CENTERLINE COMMUNICATIONS

dish WIRELESS

Gamma Purchasing L.L.C. ("DISH")

Alex Murshteyn
Real Estate Consultant
750 W. Center St, Suite 301
W. Bridgewater, MA 02379
Phone: (508) 821-0159
amurshteyn@clinellc.com

February 4, 2019

Honorable James J. Murphy, Jr., Acting Chairman
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: **Request for Tower Share**
Gamma Purchasing L.L.C. ("DISH" a/k/a "Dish" f/k/a "Dish Network") Request for Approval of the Shared Use of an Existing Tower at 1 Deerfield Lane, Ansonia, CT (f/k/a 2 Osbourne Lane a/k/a Osborne Lane)
DISH site number: CT0100002A (SBA: CT13071-A)

Dear Chairman Murphy and Members of the Council:

Dish proposes to share an existing telecommunications tower located at 1 Deerfield Lane (a/k/a Osborne Lane, at Woodbridge line) in Ansonia, CT (the facility). The subject parcel is identified by the City of Ansonia as Map 100, Block 0003. The property is owned by Macabee Properties, LLC. The tower is owned by SBA Communications. The property is roughly 16.2± acres and accommodates four existing one-story industrial building plus the self-supporting lattice tower with its chain-link fenced compound, with two utility buildings, generators and concrete pads within. The facility is and will continue to be owned and operated by SBA Communications.

Pursuant to Connecticut General Statues Section 16-50aa (the Statute), Dish requests a finding from the Connecticut Siting Council that the shared use of this facility is technically, legally, environmentally and economically feasible, will meet safety concerns, will avoid the unnecessary proliferation of towers and is in the public interest. It further requests an order approving the shared use of this facility.

The purpose of this request is to use an existing tower to develop Dish's wireless network to provide high speed wireless data and wireless service within the State of Connecticut and in this part of Ansonia: avoiding the need for an additional tower in Ansonia nearby Woodbridge and Seymour, CT.

Dish is licensed by the Federal Communications Commission ("FCC") to provide multiple technologies, including NB-IoT, PCS and AWS (1900 MHz and 2000-2020 MHz) in New Haven County. Dish is building and enhancing its network to take advantage of its licensed spectrum, and improve its Personal Carrier Services (PCS) and other FCC-licensed wireless data services.

Existing Facility & Proposed Modification

The existing facility is and will continue to be a 169' monopole tower located at 1 Deerfield Lane on the Ansonia side of Osborne Lane. Site coordinates (NAD83) are N41° 21' 2.69" and W73° 2' 57.3" (or 43.35075, -73.04925). Currently there are four other commercial wireless carriers licensed on this tower, whereby Dish now intends to use the vacant space near the bottom of the pole. The site plan of the facility is included in the proposed Construction Drawings, prepared by Foresite Group, Inc. dated January 21, 2019 and enclosed herewith.

Dish intends to install three (3) ODI2-065R18K-GQ Comba panel antennas and five (5) Ericsson RRUs on an antenna sector frame to be attached to the monopole tower at the 117' mount level. Dish will also install one (1) 1-1/4" hybrid fiber cable on the tower. Down below, inside the existing fenced compound, it will install one (1) platform with a platform-level 3' dish antenna.

Dish intends to enter into a new agreement, at this tower height, in order to license the portion of space within the existing fenced compound for new 5'-0" x 7'-0" steel platform with canopy on concrete piers. It will install one (1) new 5'-3" stacked cabinet beneath the ice canopy, along with one (1) telco and one (1) power cabinet on an H-frame thereon. Equipment will thus remain within the existing fenced compound. A new ground conduit will also be installed on sleepers beneath the ice canopy in order to connect the equipment with the tower. A GPS antenna with a 3' satellite dish will be located on the platform canopy near the ice bridge.

Consistent with the requirements of the Statute, it is feasible for Dish to collocate at this facility. Dish is proposing to collocate on the existing monopole tower that will continue to remain in the ownership of SBA Communications. Included with this application is a Structural Analysis Report from Tower Engineering Solutions dated January 21, 2019 that shows that the existing tower can support Dish's proposed equipment.

The Proposal is Legally Feasible.

The Council has authority, pursuant to statute, to issue an order approving of the shared use of this tower. By issuing an order approving Dish's shared use of this tower, Dish will be able to proceed with obtaining a building permit for the proposed installation. SBA Communications has executed a Letter of Authorization that approved Dish's Request for Tower Share filing on February 4, 2019, which approval is included with this application. Dish's proposal is legally feasible.

Dish is a telecommunication provider licensed by the FCC to provide service in the State of Connecticut, including but not limited to New London County. Dish will enter into an agreement with the owner of this facility, American Tower, for the location of this proposed equipment on the existing tower so that it may provide telecommunications services to the surrounding community. Consequently, the proposal is legally feasible.

The Proposal is Environmentally Feasible.

Pursuant to the Statute, the proposal will be environmentally feasible for the following reasons:

- The overall impact on the City of Ansonia will be decreased with the sharing of a single tower versus the proliferation of multiple towers.
- There will be no material increase in the visibility of the tower with the addition of the antennas and associated equipment on the tower.
- There will be no increased impact on air quality because no air pollutants will be generated during normal operation of the facility.
- There will only be a brief, slight increase in noise pollution while the site is under construction.
- During construction, the proposed project will generate a small amount of traffic as construction takes place. Upon completion, traffic will be limited to an average of one trip per month for maintenance and inspections.
- There will be no adverse impact to the health and safety of the surrounding community or workers at the facility due to the addition of Dish's new antennas to the tower. Dish has performed an analysis of the radio frequency field emanating from the transmitting antennas on the tower to ensure compliance with the National Council on Radiation Protection and measurements (NCRP) standard for maximum permissible exposure (MPE) adopted by the FCC. The analysis dated January 16, 2019 indicates that Dish and other antennas on the tower will cumulatively emit 12.74% of the NCRP standard for maximum permissible exposure. The report indicates that maximum level of exposure will be well below the FCC's mandated radio frequency exposure limits. The report is enclosed herewith and the calculations are below.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Comba ODD2-06521SX-GQ	1930 MHz (PCS) - H Block Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	1.71
						Sector A Composite MPE%	1.71
Antenna B1	Comba ODD2-06521SX-GQ	1930 MHz (PCS) - H Block Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	1.71
						Sector B Composite MPE%	1.71
Antenna C1	Comba ODD2-06521SX-GQ	1930 MHz (PCS) - H Block Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	1.71
						Sector C Composite MPE%	1.71

Site Composite MPE%	
Carrier	MPE%
Dish Wireless – Max Per Sector Value	1.71 %
T-Mobile	1.79 %
Sprint	3.14 %
Clearwire	0.05 %
Verizon Wireless	2.04 %
MetroPCS	0.40 %
AT&T	3.61 %
Site Total MPE %:	12.74 %

Dish Wireless Sector A Total:	1.71 %
Dish Wireless Sector B Total:	1.71 %
Dish Wireless Sector C Total:	1.71 %
Site Total:	12.74 %

- Dish expects to enhance safety in this portion of Ansonia, Woodbridge and Seymour by improving wireless telecommunications for local residents and travelers. Dish is currently developing its network to provide its customers with quality and reliable coverage to comply with their FCC license, the site is a necessary part of Dish's network development.

- Specifically, this proposal is designed to provide reliable wireless coverage for this section of Ansonia, CT.

Conclusions:

For the reasons stated above, the attachment of Dish's antennas and associated equipment to the tower would meet all the requirements set forth in the Statute. The proposal is legally, technically, economically and environmentally feasible and meets all public safety concerns. Therefore, Dish respectfully requests that the Council approve this request for the shared use of this tower located at 1 Deerfield Lane, Ansonia, CT.

Respectfully yours,

Alex Murshteyn
Real Estate Consultant – Site Acquisition
c/o Gamma Purchasing L.L.C. (Dish)
Centerline Communications, LLC
750 West Center Street, Floor 3 / Suite 301
West Bridgewater, MA 02379
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

Enclosures (7)

cc: Davis S. Cassetti, City of Ansonia, Mayor of Ansonia - chief elected official
David Blackwell, Sr., Zoning Enforcement Officer / Anti-Blight Officer - P&Z official
Macabee Properties, LLC - property owner
SBA Communications - tower owner
DISH (e-mail)

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

DWT: 14,10,1

SHIP TO:
DAVID S. CASSETTI, MAYOR
CITY OF ANSONIA
253 MAIN STREET
ANSONIA CT 06401-1806

CT 064 7-02

UPS GROUND
TRACKING #: 1Z 9Y4 503 03 2808 9420

BILLING: P/P

Reference#1: CT0100002A
Reference#2: CSC TS - CEO

UIS 21.0.23. WNTNV50 09.0A 01/2019

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

DWT: 14,10,1

SHIP TO:

DAVID BLACKWELL, SR., ZONING ENFOR-
CEMENT OFFICER/ANTI-BLIGHT OFFICER
253 MAIN STREET
CITY OF ANSONIA
ANSONIA CT 06401-1806

CT 064 7-02

UPS GROUND

TRACKING #: 1Z 9Y4 503 03 2435 5032

BILLING: P/P

Reference#1: CT0100002A
Reference#2: CSC TS - P&Z

UIS 21.0.23. WNTNV50 09.0A 01/2019

TM

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

DWT: 14,10,1

SHIP TO:

SHAWN NOTTAGE, SITE MARKETING MGR
4015336434
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVENUE
BOCA RATON FL 33487-1307

FL 332 6-07

UPS GROUND

TRACKING #: 1Z 9Y4 503 03 3366 5252

BILLING: P/P

Reference#1: CT0100002A
Reference#2: CSC EM - TO

UIS 21.0.23. WNTNV50 09.0A 01/2019

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

DWT: 14,10,1

SHIP TO:
MACABEE PROPERTIES, LLC
11 HEMLOCK HOLLOW RD
WOODBRIDGE CT 06525-1313

CT 064 7-02

UPS GROUND

TRACKING #: 1Z 9Y4 503 03 2591 3641

BILLING: P/P

Reference#1: CT0100002A
Reference#2: CSC EM - PO

UIS 21.0.23. WNTNV50 09.0A 01/2019

SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487-1307

T + 561.995.7670
F + 561.995.7626

sbasite.com

LETTER OF AUTHORIZATION

SBA Site ID: CT13071-A, Woodbridge

Property Located at: 1 Deerfield Lane, Ansonia, CT, 06401

THE CITY/COUNTY OF: Ansonia / New Haven/Ansonia

APPLICATION FOR ZONING/USE/BUILDING PERMIT

This letter authorizes Dish Network and its authorized agents to file for all necessary zoning, planning and building permits (local, state and federal) for the purposes of installing, operating and maintaining a telecommunications facility on the existing tower on the property referenced above on behalf of Macabee Properties, LLC.

All approval conditions that may be granted to Dish Network in connection with above referenced facility relating to this specific application are the sole responsibility of Dish Network.

SBA Towers IV, LLC

Jason Silberstein

Executive VP, Site Leasing

Date: 2/04/2019

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

Structural Analysis Report

Existing 169 ft SABRE Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13071-A

Customer Site Name: Woodbridge

Carrier Name: Dish Network (App#: 105639, V2)

Carrier Site ID / Name: CT0100002A / TBD

Site Location: 1 Deerfield Lane

Ansonia, Connecticut

New Haven County

Latitude: 41.350750

Longitude: -73.049250

1/21/19

Analysis Result:

Max Structural Usage: 81.0% [Pass]

Max Foundation Usage: 80.0% [Pass]

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

Report Prepared By : Linfeng Chen

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

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

Report Prepared By : Linfeng Chen

Introduction

The purpose of this report is to summarize the analysis results on the 169 ft SABRE 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	Sabre, DWG # 08-01016-PE, dated 1/7/2008
Foundation Drawing	Sabre, DWG # 08-01016, dated 1/30/2008
Geotechnical Report	JGI Eastern, Inc., Project # J2085109, dated 1/29/2008
Modification Drawings	TES, Project # 17022, dated 9/1/2015 TES, Project # 19194, dated 12/9/2015 TES, Project # 22848 dated 6/23/2016

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} = 125.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 97.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.176, S_1 = 0.063

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	167.0	3	Ericsson - AIR 21 B2A/B4P - Panel	(3) T-Arms/Commscope VSR-MS-B	(12) 1 5/8" (1) 1 5/8" Fiber (1) 1-1/4" Fiber	T-Mobile
2		3	Ericsson - AIR 21 B4A/B2P - Panel			
3		3	RFS - APXVAA24_43-U-A20 - Panel			
4		3	Ericsson - KRY 112 144/2 - TMA			
5		3	Ericsson - Radio 4449 B71+B12 - RRU			
6	157.0	3	ALU RRH2X60-AWS RRH	(3) T-Arms	(6) 1 5/8" (12) 1 5/8" (1) 1 5/8" Fiber (1) 1/2"	Verizon[1]
7		3	ALU/900 RRH2X60W - RRH			
8		1	Antel BXA-70063/6CF - Panel			
9		4	Decibel - DB846F65ZAXY - Panel			
10		2	Decibel - DB846H80E-SX - Panel			
11		1	GPS			
12		6	Andrew - HBX-6517DS-VTM - Panel			
13		1	RFS DB T1-6Z-8AB-OZ Distribution Box			
14		2	Swedcom - SLCP 2x6014F - Panel			
15	148.0	3	Powerwave 7770 - Panel	(3) T-Arms w/ (6) 2" STD Steel Pipe Brace Secured Existing Mount & Tower *	(12) 1 5/8" (1) 1/2" Fiber (2) 3/4" DC Power	AT&T
16		1	Cci OPA-65R-LCUU-H6 - Panel			
17		2	Cci OPA-65R-LCUU-H8 - Panel			
18		2	CCI HPA-65R-BUU-H6 - Panel			
19		4	CCI HPA-65R-BUU-H8 - Panel			
20		6	Powerwave LGP21401 TMA			
21		6	Powerwave LGP13519 Diplexer			
22		3	Ericsson RRUS-11 (17.8x17.3x7.2) - RRU			
23		9	Ericsson RRUS 32 - RRU			
24		3	Powerwave 1001940 - Bias-T			
25		2	Raycap DC6-48-60-18-8F - Surge			
26		1	Commscope - WCS-IMFQ-AMT - Filter			
27	137.0	6	APXV18-206517S-C – Panel	(3) T-Arms	(6) 1 5/8"	Metro PCS
28	127.0	3	Nokia AAHC - Panel	(1) SitePro Low Profile Platform w/ handrail (RMQP-4096-HK)	(4) 1/2" Coax (1) 1-5/8" Fiber (4) 1-1/4 Fiber	Sprint Nextel
29		3	Commscope NNVV-65B-R4 - Panel			
30		4	Dragonwave Horizon Duo			
31		3	ALU 1900 Mhz - RRU			
32		6	ALU 800 Mhz - RRU			
33		3	ALU TD-RRH8x20-25 - RRU			
34		3	Andrew VHLP2-11 - Dish			
35		1	Andrew VHLP800-11 - Dish			

*AT&T added mount modifications in this SA.

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
36	117.0	2	Ericsson 4415 RRU	Standoff Sector Frame (3) Commscope SF-SU7-2-96	(1) 1-1/4" Hybrid	Dish Network
37		3	Ericsson 0208 RRU			
38		3	Comba ODI2-065R18K-GQ - Panel			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**81.0%**	**75.1%**	**62.6%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	4554.4	35.6	59.8

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):

The maximum twist and sway of the microwave dishes under the operational wind speed as specified in the Analysis Criteria are listed in the table below:

Elevation (ft)	Antenna / Dish	Carrier	Twist (deg)	Sway (deg)
127.0	Andrew - VHLP2-11 - Dish	Sprint Nextel	0.001	1.450
127.0	Andrew Microwaves - VHLP800-11 - Dish	Sprint Nextel	0.001	1.450

It is recommended that the carriers review the twist and sway values of the microwave dishes.

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.

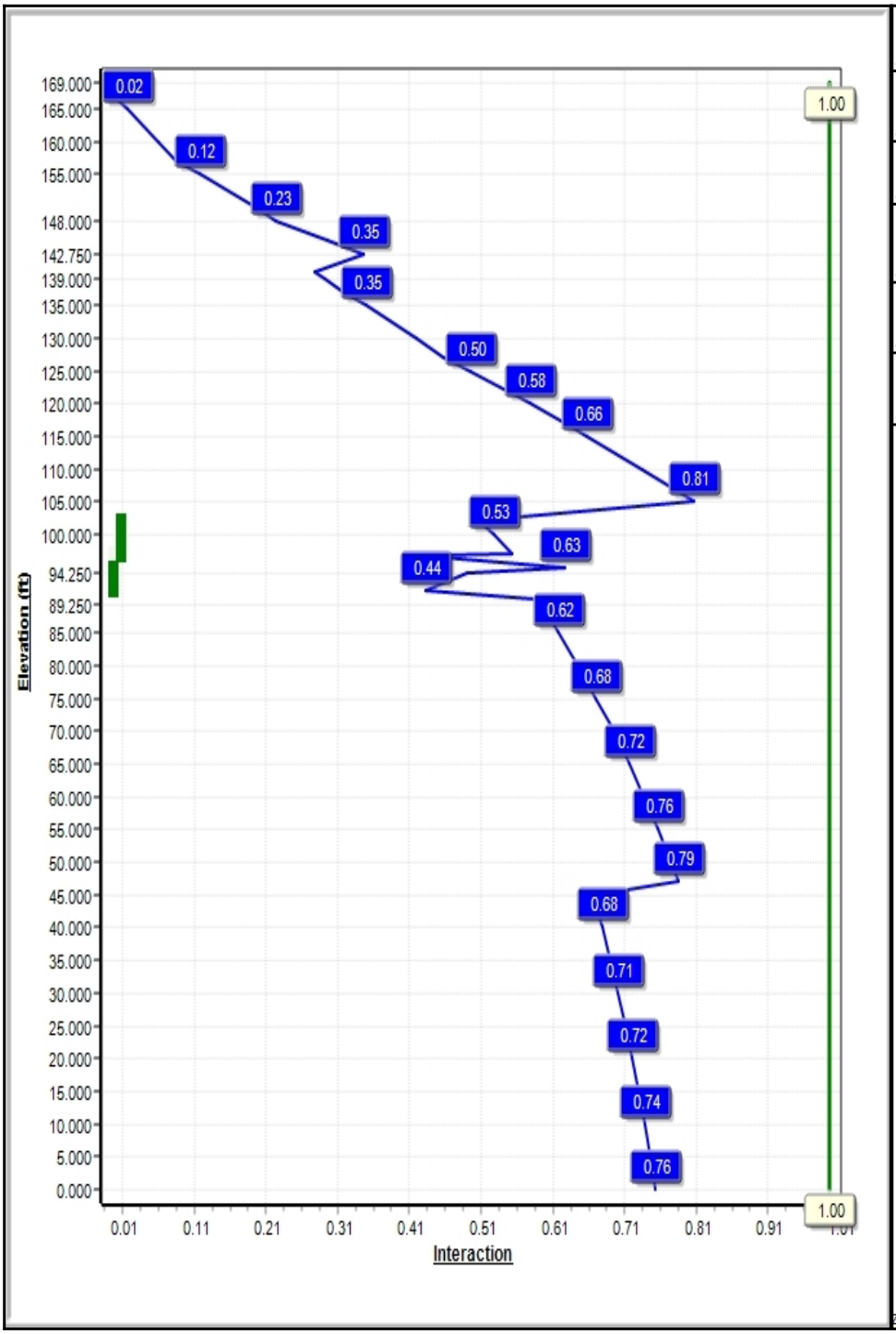
Usage Diagram - Max Ratio 81.04% at 105.0ft

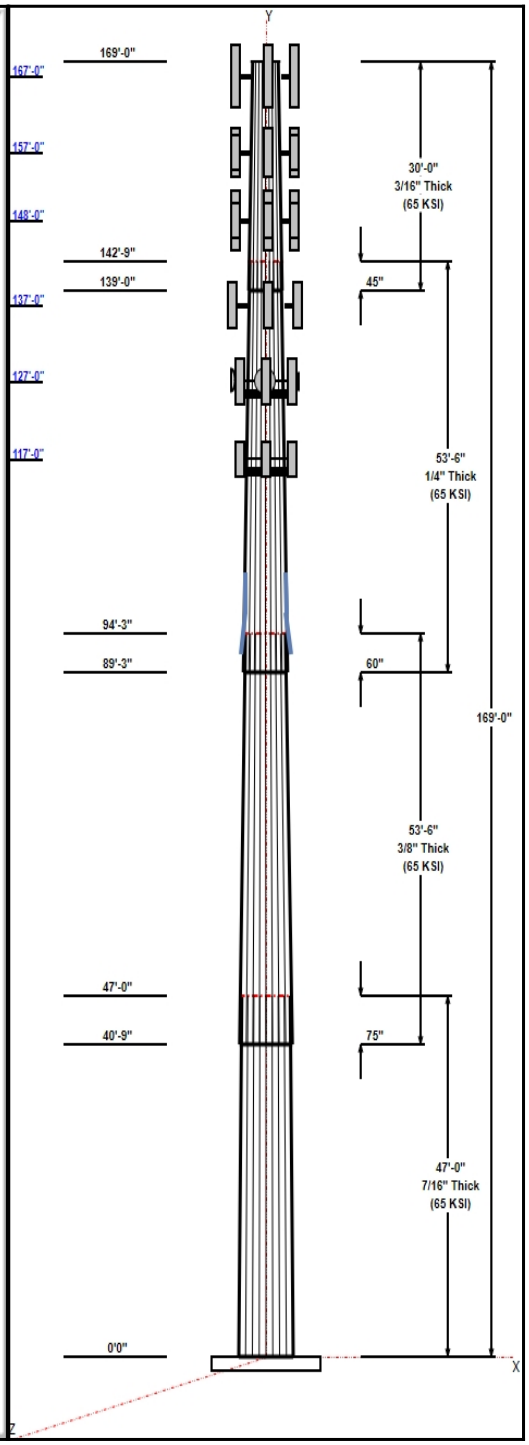
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge	**Exposure:**	B	
Height:	169.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

Tower Engineering Solutions

Dead Load Factor:	1.20	**Iterations:**	27
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 97 mph Wind





Structure: CT13071-A-SBA

Type: Tapered
Site Name: Woodbridge
Height: 169.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.20003

1/21/2019

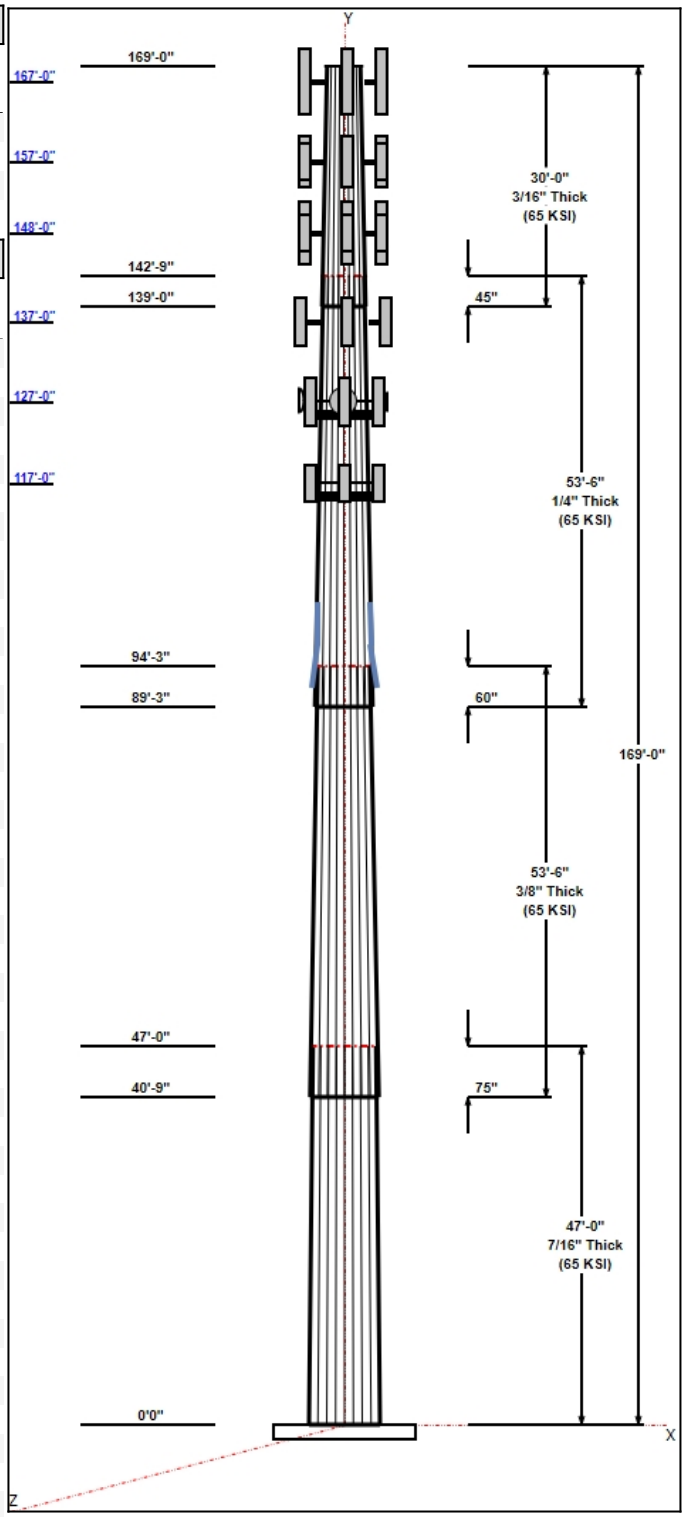
Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	47.00	46.78	56.18	0.438		0.20003	65
2	53.50	38.08	48.78	0.375	Slip	0.20003	65
3	53.50	28.88	39.58	0.250	Slip	0.20003	65
4	30.00	24.00	30.00	0.188	Slip	0.20003	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
167.00	167.50	3	T-Arms/Commscope	T-Mobile
167.00	167.00	3	AIR 21 B2A/B4P	T-Mobile
167.00	167.00	3	AIR 21 B4A/B2P	T-Mobile
167.00	167.00	3	Ericsson - KRY 112 144/2	T-Mobile
167.00	167.00	3	APXVAA24_43-U-A20	T-Mobile
167.00	167.00	3	Ericsson - Radio 4449	T-Mobile
157.00	157.00	3	ALU/900 RRH2X60W -	Verizon
157.00	157.00	1	BXA-70063/6CF	Verizon
157.00	157.00	3	T-Arms	Verizon
157.00	157.00	2	SLCP 2x6014F	Verizon
157.00	157.00	4	DB846F65ZAXY	Verizon
157.00	157.00	2	DB846H80E-SX	Verizon
157.00	157.00	6	HBX-6517DS-VTM	Verizon
157.00	157.00	3	ALU RRH2X60-AWS RRH	Verizon
157.00	157.00	1	RFS DB T1-6Z-8AB-OZ	Verizon
157.00	157.00	1	GPS	Verizon
150.00	150.00	1	Collar Mount	AT&T
148.00	148.00	3	Ericsson RRUS-11-RRU	AT&T
148.00	148.00	2	Raycap	AT&T
148.00	148.00	3	T-Arms w/ Modifications	AT&T
148.00	148.00	3	Powerwave 7770	AT&T
148.00	148.00	6	Powerwave LGP21401	AT&T
148.00	148.00	6	Powerwave LGP13519	AT&T
148.00	148.00	1	Commscope	AT&T
148.00	148.00	1	Cci OPA-65R-LCUU-H6	AT&T
148.00	148.00	2	Cci OPA-65R-LCUU-H8	AT&T
148.00	148.00	2	CCI HPA-65R-BUU-H6	AT&T
148.00	148.00	4	CCI HPA-65R-BUU-H8	AT&T
148.00	148.00	3	Powerwave 1001940-Bias	AT&T
148.00	148.00	9	Ericsson RRUS 32-RRU	AT&T
137.00	137.00	3	T-Arms	Metro PCS
137.00	137.00	6	APXV18-206517S-C	Metro PCS
127.00	127.00	3	VHLP2-11	Sprint Nextel
127.00	127.00	1	VHLP800-11	Sprint Nextel
127.00	127.00	4	Horizon Duo	Sprint Nextel
127.00	127.00	3	1900MHz RRH	Sprint Nextel
127.00	127.00	6	800 MHz RRH	Sprint Nextel
127.00	127.00	3	TD-RRH8x20-25	Sprint Nextel
127.00	127.00	1	RMQP-4096-HK	Sprint Nextel
127.00	127.00	3	AAHC	Sprint Nextel
127.00	127.00	3	NNVV-65B-R4	Sprint Nextel
117.00	117.00	3	Standoff Sector Frame	Dish Network
117.00	117.00	2	Ericsson 4415 RRU	Dish Network
117.00	117.00	3	Ericsson 0208 RRU	Dish Network
117.00	117.00	3	Comba	Dish Network



Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	167.00	Inside	1 5/8" Coax	T-Mobile
0.00	167.00	Inside	1 5/8" Fiber	T-Mobile
0.00	167.00	Inside	1-1/4" Fiber	T-Mobile
0.00	157.00	Inside	1 5/8" Coax	Verizon
0.00	157.00	Outside	1 5/8" Coax	Verizon
0.00	157.00	Inside	1 5/8" Fiber	Verizon
0.00	157.00	Inside	1/2" Coax	Verizon
0.00	148.00	Inside	1 5/8" Coax	AT&T
0.00	148.00	Inside	1/2" Fiber	AT&T
0.00	148.00	Inside	3/4" DC	AT&T
0.00	137.00	Inside	1 5/8" Coax	Metro PCS
0.00	127.00	Inside	1 5/8" Fiber	Sprint Nextel
0.00	127.00	Inside	1-1/4" Fiber	Sprint Nextel
0.00	127.00	Inside	1/2" Coax	Sprint Nextel
0.00	117.00	Inside	1-1/4" Hybrid	Dish Network
99.25	104.50	Outside	1" Reinforcing plate	
89.25	99.25	Outside	1" Reinforcing plate	44 Farms

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
16	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.0000	61.3	60.0	Clipped

Reactions

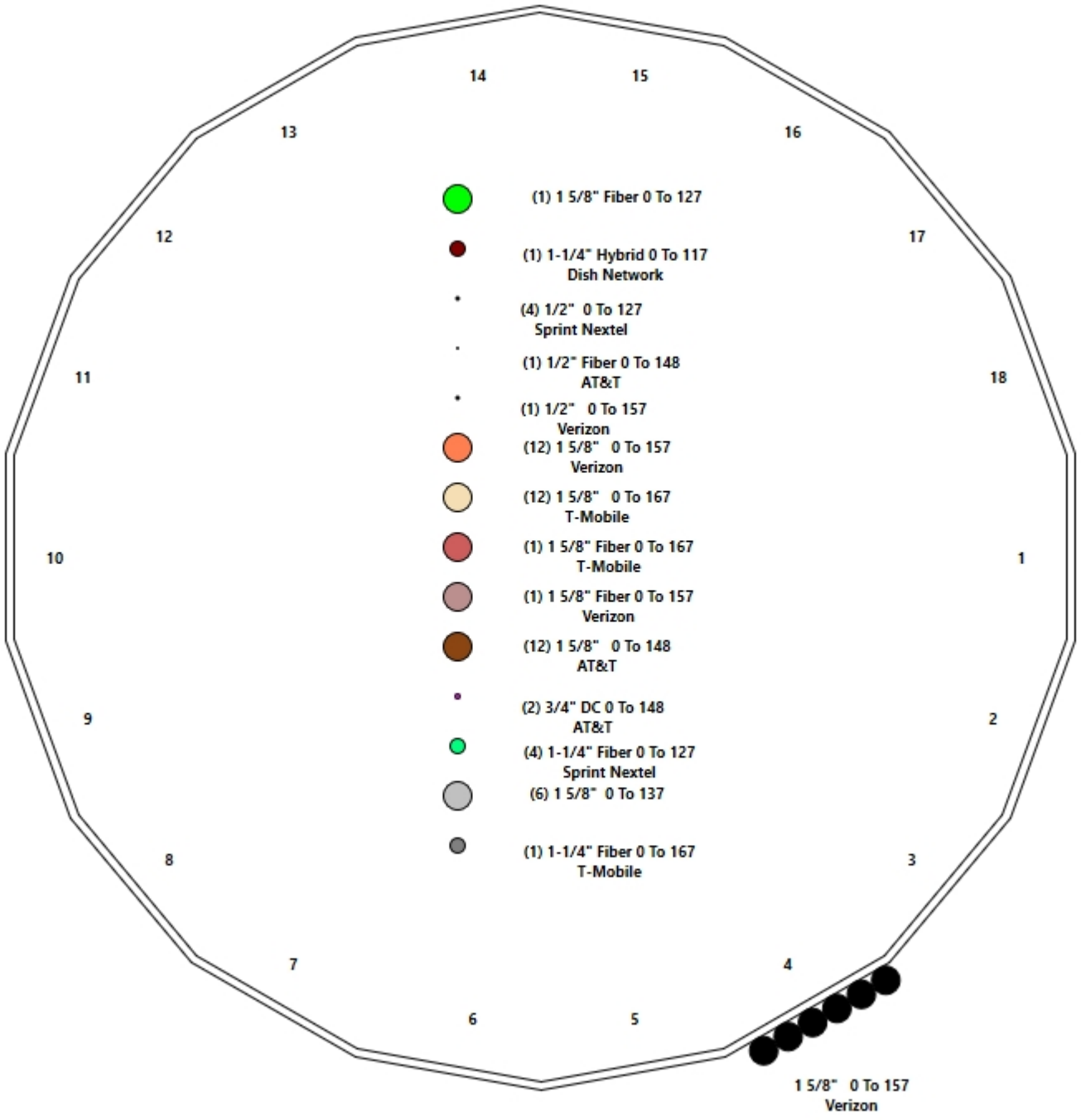
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	4554.4	35.6	59.8
0.9D + 1.6W 97 mph Wind	4489.6	35.5	44.8
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1250.0	9.7	93.8
1.2D + 1.0E	225.2	1.8	59.8
0.9D + 1.0E	221.8	1.8	44.9
1.0D + 1.0W 60 mph Wind	1080.9	8.5	49.9

Structure: CT13071-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Woodbridge
Height: 169.00 (ft)

1/21/2019

Tower Engineering Solutions



Shaft Properties

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	47.000	0.4375	65		0.00	11,335
2	18	53.500	0.3750	65	Slip	75.00	9,329
3	18	53.500	0.2500	65	Slip	60.00	4,908
4	18	30.000	0.1875	65	Slip	45.00	1,629
					Total Shaft Weight:		**27,200**

	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	56.18	0.00	77.40	30386.58	21.23	128.41	46.78	47.00	64.35	17459.0	17.44	106.9	0.200030
2	48.78	40.75	57.61	17053.51	21.53	130.08	38.08	94.25	44.87	8058.91	16.49	101.5	0.200030
3	39.58	89.25	31.21	6097.74	26.50	158.31	28.88	142.75	22.71	2351.56	18.96	115.5	0.200030
4	30.00	139.0	17.74	1992.41	26.80	160.00	24.00	169.00	14.17	1015.22	21.16	128.0	0.200030

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**
91.50	97.00	3	LNP LP6X100-G-10TT	65	80	0.00	5/8" Hollo Bolt	23.00	5/8" Hollo Bolt		9	9
96.75	102.2	3	LNP LP6X100-G-10TT	65	80	0.00	5/8" Hollo Bolt	23.00	5/8" Hollo Bolt		9	9

Load Summary

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	167.00	T-Arms/Commscope VSR-MS-B	3	340.00	6.75	0.75	579.91	12.704	0.75	0.00	0.50
2	167.00	AIR 21 B2A/B4P	3	92.00	6.09	0.86	263.11	7.155	0.86	0.00	0.00
3	167.00	AIR 21 B4A/B2P	3	91.50	6.09	0.86	262.32	7.200	0.86	0.00	0.00
4	167.00	Ericsson - KRY 112 144/2	3	11.00	0.41	0.75	21.90	0.890	0.75	0.00	0.00
5	167.00	APXVAA24_43-U-A20	3	128.00	20.24	0.73	561.31	22.187	0.73	0.00	0.00
6	167.00	Ericsson - Radio 4449 B71+B12	3	74.00	1.65	0.75	142.20	2.167	0.75	0.00	0.00
7	157.00	ALU/900 RRH2X60W - RRH	3	46.00	1.88	0.76	115.51	2.469	0.78	0.00	0.00
8	157.00	BXA-70063/6CF	1	17.00	7.57	1.00	159.36	10.346	1.00	0.00	0.00
9	157.00	T-Arms	3	350.00	8.00	0.75	595.45	15.013	0.75	0.00	0.00
10	157.00	SLCP 2x6014F	2	20.00	6.49	0.93	197.04	8.575	0.93	0.00	0.00
11	157.00	DB846F65ZAXY	4	21.00	7.05	0.92	219.47	8.287	0.93	0.00	0.00
12	157.00	DB846H80E-SX	2	16.00	5.01	1.10	176.40	6.231	1.10	0.00	0.00
13	157.00	HBX-6517DS-VTM	6	18.70	5.29	0.75	140.62	6.584	0.75	0.00	0.00
14	157.00	ALU RRH2X60-AWS RRH	3	60.00	3.50	0.76	147.69	4.293	0.78	0.00	0.00
15	157.00	RFS DB T1-6Z-8AB-OZ Distribution	1	19.00	3.20	1.00	94.95	4.035	1.00	0.00	0.00
16	157.00	GPS	1	10.00	1.00	1.00	39.45	1.715	1.00	0.00	0.00
17	150.00	Collar Mount	1	100.00	3.50	1.00	183.77	5.943	1.00	0.00	0.00
18	148.00	Ericsson RRUS-11-RRU	3	50.00	2.52	0.76	140.08	3.220	0.78	0.00	0.00
19	148.00	Raycap DC6-48-60-18-8F-Surge	2	32.80	1.47	0.90	96.48	2.169	0.90	0.00	0.00
20	148.00	T-Arms w/ Modifications	3	450.00	12.00	0.75	763.72	22.457	0.75	0.00	0.00
21	148.00	Powerwave 7770	3	35.00	5.51	0.77	169.93	6.566	0.80	0.00	0.00
22	148.00	Powerwave LGP21401 TMA	6	14.10	1.29	0.75	39.07	2.125	0.77	0.00	0.00
23	148.00	Powerwave LGP13519	6	5.30	0.34	0.75	14.78	0.793	0.77	0.00	0.00
24	148.00	Commscope WCS-IMFQ-AMT -	1	6.60	1.19	1.00	30.81	1.976	1.00	0.00	0.00
25	148.00	Cci OPA-65R-LCUU-H6	1	73.00	9.66	0.79	304.40	11.024	0.79	0.00	0.00
26	148.00	Cci OPA-65R-LCUU-H8	2	88.00	12.75	0.79	373.59	14.593	0.79	0.00	0.00
27	148.00	CCI HPA-65R-BUU-H6	2	51.00	9.66	0.85	298.72	11.024	0.85	0.00	0.00
28	148.00	CCI HPA-65R-BUU-H8	4	68.00	12.98	0.79	358.59	14.593	0.79	0.00	0.00
29	148.00	Powerwave 1001940-Bias Ts	3	2.00	0.07	0.90	9.46	0.300	0.91	0.00	0.00
30	148.00	Ericsson RRUS 32-RRU	9	77.00	1.65	0.70	125.40	2.229	0.72	0.00	0.00
31	137.00	T-Arms	3	242.00	8.19	0.75	446.08	18.359	0.75	0.00	0.00
32	137.00	APXV18-206517S-C	6	26.40	5.17	0.74	118.41	7.523	0.74	0.00	0.00
33	127.00	VHLP2-11	3	27.00	4.68	1.00	123.25	5.933	1.00	0.10	0.00
34	127.00	VHLP800-11	1	48.00	8.43	1.00	219.27	10.108	1.00	0.10	0.00
35	127.00	Horizon Duo	4	7.00	0.59	0.75	22.26	1.143	0.75	0.00	0.00
36	127.00	1900MHz RRH	3	60.00	2.77	0.99	142.06	4.018	0.99	0.00	0.00
37	127.00	800 MHz RRH	6	53.00	2.49	0.92	125.74	3.615	0.92	0.00	0.00
38	127.00	TD-RRH8x20-25	3	70.00	4.05	0.69	178.26	4.849	0.71	0.00	0.00
39	127.00	RMQP-4096-HK	1	2645.00	51.70	1.00	5368.94	89.325	1.00	0.00	0.00
40	127.00	AAHC	3	103.60	4.21	0.75	207.38	5.008	0.75	0.00	0.00
41	127.00	NNVV-65B-R4	3	77.40	12.27	0.74	358.24	13.702	0.74	0.00	0.00
42	117.00	Standoff Sector Frame Commscope	3	395.00	15.10	0.75	771.57	33.608	0.75	0.00	0.00
43	117.00	Ericsson 4415 RRU	2	44.10	1.86	0.67	90.38	2.419	0.67	0.00	0.00
44	117.00	Ericsson 0208 RRU	3	19.80	1.37	0.67	53.88	1.856	0.67	0.00	0.00
45	117.00	Comba ODI2-065R18K-GQ	3	25.10	4.85	0.70	129.02	5.808	0.70	0.00	0.00
		Totals:	**137**	**13,452.60**			**33,574.84**				

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)

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	167.00	(12) 1 5/8" Coax	0.00	Inside
0.00	167.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	167.00	(1) 1-1/4" Fiber	0.00	Inside
0.00	157.00	(12) 1 5/8" Coax	0.00	Inside
0.00	157.00	(6) 1 5/8" Coax	1.98	Outside
0.00	157.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	157.00	(1) 1/2" Coax	0.00	Inside
0.00	148.00	(12) 1 5/8" Coax	0.00	Inside
0.00	148.00	(1) 1/2" Fiber	0.00	Inside
0.00	148.00	(2) 3/4" DC	0.00	Inside
0.00	137.00	(6) 1 5/8" Coax	0.00	Inside
0.00	127.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	127.00	(4) 1-1/4" Fiber	0.00	Inside
0.00	127.00	(4) 1/2" Coax	0.00	Inside
0.00	117.00	(1) 1-1/4" Hybrid	0.00	Inside
99.25	104.50	(1) 1" Reinforcing plate	1.00	Outside
89.25	99.25	(1) 1" Reinforcing plate	1.00	Outside

Shaft Section Properties

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Increment Length: **5 (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		0.4375	56.180	77.403	30386.6	21.23	128.41	65	76	0.0				
5.00		0.4375	55.180	76.014	28780.1	20.83	126.13	65	77	1305.1				
10.00		0.4375	54.180	74.625	27231.3	20.43	123.84	65	77	1281.5				
15.00		0.4375	53.180	73.236	25739.1	20.02	121.55	65	78	1257.8				
20.00		0.4375	52.179	71.848	24302.4	19.62	119.27	65	78	1234.2				
25.00		0.4375	51.179	70.459	22920.2	19.22	116.98	65	79	1210.6				
30.00		0.4375	50.179	69.070	21591.5	18.81	114.70	65	79	1187.0				
35.00		0.4375	49.179	67.681	20315.1	18.41	112.41	65	80	1163.3				
40.00		0.4375	48.179	66.292	19090.0	18.01	110.12	65	80	1139.7				
40.75	Bot - Section 2	0.4375	48.029	66.084	18910.6	17.95	109.78	65	80	168.9				
45.00		0.4375	47.179	64.904	17915.2	17.60	107.84	65	81	1773.0				
47.00	Top - Section 1	0.3750	47.529	56.123	15766.0	20.94	126.74	65	77	823.4				
50.00		0.3750	46.929	55.408	15171.7	20.66	125.14	65	77	569.3				
55.00		0.3750	45.928	54.218	14214.7	20.19	122.48	65	78	932.6				
60.00		0.3750	44.928	53.028	13298.8	19.71	119.81	65	78	912.3				
65.00		0.3750	43.928	51.837	12423.2	19.24	117.14	65	79	892.1				
70.00		0.3750	42.928	50.647	11586.8	18.77	114.47	65	79	871.8				
75.00		0.3750	41.928	49.456	10788.9	18.30	111.81	65	80	851.6				
80.00		0.3750	40.928	48.266	10028.4	17.83	109.14	65	80	831.3				
85.00		0.3750	39.927	47.076	9304.6	17.36	106.47	65	81	811.1				
89.25	Bot - Section 3	0.3750	39.077	46.064	8717.4	16.96	104.21	65	81	673.5				
90.00		0.3750	38.927	45.885	8616.4	16.89	103.81	65	82	196.8				
91.50	RB1	0.3750	38.627	45.528	8416.8	16.75	103.01	65	82	391.4	18.00	4449.0	2805.1	91.9
94.25	Top - Section 2	0.2500	38.577	30.412	5644.2	25.80	154.31	65	71	709.6	18.00	4328.3	2729.4	168.4
95.00		0.2500	38.427	30.293	5578.2	25.69	153.71	65	71	77.5	18.00	4290.5	2703.4	45.9
96.75	RB2	0.2500	38.077	30.015	5426.2	25.45	152.31	65	71	179.6	36.00	7688.0	6129.7	214.4
97.00	RT1	0.2500	38.027	29.975	5404.7	25.41	152.11	65	72	25.5	18.00	3454.8	3454.8	15.3
100.00		0.2500	37.427	29.499	5151.2	24.99	149.71	65	72	303.6	18.00	3350.2	3350.2	183.7
102.25	RT2	0.2500	36.977	29.142	4966.4	24.67	147.91	65	72	224.5	18.00	3272.8	3272.8	137.8
105.00		0.2500	36.427	28.705	4746.6	24.28	145.71	65	73	270.7				
110.00		0.2500	35.427	27.912	4363.7	23.58	141.71	65	74	481.6				
115.00		0.2500	34.427	27.118	4001.9	22.87	137.71	65	75	468.1				
117.00		0.2500	34.027	26.801	3863.0	22.59	136.11	65	75	183.5				
120.00		0.2500	33.426	26.325	3660.8	22.17	133.71	65	75	271.2				
125.00		0.2500	32.426	25.531	3339.6	21.46	129.71	65	76	441.1				
127.00		0.2500	32.026	25.214	3216.6	21.18	128.10	65	76	172.7				
130.00		0.2500	31.426	24.737	3037.7	20.75	125.70	65	77	255.0				
135.00		0.2500	30.426	23.944	2754.7	20.05	121.70	65	78	414.1				
137.00		0.2500	30.026	23.626	2646.6	19.77	120.10	65	78	161.9				
139.00	Bot - Section 4	0.2500	29.626	23.309	2541.3	19.48	118.50	65	78	159.7				
140.00		0.2500	29.426	23.150	2489.7	19.34	117.70	65	79	139.2				
142.75	Top - Section 3	0.1875	29.251	17.296	1845.8	26.10	156.00	65	71	378.0				
145.00		0.1875	28.801	17.028	1761.3	25.67	153.60	65	71	131.4				
148.00		0.1875	28.201	16.671	1652.8	25.11	150.40	65	72	172.0				
150.00		0.1875	27.801	16.433	1583.0	24.73	148.27	65	72	112.6				
155.00		0.1875	26.800	15.837	1417.2	23.79	142.94	65	73	274.5				
157.00		0.1875	26.400	15.599	1354.2	23.42	140.80	65	74	107.0				
160.00		0.1875	25.800	15.242	1263.3	22.85	137.60	65	75	157.4				
165.00		0.1875	24.800	14.647	1121.0	21.91	132.27	65	76	254.3				
167.00		0.1875	24.400	14.409	1067.3	21.54	130.13	65	76	98.9				

