CENTERLINE COMMUNICATIONS

dish WIRELESS

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

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April 3, 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 52 Stadley Rough Road, Danbury, CT
DISH site number: CT0100004B (SBA: CT13549-S)

Dear Chairman Murphy and Members of the Council:

Dish proposes to share an existing telecommunications tower located at 52 Stadley Rough Road in Danbury, CT (the facility). The subject parcel is identified by the City of Danbury as Map K7, Block 19. The property is owned by Christ The Shepherd Church PCA. The tower is owned by SBA Communications. The property is roughly 4.85± acres and accommodates one existing church building plus the monopole tower within its 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 Danbury: avoiding the need for an additional tower in Danbury, 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 Fairfield

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 139' monopole tower located at 52 Stadley Rough Road in Danbury. Site coordinates (NAD83) are N41° 25' 54.17" and W73° 25' 54.9" (or 41.4331, -73.4319). 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 Hudson Design Group LLC dated March 25, 2019 and enclosed herewith.

Dish intends to install three (3) ODI2-065R18K-GQ Comba panel antennas and five (5) Ericsson RRUs on an antenna standoff with ring mount, as shown in the Construction Drawing, to be attached to the monopole tower at the 87' mount level. Dish will also install one (1) 7/8" 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. The new ground conduits will also be installed beneath an ice bridge and 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 February 26, 2019 that shows that the existing tower can support Dish's proposed equipment. Please disregard the larger and heavier three (3) sector frames mounting system initially noted herein and refer instead to the Construction Drawings, which depict the final, smaller and lighter collar with short standoffs that is being proposed hereby.

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 April 3, 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 Fairfield County. Dish will enter into an agreement with the owner of this facility, SBA Communications, 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 Danbury 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 April 1, 2019 indicates that Dish and other antennas on the tower will cumulatively emit 19.69% 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 ODD2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	3.22
						Sector A Composite MPE%	3.22
Antenna B1	Comba ODD2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	3.22
						Sector B Composite MPE%	3.22
Antenna C1	Comba ODD2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	3.22
						Sector C Composite MPE%	3.22

Site Composite MPE%	
Carrier	MPE%
Dish Wireless – Max Per Sector Value	3.22 %
T-Mobile	2.27 %
AT&T	7.90 %
Clearwire	0.18 %
MetroPCS	0.39 %
Verizon Wireless	5.73 %
Site Total MPE %:	19.69 %

Dish Wireless Sector A Total:	3.22 %
Dish Wireless Sector B Total:	3.22 %
Dish Wireless Sector C Total:	3.22 %
Site Total:	19.69 %

- Dish expects to enhance safety in this portion of Danbury 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 Danbury, 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 52 Stadley Rough Road, Danbury, CT.

Respectfully yours,

Alex Mushteyn
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
AMushteyn@centerlinecommunications.com

Enclosures (8)

cc: Mark Boughton, Mayor, City of Danbury - chief elected official
Sharon B. Calitro, AICP, Director of Planning & Zoning, City of Danbury - P&Z official
Christ The Shepherd Church PCA - property owner
SBA Communications - tower owner
DISH (e-mail)

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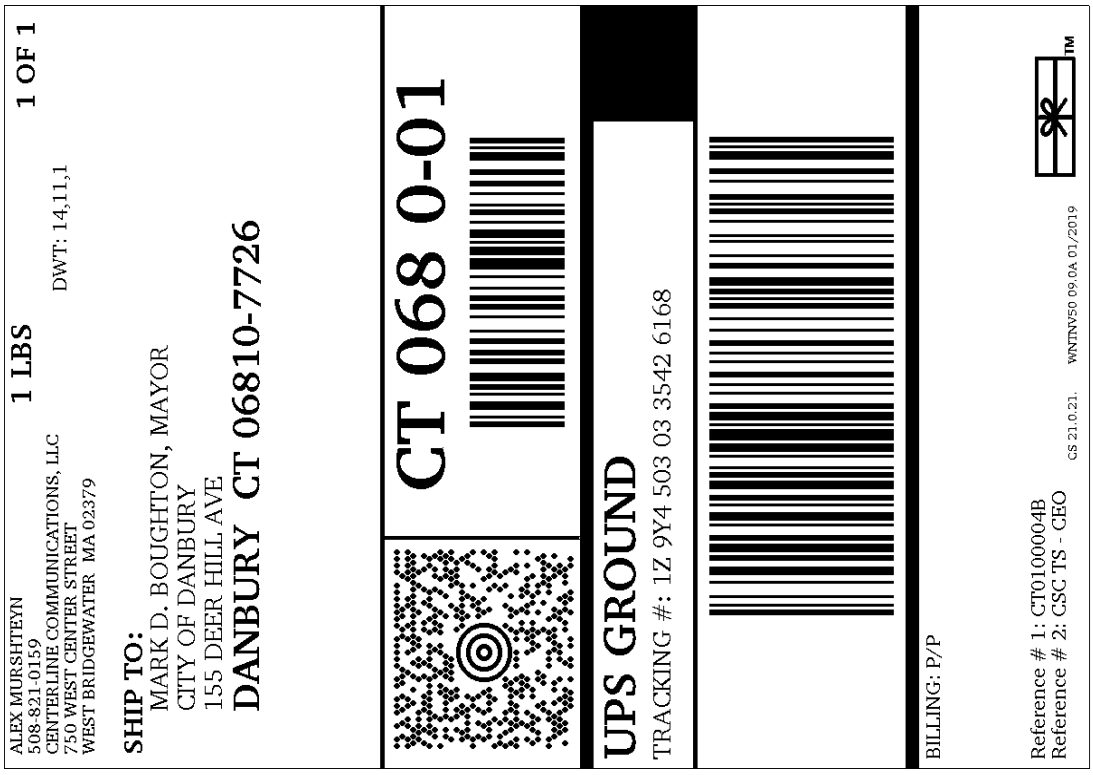

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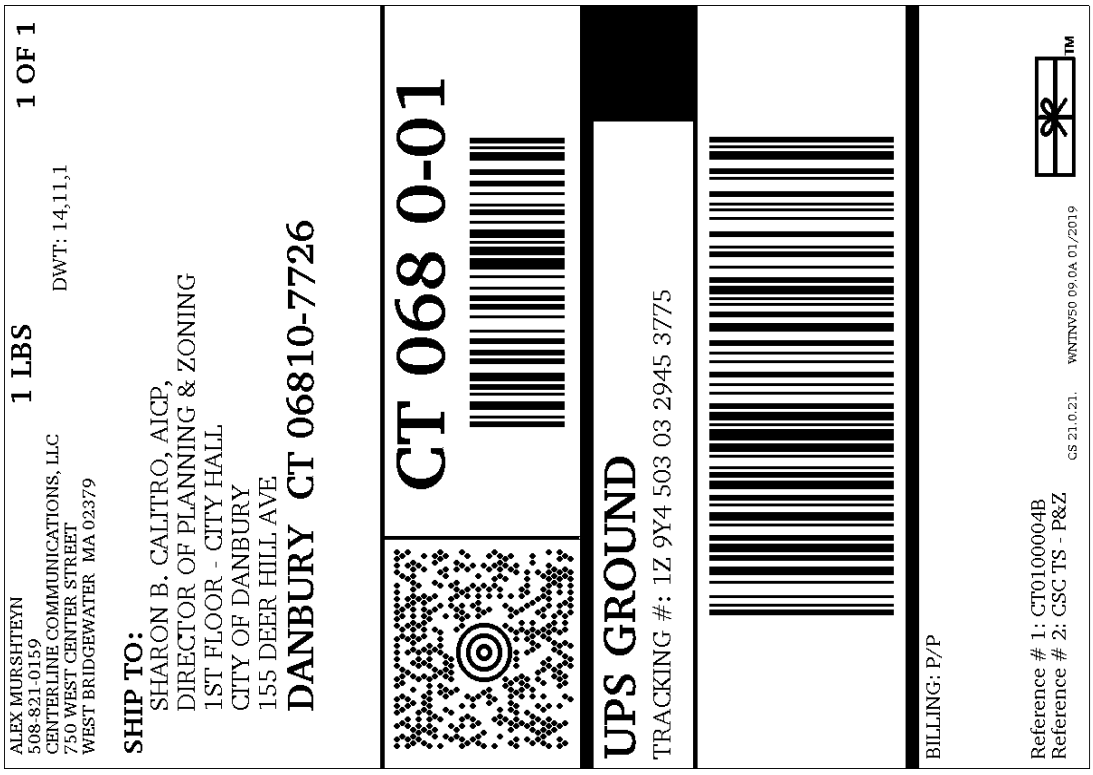

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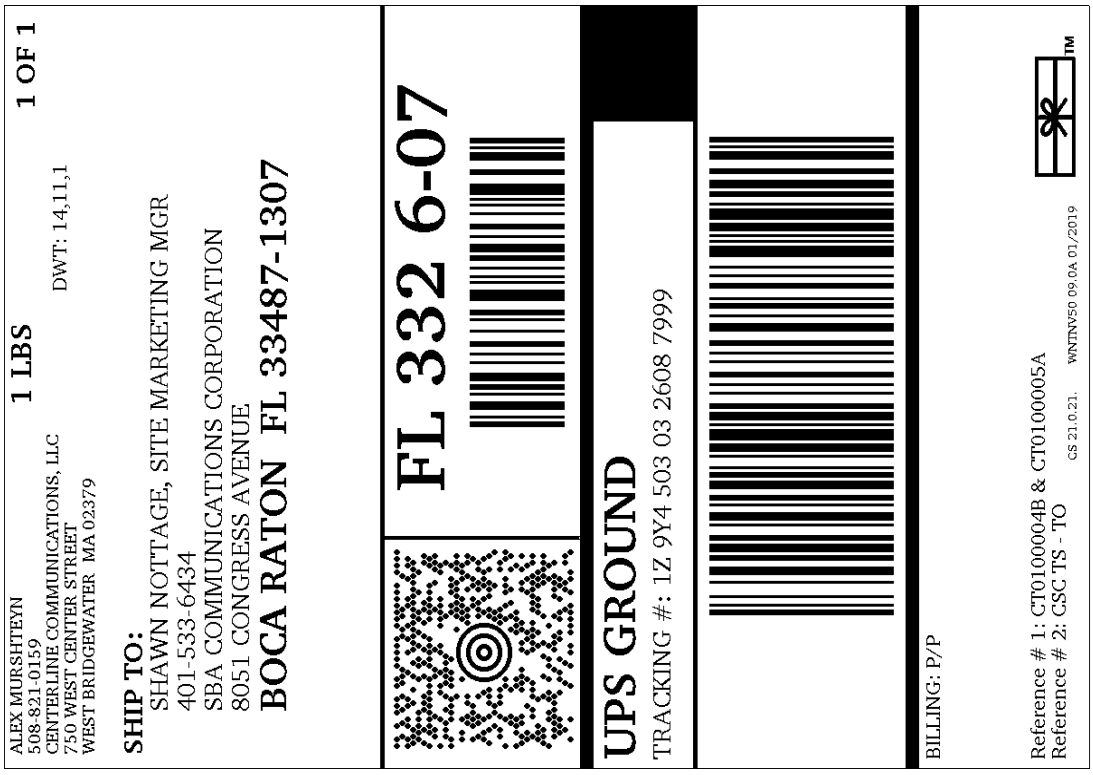

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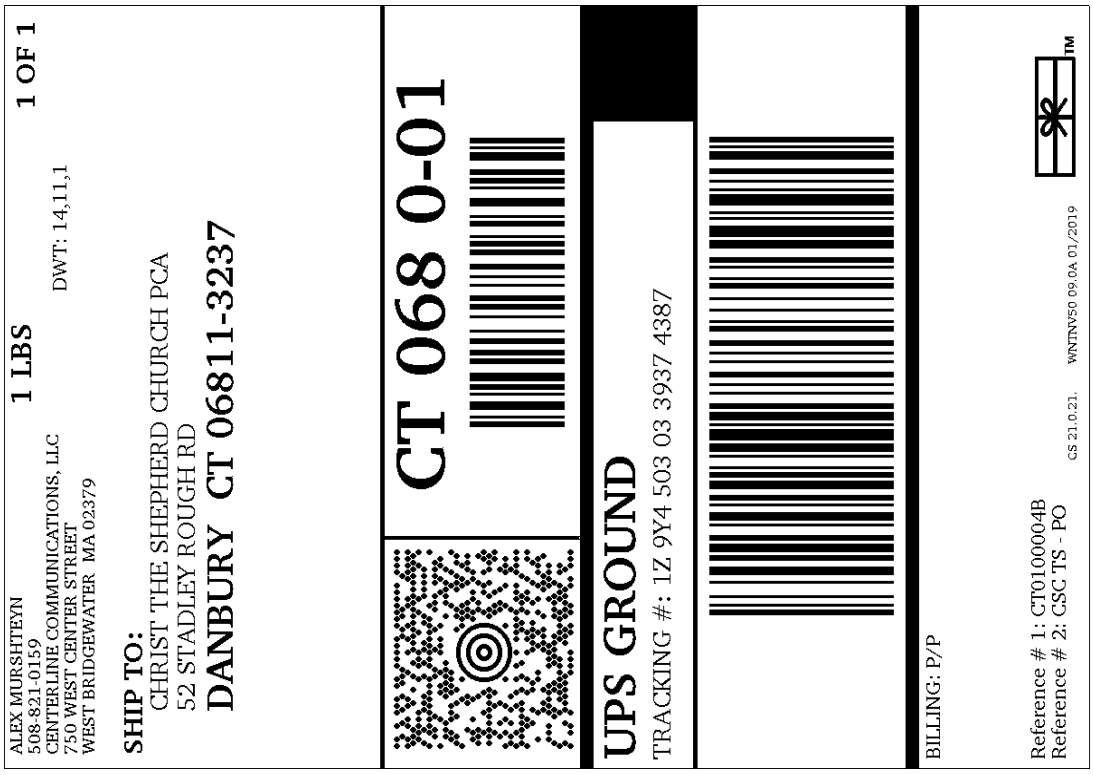

SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487-1307

T + 561.995.7670
F + 561.995.7626

sbasite.com

LETTER OF AUTHORIZATION

SBA Site ID: CT13549-S, Danbury 1

Property Located at: 52 Stadley Rough Road, Danbury, CT, 06811

THE CITY/COUNTY OF: Danbury / Fairfield

APPLICATION FOR ZONING/USE/BUILDING PERMIT

This letter authorizes Gamma Purchasing LLC 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 Christ the Shepherd Church PCA.

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

SBA Towers II LLC

Jason Silberstein

Executive VP, Site Leasing

Date: 4/03/2019

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

Structural Analysis Report

Existing 139 ft SABRE Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13549-S

Customer Site Name: Danbury 1

Carrier Name: Dish Network (App#: 108996, V2)

Carrier Site ID / Name: CT0100004B / TBD

Site Location: 52 Stadley Rough Road

Danbury, Connecticut

Fairfield County

Latitude: 41.433102

Longitude: -73.431916

2/26/19

Analysis Result:

Max Structural Usage: 75.7% [Pass]

Max Foundation Usage: 70.0% [Pass]

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

Report Prepared By : Dipika Dhungana

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Introduction

The purpose of this report is to summarize the analysis results on the 139 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	Tower Drawings prepared by Sabre Towers and Poles, Job # 10-01206 Dated 01/28/2010
Foundation Drawing	Foundation Drawings prepared by Sabre Towers and Poles, Job # 10-01206 Dated 01/28/2010
Geotechnical Report	Geotechnical Report prepared by Tower Engineering Professionals Project # 091184.01 Dated 05/13/2009
Modification Drawings	N/A

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} = 125mph (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:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.215, S_1 = 0.056

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	137.0	3	AIR 21 B2A/B4P - Panel	(3) T-Arms (SitePro-UDS-NP)	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	AIR 21 B4A/B12P - Panel			
3		3	Ericsson - KRY 112 144/1 - TMA			
4		3	Ericsson - S11B12 - RRU			
5	117.0	3	Kathrein - 800 10504 - Panel	(1) Flush Mount	(12) 1 5/8"	Metro PCS
6		3	Kathrein - 742 351 - Panel			
7	107.0	3	CCI OPA-65R-LCUU-H6	(1) Commscope MC-HPM1250-B (1) Commscope RR-RM1560	(6) 3/4" DC Power (2) 3/8" Fiber (6) 7/8" Coax	AT&T
8		3	KMW EPBQ-652L8H6-L2			
9		3	CCI DTMABP7819VG12A TMA			
10		3	Ericsson RRUS-11 700MHz			
11		3	Ericsson RRUS-12			
12		3	Ericsson RRUS-32			
13		3	Ericsson RRUS 4449 B5/B12			
14		3	Ericsson RRUS 4426 B66			
15		3	Ericsson RRUS-A2			
16		3	Kaelus DBC2055F1V1			
17		3	Raycap DC6-48-60-18-8F			
18	97.0	3	Antel - BXA-70063/6CF - Panel	(1)Flush Mount	(12) 1 5/8" (1) 1 5/8" Fiber	Verizon
19		3	Antel - BXA-171063/12CF - Panel			
20		3	Andrew - DBXNH-6565A-VTM - Panel			
21		3	Alcatel - RRH2x40-AWS - RRH			
22		6	RFS - FD9R6004/2C-3L - Diplexer			
23		1	RFS - DB-T1-6Z-8AB-0Z - Junction Box			

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
24	87.0	3	Comba ODI2-065R18K-GQ	(3)Standoff Sector frame Commscope SF-SU7-2-96	(1) 1 1/4" Hybrid	Dish Network
25		2	Ericsson 4415			
26		3	Ericsson 0208			

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:	**75.7%**	**64.6%**	**61.2%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	2141.3	23.1	47.9

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

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.0958 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

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

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

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

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

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

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

Usage Diagram - Max Ratio 75.70% at 53.3ft

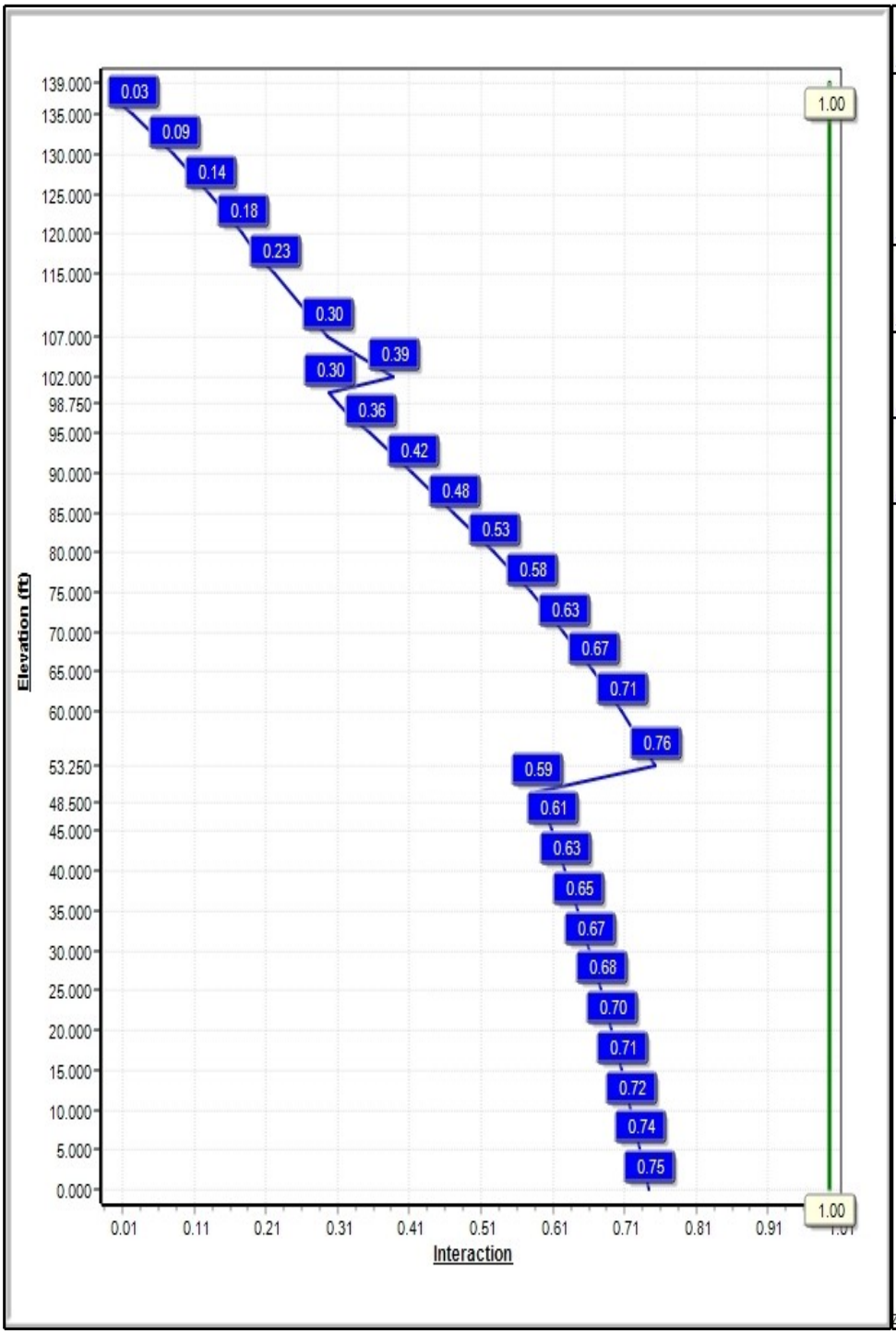
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019
Site Name:	Danbury 1	**Exposure:**	C	
Height:	139.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

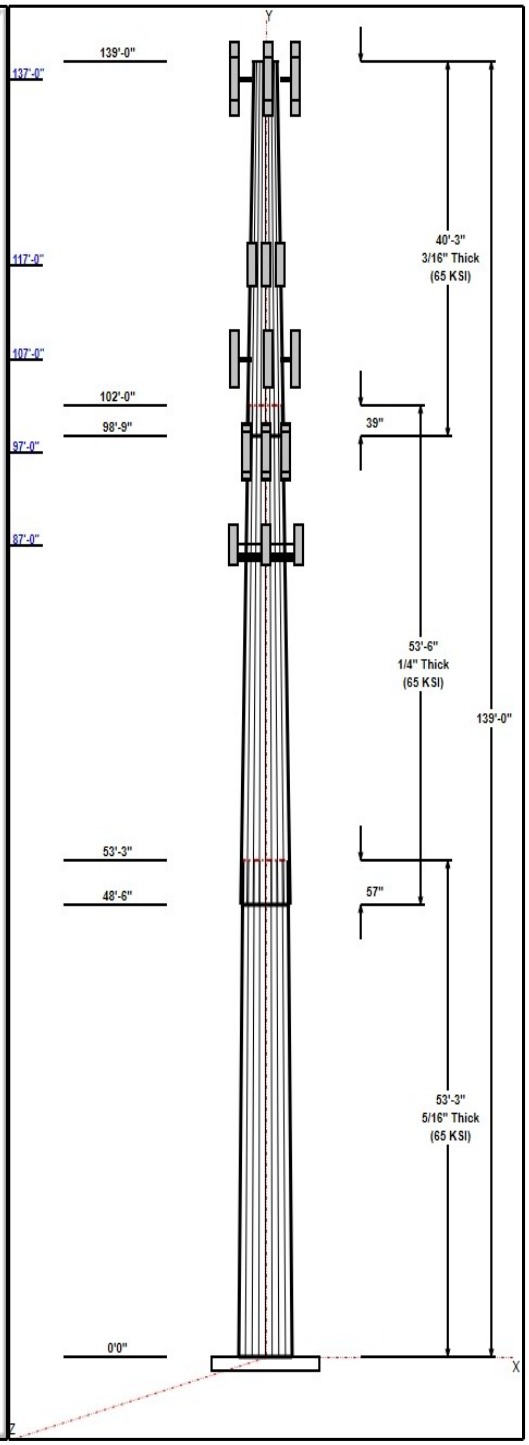
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 97 mph Wind

Iterations: 26





Structure: CT13549-S-SBA

Type: Tapered
Site Name: Danbury 1
Height: 139.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.23097

