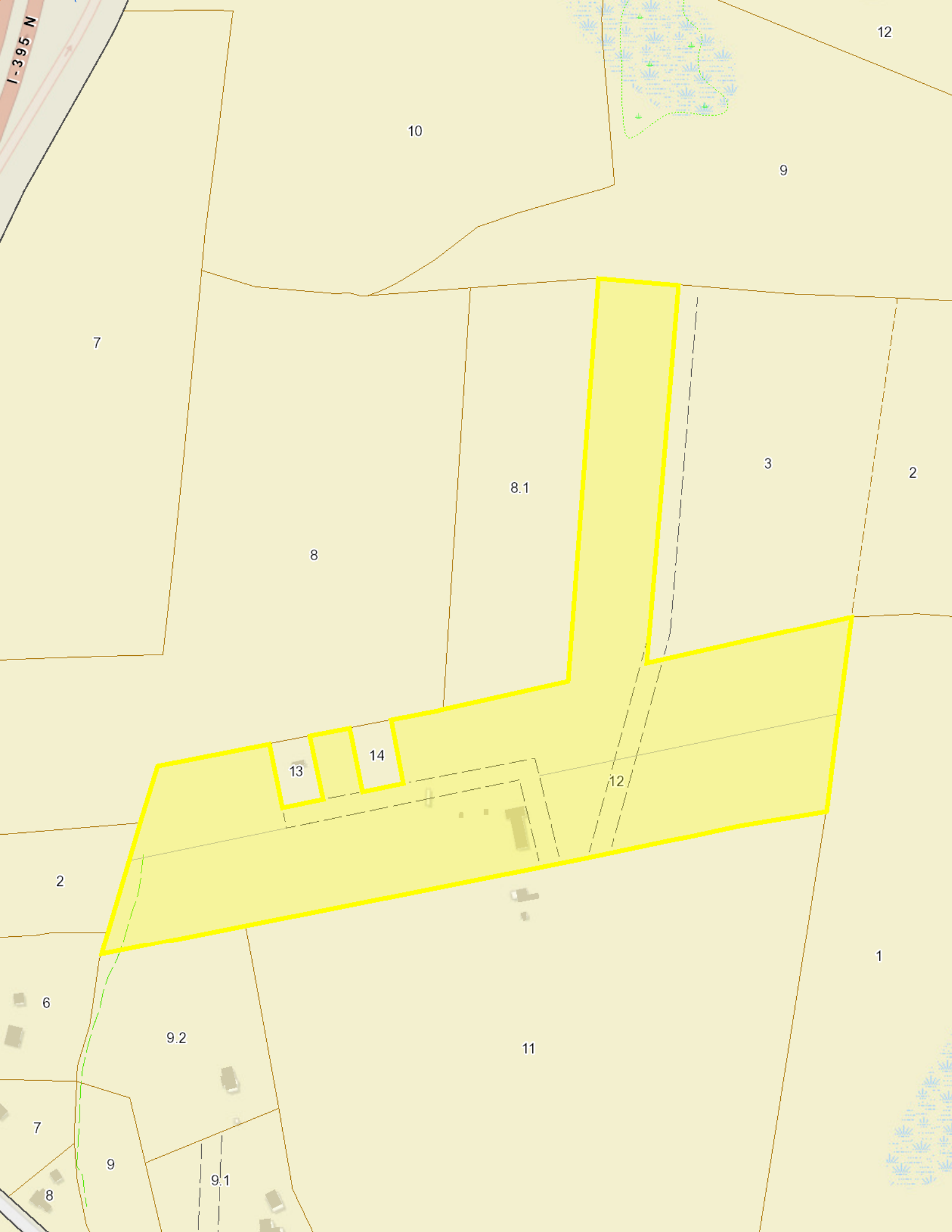
Type	Size 1	Size 2	Area	Qty	Yr Blt	Grade	Condition	Value
Poultry	11	x 12	132	1	2000	D	P	390
Frame Shed		x	174	1	2008	C	A	1,250

Condominium / Mobile Home Information

Complex Name			
Condo Model			
Unit Number			
Unit Level		**Unit Location**	
Unit Parking		**Unit View**	
Model (MH)		**Model Make (MH)**	

Addition Details

Line #	Low	1st	2nd	3rd	Value
1	50	10			23,600
2		35			
3	50	10	10		41,300


I-395 N
12
10
9
7
8.1
3
2
8
13
14
12
2
1
6
9.2
11
7
9
9.1
8

DATE: 2/02/99

TOWN OF KILLINGLY, CONNECTICUT
ZONING PERMIT

№ 006544

Complete Items #1-9 and the plot plan on the reverse side of the top sheet.

1. Location of Property 246 E. FRANKLIN ST.
   House # & Street
   Tax Map Number 3995 Block 022 Lot 106A Zoning District RD Volume 555 Page 118 List 2601
2. Property Owner's Name CHARLES R. HUTCHINS Phone 774-1903
3. Property Owner's Address if different from property location
4. Applicant's Name and Address if different from Property Owner's Name and Address SCOTT THOMAE SBA INC 125 SHAW ST NEW LONDON, CT 06372 Phone (860) 908-5356

5. Lot Size 21.6 AC. Lot Frontage NA
6. This permit is applied for in accordance with the requirements of the Town of Killingly and/or Borough of Danielson Zoning Regulations for:
   - ☑ new construction
   - ☐ addition
   - ☐ accessory structure (sheds, satellite dishes, etc.)
   - ☐ swimming pool
   - ☐ excavating/filling/earth removal
   - ☐ sign
   - ☐ change of use
   - ☐ other
7. Proposed structure or project — Provide description and dimensions:
   CONSTRUCTION OF A 160' MULTITENANT MONOPOLE TELECOM. FACILITY & PLACEMENT OF ASSOC EQUIPMENT
8. Property Use:
   - ☐ single family residential
   - ☐ two-family residential
   - ☐ mobile home — residential
   - ☐ multi-family — residential
   - ☐ Industrial specify
   - ☑ Commercial specify MONOPOLE TELECOM FACILITY
   - ☐ Professional and Business specify
9. PERMIT VOID IF ...
   work or activity is not commenced within one year from the date of issue and diligently prosecuted to completion.
   This permit, if issued, is based upon the plot plan submitted. Falsification, by misrepresentation or omission, or failure to comply with the conditions of approval of this permit shall constitute a violation of the Town of Killingly and/or Borough of Danielson Zoning Regulations.
   Agents of the Town of Killingly are authorized to enter upon the property for the purpose of inspection and verification of compliance with the terms of this permit.

SBA INC. (860) 908 5356
(Signature of Owner or authorized agent) (Agent's phone #)

FOR OFFICE USE ONLY:

Inland Wetlands N/A - OUTSIDE 200' REGULATED AREA 2-4-99
Historic District? Yes (No)
Slope greater than 15%? (Yes) No
Flood Hazard Zone? NO
Aquifer Protection Zone? Yes (No)
Public Sewer On-Site Septic
Site Plan Review Necessary? Yes No
Applicant's Name as part of spec. permit
Application No.
P&Z Commission Approval Date

Driveway Permit NA - existing
Special Permit necessary? (Yes) No
Applicant's Name SBA INC.
Application No. 98-704
P&Z Commission Approval Date July 13, 1998
Subdivision necessary? Yes (No)
Applicant's Name
Application No.
P&Z Commission Approval Date
Variance Necessary? Yes (No)
Applicant's Name
Application No.
ZBA Approval Date

Approved ✓ Disapproved Date February 5, 1999
Reason for Disapproval:
Comments: Adhere to all approval conditions and site work of special permit #98-704 Call for erosion + sediment control + other inspections

Linda E. Walden, CZEO
Zoning Enforcement Officer

Orig./White: Z.E.O. / Blue: P &Z / Green: Bldg. Official / Yellow: Applicant

APPLICATION FOR PLAN EXAMINATION AND BUILDING PERMIT

№ 013425

DATE 2-2-99

ALVIN N. KILBURN
Building Official
(203) 774-8601

TOWN OF KILLINGLY - DEPARTMENT OF BUILDING INSPECTION

DEED INFORMATION: VOL 555/118 PAGE 118 MAP 3995 BLOCK 022 LOT 1064 SOILS _____

ZONE RD CONFORMING ☐ NON-CONFORMING ☐ DRIVEWAY PERMIT STATE OF CONN. YES _____ NO _____

Aquifer Yes _____ No _____ Flood Hazard Yes _____ No _____ Inland Wetland Yes _____ No _____

1. Location of Building 246 EAST FRANKLIN STREET Lot 2601
2. Applicant SBA INC Address 125 SHAW ST NLondon Tel.: (860) 459-0152
3. Owner CHARLIE HUTCHINS Address 246 EAST FRANKLIN Tel.: _____
4. Contractor DICIN ELECTRIC Address 156 CROSS RD WATERFORD Tel.: (860) 442 0826
5. Elec. Cont. " RUDY CHIGLA Address " 1028346-1 Tel.: "
6. Plumbing - Htg. Cont. N/A Address N/A Tel.: N/A
7. ZONING PERMIT NO. _____ DRIVEWAY PERMIT NO. _____

8. TYPE OF IMPROVEMENT

- ☑ New building
- ☐ Addition (If residential, enter number of new housing units added, if any, in Part 9).
- ☐ Renovations
- ☐ Repair, replacement
- ☐ Demolition (If multifamily residential, enter number of units in building in Part 9).
- ☐ Moving (relocation)
- ☐ Foundation only

9. PROPOSED USE

Residential

- ☐ One family
- ☐ Two or more family — Enter number of units .....
- ☐ Transient hotel, motel, or dormitory - Enter number of units .....
- ☐ Garage
- ☐ Carport
- ☑ Other - Specify TELECOMMUNICATION TOWER + ASSOCIATED UTILITIES

Nonresidential

- ☐ Amusement, recreational
- ☐ Church, other religious
- ☐ Industrial
- ☐ Parking garage
- ☐ Service station, repair garage
- ☐ Hospital, institutional
- ☐ Office, bank, professional
- ☐ Public utility
- ☐ School, library, other educational
- ☐ Stores, mercantile
- ☐ Tanks, towers
- ☑ Other - Specify _____

10a. ESTIMATED COST
$ 210,000.00

10b. PERMIT FEE
$ 1,470.-

11. TYPE OF SEWAGE DISPOSAL
☐ Private ☐ Public N/A

12. TYPE OF WATER SUPPLY
☐ Private ☐ Public N/A

NONRESIDENTIAL — Describe in detail proposed use of buildings, e.g., food processing plant, machine shop, laundry building at hospital, elementary school, secondary school, college, parochial school, parking garage for department store, rental office building, office building at industrial plant. If use of existing building is being changed, enter proposed use.

TELECOMMUNICATION TOWER AND ASSOCIATED UTILITIES

13. PRINCIPAL TYPE OF FRAME

- ☐ Masonry (wall bearing)
- ☐ Wood frame
- ☐ Structural steel
- ☑ Reinforced concrete FOUNDATION
- ☐ Other - Specify _____

14. PRINCIPAL TYPE OF HEATING FUEL

HEATING SYSTEM

- ☐ Steam
- ☐ Water
- ☐ Air
- ☐ Electric
- ☐ Fireplace

N/A

The owner of this building and the undersigned agree to conform to the State of Conn. basic building Code, The Connecticut Fire Safety Code, and the laws of this jurisdiction and to notify the Building Official of any changes in plans for which this permit is requested.

Signature of Applicant _____ Date 2/2/99

Alvin N Kilburn 2-2-99
Date Permit Issued

BUILDING: White Copy / ASSESSOR: Yellow / OWNER: Pink

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

PLAINFIELD/I-395_1

SITE ID: CT11315C

246 EAST FRANKLIN STREET

DANIELSON, CT 06239

T-MOBILE RF CONFIGURATION
94G_1xAIR

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

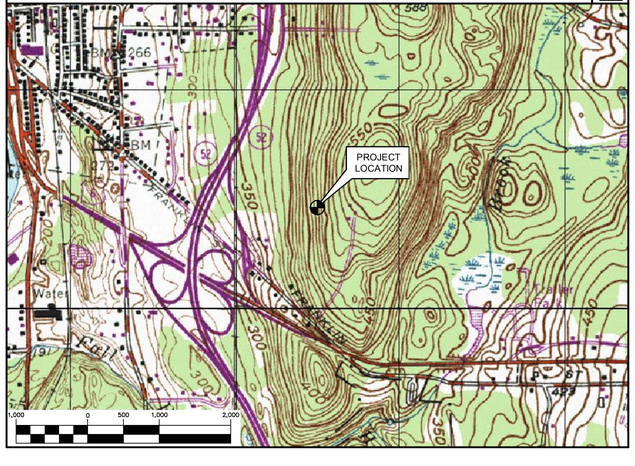
TO: 246 EAST FRANKLIN STREET
DANIELSON, CT 06239

1.	HEAD SOUTHEAST ON W NEWBERRY RD TOWARD GRIFFIN RD S.	0.10 MI.
2.	TURN LEFT ONTO GRIFFIN RD S.	0.60 MI.
3.	TURN RIGHT ONTO DAY HILL RD.	3.60 MI.
4.	USE THE RIGHT LANE TO MERGE ONTO I-91 S VIA THE RAMP TO HARTFORD.	0.40 MI.
5.	MERGE ONTO I-91 S.	3.60 MI.
6.	TAKE EXIT 35A FOR I-291 TOWARD MANCHESTER.	0.60 MI.
7.	CONTINUE ONTO I-291 E.	5.60 MI.
8.	USE THE LEFT LANE TO MERGE ONTO I-84 E TOWARD BOSTON.	15.40 MI.
9.	TAKE EXIT 69 FOR CT-74 TOWARD U.S. 44/WILLINGTON/PUTNAM.	0.30 MI.
10.	TURN RIGHT ONTO CT-74 E.	0.60 MI.
11.	TURN LEFT TO STAY ON CT-74 E.	6.90 MI.
12.	TURN LEFT ONTO U.S. 44 E.	11.90 MI.
13.	CONTINUE STRAIGHT ONTO CT-101 E.	4.80 MI.
14.	TURN RIGHT ONTO THE INTERSTATE 395 S RAMP TO NORWICH.	0.20 MI.
15.	MERGE ONTO I-395 S.	3.30 MI.
16.	TAKE EXIT 37A TO MERGE ONTO U.S. 6 E TOWARD PROVIDENCE.	0.80 MI.
17.	SHARP LEFT ONTO E FRANKLIN ST.	0.10 MI.

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

   A. REMOVE (2) PANEL ANTENNAS.
   B. INSTALL (3) PANEL ANTENNAS.
   C. REMOVE (4) TMAs.
   D. INSTALL (3) TMAs.
   E. INSTALL (6) DIPLEXERS AT GRADE.
   F. INSTALL NEW UNISTRUT FRAME AT GRADE.
   G. ROTATE ANTENNA MOUNTS TO ACCOMMODATE NEW AZIMUTHS.
   H. INSTALL (1) BBU CABINET ON EXISTING CONCRETE PAD.

PROJECT INFORMATION

SITE NAME:	PLAINFIELD/I-395_1
SITE ID:	CT11315C
SITE ADDRESS:	246 EAST FRANKLIN STREET DANIELSON, CT 06239
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-47'-44.98" N LONGITUDE: 71°-52'-13.28" W GROUND ELEVATION: 481'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	DESIGN BASIS AND SITE NOTES	0
C-1	SITE LOCATION PLAN	0
C-2	PLAN, ELEVATION & ANTENNA MOUNTING CONFIGURATION	0
E-1	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/10/19	LGL	TJL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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DATE: 09/13/18
SCALE: AS NOTED
JOB NO. 18127.04

TITLE SHEET

T-1

Sheet No. 1 of 5

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90-105 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 101 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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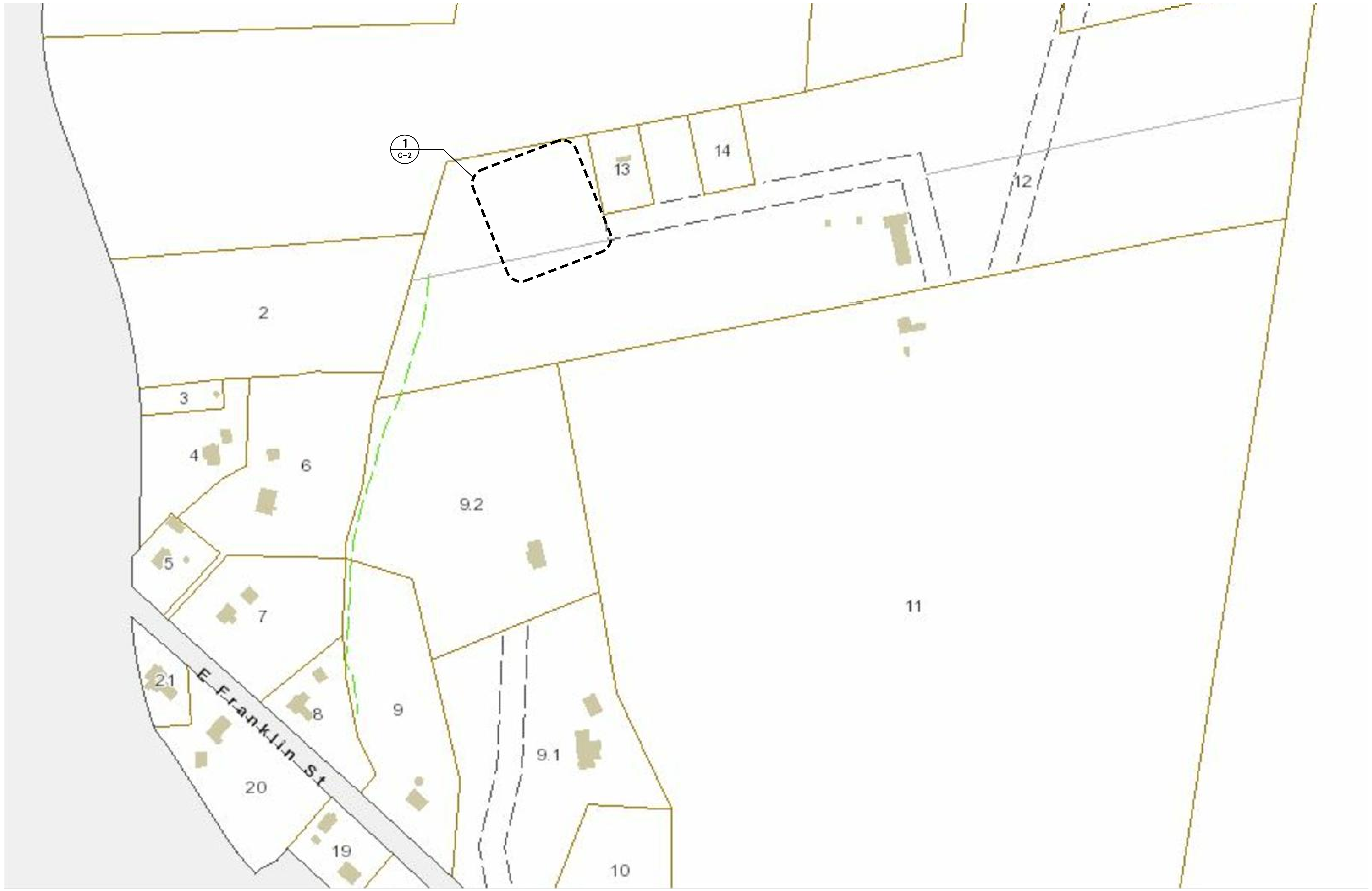
DANIELSON, CT 06239

DATE: 09/13/18
SCALE: AS NOTED
JOB NO. 18127.04

DESIGN BASIS AND SITE NOTES

N-1

Sheet No. 2 of 5



1 SITE LOCATION PLAN
C-1
SCALE: 1" = 100'

APPROX. NORTH

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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DATE: 09/13/18
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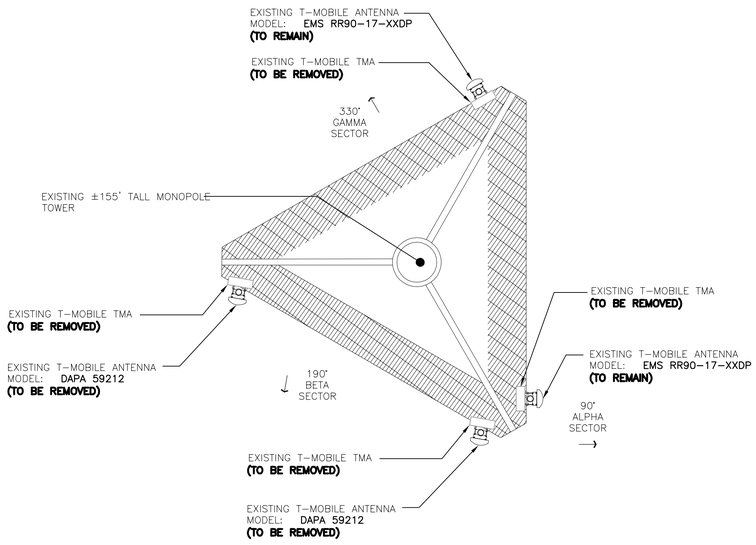
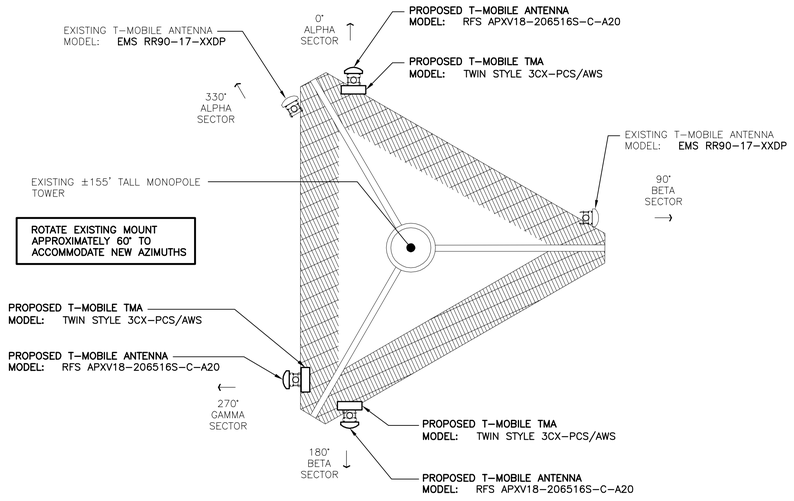
SITE LOCATION PLAN

C-1

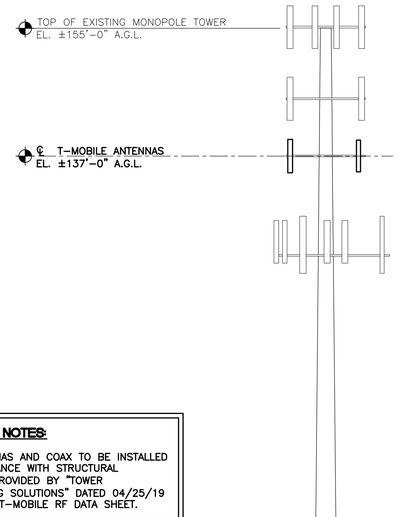
Sheet No. 3 of 5



3 C-2 **EXISTING ANTENNA MOUNTING CONFIGURATION**
SCALE: 3/8" = 1' 137' ELEVATION TRUE NORTH

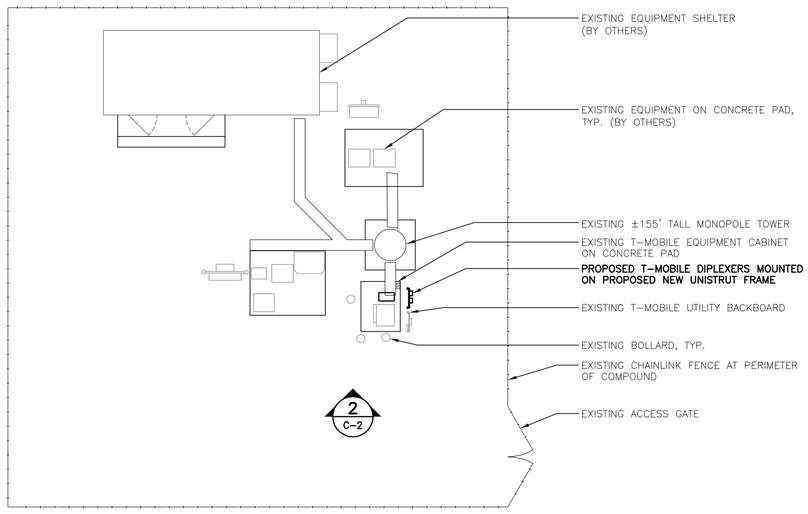


4 C-2 **PROPOSED ANTENNA MOUNTING CONFIGURATION**
SCALE: 3/8" = 1' 137' ELEVATION TRUE NORTH



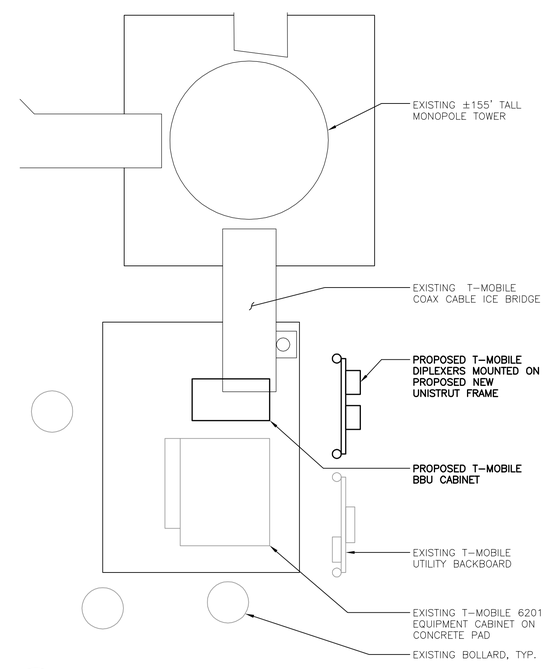
STRUCTURAL NOTES:

1. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY "TOWER ENGINEERING SOLUTIONS" DATED 04/25/19 AND FINAL T-MOBILE RF DATA SHEET.

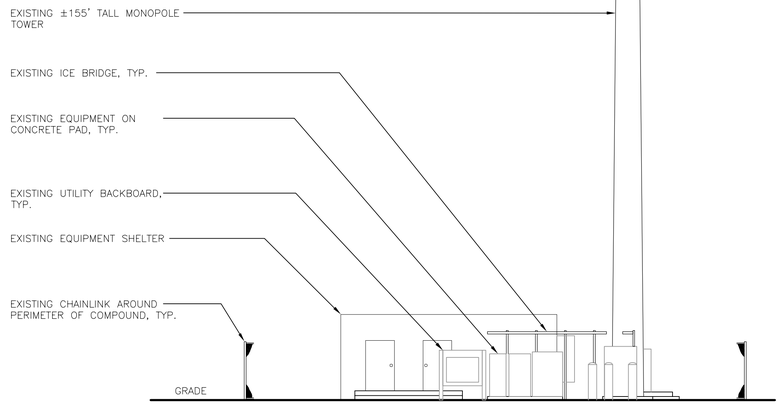


1 C-2 **COMPOUND PLAN**
SCALE: 1" = 10' TRUE NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



1 C-2 **COMPOUND PLAN**
SCALE: 1" = 10'



2 C-2 **TOWER ELEVATION**
SCALE: 1" = 10'

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

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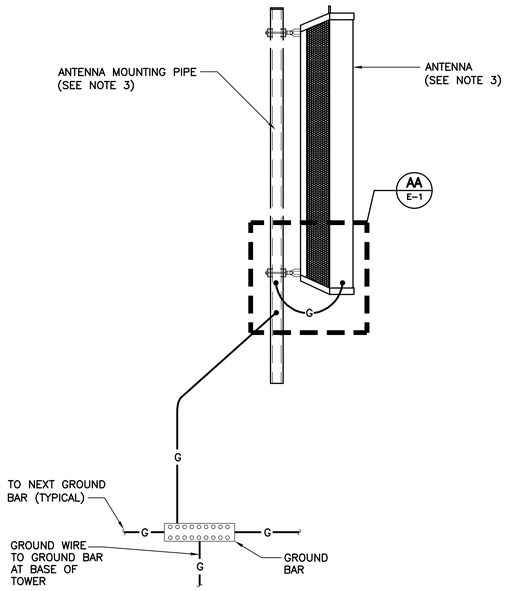
PLAN, ELEVATION & ANTENNA MOUNTING CONFIGURATION

C-2



NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NONE

FRONT

RFS ANTENNA

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXV18-206516S-C-A20	53.1"L x 6.9"W x 3.15"D	18.7 LBS.