Increment Length: **5 (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)
169.00		0.1875	24.000	14.171	1015.2	21.16	128.00	65	77	97.3				
									Total Weight	**27200.5**				**857.5**

Wind Loading - Shaft

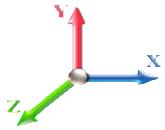
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

IES Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 27

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	16.018	17.62	385.81	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	16.018	17.62	378.94	0.650	0.000	5.00	23.558	15.31	431.7	0.0	1566.1
10.00		1.00	0.70	16.018	17.62	372.07	0.650	0.000	5.00	23.135	15.04	423.9	0.0	1537.8
15.00		1.00	0.70	16.018	17.62	365.20	0.650	0.000	5.00	22.712	14.76	416.2	0.0	1509.4
20.00		1.00	0.70	16.018	17.62	358.33	0.650	0.000	5.00	22.288	14.49	408.4	0.0	1481.1
25.00		1.00	0.70	16.018	17.62	351.46	0.650	0.000	5.00	21.865	14.21	400.7	0.0	1452.7
30.00		1.00	0.70	16.031	17.63	344.74	0.650	0.000	5.00	21.442	13.94	393.2	0.0	1424.4
35.00		1.00	0.73	16.753	18.43	345.39	0.650	0.000	5.00	21.019	13.66	402.8	0.0	1396.0
40.00		1.00	0.76	17.405	19.15	344.89	0.650	0.000	5.00	20.596	13.39	410.1	0.0	1367.6
40.75	Bot - Section 2	1.00	0.76	17.497	19.25	344.73	0.650	0.000	0.75	3.053	1.98	61.1	0.0	202.7
45.00		1.00	0.79	18.000	19.80	343.46	0.650	0.000	4.25	17.389	11.30	358.1	0.0	2127.6
47.00	Top - Section 1	1.00	0.80	18.225	20.05	342.67	0.650	0.000	2.00	8.077	5.25	168.4	0.0	988.1
50.00		1.00	0.81	18.551	20.41	346.82	0.650	0.000	3.00	11.989	7.79	254.4	0.0	683.1
55.00		1.00	0.83	19.063	20.97	344.08	0.650	0.000	5.00	19.644	12.77	428.4	0.0	1119.1
60.00		1.00	0.85	19.543	21.50	340.80	0.650	0.000	5.00	19.220	12.49	429.7	0.0	1094.8
65.00		1.00	0.87	19.995	21.99	337.04	0.650	0.000	5.00	18.797	12.22	430.0	0.0	1070.5
70.00		1.00	0.89	20.422	22.46	332.87	0.650	0.000	5.00	18.374	11.94	429.3	0.0	1046.2
75.00		1.00	0.91	20.829	22.91	328.34	0.650	0.000	5.00	17.951	11.67	427.7	0.0	1021.9
80.00		1.00	0.93	21.217	23.34	323.47	0.650	0.000	5.00	17.528	11.39	425.4	0.0	997.6
85.00		1.00	0.94	21.587	23.75	318.32	0.650	0.000	5.00	17.105	11.12	422.4	0.0	973.3
89.25	Bot - Section 3	1.00	0.96	21.890	24.08	313.72	0.650	0.000	4.25	14.206	9.23	355.8	0.0	808.2
90.00		1.00	0.96	21.943	24.14	312.89	0.650	0.000	0.75	2.507	1.63	62.9	0.0	236.2
91.50	RB1	1.00	0.96	22.047	24.25	311.21	0.650	0.000	1.50	4.985	3.24	125.7	0.0	469.6
94.25	Top - Section 2	1.00	0.97	22.234	24.46	308.08	0.650	0.000	2.75	9.041	5.88	230.0	0.0	851.5
95.00		1.00	0.97	22.284	24.51	311.26	0.650	0.000	0.75	2.444	1.59	62.3	0.0	93.0
96.75	RB2	1.00	0.98	22.401	24.64	309.23	0.650	0.000	1.75	5.664	3.68	145.2	0.0	215.5
97.00	RT1	1.00	0.98	22.417	24.66	308.94	0.650	0.000	0.25	0.805	0.52	20.6	0.0	30.6
100.00		1.00	0.99	22.613	24.87	305.39	0.650	0.000	3.00	9.577	6.23	247.8	0.0	364.3
102.25	RT2	1.00	0.99	22.758	25.03	302.68	0.650	0.000	2.25	7.083	4.60	184.4	0.0	269.4
105.00		1.00	1.00	22.931	25.22	299.31	0.650	0.000	2.75	8.541	5.55	224.0	0.0	324.8
110.00		1.00	1.02	23.238	25.56	293.03	0.650	0.000	5.00	15.200	9.88	404.1	0.0	578.0
115.00		1.00	1.03	23.535	25.89	286.57	0.650	0.000	5.00	14.777	9.61	397.9	0.0	561.8
117.00	Appurtenance(s)	1.00	1.03	23.651	26.02	283.94	0.650	0.000	2.00	5.792	3.77	156.7	0.0	220.2
120.00		1.00	1.04	23.823	26.20	279.94	0.650	0.000	3.00	8.562	5.57	233.3	0.0	325.4
125.00		1.00	1.05	24.102	26.51	273.16	0.650	0.000	5.00	13.931	9.06	384.1	0.0	529.4
127.00	Appurtenance(s)	1.00	1.06	24.212	26.63	270.40	0.650	0.000	2.00	5.454	3.55	151.1	0.0	207.2
130.00		1.00	1.07	24.374	26.81	266.22	0.650	0.000	3.00	8.054	5.24	224.6	0.0	305.9
135.00		1.00	1.08	24.638	27.10	259.14	0.650	0.000	5.00	13.085	8.51	368.8	0.0	497.0
137.00	Appurtenance(s)	1.00	1.08	24.742	27.22	256.27	0.650	0.000	2.00	5.115	3.32	144.8	0.0	194.2
139.00	Bot - Section 4	1.00	1.09	24.844	27.33	253.38	0.650	0.000	2.00	5.048	3.28	143.5	0.0	191.7
140.00		1.00	1.09	24.895	27.38	251.93	0.650	0.000	1.00	2.530	1.64	72.1	0.0	167.1
142.75	Top - Section 3	1.00	1.09	25.034	27.54	247.90	0.650	0.000	2.75	6.871	4.47	196.8	0.0	453.6
145.00		1.00	1.10	25.146	27.66	247.81	0.650	0.000	2.25	5.526	3.59	159.0	0.0	157.7
148.00	Appurtenance(s)	1.00	1.11	25.294	27.82	243.36	0.650	0.000	3.00	7.235	4.70	209.4	0.0	206.4
150.00	Appurtenance(s)	1.00	1.11	25.391	27.93	240.37	0.650	0.000	2.00	4.739	3.08	137.6	0.0	135.2
155.00		1.00	1.12	25.630	28.19	232.81	0.650	0.000	5.00	11.551	7.51	338.7	0.0	329.4
157.00	Appurtenance(s)	1.00	1.12	25.724	28.30	229.75	0.650	0.000	2.00	4.502	2.93	132.5	0.0	128.4

Wind Loading - Shaft

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

160.00		1.00	1.13	25.863	28.45	225.14	0.650	0.000	3.00	6.626	4.31	196.0	0.0	188.9
165.00		1.00	1.14	26.092	28.70	217.37	0.650	0.000	5.00	10.704	6.96	319.5	0.0	305.1
167.00	Appurtenance(s)	1.00	1.14	26.182	28.80	214.23	0.650	0.000	2.00	4.163	2.71	124.7	0.0	118.6
169.00		1.00	1.15	26.271	28.90	211.07	0.650	0.000	2.00	4.096	2.66	123.1	0.0	116.7
								Totals:	**169.00**			**13,398.8**		**32,640.6**

Discrete Appurtenance Forces

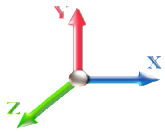
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 27

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	167.00	AIR 21 B4A/B2P	3	26.182	28.800	0.77	0.90	14.14	329.40	0.000	0.000	651.61	0.00	0.00
2	167.00	T-Arms/Commscope	3	26.204	28.825	0.56	0.75	11.39	1224.00	0.000	0.500	525.33	0.00	262.66
3	167.00	AIR 21 B2A/B4P	3	26.182	28.800	0.77	0.90	14.14	331.20	0.000	0.000	651.61	0.00	0.00
4	167.00	Ericsson - Radio 4449	3	26.182	28.800	0.60	0.80	2.97	266.40	0.000	0.000	136.86	0.00	0.00
5	167.00	Ericsson - KRY 112 144/2	3	26.182	28.800	0.60	0.80	0.74	39.60	0.000	0.000	34.01	0.00	0.00
6	167.00	APXVAA24_43-U-A20	3	26.182	28.800	0.66	0.90	39.89	460.80	0.000	0.000	1838.27	0.00	0.00
7	157.00	BXA-70063/6CF	1	25.724	28.296	1.00	1.00	7.57	20.40	0.000	0.000	342.72	0.00	0.00
8	157.00	T-Arms	3	25.724	28.296	0.56	0.75	13.50	1260.00	0.000	0.000	611.20	0.00	0.00
9	157.00	SLCP 2x6014F	2	25.724	28.296	0.84	0.90	10.86	48.00	0.000	0.000	491.87	0.00	0.00
10	157.00	DB846F65ZAXY	4	25.724	28.296	0.74	0.80	20.76	100.80	0.000	0.000	939.67	0.00	0.00
11	157.00	DB846H80E-SX	2	25.724	28.296	0.88	0.80	8.82	38.40	0.000	0.000	399.21	0.00	0.00
12	157.00	HBX-6517DS-VTM	6	25.724	28.296	0.60	0.80	19.04	134.64	0.000	0.000	862.20	0.00	0.00
13	157.00	ALU RRH2X60-AWS RRH	3	25.724	28.296	0.61	0.80	6.38	216.00	0.000	0.000	289.03	0.00	0.00
14	157.00	RFS DB T1-6Z-8AB-OZ	1	25.724	28.296	1.00	1.00	3.20	22.80	0.000	0.000	144.88	0.00	0.00
15	157.00	GPS	1	25.724	28.296	1.00	1.00	1.00	12.00	0.000	0.000	45.27	0.00	0.00
16	157.00	ALU/900 RRH2X60W -	3	25.724	28.296	0.61	0.80	3.43	165.60	0.000	0.000	155.25	0.00	0.00
17	150.00	Collar Mount	1	25.391	27.930	1.00	1.00	3.50	120.00	0.000	0.000	156.41	0.00	0.00
18	148.00	Commscope	1	25.294	27.823	1.00	1.00	1.19	7.92	0.000	0.000	52.98	0.00	0.00
19	148.00	Ericsson RRUS 32-RRU	9	25.294	27.823	0.56	0.80	8.32	831.60	0.000	0.000	370.20	0.00	0.00
20	148.00	Powerwave 1001940-Bias	3	25.294	27.823	0.72	0.80	0.15	7.20	0.000	0.000	6.73	0.00	0.00
21	148.00	CCI HPA-65R-BUU-H8	4	25.294	27.823	0.63	0.80	32.81	326.40	0.000	0.000	1460.75	0.00	0.00
22	148.00	CCI HPA-65R-BUU-H6	2	25.294	27.823	0.68	0.80	13.14	122.40	0.000	0.000	584.84	0.00	0.00
23	148.00	Cci OPA-65R-LCUU-H8	2	25.294	27.823	0.63	0.80	16.12	211.20	0.000	0.000	717.43	0.00	0.00
24	148.00	T-Arms w/ Modifications	3	25.294	27.823	0.60	0.80	21.60	1620.00	0.000	0.000	961.56	0.00	0.00
25	148.00	Ericsson RRUS-11-RRU	3	25.294	27.823	0.61	0.80	4.60	180.00	0.000	0.000	204.62	0.00	0.00
26	148.00	Raycap	2	25.294	27.823	0.81	0.90	2.38	78.72	0.000	0.000	106.01	0.00	0.00
27	148.00	Cci OPA-65R-LCUU-H6	1	25.294	27.823	0.63	0.80	6.11	87.60	0.000	0.000	271.78	0.00	0.00
28	148.00	Powerwave 7770	3	25.294	27.823	0.61	0.80	10.13	126.00	0.000	0.000	450.94	0.00	0.00
29	148.00	Powerwave LGP21401	6	25.294	27.823	0.60	0.80	4.64	101.52	0.000	0.000	206.74	0.00	0.00
30	148.00	Powerwave LGP13519	6	25.294	27.823	0.60	0.80	1.22	38.16	0.000	0.000	54.49	0.00	0.00
31	137.00	APXV18-206517S-C	6	24.742	27.216	0.59	0.80	18.36	190.08	0.000	0.000	799.66	0.00	0.00
32	137.00	T-Arms	3	24.742	27.216	0.56	0.75	13.82	871.20	0.000	0.000	601.82	0.00	0.00
33	127.00	Horizon Duo	4	24.212	26.633	0.60	0.80	1.42	33.60	0.000	0.000	60.34	0.00	0.00
34	127.00	VHLP800-11	1	24.212	26.633	1.00	1.00	8.43	57.60	1.455	0.000	359.22	326.67	0.00
35	127.00	1900MHz RRH	3	24.212	26.633	0.74	0.75	6.17	216.00	0.000	0.000	262.93	0.00	0.00
36	127.00	VHLP2-11	3	24.212	26.633	1.00	1.00	14.04	97.20	1.455	0.000	598.28	544.06	0.00
37	127.00	NNVV-65B-R4	3	24.212	26.633	0.55	0.75	20.43	278.64	0.000	0.000	870.55	0.00	0.00
38	127.00	800 MHz RRH	6	24.212	26.633	0.69	0.75	10.31	381.60	0.000	0.000	439.27	0.00	0.00
39	127.00	TD-RRH8x20-25	3	24.212	26.633	0.52	0.75	6.29	252.00	0.000	0.000	267.93	0.00	0.00
40	127.00	AAHC	3	24.212	26.633	0.56	0.75	7.10	372.96	0.000	0.000	302.73	0.00	0.00
41	127.00	RMQP-4096-HK	1	24.212	26.633	1.00	1.00	51.70	3174.00	0.000	0.000	2203.06	0.00	0.00
42	117.00	Ericsson 0208 RRU	3	23.651	26.016	0.54	0.80	2.20	71.28	0.000	0.000	91.70	0.00	0.00
43	117.00	Ericsson 4415 RRU	2	23.651	26.016	0.54	0.80	1.99	105.84	0.000	0.000	83.00	0.00	0.00
44	117.00	Standoff Sector Frame	3	23.651	26.016	0.56	0.75	25.48	1422.00	0.000	0.000	1060.67	0.00	0.00
45	117.00	Comba	3	23.651	26.016	0.56	0.80	8.15	90.36	0.000	0.000	339.16	0.00	0.00
							Totals:		**16,143.12**			**22,064.82**		

Total Applied Force Summary

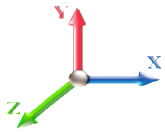
Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 13

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 27

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		431.69	1929.75	0.00	0.00
10.00		423.93	1901.40	0.00	0.00
15.00		416.18	1873.04	0.00	0.00
20.00		408.42	1844.69	0.00	0.00
25.00		400.67	1816.33	0.00	0.00
30.00		393.25	1787.98	0.00	0.00
35.00		402.84	1759.63	0.00	0.00
40.00		410.08	1731.27	0.00	0.00
40.75		61.11	257.25	0.00	0.00
45.00		358.09	2436.67	0.00	0.00
47.00		168.42	1133.51	0.00	0.00
50.00		254.43	901.30	0.00	0.00
55.00		428.38	1482.73	0.00	0.00
60.00		429.70	1458.42	0.00	0.00
65.00		429.97	1434.12	0.00	0.00
70.00		429.28	1409.81	0.00	0.00
75.00		427.74	1385.51	0.00	0.00
80.00		425.43	1361.21	0.00	0.00
85.00		422.42	1336.90	0.00	0.00
89.25		355.76	1117.26	0.00	0.00
90.00		62.93	290.72	0.00	0.00
91.50		125.74	578.71	0.00	0.00
94.25		229.96	1051.51	0.00	0.00
95.00		62.29	147.50	0.00	0.00
96.75		145.16	342.74	0.00	0.00
97.00		20.64	48.80	0.00	0.00
100.00		247.76	582.45	0.00	0.00
102.25		184.40	433.01	0.00	0.00
105.00		224.04	524.78	0.00	0.00
110.00		404.09	941.59	0.00	0.00
115.00		397.86	925.39	0.00	0.00
117.00	(11) attachments	1731.26	2055.10	0.00	0.00
120.00		233.33	540.13	0.00	0.00
125.00		384.12	887.26	0.00	0.00
127.00	(27) attachments	5515.39	5213.97	870.74	0.00
130.00		224.57	500.69	0.00	0.00
135.00		368.80	821.52	0.00	0.00
137.00	(9) attachments	1546.27	1385.35	0.00	0.00
139.00		143.46	306.50	0.00	0.00
140.00		72.06	224.48	0.00	0.00
142.75		196.77	611.48	0.00	0.00
145.00		158.98	286.88	0.00	0.00
148.00	(45) attachments	5658.43	4117.40	0.00	0.00
150.00	(1) attachments	294.06	338.01	0.00	0.00
155.00		338.67	536.51	0.00	0.00
157.00	(26) attachments	4413.79	2229.84	0.00	0.00

Total Applied Force Summary

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 14

160.00		196.04	241.23	0.00	0.00
165.00		319.51	392.32	0.00	0.00
167.00	(18) attachments	3962.39	2804.93	0.00	262.66
169.00		123.09	116.70	0.00	0.00
	Totals:	**35,463.66**	**59,836.27**	**870.74**	**262.66**

Linear Appurtenance Segment Forces (Factored)

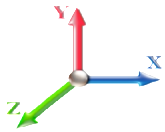
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 27

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)
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.035	0.000	16.018	0.00	37.44
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.036	0.000	16.018	0.00	37.44
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.036	0.000	16.018	0.00	37.44
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.037	0.000	16.018	0.00	37.44
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.038	0.000	16.018	0.00	37.44
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.038	0.000	16.031	0.00	37.44
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.039	0.000	16.753	0.00	37.44
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.040	0.000	17.405	0.00	37.44
40.75	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.041	0.000	17.497	0.00	5.62
45.00	1 5/8" Coax	Yes	4.25	0.000	1.98	0.70	0.00	0.041	0.000	18.000	0.00	31.82
47.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.042	0.000	18.225	0.00	14.98
50.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.041	0.000	18.551	0.00	22.46
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.042	0.000	19.063	0.00	37.44
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.043	0.000	19.543	0.00	37.44
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.044	0.000	19.995	0.00	37.44
70.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.045	0.000	20.422	0.00	37.44
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.046	0.000	20.829	0.00	37.44
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.047	0.000	21.217	0.00	37.44
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.048	0.000	21.587	0.00	37.44
89.25	1 5/8" Coax	Yes	4.25	0.000	1.98	0.70	0.00	0.049	0.000	21.890	0.00	31.82
90.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.075	0.000	21.943	0.00	5.62
90.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.075	0.000	21.943	0.00	0.00
91.50	1 5/8" Coax	Yes	1.50	0.000	1.98	0.25	0.00	0.076	0.000	22.047	0.00	11.23
91.50	1" Reinforcing plate	Yes	1.50	0.000	1.00	0.13	0.00	0.076	0.000	22.047	0.00	0.00
94.25	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.077	0.000	22.234	0.00	20.59
94.25	1" Reinforcing plate	Yes	2.75	0.000	1.00	0.23	0.00	0.077	0.000	22.234	0.00	0.00
95.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.076	0.000	22.284	0.00	5.62
95.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.076	0.000	22.284	0.00	0.00
96.75	1 5/8" Coax	Yes	1.75	0.000	1.98	0.29	0.00	0.077	0.000	22.401	0.00	13.10
96.75	1" Reinforcing plate	Yes	1.75	0.000	1.00	0.15	0.00	0.077	0.000	22.401	0.00	0.00
97.00	1 5/8" Coax	Yes	0.25	0.000	1.98	0.04	0.00	0.077	0.000	22.417	0.00	1.87
97.00	1" Reinforcing plate	Yes	0.25	0.000	1.00	0.02	0.00	0.077	0.000	22.417	0.00	0.00
100.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.078	0.000	22.613	0.00	22.46
100.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.078	0.000	22.613	0.00	0.00
100.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.078	0.000	22.613	0.00	0.00
102.25	1 5/8" Coax	Yes	2.25	0.000	1.98	0.37	0.00	0.079	0.000	22.758	0.00	16.85
102.25	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.079	0.000	22.758	0.00	0.00
105.00	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.075	0.000	22.931	0.00	20.59
105.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.075	0.000	22.931	0.00	0.00
110.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.054	0.000	23.238	0.00	37.44
115.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.056	0.000	23.535	0.00	37.44
117.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.057	0.000	23.651	0.00	14.98
120.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.058	0.000	23.823	0.00	22.46
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.059	0.000	24.102	0.00	37.44
127.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.061	0.000	24.212	0.00	14.98
130.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.061	0.000	24.374	0.00	22.46
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.063	0.000	24.638	0.00	37.44

Linear Appurtenance Segment Forces (Factored)

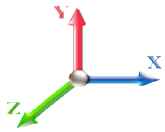
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 27

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)
137.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.065	0.000	24.742	0.00	14.98
139.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.065	0.000	24.844	0.00	14.98
140.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.17	0.00	0.066	0.000	24.895	0.00	7.49
142.75	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.067	0.000	25.034	0.00	20.59
145.00	1 5/8" Coax	Yes	2.25	0.000	1.98	0.37	0.00	0.067	0.000	25.146	0.00	16.85
148.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.068	0.000	25.294	0.00	22.46
150.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.070	0.000	25.391	0.00	14.98
155.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.071	0.000	25.630	0.00	37.44
157.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.073	0.000	25.724	0.00	14.98
										Totals:	**0.0**	**1,175.6**

Calculated Forces

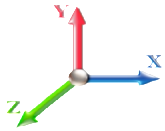
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 27

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	-59.77	-35.57	-0.85	-4554.4	-0.02	4554.45	5324.18	2662.09	12195.0	6106.56	0.00	0.000	0.000	0.757
5.00	-57.71	-35.35	-0.85	-4376.5	-0.02	4376.58	5261.08	2630.54	11832.5	5925.09	0.11	-0.209	0.000	0.750
10.00	-55.68	-35.13	-0.85	-4199.8	-0.02	4199.82	5196.80	2598.40	11472.7	5744.92	0.44	-0.421	0.000	0.742
15.00	-53.68	-34.89	-0.85	-4024.2	-0.02	4024.20	5131.34	2565.67	11115.7	5566.13	1.00	-0.636	0.000	0.734
20.00	-51.71	-34.66	-0.85	-3849.7	-0.02	3849.73	5064.69	2532.35	10761.6	5388.80	1.78	-0.853	0.000	0.725
25.00	-49.77	-34.42	-0.85	-3676.4	-0.02	3676.44	4996.86	2498.43	10410.5	5212.99	2.80	-1.074	0.000	0.715
30.00	-47.86	-34.18	-0.85	-3504.3	-0.02	3504.34	4927.84	2463.92	10062.6	5038.79	4.04	-1.296	0.000	0.705
35.00	-45.97	-33.91	-0.85	-3333.4	-0.02	3333.45	4857.63	2428.82	9718.08	4866.26	5.52	-1.522	0.000	0.695
40.00	-44.18	-33.56	-0.85	-3163.8	-0.02	3163.88	4786.24	2393.12	9377.03	4695.49	7.23	-1.749	0.000	0.683
40.75	-43.85	-33.58	-0.85	-3138.7	-0.02	3138.71	4775.43	2387.72	9326.19	4670.03	7.51	-1.784	0.000	0.681
45.00	-41.35	-33.24	-0.85	-2996.0	-0.02	2996.02	4713.67	2356.83	9039.63	4526.53	9.19	-1.981	0.000	0.671
47.00	-40.15	-33.12	-0.85	-2929.5	-0.02	2929.54	3877.89	1938.95	7512.92	3762.05	10.04	-2.075	0.000	0.789
50.00	-39.15	-32.97	-0.85	-2830.1	-0.03	2830.19	3845.09	1922.55	7353.82	3682.38	11.39	-2.215	-0.001	0.779
55.00	-37.54	-32.65	-0.85	-2665.3	-0.03	2665.37	3789.47	1894.74	7090.51	3550.52	13.85	-2.473	-0.001	0.761
60.00	-35.95	-32.31	-0.85	-2502.1	-0.03	2502.14	3732.67	1866.34	6829.63	3419.89	16.57	-2.732	-0.001	0.742
65.00	-34.40	-31.97	-0.86	-2340.5	-0.03	2340.58	3674.68	1837.34	6571.34	3290.55	19.57	-2.991	-0.001	0.721
70.00	-32.87	-31.61	-0.86	-2180.7	-0.03	2180.74	3615.51	1807.76	6315.78	3162.58	22.84	-3.250	-0.001	0.699
75.00	-31.37	-31.24	-0.86	-2022.6	-0.03	2022.69	3555.15	1777.58	6063.10	3036.06	26.38	-3.508	-0.001	0.675
80.00	-29.90	-30.87	-0.86	-1866.4	-0.04	1866.47	3493.61	1746.80	5813.45	2911.05	30.19	-3.764	-0.001	0.650
85.00	-28.47	-30.47	-0.86	-1712.1	-0.04	1712.14	3430.88	1715.44	5566.98	2787.63	34.27	-4.018	-0.001	0.623
89.25	-27.32	-30.09	-0.86	-1582.6	-0.04	1582.65	3376.63	1688.32	5360.08	2684.02	37.94	-4.232	-0.001	0.598
90.00	-27.01	-30.04	-0.86	-1560.0	-0.04	1560.08	3366.97	1683.48	5323.83	2665.87	38.61	-4.270	-0.001	0.594
91.50	-26.39	-29.91	-0.86	-1515.0	-0.04	1515.02	3347.56	1673.78	5251.55	2629.68	39.96	-4.346	-0.001	0.438
94.25	-25.33	-29.63	-0.86	-1432.7	-0.04	1432.77	1944.87	972.44	3066.99	1535.78	42.49	-4.449	-0.001	0.495
95.00	-25.16	-29.58	-0.86	-1410.5	-0.04	1410.55	1940.65	970.33	3048.28	1526.41	43.19	-4.477	-0.001	0.631
96.75	-24.80	-29.43	-0.86	-1358.7	-0.04	1358.79	1930.70	965.35	3004.67	1504.57	44.85	-4.560	-0.002	0.431
97.00	-24.72	-29.43	-0.86	-1351.4	-0.04	1351.43	1929.27	964.63	2998.44	1501.45	45.09	-4.569	-0.002	0.558
100.00	-24.10	-29.18	-0.86	-1263.1	-0.04	1263.13	1911.84	955.92	2923.84	1464.09	48.00	-4.695	-0.002	0.532
102.25	-23.64	-29.01	-0.86	-1197.4	-0.04	1197.47	1898.49	949.24	2868.04	1436.15	50.23	-4.787	-0.002	0.511
102.25	-23.64	-29.01	-0.86	-1197.4	-0.04	1197.47	1898.49	949.24	2868.04	1436.15	50.23	-4.787	-0.002	0.511
105.00	-23.02	-28.83	-0.86	-1117.7	-0.05	1117.70	1881.84	940.92	2800.02	1402.09	53.02	-4.897	-0.002	0.810
110.00	-21.97	-28.46	-0.87	-973.57	-0.05	973.57	1850.66	925.33	2676.97	1340.48	58.31	-5.211	-0.002	0.739
115.00	-20.99	-28.05	-0.87	-831.29	-0.05	831.29	1818.29	909.14	2554.84	1279.32	63.92	-5.505	-0.003	0.662
117.00	-19.05	-26.17	-0.87	-775.19	-0.06	775.19	1805.01	902.50	2506.28	1255.00	66.25	-5.619	-0.003	0.629
120.00	-18.44	-25.95	-0.87	-696.68	-0.06	696.68	1784.73	892.37	2433.78	1218.70	69.83	-5.782	-0.003	0.583
125.00	-17.52	-25.53	-0.87	-566.91	-0.06	566.91	1749.99	875.00	2313.93	1158.68	76.01	-6.027	-0.003	0.500
127.00	-12.88	-19.52	0.00	-515.85	0.03	515.85	1735.77	867.88	2266.36	1134.86	78.55	-6.119	-0.003	0.462
130.00	-12.36	-19.28	0.00	-457.30	0.02	457.30	1714.07	857.04	2195.44	1099.35	82.43	-6.248	-0.003	0.424
135.00	-11.54	-18.85	0.00	-360.91	0.02	360.91	1676.96	838.48	2078.45	1040.77	89.06	-6.440	-0.003	0.354
137.00	-10.32	-17.17	0.00	-323.22	0.02	323.22	1661.79	830.89	2032.11	1017.57	91.77	-6.511	-0.003	0.324
139.00	-10.01	-17.00	0.00	-288.89	0.02	288.89	1646.42	823.21	1986.05	994.50	94.51	-6.576	-0.003	0.297
140.00	-9.78	-16.91	0.00	-271.90	0.01	271.90	1638.67	819.33	1963.12	983.02	95.89	-6.608	-0.003	0.283
142.75	-9.18	-16.65	0.00	-225.40	0.01	225.40	1100.62	550.31	1316.21	659.08	99.71	-6.686	-0.003	0.351
145.00	-8.89	-16.47	0.00	-187.93	0.01	187.93	1091.20	545.60	1284.61	643.26	102.87	-6.742	-0.003	0.301
148.00	-5.46	-10.37	0.00	-138.51	0.01	138.51	1078.27	539.14	1242.60	622.22	107.12	-6.821	-0.003	0.228
150.00	-5.15	-10.05	0.00	-117.77	0.01	117.77	1069.42	534.71	1214.68	608.24	109.98	-6.865	-0.003	0.199
155.00	-4.65	-9.65	0.00	-67.54	0.00	67.54	1046.45	523.23	1145.25	573.48	117.21	-6.949	-0.003	0.123
157.00	-2.97	-5.00	0.00	-48.24	0.00	48.24	1036.93	518.47	1117.66	559.66	120.12	-6.972	-0.003	0.089

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

160.00	-2.75	-4.78	0.00	-33.24	0.00	33.24	1022.30	511.15	1076.48	539.04	124.49	-6.998	-0.003	0.064
165.00	-2.40	-4.41	0.00	-9.36	0.00	9.36	996.96	498.48	1008.51	505.00	131.82	-7.022	-0.003	0.021
167.00	-0.10	-0.14	0.00	-0.27	0.00	0.27	986.50	493.25	981.58	491.52	134.76	-7.024	-0.003	0.001
169.00	0.00	-0.12	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	137.69	-7.024	-0.003	0.000

Wind Loading - Shaft

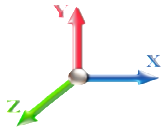
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

IES Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 27

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	16.018	17.62	385.81	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	16.018	17.62	378.94	0.650	0.000	5.00	23.558	15.31	431.7	0.0	1174.6
10.00		1.00	0.70	16.018	17.62	372.07	0.650	0.000	5.00	23.135	15.04	423.9	0.0	1153.3
15.00		1.00	0.70	16.018	17.62	365.20	0.650	0.000	5.00	22.712	14.76	416.2	0.0	1132.1
20.00		1.00	0.70	16.018	17.62	358.33	0.650	0.000	5.00	22.288	14.49	408.4	0.0	1110.8
25.00		1.00	0.70	16.018	17.62	351.46	0.650	0.000	5.00	21.865	14.21	400.7	0.0	1089.5
30.00		1.00	0.70	16.031	17.63	344.74	0.650	0.000	5.00	21.442	13.94	393.2	0.0	1068.3
35.00		1.00	0.73	16.753	18.43	345.39	0.650	0.000	5.00	21.019	13.66	402.8	0.0	1047.0
40.00		1.00	0.76	17.405	19.15	344.89	0.650	0.000	5.00	20.596	13.39	410.1	0.0	1025.7
40.75	Bot - Section 2	1.00	0.76	17.497	19.25	344.73	0.650	0.000	0.75	3.053	1.98	61.1	0.0	152.0
45.00		1.00	0.79	18.000	19.80	343.46	0.650	0.000	4.25	17.389	11.30	358.1	0.0	1595.7
47.00	Top - Section 1	1.00	0.80	18.225	20.05	342.67	0.650	0.000	2.00	8.077	5.25	168.4	0.0	741.0
50.00		1.00	0.81	18.551	20.41	346.82	0.650	0.000	3.00	11.989	7.79	254.4	0.0	512.3
55.00		1.00	0.83	19.063	20.97	344.08	0.650	0.000	5.00	19.644	12.77	428.4	0.0	839.3
60.00		1.00	0.85	19.543	21.50	340.80	0.650	0.000	5.00	19.220	12.49	429.7	0.0	821.1
65.00		1.00	0.87	19.995	21.99	337.04	0.650	0.000	5.00	18.797	12.22	430.0	0.0	802.9
70.00		1.00	0.89	20.422	22.46	332.87	0.650	0.000	5.00	18.374	11.94	429.3	0.0	784.6
75.00		1.00	0.91	20.829	22.91	328.34	0.650	0.000	5.00	17.951	11.67	427.7	0.0	766.4
80.00		1.00	0.93	21.217	23.34	323.47	0.650	0.000	5.00	17.528	11.39	425.4	0.0	748.2
85.00		1.00	0.94	21.587	23.75	318.32	0.650	0.000	5.00	17.105	11.12	422.4	0.0	730.0
89.25	Bot - Section 3	1.00	0.96	21.890	24.08	313.72	0.650	0.000	4.25	14.206	9.23	355.8	0.0	606.1
90.00		1.00	0.96	21.943	24.14	312.89	0.650	0.000	0.75	2.507	1.63	62.9	0.0	177.1
91.50	RB1	1.00	0.96	22.047	24.25	311.21	0.650	0.000	1.50	4.985	3.24	125.7	0.0	352.2
94.25	Top - Section 2	1.00	0.97	22.234	24.46	308.08	0.650	0.000	2.75	9.041	5.88	230.0	0.0	638.6
95.00		1.00	0.97	22.284	24.51	311.26	0.650	0.000	0.75	2.444	1.59	62.3	0.0	69.7
96.75	RB2	1.00	0.98	22.401	24.64	309.23	0.650	0.000	1.75	5.664	3.68	145.2	0.0	161.6
97.00	RT1	1.00	0.98	22.417	24.66	308.94	0.650	0.000	0.25	0.805	0.52	20.6	0.0	23.0
100.00		1.00	0.99	22.613	24.87	305.39	0.650	0.000	3.00	9.577	6.23	247.8	0.0	273.2
102.25	RT2	1.00	0.99	22.758	25.03	302.68	0.650	0.000	2.25	7.083	4.60	184.4	0.0	202.0
105.00		1.00	1.00	22.931	25.22	299.31	0.650	0.000	2.75	8.541	5.55	224.0	0.0	243.6
110.00		1.00	1.02	23.238	25.56	293.03	0.650	0.000	5.00	15.200	9.88	404.1	0.0	433.5
115.00		1.00	1.03	23.535	25.89	286.57	0.650	0.000	5.00	14.777	9.61	397.9	0.0	421.3
117.00	Appurtenance(s)	1.00	1.03	23.651	26.02	283.94	0.650	0.000	2.00	5.792	3.77	156.7	0.0	165.1
120.00		1.00	1.04	23.823	26.20	279.94	0.650	0.000	3.00	8.562	5.57	233.3	0.0	244.0
125.00		1.00	1.05	24.102	26.51	273.16	0.650	0.000	5.00	13.931	9.06	384.1	0.0	397.0
127.00	Appurtenance(s)	1.00	1.06	24.212	26.63	270.40	0.650	0.000	2.00	5.454	3.55	151.1	0.0	155.4
130.00		1.00	1.07	24.374	26.81	266.22	0.650	0.000	3.00	8.054	5.24	224.6	0.0	229.5
135.00		1.00	1.08	24.638	27.10	259.14	0.650	0.000	5.00	13.085	8.51	368.8	0.0	372.7
137.00	Appurtenance(s)	1.00	1.08	24.742	27.22	256.27	0.650	0.000	2.00	5.115	3.32	144.8	0.0	145.7
139.00	Bot - Section 4	1.00	1.09	24.844	27.33	253.38	0.650	0.000	2.00	5.048	3.28	143.5	0.0	143.7
140.00		1.00	1.09	24.895	27.38	251.93	0.650	0.000	1.00	2.530	1.64	72.1	0.0	125.3
142.75	Top - Section 3	1.00	1.09	25.034	27.54	247.90	0.650	0.000	2.75	6.871	4.47	196.8	0.0	340.2
145.00		1.00	1.10	25.146	27.66	247.81	0.650	0.000	2.25	5.526	3.59	159.0	0.0	118.3
148.00	Appurtenance(s)	1.00	1.11	25.294	27.82	243.36	0.650	0.000	3.00	7.235	4.70	209.4	0.0	154.8
150.00	Appurtenance(s)	1.00	1.11	25.391	27.93	240.37	0.650	0.000	2.00	4.739	3.08	137.6	0.0	101.4
155.00		1.00	1.12	25.630	28.19	232.81	0.650	0.000	5.00	11.551	7.51	338.7	0.0	247.1
157.00	Appurtenance(s)	1.00	1.12	25.724	28.30	229.75	0.650	0.000	2.00	4.502	2.93	132.5	0.0	96.3

Wind Loading - Shaft

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

160.00		1.00	1.13	25.863	28.45	225.14	0.650	0.000	3.00	6.626	4.31	196.0	0.0	141.7
165.00		1.00	1.14	26.092	28.70	217.37	0.650	0.000	5.00	10.704	6.96	319.5	0.0	228.8
167.00	Appurtenance(s)	1.00	1.14	26.182	28.80	214.23	0.650	0.000	2.00	4.163	2.71	124.7	0.0	89.0
169.00		1.00	1.15	26.271	28.90	211.07	0.650	0.000	2.00	4.096	2.66	123.1	0.0	87.5
								Totals:	**169.00**			**13,398.8**		**24,480.4**

Discrete Appurtenance Forces

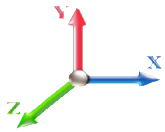
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 27

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	167.00	AIR 21 B4A/B2P	3	26.182	28.800	0.77	0.90	14.14	247.05	0.000	0.000	651.61	0.00	0.00
2	167.00	T-Arms/Commscope	3	26.204	28.825	0.56	0.75	11.39	918.00	0.000	0.500	525.33	0.00	262.66
3	167.00	AIR 21 B2A/B4P	3	26.182	28.800	0.77	0.90	14.14	248.40	0.000	0.000	651.61	0.00	0.00
4	167.00	Ericsson - Radio 4449	3	26.182	28.800	0.60	0.80	2.97	199.80	0.000	0.000	136.86	0.00	0.00
5	167.00	Ericsson - KRY 112 144/2	3	26.182	28.800	0.60	0.80	0.74	29.70	0.000	0.000	34.01	0.00	0.00
6	167.00	APXVAA24_43-U-A20	3	26.182	28.800	0.66	0.90	39.89	345.60	0.000	0.000	1838.27	0.00	0.00
7	157.00	BXA-70063/6CF	1	25.724	28.296	1.00	1.00	7.57	15.30	0.000	0.000	342.72	0.00	0.00
8	157.00	T-Arms	3	25.724	28.296	0.56	0.75	13.50	945.00	0.000	0.000	611.20	0.00	0.00
9	157.00	SLCP 2x6014F	2	25.724	28.296	0.84	0.90	10.86	36.00	0.000	0.000	491.87	0.00	0.00
10	157.00	DB846F65ZAXY	4	25.724	28.296	0.74	0.80	20.76	75.60	0.000	0.000	939.67	0.00	0.00
11	157.00	DB846H80E-SX	2	25.724	28.296	0.88	0.80	8.82	28.80	0.000	0.000	399.21	0.00	0.00
12	157.00	HBX-6517DS-VTM	6	25.724	28.296	0.60	0.80	19.04	100.98	0.000	0.000	862.20	0.00	0.00
13	157.00	ALU RRH2X60-AWS RRH	3	25.724	28.296	0.61	0.80	6.38	162.00	0.000	0.000	289.03	0.00	0.00
14	157.00	RFS DB T1-6Z-8AB-OZ	1	25.724	28.296	1.00	1.00	3.20	17.10	0.000	0.000	144.88	0.00	0.00
15	157.00	GPS	1	25.724	28.296	1.00	1.00	1.00	9.00	0.000	0.000	45.27	0.00	0.00
16	157.00	ALU/900 RRH2X60W -	3	25.724	28.296	0.61	0.80	3.43	124.20	0.000	0.000	155.25	0.00	0.00
17	150.00	Collar Mount	1	25.391	27.930	1.00	1.00	3.50	90.00	0.000	0.000	156.41	0.00	0.00
18	148.00	Commscope	1	25.294	27.823	1.00	1.00	1.19	5.94	0.000	0.000	52.98	0.00	0.00
19	148.00	Ericsson RRUS 32-RRU	9	25.294	27.823	0.56	0.80	8.32	623.70	0.000	0.000	370.20	0.00	0.00
20	148.00	Powerwave 1001940-Bias	3	25.294	27.823	0.72	0.80	0.15	5.40	0.000	0.000	6.73	0.00	0.00
21	148.00	CCI HPA-65R-BUU-H8	4	25.294	27.823	0.63	0.80	32.81	244.80	0.000	0.000	1460.75	0.00	0.00
22	148.00	CCI HPA-65R-BUU-H6	2	25.294	27.823	0.68	0.80	13.14	91.80	0.000	0.000	584.84	0.00	0.00
23	148.00	Cci OPA-65R-LCUU-H8	2	25.294	27.823	0.63	0.80	16.12	158.40	0.000	0.000	717.43	0.00	0.00
24	148.00	T-Arms w/ Modifications	3	25.294	27.823	0.60	0.80	21.60	1215.00	0.000	0.000	961.56	0.00	0.00
25	148.00	Ericsson RRUS-11-RRU	3	25.294	27.823	0.61	0.80	4.60	135.00	0.000	0.000	204.62	0.00	0.00
26	148.00	Raycap	2	25.294	27.823	0.81	0.90	2.38	59.04	0.000	0.000	106.01	0.00	0.00
27	148.00	Cci OPA-65R-LCUU-H6	1	25.294	27.823	0.63	0.80	6.11	65.70	0.000	0.000	271.78	0.00	0.00
28	148.00	Powerwave 7770	3	25.294	27.823	0.61	0.80	10.13	94.50	0.000	0.000	450.94	0.00	0.00
29	148.00	Powerwave LGP21401	6	25.294	27.823	0.60	0.80	4.64	76.14	0.000	0.000	206.74	0.00	0.00
30	148.00	Powerwave LGP13519	6	25.294	27.823	0.60	0.80	1.22	28.62	0.000	0.000	54.49	0.00	0.00
31	137.00	APXV18-206517S-C	6	24.742	27.216	0.59	0.80	18.36	142.56	0.000	0.000	799.66	0.00	0.00
32	137.00	T-Arms	3	24.742	27.216	0.56	0.75	13.82	653.40	0.000	0.000	601.82	0.00	0.00
33	127.00	Horizon Duo	4	24.212	26.633	0.60	0.80	1.42	25.20	0.000	0.000	60.34	0.00	0.00
34	127.00	VHLP800-11	1	24.212	26.633	1.00	1.00	8.43	43.20	1.455	0.000	359.22	326.67	0.00
35	127.00	1900MHz RRH	3	24.212	26.633	0.74	0.75	6.17	162.00	0.000	0.000	262.93	0.00	0.00
36	127.00	VHLP2-11	3	24.212	26.633	1.00	1.00	14.04	72.90	1.455	0.000	598.28	544.06	0.00
37	127.00	NNVV-65B-R4	3	24.212	26.633	0.55	0.75	20.43	208.98	0.000	0.000	870.55	0.00	0.00
38	127.00	800 MHz RRH	6	24.212	26.633	0.69	0.75	10.31	286.20	0.000	0.000	439.27	0.00	0.00
39	127.00	TD-RRH8x20-25	3	24.212	26.633	0.52	0.75	6.29	189.00	0.000	0.000	267.93	0.00	0.00
40	127.00	AAHC	3	24.212	26.633	0.56	0.75	7.10	279.72	0.000	0.000	302.73	0.00	0.00
41	127.00	RMQP-4096-HK	1	24.212	26.633	1.00	1.00	51.70	2380.50	0.000	0.000	2203.06	0.00	0.00
42	117.00	Ericsson 0208 RRU	3	23.651	26.016	0.54	0.80	2.20	53.46	0.000	0.000	91.70	0.00	0.00
43	117.00	Ericsson 4415 RRU	2	23.651	26.016	0.54	0.80	1.99	79.38	0.000	0.000	83.00	0.00	0.00
44	117.00	Standoff Sector Frame	3	23.651	26.016	0.56	0.75	25.48	1066.50	0.000	0.000	1060.67	0.00	0.00
45	117.00	Comba	3	23.651	26.016	0.56	0.80	8.15	67.77	0.000	0.000	339.16	0.00	0.00
							Totals:		**12,107.34**			**22,064.82**		

Total Applied Force Summary

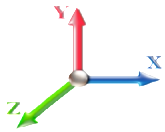
Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 22