2/26/2019

Tower Engineering Solutions

Shaft Properties

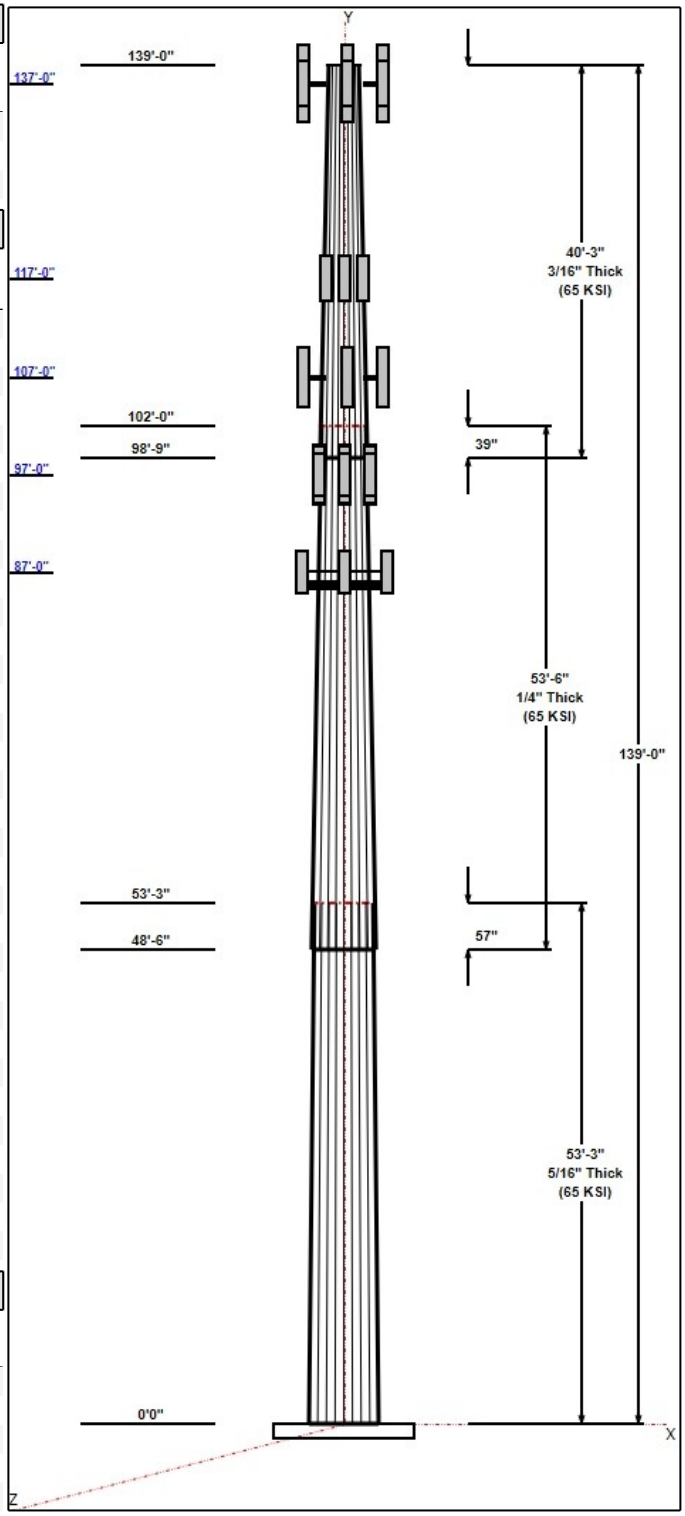
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	34.93	47.23	0.313		0.23097	65
2	53.50	24.17	36.53	0.250	Slip	0.23097	65
3	40.25	16.00	25.30	0.188	Slip	0.23097	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
139.00	139.00	1	6' Lightning rod	T-Mobile
137.00	137.00	3	T-Arms	T-Mobile
137.00	137.00	3	AIR 21, 1.3M, B2A B4P	T-Mobile
137.00	137.00	3	KRY 112 144/1	T-Mobile
137.00	137.00	3	S11B12	T-Mobile
137.00	137.00	3	AIR 21 B4A/B12P	T-Mobile
117.00	117.00	3	800 10504	Metro PCS
117.00	117.00	3	742 351	Metro PCS
117.00	117.00	1	Flush Mount	Metro PCS
107.00	107.00	3	RRUS-11 700MHz	AT&T
107.00	107.00	3	RRUS 12	AT&T
107.00	107.00	3	RRUS A2	AT&T
107.00	107.00	3	RRUS-32	AT&T
107.00	107.00	3	DC6-48-60-18-8F	AT&T
107.00	107.00	3	OPA-65R-LCUU-H6	AT&T
107.00	107.00	3	EPBQ-652L8H6-L2	AT&T
107.00	107.00	3	DBC20056F1V1	AT&T
107.00	107.00	3	DTMABP7819VG12A	AT&T
107.00	107.00	3	RRUS-E2	AT&T
107.00	107.00	1	Collar Mount Commscope	AT&T
107.00	107.00	3	T-Arm Commscope	AT&T
107.00	107.00	3	RRUS 4449 B5/B12	AT&T
97.00	97.00	1	Flush Mount	Verizon
97.00	97.00	3	BXA-70063/6CF	Verizon
97.00	97.00	3	BXA-171063/12CF	Verizon
97.00	97.00	3	DBXNH-6565A-VTM	Verizon
97.00	97.00	3	RRH2x40-AWS	Verizon
97.00	97.00	6	FD9R6004/2C-3L (3.1 lbs)	Verizon
97.00	97.00	1	DB-T1-6Z-8AB-0Z	Verizon
87.00	87.00	3	ODI2-065R18K-GQ	Dish Network
87.00	87.00	3	SF-SU7-2-96	Dish Network
87.00	87.00	2	4415	Dish Network
87.00	87.00	3	0208	Dish Network

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	137.00	Inside	1 5/8" Coax	T-Mobile
0.00	137.00	Inside	1 5/8" Hybrid	T-Mobile
0.00	117.00	Inside	1 5/8" Coax	Metro PCS
0.00	107.00	Inside	3/4" DC	AT&T
0.00	107.00	Inside	3/8" Fiber	AT&T
0.00	107.00	Inside	7/8" Coax	AT&T
0.00	97.00	Inside	1 5/8" Coax	Verizon
0.00	97.00	Inside	1 5/8" Hybrid	Verizon
0.00	87.00	Inside	1 1/4" Coax	Dish Network



Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	51.5	50.0	Clipped

Reactions

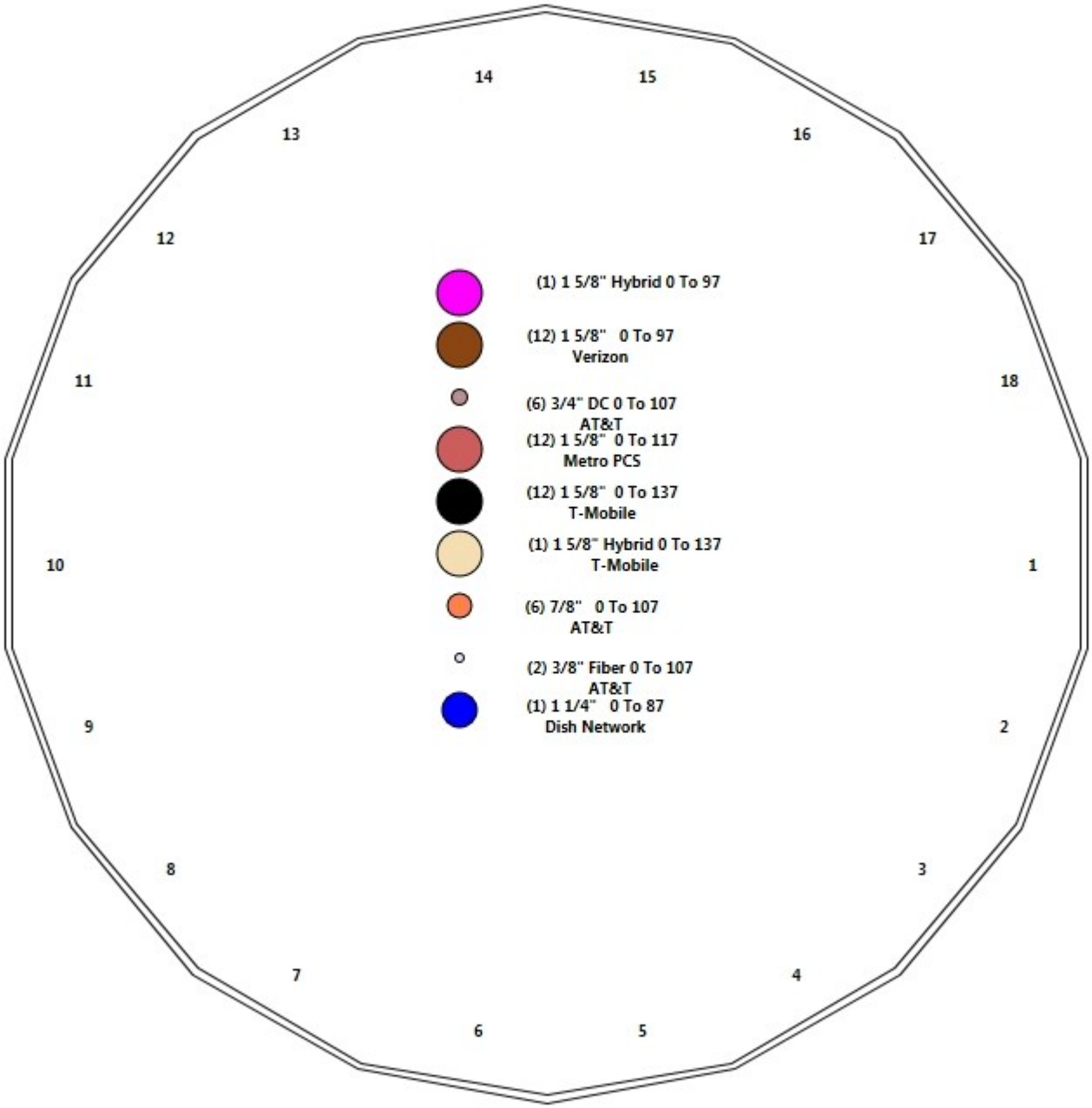
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	2141.3	23.1	30.6
0.9D + 1.6W 97 mph Wind	2117.9	23.0	22.9
1.2D + 1.0Di + 1.0Wi 50 mph Wind	625.8	6.8	47.9
1.2D + 1.0E	108.0	1.0	30.7
0.9D + 1.0E	106.5	1.0	23.0
1.0D + 1.0W 60 mph Wind	509.0	5.5	25.5

Structure: CT13549-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Danbury 1
Height: 139.00 (ft)

2/26/2019

Tower Engineering Solutions



Shaft Properties

Structure:	CT13549-S-SBA		**Code:**	EIA/TIA-222-G	2/26/2019
Site Name:	Danbury 1		**Exposure:**	C	
Height:	139.00 (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	53.250	0.3125	65		0.00	7,327
2	18	53.500	0.2500	65	Slip	57.00	4,348
3	18	40.250	0.1875	65	Slip	39.00	1,668
					Total Shaft Weight:		**13,342**

	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	47.23	0.00	46.53	12941.93	25.24	151.14	34.93	53.25	34.34	5198.89	18.30	111.7	0.230971
2	36.53	48.50	28.79	4786.42	24.35	146.11	24.17	102.00	18.98	1372.20	15.64	96.68	0.230971
3	25.30	98.75	14.94	1190.25	22.38	134.92	16.00	139.00	9.41	297.27	13.64	85.33	0.230971

Load Summary

Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (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	139.00	6' Lightning rod	1	6.50	0.38	1.00	42.53	1.459	1.00	0.00	0.00
2	137.00	T-Arms	3	350.00	8.00	0.50	592.13	14.918	0.50	0.00	0.00
3	137.00	AIR 21, 1.3M, B2A B4P	3	91.50	6.09	0.86	258.57	7.177	0.86	0.00	0.00
4	137.00	KRY 112 144/1	3	11.00	0.41	0.70	21.68	0.881	0.70	0.00	0.00
5	137.00	S11B12	3	51.00	2.83	0.70	119.97	3.496	0.70	0.00	0.00
6	137.00	AIR 21 B4A/B12P	3	126.00	11.54	0.89	408.26	13.183	0.89	0.00	0.00
7	117.00	800 10504	3	17.60	3.34	0.72	78.99	5.109	0.72	0.00	0.00
8	117.00	742 351	3	29.80	5.38	0.61	122.76	7.318	0.61	0.00	0.00
9	117.00	Flush Mount	1	350.00	5.00	1.00	636.00	8.405	1.00	0.00	0.00
10	107.00	RRUS-11 700MHz	3	50.70	2.52	0.76	136.29	3.148	0.76	0.00	0.00
11	107.00	RRUS 12	3	58.00	3.15	0.70	149.55	3.838	0.70	0.00	0.00
12	107.00	RRUS A2	3	21.20	1.86	0.62	56.11	2.801	0.62	0.00	0.00
13	107.00	RRUS-32	3	77.00	3.87	0.87	186.06	4.078	0.87	0.00	0.00
14	107.00	DC6-48-60-18-8F	3	31.80	1.47	1.00	91.57	2.147	1.00	0.00	0.00
15	107.00	OPA-65R-LCUU-H6	3	80.00	9.66	0.79	302.78	10.978	0.79	0.00	0.00
16	107.00	EPBQ-652L8H6-L2	3	72.80	9.66	0.85	343.47	14.704	0.85	0.00	0.00
17	107.00	DBC20056F1V1	3	6.60	0.41	0.80	19.83	0.720	0.80	0.00	0.00
18	107.00	DTMABP7819VG12A	3	19.20	1.14	0.67	43.87	1.884	0.67	0.00	0.00
19	107.00	RRUS-E2	3	77.00	1.65	0.70	123.37	2.209	0.70	0.00	0.00
20	107.00	Collar Mount Commscope	1	122.40	5.00	1.00	411.53	13.436	1.00	0.00	0.00
21	107.00	T-Arm Commscope MC-HPM1250-B	3	178.00	10.00	0.75	298.13	18.436	0.75	0.00	0.00
22	107.00	RRUS 4449 B5/B12	3	85.00	1.65	0.70	198.76	4.261	0.70	0.00	0.00
23	97.00	Flush Mount	1	350.00	5.00	0.50	630.69	8.341	0.50	0.00	0.00
24	97.00	BXA-70063/6CF	3	17.00	7.57	0.70	152.66	10.216	0.70	0.00	0.00
25	97.00	BXA-171063/12CF	3	15.00	4.78	0.84	106.74	7.038	0.84	0.00	0.00
26	97.00	DBXNH-6565A-VTM	3	34.20	5.37	0.80	155.54	7.261	0.80	0.00	0.00
27	97.00	RRH2x40-AWS	3	44.00	2.52	0.82	102.13	3.691	0.82	0.00	0.00
28	97.00	FD9R6004/2C-3L (3.1 lbs)	6	3.10	0.36	1.00	10.78	0.784	1.00	0.00	0.00
29	97.00	DB-T1-6Z-8AB-0Z	1	18.90	4.80	0.71	155.45	5.634	0.71	0.00	0.00
30	87.00	ODI2-065R18K-GQ	3	25.10	4.85	0.70	125.99	5.780	0.70	0.00	0.00
31	87.00	SF-SU7-2-96	3	395.00	15.10	0.75	760.58	33.068	0.75	0.00	0.00
32	87.00	4415	2	44.10	1.86	0.69	89.03	2.402	0.69	0.00	0.00
33	87.00	0208	3	19.80	1.37	0.65	52.89	1.842	0.65	0.00	0.00
		Totals:	**91**	**6,907.50**			**17,144.97**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	137.00	(12) 1 5/8" Coax	0.00	Inside
0.00	137.00	(1) 1 5/8" Hybrid	0.00	Inside
0.00	117.00	(12) 1 5/8" Coax	0.00	Inside
0.00	107.00	(6) 3/4" DC	0.00	Inside
0.00	107.00	(2) 3/8" Fiber	0.00	Inside
0.00	107.00	(6) 7/8" Coax	0.00	Inside
0.00	97.00	(12) 1 5/8" Coax	0.00	Inside
0.00	97.00	(1) 1 5/8" Hybrid	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	87.00	(1) 1 1/4" Coax			0.00	Inside					

Shaft Section Properties

Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (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	

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.3125	47.230	46.535	12941.9	25.24	151.14	71.7	539.7	0.0
5.00		0.3125	46.075	45.389	12009.6	24.59	147.44	72.5	513.4	782.0
10.00		0.3125	44.920	44.244	11123.1	23.94	143.74	73.2	487.7	762.5
15.00		0.3125	43.765	43.098	10281.4	23.28	140.05	74.0	462.7	743.0
20.00		0.3125	42.611	41.953	9483.2	22.63	136.35	74.8	438.3	723.5
25.00		0.3125	41.456	40.807	8727.5	21.98	132.66	75.5	414.7	704.0
30.00		0.3125	40.301	39.662	8013.0	21.33	128.96	76.3	391.6	684.5
35.00		0.3125	39.146	38.517	7338.6	20.68	125.27	77.1	369.2	665.1
40.00		0.3125	37.991	37.371	6703.2	20.03	121.57	77.8	347.5	645.6
45.00		0.3125	36.836	36.226	6105.5	19.37	117.88	78.6	326.5	626.1
48.50	Bot - Section 2	0.3125	36.028	35.424	5709.0	18.92	115.29	79.1	312.1	426.7
50.00		0.3125	35.681	35.080	5544.5	18.72	114.18	79.4	306.1	326.2
53.25	Top - Section 1	0.2500	35.431	27.915	4365.2	23.58	141.72	0.0	0.0	695.8
55.00		0.2500	35.027	27.594	4216.4	23.29	140.11	74.0	237.1	165.3
60.00		0.2500	33.872	26.678	3810.2	22.48	135.49	75.0	221.6	461.7
65.00		0.2500	32.717	25.762	3430.9	21.66	130.87	75.9	206.5	446.1
70.00		0.2500	31.562	24.845	3077.6	20.85	126.25	76.9	192.1	430.5
75.00		0.2500	30.407	23.929	2749.5	20.04	121.63	77.8	178.1	414.9
80.00		0.2500	29.252	23.012	2445.6	19.22	117.01	78.8	164.7	399.3
85.00		0.2500	28.097	22.096	2164.9	18.41	112.39	79.8	151.8	383.7
87.00		0.2500	27.636	21.730	2059.0	18.08	110.54	80.1	146.7	149.1
90.00		0.2500	26.943	21.180	1906.6	17.59	107.77	80.7	139.4	219.0
95.00		0.2500	25.788	20.263	1669.7	16.78	103.15	81.7	127.5	352.6
97.00		0.2500	25.326	19.897	1580.7	16.45	101.30	82.1	122.9	136.7
98.75	Bot - Section 3	0.2500	24.922	19.576	1505.5	16.17	99.69	82.4	119.0	117.5
100.00		0.2500	24.633	19.347	1453.2	15.96	98.53	82.5	116.2	146.0
102.00	Top - Section 2	0.1875	24.546	14.496	1086.7	21.67	130.91	0.0	0.0	230.0
105.00		0.1875	23.853	14.083	996.5	21.02	127.22	76.7	82.3	145.9
107.00		0.1875	23.391	13.809	939.3	20.59	124.75	77.2	79.1	94.9
110.00		0.1875	22.698	13.396	857.7	19.93	121.06	78.0	74.4	138.9
115.00		0.1875	21.543	12.709	732.3	18.85	114.90	79.2	67.0	222.1
117.00		0.1875	21.081	12.434	685.8	18.41	112.43	79.7	64.1	85.6
120.00		0.1875	20.388	12.022	619.8	17.76	108.74	80.5	59.9	124.8
125.00		0.1875	19.234	11.334	519.5	16.68	102.58	81.8	53.2	198.7
130.00		0.1875	18.079	10.647	430.6	15.59	96.42	82.5	46.9	187.0
135.00		0.1875	16.924	9.960	352.5	14.50	90.26	82.5	41.0	175.3
137.00		0.1875	16.462	9.685	324.1	14.07	87.80	82.5	38.8	66.8
139.00		0.1875	16.000	9.410	297.3	13.64	85.33	82.5	36.6	65.0
										13342.3

Wind Loading - Shaft

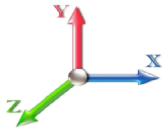
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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	0.85	19.450	21.40	357.41	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	348.67	0.650	0.000	5.00	19.738	12.83	439.2	0.0	938.4
10.00		1.00	0.85	19.450	21.40	339.93	0.650	0.000	5.00	19.250	12.51	428.3	0.0	915.0
15.00		1.00	0.85	19.450	21.40	331.19	0.650	0.000	5.00	18.761	12.19	417.5	0.0	891.6
20.00		1.00	0.90	20.638	22.70	332.15	0.650	0.000	5.00	18.273	11.88	431.4	0.0	868.2
25.00		1.00	0.95	21.630	23.79	330.83	0.650	0.000	5.00	17.784	11.56	440.1	0.0	844.8
30.00		1.00	0.98	22.477	24.72	327.84	0.650	0.000	5.00	17.295	11.24	444.7	0.0	821.5
35.00		1.00	1.01	23.218	25.54	323.66	0.650	0.000	5.00	16.807	10.92	446.4	0.0	798.1
40.00		1.00	1.04	23.880	26.27	318.56	0.650	0.000	5.00	16.318	10.61	445.8	0.0	774.7
45.00		1.00	1.07	24.479	26.93	312.72	0.650	0.000	5.00	15.830	10.29	443.3	0.0	751.3
48.50	Bot - Section 2	1.00	1.09	24.869	27.36	308.28	0.650	0.000	3.50	10.790	7.01	307.0	0.0	512.0
50.00		1.00	1.09	25.029	27.53	306.30	0.650	0.000	1.50	4.614	3.00	132.1	0.0	391.4
53.25	Top - Section 1	1.00	1.11	25.363	27.90	301.85	0.650	0.000	3.25	9.847	6.40	285.7	0.0	835.0
55.00		1.00	1.12	25.536	28.09	303.71	0.650	0.000	1.75	5.217	3.39	152.4	0.0	198.3
60.00		1.00	1.14	26.008	28.61	296.40	0.650	0.000	5.00	14.575	9.47	433.7	0.0	554.0
65.00		1.00	1.16	26.450	29.09	288.71	0.650	0.000	5.00	14.087	9.16	426.2	0.0	535.3
70.00		1.00	1.17	26.866	29.55	280.70	0.650	0.000	5.00	13.598	8.84	417.9	0.0	516.6
75.00		1.00	1.19	27.259	29.98	272.40	0.650	0.000	5.00	13.109	8.52	408.8	0.0	497.9
80.00		1.00	1.21	27.632	30.39	263.85	0.650	0.000	5.00	12.621	8.20	399.0	0.0	479.2
85.00		1.00	1.22	27.987	30.79	255.05	0.650	0.000	5.00	12.132	7.89	388.4	0.0	460.5
87.00	Appurtenance(s)	1.00	1.23	28.124	30.94	251.47	0.650	0.000	2.00	4.716	3.07	151.7	0.0	179.0
90.00		1.00	1.24	28.325	31.16	246.04	0.650	0.000	3.00	6.928	4.50	224.5	0.0	262.8
95.00		1.00	1.25	28.650	31.51	236.84	0.650	0.000	5.00	11.155	7.25	365.6	0.0	423.1
97.00	Appurtenance(s)	1.00	1.26	28.776	31.65	233.11	0.650	0.000	2.00	4.325	2.81	142.4	0.0	164.0
98.75	Bot - Section 3	1.00	1.26	28.884	31.77	229.82	0.650	0.000	1.75	3.720	2.42	122.9	0.0	141.0
100.00		1.00	1.27	28.961	31.86	227.46	0.650	0.000	1.25	2.660	1.73	88.1	0.0	175.2
102.00	Top - Section 2	1.00	1.27	29.082	31.99	223.66	0.650	0.000	2.00	4.193	2.73	139.5	0.0	276.0
105.00		1.00	1.28	29.260	32.19	221.39	0.650	0.000	3.00	6.143	3.99	205.6	0.0	175.0
107.00	Appurtenance(s)	1.00	1.28	29.376	32.31	217.54	0.650	0.000	2.00	3.998	2.60	134.3	0.0	113.9
110.00		1.00	1.29	29.548	32.50	211.71	0.650	0.000	3.00	5.850	3.80	197.7	0.0	166.6
115.00		1.00	1.30	29.826	32.81	201.88	0.650	0.000	5.00	9.359	6.08	319.3	0.0	266.5
117.00	Appurtenance(s)	1.00	1.31	29.934	32.93	197.91	0.650	0.000	2.00	3.607	2.34	123.5	0.0	102.7
120.00		1.00	1.32	30.094	33.10	191.92	0.650	0.000	3.00	5.264	3.42	181.2	0.0	149.8
125.00		1.00	1.33	30.354	33.39	181.82	0.650	0.000	5.00	8.382	5.45	291.1	0.0	238.4
130.00		1.00	1.34	30.605	33.67	171.61	0.650	0.000	5.00	7.893	5.13	276.4	0.0	224.4
135.00		1.00	1.35	30.850	33.93	161.29	0.650	0.000	5.00	7.405	4.81	261.3	0.0	210.4
137.00	Appurtenance(s)	1.00	1.35	30.945	34.04	157.13	0.650	0.000	2.00	2.825	1.84	100.0	0.0	80.2
139.00	Appurtenance(s)	1.00	1.36	31.040	34.14	152.96	0.650	0.000	2.00	2.747	1.79	97.5	0.0	78.0
								Totals:	**139.00**			**10,710.8**		**16,010.8**