2 E-1 PROPOSED ANTENNA DETAIL

SCALE: NONE

ATMA4P4DBP-1A20

TOWER MOUNTED AMPLIFIER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: ATMA4P4DBP-1A20	11.2"L x 8.0"W x 4.9"D	15.9 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

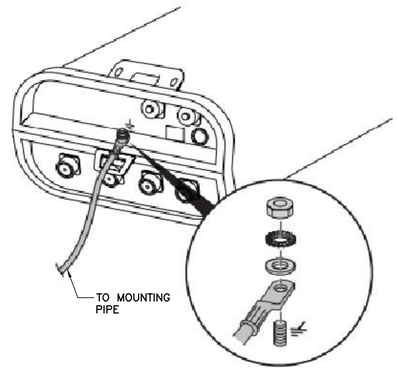
3 E-1 PROPOSED TMA DETAIL

SCALE: NONE

Specifications	
Maximum Battery Size	190Ah
Maximum Number of Batteries	4
Internal Circuit Breaker Rating (Optional)	200 Amperes Max
Input Circuit Breaker Rating	200 Amperes Max
Input Connections	1/4" inch 2 hole 5/8 inch Spacing
Expansion	Modular / Stringable
Temp Control	Direct Contact Heater Mat Convection Cooled
Local Safety Ground Connection	1/4" inch 2 hole 5/8 inch Spacing
Enclosure Rating	Outdoor
Access Restriction	Front Hatch 5/32 Allen
Dimensions Height Width Depth	Body 32.245" 14.040" 26.305"
Unit Weight / Shipping Weight	60 lbs / 65 lbs
Paint	Almond Powder Coat
Construction	Aluminum

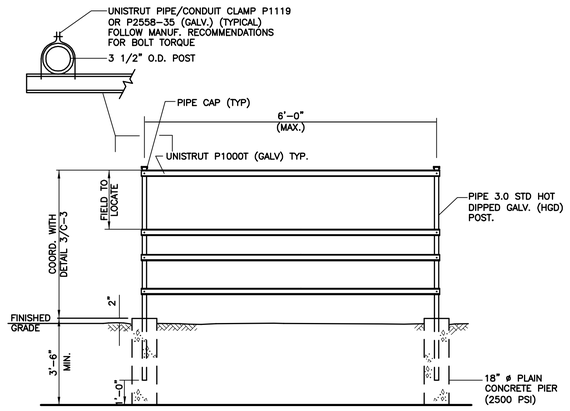
4 E-1 BATTERY CABINET DETAIL

NOT TO SCALE



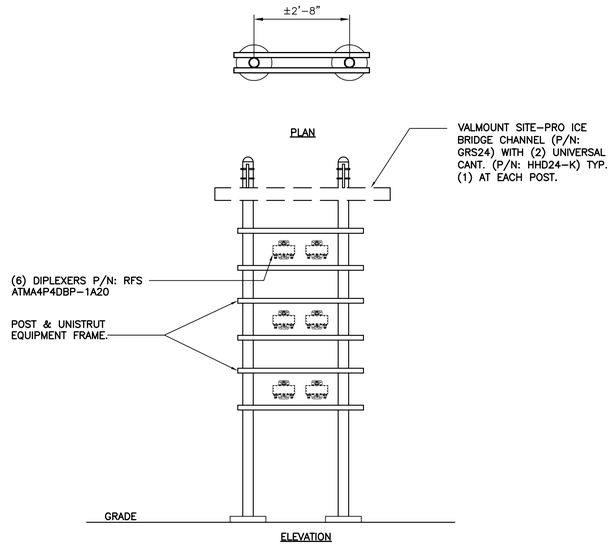
AA E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NONE



5 E-1 PROPOSED EQUIPMENT MOUNTING FRAME DETAIL

SCALE: NOT TO SCALE



6 E-1 RRU MOUNTING CONFIG.

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

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DANIELSON, CT 06239

DATE: 09/13/18

SCALE: AS NOTED

JOB NO. 18127.04

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 5 of 5

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

Structural Analysis Report

Existing 155 ft Nudd Corporation Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT00302-S

Customer Site Name: Danielson

Carrier Name: T-Mobile (App#: 93951, V4)

Carrier Site ID / Name: CT11315C / Plainfield/I-395_1

Site Location: 246 East Franklin Street

Danielson, Connecticut

Windham County

Latitude: 41.795822

Longitude: -71.870333

Analysis Result:

Max Structural Usage: 99.6% [Pass]

Max Foundation Usage: 61.0% [Pass]

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

Report Prepared By: Sital Shrestha

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

Report Prepared By: Sital Shrestha

Introduction

The purpose of this report is to summarize the analysis results on the 155 ft Nudd Corporation Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Nudd Corporation, Project #6410 dated October 27, 1998
Foundation Drawing	Nudd Corporation, Project #98-6410-4 dated November 2, 1998
Geotechnical Report	Jaworski Geotech, Inc., Project #C98423G dated October 14, 1998
Modification Drawings	Vertical Solutions, Inc., Job #TA2002007001-T1 dated October 7, 2002 Vertical Solutions, Inc., Job #TA2008007031-T3 dated November 10, 2008 Vertical Solutions, Inc., Job #TA2009007021-T2 dated July 16, 2009 FDH Engineering, Project #12-01571E S4 dated March 13, 2013 FDH Engineering, Project #1466VA1400 dated July 8, 2014

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} =130.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 101.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Structure Class:	II
Topographic Category:	3
Crest Height:	172 ft
Seismic Parameters:	S_S = 0.171, S_1 = 0.062

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	155.0	3	Commscope LNX-6514DS-A1M - Panel	(3) T-Frame w/ Platforms	(11) 1 5/8" (2) 1 5/8" Fiber	Verizon
2		3	BXA-70080-4BF - Panel			
3		6	Commscope HBXX-6517DS-A2M - Panel			
4		3	Alcatel Lucent RRH2X60-AWS			
5		3	Alcatel Lucent RRH2X60-PCS			
6		3	Alcatel Lucent RRH2X60-700			
7		6	RFS Celwave FD9R6004/2C-3L			
8		1	RFS DB-T1-6Z-8AB-0Z			
9	147.0	3	RFS APXVSPP18-C-A20 - Panel	(3) T-Frame w/ Platforms (1) SitePro1 PRK-SFS-L (1) SitePro1 PRK-1245L	(4) 1-1/4" Hybrid	Sprint Nextel
10		3	RFS APXVTM14-C-120 - Panel			
11		3	ALU TD-RRH8x20-25			
12		3	ALU 1900MHz RRH			
13		3	ALU 800 MHz RRH			
14		3	ALU 800 MHz Filters			
15		4	RFS ACU-A20-N RET			
-	137.0	6	DAPA 59212 - Panel	(3) T-Frame w/ Platforms	(6) 1 5/8"	T-Mobile
19	127.0	6	Powerwave 7770.00 - Panel	Low Profile Platform	(12) 1 5/8" (2) 3/4" DC (1) 7/16" Fiber	AT&T
20		3	CCI HPA-65R-BUU-H8 - Panel			
21		6	Powerwave LGP21401 - TMA			
22		3	Ericsson RRUS 11 - RRU			
23		3	Ericsson RRUS 32 B2 - RRU			
24		6	Powerwave LGP13519 - Diplexer			
25		1	Raycap DC6-48-60-18-8F			
26	117.0	6	Kathrein 742 351 - Panel	(3) T-Frames	(12) 1 5/8" (1) 3/8"	Metro PCS
27	35.0	1	Decibel DB589	(1) Standoff	(2) 7/8"	American Messaging

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
16	137.0	3	EMS RR90-17-XXDP	(3) T-Arms Ericsson	(6)1-1/4" Coax	T-Mobile
17		3	RFS APX18-206516			
18		3	Ericsson KRY 112 144/2			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate	Reinforcement
Max. Usage:	**95.8%**	**71.0%**	**53.3%**	**99.6%**
Pass/Fail	**Pass**	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	5052.5	50.7	102.8

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

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.1739 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

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

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

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

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

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

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

Usage Diagram - Max Ratio 95.83% at 0.0ft

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Gh:**	1.1		
Base Elev:	0.000 (ft)			Page: 1	

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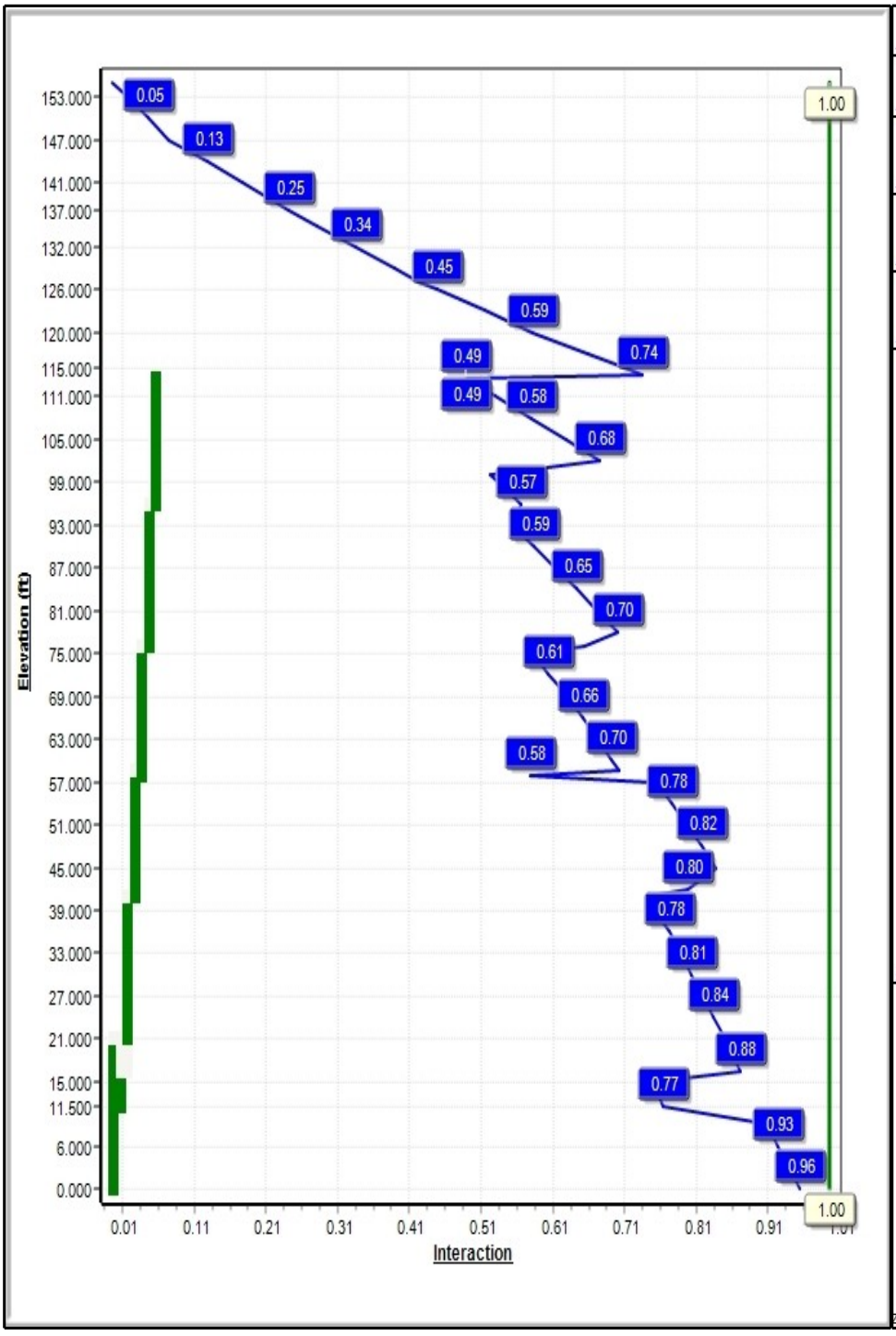
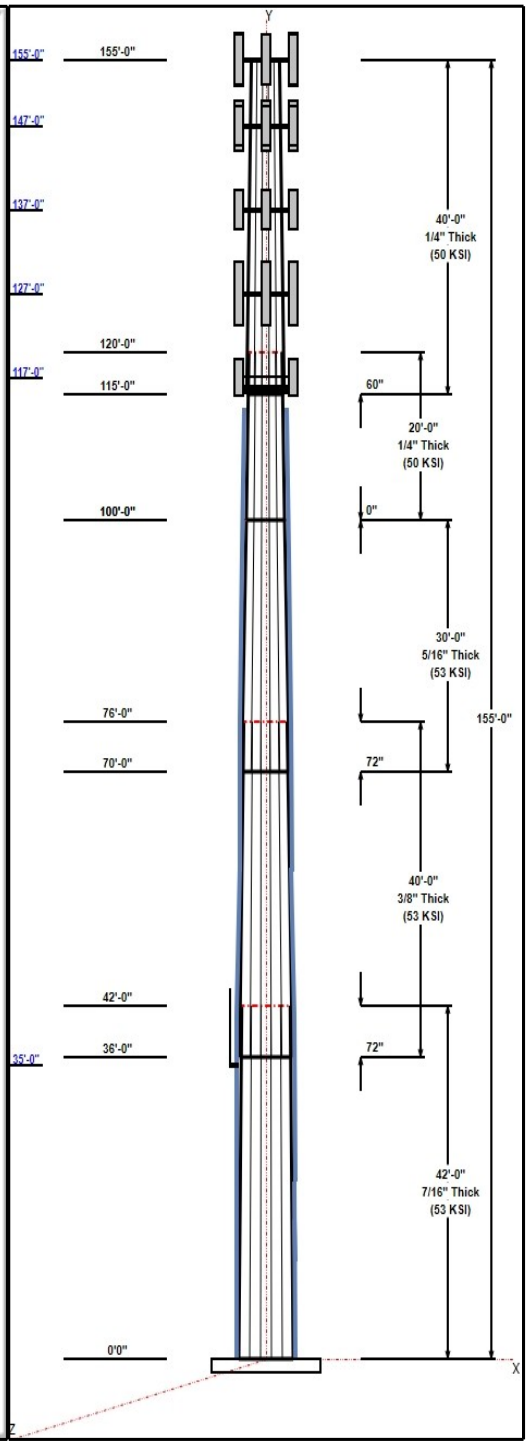
Dead Load Factor:	1.20	**Iterations:**	24
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 101 mph Wind





Structure: CT00302-S-SBA

Type: Tapered
Site Name: Danielson
Height: 155.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 12 Sided
Taper: 0.19129

4/25/2019

Tower Engineering Solutions

Shaft Properties

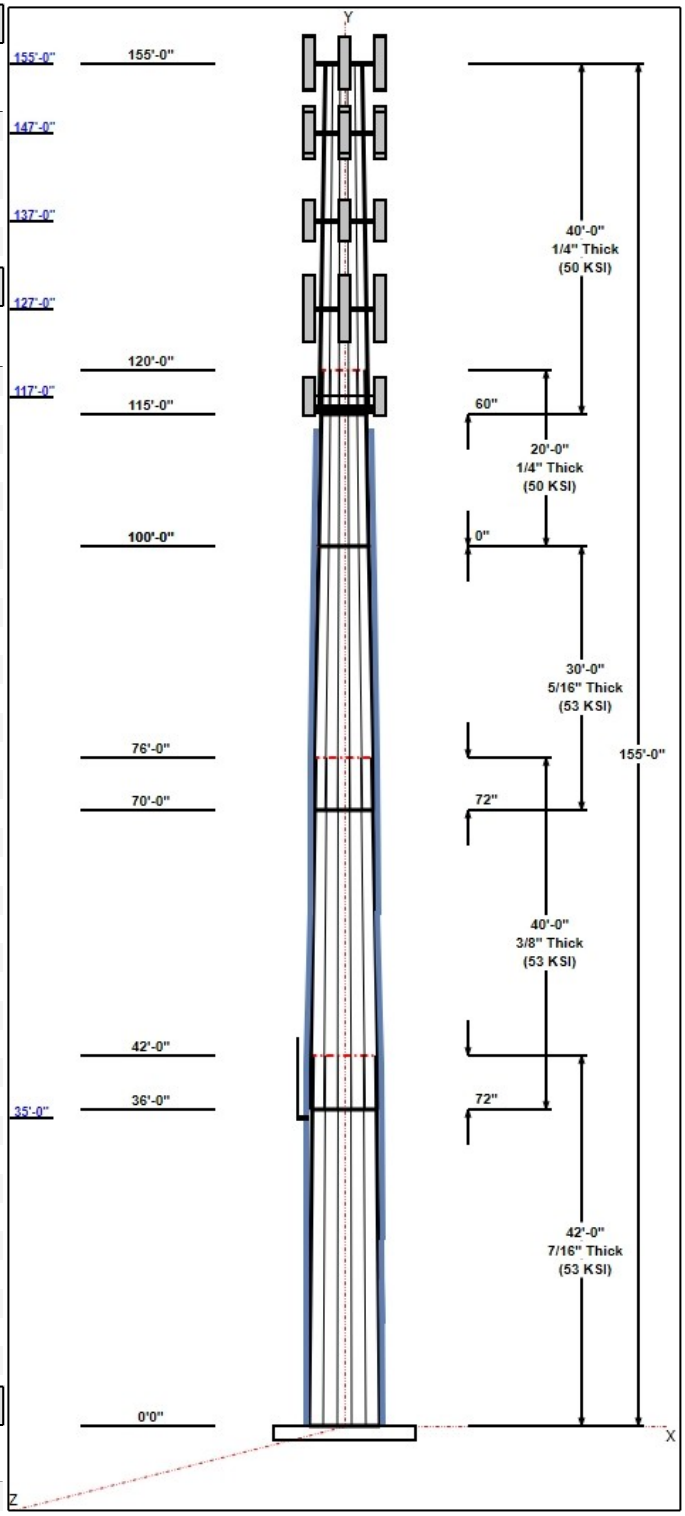
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	42.00	45.87	53.90	0.433		0.19129	53
2	40.00	40.11	47.76	0.375	Slip	0.19129	53
3	30.00	36.15	41.88	0.313	Slip	0.19129	53
4	20.00	32.32	36.15	0.250	Butt	0.19129	50
5	40.00	26.13	33.78	0.250	Slip	0.19129	50

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
155.00	155.00	3	LNX-6514DS-A1M	Verizon
155.00	155.00	3	BXA-70080-4BF	Verizon
155.00	155.00	6	HBXX-6517DS-A2M	Verizon
155.00	155.00	3	RRH2X60-AWS	Verizon
155.00	155.00	3	RRH2X60-PCS	Verizon
155.00	155.00	3	RRH2X60-700	Verizon
155.00	155.00	6	FD9R6004/2C-3L	Verizon
155.00	155.00	1	DB-T1-6Z-8AB-0Z	Verizon
155.00	155.00	1	(3) T-Frame w/ Platforms	Verizon
147.00	147.00	1	(3) T-Frame w/ Platforms	Sprint Nextel
147.00	147.00	1	PRK-1245 (kicker kit)	Sprint Nextel
147.00	147.00	1	(3) SFS-H (V-Braces)	Sprint Nextel
147.00	147.00	3	APXVSPP18-C-A20	Sprint Nextel
147.00	147.00	3	APXVTM14-C-I20	Sprint Nextel
147.00	147.00	3	Alcatel Lucent	Sprint Nextel
147.00	147.00	3	Alcatel Lucent 1900 MHz	Sprint Nextel
147.00	147.00	3	Alcatel Lucent 800 MHz	Sprint Nextel
147.00	147.00	3	Alcatel Lucent 800 MHz	Sprint Nextel
147.00	147.00	4	RFS ACU-A20-N RET	Sprint Nextel
137.00	137.00	3	Ericsson RR90-17-XXDP	T-Mobile
137.00	137.00	3	Ericsson APX18-206516	T-Mobile
137.00	137.00	3	Ericsson KRY 112 144/2	T-Mobile
137.00	137.00	1	(3) T-Frame w/ Platforms	T-Mobile
127.00	127.00	1	Low Profile	AT&T
127.00	127.00	6	7770.00	AT&T
127.00	127.00	3	HPA-65R-BUU-H8	AT&T
127.00	127.00	6	LGP21401	AT&T
127.00	127.00	3	RRUS 11	AT&T
127.00	127.00	3	RRUS 32 B2	AT&T
127.00	127.00	1	DC6-48-60-18-8F	AT&T
127.00	127.00	6	LGP13519	AT&T
117.00	117.00	3	T-Frames	Metro PCS
117.00	117.00	6	742 351	Metro PCS
35.00	39.60	1	DB589	American Messaging
35.00	35.00	1	3.58' Standoff	American Messaging

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	155.00	Inside	1 5/8" Coax	Verizon
0.00	155.00	Inside	1 5/8" Fiber	Verizon
0.00	147.00	Inside	1 1/4" Coax	Sprint Nextel
0.00	137.00	Inside	1 1/4" Coax	T-Mobile
0.00	127.00	Inside	1 5/8" Coax	AT&T
0.00	127.00	Inside	3" Conduit	AT&T



0.00	127.00	Inside	3/4" DC	AT&T
0.00	127.00	Inside	7/16" Fiber	AT&T
0.00	117.00	Inside	1 5/8" Coax	Metro PCS
0.00	117.00	Inside	3/8" Coax	Metro PCS
58.00	115.00	Outside	1.25" Reinforcing plate	
0.00	58.00	Outside	10"x1/2" Bent plate	
0.00	35.00	Inside	7/8" Coax	American Messaging

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
18	2.00" A687	105.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.7500	67.0	36.0	Round

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	5052.5	50.7	54.2
0.9D + 1.6W 101 mph Wind	5005.4	50.7	40.6
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1264.5	11.5	102.8
1.2D + 1.0E	194.3	1.6	54.2
0.9D + 1.0E	192.1	1.6	40.7
1.0D + 1.0W 60 mph Wind	1108.8	11.2	45.2

Structure: CT00302-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Danielson
Height: 155.00 (ft)

4/25/2019

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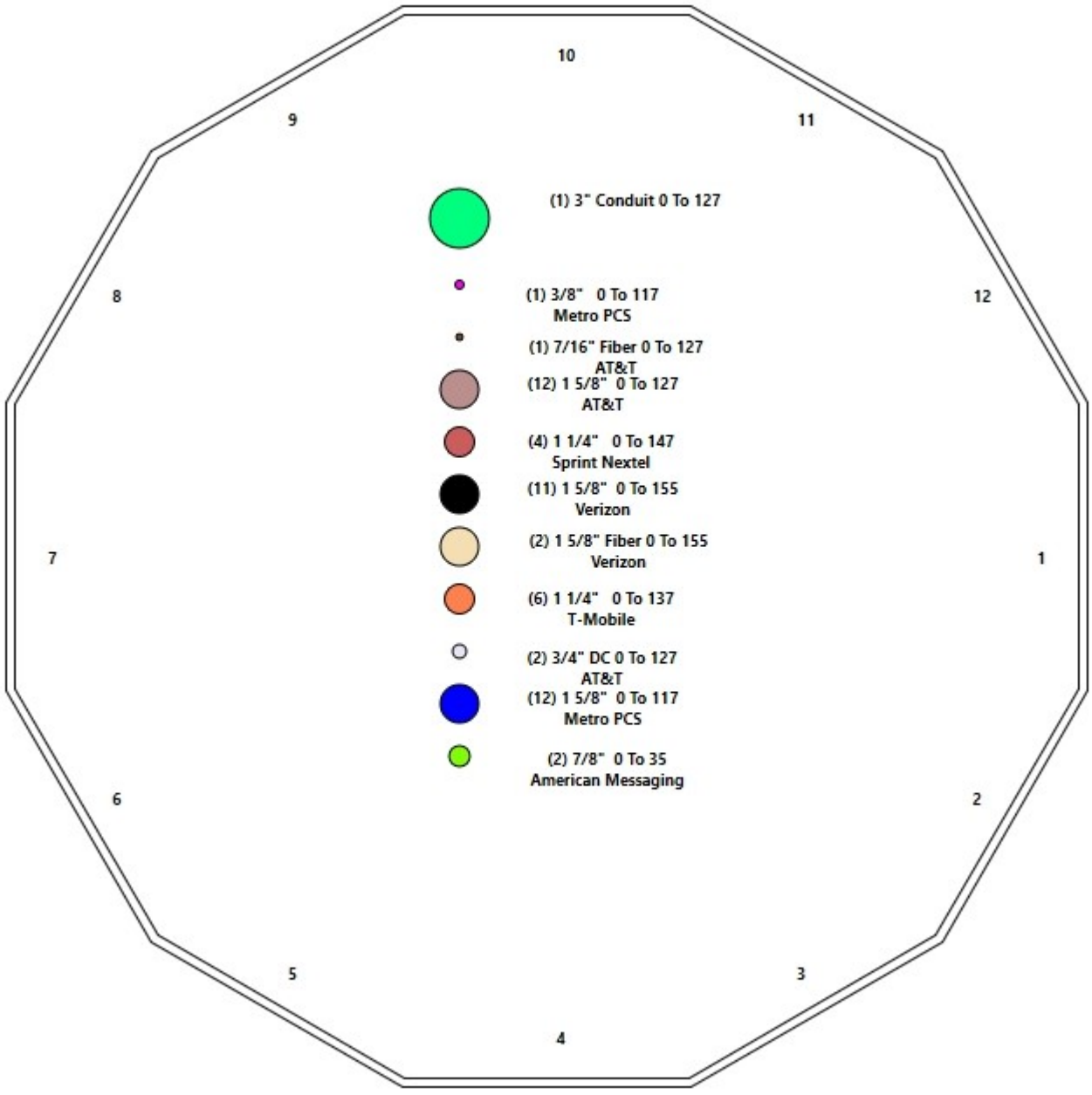

Shaft Properties

Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 5

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	12	42.000	0.4331	53		0.00	9,856
2	12	40.000	0.3750	53	Slip	72.00	7,160
3	12	30.000	0.3125	53	Slip	72.00	3,976
4	12	20.000	0.2500	50	Flange	0.00	1,862
5	12	40.000	0.2500	50	Slip	60.00	3,254
					Total Shaft Weight:		**26,107**

	Bottom						Top						
Sec. No.	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Taper**
1	53.90	0.00	74.56	27207.27	31.20	124.45	45.87	42.00	63.36	16693.0	26.23	105.9	0.191290
2	47.76	36.00	57.22	16401.87	31.98	127.37	40.11	76.00	47.98	9670.66	26.52	106.9	0.191290
3	41.88	70.00	41.83	9227.84	33.77	134.03	36.15	100.00	36.06	5909.60	28.85	115.6	0.191290
4	36.15	100.0	28.90	4752.46	36.60	144.58	32.32	120.00	25.82	3389.11	32.50	129.2	0.191290
5	33.78	115.0	26.99	3872.14	34.06	135.11	26.13	155.00	20.83	1780.01	25.86	104.5	0.191290

Additional Steel

							Intermediate Connectors		Termination Connectors			
Elev From (ft)	**Elev To (ft)**	**Qty**	**Description**	**Fy (ksi)**	**Fu (ksi)**	**Offset (in)**	**Description**	**Spacing (in)**	**Description**	**Spacing (in)**	**Lower Qty**	**Upper Qty**
0.00	21.00	3	PLT 6"X1-1/4"(1.25" Hole	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00		
11.50	16.50	1	PLT 6"X1-1/4"(1.25" Hole	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	11	11
21.00	41.00	3	PLT 6"X1-1/4"(1.25" Hole	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00		
41.00	58.50	3	PLT 6"X1-1/4"(1.25" Hole	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00		11
58.00	76.00	3	PLT 5"x1-1/4"(1.25"Hole)	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	8	
76.00	96.00	3	PLT 4.5"x 1-1/4"(1.25"ho	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00		
96.00	113.5	3	PLT 3.5x1.25(1.25 Hole)	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00		6

Load Summary

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 6	

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Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	155.00	LNX-6514DS-A1M	3	38.40	8.17	0.83	287.05	12.152	0.83	0.00	0.00
2	155.00	BXA-70080-4BF	3	13.00	4.76	0.76	164.47	7.385	0.76	0.00	0.00
3	155.00	HBXX-6517DS-A2M	6	40.80	8.55	0.77	289.40	12.667	0.77	0.00	0.00
4	155.00	RRH2X60-AWS	3	55.00	3.50	0.50	167.86	4.613	0.67	0.00	0.00
5	155.00	RRH2X60-PCS	3	55.00	2.20	0.50	186.08	3.132	0.67	0.00	0.00
6	155.00	RRH2X60-700	3	46.00	1.88	0.50	154.30	2.743	0.67	0.00	0.00
7	155.00	FD9R6004/2C-3L	6	3.10	0.36	0.50	14.42	0.985	0.50	0.00	0.00
8	155.00	DB-T1-6Z-8AB-0Z	1	18.90	4.80	0.71	236.82	6.067	0.71	0.00	0.00
9	155.00	(3) T-Frame w/ Platforms	1	1620.00	25.00	1.00	3613.98	53.310	1.00	0.00	0.00
10	147.00	(3) T-Frame w/ Platforms	1	1620.00	25.00	1.00	3613.31	53.300	1.00	0.00	0.00
11	147.00	PRK-1245 (kicker kit)	1	464.91	9.50	1.00	922.54	23.527	1.00	0.00	0.00
12	147.00	(3) SFS-H (V-Braces)	1	197.00	9.60	1.00	681.79	19.050	1.00	0.00	0.00
13	147.00	APXVSPP18-C-A20	3	57.00	8.02	0.83	300.73	11.959	0.83	0.00	0.00
14	147.00	APXVTM14-C-I20	3	56.00	6.34	0.79	301.28	7.951	0.79	0.00	0.00
15	147.00	Alcatel Lucent TD-RRH8x20-25	3	70.00	4.05	0.67	239.41	5.233	0.67	0.00	0.00
16	147.00	Alcatel Lucent 1900 MHz RRH	3	60.00	2.31	0.67	477.97	3.231	0.67	0.00	0.00
17	147.00	Alcatel Lucent 800 MHz RRH	3	53.00	2.49	0.67	157.29	4.103	0.67	0.00	0.00
18	147.00	Alcatel Lucent 800 MHz Filter	3	8.80	0.78	0.67	33.68	1.692	0.67	0.00	0.00
19	147.00	RFS ACU-A20-N RET	4	1.00	0.14	0.50	7.06	0.558	0.79	0.00	0.00
20	137.00	Ericsson RR90-17-XXDP	3	18.00	4.36	0.68	174.29	5.804	0.68	0.00	0.00
21	137.00	Ericsson APX18-206516	3	18.70	3.61	0.73	161.20	4.997	0.73	0.00	0.00
22	137.00	Ericsson KRY 112 144/2 TMA	3	13.20	0.67	0.67	38.56	1.577	0.67	0.00	0.00
23	137.00	(3) T-Frame w/ Platforms	1	1620.00	25.00	1.00	3612.87	53.294	1.00	0.00	0.00
24	127.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	3345.27	46.899	1.00	0.00	0.00
25	127.00	7770.00	6	35.00	5.50	0.73	243.68	7.042	0.73	0.00	0.00
26	127.00	HPA-65R-BUU-H8	3	68.00	12.98	0.79	506.37	15.313	0.79	0.00	0.00
27	127.00	LGP21401	6	17.50	0.95	0.50	46.11	1.999	0.50	0.00	0.00
28	127.00	RRUS 11	3	50.70	2.52	0.67	188.40	3.472	0.67	0.00	0.00
29	127.00	RRUS 32 B2	3	60.00	2.74	0.67	196.55	3.800	0.67	0.00	0.00
30	127.00	DC6-48-60-18-8F	1	31.80	0.92	1.00	118.96	1.538	1.00	0.00	0.00
31	127.00	LGP13519	6	5.30	0.34	0.67	18.69	0.980	0.67	0.00	0.00
32	117.00	T-Frames	3	880.00	20.40	0.75	1850.19	34.858	0.75	0.00	0.00
33	117.00	742 351	6	29.80	5.38	0.61	164.18	8.181	0.61	0.00	0.00
34	35.00	DB589	1	11.50	1.38	1.00	63.95	4.630	1.00	0.00	4.60
35	35.00	3.58' Standoff	1	70.00	1.67	0.67	155.41	4.392	0.67	0.00	0.00
		Totals:	**104**	**12,809.51**			**37,809.04**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	155.00	(11) 1 5/8" Coax	0.00	Inside
0.00	155.00	(2) 1 5/8" Fiber	0.00	Inside
0.00	147.00	(4) 1 1/4" Coax	0.00	Inside
0.00	137.00	(6) 1 1/4" Coax	0.00	Inside
0.00	127.00	(12) 1 5/8" Coax	0.00	Inside
0.00	127.00	(1) 3" Conduit	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	127.00	(2) 3/4" DC			0.00	Inside					
0.00	127.00	(1) 7/16" Fiber			0.00	Inside					
0.00	117.00	(12) 1 5/8" Coax			0.00	Inside					
0.00	117.00	(1) 3/8" Coax			0.00	Inside					
58.00	115.00	(3) 1.25" Reinforcing plate			1.25	Outside					
0.00	58.00	(3) 10"x1/2" Bent plate			3.56	Outside					
0.00	35.00	(2) 7/8" Coax			0.00	Inside					

Shaft Section Properties

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 8	

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Increment Length: **3 (ft)**

											Additional Reinforcing			
Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Area (in^2)	Ixp (in^4)	Iyp (in^4)	Weight (lb)
0.00	RB1	0.4331	53.900	74.564	27207.3	31.20	124.45	53	60	0.0	22.50	11335.6	5634.6	
3.00		0.4331	53.326	73.764	26340.6	30.85	123.13	53	61	757.1	22.50	11100.9	5518.0	229.7
6.00		0.4331	52.752	72.963	25492.5	30.49	121.80	53	61	748.9	22.50	10868.6	5402.6	229.7
9.00		0.4331	52.178	72.163	24662.8	30.14	120.48	53	61	740.7	22.50	10638.8	5288.4	229.7
11.50	RB2	0.4331	51.700	71.496	23985.3	29.84	119.37	53	61	611.1	30.00	10560.9	10206.1	255.2
12.00		0.4331	51.605	71.363	23851.3	29.78	119.15	53	61	121.5	30.00	10523.0	10169.0	51.0
15.00		0.4331	51.031	70.562	23057.8	29.43	117.83	53	62	724.4	30.00	10296.7	9948.1	306.2
16.50	RT2	0.4331	50.744	70.162	22667.8	29.25	117.16	53	62	359.1	22.50	10075.2	5008.4	114.8
18.00		0.4331	50.457	69.762	22282.1	29.07	116.50	53	62	357.1	22.50	9964.3	4953.3	114.8
21.00	RT1 RB3	0.4331	49.883	68.962	21524.0	28.72	115.18	53	62	708.1	22.50	9744.4	4844.1	229.7
24.00		0.4331	49.309	68.161	20783.3	28.36	113.85	53	63	699.9	22.50	9526.9	4736.1	229.7
27.00		0.4331	48.735	67.361	20059.8	28.01	112.53	53	63	691.7	22.50	9312.0	4629.3	229.7
30.00		0.4331	48.161	66.561	19353.3	27.65	111.20	53	63	683.6	22.50	9099.5	4523.8	229.7
33.00		0.4331	47.587	65.761	18663.6	27.30	109.88	53	63	675.4	22.50	8889.4	4419.5	229.7
35.00		0.4331	47.205	65.227	18213.0	27.06	108.99	53	64	445.7	22.50	8750.8	4350.6	153.1
36.00	Bot - Section 2	0.4331	47.014	64.960	17990.4	26.94	108.55	53	64	221.5	22.50	8681.8	4316.4	76.6
39.00		0.4331	46.440	64.160	17333.6	26.59	107.23	53	64	1239.7	22.50	8744.4	4347.0	229.7
41.00	RT3 RB4	0.4331	46.057	63.626	16904.8	26.35	106.34	53	64	818.0	22.50	8606.9	4278.7	153.1
42.00	Top - Section 1	0.3750	46.616	55.836	15238.7	31.16	124.31	53	60	406.4	22.50	8538.6	4244.8	76.6
45.00		0.3750	46.042	55.143	14678.4	30.75	122.78	53	61	566.5	22.50	8328.6	4136.7	229.7
48.00		0.3750	45.468	54.450	14132.0	30.34	121.25	53	61	559.4	22.50	8127.8	4037.1	229.7
51.00		0.3750	44.894	53.757	13599.2	29.93	119.72	53	61	552.3	22.50	7929.5	3938.7	229.7
54.00		0.3750	44.320	53.064	13080.1	29.52	118.19	53	62	545.2	22.50	7733.7	3841.6	229.7
57.00		0.3750	43.746	52.371	12574.3	29.11	116.66	53	62	538.2	22.50	7540.4	3745.7	229.7
58.00	RB5	0.3750	43.555	52.140	12408.7	28.98	116.15	53	62	177.8	41.25	12224.5	8463.6	140.3
58.50	RT4	0.3750	43.460	52.025	12326.4	28.91	115.89	53	62	88.6	18.75	4705.8	4705.8	31.9
60.00		0.3750	43.173	51.678	12081.8	28.70	115.13	53	62	264.7	18.75	4645.8	4645.8	95.7
63.00		0.3750	42.599	50.985	11602.3	28.29	113.60	53	63	524.0	18.75	4527.1	4527.1	191.3
66.00		0.3750	42.025	50.292	11135.6	27.88	112.07	53	63	516.9	18.75	4409.9	4409.9	191.3
69.00		0.3750	41.451	49.599	10681.6	27.47	110.54	53	63	509.9	18.75	4294.3	4294.3	191.3
70.00	Bot - Section 3	0.3750	41.260	49.368	10533.1	27.34	110.03	53	63	168.4	18.75	4256.1	4256.1	63.8
72.00		0.3750	40.877	48.906	10240.1	27.06	109.01	53	64	617.8	18.75	4304.5	4304.5	127.6
75.00		0.3750	40.303	48.213	9811.0	26.65	107.48	53	64	915.9	18.75	4190.3	4190.3	191.3
76.00	Top - Section 2 RT5	0.3125	40.737	40.677	8484.5	32.79	130.36	53	59	302.4	16.88	3734.0	3734.0	57.4
78.00		0.3125	40.354	40.292	8245.8	32.46	129.13	53	59	275.5	16.88	3666.5	3666.5	114.8
81.00		0.3125	39.780	39.715	7896.4	31.97	127.30	53	60	408.4	16.88	3566.5	3566.5	172.3
84.00		0.3125	39.207	39.137	7556.9	31.47	125.46	53	60	402.5	16.88	3467.8	3467.8	172.3
87.00		0.3125	38.633	38.560	7227.3	30.98	123.62	53	61	396.6	16.88	3370.6	3370.6	172.3
90.00		0.3125	38.059	37.982	6907.4	30.49	121.79	53	61	390.7	16.88	3274.7	3274.7	172.3
93.00		0.3125	37.485	37.405	6597.2	30.00	119.95	53	61	384.8	16.88	3180.2	3180.2	172.3
96.00	RT6 RB7	0.3125	36.911	36.827	6296.3	29.51	118.12	53	62	378.9	13.13	2396.7	2396.7	134.0
99.00		0.3125	36.337	36.250	6004.8	29.01	116.28	53	62	373.0	13.13	2325.4	2325.4	134.0
100.00	Top - Section 3	0.3125	36.146	36.057	5909.6	28.85	115.67	53	62	123.0	13.13	2301.9	2301.9	44.7
100.00	Bot - Section 4	0.2500	36.146	28.896	4752.5	36.06	144.58	50	54					
102.00		0.2500	35.763	28.588	4602.1	36.19	143.05	50	54	195.6	13.13	2255.2	2255.2	89.3
105.00		0.2500	35.190	28.126	4382.6	35.57	140.76	50	54	289.5	13.13	2186.0	2186.0	134.0
108.00		0.2500	34.616	27.664	4170.2	34.96	138.46	50	55	284.8	13.13	2118.0	2118.0	134.0
111.00		0.2500	34.042	27.202	3964.7	34.34	136.17	50	55	280.0	13.13	2051.0	2051.0	134.0
113.50	RT7	0.2500	33.564	26.817	3798.8	33.83	134.25	50	56	229.8	13.13	1996.0	1996.0	111.7
114.00		0.2500	33.468	26.740	3766.2	33.73	133.87	50	56	45.6				