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 27

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		431.69	1447.31	0.00	0.00
10.00		423.93	1426.05	0.00	0.00
15.00		416.18	1404.78	0.00	0.00
20.00		408.42	1383.52	0.00	0.00
25.00		400.67	1362.25	0.00	0.00
30.00		393.25	1340.98	0.00	0.00
35.00		402.84	1319.72	0.00	0.00
40.00		410.08	1298.45	0.00	0.00
40.75		61.11	192.93	0.00	0.00
45.00		358.09	1827.51	0.00	0.00
47.00		168.42	850.13	0.00	0.00
50.00		254.43	675.98	0.00	0.00
55.00		428.38	1112.04	0.00	0.00
60.00		429.70	1093.82	0.00	0.00
65.00		429.97	1075.59	0.00	0.00
70.00		429.28	1057.36	0.00	0.00
75.00		427.74	1039.13	0.00	0.00
80.00		425.43	1020.91	0.00	0.00
85.00		422.42	1002.68	0.00	0.00
89.25		355.76	837.94	0.00	0.00
90.00		62.93	218.04	0.00	0.00
91.50		125.74	434.04	0.00	0.00
94.25		229.96	788.63	0.00	0.00
95.00		62.29	110.62	0.00	0.00
96.75		145.16	257.06	0.00	0.00
97.00		20.64	36.60	0.00	0.00
100.00		247.76	436.84	0.00	0.00
102.25		184.40	324.76	0.00	0.00
105.00		224.04	393.59	0.00	0.00
110.00		404.09	706.19	0.00	0.00
115.00		397.86	694.04	0.00	0.00
117.00	(11) attachments	1731.26	1541.32	0.00	0.00
120.00		233.33	405.10	0.00	0.00
125.00		384.12	665.44	0.00	0.00
127.00	(27) attachments	5515.39	3910.48	870.74	0.00
130.00		224.57	375.52	0.00	0.00
135.00		368.80	616.14	0.00	0.00
137.00	(9) attachments	1546.27	1039.01	0.00	0.00
139.00		143.46	229.88	0.00	0.00
140.00		72.06	168.36	0.00	0.00
142.75		196.77	458.61	0.00	0.00
145.00		158.98	215.16	0.00	0.00
148.00	(45) attachments	5658.43	3088.05	0.00	0.00
150.00	(1) attachments	294.06	253.50	0.00	0.00
155.00		338.67	402.38	0.00	0.00
157.00	(26) attachments	4413.79	1672.38	0.00	0.00

Total Applied Force Summary

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 23

Tower Engineering Solutions

160.00		196.04	180.92	0.00	0.00
165.00		319.51	294.24	0.00	0.00
167.00	(18) attachments	3962.39	2103.70	0.00	262.66
169.00		123.09	87.53	0.00	0.00
	Totals:	**35,463.66**	**44,877.20**	**870.74**	**262.66**

Linear Appurtenance Segment Forces (Factored)

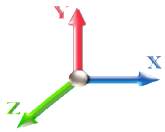
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 27

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)
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.035	0.000	16.018	0.00	28.08
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.036	0.000	16.018	0.00	28.08
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.036	0.000	16.018	0.00	28.08
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.037	0.000	16.018	0.00	28.08
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.038	0.000	16.018	0.00	28.08
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.038	0.000	16.031	0.00	28.08
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.039	0.000	16.753	0.00	28.08
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.040	0.000	17.405	0.00	28.08
40.75	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.041	0.000	17.497	0.00	4.21
45.00	1 5/8" Coax	Yes	4.25	0.000	1.98	0.70	0.00	0.041	0.000	18.000	0.00	23.87
47.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.042	0.000	18.225	0.00	11.23
50.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.041	0.000	18.551	0.00	16.85
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.042	0.000	19.063	0.00	28.08
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.043	0.000	19.543	0.00	28.08
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.044	0.000	19.995	0.00	28.08
70.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.045	0.000	20.422	0.00	28.08
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.046	0.000	20.829	0.00	28.08
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.047	0.000	21.217	0.00	28.08
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.048	0.000	21.587	0.00	28.08
89.25	1 5/8" Coax	Yes	4.25	0.000	1.98	0.70	0.00	0.049	0.000	21.890	0.00	23.87
90.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.075	0.000	21.943	0.00	4.21
90.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.075	0.000	21.943	0.00	0.00
91.50	1 5/8" Coax	Yes	1.50	0.000	1.98	0.25	0.00	0.076	0.000	22.047	0.00	8.42
91.50	1" Reinforcing plate	Yes	1.50	0.000	1.00	0.13	0.00	0.076	0.000	22.047	0.00	0.00
94.25	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.077	0.000	22.234	0.00	15.44
94.25	1" Reinforcing plate	Yes	2.75	0.000	1.00	0.23	0.00	0.077	0.000	22.234	0.00	0.00
95.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.076	0.000	22.284	0.00	4.21
95.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.076	0.000	22.284	0.00	0.00
96.75	1 5/8" Coax	Yes	1.75	0.000	1.98	0.29	0.00	0.077	0.000	22.401	0.00	9.83
96.75	1" Reinforcing plate	Yes	1.75	0.000	1.00	0.15	0.00	0.077	0.000	22.401	0.00	0.00
97.00	1 5/8" Coax	Yes	0.25	0.000	1.98	0.04	0.00	0.077	0.000	22.417	0.00	1.40
97.00	1" Reinforcing plate	Yes	0.25	0.000	1.00	0.02	0.00	0.077	0.000	22.417	0.00	0.00
100.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.078	0.000	22.613	0.00	16.85
100.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.078	0.000	22.613	0.00	0.00
100.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.078	0.000	22.613	0.00	0.00
102.25	1 5/8" Coax	Yes	2.25	0.000	1.98	0.37	0.00	0.079	0.000	22.758	0.00	12.64
102.25	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.079	0.000	22.758	0.00	0.00
105.00	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.075	0.000	22.931	0.00	15.44
105.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.075	0.000	22.931	0.00	0.00
110.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.054	0.000	23.238	0.00	28.08
115.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.056	0.000	23.535	0.00	28.08
117.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.057	0.000	23.651	0.00	11.23
120.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.058	0.000	23.823	0.00	16.85
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.059	0.000	24.102	0.00	28.08
127.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.061	0.000	24.212	0.00	11.23
130.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.061	0.000	24.374	0.00	16.85
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.063	0.000	24.638	0.00	28.08

Linear Appurtenance Segment Forces (Factored)

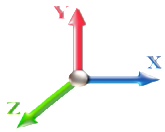
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 27

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)
137.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.065	0.000	24.742	0.00	11.23
139.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.065	0.000	24.844	0.00	11.23
140.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.17	0.00	0.066	0.000	24.895	0.00	5.62
142.75	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.067	0.000	25.034	0.00	15.44
145.00	1 5/8" Coax	Yes	2.25	0.000	1.98	0.37	0.00	0.067	0.000	25.146	0.00	12.64
148.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.068	0.000	25.294	0.00	16.85
150.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.070	0.000	25.391	0.00	11.23
155.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.071	0.000	25.630	0.00	28.08
157.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.073	0.000	25.724	0.00	11.23
										Totals:	**0.0**	**881.7**

Calculated Forces

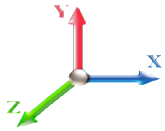
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 27

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-44.81	-35.55	-0.85	-4489.6	-0.01	4489.64	5324.18	2662.09	12195.0	6106.56	0.00	0.000	0.000	0.744
5.00	-43.24	-35.27	-0.85	-4311.9	-0.01	4311.92	5261.08	2630.54	11832.5	5925.09	0.11	-0.206	0.000	0.736
10.00	-41.69	-34.99	-0.85	-4135.5	-0.01	4135.58	5196.80	2598.40	11472.7	5744.92	0.44	-0.415	0.000	0.728
15.00	-40.16	-34.71	-0.85	-3960.6	-0.01	3960.63	5131.34	2565.67	11115.7	5566.13	0.99	-0.626	0.000	0.720
20.00	-38.65	-34.43	-0.85	-3787.0	-0.02	3787.09	5064.69	2532.35	10761.6	5388.80	1.76	-0.840	0.000	0.711
25.00	-37.16	-34.15	-0.85	-3614.9	-0.02	3614.94	4996.86	2498.43	10410.5	5212.99	2.75	-1.057	0.000	0.701
30.00	-35.70	-33.86	-0.85	-3444.2	-0.02	3444.21	4927.84	2463.92	10062.6	5038.79	3.98	-1.276	0.000	0.691
35.00	-34.26	-33.56	-0.85	-3274.8	-0.02	3274.89	4857.63	2428.82	9718.08	4866.26	5.43	-1.497	0.000	0.680
40.00	-32.90	-33.19	-0.85	-3107.0	-0.02	3107.07	4786.24	2393.12	9377.03	4695.49	7.12	-1.721	0.000	0.669
40.75	-32.64	-33.19	-0.85	-3082.1	-0.02	3082.18	4775.43	2387.72	9326.19	4670.03	7.39	-1.755	0.000	0.667
45.00	-30.75	-32.85	-0.85	-2941.1	-0.02	2941.13	4713.67	2356.83	9039.63	4526.53	9.04	-1.948	0.000	0.656
47.00	-29.84	-32.71	-0.85	-2875.4	-0.02	2875.43	3877.89	1938.95	7512.92	3762.05	9.88	-2.040	0.000	0.772
50.00	-29.06	-32.53	-0.85	-2777.3	-0.02	2777.30	3845.09	1922.55	7353.82	3682.38	11.21	-2.179	-0.001	0.762
55.00	-27.82	-32.18	-0.85	-2614.6	-0.02	2614.65	3789.47	1894.74	7090.51	3550.52	13.62	-2.431	-0.001	0.744
60.00	-26.61	-31.82	-0.86	-2453.7	-0.02	2453.75	3732.67	1866.34	6829.63	3419.89	16.30	-2.685	-0.001	0.725
65.00	-25.42	-31.45	-0.86	-2294.6	-0.03	2294.64	3674.68	1837.34	6571.34	3290.55	19.25	-2.939	-0.001	0.705
70.00	-24.25	-31.07	-0.86	-2137.3	-0.03	2137.38	3615.51	1807.76	6315.78	3162.58	22.47	-3.193	-0.001	0.683
75.00	-23.10	-30.69	-0.86	-1982.0	-0.03	1982.01	3555.15	1777.58	6063.10	3036.06	25.94	-3.445	-0.001	0.660
80.00	-21.98	-30.30	-0.86	-1828.5	-0.03	1828.57	3493.61	1746.80	5813.45	2911.05	29.68	-3.697	-0.001	0.635
85.00	-20.89	-29.89	-0.86	-1677.0	-0.03	1677.08	3430.88	1715.44	5566.98	2787.63	33.69	-3.945	-0.001	0.608
89.25	-20.01	-29.52	-0.86	-1550.0	-0.04	1550.04	3376.63	1688.32	5360.08	2684.02	37.29	-4.155	-0.001	0.584
90.00	-19.77	-29.46	-0.86	-1527.9	-0.04	1527.90	3366.97	1683.48	5323.83	2665.87	37.95	-4.193	-0.001	0.579
91.50	-19.30	-29.33	-0.86	-1483.7	-0.04	1483.71	3347.56	1673.78	5251.55	2629.68	39.28	-4.267	-0.001	0.427
94.25	-18.50	-29.07	-0.86	-1403.0	-0.04	1403.04	1944.87	972.44	3066.99	1535.78	41.76	-4.368	-0.001	0.483
95.00	-18.37	-29.01	-0.86	-1381.2	-0.04	1381.24	1940.65	970.33	3048.28	1526.41	42.45	-4.395	-0.002	0.616
96.75	-18.10	-28.86	-0.86	-1330.4	-0.04	1330.47	1930.70	965.35	3004.67	1504.57	44.08	-4.477	-0.002	0.420
97.00	-18.03	-28.86	-0.86	-1323.2	-0.04	1323.26	1929.27	964.63	2998.44	1501.45	44.31	-4.485	-0.002	0.544
100.00	-17.56	-28.61	-0.86	-1236.6	-0.04	1236.68	1911.84	955.92	2923.84	1464.09	47.17	-4.608	-0.002	0.518
102.25	-17.20	-28.43	-0.86	-1172.3	-0.04	1172.30	1898.49	949.24	2868.04	1436.15	49.36	-4.699	-0.002	0.499
102.25	-17.20	-28.43	-0.86	-1172.3	-0.04	1172.30	1898.49	949.24	2868.04	1436.15	49.36	-4.699	-0.002	0.499
105.00	-16.73	-28.24	-0.86	-1094.1	-0.04	1094.12	1881.84	940.92	2800.02	1402.09	52.09	-4.806	-0.002	0.790
110.00	-15.91	-27.86	-0.87	-952.94	-0.05	952.94	1850.66	925.33	2676.97	1340.48	57.29	-5.113	-0.002	0.720
115.00	-15.16	-27.45	-0.87	-813.66	-0.05	813.66	1818.29	909.14	2554.84	1279.32	62.79	-5.401	-0.003	0.645
117.00	-13.73	-25.61	-0.87	-758.76	-0.05	758.76	1805.01	902.50	2506.28	1255.00	65.08	-5.513	-0.003	0.613
120.00	-13.26	-25.39	-0.87	-681.93	-0.06	681.93	1784.73	892.37	2433.78	1218.70	68.59	-5.672	-0.003	0.568
125.00	-12.57	-24.97	-0.87	-555.00	-0.06	555.00	1749.99	875.00	2313.93	1158.68	74.65	-5.912	-0.003	0.487
127.00	-9.22	-19.10	0.00	-505.06	0.03	505.06	1735.77	867.88	2266.36	1134.86	77.15	-6.003	-0.003	0.451
130.00	-8.82	-18.86	0.00	-447.76	0.02	447.76	1714.07	857.04	2195.44	1099.35	80.95	-6.129	-0.003	0.413
135.00	-8.20	-18.44	0.00	-353.46	0.02	353.46	1676.96	838.48	2078.45	1040.77	87.46	-6.317	-0.003	0.345
137.00	-7.32	-16.80	0.00	-316.57	0.02	316.57	1661.79	830.89	2032.11	1017.57	90.12	-6.386	-0.003	0.316
139.00	-7.10	-16.64	0.00	-282.97	0.02	282.97	1646.42	823.21	1986.05	994.50	92.80	-6.450	-0.003	0.289
140.00	-6.92	-16.55	0.00	-266.33	0.01	266.33	1638.67	819.33	1963.12	983.02	94.16	-6.481	-0.003	0.276
142.75	-6.47	-16.31	0.00	-220.81	0.01	220.81	1100.62	550.31	1316.21	659.08	97.91	-6.558	-0.003	0.342
145.00	-6.25	-16.14	0.00	-184.10	0.01	184.10	1091.20	545.60	1284.61	643.26	101.00	-6.613	-0.003	0.293
148.00	-3.83	-10.17	0.00	-135.68	0.01	135.68	1078.27	539.14	1242.60	622.22	105.18	-6.690	-0.003	0.222
150.00	-3.60	-9.85	0.00	-115.35	0.01	115.35	1069.42	534.71	1214.68	608.24	107.98	-6.733	-0.003	0.193
155.00	-3.24	-9.47	0.00	-66.11	0.00	66.11	1046.45	523.23	1145.25	573.48	115.07	-6.815	-0.003	0.119
157.00	-2.10	-4.89	0.00	-47.18	0.00	47.18	1036.93	518.47	1117.66	559.66	117.92	-6.838	-0.003	0.086

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

160.00	-1.94	-4.67	0.00	-32.52	0.00	32.52	1022.30	511.15	1076.48	539.04	122.22	-6.863	-0.003	0.062
165.00	-1.69	-4.32	0.00	-9.17	0.00	9.17	996.96	498.48	1008.51	505.00	129.40	-6.886	-0.003	0.020
167.00	-0.07	-0.13	0.00	-0.27	0.00	0.27	986.50	493.25	981.58	491.52	132.28	-6.889	-0.003	0.001
169.00	0.00	-0.12	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	135.16	-6.889	-0.003	0.000

Wind Loading - Shaft

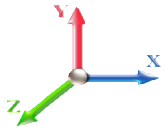
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

IES 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 26

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	4.256	4.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	4.256	4.68	0.00	1.200	1.242	5.00	24.593	29.51	138.2	439.0	2005.1
10.00		1.00	0.70	4.256	4.68	0.00	1.200	1.331	5.00	24.244	29.09	136.2	462.9	2000.7
15.00		1.00	0.70	4.256	4.68	0.00	1.200	1.386	5.00	23.867	28.64	134.1	473.8	1983.3
20.00		1.00	0.70	4.256	4.68	0.00	1.200	1.427	5.00	23.477	28.17	131.9	479.1	1960.2
25.00		1.00	0.70	4.256	4.68	0.00	1.200	1.459	5.00	23.081	27.70	129.7	481.0	1933.8
30.00		1.00	0.70	4.260	4.69	0.00	1.200	1.486	5.00	22.680	27.22	127.5	480.8	1905.2
35.00		1.00	0.73	4.451	4.90	0.00	1.200	1.509	5.00	22.276	26.73	130.9	479.1	1875.1
40.00		1.00	0.76	4.625	5.09	0.00	1.200	1.529	5.00	21.870	26.24	133.5	476.1	1843.8
40.75	Bot - Section 2	1.00	0.76	4.649	5.11	0.00	1.200	1.532	0.75	3.244	3.89	19.9	71.3	274.0
45.00		1.00	0.79	4.783	5.26	0.00	1.200	1.547	4.25	18.485	22.18	116.7	407.6	2535.2
47.00	Top - Section 1	1.00	0.80	4.843	5.33	0.00	1.200	1.554	2.00	8.595	10.31	54.9	191.1	1179.2
50.00		1.00	0.81	4.929	5.42	0.00	1.200	1.564	3.00	12.771	15.33	83.1	285.0	968.1
55.00		1.00	0.83	5.065	5.57	0.00	1.200	1.579	5.00	20.959	25.15	140.1	469.7	1588.8
60.00		1.00	0.85	5.193	5.71	0.00	1.200	1.592	5.00	20.547	24.66	140.8	464.0	1558.8
65.00		1.00	0.87	5.313	5.84	0.00	1.200	1.605	5.00	20.135	24.16	141.2	457.8	1528.3
70.00		1.00	0.89	5.426	5.97	0.00	1.200	1.617	5.00	19.722	23.67	141.3	451.2	1497.4
75.00		1.00	0.91	5.534	6.09	0.00	1.200	1.628	5.00	19.308	23.17	141.1	444.2	1466.1
80.00		1.00	0.93	5.637	6.20	0.00	1.200	1.639	5.00	18.894	22.67	140.6	436.9	1434.5
85.00		1.00	0.94	5.736	6.31	0.00	1.200	1.649	5.00	18.479	22.17	139.9	429.3	1402.6
89.25	Bot - Section 3	1.00	0.96	5.816	6.40	0.00	1.200	1.657	4.25	15.380	18.46	118.1	359.3	1167.5
90.00		1.00	0.96	5.830	6.41	0.00	1.200	1.658	0.75	2.714	3.26	20.9	64.0	300.2
91.50	RB1	1.00	0.96	5.858	6.44	0.00	1.200	1.661	1.50	5.401	6.48	41.8	127.3	596.9
94.25	Top - Section 2	1.00	0.97	5.908	6.50	0.00	1.200	1.666	2.75	9.805	11.77	76.5	230.9	1082.4
95.00		1.00	0.97	5.921	6.51	0.00	1.200	1.667	0.75	2.652	3.18	20.7	62.8	155.8
96.75	RB2	1.00	0.98	5.952	6.55	0.00	1.200	1.670	1.75	6.152	7.38	48.3	145.5	361.0
97.00	RT1	1.00	0.98	5.956	6.55	0.00	1.200	1.671	0.25	0.875	1.05	6.9	20.8	51.4
100.00		1.00	0.99	6.008	6.61	0.00	1.200	1.676	3.00	10.415	12.50	82.6	246.2	610.5
102.25	RT2	1.00	0.99	6.047	6.65	0.00	1.200	1.680	2.25	7.713	9.26	61.6	183.0	452.4
105.00		1.00	1.00	6.093	6.70	0.00	1.200	1.684	2.75	9.312	11.17	74.9	221.1	545.9
110.00		1.00	1.02	6.174	6.79	0.00	1.200	1.692	5.00	16.610	19.93	135.4	393.3	971.2
115.00		1.00	1.03	6.253	6.88	0.00	1.200	1.699	5.00	16.193	19.43	133.7	384.5	946.2
117.00	Appurtenance(s)	1.00	1.03	6.284	6.91	0.00	1.200	1.702	2.00	6.360	7.63	52.8	152.4	372.5
120.00		1.00	1.04	6.330	6.96	0.00	1.200	1.707	3.00	9.415	11.30	78.7	225.3	550.7
125.00		1.00	1.05	6.404	7.04	0.00	1.200	1.714	5.00	15.359	18.43	129.8	366.4	895.7
127.00	Appurtenance(s)	1.00	1.06	6.433	7.08	0.00	1.200	1.716	2.00	6.026	7.23	51.2	145.1	352.3
130.00		1.00	1.07	6.476	7.12	0.00	1.200	1.720	3.00	8.914	10.70	76.2	214.2	520.2
135.00		1.00	1.08	6.546	7.20	0.00	1.200	1.727	5.00	14.524	17.43	125.5	347.7	844.6
137.00	Appurtenance(s)	1.00	1.08	6.574	7.23	0.00	1.200	1.729	2.00	5.692	6.83	49.4	137.6	331.8
139.00	Bot - Section 4	1.00	1.09	6.601	7.26	0.00	1.200	1.732	2.00	5.625	6.75	49.0	136.0	327.7
140.00		1.00	1.09	6.615	7.28	0.00	1.200	1.733	1.00	2.819	3.38	24.6	68.4	235.5
142.75	Top - Section 3	1.00	1.09	6.652	7.32	0.00	1.200	1.737	2.75	7.667	9.20	67.3	185.3	638.9
145.00		1.00	1.10	6.681	7.35	0.00	1.200	1.739	2.25	6.179	7.41	54.5	149.7	307.3
148.00	Appurtenance(s)	1.00	1.11	6.721	7.39	0.00	1.200	1.743	3.00	8.107	9.73	71.9	196.1	402.5
150.00	Appurtenance(s)	1.00	1.11	6.746	7.42	0.00	1.200	1.745	2.00	5.320	6.38	47.4	129.1	264.3
155.00		1.00	1.12	6.810	7.49	0.00	1.200	1.751	5.00	13.010	15.61	116.9	313.0	642.4
157.00	Appurtenance(s)	1.00	1.12	6.835	7.52	0.00	1.200	1.753	2.00	5.086	6.10	45.9	123.6	252.0

Wind Loading - Shaft

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

160.00		1.00	1.13	6.872	7.56	0.00	1.200	1.757	3.00	7.504	9.00	68.1	181.8	370.7
165.00		1.00	1.14	6.933	7.63	0.00	1.200	1.762	5.00	12.173	14.61	111.4	293.0	598.1
167.00	Appurtenance(s)	1.00	1.14	6.957	7.65	0.00	1.200	1.764	2.00	4.751	5.70	43.6	115.6	234.2
169.00		1.00	1.15	6.980	7.68	0.00	1.200	1.766	2.00	4.684	5.62	43.2	114.0	230.7
								Totals:	**169.00**			**4,450.1**		**46,553.3**

Discrete Appurtenance Forces

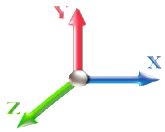
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

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 26

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	167.00	AIR 21 B4A/B2P	3	6.957	7.652	0.77	0.90	16.72	841.87	0.000	0.000	127.93	0.00	0.00
2	167.00	T-Arms/Commscope	3	6.963	7.659	0.56	0.75	21.44	1703.73	0.000	0.500	164.18	0.00	82.09
3	167.00	AIR 21 B2A/B4P	3	6.957	7.652	0.77	0.90	16.61	844.54	0.000	0.000	127.14	0.00	0.00
4	167.00	Ericsson - Radio 4449	3	6.957	7.652	0.60	0.80	3.90	471.00	0.000	0.000	29.85	0.00	0.00
5	167.00	Ericsson - KRY 112 144/2	3	6.957	7.652	0.60	0.80	1.60	62.99	0.000	0.000	12.26	0.00	0.00
6	167.00	APXVAA24_43-U-A20	3	6.957	7.652	0.66	0.90	43.73	1760.74	0.000	0.000	334.63	0.00	0.00
7	157.00	BXA-70063/6CF	1	6.835	7.518	1.00	1.00	10.35	122.16	0.000	0.000	77.79	0.00	0.00
8	157.00	T-Arms	3	6.835	7.518	0.56	0.75	25.33	1786.34	0.000	0.000	190.47	0.00	0.00
9	157.00	SLCP 2x6014F	2	6.835	7.518	0.84	0.90	14.35	301.29	0.000	0.000	107.92	0.00	0.00
10	157.00	DB846F65ZAXY	4	6.835	7.518	0.74	0.80	24.66	894.70	0.000	0.000	185.42	0.00	0.00
11	157.00	DB846H80E-SX	2	6.835	7.518	0.88	0.80	10.97	359.21	0.000	0.000	82.45	0.00	0.00
12	157.00	HBX-6517DS-VTM	6	6.835	7.518	0.60	0.80	23.70	866.16	0.000	0.000	178.19	0.00	0.00
13	157.00	ALU RRH2X60-AWS RRH	3	6.835	7.518	0.62	0.80	8.04	418.76	0.000	0.000	60.42	0.00	0.00
14	157.00	RFS DB T1-6Z-8AB-OZ	1	6.835	7.518	1.00	1.00	4.03	81.95	0.000	0.000	30.34	0.00	0.00
15	157.00	GPS	1	6.835	7.518	1.00	1.00	1.72	33.45	0.000	0.000	12.90	0.00	0.00
16	157.00	ALU/900 RRH2X60W -	3	6.835	7.518	0.62	0.80	4.62	374.13	0.000	0.000	34.75	0.00	0.00
17	150.00	Collar Mount	1	6.746	7.421	1.00	1.00	5.94	-146.23	0.000	0.000	44.11	0.00	0.00
18	148.00	Commscope	1	6.721	7.393	1.00	1.00	1.98	25.23	0.000	0.000	14.61	0.00	0.00
19	148.00	Ericsson RRUS 32-RRU	9	6.721	7.393	0.58	0.80	11.55	1267.24	0.000	0.000	85.41	0.00	0.00
20	148.00	Powerwave 1001940-Bias	3	6.721	7.393	0.73	0.80	0.65	31.38	0.000	0.000	4.84	0.00	0.00
21	148.00	CCI HPA-65R-BUU-H8	4	6.721	7.393	0.63	0.80	36.89	1488.76	0.000	0.000	272.72	0.00	0.00
22	148.00	CCI HPA-65R-BUU-H6	2	6.721	7.393	0.68	0.80	14.99	617.83	0.000	0.000	110.84	0.00	0.00
23	148.00	Cci OPA-65R-LCUU-H8	2	6.721	7.393	0.63	0.80	18.45	782.38	0.000	0.000	136.36	0.00	0.00
24	148.00	T-Arms w/ Modifications	3	6.721	7.393	0.60	0.80	40.42	2651.15	0.000	0.000	298.83	0.00	0.00
25	148.00	Ericsson RRUS-11-RRU	3	6.721	7.393	0.62	0.80	6.03	450.24	0.000	0.000	44.56	0.00	0.00
26	148.00	Raycap	2	6.721	7.393	0.81	0.90	3.51	172.69	0.000	0.000	25.98	0.00	0.00
27	148.00	Cci OPA-65R-LCUU-H6	1	6.721	7.393	0.63	0.80	6.97	319.00	0.000	0.000	51.51	0.00	0.00
28	148.00	Powerwave 7770	3	6.721	7.393	0.64	0.80	12.54	635.80	0.000	0.000	92.74	0.00	0.00
29	148.00	Powerwave LGP21401	6	6.721	7.393	0.62	0.80	7.85	208.73	0.000	0.000	58.05	0.00	0.00
30	148.00	Powerwave LGP13519	6	6.721	7.393	0.62	0.80	2.93	78.87	0.000	0.000	21.68	0.00	0.00
31	137.00	APXV18-206517S-C	6	6.574	7.231	0.59	0.80	26.72	582.54	0.000	0.000	193.24	0.00	0.00
32	137.00	T-Arms	3	6.574	7.231	0.56	0.75	30.98	1306.43	0.000	0.000	224.04	0.00	0.00
33	127.00	Horizon Duo	4	6.433	7.076	0.60	0.80	2.74	77.05	0.000	0.000	19.40	0.00	0.00
34	127.00	VHLP800-11	1	6.433	7.076	1.00	1.00	10.11	179.87	1.455	0.000	71.53	104.08	0.00
35	127.00	1900MHz RRH	3	6.433	7.076	0.74	0.75	8.95	390.47	0.000	0.000	63.33	0.00	0.00
36	127.00	VHLP2-11	3	6.433	7.076	1.00	1.00	17.80	301.94	1.455	0.000	125.96	183.27	0.00
37	127.00	NNVV-65B-R4	3	6.433	7.076	0.55	0.75	22.81	923.77	0.000	0.000	161.44	0.00	0.00
38	127.00	800 MHz RRH	6	6.433	7.076	0.69	0.75	14.97	691.44	0.000	0.000	105.90	0.00	0.00
39	127.00	TD-RRH8x20-25	3	6.433	7.076	0.53	0.75	7.75	576.79	0.000	0.000	54.81	0.00	0.00
40	127.00	AAHC	3	6.433	7.076	0.56	0.75	8.45	608.99	0.000	0.000	59.80	0.00	0.00
41	127.00	RMQP-4096-HK	1	6.433	7.076	1.00	1.00	89.33	5142.94	0.000	0.000	632.10	0.00	0.00
42	117.00	Ericsson 0208 RRU	3	6.284	6.913	0.54	0.80	2.98	151.63	0.000	0.000	20.63	0.00	0.00
43	117.00	Ericsson 4415 RRU	2	6.284	6.913	0.54	0.80	2.59	177.99	0.000	0.000	17.92	0.00	0.00
44	117.00	Standoff Sector Frame	3	6.284	6.913	0.56	0.75	56.71	2086.70	0.000	0.000	392.04	0.00	0.00
45	117.00	Comba	3	6.284	6.913	0.56	0.80	9.76	336.12	0.000	0.000	67.45	0.00	0.00
							Totals:		**33,040.76**			**5,228.47**		

Total Applied Force Summary

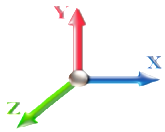
Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 31

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 26

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		138.16	2445.38	0.00	0.00
10.00		136.20	2446.45	0.00	0.00
15.00		134.08	2432.49	0.00	0.00
20.00		131.89	2411.94	0.00	0.00
25.00		129.67	2387.60	0.00	0.00
30.00		127.52	2360.75	0.00	0.00
35.00		130.89	2332.12	0.00	0.00
40.00		133.50	2302.12	0.00	0.00
40.75		19.91	342.82	0.00	0.00
45.00		116.70	2925.78	0.00	0.00
47.00		54.94	1363.15	0.00	0.00
50.00		83.09	1244.45	0.00	0.00
55.00		140.13	2050.43	0.00	0.00
60.00		140.83	2021.29	0.00	0.00
65.00		141.20	1991.62	0.00	0.00
70.00		141.26	1961.49	0.00	0.00
75.00		141.05	1930.96	0.00	0.00
80.00		140.59	1900.06	0.00	0.00
85.00		139.91	1868.84	0.00	0.00
89.25		118.08	1564.22	0.00	0.00
90.00		20.89	373.76	0.00	0.00
91.50		41.76	744.15	0.00	0.00
94.25		76.46	1352.61	0.00	0.00
95.00		20.73	229.45	0.00	0.00
96.75		48.33	533.06	0.00	0.00
97.00		6.88	75.97	0.00	0.00
100.00		82.60	905.78	0.00	0.00
102.25		61.56	673.96	0.00	0.00
105.00		74.90	814.49	0.00	0.00
110.00		135.38	1440.34	0.00	0.00
115.00		133.67	1415.82	0.00	0.00
117.00	(11) attachments	550.79	3312.89	0.00	0.00
120.00		78.67	829.30	0.00	0.00
125.00		129.83	1360.54	0.00	0.00
127.00	(27) attachments	1345.45	9431.53	287.35	0.00
130.00		76.20	779.36	0.00	0.00
135.00		125.50	1277.01	0.00	0.00
137.00	(9) attachments	466.67	2393.79	0.00	0.00
139.00		49.01	485.79	0.00	0.00
140.00		24.61	314.57	0.00	0.00
142.75		67.31	856.45	0.00	0.00
145.00		54.49	485.44	0.00	0.00
148.00	(45) attachments	1290.04	9369.36	0.00	0.00
150.00	(1) attachments	91.49	244.53	0.00	0.00
155.00		116.95	958.93	0.00	0.00
157.00	(26) attachments	1006.54	5616.78	0.00	0.00

Total Applied Force Summary

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 32

Tower Engineering Solutions

160.00		68.07	423.05	0.00	0.00
165.00		111.39	685.31	0.00	0.00
167.00	(18) attachments	839.63	5953.98	0.00	82.09
169.00		43.16	230.65	0.00	0.00
	Totals:	**9,678.58**	**93,852.66**	**287.35**	**82.09**

Linear Appurtenance Segment Forces (Factored)

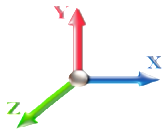
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

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 26

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)
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	1.86	0.00	0.035	0.000	4.256	0.00	114.06
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	1.93	0.00	0.036	0.000	4.256	0.00	119.58
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	1.98	0.00	0.036	0.000	4.256	0.00	123.04
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.01	0.00	0.037	0.000	4.256	0.00	125.61
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.04	0.00	0.038	0.000	4.256	0.00	127.66
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.06	0.00	0.038	0.000	4.260	0.00	129.38
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.08	0.00	0.039	0.000	4.451	0.00	130.87
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.10	0.00	0.040	0.000	4.625	0.00	132.19
40.75	1 5/8" Coax	Yes	0.75	0.000	1.98	0.32	0.00	0.041	0.000	4.649	0.00	19.86
45.00	1 5/8" Coax	Yes	4.25	0.000	1.98	1.80	0.00	0.041	0.000	4.783	0.00	113.36
47.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.85	0.00	0.042	0.000	4.843	0.00	53.52
50.00	1 5/8" Coax	Yes	3.00	0.000	1.98	1.28	0.00	0.041	0.000	4.929	0.00	80.66
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.14	0.00	0.042	0.000	5.065	0.00	135.41
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.15	0.00	0.043	0.000	5.193	0.00	136.31
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.16	0.00	0.044	0.000	5.313	0.00	137.16
70.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.17	0.00	0.045	0.000	5.426	0.00	137.94
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.18	0.00	0.046	0.000	5.534	0.00	138.68
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.19	0.00	0.047	0.000	5.637	0.00	139.38
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.20	0.00	0.048	0.000	5.736	0.00	140.04
89.25	1 5/8" Coax	Yes	4.25	0.000	1.98	1.87	0.00	0.049	0.000	5.816	0.00	119.49
90.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.33	0.00	0.075	0.000	5.830	0.00	21.10
90.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.27	0.00	0.075	0.000	5.830	0.00	3.55
91.50	1 5/8" Coax	Yes	1.50	0.000	1.98	0.66	0.00	0.076	0.000	5.858	0.00	42.26
91.50	1" Reinforcing plate	Yes	1.50	0.000	1.00	0.54	0.00	0.076	0.000	5.858	0.00	7.12
94.25	1 5/8" Coax	Yes	2.75	0.000	1.98	1.22	0.00	0.077	0.000	5.908	0.00	77.65
94.25	1" Reinforcing plate	Yes	2.75	0.000	1.00	0.99	0.00	0.077	0.000	5.908	0.00	13.12
95.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.33	0.00	0.076	0.000	5.921	0.00	21.19
95.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.27	0.00	0.076	0.000	5.921	0.00	3.58
96.75	1 5/8" Coax	Yes	1.75	0.000	1.98	0.78	0.00	0.077	0.000	5.952	0.00	49.51
96.75	1" Reinforcing plate	Yes	1.75	0.000	1.00	0.63	0.00	0.077	0.000	5.952	0.00	8.38
97.00	1 5/8" Coax	Yes	0.25	0.000	1.98	0.11	0.00	0.077	0.000	5.956	0.00	7.07
97.00	1" Reinforcing plate	Yes	0.25	0.000	1.00	0.09	0.00	0.077	0.000	5.956	0.00	1.20
100.00	1 5/8" Coax	Yes	3.00	0.000	1.98	1.33	0.00	0.078	0.000	6.008	0.00	85.10
100.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.27	0.00	0.078	0.000	6.008	0.00	3.61
100.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.82	0.00	0.078	0.000	6.008	0.00	10.84
102.25	1 5/8" Coax	Yes	2.25	0.000	1.98	1.00	0.00	0.079	0.000	6.047	0.00	63.94
102.25	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.82	0.00	0.079	0.000	6.047	0.00	10.88
105.00	1 5/8" Coax	Yes	2.75	0.000	1.98	1.23	0.00	0.075	0.000	6.093	0.00	78.31
105.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.82	0.00	0.075	0.000	6.093	0.00	10.93
110.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.23	0.00	0.054	0.000	6.174	0.00	142.91
115.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.24	0.00	0.056	0.000	6.253	0.00	143.41
117.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.90	0.00	0.057	0.000	6.284	0.00	57.44
120.00	1 5/8" Coax	Yes	3.00	0.000	1.98	1.35	0.00	0.058	0.000	6.330	0.00	86.34
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.25	0.00	0.059	0.000	6.404	0.00	144.37
127.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.90	0.00	0.061	0.000	6.433	0.00	57.82
130.00	1 5/8" Coax	Yes	3.00	0.000	1.98	1.36	0.00	0.061	0.000	6.476	0.00	86.89
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.26	0.00	0.063	0.000	6.546	0.00	145.26

Linear Appurtenance Segment Forces (Factored)

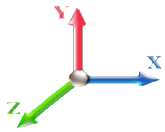
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

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 26

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)
137.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.91	0.00	0.065	0.000	6.574	0.00	58.17
139.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.91	0.00	0.065	0.000	6.601	0.00	58.24
140.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.45	0.00	0.066	0.000	6.615	0.00	29.14
142.75	1 5/8" Coax	Yes	2.75	0.000	1.98	1.25	0.00	0.067	0.000	6.652	0.00	80.25
145.00	1 5/8" Coax	Yes	2.25	0.000	1.98	1.02	0.00	0.067	0.000	6.681	0.00	65.74
148.00	1 5/8" Coax	Yes	3.00	0.000	1.98	1.37	0.00	0.068	0.000	6.721	0.00	87.80
150.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.91	0.00	0.070	0.000	6.746	0.00	58.60
155.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.28	0.00	0.071	0.000	6.810	0.00	146.88
157.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.91	0.00	0.073	0.000	6.835	0.00	58.81
										Totals:	**0.0**	**4,381.6**

Calculated Forces

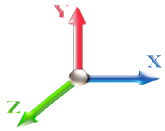
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

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 26

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	-93.85	-9.73	-0.29	-1250.0	0.00	1250.05	5324.18	2662.09	12195.0	6106.56	0.00	0.000	0.000	0.222
5.00	-91.39	-9.68	-0.29	-1201.4	0.00	1201.42	5261.08	2630.54	11832.5	5925.09	0.03	-0.057	0.000	0.220
10.00	-88.94	-9.63	-0.29	-1153.0	0.00	1153.03	5196.80	2598.40	11472.7	5744.92	0.12	-0.116	0.000	0.218
15.00	-86.49	-9.58	-0.29	-1104.8	0.00	1104.88	5131.34	2565.67	11115.7	5566.13	0.27	-0.175	0.000	0.215
20.00	-84.07	-9.53	-0.29	-1056.9	0.00	1056.99	5064.69	2532.35	10761.6	5388.80	0.49	-0.234	0.000	0.213
25.00	-81.68	-9.47	-0.29	-1009.3	0.00	1009.36	4996.86	2498.43	10410.5	5212.99	0.77	-0.295	0.000	0.210
30.00	-79.31	-9.42	-0.29	-961.99	0.00	961.99	4927.84	2463.92	10062.6	5038.79	1.11	-0.356	0.000	0.207
35.00	-76.96	-9.35	-0.29	-914.91	0.00	914.91	4857.63	2428.82	9718.08	4866.26	1.51	-0.418	0.000	0.204
40.00	-74.66	-9.25	-0.29	-868.14	0.00	868.14	4786.24	2393.12	9377.03	4695.49	1.99	-0.480	0.000	0.201
40.75	-74.31	-9.27	-0.29	-861.20	0.00	861.20	4775.43	2387.72	9326.19	4670.03	2.06	-0.490	0.000	0.200
45.00	-71.38	-9.17	-0.29	-821.82	0.00	821.82	4713.67	2356.83	9039.63	4526.53	2.52	-0.544	0.000	0.197
47.00	-70.01	-9.15	-0.29	-803.47	0.00	803.47	3877.89	1938.95	7512.92	3762.05	2.76	-0.569	0.000	0.232
50.00	-68.76	-9.12	-0.29	-776.04	0.00	776.04	3845.09	1922.55	7353.82	3682.38	3.13	-0.608	0.000	0.229
55.00	-66.70	-9.03	-0.29	-730.46	0.00	730.46	3789.47	1894.74	7090.51	3550.52	3.80	-0.679	0.000	0.223
60.00	-64.67	-8.95	-0.29	-685.29	0.00	685.29	3732.67	1866.34	6829.63	3419.89	4.55	-0.750	0.000	0.218
65.00	-62.67	-8.86	-0.29	-640.55	0.00	640.55	3674.68	1837.34	6571.34	3290.55	5.37	-0.820	0.000	0.212
70.00	-60.70	-8.76	-0.29	-596.27	0.00	596.27	3615.51	1807.76	6315.78	3162.58	6.27	-0.891	0.000	0.205
75.00	-58.76	-8.66	-0.29	-552.46	0.00	552.46	3555.15	1777.58	6063.10	3036.06	7.24	-0.962	0.000	0.199
80.00	-56.85	-8.56	-0.29	-509.15	0.00	509.15	3493.61	1746.80	5813.45	2911.05	8.29	-1.032	0.000	0.191
85.00	-54.98	-8.44	-0.29	-466.37	-0.01	466.37	3430.88	1715.44	5566.98	2787.63	9.40	-1.101	0.000	0.183
89.25	-53.41	-8.33	-0.29	-430.49	-0.01	430.49	3376.63	1688.32	5360.08	2684.02	10.41	-1.159	0.000	0.176
90.00	-53.03	-8.31	-0.29	-424.24	-0.01	424.24	3366.97	1683.48	5323.83	2665.87	10.59	-1.170	0.000	0.175
91.50	-52.29	-8.28	-0.29	-411.77	-0.01	411.77	3347.56	1673.78	5251.55	2629.68	10.97	-1.190	0.000	0.129
94.25	-50.94	-8.19	-0.29	-389.01	-0.01	389.01	1944.87	972.44	3066.99	1535.78	11.66	-1.218	0.000	0.145
95.00	-50.70	-8.18	-0.29	-382.87	-0.01	382.87	1940.65	970.33	3048.28	1526.41	11.85	-1.226	-0.001	0.185
96.75	-50.17	-8.13	-0.29	-368.56	-0.01	368.56	1930.70	965.35	3004.67	1504.57	12.30	-1.248	-0.001	0.127
97.00	-50.09	-8.13	-0.29	-366.53	-0.01	366.53	1929.27	964.63	2998.44	1501.45	12.37	-1.251	-0.001	0.165
100.00	-49.18	-8.06	-0.29	-342.13	-0.01	342.13	1911.84	955.92	2923.84	1464.09	13.17	-1.285	-0.001	0.158
102.25	-48.51	-8.00	-0.29	-324.00	-0.01	324.00	1898.49	949.24	2868.04	1436.15	13.78	-1.310	-0.001	0.152
102.25	-48.51	-8.00	-0.29	-324.00	-0.01	324.00	1898.49	949.24	2868.04	1436.15	13.78	-1.310	-0.001	0.152
105.00	-47.69	-7.96	-0.29	-301.99	-0.01	301.99	1881.84	940.92	2800.02	1402.09	14.54	-1.340	-0.001	0.241
110.00	-46.24	-7.85	-0.29	-262.20	-0.01	262.20	1850.66	925.33	2676.97	1340.48	15.99	-1.424	-0.001	0.221
115.00	-44.82	-7.73	-0.29	-222.93	-0.01	222.93	1818.29	909.14	2554.84	1279.32	17.53	-1.503	-0.001	0.199
117.00	-41.52	-7.12	-0.29	-207.48	-0.01	207.48	1805.01	902.50	2506.28	1255.00	18.16	-1.534	-0.001	0.188
120.00	-40.68	-7.05	-0.29	-186.14	-0.01	186.14	1784.73	892.37	2433.78	1218.70	19.14	-1.577	-0.001	0.176
125.00	-39.32	-6.92	-0.29	-150.87	-0.01	150.87	1749.99	875.00	2313.93	1158.68	20.83	-1.643	-0.001	0.153
127.00	-29.93	-5.31	0.00	-137.04	0.00	137.04	1735.77	867.88	2266.36	1134.86	21.52	-1.667	-0.001	0.138
130.00	-29.15	-5.24	0.00	-121.10	0.00	121.10	1714.07	857.04	2195.44	1099.35	22.58	-1.702	-0.001	0.127
135.00	-27.88	-5.09	0.00	-94.92	0.00	94.92	1676.96	838.48	2078.45	1040.77	24.39	-1.752	-0.001	0.108
137.00	-25.50	-4.56	0.00	-84.74	0.00	84.74	1661.79	830.89	2032.11	1017.57	25.13	-1.771	-0.001	0.099
139.00	-25.01	-4.50	0.00	-75.63	0.00	75.63	1646.42	823.21	1986.05	994.50	25.88	-1.788	-0.001	0.091
140.00	-24.70	-4.47	0.00	-71.13	0.00	71.13	1638.67	819.33	1963.12	983.02	26.25	-1.796	-0.001	0.087
142.75	-23.84	-4.38	0.00	-58.84	0.00	58.84	1100.62	550.31	1316.21	659.08	27.29	-1.817	-0.001	0.111
145.00	-23.36	-4.32	0.00	-48.98	0.00	48.98	1091.20	545.60	1284.61	643.26	28.15	-1.831	-0.001	0.098
148.00	-14.03	-2.73	0.00	-36.02	0.00	36.02	1078.27	539.14	1242.60	622.22	29.31	-1.852	-0.001	0.071
150.00	-13.79	-2.64	0.00	-30.55	0.00	30.55	1069.42	534.71	1214.68	608.24	30.09	-1.863	-0.001	0.063
155.00	-12.83	-2.49	0.00	-17.36	0.00	17.36	1046.45	523.23	1145.25	573.48	32.05	-1.885	-0.001	0.043
157.00	-7.25	-1.30	0.00	-12.37	0.00	12.37	1036.93	518.47	1117.66	559.66	32.84	-1.891	-0.001	0.029