Discrete Appurtenance Forces

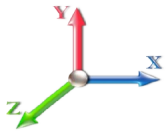
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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	139.00	6' Lightning rod	1	31.040	34.144	1.00	1.00	0.38	7.80	0.000	0.000	20.76	0.00	0.00
2	137.00	AIR 21 B4A/B12P	3	30.945	34.040	0.67	0.75	23.11	453.60	0.000	0.000	1258.59	0.00	0.00
3	137.00	S11B12	3	30.945	34.040	0.52	0.75	4.46	183.60	0.000	0.000	242.76	0.00	0.00
4	137.00	KRY 112 144/1	3	30.945	34.040	0.52	0.75	0.65	39.60	0.000	0.000	35.17	0.00	0.00
5	137.00	AIR 21, 1.3M, B2A B4P	3	30.945	34.040	0.65	0.75	11.78	329.40	0.000	0.000	641.81	0.00	0.00
6	137.00	T-Arms	3	30.945	34.040	0.45	0.90	10.80	1260.00	0.000	0.000	588.21	0.00	0.00
7	117.00	800 10504	3	29.934	32.927	0.54	0.75	5.41	63.36	0.000	0.000	285.06	0.00	0.00
8	117.00	742 351	3	29.934	32.927	0.46	0.75	7.38	107.28	0.000	0.000	389.02	0.00	0.00
9	117.00	Flush Mount	1	29.934	32.927	1.00	1.00	5.00	420.00	0.000	0.000	263.42	0.00	0.00
10	107.00	T-Arm Commscope	3	29.376	32.314	0.56	0.75	16.88	640.80	0.000	0.000	872.47	0.00	0.00
11	107.00	Collar Mount Commscope	1	29.376	32.314	1.00	1.00	5.00	146.88	0.000	0.000	258.51	0.00	0.00
12	107.00	RRUS-E2	3	29.376	32.314	0.52	0.75	2.60	277.20	0.000	0.000	134.36	0.00	0.00
13	107.00	DTMABP7819VG12A	3	29.376	32.314	0.50	0.75	1.72	69.12	0.000	0.000	88.85	0.00	0.00
14	107.00	DBC20056F1V1	3	29.376	32.314	0.60	0.75	0.74	23.76	0.000	0.000	38.16	0.00	0.00
15	107.00	EPBQ-652L8H6-L2	3	29.376	32.314	0.64	0.75	18.47	262.08	0.000	0.000	955.18	0.00	0.00
16	107.00	OPA-65R-LCUU-H6	3	29.376	32.314	0.59	0.75	17.17	288.00	0.000	0.000	887.76	0.00	0.00
17	107.00	DC6-48-60-18-8F	3	29.376	32.314	0.67	0.67	2.95	114.48	0.000	0.000	152.76	0.00	0.00
18	107.00	RRUS A2	3	29.376	32.314	0.46	0.75	2.59	76.32	0.000	0.000	134.15	0.00	0.00
19	107.00	RRUS 12	3	29.376	32.314	0.52	0.75	4.96	208.80	0.000	0.000	256.51	0.00	0.00
20	107.00	RRUS-11 700MHz	3	29.376	32.314	0.57	0.75	4.31	182.52	0.000	0.000	222.79	0.00	0.00
21	107.00	RRUS 4449 B5/B12	3	29.376	32.314	0.52	0.75	2.60	306.00	0.000	0.000	134.36	0.00	0.00
22	107.00	RRUS-32	3	29.376	32.314	0.65	0.75	7.58	277.20	0.000	0.000	391.67	0.00	0.00
23	97.00	BXA-171063/12CF	3	28.776	31.653	0.63	0.75	9.03	54.00	0.000	0.000	457.54	0.00	0.00
24	97.00	Flush Mount	1	28.776	31.653	0.50	1.00	2.50	420.00	0.000	0.000	126.61	0.00	0.00
25	97.00	BXA-70063/6CF	3	28.776	31.653	0.52	0.75	11.92	61.20	0.000	0.000	603.83	0.00	0.00
26	97.00	RRH2x40-AWS	3	28.776	31.653	0.61	0.75	4.65	158.40	0.000	0.000	235.47	0.00	0.00
27	97.00	DBXNH-6565A-VTM	3	28.776	31.653	0.60	0.75	9.67	123.12	0.000	0.000	489.54	0.00	0.00
28	97.00	FD9R6004/2C-3L (3.1 lbs)	6	28.776	31.653	0.75	0.75	1.62	22.32	0.000	0.000	82.05	0.00	0.00
29	97.00	DB-T1-6Z-8AB-0Z	1	28.776	31.653	0.71	1.00	3.41	22.68	0.000	0.000	172.60	0.00	0.00
30	87.00	0208	3	28.124	30.936	0.52	0.80	2.14	71.28	0.000	0.000	105.79	0.00	0.00
31	87.00	4415	2	28.124	30.936	0.55	0.80	2.05	105.84	0.000	0.000	101.64	0.00	0.00
32	87.00	SF-SU7-2-96	3	28.124	30.936	0.56	0.75	25.48	1422.00	0.000	0.000	1261.28	0.00	0.00
33	87.00	ODI2-065R18K-GQ	3	28.124	30.936	0.56	0.80	8.15	90.36	0.000	0.000	403.31	0.00	0.00
							Totals:		**8,289.00**			**12,291.99**		

Total Applied Force Summary

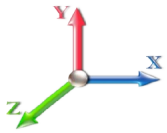
Structure:	CT13549-S-SBA		**Code:**	EIA/TIA-222-G	2/26/2019
Site Name:	Danbury 1		**Exposure:**	C	
Height:	139.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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		439.20	1214.03	0.00	0.00
10.00		428.33	1190.64	0.00	0.00
15.00		417.46	1167.26	0.00	0.00
20.00		431.40	1143.87	0.00	0.00
25.00		440.06	1120.49	0.00	0.00
30.00		444.72	1097.10	0.00	0.00
35.00		446.41	1073.71	0.00	0.00
40.00		445.79	1050.33	0.00	0.00
45.00		443.30	1026.94	0.00	0.00
48.50		306.97	704.94	0.00	0.00
50.00		132.12	474.08	0.00	0.00
53.25		285.71	1014.18	0.00	0.00
55.00		152.40	294.80	0.00	0.00
60.00		433.66	829.67	0.00	0.00
65.00		426.24	810.96	0.00	0.00
70.00		417.93	792.25	0.00	0.00
75.00		408.80	773.54	0.00	0.00
80.00		398.95	754.83	0.00	0.00
85.00		388.43	736.12	0.00	0.00
87.00	(11) attachments	2023.75	1978.69	0.00	0.00
90.00		224.48	425.83	0.00	0.00
95.00		365.61	694.75	0.00	0.00
97.00	(20) attachments	2310.01	1134.38	0.00	0.00
98.75		122.93	207.60	0.00	0.00
100.00		88.14	222.72	0.00	0.00
102.00		139.51	352.09	0.00	0.00
105.00		205.63	289.17	0.00	0.00
107.00	(37) attachments	4661.90	3063.13	0.00	0.00
110.00		197.75	260.44	0.00	0.00
115.00		319.34	422.85	0.00	0.00
117.00	(7) attachments	1061.02	755.85	0.00	0.00
120.00		181.22	198.68	0.00	0.00
125.00		291.06	319.91	0.00	0.00
130.00		276.37	305.87	0.00	0.00
135.00		261.33	291.84	0.00	0.00
137.00	(15) attachments	2866.54	2379.01	0.00	0.00
139.00	(1) attachments	118.30	85.77	0.00	0.00
	Totals:	**23,002.77**	**30,658.33**	**0.00**	**0.00**

Calculated Forces

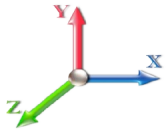
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 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	-30.61	-23.06	0.00	-2141.2	0.00	2141.27	3003.53	1501.76	5797.25	2902.93	0.00	0.000	0.000	0.748
5.00	-29.31	-22.74	0.00	-2025.9	0.00	2025.95	2960.91	1480.45	5573.38	2790.83	0.12	-0.229	0.000	0.736
10.00	-28.03	-22.42	0.00	-1912.2	0.00	1912.24	2916.70	1458.35	5350.68	2679.32	0.49	-0.462	0.000	0.724
15.00	-26.77	-22.10	0.00	-1800.1	0.00	1800.14	2870.92	1435.46	5129.40	2568.51	1.10	-0.700	0.000	0.710
20.00	-25.54	-21.76	0.00	-1689.6	0.00	1689.62	2823.56	1411.78	4909.74	2458.52	1.96	-0.941	0.000	0.697
25.00	-24.34	-21.41	0.00	-1580.8	0.00	1580.80	2774.61	1387.31	4691.94	2349.46	3.08	-1.186	0.000	0.682
30.00	-23.16	-21.04	0.00	-1473.7	0.00	1473.76	2724.09	1362.04	4476.23	2241.44	4.46	-1.435	0.000	0.666
35.00	-22.01	-20.66	0.00	-1368.5	0.00	1368.56	2671.99	1335.99	4262.83	2134.58	6.09	-1.688	0.000	0.650
40.00	-20.88	-20.28	0.00	-1265.2	0.00	1265.24	2618.30	1309.15	4051.97	2029.00	8.00	-1.943	0.000	0.632
45.00	-19.79	-19.87	0.00	-1163.8	0.00	1163.86	2563.04	1281.52	3843.87	1924.79	10.17	-2.201	0.000	0.613
48.50	-19.06	-19.58	0.00	-1094.3	0.00	1094.30	2523.41	1261.71	3699.97	1852.74	11.85	-2.385	0.000	0.598
50.00	-18.55	-19.47	0.00	-1064.9	0.00	1064.92	2506.19	1253.10	3638.77	1822.09	12.62	-2.465	0.000	0.592
53.25	-17.50	-19.18	0.00	-1001.6	0.00	1001.64	1850.79	925.39	2677.47	1340.72	14.36	-2.638	0.000	0.757
55.00	-17.15	-19.08	0.00	-968.07	0.00	968.07	1837.85	918.92	2627.99	1315.95	15.34	-2.732	0.000	0.745
60.00	-16.24	-18.69	0.00	-872.69	0.00	872.69	1799.82	899.91	2487.54	1245.62	18.37	-3.043	0.000	0.710
65.00	-15.35	-18.30	0.00	-779.24	0.00	779.24	1760.21	880.10	2348.61	1176.05	21.72	-3.351	0.000	0.672
70.00	-14.49	-17.91	0.00	-687.73	0.00	687.73	1719.02	859.51	2211.45	1107.37	25.39	-3.655	0.000	0.630
75.00	-13.66	-17.52	0.00	-598.17	0.00	598.17	1676.25	838.13	2076.26	1039.67	29.38	-3.952	0.000	0.584
80.00	-12.85	-17.13	0.00	-510.55	0.00	510.55	1631.90	815.95	1943.29	973.09	33.67	-4.239	0.000	0.533
85.00	-12.09	-16.73	0.00	-424.88	0.00	424.88	1585.97	792.99	1812.75	907.72	38.26	-4.511	0.000	0.476
87.00	-10.25	-14.58	0.00	-391.42	0.00	391.42	1567.16	783.58	1761.26	881.94	40.17	-4.618	0.000	0.451
90.00	-9.80	-14.35	0.00	-347.68	0.00	347.68	1538.46	769.23	1684.87	843.69	43.12	-4.772	0.000	0.419
95.00	-9.10	-13.96	0.00	-275.92	0.00	275.92	1489.37	744.69	1559.88	781.10	48.24	-5.004	0.000	0.360
97.00	-8.15	-11.57	0.00	-248.01	0.00	248.01	1469.29	734.65	1510.75	756.50	50.35	-5.093	0.000	0.334
98.75	-7.94	-11.43	0.00	-227.77	0.00	227.77	1451.52	725.76	1468.18	735.18	52.23	-5.168	0.000	0.316
100.00	-7.72	-11.34	0.00	-213.47	0.00	213.47	1437.39	718.70	1436.71	719.42	53.59	-5.221	0.000	0.302
102.00	-7.36	-11.18	0.00	-190.80	0.00	190.80	990.34	495.17	991.38	496.43	55.79	-5.300	0.000	0.392
105.00	-7.07	-10.96	0.00	-157.28	0.00	157.28	971.88	485.94	945.01	473.21	59.15	-5.408	0.000	0.340
107.00	-4.46	-6.03	0.00	-135.36	0.00	135.36	959.26	479.63	914.39	457.88	61.43	-5.491	0.000	0.300
110.00	-4.20	-5.82	0.00	-117.27	0.00	117.27	939.85	469.93	868.93	435.11	64.91	-5.606	0.000	0.274
115.00	-3.80	-5.47	0.00	-88.17	0.00	88.17	906.24	453.12	794.52	397.85	70.87	-5.777	0.000	0.226
117.00	-3.15	-4.34	0.00	-77.23	0.00	77.23	892.36	446.18	765.27	383.21	73.30	-5.841	0.000	0.205
120.00	-2.97	-4.15	0.00	-64.21	0.00	64.21	871.06	435.53	722.01	361.54	76.99	-5.929	0.000	0.181
125.00	-2.67	-3.83	0.00	-43.48	0.00	43.48	834.29	417.15	651.64	326.30	83.26	-6.052	0.000	0.137
130.00	-2.39	-3.52	0.00	-24.34	0.00	24.34	791.03	395.51	580.02	290.44	89.64	-6.145	0.000	0.087
135.00	-2.13	-3.23	0.00	-6.72	0.00	6.72	739.97	369.98	507.20	253.97	96.10	-6.197	0.000	0.029
137.00	-0.07	-0.13	0.00	-0.25	0.00	0.25	719.55	359.77	479.43	240.07	98.69	-6.202	0.000	0.001
139.00	0.00	-0.12	0.00	0.00	0.00	0.00	699.12	349.56	452.45	226.56	101.28	-6.202	0.000	0.000

Wind Loading - Shaft

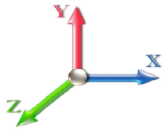
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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	0.85	19.450	21.40	357.41	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	348.67	0.650	0.000	5.00	19.738	12.83	439.2	0.0	703.8
10.00		1.00	0.85	19.450	21.40	339.93	0.650	0.000	5.00	19.250	12.51	428.3	0.0	686.3
15.00		1.00	0.85	19.450	21.40	331.19	0.650	0.000	5.00	18.761	12.19	417.5	0.0	668.7
20.00		1.00	0.90	20.638	22.70	332.15	0.650	0.000	5.00	18.273	11.88	431.4	0.0	651.2
25.00		1.00	0.95	21.630	23.79	330.83	0.650	0.000	5.00	17.784	11.56	440.1	0.0	633.6
30.00		1.00	0.98	22.477	24.72	327.84	0.650	0.000	5.00	17.295	11.24	444.7	0.0	616.1
35.00		1.00	1.01	23.218	25.54	323.66	0.650	0.000	5.00	16.807	10.92	446.4	0.0	598.6
40.00		1.00	1.04	23.880	26.27	318.56	0.650	0.000	5.00	16.318	10.61	445.8	0.0	581.0
45.00		1.00	1.07	24.479	26.93	312.72	0.650	0.000	5.00	15.830	10.29	443.3	0.0	563.5
48.50	Bot - Section 2	1.00	1.09	24.869	27.36	308.28	0.650	0.000	3.50	10.790	7.01	307.0	0.0	384.0
50.00		1.00	1.09	25.029	27.53	306.30	0.650	0.000	1.50	4.614	3.00	132.1	0.0	293.5
53.25	Top - Section 1	1.00	1.11	25.363	27.90	301.85	0.650	0.000	3.25	9.847	6.40	285.7	0.0	626.3
55.00		1.00	1.12	25.536	28.09	303.71	0.650	0.000	1.75	5.217	3.39	152.4	0.0	148.7
60.00		1.00	1.14	26.008	28.61	296.40	0.650	0.000	5.00	14.575	9.47	433.7	0.0	415.5
65.00		1.00	1.16	26.450	29.09	288.71	0.650	0.000	5.00	14.087	9.16	426.2	0.0	401.5
70.00		1.00	1.17	26.866	29.55	280.70	0.650	0.000	5.00	13.598	8.84	417.9	0.0	387.5
75.00		1.00	1.19	27.259	29.98	272.40	0.650	0.000	5.00	13.109	8.52	408.8	0.0	373.4
80.00		1.00	1.21	27.632	30.39	263.85	0.650	0.000	5.00	12.621	8.20	399.0	0.0	359.4
85.00		1.00	1.22	27.987	30.79	255.05	0.650	0.000	5.00	12.132	7.89	388.4	0.0	345.4
87.00	Appurtenance(s)	1.00	1.23	28.124	30.94	251.47	0.650	0.000	2.00	4.716	3.07	151.7	0.0	134.2
90.00		1.00	1.24	28.325	31.16	246.04	0.650	0.000	3.00	6.928	4.50	224.5	0.0	197.1
95.00		1.00	1.25	28.650	31.51	236.84	0.650	0.000	5.00	11.155	7.25	365.6	0.0	317.3
97.00	Appurtenance(s)	1.00	1.26	28.776	31.65	233.11	0.650	0.000	2.00	4.325	2.81	142.4	0.0	123.0
98.75	Bot - Section 3	1.00	1.26	28.884	31.77	229.82	0.650	0.000	1.75	3.720	2.42	122.9	0.0	105.8
100.00		1.00	1.27	28.961	31.86	227.46	0.650	0.000	1.25	2.660	1.73	88.1	0.0	131.4
102.00	Top - Section 2	1.00	1.27	29.082	31.99	223.66	0.650	0.000	2.00	4.193	2.73	139.5	0.0	207.0
105.00		1.00	1.28	29.260	32.19	221.39	0.650	0.000	3.00	6.143	3.99	205.6	0.0	131.3
107.00	Appurtenance(s)	1.00	1.28	29.376	32.31	217.54	0.650	0.000	2.00	3.998	2.60	134.3	0.0	85.4
110.00		1.00	1.29	29.548	32.50	211.71	0.650	0.000	3.00	5.850	3.80	197.7	0.0	125.0
115.00		1.00	1.30	29.826	32.81	201.88	0.650	0.000	5.00	9.359	6.08	319.3	0.0	199.9
117.00	Appurtenance(s)	1.00	1.31	29.934	32.93	197.91	0.650	0.000	2.00	3.607	2.34	123.5	0.0	77.0
120.00		1.00	1.32	30.094	33.10	191.92	0.650	0.000	3.00	5.264	3.42	181.2	0.0	112.3
125.00		1.00	1.33	30.354	33.39	181.82	0.650	0.000	5.00	8.382	5.45	291.1	0.0	178.8
130.00		1.00	1.34	30.605	33.67	171.61	0.650	0.000	5.00	7.893	5.13	276.4	0.0	168.3
135.00		1.00	1.35	30.850	33.93	161.29	0.650	0.000	5.00	7.405	4.81	261.3	0.0	157.8
137.00	Appurtenance(s)	1.00	1.35	30.945	34.04	157.13	0.650	0.000	2.00	2.825	1.84	100.0	0.0	60.2
139.00	Appurtenance(s)	1.00	1.36	31.040	34.14	152.96	0.650	0.000	2.00	2.747	1.79	97.5	0.0	58.5
								Totals:	**139.00**			**10,710.8**		**12,008.1**

Discrete Appurtenance Forces

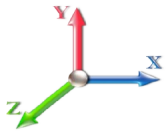
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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	139.00	6' Lightning rod	1	31.040	34.144	1.00	1.00	0.38	5.85	0.000	0.000	20.76	0.00	0.00
2	137.00	AIR 21 B4A/B12P	3	30.945	34.040	0.67	0.75	23.11	340.20	0.000	0.000	1258.59	0.00	0.00
3	137.00	S11B12	3	30.945	34.040	0.52	0.75	4.46	137.70	0.000	0.000	242.76	0.00	0.00
4	137.00	KRY 112 144/1	3	30.945	34.040	0.52	0.75	0.65	29.70	0.000	0.000	35.17	0.00	0.00
5	137.00	AIR 21, 1.3M, B2A B4P	3	30.945	34.040	0.65	0.75	11.78	247.05	0.000	0.000	641.81	0.00	0.00
6	137.00	T-Arms	3	30.945	34.040	0.45	0.90	10.80	945.00	0.000	0.000	588.21	0.00	0.00
7	117.00	800 10504	3	29.934	32.927	0.54	0.75	5.41	47.52	0.000	0.000	285.06	0.00	0.00
8	117.00	742 351	3	29.934	32.927	0.46	0.75	7.38	80.46	0.000	0.000	389.02	0.00	0.00
9	117.00	Flush Mount	1	29.934	32.927	1.00	1.00	5.00	315.00	0.000	0.000	263.42	0.00	0.00
10	107.00	T-Arm Commscope	3	29.376	32.314	0.56	0.75	16.88	480.60	0.000	0.000	872.47	0.00	0.00
11	107.00	Collar Mount Commscope	1	29.376	32.314	1.00	1.00	5.00	110.16	0.000	0.000	258.51	0.00	0.00
12	107.00	RRUS-E2	3	29.376	32.314	0.52	0.75	2.60	207.90	0.000	0.000	134.36	0.00	0.00
13	107.00	DTMABP7819VG12A	3	29.376	32.314	0.50	0.75	1.72	51.84	0.000	0.000	88.85	0.00	0.00
14	107.00	DBC20056F1V1	3	29.376	32.314	0.60	0.75	0.74	17.82	0.000	0.000	38.16	0.00	0.00
15	107.00	EPBQ-652L8H6-L2	3	29.376	32.314	0.64	0.75	18.47	196.56	0.000	0.000	955.18	0.00	0.00
16	107.00	OPA-65R-LCUU-H6	3	29.376	32.314	0.59	0.75	17.17	216.00	0.000	0.000	887.76	0.00	0.00
17	107.00	DC6-48-60-18-8F	3	29.376	32.314	0.67	0.67	2.95	85.86	0.000	0.000	152.76	0.00	0.00
18	107.00	RRUS A2	3	29.376	32.314	0.46	0.75	2.59	57.24	0.000	0.000	134.15	0.00	0.00
19	107.00	RRUS 12	3	29.376	32.314	0.52	0.75	4.96	156.60	0.000	0.000	256.51	0.00	0.00
20	107.00	RRUS-11 700MHz	3	29.376	32.314	0.57	0.75	4.31	136.89	0.000	0.000	222.79	0.00	0.00
21	107.00	RRUS 4449 B5/B12	3	29.376	32.314	0.52	0.75	2.60	229.50	0.000	0.000	134.36	0.00	0.00
22	107.00	RRUS-32	3	29.376	32.314	0.65	0.75	7.58	207.90	0.000	0.000	391.67	0.00	0.00
23	97.00	BXA-171063/12CF	3	28.776	31.653	0.63	0.75	9.03	40.50	0.000	0.000	457.54	0.00	0.00
24	97.00	Flush Mount	1	28.776	31.653	0.50	1.00	2.50	315.00	0.000	0.000	126.61	0.00	0.00
25	97.00	BXA-70063/6CF	3	28.776	31.653	0.52	0.75	11.92	45.90	0.000	0.000	603.83	0.00	0.00
26	97.00	RRH2x40-AWS	3	28.776	31.653	0.61	0.75	4.65	118.80	0.000	0.000	235.47	0.00	0.00
27	97.00	DBXNH-6565A-VTM	3	28.776	31.653	0.60	0.75	9.67	92.34	0.000	0.000	489.54	0.00	0.00
28	97.00	FD9R6004/2C-3L (3.1 lbs)	6	28.776	31.653	0.75	0.75	1.62	16.74	0.000	0.000	82.05	0.00	0.00
29	97.00	DB-T1-6Z-8AB-0Z	1	28.776	31.653	0.71	1.00	3.41	17.01	0.000	0.000	172.60	0.00	0.00
30	87.00	0208	3	28.124	30.936	0.52	0.80	2.14	53.46	0.000	0.000	105.79	0.00	0.00
31	87.00	4415	2	28.124	30.936	0.55	0.80	2.05	79.38	0.000	0.000	101.64	0.00	0.00
32	87.00	SF-SU7-2-96	3	28.124	30.936	0.56	0.75	25.48	1066.50	0.000	0.000	1261.28	0.00	0.00
33	87.00	ODI2-065R18K-GQ	3	28.124	30.936	0.56	0.80	8.15	67.77	0.000	0.000	403.31	0.00	0.00
							Totals:		**6,216.75**			**12,291.99**		

Total Applied Force Summary

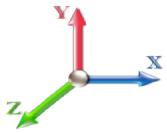
Structure:	CT13549-S-SBA		**Code:**	EIA/TIA-222-G	2/26/2019
Site Name:	Danbury 1		**Exposure:**	C	
Height:	139.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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		439.20	910.52	0.00	0.00
10.00		428.33	892.98	0.00	0.00
15.00		417.46	875.44	0.00	0.00
20.00		431.40	857.90	0.00	0.00
25.00		440.06	840.36	0.00	0.00
30.00		444.72	822.82	0.00	0.00
35.00		446.41	805.29	0.00	0.00
40.00		445.79	787.75	0.00	0.00
45.00		443.30	770.21	0.00	0.00
48.50		306.97	528.71	0.00	0.00
50.00		132.12	355.56	0.00	0.00
53.25		285.71	760.63	0.00	0.00
55.00		152.40	221.10	0.00	0.00
60.00		433.66	622.25	0.00	0.00
65.00		426.24	608.22	0.00	0.00
70.00		417.93	594.19	0.00	0.00
75.00		408.80	580.16	0.00	0.00
80.00		398.95	566.12	0.00	0.00
85.00		388.43	552.09	0.00	0.00
87.00	(11) attachments	2023.75	1484.02	0.00	0.00
90.00		224.48	319.37	0.00	0.00
95.00		365.61	521.06	0.00	0.00
97.00	(20) attachments	2310.01	850.79	0.00	0.00
98.75		122.93	155.70	0.00	0.00
100.00		88.14	167.04	0.00	0.00
102.00		139.51	264.07	0.00	0.00
105.00		205.63	216.88	0.00	0.00
107.00	(37) attachments	4661.90	2297.35	0.00	0.00
110.00		197.75	195.33	0.00	0.00
115.00		319.34	317.14	0.00	0.00
117.00	(7) attachments	1061.02	566.89	0.00	0.00
120.00		181.22	149.01	0.00	0.00
125.00		291.06	239.93	0.00	0.00
130.00		276.37	229.41	0.00	0.00
135.00		261.33	218.88	0.00	0.00
137.00	(15) attachments	2866.54	1784.26	0.00	0.00
139.00	(1) attachments	118.30	64.33	0.00	0.00
	Totals:	**23,002.77**	**22,993.75**	**0.00**	**0.00**