Increment Length: 3 (ft)

Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Additional Reinforcing Area (in^2)	Additional Reinforcing Ixp (in^4)	Additional Reinforcing Iyp (in^4)	Additional Reinforcing Weight (lb)
115.00	Bot - Section 5	0.2500	33.277	26.586	3701.5	33.52	133.11	50	56	90.7				
117.00		0.2500	32.894	26.278	3574.3	33.11	131.58	50	56	362.5				
120.00	Top - Section 4	0.2500	32.820	26.219	3550.1	33.03	131.28	50	56	535.9				
123.00		0.2500	32.246	25.757	3365.7	32.42	128.99	50	57	265.3				
126.00		0.2500	31.672	25.295	3187.9	31.80	126.69	50	57	260.6				
127.00		0.2500	31.481	25.141	3130.0	31.60	125.92	50	57	85.8				
129.00		0.2500	31.099	24.833	3016.4	31.19	124.39	50	58	170.1				
132.00		0.2500	30.525	24.371	2851.2	30.57	122.10	50	58	251.1				
135.00		0.2500	29.951	23.909	2692.1	29.96	119.80	50	59	246.4				
137.00		0.2500	29.568	23.601	2589.4	29.55	118.27	50	59	161.7				
138.00		0.2500	29.377	23.447	2539.0	29.34	117.51	50	59	80.0				
141.00		0.2500	28.803	22.985	2391.9	28.73	115.21	50	59	237.0				
144.00		0.2500	28.229	22.523	2250.5	28.11	112.92	50	60	232.3				
147.00		0.2500	27.655	22.061	2114.9	27.50	110.62	50	60	227.6				
150.00		0.2500	27.081	21.599	1984.8	26.88	108.33	50	61	222.9				
153.00		0.2500	26.508	21.137	1860.1	26.27	106.03	50	61	218.1				
155.00		0.2500	26.125	20.829	1780.0	25.86	104.50	50	62	142.8				
									Total Weight	**26107.2**				**7690.8**

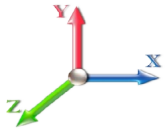
Wind Loading - Shaft

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 10	

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	2.18	0.70	37.885	41.67	580.38	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
3.00		2.13	0.70	37.051	40.76	567.85	1.000	0.000	3.00	13.876	13.88	904.8	0.0	908.5
6.00		2.09	0.70	36.254	39.88	555.66	1.000	0.000	3.00	13.728	13.73	875.9	0.0	898.7
9.00		2.04	0.70	35.493	39.04	543.82	1.000	0.000	3.00	13.579	13.58	848.2	0.0	888.9
11.50	RB2	2.01	0.70	34.884	38.37	534.19	1.000	0.000	2.50	11.202	11.20	687.8	0.0	733.3
12.00		2.00	0.70	34.765	38.24	532.30	1.000	0.000	0.50	2.228	2.23	136.3	0.0	145.8
15.00		1.96	0.70	34.070	37.48	521.09	1.000	0.000	3.00	13.282	13.28	796.4	0.0	869.3
16.50	RT2	1.94	0.70	33.734	37.11	515.59	1.000	0.000	1.50	6.585	6.59	391.0	0.0	431.0
18.00		1.92	0.70	33.405	36.75	510.17	1.000	0.000	1.50	6.548	6.55	385.0	0.0	428.5
21.00	RT1 RB3	1.89	0.70	32.769	36.05	499.55	1.000	0.000	3.00	12.985	12.98	748.9	0.0	849.7
24.00		1.85	0.70	32.161	35.38	489.20	1.000	0.000	3.00	12.836	12.84	726.6	0.0	839.9
27.00		1.82	0.70	31.579	34.74	479.11	1.000	0.000	3.00	12.688	12.69	705.2	0.0	830.1
30.00		1.79	0.70	31.048	34.15	469.47	1.000	0.000	3.00	12.539	12.54	685.2	0.0	820.3
33.00		1.76	0.72	31.357	34.49	466.18	1.000	0.000	3.00	12.391	12.39	683.8	0.0	810.5
35.00	Appurtenance(s)	1.74	0.73	31.530	34.68	463.70	1.000	0.000	2.00	8.178	8.18	453.8	0.0	534.9
36.00	Bot - Section 2	1.73	0.74	31.608	34.77	462.40	1.000	0.000	1.00	4.064	4.06	226.1	0.0	265.8
39.00		1.70	0.76	31.812	34.99	458.22	1.000	0.000	3.00	12.288	12.29	688.0	0.0	1487.6
41.00	RT3 RB4	1.68	0.77	31.925	35.12	455.26	1.000	0.000	2.00	8.109	8.11	455.7	0.0	981.6
42.00	Top - Section 1	1.67	0.77	31.976	35.17	453.73	1.000	0.000	1.00	4.030	4.03	226.8	0.0	487.7
45.00		1.65	0.79	32.108	35.32	456.41	1.000	0.000	3.00	11.991	11.99	677.6	0.0	679.7
48.00		1.62	0.80	32.214	35.44	451.46	1.000	0.000	3.00	11.842	11.84	671.4	0.0	671.3
51.00		1.60	0.82	32.296	35.53	446.33	1.000	0.000	3.00	11.694	11.69	664.7	0.0	662.8
54.00		1.57	0.83	32.360	35.60	441.07	1.000	0.000	3.00	11.545	11.55	657.5	0.0	654.3
57.00		1.55	0.84	32.408	35.65	435.68	1.000	0.000	3.00	11.397	11.40	650.1	0.0	645.8
58.00	RB5	1.55	0.85	32.422	35.66	433.86	1.000	0.000	1.00	3.766	3.77	214.9	0.0	213.4
58.50	RT4	1.54	0.85	32.427	35.67	432.95	1.000	0.000	0.50	1.877	1.88	107.1	0.0	106.3
60.00		1.53	0.85	32.444	35.69	430.19	1.000	0.000	1.50	5.606	5.61	320.1	0.0	317.6
63.00		1.51	0.87	32.468	35.71	424.63	1.000	0.000	3.00	11.100	11.10	634.3	0.0	628.8
66.00		1.49	0.88	32.483	35.73	419.01	1.000	0.000	3.00	10.951	10.95	626.1	0.0	620.3
69.00		1.47	0.89	32.490	35.74	413.34	1.000	0.000	3.00	10.803	10.80	617.7	0.0	611.8
70.00	Bot - Section 3	1.47	0.89	32.491	35.74	411.44	1.000	0.000	1.00	3.568	3.57	204.0	0.0	202.1
72.00		1.46	0.90	32.492	35.74	407.62	1.000	0.000	2.00	7.194	7.19	411.4	0.0	741.3
75.00		1.44	0.91	32.488	35.74	401.88	1.000	0.000	3.00	10.667	10.67	609.9	0.0	1099.0
76.00	Top - Section 2 RT5	1.43	0.91	32.486	35.73	399.96	1.000	0.000	1.00	3.523	3.52	201.4	0.0	362.9
78.00		1.42	0.92	32.481	35.73	402.34	1.000	0.000	2.00	6.996	7.00	399.9	0.0	330.6
81.00		1.41	0.93	32.470	35.72	396.56	1.000	0.000	3.00	10.370	10.37	592.6	0.0	490.0
84.00		1.39	0.94	32.458	35.70	390.76	1.000	0.000	3.00	10.222	10.22	583.9	0.0	483.0
87.00		1.38	0.95	32.443	35.69	384.96	1.000	0.000	3.00	10.073	10.07	575.2	0.0	475.9
90.00		1.36	0.96	32.428	35.67	379.15	1.000	0.000	3.00	9.925	9.92	566.4	0.0	468.8
93.00		1.35	0.97	32.412	35.65	373.34	1.000	0.000	3.00	9.776	9.78	557.7	0.0	461.7
96.00	RT6 RB7	1.34	0.98	32.396	35.64	367.53	1.000	0.000	3.00	9.628	9.63	548.9	0.0	454.7
99.00		1.32	0.99	32.380	35.62	361.73	1.000	0.000	3.00	9.479	9.48	540.2	0.0	447.6
100.00	Top - Section 3	1.32	0.99	32.375	35.61	359.80	1.000	0.000	1.00	3.127	3.13	178.2	0.0	147.6
102.00		1.31	0.99	32.364	35.60	355.93	1.000	0.000	2.00	6.204	6.20	353.4	0.0	234.7
105.00		1.30	1.00	32.350	35.58	350.14	1.000	0.000	3.00	9.182	9.18	522.8	0.0	347.4
108.00		1.29	1.01	32.336	35.57	344.36	1.000	0.000	3.00	9.033	9.03	514.1	0.0	341.7
111.00		1.28	1.02	32.323	35.56	338.58	1.000	0.000	3.00	8.885	8.88	505.5	0.0	336.1

Wind Loading - Shaft

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 11	

113.50 RT7	1.27	1.02	32.314	35.55	333.78	1.000	0.000	2.50	7.291	7.29	414.6	0.0	275.7
114.00	1.27	1.03	32.312	35.54	332.82	1.000	0.000	0.50	1.446	1.45	82.2	0.0	54.7
115.00 Bot - Section 5	1.27	1.03	32.309	35.54	330.90	1.000	0.000	1.00	2.879	2.88	163.7	0.0	108.9
117.00 Appurtenance(s)	1.26	1.03	32.302	35.53	327.06	1.000	0.000	2.00	5.795	5.80	329.5	0.0	435.0
120.00 Top - Section 4	1.25	1.04	32.294	35.52	321.31	1.000	0.000	3.00	8.569	8.57	487.0	0.0	643.1
123.00	1.24	1.05	32.287	35.52	320.55	1.000	0.000	3.00	8.420	8.42	478.5	0.0	318.4
126.00	1.23	1.06	32.282	35.51	314.82	1.000	0.000	3.00	8.272	8.27	470.0	0.0	312.7
127.00 Appurtenance(s)	1.23	1.06	32.281	35.51	312.91	1.000	0.000	1.00	2.724	2.72	154.8	0.0	103.0
129.00	1.22	1.06	32.279	35.51	309.10	1.000	0.000	2.00	5.399	5.40	306.7	0.0	204.1
132.00	1.22	1.07	32.278	35.51	303.39	1.000	0.000	3.00	7.975	7.97	453.0	0.0	301.4
135.00	1.21	1.08	32.279	35.51	297.69	1.000	0.000	3.00	7.826	7.83	444.6	0.0	295.7
137.00 Appurtenance(s)	1.20	1.08	32.280	35.51	293.89	1.000	0.000	2.00	5.135	5.13	291.7	0.0	194.0
138.00	1.20	1.08	32.281	35.51	291.99	1.000	0.000	1.00	2.543	2.54	144.5	0.0	96.1
141.00	1.19	1.09	32.286	35.51	286.31	1.000	0.000	3.00	7.529	7.53	427.8	0.0	284.4
144.00	1.19	1.10	32.292	35.52	280.63	1.000	0.000	3.00	7.381	7.38	419.5	0.0	278.7
147.00 Appurtenance(s)	1.18	1.10	32.300	35.53	274.96	1.000	0.000	3.00	7.232	7.23	411.1	0.0	273.1
150.00	1.17	1.11	32.311	35.54	269.30	1.000	0.000	3.00	7.083	7.08	402.8	0.0	267.4
153.00	1.17	1.12	32.323	35.55	263.64	1.000	0.000	3.00	6.935	6.93	394.5	0.0	261.8
155.00 Appurtenance(s)	1.16	1.12	32.332	35.56	259.87	1.000	0.000	2.00	4.541	4.54	258.4	0.0	171.4
							Totals:	**155.00**			**30,867.5**		**31,328.6**

Discrete Appurtenance Forces

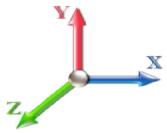
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	RRH2X60-AWS	3	32.332	35.565	0.40	0.80	4.20	198.00	0.000	0.000	239.00	0.00	0.00
2	155.00	LNX-6514DS-A1M	3	32.332	35.565	0.66	0.80	16.27	138.24	0.000	0.000	926.09	0.00	0.00
3	155.00	BXA-70080-4BF	3	32.332	35.565	0.61	0.80	8.68	46.80	0.000	0.000	494.05	0.00	0.00
4	155.00	HBXX-6517DS-A2M	6	32.332	35.565	0.62	0.80	31.60	293.76	0.000	0.000	1798.21	0.00	0.00
5	155.00	(3) T-Frame w/ Platforms	1	32.332	35.565	1.00	1.00	25.00	1944.00	0.000	0.000	1422.60	0.00	0.00
6	155.00	RRH2X60-700	3	32.332	35.565	0.40	0.80	2.26	165.60	0.000	0.000	128.38	0.00	0.00
7	155.00	FD9R6004/2C-3L	6	32.332	35.565	0.40	0.80	0.86	22.32	0.000	0.000	49.17	0.00	0.00
8	155.00	DB-T1-6Z-8AB-0Z	1	32.332	35.565	0.57	0.80	2.73	22.68	0.000	0.000	155.14	0.00	0.00
9	155.00	RRH2X60-PCS	3	32.332	35.565	0.40	0.80	2.64	198.00	0.000	0.000	150.23	0.00	0.00
10	147.00	Alcatel Lucent	3	32.300	35.530	0.54	0.80	6.51	252.00	0.000	0.000	370.22	0.00	0.00
11	147.00	(3) SFS-H (V-Braces)	1	32.300	35.530	0.75	0.75	7.20	236.40	0.000	0.000	409.31	0.00	0.00
12	147.00	APXVSPP18-C-A20	3	32.300	35.530	0.66	0.80	15.98	205.20	0.000	0.000	908.21	0.00	0.00
13	147.00	APXVTM14-C-I20	3	32.300	35.530	0.63	0.80	12.02	201.60	0.000	0.000	683.36	0.00	0.00
14	147.00	Alcatel Lucent 800 MHz	3	32.300	35.530	0.54	0.80	1.25	31.68	0.000	0.000	71.30	0.00	0.00
15	147.00	Alcatel Lucent 1900 MHz	3	32.300	35.530	0.54	0.80	3.71	216.00	0.000	0.000	211.16	0.00	0.00
16	147.00	Alcatel Lucent 800 MHz	3	32.300	35.530	0.54	0.80	4.00	190.80	0.000	0.000	227.62	0.00	0.00
17	147.00	RFS ACU-A20-N RET	4	32.300	35.530	0.40	0.80	0.22	4.80	0.000	0.000	12.73	0.00	0.00
18	147.00	PRK-1245 (kicker kit)	1	32.300	35.530	0.75	0.75	7.13	557.89	0.000	0.000	405.05	0.00	0.00
19	147.00	(3) T-Frame w/ Platforms	1	32.300	35.530	1.00	1.00	25.00	1944.00	0.000	0.000	1421.22	0.00	0.00
20	137.00	(3) T-Frame w/ Platforms	1	32.280	35.508	1.00	1.00	25.00	1944.00	0.000	0.000	1420.33	0.00	0.00
21	137.00	Ericsson KRY 112 144/2	3	32.280	35.508	0.54	0.80	1.08	47.52	0.000	0.000	61.21	0.00	0.00
22	137.00	Ericsson APX18-206516	3	32.280	35.508	0.58	0.80	6.32	67.32	0.000	0.000	359.33	0.00	0.00
23	137.00	Ericsson RR90-17-XXDP	3	32.280	35.508	0.54	0.80	7.12	64.80	0.000	0.000	404.26	0.00	0.00
24	127.00	LGP21401	6	32.281	35.509	0.40	0.80	2.28	126.00	0.000	0.000	129.54	0.00	0.00
25	127.00	Low Profile	1	32.281	35.509	1.00	1.00	22.00	1800.00	0.000	0.000	1249.93	0.00	0.00
26	127.00	7770.00	6	32.281	35.509	0.58	0.80	19.27	252.00	0.000	0.000	1094.94	0.00	0.00
27	127.00	HPA-65R-BUU-H8	3	32.281	35.509	0.63	0.80	24.61	244.80	0.000	0.000	1398.22	0.00	0.00
28	127.00	RRUS 11	3	32.281	35.509	0.54	0.80	4.05	182.52	0.000	0.000	230.22	0.00	0.00
29	127.00	RRUS 32 B2	3	32.281	35.509	0.54	0.80	4.41	216.00	0.000	0.000	250.32	0.00	0.00
30	127.00	DC6-48-60-18-8F	1	32.281	35.509	0.80	0.80	0.74	38.16	0.000	0.000	41.82	0.00	0.00
31	127.00	LGP13519	6	32.281	35.509	0.54	0.80	1.09	38.16	0.000	0.000	62.12	0.00	0.00
32	117.00	742 351	6	32.302	35.532	0.49	0.80	15.75	214.56	0.000	0.000	895.57	0.00	0.00
33	117.00	T-Frames	3	32.302	35.532	0.56	0.75	34.42	3168.00	0.000	0.000	1957.13	0.00	0.00
34	35.00	3.58' Standoff	1	31.530	34.683	0.67	1.00	1.12	84.00	0.000	0.000	62.09	0.00	0.00
35	35.00	DB589	1	31.847	35.032	0.80	0.80	1.10	13.80	0.000	4.600	61.88	0.00	284.65
							Totals:		**15,371.41**			**19,761.94**		

Total Applied Force Summary

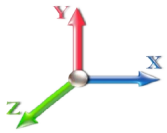
Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 13

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
3.00		904.85	1079.58	0.00	0.00
6.00		875.91	1069.78	0.00	0.00
9.00		848.24	1059.97	0.00	0.00
11.50		687.78	875.82	0.00	0.00
12.00		136.33	174.35	0.00	0.00
15.00		796.43	1040.36	0.00	0.00
16.50		390.98	516.51	0.00	0.00
18.00		384.98	514.05	0.00	0.00
21.00		748.89	1020.76	0.00	0.00
24.00		726.58	1010.95	0.00	0.00
27.00		705.18	1001.15	0.00	0.00
30.00		685.21	991.34	0.00	0.00
33.00		683.82	981.54	0.00	0.00
35.00	(2) attachments	577.79	746.71	0.00	284.65
36.00		226.09	321.58	0.00	0.00
39.00		687.98	1654.91	0.00	0.00
41.00		455.65	1093.11	0.00	0.00
42.00		226.80	543.51	0.00	0.00
45.00		677.61	847.07	0.00	0.00
48.00		671.41	838.58	0.00	0.00
51.00		664.69	830.09	0.00	0.00
54.00		657.55	821.61	0.00	0.00
57.00		650.05	813.12	0.00	0.00
58.00		214.89	269.15	0.00	0.00
58.50		107.11	134.22	0.00	0.00
60.00		320.08	401.25	0.00	0.00
63.00		634.26	796.14	0.00	0.00
66.00		626.07	787.65	0.00	0.00
69.00		617.72	779.16	0.00	0.00
70.00		204.03	257.83	0.00	0.00
72.00		411.39	852.90	0.00	0.00
75.00		609.95	1266.37	0.00	0.00
76.00		201.42	418.67	0.00	0.00
78.00		399.93	442.18	0.00	0.00
81.00		592.64	657.37	0.00	0.00
84.00		583.92	650.30	0.00	0.00
87.00		575.18	643.22	0.00	0.00
90.00		566.43	636.15	0.00	0.00
93.00		557.68	629.07	0.00	0.00
96.00		548.93	622.00	0.00	0.00
99.00		540.20	614.93	0.00	0.00
100.00		178.16	203.40	0.00	0.00
102.00		353.38	346.28	0.00	0.00
105.00		522.78	514.70	0.00	0.00
108.00		514.11	509.05	0.00	0.00
111.00		505.46	503.39	0.00	0.00

Total Applied Force Summary

Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 14

Tower Engineering Solutions

113.50		414.64	415.17	0.00	0.00
114.00		82.22	82.56	0.00	0.00
115.00		163.72	164.65	0.00	0.00
117.00	(9) attachments	3182.15	3929.13	0.00	0.00
120.00		487.02	765.21	0.00	0.00
123.00		478.48	440.46	0.00	0.00
126.00		469.97	434.81	0.00	0.00
127.00	(29) attachments	4611.89	3041.32	0.00	0.00
129.00		306.72	252.64	0.00	0.00
132.00		453.04	374.24	0.00	0.00
135.00		444.61	368.58	0.00	0.00
137.00	(10) attachments	2536.85	2366.22	0.00	0.00
138.00		144.46	115.59	0.00	0.00
141.00		427.82	343.01	0.00	0.00
144.00		419.47	337.35	0.00	0.00
147.00	(25) attachments	5131.31	4172.06	0.00	0.00
150.00		402.81	316.53	0.00	0.00
153.00		394.51	310.87	0.00	0.00
155.00	(29) attachments	5621.25	3233.50	0.00	0.00
	Totals:	**50,629.46**	**54,245.71**	**0.00**	**284.65**

Linear Appurtenance Segment Forces (Factored)

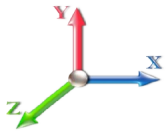
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
3.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.064	0.000	37.051	0.00	0.00
6.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.065	0.000	36.254	0.00	0.00
9.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.066	0.000	35.493	0.00	0.00
11.50	10"x1/2" Bent plate	Yes	2.50	0.000	3.56	0.74	0.00	0.066	0.000	34.884	0.00	0.00
12.00	10"x1/2" Bent plate	Yes	0.50	0.000	3.56	0.15	0.00	0.067	0.000	34.765	0.00	0.00
15.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.067	0.000	34.070	0.00	0.00
16.50	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	0.45	0.00	0.068	0.000	33.734	0.00	0.00
18.00	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	0.45	0.00	0.068	0.000	33.405	0.00	0.00
21.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.069	0.000	32.769	0.00	0.00
24.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.069	0.000	32.161	0.00	0.00
27.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.070	0.000	31.579	0.00	0.00
30.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.071	0.000	31.048	0.00	0.00
33.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.072	0.000	31.357	0.00	0.00
35.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	0.59	0.00	0.073	0.000	31.530	0.00	0.00
36.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.073	0.000	31.608	0.00	0.00
39.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.074	0.000	31.812	0.00	0.00
41.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	0.59	0.00	0.074	0.000	31.925	0.00	0.00
42.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.075	0.000	31.976	0.00	0.00
45.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.074	0.000	32.108	0.00	0.00
48.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.075	0.000	32.214	0.00	0.00
51.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.076	0.000	32.296	0.00	0.00
54.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.077	0.000	32.360	0.00	0.00
57.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.078	0.000	32.408	0.00	0.00
58.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.079	0.000	32.422	0.00	0.00
58.50	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.05	0.00	0.028	0.000	32.427	0.00	0.00
60.00	1.25" Reinforcing	Yes	1.50	0.000	1.25	0.16	0.00	0.028	0.000	32.444	0.00	0.00
63.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.028	0.000	32.468	0.00	0.00
66.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.029	0.000	32.483	0.00	0.00
69.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.029	0.000	32.490	0.00	0.00
70.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.029	0.000	32.491	0.00	0.00
72.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.029	0.000	32.492	0.00	0.00
75.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.030	0.000	32.488	0.00	0.00
76.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.030	0.000	32.486	0.00	0.00
78.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.030	0.000	32.481	0.00	0.00
81.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.030	0.000	32.470	0.00	0.00
84.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	32.458	0.00	0.00
87.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	32.443	0.00	0.00
90.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	32.428	0.00	0.00
93.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.032	0.000	32.412	0.00	0.00
96.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.032	0.000	32.396	0.00	0.00
99.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.033	0.000	32.380	0.00	0.00
100.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.033	0.000	32.375	0.00	0.00
102.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.034	0.000	32.364	0.00	0.00
105.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.034	0.000	32.350	0.00	0.00
108.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.035	0.000	32.336	0.00	0.00
111.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.035	0.000	32.323	0.00	0.00
113.50	1.25" Reinforcing	Yes	2.50	0.000	1.25	0.26	0.00	0.036	0.000	32.314	0.00	0.00

Linear Appurtenance Segment Forces (Factored)

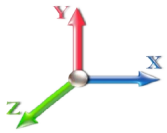
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
114.00	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.05	0.00	0.036	0.000	32.312	0.00	0.00
115.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.036	0.000	32.309	0.00	0.00
									Totals:		**0.0**	**0.0**

Calculated Forces

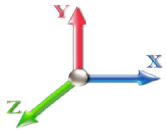
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-54.19	-50.69	0.00	-5052.4	0.00	5052.47	4048.32	2024.16	8933.65	4411.99	0.00	0.000	0.000	0.958
3.00	-53.00	-49.90	0.00	-4900.4	0.00	4900.40	4023.80	2011.90	8783.46	4337.82	0.04	-0.129	0.000	0.943
6.00	-51.82	-49.14	0.00	-4750.6	0.00	4750.68	3998.87	1999.43	8633.56	4263.79	0.17	-0.258	0.000	0.929
9.00	-50.66	-48.39	0.00	-4603.2	0.00	4603.26	3973.52	1986.76	8483.97	4189.91	0.37	-0.387	0.000	0.914
11.50	-49.74	-47.75	0.00	-4482.2	0.00	4482.28	3952.09	1976.04	8359.57	4128.48	0.60	-0.495	0.000	0.768
12.00	-49.51	-47.67	0.00	-4458.4	0.00	4458.41	3947.76	1973.88	8334.72	4116.20	0.65	-0.513	0.000	0.766
15.00	-48.41	-46.93	0.00	-4315.4	0.00	4315.40	3921.60	1960.80	8185.84	4042.68	1.01	-0.623	0.000	0.752
16.50	-47.85	-46.59	0.00	-4245.0	0.00	4245.00	3908.36	1954.18	8111.55	4005.99	1.22	-0.678	0.000	0.876
18.00	-47.27	-46.27	0.00	-4175.1	0.00	4175.12	3895.02	1947.51	8037.37	3969.35	1.44	-0.743	0.000	0.869
21.00	-46.15	-45.62	0.00	-4036.3	0.00	4036.30	3868.03	1934.02	7889.33	3896.24	1.95	-0.871	0.000	0.854
24.00	-45.05	-44.97	0.00	-3899.4	0.00	3899.46	3840.63	1920.32	7741.75	3823.36	2.54	-1.000	0.000	0.839
27.00	-43.97	-44.35	0.00	-3764.5	0.00	3764.54	3812.82	1906.41	7594.66	3750.72	3.21	-1.128	0.000	0.823
30.00	-42.89	-43.74	0.00	-3631.5	0.00	3631.50	3784.60	1892.30	7448.09	3678.33	3.96	-1.255	0.000	0.808
33.00	-41.85	-43.11	0.00	-3500.2	0.00	3500.29	3755.97	1877.99	7302.07	3606.22	4.79	-1.383	0.000	0.792
35.00	-41.07	-42.56	0.00	-3413.7	0.00	3413.79	3736.66	1868.33	7205.04	3558.30	5.39	-1.468	0.000	0.782
36.00	-40.69	-42.38	0.00	-3371.2	0.00	3371.24	3726.93	1863.47	7156.62	3534.39	5.70	-1.510	0.000	0.777
39.00	-38.98	-41.72	0.00	-3244.0	0.00	3244.09	3697.48	1848.74	7011.79	3462.86	6.69	-1.637	0.000	0.756
41.00	-37.85	-41.28	0.00	-3160.6	0.00	3160.64	3677.62	1838.81	6915.58	3415.35	7.39	-1.721	0.000	0.745
42.00	-37.26	-41.09	0.00	-3119.3	0.00	3119.37	3033.05	1516.53	5788.55	2858.75	7.76	-1.763	0.000	0.801
45.00	-36.34	-40.46	0.00	-2996.1	0.00	2996.11	3011.75	1505.88	5675.99	2803.16	8.91	-1.887	0.000	0.841
48.00	-35.44	-39.85	0.00	-2874.7	0.00	2874.72	2990.04	1495.02	5563.69	2747.70	10.14	-2.020	0.000	0.821
51.00	-34.54	-39.23	0.00	-2755.1	0.00	2755.18	2967.92	1483.96	5451.67	2692.37	11.45	-2.152	0.000	0.801
54.00	-33.66	-38.62	0.00	-2637.4	0.00	2637.48	2945.39	1472.69	5339.95	2637.20	12.84	-2.283	0.000	0.780
57.00	-32.81	-37.99	0.00	-2521.6	0.00	2521.62	2922.45	1461.22	5228.58	2582.20	14.32	-2.413	0.000	0.759
58.00	-32.53	-37.78	0.00	-2483.6	0.00	2483.64	2914.71	1457.35	5191.54	2563.91	14.83	-2.456	0.000	0.582
58.50	-32.38	-37.69	0.00	-2464.7	0.00	2464.75	2910.82	1455.41	5173.04	2554.77	15.09	-2.473	0.000	0.707
60.00	-31.93	-37.40	0.00	-2408.2	0.00	2408.22	2899.09	1449.55	5117.58	2527.38	15.87	-2.534	0.000	0.697
63.00	-31.09	-36.80	0.00	-2296.0	0.00	2296.02	2875.33	1437.66	5006.98	2472.76	17.50	-2.654	0.000	0.676
66.00	-30.26	-36.20	0.00	-2185.6	0.00	2185.64	2851.15	1425.58	4896.82	2418.35	19.21	-2.773	0.000	0.656
69.00	-29.46	-35.58	0.00	-2077.0	0.00	2077.05	2826.57	1413.28	4787.10	2364.17	20.99	-2.890	0.000	0.635
70.00	-29.18	-35.39	0.00	-2041.4	0.00	2041.47	2818.28	1409.14	4750.64	2346.16	21.60	-2.929	0.000	0.628
72.00	-28.29	-34.98	0.00	-1970.6	0.00	1970.69	2801.57	1400.79	4677.88	2310.23	22.84	-3.006	0.000	0.608
75.00	-27.01	-34.34	0.00	-1865.7	0.00	1865.74	2776.16	1388.08	4569.18	2256.54	24.77	-3.119	0.000	0.587
76.00	-26.57	-34.15	0.00	-1831.4	0.00	1831.40	2161.97	1080.98	3608.45	1782.08	25.42	-3.156	0.000	0.659
78.00	-26.10	-33.77	0.00	-1763.1	0.00	1763.11	2151.06	1075.53	3556.01	1756.18	26.76	-3.232	0.000	0.704
81.00	-25.40	-33.19	0.00	-1661.8	0.00	1661.81	2134.35	1067.18	3477.43	1717.37	28.83	-3.355	0.000	0.676
84.00	-24.72	-32.62	0.00	-1562.2	0.00	1562.24	2117.24	1058.62	3398.99	1678.63	30.98	-3.475	0.000	0.647
87.00	-24.05	-32.06	0.00	-1464.3	0.00	1464.37	2099.71	1049.85	3320.72	1639.98	33.20	-3.592	0.000	0.618
90.00	-23.39	-31.50	0.00	-1368.2	0.00	1368.21	2081.77	1040.89	3242.65	1601.42	35.49	-3.706	0.000	0.588
93.00	-22.74	-30.94	0.00	-1273.7	0.00	1273.72	2063.43	1031.71	3164.81	1562.98	37.86	-3.817	0.000	0.558
96.00	-22.10	-30.39	0.00	-1180.9	0.00	1180.90	2044.67	1022.33	3087.22	1524.66	40.29	-3.924	0.000	0.570
99.00	-21.48	-29.84	0.00	-1089.7	0.00	1089.72	2025.50	1012.75	3009.91	1486.48	42.79	-4.036	0.000	0.537
100.00	-21.27	-29.67	0.00	-1059.8	0.00	1059.88	2019.02	1009.51	2984.22	1473.79	43.64	-4.072	0.000	0.526
100.00	-21.27	-29.67	0.00	-1059.8	0.00	1059.88	1394.49	697.25	2068.33	1021.47	43.64	-4.072	0.000	0.611
102.00	-20.90	-29.33	0.00	-1000.5	0.00	1000.54	1387.39	693.70	2035.72	1005.36	45.36	-4.144	0.000	0.680
105.00	-20.36	-28.81	0.00	-912.56	0.00	912.56	1376.43	688.21	1986.77	981.19	48.00	-4.263	0.000	0.632
108.00	-19.84	-28.30	0.00	-826.14	0.00	826.14	1365.09	682.55	1937.81	957.01	50.71	-4.376	0.000	0.584
111.00	-19.33	-27.78	0.00	-741.26	0.00	741.26	1353.38	676.69	1888.86	932.84	53.50	-4.482	0.000	0.535