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 36	

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160.00	-6.83	-1.22	0.00	-8.47	0.00	8.47	1022.30	511.15	1076.48	539.04	34.03	-1.897	-0.001	0.022
165.00	-6.15	-1.09	0.00	-2.36	0.00	2.36	996.96	498.48	1008.51	505.00	36.02	-1.904	-0.001	0.011
167.00	-0.23	-0.05	0.00	-0.10	0.00	0.10	986.50	493.25	981.58	491.52	36.82	-1.904	-0.001	0.000
169.00	0.00	-0.04	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	37.62	-1.904	-0.001	0.000

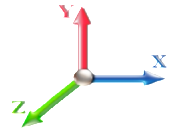
Seismic Segment Forces (Factored)

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 37	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	24
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.28	**SA**	0.03	**S1**	0.06
						Seismic Importance Factor	1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1305.1	0.00	0.03	0.02	24.42	
10.00		1281.4	0.01	0.05	0.03	34.76	
15.00		1257.8	0.01	0.06	0.04	39.54	
20.00		1234.2	0.03	0.07	0.04	41.64	
25.00		1210.5	0.04	0.07	0.04	42.44	
30.00		1186.9	0.06	0.07	0.04	42.67	
35.00		1163.3	0.08	0.07	0.04	42.74	
40.00		1139.7	0.11	0.07	0.04	42.78	
40.75	Bot - Section 2	168.92	0.11	0.07	0.04	6.36	
45.00		1773.0	0.13	0.07	0.03	67.97	
47.00	Top - Section 1	823.38	0.15	0.07	0.03	31.81	
50.00		569.27	0.17	0.07	0.03	22.20	
55.00		932.58	0.20	0.06	0.02	36.56	
60.00		912.33	0.24	0.06	0.02	35.17	
65.00		892.08	0.28	0.05	0.01	32.51	
70.00		871.83	0.32	0.04	0.01	28.06	
75.00		851.57	0.37	0.03	0.01	21.38	
80.00		831.32	0.42	0.01	0.01	12.38	
85.00		811.07	0.48	-0.01	0.01	1.66	
89.25	Bot - Section 3	673.48	0.53	-0.03	0.01	-6.60	
90.00		196.82	0.54	-0.03	0.01	-2.34	
91.50	RB1	391.36	0.55	-0.04	0.01	-6.24	
94.25	Top - Section 2	709.60	0.59	-0.05	0.01	-16.27	
95.00		77.46	0.60	-0.05	0.01	-1.91	
96.75	RB2	179.56	0.62	-0.06	0.02	-5.13	
97.00	RT1	25.52	0.62	-0.06	0.02	-0.74	
100.00		303.57	0.66	-0.07	0.02	-10.49	
102.25	RT2	224.48	0.69	-0.08	0.03	-8.47	
105.00		270.66	0.73	-0.10	0.04	-10.96	
110.00		481.64	0.80	-0.11	0.05	-20.30	
115.00		468.14	0.88	-0.12	0.08	-18.58	
117.00	Appurtenance(s)	1591.3	0.91	-0.12	0.09	-59.78	
120.00		271.16	0.95	-0.12	0.11	-9.01	
125.00		441.13	1.03	-0.10	0.15	-10.11	
127.00	Appurtenance(s)	4225.6	1.07	-0.09	0.17	-74.91	
130.00		254.96	1.12	-0.06	0.20	-2.25	
135.00		414.13	1.21	0.01	0.26	3.74	
137.00	Appurtenance(s)	1046.2	1.24	0.05	0.29	18.03	
139.00	Bot - Section 4	159.71	1.28	0.09	0.32	4.16	
140.00		139.21	1.30	0.12	0.33	4.27	
142.75	Top - Section 3	377.97	1.35	0.19	0.38	16.71	
145.00		131.39	1.39	0.27	0.42	7.38	
148.00	Appurtenance(s)	3287.6	1.45	0.38	0.48	241.18	
150.00	Appurtenance(s)	212.64	1.49	0.47	0.53	18.20	
155.00		274.52	1.59	0.75	0.66	32.68	

Seismic Segment Forces (Factored)

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 38

157.00	Appurtenance(s)	1789.1	1.63	0.88	0.71	238.99			
160.00		157.42	1.69	1.10	0.81	24.65			
165.00		254.27	1.80	1.55	0.98	50.44			
167.00	Appurtenance(s)	2308.3	1.85	1.75	1.06	499.20			
169.00		97.25	1.89	1.98	1.14	22.84			
	Totals:	**40,653.1**				**1,525.4**	**Total Wind:**	**35,463.7**	

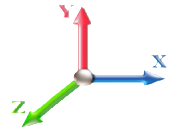
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	24		
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18		
Wind Load Factor	0.00	**Structure Frequency**	0.28	**SA**	0.03	**S1**	0.06	**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	-59.84	-1.79	0.00	-225.21	0.00	225.21	5324.18	2662.09	12195.0	6106.56		0.00	0.00	0.048
5.00	-57.91	-1.78	0.00	-216.24	0.00	216.24	5261.08	2630.54	11832.5	5925.09		0.01	-0.01	0.048
10.00	-56.00	-1.76	0.00	-207.34	0.00	207.34	5196.80	2598.40	11472.7	5744.92		0.02	-0.02	0.047
15.00	-54.13	-1.72	0.00	-198.56	0.00	198.56	5131.34	2565.67	11115.7	5566.13		0.05	-0.03	0.046
20.00	-52.29	-1.69	0.00	-189.94	0.00	189.94	5064.69	2532.35	10761.6	5388.80		0.09	-0.04	0.046
25.00	-50.47	-1.66	0.00	-181.48	0.00	181.48	4996.86	2498.43	10410.5	5212.99		0.14	-0.05	0.045
30.00	-48.68	-1.62	0.00	-173.19	0.00	173.19	4927.84	2463.92	10062.6	5038.79		0.20	-0.06	0.044
35.00	-46.92	-1.59	0.00	-165.08	0.00	165.08	4857.63	2428.82	9718.08	4866.26		0.27	-0.08	0.044
40.00	-45.19	-1.55	0.00	-157.14	0.00	157.14	4786.24	2393.12	9377.03	4695.49		0.36	-0.09	0.043
40.75	-44.93	-1.54	0.00	-155.98	0.00	155.98	4775.43	2387.72	9326.19	4670.03		0.37	-0.09	0.043
45.00	-42.50	-1.48	0.00	-149.42	0.00	149.42	4713.67	2356.83	9039.63	4526.53		0.45	-0.10	0.042
47.00	-41.36	-1.45	0.00	-146.46	0.00	146.46	3877.89	1938.95	7512.92	3762.05		0.50	-0.10	0.050
50.00	-40.46	-1.43	0.00	-142.12	0.00	142.12	3845.09	1922.55	7353.82	3682.38		0.56	-0.11	0.049
55.00	-38.98	-1.40	0.00	-134.96	0.00	134.96	3789.47	1894.74	7090.51	3550.52		0.68	-0.12	0.048
60.00	-37.52	-1.37	0.00	-127.96	0.00	127.96	3732.67	1866.34	6829.63	3419.89		0.82	-0.14	0.047
65.00	-36.08	-1.34	0.00	-121.10	0.00	121.10	3674.68	1837.34	6571.34	3290.55		0.97	-0.15	0.047
70.00	-34.67	-1.32	0.00	-114.38	0.00	114.38	3615.51	1807.76	6315.78	3162.58		1.13	-0.16	0.046
75.00	-33.29	-1.30	0.00	-107.79	0.00	107.79	3555.15	1777.58	6063.10	3036.06		1.31	-0.18	0.045
80.00	-31.93	-1.29	0.00	-101.27	0.00	101.27	3493.61	1746.80	5813.45	2911.05		1.50	-0.19	0.044
85.00	-30.59	-1.29	0.00	-94.81	0.00	94.81	3430.88	1715.44	5566.98	2787.63		1.71	-0.20	0.043
89.25	-29.47	-1.29	0.00	-89.31	0.00	89.31	3376.63	1688.32	5360.08	2684.02		1.90	-0.22	0.042
90.00	-29.18	-1.29	0.00	-88.34	0.00	88.34	3366.97	1683.48	5323.83	2665.87		1.93	-0.22	0.042
91.50	-28.60	-1.29	0.00	-86.40	0.00	86.40	3347.56	1673.78	5251.55	2629.68		2.00	-0.22	0.031
94.25	-27.55	-1.29	0.00	-82.84	0.00	82.84	1944.87	972.44	3066.99	1535.78		2.13	-0.23	0.035
95.00	-27.40	-1.29	0.00	-81.87	0.00	81.87	1940.65	970.33	3048.28	1526.41		2.17	-0.23	0.045
96.75	-27.06	-1.29	0.00	-79.61	0.00	79.61	1930.70	965.35	3004.67	1504.57		2.25	-0.23	0.031
97.00	-27.01	-1.29	0.00	-79.28	0.00	79.28	1929.27	964.63	2998.44	1501.45		2.26	-0.24	0.041
100.00	-26.43	-1.30	0.00	-75.40	0.00	75.40	1911.84	955.92	2923.84	1464.09		2.41	-0.24	0.040
102.25	-26.00	-1.30	0.00	-72.49	0.00	72.49	1898.49	949.24	2868.04	1436.15		2.53	-0.25	0.039
102.25	-26.00	-1.30	0.00	-72.49	0.00	72.49	1898.49	949.24	2868.04	1436.15		2.53	-0.25	0.039
105.00	-25.47	-1.30	0.00	-68.92	0.00	68.92	1881.84	940.92	2800.02	1402.09		2.67	-0.26	0.063
110.00	-24.53	-1.30	0.00	-62.42	0.00	62.42	1850.66	925.33	2676.97	1340.48		2.95	-0.27	0.060
115.00	-23.60	-1.30	0.00	-55.90	0.00	55.90	1818.29	909.14	2554.84	1279.32		3.25	-0.29	0.057
117.00	-21.55	-1.30	0.00	-53.30	0.00	53.30	1805.01	902.50	2506.28	1255.00		3.37	-0.30	0.054
120.00	-21.01	-1.30	0.00	-49.40	0.00	49.40	1784.73	892.37	2433.78	1218.70		3.57	-0.31	0.052
125.00	-20.12	-1.30	0.00	-42.90	0.00	42.90	1749.99	875.00	2313.93	1158.68		3.91	-0.33	0.049
127.00	-14.91	-1.27	0.00	-40.30	0.00	40.30	1735.77	867.88	2266.36	1134.86		4.05	-0.34	0.044
130.00	-14.41	-1.27	0.00	-36.49	0.00	36.49	1714.07	857.04	2195.44	1099.35		4.26	-0.35	0.042
135.00	-13.58	-1.27	0.00	-30.13	0.00	30.13	1676.96	838.48	2078.45	1040.77		4.64	-0.36	0.037
137.00	-12.20	-1.24	0.00	-27.60	0.00	27.60	1661.79	830.89	2032.11	1017.57		4.79	-0.37	0.034
139.00	-11.89	-1.23	0.00	-25.12	0.00	25.12	1646.42	823.21	1986.05	994.50		4.95	-0.38	0.032
140.00	-11.67	-1.23	0.00	-23.89	0.00	23.89	1638.67	819.33	1963.12	983.02		5.02	-0.38	0.031
142.75	-11.06	-1.21	0.00	-20.50	0.00	20.50	1100.62	550.31	1316.21	659.08		5.24	-0.39	0.041
145.00	-10.77	-1.20	0.00	-17.78	0.00	17.78	1091.20	545.60	1284.61	643.26		5.43	-0.39	0.038
148.00	-6.65	-0.93	0.00	-14.18	0.00	14.18	1078.27	539.14	1242.60	622.22		5.68	-0.40	0.029
150.00	-6.32	-0.91	0.00	-12.31	0.00	12.31	1069.42	534.71	1214.68	608.24		5.84	-0.40	0.026
155.00	-5.78	-0.88	0.00	-7.74	0.00	7.74	1046.45	523.23	1145.25	573.48		6.27	-0.41	0.019

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

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157.00	-3.55	-0.62	0.00	-5.99	0.00	5.99	1036.93	518.47	1117.66	559.66	6.44	-0.41	0.014
160.00	-3.31	-0.60	0.00	-4.12	0.00	4.12	1022.30	511.15	1076.48	539.04	6.70	-0.42	0.011
165.00	-2.92	-0.54	0.00	-1.13	0.00	1.13	996.96	498.48	1008.51	505.00	7.14	-0.42	0.005
167.00	-0.12	-0.02	0.00	-0.05	0.00	0.05	986.50	493.25	981.58	491.52	7.32	-0.42	0.000
169.00	0.00	-0.02	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	7.50	-0.42	0.000

Seismic Segment Forces (Factored)

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 41	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E					**Iterations**	24
Gust Response Factor	1.10			**Sds**	0.19	**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.28	**SA**	0.03	**Seismic Importance Factor**	1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1305.1	0.00	0.03	0.02	24.42	
10.00		1281.4	0.01	0.05	0.03	34.76	
15.00		1257.8	0.01	0.06	0.04	39.54	
20.00		1234.2	0.03	0.07	0.04	41.64	
25.00		1210.5	0.04	0.07	0.04	42.44	
30.00		1186.9	0.06	0.07	0.04	42.67	
35.00		1163.3	0.08	0.07	0.04	42.74	
40.00		1139.7	0.11	0.07	0.04	42.78	
40.75	Bot - Section 2	168.92	0.11	0.07	0.04	6.36	
45.00		1773.0	0.13	0.07	0.03	67.97	
47.00	Top - Section 1	823.38	0.15	0.07	0.03	31.81	
50.00		569.27	0.17	0.07	0.03	22.20	
55.00		932.58	0.20	0.06	0.02	36.56	
60.00		912.33	0.24	0.06	0.02	35.17	
65.00		892.08	0.28	0.05	0.01	32.51	
70.00		871.83	0.32	0.04	0.01	28.06	
75.00		851.57	0.37	0.03	0.01	21.38	
80.00		831.32	0.42	0.01	0.01	12.38	
85.00		811.07	0.48	-0.01	0.01	1.66	
89.25	Bot - Section 3	673.48	0.53	-0.03	0.01	-6.60	
90.00		196.82	0.54	-0.03	0.01	-2.34	
91.50	RB1	391.36	0.55	-0.04	0.01	-6.24	
94.25	Top - Section 2	709.60	0.59	-0.05	0.01	-16.27	
95.00		77.46	0.60	-0.05	0.01	-1.91	
96.75	RB2	179.56	0.62	-0.06	0.02	-5.13	
97.00	RT1	25.52	0.62	-0.06	0.02	-0.74	
100.00		303.57	0.66	-0.07	0.02	-10.49	
102.25	RT2	224.48	0.69	-0.08	0.03	-8.47	
105.00		270.66	0.73	-0.10	0.04	-10.96	
110.00		481.64	0.80	-0.11	0.05	-20.30	
115.00		468.14	0.88	-0.12	0.08	-18.58	
117.00	Appurtenance(s)	1591.3	0.91	-0.12	0.09	-59.78	
120.00		271.16	0.95	-0.12	0.11	-9.01	
125.00		441.13	1.03	-0.10	0.15	-10.11	
127.00	Appurtenance(s)	4225.6	1.07	-0.09	0.17	-74.91	
130.00		254.96	1.12	-0.06	0.20	-2.25	
135.00		414.13	1.21	0.01	0.26	3.74	
137.00	Appurtenance(s)	1046.2	1.24	0.05	0.29	18.03	
139.00	Bot - Section 4	159.71	1.28	0.09	0.32	4.16	
140.00		139.21	1.30	0.12	0.33	4.27	
142.75	Top - Section 3	377.97	1.35	0.19	0.38	16.71	
145.00		131.39	1.39	0.27	0.42	7.38	
148.00	Appurtenance(s)	3287.6	1.45	0.38	0.48	241.18	
150.00	Appurtenance(s)	212.64	1.49	0.47	0.53	18.20	
155.00		274.52	1.59	0.75	0.66	32.68	

Seismic Segment Forces (Factored)

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 42

157.00	Appurtenance(s)	1789.1	1.63	0.88	0.71	238.99			
160.00		157.42	1.69	1.10	0.81	24.65			
165.00		254.27	1.80	1.55	0.98	50.44			
167.00	Appurtenance(s)	2308.3	1.85	1.75	1.06	499.20			
169.00		97.25	1.89	1.98	1.14	22.84			
	Totals:	**40,653.1**				**1,525.4**	**Total Wind:**	**35,463.7**	

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

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 43	

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Load Case:	0.9D + 1.0E							**Iterations**	24
Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.28	**SA**	0.03			**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	-44.88	-1.79	0.00	-221.82	0.00	221.82	5324.18	2662.09	12195.0	6106.56		0.00	0.00	0.045
5.00	-43.43	-1.78	0.00	-212.85	0.00	212.85	5261.08	2630.54	11832.5	5925.09		0.01	-0.01	0.044
10.00	-42.00	-1.75	0.00	-203.97	0.00	203.97	5196.80	2598.40	11472.7	5744.92		0.02	-0.02	0.044
15.00	-40.60	-1.72	0.00	-195.23	0.00	195.23	5131.34	2565.67	11115.7	5566.13		0.05	-0.03	0.043
20.00	-39.21	-1.68	0.00	-186.65	0.00	186.65	5064.69	2532.35	10761.6	5388.80		0.09	-0.04	0.042
25.00	-37.85	-1.64	0.00	-178.25	0.00	178.25	4996.86	2498.43	10410.5	5212.99		0.14	-0.05	0.042
30.00	-36.51	-1.61	0.00	-170.03	0.00	170.03	4927.84	2463.92	10062.6	5038.79		0.20	-0.06	0.041
35.00	-35.19	-1.57	0.00	-161.99	0.00	161.99	4857.63	2428.82	9718.08	4866.26		0.27	-0.07	0.041
40.00	-33.89	-1.53	0.00	-154.14	0.00	154.14	4786.24	2393.12	9377.03	4695.49		0.35	-0.08	0.040
40.75	-33.70	-1.53	0.00	-153.00	0.00	153.00	4775.43	2387.72	9326.19	4670.03		0.36	-0.09	0.040
45.00	-31.87	-1.46	0.00	-146.52	0.00	146.52	4713.67	2356.83	9039.63	4526.53		0.45	-0.10	0.039
47.00	-31.02	-1.43	0.00	-143.60	0.00	143.60	3877.89	1938.95	7512.92	3762.05		0.49	-0.10	0.046
50.00	-30.34	-1.41	0.00	-139.31	0.00	139.31	3845.09	1922.55	7353.82	3682.38		0.55	-0.11	0.046
55.00	-29.23	-1.38	0.00	-132.26	0.00	132.26	3789.47	1894.74	7090.51	3550.52		0.67	-0.12	0.045
60.00	-28.14	-1.35	0.00	-125.38	0.00	125.38	3732.67	1866.34	6829.63	3419.89		0.81	-0.13	0.044
65.00	-27.06	-1.32	0.00	-118.64	0.00	118.64	3674.68	1837.34	6571.34	3290.55		0.95	-0.15	0.043
70.00	-26.01	-1.29	0.00	-112.06	0.00	112.06	3615.51	1807.76	6315.78	3162.58		1.11	-0.16	0.043
75.00	-24.97	-1.27	0.00	-105.59	0.00	105.59	3555.15	1777.58	6063.10	3036.06		1.29	-0.17	0.042
80.00	-23.94	-1.26	0.00	-99.22	0.00	99.22	3493.61	1746.80	5813.45	2911.05		1.48	-0.19	0.041
85.00	-22.94	-1.26	0.00	-92.90	0.00	92.90	3430.88	1715.44	5566.98	2787.63		1.68	-0.20	0.040
89.25	-22.10	-1.26	0.00	-87.53	0.00	87.53	3376.63	1688.32	5360.08	2684.02		1.86	-0.21	0.039
90.00	-21.89	-1.26	0.00	-86.58	0.00	86.58	3366.97	1683.48	5323.83	2665.87		1.90	-0.21	0.039
91.50	-21.45	-1.26	0.00	-84.68	0.00	84.68	3347.56	1673.78	5251.55	2629.68		1.96	-0.22	0.029
94.25	-20.66	-1.26	0.00	-81.20	0.00	81.20	1944.87	972.44	3066.99	1535.78		2.09	-0.22	0.033
95.00	-20.55	-1.26	0.00	-80.26	0.00	80.26	1940.65	970.33	3048.28	1526.41		2.13	-0.23	0.042
96.75	-20.29	-1.26	0.00	-78.04	0.00	78.04	1930.70	965.35	3004.67	1504.57		2.21	-0.23	0.029
97.00	-20.26	-1.26	0.00	-77.73	0.00	77.73	1929.27	964.63	2998.44	1501.45		2.22	-0.23	0.038
100.00	-19.82	-1.27	0.00	-73.93	0.00	73.93	1911.84	955.92	2923.84	1464.09		2.37	-0.24	0.037
102.25	-19.50	-1.27	0.00	-71.09	0.00	71.09	1898.49	949.24	2868.04	1436.15		2.48	-0.24	0.036
102.25	-19.50	-1.27	0.00	-71.09	0.00	71.09	1898.49	949.24	2868.04	1436.15		2.48	-0.24	0.036
105.00	-19.10	-1.27	0.00	-67.61	0.00	67.61	1881.84	940.92	2800.02	1402.09		2.63	-0.25	0.058
110.00	-18.40	-1.27	0.00	-61.26	0.00	61.26	1850.66	925.33	2676.97	1340.48		2.90	-0.27	0.056
115.00	-17.70	-1.27	0.00	-54.90	0.00	54.90	1818.29	909.14	2554.84	1279.32		3.19	-0.29	0.053
117.00	-16.16	-1.27	0.00	-52.36	0.00	52.36	1805.01	902.50	2506.28	1255.00		3.31	-0.30	0.051
120.00	-15.75	-1.27	0.00	-48.56	0.00	48.56	1784.73	892.37	2433.78	1218.70		3.50	-0.31	0.049
125.00	-15.09	-1.27	0.00	-42.21	0.00	42.21	1749.99	875.00	2313.93	1158.68		3.83	-0.32	0.045
127.00	-11.18	-1.25	0.00	-39.68	0.00	39.68	1735.77	867.88	2266.36	1134.86		3.97	-0.33	0.041
130.00	-10.80	-1.25	0.00	-35.93	0.00	35.93	1714.07	857.04	2195.44	1099.35		4.18	-0.34	0.039
135.00	-10.19	-1.24	0.00	-29.69	0.00	29.69	1676.96	838.48	2078.45	1040.77		4.55	-0.36	0.035
137.00	-9.15	-1.22	0.00	-27.21	0.00	27.21	1661.79	830.89	2032.11	1017.57		4.70	-0.36	0.032
139.00	-8.92	-1.21	0.00	-24.77	0.00	24.77	1646.42	823.21	1986.05	994.50		4.85	-0.37	0.030
140.00	-8.75	-1.21	0.00	-23.56	0.00	23.56	1638.67	819.33	1963.12	983.02		4.93	-0.37	0.029
142.75	-8.29	-1.19	0.00	-20.23	0.00	20.23	1100.62	550.31	1316.21	659.08		5.15	-0.38	0.038
145.00	-8.07	-1.18	0.00	-17.55	0.00	17.55	1091.20	545.60	1284.61	643.26		5.33	-0.38	0.035
148.00	-4.99	-0.92	0.00	-14.01	0.00	14.01	1078.27	539.14	1242.60	622.22		5.57	-0.39	0.027
150.00	-4.73	-0.90	0.00	-12.16	0.00	12.16	1069.42	534.71	1214.68	608.24		5.74	-0.40	0.024
155.00	-4.33	-0.87	0.00	-7.65	0.00	7.65	1046.45	523.23	1145.25	573.48		6.15	-0.40	0.017

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 44	

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157.00	-2.66	-0.62	0.00	-5.92	0.00	5.92	1036.93	518.47	1117.66	559.66	6.32	-0.41	0.013
160.00	-2.48	-0.59	0.00	-4.07	0.00	4.07	1022.30	511.15	1076.48	539.04	6.58	-0.41	0.010
165.00	-2.19	-0.54	0.00	-1.12	0.00	1.12	996.96	498.48	1008.51	505.00	7.01	-0.41	0.004
167.00	-0.09	-0.02	0.00	-0.05	0.00	0.05	986.50	493.25	981.58	491.52	7.19	-0.41	0.000
169.00	0.00	-0.02	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	7.36	-0.41	0.000

Wind Loading - Shaft

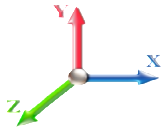
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 45	

TES Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	6.129	6.74	238.64	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	6.129	6.74	234.39	0.650	0.000	5.00	23.558	15.31	103.2	0.0	1305.1
10.00		1.00	0.70	6.129	6.74	230.15	0.650	0.000	5.00	23.135	15.04	101.4	0.0	1281.5
15.00		1.00	0.70	6.129	6.74	225.90	0.650	0.000	5.00	22.712	14.76	99.5	0.0	1257.8
20.00		1.00	0.70	6.129	6.74	221.65	0.650	0.000	5.00	22.288	14.49	97.7	0.0	1234.2
25.00		1.00	0.70	6.129	6.74	217.40	0.650	0.000	5.00	21.865	14.21	95.8	0.0	1210.6
30.00		1.00	0.70	6.134	6.75	213.24	0.650	0.000	5.00	21.442	13.94	94.0	0.0	1187.0
35.00		1.00	0.73	6.410	7.05	213.65	0.650	0.000	5.00	21.019	13.66	96.3	0.0	1163.3
40.00		1.00	0.76	6.659	7.33	213.33	0.650	0.000	5.00	20.596	13.39	98.1	0.0	1139.7
40.75	Bot - Section 2	1.00	0.76	6.695	7.36	213.23	0.650	0.000	0.75	3.053	1.98	14.6	0.0	168.9
45.00		1.00	0.79	6.887	7.58	212.45	0.650	0.000	4.25	17.389	11.30	85.6	0.0	1773.0
47.00	Top - Section 1	1.00	0.80	6.973	7.67	211.96	0.650	0.000	2.00	8.077	5.25	40.3	0.0	823.4
50.00		1.00	0.81	7.098	7.81	214.53	0.650	0.000	3.00	11.989	7.79	60.8	0.0	569.3
55.00		1.00	0.83	7.294	8.02	212.83	0.650	0.000	5.00	19.644	12.77	102.4	0.0	932.6
60.00		1.00	0.85	7.477	8.22	210.80	0.650	0.000	5.00	19.220	12.49	102.8	0.0	912.3
65.00		1.00	0.87	7.650	8.42	208.48	0.650	0.000	5.00	18.797	12.22	102.8	0.0	892.1
70.00		1.00	0.89	7.814	8.60	205.90	0.650	0.000	5.00	18.374	11.94	102.7	0.0	871.8
75.00		1.00	0.91	7.969	8.77	203.10	0.650	0.000	5.00	17.951	11.67	102.3	0.0	851.6
80.00		1.00	0.93	8.118	8.93	200.09	0.650	0.000	5.00	17.528	11.39	101.7	0.0	831.3
85.00		1.00	0.94	8.260	9.09	196.90	0.650	0.000	5.00	17.105	11.12	101.0	0.0	811.1
89.25	Bot - Section 3	1.00	0.96	8.376	9.21	194.05	0.650	0.000	4.25	14.206	9.23	85.1	0.0	673.5
90.00		1.00	0.96	8.396	9.24	193.54	0.650	0.000	0.75	2.507	1.63	15.0	0.0	196.8
91.50	RB1	1.00	0.96	8.435	9.28	192.50	0.650	0.000	1.50	4.985	3.24	30.1	0.0	391.4
94.25	Top - Section 2	1.00	0.97	8.507	9.36	190.56	0.650	0.000	2.75	9.041	5.88	55.0	0.0	709.6
95.00		1.00	0.97	8.526	9.38	192.53	0.650	0.000	0.75	2.444	1.59	14.9	0.0	77.5
96.75	RB2	1.00	0.98	8.571	9.43	191.28	0.650	0.000	1.75	5.664	3.68	34.7	0.0	179.6
97.00	RT1	1.00	0.98	8.577	9.43	191.10	0.650	0.000	0.25	0.805	0.52	4.9	0.0	25.5
100.00		1.00	0.99	8.652	9.52	188.90	0.650	0.000	3.00	9.577	6.23	59.2	0.0	303.6
102.25	RT2	1.00	0.99	8.707	9.58	187.22	0.650	0.000	2.25	7.083	4.60	44.1	0.0	224.5
105.00		1.00	1.00	8.774	9.65	185.14	0.650	0.000	2.75	8.541	5.55	53.6	0.0	270.7
110.00		1.00	1.02	8.891	9.78	181.26	0.650	0.000	5.00	15.200	9.88	96.6	0.0	481.6
115.00		1.00	1.03	9.005	9.91	177.26	0.650	0.000	5.00	14.777	9.61	95.1	0.0	468.1
117.00	Appurtenance(s)	1.00	1.03	9.049	9.95	175.63	0.650	0.000	2.00	5.792	3.77	37.5	0.0	183.5
120.00		1.00	1.04	9.115	10.03	173.16	0.650	0.000	3.00	8.562	5.57	55.8	0.0	271.2
125.00		1.00	1.05	9.222	10.14	168.96	0.650	0.000	5.00	13.931	9.06	91.9	0.0	441.1
127.00	Appurtenance(s)	1.00	1.06	9.264	10.19	167.26	0.650	0.000	2.00	5.454	3.55	36.1	0.0	172.7
130.00		1.00	1.07	9.326	10.26	164.67	0.650	0.000	3.00	8.054	5.24	53.7	0.0	255.0
135.00		1.00	1.08	9.427	10.37	160.29	0.650	0.000	5.00	13.085	8.51	88.2	0.0	414.1
137.00	Appurtenance(s)	1.00	1.08	9.466	10.41	158.52	0.650	0.000	2.00	5.115	3.32	34.6	0.0	161.9
139.00	Bot - Section 4	1.00	1.09	9.506	10.46	156.73	0.650	0.000	2.00	5.048	3.28	34.3	0.0	159.7
140.00		1.00	1.09	9.525	10.48	155.83	0.650	0.000	1.00	2.530	1.64	17.2	0.0	139.2
142.75	Top - Section 3	1.00	1.09	9.578	10.54	153.34	0.650	0.000	2.75	6.871	4.47	47.1	0.0	378.0
145.00		1.00	1.10	9.621	10.58	153.29	0.650	0.000	2.25	5.526	3.59	38.0	0.0	131.4
148.00	Appurtenance(s)	1.00	1.11	9.678	10.65	150.53	0.650	0.000	3.00	7.235	4.70	50.1	0.0	172.0
150.00	Appurtenance(s)	1.00	1.11	9.715	10.69	148.68	0.650	0.000	2.00	4.739	3.08	32.9	0.0	112.6
155.00		1.00	1.12	9.806	10.79	144.01	0.650	0.000	5.00	11.551	7.51	81.0	0.0	274.5
157.00	Appurtenance(s)	1.00	1.12	9.842	10.83	142.12	0.650	0.000	2.00	4.502	2.93	31.7	0.0	107.0

Wind Loading - Shaft

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 46

Tower Engineering Solutions

160.00		1.00	1.13	9.896	10.89	139.26	0.650	0.000	3.00	6.626	4.31	46.9	0.0	157.4
165.00		1.00	1.14	9.983	10.98	134.45	0.650	0.000	5.00	10.704	6.96	76.4	0.0	254.3
167.00	Appurtenance(s)	1.00	1.14	10.017	11.02	132.51	0.650	0.000	2.00	4.163	2.71	29.8	0.0	98.9
169.00		1.00	1.15	10.052	11.06	130.56	0.650	0.000	2.00	4.096	2.66	29.4	0.0	97.3
								Totals:	**169.00**			**3,204.1**		**27,200.5**

Discrete Appurtenance Forces

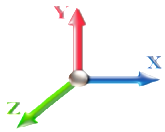
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 47	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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	167.00	AIR 21 B4A/B2P	3	10.017	11.019	0.77	0.90	14.14	274.50	0.000	0.000	155.82	0.00	0.00
2	167.00	T-Arms/Commscope	3	10.026	11.029	0.56	0.75	11.39	1020.00	0.000	0.500	125.62	0.00	62.81
3	167.00	AIR 21 B2A/B4P	3	10.017	11.019	0.77	0.90	14.14	276.00	0.000	0.000	155.82	0.00	0.00
4	167.00	Ericsson - Radio 4449	3	10.017	11.019	0.60	0.80	2.97	222.00	0.000	0.000	32.73	0.00	0.00
5	167.00	Ericsson - KRY 112 144/2	3	10.017	11.019	0.60	0.80	0.74	33.00	0.000	0.000	8.13	0.00	0.00
6	167.00	APXVAA24_43-U-A20	3	10.017	11.019	0.66	0.90	39.89	384.00	0.000	0.000	439.59	0.00	0.00
7	157.00	BXA-70063/6CF	1	9.842	10.827	1.00	1.00	7.57	17.00	0.000	0.000	81.96	0.00	0.00
8	157.00	T-Arms	3	9.842	10.827	0.56	0.75	13.50	1050.00	0.000	0.000	146.16	0.00	0.00
9	157.00	SLCP 2x6014F	2	9.842	10.827	0.84	0.90	10.86	40.00	0.000	0.000	117.62	0.00	0.00
10	157.00	DB846F65ZAXY	4	9.842	10.827	0.74	0.80	20.76	84.00	0.000	0.000	224.71	0.00	0.00
11	157.00	DB846H80E-SX	2	9.842	10.827	0.88	0.80	8.82	32.00	0.000	0.000	95.46	0.00	0.00
12	157.00	HBX-6517DS-VTM	6	9.842	10.827	0.60	0.80	19.04	112.20	0.000	0.000	206.18	0.00	0.00
13	157.00	ALU RRH2X60-AWS RRH	3	9.842	10.827	0.61	0.80	6.38	180.00	0.000	0.000	69.12	0.00	0.00
14	157.00	RFS DB T1-6Z-8AB-OZ	1	9.842	10.827	1.00	1.00	3.20	19.00	0.000	0.000	34.64	0.00	0.00
15	157.00	GPS	1	9.842	10.827	1.00	1.00	1.00	10.00	0.000	0.000	10.83	0.00	0.00
16	157.00	ALU/900 RRH2X60W -	3	9.842	10.827	0.61	0.80	3.43	138.00	0.000	0.000	37.13	0.00	0.00
17	150.00	Collar Mount	1	9.715	10.686	1.00	1.00	3.50	100.00	0.000	0.000	37.40	0.00	0.00
18	148.00	Commscope	1	9.678	10.645	1.00	1.00	1.19	6.60	0.000	0.000	12.67	0.00	0.00
19	148.00	Ericsson RRUS 32-RRU	9	9.678	10.645	0.56	0.80	8.32	693.00	0.000	0.000	88.53	0.00	0.00
20	148.00	Powerwave 1001940-Bias	3	9.678	10.645	0.72	0.80	0.15	6.00	0.000	0.000	1.61	0.00	0.00
21	148.00	CCI HPA-65R-BUU-H8	4	9.678	10.645	0.63	0.80	32.81	272.00	0.000	0.000	349.31	0.00	0.00
22	148.00	CCI HPA-65R-BUU-H6	2	9.678	10.645	0.68	0.80	13.14	102.00	0.000	0.000	139.86	0.00	0.00
23	148.00	Cci OPA-65R-LCUU-H8	2	9.678	10.645	0.63	0.80	16.12	176.00	0.000	0.000	171.56	0.00	0.00
24	148.00	T-Arms w/ Modifications	3	9.678	10.645	0.60	0.80	21.60	1350.00	0.000	0.000	229.94	0.00	0.00
25	148.00	Ericsson RRUS-11-RRU	3	9.678	10.645	0.61	0.80	4.60	150.00	0.000	0.000	48.93	0.00	0.00
26	148.00	Raycap	2	9.678	10.645	0.81	0.90	2.38	65.60	0.000	0.000	25.35	0.00	0.00
27	148.00	Cci OPA-65R-LCUU-H6	1	9.678	10.645	0.63	0.80	6.11	73.00	0.000	0.000	64.99	0.00	0.00
28	148.00	Powerwave 7770	3	9.678	10.645	0.61	0.80	10.13	105.00	0.000	0.000	107.83	0.00	0.00
29	148.00	Powerwave LGP21401	6	9.678	10.645	0.60	0.80	4.64	84.60	0.000	0.000	49.44	0.00	0.00
30	148.00	Powerwave LGP13519	6	9.678	10.645	0.60	0.80	1.22	31.80	0.000	0.000	13.03	0.00	0.00
31	137.00	APXV18-206517S-C	6	9.466	10.413	0.59	0.80	18.36	158.40	0.000	0.000	191.22	0.00	0.00
32	137.00	T-Arms	3	9.466	10.413	0.56	0.75	13.82	726.00	0.000	0.000	143.92	0.00	0.00
33	127.00	Horizon Duo	4	9.264	10.190	0.60	0.80	1.42	28.00	0.000	0.000	14.43	0.00	0.00
34	127.00	VHLP800-11	1	9.264	10.190	1.00	1.00	8.43	48.00	1.455	0.000	85.90	124.99	0.00
35	127.00	1900MHz RRH	3	9.264	10.190	0.74	0.75	6.17	180.00	0.000	0.000	62.87	0.00	0.00
36	127.00	VHLP2-11	3	9.264	10.190	1.00	1.00	14.04	81.00	1.455	0.000	143.07	208.17	0.00
37	127.00	NNVV-65B-R4	3	9.264	10.190	0.55	0.75	20.43	232.20	0.000	0.000	208.18	0.00	0.00
38	127.00	800 MHz RRH	6	9.264	10.190	0.69	0.75	10.31	318.00	0.000	0.000	105.04	0.00	0.00
39	127.00	TD-RRH8x20-25	3	9.264	10.190	0.52	0.75	6.29	210.00	0.000	0.000	64.07	0.00	0.00
40	127.00	AAHC	3	9.264	10.190	0.56	0.75	7.10	310.80	0.000	0.000	72.39	0.00	0.00
41	127.00	RMQP-4096-HK	1	9.264	10.190	1.00	1.00	51.70	2645.00	0.000	0.000	526.82	0.00	0.00
42	117.00	Ericsson 0208 RRU	3	9.049	9.954	0.54	0.80	2.20	59.40	0.000	0.000	21.93	0.00	0.00
43	117.00	Ericsson 4415 RRU	2	9.049	9.954	0.54	0.80	1.99	88.20	0.000	0.000	19.85	0.00	0.00
44	117.00	Standoff Sector Frame	3	9.049	9.954	0.56	0.75	25.48	1185.00	0.000	0.000	253.64	0.00	0.00
45	117.00	Comba	3	9.049	9.954	0.56	0.80	8.15	75.30	0.000	0.000	81.11	0.00	0.00
							Totals:		**13,452.60**			**5,276.42**		

Total Applied Force Summary

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 48

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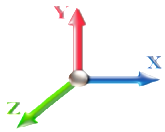
Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		103.23	1608.13	0.00	0.00
10.00		101.38	1584.50	0.00	0.00
15.00		99.52	1560.87	0.00	0.00
20.00		97.67	1537.24	0.00	0.00
25.00		95.81	1513.61	0.00	0.00
30.00		94.04	1489.98	0.00	0.00
35.00		96.33	1466.35	0.00	0.00
40.00		98.06	1442.73	0.00	0.00
40.75		14.61	214.37	0.00	0.00
45.00		85.63	2030.56	0.00	0.00
47.00		40.27	944.59	0.00	0.00
50.00		60.84	751.08	0.00	0.00
55.00		102.44	1235.60	0.00	0.00
60.00		102.76	1215.35	0.00	0.00
65.00		102.82	1195.10	0.00	0.00
70.00		102.66	1174.85	0.00	0.00
75.00		102.29	1154.59	0.00	0.00
80.00		101.73	1134.34	0.00	0.00
85.00		101.01	1114.09	0.00	0.00
89.25		85.07	931.05	0.00	0.00
90.00		15.05	242.27	0.00	0.00
91.50		30.07	482.26	0.00	0.00
94.25		54.99	876.26	0.00	0.00
95.00		14.90	122.91	0.00	0.00
96.75		34.71	285.62	0.00	0.00
97.00		4.94	40.67	0.00	0.00
100.00		59.25	485.38	0.00	0.00
102.25		44.10	360.84	0.00	0.00
105.00		53.58	437.32	0.00	0.00
110.00		96.63	784.66	0.00	0.00
115.00		95.14	771.16	0.00	0.00
117.00	(11) attachments	414.00	1712.58	0.00	0.00
120.00		55.80	450.11	0.00	0.00
125.00		91.85	739.38	0.00	0.00
127.00	(27) attachments	1318.91	4344.97	333.15	0.00
130.00		53.70	417.24	0.00	0.00
135.00		88.19	684.60	0.00	0.00
137.00	(9) attachments	369.76	1154.46	0.00	0.00
139.00		34.31	255.42	0.00	0.00
140.00		17.23	187.07	0.00	0.00
142.75		47.05	509.57	0.00	0.00
145.00		38.02	239.07	0.00	0.00
148.00	(45) attachments	1353.12	3431.16	0.00	0.00
150.00	(1) attachments	70.32	281.67	0.00	0.00
155.00		80.99	447.09	0.00	0.00
157.00	(26) attachments	1055.48	1858.20	0.00	0.00

Total Applied Force Summary

Structure:	CT13071-A-SBA		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 49

Tower Engineering Solutions

160.00		46.88	201.02	0.00	0.00
165.00		76.41	326.94	0.00	0.00
167.00	(18) attachments	947.54	2337.44	0.00	62.81
169.00		29.43	97.25	0.00	0.00
	Totals:	**8,480.52**	**49,863.56**	**333.15**	**62.81**

Linear Appurtenance Segment Forces (Factored)

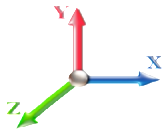
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 50	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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)
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.035	0.000	6.129	0.00	31.20
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.036	0.000	6.129	0.00	31.20
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.036	0.000	6.129	0.00	31.20
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.037	0.000	6.129	0.00	31.20
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.038	0.000	6.129	0.00	31.20
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.038	0.000	6.134	0.00	31.20
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.039	0.000	6.410	0.00	31.20
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.040	0.000	6.659	0.00	31.20
40.75	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.041	0.000	6.695	0.00	4.68
45.00	1 5/8" Coax	Yes	4.25	0.000	1.98	0.70	0.00	0.041	0.000	6.887	0.00	26.52
47.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.042	0.000	6.973	0.00	12.48
50.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.041	0.000	7.098	0.00	18.72
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.042	0.000	7.294	0.00	31.20
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.043	0.000	7.477	0.00	31.20
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.044	0.000	7.650	0.00	31.20
70.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.045	0.000	7.814	0.00	31.20
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.046	0.000	7.969	0.00	31.20
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.047	0.000	8.118	0.00	31.20
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.048	0.000	8.260	0.00	31.20
89.25	1 5/8" Coax	Yes	4.25	0.000	1.98	0.70	0.00	0.049	0.000	8.376	0.00	26.52
90.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.075	0.000	8.396	0.00	4.68
90.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.075	0.000	8.396	0.00	0.00
91.50	1 5/8" Coax	Yes	1.50	0.000	1.98	0.25	0.00	0.076	0.000	8.435	0.00	9.36
91.50	1" Reinforcing plate	Yes	1.50	0.000	1.00	0.13	0.00	0.076	0.000	8.435	0.00	0.00
94.25	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.077	0.000	8.507	0.00	17.16
94.25	1" Reinforcing plate	Yes	2.75	0.000	1.00	0.23	0.00	0.077	0.000	8.507	0.00	0.00
95.00	1 5/8" Coax	Yes	0.75	0.000	1.98	0.12	0.00	0.076	0.000	8.526	0.00	4.68
95.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.076	0.000	8.526	0.00	0.00
96.75	1 5/8" Coax	Yes	1.75	0.000	1.98	0.29	0.00	0.077	0.000	8.571	0.00	10.92
96.75	1" Reinforcing plate	Yes	1.75	0.000	1.00	0.15	0.00	0.077	0.000	8.571	0.00	0.00
97.00	1 5/8" Coax	Yes	0.25	0.000	1.98	0.04	0.00	0.077	0.000	8.577	0.00	1.56
97.00	1" Reinforcing plate	Yes	0.25	0.000	1.00	0.02	0.00	0.077	0.000	8.577	0.00	0.00
100.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.078	0.000	8.652	0.00	18.72
100.00	1" Reinforcing plate	Yes	0.75	0.000	1.00	0.06	0.00	0.078	0.000	8.652	0.00	0.00
100.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.078	0.000	8.652	0.00	0.00
102.25	1 5/8" Coax	Yes	2.25	0.000	1.98	0.37	0.00	0.079	0.000	8.707	0.00	14.04
102.25	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.079	0.000	8.707	0.00	0.00
105.00	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.075	0.000	8.774	0.00	17.16
105.00	1" Reinforcing plate	Yes	2.25	0.000	1.00	0.19	0.00	0.075	0.000	8.774	0.00	0.00
110.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.054	0.000	8.891	0.00	31.20
115.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.056	0.000	9.005	0.00	31.20
117.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.057	0.000	9.049	0.00	12.48
120.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.058	0.000	9.115	0.00	18.72
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.059	0.000	9.222	0.00	31.20
127.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.061	0.000	9.264	0.00	12.48
130.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.061	0.000	9.326	0.00	18.72
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.063	0.000	9.427	0.00	31.20

Linear Appurtenance Segment Forces (Factored)

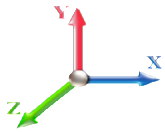
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 51	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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)
137.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.065	0.000	9.466	0.00	12.48
139.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.065	0.000	9.506	0.00	12.48
140.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.17	0.00	0.066	0.000	9.525	0.00	6.24
142.75	1 5/8" Coax	Yes	2.75	0.000	1.98	0.45	0.00	0.067	0.000	9.578	0.00	17.16
145.00	1 5/8" Coax	Yes	2.25	0.000	1.98	0.37	0.00	0.067	0.000	9.621	0.00	14.04
148.00	1 5/8" Coax	Yes	3.00	0.000	1.98	0.49	0.00	0.068	0.000	9.678	0.00	18.72
150.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.070	0.000	9.715	0.00	12.48
155.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.071	0.000	9.806	0.00	31.20
157.00	1 5/8" Coax	Yes	2.00	0.000	1.98	0.33	0.00	0.073	0.000	9.842	0.00	12.48
										Totals:	**0.0**	**979.7**