Calculated Forces

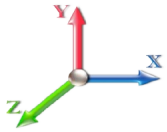
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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	-22.95	-23.05	0.00	-2117.9	0.00	2117.91	3003.53	1501.76	5797.25	2902.93	0.00	0.000	0.000	0.737
5.00	-21.95	-22.70	0.00	-2002.6	0.00	2002.67	2960.91	1480.45	5573.38	2790.83	0.12	-0.226	0.000	0.725
10.00	-20.97	-22.35	0.00	-1889.1	0.00	1889.19	2916.70	1458.35	5350.68	2679.32	0.48	-0.457	0.000	0.713
15.00	-20.00	-22.00	0.00	-1777.4	0.00	1777.46	2870.92	1435.46	5129.40	2568.51	1.09	-0.691	0.000	0.699
20.00	-19.06	-21.64	0.00	-1667.4	0.00	1667.45	2823.56	1411.78	4909.74	2458.52	1.94	-0.930	0.000	0.685
25.00	-18.14	-21.26	0.00	-1559.2	0.00	1559.25	2774.61	1387.31	4691.94	2349.46	3.04	-1.172	0.000	0.670
30.00	-17.24	-20.87	0.00	-1452.9	0.00	1452.94	2724.09	1362.04	4476.23	2241.44	4.40	-1.417	0.000	0.655
35.00	-16.35	-20.48	0.00	-1348.5	0.00	1348.58	2671.99	1335.99	4262.83	2134.58	6.02	-1.666	0.000	0.638
40.00	-15.49	-20.07	0.00	-1246.2	0.00	1246.20	2618.30	1309.15	4051.97	2029.00	7.90	-1.917	0.000	0.620
45.00	-14.67	-19.66	0.00	-1145.8	0.00	1145.82	2563.04	1281.52	3843.87	1924.79	10.04	-2.171	0.000	0.601
48.50	-14.11	-19.36	0.00	-1077.0	0.00	1077.01	2523.41	1261.71	3699.97	1852.74	11.70	-2.352	0.000	0.587
50.00	-13.71	-19.25	0.00	-1047.9	0.00	1047.97	2506.19	1253.10	3638.77	1822.09	12.46	-2.432	0.000	0.581
53.25	-12.92	-18.96	0.00	-985.42	0.00	985.42	1850.79	925.39	2677.47	1340.72	14.17	-2.601	0.000	0.742
55.00	-12.64	-18.84	0.00	-952.24	0.00	952.24	1837.85	918.92	2627.99	1315.95	15.14	-2.694	0.000	0.731
60.00	-11.94	-18.44	0.00	-858.04	0.00	858.04	1799.82	899.91	2487.54	1245.62	18.13	-3.000	0.000	0.696
65.00	-11.27	-18.04	0.00	-765.84	0.00	765.84	1760.21	880.10	2348.61	1176.05	21.43	-3.303	0.000	0.658
70.00	-10.61	-17.64	0.00	-675.64	0.00	675.64	1719.02	859.51	2211.45	1107.37	25.05	-3.602	0.000	0.617
75.00	-9.97	-17.25	0.00	-587.43	0.00	587.43	1676.25	838.13	2076.26	1039.67	28.98	-3.893	0.000	0.571
80.00	-9.35	-16.85	0.00	-501.19	0.00	501.19	1631.90	815.95	1943.29	973.09	33.21	-4.175	0.000	0.521
85.00	-8.78	-16.45	0.00	-416.93	0.00	416.93	1585.97	792.99	1812.75	907.72	37.72	-4.442	0.000	0.465
87.00	-7.43	-14.34	0.00	-384.02	0.00	384.02	1567.16	783.58	1761.26	881.94	39.60	-4.547	0.000	0.440
90.00	-7.08	-14.11	0.00	-341.01	0.00	341.01	1538.46	769.23	1684.87	843.69	42.51	-4.698	0.000	0.409
95.00	-6.55	-13.72	0.00	-270.46	0.00	270.46	1489.37	744.69	1559.88	781.10	47.55	-4.926	0.000	0.351
97.00	-5.89	-11.35	0.00	-243.02	0.00	243.02	1469.29	734.65	1510.75	756.50	49.63	-5.013	0.000	0.325
98.75	-5.73	-11.22	0.00	-223.15	0.00	223.15	1451.52	725.76	1468.18	735.18	51.48	-5.087	0.000	0.308
100.00	-5.56	-11.13	0.00	-209.13	0.00	209.13	1437.39	718.70	1436.71	719.42	52.81	-5.138	0.000	0.295
102.00	-5.29	-10.97	0.00	-186.87	0.00	186.87	990.34	495.17	991.38	496.43	54.98	-5.215	0.000	0.382
105.00	-5.08	-10.76	0.00	-153.95	0.00	153.95	971.88	485.94	945.01	473.21	58.29	-5.321	0.000	0.331
107.00	-3.22	-5.91	0.00	-132.44	0.00	132.44	959.26	479.63	914.39	457.88	60.53	-5.403	0.000	0.293
110.00	-3.03	-5.70	0.00	-114.72	0.00	114.72	939.85	469.93	868.93	435.11	63.96	-5.515	0.000	0.267
115.00	-2.73	-5.35	0.00	-86.24	0.00	86.24	906.24	453.12	794.52	397.85	69.82	-5.682	0.000	0.220
117.00	-2.27	-4.25	0.00	-75.53	0.00	75.53	892.36	446.18	765.27	383.21	72.21	-5.745	0.000	0.200
120.00	-2.13	-4.05	0.00	-62.79	0.00	62.79	871.06	435.53	722.01	361.54	75.84	-5.831	0.000	0.176
125.00	-1.92	-3.74	0.00	-42.53	0.00	42.53	834.29	417.15	651.64	326.30	82.01	-5.952	0.000	0.133
130.00	-1.71	-3.45	0.00	-23.81	0.00	23.81	791.03	395.51	580.02	290.44	88.28	-6.043	0.000	0.084
135.00	-1.52	-3.16	0.00	-6.58	0.00	6.58	739.97	369.98	507.20	253.97	94.63	-6.093	0.000	0.028
137.00	-0.05	-0.12	0.00	-0.25	0.00	0.25	719.55	359.77	479.43	240.07	97.18	-6.098	0.000	0.001
139.00	0.00	-0.12	0.00	0.00	0.00	0.00	699.12	349.56	452.45	226.56	99.73	-6.098	0.000	0.000

Wind Loading - Shaft

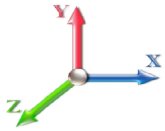
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

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

Dead Load Factor 1.20

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	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	20.773	24.93	141.7	368.1	1306.5
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	20.359	24.43	138.9	385.7	1300.7
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	19.916	23.90	135.9	392.1	1283.7
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	19.462	23.35	140.9	393.5	1261.8
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	19.000	22.80	144.1	392.1	1237.0
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	18.534	22.24	146.1	388.9	1210.3
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	18.064	21.68	147.1	384.2	1182.3
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	17.592	21.11	147.3	378.5	1153.2
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	5.00	17.119	20.54	147.0	371.9	1123.2
48.50	Bot - Section 2	1.00	1.09	6.608	7.27	0.00	1.200	1.559	3.50	11.699	14.04	102.0	256.9	768.9
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	1.50	5.005	6.01	43.9	110.9	502.3
53.25	Top - Section 1	1.00	1.11	6.739	7.41	0.00	1.200	1.574	3.25	10.699	12.84	95.2	237.0	1072.0
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	1.75	5.677	6.81	50.8	126.7	325.0
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	15.902	19.08	145.1	353.7	907.7
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	15.424	18.51	143.1	345.0	880.3
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	14.946	17.93	140.8	336.0	852.6
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	14.466	17.36	138.3	326.6	824.5
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	13.987	16.78	135.5	317.0	796.2
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	13.506	16.21	132.6	307.1	767.6
87.00	Appurtenance(s)	1.00	1.23	7.473	8.22	0.00	1.200	1.653	2.00	5.267	6.32	52.0	121.2	300.2
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	3.00	7.757	9.31	77.1	178.2	441.0
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	5.00	12.544	15.05	126.0	286.6	709.7
97.00	Appurtenance(s)	1.00	1.26	7.646	8.41	0.00	1.200	1.671	2.00	4.882	5.86	49.3	113.0	276.9
98.75	Bot - Section 3	1.00	1.26	7.675	8.44	0.00	1.200	1.674	1.75	4.209	5.05	42.6	97.5	238.6
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	1.25	3.010	3.61	30.6	70.0	245.2
102.00	Top - Section 2	1.00	1.27	7.727	8.50	0.00	1.200	1.679	2.00	4.753	5.70	48.5	110.3	386.3
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	3.00	6.985	8.38	71.7	161.5	336.6
107.00	Appurtenance(s)	1.00	1.28	7.805	8.59	0.00	1.200	1.687	2.00	4.560	5.47	47.0	106.0	219.8
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	3.00	6.696	8.04	69.4	155.0	321.6
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	10.775	12.93	112.7	247.3	513.7
117.00	Appurtenance(s)	1.00	1.31	7.954	8.75	0.00	1.200	1.702	2.00	4.174	5.01	43.8	97.1	199.8
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	3.00	6.117	7.34	64.6	141.6	291.4
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	9.810	11.77	104.4	224.7	463.1
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	5.00	9.327	11.19	100.1	213.2	437.6
135.00		1.00	1.35	8.197	9.02	0.00	1.200	1.727	5.00	8.844	10.61	95.7	201.6	411.9
137.00	Appurtenance(s)	1.00	1.35	8.222	9.04	0.00	1.200	1.729	2.00	3.402	4.08	36.9	78.7	159.0
139.00	Appurtenance(s)	1.00	1.36	8.247	9.07	0.00	1.200	1.732	2.00	3.324	3.99	36.2	76.9	154.8
								Totals:	**139.00**			**3,624.9**		**24,863.0**

Discrete Appurtenance Forces

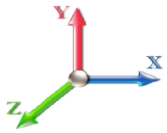
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

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

Dead Load Factor 1.20

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	139.00	6' Lightning rod	1	8.247	9.072	1.00	1.00	1.46	38.53	0.000	0.000	13.24	0.00	0.00
2	137.00	AIR 21 B4A/B12P	3	8.222	9.044	0.67	0.75	26.40	1300.38	0.000	0.000	238.77	0.00	0.00
3	137.00	S11B12	3	8.222	9.044	0.52	0.75	5.51	342.22	0.000	0.000	49.80	0.00	0.00
4	137.00	KRY 112 144/1	3	8.222	9.044	0.52	0.75	1.39	62.35	0.000	0.000	12.55	0.00	0.00
5	137.00	AIR 21, 1.3M, B2A B4P	3	8.222	9.044	0.65	0.75	13.89	830.61	0.000	0.000	125.60	0.00	0.00
6	137.00	T-Arms	3	8.222	9.044	0.45	0.90	20.14	1776.38	0.000	0.000	182.15	0.00	0.00
7	117.00	800 10504	3	7.954	8.749	0.54	0.75	8.28	193.22	0.000	0.000	72.42	0.00	0.00
8	117.00	742 351	3	7.954	8.749	0.46	0.75	10.04	304.26	0.000	0.000	87.87	0.00	0.00
9	117.00	Flush Mount	1	7.954	8.749	1.00	1.00	8.40	606.00	0.000	0.000	73.53	0.00	0.00
10	107.00	T-Arm Commscope	3	7.805	8.586	0.56	0.75	31.11	875.20	0.000	0.000	267.12	0.00	0.00
11	107.00	Collar Mount Commscope	1	7.805	8.586	1.00	1.00	13.44	398.01	0.000	0.000	115.36	0.00	0.00
12	107.00	RRUS-E2	3	7.805	8.586	0.52	0.75	3.48	416.30	0.000	0.000	29.87	0.00	0.00
13	107.00	DTMABP7819VG12A	3	7.805	8.586	0.50	0.75	2.84	121.24	0.000	0.000	24.38	0.00	0.00
14	107.00	DBC20056F1V1	3	7.805	8.586	0.60	0.75	1.30	55.05	0.000	0.000	11.13	0.00	0.00
15	107.00	EPBQ-652L8H6-L2	3	7.805	8.586	0.64	0.75	28.12	1074.08	0.000	0.000	241.45	0.00	0.00
16	107.00	OPA-65R-LCUU-H6	3	7.805	8.586	0.59	0.75	19.51	956.35	0.000	0.000	167.54	0.00	0.00
17	107.00	DC6-48-60-18-8F	3	7.805	8.586	0.67	0.67	4.31	240.69	0.000	0.000	37.05	0.00	0.00
18	107.00	RRUS A2	3	7.805	8.586	0.46	0.75	3.91	150.45	0.000	0.000	33.55	0.00	0.00
19	107.00	RRUS 12	3	7.805	8.586	0.52	0.75	6.05	483.44	0.000	0.000	51.91	0.00	0.00
20	107.00	RRUS-11 700MHz	3	7.805	8.586	0.57	0.75	5.38	439.28	0.000	0.000	46.22	0.00	0.00
21	107.00	RRUS 4449 B5/B12	3	7.805	8.586	0.52	0.75	6.71	647.28	0.000	0.000	57.62	0.00	0.00
22	107.00	RRUS-32	3	7.805	8.586	0.65	0.75	7.98	604.39	0.000	0.000	68.54	0.00	0.00
23	97.00	BXA-171063/12CF	3	7.646	8.410	0.63	0.75	13.30	247.01	0.000	0.000	111.88	0.00	0.00
24	97.00	Flush Mount	1	7.646	8.410	0.50	1.00	4.17	600.69	0.000	0.000	35.08	0.00	0.00
25	97.00	BXA-70063/6CF	3	7.646	8.410	0.52	0.75	16.09	346.39	0.000	0.000	135.32	0.00	0.00
26	97.00	RRH2x40-AWS	3	7.646	8.410	0.61	0.75	6.81	280.60	0.000	0.000	57.27	0.00	0.00
27	97.00	DBXNH-6565A-VTM	3	7.646	8.410	0.60	0.75	13.07	378.25	0.000	0.000	109.93	0.00	0.00
28	97.00	FD9R6004/2C-3L (3.1 lbs)	6	7.646	8.410	0.75	0.75	3.53	54.62	0.000	0.000	29.69	0.00	0.00
29	97.00	DB-T1-6Z-8AB-0Z	1	7.646	8.410	0.71	1.00	4.00	159.23	0.000	0.000	33.64	0.00	0.00
30	87.00	0208	3	7.473	8.220	0.52	0.80	2.87	148.65	0.000	0.000	23.62	0.00	0.00
31	87.00	4415	2	7.473	8.220	0.55	0.80	2.65	175.29	0.000	0.000	21.80	0.00	0.00
32	87.00	SF-SU7-2-96	3	7.473	8.220	0.56	0.75	55.80	2053.73	0.000	0.000	458.69	0.00	0.00
33	87.00	ODI2-065R18K-GQ	3	7.473	8.220	0.56	0.80	9.71	327.02	0.000	0.000	79.82	0.00	0.00
							Totals:		**16,687.17**			**3,104.37**		

Total Applied Force Summary

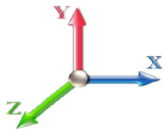
Structure:	CT13549-S-SBA		**Code:**	EIA/TIA-222-G	2/26/2019
Site Name:	Danbury 1		**Exposure:**	C	
Height:	139.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 19

IES Tower Engineering Solutions

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

Dead Load Factor 1.20

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		141.71	1582.17	0.00	0.00
10.00		138.89	1576.31	0.00	0.00
15.00		135.87	1559.32	0.00	0.00
20.00		140.87	1537.41	0.00	0.00
25.00		144.14	1512.63	0.00	0.00
30.00		146.10	1485.96	0.00	0.00
35.00		147.10	1457.91	0.00	0.00
40.00		147.34	1428.81	0.00	0.00
45.00		146.98	1398.88	0.00	0.00
48.50		102.04	961.81	0.00	0.00
50.00		43.94	584.97	0.00	0.00
53.25		95.18	1251.20	0.00	0.00
55.00		50.85	421.46	0.00	0.00
60.00		145.06	1183.33	0.00	0.00
65.00		143.09	1155.97	0.00	0.00
70.00		140.83	1128.24	0.00	0.00
75.00		138.30	1100.19	0.00	0.00
80.00		135.55	1071.84	0.00	0.00
85.00		132.57	1043.23	0.00	0.00
87.00	(11) attachments	635.88	3115.12	0.00	0.00
90.00		77.06	604.00	0.00	0.00
95.00		126.05	981.34	0.00	0.00
97.00	(20) attachments	562.08	2452.42	0.00	0.00
98.75		42.63	305.15	0.00	0.00
100.00		30.57	292.71	0.00	0.00
102.00		48.48	462.37	0.00	0.00
105.00		71.68	450.71	0.00	0.00
107.00	(37) attachments	1198.71	6757.67	0.00	0.00
110.00		69.39	415.44	0.00	0.00
115.00		112.72	670.11	0.00	0.00
117.00	(7) attachments	277.65	1365.80	0.00	0.00
120.00		64.56	340.30	0.00	0.00
125.00		104.44	544.58	0.00	0.00
130.00		100.12	519.05	0.00	0.00
135.00		95.69	493.40	0.00	0.00
137.00	(15) attachments	645.77	4503.50	0.00	0.00
139.00	(1) attachments	49.43	193.37	0.00	0.00
	Totals:	**6,729.29**	**47,908.67**	**0.00**	**0.00**

Calculated Forces

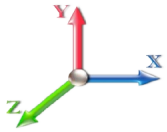
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

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 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	-47.90	-6.76	0.00	-625.83	0.00	625.83	3003.53	1501.76	5797.25	2902.93	0.00	0.000	0.000	0.232
5.00	-46.31	-6.67	0.00	-592.05	0.00	592.05	2960.91	1480.45	5573.38	2790.83	0.04	-0.067	0.000	0.228
10.00	-44.73	-6.58	0.00	-558.70	0.00	558.70	2916.70	1458.35	5350.68	2679.32	0.14	-0.135	0.000	0.224
15.00	-43.16	-6.49	0.00	-525.80	0.00	525.80	2870.92	1435.46	5129.40	2568.51	0.32	-0.204	0.000	0.220
20.00	-41.62	-6.40	0.00	-493.34	0.00	493.34	2823.56	1411.78	4909.74	2458.52	0.57	-0.275	0.000	0.215
25.00	-40.10	-6.30	0.00	-461.35	0.00	461.35	2774.61	1387.31	4691.94	2349.46	0.90	-0.347	0.000	0.211
30.00	-38.61	-6.19	0.00	-429.88	0.00	429.88	2724.09	1362.04	4476.23	2241.44	1.30	-0.419	0.000	0.206
35.00	-37.14	-6.08	0.00	-398.93	0.00	398.93	2671.99	1335.99	4262.83	2134.58	1.78	-0.493	0.000	0.201
40.00	-35.71	-5.96	0.00	-368.55	0.00	368.55	2618.30	1309.15	4051.97	2029.00	2.34	-0.567	0.000	0.195
45.00	-34.30	-5.84	0.00	-338.73	0.00	338.73	2563.04	1281.52	3843.87	1924.79	2.97	-0.642	0.000	0.189
48.50	-33.34	-5.75	0.00	-318.29	0.00	318.29	2523.41	1261.71	3699.97	1852.74	3.46	-0.696	0.000	0.185
50.00	-32.75	-5.72	0.00	-309.66	0.00	309.66	2506.19	1253.10	3638.77	1822.09	3.68	-0.719	0.000	0.183
53.25	-31.50	-5.63	0.00	-291.07	0.00	291.07	1850.79	925.39	2677.47	1340.72	4.19	-0.769	0.000	0.234
55.00	-31.07	-5.61	0.00	-281.22	0.00	281.22	1837.85	918.92	2627.99	1315.95	4.48	-0.797	0.000	0.231
60.00	-29.88	-5.49	0.00	-253.20	0.00	253.20	1799.82	899.91	2487.54	1245.62	5.36	-0.887	0.000	0.220
65.00	-28.72	-5.37	0.00	-225.75	0.00	225.75	1760.21	880.10	2348.61	1176.05	6.34	-0.976	0.000	0.208
70.00	-27.59	-5.25	0.00	-198.89	0.00	198.89	1719.02	859.51	2211.45	1107.37	7.41	-1.064	0.000	0.196
75.00	-26.48	-5.13	0.00	-172.63	0.00	172.63	1676.25	838.13	2076.26	1039.67	8.57	-1.150	0.000	0.182
80.00	-25.41	-5.01	0.00	-146.96	0.00	146.96	1631.90	815.95	1943.29	973.09	9.82	-1.233	0.000	0.167
85.00	-24.36	-4.88	0.00	-121.91	0.00	121.91	1585.97	792.99	1812.75	907.72	11.15	-1.311	0.000	0.150
87.00	-21.26	-4.18	0.00	-112.16	0.00	112.16	1567.16	783.58	1761.26	881.94	11.71	-1.342	0.000	0.141
90.00	-20.65	-4.11	0.00	-99.61	0.00	99.61	1538.46	769.23	1684.87	843.69	12.57	-1.386	0.000	0.132
95.00	-19.67	-3.98	0.00	-79.05	0.00	79.05	1489.37	744.69	1559.88	781.10	14.06	-1.452	0.000	0.114
97.00	-17.23	-3.36	0.00	-71.09	0.00	71.09	1469.29	734.65	1510.75	756.50	14.67	-1.478	0.000	0.106
98.75	-16.93	-3.31	0.00	-65.21	0.00	65.21	1451.52	725.76	1468.18	735.18	15.22	-1.499	0.000	0.100
100.00	-16.63	-3.28	0.00	-61.07	0.00	61.07	1437.39	718.70	1436.71	719.42	15.61	-1.514	0.000	0.096
102.00	-16.17	-3.23	0.00	-54.50	0.00	54.50	990.34	495.17	991.38	496.43	16.25	-1.537	0.000	0.126
105.00	-15.72	-3.15	0.00	-44.82	0.00	44.82	971.88	485.94	945.01	473.21	17.23	-1.568	0.000	0.111
107.00	-9.00	-1.77	0.00	-38.51	0.00	38.51	959.26	479.63	914.39	457.88	17.89	-1.592	0.000	0.094
110.00	-8.58	-1.70	0.00	-33.19	0.00	33.19	939.85	469.93	868.93	435.11	18.90	-1.624	0.000	0.085
115.00	-7.92	-1.57	0.00	-24.71	0.00	24.71	906.24	453.12	794.52	397.85	20.63	-1.672	0.000	0.071
117.00	-6.56	-1.26	0.00	-21.57	0.00	21.57	892.36	446.18	765.27	383.21	21.33	-1.690	0.000	0.064
120.00	-6.22	-1.18	0.00	-17.80	0.00	17.80	871.06	435.53	722.01	361.54	22.40	-1.715	0.000	0.056
125.00	-5.68	-1.07	0.00	-11.88	0.00	11.88	834.29	417.15	651.64	326.30	24.21	-1.749	0.000	0.043
130.00	-5.16	-0.95	0.00	-6.55	0.00	6.55	791.03	395.51	580.02	290.44	26.06	-1.774	0.000	0.029
135.00	-4.67	-0.84	0.00	-1.79	0.00	1.79	739.97	369.98	507.20	253.97	27.93	-1.788	0.000	0.013
137.00	-0.19	-0.06	0.00	-0.11	0.00	0.11	719.55	359.77	479.43	240.07	28.68	-1.789	0.000	0.001
139.00	0.00	-0.05	0.00	0.00	0.00	0.00	699.12	349.56	452.45	226.56	29.43	-1.789	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (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:	1.2D + 1.0E					**Iterations**	24
Gust Response Factor	1.10			**Sds**	0.23	**Ss**	0.21
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.09	**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37	**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		781.99	0.00	0.03	0.02	20.77	
10.00		762.50	0.01	0.05	0.03	27.98	
15.00		743.01	0.02	0.07	0.04	30.65	
20.00		723.53	0.04	0.07	0.04	31.45	
25.00		704.04	0.06	0.07	0.04	31.55	
30.00		684.55	0.09	0.07	0.04	31.49	
35.00		665.06	0.12	0.07	0.03	31.42	
40.00		645.57	0.16	0.07	0.03	31.24	
45.00		626.08	0.20	0.06	0.02	30.63	
48.50	Bot - Section 2	426.66	0.23	0.06	0.02	20.66	
50.00		326.16	0.24	0.06	0.02	15.62	
53.25	Top - Section 1	695.84	0.28	0.05	0.01	31.83	
55.00		165.27	0.30	0.05	0.01	7.26	
60.00		461.69	0.35	0.03	0.01	16.33	
65.00		446.10	0.41	0.01	0.01	9.32	
70.00		430.51	0.48	-0.01	0.01	0.46	
75.00		414.92	0.55	-0.03	0.01	-8.49	
80.00		399.33	0.63	-0.06	0.02	-15.44	
85.00		383.74	0.71	-0.09	0.03	-19.20	
87.00	Appurtenance(s)	1557.0	0.74	-0.10	0.04	-81.60	
90.00		219.02	0.79	-0.11	0.05	-11.74	
95.00		352.56	0.88	-0.12	0.08	-17.49	
97.00	Appurtenance(s)	854.76	0.92	-0.12	0.10	-39.30	
98.75	Bot - Section 3	117.53	0.95	-0.12	0.11	-4.92	
100.00		145.97	0.98	-0.11	0.12	-5.62	
102.00	Top - Section 2	230.01	1.02	-0.11	0.14	-7.38	
105.00		145.87	1.08	-0.08	0.17	-2.99	
107.00	Appurtenance(s)	2489.2	1.12	-0.06	0.20	-28.43	
110.00		138.86	1.18	-0.01	0.24	0.59	
115.00		222.07	1.29	0.11	0.33	7.93	
117.00	Appurtenance(s)	577.76	1.34	0.18	0.37	29.03	
120.00		124.83	1.41	0.30	0.44	9.25	
125.00		198.69	1.53	0.57	0.58	23.77	
130.00		187.00	1.65	0.95	0.74	32.24	
135.00		175.30	1.78	1.46	0.95	40.80	
137.00	Appurtenance(s)	1955.3	1.84	1.71	1.04	506.43	
139.00	Appurtenance(s)	71.48	1.89	1.98	1.14	20.48	
	Totals:	**20,249.8**				**796.5**	**Total Wind:** **23,002.8**