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 18

113.50	-18.93	-27.35	0.00	-671.80	0.00	671.80	1343.33	671.66	1848.11	912.71	55.86	-4.566	0.000	0.494
113.50	-18.93	-27.35	0.00	-671.80	0.00	671.80	1343.33	671.66	1848.11	912.71	55.86	-4.566	0.000	0.494
114.00	-18.83	-27.28	0.00	-658.12	0.00	658.12	1341.28	670.64	1839.96	908.69	56.34	-4.582	0.000	0.740
115.00	-18.65	-27.12	0.00	-630.84	0.00	630.84	1337.17	668.58	1823.68	900.65	57.31	-4.631	0.000	0.716
117.00	-14.95	-23.66	0.00	-576.60	0.00	576.60	1328.82	664.41	1791.13	884.57	59.27	-4.724	0.000	0.664
120.00	-14.18	-23.14	0.00	-505.61	0.00	505.61	1327.18	663.59	1784.85	881.47	62.27	-4.853	0.000	0.585
123.00	-13.73	-22.65	0.00	-436.19	0.00	436.19	1314.29	657.15	1736.13	857.41	65.36	-4.971	0.000	0.520
126.00	-13.32	-22.16	0.00	-368.22	0.00	368.22	1301.02	650.51	1687.54	833.41	68.51	-5.073	0.000	0.453
127.00	-10.68	-17.31	0.00	-346.06	0.00	346.06	1296.51	648.26	1671.38	825.43	69.58	-5.105	0.000	0.428
129.00	-10.44	-16.99	0.00	-311.44	0.00	311.44	1287.38	643.69	1639.11	809.49	71.73	-5.165	0.000	0.394
132.00	-10.08	-16.52	0.00	-260.46	0.00	260.46	1273.35	636.68	1590.85	785.66	75.00	-5.246	0.000	0.340
135.00	-9.74	-16.05	0.00	-210.90	0.00	210.90	1258.96	629.48	1542.80	761.93	78.31	-5.316	0.000	0.285
137.00	-7.62	-13.31	0.00	-178.79	0.00	178.79	1249.15	624.57	1510.90	746.18	80.55	-5.358	0.000	0.246
138.00	-7.51	-13.16	0.00	-165.48	0.00	165.48	1244.18	622.09	1494.99	738.32	81.67	-5.377	0.000	0.231
141.00	-7.20	-12.71	0.00	-125.99	0.00	125.99	1229.03	614.52	1447.44	714.84	85.06	-5.426	0.000	0.183
144.00	-6.89	-12.26	0.00	-87.86	0.00	87.86	1213.50	606.75	1400.19	691.50	88.48	-5.464	0.000	0.133
147.00	-3.23	-6.76	0.00	-51.07	0.00	51.07	1197.60	598.80	1353.24	668.32	91.92	-5.490	0.000	0.079
150.00	-2.95	-6.33	0.00	-30.80	0.00	30.80	1181.32	590.66	1306.64	645.30	95.37	-5.507	0.000	0.050
153.00	-2.68	-5.91	0.00	-11.81	0.00	11.81	1164.66	582.33	1260.41	622.47	98.83	-5.516	0.000	0.021
155.00	0.00	-5.62	0.00	0.00	0.00	0.00	1153.35	576.68	1229.81	607.36	101.13	-5.518	0.000	0.000

Wind Loading - Shaft

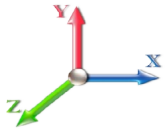
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	2.18	0.70	37.885	41.67	580.38	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
3.00		2.13	0.70	37.051	40.76	567.85	1.000	0.000	3.00	13.876	13.88	904.8	0.0	681.4
6.00		2.09	0.70	36.254	39.88	555.66	1.000	0.000	3.00	13.728	13.73	875.9	0.0	674.0
9.00		2.04	0.70	35.493	39.04	543.82	1.000	0.000	3.00	13.579	13.58	848.2	0.0	666.7
11.50	RB2	2.01	0.70	34.884	38.37	534.19	1.000	0.000	2.50	11.202	11.20	687.8	0.0	549.9
12.00		2.00	0.70	34.765	38.24	532.30	1.000	0.000	0.50	2.228	2.23	136.3	0.0	109.4
15.00		1.96	0.70	34.070	37.48	521.09	1.000	0.000	3.00	13.282	13.28	796.4	0.0	652.0
16.50	RT2	1.94	0.70	33.734	37.11	515.59	1.000	0.000	1.50	6.585	6.59	391.0	0.0	323.2
18.00		1.92	0.70	33.405	36.75	510.17	1.000	0.000	1.50	6.548	6.55	385.0	0.0	321.4
21.00	RT1 RB3	1.89	0.70	32.769	36.05	499.55	1.000	0.000	3.00	12.985	12.98	748.9	0.0	637.3
24.00		1.85	0.70	32.161	35.38	489.20	1.000	0.000	3.00	12.836	12.84	726.6	0.0	629.9
27.00		1.82	0.70	31.579	34.74	479.11	1.000	0.000	3.00	12.688	12.69	705.2	0.0	622.6
30.00		1.79	0.70	31.048	34.15	469.47	1.000	0.000	3.00	12.539	12.54	685.2	0.0	615.2
33.00		1.76	0.72	31.357	34.49	466.18	1.000	0.000	3.00	12.391	12.39	683.8	0.0	607.9
35.00	Appurtenance(s)	1.74	0.73	31.530	34.68	463.70	1.000	0.000	2.00	8.178	8.18	453.8	0.0	401.1
36.00	Bot - Section 2	1.73	0.74	31.608	34.77	462.40	1.000	0.000	1.00	4.064	4.06	226.1	0.0	199.3
39.00		1.70	0.76	31.812	34.99	458.22	1.000	0.000	3.00	12.288	12.29	688.0	0.0	1115.7
41.00	RT3 RB4	1.68	0.77	31.925	35.12	455.26	1.000	0.000	2.00	8.109	8.11	455.7	0.0	736.2
42.00	Top - Section 1	1.67	0.77	31.976	35.17	453.73	1.000	0.000	1.00	4.030	4.03	226.8	0.0	365.8
45.00		1.65	0.79	32.108	35.32	456.41	1.000	0.000	3.00	11.991	11.99	677.6	0.0	509.8
48.00		1.62	0.80	32.214	35.44	451.46	1.000	0.000	3.00	11.842	11.84	671.4	0.0	503.4
51.00		1.60	0.82	32.296	35.53	446.33	1.000	0.000	3.00	11.694	11.69	664.7	0.0	497.1
54.00		1.57	0.83	32.360	35.60	441.07	1.000	0.000	3.00	11.545	11.55	657.5	0.0	490.7
57.00		1.55	0.84	32.408	35.65	435.68	1.000	0.000	3.00	11.397	11.40	650.1	0.0	484.3
58.00	RB5	1.55	0.85	32.422	35.66	433.86	1.000	0.000	1.00	3.766	3.77	214.9	0.0	160.0
58.50	RT4	1.54	0.85	32.427	35.67	432.95	1.000	0.000	0.50	1.877	1.88	107.1	0.0	79.8
60.00		1.53	0.85	32.444	35.69	430.19	1.000	0.000	1.50	5.606	5.61	320.1	0.0	238.2
63.00		1.51	0.87	32.468	35.71	424.63	1.000	0.000	3.00	11.100	11.10	634.3	0.0	471.6
66.00		1.49	0.88	32.483	35.73	419.01	1.000	0.000	3.00	10.951	10.95	626.1	0.0	465.2
69.00		1.47	0.89	32.490	35.74	413.34	1.000	0.000	3.00	10.803	10.80	617.7	0.0	458.9
70.00	Bot - Section 3	1.47	0.89	32.491	35.74	411.44	1.000	0.000	1.00	3.568	3.57	204.0	0.0	151.5
72.00		1.46	0.90	32.492	35.74	407.62	1.000	0.000	2.00	7.194	7.19	411.4	0.0	556.0
75.00		1.44	0.91	32.488	35.74	401.88	1.000	0.000	3.00	10.667	10.67	609.9	0.0	824.3
76.00	Top - Section 2 RT5	1.43	0.91	32.486	35.73	399.96	1.000	0.000	1.00	3.523	3.52	201.4	0.0	272.2
78.00		1.42	0.92	32.481	35.73	402.34	1.000	0.000	2.00	6.996	7.00	399.9	0.0	248.0
81.00		1.41	0.93	32.470	35.72	396.56	1.000	0.000	3.00	10.370	10.37	592.6	0.0	367.5
84.00		1.39	0.94	32.458	35.70	390.76	1.000	0.000	3.00	10.222	10.22	583.9	0.0	362.2
87.00		1.38	0.95	32.443	35.69	384.96	1.000	0.000	3.00	10.073	10.07	575.2	0.0	356.9
90.00		1.36	0.96	32.428	35.67	379.15	1.000	0.000	3.00	9.925	9.92	566.4	0.0	351.6
93.00		1.35	0.97	32.412	35.65	373.34	1.000	0.000	3.00	9.776	9.78	557.7	0.0	346.3
96.00	RT6 RB7	1.34	0.98	32.396	35.64	367.53	1.000	0.000	3.00	9.628	9.63	548.9	0.0	341.0
99.00		1.32	0.99	32.380	35.62	361.73	1.000	0.000	3.00	9.479	9.48	540.2	0.0	335.7
100.00	Top - Section 3	1.32	0.99	32.375	35.61	359.80	1.000	0.000	1.00	3.127	3.13	178.2	0.0	110.7
102.00		1.31	0.99	32.364	35.60	355.93	1.000	0.000	2.00	6.204	6.20	353.4	0.0	176.0
105.00		1.30	1.00	32.350	35.58	350.14	1.000	0.000	3.00	9.182	9.18	522.8	0.0	260.5
108.00		1.29	1.01	32.336	35.57	344.36	1.000	0.000	3.00	9.033	9.03	514.1	0.0	256.3
111.00		1.28	1.02	32.323	35.56	338.58	1.000	0.000	3.00	8.885	8.88	505.5	0.0	252.0

Wind Loading - Shaft

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 20	

113.50 RT7	1.27	1.02	32.314	35.55	333.78	1.000	0.000	2.50	7.291	7.29	414.6	0.0	206.8
114.00	1.27	1.03	32.312	35.54	332.82	1.000	0.000	0.50	1.446	1.45	82.2	0.0	41.0
115.00 Bot - Section 5	1.27	1.03	32.309	35.54	330.90	1.000	0.000	1.00	2.879	2.88	163.7	0.0	81.7
117.00 Appurtenance(s)	1.26	1.03	32.302	35.53	327.06	1.000	0.000	2.00	5.795	5.80	329.5	0.0	326.3
120.00 Top - Section 4	1.25	1.04	32.294	35.52	321.31	1.000	0.000	3.00	8.569	8.57	487.0	0.0	482.3
123.00	1.24	1.05	32.287	35.52	320.55	1.000	0.000	3.00	8.420	8.42	478.5	0.0	238.8
126.00	1.23	1.06	32.282	35.51	314.82	1.000	0.000	3.00	8.272	8.27	470.0	0.0	234.5
127.00 Appurtenance(s)	1.23	1.06	32.281	35.51	312.91	1.000	0.000	1.00	2.724	2.72	154.8	0.0	77.2
129.00	1.22	1.06	32.279	35.51	309.10	1.000	0.000	2.00	5.399	5.40	306.7	0.0	153.0
132.00	1.22	1.07	32.278	35.51	303.39	1.000	0.000	3.00	7.975	7.97	453.0	0.0	226.0
135.00	1.21	1.08	32.279	35.51	297.69	1.000	0.000	3.00	7.826	7.83	444.6	0.0	221.8
137.00 Appurtenance(s)	1.20	1.08	32.280	35.51	293.89	1.000	0.000	2.00	5.135	5.13	291.7	0.0	145.5
138.00	1.20	1.08	32.281	35.51	291.99	1.000	0.000	1.00	2.543	2.54	144.5	0.0	72.0
141.00	1.19	1.09	32.286	35.51	286.31	1.000	0.000	3.00	7.529	7.53	427.8	0.0	213.3
144.00	1.19	1.10	32.292	35.52	280.63	1.000	0.000	3.00	7.381	7.38	419.5	0.0	209.1
147.00 Appurtenance(s)	1.18	1.10	32.300	35.53	274.96	1.000	0.000	3.00	7.232	7.23	411.1	0.0	204.8
150.00	1.17	1.11	32.311	35.54	269.30	1.000	0.000	3.00	7.083	7.08	402.8	0.0	200.6
153.00	1.17	1.12	32.323	35.55	263.64	1.000	0.000	3.00	6.935	6.93	394.5	0.0	196.3
155.00 Appurtenance(s)	1.16	1.12	32.332	35.56	259.87	1.000	0.000	2.00	4.541	4.54	258.4	0.0	128.5
							Totals:	**155.00**			**30,867.5**		**23,496.5**

Discrete Appurtenance Forces

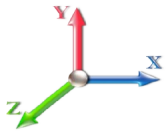
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	RRH2X60-AWS	3	32.332	35.565	0.40	0.80	4.20	148.50	0.000	0.000	239.00	0.00	0.00
2	155.00	LNX-6514DS-A1M	3	32.332	35.565	0.66	0.80	16.27	103.68	0.000	0.000	926.09	0.00	0.00
3	155.00	BXA-70080-4BF	3	32.332	35.565	0.61	0.80	8.68	35.10	0.000	0.000	494.05	0.00	0.00
4	155.00	HBXX-6517DS-A2M	6	32.332	35.565	0.62	0.80	31.60	220.32	0.000	0.000	1798.21	0.00	0.00
5	155.00	(3) T-Frame w/ Platforms	1	32.332	35.565	1.00	1.00	25.00	1458.00	0.000	0.000	1422.60	0.00	0.00
6	155.00	RRH2X60-700	3	32.332	35.565	0.40	0.80	2.26	124.20	0.000	0.000	128.38	0.00	0.00
7	155.00	FD9R6004/2C-3L	6	32.332	35.565	0.40	0.80	0.86	16.74	0.000	0.000	49.17	0.00	0.00
8	155.00	DB-T1-6Z-8AB-0Z	1	32.332	35.565	0.57	0.80	2.73	17.01	0.000	0.000	155.14	0.00	0.00
9	155.00	RRH2X60-PCS	3	32.332	35.565	0.40	0.80	2.64	148.50	0.000	0.000	150.23	0.00	0.00
10	147.00	Alcatel Lucent	3	32.300	35.530	0.54	0.80	6.51	189.00	0.000	0.000	370.22	0.00	0.00
11	147.00	(3) SFS-H (V-Braces)	1	32.300	35.530	0.75	0.75	7.20	177.30	0.000	0.000	409.31	0.00	0.00
12	147.00	APXVSPP18-C-A20	3	32.300	35.530	0.66	0.80	15.98	153.90	0.000	0.000	908.21	0.00	0.00
13	147.00	APXVTM14-C-I20	3	32.300	35.530	0.63	0.80	12.02	151.20	0.000	0.000	683.36	0.00	0.00
14	147.00	Alcatel Lucent 800 MHz	3	32.300	35.530	0.54	0.80	1.25	23.76	0.000	0.000	71.30	0.00	0.00
15	147.00	Alcatel Lucent 1900 MHz	3	32.300	35.530	0.54	0.80	3.71	162.00	0.000	0.000	211.16	0.00	0.00
16	147.00	Alcatel Lucent 800 MHz	3	32.300	35.530	0.54	0.80	4.00	143.10	0.000	0.000	227.62	0.00	0.00
17	147.00	RFS ACU-A20-N RET	4	32.300	35.530	0.40	0.80	0.22	3.60	0.000	0.000	12.73	0.00	0.00
18	147.00	PRK-1245 (kicker kit)	1	32.300	35.530	0.75	0.75	7.13	418.42	0.000	0.000	405.05	0.00	0.00
19	147.00	(3) T-Frame w/ Platforms	1	32.300	35.530	1.00	1.00	25.00	1458.00	0.000	0.000	1421.22	0.00	0.00
20	137.00	(3) T-Frame w/ Platforms	1	32.280	35.508	1.00	1.00	25.00	1458.00	0.000	0.000	1420.33	0.00	0.00
21	137.00	Ericsson KRY 112 144/2	3	32.280	35.508	0.54	0.80	1.08	35.64	0.000	0.000	61.21	0.00	0.00
22	137.00	Ericsson APX18-206516	3	32.280	35.508	0.58	0.80	6.32	50.49	0.000	0.000	359.33	0.00	0.00
23	137.00	Ericsson RR90-17-XXDP	3	32.280	35.508	0.54	0.80	7.12	48.60	0.000	0.000	404.26	0.00	0.00
24	127.00	LGP21401	6	32.281	35.509	0.40	0.80	2.28	94.50	0.000	0.000	129.54	0.00	0.00
25	127.00	Low Profile	1	32.281	35.509	1.00	1.00	22.00	1350.00	0.000	0.000	1249.93	0.00	0.00
26	127.00	7770.00	6	32.281	35.509	0.58	0.80	19.27	189.00	0.000	0.000	1094.94	0.00	0.00
27	127.00	HPA-65R-BUU-H8	3	32.281	35.509	0.63	0.80	24.61	183.60	0.000	0.000	1398.22	0.00	0.00
28	127.00	RRUS 11	3	32.281	35.509	0.54	0.80	4.05	136.89	0.000	0.000	230.22	0.00	0.00
29	127.00	RRUS 32 B2	3	32.281	35.509	0.54	0.80	4.41	162.00	0.000	0.000	250.32	0.00	0.00
30	127.00	DC6-48-60-18-8F	1	32.281	35.509	0.80	0.80	0.74	28.62	0.000	0.000	41.82	0.00	0.00
31	127.00	LGP13519	6	32.281	35.509	0.54	0.80	1.09	28.62	0.000	0.000	62.12	0.00	0.00
32	117.00	742 351	6	32.302	35.532	0.49	0.80	15.75	160.92	0.000	0.000	895.57	0.00	0.00
33	117.00	T-Frames	3	32.302	35.532	0.56	0.75	34.42	2376.00	0.000	0.000	1957.13	0.00	0.00
34	35.00	3.58' Standoff	1	31.530	34.683	0.67	1.00	1.12	63.00	0.000	0.000	62.09	0.00	0.00
35	35.00	DB589	1	31.847	35.032	0.80	0.80	1.10	10.35	0.000	4.600	61.88	0.00	284.65
							Totals:		**11,528.56**			**19,761.94**		

Total Applied Force Summary

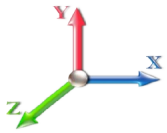
Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 22

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
3.00		904.85	809.68	0.00	0.00
6.00		875.91	802.33	0.00	0.00
9.00		848.24	794.98	0.00	0.00
11.50		687.78	656.87	0.00	0.00
12.00		136.33	130.76	0.00	0.00
15.00		796.43	780.27	0.00	0.00
16.50		390.98	387.38	0.00	0.00
18.00		384.98	385.54	0.00	0.00
21.00		748.89	765.57	0.00	0.00
24.00		726.58	758.21	0.00	0.00
27.00		705.18	750.86	0.00	0.00
30.00		685.21	743.51	0.00	0.00
33.00		683.82	736.16	0.00	0.00
35.00	(2) attachments	577.79	560.04	0.00	284.65
36.00		226.09	241.18	0.00	0.00
39.00		687.98	1241.18	0.00	0.00
41.00		455.65	819.83	0.00	0.00
42.00		226.80	407.63	0.00	0.00
45.00		677.61	635.30	0.00	0.00
48.00		671.41	628.94	0.00	0.00
51.00		664.69	622.57	0.00	0.00
54.00		657.55	616.20	0.00	0.00
57.00		650.05	609.84	0.00	0.00
58.00		214.89	201.86	0.00	0.00
58.50		107.11	100.67	0.00	0.00
60.00		320.08	300.94	0.00	0.00
63.00		634.26	597.11	0.00	0.00
66.00		626.07	590.74	0.00	0.00
69.00		617.72	584.37	0.00	0.00
70.00		204.03	193.38	0.00	0.00
72.00		411.39	639.67	0.00	0.00
75.00		609.95	949.78	0.00	0.00
76.00		201.42	314.00	0.00	0.00
78.00		399.93	331.63	0.00	0.00
81.00		592.64	493.03	0.00	0.00
84.00		583.92	487.72	0.00	0.00
87.00		575.18	482.42	0.00	0.00
90.00		566.43	477.11	0.00	0.00
93.00		557.68	471.81	0.00	0.00
96.00		548.93	466.50	0.00	0.00
99.00		540.20	461.19	0.00	0.00
100.00		178.16	152.55	0.00	0.00
102.00		353.38	259.71	0.00	0.00
105.00		522.78	386.03	0.00	0.00
108.00		514.11	381.78	0.00	0.00
111.00		505.46	377.54	0.00	0.00

Total Applied Force Summary

Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 23

113.50		414.64	311.37	0.00	0.00
114.00		82.22	61.92	0.00	0.00
115.00		163.72	123.49	0.00	0.00
117.00	(9) attachments	3182.15	2946.85	0.00	0.00
120.00		487.02	573.90	0.00	0.00
123.00		478.48	330.35	0.00	0.00
126.00		469.97	326.10	0.00	0.00
127.00	(29) attachments	4611.89	2280.99	0.00	0.00
129.00		306.72	189.48	0.00	0.00
132.00		453.04	280.68	0.00	0.00
135.00		444.61	276.44	0.00	0.00
137.00	(10) attachments	2536.85	1774.66	0.00	0.00
138.00		144.46	86.69	0.00	0.00
141.00		427.82	257.25	0.00	0.00
144.00		419.47	253.01	0.00	0.00
147.00	(25) attachments	5131.31	3129.05	0.00	0.00
150.00		402.81	237.39	0.00	0.00
153.00		394.51	233.15	0.00	0.00
155.00	(29) attachments	5621.25	2425.13	0.00	0.00
	Totals:	**50,629.46**	**40,684.28**	**0.00**	**284.65**

Linear Appurtenance Segment Forces (Factored)

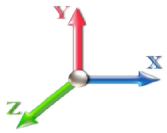
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
3.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.064	0.000	37.051	0.00	0.00
6.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.065	0.000	36.254	0.00	0.00
9.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.066	0.000	35.493	0.00	0.00
11.50	10"x1/2" Bent plate	Yes	2.50	0.000	3.56	0.74	0.00	0.066	0.000	34.884	0.00	0.00
12.00	10"x1/2" Bent plate	Yes	0.50	0.000	3.56	0.15	0.00	0.067	0.000	34.765	0.00	0.00
15.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.067	0.000	34.070	0.00	0.00
16.50	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	0.45	0.00	0.068	0.000	33.734	0.00	0.00
18.00	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	0.45	0.00	0.068	0.000	33.405	0.00	0.00
21.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.069	0.000	32.769	0.00	0.00
24.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.069	0.000	32.161	0.00	0.00
27.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.070	0.000	31.579	0.00	0.00
30.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.071	0.000	31.048	0.00	0.00
33.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.072	0.000	31.357	0.00	0.00
35.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	0.59	0.00	0.073	0.000	31.530	0.00	0.00
36.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.073	0.000	31.608	0.00	0.00
39.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.074	0.000	31.812	0.00	0.00
41.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	0.59	0.00	0.074	0.000	31.925	0.00	0.00
42.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.075	0.000	31.976	0.00	0.00
45.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.074	0.000	32.108	0.00	0.00
48.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.075	0.000	32.214	0.00	0.00
51.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.076	0.000	32.296	0.00	0.00
54.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.077	0.000	32.360	0.00	0.00
57.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.078	0.000	32.408	0.00	0.00
58.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.079	0.000	32.422	0.00	0.00
58.50	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.05	0.00	0.028	0.000	32.427	0.00	0.00
60.00	1.25" Reinforcing	Yes	1.50	0.000	1.25	0.16	0.00	0.028	0.000	32.444	0.00	0.00
63.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.028	0.000	32.468	0.00	0.00
66.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.029	0.000	32.483	0.00	0.00
69.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.029	0.000	32.490	0.00	0.00
70.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.029	0.000	32.491	0.00	0.00
72.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.029	0.000	32.492	0.00	0.00
75.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.030	0.000	32.488	0.00	0.00
76.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.030	0.000	32.486	0.00	0.00
78.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.030	0.000	32.481	0.00	0.00
81.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.030	0.000	32.470	0.00	0.00
84.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	32.458	0.00	0.00
87.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	32.443	0.00	0.00
90.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	32.428	0.00	0.00
93.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.032	0.000	32.412	0.00	0.00
96.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.032	0.000	32.396	0.00	0.00
99.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.033	0.000	32.380	0.00	0.00
100.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.033	0.000	32.375	0.00	0.00
102.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.034	0.000	32.364	0.00	0.00
105.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.034	0.000	32.350	0.00	0.00
108.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.035	0.000	32.336	0.00	0.00
111.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.035	0.000	32.323	0.00	0.00
113.50	1.25" Reinforcing	Yes	2.50	0.000	1.25	0.26	0.00	0.036	0.000	32.314	0.00	0.00

Linear Appurtenance Segment Forces (Factored)

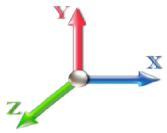
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
114.00	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.05	0.00	0.036	0.000	32.312	0.00	0.00
115.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.036	0.000	32.309	0.00	0.00
									Totals:		**0.0**	**0.0**

Calculated Forces

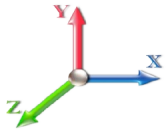
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-40.63	-50.68	0.00	-5005.4	0.00	5005.42	4048.32	2024.16	8933.65	4411.99	0.00	0.000	0.000	0.947
3.00	-39.71	-49.86	0.00	-4853.4	0.00	4853.40	4023.80	2011.90	8783.46	4337.82	0.04	-0.128	0.000	0.932
6.00	-38.80	-49.07	0.00	-4703.8	0.00	4703.82	3998.87	1999.43	8633.56	4263.79	0.16	-0.256	0.000	0.917
9.00	-37.91	-48.29	0.00	-4556.6	0.00	4556.63	3973.52	1986.76	8483.97	4189.91	0.37	-0.383	0.000	0.902
11.50	-37.21	-47.64	0.00	-4435.9	0.00	4435.90	3952.09	1976.04	8359.57	4128.48	0.60	-0.490	0.000	0.758
12.00	-37.02	-47.54	0.00	-4412.0	0.00	4412.08	3947.76	1973.88	8334.72	4116.20	0.65	-0.508	0.000	0.755
15.00	-36.18	-46.79	0.00	-4269.4	0.00	4269.46	3921.60	1960.80	8185.84	4042.68	1.00	-0.617	0.000	0.742
16.50	-35.75	-46.43	0.00	-4199.2	0.00	4199.28	3908.36	1954.18	8111.55	4005.99	1.21	-0.671	0.000	0.865
18.00	-35.30	-46.10	0.00	-4129.6	0.00	4129.63	3895.02	1947.51	8037.37	3969.35	1.43	-0.736	0.000	0.857
21.00	-34.44	-45.42	0.00	-3991.3	0.00	3991.33	3868.03	1934.02	7889.33	3896.24	1.93	-0.863	0.000	0.842
24.00	-33.59	-44.75	0.00	-3855.0	0.00	3855.08	3840.63	1920.32	7741.75	3823.36	2.51	-0.989	0.000	0.827
27.00	-32.76	-44.11	0.00	-3720.8	0.00	3720.82	3812.82	1906.41	7594.66	3750.72	3.18	-1.116	0.000	0.812
30.00	-31.93	-43.48	0.00	-3588.5	0.00	3588.50	3784.60	1892.30	7448.09	3678.33	3.92	-1.242	0.000	0.796
33.00	-31.14	-42.83	0.00	-3458.0	0.00	3458.08	3755.97	1877.99	7302.07	3606.22	4.74	-1.368	0.000	0.781
35.00	-30.54	-42.28	0.00	-3372.1	0.00	3372.13	3736.66	1868.33	7205.04	3558.30	5.33	-1.452	0.000	0.770
36.00	-30.25	-42.09	0.00	-3329.8	0.00	3329.85	3726.93	1863.47	7156.62	3534.39	5.64	-1.494	0.000	0.765
39.00	-28.95	-41.42	0.00	-3203.5	0.00	3203.59	3697.48	1848.74	7011.79	3462.86	6.62	-1.619	0.000	0.745
41.00	-28.10	-40.97	0.00	-3120.7	0.00	3120.76	3677.62	1838.81	6915.58	3415.35	7.32	-1.702	0.000	0.734
42.00	-27.64	-40.77	0.00	-3079.7	0.00	3079.79	3033.05	1516.53	5788.55	2858.75	7.68	-1.743	0.000	0.789
45.00	-26.94	-40.13	0.00	-2957.4	0.00	2957.48	3011.75	1505.88	5675.99	2803.16	8.81	-1.866	0.000	0.828
48.00	-26.24	-39.50	0.00	-2837.0	0.00	2837.08	2990.04	1495.02	5563.69	2747.70	10.03	-1.997	0.000	0.808
51.00	-25.56	-38.87	0.00	-2718.5	0.00	2718.58	2967.92	1483.96	5451.67	2692.37	11.32	-2.127	0.000	0.788
54.00	-24.88	-38.25	0.00	-2601.9	0.00	2601.97	2945.39	1472.69	5339.95	2637.20	12.70	-2.256	0.000	0.768
57.00	-24.24	-37.61	0.00	-2487.2	0.00	2487.23	2922.45	1461.22	5228.58	2582.20	14.16	-2.385	0.000	0.747
58.00	-24.03	-37.40	0.00	-2449.6	0.00	2449.62	2914.71	1457.35	5191.54	2563.91	14.67	-2.427	0.000	0.573
58.50	-23.91	-37.30	0.00	-2430.9	0.00	2430.92	2910.82	1455.41	5173.04	2554.77	14.92	-2.444	0.000	0.695
60.00	-23.56	-37.01	0.00	-2374.9	0.00	2374.96	2899.09	1449.55	5117.58	2527.38	15.70	-2.504	0.000	0.685
63.00	-22.92	-36.39	0.00	-2263.9	0.00	2263.94	2875.33	1437.66	5006.98	2472.76	17.31	-2.623	0.000	0.665
66.00	-22.29	-35.79	0.00	-2154.7	0.00	2154.76	2851.15	1425.58	4896.82	2418.35	19.00	-2.740	0.000	0.645
69.00	-21.69	-35.17	0.00	-2047.4	0.00	2047.41	2826.57	1413.28	4787.10	2364.17	20.75	-2.855	0.000	0.624
70.00	-21.47	-34.98	0.00	-2012.2	0.00	2012.24	2818.28	1409.14	4750.64	2346.16	21.36	-2.893	0.000	0.617
72.00	-20.79	-34.57	0.00	-1942.2	0.00	1942.28	2801.57	1400.79	4677.88	2310.23	22.59	-2.970	0.000	0.598
75.00	-19.83	-33.93	0.00	-1838.5	0.00	1838.58	2776.16	1388.08	4569.18	2256.54	24.49	-3.080	0.000	0.577
76.00	-19.50	-33.74	0.00	-1804.6	0.00	1804.64	2161.97	1080.98	3608.45	1782.08	25.14	-3.118	0.000	0.648
78.00	-19.13	-33.35	0.00	-1737.1	0.00	1737.17	2151.06	1075.53	3556.01	1756.18	26.46	-3.193	0.000	0.692
81.00	-18.61	-32.77	0.00	-1637.1	0.00	1637.12	2134.35	1067.18	3477.43	1717.37	28.50	-3.314	0.000	0.664
84.00	-18.09	-32.20	0.00	-1538.8	0.00	1538.81	2117.24	1058.62	3398.99	1678.63	30.62	-3.432	0.000	0.635
87.00	-17.58	-31.63	0.00	-1442.2	0.00	1442.22	2099.71	1049.85	3320.72	1639.98	32.81	-3.547	0.000	0.606
90.00	-17.08	-31.06	0.00	-1347.3	0.00	1347.34	2081.77	1040.89	3242.65	1601.42	35.08	-3.660	0.000	0.577
93.00	-16.59	-30.51	0.00	-1254.1	0.00	1254.15	2063.43	1031.71	3164.81	1562.98	37.41	-3.769	0.000	0.548
96.00	-16.10	-29.96	0.00	-1162.6	0.00	1162.63	2044.67	1022.33	3087.22	1524.66	39.81	-3.874	0.000	0.559
99.00	-15.64	-29.41	0.00	-1072.7	0.00	1072.74	2025.50	1012.75	3009.91	1486.48	42.28	-3.984	0.000	0.527
100.00	-15.47	-29.24	0.00	-1043.3	0.00	1043.34	2019.02	1009.51	2984.22	1473.79	43.12	-4.020	0.000	0.516
100.00	-15.47	-29.24	0.00	-1043.3	0.00	1043.34	1394.49	697.25	2068.33	1021.47	43.12	-4.020	0.000	0.599
102.00	-15.19	-28.89	0.00	-984.86	0.00	984.86	1387.39	693.70	2035.72	1005.36	44.82	-4.090	0.000	0.667
105.00	-14.79	-28.37	0.00	-898.20	0.00	898.20	1376.43	688.21	1986.77	981.19	47.43	-4.207	0.000	0.620
108.00	-14.39	-27.86	0.00	-813.09	0.00	813.09	1365.09	682.55	1937.81	957.01	50.10	-4.319	0.000	0.572
111.00	-14.01	-27.35	0.00	-729.52	0.00	729.52	1353.38	676.69	1888.86	932.84	52.85	-4.423	0.000	0.524