Calculated Forces

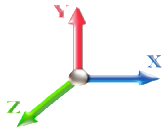
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 52	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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	-49.86	-8.50	-0.33	-1080.8	0.00	1080.86	5324.18	2662.09	12195.0	6106.56	0.00	0.000	0.000	0.186
5.00	-48.24	-8.44	-0.33	-1038.3	0.00	1038.36	5261.08	2630.54	11832.5	5925.09	0.03	-0.050	0.000	0.184
10.00	-46.65	-8.38	-0.33	-996.16	0.00	996.16	5196.80	2598.40	11472.7	5744.92	0.11	-0.100	0.000	0.182
15.00	-45.08	-8.31	-0.33	-954.27	0.00	954.27	5131.34	2565.67	11115.7	5566.13	0.24	-0.151	0.000	0.180
20.00	-43.54	-8.25	-0.33	-912.70	0.00	912.70	5064.69	2532.35	10761.6	5388.80	0.42	-0.202	0.000	0.178
25.00	-42.02	-8.19	-0.33	-871.44	0.00	871.44	4996.86	2498.43	10410.5	5212.99	0.66	-0.255	0.000	0.176
30.00	-40.52	-8.12	-0.33	-830.50	0.00	830.50	4927.84	2463.92	10062.6	5038.79	0.96	-0.307	0.000	0.173
35.00	-39.05	-8.06	-0.33	-789.88	0.00	789.88	4857.63	2428.82	9718.08	4866.26	1.31	-0.361	0.000	0.170
40.00	-37.60	-7.97	-0.33	-749.60	0.00	749.60	4786.24	2393.12	9377.03	4695.49	1.72	-0.415	0.000	0.168
40.75	-37.38	-7.97	-0.33	-743.62	0.00	743.62	4775.43	2387.72	9326.19	4670.03	1.78	-0.423	0.000	0.167
45.00	-35.35	-7.89	-0.33	-709.75	0.00	709.75	4713.67	2356.83	9039.63	4526.53	2.18	-0.470	0.000	0.164
47.00	-34.40	-7.86	-0.33	-693.97	0.00	693.97	3877.89	1938.95	7512.92	3762.05	2.38	-0.492	0.000	0.193
50.00	-33.65	-7.82	-0.33	-670.39	0.00	670.39	3845.09	1922.55	7353.82	3682.38	2.70	-0.525	0.000	0.191
55.00	-32.40	-7.74	-0.33	-631.30	0.00	631.30	3789.47	1894.74	7090.51	3550.52	3.28	-0.586	0.000	0.186
60.00	-31.18	-7.66	-0.33	-592.60	0.00	592.60	3732.67	1866.34	6829.63	3419.89	3.93	-0.647	0.000	0.182
65.00	-29.98	-7.57	-0.33	-554.32	0.00	554.32	3674.68	1837.34	6571.34	3290.55	4.64	-0.709	0.000	0.177
70.00	-28.80	-7.48	-0.33	-516.46	0.00	516.46	3615.51	1807.76	6315.78	3162.58	5.42	-0.770	0.000	0.171
75.00	-27.64	-7.40	-0.33	-479.03	0.00	479.03	3555.15	1777.58	6063.10	3036.06	6.26	-0.831	0.000	0.166
80.00	-26.50	-7.31	-0.33	-442.05	0.00	442.05	3493.61	1746.80	5813.45	2911.05	7.16	-0.892	0.000	0.159
85.00	-25.38	-7.21	-0.33	-405.53	0.00	405.53	3430.88	1715.44	5566.98	2787.63	8.13	-0.952	0.000	0.153
89.25	-24.44	-7.12	-0.33	-374.88	0.00	374.88	3376.63	1688.32	5360.08	2684.02	9.00	-1.003	-0.001	0.147
90.00	-24.20	-7.11	-0.33	-369.54	0.00	369.54	3366.97	1683.48	5323.83	2665.87	9.15	-1.012	-0.001	0.146
91.50	-23.72	-7.08	-0.33	-358.88	0.00	358.88	3347.56	1673.78	5251.55	2629.68	9.48	-1.030	-0.001	0.107
94.25	-22.84	-7.01	-0.33	-339.41	0.00	339.41	1944.87	972.44	3066.99	1535.78	10.08	-1.054	-0.001	0.121
95.00	-22.71	-7.00	-0.33	-334.15	0.00	334.15	1940.65	970.33	3048.28	1526.41	10.24	-1.061	-0.001	0.155
96.75	-22.43	-6.97	-0.33	-321.90	0.00	321.90	1930.70	965.35	3004.67	1504.57	10.63	-1.081	-0.001	0.106
97.00	-22.39	-6.97	-0.33	-320.16	0.00	320.16	1929.27	964.63	2998.44	1501.45	10.69	-1.083	-0.001	0.137
100.00	-21.90	-6.91	-0.33	-299.26	0.00	299.26	1911.84	955.92	2923.84	1464.09	11.38	-1.112	-0.001	0.131
102.25	-21.54	-6.87	-0.33	-283.71	0.00	283.71	1898.49	949.24	2868.04	1436.15	11.91	-1.134	-0.001	0.126
102.25	-21.54	-6.87	-0.33	-283.71	0.00	283.71	1898.49	949.24	2868.04	1436.15	11.91	-1.134	-0.001	0.126
105.00	-21.09	-6.82	-0.33	-264.83	0.00	264.83	1881.84	940.92	2800.02	1402.09	12.57	-1.160	-0.001	0.200
110.00	-20.30	-6.74	-0.33	-230.72	0.00	230.72	1850.66	925.33	2676.97	1340.48	13.83	-1.235	-0.001	0.183
115.00	-19.53	-6.64	-0.33	-197.04	0.00	197.04	1818.29	909.14	2554.84	1279.32	15.16	-1.304	-0.001	0.165
117.00	-17.82	-6.20	-0.33	-183.76	-0.01	183.76	1805.01	902.50	2506.28	1255.00	15.71	-1.331	-0.001	0.156
120.00	-17.37	-6.14	-0.33	-165.17	-0.01	165.17	1784.73	892.37	2433.78	1218.70	16.56	-1.370	-0.001	0.145
125.00	-16.63	-6.05	-0.33	-134.45	-0.01	134.45	1749.99	875.00	2313.93	1158.68	18.03	-1.428	-0.001	0.126
127.00	-12.31	-4.62	0.00	-122.36	0.00	122.36	1735.77	867.88	2266.36	1134.86	18.63	-1.450	-0.001	0.115
130.00	-11.90	-4.57	0.00	-108.49	0.00	108.49	1714.07	857.04	2195.44	1099.35	19.55	-1.481	-0.001	0.106
135.00	-11.21	-4.47	0.00	-85.65	0.00	85.65	1676.96	838.48	2078.45	1040.77	21.13	-1.526	-0.001	0.089
137.00	-10.07	-4.07	0.00	-76.71	0.00	76.71	1661.79	830.89	2032.11	1017.57	21.77	-1.543	-0.001	0.081
139.00	-9.81	-4.03	0.00	-68.57	0.00	68.57	1646.42	823.21	1986.05	994.50	22.42	-1.559	-0.001	0.075
140.00	-9.62	-4.01	0.00	-64.54	0.00	64.54	1638.67	819.33	1963.12	983.02	22.75	-1.566	-0.001	0.072
142.75	-9.11	-3.95	0.00	-53.51	0.00	53.51	1100.62	550.31	1316.21	659.08	23.66	-1.585	-0.001	0.090
145.00	-8.87	-3.91	0.00	-44.62	0.00	44.62	1091.20	545.60	1284.61	643.26	24.41	-1.598	-0.001	0.078
148.00	-5.48	-2.46	0.00	-32.88	0.00	32.88	1078.27	539.14	1242.60	622.22	25.42	-1.617	-0.001	0.058
150.00	-5.20	-2.39	0.00	-27.96	0.00	27.96	1069.42	534.71	1214.68	608.24	26.10	-1.627	-0.001	0.051
155.00	-4.76	-2.29	0.00	-16.03	0.00	16.03	1046.45	523.23	1145.25	573.48	27.81	-1.647	-0.001	0.033
157.00	-2.93	-1.19	0.00	-11.44	0.00	11.44	1036.93	518.47	1117.66	559.66	28.50	-1.652	-0.001	0.023

Calculated Forces

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 53	

160.00	-2.73	-1.13	0.00	-7.89	0.00	7.89	1022.30	511.15	1076.48	539.04	29.54	-1.658	-0.001	0.017
165.00	-2.41	-1.05	0.00	-2.22	0.00	2.22	996.96	498.48	1008.51	505.00	31.28	-1.664	-0.001	0.007
167.00	-0.10	-0.03	0.00	-0.06	0.00	0.06	986.50	493.25	981.58	491.52	31.98	-1.665	-0.001	0.000
169.00	0.00	-0.03	0.00	0.00	0.00	0.00	975.84	487.92	954.81	478.11	32.68	-1.665	-0.001	0.000

Final Analysis Summary

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-G	1/21/2019	
Site Name:	Woodbridge	**Exposure:**	B		
Height:	169.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**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 97 mph Wind	35.6	0.00	59.77	0.02	0.85	4554.45
0.9D + 1.6W 97 mph Wind	35.5	0.00	44.81	0.01	0.85	4489.64
1.2D + 1.0Di + 1.0Wi 50 mph Wind	9.7	0.00	93.85	0.00	0.29	1250.05
1.2D + 1.0E	1.8	0.00	59.84	0.00	0.00	225.21
0.9D + 1.0E	1.8	0.00	44.88	0.00	0.00	221.82
1.0D + 1.0W 60 mph Wind	8.5	0.00	49.86	0.00	0.33	1080.86

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 97 mph Wind	-23.02	-28.83	-0.86	-1117.7	-0.05	-1117.7	1881.84	940.92	2800.02	1402.09	105.00	0.810
0.9D + 1.6W 97 mph Wind	-16.73	-28.24	-0.86	-1094.1	-0.04	-1094.1	1881.84	940.92	2800.02	1402.09	105.00	0.790
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-47.69	-7.96	-0.29	-301.99	-0.01	-301.99	1881.84	940.92	2800.02	1402.09	105.00	0.241
1.2D + 1.0E	-25.47	-1.30	0.00	-68.92	0.00	-68.92	1881.84	940.92	2800.02	1402.09	105.00	0.063
0.9D + 1.0E	-19.10	-1.27	0.00	-67.61	0.00	-67.61	1881.84	940.92	2800.02	1402.09	105.00	0.058
1.0D + 1.0W 60 mph Wind	-21.09	-6.82	-0.33	-264.83	0.00	-264.83	1881.84	940.92	2800.02	1402.09	105.00	0.200

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
91.5	97.0	(3) LNP-LP6X100-G-10TT	-399.2	-9.18	25.3	185.2	25.3	8	9	156.9	25.3	7	9	226.20	301.8	292.50	0.773
96.8	102.3	(3) LNP-LP6X100-G-10TT	401.1	9.23	25.3	161.2	25.3	7	9	198.7	25.3	8	9	214.32	301.8	292.50	0.733

Base Plate Summary

Structure:	CT13071-A-SB		**Code:**	EIA/TIA-222-G	1/21/2019
Site Name:	Woodbridge		**Exposure:**	B	
Height:	169.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 55

Tower Engineering Solutions

Reactions		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	60.00	**Bolt Circle:**	62.75
Moment (kip-ft):	4977.00	**Width (in):**	61.25	**Number Bolts:**	16.00
Axial (kip):	60.20	**Style:**	Clipped	**Bolt Type:**	2.25" 18J
Shear (kip):	43.70	**Polygon Sides:**	0.00	**Bolt Diameter (in):**	2.25
Analysis		**Clip Length (in):**	12.00	**Yield (ksi):**	75.00
Moment (kip-ft):	4554.45	**Effective Len (in):**	8.31	**Ultimate (ksi):**	100.00
Axial (kip):	93.85	**Moment (kip-in):**	631.71	**Arrangement:**	Clustered
Shear (kip):	35.57	**Allow Stress (ksi):**	81.00	**Cluster Dist (in):**	6.00
		Applied Stress (ksi):	-2.49769325791853	**Start Angle (deg):**	45.00
Moment Design %:	91.51	**Stress Ratio:**	0.63	Compression	
				Force (kip):	190.93
				Allowable (kip):	260.00
				Ratio:	0.75
				Tension	
				Force (kip):	179.20
				Allowable (kip):	260.00
				Ratio:	0.71

Monopole Mat Foundation Design

			Date: 1/21/2019
Customer Name:	Dish Network	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	169
Site Number:	CT13071-A-SBA	**Engineer Name:**	H. You
Engr. Number:	68169	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

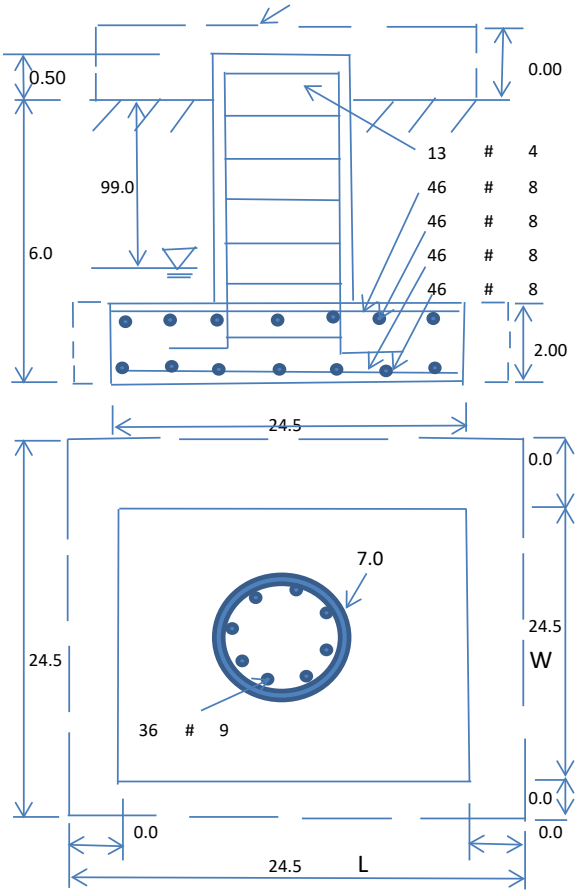
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	59.8	Shear Force (Kips):	35.6
Uplift Force (Kips):	0.0	Moment (Kips-ft):	4554.4
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.):	0.50	Thickness of Pad (ft):	2.00
Length of Pad (ft.):	24.5	Width of Pad (ft.):	24.5
Final Length of pad (ft)	24.5	Final width of pad (ft):	24.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	36	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
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):	46	Qty. of Rebar in Pad (W):	46

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	46	Qty. of Rebar in Pad (W):	46
Apply 1.35 factor for e/w Per G:	1.35		

Soil Design Parameters:

Soil Unit Weight (pcf):	120.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	10000	Ultimate Skin Friction:	200	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.):	2247.06	Total Dry Soil Weight (Kips):	269.65
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	269.65	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1373.68	Total Dry Concrete Weight (Kips):	206.05
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	206.05	Total Vertical Load on Base (Kips):	535.47

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	3917	<	Allowable Factored Soil Bearing (psf): 7500	0.52	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	5976.8	>	Design Factored Momont (kips-ft): 4786	0.80	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.25	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):	1.00		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	6026.1	>	Design Factored Moment (Mu, Kips-Ft	4714.6	0.78	OK!
Calculated Shear Capacity (Kips):	794.5	>	Design Factored Shear (Kips):	35.6	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	1944.0	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9734.2	>	Design Factored Axial Load (Pu Kips):	59.8	0.01	OK!
Moment & Axial Strength Combination:	0.78	OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI				
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	571.8	>	One-Way Factored Shear (L-D. Kips):	309.1	0.54	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	571.8	>	One-Way Factored Shear (W-D., Kips)	309.1	0.54	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	645.2	>	One-Way Factored Shear (C-C, Kips):	335.2	0.52	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0060	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0060		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	3174.0	>	Moment at Bottom (L-Direct. K-Ft):	1088.2	0.34	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	3174.0	>	Moment at Bottom (W-Direct. K-Ft):	1088.2	0.34	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	4424.9	>	Moment at Bottom (C-C Dir. K-Ft):	1539.0	0.35	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0060	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0060		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	3174.0	>	Moment at the top (L-Dir Kips-Ft):	382.0	0.12	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	3174.0	>	Moment at the top (W-Dir Kips-Ft):	382.0	0.12	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	4424.9	>	Moment at the top (C-C Direc. K-Ft):	550.0	0.12	OK!

Radio Frequency Emissions Analysis Report

Dish Wireless Proposed Facility

Site ID: CT0100002A

SBA Ansonia
1 Deerfield Road
Ansonia, CT 06401

January 16, 2019

Centerline Communications Project Number: 950033-002

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**12.74 %**

January 16, 2019

Dish Wireless
9601 South Meriden Blvd
Englewood, CO 80112

Emissions Analysis for Site: **CT0100002A – SBA Ansonia**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed Dish Wireless facility located at **1 Deerfield Road, Ansonia, CT**, for the purpose of determining whether the emissions from the Proposed DISH WIRELESS 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.

General population 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) – H Block and Band 70 (2000 to 2020 MHz) is 1000 $\mu W/cm^2$.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed Dish Wireless antenna facility located at **1 Deerfield Road, Ansonia, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless 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, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
NB-IoT	1900 MHz (PCS) - H Block	2	40
NB-IoT	Band 70 (2000 to 2020 MHz)	2	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 1900 MHz (PCS) – H Block and Band 70 (2000 to 2020 MHz) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Comba ODI2-065R18K-GQ	117
B	1	Comba ODI2-065R18K-GQ	117
C	1	Comba ODI2-065R18K-GQ	117

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed Dish Wireless configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Comba ODI2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	1.71
						Sector A Composite MPE%	**1.71**
Antenna B1	Comba ODI2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	1.71
						Sector B Composite MPE%	**1.71**
Antenna C1	Comba ODI2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	1.71
						Sector C Composite MPE%	**1.71**

Table 3: Dish Wireless Emissions Levels

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

Site Composite MPE%	
Carrier	**MPE%**
Dish Wireless – Max Per Sector Value	**1.71 %**
T-Mobile	1.79 %
Sprint	3.14 %
Clearwire	0.05 %
Verizon Wireless	2.04 %
MetroPCS	0.40 %
AT&T	3.61 %
Site Total MPE %:	**12.74 %**

Table 4: All Carrier MPE Contributions

Dish Wireless Sector A Total:	1.71 %
Dish Wireless Sector B Total:	1.71 %
Dish Wireless Sector C Total:	1.71 %
Site Total:	12.74 %

Table 5: Site MPE Summary

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

DISH WIRELESS _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Dish Wireless 1900 MHz (PCS) - H Block LTE	2	1,469.13	117	8.57	1900 MHz (PCS) - H Block	1000	0.86%
Dish Wireless Band 70 (2000 to 2020 MHz) LTE	2	1,469.13	117	8.57	Band 70 (2000 to 2020 MHz)	1000	0.86%
						Total:	**1.71%**

Table 6: Dish Wireless Maximum Sector MPE Power Values

Summary

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

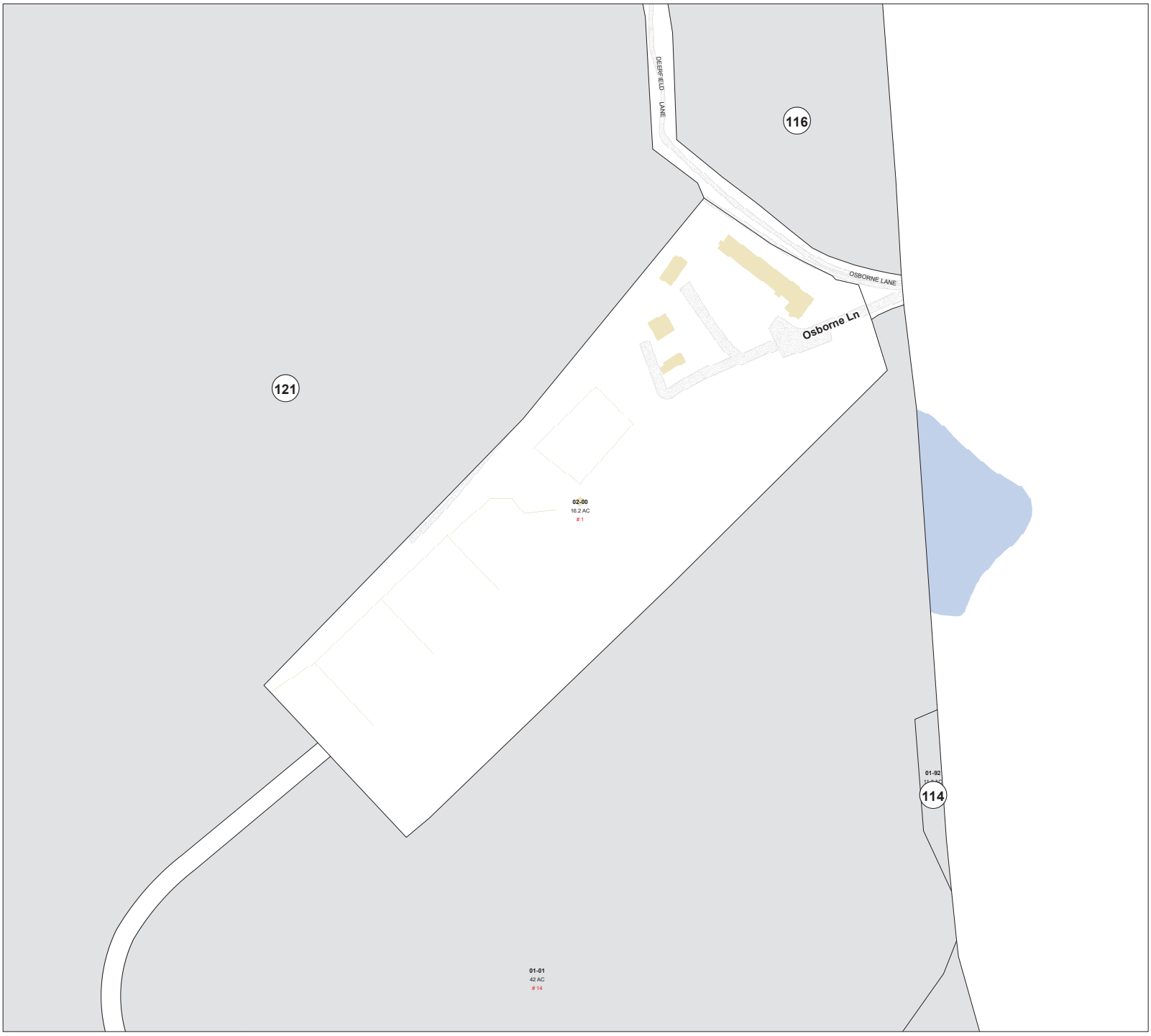
The anticipated maximum composite contributions from the Dish Wireless facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

DISH WIRELESS Sector	Power Density Value (%)
Sector A:	1.71 %
Sector B:	1.71 %
Sector C:	1.71 %
Dish Wireless Maximum Total (per sector):	1.71 %
Site Total:	12.74 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **12.74 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767



Map: 100

NEGEO
New England Geosystems
www.negeosystems.com
282 Main Street Extension - C2
Middletown, CT 06457 - (203) 404 - 7129

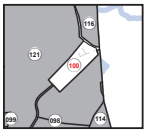
1 inch = 100 feet
100 0 100
Feet

City of Ansonia, Connecticut
2017 Assessment Parcel Map

Map Coordinates based on NAD 83 Connecticut State Plane Feet.
Planimetric features based on aerial photography dated April 2006.

70-15	Block - Lot		Parcels
0.18 AC	Acreage		Buildings
# 72	Address		Railroad
60'	Dimensions		Driveways and Parking

Adjacent Map
109
Hydrology



Map: 100

City of Ansonia

Geographic Information System (GIS)

Date Printed: 1/30/2019

MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The City of Ansonia and its mapping contractors assume no legal responsibility for the information contained herein.

0 200 Feet

N W E S

City of Ansonia, CT

Property Listing Report

Map Block Lot	10000020000	Account	16660

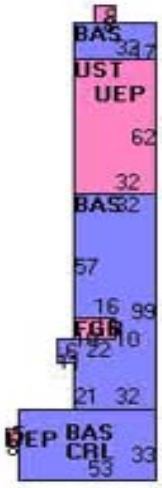
Property Information

Property Location	1 DEERFIELD LA
Owner	MACABEE PROPERTIES LLC
Co-Owner	
Mailing Address	11 HEMLOCK HOLLOW RD WOODBRIDGE CT 06525
Land Use	104 4 Family
Land Class	R
Zoning Code	AA
Census Tract	
Sub Lot	

Neighborhood	
Acreage	16.2
Utilities	Public Water,Septic
Lot Setting/Desc	Level
Survey Map	
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	1958
Stories	1
Building Style	Family Flat
Building Use	Residential
Building Condition	Average
Floors	Carpet
Total Rooms	12

Bedrooms	8 Bedrooms
Full Bathrooms	4
Half Bathrooms	0
Bath Style	Average
Kitchen Style	Average
Roof Style	Flat
Roof Cover	Tar + Gravel

Exterior Walls	Concr/Cinder
Interior Walls	Plaster
Heating Type	Hot Water
Heating Fuel	Oil
AC Type	None
Gross Bldg Area	9364
Total Living Area	5367

Report Created On 1/30/2019

City of Ansonia, CT

Property Listing Report | Map Block Lot **10000020000** | Account **16660**

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	240300	168200
Extras	0	0
Outbuildings	27900	19600
Land	280100	106820
Total	548300	294620

Outbuilding and Extra Items

Type	Description
Garage poor	1200.00 S.F.
Barn 1 St	384.00 S.F.
Stable	800.00 S.F.
Shed	800.00 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	5367	5367
Crawl space	1749	0
Garage	160	0
Porch, Enclosed, Unfinished	104	0
Utility, Storage, Unfinished	1984	0
Total Area	9364	5367

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
MACABEE PROPERTIES LLC	435/ 195	12/28/2005	0
GELERTNER JOEL & CHERYL	316/ 863	12/2/1998	235000

Report Created On **1/30/2019**

DISH WIRELESS FIRST TIME INSTALL
CONSTRUCTION DRAWINGS

DISH WIRELESS

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
1 DEERFIELD RD
ANSONIA, CT 06401
(CITY OF ANSONIA)

SITE SUMMARY

PROJECT SCOPE:	PROJECT CONSISTS OF INSTALLING PROPOSED DISH WIRELESS TELECOMMUNICATION EQUIPMENT, CABLING, AND ANTENNAS AT AN EXISTING TELECOMMUNICATION SITE
SITE TYPE:	CO-LOCATION
TYPE OF OCCUPANCY:	TELECOMMUNICATIONS
TOWER TYPE:	MONOPOLE
TOWER HEIGHT:	171' AGL
RAD CENTER:	117' AGL
TOWER LATITUDE:	41° 21' 02.69" N (41.350750)
TOWER LONGITUDE:	73° 02' 57.3" W (-73.049249)
ZONING JURISDICTION:	CITY OF ANSONIA
COUNTY:	NEW HAVEN
PARCEL NUMBER:	10000020000
POWER COMPANY:	UNITED ILLUMINATING
	(800) 722-5584
TELEPHONE COMPANY:	FIBERTECH NETWORKS
	(203) 272-4400

PROJECT DIRECTORY

TOWER OWNER:	SBA TOWERS 8051 CONGRESS AVENUE BOCA RATON, FLORIDA 33487 PHONE: (800) 487-7483 FCC #: 1261858
APPLICANT:	DISH WIRELESS 9601 S MERIDIAN BLVD ENGLEWOOD, CO 80112 PHONE: (866) 624-6874
PROJECT MANAGER:	CENTERLINE COMMUNICATIONS 750 W CENTER ST, FLOOR 3 WEST BRIDGEWATER, MA 02379
SITE DESIGNER:	FORESITE GROUP, INC. 1875 CONNECTICUT AVE. NW, 10TH FL WASHINGTON, DC 20009 CONTACT: ADRIAN ROZEN PHONE: (813) 549-3250 EMAIL: AROZEN@FG-INC.NET

GENERAL NOTES

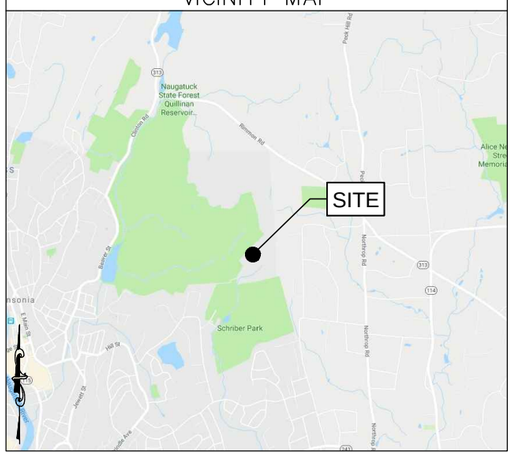
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION, THEREFORE HANDICAP ACCESS IS NOT REQUIRED. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

811
Know what's **below**
Call before you dig
48 HOURS BEFORE YOU DIG

CAUTION
THE UTILITIES SHOWN HEREON ARE FOR THE CONTRACTOR'S CONVENIENCE ONLY. THERE MAY BE OTHER UTILITIES NOT SHOWN ON THESE PLANS. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS SHOWN AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES WITHIN THE LIMITS OF THE WORK. ALL DAMAGE MADE TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

FOR EMERGENCIES CALL: 911

VICINITY MAP



LOCAL MAP

DISH WIRELESS PROJECT MANAGER APPROVAL:
SIGNATURE DATE

CONSTRUCTION MANAGER APPROVAL:
SIGNATURE DATE

LEASING/SITE ACQUISITION:
SIGNATURE DATE

RF ENGINEER:
SIGNATURE DATE

LANDLORD/TOWER OWNER APPROVAL:
SIGNATURE DATE

SHEET INDEX

SHEET	DESCRIPTION	REV.
T-1	TITLE SHEET	0
GN-1	GENERAL NOTES	0
GN-2	GENERAL NOTES	0
EN-1	ELECTRICAL NOTES	0
EN-2	ELECTRICAL NOTES	0
C-1	COMPOUND PLAN	0
C-2	EQUIPMENT PLAN	0
C-3	TOWER ELEVATION & ANTENNA LAYOUT	0
C-3.1	ANTENNA SCHEDULE & PLUMBING DIAGRAM	0
C-3.2	CABLE COLOR CODE	0
C-4	EQUIPMENT DETAILS	0
C-5	EQUIPMENT DETAILS	0
C-6	EQUIPMENT DETAILS	0
C-7	EQUIPMENT DETAILS	0
C-8	PLATFORM DETAILS	0
C-9	CABLE SUPPORT DETAILS	0
C-10	PLATFORM CANOPY DETAILS	0
E-1	UTILITY PLANS	0
E-2	ELECTRICAL DETAILS	0
G-1	GROUNDING PLAN	0
G-2	GROUNDING NOTES & DETAILS	0
G-3	GROUNDING NOTES & DETAILS	0
RF-1	RF DATA SHEET	0
RF-2	PLUMBING DIAGRAM	0

CODE COMPLIANCE

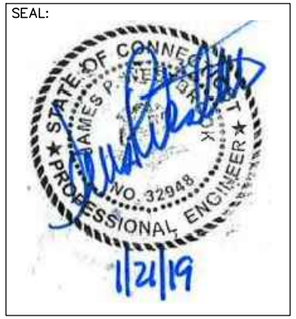
ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING:

- 2015 INTERNATIONAL BUILDING CODE
- 2015 INTERNATIONAL EXISTING BUILDING CODE
- 2015 INTERNATIONAL ENERGY CONSERVATION CODE
- 2015 INTERNATIONAL MECHANICAL CODE
- 2015 INTERNATIONAL PLUMBING CODE
- 2015 INTERNATIONAL RESIDENTIAL CODE
- 2015 INTERNATIONAL FIRE CODE
- 2015 NFPA 101 LIFE SAFETY CODE
- 2017 NFPA 70 NATIONAL ELECTRICAL CODE
- ANSI/TIA/EIA-222-G
- NFPA 780 – LIGHTNING PROTECTION CODE

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group
Foresite Group, Inc.
1875 Connecticut Ave. NW 10th Floor
Washington, DC 20009
o | 202.697.4808
f | 334.887.6024
w | www.fg-inc.net

SEAL:


PROJECT:
DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

TITLE SHEET

SHEET NUMBER:	T-1
JOB/FILE NUMBER:	1213.001

Drawing name: C:\Users\jmarooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg T-1 Jan 21, 2019 8:09am by jmarooney

GENERAL NOTES:

1. EVERY EFFORT HAS BEEN MADE IN THE CONSTRUCTION DOCUMENTS TO PROVIDE A COMPLETE SCOPE OF WORK. MINOR DISCREPANCIES IN THE DRAWINGS AND/OR SPECIFICATIONS SHALL NOT EXCUSE CONTRACTORS FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

2. ALL REFERENCES TO CARRIER HEREIN SHALL BE CONSTRUED TO MEAN DISH WIRELESS OR ITS DESIGNATED REPRESENTATIVE.

3. BIDDING REQUIREMENTS
   a. PRIOR TO THE SUBMISSION OF BIDS, VISIT THE JOB SITE TO BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE PROPOSED PROJECT. VISIT THE SITE WITH THE CONSTRUCTION DOCUMENTS TO VERIFY FIELD DIMENSIONS AND CONDITIONS TO CONFIRM THAT THE PROJECT WILL BE ACCOMPLISHED AS SHOWN.
   b. PROVIDE NOTIFICATION TO CARRIER IN WRITING OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO SUBMISSION OF PRICE PROPOSAL. IN THE EVENT OF DISCREPANCIES, PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED OTHERWISE.
   c. WHEN TOWER IS OWNED BY A THIRD PARTY, CONTACT TOWER CARRIER REPRESENTATIVE FOR PARTICIPATION IN BID WALK.
   d. WHERE ANCHORING TO A CONCRETE ROOF SLAB, CONFIRM (PRIOR TO SUBMITTING BID) THE PRESENCE OF POST TENSION TENDONS. INCLUDE PROVISIONS FOR X-RAY PROCEDURES TO LOCATE THE TENDONS PRIOR TO CONSTRUCTION.

4. DRAWINGS ARE NOT TO BE SCALED. WRITTEN DIMENSIONS TAKE PRECEDENCE. CONSTRUCTION DOCUMENTS ARE INTENDED FOR DIAGRAMMATIC PURPOSES ONLY, UNO.

5. FIELD VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. BRING ANY DISCREPANCIES IMMEDIATELY TO THE ATTENTION OF THE CARRIER AND RESOLVE BEFORE PROCEEDING WITH THE WORK.

6. FURNISH ALL MATERIALS, EQUIPMENT, LABOR, AND ANY REQUIREMENTS NECESSARY TO COMPLETE PROJECT AS DESCRIBED IN THE CONSTRUCTION DOCUMENTS AND CONSTRUCTION SOW.

7. SUPERVISE AND DIRECT THE PROJECT DESCRIBED IN THE CONSTRUCTION DOCUMENTS. PROVIDE ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

8. ALL WORK PERFORMED ON THE PROJECT AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES APPLICABLE TO THE WORK.

9. CONSTRUCTION COORDINATION REQUIREMENTS
   a. NOTIFY CARRIER OF ANY DISCREPANCIES PRIOR TO START OF WORK.
   b. OBTAIN ALL PERMITS. SCHEDULE AND COORDINATE ALL INSPECTIONS.
   c. PROVIDE, AT THE PROJECT SITE, A FULL, CURRENT SET OF CONSTRUCTION DOCUMENTS FOR USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
   d. RECEIVE WRITTEN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DOCUMENTS.
   e. PERFORM WORK DURING CARRIER'S PREFERRED HOURS TO AVOID DISTURBING NORMAL BUSINESS.
   f. PROVIDE FALL PROTECTION IN ACCORDANCE WITH FEDERAL, STATE, LOCAL, AND CARRIER REQUIREMENTS.
   g. IF FAA LIGHTING AND MARKING IS PRESENT ON SITE AND IS POWERED BY ELECTRICAL SERVICE THAT IS TO BE INTERRUPTED, MAINTAIN THE NECESSARY LIGHTS DURING CONSTRUCTION AND NOTIFY THE PROPER AUTHORITIES IN THE EVENT OF A DISRUPTION.
   h. PROVIDE A PORTABLE FIRE EXTINGUISHER WITH A RATING OF NOT LESS THAN 2-A OR 2-A10BC WITHIN 75 FEET TRAVEL DISTANCE TO ALL PORTIONS OF PROJECT AREA DURING CONSTRUCTION.
   i. STRUCTURAL COMPONENTS OF ADJACENT FACILITIES SHALL NOT BE ALTERED BY THIS CONSTRUCTION PROJECT, UNO. ENSURE THAT EXCAVATION DOES NOT AFFECT ADJACENT STRUCTURES.
   j. SEAL ALL PENETRATIONS THROUGH FIRE-RATED AREAS WITH U.L. LISTED OR FIRE MARSHALL-APPROVED MATERIALS, IF APPLICABLE.
   k. BURIED UTILITIES MAY EXIST IN THE AREA AND UTILITY INFORMATION SHOWN MAY NOT BE COMPLETE. CONTACT THE UTILITY LOCATE SERVICE A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION.
   l. COORDINATE ALL POWER INSTALLATION WITH POWER COMPANY AS REQUIRED. REPORT POWER INSTALLATION COORDINATION SOLUTION(S) TO CARRIER.
   m. PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
   n. KEEP GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH. REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OR PREMISES. SITE SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
   o. MAINTAIN THE INTEGRITY OF THE BUILDING ENVELOPE AND CONSTRUCT BARRIERS IN THE AREA OF WORK TO PREVENT DAMAGE FROM WEATHER AS WELL AS FROM CONSTRUCTION DUST AND DEBRIS.

10. INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO MANUFACTURER'S SPECIFICATIONS, UNO, OR WHERE LOCAL CODES OR ORDINANCES DIRECT OTHERWISE.

11. PROPOSED CELLULAR EQUIPMENT AND FIXTURES WILL BE FURNISHED BY CARRIER AND INSTALLED BY CONTRACTOR, UNLESS NOTED OTHERWISE.

12. ANY SUBSTITUTIONS OF MATERIALS AND/OR EQUIPMENT, MUST BE APPROVED BY CARRIER.

13. DOCUMENT ALL CHANGES MADE IN THE FIELD BY MARKING UP THE APPROVED CONSTRUCTION DRAWINGS AND SUBMITTING THE REDLINED SET TO CARRIER UPON COMPLETION. DOCUMENT ALL WORK PERFORMED WITH PHOTOGRAPHS TO BE SUBMITTED WITH REDLINED CONSTRUCTION DRAWINGS.

14. PROVIDE SUPPORTS FOR CABLES TO THE ELEVATION OF ALL INITIAL AND FUTURE ANTENNAS IN ACCORDANCE WITH ALL MANUFACTURER'S REQUIREMENTS.

15. CONFIRM THAT THE REQUIREMENTS OF THE STRUCTURAL ANALYSIS, MOUNT ANALYSIS AND ANY ASSOCIATED MODIFICATIONS HAVE BEEN FOLLOWED AND COMPLETED AS REQUIRED TO SUPPORT THE EQUIPMENT ASSOCIATED WITH THIS PROJECT.

16. KNOW AND OBSERVE MANUFACTURER'S MINIMUM BEND RADIUS SPECIFICATIONS BEFORE HANDLING HYBRID CABLES, RF CABLES, AND FIBER OPTIC LINES.

17. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS STIPULATED IN THE CONSTRUCTION SCOPE OF WORK CONTRACT, REGARDLESS OF INCLUSION OR OMISSION FROM THE CONSTRUCTION DRAWING(S).

ABBREVIATIONS

A/C	AIR CONDITIONING
AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GROUND LEVEL, ABOVE GRADE LEVEL
AWS	ADVANCED WIRELESS SERVICE
BBU	BATTERY BACKUP UNIT
BLDG	BUILDING
BLK	BLOCKING
CLG	CEILING
CLR	CLEAR
CONC	CONCRETE
CONT	CONTINUOUS
D	DEPTH
DBL	DOUBLE
DEG	DEGREE
ø, DIA	DIAMETER
DIAG	DIAGONAL
DN	DOWN
DET	DETAIL
DWG	DRAWING
E	EXISTING
EA	EACH
ELEV, EL	ELEVATION
ELEC	ELECTRICAL
EQ	EQUAL
EQUIP	EQUIPMENT
EXT	EXTERIOR
FIF	FIBER INTERFACE FRAME, FACILITY INTERFACE FRAME
FIN	FINISH
FLUOR	FLUORESCENT
FLR	FLOOR
FT	FOOT, FEET
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRND	GROUND
GSM	GLOBAL SYSTEM MOBILE
GYP	GYPSUM BOARD
HORZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
ID	INSIDE DIAMETER
IN	INCH, INCHES
INSUL	INSULATION
INT	INTERIOR
L	LENGTH
LBS	POUNDS
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MECH	MECHANICAL
MTL	METAL
MFR	MANUFACTURER
MGR	MANAGER
MIMO	MULTIPLE IN MULTIPLE OUT
mMIMO	MASSIVE MULTIPLE IN MULTIPLE OUT
MIN	MINIMUM
MISC	MISCELLANEOUS
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PCS	PERSONAL COMMUNICATION SERVICE
PDU	POWER DISTRIBUTION UNIT
PROJ	PROJECT
PROP	PROPERTY
PT	PRESSURE TREATED
PVC	POLYVINYL CHLORIDE
REQ	REQUIRED
RF	RADIO FREQUENCY
RM	ROOM
RO	ROUGH OPENING
RRH	REMOTE RADIO HEAD
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATION
SF	SQUARE FOOT
SS	STAINLESS STEEL
STL	STEEL
SUSP	SUSPENDED
TMA	TOWER MOUNTED AMPLIFIER
TND	TINNED
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATION SERVICE
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/	WITH
W/O	WITHOUT
WCS	WIRELESS COMMUNICATION SERVICE
WP	WATER PROOF

PROJECT NOTES

1. THE FOLLOWING INFORMATION HAS BEEN PROVIDED BY DISH WIRELESS FOR THIS PROJECT AND HAS NOT BEEN FIELD VERIFIED AS PART OF THIS PROJECT.
   a. EXISTING TOWER, MOUNT, AND EQUIPMENT ELEVATIONS
   b. DESIGN PACKAGE BASED ON THE APPLICATION #: 105639

2. A STRUCTURAL ANALYSIS TO DETERMINE THE TOWER CAPACITY TO SUPPORT THIS PROPOSED EQUIPMENT WAS PERFORMED FOR DISH WIRELESS OUTSIDE THE SCOPE OF THIS PROJECT.

3. CONFIRM THAT THE REQUIREMENTS OF THE STRUCTURAL ANALYSIS, MOUNT ANALYSIS, AND ANY ASSOCIATED MODIFICATIONS HAVE BEEN FOLLOWED AND COMPLETED AS REQUIRED TO SUPPORT THE EQUIPMENT ASSOCIATED WITH THIS PROJECT.

4. CONTRACTOR TO REFERENCE DISH NETWORK ISSUED RFDS AND GIVE PRECEDENCE TO INFORMATION PROVIDED IN RFDS OVER INFORMATION PROVIDED IN THIS TABLE.

5. CONTRACTOR TO VERIFY PROPOSED LOADING WITH PASSING STRUCTURAL ANALYSIS PRIOR TO CONSTRUCTION AND CONTACT DISH NETWORK IN THE EVENT OF ANY DISCREPANCIES.

6. IF PASSING STRUCTURAL ANALYSIS AND RFDS DO NOT MATCH, CONTRACTOR IS TO CONTACT DISH NETWORK IMMEDIATELY.

7. SECTOR FRAMES AND ANTENNAS SHOULD HAVE IDENTIFYING TORQUE MARKS SHOWN AFTER INSTALLATION.

8. ALL CABLE SUPPORTS SHALL BE BLOCKS AND GROMMETS; NO SNAP-INS ALLOWED.

PROJECT SCOPE

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) ANTENNA MOUNTS
- INSTALL JUMPERS
- INSTALL (5) RRUS
- INSTALL (1) HYBRID CABLE
- INSTALL (1) METAL PLATFORM WITH CANOPY FOR GROUND EQUIPMENT
- INSTALL (1) PROPOSED CABLE CONDUIT
- INSTALL (1) BBU IN CABINET
- INSTALL (1) PPC CABINET MOUNTED TO H-FRAME
- INSTALL (1) SURGE SUPPRESSION DEVICE
- INSTALL (1) EQUIPMENT CABINET
- INSTALL (1) RBS CHASSIS IN EQUIPMENT CABINET
- INSTALL (1) BASEBAND UNIT IN RBS CHASSIS
- INSTALL (1) POWER CONDUIT FROM PLATFORM TO DEMARC DESIGNATED BY POWER COMPANY
- INSTALL (1) TELCO CONDUIT FROM PLATFORM TO DEMARC DESIGNATED BY TELCO PROVIDER
- INSTALL (1) NEMA4 TELCO-FIBER BOX MOUNTED TO H-FRAME
- INSTALL (1) GPS ANTENNA
- INSTALL (1) PIPE MAST
- INSTALL (1) DISH WIRELESS (3'-0") DISH ANTENNA ON PROPOSED PIPE MAST

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
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SEAL:
STATE OF CONNECTICUT
JAMES P. [illegible]
NO. 32948
PROFESSIONAL ENGINEER
1/21/19

PROJECT:
DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

GENERAL NOTES

SHEET NUMBER:	GN-1
JOB/FILE NUMBER:	1213.001

SITE NOTES:

1. WHEN SITE WORK IS INCLUDED IN SCOPE:
   a. CLEAR AND GRUB SITE OF ALL VEGETATION, PAVING, GRAVEL BASE AND OTHER DEBRIS NOT TO REMAIN. SUBGRADES ARE TO BE SET PRIOR TO LANDSCAPE INSTALLATION.
   b. PROVIDE ELEVATION OF SUBGRADE WITHIN 0.10 FOOT OF ELEVATIONS SHOWN ON PLAN MINUS DEPTH OF TOPSOIL, FILL, AND MULCH.
   c. ROUGH GRADE ALL AREAS WITHIN 1 FOOT OF ELEVATIONS INDICATED BEFORE PLANTING. PROVIDE POSITIVE DRAINAGE AWAY FROM EQUIPMENT SLABS, BUILDINGS AND THROUGH ALL PLANTER AREAS TO AVOID LOW SPOTS AND STANDING WATER.
   d. BLEND NEW GRADES NATURALLY INTO EXISTING GRADES.
   e. MAINTAIN POSITIVE DRAINAGE ON THE SITE AT ALL TIMES.
   f. IF REQUIRED, MAINTAIN CONTINUOUS EROSION CONTROL ON THE DOWNSTREAM SIDE OF THE SITE.
   g. IN LANDSCAPE AREAS, FINISH GRADES ARE TO FOLLOW THE GRADES AND EDGE DETAILS INDICATED AND BE MOUNDED 6 INCHES IN THE CENTER OF THE BED ABOVE THE EDGE OF THE LANDSCAPE AREA.
   h. DO NOT PLACE FILL OR EMBANKMENT MATERIAL ON FROZEN GROUND. DO NOT PLACE FROZEN MATERIALS, SNOW OR ICE IN ANY FILL OR EMBANKMENT.
   i. NOTIFY CARRIER IF MODIFICATIONS TO THE PROPOSED GRADING SEEM NECESSARY AND OBTAIN APPROVAL PRIOR TO START OF WORK.