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

Calculated Forces

Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (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: 1.2D + 1.0E

Iterations 24

Gust Response Factor	1.10			**Sds**	0.23			**Ss**	0.21
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.09			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37	**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	-30.66	-1.04	0.00	-108.01	0.00	108.01	3003.53	1501.76	5797.25	2902.93		0.00	0.00	0.047
5.00	-29.44	-1.03	0.00	-102.80	0.00	102.80	2960.91	1480.45	5573.38	2790.83		0.01	-0.01	0.047
10.00	-28.25	-1.00	0.00	-97.67	0.00	97.67	2916.70	1458.35	5350.68	2679.32		0.02	-0.02	0.046
15.00	-27.09	-0.98	0.00	-92.65	0.00	92.65	2870.92	1435.46	5129.40	2568.51		0.06	-0.04	0.046
20.00	-25.94	-0.95	0.00	-87.75	0.00	87.75	2823.56	1411.78	4909.74	2458.52		0.10	-0.05	0.045
25.00	-24.82	-0.93	0.00	-82.99	0.00	82.99	2774.61	1387.31	4691.94	2349.46		0.16	-0.06	0.044
30.00	-23.72	-0.90	0.00	-78.36	0.00	78.36	2724.09	1362.04	4476.23	2241.44		0.23	-0.07	0.044
35.00	-22.65	-0.87	0.00	-73.87	0.00	73.87	2671.99	1335.99	4262.83	2134.58		0.31	-0.09	0.043
40.00	-21.60	-0.84	0.00	-69.52	0.00	69.52	2618.30	1309.15	4051.97	2029.00		0.41	-0.10	0.043
45.00	-20.57	-0.81	0.00	-65.30	0.00	65.30	2563.04	1281.52	3843.87	1924.79		0.53	-0.12	0.042
48.50	-19.87	-0.80	0.00	-62.45	0.00	62.45	2523.41	1261.71	3699.97	1852.74		0.61	-0.13	0.042
50.00	-19.39	-0.78	0.00	-61.25	0.00	61.25	2506.19	1253.10	3638.77	1822.09		0.65	-0.13	0.041
53.25	-18.38	-0.75	0.00	-58.72	0.00	58.72	1850.79	925.39	2677.47	1340.72		0.75	-0.14	0.054
55.00	-18.08	-0.75	0.00	-57.40	0.00	57.40	1837.85	918.92	2627.99	1315.95		0.80	-0.15	0.053
60.00	-17.25	-0.73	0.00	-53.68	0.00	53.68	1799.82	899.91	2487.54	1245.62		0.96	-0.17	0.053
65.00	-16.44	-0.73	0.00	-50.02	0.00	50.02	1760.21	880.10	2348.61	1176.05		1.15	-0.18	0.052
70.00	-15.65	-0.73	0.00	-46.38	0.00	46.38	1719.02	859.51	2211.45	1107.37		1.35	-0.20	0.051
75.00	-14.88	-0.73	0.00	-42.74	0.00	42.74	1676.25	838.13	2076.26	1039.67		1.58	-0.23	0.050
80.00	-14.12	-0.73	0.00	-39.08	0.00	39.08	1631.90	815.95	1943.29	973.09		1.82	-0.25	0.049
85.00	-13.39	-0.73	0.00	-35.42	0.00	35.42	1585.97	792.99	1812.75	907.72		2.09	-0.27	0.047
87.00	-11.41	-0.73	0.00	-33.95	0.00	33.95	1567.16	783.58	1761.26	881.94		2.21	-0.28	0.046
90.00	-10.98	-0.73	0.00	-31.77	0.00	31.77	1538.46	769.23	1684.87	843.69		2.38	-0.29	0.045
95.00	-10.29	-0.73	0.00	-28.13	0.00	28.13	1489.37	744.69	1559.88	781.10		2.70	-0.31	0.043
97.00	-9.15	-0.72	0.00	-26.68	0.00	26.68	1469.29	734.65	1510.75	756.50		2.83	-0.32	0.041
98.75	-8.94	-0.72	0.00	-25.41	0.00	25.41	1451.52	725.76	1468.18	735.18		2.95	-0.33	0.041
100.00	-8.72	-0.72	0.00	-24.51	0.00	24.51	1437.39	718.70	1436.71	719.42		3.04	-0.34	0.040
102.00	-8.37	-0.72	0.00	-23.06	0.00	23.06	990.34	495.17	991.38	496.43		3.18	-0.35	0.055
105.00	-8.08	-0.72	0.00	-20.90	0.00	20.90	971.88	485.94	945.01	473.21		3.41	-0.36	0.052
107.00	-5.02	-0.70	0.00	-19.46	0.00	19.46	959.26	479.63	914.39	457.88		3.56	-0.37	0.048
110.00	-4.75	-0.70	0.00	-17.35	0.00	17.35	939.85	469.93	868.93	435.11		3.80	-0.39	0.045
115.00	-4.33	-0.69	0.00	-13.83	0.00	13.83	906.24	453.12	794.52	397.85		4.22	-0.41	0.040
117.00	-3.58	-0.66	0.00	-12.44	0.00	12.44	892.36	446.18	765.27	383.21		4.39	-0.42	0.036
120.00	-3.38	-0.65	0.00	-10.46	0.00	10.46	871.06	435.53	722.01	361.54		4.66	-0.44	0.033
125.00	-3.06	-0.62	0.00	-7.21	0.00	7.21	834.29	417.15	651.64	326.30		5.13	-0.46	0.026
130.00	-2.75	-0.59	0.00	-4.09	0.00	4.09	791.03	395.51	580.02	290.44		5.62	-0.47	0.018
135.00	-2.46	-0.55	0.00	-1.14	0.00	1.14	739.97	369.98	507.20	253.97		6.13	-0.48	0.008
137.00	-0.09	-0.02	0.00	-0.04	0.00	0.04	719.55	359.77	479.43	240.07		6.33	-0.48	0.000
139.00	0.00	-0.02	0.00	0.00	0.00	0.00	699.12	349.56	452.45	226.56		6.53	-0.48	0.000

Seismic Segment Forces (Factored)

Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (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

Load Case:	0.9D + 1.0E					**Iterations**	23
Gust Response Factor	1.10			**Sds**	0.23	**Ss**	0.21
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09	**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37	**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		781.99	0.00	0.03	0.02	20.77	
10.00		762.50	0.01	0.05	0.03	27.98	
15.00		743.01	0.02	0.07	0.04	30.65	
20.00		723.53	0.04	0.07	0.04	31.45	
25.00		704.04	0.06	0.07	0.04	31.55	
30.00		684.55	0.09	0.07	0.04	31.49	
35.00		665.06	0.12	0.07	0.03	31.42	
40.00		645.57	0.16	0.07	0.03	31.24	
45.00		626.08	0.20	0.06	0.02	30.63	
48.50	Bot - Section 2	426.66	0.23	0.06	0.02	20.66	
50.00		326.16	0.24	0.06	0.02	15.62	
53.25	Top - Section 1	695.84	0.28	0.05	0.01	31.83	
55.00		165.27	0.30	0.05	0.01	7.26	
60.00		461.69	0.35	0.03	0.01	16.33	
65.00		446.10	0.41	0.01	0.01	9.32	
70.00		430.51	0.48	-0.01	0.01	0.46	
75.00		414.92	0.55	-0.03	0.01	-8.49	
80.00		399.33	0.63	-0.06	0.02	-15.44	
85.00		383.74	0.71	-0.09	0.03	-19.20	
87.00	Appurtenance(s)	1557.0	0.74	-0.10	0.04	-81.60	
90.00		219.02	0.79	-0.11	0.05	-11.74	
95.00		352.56	0.88	-0.12	0.08	-17.49	
97.00	Appurtenance(s)	854.76	0.92	-0.12	0.10	-39.30	
98.75	Bot - Section 3	117.53	0.95	-0.12	0.11	-4.92	
100.00		145.97	0.98	-0.11	0.12	-5.62	
102.00	Top - Section 2	230.01	1.02	-0.11	0.14	-7.38	
105.00		145.87	1.08	-0.08	0.17	-2.99	
107.00	Appurtenance(s)	2489.2	1.12	-0.06	0.20	-28.43	
110.00		138.86	1.18	-0.01	0.24	0.59	
115.00		222.07	1.29	0.11	0.33	7.93	
117.00	Appurtenance(s)	577.76	1.34	0.18	0.37	29.03	
120.00		124.83	1.41	0.30	0.44	9.25	
125.00		198.69	1.53	0.57	0.58	23.77	
130.00		187.00	1.65	0.95	0.74	32.24	
135.00		175.30	1.78	1.46	0.95	40.80	
137.00	Appurtenance(s)	1955.3	1.84	1.71	1.04	506.43	
139.00	Appurtenance(s)	71.48	1.89	1.98	1.14	20.48	
	Totals:	**20,249.8**				**796.5**	**Total Wind:** **23,002.8**

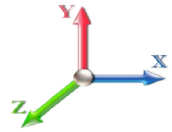
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (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 + 1.0E



Gust Response Factor	1.10			**Sds**	0.23	**Iterations**	23		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09	**Ss**	0.21		
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37	**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	-22.99	-1.04	0.00	-106.54	0.00	106.54	3003.53	1501.76	5797.25	2902.93		0.00	0.00	0.044
5.00	-22.08	-1.02	0.00	-101.34	0.00	101.34	2960.91	1480.45	5573.38	2790.83		0.01	-0.01	0.044
10.00	-21.19	-1.00	0.00	-96.22	0.00	96.22	2916.70	1458.35	5350.68	2679.32		0.02	-0.02	0.043
15.00	-20.31	-0.97	0.00	-91.22	0.00	91.22	2870.92	1435.46	5129.40	2568.51		0.06	-0.04	0.043
20.00	-19.46	-0.95	0.00	-86.36	0.00	86.36	2823.56	1411.78	4909.74	2458.52		0.10	-0.05	0.042
25.00	-18.62	-0.92	0.00	-81.63	0.00	81.63	2774.61	1387.31	4691.94	2349.46		0.15	-0.06	0.041
30.00	-17.79	-0.89	0.00	-77.05	0.00	77.05	2724.09	1362.04	4476.23	2241.44		0.22	-0.07	0.041
35.00	-16.99	-0.86	0.00	-72.60	0.00	72.60	2671.99	1335.99	4262.83	2134.58		0.31	-0.09	0.040
40.00	-16.20	-0.83	0.00	-68.30	0.00	68.30	2618.30	1309.15	4051.97	2029.00		0.41	-0.10	0.040
45.00	-15.43	-0.80	0.00	-64.15	0.00	64.15	2563.04	1281.52	3843.87	1924.79		0.52	-0.11	0.039
48.50	-14.90	-0.78	0.00	-61.34	0.00	61.34	2523.41	1261.71	3699.97	1852.74		0.61	-0.12	0.039
50.00	-14.54	-0.77	0.00	-60.16	0.00	60.16	2506.19	1253.10	3638.77	1822.09		0.64	-0.13	0.039
53.25	-13.78	-0.74	0.00	-57.67	0.00	57.67	1850.79	925.39	2677.47	1340.72		0.74	-0.14	0.050
55.00	-13.56	-0.73	0.00	-56.38	0.00	56.38	1837.85	918.92	2627.99	1315.95		0.79	-0.14	0.050
60.00	-12.94	-0.72	0.00	-52.72	0.00	52.72	1799.82	899.91	2487.54	1245.62		0.95	-0.16	0.050
65.00	-12.33	-0.71	0.00	-49.13	0.00	49.13	1760.21	880.10	2348.61	1176.05		1.13	-0.18	0.049
70.00	-11.74	-0.71	0.00	-45.57	0.00	45.57	1719.02	859.51	2211.45	1107.37		1.33	-0.20	0.048
75.00	-11.16	-0.71	0.00	-42.01	0.00	42.01	1676.25	838.13	2076.26	1039.67		1.55	-0.22	0.047
80.00	-10.59	-0.72	0.00	-38.44	0.00	38.44	1631.90	815.95	1943.29	973.09		1.79	-0.24	0.046
85.00	-10.04	-0.72	0.00	-34.86	0.00	34.86	1585.97	792.99	1812.75	907.72		2.06	-0.26	0.045
87.00	-8.55	-0.71	0.00	-33.43	0.00	33.43	1567.16	783.58	1761.26	881.94		2.17	-0.27	0.043
90.00	-8.23	-0.71	0.00	-31.29	0.00	31.29	1538.46	769.23	1684.87	843.69		2.35	-0.29	0.042
95.00	-7.71	-0.71	0.00	-27.73	0.00	27.73	1489.37	744.69	1559.88	781.10		2.66	-0.31	0.041
97.00	-6.86	-0.71	0.00	-26.31	0.00	26.31	1469.29	734.65	1510.75	756.50		2.79	-0.32	0.039
98.75	-6.71	-0.71	0.00	-25.07	0.00	25.07	1451.52	725.76	1468.18	735.18		2.91	-0.33	0.039
100.00	-6.54	-0.71	0.00	-24.19	0.00	24.19	1437.39	718.70	1436.71	719.42		2.99	-0.33	0.038
102.00	-6.28	-0.71	0.00	-22.77	0.00	22.77	990.34	495.17	991.38	496.43		3.13	-0.34	0.052
105.00	-6.06	-0.71	0.00	-20.65	0.00	20.65	971.88	485.94	945.01	473.21		3.35	-0.35	0.050
107.00	-3.76	-0.69	0.00	-19.23	0.00	19.23	959.26	479.63	914.39	457.88		3.50	-0.37	0.046
110.00	-3.57	-0.69	0.00	-17.15	0.00	17.15	939.85	469.93	868.93	435.11		3.74	-0.38	0.043
115.00	-3.25	-0.68	0.00	-13.68	0.00	13.68	906.24	453.12	794.52	397.85		4.15	-0.41	0.038
117.00	-2.68	-0.65	0.00	-12.31	0.00	12.31	892.36	446.18	765.27	383.21		4.32	-0.42	0.035
120.00	-2.53	-0.64	0.00	-10.35	0.00	10.35	871.06	435.53	722.01	361.54		4.59	-0.43	0.032
125.00	-2.29	-0.62	0.00	-7.14	0.00	7.14	834.29	417.15	651.64	326.30		5.05	-0.45	0.025
130.00	-2.06	-0.58	0.00	-4.05	0.00	4.05	791.03	395.51	580.02	290.44		5.53	-0.47	0.017
135.00	-1.84	-0.54	0.00	-1.13	0.00	1.13	739.97	369.98	507.20	253.97		6.03	-0.48	0.007
137.00	-0.06	-0.02	0.00	-0.04	0.00	0.04	719.55	359.77	479.43	240.07		6.23	-0.48	0.000
139.00	0.00	-0.02	0.00	0.00	0.00	0.00	699.12	349.56	452.45	226.56		6.43	-0.48	0.000

Wind Loading - Shaft

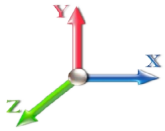
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 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	0.85	7.442	8.19	221.08	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	215.67	0.650	0.000	5.00	19.738	12.83	105.0	0.0	782.0
10.00		1.00	0.85	7.442	8.19	210.27	0.650	0.000	5.00	19.250	12.51	102.4	0.0	762.5
15.00		1.00	0.85	7.442	8.19	204.86	0.650	0.000	5.00	18.761	12.19	99.8	0.0	743.0
20.00		1.00	0.90	7.896	8.69	205.45	0.650	0.000	5.00	18.273	11.88	103.2	0.0	723.5
25.00		1.00	0.95	8.276	9.10	204.63	0.650	0.000	5.00	17.784	11.56	105.2	0.0	704.0
30.00		1.00	0.98	8.600	9.46	202.79	0.650	0.000	5.00	17.295	11.24	106.3	0.0	684.5
35.00		1.00	1.01	8.883	9.77	200.20	0.650	0.000	5.00	16.807	10.92	106.8	0.0	665.1
40.00		1.00	1.04	9.137	10.05	197.04	0.650	0.000	5.00	16.318	10.61	106.6	0.0	645.6
45.00		1.00	1.07	9.366	10.30	193.44	0.650	0.000	5.00	15.830	10.29	106.0	0.0	626.1
48.50	Bot - Section 2	1.00	1.09	9.515	10.47	190.69	0.650	0.000	3.50	10.790	7.01	73.4	0.0	426.7
50.00		1.00	1.09	9.576	10.53	189.46	0.650	0.000	1.50	4.614	3.00	31.6	0.0	326.2
53.25	Top - Section 1	1.00	1.11	9.704	10.67	186.71	0.650	0.000	3.25	9.847	6.40	68.3	0.0	695.8
55.00		1.00	1.12	9.770	10.75	187.86	0.650	0.000	1.75	5.217	3.39	36.4	0.0	165.3
60.00		1.00	1.14	9.951	10.95	183.34	0.650	0.000	5.00	14.575	9.47	103.7	0.0	461.7
65.00		1.00	1.16	10.120	11.13	178.59	0.650	0.000	5.00	14.087	9.16	101.9	0.0	446.1
70.00		1.00	1.17	10.279	11.31	173.63	0.650	0.000	5.00	13.598	8.84	99.9	0.0	430.5
75.00		1.00	1.19	10.430	11.47	168.50	0.650	0.000	5.00	13.109	8.52	97.8	0.0	414.9
80.00		1.00	1.21	10.572	11.63	163.20	0.650	0.000	5.00	12.621	8.20	95.4	0.0	399.3
85.00		1.00	1.22	10.708	11.78	157.76	0.650	0.000	5.00	12.132	7.89	92.9	0.0	383.7
87.00	Appurtenance(s)	1.00	1.23	10.761	11.84	155.55	0.650	0.000	2.00	4.716	3.07	36.3	0.0	149.1
90.00		1.00	1.24	10.838	11.92	152.19	0.650	0.000	3.00	6.928	4.50	53.7	0.0	219.0
95.00		1.00	1.25	10.962	12.06	146.50	0.650	0.000	5.00	11.155	7.25	87.4	0.0	352.6
97.00	Appurtenance(s)	1.00	1.26	11.010	12.11	144.19	0.650	0.000	2.00	4.325	2.81	34.0	0.0	136.7
98.75	Bot - Section 3	1.00	1.26	11.051	12.16	142.16	0.650	0.000	1.75	3.720	2.42	29.4	0.0	117.5
100.00		1.00	1.27	11.081	12.19	140.70	0.650	0.000	1.25	2.660	1.73	21.1	0.0	146.0
102.00	Top - Section 2	1.00	1.27	11.127	12.24	138.35	0.650	0.000	2.00	4.193	2.73	33.4	0.0	230.0
105.00		1.00	1.28	11.195	12.31	136.94	0.650	0.000	3.00	6.143	3.99	49.2	0.0	145.9
107.00	Appurtenance(s)	1.00	1.28	11.240	12.36	134.56	0.650	0.000	2.00	3.998	2.60	32.1	0.0	94.9
110.00		1.00	1.29	11.305	12.44	130.95	0.650	0.000	3.00	5.850	3.80	47.3	0.0	138.9
115.00		1.00	1.30	11.412	12.55	124.87	0.650	0.000	5.00	9.359	6.08	76.4	0.0	222.1
117.00	Appurtenance(s)	1.00	1.31	11.453	12.60	122.42	0.650	0.000	2.00	3.607	2.34	29.5	0.0	85.6
120.00		1.00	1.32	11.514	12.67	118.71	0.650	0.000	3.00	5.264	3.42	43.3	0.0	124.8
125.00		1.00	1.33	11.614	12.78	112.47	0.650	0.000	5.00	8.382	5.45	69.6	0.0	198.7
130.00		1.00	1.34	11.710	12.88	106.15	0.650	0.000	5.00	7.893	5.13	66.1	0.0	187.0
135.00		1.00	1.35	11.803	12.98	99.77	0.650	0.000	5.00	7.405	4.81	62.5	0.0	175.3
137.00	Appurtenance(s)	1.00	1.35	11.840	13.02	97.19	0.650	0.000	2.00	2.825	1.84	23.9	0.0	66.8
139.00	Appurtenance(s)	1.00	1.36	11.876	13.06	94.61	0.650	0.000	2.00	2.747	1.79	23.3	0.0	65.0
								Totals:	**139.00**			**2,561.3**		**13,342.3**

Discrete Appurtenance Forces

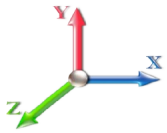
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 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	139.00	6' Lightning rod	1	11.876	13.064	1.00	1.00	0.38	6.50	0.000	0.000	4.96	0.00	0.00
2	137.00	AIR 21 B4A/B12P	3	11.840	13.024	0.67	0.75	23.11	378.00	0.000	0.000	300.97	0.00	0.00
3	137.00	S11B12	3	11.840	13.024	0.52	0.75	4.46	153.00	0.000	0.000	58.05	0.00	0.00
4	137.00	KRY 112 144/1	3	11.840	13.024	0.52	0.75	0.65	33.00	0.000	0.000	8.41	0.00	0.00
5	137.00	AIR 21, 1.3M, B2A B4P	3	11.840	13.024	0.65	0.75	11.78	274.50	0.000	0.000	153.48	0.00	0.00
6	137.00	T-Arms	3	11.840	13.024	0.45	0.90	10.80	1050.00	0.000	0.000	140.66	0.00	0.00
7	117.00	800 10504	3	11.453	12.598	0.54	0.75	5.41	52.80	0.000	0.000	68.17	0.00	0.00
8	117.00	742 351	3	11.453	12.598	0.46	0.75	7.38	89.40	0.000	0.000	93.03	0.00	0.00
9	117.00	Flush Mount	1	11.453	12.598	1.00	1.00	5.00	350.00	0.000	0.000	62.99	0.00	0.00
10	107.00	T-Arm Commscope	3	11.240	12.364	0.56	0.75	16.88	534.00	0.000	0.000	208.64	0.00	0.00
11	107.00	Collar Mount Commscope	1	11.240	12.364	1.00	1.00	5.00	122.40	0.000	0.000	61.82	0.00	0.00
12	107.00	RRUS-E2	3	11.240	12.364	0.52	0.75	2.60	231.00	0.000	0.000	32.13	0.00	0.00
13	107.00	DTMABP7819VG12A	3	11.240	12.364	0.50	0.75	1.72	57.60	0.000	0.000	21.25	0.00	0.00
14	107.00	DBC20056F1V1	3	11.240	12.364	0.60	0.75	0.74	19.80	0.000	0.000	9.12	0.00	0.00
15	107.00	EPBQ-652L8H6-L2	3	11.240	12.364	0.64	0.75	18.47	218.40	0.000	0.000	228.42	0.00	0.00
16	107.00	OPA-65R-LCUU-H6	3	11.240	12.364	0.59	0.75	17.17	240.00	0.000	0.000	212.29	0.00	0.00
17	107.00	DC6-48-60-18-8F	3	11.240	12.364	0.67	0.67	2.95	95.40	0.000	0.000	36.53	0.00	0.00
18	107.00	RRUS A2	3	11.240	12.364	0.46	0.75	2.59	63.60	0.000	0.000	32.08	0.00	0.00
19	107.00	RRUS 12	3	11.240	12.364	0.52	0.75	4.96	174.00	0.000	0.000	61.34	0.00	0.00
20	107.00	RRUS-11 700MHz	3	11.240	12.364	0.57	0.75	4.31	152.10	0.000	0.000	53.28	0.00	0.00
21	107.00	RRUS 4449 B5/B12	3	11.240	12.364	0.52	0.75	2.60	255.00	0.000	0.000	32.13	0.00	0.00
22	107.00	RRUS-32	3	11.240	12.364	0.65	0.75	7.58	231.00	0.000	0.000	93.66	0.00	0.00
23	97.00	BXA-171063/12CF	3	11.010	12.111	0.63	0.75	9.03	45.00	0.000	0.000	109.41	0.00	0.00
24	97.00	Flush Mount	1	11.010	12.111	0.50	1.00	2.50	350.00	0.000	0.000	30.28	0.00	0.00
25	97.00	BXA-70063/6CF	3	11.010	12.111	0.52	0.75	11.92	51.00	0.000	0.000	144.40	0.00	0.00
26	97.00	RRH2x40-AWS	3	11.010	12.111	0.61	0.75	4.65	132.00	0.000	0.000	56.31	0.00	0.00
27	97.00	DBXNH-6565A-VTM	3	11.010	12.111	0.60	0.75	9.67	102.60	0.000	0.000	117.06	0.00	0.00
28	97.00	FD9R6004/2C-3L (3.1 lbs)	6	11.010	12.111	0.75	0.75	1.62	18.60	0.000	0.000	19.62	0.00	0.00
29	97.00	DB-T1-6Z-8AB-0Z	1	11.010	12.111	0.71	1.00	3.41	18.90	0.000	0.000	41.27	0.00	0.00
30	87.00	0208	3	10.761	11.837	0.52	0.80	2.14	59.40	0.000	0.000	25.30	0.00	0.00
31	87.00	4415	2	10.761	11.837	0.55	0.80	2.05	88.20	0.000	0.000	24.31	0.00	0.00
32	87.00	SF-SU7-2-96	3	10.761	11.837	0.56	0.75	25.48	1185.00	0.000	0.000	301.61	0.00	0.00
33	87.00	ODI2-065R18K-GQ	3	10.761	11.837	0.56	0.80	8.15	75.30	0.000	0.000	96.45	0.00	0.00
							Totals:		**6,907.50**			**2,939.42**		