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 27

113.50	-13.71	-26.92	0.00	-661.15	0.00	661.15	1343.33	671.66	1848.11	912.71	55.19	-4.505	0.000	0.483
113.50	-13.71	-26.92	0.00	-661.15	0.00	661.15	1343.33	671.66	1848.11	912.71	55.19	-4.505	0.000	0.483
114.00	-13.64	-26.84	0.00	-647.69	0.00	647.69	1341.28	670.64	1839.96	908.69	55.66	-4.522	0.000	0.725
115.00	-13.50	-26.69	0.00	-620.85	0.00	620.85	1337.17	668.58	1823.68	900.65	56.61	-4.569	0.000	0.701
117.00	-10.77	-23.30	0.00	-567.48	0.00	567.48	1328.82	664.41	1791.13	884.57	58.54	-4.661	0.000	0.651
120.00	-10.19	-22.79	0.00	-497.59	0.00	497.59	1327.18	663.59	1784.85	881.47	61.51	-4.788	0.000	0.573
123.00	-9.86	-22.30	0.00	-429.24	0.00	429.24	1314.29	657.15	1736.13	857.41	64.56	-4.905	0.000	0.509
126.00	-9.55	-21.81	0.00	-362.34	0.00	362.34	1301.02	650.51	1687.54	833.41	67.67	-5.005	0.000	0.443
127.00	-7.67	-17.03	0.00	-340.52	0.00	340.52	1296.51	648.26	1671.38	825.43	68.72	-5.036	0.000	0.419
129.00	-7.49	-16.71	0.00	-306.47	0.00	306.47	1287.38	643.69	1639.11	809.49	70.84	-5.095	0.000	0.385
132.00	-7.23	-16.25	0.00	-256.33	0.00	256.33	1273.35	636.68	1590.85	785.66	74.06	-5.175	0.000	0.333
135.00	-6.98	-15.79	0.00	-207.59	0.00	207.59	1258.96	629.48	1542.80	761.93	77.34	-5.244	0.000	0.279
137.00	-5.44	-13.10	0.00	-176.02	0.00	176.02	1249.15	624.57	1510.90	746.18	79.54	-5.285	0.000	0.241
138.00	-5.36	-12.95	0.00	-162.92	0.00	162.92	1244.18	622.09	1494.99	738.32	80.65	-5.303	0.000	0.225
141.00	-5.13	-12.50	0.00	-124.07	0.00	124.07	1229.03	614.52	1447.44	714.84	83.99	-5.352	0.000	0.178
144.00	-4.91	-12.07	0.00	-86.56	0.00	86.56	1213.50	606.75	1400.19	691.50	87.36	-5.389	0.000	0.130
147.00	-2.28	-6.66	0.00	-50.36	0.00	50.36	1197.60	598.80	1353.24	668.32	90.75	-5.415	0.000	0.077
150.00	-2.08	-6.24	0.00	-30.37	0.00	30.37	1181.32	590.66	1306.64	645.30	94.16	-5.431	0.000	0.049
153.00	-1.88	-5.83	0.00	-11.65	0.00	11.65	1164.66	582.33	1260.41	622.47	97.57	-5.441	0.000	0.020
155.00	0.00	-5.62	0.00	0.00	0.00	0.00	1153.35	576.68	1229.81	607.36	99.85	-5.442	0.000	0.000

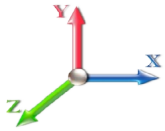
Wind Loading - Shaft

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 28	

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	2.18	0.70	9.285	10.21	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
3.00		2.13	0.70	9.080	9.99	0.00	1.200	2.052	3.00	14.902	17.88	178.6	441.3	1349.8
6.00		2.09	0.70	8.885	9.77	0.00	1.200	2.182	3.00	14.819	17.78	173.8	465.6	1364.3
9.00		2.04	0.70	8.698	9.57	0.00	1.200	2.256	3.00	14.707	17.65	168.9	476.8	1365.7
11.50	RB2	2.01	0.70	8.549	9.40	0.00	1.200	2.298	2.50	12.160	14.59	137.2	401.5	1134.8
12.00		2.00	0.70	8.520	9.37	0.00	1.200	2.305	0.50	2.420	2.90	27.2	80.4	226.3
15.00		1.96	0.70	8.350	9.18	0.00	1.200	2.340	3.00	14.452	17.34	159.3	485.0	1354.3
16.50	RT2	1.94	0.70	8.267	9.09	0.00	1.200	2.354	1.50	7.174	8.61	78.3	242.7	673.7
18.00		1.92	0.70	8.187	9.01	0.00	1.200	2.367	1.50	7.140	8.57	77.2	242.7	671.3
21.00	RT1 RB3	1.89	0.70	8.031	8.83	0.00	1.200	2.387	3.00	14.179	17.01	150.3	484.6	1334.3
24.00		1.85	0.70	7.882	8.67	0.00	1.200	2.404	3.00	14.038	16.85	146.1	482.7	1322.5
27.00		1.82	0.70	7.739	8.51	0.00	1.200	2.417	3.00	13.896	16.68	142.0	480.0	1310.1
30.00		1.79	0.70	7.609	8.37	0.00	1.200	2.427	3.00	13.753	16.50	138.1	476.7	1297.0
33.00		1.76	0.72	7.685	8.45	0.00	1.200	2.435	3.00	13.609	16.33	138.0	473.0	1283.5
35.00	Appurtenance(s)	1.74	0.73	7.727	8.50	0.00	1.200	2.440	2.00	8.991	10.79	91.7	313.6	848.4
36.00	Bot - Section 2	1.73	0.74	7.746	8.52	0.00	1.200	2.442	1.00	4.471	5.37	45.7	156.3	422.1
39.00		1.70	0.76	7.796	8.58	0.00	1.200	2.448	3.00	13.512	16.21	139.0	471.7	1959.3
41.00	RT3 RB4	1.68	0.77	7.824	8.61	0.00	1.200	2.451	2.00	8.926	10.71	92.2	312.5	1294.0
42.00	Top - Section 1	1.67	0.77	7.837	8.62	0.00	1.200	2.452	1.00	4.439	5.33	45.9	155.7	643.5
45.00		1.65	0.79	7.869	8.66	0.00	1.200	2.456	3.00	13.219	15.86	137.3	462.4	1142.1
48.00		1.62	0.80	7.895	8.68	0.00	1.200	2.459	3.00	13.072	15.69	136.2	457.5	1128.7
51.00		1.60	0.82	7.915	8.71	0.00	1.200	2.461	3.00	12.924	15.51	135.0	452.4	1115.2
54.00		1.57	0.83	7.931	8.72	0.00	1.200	2.462	3.00	12.776	15.33	133.8	447.2	1101.5
57.00		1.55	0.84	7.942	8.74	0.00	1.200	2.464	3.00	12.629	15.15	132.4	442.0	1087.8
58.00	RB5	1.55	0.85	7.946	8.74	0.00	1.200	2.464	1.00	4.177	5.01	43.8	146.7	360.1
58.50	RT4	1.54	0.85	7.947	8.74	0.00	1.200	2.464	0.50	2.082	2.50	21.8	73.2	179.6
60.00		1.53	0.85	7.951	8.75	0.00	1.200	2.465	1.50	6.222	7.47	65.3	218.3	535.9
63.00		1.51	0.87	7.957	8.75	0.00	1.200	2.465	3.00	12.332	14.80	129.5	431.3	1060.1
66.00		1.49	0.88	7.961	8.76	0.00	1.200	2.466	3.00	12.184	14.62	128.0	425.8	1046.2
69.00		1.47	0.89	7.962	8.76	0.00	1.200	2.466	3.00	12.036	14.44	126.5	420.4	1032.2
70.00	Bot - Section 3	1.47	0.89	7.963	8.76	0.00	1.200	2.466	1.00	3.979	4.77	41.8	139.5	341.6
72.00		1.46	0.90	7.963	8.76	0.00	1.200	2.466	2.00	8.016	9.62	84.3	280.6	1021.9
75.00		1.44	0.91	7.962	8.76	0.00	1.200	2.466	3.00	11.900	14.28	125.1	415.4	1514.4
76.00	Top - Section 2 RT5	1.43	0.91	7.962	8.76	0.00	1.200	2.466	1.00	3.934	4.72	41.3	137.8	500.7
78.00		1.42	0.92	7.960	8.76	0.00	1.200	2.466	2.00	7.818	9.38	82.1	273.2	603.8
81.00		1.41	0.93	7.958	8.75	0.00	1.200	2.465	3.00	11.603	13.92	121.9	404.3	894.3
84.00		1.39	0.94	7.955	8.75	0.00	1.200	2.465	3.00	11.454	13.75	120.3	398.7	881.7
87.00		1.38	0.95	7.951	8.75	0.00	1.200	2.465	3.00	11.305	13.57	118.7	393.1	869.0
90.00		1.36	0.96	7.947	8.74	0.00	1.200	2.464	3.00	11.157	13.39	117.0	387.6	856.4
93.00		1.35	0.97	7.943	8.74	0.00	1.200	2.464	3.00	11.008	13.21	115.4	382.0	843.7
96.00	RT6 RB7	1.34	0.98	7.939	8.73	0.00	1.200	2.463	3.00	10.859	13.03	113.8	376.4	831.1
99.00		1.32	0.99	7.935	8.73	0.00	1.200	2.463	3.00	10.711	12.85	112.2	370.9	818.5
100.00	Top - Section 3	1.32	0.99	7.934	8.73	0.00	1.200	2.463	1.00	3.537	4.24	37.0	123.0	270.6
102.00		1.31	0.99	7.932	8.72	0.00	1.200	2.463	2.00	7.025	8.43	73.5	243.5	478.3
105.00		1.30	1.00	7.928	8.72	0.00	1.200	2.462	3.00	10.413	12.50	109.0	359.7	707.1
108.00		1.29	1.01	7.925	8.72	0.00	1.200	2.462	3.00	10.264	12.32	107.4	354.2	695.9
111.00		1.28	1.02	7.922	8.71	0.00	1.200	2.461	3.00	10.116	12.14	105.8	348.6	684.7

Wind Loading - Shaft

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

113.50 RT7	1.27	1.02	7.919	8.71	0.00	1.200	2.461	2.50	8.316	9.98	86.9	286.7	562.4
114.00	1.27	1.03	7.919	8.71	0.00	1.200	2.461	0.50	1.651	1.98	17.3	57.2	111.9
115.00 Bot - Section 5	1.27	1.03	7.918	8.71	0.00	1.200	2.461	1.00	3.289	3.95	34.4	113.8	222.6
117.00 Appurtenance(s)	1.26	1.03	7.916	8.71	0.00	1.200	2.461	2.00	6.615	7.94	69.1	228.2	663.3
120.00 Top - Section 4	1.25	1.04	7.914	8.71	0.00	1.200	2.461	3.00	9.799	11.76	102.4	336.8	979.9
123.00	1.24	1.05	7.913	8.70	0.00	1.200	2.461	3.00	9.650	11.58	100.8	331.3	649.7
126.00	1.23	1.06	7.912	8.70	0.00	1.200	2.460	3.00	9.502	11.40	99.2	325.8	638.5
127.00 Appurtenance(s)	1.23	1.06	7.911	8.70	0.00	1.200	2.460	1.00	3.134	3.76	32.7	108.0	211.0
129.00	1.22	1.06	7.911	8.70	0.00	1.200	2.460	2.00	6.219	7.46	64.9	213.5	417.6
132.00	1.22	1.07	7.911	8.70	0.00	1.200	2.460	3.00	9.205	11.05	96.1	314.8	616.2
135.00	1.21	1.08	7.911	8.70	0.00	1.200	2.460	3.00	9.056	10.87	94.6	309.3	605.0
137.00 Appurtenance(s)	1.20	1.08	7.911	8.70	0.00	1.200	2.460	2.00	5.955	7.15	62.2	203.8	397.8
138.00	1.20	1.08	7.911	8.70	0.00	1.200	2.460	1.00	2.953	3.54	30.8	101.3	197.3
141.00	1.19	1.09	7.912	8.70	0.00	1.200	2.460	3.00	8.759	10.51	91.5	298.4	582.8
144.00	1.19	1.10	7.914	8.71	0.00	1.200	2.461	3.00	8.611	10.33	90.0	292.9	571.6
147.00 Appurtenance(s)	1.18	1.10	7.916	8.71	0.00	1.200	2.461	3.00	8.462	10.15	88.4	287.4	560.5
150.00	1.17	1.11	7.918	8.71	0.00	1.200	2.461	3.00	8.314	9.98	86.9	282.0	549.4
153.00	1.17	1.12	7.921	8.71	0.00	1.200	2.461	3.00	8.166	9.80	85.4	276.5	538.3
155.00 Appurtenance(s)	1.16	1.12	7.924	8.72	0.00	1.200	2.462	2.00	5.361	6.43	56.1	181.9	353.3
							Totals:	**155.00**			**6,335.5**		**51,887.0**

Discrete Appurtenance Forces

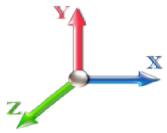
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	RRH2X60-AWS	3	7.924	8.716	0.54	0.80	7.42	476.29	0.000	0.000	64.66	0.00	0.00
2	155.00	LNX-6514DS-A1M	3	7.924	8.716	0.66	0.80	24.21	732.69	0.000	0.000	210.99	0.00	0.00
3	155.00	BXA-70080-4BF	3	7.924	8.716	0.61	0.80	13.47	409.12	0.000	0.000	117.40	0.00	0.00
4	155.00	HBXX-6517DS-A2M	6	7.924	8.716	0.62	0.80	46.82	1482.98	0.000	0.000	408.06	0.00	0.00
5	155.00	(3) T-Frame w/ Platforms	1	7.924	8.716	1.00	1.00	53.31	3757.98	0.000	0.000	464.65	0.00	0.00
6	155.00	RRH2X60-700	3	7.924	8.716	0.54	0.80	4.41	490.50	0.000	0.000	38.44	0.00	0.00
7	155.00	FD9R6004/2C-3L	6	7.924	8.716	0.40	0.80	2.36	76.45	0.000	0.000	20.61	0.00	0.00
8	155.00	DB-T1-6Z-8AB-0Z	1	7.924	8.716	0.57	0.80	3.45	240.60	0.000	0.000	30.03	0.00	0.00
9	155.00	RRH2X60-PCS	3	7.924	8.716	0.54	0.80	5.04	591.23	0.000	0.000	43.89	0.00	0.00
10	147.00	Alcatel Lucent	3	7.916	8.708	0.54	0.80	8.41	760.24	0.000	0.000	73.27	0.00	0.00
11	147.00	(3) SFS-H (V-Braces)	1	7.916	8.708	0.75	0.75	14.29	236.40	0.000	0.000	124.41	0.00	0.00
12	147.00	APXVSPP18-C-A20	3	7.916	8.708	0.66	0.80	23.82	787.90	0.000	0.000	207.44	0.00	0.00
13	147.00	APXVTM14-C-I20	3	7.916	8.708	0.63	0.80	15.08	937.44	0.000	0.000	131.27	0.00	0.00
14	147.00	Alcatel Lucent 800 MHz	3	7.916	8.708	0.54	0.80	2.72	91.31	0.000	0.000	23.69	0.00	0.00
15	147.00	Alcatel Lucent 1900 MHz	3	7.916	8.708	0.54	0.80	5.20	1424.32	0.000	0.000	45.24	0.00	0.00
16	147.00	Alcatel Lucent 800 MHz	3	7.916	8.708	0.54	0.80	6.60	440.37	0.000	0.000	57.45	0.00	0.00
17	147.00	RFS ACU-A20-N RET	4	7.916	8.708	0.63	0.80	1.41	23.83	0.000	0.000	12.29	0.00	0.00
18	147.00	PRK-1245 (kicker kit)	1	7.916	8.708	0.75	0.75	17.65	920.44	0.000	0.000	153.65	0.00	0.00
19	147.00	(3) T-Frame w/ Platforms	1	7.916	8.708	1.00	1.00	53.30	3757.31	0.000	0.000	464.11	0.00	0.00
20	137.00	(3) T-Frame w/ Platforms	1	7.911	8.702	1.00	1.00	53.29	3756.87	0.000	0.000	463.77	0.00	0.00
21	137.00	Ericsson KRY 112 144/2	3	7.911	8.702	0.54	0.80	2.54	108.29	0.000	0.000	22.06	0.00	0.00
22	137.00	Ericsson APX18-206516	3	7.911	8.702	0.58	0.80	8.76	494.81	0.000	0.000	76.19	0.00	0.00
23	137.00	Ericsson RR90-17-XXDP	3	7.911	8.702	0.54	0.80	9.47	533.68	0.000	0.000	82.43	0.00	0.00
24	127.00	LGP21401	6	7.911	8.702	0.40	0.80	4.80	262.84	0.000	0.000	41.75	0.00	0.00
25	127.00	Low Profile	1	7.911	8.702	1.00	1.00	46.90	3345.27	0.000	0.000	408.13	0.00	0.00
26	127.00	7770.00	6	7.911	8.702	0.58	0.80	24.68	1504.06	0.000	0.000	214.74	0.00	0.00
27	127.00	HPA-65R-BUU-H8	3	7.911	8.702	0.63	0.80	29.03	1559.90	0.000	0.000	252.66	0.00	0.00
28	127.00	RRUS 11	3	7.911	8.702	0.54	0.80	5.58	595.61	0.000	0.000	48.58	0.00	0.00
29	127.00	RRUS 32 B2	3	7.911	8.702	0.54	0.80	6.11	625.64	0.000	0.000	53.18	0.00	0.00
30	127.00	DC6-48-60-18-8F	1	7.911	8.702	0.80	0.80	1.23	107.62	0.000	0.000	10.70	0.00	0.00
31	127.00	LGP13519	6	7.911	8.702	0.54	0.80	3.15	102.30	0.000	0.000	27.43	0.00	0.00
32	117.00	742 351	6	7.916	8.708	0.49	0.80	23.96	857.04	0.000	0.000	208.61	0.00	0.00
33	117.00	T-Frames	3	7.916	8.708	0.56	0.75	58.82	7068.58	0.000	0.000	512.24	0.00	0.00
34	35.00	3.58' Standoff	1	7.727	8.500	0.67	1.00	2.94	89.41	0.000	0.000	25.01	0.00	0.00
35	35.00	DB589	1	7.805	8.585	0.80	0.80	3.70	55.45	0.000	4.600	31.80	0.00	146.29
							Totals:		**38,704.76**			**5,170.85**		

Total Applied Force Summary

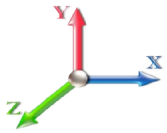
Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 31

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
3.00		178.61	1695.83	0.00	0.00
6.00		173.79	1719.53	0.00	0.00
9.00		168.86	1726.24	0.00	0.00
11.50		137.22	1437.70	0.00	0.00
12.00		27.22	286.92	0.00	0.00
15.00		159.28	1720.86	0.00	0.00
16.50		78.29	857.49	0.00	0.00
18.00		77.16	855.51	0.00	0.00
21.00		150.30	1704.25	0.00	0.00
24.00		146.05	1693.72	0.00	0.00
27.00		141.96	1682.19	0.00	0.00
30.00		138.13	1669.90	0.00	0.00
33.00		138.04	1657.00	0.00	0.00
35.00	(2) attachments	148.53	1242.52	0.00	146.29
36.00		45.72	545.54	0.00	0.00
39.00		139.05	2329.99	0.00	0.00
41.00		92.19	1541.29	0.00	0.00
42.00		45.91	767.11	0.00	0.00
45.00		137.30	1513.38	0.00	0.00
48.00		136.22	1500.16	0.00	0.00
51.00		135.03	1486.78	0.00	0.00
54.00		133.75	1473.24	0.00	0.00
57.00		132.40	1459.60	0.00	0.00
58.00		43.81	484.06	0.00	0.00
58.50		21.84	214.94	0.00	0.00
60.00		65.30	642.08	0.00	0.00
63.00		129.53	1272.43	0.00	0.00
66.00		128.03	1258.53	0.00	0.00
69.00		126.50	1244.58	0.00	0.00
70.00		41.82	412.36	0.00	0.00
72.00		84.26	1163.50	0.00	0.00
75.00		125.07	1726.76	0.00	0.00
76.00		41.34	571.51	0.00	0.00
78.00		82.15	745.41	0.00	0.00
81.00		121.88	1106.66	0.00	0.00
84.00		120.27	1094.01	0.00	0.00
87.00		118.66	1081.36	0.00	0.00
90.00		117.04	1068.71	0.00	0.00
93.00		115.42	1056.06	0.00	0.00
96.00		113.81	1043.40	0.00	0.00
99.00		112.19	1030.75	0.00	0.00
100.00		37.05	341.39	0.00	0.00
102.00		73.55	619.78	0.00	0.00
105.00		108.97	919.39	0.00	0.00
108.00		107.37	908.17	0.00	0.00
111.00		105.77	896.95	0.00	0.00

Total Applied Force Summary

Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 32

113.50		86.93	739.29	0.00	0.00
114.00		17.26	147.23	0.00	0.00
115.00		34.38	293.38	0.00	0.00
117.00	(9) attachments	789.97	8700.43	0.00	0.00
120.00		102.37	1102.04	0.00	0.00
123.00		100.80	771.79	0.00	0.00
126.00		99.23	760.62	0.00	0.00
127.00	(29) attachments	1089.91	8354.90	0.00	0.00
129.00		64.94	466.18	0.00	0.00
132.00		96.12	689.05	0.00	0.00
135.00		94.57	677.91	0.00	0.00
137.00	(10) attachments	706.64	5340.01	0.00	0.00
138.00		30.84	216.87	0.00	0.00
141.00		91.49	641.37	0.00	0.00
144.00		89.95	630.24	0.00	0.00
147.00	(25) attachments	1381.24	9998.67	0.00	0.00
150.00		86.90	598.50	0.00	0.00
153.00		85.38	587.39	0.00	0.00
155.00	(29) attachments	1454.81	8643.87	0.00	0.00
	Totals:	**11,506.35**	**102,829.29**	**0.00**	**146.29**

Linear Appurtenance Segment Forces (Factored)

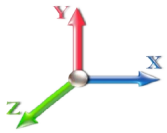
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 33	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
3.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	1.92	0.00	0.064	0.000	9.080	0.00	174.96
6.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	1.98	0.00	0.065	0.000	8.885	0.00	184.18
9.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.02	0.00	0.066	0.000	8.698	0.00	189.43
11.50	10"x1/2" Bent plate	Yes	2.50	0.000	3.56	1.70	0.00	0.066	0.000	8.549	0.00	160.37
12.00	10"x1/2" Bent plate	Yes	0.50	0.000	3.56	0.34	0.00	0.067	0.000	8.520	0.00	32.16
15.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.06	0.00	0.067	0.000	8.350	0.00	195.50
16.50	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	1.03	0.00	0.068	0.000	8.267	0.00	98.27
18.00	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	1.04	0.00	0.068	0.000	8.187	0.00	98.72
21.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.08	0.00	0.069	0.000	8.031	0.00	198.93
24.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.09	0.00	0.069	0.000	7.882	0.00	200.11
27.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.10	0.00	0.070	0.000	7.739	0.00	201.06
30.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.10	0.00	0.071	0.000	7.609	0.00	201.82
33.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.11	0.00	0.072	0.000	7.685	0.00	202.43
35.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	1.41	0.00	0.073	0.000	7.727	0.00	135.18
36.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.70	0.00	0.073	0.000	7.746	0.00	67.64
39.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.11	0.00	0.074	0.000	7.796	0.00	203.33
41.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	1.41	0.00	0.074	0.000	7.824	0.00	135.70
42.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.71	0.00	0.075	0.000	7.837	0.00	67.88
45.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.12	0.00	0.074	0.000	7.869	0.00	203.91
48.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.12	0.00	0.075	0.000	7.895	0.00	204.12
51.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.12	0.00	0.076	0.000	7.915	0.00	204.28
54.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.12	0.00	0.077	0.000	7.931	0.00	204.40
57.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	2.12	0.00	0.078	0.000	7.942	0.00	204.50
58.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.71	0.00	0.079	0.000	7.946	0.00	68.17
58.50	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.26	0.00	0.028	0.000	7.947	0.00	7.50
60.00	1.25" Reinforcing	Yes	1.50	0.000	1.25	0.77	0.00	0.028	0.000	7.951	0.00	22.50
63.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.55	0.00	0.028	0.000	7.957	0.00	45.02
66.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.55	0.00	0.029	0.000	7.961	0.00	45.03
69.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.55	0.00	0.029	0.000	7.962	0.00	45.04
70.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.52	0.00	0.029	0.000	7.963	0.00	15.01
72.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	1.03	0.00	0.029	0.000	7.963	0.00	30.03
75.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.55	0.00	0.030	0.000	7.962	0.00	45.04
76.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.52	0.00	0.030	0.000	7.962	0.00	15.01
78.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	1.03	0.00	0.030	0.000	7.960	0.00	30.02
81.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.55	0.00	0.030	0.000	7.958	0.00	45.02
84.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.55	0.00	0.031	0.000	7.955	0.00	45.01
87.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.031	0.000	7.951	0.00	45.00
90.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.031	0.000	7.947	0.00	44.99
93.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.032	0.000	7.943	0.00	44.98
96.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.032	0.000	7.939	0.00	44.97
99.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.033	0.000	7.935	0.00	44.96
100.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.51	0.00	0.033	0.000	7.934	0.00	14.99
102.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	1.03	0.00	0.034	0.000	7.932	0.00	29.97
105.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.034	0.000	7.928	0.00	44.94
108.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.035	0.000	7.925	0.00	44.93
111.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	1.54	0.00	0.035	0.000	7.922	0.00	44.92
113.50	1.25" Reinforcing	Yes	2.50	0.000	1.25	1.29	0.00	0.036	0.000	7.919	0.00	37.43

Linear Appurtenance Segment Forces (Factored)

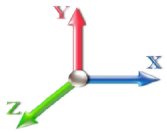
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 34	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
114.00	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.26	0.00	0.036	0.000	7.919	0.00	7.49
115.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.51	0.00	0.036	0.000	7.918	0.00	14.97
										Totals:	**0.0**	**4,691.8**

Calculated Forces

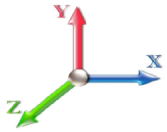
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 35	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-102.8	-11.54	0.00	-1264.4	0.00	1264.47	4048.32	2024.16	8933.65	4411.99	0.00	0.000	0.000	0.257
3.00	-101.1	-11.41	0.00	-1229.8	0.00	1229.87	4023.80	2011.90	8783.46	4337.82	0.01	-0.032	0.000	0.253
6.00	-99.40	-11.29	0.00	-1195.6	0.00	1195.63	3998.87	1999.43	8633.56	4263.79	0.04	-0.065	0.000	0.250
9.00	-97.67	-11.17	0.00	-1161.7	0.00	1161.74	3973.52	1986.76	8483.97	4189.91	0.09	-0.097	0.000	0.247
11.50	-96.23	-11.06	0.00	-1133.8	0.00	1133.81	3952.09	1976.04	8359.57	4128.48	0.15	-0.125	0.000	0.209
12.00	-95.94	-11.06	0.00	-1128.2	0.00	1128.28	3947.76	1973.88	8334.72	4116.20	0.16	-0.129	0.000	0.208
15.00	-94.21	-10.93	0.00	-1095.1	0.00	1095.10	3921.60	1960.80	8185.84	4042.68	0.25	-0.157	0.000	0.205
16.50	-93.35	-10.88	0.00	-1078.7	0.00	1078.70	3908.36	1954.18	8111.55	4005.99	0.31	-0.171	0.000	0.238
18.00	-92.49	-10.84	0.00	-1062.3	0.00	1062.39	3895.02	1947.51	8037.37	3969.35	0.36	-0.187	0.000	0.237
21.00	-90.78	-10.73	0.00	-1029.8	0.00	1029.88	3868.03	1934.02	7889.33	3896.24	0.49	-0.220	0.000	0.233
24.00	-89.08	-10.63	0.00	-997.69	0.00	997.69	3840.63	1920.32	7741.75	3823.36	0.64	-0.253	0.000	0.230
27.00	-87.39	-10.53	0.00	-965.81	0.00	965.81	3812.82	1906.41	7594.66	3750.72	0.81	-0.286	0.000	0.226
30.00	-85.72	-10.43	0.00	-934.22	0.00	934.22	3784.60	1892.30	7448.09	3678.33	1.00	-0.319	0.000	0.222
33.00	-84.06	-10.32	0.00	-902.93	0.00	902.93	3755.97	1877.99	7302.07	3606.22	1.21	-0.351	0.000	0.219
35.00	-82.81	-10.19	0.00	-882.14	0.00	882.14	3736.66	1868.33	7205.04	3558.30	1.36	-0.373	0.000	0.216
36.00	-82.26	-10.17	0.00	-871.95	0.00	871.95	3726.93	1863.47	7156.62	3534.39	1.44	-0.384	0.000	0.215
39.00	-79.93	-10.06	0.00	-841.43	0.00	841.43	3697.48	1848.74	7011.79	3462.86	1.69	-0.417	0.000	0.210
41.00	-78.39	-9.97	0.00	-821.32	0.00	821.32	3677.62	1838.81	6915.58	3415.35	1.87	-0.439	0.000	0.207
42.00	-77.62	-9.95	0.00	-811.34	0.00	811.34	3033.05	1516.53	5788.55	2858.75	1.97	-0.450	0.000	0.223
45.00	-76.10	-9.85	0.00	-781.49	0.00	781.49	3011.75	1505.88	5675.99	2803.16	2.26	-0.482	0.000	0.235
48.00	-74.59	-9.74	0.00	-751.95	0.00	751.95	2990.04	1495.02	5563.69	2747.70	2.57	-0.517	0.000	0.230
51.00	-73.10	-9.64	0.00	-722.72	0.00	722.72	2967.92	1483.96	5451.67	2692.37	2.91	-0.551	0.000	0.225
54.00	-71.63	-9.53	0.00	-693.81	0.00	693.81	2945.39	1472.69	5339.95	2637.20	3.27	-0.586	0.000	0.220
57.00	-70.16	-9.41	0.00	-665.21	0.00	665.21	2922.45	1461.22	5228.58	2582.20	3.65	-0.620	0.000	0.215
58.00	-69.68	-9.37	0.00	-655.80	0.00	655.80	2914.71	1457.35	5191.54	2563.91	3.78	-0.632	0.000	0.165
58.50	-69.46	-9.36	0.00	-651.12	0.00	651.12	2910.82	1455.41	5173.04	2554.77	3.84	-0.636	0.000	0.202
60.00	-68.82	-9.32	0.00	-637.07	0.00	637.07	2899.09	1449.55	5117.58	2527.38	4.05	-0.652	0.000	0.200
63.00	-67.54	-9.21	0.00	-609.12	0.00	609.12	2875.33	1437.66	5006.98	2472.76	4.47	-0.684	0.000	0.194
66.00	-66.28	-9.10	0.00	-581.49	0.00	581.49	2851.15	1425.58	4896.82	2418.35	4.91	-0.715	0.000	0.189
69.00	-65.03	-8.98	0.00	-554.18	0.00	554.18	2826.57	1413.28	4787.10	2364.17	5.37	-0.747	0.000	0.184
70.00	-64.62	-8.95	0.00	-545.20	0.00	545.20	2818.28	1409.14	4750.64	2346.16	5.52	-0.757	0.000	0.182
72.00	-63.45	-8.88	0.00	-527.29	0.00	527.29	2801.57	1400.79	4677.88	2310.23	5.85	-0.778	0.000	0.177
75.00	-61.73	-8.76	0.00	-500.64	0.00	500.64	2776.16	1388.08	4569.18	2256.54	6.34	-0.808	0.000	0.172
76.00	-61.15	-8.72	0.00	-491.88	0.00	491.88	2161.97	1080.98	3608.45	1782.08	6.51	-0.818	0.000	0.193
78.00	-60.40	-8.66	0.00	-474.44	0.00	474.44	2151.06	1075.53	3556.01	1756.18	6.86	-0.838	0.000	0.207
81.00	-59.29	-8.55	0.00	-448.47	0.00	448.47	2134.35	1067.18	3477.43	1717.37	7.40	-0.871	0.000	0.199
84.00	-58.20	-8.45	0.00	-422.81	0.00	422.81	2117.24	1058.62	3398.99	1678.63	7.96	-0.904	0.000	0.192
87.00	-57.11	-8.34	0.00	-397.46	0.00	397.46	2099.71	1049.85	3320.72	1639.98	8.54	-0.936	0.000	0.184
90.00	-56.04	-8.24	0.00	-372.43	0.00	372.43	2081.77	1040.89	3242.65	1601.42	9.13	-0.967	0.000	0.176
93.00	-54.98	-8.13	0.00	-347.71	0.00	347.71	2063.43	1031.71	3164.81	1562.98	9.75	-0.997	0.000	0.169
96.00	-53.94	-8.03	0.00	-323.31	0.00	323.31	2044.67	1022.33	3087.22	1524.66	10.39	-1.026	0.000	0.173
99.00	-52.91	-7.92	0.00	-299.21	0.00	299.21	2025.50	1012.75	3009.91	1486.48	11.04	-1.057	0.000	0.164
100.00	-52.56	-7.89	0.00	-291.30	0.00	291.30	2019.02	1009.51	2984.22	1473.79	11.26	-1.067	0.000	0.161
100.00	-52.56	-7.89	0.00	-291.30	0.00	291.30	1394.49	697.25	2068.33	1021.47	11.26	-1.067	0.000	0.187
102.00	-51.94	-7.83	0.00	-275.52	0.00	275.52	1387.39	693.70	2035.72	1005.36	11.72	-1.086	0.000	0.210
105.00	-51.02	-7.73	0.00	-252.04	0.00	252.04	1376.43	688.21	1986.77	981.19	12.41	-1.119	0.000	0.197
108.00	-50.11	-7.63	0.00	-228.85	0.00	228.85	1365.09	682.55	1937.81	957.01	13.12	-1.150	0.000	0.184
111.00	-49.21	-7.53	0.00	-205.96	0.00	205.96	1353.38	676.69	1888.86	932.84	13.86	-1.180	0.000	0.170