2. FOOTINGS SHALL BEAR ON FIRM, NATURAL, UNDISTURBED SOIL, OR ON ENGINEERED FILL (COMPACTED TO 95% ASTM D1557). ENSURE THAT EXCAVATIONS ARE FREE OF ORGANIC MATERIAL, DEBRIS, OR OTHER FOREIGN MATERIAL. NOTIFY CARRIER IF ANY UNUSUAL CONDITIONS ARE ENCOUNTERED.

3. FILL AND SLAB BASE MATERIAL SHALL BE 3/4"± CRUSHED ROCK PLACED IN 8" (MAXIMUM) LOOSE LIFTS AND COMPACTED TO 98% ASTM D1557.

CONCRETE NOTES:

1. CONCRETE AND REINFORCING SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

CONCRETE CONSTRUCTION	ACI 318, f'c=4 KSI, UNO
CEMENT	ASTM C150, PORTLAND CEMENT TYPE II, UNO
REINFORCING STEEL	ASTM A615 (INCLUDING SUPPLEMENT S1), GRADE 60, fy=60 KSI, UNO
WELDED WIRE FABRIC	ASTM A185
SPIRAL REINFORCEMENT	ASTM A615, GRADE 60, fy=60 KSI
ANCHOR BOLTS	ASTM A307
GRADE 60 REBAR WELDING	ASTM A706

NOTES: ANY BARS SO NOTED ON THE DRAWINGS SHALL BE GRADE 60, fy=60 KSI. REINFORCING COMPLYING WITH ASTM A615(S1) MAY BE WELDED ONLY IF MATERIAL PROPERTY REPORTS INDICATING CONFORMANCE WITH WELDING PROCEDURES SPECIFIED IN A.W.S. D14 ARE SUBMITTED.

2. CONCRETE PROTECTION (COVER) FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

FOOTINGS AND OTHER UNFORMED SURFACES, EARTH FACE		3"
FORMED SURFACES EXPOSED TO EARTH OR WEATHER	(≥ #6 BARS)	2"
FORMED SURFACES EXPOSED TO EARTH OR WEATHER	(≤ #5 BARS)	1 1/2"
SLABS AND WALLS	(INTERIOR FACE)	3/4"

3. AIR ENTRAIN ALL CONCRETE WITH SURFACES EXPOSED TO WEATHER WITH AN AIR-ENTRAINING AGENT CONFORMING TO ASTM C260, C494, C618, C989 AND C1017. AIR ENTRAIN CONCRETE EXPOSED TO FREEZING AND THAWING WHILE MOIST IN ACCORDANCE WITH ACI 318, SECTION 4.4.1.

4. DETAIL REINFORCING STEEL (INCLUDING HOOKS AND BENDS) IN ACCORDANCE WITH ACI 315 AND 318. LAP ALL CONTINUOUS REINFORCEMENT AT LEAST 30 BAR DIAMETERS OR A MINIMUM OF 2'-0". PROVIDE CORNER BARS AT ALL WALL AND FOOTING INTERSECTIONS. LAP CORNER BARS AT LEAST 30 BAR DIAMETERS OR A MINIMUM OF 2'-0". LAP ADJACENT MATS OF WELDED WIRE FABRIC A MINIMUM OF 8" AT SIDES AND ENDS.

5. PERFORM WELDING OF GRADE 60 REINFORCING BARS (IF REQUIRED) USING LOW HYDROGEN ELECTRODES. PERFORM WELDING OF GRADE 40 REINFORCING BARS (IF REQUIRED) USING E70 XX ELECTRODES. DO NOT WELD WITHIN 4" OF COLD BENDS IN REINFORCING STEEL.

6. DO NOT FIELD BEND REINFORCING PARTIALLY EMBEDDED IN CONCRETE UNLESS SPECIFICALLY SO DETAILED OR APPROVED BY THE ENGINEER.

7. SUPPORT BARS ON CHAIRS OR DOBIE BRICKS.

8. FURNISH NON-SHRINK GROUT BY AN APPROVED MANUFACTURER. MIX AND PLACE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS. GROUT STRENGTH SHALL BE AT LEAST EQUAL TO THE MATERIAL ON WHICH IT IS PLACED (4 KSI, MINIMUM).

9. ALL EXPANSION ANCHORS TO BE HILTI BRAND, UNO. TEST ADHESIVE ANCHORS TO CONFIRM CAPACITY UNLESS WAIVED BY ENGINEER AND LOCAL JURISDICTION.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

WIDE FLANGE SHAPES	ASTM A992, GRADE 50
SHAPES, PLATES, ANGLES, & RODS	ASTM A36, Fy 36 KSI
SPECIAL SHAPES AND PLATES	ASTM A572, Fy 50 KSI
PIPE COLUMNS	ASTM A53, GR B, Fy 35 KSI
STRUCTURAL TUBING	ASTM A500, GR B, Fy 46KSI
ANCHOR BOLTS	ASTM A307
CONNECTION BOLTS	ASTM A325 TWIST-OFF

2. BASE STRUCTURAL STEEL DESIGN, FABRICATION AND ERECTION (INCLUDING FIELD WELDING, HIGH STRENGTH FIELD BOLTING, EXPANSION BOLTS, AND THREADED EXPANSION ANCHORS) ON THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" LATEST EDITION.

3. HOT DIP GALVANIZE AFTER FABRICATION PER A123/A123M-00 ALL STEEL EXPOSED TO WEATHER AND WHERE NOTED.

4. CONFORM TO ALL AISC AND AWS STANDARDS FOR WELDING. PERFORM WELDING BY ANSI/AWS D1.1 CERTIFIED WELDERS USING E70XX ELECTRODES. USE ONLY PRE-QUALIFIED WELDS AS DEFINED BY AWS.

5. PROVIDE COLD-FORMED STEEL FRAMING MEMBERS OF THE SHAPE, SIZE, AND GAUGE SHOWN ON THE PLANS. PROVIDE MINIMUM SECTION PROPERTIES INDICATED. ALL COLD-FORMED STEEL FRAMING SHALL CONFORM TO THE AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS."

6. FOR BOLTED CONNECTIONS, USE 3/4" DIA., BEARING-TYPE, A325 BOLTS WITH A MINIMUM OF TWO BOLTS, UNO.

7. FOR NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING, USE 5/8" DIA. A307 BOLTS, UNO.

8. PREPARE AND PAINT IN ACCORDANCE WITH THE PAINT MANUFACTURERS WRITTEN INSTRUCTIONS, UNO.

9. TOUCH UP ALL FIELD DRILLING, WELDING AND CUT SURFACES WITH 2 COATS OF GALVACON (ZINC RICH PAINT) OR APPROVED EQUAL.

10. THE STRUCTURAL INTEGRITY OF THE EQUIPMENT PLATFORM HAS NOT BEEN REVIEWED BY FORESITE GROUP INC.

SPECIAL INSPECTIONS (WHEN REQUIRED):

1. PROVIDE SPECIAL INSPECTIONS PERFORMED BY AN INDEPENDENT INSPECTOR, APPROVED BY CARRIER'S REPRESENTATIVE AND THE LOCAL JURISDICTION.

2. THE SPECIAL INSPECTOR SHALL PROVIDE A COPY OF THE REPORT TO THE CARRIER'S REPRESENTATIVE, STRUCTURAL ENGINEER, CONTRACTOR, AND BUILDING OFFICIAL.

PREPARED FOR:

dish WIRELESS

PROJECT MANAGER:

CENTERLINE COMMUNICATIONS

PREPARED BY:

FORESITE group

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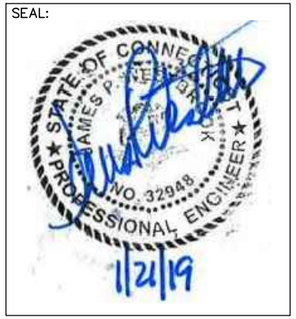
SEAL:



PROJECT:

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

GENERAL NOTES

SHEET NUMBER: GN-2

JOB/FILE NUMBER: 1213.001

Drawing name: C:\Users\jmarooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg GN-2 Jan 21, 2019 8:10am by: jmarooney

ELECTRICAL NOTES:

GENERAL

GENERAL CONDITIONS:

A. CONTRACTOR SHALL INSPECT THE EXISTING SITE CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARD TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE ISSUED TO CONSTRUCTION MANAGER IN WRITING FOR CLARIFICATION PRIOR TO SUBMITTAL OF BID AND CONTRACT AWARD.

B. THE CONTRACTOR SHALL OBTAIN PERMITS, LICENSES, MAKE ALL DEPOSITS, AND PAY ALL FEES REQUIRED FOR THE CONSTRUCTION OF WORK UNDER THIS SECTION.

C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. DRAWINGS SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.

LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES:

A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES. CONDUIT BENDS SHALL BE THE RADIUS BEND FOR THE TRADE SIZE OF CONDUIT IN COMPLIANCE WITH THE LATEST EDITIONS OF NEC.

REFERENCES:

A. THE PUBLICATIONS LISTED BELOW ARE PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE. THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENT SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISION OF THESE PUBLICATIONS.

1. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
2. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
3. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
4. NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
5. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
6. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
7. UL (UNDERWRITERS LABORATORIES. INC.)
8. DISH WIRELESS GROUNDING AND BONDING STANDARDS, LATEST EDITION, AND COMPLY WITH DISH WIRELESS GROUNDING CHECKLIST, LATEST VERSION
9. R56 MOTOROLA STANDARDS

SCOPE OF WORK:

A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL, AND ASSOCIATED SERVICES REQUIRED TO COMPLETE REQUIRED CONSTRUCTION AND BE OPERATIONAL.

B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING OF TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.

D. THE CONTRACTOR SHALL PREPARE A COMPLETE SET OF AS-BUILT DRAWINGS, DOCUMENT ALL WIRING EQUIPMENT CONDITIONS, AND CHANGES WHILE COMPLETING THIS CONTRACT, THE AS-BUILT DRAWINGS SHALL BE SUBMITTED AT COMPLETION OF THE PROJECT.

PRODUCTS

GENERAL:

A. ALL MATERIALS AND EQUIPMENT SHALL BE UL LISTED, NEW, AND FREE FROM DEFECTS.

B. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.

C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING EQUAL TO OR GREATER THAN THE SHORT CIRCUIT CURRENT AVAILABLE, 10,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT.

MATERIALS AND EQUIPMENT:

A. CONDUIT:

1. RIGID METAL CONDUIT (RMC) SHALL BE HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.

2. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE UL LISTED.

3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION AND CONCRETE TIGHT TYPE.

4. NONMETALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC UNLESS SCHEDULE 80 PVC IS SPECIFIED. INSTALL USING SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.

B. CONDUCTORS AND CABLE:

1. CONDUCTORS AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN-2, 600 VOLT, SIZE AS INDICATED, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR USED.

2. #10 AWG AND SMALLER CONDUCTOR SHALL BE SOLID OR STRANDED AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.

3. SOLDERLESS, COMPRESSION-TYPE CONNECTORS SHALL BE USED FOR TERMINATION OF ALL STRANDED CONDUCTORS.

4. STRAIN-RELIEF SUPPORTS GRIPS SHALL BE HUBBELL KELLEMS OR APPROVED EQUAL. CABLES SHALL BE SUPPORTED IN ACCORDANCE WITH THE NEC AND CABLE MANUFACTURER'S RECOMMENDATIONS.

5. ALL CONDUCTORS SHALL BE TAGGED AT BOTH ENDS OF THE CONDUCTOR, AT ALL PULL BOXES, J-BOXES, EQUIPMENT AND CABINETS AND SHALL BE IDENTIFIED WITH APPROVED PLASTIC TAGS (ACTION CRAFT, BRADY, OR APPROVED EQUAL).

C. DISCONNECT SWITCHES:

1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCK WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE-D OR ENGINEER APPROVED EQUAL.

D. CHEMICAL ELECTROLYTIC GROUNDING SYSTEM:

1. INSTALL CHEMICAL GROUNDING AS REQUIRED. THE SYSTEM SHALL BE ELECTROLYTIC MAINTENANCE FREE ELECTRODE CONSISTING OF RODS WITH A MINIMUM #2 AWG CU EXOTHERMICALLY WELDED PIGTAIL, PROTECTIVE BOXES, AND BACKFILL MATERIAL. MANUFACTURER SHALL BE LYNCOLE XIT GROUNDING ROD TYPES K2-(*)CS OR K2L-(*)CS (*) LENGTH AS REQUIRED.

2. GROUND ACCESS BOX SHALL BE A POLYPLASTIC BOX FOR NON-TRAFFIC APPLICATIONS, INCLUDING BOLT DOWN FLUSH COVER WITH "BREATHER" HOLES, XIT MODEL #XB-22. ALL DISCONNECT SWITCHES AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS ID NUMBERING, AND THE ELECTRICAL POWER SOURCE.

3. BACKFILL MATERIAL SHALL BE LYNCONITE AND LYNCOLE GROUNDING GRAVEL.

E. SYSTEM GROUNDING

1. ALL GROUNDING COMPONENTS SHALL BE TINNED AND GROUNDING CONDUCTOR SHALL BE #2 AWG BARE, SOLID, TINNED, COPPER. ABOVE GRADE GROUNDING CONDUCTORS SHALL BE INSULATED WHERE NOTED.

2. GROUNDING BUSES SHALL BE BARE, TINNED ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. STANDARD BUS BARS MGB, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.

3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS. INTERIOR CONNECTIONS USE TWO-HOLE COMPRESSION LUGS WITH INSPECTION WINDOW AND CLEAR HEAT SHRINK.

4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.

5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 5/8"x10'-0". ALL GROUNDING RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES.

6. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS IN COMPLIANCE WITH THE DISH WIRELESS SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED TO ALL METALLIC JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT.

F. OTHER MATERIALS:

1. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.

2. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.

G. PANELS AND LOAD CENTERS:

1. ALL PANEL LABELS SHALL BE TYPEWRITTEN.

EXECUTION:

GENERAL:

A. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.

LABOR AND WORKMANSHIP:

A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE INSTALLED BY EXPERIENCED WIREMEN, IN A NEAT AND WORKMAN-LIKE MANNER.

B. ALL ELECTRICAL EQUIPMENT SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.

C. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.

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dish WIRELESS

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1/21/19

PROJECT:
DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
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REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
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ELECTRICAL NOTES

SHEET NUMBER: EN-1

JOB/FILE NUMBER: 1213.001

ELECTRICAL NOTES (CONTINUED)

COORDINATION:

A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE CARRIER-FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

INSTALLATION:

A. CONDUIT:

1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH TRADE SIZE.
2. PROVIDE RMC CONDUITS FOR ALL RISERS.
3. INSTALL SCHEDULE 40 PVC CONDUIT WITH A MINIMUM COVER OF 24" UNDER ROADWAYS, PARKING LOTS, STREETS, AND ALLEYS. CONDUIT SHALL HAVE A MINIMUM COVER OF 18" IN ALL OTHER NON-TRAFFIC APPLICATIONS (REFER TO 2017 NEC, TABLE 300.5).
4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION TO EQUIPMENT WITH MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUID TIGHT, FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORT TO ALLOW FOR EXPANSION AND CONTRACTION.
5. A RUN OF CONDUIT BETWEEN BOXES OR EQUIPMENT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF THREE 90 DEGREE BENDS MAX. CONDUIT BEND SHALL BE MADE WITH THE UL LISTED BENDER OR FACTORY 90 DEGREE ELBOWS MAY BE USED.
6. FIELD FABRICATED CONDUITS SHALL BE CUT SQUARE WITH A CONDUIT CUTTING TOOL AND REAMED TO PROVIDE A SMOOTH INSIDE SURFACE.
7. PROVIDE INSULATED GROUNDING BUSHING FOR ALL CONDUITS.
8. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
9. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF CONDUCTORS OR CABLES. CONDUIT SHALL BE FREE OF DIRT AND DEBRIS.
10. INSTALL PULL STRINGS IN ALL CLEAN EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END.
11. INSTALL 2" HIGHLY VISIBLE AND DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUITS AND CONDUCTORS.
12. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.
13. PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS TO ALLOW FOR RACEWAYS AND CABLES TO BE ROUTED THROUGH THE BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS AND/OR SLEEVES. PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE EFFECTIVELY SEALED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FIRE STOPS AT FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE, AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THE PURPOSE.

B. CONDUCTORS AND CABLE:

1. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAY CONDUITS APPROVED FOR THIS PURPOSE.
2. PULLING LUBRICANTS SHALL BE UL APPROVED. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CONDUCTOR OR CABLES INTO THE CONDUIT.
3. CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES AND EQUIPMENT TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS. CONDUCTORS SHALL BE PROTECTED FROM MECHANICAL INJURY AND MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS IS PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

C. DISCONNECT SWITCHES:

1. INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUNDING SYSTEM AS INDICATED.

D. GROUNDING:

1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, DISH WIRELESS GROUNDING AND BONDING STANDARDS, LATEST EDITION, AND COMPLY WITH DISH WIRELESS GROUNDING CHECKLIST, LATEST VERSION, AND THE NATIONAL ELECTRICAL CODE.
2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWER, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 AWG COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). SEE STANDARD 6.3.2.2.
5. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
6. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING GROUNDING SYSTEM. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
8. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE KOPR-SHIELD ANTI-OXIDATION COMPOUND ON ALL COMPRESSION GROUNDING CONNECTIONS.
9. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
10. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
11. DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 30" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
12. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
13. THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
14. DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 30" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
15. CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.

ACCEPTANCE TESTING:

A. CERTIFIED PERSONNEL USING CERTIFIED EQUIPMENT SHALL PERFORM REQUIRED TESTS AND SUBMIT WRITTEN TEST REPORTS UPON COMPLETION.

B. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NON-COMPLYING ITEMS SHALL BE REMOVED FROM THE PROJECT SITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE FOR NON-COMPLIANCE.

C. TEST PROCEDURES:

1. ALL FEEDERS SHALL HAVE INSULATION TESTED AFTER INSTALLATION, BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. PROVIDE WRITTEN DOCUMENTATION FOR ALL TEST RESULTS.
2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE CONDUCTORS AND NEUTRALS, SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4. PERFORM GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

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DISH WIRELESS

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PROFESSIONAL ENGINEER
1/21/19

PROJECT:
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TOWER OWNER SITE ID: CT13071
SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

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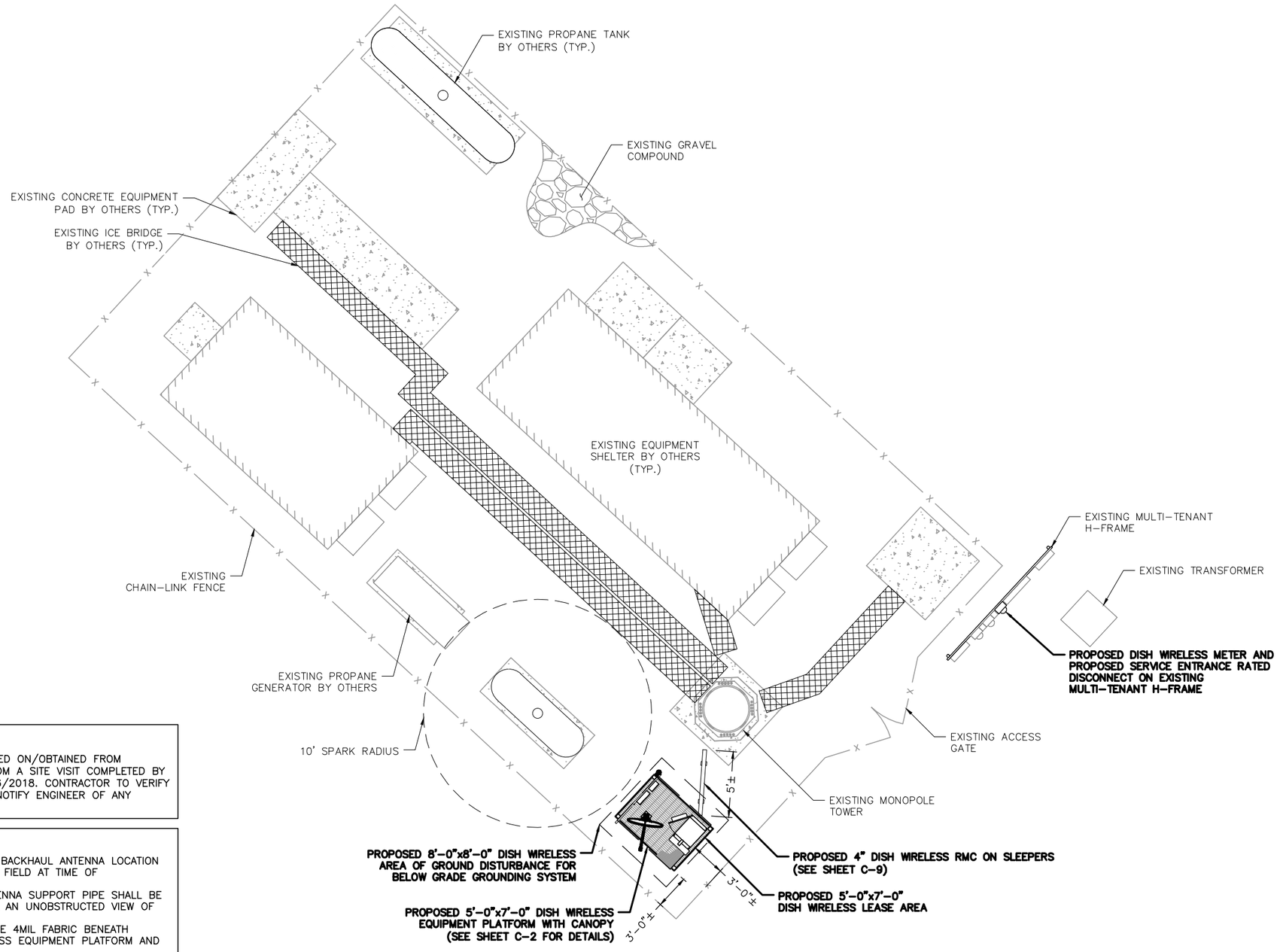
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

ELECTRICAL NOTES

SHEET NUMBER:	EN-2
JOB/FILE NUMBER:	1213.001



NOTE:

EXISTING SITE PLAN IS BASED ON/OBTAINED FROM INFORMATION GATHERED FROM A SITE VISIT COMPLETED BY FORESITE GROUP ON 11/26/2018. CONTRACTOR TO VERIFY EXISTING CONDITIONS AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

NOTES:

1. WHEN APPLICABLE, LTE BACKHAUL ANTENNA LOCATION TO BE VERIFIED IN THE FIELD AT TIME OF CONSTRUCTION.
2. WHEN APPLICABLE, ANTENNA SUPPORT PIPE SHALL BE POSITIONED TO PROVIDE AN UNOBSTRUCTED VIEW OF THE SOUTHERN SKY.
3. CONTRACTOR TO PROVIDE 4MIL FABRIC BENEATH PROPOSED DISH WIRELESS EQUIPMENT PLATFORM AND LEGS IF NONE PRESENT.
4. PROPOSED PLATFORM MODEL SHOWN IS BASED ON DISH SPECIFICATIONS. DESIGN/ANALYSIS OF EQUIPMENT PLATFORM/CANOPY/CONNECTIONS/ FOUNDATION WAS PREPARED BY MANUFACTURER AND WAS NOT EVALUATED BY FORESITE GROUP.
5. CONTRACTOR TO INSTALL ADDITIONAL BALLAST ON PLATFORM PER PLATFORM MANUFACTURER'S SPECIFICATIONS AS NEEDED FOR LOCAL DESIGN WIND SPEEDS.

TRUE NORTH

1 COMPOUND PLAN

24x36 SHEET SCALE: 1"= 5'
11x17 SHEET SCALE: 1"= 10'

0 2.5' 5' 10'

PREPARED FOR:
dish WIRELESS

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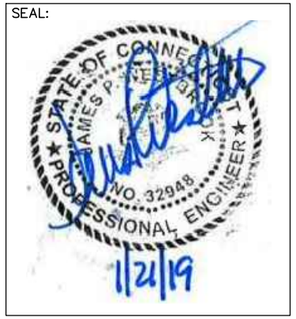

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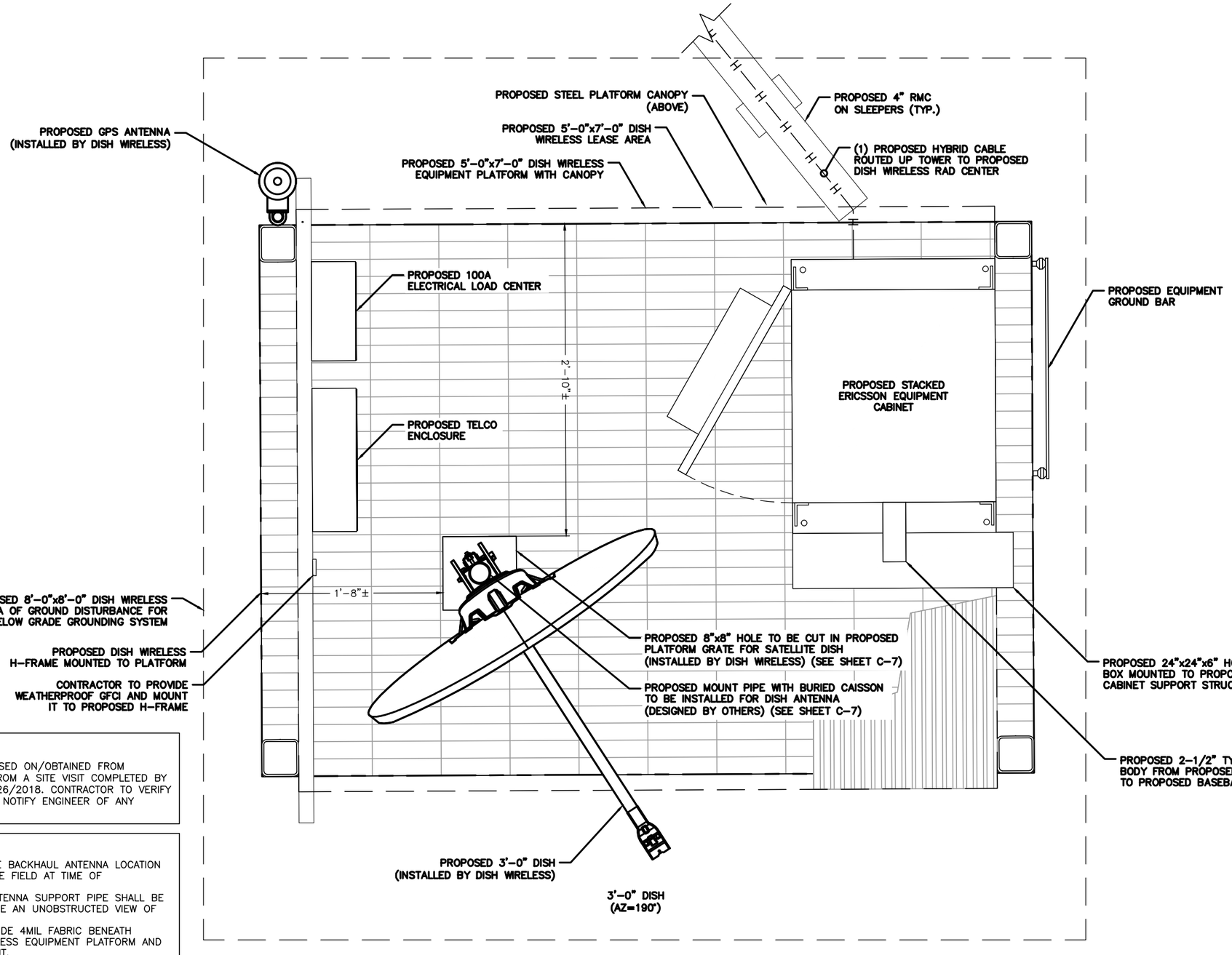
COMPOUND PLAN

SHEET NUMBER:	C-1
JOB/FILE NUMBER:	1213.001

Drawing name: C:\Users\jmrooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg C-1 Jan 21, 2019 8:10am by: jmrooney



NOTE:

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NOTES:

1. WHEN APPLICABLE, LTE BACKHAUL ANTENNA LOCATION TO BE VERIFIED IN THE FIELD AT TIME OF CONSTRUCTION.
2. WHEN APPLICABLE, ANTENNA SUPPORT PIPE SHALL BE POSITIONED TO PROVIDE AN UNOBSTRUCTED VIEW OF THE SOUTHERN SKY.
3. CONTRACTOR TO PROVIDE 4MIL FABRIC BENEATH PROPOSED DISH WIRELESS EQUIPMENT PLATFORM AND LEGS IF NONE PRESENT.
4. PROPOSED PLATFORM MODEL SHOWN IS BASED ON DISH SPECIFICATIONS. DESIGN/ANALYSIS OF EQUIPMENT PLATFORM/CANOPY/CONNECTIONS/ FOUNDATION WAS PREPARED BY MANUFACTURER AND WAS NOT EVALUATED BY FORESITE GROUP.
5. CONTRACTOR TO INSTALL ADDITIONAL BALLAST ON PLATFORM PER PLATFORM MANUFACTURER'S SPECIFICATIONS AS NEEDED FOR LOCAL DESIGN WIND SPEEDS.

TRUE NORTH

1 EQUIPMENT PLAN

24x36 SHEET SCALE: 1"= 1'
11x17 SHEET SCALE: 1"= 2'

0 0.5' 1' 2'

SAFETY NOTE:

WHEN APPLICABLE, CONTRACTOR SHALL COVER PROPOSED (8"x8") HOLE IN PLATFORM GRATE TO PREVENT TRIPPING HAZARD. SEE OSHA STANDARDS, SECTION 29 CFR 1926.501(b)(4)(ii).

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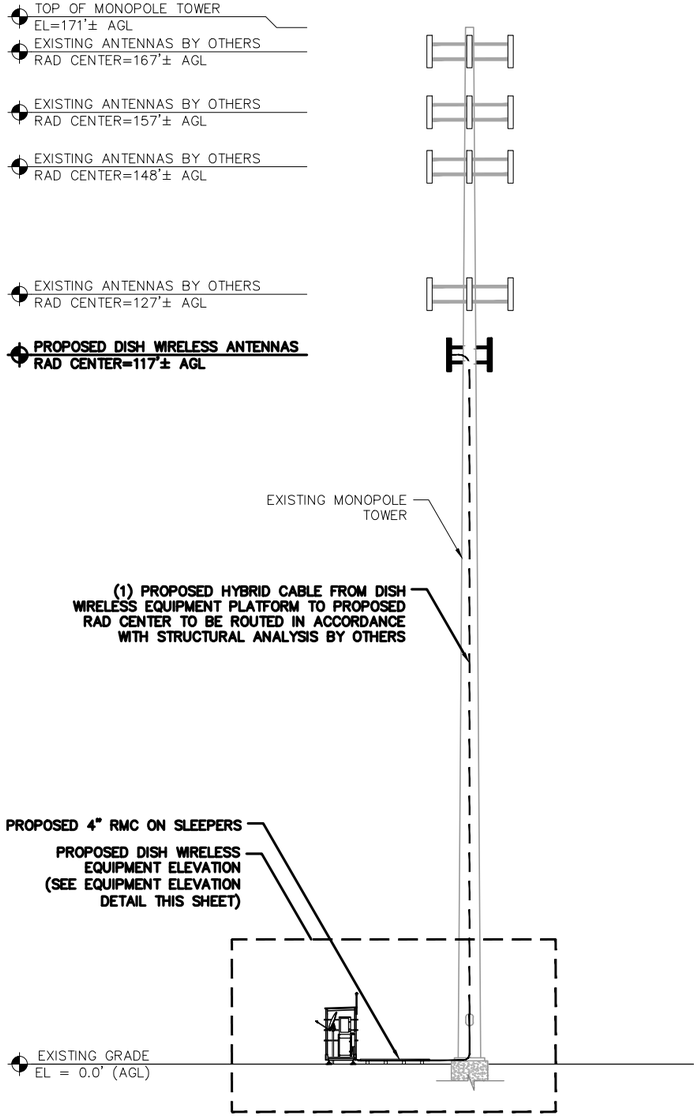
EQUIPMENT PLAN

SHEET NUMBER: C-2

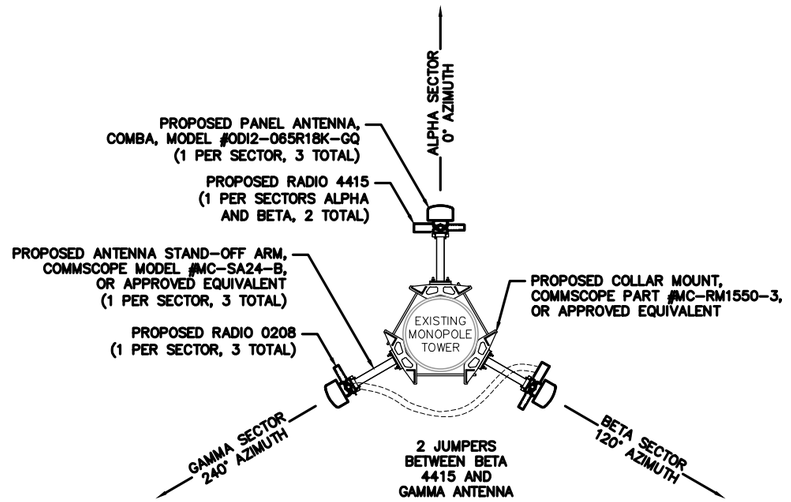
JOB/FILE NUMBER: 1213.001

NOTE:

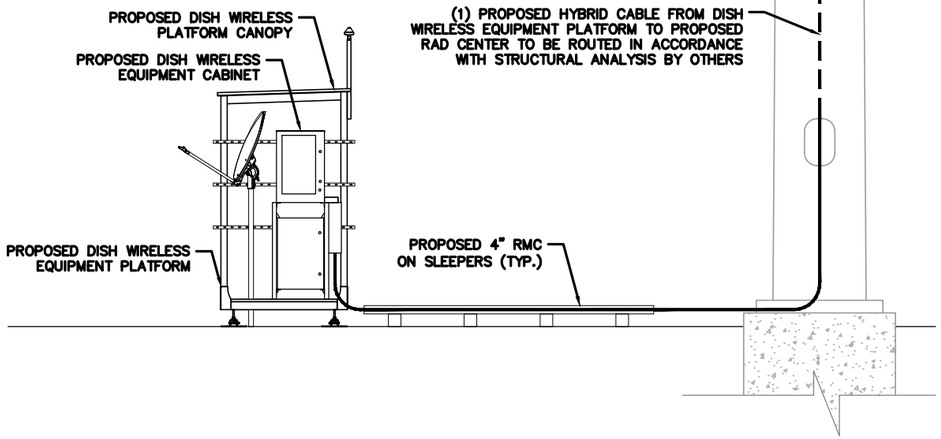
1. DISH WIRELESS TO CONFIRM WITH TOWER OWNER THE VERTICAL LEASE AREA RIGHTS AVAILABLE PRIOR TO CONSTRUCTION. EXISTING EQUIPMENT MAY OBSTRUCT DESIRED DISH WIRELESS RAD-CENTER.
2. TOWER STRUCTURAL ANALYSIS SHALL BE COMPLETED BY OTHERS BEFORE ANY INSTALLATION OF EQUIPMENT OR ANY OTHER MODIFICATIONS TO THE TOWER ARE COMPLETED. FORESITE GROUP ACCEPTS NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY OF THE TOWER AND FOUNDATIONS. CONTRACTOR SHALL COORDINATE WITH AND COMPLY WITH THE PROVISIONS OF THE STRUCTURAL ANALYSIS PRIOR TO INSTALLATION OF EQUIPMENT ON TOWER.
3. STRUCTURAL ANALYSIS OF DISH WIRELESS ANTENNA MOUNTS COMPLETED BY OTHERS.



1 TOWER ELEVATION
SCALE: N.T.S.



2 PROPOSED ANTENNA LAYOUT
SCALE: N.T.S.



3 EQUIPMENT ELEVATION
SCALE: N.T.S.

ANTENNA LAYOUT NOTES:

1. THIS ANTENNA ORIENTATION PLAN IS A SCHEMATIC. THE CONTRACTOR SHALL VERIFY TOWER ORIENTATION AND FIELD COORDINATE REQUIRED ADJUSTMENTS TO ACHIEVE THE DESIRED ANTENNA AZIMUTHS.
2. ANTENNA CENTERLINE HEIGHT REFERENCED FROM GROUND AT BASE OF TOWER, ASSUMING HEIGHT OF 0'-0" AT SAID REFERENCE POINT.
3. ALL ANTENNAS, CABLES AND MOUNTS SHALL BE INSTALLED IN ACCORDANCE WITH THE TOWER ENGINEER'S RECOMMENDATIONS IN A MANNER CONSISTENT WITH THE STRUCTURAL ANALYSIS REPORT.
4. ALL ANTENNA BRACKETS PER ANTENNA MANUFACTURER, OR EQUAL. CONTRACTOR TO COORDINATE REQUIRED MECHANICAL DOWN TILT WITH DISH WIRELESS.
5. ALL ANTENNA INFORMATION TO BE CONFIRMED WITH DISH WIRELESS RF DESIGN PRIOR TO INSTALLATION.
6. VERIFY POSITIONS AND AZIMUTH OF ANTENNAS WITH DISH WIRELESS PRIOR TO INSTALLATION.
7. SECTOR FRAMES AND ANTENNAS SHOULD HAVE IDENTIFYING TORQUE MARKS SHOWN AFTER INSTALLATION.
8. ALL CLOSE-OUT PHOTOS ADHERE TO CLOSE-OUT DOCUMENTATION.
9. THE SIZE, HEIGHT, AND DIRECTION OF ALL ANTENNAS SHALL BE ADJUSTED TO MEET SYSTEM REQUIREMENTS DEPICTED BY THE LATEST APPROVED RFDS.

EQUIPMENT TESTING:

CONTRACTOR SHALL COMPLETE THE FOLLOWING REQUIREMENTS:

1. ANTENNAS & RF JUMPERS:
- ALL RF JUMPERS & ANTENNA PORTS MUST HAVE DOCUMENTED PASSING SYSTEM SWEEP TEST.
- PIM TESTING IS REQUIRED FOR ALL INSTALLED ANTENNAS & FEEDLINES.
- SYSTEM SWEEPS SHALL BE AT A RETURN LOSS OF ≤ -16db.
- ALL SWEEPS MUST BE PROVIDED IN A PDF AS WELL AS ANRITSU (OR EQUAL) DATA FILE FORMAT.
- FINAL ACCEPTANCE: PERFORM ALL TECHNICAL TESTS SPECIFIED IN THE CONSTRUCTION SOW, SECTION XIV

2. HYBRID CABLES:
- ALL FIBER PAIRS MUST HAVE A DOCUMENTED PASSING POWER & A FIBER INSPECTION SCOPE TEST.
- PASSING POWER TEST SHALL BE ≤ 3db.
- REQUIRED FIBER TEST GEAR SHALL BE VIAVI JDSU FIT-SD103; P5000i FIBER SCOPE DIGITAL INSPECTION KIT; VIAVI 2303/11, OLS-35 OPTICAL LASER LIGHT SOURCE 1310/1550 NM, SM, INTERCHANGEABLE ADAPTER OR EQUAL.
- ALL FIBER TEST RESULTS MUST BE PROVIDED IN PDF FORMAT.
- FINAL ACCEPTANCE: PERFORM ALL TECHNICAL TESTS SPECIFIED IN THE CONSTRUCTION SOW, SECTION XIV

INSTALLER NOTES:

1. SCHEMATIC LAYOUT ONLY. REFER TO SHEETS C-1 AND C-2 FOR EXACT EQUIPMENT LAYOUT, SIZES AND LOCATIONS OF ICE BRIDGE UNLESS NOTED OTHERWISE.
2. ALL CABLE SUPPORTS SHOULD BE BLOCKS WITH GROMMETS, NO SNAP-INS ARE ALLOWED.
3. STRAIN-RELIEVE SUPPORT FOR ALL CABLING SHALL OCCUR EVERY 48" VERTICALLY, AND 24" HORIZONTALLY.

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TITLE:	

TOWER ELEVATION & ANTENNA LAYOUT

SHEET NUMBER:	C-3
JOB/FILE NUMBER:	1213.001

Drawing name: C:\Users\jmorooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg C-3 Jan 21, 2019 8:10am by: jmorooney

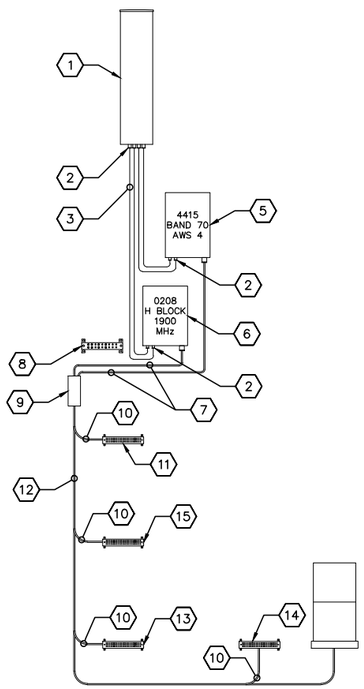
ANTENNA SCHEDULE

SECTOR/ POSITION	ANTENNA MANUFACTURER/MODEL	PRIMARY FEEDER (COAX/HYBRID CABLE)	AZIMUTH	RAD CENTER	MECH D-TILT	ELECT D-TILT	RRU MANUFACTURER/MODEL	RRU TECHNOLOGY	RRU LOCATION	PRIMARY FEEDER SIZE	JUMPER SIZE	JUMPER QTY	JUMPER LENGTH
ALPHA 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ALPHA 2	COMBA/ ODI2-065R18K-GQ	HYBRID - DSHYBKIT-18612-10M - 7/8"ø	0°	117'	0°	2°	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ALPHA 3	N/A	N/A	N/A	N/A	N/A	N/A	ERICSSON 0208	H BLOCK	SECTOR	N/A	1/2"	2	10'-0"
							ERICSSON 4415	BAND 70	SECTOR	N/A	1/2"	2	10'-0"
ALPHA 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BETA 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BETA 2	COMBA/ ODI2-065R18K-GQ	SHARED WITH ALPHA	120°	117'	0°	2°	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BETA 3	N/A	N/A	N/A	N/A	N/A	N/A	ERICSSON 0208	H BLOCK	SECTOR	N/A	1/2"	2	10'-0"
							ERICSSON 4415	BAND 70	SECTOR	N/A	1/2"	2	10'-0"
BETA 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GAMMA 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GAMMA 2	COMBA/ ODI2-065R18K-GQ	SHARED WITH ALPHA	240°	117'	0°	2°	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GAMMA 3	N/A	N/A	N/A	N/A	N/A	N/A	ERICSSON 0208	H BLOCK	SECTOR	N/A	1/2"	2	10'-0"
							***	***	***	N/A	1/2"	2	30'-0"
GAMMA 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

INSTALL PROPOSED RET CABLE FROM 4415 RRU TO ANTENNA (1 PER SECTOR).
BETA SECTOR TO BE DAISY CHAINED TO GAMMA.