Total Applied Force Summary

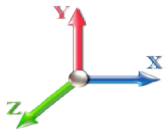
Structure:	CT13549-S-SBA		**Code:**	EIA/TIA-222-G	2/26/2019
Site Name:	Danbury 1		**Exposure:**	C	
Height:	139.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 27

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	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		105.03	1011.69	0.00	0.00
10.00		102.43	992.20	0.00	0.00
15.00		99.83	972.71	0.00	0.00
20.00		103.16	953.23	0.00	0.00
25.00		105.23	933.74	0.00	0.00
30.00		106.35	914.25	0.00	0.00
35.00		106.75	894.76	0.00	0.00
40.00		106.60	875.27	0.00	0.00
45.00		106.01	855.78	0.00	0.00
48.50		73.41	587.45	0.00	0.00
50.00		31.60	395.07	0.00	0.00
53.25		68.32	845.15	0.00	0.00
55.00		36.44	245.67	0.00	0.00
60.00		103.70	691.39	0.00	0.00
65.00		101.93	675.80	0.00	0.00
70.00		99.94	660.21	0.00	0.00
75.00		97.76	644.62	0.00	0.00
80.00		95.40	629.03	0.00	0.00
85.00		92.89	613.44	0.00	0.00
87.00	(11) attachments	483.95	1648.91	0.00	0.00
90.00		53.68	354.86	0.00	0.00
95.00		87.43	578.96	0.00	0.00
97.00	(20) attachments	552.40	945.32	0.00	0.00
98.75		29.40	173.00	0.00	0.00
100.00		21.08	185.60	0.00	0.00
102.00		33.36	293.41	0.00	0.00
105.00		49.17	240.97	0.00	0.00
107.00	(37) attachments	1114.81	2552.61	0.00	0.00
110.00		47.29	217.04	0.00	0.00
115.00		76.36	352.37	0.00	0.00
117.00	(7) attachments	253.72	629.88	0.00	0.00
120.00		43.33	165.57	0.00	0.00
125.00		69.60	266.59	0.00	0.00
130.00		66.09	254.90	0.00	0.00
135.00		62.49	243.20	0.00	0.00
137.00	(15) attachments	685.48	1982.51	0.00	0.00
139.00	(1) attachments	28.29	71.48	0.00	0.00
	Totals:	**5,500.72**	**25,548.61**	**0.00**	**0.00**

Calculated Forces

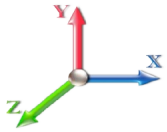
Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

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	-25.55	-5.51	0.00	-509.00	0.00	509.00	3003.53	1501.76	5797.25	2902.93	0.00	0.000	0.000	0.184
5.00	-24.53	-5.43	0.00	-481.44	0.00	481.44	2960.91	1480.45	5573.38	2790.83	0.03	-0.054	0.000	0.181
10.00	-23.53	-5.35	0.00	-454.28	0.00	454.28	2916.70	1458.35	5350.68	2679.32	0.12	-0.110	0.000	0.178
15.00	-22.55	-5.27	0.00	-427.54	0.00	427.54	2870.92	1435.46	5129.40	2568.51	0.26	-0.166	0.000	0.174
20.00	-21.60	-5.19	0.00	-401.19	0.00	401.19	2823.56	1411.78	4909.74	2458.52	0.47	-0.224	0.000	0.171
25.00	-20.66	-5.10	0.00	-375.26	0.00	375.26	2774.61	1387.31	4691.94	2349.46	0.73	-0.282	0.000	0.167
30.00	-19.74	-5.01	0.00	-349.78	0.00	349.78	2724.09	1362.04	4476.23	2241.44	1.06	-0.341	0.000	0.163
35.00	-18.84	-4.91	0.00	-324.75	0.00	324.75	2671.99	1335.99	4262.83	2134.58	1.45	-0.401	0.000	0.159
40.00	-17.96	-4.82	0.00	-300.18	0.00	300.18	2618.30	1309.15	4051.97	2029.00	1.90	-0.461	0.000	0.155
45.00	-17.10	-4.72	0.00	-276.09	0.00	276.09	2563.04	1281.52	3843.87	1924.79	2.42	-0.522	0.000	0.150
48.50	-16.51	-4.65	0.00	-259.56	0.00	259.56	2523.41	1261.71	3699.97	1852.74	2.82	-0.566	0.000	0.147
50.00	-16.11	-4.62	0.00	-252.58	0.00	252.58	2506.19	1253.10	3638.77	1822.09	3.00	-0.585	0.000	0.145
53.25	-15.27	-4.56	0.00	-237.55	0.00	237.55	1850.79	925.39	2677.47	1340.72	3.41	-0.626	0.000	0.185
55.00	-15.02	-4.53	0.00	-229.58	0.00	229.58	1837.85	918.92	2627.99	1315.95	3.64	-0.649	0.000	0.183
60.00	-14.32	-4.44	0.00	-206.94	0.00	206.94	1799.82	899.91	2487.54	1245.62	4.36	-0.722	0.000	0.174
65.00	-13.64	-4.34	0.00	-184.76	0.00	184.76	1760.21	880.10	2348.61	1176.05	5.16	-0.795	0.000	0.165
70.00	-12.98	-4.25	0.00	-163.05	0.00	163.05	1719.02	859.51	2211.45	1107.37	6.03	-0.867	0.000	0.155
75.00	-12.33	-4.16	0.00	-141.81	0.00	141.81	1676.25	838.13	2076.26	1039.67	6.98	-0.938	0.000	0.144
80.00	-11.70	-4.06	0.00	-121.03	0.00	121.03	1631.90	815.95	1943.29	973.09	8.00	-1.006	0.000	0.132
85.00	-11.08	-3.97	0.00	-100.71	0.00	100.71	1585.97	792.99	1812.75	907.72	9.09	-1.070	0.000	0.118
87.00	-9.44	-3.46	0.00	-92.78	0.00	92.78	1567.16	783.58	1761.26	881.94	9.54	-1.096	0.000	0.111
90.00	-9.09	-3.40	0.00	-82.40	0.00	82.40	1538.46	769.23	1684.87	843.69	10.24	-1.132	0.000	0.104
95.00	-8.51	-3.31	0.00	-65.38	0.00	65.38	1489.37	744.69	1559.88	781.10	11.46	-1.187	0.000	0.089
97.00	-7.57	-2.74	0.00	-58.76	0.00	58.76	1469.29	734.65	1510.75	756.50	11.96	-1.208	0.000	0.083
98.75	-7.40	-2.71	0.00	-53.96	0.00	53.96	1451.52	725.76	1468.18	735.18	12.40	-1.226	0.000	0.079
100.00	-7.21	-2.69	0.00	-50.57	0.00	50.57	1437.39	718.70	1436.71	719.42	12.73	-1.238	0.000	0.075
102.00	-6.92	-2.65	0.00	-45.20	0.00	45.20	990.34	495.17	991.38	496.43	13.25	-1.257	0.000	0.098
105.00	-6.68	-2.60	0.00	-37.25	0.00	37.25	971.88	485.94	945.01	473.21	14.05	-1.283	0.000	0.086
107.00	-4.15	-1.43	0.00	-32.05	0.00	32.05	959.26	479.63	914.39	457.88	14.59	-1.303	0.000	0.074
110.00	-3.94	-1.38	0.00	-27.77	0.00	27.77	939.85	469.93	868.93	435.11	15.42	-1.330	0.000	0.068
115.00	-3.58	-1.30	0.00	-20.88	0.00	20.88	906.24	453.12	794.52	397.85	16.83	-1.370	0.000	0.056
117.00	-2.96	-1.03	0.00	-18.29	0.00	18.29	892.36	446.18	765.27	383.21	17.41	-1.385	0.000	0.051
120.00	-2.80	-0.98	0.00	-15.20	0.00	15.20	871.06	435.53	722.01	361.54	18.29	-1.406	0.000	0.045
125.00	-2.53	-0.91	0.00	-10.30	0.00	10.30	834.29	417.15	651.64	326.30	19.78	-1.435	0.000	0.035
130.00	-2.28	-0.83	0.00	-5.77	0.00	5.77	791.03	395.51	580.02	290.44	21.29	-1.457	0.000	0.023
135.00	-2.03	-0.77	0.00	-1.59	0.00	1.59	739.97	369.98	507.20	253.97	22.83	-1.470	0.000	0.009
137.00	-0.07	-0.03	0.00	-0.06	0.00	0.06	719.55	359.77	479.43	240.07	23.44	-1.471	0.000	0.000
139.00	0.00	-0.03	0.00	0.00	0.00	0.00	699.12	349.56	452.45	226.56	24.06	-1.471	0.000	0.000

Final Analysis Summary

Structure:	CT13549-S-SBA	**Code:**	EIA/TIA-222-G	2/26/2019	
Site Name:	Danbury 1	**Exposure:**	C		
Height:	139.00 (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

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	23.1	0.00	30.61	0.00	0.00	2141.27
0.9D + 1.6W 97 mph Wind	23.0	0.00	22.95	0.00	0.00	2117.91
1.2D + 1.0Di + 1.0Wi 50 mph Wind	6.8	0.00	47.90	0.00	0.00	625.83
1.2D + 1.0E	1.0	0.00	30.66	0.00	0.00	108.01
0.9D + 1.0E	1.0	0.00	22.99	0.00	0.00	106.54
1.0D + 1.0W 60 mph Wind	5.5	0.00	25.55	0.00	0.00	509.00

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	-17.50	-19.18	0.00	-1001.6	0.00	-1001.6	1850.79	925.39	2677.47	1340.72	53.25	0.757
0.9D + 1.6W 97 mph Wind	-12.92	-18.96	0.00	-985.42	0.00	-985.42	1850.79	925.39	2677.47	1340.72	53.25	0.742
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-31.50	-5.63	0.00	-291.07	0.00	-291.07	1850.79	925.39	2677.47	1340.72	53.25	0.234
1.2D + 1.0E	-8.37	-0.72	0.00	-23.06	0.00	-23.06	990.34	495.17	991.38	496.43	102.00	0.055
0.9D + 1.0E	-6.28	-0.71	0.00	-22.77	0.00	-22.77	990.34	495.17	991.38	496.43	102.00	0.052
1.0D + 1.0W 60 mph Wind	-15.27	-4.56	0.00	-237.55	0.00	-237.55	1850.79	925.39	2677.47	1340.72	53.25	0.185

Base Plate Summary

Structure:	CT13549-S-SB		**Code:**	EIA/TIA-222-G	2/26/2019
Site Name:	Danbury 1		**Exposure:**	C	
Height:	139.00 (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

Reactions		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	50.00	**Bolt Circle:**	53.50
Moment (kip-ft):	2074.00	**Width (in):**	51.50	**Number Bolts:**	12.00
Axial (kip):	21.70	**Style:**	Clipped	**Bolt Type:**	2.25" 18J
Shear (kip):	20.70	**Polygon Sides:**	4.00	**Bolt Diameter (in):**	2.25
Analysis		**Clip Length (in):**	9.00	**Yield (ksi):**	75.00
Moment (kip-ft):	2141.27	**Effective Len (in):**	9.88	**Ultimate (ksi):**	100.00
Axial (kip):	47.90	**Moment (kip-in):**	514.41	**Arrangement:**	Clustered
Shear (kip):	23.06	**Allow Stress (ksi):**	67.50	**Cluster Dist (in):**	6.00
		Applied Stress (ksi):	0.00	**Start Angle (deg):**	45.00
Moment Design %:	103.24	**Stress Ratio:**	0.61	Compression	
				Force (kip):	164.09
				Allowable (kip):	260.00
				Ratio:	0.65
				Tension	
				Force (kip):	156.10
				Allowable (kip):	260.00
				Ratio:	0.62

Monopole Mat Foundation Design

			Date: 2/26/2019
Customer Name:	Dish Network	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	139
Site Number:	CT13549-S-SBA	**Engineer Name:**	J. Chen
Engr. Number:	70488	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

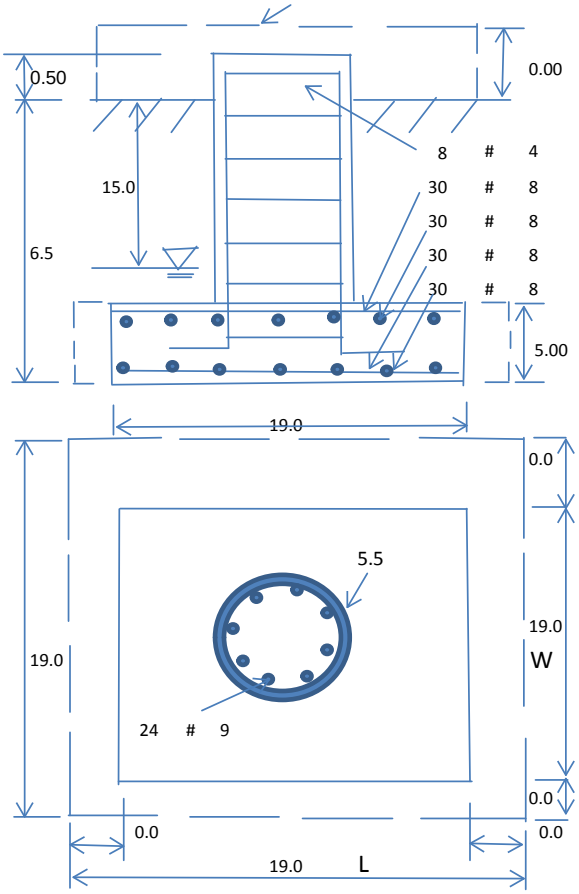
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	30.6	Shear Force (Kips):	23.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2141.2
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	5.5	Depth of Base BG (ft.):	6.5
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	5.00
Length of Pad (ft.):	19	Width of Pad (ft.):	19
Final Length of pad (ft)	19.0	Final width of pad (ft):	19.0
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:	24	Tie Spacing (in):	12.0	
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):	30	Qty. of Rebar in Pad (W):	30	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	115.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	15.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	8600	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	Yes	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.):	505.86	Total Dry Soil Weight (Kips):	58.17
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	58.17	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1852.52	Total Dry Concrete Weight (Kips):	277.88
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	277.88	Total Vertical Load on Base (Kips):	366.65

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	3455	<	Allowable Factored Soil Bearing (psf): 6450	0.54	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	3163.9	>	Design Factored Momont (kips-ft): 2118	0.67	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.49	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):	3146.1 >	Design Factored Moment (Mu, Kips-F	2187.4	0.70	OK!
Calculated Shear Capacity (Kips):	430.2 >	Design Factored Shear (Kips):	23.1	0.05	OK!
Calculated Tension Capacity (Tn, Kips):	1296.0 >	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	6006.2 >	Design Factored Axial Load (Pu Kips):	30.6	0.01	OK!
Moment & Axial Strength Combination:	0.70 OK!	Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.007	Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:					
One-Way Design Shear Capacity (L-Direction, Kips):	1222.1 >	One-Way Factored Shear (L-D. Kips):	88.6	0.07	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1222.1 >	One-Way Factored Shear (W-D., Kips)	88.6	0.07	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	768.9 >	One-Way Factored Shear (C-C, Kips):	92.6	0.12	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0018 OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0018		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5927.9 >	Moment at Bottom (L-Dir. K-Ft):	696.9	0.12	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5927.9 >	Moment at Bottom (W-Dir. K-Ft):	696.9	0.12	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	8347.7 >	Moment at Bottom (C-C Dir. K-Ft):	985.6	0.12	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0018 OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0018		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	5927.9 >	Moment at the top (L-Dir K-Ft):	320.7	0.05	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	5927.9 >	Moment at the top (W-Dir K-Ft):	320.7	0.05	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	8347.7 >	Moment at the top (C-C Dir. K-Ft):	301.3	0.04	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:					
Moment transferred by punching shear:	856.5 k-ft.	Max. factored shear stress v_{u_CD}:		2.7	Psi
Max. factored shear stress v_{u_AB}:	4.6 Psi	Factored shear Strength ϕv_n:		189.7	Psi
Max. factored shear stress v_u:	4.6 Psi	Check Usage of Punching Shear Capacity:		0.02	OK!

Radio Frequency Emissions Analysis Report

Dish Wireless Proposed Facility

Site ID: CT0100004B

SBA Danbury
52 Stadley Rough Road
Danbury, CT 06811

April 1, 2019

Centerline Communications Project Number: 950033-006

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**19.69 %**

April 1, 2019

Dish Wireless
9601 South Meriden Blvd
Englewood, CO 80112

Emissions Analysis for Site: **CT0100004B – SBA Danbury**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed Dish Wireless facility located at **52 Stadley Rough Road, Danbury, 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 **52 Stadley Rough Road, Danbury, 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	87
B	1	Comba ODI2-065R18K-GQ	87
C	1	Comba ODI2-065R18K-GQ	87

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	3.22
						Sector A Composite MPE%	**3.22**
Antenna B1	Comba ODI2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	3.22
						Sector B Composite MPE%	**3.22**
Antenna C1	Comba ODI2-065R18K-GQ	1900 MHz (PCS) - H Block / Band 70 (2000 to 2020 MHz)	15.65	4	160	5,876.52	3.22
						Sector C Composite MPE%	**3.22**

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	**3.22 %**
T-Mobile	2.27 %
AT&T	7.90 %
Clearwire	0.18 %
MetroPCS	0.39 %
Verizon Wireless	5.73 %
Site Total MPE %:	**19.69 %**

Table 4: All Carrier MPE Contributions

Dish Wireless Sector A Total:	3.22 %
Dish Wireless Sector B Total:	3.22 %
Dish Wireless Sector C Total:	3.22 %
Site Total:	19.69 %

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	87	16.10	1900 MHz (PCS) - H Block	1000	1.61%
Dish Wireless Band 70 (2000 to 2020 MHz) LTE	2	1,469.13	87	16.10	Band 70 (2000 to 2020 MHz)	1000	1.61%
						Total:	**3.22%**

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.

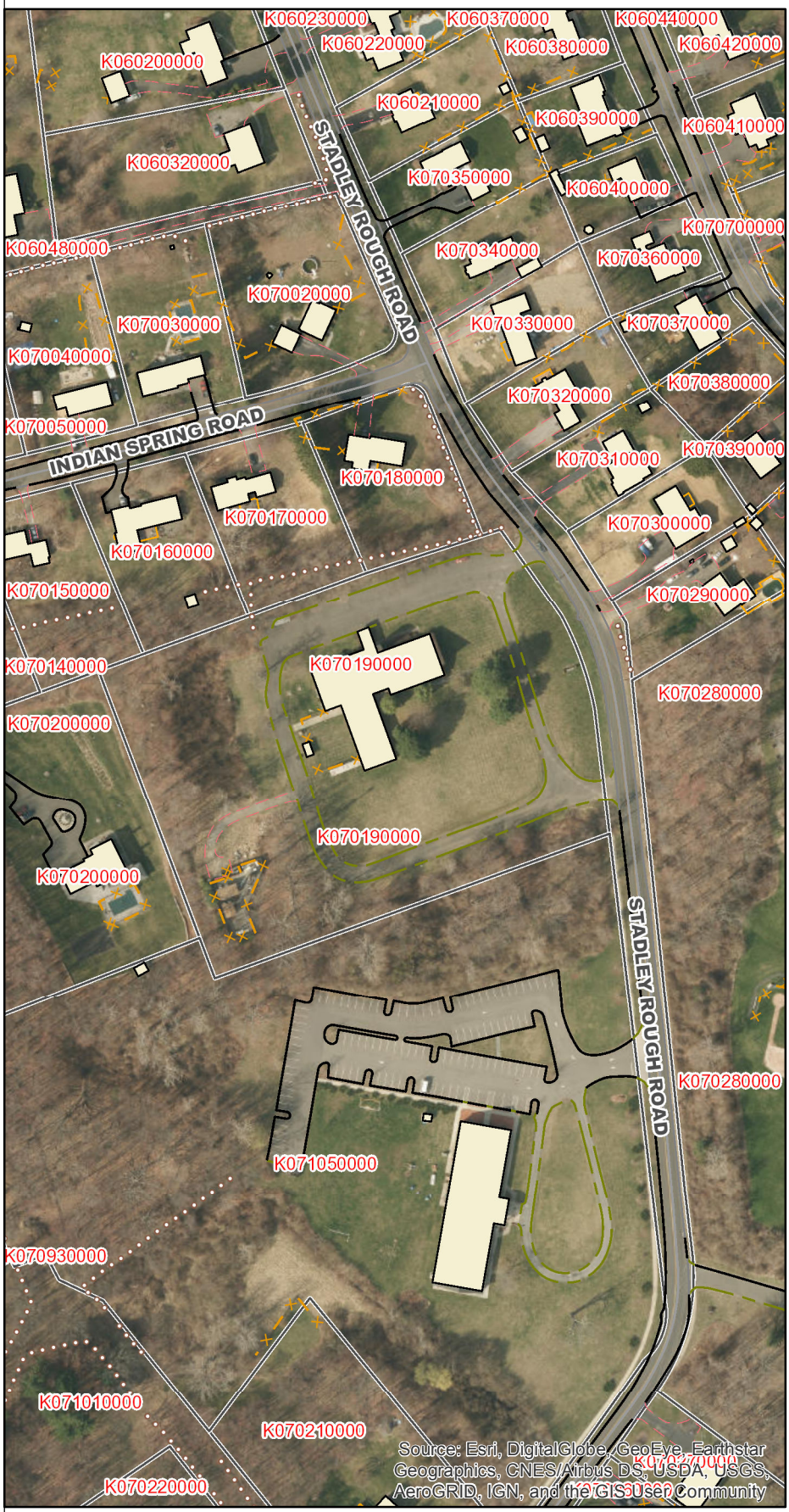
The anticipated maximum composite contributions from the Dish Wireless facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

DISH WIRELESS Sector	Power Density Value (%)
Sector A:	3.22 %
Sector B:	3.22 %
Sector C:	3.22 %
Dish Wireless Maximum Total (Per sector):	3.22 %
Site Total:	19.69 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **19.69 %** 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



Not a legal survey.