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 36

113.50	-48.47	-7.44	0.00	-187.14	0.00	187.14	1343.33	671.66	1848.11	912.71	14.48	-1.203	0.000	0.159
113.50	-48.47	-7.44	0.00	-187.14	0.00	187.14	1343.33	671.66	1848.11	912.71	14.48	-1.203	0.000	0.159
114.00	-48.33	-7.43	0.00	-183.42	0.00	183.42	1341.28	670.64	1839.96	908.69	14.61	-1.208	0.000	0.238
115.00	-48.03	-7.40	0.00	-175.99	0.00	175.99	1337.17	668.58	1823.68	900.65	14.86	-1.221	0.000	0.231
117.00	-39.35	-6.45	0.00	-161.19	0.00	161.19	1328.82	664.41	1791.13	884.57	15.38	-1.247	0.000	0.212
120.00	-38.24	-6.34	0.00	-141.85	0.00	141.85	1327.18	663.59	1784.85	881.47	16.17	-1.283	0.000	0.190
123.00	-37.47	-6.24	0.00	-122.82	0.00	122.82	1314.29	657.15	1736.13	857.41	16.99	-1.317	0.000	0.172
126.00	-36.71	-6.14	0.00	-104.09	0.00	104.09	1301.02	650.51	1687.54	833.41	17.83	-1.346	0.000	0.153
127.00	-28.38	-4.86	0.00	-97.95	0.00	97.95	1296.51	648.26	1671.38	825.43	18.11	-1.355	0.000	0.141
129.00	-27.92	-4.79	0.00	-88.23	0.00	88.23	1287.38	643.69	1639.11	809.49	18.68	-1.372	0.000	0.131
132.00	-27.23	-4.69	0.00	-73.85	0.00	73.85	1273.35	636.68	1590.85	785.66	19.55	-1.394	0.000	0.115
135.00	-26.55	-4.59	0.00	-59.78	0.00	59.78	1258.96	629.48	1542.80	761.93	20.44	-1.414	0.000	0.100
137.00	-21.23	-3.75	0.00	-50.61	0.00	50.61	1249.15	624.57	1510.90	746.18	21.03	-1.426	0.000	0.085
138.00	-21.01	-3.72	0.00	-46.86	0.00	46.86	1244.18	622.09	1494.99	738.32	21.33	-1.431	0.000	0.080
141.00	-20.37	-3.62	0.00	-35.70	0.00	35.70	1229.03	614.52	1447.44	714.84	22.23	-1.445	0.000	0.067
144.00	-19.75	-3.51	0.00	-24.85	0.00	24.85	1213.50	606.75	1400.19	691.50	23.15	-1.456	0.000	0.052
147.00	-9.78	-1.88	0.00	-14.32	0.00	14.32	1197.60	598.80	1353.24	668.32	24.06	-1.464	0.000	0.030
150.00	-9.19	-1.78	0.00	-8.68	0.00	8.68	1181.32	590.66	1306.64	645.30	24.99	-1.468	0.000	0.021
153.00	-8.60	-1.68	0.00	-3.35	0.00	3.35	1164.66	582.33	1260.41	622.47	25.91	-1.471	0.000	0.013
155.00	0.00	-1.45	0.00	0.00	0.00	0.00	1153.35	576.68	1229.81	607.36	26.53	-1.471	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 37

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Load Case:	1.2D + 1.0E							**Iterations**	22
Gust Response Factor	1.10				**Sds**	0.14		**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.07		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32		**SA**	0.02	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1	0.00	0.00	0.00	0.00	0.00	
3.00		757.09	0.00	0.02	0.01	7.38	
6.00		748.92	0.00	0.04	0.02	11.54	
9.00		740.75	0.01	0.05	0.03	14.05	
11.50	RB2	611.05	0.01	0.06	0.03	12.82	
12.00		121.53	0.01	0.06	0.03	2.59	
15.00		724.41	0.02	0.06	0.04	16.54	
16.50	RT2	359.14	0.02	0.06	0.04	8.40	
18.00		357.10	0.03	0.07	0.04	8.52	
21.00	RT1 RB3	708.07	0.03	0.07	0.04	17.41	
24.00		699.90	0.05	0.07	0.04	17.57	
27.00		691.73	0.06	0.07	0.04	17.66	
30.00		683.56	0.07	0.07	0.04	17.70	
33.00		675.39	0.09	0.07	0.04	17.74	
35.00	Appurtenance(s)	527.22	0.10	0.07	0.04	13.98	
36.00	Bot - Section 2	221.50	0.10	0.07	0.04	5.90	
39.00		1239.6	0.12	0.07	0.03	33.48	
41.00	RT3 RB4	817.97	0.13	0.07	0.03	22.28	
42.00	Top - Section 1	406.44	0.14	0.07	0.03	11.12	
45.00		566.45	0.16	0.07	0.03	15.66	
48.00		559.38	0.18	0.06	0.03	15.56	
51.00		552.31	0.20	0.06	0.02	15.36	
54.00		545.23	0.23	0.06	0.02	15.01	
57.00		538.16	0.26	0.05	0.02	14.44	
58.00	RB5	177.81	0.26	0.05	0.02	4.71	
58.50	RT4	88.61	0.27	0.05	0.02	2.33	
60.00		264.66	0.28	0.05	0.01	6.79	
63.00		524.01	0.31	0.04	0.01	12.47	
66.00		516.94	0.34	0.03	0.01	10.95	
69.00		509.86	0.37	0.03	0.01	9.02	
70.00	Bot - Section 3	168.38	0.39	0.02	0.01	2.75	
72.00		617.79	0.41	0.02	0.01	8.22	
75.00		915.87	0.44	0.00	0.01	7.38	
76.00	Top - Section 2 RT5 RB6	302.41	0.45	0.00	0.01	1.86	
78.00		275.52	0.48	-0.01	0.01	0.60	
81.00		408.37	0.52	-0.02	0.01	-1.67	
84.00		402.47	0.56	-0.04	0.01	-4.14	
87.00		396.58	0.60	-0.05	0.01	-6.36	
90.00		390.68	0.64	-0.07	0.02	-8.20	
93.00		384.79	0.68	-0.08	0.03	-9.57	
96.00	RT6 RB7	378.89	0.73	-0.09	0.03	-10.43	
99.00		373.00	0.77	-0.11	0.05	-10.79	
100.00	Top - Section 3	123.02	0.79	-0.11	0.05	-3.58	
102.00		195.61	0.82	-0.12	0.06	-5.68	
105.00		289.48	0.87	-0.12	0.08	-8.07	
108.00		284.76	0.92	-0.12	0.09	-7.25	

Seismic Segment Forces (Factored)

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 38	

111.00			280.05	0.97	-0.12	0.12	-6.10		
113.50	RT7		229.77	1.01	-0.11	0.14	-4.10		
114.00			45.56	1.02	-0.10	0.14	-0.77		
115.00	Bot - Section 5		90.73	1.04	-0.10	0.15	-1.37		
117.00	Appurtenance(s)		3181.3	1.08	-0.08	0.17	-34.66		
120.00	Top - Section 4		535.91	1.13	-0.05	0.21	-1.96		
123.00			265.29	1.19	0.00	0.25	1.26		
126.00			260.58	1.25	0.06	0.29	3.74		
127.00	Appurtenance(s)		2500.5	1.27	0.08	0.31	44.61		
129.00			170.05	1.31	0.13	0.34	4.28		
132.00			251.15	1.37	0.23	0.40	9.34		
135.00			246.43	1.43	0.35	0.47	12.44		
137.00	Appurtenance(s)		1931.3	1.48	0.44	0.52	115.85		
138.00			80.05	1.50	0.50	0.54	5.20		
141.00			237.00	1.56	0.67	0.62	19.13		
144.00			232.28	1.63	0.88	0.71	22.70		
147.00	Appurtenance(s)		3427.8	1.70	1.12	0.81	397.89		
150.00			222.85	1.77	1.41	0.93	30.24		
153.00			218.14	1.84	1.73	1.05	34.18		
155.00	Appurtenance(s)		2667.3	1.89	1.98	1.14	457.26		
		Totals:	**38,916.7**				**1,433.2**	**Total Wind:**	**50,629.5**

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

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 39	

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Load Case: 1.2D + 1.0E

Iterations 22

Gust Response Factor	1.10			**Sds**	0.14			**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.07			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32	**SA**	0.02	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-54.25	-1.56	0.00	-194.32	0.00	194.32	4048.32	2024.16	8933.65	4411.99		0.00	0.00	0.047
3.00	-53.17	-1.56	0.00	-189.64	0.00	189.64	4023.80	2011.90	8783.46	4337.82		0.00	0.00	0.046
6.00	-52.10	-1.55	0.00	-184.97	0.00	184.97	3998.87	1999.43	8633.56	4263.79		0.01	-0.01	0.046
9.00	-51.04	-1.54	0.00	-180.32	0.00	180.32	3973.52	1986.76	8483.97	4189.91		0.01	-0.02	0.045
11.50	-50.16	-1.53	0.00	-176.47	0.00	176.47	3952.09	1976.04	8359.57	4128.48		0.02	-0.02	0.039
12.00	-49.99	-1.53	0.00	-175.71	0.00	175.71	3947.76	1973.88	8334.72	4116.20		0.03	-0.02	0.039
15.00	-48.95	-1.51	0.00	-171.13	0.00	171.13	3921.60	1960.80	8185.84	4042.68		0.04	-0.02	0.038
16.50	-48.43	-1.51	0.00	-168.85	0.00	168.85	3908.36	1954.18	8111.55	4005.99		0.05	-0.03	0.044
18.00	-47.91	-1.50	0.00	-166.59	0.00	166.59	3895.02	1947.51	8037.37	3969.35		0.06	-0.03	0.044
21.00	-46.89	-1.49	0.00	-162.09	0.00	162.09	3868.03	1934.02	7889.33	3896.24		0.08	-0.03	0.043
24.00	-45.88	-1.47	0.00	-157.62	0.00	157.62	3840.63	1920.32	7741.75	3823.36		0.10	-0.04	0.043
27.00	-44.88	-1.46	0.00	-153.20	0.00	153.20	3812.82	1906.41	7594.66	3750.72		0.13	-0.04	0.042
30.00	-43.89	-1.45	0.00	-148.82	0.00	148.82	3784.60	1892.30	7448.09	3678.33		0.16	-0.05	0.041
33.00	-42.91	-1.43	0.00	-144.49	0.00	144.49	3755.97	1877.99	7302.07	3606.22		0.19	-0.06	0.041
35.00	-42.16	-1.42	0.00	-141.63	0.00	141.63	3736.66	1868.33	7205.04	3558.30		0.21	-0.06	0.040
36.00	-41.84	-1.41	0.00	-140.21	0.00	140.21	3726.93	1863.47	7156.62	3534.39		0.22	-0.06	0.040
39.00	-40.18	-1.38	0.00	-135.97	0.00	135.97	3697.48	1848.74	7011.79	3462.86		0.26	-0.07	0.039
41.00	-39.09	-1.36	0.00	-133.21	0.00	133.21	3677.62	1838.81	6915.58	3415.35		0.29	-0.07	0.039
42.00	-38.55	-1.35	0.00	-131.85	0.00	131.85	3033.05	1516.53	5788.55	2858.75		0.31	-0.07	0.042
45.00	-37.70	-1.34	0.00	-127.80	0.00	127.80	3011.75	1505.88	5675.99	2803.16		0.35	-0.08	0.044
48.00	-36.86	-1.32	0.00	-123.79	0.00	123.79	2990.04	1495.02	5563.69	2747.70		0.40	-0.08	0.044
51.00	-36.03	-1.31	0.00	-119.82	0.00	119.82	2967.92	1483.96	5451.67	2692.37		0.46	-0.09	0.043
54.00	-35.21	-1.30	0.00	-115.88	0.00	115.88	2945.39	1472.69	5339.95	2637.20		0.51	-0.09	0.042
57.00	-34.40	-1.28	0.00	-111.99	0.00	111.99	2922.45	1461.22	5228.58	2582.20		0.57	-0.10	0.042
58.00	-34.13	-1.28	0.00	-110.71	0.00	110.71	2914.71	1457.35	5191.54	2563.91		0.59	-0.10	0.032
58.50	-33.99	-1.28	0.00	-110.07	0.00	110.07	2910.82	1455.41	5173.04	2554.77		0.61	-0.10	0.040
60.00	-33.59	-1.27	0.00	-108.15	0.00	108.15	2899.09	1449.55	5117.58	2527.38		0.64	-0.10	0.039
63.00	-32.80	-1.26	0.00	-104.33	0.00	104.33	2875.33	1437.66	5006.98	2472.76		0.71	-0.11	0.039
66.00	-32.01	-1.25	0.00	-100.54	0.00	100.54	2851.15	1425.58	4896.82	2418.35		0.78	-0.12	0.038
69.00	-31.23	-1.24	0.00	-96.78	0.00	96.78	2826.57	1413.28	4787.10	2364.17		0.85	-0.12	0.037
70.00	-30.97	-1.24	0.00	-95.53	0.00	95.53	2818.28	1409.14	4750.64	2346.16		0.88	-0.12	0.037
72.00	-30.12	-1.24	0.00	-93.05	0.00	93.05	2801.57	1400.79	4677.88	2310.23		0.93	-0.13	0.036
75.00	-28.85	-1.23	0.00	-89.34	0.00	89.34	2776.16	1388.08	4569.18	2256.54		1.01	-0.13	0.035
76.00	-28.43	-1.23	0.00	-88.12	0.00	88.12	2161.97	1080.98	3608.45	1782.08		1.04	-0.13	0.040
78.00	-27.99	-1.23	0.00	-85.67	0.00	85.67	2151.06	1075.53	3556.01	1756.18		1.09	-0.14	0.043
81.00	-27.33	-1.23	0.00	-81.99	0.00	81.99	2134.35	1067.18	3477.43	1717.37		1.18	-0.14	0.042
84.00	-26.68	-1.23	0.00	-78.31	0.00	78.31	2117.24	1058.62	3398.99	1678.63		1.27	-0.15	0.041
87.00	-26.04	-1.23	0.00	-74.62	0.00	74.62	2099.71	1049.85	3320.72	1639.98		1.37	-0.15	0.040
90.00	-25.40	-1.23	0.00	-70.94	0.00	70.94	2081.77	1040.89	3242.65	1601.42		1.47	-0.16	0.038
93.00	-24.77	-1.23	0.00	-67.25	0.00	67.25	2063.43	1031.71	3164.81	1562.98		1.57	-0.17	0.037
96.00	-24.15	-1.23	0.00	-63.55	0.00	63.55	2044.67	1022.33	3087.22	1524.66		1.68	-0.17	0.039
99.00	-23.54	-1.23	0.00	-59.86	0.00	59.86	2025.50	1012.75	3009.91	1486.48		1.79	-0.18	0.038
100.00	-23.33	-1.23	0.00	-58.63	0.00	58.63	2019.02	1009.51	2984.22	1473.79		1.83	-0.18	0.037
100.00	-23.33	-1.23	0.00	-58.63	0.00	58.63	1394.49	697.25	2068.33	1021.47		1.83	-0.18	0.043
102.00	-22.99	-1.23	0.00	-56.16	0.00	56.16	1387.39	693.70	2035.72	1005.36		1.90	-0.18	0.049
105.00	-22.47	-1.23	0.00	-52.46	0.00	52.46	1376.43	688.21	1986.77	981.19		2.02	-0.19	0.047
108.00	-21.96	-1.23	0.00	-48.76	0.00	48.76	1365.09	682.55	1937.81	957.01		2.14	-0.20	0.045

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 40

111.00	-21.46	-1.24	0.00	-45.06	0.00	45.06	1353.38	676.69	1888.86	932.84	2.27	-0.20	0.043
113.50	-21.04	-1.23	0.00	-41.97	0.00	41.97	1343.33	671.66	1848.11	912.71	2.38	-0.21	0.041
113.50	-21.04	-1.23	0.00	-41.97	0.00	41.97	1343.33	671.66	1848.11	912.71	2.38	-0.21	0.041
114.00	-20.96	-1.24	0.00	-41.35	0.00	41.35	1341.28	670.64	1839.96	908.69	2.40	-0.21	0.061
115.00	-20.80	-1.24	0.00	-40.12	0.00	40.12	1337.17	668.58	1823.68	900.65	2.44	-0.21	0.060
117.00	-16.87	-1.22	0.00	-37.65	0.00	37.65	1328.82	664.41	1791.13	884.57	2.53	-0.22	0.055
120.00	-16.10	-1.22	0.00	-33.98	0.00	33.98	1327.18	663.59	1784.85	881.47	2.67	-0.23	0.051
123.00	-15.66	-1.22	0.00	-30.31	0.00	30.31	1314.29	657.15	1736.13	857.41	2.82	-0.24	0.047
126.00	-15.23	-1.22	0.00	-26.64	0.00	26.64	1301.02	650.51	1687.54	833.41	2.97	-0.24	0.044
127.00	-12.19	-1.16	0.00	-25.42	0.00	25.42	1296.51	648.26	1671.38	825.43	3.02	-0.25	0.040
129.00	-11.93	-1.16	0.00	-23.10	0.00	23.10	1287.38	643.69	1639.11	809.49	3.13	-0.25	0.038
132.00	-11.56	-1.15	0.00	-19.63	0.00	19.63	1273.35	636.68	1590.85	785.66	3.28	-0.26	0.034
135.00	-11.19	-1.13	0.00	-16.19	0.00	16.19	1258.96	629.48	1542.80	761.93	3.45	-0.26	0.030
137.00	-8.82	-1.01	0.00	-13.92	0.00	13.92	1249.15	624.57	1510.90	746.18	3.56	-0.26	0.026
138.00	-8.71	-1.00	0.00	-12.92	0.00	12.92	1244.18	622.09	1494.99	738.32	3.61	-0.27	0.024
141.00	-8.37	-0.98	0.00	-9.91	0.00	9.91	1229.03	614.52	1447.44	714.84	3.78	-0.27	0.021
144.00	-8.03	-0.96	0.00	-6.97	0.00	6.97	1213.50	606.75	1400.19	691.50	3.95	-0.27	0.017
147.00	-3.86	-0.54	0.00	-4.09	0.00	4.09	1197.60	598.80	1353.24	668.32	4.12	-0.27	0.009
150.00	-3.54	-0.51	0.00	-2.47	0.00	2.47	1181.32	590.66	1306.64	645.30	4.30	-0.28	0.007
153.00	-3.23	-0.47	0.00	-0.95	0.00	0.95	1164.66	582.33	1260.41	622.47	4.47	-0.28	0.004
155.00	0.00	-0.46	0.00	0.00	0.00	0.00	1153.35	576.68	1229.81	607.36	4.59	-0.28	0.000

Seismic Segment Forces (Factored)

Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 41

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Load Case:	0.9D + 1.0E							**Iterations**	21
Gust Response Factor	1.10				**Sds**	0.14		**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.07		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32		**SA**	0.02	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1	0.00	0.00	0.00	0.00	0.00	
3.00		757.09	0.00	0.02	0.01	7.38	
6.00		748.92	0.00	0.04	0.02	11.54	
9.00		740.75	0.01	0.05	0.03	14.05	
11.50	RB2	611.05	0.01	0.06	0.03	12.82	
12.00		121.53	0.01	0.06	0.03	2.59	
15.00		724.41	0.02	0.06	0.04	16.54	
16.50	RT2	359.14	0.02	0.06	0.04	8.40	
18.00		357.10	0.03	0.07	0.04	8.52	
21.00	RT1 RB3	708.07	0.03	0.07	0.04	17.41	
24.00		699.90	0.05	0.07	0.04	17.57	
27.00		691.73	0.06	0.07	0.04	17.66	
30.00		683.56	0.07	0.07	0.04	17.70	
33.00		675.39	0.09	0.07	0.04	17.74	
35.00	Appurtenance(s)	527.22	0.10	0.07	0.04	13.98	
36.00	Bot - Section 2	221.50	0.10	0.07	0.04	5.90	
39.00		1239.6	0.12	0.07	0.03	33.48	
41.00	RT3 RB4	817.97	0.13	0.07	0.03	22.28	
42.00	Top - Section 1	406.44	0.14	0.07	0.03	11.12	
45.00		566.45	0.16	0.07	0.03	15.66	
48.00		559.38	0.18	0.06	0.03	15.56	
51.00		552.31	0.20	0.06	0.02	15.36	
54.00		545.23	0.23	0.06	0.02	15.01	
57.00		538.16	0.26	0.05	0.02	14.44	
58.00	RB5	177.81	0.26	0.05	0.02	4.71	
58.50	RT4	88.61	0.27	0.05	0.02	2.33	
60.00		264.66	0.28	0.05	0.01	6.79	
63.00		524.01	0.31	0.04	0.01	12.47	
66.00		516.94	0.34	0.03	0.01	10.95	
69.00		509.86	0.37	0.03	0.01	9.02	
70.00	Bot - Section 3	168.38	0.39	0.02	0.01	2.75	
72.00		617.79	0.41	0.02	0.01	8.22	
75.00		915.87	0.44	0.00	0.01	7.38	
76.00	Top - Section 2 RT5 RB6	302.41	0.45	0.00	0.01	1.86	
78.00		275.52	0.48	-0.01	0.01	0.60	
81.00		408.37	0.52	-0.02	0.01	-1.67	
84.00		402.47	0.56	-0.04	0.01	-4.14	
87.00		396.58	0.60	-0.05	0.01	-6.36	
90.00		390.68	0.64	-0.07	0.02	-8.20	
93.00		384.79	0.68	-0.08	0.03	-9.57	
96.00	RT6 RB7	378.89	0.73	-0.09	0.03	-10.43	
99.00		373.00	0.77	-0.11	0.05	-10.79	
100.00	Top - Section 3	123.02	0.79	-0.11	0.05	-3.58	
102.00		195.61	0.82	-0.12	0.06	-5.68	
105.00		289.48	0.87	-0.12	0.08	-8.07	
108.00		284.76	0.92	-0.12	0.09	-7.25	

Seismic Segment Forces (Factored)

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 42	

111.00		280.05	0.97	-0.12	0.12	-6.10		
113.50	RT7	229.77	1.01	-0.11	0.14	-4.10		
114.00		45.56	1.02	-0.10	0.14	-0.77		
115.00	Bot - Section 5	90.73	1.04	-0.10	0.15	-1.37		
117.00	Appurtenance(s)	3181.3	1.08	-0.08	0.17	-34.66		
120.00	Top - Section 4	535.91	1.13	-0.05	0.21	-1.96		
123.00		265.29	1.19	0.00	0.25	1.26		
126.00		260.58	1.25	0.06	0.29	3.74		
127.00	Appurtenance(s)	2500.5	1.27	0.08	0.31	44.61		
129.00		170.05	1.31	0.13	0.34	4.28		
132.00		251.15	1.37	0.23	0.40	9.34		
135.00		246.43	1.43	0.35	0.47	12.44		
137.00	Appurtenance(s)	1931.3	1.48	0.44	0.52	115.85		
138.00		80.05	1.50	0.50	0.54	5.20		
141.00		237.00	1.56	0.67	0.62	19.13		
144.00		232.28	1.63	0.88	0.71	22.70		
147.00	Appurtenance(s)	3427.8	1.70	1.12	0.81	397.89		
150.00		222.85	1.77	1.41	0.93	30.24		
153.00		218.14	1.84	1.73	1.05	34.18		
155.00	Appurtenance(s)	2667.3	1.89	1.98	1.14	457.26		
	Totals:	**38,916.7**				**1,433.2**	**Total Wind:**	**50,629.5**

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

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 43	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Iterations 21

Gust Response Factor	1.10			**Sds**	0.14			**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.07			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.32	**SA**	0.02			**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-40.68	-1.56	0.00	-192.10	0.00	192.10	4048.32	2024.16	8933.65	4411.99		0.00	0.00	0.044
3.00	-39.87	-1.55	0.00	-187.43	0.00	187.43	4023.80	2011.90	8783.46	4337.82		0.00	0.00	0.043
6.00	-39.07	-1.55	0.00	-182.76	0.00	182.76	3998.87	1999.43	8633.56	4263.79		0.01	-0.01	0.043
9.00	-38.28	-1.53	0.00	-178.13	0.00	178.13	3973.52	1986.76	8483.97	4189.91		0.01	-0.01	0.042
11.50	-37.62	-1.52	0.00	-174.29	0.00	174.29	3952.09	1976.04	8359.57	4128.48		0.02	-0.02	0.036
12.00	-37.49	-1.52	0.00	-173.53	0.00	173.53	3947.76	1973.88	8334.72	4116.20		0.03	-0.02	0.036
15.00	-36.71	-1.51	0.00	-168.97	0.00	168.97	3921.60	1960.80	8185.84	4042.68		0.04	-0.02	0.036
16.50	-36.32	-1.50	0.00	-166.71	0.00	166.71	3908.36	1954.18	8111.55	4005.99		0.05	-0.03	0.041
18.00	-35.94	-1.49	0.00	-164.46	0.00	164.46	3895.02	1947.51	8037.37	3969.35		0.06	-0.03	0.041
21.00	-35.17	-1.48	0.00	-159.98	0.00	159.98	3868.03	1934.02	7889.33	3896.24		0.08	-0.03	0.040
24.00	-34.41	-1.46	0.00	-155.54	0.00	155.54	3840.63	1920.32	7741.75	3823.36		0.10	-0.04	0.040
27.00	-33.66	-1.45	0.00	-151.15	0.00	151.15	3812.82	1906.41	7594.66	3750.72		0.12	-0.04	0.039
30.00	-32.92	-1.43	0.00	-146.80	0.00	146.80	3784.60	1892.30	7448.09	3678.33		0.15	-0.05	0.039
33.00	-32.18	-1.42	0.00	-142.50	0.00	142.50	3755.97	1877.99	7302.07	3606.22		0.19	-0.05	0.038
35.00	-31.62	-1.40	0.00	-139.67	0.00	139.67	3736.66	1868.33	7205.04	3558.30		0.21	-0.06	0.038
36.00	-31.38	-1.40	0.00	-138.26	0.00	138.26	3726.93	1863.47	7156.62	3534.39		0.22	-0.06	0.038
39.00	-30.14	-1.37	0.00	-134.06	0.00	134.06	3697.48	1848.74	7011.79	3462.86		0.26	-0.06	0.037
41.00	-29.32	-1.35	0.00	-131.33	0.00	131.33	3677.62	1838.81	6915.58	3415.35		0.29	-0.07	0.037
42.00	-28.91	-1.34	0.00	-129.98	0.00	129.98	3033.05	1516.53	5788.55	2858.75		0.30	-0.07	0.039
45.00	-28.28	-1.32	0.00	-125.98	0.00	125.98	3011.75	1505.88	5675.99	2803.16		0.35	-0.08	0.042
48.00	-27.65	-1.31	0.00	-122.01	0.00	122.01	2990.04	1495.02	5563.69	2747.70		0.40	-0.08	0.041
51.00	-27.02	-1.29	0.00	-118.08	0.00	118.08	2967.92	1483.96	5451.67	2692.37		0.45	-0.09	0.040
54.00	-26.41	-1.28	0.00	-114.20	0.00	114.20	2945.39	1472.69	5339.95	2637.20		0.51	-0.09	0.040
57.00	-25.80	-1.27	0.00	-110.36	0.00	110.36	2922.45	1461.22	5228.58	2582.20		0.57	-0.10	0.039
58.00	-25.60	-1.26	0.00	-109.09	0.00	109.09	2914.71	1457.35	5191.54	2563.91		0.59	-0.10	0.030
58.50	-25.49	-1.26	0.00	-108.46	0.00	108.46	2910.82	1455.41	5173.04	2554.77		0.60	-0.10	0.037
60.00	-25.19	-1.26	0.00	-106.57	0.00	106.57	2899.09	1449.55	5117.58	2527.38		0.63	-0.10	0.037
63.00	-24.60	-1.24	0.00	-102.80	0.00	102.80	2875.33	1437.66	5006.98	2472.76		0.70	-0.11	0.036
66.00	-24.01	-1.23	0.00	-99.06	0.00	99.06	2851.15	1425.58	4896.82	2418.35		0.77	-0.11	0.035
69.00	-23.42	-1.23	0.00	-95.36	0.00	95.36	2826.57	1413.28	4787.10	2364.17		0.84	-0.12	0.035
70.00	-23.23	-1.22	0.00	-94.13	0.00	94.13	2818.28	1409.14	4750.64	2346.16		0.86	-0.12	0.035
72.00	-22.59	-1.22	0.00	-91.69	0.00	91.69	2801.57	1400.79	4677.88	2310.23		0.92	-0.12	0.034
75.00	-21.64	-1.21	0.00	-88.04	0.00	88.04	2776.16	1388.08	4569.18	2256.54		1.00	-0.13	0.033
76.00	-21.32	-1.21	0.00	-86.83	0.00	86.83	2161.97	1080.98	3608.45	1782.08		1.02	-0.13	0.037
78.00	-20.99	-1.21	0.00	-84.42	0.00	84.42	2151.06	1075.53	3556.01	1756.18		1.08	-0.14	0.040
81.00	-20.50	-1.21	0.00	-80.80	0.00	80.80	2134.35	1067.18	3477.43	1717.37		1.17	-0.14	0.039
84.00	-20.01	-1.21	0.00	-77.17	0.00	77.17	2117.24	1058.62	3398.99	1678.63		1.26	-0.15	0.038
87.00	-19.53	-1.21	0.00	-73.55	0.00	73.55	2099.71	1049.85	3320.72	1639.98		1.35	-0.15	0.037
90.00	-19.05	-1.21	0.00	-69.92	0.00	69.92	2081.77	1040.89	3242.65	1601.42		1.45	-0.16	0.036
93.00	-18.58	-1.21	0.00	-66.29	0.00	66.29	2063.43	1031.71	3164.81	1562.98		1.55	-0.16	0.035
96.00	-18.11	-1.21	0.00	-62.66	0.00	62.66	2044.67	1022.33	3087.22	1524.66		1.65	-0.17	0.036
99.00	-17.65	-1.21	0.00	-59.02	0.00	59.02	2025.50	1012.75	3009.91	1486.48		1.76	-0.18	0.035
100.00	-17.50	-1.21	0.00	-57.81	0.00	57.81	2019.02	1009.51	2984.22	1473.79		1.80	-0.18	0.035
100.00	-17.50	-1.21	0.00	-57.81	0.00	57.81	1394.49	697.25	2068.33	1021.47		1.80	-0.18	0.040
102.00	-17.24	-1.21	0.00	-55.39	0.00	55.39	1387.39	693.70	2035.72	1005.36		1.88	-0.18	0.045
105.00	-16.85	-1.21	0.00	-51.75	0.00	51.75	1376.43	688.21	1986.77	981.19		1.99	-0.19	0.044
108.00	-16.47	-1.21	0.00	-48.11	0.00	48.11	1365.09	682.55	1937.81	957.01		2.11	-0.19	0.042

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 44

111.00	-16.09	-1.21	0.00	-44.47	0.00	44.47	1353.38	676.69	1888.86	932.84	2.24	-0.20	0.039
113.50	-15.78	-1.21	0.00	-41.44	0.00	41.44	1343.33	671.66	1848.11	912.71	2.34	-0.21	0.038
113.50	-15.78	-1.21	0.00	-41.44	0.00	41.44	1343.33	671.66	1848.11	912.71	2.34	-0.21	0.038
114.00	-15.72	-1.21	0.00	-40.83	0.00	40.83	1341.28	670.64	1839.96	908.69	2.37	-0.21	0.057
115.00	-15.60	-1.22	0.00	-39.61	0.00	39.61	1337.17	668.58	1823.68	900.65	2.41	-0.21	0.056
117.00	-12.65	-1.21	0.00	-37.18	0.00	37.18	1328.82	664.41	1791.13	884.57	2.50	-0.22	0.052
120.00	-12.08	-1.21	0.00	-33.57	0.00	33.57	1327.18	663.59	1784.85	881.47	2.64	-0.22	0.047
123.00	-11.75	-1.20	0.00	-29.95	0.00	29.95	1314.29	657.15	1736.13	857.41	2.78	-0.23	0.044
126.00	-11.42	-1.20	0.00	-26.34	0.00	26.34	1301.02	650.51	1687.54	833.41	2.93	-0.24	0.040
127.00	-9.14	-1.15	0.00	-25.14	0.00	25.14	1296.51	648.26	1671.38	825.43	2.98	-0.24	0.038
129.00	-8.95	-1.14	0.00	-22.85	0.00	22.85	1287.38	643.69	1639.11	809.49	3.08	-0.25	0.035
132.00	-8.67	-1.13	0.00	-19.42	0.00	19.42	1273.35	636.68	1590.85	785.66	3.24	-0.25	0.032
135.00	-8.39	-1.12	0.00	-16.02	0.00	16.02	1258.96	629.48	1542.80	761.93	3.40	-0.26	0.028
137.00	-6.62	-1.00	0.00	-13.78	0.00	13.78	1249.15	624.57	1510.90	746.18	3.51	-0.26	0.024
138.00	-6.53	-0.99	0.00	-12.78	0.00	12.78	1244.18	622.09	1494.99	738.32	3.56	-0.26	0.023
141.00	-6.27	-0.97	0.00	-9.81	0.00	9.81	1229.03	614.52	1447.44	714.84	3.73	-0.27	0.019
144.00	-6.02	-0.95	0.00	-6.90	0.00	6.90	1213.50	606.75	1400.19	691.50	3.90	-0.27	0.015
147.00	-2.89	-0.54	0.00	-4.05	0.00	4.05	1197.60	598.80	1353.24	668.32	4.07	-0.27	0.008
150.00	-2.66	-0.50	0.00	-2.45	0.00	2.45	1181.32	590.66	1306.64	645.30	4.24	-0.27	0.006
153.00	-2.42	-0.47	0.00	-0.94	0.00	0.94	1164.66	582.33	1260.41	622.47	4.41	-0.27	0.004
155.00	0.00	-0.46	0.00	0.00	0.00	0.00	1153.35	576.68	1229.81	607.36	4.53	-0.27	0.000