***** ERICSSON 4415 IN BETA SECTOR WILL FEED ANTENNA IN GAMMA SECTOR**

TYPICAL SECTOR



KEY NOTES**:

1. ANTENNA-COMBA ODI-65R16M18JJ-GQ V2 DS 0-0-0 (DISH PROVIDED)
2. CLAMSHELL WEATHER PROOFING (CONTRACTOR PROVIDED)
3. PROPOSED (4 EA.) 1/2" COAX JUMPERS FROM RRUS TO ANTENNA (DISH PROVIDED) - VARIABLE LENGTHS. BOND ALL JUMPERS TO SECTOR GROUND BUS BAR
4. RRU-E2 (x3) BAND 29 700 MHz (DISH PROVIDED)
5. RRU-4415 (x2) BAND 70 AWS 4 (DISH PROVIDED)
6. RRU-0208 (x3) H BLOCK 1900 MHz (DISH PROVIDED)
7. DC/FIBER JUMPER CABLES (BREAKOUT CYLINDER TO RRU)
8. SECTOR GROUND BUS BAR - 12"x2"x1/4" (DISH PROVIDED)
9. FIBER/POWER BREAKOUT CYLINDER
10. GROUND KIT ON HYBRID CABLE
11. UPPER TOWER GROUND BUS BAR - 12"x4"x1/4" (DISH PROVIDED)
12. HYBRID CABLE
13. LOWER TOWER GROUND BUS BAR - 12"x4"x1/4" (DISH PROVIDED)
14. EQUIPMENT GROUND BUS BAR - 12"x4"x1/4" (DISH PROVIDED)
15. ADD ADDITIONAL BUS BARS AND GROUND KITS ON TOWER IN 50, 100, OR 200-FOOT INCREMENTS BASED ON TOWER HEIGHT AND LIGHTNING ZONE REQUIREMENTS

**SEE SHEET G-2 FOR FULL GROUNDING DETAILS

NOTE:

1. CONTRACTOR TO REFER TO AND VALIDATE THE LATEST RFDS PRIOR TO CONSTRUCTION.

1 PLUMBING DIAGRAM
SCALE: N.T.S.

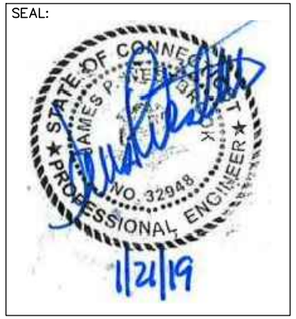
NOTE:

SEE SHEET C-3 FOR PROPOSED ANTENNA LAYOUT AND SHEET C-4 FOR EQUIPMENT SPECS

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group
Foresite Group, Inc.
1875 Connecticut Ave. NW 10th Floor
Washington, DC 20009
o | 202.697.4808
f | 334.887.6024
w | www.fg-inc.net

SEAL:


PROJECT:
DISH WIRELESS SITE ID: CT0100002A

TOWER OWNER SITE ID: CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

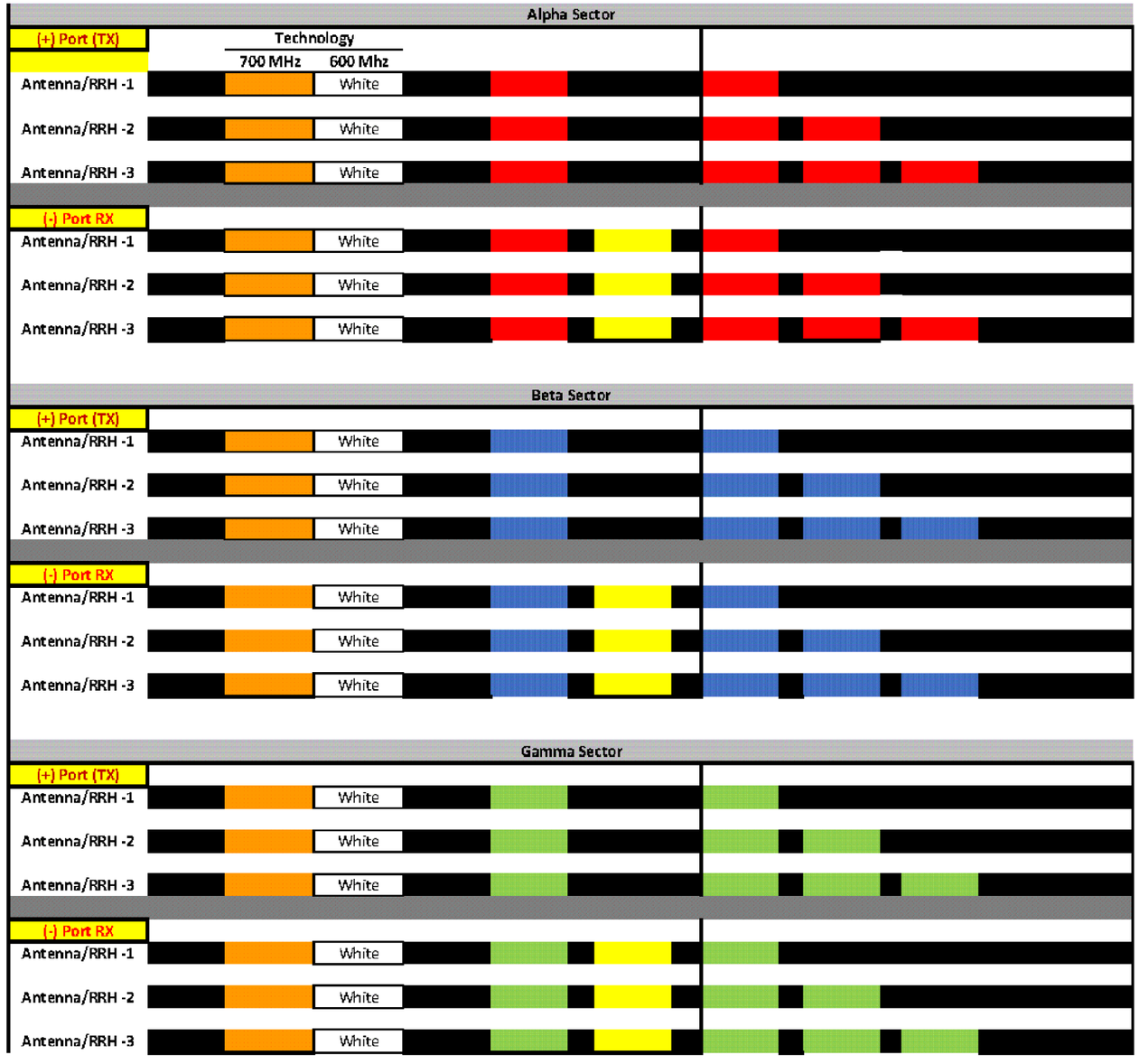
ANTENNA SCHEDULE & PLUMBING DIAGRAM

SHEET NUMBER:	C-3.1
JOB/FILE NUMBER:	1213.001

Drawing name: C:\Users\jmarooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg C-3.1 Jan 21, 2019 8:10am by: jmarooney

NOTE:

1. CONTRACTOR TO REFER TO AND VALIDATE THE LATEST RFDS PRIOR TO CONSTRUCTION.



1 CABLE COLOR CODE
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group

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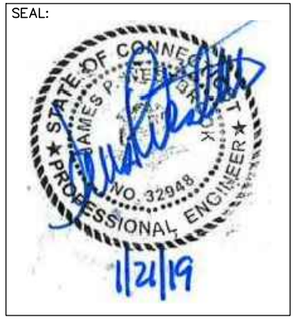


PROJECT:

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

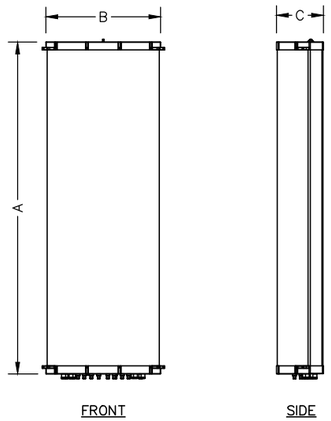
ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

CABLE COLOR CODE

SHEET NUMBER: C-3.2

JOB/FILE NUMBER: 1213.001

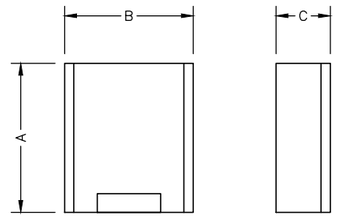
Drawing name: C:\Users\jmarooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg C-3.2 Jan 21, 2019 8:10am by: jmarooney



FRONT SIDE

ANTENNA SPECIFICATIONS				
MODEL	LENGTH (A)	WIDTH (B)	DEPTH (C)	WEIGHT (lb)
COMBA – ODI2–065R18K–GQ	53.5"	9.8"	2.4"	25.1

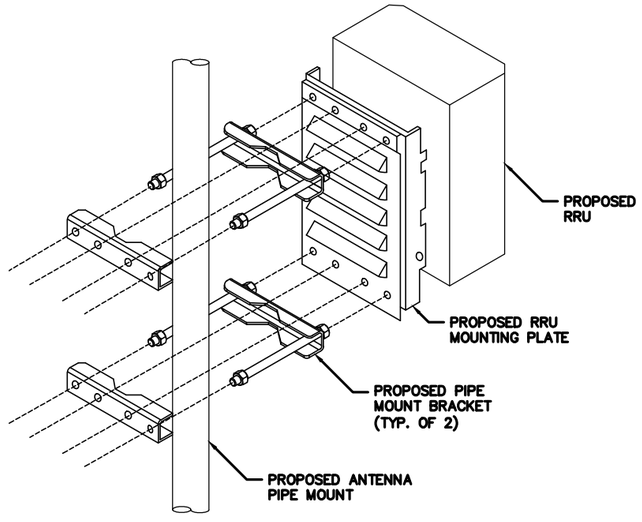
1 ANTENNA SPECIFICATIONS
SCALE: N.T.S.



FRONT SIDE

RADIO SPECIFICATIONS				
MODEL	LENGTH (A)	WIDTH (B)	DEPTH (C)	WEIGHT (lb)
ERICSSON – RADIO 4415	16.54"	13.46"	4.84"	44.09
ERICSSON – RADIO 0208	13.82"	11.73"	3.31"	18.52

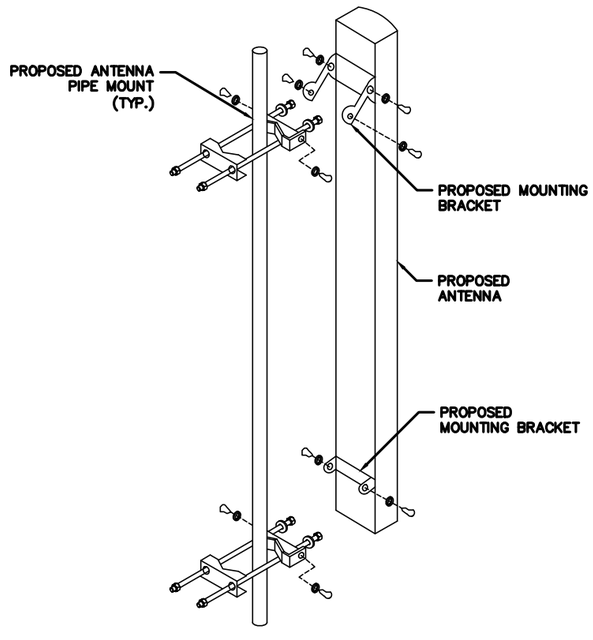
2 RADIO SPECIFICATIONS
SCALE: N.T.S.



NOTES:

1. ERICSSON VIA DISH WIRELESS SUPPLIES RRU, RRU PIPE–MOUNTING BRACKET. SUBCONTRACTOR SHALL INSTALL ALL MOUNTING HARDWARE INCLUDING RRU PIPE–MOUNTING BRACKET.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED

3 REMOTE RADIO UNIT (RRU) PIPE MOUNT
SCALE: N.T.S.

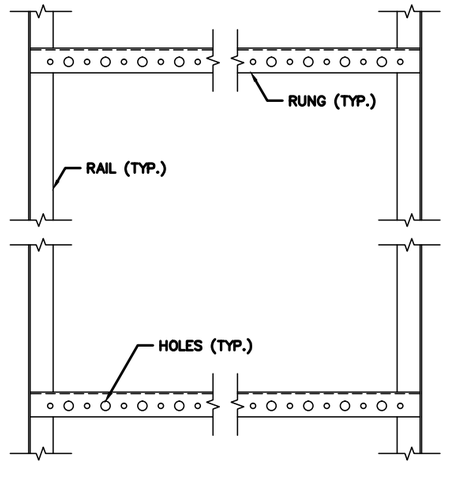


4 ANTENNA MOUNTING
SCALE: N.T.S.

*CONTRACTOR TO VERIFY NEED WITH DISH PM/CM. DISH PREFERS TO USE EXISTING CABLE SUPPORT, IF AVAILABLE.

LADDER NOTE:

LADDER TO BE PLACED ON TOWER IN 20'–0" SECTIONS UP TO PROPOSED DISH WIRELESS RAD CENTER.



5 CABLE LADDER DETAIL (OPTIONAL)
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group

Foresite Group, Inc.
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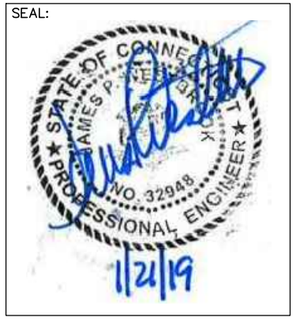

PROJECT:

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
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SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

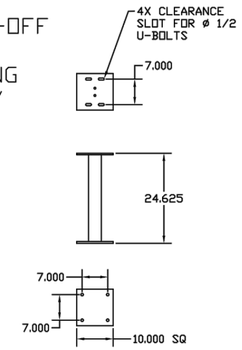
REVISIONS	DATE

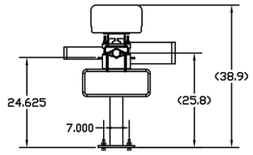
ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

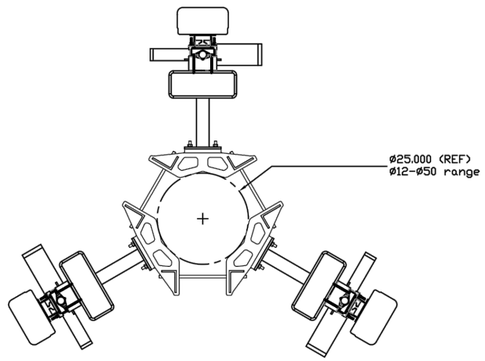
EQUIPMENT DETAILS

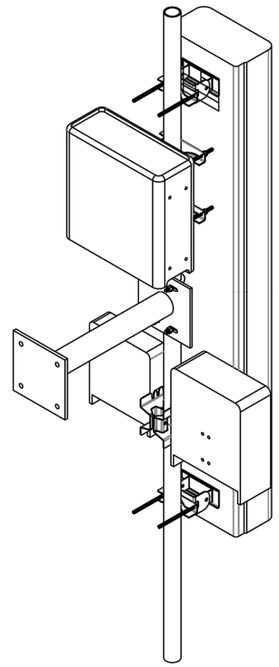
SHEET NUMBER:	C–4
JOB/FILE NUMBER:	1213.001

MC-SA24-B STAND-OFF
SUPPORT
10" X 24-5/8" LONG
ONE 2-3/8" X 108"
PIPE CONFIG.









MC-RM1550-3 "OR" MC-RM1030-3 COMMSCOPE RING MOUNTS
AND MC-SA24-B COMMSCOPE STAND-OFF
W ERICSSON GEAR

SCALE 1:16

BY: J. LAPALME
10/30/2018

dish TECHNOLOGIES

LE
TOP VIEW, MONOPOLE
MC-SA24-B CONFIG.

SIZE	DWG NO	REV
3	N/A	WC01
SCALE: NONE		SHEET 1 OF 1

1 ANTENNA MOUNT SPECIFICATIONS
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group
Foresite Group, Inc.
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10th Floor
Washington, DC 20009
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w | www.fg-inc.net

SEAL:
STATE OF CONNECTICUT
JAMES P. LAPALME
NO. 32948
PROFESSIONAL ENGINEER
1/21/19

PROJECT:
DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

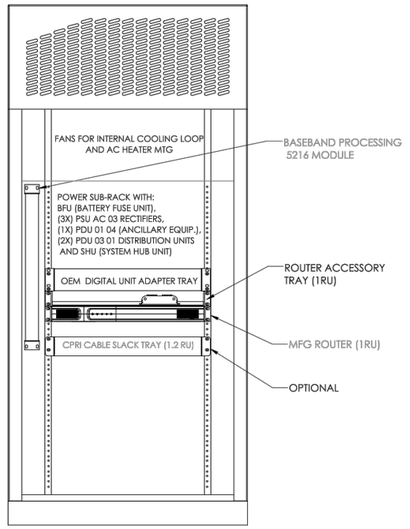
SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

EQUIPMENT DETAILS

SHEET NUMBER:	C-5
JOB/FILE NUMBER:	1213.001



REVISIONS					
ECO NO.	ITEM MASTER	REV	DESCRIPTION	DATE	BY
C45181	219097	01	INITIAL RELEASE. CREATED FROM 217165. UPDATED WITH RBS6101 CABINET WITH BATTERY ENCLOSURE/PLINTH BBU6101.	12-19-18	JL

NOTES: UNLESS OTHERWISE SPECIFIED

1. POWER CABINET WEIGHT IS **180kg** (397 LBS) MAX. INCLUDES STANDARD EQUIPMENT. DISH HAS ALSO ADDED: A MFG ROUTER @ **3.72 kg** (8.2 LBS) AND/OR LTE ROUTER @ **0.58kg** (1.3 LBS) AND 1 ACCESSORY TRAY@ **0.69kg** (3.73lbs).
2. BATTERY ENCLOSURE WEIGHT IS **≤ 93kg** (205 LBS) EXCLUDING THE STORAGE BATTERIES. THE **NSB 40FT HT RED** BATTERY WEIGHT IS **14kg** (30.86 LBS) EACH X 4 (**56kg** / 123.5 LBS TOTAL), EXCLUDING CABLES.
3. POWER EQUIPMENT IN THE CABINET CONVERTS AC POWER INTO **-48V DC** POWER FOR THE BASE STATION.
4. THE POWER SYSTEM CAPACITY RATING IS 10kW MAXIMUM. THE SYSTEM IS OUTFITTED WITH 3X 2500W RECTIFIERS (7.5kW), WHICH 1 RECTIFIER (2.5kW) IS FOR SYSTEM REDUNDANCY.
5. AC INPUT POWER OPTION: PLEASE SEE SEPARATE RBS6101 CABINET DOCUMENT WITH OTHER AC POWER OPTIONS.

AC INPUT	VOLTAGE RANGE V AC	NOMINAL VOLTAGE	RECOMMENDED EQUIP. AC BREAKER	RATED PWR	TYP PWR
2W + PE + N 120/240V AC, 60 Hz	200/100 240/120	115V	60A	10kW	2.5kW

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
X.XXX ± .100 HOLE DIA. ±.075
X.XX ± .25
X.X ± .40 ANGLES ± .5°
X. ± .75

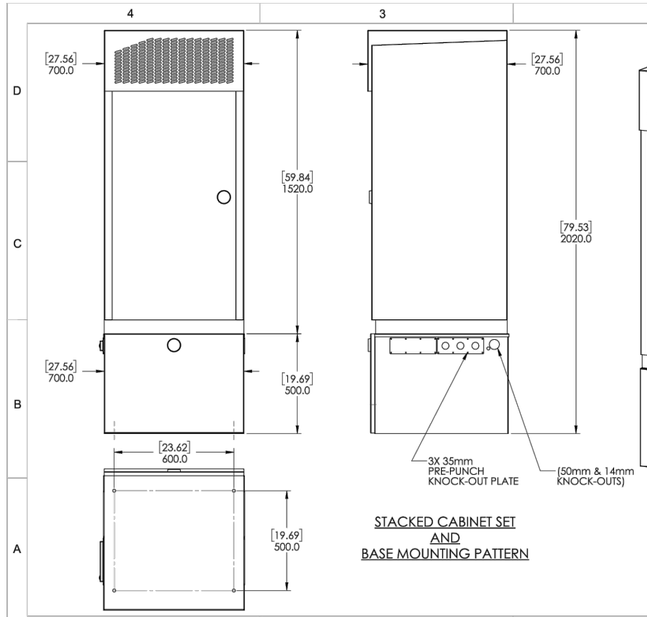
APPROVALS	DATE
DESIGNED	
DRAWN J. LAPALME	05-04-18
CHECKED	

dish TECHNOLOGIES

TITLE: ASSY DWG, ERICSSON RBS6101 CABINET AND BATTERY PLINTH WITH SELECTED DISH MODULES

SIZE	DWG. NO.	REV.
B	219097	01

SCALE NONE SHEET 1 OF 3



STACKED CABINET SET AND BASE MOUNTING PATTERN

dish TECHNOLOGIES

TITLE: ASSY DWG, ERICSSON RBS6101 CABINET AND BATTERY PLINTH WITH SELECTED DISH MODULES

SIZE	DWG. NO.	REV.
B	219097	01

SCALE NONE SHEET 3 OF 3

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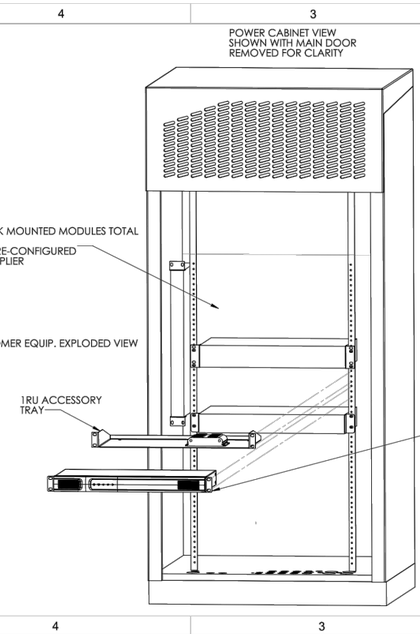

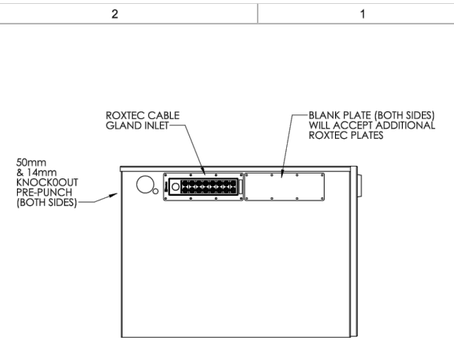

LEFT SIDE OF BBU6101 BATTERY CABINET: WITH ROXTEC CABLE INLET AND BLANK COVER PLATE

dish TECHNOLOGIES

TITLE: ASSY DWG, ERICSSON RBS6101 CABINET AND BATTERY PLINTH WITH SELECTED DISH MODULES

SIZE	DWG. NO.	REV.
B	219097	01

SCALE NONE SHEET 2 OF 3

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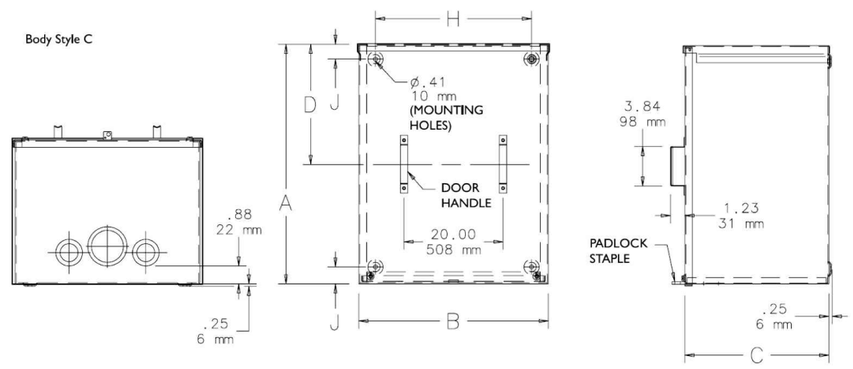
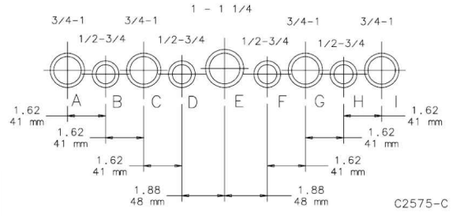
1 ERICSSON POWER CABINET DETAILS

SCALE: N.T.S.

Body Style C





A x B x C in. / mm
24.00 x 24.00 x 8.00
510 x 610 x 203

P/N: A24R248

2 HOFFMAN BOX DETAILS

SCALE: N.T.S.

PREPARED FOR: dish WIRELESS

PROJECT MANAGER: CENTERLINE COMMUNICATIONS

PREPARED BY:

FORESITE group
Foresite Group, Inc.
1875 Connecticut Ave. NW
10th Floor
Washington, DC 20009
o | 202.697.4808
f | 334.887.6024
w | www.fg-inc.net

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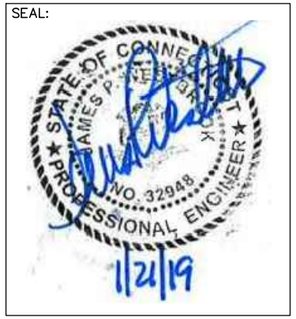

PROJECT:

DISH WIRELESS SITE ID: CT0100002A

TOWER OWNER SITE ID: CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

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PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

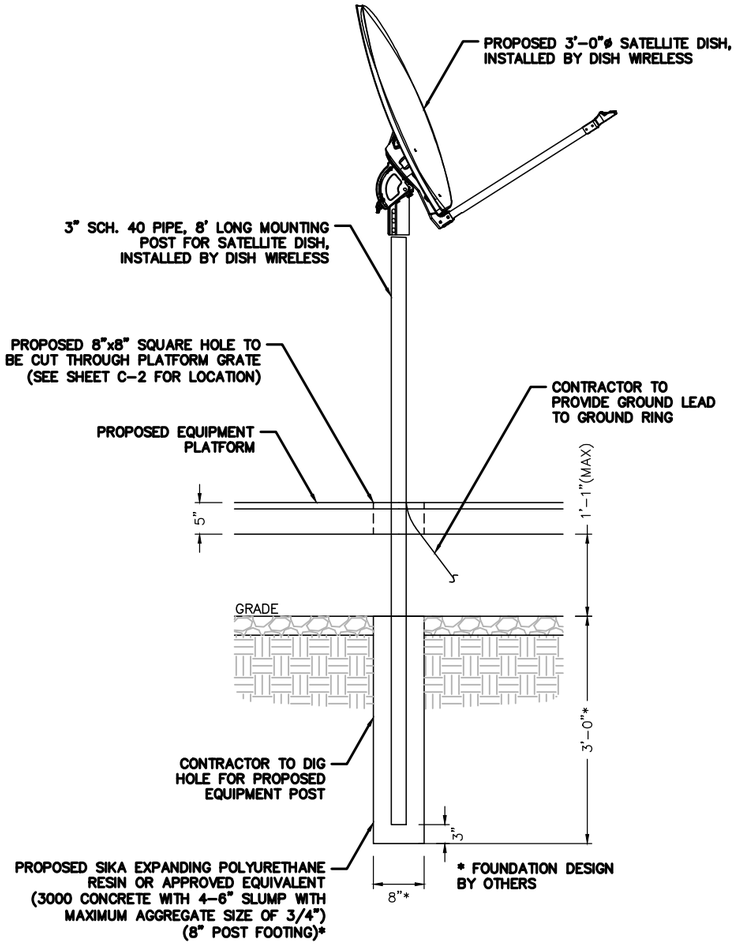
EQUIPMENT DETAILS

SHEET NUMBER:	C-6
JOB/FILE NUMBER:	1213.001

Drawing name: C:\Users\jmarooney\Desktop\Worcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg C-6 Jan 21, 2019 8:10am by: jmarooney

NOTE:

OPENING TO BE REINFORCED TO MAINTAIN FULL CAPACITY OF GRATING. EXPOSED OR ABRADED AREAS SHALL BE COLD-GALVANIZED.



1 EQUIPMENT POST ELEVATION DETAIL
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group

Foresite Group, Inc.
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Washington, DC 20009
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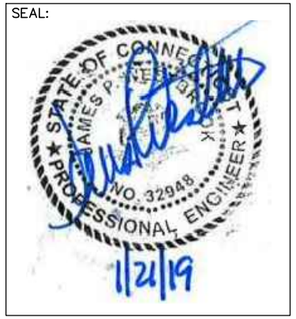
w | www.fg-inc.net

SEAL:



PROJECT:

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

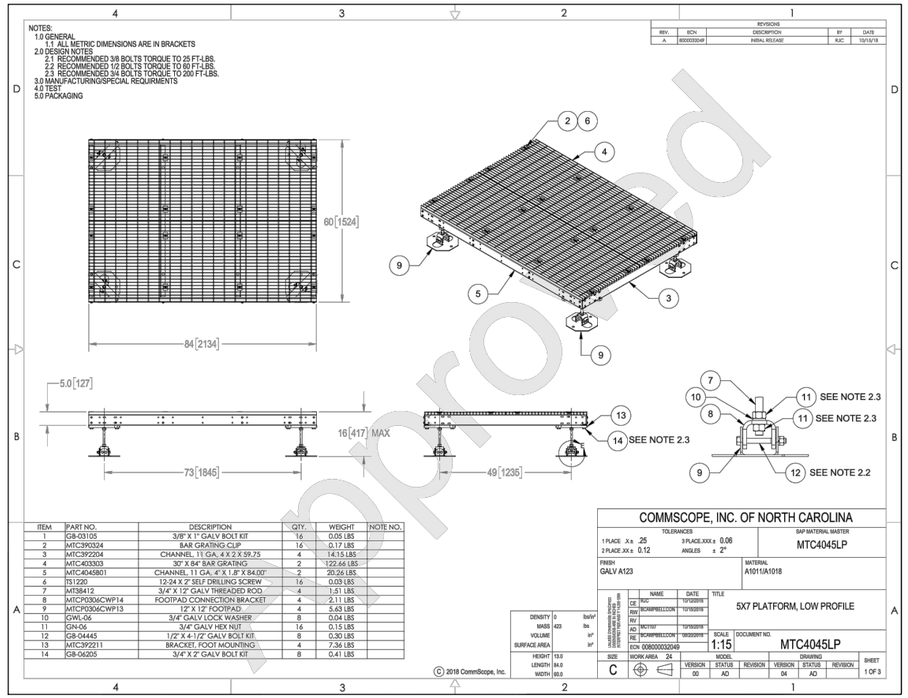
SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

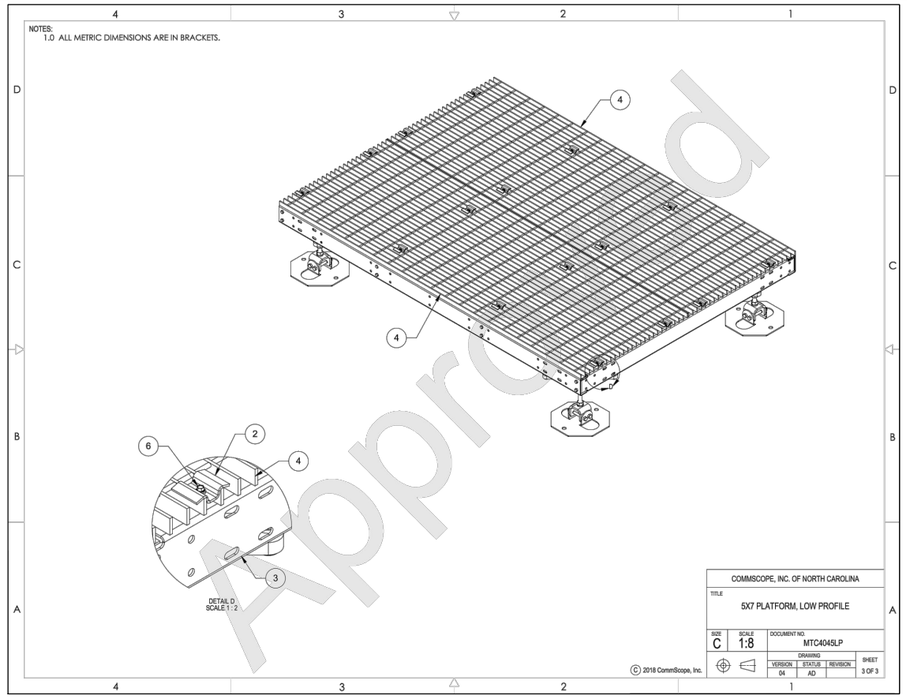
REVISIONS	DATE

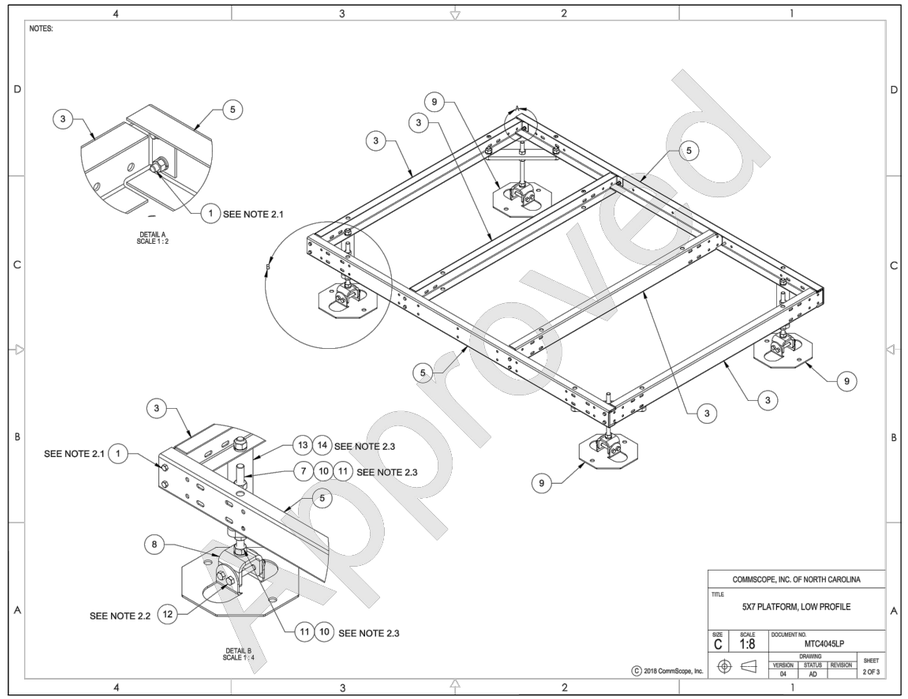
ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

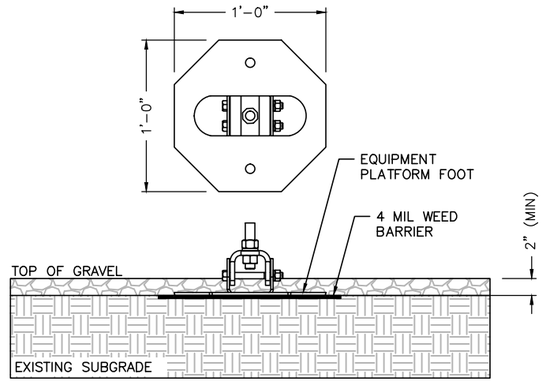
EQUIPMENT DETAILS

SHEET NUMBER:	C-7
JOB/FILE NUMBER:	1213.001









NOTE:

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF GRAVEL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH WIRELESS CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. TO BE INSTALLED AS ONE SHEET 8'–0"x8'–0" UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. SEE SITE NOTES ON SHEET GN–2

EQUIPMENT	DIMENSIONS	WEIGHT FULLY LOADED
CABINET	79.53"Hx27.56"Wx27.56"D	737.43 lbs
DISH ANTENNA	33.75"Hx36.86"Wx40.00"D	30.0 lbs

1 EQUIPMENT PLATFORM DETAILS
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group
Foresite Group, Inc.
1875 Connecticut Ave. NW
10th Floor
Washington, DC 20009
o | 202.697.4808
f | 334.887.6024
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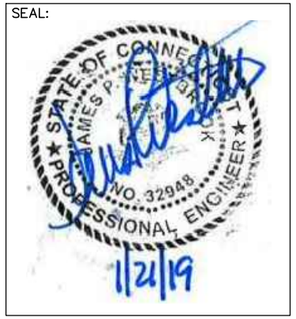
SEAL:


PROJECT:
DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
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SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

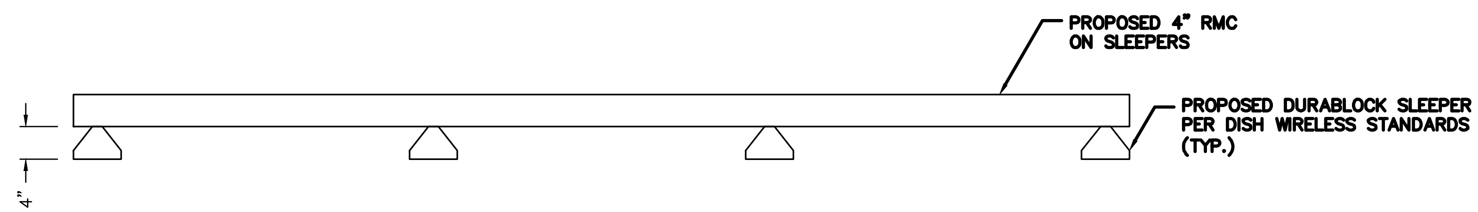
ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

PLATFORM DETAILS

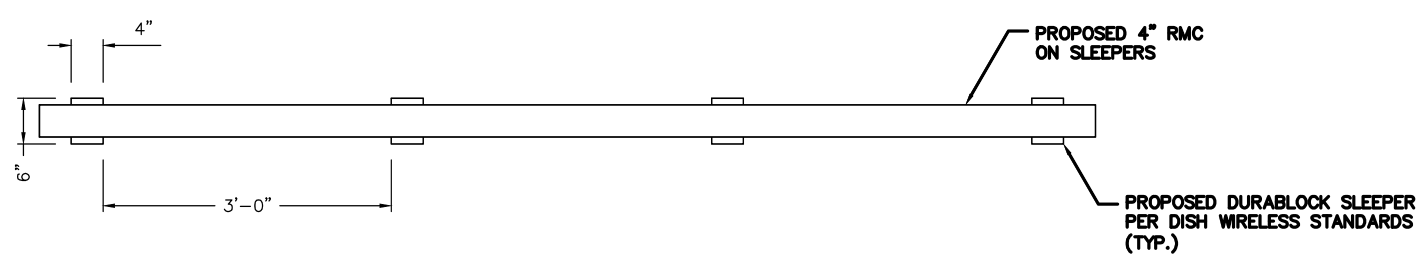
SHEET NUMBER: C–8

JOB/FILE NUMBER: 1213.001

Drawing name: C:\Users\jmarooney\Desktop\Norcross\1213 – Centerline Communications\1213.001 – DISH Wireless\CT0100002A\CT0100002A.dwg C–8 Jan 21, 2019 8:11am by: jmarooney



1 RMC ON PVC SLEEPER (ELEVATION VIEW)
SCALE: N.T.S.



2 RMC ON PVC SLEEPER (PLAN VIEW)
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group

Foresite Group, Inc.
1875 Connecticut Ave. NW
10th Floor
Washington, DC 20009
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f | 334.887.6024
w | www.fg-inc.net

SEAL:

PROJECT:

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR: PERMIT/CONSTRUCTION
PROJECT MANAGER: JCM
DRAWING BY: MDB
DATE: 01/21/19
TITLE:

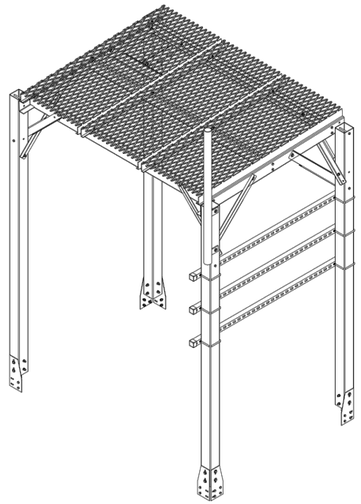
CABLE
SUPPORT DETAILS

SHEET NUMBER: C-9
JOB/FILE NUMBER: 1213.001

Drawing name: C:\Users\jmarooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg C-10 Jan 21, 2019 8:11am by: jmarooney

NOTES:
1.0 GENERAL NOTES
1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS.
2.0 DESIGN NOTES
2.1 TORQUE ALL BOLTS TO 25 FT-LBS.
3.0 MANUFACTURING/SPECIAL REQUIREMENTS
4.0 TEST
5.0 PACKAGING

REVISIONS			
REV.:	DESCRIPTION	DATE	APPROVED
PRR1	INITIAL RELEASE 8000332270	10/30/19	RJC



ITEM	PART NO.	DESCRIPTION	QTY	WEIGHT	NOTE NO.
1	MTC4045CHK	HARDWARE KIT FOR MTC4045C	1		
2	MTC4045CSB	STEEL BUNDLE FOR MTC4045C	1		

COMMSCOPE, INC. OF NORTH CAROLINA

TOLERANCES: 0 PLACE X ± .25; 1 PLACE X ± 0.12; 2 PLACE .XX ± 0.06; ANGLES ± 2°
SAP MATERIAL MASTER: MTC4045GC
FINISH: GALV A123
MATERIAL: A1011/A1018, A500

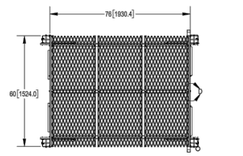
	NAME	DATE
CE	RJC	10/30/19
RM		
RV		
AO		
RE		

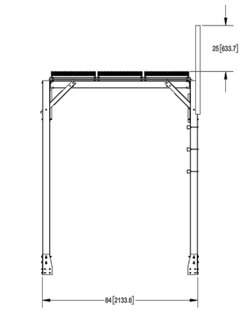
TITLE: ICE CANOPY 5X7 PLATFORM

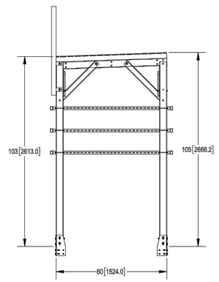
DENSITY 0.30 lbs/in³
MASS 560.34 lbs
VOLUME 1867.29 in³
SURFACE AREA in²
HEIGHT
LENGTH
WIDTH

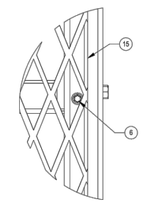
ECN 0|8000332270
SCALE 1:12
DOCUMENT NO. MTC4045GC
SIZE C
WORK AREA 24
MODEL: VERSION 00, STATUS IW, REVISION
DRAWING: VERSION 00, STATUS IW, REVISION
SHEET 1 OF 4

NOTES:







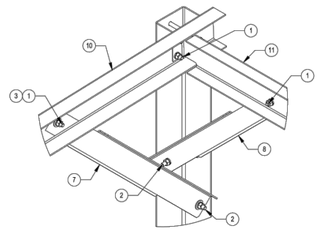


DETAIL D
SCALE 1 : 2

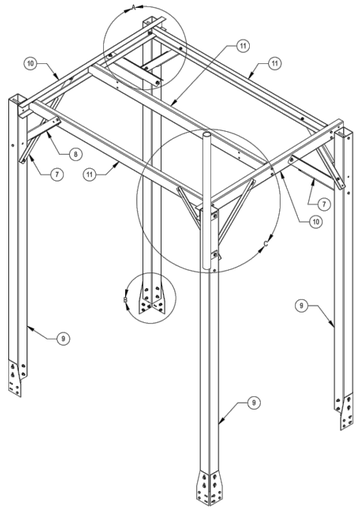
ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	GB-03105	3/8" X 1" GALV BOLT KIT	44	0.05 LBS	
2	GB-03505	3/8" X 5" GALV BOLT KIT	29	0.17 LBS	
3	GWF-03	3/8" GALV FLAT WASHER	30	0.01 LBS	
4	MTC997301	UNISTRUT 66"	3	10.30 LBS	
5	MTC371084	3/8" X 4" X 5" SQUARE U-BOLT	6	0.80 LBS	
6	MTC371531	1/4-14X7/8 SELF DRILLING HEX HEAD SCREW	18	0.02 LBS	
7	MTC3813C14	CANOPY BRACE, 11 GA, 30°	4	4.18 LBS	
8	MTC992212	CANOPY BRACE, 11 GA, 30°	4	2.75 LBS	
9	MTC4045C01	POST, 4 X 4 VERTICAL	4	51.35 LBS	
10	MTC4045C02	END CHANNEL CANOPY	2	14.89 LBS	
11	MTC4045C03	CHANNEL, LONG CANOPY	3	16.71 LBS	
12	MTC4045C04	PLATE, 4" CANOPY LEG SUPPORT	8	1.44 LBS	
13	MTC4045PM	MAST, PIPE	1	15.34 LBS	
14	PTCR01	END CAP	6	0.05 LBS	
15	MTC9232.05	SAFETY GRATING 24" X 5'	3	55.50 LBS	

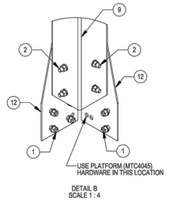
COMMSCOPE, INC. OF NORTH CAROLINA
TITLE: ICE CANOPY 5X7 PLATFORM
SIZE C; SCALE 1:22; DOCUMENT NO. MTC4045GC
DRAWING: VERSION 00, STATUS IW, REVISION
SHEET 2 OF 4

NOTES:

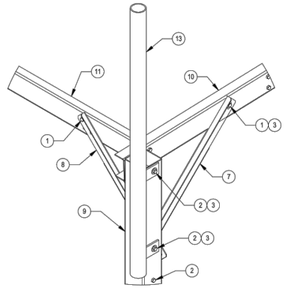


DETAIL A
SCALE 1 : 4





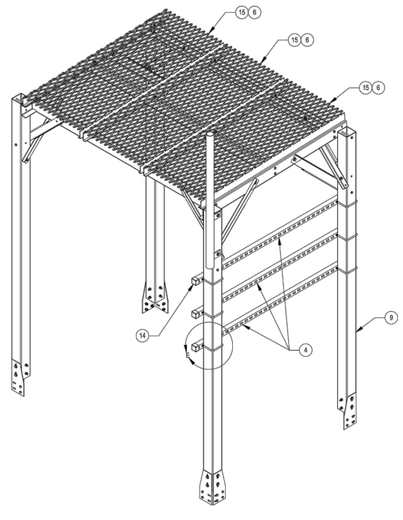
DETAIL B
SCALE 1 : 4

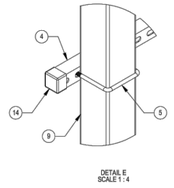


DETAIL C
SCALE 1 : 6

COMMSCOPE, INC. OF NORTH CAROLINA
TITLE: ICE CANOPY 5X7 PLATFORM
SIZE C; SCALE 1:12; DOCUMENT NO. MTC4045GC
DRAWING: VERSION 00, STATUS IW, REVISION
SHEET 3 OF 4

NOTES:





DETAIL E
SCALE 1 : 4

COMMSCOPE, INC. OF NORTH CAROLINA
TITLE: ICE CANOPY 5X7 PLATFORM
SIZE C; SCALE 1:12; DOCUMENT NO. MTC4045GC
DRAWING: VERSION 00, STATUS IW, REVISION
SHEET 4 OF 4

1 PLATFORM CANOPY DETAILS
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group

Foresite Group, Inc.
1875 Connecticut Ave. NW
10th Floor
Washington, DC 20009
o | 202.697.4808
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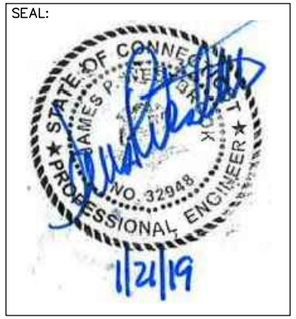
SEAL:



PROJECT:

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

PLATFORM CANOPY DETAILS

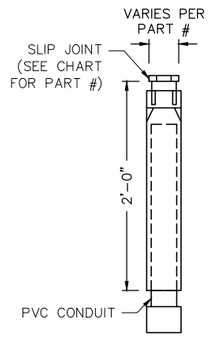
SHEET NUMBER:	C-10
JOB/FILE NUMBER:	1213.001

UTILITY NOTES:

1. CONTRACTOR TO COORDINATE SERVICE ROUTING AND CONNECTION WITH LOCAL POWER COMPANY (IF NEW COMMERCIAL SERVICE IS REQUIRED) AND TELEPHONE COMPANY.
2. CONTRACTOR SHALL FOLLOW LOCAL UTILITY COMPANY STANDARDS WHEN CONNECTING TO UTILITIES, PROVIDING REQUIRED CLEARANCES AND ACCESS PER NEC. LOCAL AND STATE BUILDING CODES SHALL GOVERN IN CASES WHERE UTILITY CO. STANDARDS DIFFER.
3. CONTRACTOR TO PROVIDE SPARE 3" TELCO CONDUIT WITH PULL-STRING FOR POTENTIAL FUTURE FIBER APPLICATIONS.