52 STADLEY ROUGH RD

Location	52 STADLEY ROUGH RD	**Mblu**	K07/ / 19/ /
Acct#		**Owner**	CHRIST THE SHEPHERD CHURCH PCA
Assessment	$1,400,200	**Appraisal**	$2,000,200
PID	23658	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$1,482,100	$518,100	$2,000,200
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$1,037,500	$362,700	$1,400,200

Owner of Record

Owner	CHRIST THE SHEPHERD CHURCH PCA	**Sale Price**	$450,000
Co-Owner		**Book & Page**	1948/ 939
Address	52 STADLEY ROUGH RD DANBURY, CT 06811	**Sale Date**	07/25/2007
		Instrument	25

Ownership History

Ownership History				
Owner	**Sale Price**	**Book & Page**	**Instrument**	**Sale Date**
CHRIST THE SHEPHERD CHURCH PCA	$450,000	1948/ 939	25	07/25/2007
CANDLEWOOD BAPTIST CHURCH	$0	0510/0346		01/24/1972

Building Information

Building 1 : Section 1

Year Built:	1997
Living Area:	11,320
Replacement Cost:	$1,540,478
Building Percent Good:	85
Replacement Cost Less Depreciation:	$1,309,400

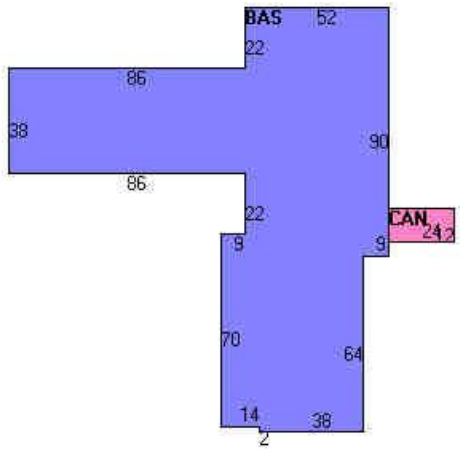
Building Attributes

Field	Description
STYLE	Churches
MODEL	Ind/Comm
Grade	Good
Stories:	1
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shngl.
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Air-Duc
AC Type	Central
Bldg Use	Church
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	200I
Heat/AC	HEAT/AC PKGS
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL & WL
Rooms/Prtns	AVERAGE
Wall Height	12
% Comn Wall	0

Building Photo

(http://images.vgsi.com/photos2/DanburyCTPhotos//\00\02\81/2

Building Layout



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Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	11,320	11,320
CAN	Canopy	288	0
		11,608	11,320

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	918
Description	Church

Land Line Valuation

Size (Acres)	4.85
Frontage	0

Zone	RA40	**Depth**	0
Neighborhood	3000	**Assessed Value**	$362,700
Alt Land Appr	No	**Appraised Value**	$518,100
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving-Asphalt			20000 S.F.	$21,000	1
SHD1	Shed-Avg			128 S.F.	$1,100	1
FN3	Fence 3			160 L.F.	$600	1
CEL	Cell Tower			1 UNITS	$150,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$1,482,100	$518,100	$2,000,200
2016	$1,340,100	$499,700	$1,839,800
2015	$1,340,100	$499,700	$1,839,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$1,037,500	$362,700	$1,400,200
2016	$938,100	$349,800	$1,287,900
2015	$938,100	$349,800	$1,287,900

52 STADLEY ROUGH RD

Location	52 STADLEY ROUGH RD	**Mblu**	K07/ / 19/ 1/
Acct#	1	**Owner**	CHRIST THE SHEPHERD CHURCH PCA
Assessment	$173,800	**Appraisal**	$248,300
PID	128447	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$232,200	$16,100	$248,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$162,500	$11,300	$173,800

Owner of Record

Owner	CHRIST THE SHEPHERD CHURCH PCA	**Sale Price**	$450,000
Co-Owner		**Book & Page**	1948/ 939
Address	52 STADLEY ROUGH RD DANBURY, CT 06811	**Sale Date**	07/25/2007
		Instrument	25

Ownership History

Ownership History				
Owner	**Sale Price**	**Book & Page**	**Instrument**	**Sale Date**
CHRIST THE SHEPHERD CHURCH PCA	$450,000	1948/ 939	25	07/25/2007

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**

Style	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Fireplaces	
Whirlpool	
Addn'l Kitchen	
Bsm Gar	
Fin Bsm Area	
Fin Bsm Qual	
Nhbd	
MH Park	

Building Photo

(http://images.vgsi.com/photos2/DanburyCTPhotos//default.jpg)

Building Layout

(http://images.vgsi.com/photos2/DanburyCTPhotos//Sketches/12

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
UST	Unf. Storage	3,616	0
		3,616	0

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	200V	**Size (Acres)**	0
Description	Commercial MDL-00	**Frontage**	0
Zone	RA40	**Depth**	0
Neighborhood	3000	**Assessed Value**	$11,300
Alt Land Appr	No	**Appraised Value**	$16,100
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
	CELL TOWER AREA			3498	$232,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$232,200	$16,100	$248,300
2016	$232,200	$16,100	$248,300
2015	$232,200	$16,100	$248,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$162,500	$11,300	$173,800
2016	$162,500	$11,300	$173,800
2015	$162,500	$11,300	$173,800

DISH WIRELESS FIRST TIME INSTALL CONSTRUCTION DRAWINGS

DISH WIRELESS SITE ID:

CT0100004B

TOWER OWNER SITE ID:

CT13549-S

SITE ADDRESS:

52 STADLEY ROUGH ROAD
DANBURY, CT 06811
(FAIRFIELD COUNTY)

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
RAD CENTER:	87'-0"
TOWER LATITUDE:	41.43310211 N
TOWER LONGITUDE:	73.431916 W
ZONING JURISDICTION:	CITY OF DANBURY
COUNTY:	FAIRFIELD
POWER COMPANY:	EVERSOURCE 800-592-2000
TELEPHONE COMPANY:	FRONTIER 800-921-8101

PROJECT DIRECTORY

TOWER OWNER:	SBA COMMUNICATIONS 8051 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: (800) 487-7483
APPLICANT:	DISH WIRELESS 9601 S MERIDIAN BLVD ENGLEWOOD, CO 80112 PHONE: (866) 624-6874
SITE DESIGNER:	HUDSON DESIGN GROUP, LLC. 45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845 PHONE: (978) 557-5553 FAX: (978) 336-5586

GENERAL NOTES

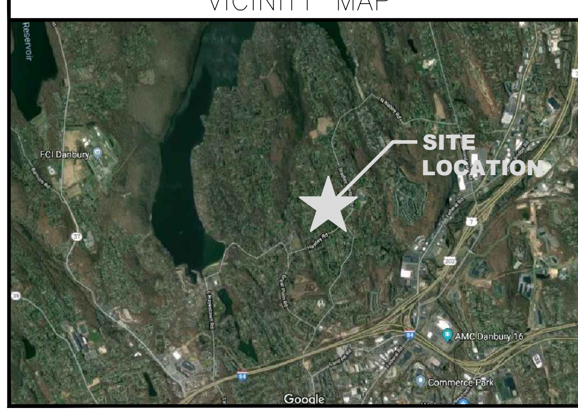
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION, THEREFORE HANDICAP ACCESS IS NOT REQUIRED. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH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

UNDERGROUND SERVICE ALERT

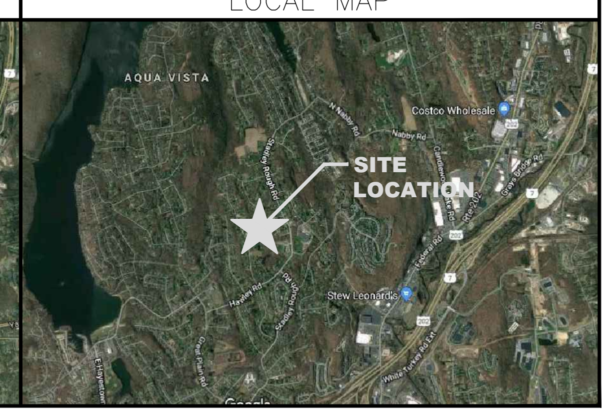
CALL 811

48 HOURS BEFORE YOU DIG

VICINITY MAP



LOCAL MAP



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:

- INTERNATIONAL BUILDING CODE, 2015 WITH 2018 CONNECTICUT STATE BUILDING CODE AMENDMENTS
- ANSI/TIA/EIA-222-G
- NFPA 70-2017 – LIGHTNING PROTECTION CODE
- NATIONAL ELECTRICAL CODE – NEC 2017

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

PLANS PREPARED FOR:

DISH WIRELESS

PLANS PREPARED BY:

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

DRAWN BY: RP

CHECKED BY: HC

APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:

CT0100004B

TOWER OWNER SITE ID:

CT13549-S

SITE ADDRESS:

52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1

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 OWNER HEREIN SHALL BE CONSTRUED TO MEAN THE CARRIER 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 OWNER 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 OWNER 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 OWNER 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 OWNER 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 OWNER TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DOCUMENTS.
   e. PERFORM WORK DURING OWNER'S PREFERRED HOURS TO AVOID DISTURBING NORMAL BUSINESS.
   f. PROVIDE FALL PROTECTION IN ACCORDANCE WITH FEDERAL, STATE, LOCAL, AND OWNER 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 OWNER.
   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 OWNER AND INSTALLED BY CONTRACTOR, UNLESS NOTED OTHERWISE.

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

13. DOCUMENT ALL CHANGES MADE IN THE FIELD BY MARKING UP THE APPROVED CONSTRUCTION DRAWINGS AND SUBMITTING THE REDLINED SET TO OWNER 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

SCOPE OF WORK

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) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (3) PROPOSED ANTENNA MOUNTS (1 PER SECTOR)
- INSTALL PROPOSED JUMPERS
- INSTALL (8) PROPOSED RRUs
- INSTALL (1) PROPOSED HYBRID CABLE
- INSTALL (1) PROPOSED CABLE LADDER (IF APPLICABLE)
- INSTALL (1) PROPOSED METAL PLATFORM WITH CANOPY FOR GROUND EQUIPMENT
- INSTALL (1) PROPOSED ICE BRIDGE (IF APPLICABLE)
- INSTALL (1) PROPOSED BBU IN CABINET
- INSTALL (1) PROPOSED PPC CABINET MOUNTED TO PROPOSED H-FRAME
- INSTALL (1) PROPOSED SURGE SUPPRESSION DEVICE
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED RBS CHASSIS IN PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED BASEBAND UNIT IN PROPOSED RBS CHASSIS
- INSTALL (1) PROPOSED POWER CONDUIT FROM PLATFORM TO MEET-ME-POINT DESIGNATED BY POWER COMPANY
- INSTALL (1) PROPOSED TELCO CONDUIT FROM PLATFORM TO MEET-ME-POINT DESIGNATED BY TELCO PROVIDER
- INSTALL (1) PROPOSED NEMA4 TELCO-FIBER BOX MOUNTED TO PROPOSED H-FRAME
- INSTALL (1) PROPOSED GPS ANTENNA WITH CABLE IN CONDUIT
- INSTALL (1) PROPOSED PIPE MAST
- INSTALL (1) PROPOSED DISH ANTENNA (IF APPLICABLE)

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 #: 297724

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 AND ANY ASSOCIATED MODIFICATIONS HAVE BEEN FOLLOWED AND COMPLETED AS REQUIRED TO SUPPORT THE EQUIPMENT ASSOCIATED WITH THIS PROJECT.

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HDG HUDSON Design Group LLC
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N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
GENERAL NOTES

SHEET NUMBER:
GN-1

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 OWNER 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 OWNER IF ANY UNUSUAL CONDITIONS ARE ENCOUNTERED.
3. FILL AND SLAB BASE MATERIAL SHALL BE 3/4" MINUS 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	($\geq$ #6 BARS)	2"
FORMED SURFACES EXPOSED TO EARTH OR WEATHER	($\leq$ #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 E70 XX 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 FDH INFRASTRUCTURE SERVICES, LLC.

SPECIAL INSPECTIONS:

1. WHEN REQUIRED, PROVIDE SPECIAL INSPECTIONS PERFORMED BY AN INDEPENDENT INSPECTOR, APPROVED BY OWNER'S REPRESENTATIVE AND THE LOCAL JURISDICTION.
2. THE SPECIAL INSPECTOR SHALL PROVIDE A COPY OF THE REPORT TO THE OWNER'S REPRESENTATIVE, STRUCTURAL ENGINEER, CONTRACTOR, AND BUILDING OFFICIAL.

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

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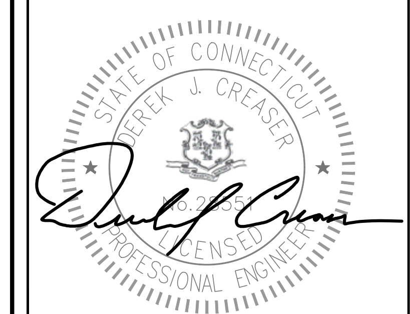

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TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
GENERAL NOTES

SHEET NUMBER:
GN-2

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.

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HUDSON Design Group LLC

45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845

TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 29854
LICENSED PROFESSIONAL ENGINEER

DRAWN BY:	RP
CHECKED BY:	HC
APPV'D:	AT

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:

CT0100004B

TOWER OWNER SITE ID:

CT13549-S

SITE ADDRESS:

52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:

ELECTRICAL NOTES

SHEET NUMBER:

EN-1

ELECTRICAL NOTES (CONTINUED)

COORDINATION:

A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER–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 RIGID PVC SCHEDULE 80 CONDUITS FOR ALL RISERS, OR WHERE RMC OTHERWISE NOTED.
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

PLANS PREPARED BY:

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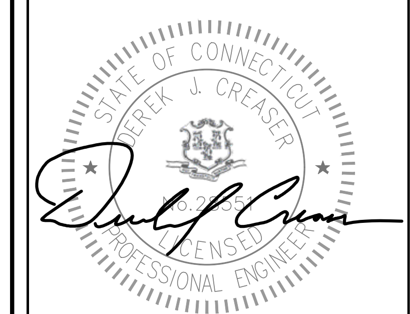

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CHECKED BY: HC
APPV'D: AT

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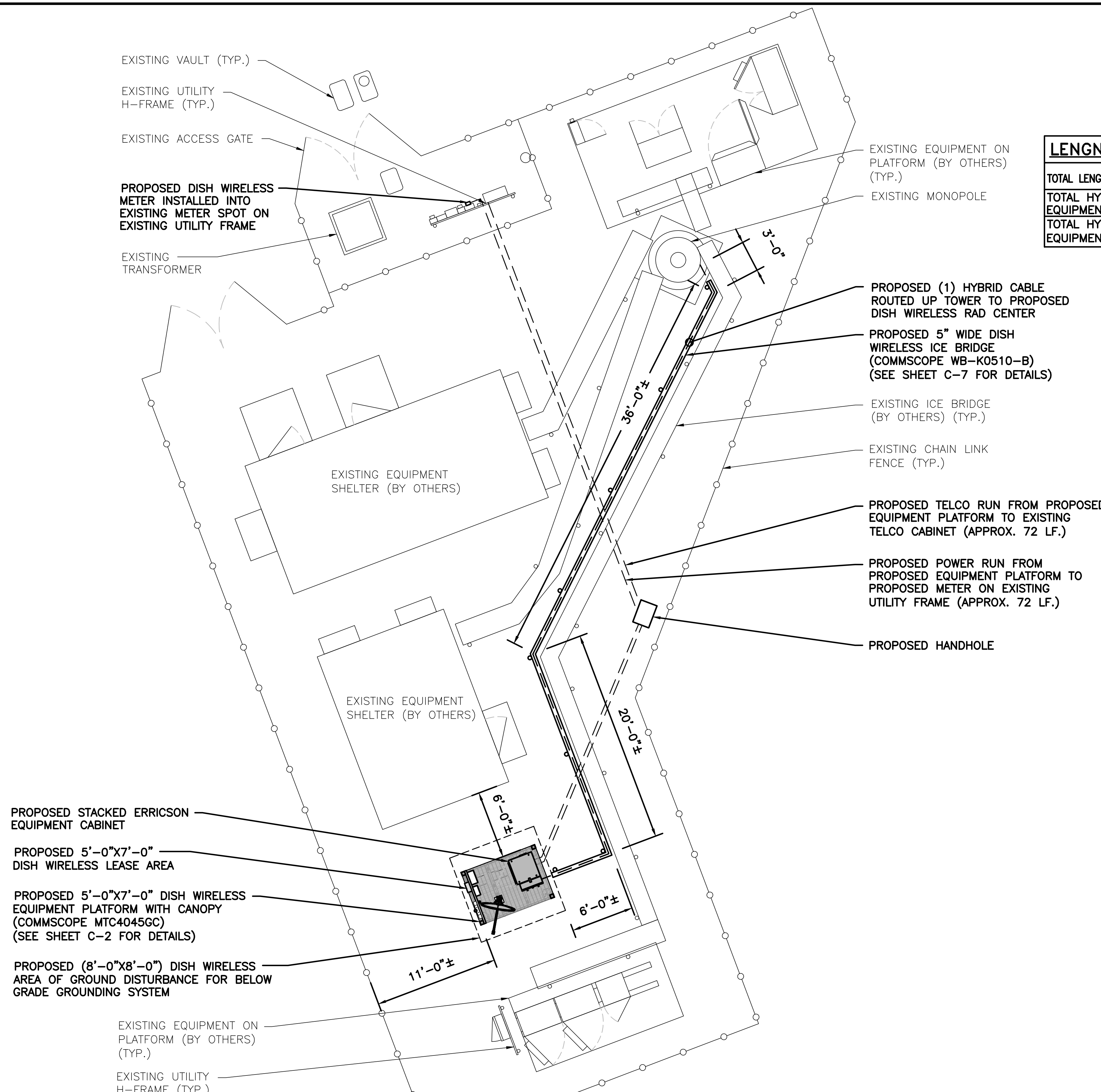
SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
ELECTRICAL NOTES

SHEET NUMBER:
EN-2



LENGNTHS:	
TOTAL LENGTH OF CABLE WITHIN MONOPOLE (APPROX.)	87'
TOTAL HYBRID FLEX RUN FROM PROPOSED EQUIPMENT AREA TO TOWER	65'
TOTAL HYBRID FLEX RUN FROM PROPOSED EQUIPMENT PLATFORM TO EACH SECTOR (+10%)	170'

NOTES:

ALL SITE INFORMATION HAS BEEN PROVIDED BY THE CLIENT. HUDSON DESIGN GROUP, LLC IS NOT LIABLE AND DOES NOT ASSUME RESPONSIBILITY FOR THIS CONTENT.

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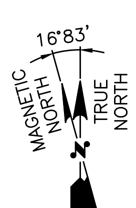

COMPOUND PLAN
SCALE: 3/32"=1'-0"

NOTE:

1. WHEN APPLICABLE, LTE BACKHAUL ANTENNA LOCATION TO BE VERIFIED IN THE FIELD AT TIME OF CONSTRUCTION.

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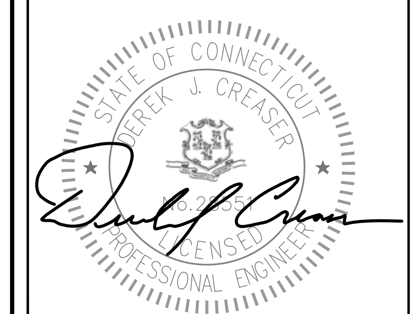

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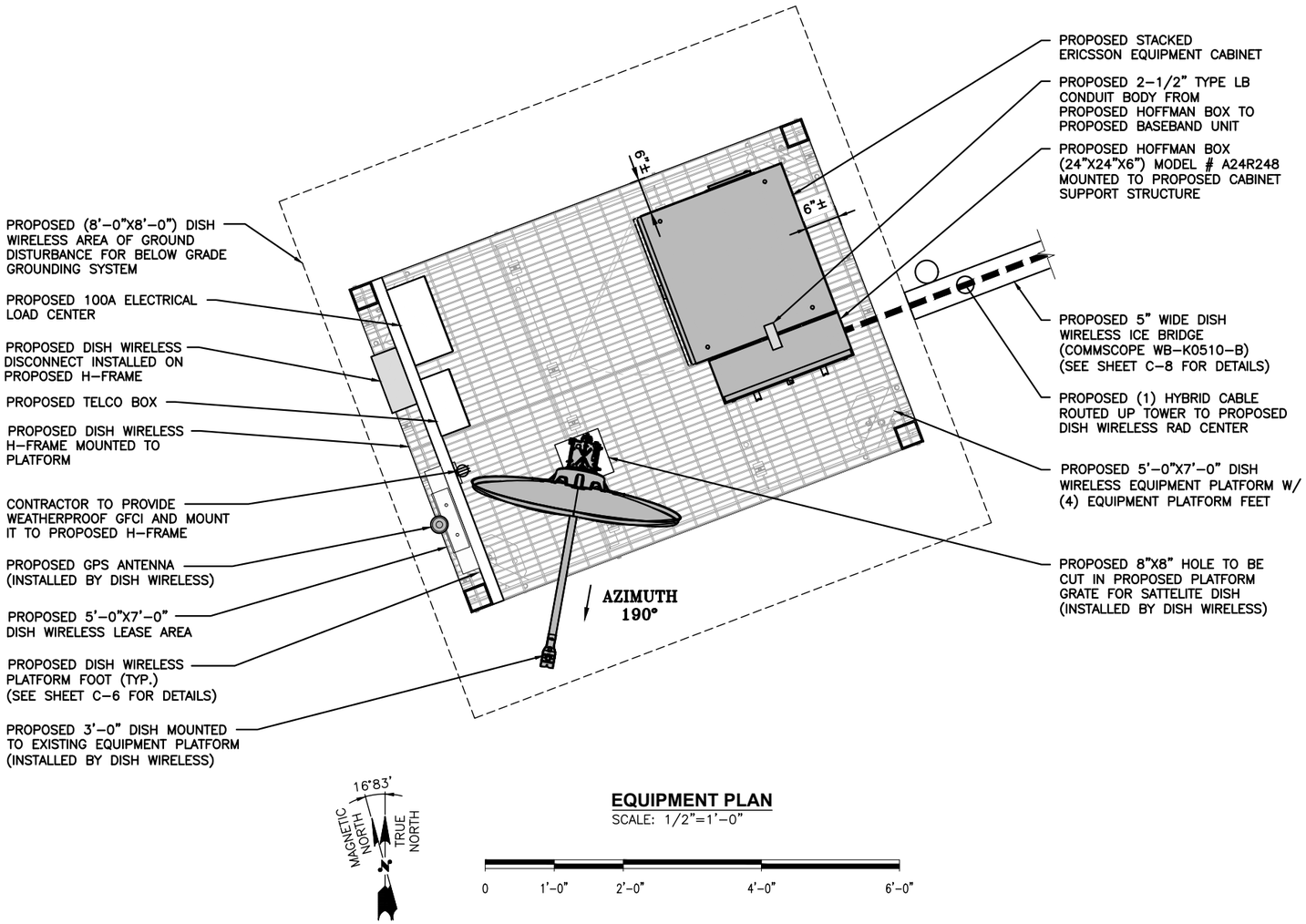
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
COMPOUND PLAN

SHEET NUMBER:
C-1

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).



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

0 1'-0" 2'-0" 4'-0" 6'-0"

PROPOSED MTC4045GC PLATFORM CANOPY NOT SHOWN FOR CLARITY. SEE SHEET C-8 FOR DETAILS

NOTES:

1. WHEN APPLICABLE, LTE BACKHAUL ANTENNA LOCATION TO BE VERIFIED IN THE FIELD AT TIME OF CONSTRUCTION.
2. WHEN APPLICABLE, DISH WIRELESS SUPPORT PIPE SHALL BE POSITIONED AS TO AFFORD FUTURE DISH A CLEAR, UNOBSTRUCTED VIEW OF THE SOUTHERN SKY.
3. CONTRACTOR TO PROVIDE 4MIL FABRIC BENEATH PROPOSED DISH WIRELESS EQUIPMENT PLATFORM AND LEGS IF NONE PRESENT.

SBA SITE #: CT13549-S

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 25854
LICENSED PROFESSIONAL ENGINEER

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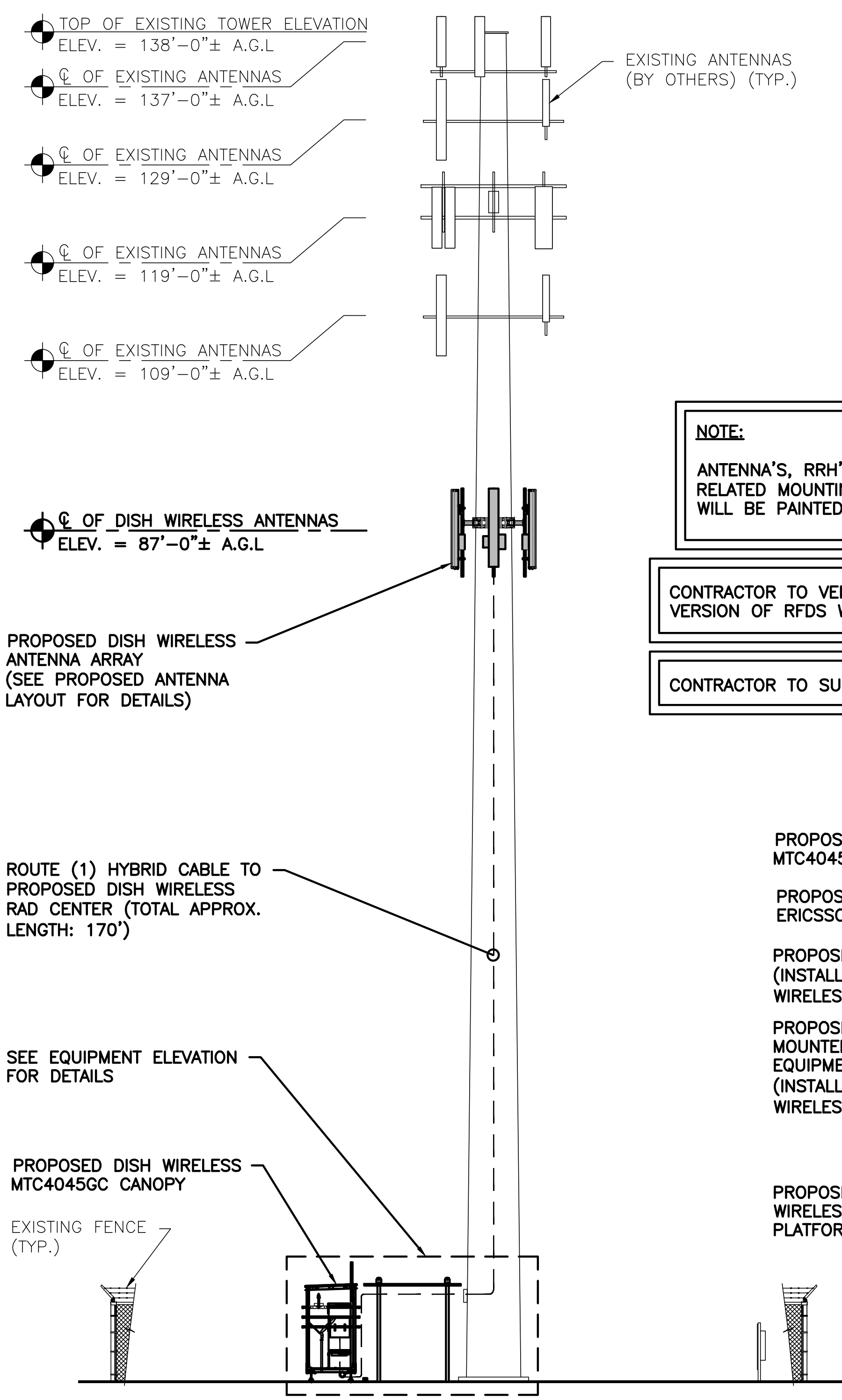
EQUIPMENT PLAN

SHEET NUMBER:
C-2

NOTE:
GENERAL CONTRACTOR SHALL ORIENT PROPOSED MOUNTS SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH PROPOSED MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE POLE USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.

NOTES:
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 FACE WIDTH/DIAMETER IS AN ESTIMATE FROM STRUCTURAL ANALYSIS.