Wind Loading - Shaft

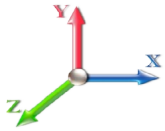
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 45	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	2.18	0.70	13.370	14.71	344.78	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
3.00		2.13	0.70	13.075	14.38	337.33	1.000	0.000	3.00	13.876	13.88	199.6	0.0	757.1
6.00		2.09	0.70	12.794	14.07	330.10	1.000	0.000	3.00	13.728	13.73	193.2	0.0	748.9
9.00		2.04	0.70	12.526	13.78	323.06	1.000	0.000	3.00	13.579	13.58	187.1	0.0	740.7
11.50	RB2	2.01	0.70	12.311	13.54	317.34	1.000	0.000	2.50	11.202	11.20	151.7	0.0	611.1
12.00		2.00	0.70	12.269	13.50	316.22	1.000	0.000	0.50	2.228	2.23	30.1	0.0	121.5
15.00		1.96	0.70	12.023	13.23	309.56	1.000	0.000	3.00	13.282	13.28	175.7	0.0	724.4
16.50	RT2	1.94	0.70	11.905	13.10	306.29	1.000	0.000	1.50	6.585	6.59	86.2	0.0	359.1
18.00		1.92	0.70	11.789	12.97	303.07	1.000	0.000	1.50	6.548	6.55	84.9	0.0	357.1
21.00	RT1 RB3	1.89	0.70	11.564	12.72	296.76	1.000	0.000	3.00	12.985	12.98	165.2	0.0	708.1
24.00		1.85	0.70	11.350	12.48	290.61	1.000	0.000	3.00	12.836	12.84	160.3	0.0	699.9
27.00		1.82	0.70	11.144	12.26	284.62	1.000	0.000	3.00	12.688	12.69	155.5	0.0	691.7
30.00		1.79	0.70	10.957	12.05	278.89	1.000	0.000	3.00	12.539	12.54	151.1	0.0	683.6
33.00		1.76	0.72	11.066	12.17	276.94	1.000	0.000	3.00	12.391	12.39	150.8	0.0	675.4
35.00	Appurtenance(s)	1.74	0.73	11.127	12.24	275.47	1.000	0.000	2.00	8.178	8.18	100.1	0.0	445.7
36.00	Bot - Section 2	1.73	0.74	11.155	12.27	274.69	1.000	0.000	1.00	4.064	4.06	49.9	0.0	221.5
39.00		1.70	0.76	11.226	12.35	272.21	1.000	0.000	3.00	12.288	12.29	151.7	0.0	1239.7
41.00	RT3 RB4	1.68	0.77	11.267	12.39	270.45	1.000	0.000	2.00	8.109	8.11	100.5	0.0	818.0
42.00	Top - Section 1	1.67	0.77	11.285	12.41	269.54	1.000	0.000	1.00	4.030	4.03	50.0	0.0	406.4
45.00		1.65	0.79	11.331	12.46	271.14	1.000	0.000	3.00	11.991	11.99	149.5	0.0	566.5
48.00		1.62	0.80	11.368	12.51	268.19	1.000	0.000	3.00	11.842	11.84	148.1	0.0	559.4
51.00		1.60	0.82	11.398	12.54	265.15	1.000	0.000	3.00	11.694	11.69	146.6	0.0	552.3
54.00		1.57	0.83	11.420	12.56	262.02	1.000	0.000	3.00	11.545	11.55	145.0	0.0	545.2
57.00		1.55	0.84	11.437	12.58	258.82	1.000	0.000	3.00	11.397	11.40	143.4	0.0	538.2
58.00	RB5	1.55	0.85	11.442	12.59	257.74	1.000	0.000	1.00	3.766	3.77	47.4	0.0	177.8
58.50	RT4	1.54	0.85	11.444	12.59	257.20	1.000	0.000	0.50	1.877	1.88	23.6	0.0	88.6
60.00		1.53	0.85	11.450	12.59	255.56	1.000	0.000	1.50	5.606	5.61	70.6	0.0	264.7
63.00		1.51	0.87	11.458	12.60	252.26	1.000	0.000	3.00	11.100	11.10	139.9	0.0	524.0
66.00		1.49	0.88	11.463	12.61	248.92	1.000	0.000	3.00	10.951	10.95	138.1	0.0	516.9
69.00		1.47	0.89	11.466	12.61	245.55	1.000	0.000	3.00	10.803	10.80	136.2	0.0	509.9
70.00	Bot - Section 3	1.47	0.89	11.466	12.61	244.42	1.000	0.000	1.00	3.568	3.57	45.0	0.0	168.4
72.00		1.46	0.90	11.467	12.61	242.15	1.000	0.000	2.00	7.194	7.19	90.7	0.0	617.8
75.00		1.44	0.91	11.465	12.61	238.74	1.000	0.000	3.00	10.667	10.67	134.5	0.0	915.9
76.00	Top - Section 2 RT5	1.43	0.91	11.465	12.61	237.60	1.000	0.000	1.00	3.523	3.52	44.4	0.0	302.4
78.00		1.42	0.92	11.463	12.61	239.02	1.000	0.000	2.00	6.996	7.00	88.2	0.0	275.5
81.00		1.41	0.93	11.459	12.60	235.58	1.000	0.000	3.00	10.370	10.37	130.7	0.0	408.4
84.00		1.39	0.94	11.455	12.60	232.14	1.000	0.000	3.00	10.222	10.22	128.8	0.0	402.5
87.00		1.38	0.95	11.450	12.59	228.69	1.000	0.000	3.00	10.073	10.07	126.9	0.0	396.6
90.00		1.36	0.96	11.444	12.59	225.24	1.000	0.000	3.00	9.925	9.92	124.9	0.0	390.7
93.00		1.35	0.97	11.438	12.58	221.79	1.000	0.000	3.00	9.776	9.78	123.0	0.0	384.8
96.00	RT6 RB7	1.34	0.98	11.433	12.58	218.34	1.000	0.000	3.00	9.628	9.63	121.1	0.0	378.9
99.00		1.32	0.99	11.427	12.57	214.89	1.000	0.000	3.00	9.479	9.48	119.1	0.0	373.0
100.00	Top - Section 3	1.32	0.99	11.425	12.57	213.74	1.000	0.000	1.00	3.127	3.13	39.3	0.0	123.0
102.00		1.31	0.99	11.422	12.56	211.44	1.000	0.000	2.00	6.204	6.20	77.9	0.0	195.6
105.00		1.30	1.00	11.416	12.56	208.00	1.000	0.000	3.00	9.182	9.18	115.3	0.0	289.5
108.00		1.29	1.01	11.412	12.55	204.57	1.000	0.000	3.00	9.033	9.03	113.4	0.0	284.8
111.00		1.28	1.02	11.407	12.55	201.14	1.000	0.000	3.00	8.885	8.88	111.5	0.0	280.0

Wind Loading - Shaft

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 46	

113.50 RT7	1.27	1.02	11.404	12.54	198.28	1.000	0.000	2.50	7.291	7.29	91.5	0.0	229.8
114.00	1.27	1.03	11.403	12.54	197.71	1.000	0.000	0.50	1.446	1.45	18.1	0.0	45.6
115.00 Bot - Section 5	1.27	1.03	11.402	12.54	196.57	1.000	0.000	1.00	2.879	2.88	36.1	0.0	90.7
117.00 Appurtenance(s)	1.26	1.03	11.400	12.54	194.29	1.000	0.000	2.00	5.795	5.80	72.7	0.0	362.5
120.00 Top - Section 4	1.25	1.04	11.397	12.54	190.88	1.000	0.000	3.00	8.569	8.57	107.4	0.0	535.9
123.00	1.24	1.05	11.394	12.53	190.42	1.000	0.000	3.00	8.420	8.42	105.5	0.0	265.3
126.00	1.23	1.06	11.393	12.53	187.02	1.000	0.000	3.00	8.272	8.27	103.7	0.0	260.6
127.00 Appurtenance(s)	1.23	1.06	11.392	12.53	185.89	1.000	0.000	1.00	2.724	2.72	34.1	0.0	85.8
129.00	1.22	1.06	11.392	12.53	183.62	1.000	0.000	2.00	5.399	5.40	67.7	0.0	170.1
132.00	1.22	1.07	11.391	12.53	180.23	1.000	0.000	3.00	7.975	7.97	99.9	0.0	251.1
135.00	1.21	1.08	11.391	12.53	176.84	1.000	0.000	3.00	7.826	7.83	98.1	0.0	246.4
137.00 Appurtenance(s)	1.20	1.08	11.392	12.53	174.59	1.000	0.000	2.00	5.135	5.13	64.3	0.0	161.7
138.00	1.20	1.08	11.392	12.53	173.46	1.000	0.000	1.00	2.543	2.54	31.9	0.0	80.0
141.00	1.19	1.09	11.394	12.53	170.09	1.000	0.000	3.00	7.529	7.53	94.4	0.0	237.0
144.00	1.19	1.10	11.396	12.54	166.71	1.000	0.000	3.00	7.381	7.38	92.5	0.0	232.3
147.00 Appurtenance(s)	1.18	1.10	11.399	12.54	163.35	1.000	0.000	3.00	7.232	7.23	90.7	0.0	227.6
150.00	1.17	1.11	11.403	12.54	159.98	1.000	0.000	3.00	7.083	7.08	88.8	0.0	222.9
153.00	1.17	1.12	11.407	12.55	156.62	1.000	0.000	3.00	6.935	6.93	87.0	0.0	218.1
155.00 Appurtenance(s)	1.16	1.12	11.410	12.55	154.38	1.000	0.000	2.00	4.541	4.54	57.0	0.0	142.8
							Totals:	**155.00**			**6,808.3**		**26,107.2**

Discrete Appurtenance Forces

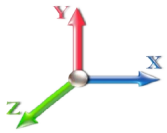
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 47	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	RRH2X60-AWS	3	11.410	12.551	0.40	0.80	4.20	165.00	0.000	0.000	52.71	0.00	0.00
2	155.00	LNX-6514DS-A1M	3	11.410	12.551	0.66	0.80	16.27	115.20	0.000	0.000	204.26	0.00	0.00
3	155.00	BXA-70080-4BF	3	11.410	12.551	0.61	0.80	8.68	39.00	0.000	0.000	108.97	0.00	0.00
4	155.00	HBXX-6517DS-A2M	6	11.410	12.551	0.62	0.80	31.60	244.80	0.000	0.000	396.63	0.00	0.00
5	155.00	(3) T-Frame w/ Platforms	1	11.410	12.551	1.00	1.00	25.00	1620.00	0.000	0.000	313.78	0.00	0.00
6	155.00	RRH2X60-700	3	11.410	12.551	0.40	0.80	2.26	138.00	0.000	0.000	28.32	0.00	0.00
7	155.00	FD9R6004/2C-3L	6	11.410	12.551	0.40	0.80	0.86	18.60	0.000	0.000	10.84	0.00	0.00
8	155.00	DB-T1-6Z-8AB-0Z	1	11.410	12.551	0.57	0.80	2.73	18.90	0.000	0.000	34.22	0.00	0.00
9	155.00	RRH2X60-PCS	3	11.410	12.551	0.40	0.80	2.64	165.00	0.000	0.000	33.13	0.00	0.00
10	147.00	Alcatel Lucent	3	11.399	12.539	0.54	0.80	6.51	210.00	0.000	0.000	81.66	0.00	0.00
11	147.00	(3) SFS-H (V-Braces)	1	11.399	12.539	0.75	0.75	7.20	197.00	0.000	0.000	90.28	0.00	0.00
12	147.00	APXVSPP18-C-A20	3	11.399	12.539	0.66	0.80	15.98	171.00	0.000	0.000	200.32	0.00	0.00
13	147.00	APXVTM14-C-I20	3	11.399	12.539	0.63	0.80	12.02	168.00	0.000	0.000	150.73	0.00	0.00
14	147.00	Alcatel Lucent 800 MHz	3	11.399	12.539	0.54	0.80	1.25	26.40	0.000	0.000	15.73	0.00	0.00
15	147.00	Alcatel Lucent 1900 MHz	3	11.399	12.539	0.54	0.80	3.71	180.00	0.000	0.000	46.58	0.00	0.00
16	147.00	Alcatel Lucent 800 MHz	3	11.399	12.539	0.54	0.80	4.00	159.00	0.000	0.000	50.20	0.00	0.00
17	147.00	RFS ACU-A20-N RET	4	11.399	12.539	0.40	0.80	0.22	4.00	0.000	0.000	2.81	0.00	0.00
18	147.00	PRK-1245 (kicker kit)	1	11.399	12.539	0.75	0.75	7.13	464.91	0.000	0.000	89.34	0.00	0.00
19	147.00	(3) T-Frame w/ Platforms	1	11.399	12.539	1.00	1.00	25.00	1620.00	0.000	0.000	313.47	0.00	0.00
20	137.00	(3) T-Frame w/ Platforms	1	11.392	12.531	1.00	1.00	25.00	1620.00	0.000	0.000	313.28	0.00	0.00
21	137.00	Ericsson KRY 112 144/2	3	11.392	12.531	0.54	0.80	1.08	39.60	0.000	0.000	13.50	0.00	0.00
22	137.00	Ericsson APX18-206516	3	11.392	12.531	0.58	0.80	6.32	56.10	0.000	0.000	79.26	0.00	0.00
23	137.00	Ericsson RR90-17-XXDP	3	11.392	12.531	0.54	0.80	7.12	54.00	0.000	0.000	89.17	0.00	0.00
24	127.00	LGP21401	6	11.392	12.531	0.40	0.80	2.28	105.00	0.000	0.000	28.57	0.00	0.00
25	127.00	Low Profile	1	11.392	12.531	1.00	1.00	22.00	1500.00	0.000	0.000	275.69	0.00	0.00
26	127.00	7770.00	6	11.392	12.531	0.58	0.80	19.27	210.00	0.000	0.000	241.51	0.00	0.00
27	127.00	HPA-65R-BUU-H8	3	11.392	12.531	0.63	0.80	24.61	204.00	0.000	0.000	308.40	0.00	0.00
28	127.00	RRUS 11	3	11.392	12.531	0.54	0.80	4.05	152.10	0.000	0.000	50.78	0.00	0.00
29	127.00	RRUS 32 B2	3	11.392	12.531	0.54	0.80	4.41	180.00	0.000	0.000	55.21	0.00	0.00
30	127.00	DC6-48-60-18-8F	1	11.392	12.531	0.80	0.80	0.74	31.80	0.000	0.000	9.22	0.00	0.00
31	127.00	LGP13519	6	11.392	12.531	0.54	0.80	1.09	31.80	0.000	0.000	13.70	0.00	0.00
32	117.00	742 351	6	11.400	12.540	0.49	0.80	15.75	178.80	0.000	0.000	197.53	0.00	0.00
33	117.00	T-Frames	3	11.400	12.540	0.56	0.75	34.42	2640.00	0.000	0.000	431.68	0.00	0.00
34	35.00	3.58' Standoff	1	11.127	12.240	0.67	1.00	1.12	70.00	0.000	0.000	13.70	0.00	0.00
35	35.00	DB589	1	11.239	12.363	0.80	0.80	1.10	11.50	0.000	4.600	13.65	0.00	62.78
							Totals:		**12,809.51**			**4,358.82**		

Total Applied Force Summary

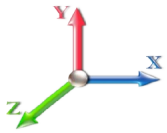
Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 48

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
3.00		199.58	899.65	0.00	0.00
6.00		193.20	891.48	0.00	0.00
9.00		187.09	883.31	0.00	0.00
11.50		151.70	729.85	0.00	0.00
12.00		30.07	145.29	0.00	0.00
15.00		175.67	866.97	0.00	0.00
16.50		86.24	430.42	0.00	0.00
18.00		84.91	428.38	0.00	0.00
21.00		165.18	850.63	0.00	0.00
24.00		160.26	842.46	0.00	0.00
27.00		155.54	834.29	0.00	0.00
30.00		151.13	826.12	0.00	0.00
33.00		150.83	817.95	0.00	0.00
35.00	(2) attachments	127.44	622.26	0.00	62.78
36.00		49.87	267.98	0.00	0.00
39.00		151.74	1379.09	0.00	0.00
41.00		100.50	910.93	0.00	0.00
42.00		50.02	452.92	0.00	0.00
45.00		149.46	705.89	0.00	0.00
48.00		148.09	698.82	0.00	0.00
51.00		146.61	691.75	0.00	0.00
54.00		145.03	684.67	0.00	0.00
57.00		143.38	677.60	0.00	0.00
58.00		47.40	224.29	0.00	0.00
58.50		23.63	111.85	0.00	0.00
60.00		70.60	334.38	0.00	0.00
63.00		139.90	663.45	0.00	0.00
66.00		138.09	656.38	0.00	0.00
69.00		136.25	649.30	0.00	0.00
70.00		45.00	214.86	0.00	0.00
72.00		90.74	710.75	0.00	0.00
75.00		134.53	1055.31	0.00	0.00
76.00		44.43	348.89	0.00	0.00
78.00		88.21	368.48	0.00	0.00
81.00		130.72	547.81	0.00	0.00
84.00		128.79	541.91	0.00	0.00
87.00		126.87	536.02	0.00	0.00
90.00		124.94	530.12	0.00	0.00
93.00		123.01	524.23	0.00	0.00
96.00		121.08	518.33	0.00	0.00
99.00		119.15	512.44	0.00	0.00
100.00		39.30	169.50	0.00	0.00
102.00		77.94	288.57	0.00	0.00
105.00		115.31	428.92	0.00	0.00
108.00		113.39	424.20	0.00	0.00
111.00		111.49	419.49	0.00	0.00

Total Applied Force Summary

Structure:	CT00302-S-SBA		**Code:**	EIA/TIA-222-G	4/25/2019
Site Name:	Danielson		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	172.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 49

Tower Engineering Solutions

113.50		91.45	345.97	0.00	0.00
114.00		18.13	68.80	0.00	0.00
115.00		36.11	137.21	0.00	0.00
117.00	(9) attachments	701.88	3274.27	0.00	0.00
120.00		107.42	637.67	0.00	0.00
123.00		105.54	367.05	0.00	0.00
126.00		103.66	362.34	0.00	0.00
127.00	(29) attachments	1017.23	2534.43	0.00	0.00
129.00		67.65	210.53	0.00	0.00
132.00		99.92	311.87	0.00	0.00
135.00		98.07	307.15	0.00	0.00
137.00	(10) attachments	559.55	1971.85	0.00	0.00
138.00		31.86	96.33	0.00	0.00
141.00		94.36	285.84	0.00	0.00
144.00		92.52	281.12	0.00	0.00
147.00	(25) attachments	1131.80	3476.72	0.00	0.00
150.00		88.85	263.77	0.00	0.00
153.00		87.02	259.06	0.00	0.00
155.00	(29) attachments	1239.86	2694.58	0.00	0.00
	Totals:	**11,167.17**	**45,204.76**	**0.00**	**62.78**

Linear Appurtenance Segment Forces (Factored)

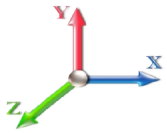
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 50	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
3.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.064	0.000	13.075	0.00	0.00
6.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.065	0.000	12.794	0.00	0.00
9.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.066	0.000	12.526	0.00	0.00
11.50	10"x1/2" Bent plate	Yes	2.50	0.000	3.56	0.74	0.00	0.066	0.000	12.311	0.00	0.00
12.00	10"x1/2" Bent plate	Yes	0.50	0.000	3.56	0.15	0.00	0.067	0.000	12.269	0.00	0.00
15.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.067	0.000	12.023	0.00	0.00
16.50	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	0.45	0.00	0.068	0.000	11.905	0.00	0.00
18.00	10"x1/2" Bent plate	Yes	1.50	0.000	3.56	0.45	0.00	0.068	0.000	11.789	0.00	0.00
21.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.069	0.000	11.564	0.00	0.00
24.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.069	0.000	11.350	0.00	0.00
27.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.070	0.000	11.144	0.00	0.00
30.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.071	0.000	10.957	0.00	0.00
33.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.072	0.000	11.066	0.00	0.00
35.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	0.59	0.00	0.073	0.000	11.127	0.00	0.00
36.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.073	0.000	11.155	0.00	0.00
39.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.074	0.000	11.226	0.00	0.00
41.00	10"x1/2" Bent plate	Yes	2.00	0.000	3.56	0.59	0.00	0.074	0.000	11.267	0.00	0.00
42.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.075	0.000	11.285	0.00	0.00
45.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.074	0.000	11.331	0.00	0.00
48.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.075	0.000	11.368	0.00	0.00
51.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.076	0.000	11.398	0.00	0.00
54.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.077	0.000	11.420	0.00	0.00
57.00	10"x1/2" Bent plate	Yes	3.00	0.000	3.56	0.89	0.00	0.078	0.000	11.437	0.00	0.00
58.00	10"x1/2" Bent plate	Yes	1.00	0.000	3.56	0.30	0.00	0.079	0.000	11.442	0.00	0.00
58.50	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.05	0.00	0.028	0.000	11.444	0.00	0.00
60.00	1.25" Reinforcing	Yes	1.50	0.000	1.25	0.16	0.00	0.028	0.000	11.450	0.00	0.00
63.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.028	0.000	11.458	0.00	0.00
66.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.029	0.000	11.463	0.00	0.00
69.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.029	0.000	11.466	0.00	0.00
70.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.029	0.000	11.466	0.00	0.00
72.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.029	0.000	11.467	0.00	0.00
75.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.030	0.000	11.465	0.00	0.00
76.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.030	0.000	11.465	0.00	0.00
78.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.030	0.000	11.463	0.00	0.00
81.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.030	0.000	11.459	0.00	0.00
84.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	11.455	0.00	0.00
87.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	11.450	0.00	0.00
90.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.031	0.000	11.444	0.00	0.00
93.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.032	0.000	11.438	0.00	0.00
96.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.032	0.000	11.433	0.00	0.00
99.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.033	0.000	11.427	0.00	0.00
100.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.033	0.000	11.425	0.00	0.00
102.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.034	0.000	11.422	0.00	0.00
105.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.034	0.000	11.416	0.00	0.00
108.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.035	0.000	11.412	0.00	0.00
111.00	1.25" Reinforcing	Yes	3.00	0.000	1.25	0.31	0.00	0.035	0.000	11.407	0.00	0.00
113.50	1.25" Reinforcing	Yes	2.50	0.000	1.25	0.26	0.00	0.036	0.000	11.404	0.00	0.00

Linear Appurtenance Segment Forces (Factored)

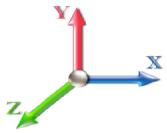
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 51	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
114.00	1.25" Reinforcing	Yes	0.50	0.000	1.25	0.05	0.00	0.036	0.000	11.403	0.00	0.00
115.00	1.25" Reinforcing	Yes	1.00	0.000	1.25	0.10	0.00	0.036	0.000	11.402	0.00	0.00
										Totals:	**0.0**	**0.0**

Calculated Forces

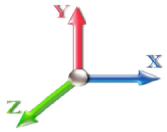
Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 52	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-45.20	-11.18	0.00	-1108.7	0.00	1108.79	4048.32	2024.16	8933.65	4411.99	0.00	0.000	0.000	0.217
3.00	-44.30	-11.00	0.00	-1075.2	0.00	1075.26	4023.80	2011.90	8783.46	4337.82	0.01	-0.028	0.000	0.213
6.00	-43.40	-10.83	0.00	-1042.2	0.00	1042.26	3998.87	1999.43	8633.56	4263.79	0.04	-0.057	0.000	0.210
9.00	-42.51	-10.66	0.00	-1009.7	0.00	1009.78	3973.52	1986.76	8483.97	4189.91	0.08	-0.085	0.000	0.206
11.50	-41.78	-10.52	0.00	-983.13	0.00	983.13	3952.09	1976.04	8359.57	4128.48	0.13	-0.109	0.000	0.174
12.00	-41.63	-10.50	0.00	-977.87	0.00	977.87	3947.76	1973.88	8334.72	4116.20	0.14	-0.113	0.000	0.173
15.00	-40.76	-10.33	0.00	-946.39	0.00	946.39	3921.60	1960.80	8185.84	4042.68	0.22	-0.137	0.000	0.170
16.50	-40.33	-10.25	0.00	-930.89	0.00	930.89	3908.36	1954.18	8111.55	4005.99	0.27	-0.149	0.000	0.198
18.00	-39.90	-10.18	0.00	-915.51	0.00	915.51	3895.02	1947.51	8037.37	3969.35	0.32	-0.163	0.000	0.196
21.00	-39.04	-10.03	0.00	-884.97	0.00	884.97	3868.03	1934.02	7889.33	3896.24	0.43	-0.191	0.000	0.193
24.00	-38.20	-9.89	0.00	-854.87	0.00	854.87	3840.63	1920.32	7741.75	3823.36	0.56	-0.219	0.000	0.189
27.00	-37.36	-9.75	0.00	-825.21	0.00	825.21	3812.82	1906.41	7594.66	3750.72	0.70	-0.247	0.000	0.186
30.00	-36.53	-9.61	0.00	-795.97	0.00	795.97	3784.60	1892.30	7448.09	3678.33	0.87	-0.275	0.000	0.182
33.00	-35.71	-9.47	0.00	-767.14	0.00	767.14	3755.97	1877.99	7302.07	3606.22	1.05	-0.303	0.000	0.179
35.00	-35.08	-9.35	0.00	-748.13	0.00	748.13	3736.66	1868.33	7205.04	3558.30	1.18	-0.322	0.000	0.176
36.00	-34.81	-9.31	0.00	-738.79	0.00	738.79	3726.93	1863.47	7156.62	3534.39	1.25	-0.331	0.000	0.175
39.00	-33.43	-9.16	0.00	-710.86	0.00	710.86	3697.48	1848.74	7011.79	3462.86	1.47	-0.359	0.000	0.171
41.00	-32.52	-9.06	0.00	-692.54	0.00	692.54	3677.62	1838.81	6915.58	3415.35	1.62	-0.377	0.000	0.168
42.00	-32.06	-9.02	0.00	-683.48	0.00	683.48	3033.05	1516.53	5788.55	2858.75	1.70	-0.386	0.000	0.181
45.00	-31.35	-8.88	0.00	-656.42	0.00	656.42	3011.75	1505.88	5675.99	2803.16	1.95	-0.414	0.000	0.190
48.00	-30.65	-8.74	0.00	-629.78	0.00	629.78	2990.04	1495.02	5563.69	2747.70	2.22	-0.443	0.000	0.185
51.00	-29.96	-8.61	0.00	-603.55	0.00	603.55	2967.92	1483.96	5451.67	2692.37	2.51	-0.472	0.000	0.181
54.00	-29.27	-8.47	0.00	-577.74	0.00	577.74	2945.39	1472.69	5339.95	2637.20	2.82	-0.500	0.000	0.176
57.00	-28.59	-8.33	0.00	-552.33	0.00	552.33	2922.45	1461.22	5228.58	2582.20	3.14	-0.529	0.000	0.171
58.00	-28.36	-8.28	0.00	-544.00	0.00	544.00	2914.71	1457.35	5191.54	2563.91	3.25	-0.538	0.000	0.131
58.50	-28.25	-8.26	0.00	-539.86	0.00	539.86	2910.82	1455.41	5173.04	2554.77	3.31	-0.542	0.000	0.160
60.00	-27.92	-8.20	0.00	-527.46	0.00	527.46	2899.09	1449.55	5117.58	2527.38	3.48	-0.555	0.000	0.158
63.00	-27.25	-8.06	0.00	-502.87	0.00	502.87	2875.33	1437.66	5006.98	2472.76	3.84	-0.582	0.000	0.153
66.00	-26.59	-7.93	0.00	-478.67	0.00	478.67	2851.15	1425.58	4896.82	2418.35	4.21	-0.608	0.000	0.149
69.00	-25.94	-7.80	0.00	-454.88	0.00	454.88	2826.57	1413.28	4787.10	2364.17	4.60	-0.633	0.000	0.144
70.00	-25.73	-7.75	0.00	-447.08	0.00	447.08	2818.28	1409.14	4750.64	2346.16	4.74	-0.642	0.000	0.142
72.00	-25.01	-7.66	0.00	-431.57	0.00	431.57	2801.57	1400.79	4677.88	2310.23	5.01	-0.659	0.000	0.138
75.00	-23.96	-7.52	0.00	-408.58	0.00	408.58	2776.16	1388.08	4569.18	2256.54	5.43	-0.683	0.000	0.133
76.00	-23.61	-7.48	0.00	-401.06	0.00	401.06	2161.97	1080.98	3608.45	1782.08	5.58	-0.692	0.000	0.149
78.00	-23.24	-7.40	0.00	-386.09	0.00	386.09	2151.06	1075.53	3556.01	1756.18	5.87	-0.708	0.000	0.160
81.00	-22.69	-7.27	0.00	-363.90	0.00	363.90	2134.35	1067.18	3477.43	1717.37	6.32	-0.735	0.000	0.153
84.00	-22.14	-7.14	0.00	-342.09	0.00	342.09	2117.24	1058.62	3398.99	1678.63	6.79	-0.762	0.000	0.147
87.00	-21.61	-7.02	0.00	-320.66	0.00	320.66	2099.71	1049.85	3320.72	1639.98	7.28	-0.787	0.000	0.141
90.00	-21.08	-6.90	0.00	-299.60	0.00	299.60	2081.77	1040.89	3242.65	1601.42	7.78	-0.812	0.000	0.134
93.00	-20.55	-6.77	0.00	-278.91	0.00	278.91	2063.43	1031.71	3164.81	1562.98	8.30	-0.836	0.000	0.127
96.00	-20.03	-6.65	0.00	-258.58	0.00	258.58	2044.67	1022.33	3087.22	1524.66	8.83	-0.860	0.000	0.130
99.00	-19.52	-6.53	0.00	-238.62	0.00	238.62	2025.50	1012.75	3009.91	1486.48	9.38	-0.884	0.000	0.123
100.00	-19.35	-6.50	0.00	-232.09	0.00	232.09	2019.02	1009.51	2984.22	1473.79	9.57	-0.892	0.000	0.120
100.00	-19.35	-6.50	0.00	-232.09	0.00	232.09	1394.49	697.25	2068.33	1021.47	9.57	-0.892	0.000	0.140
102.00	-19.06	-6.42	0.00	-219.10	0.00	219.10	1387.39	693.70	2035.72	1005.36	9.95	-0.908	0.000	0.156
105.00	-18.63	-6.31	0.00	-199.84	0.00	199.84	1376.43	688.21	1986.77	981.19	10.53	-0.934	0.000	0.145
108.00	-18.20	-6.19	0.00	-180.92	0.00	180.92	1365.09	682.55	1937.81	957.01	11.12	-0.959	0.000	0.134
111.00	-17.78	-6.08	0.00	-162.34	0.00	162.34	1353.38	676.69	1888.86	932.84	11.73	-0.982	0.000	0.124

Calculated Forces

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1	**Topography:** 3	**Struct Class:**	II	Page: 53

113.50	-17.44	-5.99	0.00	-147.14	0.00	147.14	1343.33	671.66	1848.11	912.71	12.25	-1.000	0.000	0.114
113.50	-17.44	-5.99	0.00	-147.14	0.00	147.14	1343.33	671.66	1848.11	912.71	12.25	-1.000	0.000	0.114
114.00	-17.37	-5.97	0.00	-144.15	0.00	144.15	1341.28	670.64	1839.96	908.69	12.36	-1.004	0.000	0.172
115.00	-17.23	-5.94	0.00	-138.18	0.00	138.18	1337.17	668.58	1823.68	900.65	12.57	-1.015	0.000	0.166
117.00	-13.97	-5.18	0.00	-126.30	0.00	126.30	1328.82	664.41	1791.13	884.57	13.00	-1.035	0.000	0.153
120.00	-13.33	-5.07	0.00	-110.76	0.00	110.76	1327.18	663.59	1784.85	881.47	13.66	-1.063	0.000	0.136
123.00	-12.96	-4.96	0.00	-95.55	0.00	95.55	1314.29	657.15	1736.13	857.41	14.33	-1.089	0.000	0.121
126.00	-12.60	-4.85	0.00	-80.67	0.00	80.67	1301.02	650.51	1687.54	833.41	15.03	-1.112	0.000	0.107
127.00	-10.09	-3.79	0.00	-75.81	0.00	75.81	1296.51	648.26	1671.38	825.43	15.26	-1.119	0.000	0.100
129.00	-9.88	-3.72	0.00	-68.23	0.00	68.23	1287.38	643.69	1639.11	809.49	15.73	-1.132	0.000	0.092
132.00	-9.57	-3.62	0.00	-57.07	0.00	57.07	1273.35	636.68	1590.85	785.66	16.45	-1.149	0.000	0.080
135.00	-9.26	-3.52	0.00	-46.22	0.00	46.22	1258.96	629.48	1542.80	761.93	17.18	-1.165	0.000	0.068
137.00	-7.30	-2.92	0.00	-39.19	0.00	39.19	1249.15	624.57	1510.90	746.18	17.67	-1.174	0.000	0.058
138.00	-7.20	-2.88	0.00	-36.27	0.00	36.27	1244.18	622.09	1494.99	738.32	17.91	-1.178	0.000	0.055
141.00	-6.92	-2.78	0.00	-27.62	0.00	27.62	1229.03	614.52	1447.44	714.84	18.66	-1.189	0.000	0.044
144.00	-6.64	-2.69	0.00	-19.27	0.00	19.27	1213.50	606.75	1400.19	691.50	19.41	-1.197	0.000	0.033
147.00	-3.19	-1.48	0.00	-11.21	0.00	11.21	1197.60	598.80	1353.24	668.32	20.16	-1.203	0.000	0.019
150.00	-2.93	-1.39	0.00	-6.76	0.00	6.76	1181.32	590.66	1306.64	645.30	20.92	-1.207	0.000	0.013
153.00	-2.67	-1.30	0.00	-2.59	0.00	2.59	1164.66	582.33	1260.41	622.47	21.68	-1.209	0.000	0.006
155.00	0.00	-1.24	0.00	0.00	0.00	0.00	1153.35	576.68	1229.81	607.36	22.18	-1.209	0.000	0.000