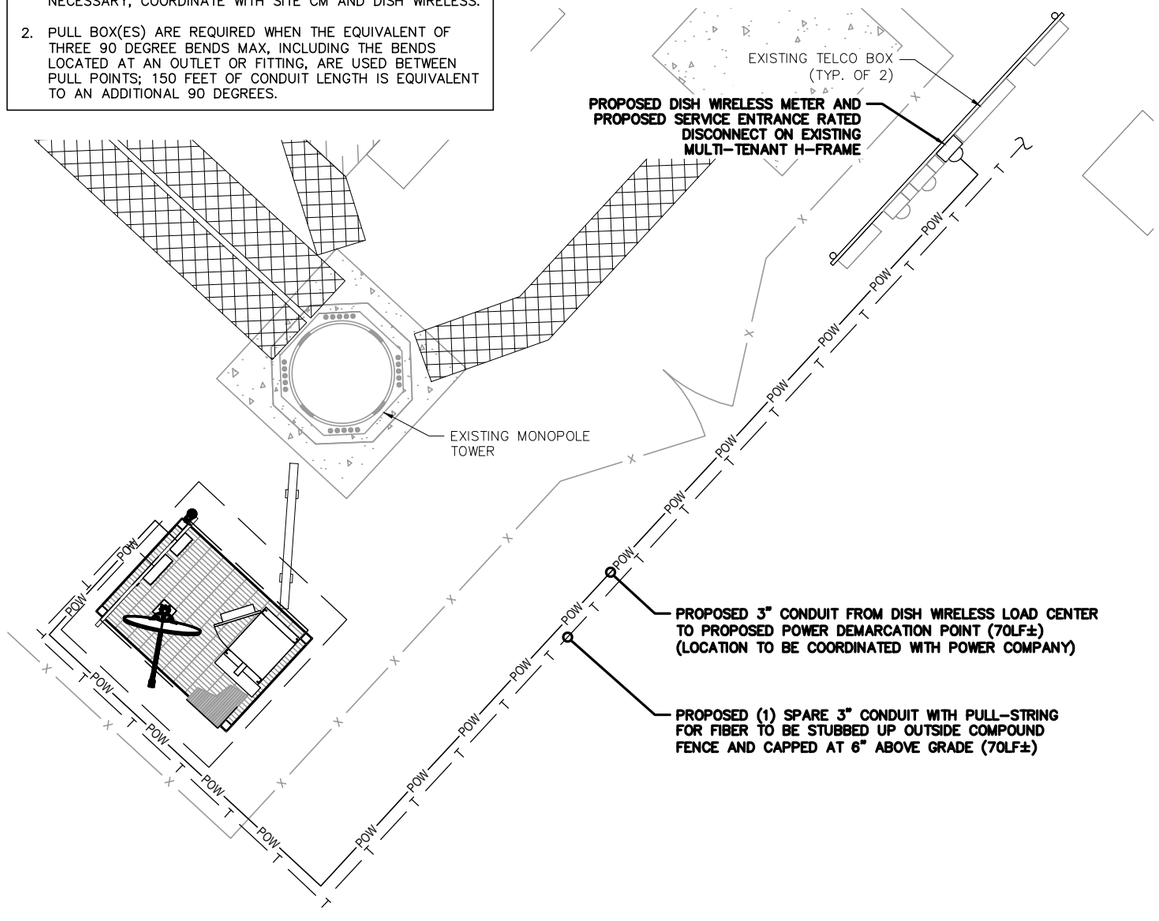
NOTES:

1. CONTRACTOR SHALL ARRANGE CONDUITS, WIRING, EQUIPMENT AND OTHER WORK AS SHOWN ON THIS PLAN AND SHEET E-2, PROVIDING REQUIRED CLEARANCES AND ACCESS PER NEC. WHERE FIELD ADJUSTMENTS ARE NECESSARY, COORDINATE WITH SITE CM AND DISH WIRELESS.
2. PULL BOX(ES) ARE REQUIRED WHEN THE EQUIVALENT OF THREE 90 DEGREE BENDS MAX, INCLUDING THE BENDS LOCATED AT AN OUTLET OR FITTING, ARE USED BETWEEN PULL POINTS; 150 FEET OF CONDUIT LENGTH IS EQUIVALENT TO AN ADDITIONAL 90 DEGREES.



CARLON EXPANSION FITTINGS

COUPLING END PART #	MALE TERMINAL ADAPTER END PART #	SIZE	STD. CTN. QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"



TRUE NORTH

1 COMPOUND UTILITY PLAN

24x36 SHEET SCALE: 1"= 1.5'
11x17 SHEET SCALE: 1"= 3'

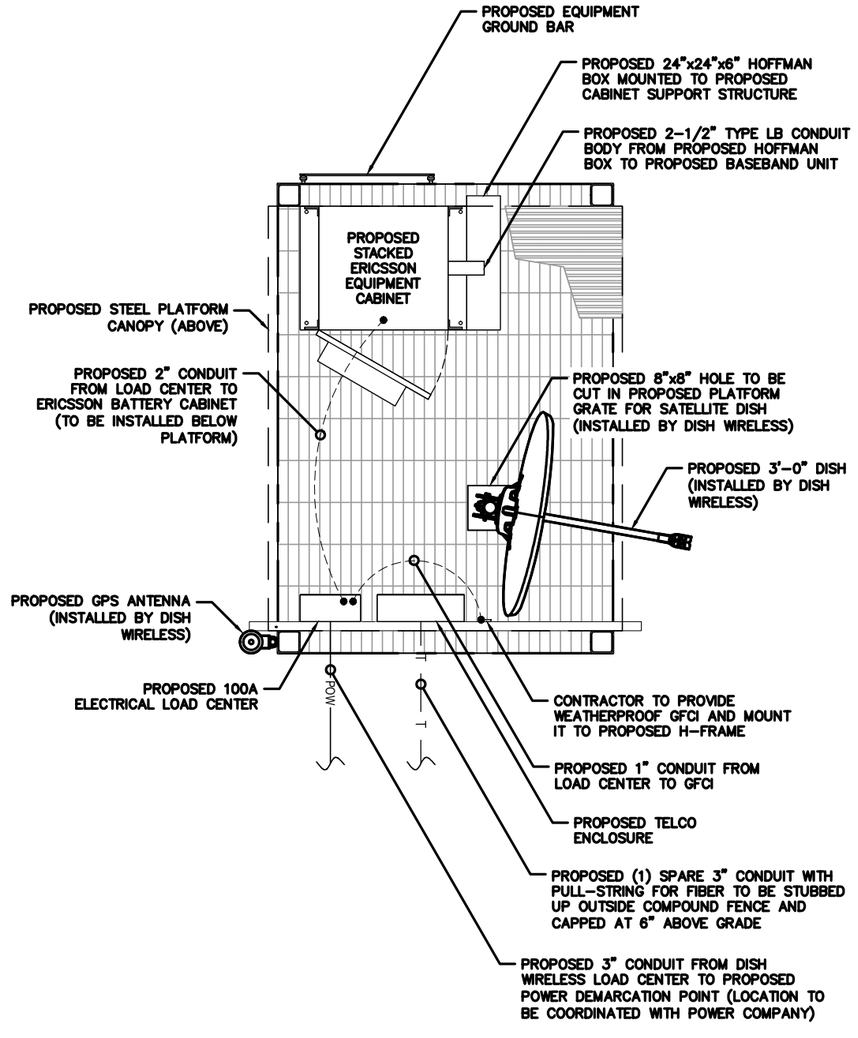
0 0.75' 1.5' 3'

NOTES:

1. UTILITY ROUTING SHOWN IS SCHEMATIC. THE CONTRACTOR SHALL VERIFY EQUIPMENT LOCATION AND UTILITY ROUTING PRIOR TO INSTALLATION.

INSTALLER NOTE:

SCHEMATIC LAYOUT ONLY. REFER TO SHEET C-2 FOR EXACT EQUIPMENT LAYOUT.



2 EQUIPMENT PLATFORM UTILITY PLAN (SCHEMATIC)

SCALE: N.T.S.

PREPARED FOR:

dish WIRELESS

PROJECT MANAGER:

CENTERLINE COMMUNICATIONS

PREPARED BY:

FORESITE group

Foresite Group, Inc.
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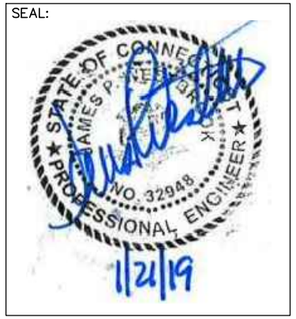
SEAL:



PROJECT:

DISH WIRELESS SITE ID: CT0100002A

TOWER OWNER SITE ID: CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

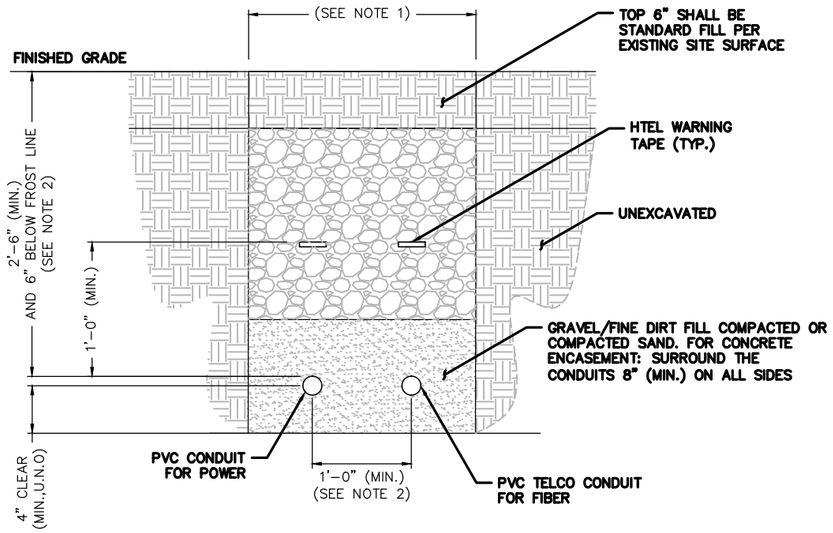
UTILITY PLANS

SHEET NUMBER:	E-1
JOB/FILE NUMBER:	1213.001

Drawing name: C:\Users\jmrooney\Desktop\Norcross\1213 - Centerline Communications\1213.001 - DISH Wireless\CT0100002A\CT0100002A.dwg E-1 Jan 21, 2019 8:11am by: jmrooney

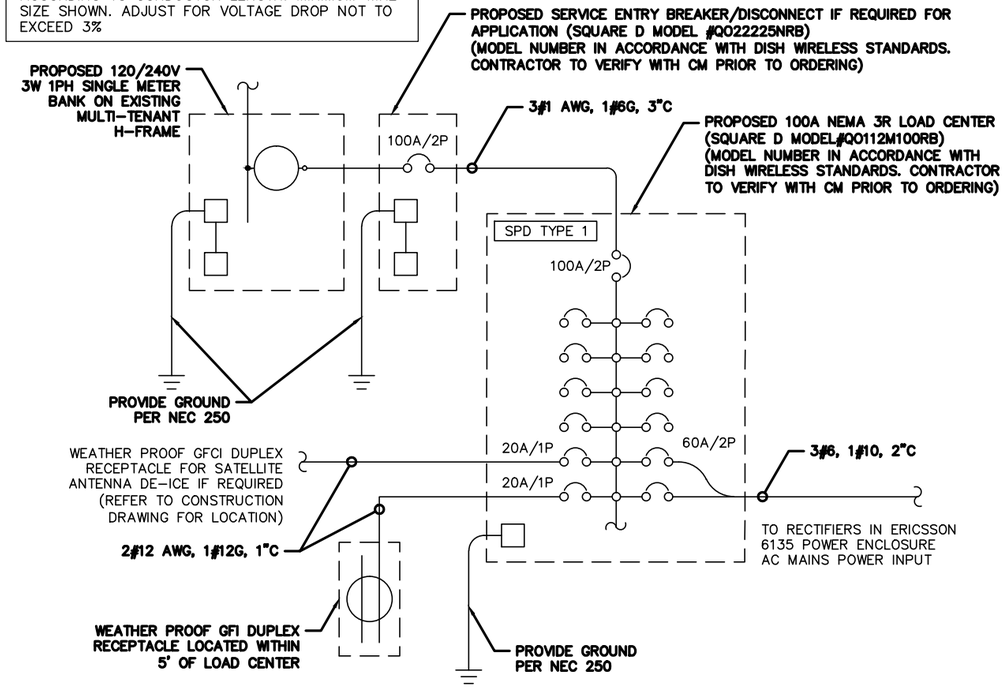
CONDUIT TRENCH NOTE:

1. WIDTH OF TRENCH AS REQUIRED BY UTILITY COMPANY OR PER QUANTITY OF CONDUITS AND LOCAL CODE REQUIREMENTS.
2. VERIFY DISTANCE PER LOCAL CODE, UTILITY COMPANY, AND CLIENT REQUIREMENTS.



1 CONDUIT TRENCH DETAIL
SCALE: N.T.S.

NOTE:
WIRE SIZE RECOMMENDATIONS ONLY MAY VARY ACCORDING TO CONDUCTOR LENGTH. MINIMUM WIRE SIZE SHOWN. ADJUST FOR VOLTAGE DROP NOT TO EXCEED 3%



2 ELECTRICAL ONE-LINE DIAGRAM
SCALE: N.T.S.

PROPOSED 100A, 120/240V POWER PANEL

LOAD SERVED	VOLT AMPERES (WATTS) L1	VOLT AMPERES (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPERES (WATTS) L1	VOLT AMPERES (WATTS) L2	LOAD SERVED
RECTIFIER	2000		60	1	A	2	20	180		GFCI
		2000		3	B	4	20		180	GFCI
SPARE	–		–	5	A	6	–	–		SPARE
SPARE		–	–	7	B	8	–		–	SPARE
SPARE	–		–	9	A	10	–	–		SPARE
SPARE		–	–	11	B	12	–		–	SPARE
VOLT AMPS	2000	2000						180	180	VOLT AMPS

L1 VOLTS AMPERES	2180	2180	L2 VOLTS AMPERES
L1 AMPS	18.2	18.2	L2 AMPS
	18.2		MAX AMPS
	22.8		MAX AMPS x125%

3 ELECTRICAL PANEL DIAGRAM
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group
Foresite Group, Inc.
1875 Connecticut Ave. NW 10th Floor
Washington, DC 20009
o | 202.697.4808
f | 334.887.6024
w | www.fg-inc.net

SEAL:
STATE OF CONNECTICUT
JAMES P. [illegible]
NO. 32948
PROFESSIONAL ENGINEER
1/21/19

PROJECT:
DISH WIRELESS SITE ID: CT0100002A

TOWER OWNER SITE ID: CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

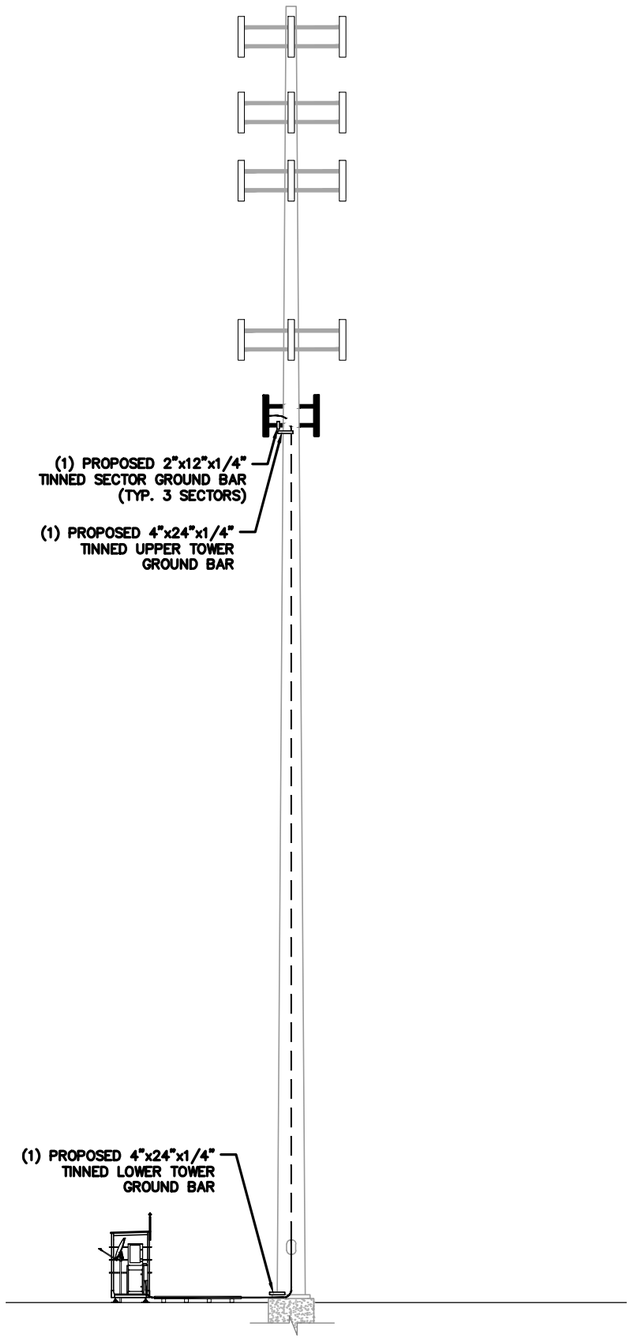
REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

ELECTRICAL DETAILS

SHEET NUMBER: E-2

JOB/FILE NUMBER: 1213.001



1 TOWER ELEVATION GROUNDING
SCALE: N.T.S.

INSTALLER NOTE:

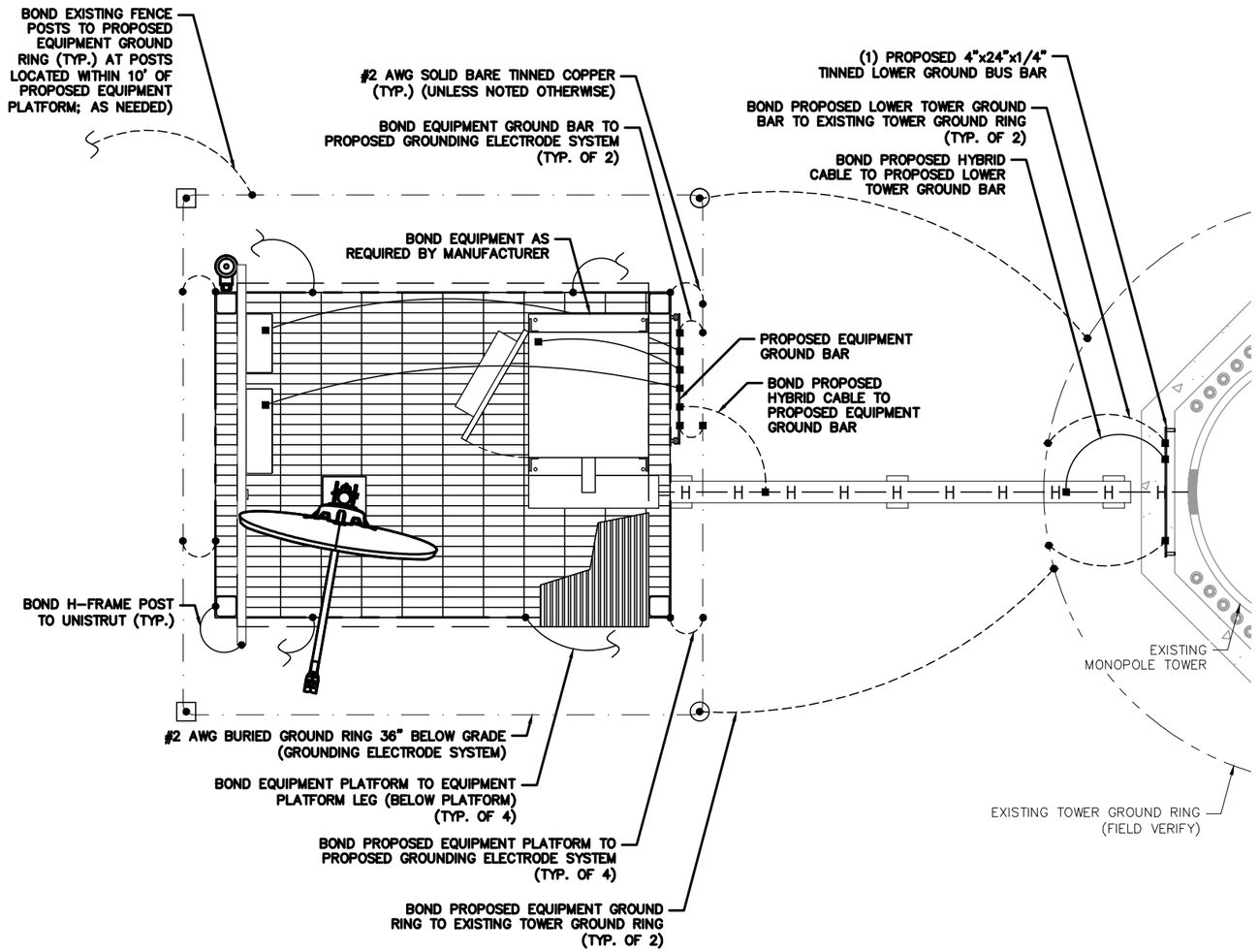
SCHEMATIC LAYOUT ONLY. REFER TO SHEETS C–1 AND C–2 FOR EXACT EQUIPMENT LAYOUT, SIZES AND LOCATIONS OF ICE BRIDGE AND ANTENNA SUPPORT STRUCTURE.

TOWER GROUNDING NOTE:

ALL CONNECTIONS TO BE MECHANICAL ON TOWER. EXOTHERMIC WELDS ARE ONLY ALLOWED AT GRADE.

LEGEND

- GROUNDING CONDUCTOR – ABOVE GRADE
- GROUND CONDUCTOR – BELOW GRADE
- GROUND ELECTRODE SYSTEM
- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND ROD
- GROUND INSPECTION/ TEST WELL



2 TYPICAL GROUNDING PLAN (SCHEMATIC)
SCALE: N.T.S.

PREPARED FOR:
dish WIRELESS

PROJECT MANAGER:
CENTERLINE COMMUNICATIONS

PREPARED BY:
FORESITE group

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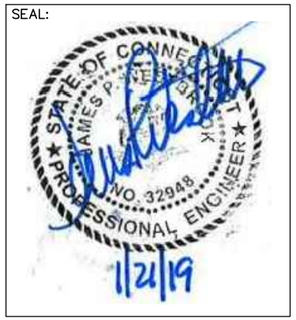


PROJECT:

DISH WIRELESS SITE ID:
CT0100002A

TOWER OWNER SITE ID:
CT13071

SITE ADDRESS:
(41.350750, -73.049249)
1 DEERFIELD RD
ANSONIA, CT 06401

REVISIONS	DATE

ISSUED FOR:	PERMIT/CONSTRUCTION
PROJECT MANAGER:	JCM
DRAWING BY:	MDB
DATE:	01/21/19
TITLE:	

GROUNDING PLAN

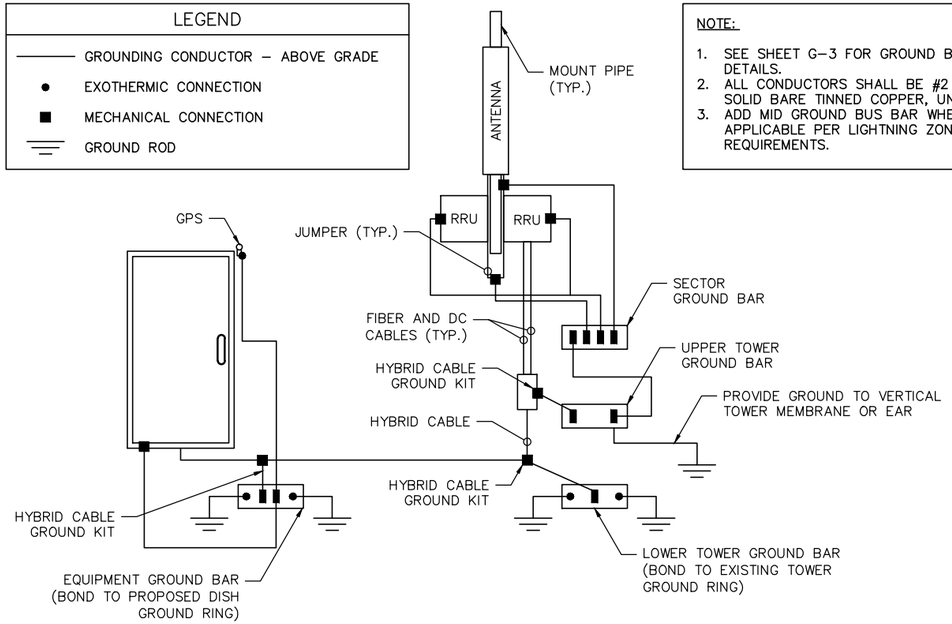
SHEET NUMBER:	G–1
JOB/FILE NUMBER:	1213.001

LEGEND

- GROUNDING CONDUCTOR – ABOVE GRADE
- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND ROD

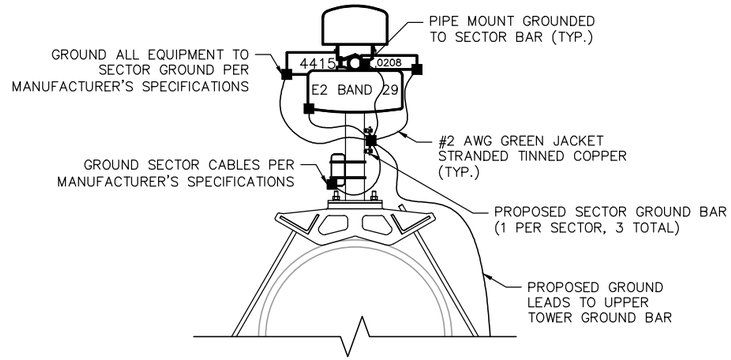
NOTE:

1. SEE SHEET G–3 FOR GROUND BAR DETAILS.
2. ALL CONDUCTORS SHALL BE #2 AWG SOLID BARE TINNED COPPER, UNO.
3. ADD MID GROUND BUS BAR WHERE APPLICABLE PER LIGHTNING ZONE REQUIREMENTS.



1 GROUNDING RISER DIAGRAM (TYPICAL PER SECTOR)

SCALE: N.T.S.

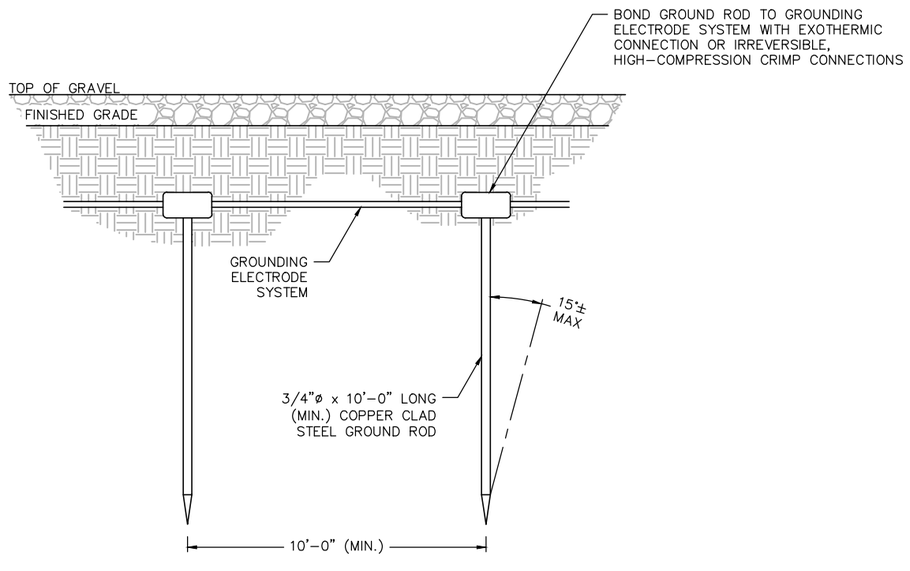


NOTE:

GROUNDING SHOWN FOR (1) SECTOR ONLY.
GROUNDING REQUIRED FOR ALL (3) SECTORS.

2 SECTOR GROUNDING DETAIL

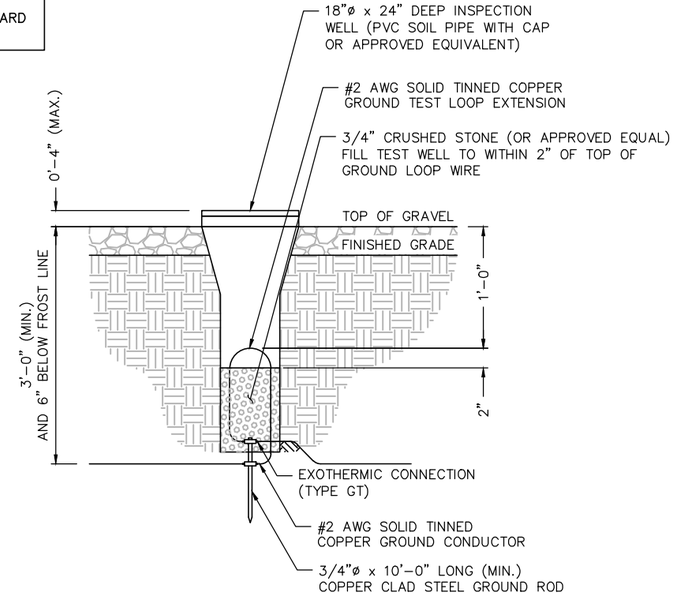
SCALE: N.T.S.



3 GROUND ROD DETAIL

SCALE: N.T.S.

NOTE:
CONTRACTOR TO INSTALL TRIP HAZARD SAFETY TAPE AS NECESSARY



4 TEST WELL DETAIL

SCALE: N.T.S.

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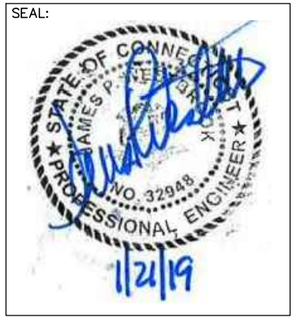

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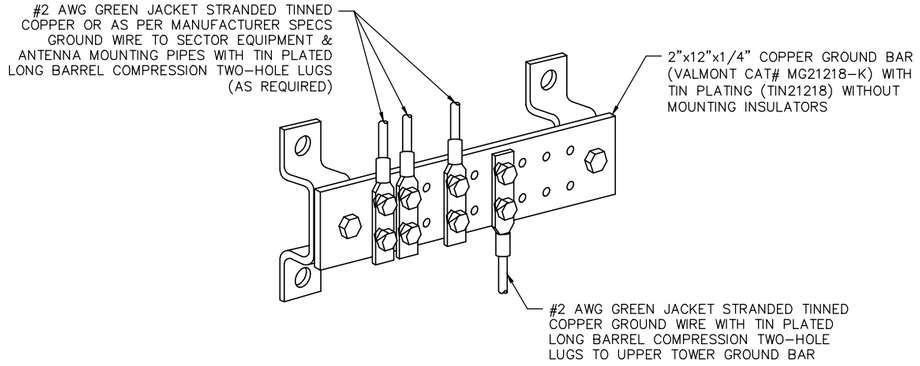
GROUNDING NOTES & DETAILS

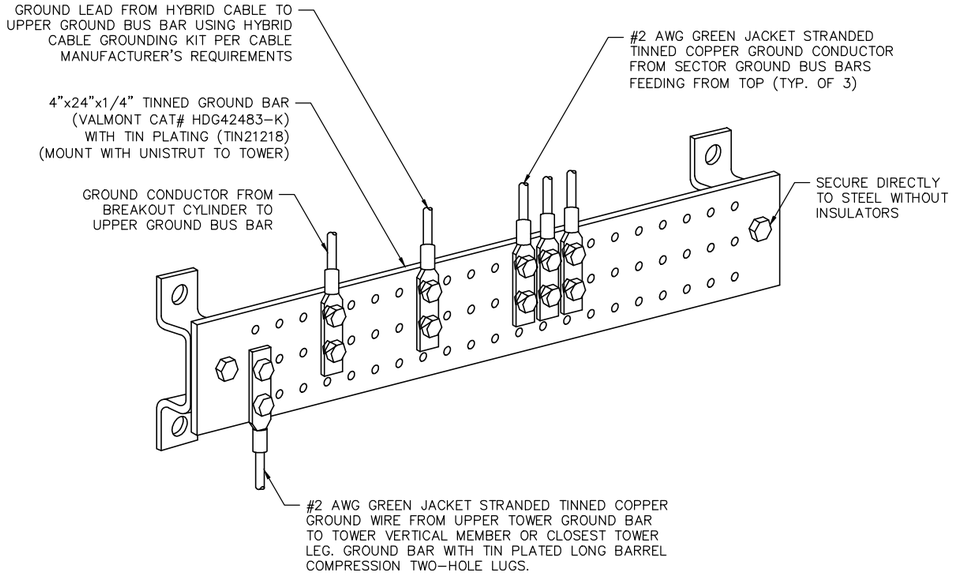
SHEET NUMBER:	G–2
JOB/FILE NUMBER:	1213.001

NOTES:

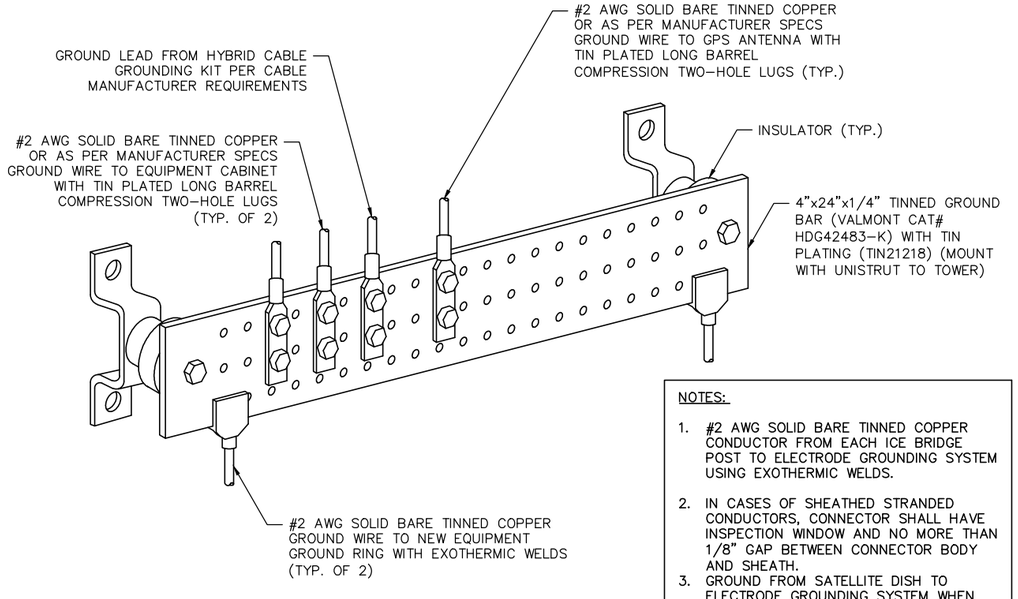
1. ALL HARDWARE SHALL BE 18–8 STAINLESS STEEL INCLUDING BELLEVILLE WASHERS, COAT ALL SURFACES WITH KOPR–SHIELD BEFORE MATING.
2. IF BONDING TO STEEL: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACE WITH KOPR–SHIELD.
3. USE A THIN COAT OF NO–OX OR UL LISTED ANTI OX COMPOUND OR EQUIVALENT AT CONNECTIONS.
4. DIMPLE OR MECHANICAL CRIMP LUGS WILL NOT BE PERMITTED.



1 SECTOR GROUND BAR DETAIL
SCALE: N.T.S.



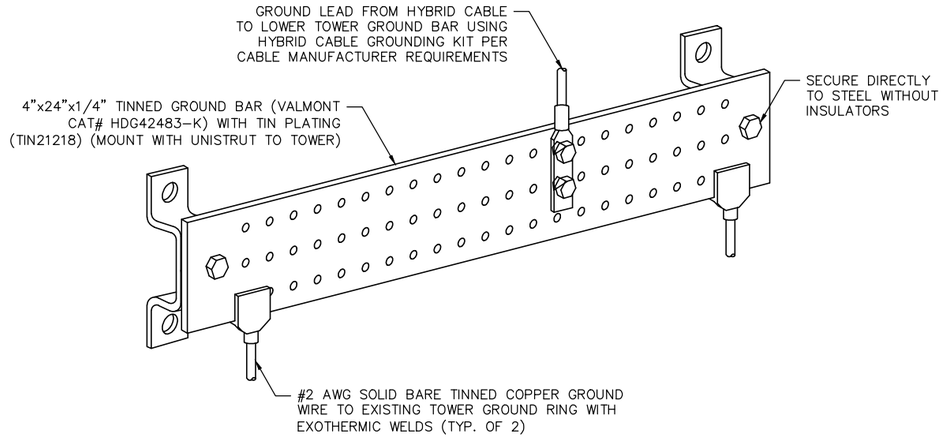
2 UPPER TOWER GROUND BAR DETAIL
SCALE: N.T.S.



NOTES:

1. #2 AWG SOLID BARE TINNED COPPER CONDUCTOR FROM EACH ICE BRIDGE POST TO ELECTRODE GROUNDING SYSTEM USING EXOTHERMIC WELDS.
2. IN CASES OF SHEATHED STRANDED CONDUCTORS, CONNECTOR SHALL HAVE INSPECTION WINDOW AND NO MORE THAN 1/8" GAP BETWEEN CONNECTOR BODY AND SHEATH.
3. GROUND FROM SATELLITE DISH TO ELECTRODE GROUNDING SYSTEM WHEN APPLICABLE

3 EQUIPMENT GROUND BAR DETAIL
SCALE: N.T.S.



4 LOWER TOWER GROUND BAR DETAIL
SCALE: N.T.S.

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SEAL:
STATE OF CONNECTICUT
JAMES P. MORONEY
NO. 32948
PROFESSIONAL ENGINEER
1/21/19

PROJECT:

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GROUNDING NOTES & DETAILS

SHEET NUMBER:	G–3
JOB/FILE NUMBER:	1213.001

Drawing name: C:\Users\jmarooney\Desktop\Worcross\1213 – Centerline Communications\1213.001 – DISH Wireless\CT0100002A\CT0100002A.dwg G–3 Jan 21, 2019 8:11am by: jmarooney

NOTE:

1. CONTRACTOR TO REFER TO AND VALIDATE THE LATEST RFDS PRIOR TO CONSTRUCTION.

RF Design Data Sheet

Site Information			
State	CT	Site ID	CT0100002A
Site Name	CT13071-A	Tower Type	Monopole
Address	1 Deerfield Rd	City	Ansonia
Latitude (degrees)	41.35075	Zip	06401
Longitude (degrees)	-73.04924967	Tower Owner	SBA
RFDS Revision	0.0	Issue Date	12/10/2018
RF Engineer	Ajit Prashar		ajit.p.prashar@ericsson.com
Design Information			
Technology	**NB-IoT**		
Vendor	**Ericsson**		
Site Configuration	**4415-2 No Band 29**		
Site Type - Equipment - Band	**AWS-4**		
Sector Information (Expected Configuration)	**Sector-1 (Alpha)**	**Sector-2 (Beta)**	**Sector-3 (Gamma)**
LTE Sector Number	CT0100002A_1	CT0100002A_2	CT0100002A_3
Antenna Center Line (ft)	117	117	117
Antenna Model Number	ODI2-065R18K-GQ	ODI2-065R18K-GQ	ODI2-065R18K-GQ
Number of Antennas / Sector	1	1	1
Antenna Dimensions (LxWxD) (In)	53.5 x 9.8 x 2.4	53.5 x 9.8 x 2.4	53.5 x 9.8 x 2.4
Antenna Weight (lbs.)	25	25	25
Antenna Manufacturer	Comba	Comba	Comba
Horizontal Beamwidth	64	64	64
Gain (dBd)	17.8	17.8	17.8
Azimuth (deg) (Relative to True North)	0	120	240
Antenna Downtilt (Mechanical)	0	0	0
Antenna Downtilt 2100 (Electrical)	2	2	2
Antenna Downtilt 700 (Electrical)	2	2	2
Radio Model (Band 70)	Radio 4415	Radio 4415	-
Radio Quantity (Band 70)	1	1	-
Radio Model (H-Block)	Radio 0208	Radio 0208	Radio 0208
Radio Quantity (H-Block)	1	1	1
Radio Model (700 band)	-	-	-
Radio Quantity (700 band)	-	-	-
Number of Feeders / Sector	4	4	4
Feeder Diameter (Nominal) (in)	1/2	1/2	1/2
Feeder Length (m)	3	3	3
700 MHz Radio location	-	-	-
700 MHz Coax Cable Type (in)	-	-	-
TX/RX Diplexer Model			
TX/RX Diplexer Qty			
TX/RX Diplexer Dim (inch) / Wt (lbs)			

Description of Cabling Configuration Changes / Additions	
Mandatory : Append Sketches indicating Locations of all new Antennas, Cabling, Duplexor, Diplexors (if applicable), TMA's etc....	
Sector Alpha	
Sector Beta	
Sector Gamma	
General Comments	

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RF DATA SHEET

SHEET NUMBER: RF-1

JOB/FILE NUMBER: 1213.001

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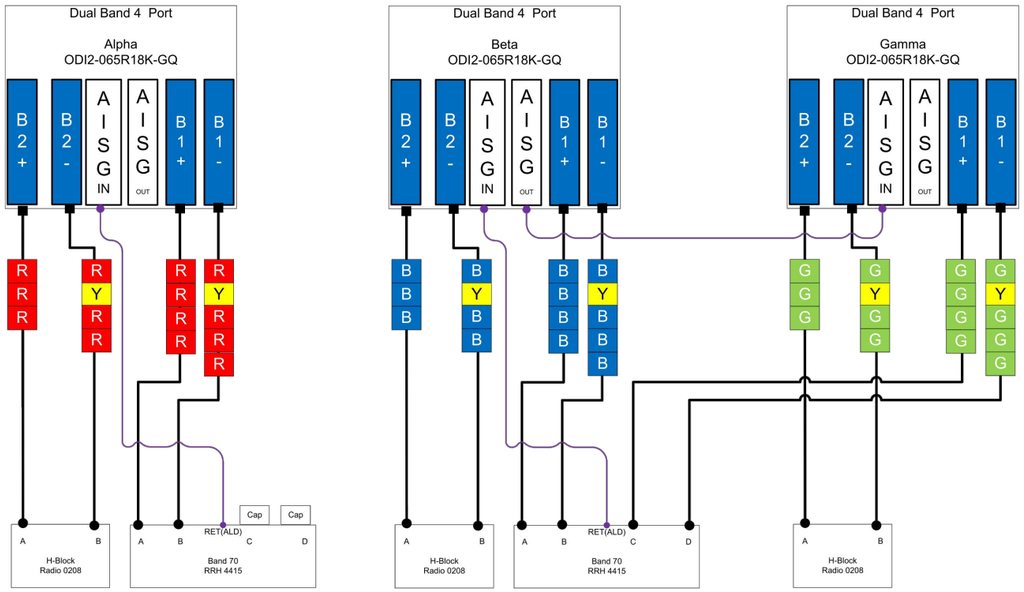
NOTE:

1. CONTRACTOR TO REFER TO AND VALIDATE THE LATEST RFDS PRIOR TO CONSTRUCTION.

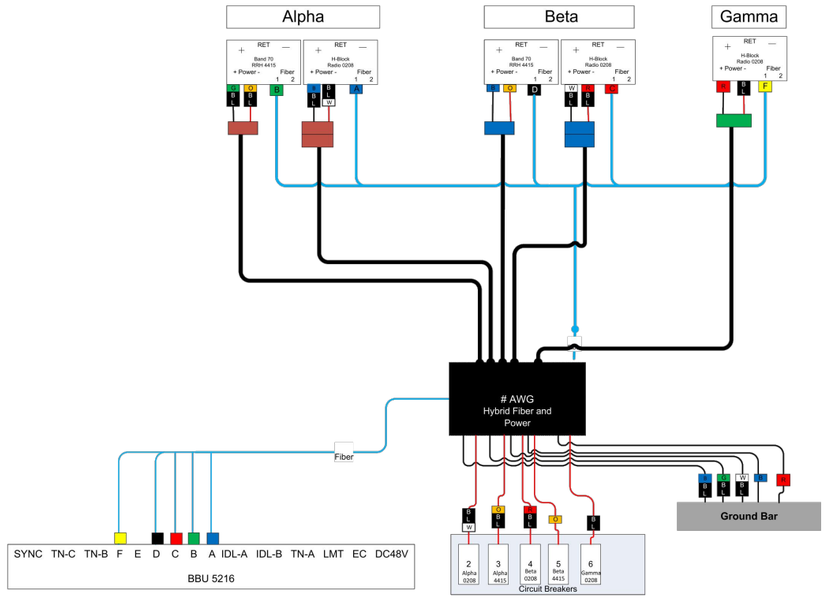
Ericsson Antenna to RRU Diagram



Ericsson 2-2-1 Configuration Plumbing diagram

Note: This Plumbing Diagram does not represent the position of the RRU or Antenna on the mount. That is stipulated in the Construction Drawings. If there is any question please address your Construction Manager before proceeding.

Ericsson LTE BBU TO RRU Fiber and Power Diagram (Rosenberger Hybrid cable is used when length ≤ 90m)



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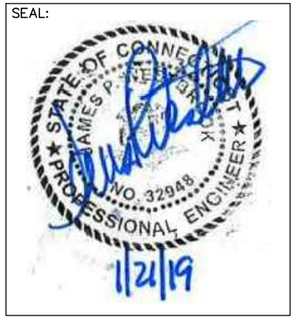

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TITLE:	

PLUMBING DIAGRAM

SHEET NUMBER: RF-2

JOB/FILE NUMBER: 1213.001

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