Final Analysis Summary

Structure:	CT00302-S-SBA	**Code:**	EIA/TIA-222-G	4/25/2019	
Site Name:	Danielson	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	172.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 3	**Struct Class:**	II	Page: 54	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 101 mph Wind	50.7	0.00	54.19	0.00	0.00	5052.47
0.9D + 1.6W 101 mph Wind	50.7	0.00	40.63	0.00	0.00	5005.42
1.2D + 1.0Di + 1.0Wi 50 mph Wind	11.5	0.00	102.83	0.00	0.00	1264.47
1.2D + 1.0E	1.6	0.00	54.25	0.00	0.00	194.32
0.9D + 1.0E	1.6	0.00	40.68	0.00	0.00	192.10
1.0D + 1.0W 60 mph Wind	11.2	0.00	45.20	0.00	0.00	1108.79

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 101 mph Wind	-54.19	-50.69	0.00	-5052.4	0.00	-5052.4	4048.32	2024.1	8933.65	4411.99	0.00	0.958
0.9D + 1.6W 101 mph Wind	-40.63	-50.68	0.00	-5005.4	0.00	-5005.4	4048.32	2024.1	8933.65	4411.99	0.00	0.947
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-102.83	-11.54	0.00	-1264.4	0.00	-1264.4	4048.32	2024.1	8933.65	4411.99	0.00	0.257
1.2D + 1.0E	-20.96	-1.24	0.00	-41.35	0.00	-41.35	1341.28	670.64	1839.96	908.69	114.00	0.061
0.9D + 1.0E	-15.72	-1.21	0.00	-40.83	0.00	-40.83	1341.28	670.64	1839.96	908.69	114.00	0.057
1.0D + 1.0W 60 mph Wind	-45.20	-11.18	0.00	-1108.7	0.00	-1108.7	4048.32	2024.1	8933.65	4411.99	0.00	0.217

Additional Steel Summary

			Intermediate Connectors			Lower Termination				Upper Termination				Max Member			
Elev From (ft)	Elev To (ft)	Member	VQ/I (lb/in)	Vu (kips)	phi Vn (kips)	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	Pu (kips)	phi Pn (kips)	phi Tn (kips)	Ratio
0.0	21.0	(3) PLT-6"X1-1/4"(1.25" Hole	306.9	5.52	37.1	354.8	37.1	10	0	325.9	37.1			354.76	413.6	356.25	0.996
11.5	16.5	(1) PLT-6"X1-1/4"(1.25" Hole	-264.7	-4.76	37.1	296.1	37.1	8	11	289.4	37.1	8	11	296.08	413.6	356.25	0.831
21.0	41.0	(3) PLT-6"X1-1/4"(1.25" Hole	323.2	5.82	37.1	325.9	37.1			297.0	37.1			325.88	413.6	356.25	0.915
41.0	58.5	(3) PLT-6"X1-1/4"(1.25" Hole	358.4	6.45	37.1	297.0	37.1			221.5	37.1	6	11	309.58	413.6	356.25	0.869
58.0	76.0	(3) PLT-5"x1-1/4"(1.25"Hole)	-324.1	-5.83	37.1	205.6	37.1	6	8	208.6	37.1			242.62	344.6	281.25	0.863
76.0	96.0	(3) PLT-4.5"x 1-1/4"(1.25"ho	-347.6	-6.26	37.1	193.6	37.1			162.1	37.1			207.82	310.2	243.75	0.853
96.0	113.5	(3) PLT-3.5x1.25(1.25 Hole)	-359.5	-6.47	37.1	136.1	37.1			105.9	37.1	3	6	141.76	241.2	168.75	0.840

Monopole Mat Foundation Design

			Date: 4/24/2019
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	155
Site Number:	CT00302-S-SBA	**Engineer Name:**	J. Tibbetts
Engr. Number:	74711	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

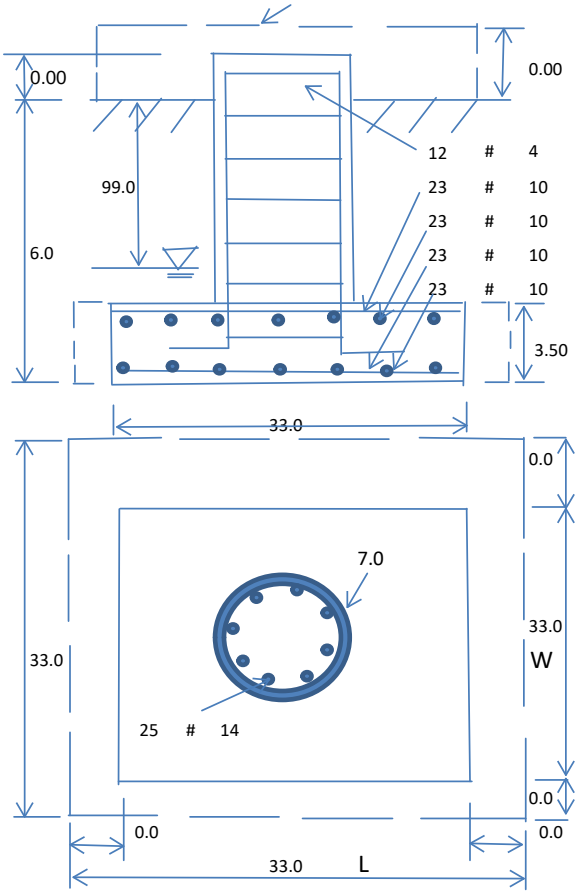
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	102.8	Shear Force (Kips):	50.7
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5052.5
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	0.00	Thickness of Pad (ft):	3.50
Length of Pad (ft.):	33	Width of Pad (ft.):	33
Final Length of pad (ft)	33.0	Final width of pad (ft):	33.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



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 #:	14	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	25	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	10	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:

Qty. of Rebar in Pad (L):	23	Qty. of Rebar in Pad (W):	23

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	23	Qty. of Rebar in Pad (W):	23
Apply 1.35 factor for e/w Per G:	1.35		

Soil Design Parameters:

Soil Unit Weight (pcf):	130.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	32000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

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

Total Dry Soil Volume (cu. Ft.):	2626.29	Total Dry Soil Weight (Kips):	341.42
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	341.42	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3907.90	Total Dry Concrete Weight (Kips):	586.19
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	586.19	Total Vertical Load on Base (Kips):	1030.40

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1727	<	Allowable Factored Soil Bearing (psf):	24000	0.07	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	15471.1	>	Design Factored Momont (kips-ft):	5357	0.35	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.89	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00		
				Load/ Capacity Ratio	
(1) Concrete Pier:					
Vertical Steel Rebar Area (sq. in./each):	2.25	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	8511.1 >	Design Factored Moment (Mu, Kips-F	5179.3	0.61	OK!
Calculated Shear Capacity (Kips):	724.1 >	Design Factored Shear (Kips):	50.7	0.07	OK!
Calculated Tension Capacity (Tn, Kips):	3037.5 >	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7273.8 >	Design Factored Axial Load (Pu Kips):	102.8	0.01	OK!
Moment & Axial Strength Combination:	0.61 OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.010	Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:					
One-Way Design Shear Capacity (L-Direction, Kips):	1248.5 >	One-Way Factored Shear (L-D. Kips):	327.7	0.26	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1248.5 >	One-Way Factored Shear (W-D., Kips)	327.7	0.26	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1258.9 >	One-Way Factored Shear (C-C, Kips):	313.1	0.25	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0019 OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0019		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	4930.1 >	Moment at Bottom (L-Dir. K-Ft):	2492.0	0.51	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	4930.1 >	Moment at Bottom (W-Dir. K-Ft):	2492.0	0.51	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	6943.8 >	Moment at Bottom (C-C Dir. K-Ft):	3524.3	0.51	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0019 OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0019		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	4930.1 >	Moment at the top (L-Dir K-Ft):	984.8	0.20	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	4930.1 >	Moment at the top (W-Dir K-Ft):	984.8	0.20	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	6943.8 >	Moment at the top (C-C Dir. K-Ft):	918.6	0.13	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:					
Moment transferred by punching shear:	2021.0 k-ft.	Max. factored shear stress v_{u_CD}:		3.1	Psi
Max. factored shear stress v_{u_AB}:	13.7 Psi	Factored shear Strength ϕv_n:		164.3	Psi
Max. factored shear stress v_u:	13.7 Psi	Check Usage of Punching Shear Capacity:		0.08	OK!

CENTEK engineering

Centered on Solutions℠

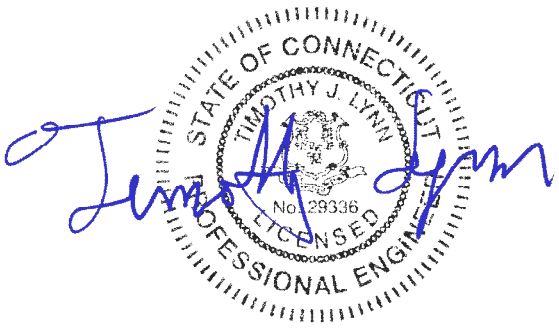
Structural Analysis Report

Antenna Mount Analysis

T-Mobile Site #: CT11315C

246 East Franklin Street
Danielson, CT

Centek Project No. 18127.04



Date: August 20, 2018

Max Stress Ratio = 24.9%

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

August 20, 2018

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11315C
246 East Franklin Street
Danielson, CT 06239

Centek Project No. 18127.04

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) 14-ft T-Arms to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2012 International Building Code as modified by the 2016 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  T-Arms: Three (3) RFS APXV18-206516S-C panel antennas, three (3) EMS RR90-17-XXDP panel antennas and three (3) TMAs mounted on three (3) T-Arms with a RAD center elevation of 137-ft +/- AGL.

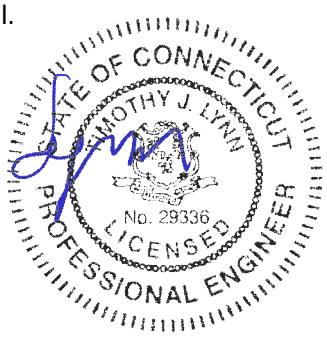
The antenna mount was analyzed per the requirements of the 2012 International Building Code as modified by the 2016 Connecticut State Building Code considering a nominal design wind speed of 101 mph for Danielson (Killingly) as required in Appendix N of the 2016 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer



Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: TIA-222-G Loads

Location: Danielson, CT

Rev. 0: 8/20/18

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 18127.04

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed: $V := 101$ mph (User Input - 2016 CSBC Appendix N)

Basic Wind Speed with Ice: $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = $Structure\_Type := Pole$ (User Input)

Structure Category = $SC := II$ (User Input)

Exposure Category = $Exp := B$ (User Input)

Structure Height = $h := 155$ ft (User Input)

Height to Center of Antennas = $z_{AT\&T} := 137$ ft (User Input)

Radial Ice Thickness = $t_i := 1.00$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 1.1$ (User Input)

Output

Wind Direction Probability Factor = $K_d := \begin{cases} 0.95 & \text{if } Structure\_Type = Pole \\ 0.85 & \text{if } Structure\_Type = Lattice \end{cases} = 0.95$ (Per Table 2-2 of TIA-222-G)

Importance Factors = $I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$ (Per Table 2-3 of TIA-222-G)

$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$

$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$

$K_{iz} := \left(\frac{z_{AT\&T}}{33}\right)^{0.1} = 1.153$

$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.306$

Velocity Pressure Coefficient Antennas = $Kz_{AT\&T} := 2.01\left(\left(\frac{z_{AT\&T}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.081$

Velocity Pressure w/o Ice Antennas = $qz_{AT\&T} := 0.00256 \cdot K_d \cdot Kz_{AT\&T} \cdot V^2 \cdot I_{Wind} = 26.824$

Velocity Pressure with Ice Antennas = $qz_{ice.AT\&T} := 0.00256 \cdot K_d \cdot Kz_{AT\&T} \cdot V_i^2 \cdot I_{Wind} = 6.574$

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXV18-206516S-C		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 53.1$	in	(User Input)
Antenna Width =	$W_{ant} := 6.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 20$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 7.7$		
Antenna Force Coefficient =	$Ca_{ant} = 1.42$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 2.5$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 107$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 49$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 4.6$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 47$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 32$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 20$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1154$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4003$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 130$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 130$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	EMS RR90-17-XXDP		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56$	in	(User Input)
Antenna Width =	$W_{ant} := 8$	in	(User Input)
Antenna Thickness =	$T_{ant} := 2.75$	in	(User Input)
Antenna Weight =	$WT_{ant} := 15$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 7.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 3.1$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 129$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.1$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 44$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 5.3$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 54$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 31$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 15$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1232$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4396$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 142$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 142$	lbs

Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model =	TMA		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 7.7$	in	(User Input)
TMA Width =	$W_{TMA} := 7.5$	in	(User Input)
TMA Thickness =	$T_{TMA} := 3.4$	in	(User Input)
TMA Weight =	$WT_{TMA} := 11$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 1$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1$		
TMA Force Coefficient =	$Ca_{TMA} = 1.2$		

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.4$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 14$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.2$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 6$	lbs

Wind Load (with ice)

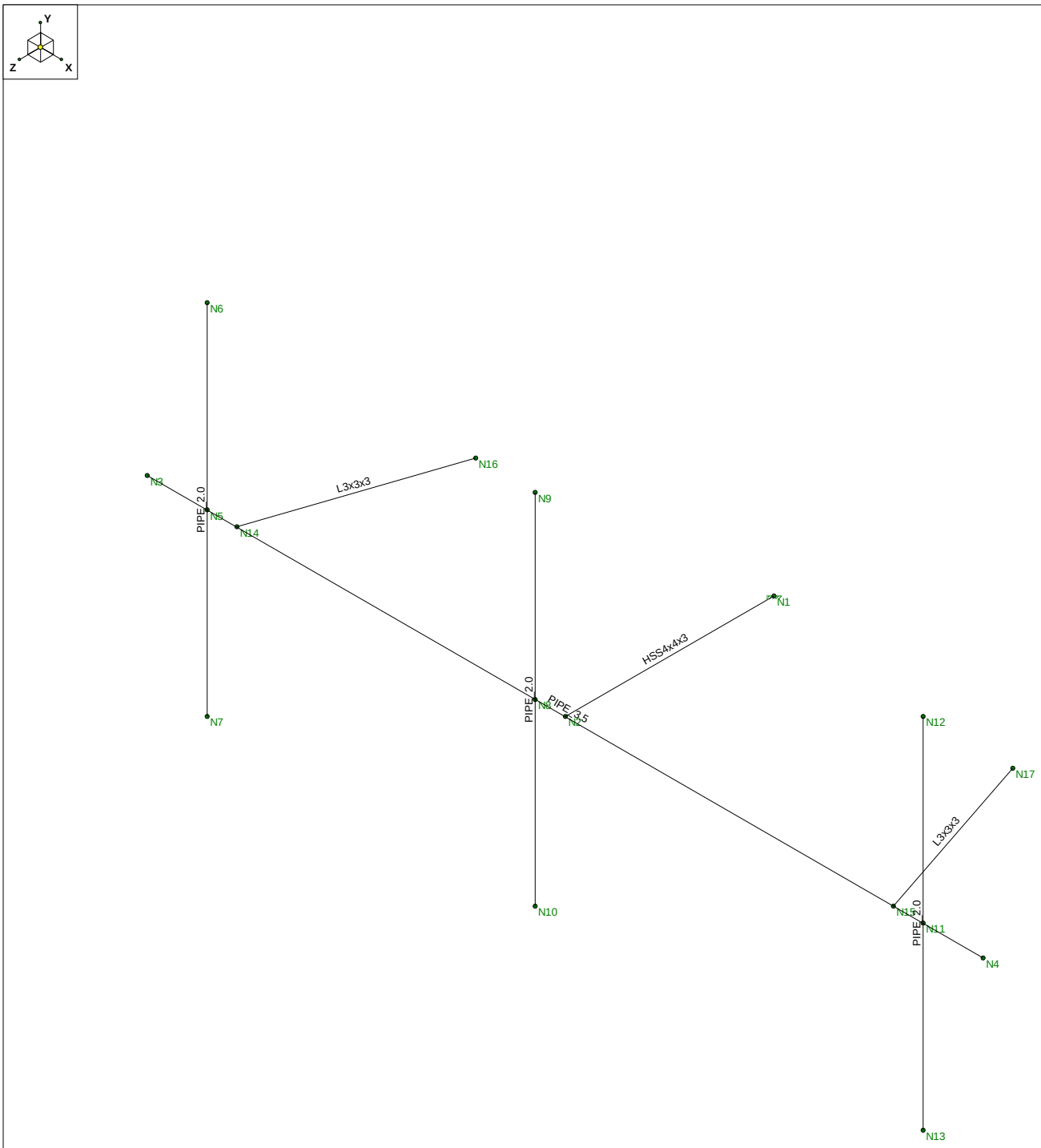
Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 1$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 9$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.7$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 6$	lbs

Gravity Load (without ice)

Weight of All TMAs =	$WT_{TMA} \cdot N_{TMA} = 11$	lbs

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 196$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz})(W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 998$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 32$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 32$	lbs



Envelope Only Solution

Centek		
TJL	CT11315C - Mount	Aug 20, 2018 at 8:34 AM
18127.04	Member Framing	Mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
	AISC 14th(360-10): ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

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	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4x4x3	Beam	Tube	A500 Gr.46	Typical	2.58	6.21	6.21	10
2	Vert	PIPE_4.0	Beam	Tube	A53 Grade B	Typical	2.96	6.82	6.82	13.6
3	Horz	PIPE_3.5	Beam	Pipe	A53 Grade B	Typical	2.5	4.52	4.52	9.04
4	Antenna Mast	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	Walkway Support	L3x3x3	Beam	Pipe	A36 Gr.36	Typical	1.09	.948	.948	.014

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	Outrigger	3.5			Lbyy						Lateral
2	M2	Horz	14			Lbyy						Lateral
3	M6	Antenna Mast	6			Lbyy						Lateral
4	M5A	Antenna Mast	6			Lbyy						Lateral
5	M6A	Antenna Mast	6			Lbyy						Lateral
6	M7	Walkway S...	3.162			Lbyy						Lateral
7	M8	Walkway S...	3.162			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N2			Outrigger	Beam	Tube	A500 Gr...	Typical
2	M2	N3	N4			Horz	Beam	Pipe	A53 Gra...	Typical
3	M6	N7	N6			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
4	M5A	N10	N9			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
5	M6A	N13	N12			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
6	M7	N14	N16			Walkway Support	Beam	Pipe	A36 Gr.36	Typical
7	M8	N15	N17			Walkway Support	Beam	Pipe	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	0	0	3.5	0	
3	N3	-7	0	3.5	0	
4	N4	7	0	3.5	0	
5	N5	-6	0	3.5	0	
6	N6	-6	3	3.5	0	
7	N7	-6	-3	3.5	0	
8	N8	-.5	0	3.5	0	
9	N9	-.5	3	3.5	0	
10	N10	-.5	-3	3.5	0	
11	N11	6	0	3.5	0	
12	N12	6	3	3.5	0	
13	N13	6	-3	3.5	0	
14	N14	-5.5	0	3.5	0	
15	N15	5.5	0	3.5	0	
16	N16	-4.5	0	.5	0	
17	N17	4.5	0	.5	0	

Joint Boundary Conditions

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

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6A	Y	-.01	.5
2	M6A	Y	-.01	5.5
3	M6	Y	-.008	.5
4	M6	Y	-.008	5.5
5	M6A	Y	-.011	4

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6A	Y	-.065	.5
2	M6A	Y	-.065	5.5
3	M6	Y	-.071	.5
4	M6	Y	-.071	5.5
5	M6A	Y	-.032	4

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6A	X	.016	.5
2	M6A	X	.016	5.5
3	M6	X	.016	.5
4	M6	X	.016	5.5
5	M6A	X	.006	4

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6A	X	.025	.5
2	M6A	X	.025	5.5
3	M6	X	.022	.5
4	M6	X	.022	5.5
5	M6A	X	.006	4

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6A	Z	.024	.5
2	M6A	Z	.024	5.5
3	M6	Z	.027	.5
4	M6	Z	.027	5.5

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6A	Z	.054	.5
2	M6A	Z	.054	5.5
3	M6	Z	.065	.5
4	M6	Z	.065	5.5

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.002	.002	0	0
2	M6	X	.002	.002	0	0
3	M5A	X	.002	.002	0	0
4	M6A	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.008	.008	0	0
2	M6	X	.008	.008	0	0
3	M5A	X	.008	.008	0	0
4	M6A	X	.008	.008	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M2	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M2	Z	.008	.008	0	0

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.05	-.021	.35	1.137
2	M1	Y	-.021	-.013	1.137	1.925
3	M1	Y	-.013	-.029	1.925	2.712
4	M1	Y	-.029	-.047	2.712	3.5
5	M7	Y	-.015	-.014	0	.791
6	M7	Y	-.014	-.015	.791	1.581
7	M7	Y	-.015	-.015	1.581	2.372
8	M7	Y	-.015	-.013	2.372	3.162
9	M8	Y	-.015	-.014	0	.791
10	M8	Y	-.014	-.015	.791	1.581
11	M8	Y	-.015	-.015	1.581	2.372
12	M8	Y	-.015	-.013	2.372	3.162

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1						
2	Equipment Weight	None					5		1	
3	Ice Weight	None					5			
4	Wind w/ Ice X	None					5	4		
5	Wind X	None					5	4		
6	Wind w/ Ice Z	None					4	1		
7	Wind Z	None					4	1		
8	BLC 2 Transient Area Loads	None						12		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D + 1.6W (X-d..	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-d..	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-d..	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-d..	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	6	1												

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	N1	max	0	6	.859	3	0	3	-1.13	5	-.036	6	.22	3
2		min	-.435	1	.416	2	-.56	4	-2.574	3	-1.445	1	.072	5
3	Totals:	max	0	6	.859	3	0	3						
4		min	-.435	1	.416	2	-.56	4						

Envelope Joint Displacements

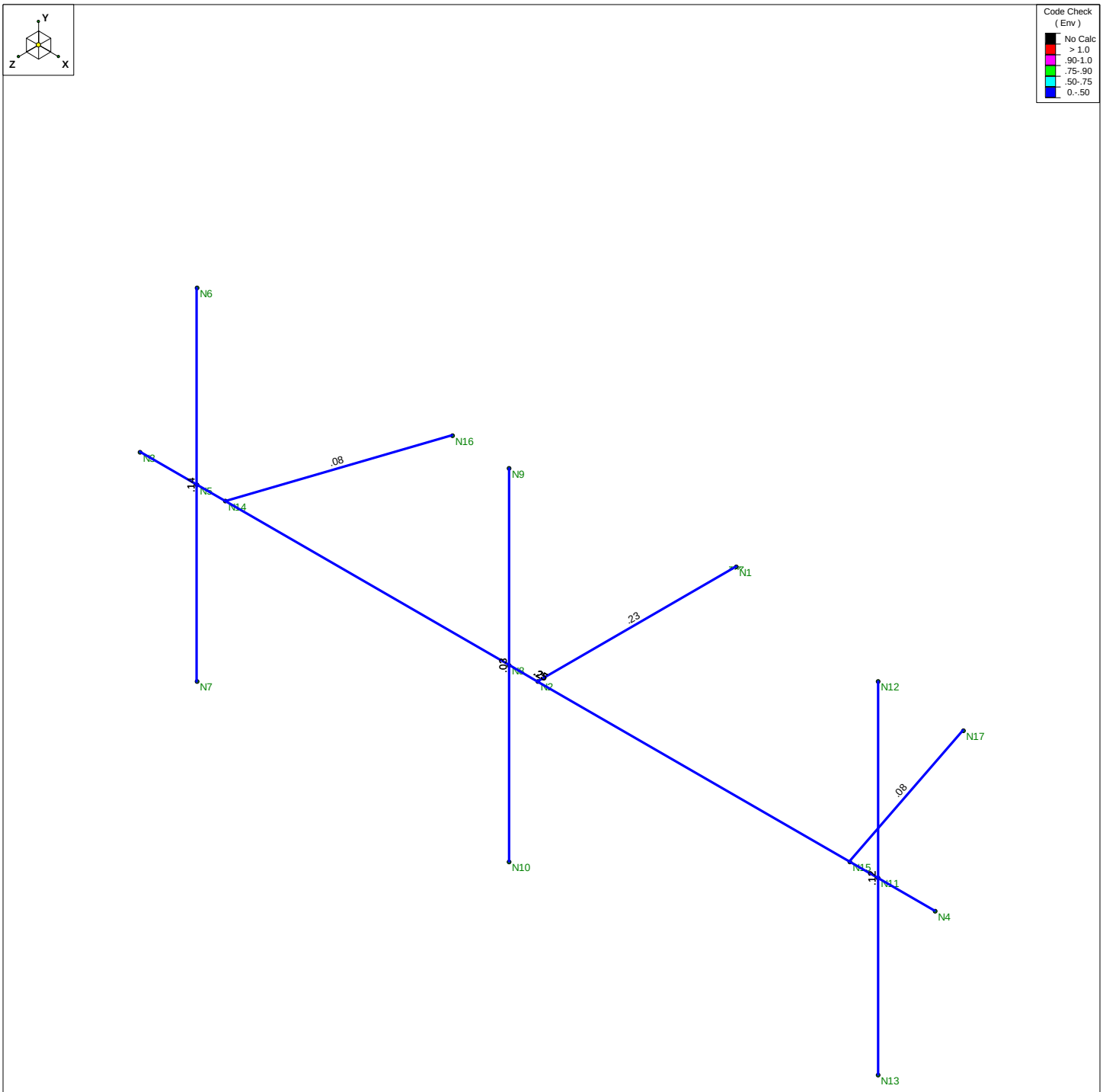
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	1	0	2	0	4	0	3	0	1	0	5
2		min	0	6	0	3	0	3	0	5	0	6	0	3
3	N2	max	.071	1	-.051	5	0	4	4.003e-03	3	2.481e-03	1	-3.237e-04	5
4		min	.003	6	-.121	3	0	3	1.603e-03	5	1.259e-04	6	-9.919e-04	3
5	N3	max	.071	1	-.166	2	.435	4	3.194e-03	6	6.884e-03	4	5.607e-03	6
6		min	.003	6	-.443	6	.056	3	9.97e-04	5	6.639e-04	3	1.957e-03	2
7	N4	max	.071	1	-.242	5	.259	4	3.196e-03	6	2.471e-03	1	-2.959e-03	5
8		min	.003	6	-.666	3	-.208	1	9.972e-04	5	-4.538e-03	4	-8.557e-03	3
9	N5	max	.071	1	-.142	2	.353	4	3.194e-03	6	6.881e-03	4	5.604e-03	6
10		min	.003	6	-.375	6	.048	3	9.97e-04	5	6.639e-04	3	1.955e-03	2
11	N6	max	.045	2	-.142	2	.485	4	4.548e-03	4	6.881e-03	4	5.616e-03	6
12		min	-.199	6	-.376	6	.163	3	9.996e-04	2	6.639e-04	3	2.96e-04	2
13	N7	max	.235	3	-.142	2	.401	5	3.187e-03	3	6.881e-03	4	6.163e-03	3
14		min	.087	5	-.376	6	-.067	3	-2.22e-03	5	6.639e-04	3	1.978e-03	5
15	N8	max	.071	1	-.05	2	.015	1	3.93e-03	3	2.482e-03	1	1.483e-04	6
16		min	.003	6	-.118	6	.002	6	1.548e-03	5	3.704e-04	6	7.092e-05	2
17	N9	max	.084	2	-.05	2	.145	3	3.931e-03	3	2.482e-03	1	1.484e-04	6
18		min	-.003	6	-.118	6	.064	5	1.548e-03	5	3.704e-04	6	-4.994e-04	2
19	N10	max	.091	1	-.05	2	-.041	2	3.929e-03	3	2.482e-03	1	6.789e-04	1
20		min	.008	6	-.118	6	-.14	6	1.547e-03	5	3.704e-04	6	9.919e-05	5
21	N11	max	.071	1	-.207	5	.205	4	3.196e-03	6	2.471e-03	1	-2.957e-03	5
22		min	.003	6	-.564	3	-.178	1	9.972e-04	5	-4.536e-03	4	-8.555e-03	3
23	N12	max	.344	3	-.207	5	.323	4	4.005e-03	4	2.471e-03	1	-2.959e-03	5
24		min	.122	5	-.564	3	-.142	2	9.999e-04	2	-4.536e-03	4	-9.196e-03	3
25	N13	max	.009	2	-.207	5	.239	5	3.189e-03	3	2.471e-03	1	-1.248e-03	2
26		min	-.303	6	-.564	3	-.226	1	-1.675e-03	5	-4.536e-03	4	-8.479e-03	6
27	N14	max	.071	1	-.131	2	.312	4	3.194e-03	6	6.838e-03	4	5.567e-03	6
28		min	.003	6	-.342	6	.044	3	9.969e-04	5	6.639e-04	3	1.945e-03	2
29	N15	max	.071	1	-.189	5	.177	4	3.196e-03	6	2.471e-03	1	-2.945e-03	5
30		min	.003	6	-.512	3	-.163	1	9.971e-04	5	-4.499e-03	4	-8.506e-03	3
31	N16	max	-.024	3	-.097	2	.225	5	2.079e-03	6	7.549e-03	4	5.195e-03	6
32		min	-.25	4	-.194	6	.029	3	1.605e-04	5	1.375e-03	3	1.666e-03	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
33	N17	max	.163	5	-.143	5	.13	4	2.08e-03	6	3.182e-03	1	-2.666e-03	5
34		min	-.037	1	-.329	3	-.129	2	1.603e-04	5	-3.965e-03	5	-8.134e-03	3

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

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc.....	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M1	HSS4x4x3	.234	0	3	.049	0	y 3	101.674	106.812	12.662	12.662	1...	H1-1b
2	M2	PIPE_3.5	.249	7	6	.030	7	6	35.421	78.75	7.954	7.954	1...	H1-1b
3	M6	PIPE_2.0	.140	3	4	.011	3	4	20.867	32.13	1.872	1.872	1...	H1-1b
4	M5A	PIPE_2.0	.031	3	1	.004	3	1	20.867	32.13	1.872	1.872	1...	H1-1b
5	M6A	PIPE_2.0	.116	3	4	.009	3	1	20.867	32.13	1.872	1.872	1...	H1-1b
6	M7	L3x3x3	.085	0	4	.006	0	y 1	26.325	35.316	1.32	2.905	2...	H2-1
7	M8	L3x3x3	.085	0	1	.006	0	y 4	26.325	35.316	1.32	2.905	2...	H2-1



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11315C - Mount	Aug 20, 2018 at 8:33 AM
18127.04	Unity Check	Mount.r3d

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

T-Mobile Existing Facility

Site ID: CT11315C

Plainfield/I-395_1
246 East Franklin Street
Danielson, CT 06239

March 10, 2019

EBI Project Number: 6219000684

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	11.94 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
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March 10, 2019

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11315C – Plainfield/I-395_1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **246 East Franklin Street, Danielson, 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.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency 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 done for the proposed T-Mobile Wireless antenna facility located at **246 East Franklin Street, Danielson, 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.

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

1) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

5) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the **RFS APXV18-206516S-C-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna 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.

7) The antenna mounting height centerline of the proposed antennas is **131 feet** above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	131 feet	Height (AGL):	131 feet	Height (AGL):	131 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	5	Channel Count	5	Channel Count	5
Total TX Power(W):	215	Total TX Power(W):	215	Total TX Power(W):	215
ERP (W):	9,171.46	ERP (W):	9,171.46	ERP (W):	9,171.46
Antenna A1 MPE%	**2.11**	Antenna B1 MPE%	**2.11**	Antenna C1 MPE%	**2.11**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.11 %**
AT&T	**4.64** %
MetroPCS	**0.39** %
Verizon Wireless	**2.13** %
Sprint	**2.67** %
Site Total MPE %:	**11.94 %**

T-Mobile Sector A Total:	2.11 %
T-Mobile Sector B Total:	2.11 %
T-Mobile Sector C Total:	2.11 %
Site Total:	11.94 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (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 PCS - 1900 MHz GSM	1	639.87	131	1.47	PCS - 1900 MHz	1000.00	0.15%
T-Mobile PCS - 1900 MHz LTE	2	1,706.32	131	7.84	PCS - 1900 MHz	1000.00	0.78%
T-Mobile AWS - 2100 MHz LTE	2	2,559.48	131	11.78	AWS - 2100 MHz	1000.00	1.18%
						Total:	**2.11%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	2.11 %
Sector B:	2.11 %
Sector C:	2.11 %
T-Mobile Maximum MPE % (Per Sector):	2.11 %
Site Total:	11.94 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.94%** 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.