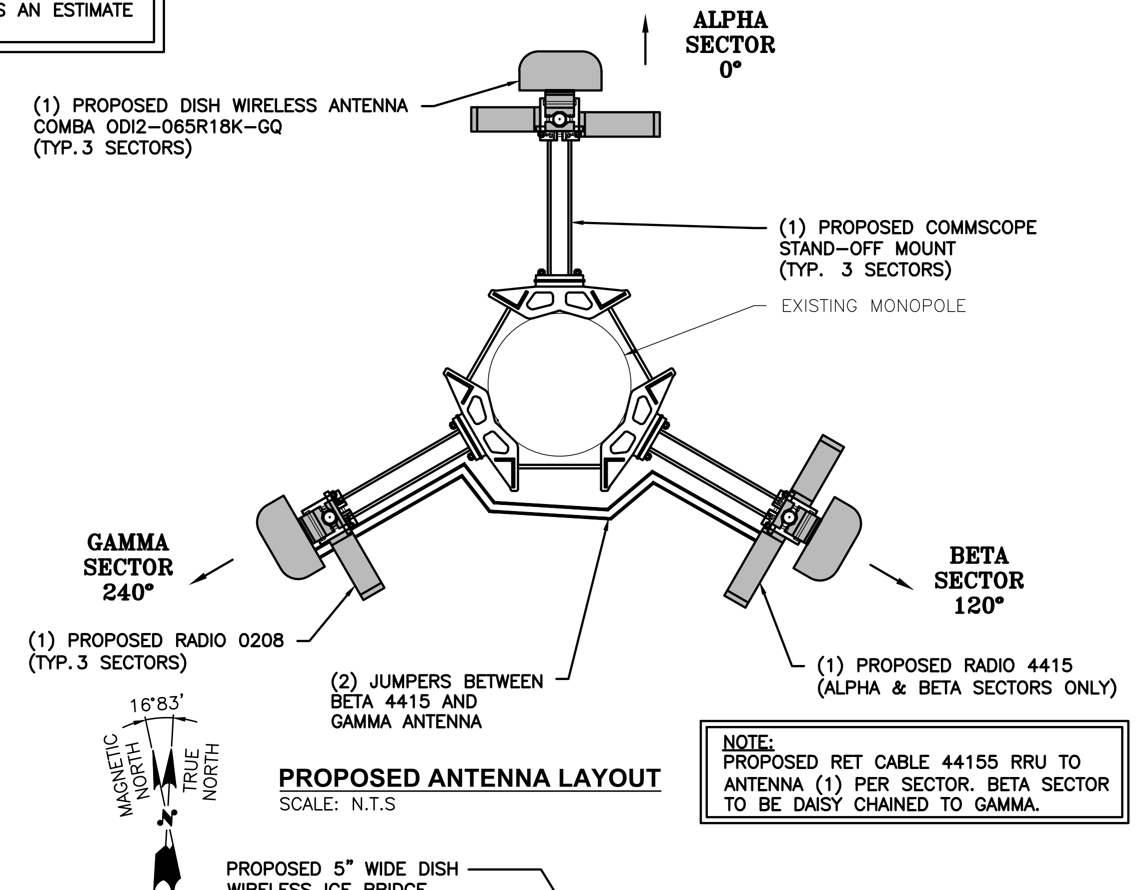


FINAL TOWER ELEVATION
SCALE: N.T.S

NOTE:
ANTENNA'S, RRH'S, AND ANY RELATED MOUNTING HARDWARE WILL BE PAINTED TO MATCH.

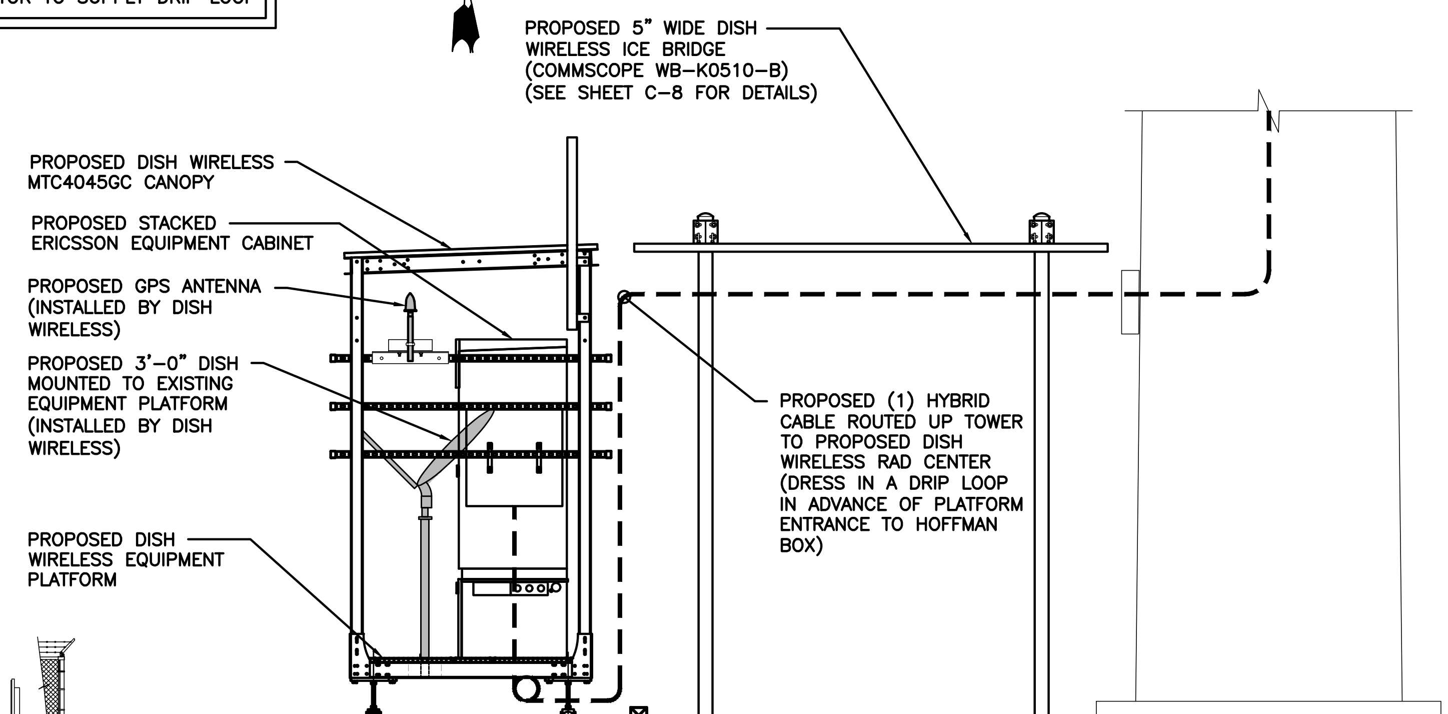
CONTRACTOR TO VERIFY LATEST VERSION OF RFDS WITH DISH CM

CONTRACTOR TO SUPPLY DRIP LOOP



PROPOSED ANTENNA LAYOUT
SCALE: N.T.S

NOTE:
PROPOSED RET CABLE 44155 RRU TO ANTENNA (1) PER SECTOR. BETA SECTOR TO BE DAISY CHAINED TO GAMMA.



PROPOSED EQUIPMENT ELEVATION
SCALE: N.T.S

SBA SITE #: CT13549-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.
2. ALL CABLE SUPPORTS SHOULD BE BLOCKS WITH GROMMETS, NO SNAP-INS ARE ALLOWED.
3. CONFIRM HOFFMAN BOX INSTALLATION WITH DISH CM PRIOR TO DRILLING OEM CABINET.

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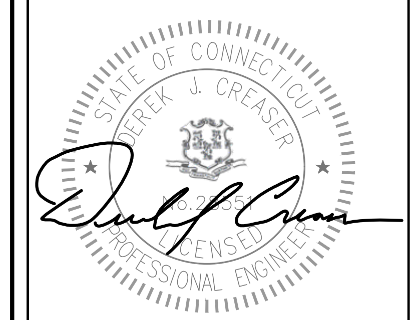

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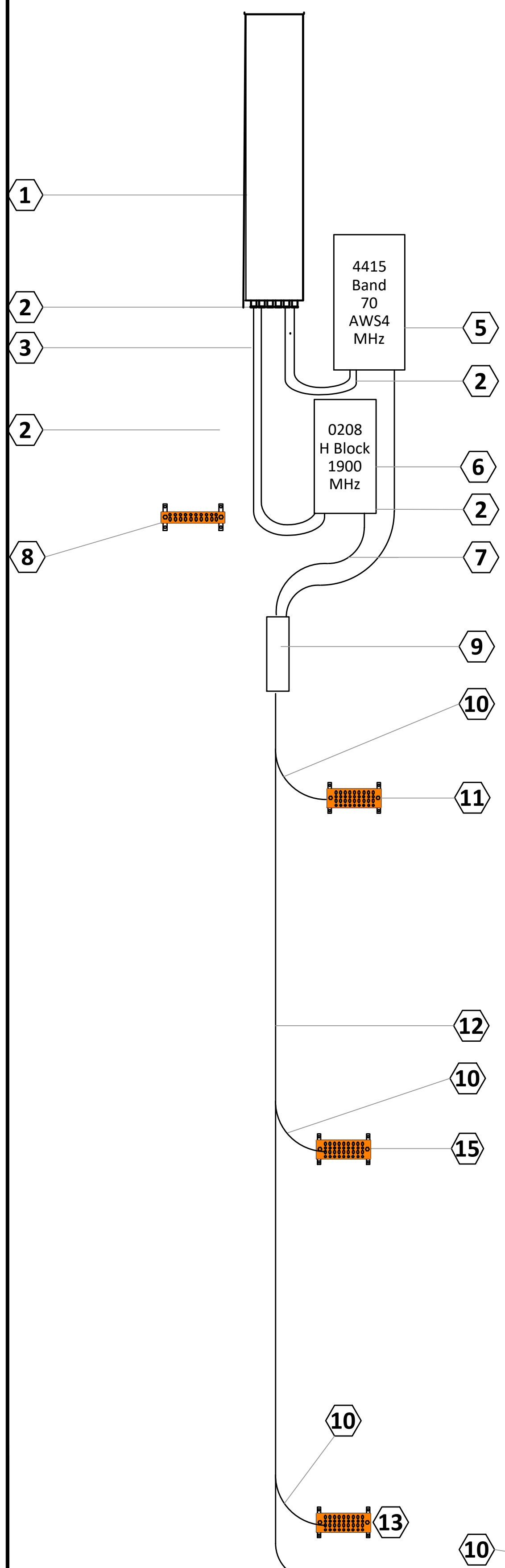
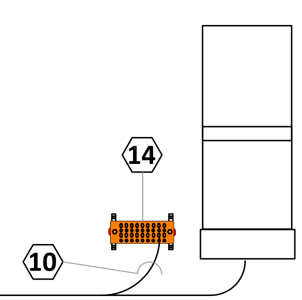
SHEET TITLE:
TOWER ELEVATION & ANTENNA LAYOUT

SHEET NUMBER:
C-3

TYPICAL SECTOR





ANTENNA SCHEDULE													
SECTOR	ANTENNA MANUFACTURER	HYBRID CABLES	AZIMUTH	RAD CENTER	MECH D-TILT	ELECT D-TILT	RRU MANUFACTURER	RRU TECHNOLOGY	RRU LOCATION	JUMPER SIZE	JUMPER QTY	JUMPER LENGTH	RET JUMPER LENGTH
ALPHA	COMBA ODI2-065R18K-GQ 53.5" X 9.8" X 2.4"	DSHYBKIT-18612-70M – 7/8"ø	0°	87'-0"	0	1°	(1) ERICSSON (0208) (1) ERICSSON (4415)	H BLOCK BAND 70	SECTOR SECTOR	1/2" 1/2"	2 2	6'-0" 6'-0"	10'-0" 10'-0"
BETA	COMBA ODI2-065R18K-GQ 53.5" X 9.8" X 2.4"	SHARE WITH ALPHA	120°	87'-0"	0	1°	(1) ERICSSON (0208) (1) ERICSSON (4415) (SHARED)	H BLOCK BAND 70	SECTOR SECTOR	1/2" 1/2"	2 2	6'-0" 6'-0"	10'-0" 10'-0"
GAMMA	COMBA ODI2-065R18K-GQ 53.5" X 9.8" X 2.4"	SHARE WITH ALPHA	240°	87'-0"	0	1°	(1) ERICSSON (0208) (4415 SHARED)	H BLOCK	SECTOR	1/2" 1/2"	2* 2	6'-0"	*30'-0" 30'-0"

* (2) JUMPERS BETWEEN BETA 4415 AND GAMMA ANTENNA

INSTALLER NOTES:

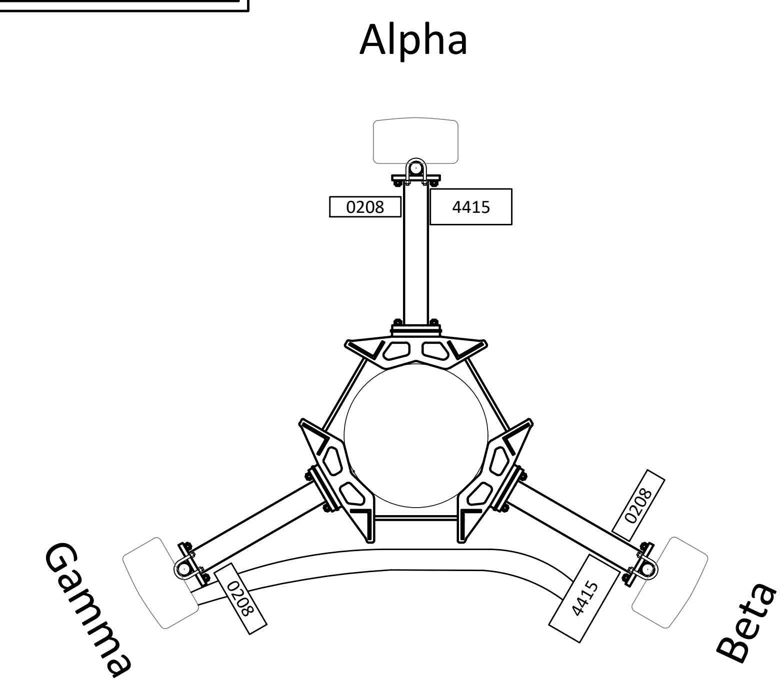
- –SCHEMATIC LAYOUT ONLY. REFER TO SHEETS C-1 AND C-2 FOR EXACT EQUIPMENT LAYOUT, SIZES AND LOCATIONS OF ICE BRIDGE OR RMC.
- –ALL CABLE SUPPORTS SHOULD BE BLOCKS AND GROMMETS. BUTTERFLIES AND SNAP-INS ARE NOT ALLOWED
- –STRAIN-RELIEVE SUPPORT FOR ALL TOWER CABLES AND/OR FIBERS, SHALL OCCUR EVERY48" VERTICALLY, AND 24" HORIZONTALLY.
- –CONTRACTOR TO REFERENCE DISH NETWORK LATEST ISSUE RFDS AND GIVE PRECEDENCE TO INFORMATION PROVIDED IN LATEST RFDS OVER INFORMATION PROVIDED IN ANTENNA SCHEDULE TABLE
- –CONTRACTOR TO VERIFY PROPOSED LOADING, TOWER / FOUNDATION MODIFICATIONS AND REMOVED EQUIPMENT AS STATED IN PASSING STRUCTURAL ANALYSIS AND MOD DESIGNS AND CONTACT DISH NETWORK IMMEDIATELY IN THE EVENT OF ANY DISCREPANCIES.
- –CONTRACTOR IS TO NOTE ANY APPURTENANCES ON TOWER THAT EXTENDS WITHIN 2' OF THE TOP OF AND 5' BELOW THE DISH ANTENNAS. IF ANY APPURTENANCES IS ENCROACHING THIS THRESHOLD, THE CONTRACTOR IS TO COMMUNICATE THE FINDING WITH DISH NETWORK IMMEDIATELY AND BEFORE CONSTRUCTION STARTS.

NOTE:

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

KEY NOTES

1. ANTENNA – COMBA ODI2-065R18K-GQ- (DISH PROVIDED)
2. CLAMSHELL WEATHER PROOFING (CONTRACTOR PROVIDED)
3. PROPOSED (6 EA.) 1/2" COAX JUMPERS FROM RRUS TO ANTENNA – (DISH PROVIDED) – VARIABLE LENGTHS
4. RRU – E2 BAND 29 700 MHZ – NOT USED
5. RRU – 4415 BAND 70 AWS4 MHZ- (DISH PROVIDED)
6. RRU – 0208 H BLOCK 1900 MHZ – (DISH PROVIDED)
7. DC/FIBER JUMPER CABLES (BREAKOUT CYLINDER TO RRU)
8. SECTOR GROUND BUS BAR – 12"X2"X¼" (DISH PROVIDED)
9. FIBER/POWER BREAKOUT CYLINDER
10. GROUND KIT ON HYBRID CABLE AND EACH RF CABLE
11. UPPER TOWER GROUND BUS BAR – 12"X4"X¼" (DISH PROVIDED)
12. HYBRID CABLE
13. LOWER TOWER GROUND BUS BAR – 12"X4"X¼" (DISH PROVIDED)
14. EQUIPMENT GROUND BUS BAR – 12"X4"X¼" (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

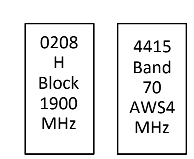


2 Jumpers between Beta 4415 and Gamma Antenna

NOTE:

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

Comba ODI2-065R18K-GQ
Antenna - 25.1 lbs. (11.4 kg)
Mount – 2.8 lbs. (6.2 kg)



19.84 lbs. (9 kg)	46 lbs. (21 kg)

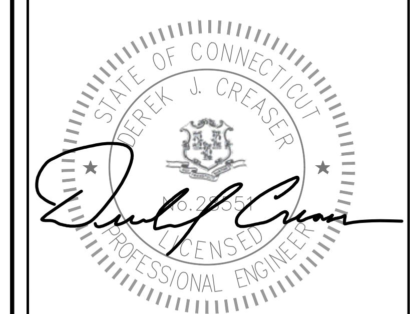
Weight, excl. mounting hardware

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

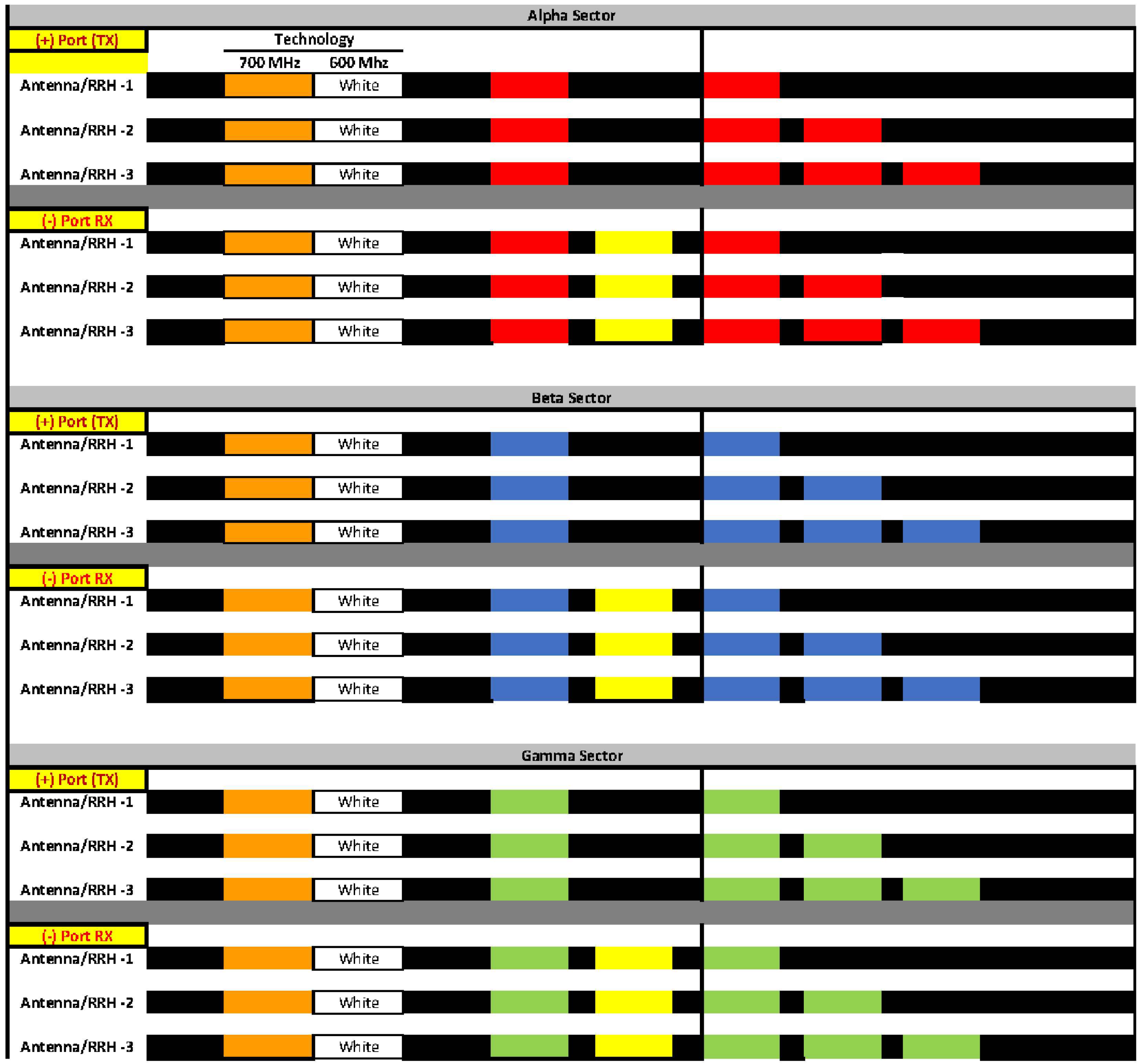
DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
ANTENNA SCHEDULE & DIAGRAM

SHEET NUMBER:
1 OF 2



NOTE:

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

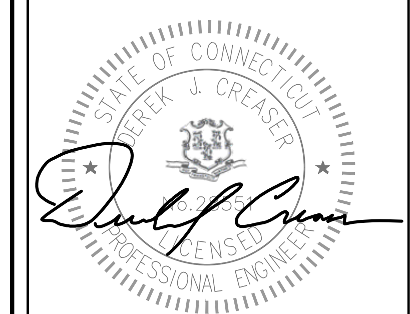
CABLE COLOR CODE

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE N. ANDOVER, MA 01845
TEL: (978) 557-5553 FAX: (978) 336-5586



DRAWN BY: RP

CHECKED BY: HC

APPV'D: AT

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:

CT0100004B

TOWER OWNER SITE ID:

CT13549-S

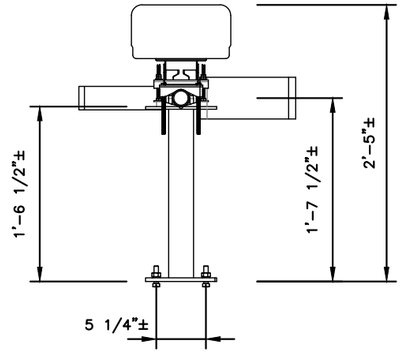
SITE ADDRESS:

52 STADLEY ROUGH ROAD
DANBURY, CT 06811

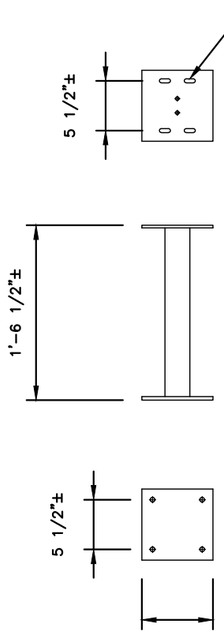
SHEET TITLE:

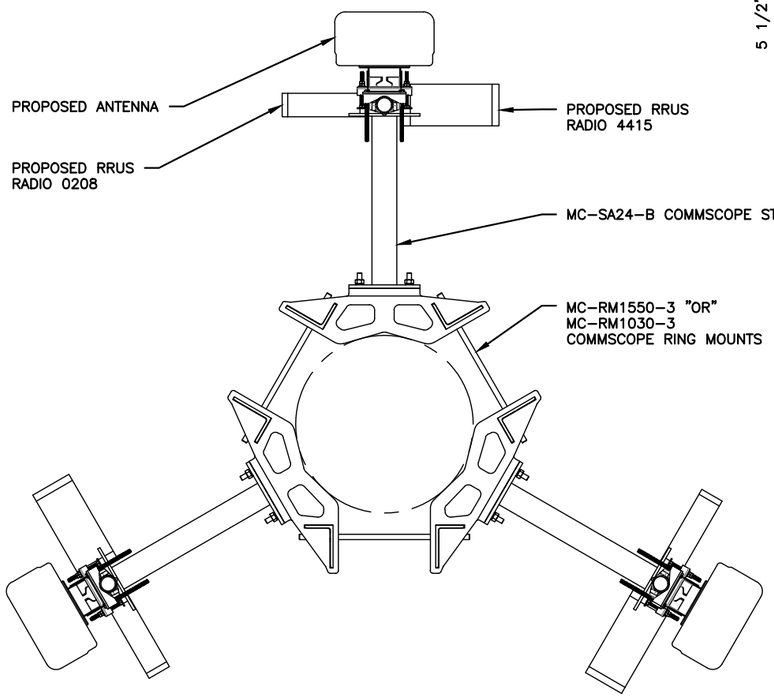
CABLE COLOR CODE

SHEET NUMBER:

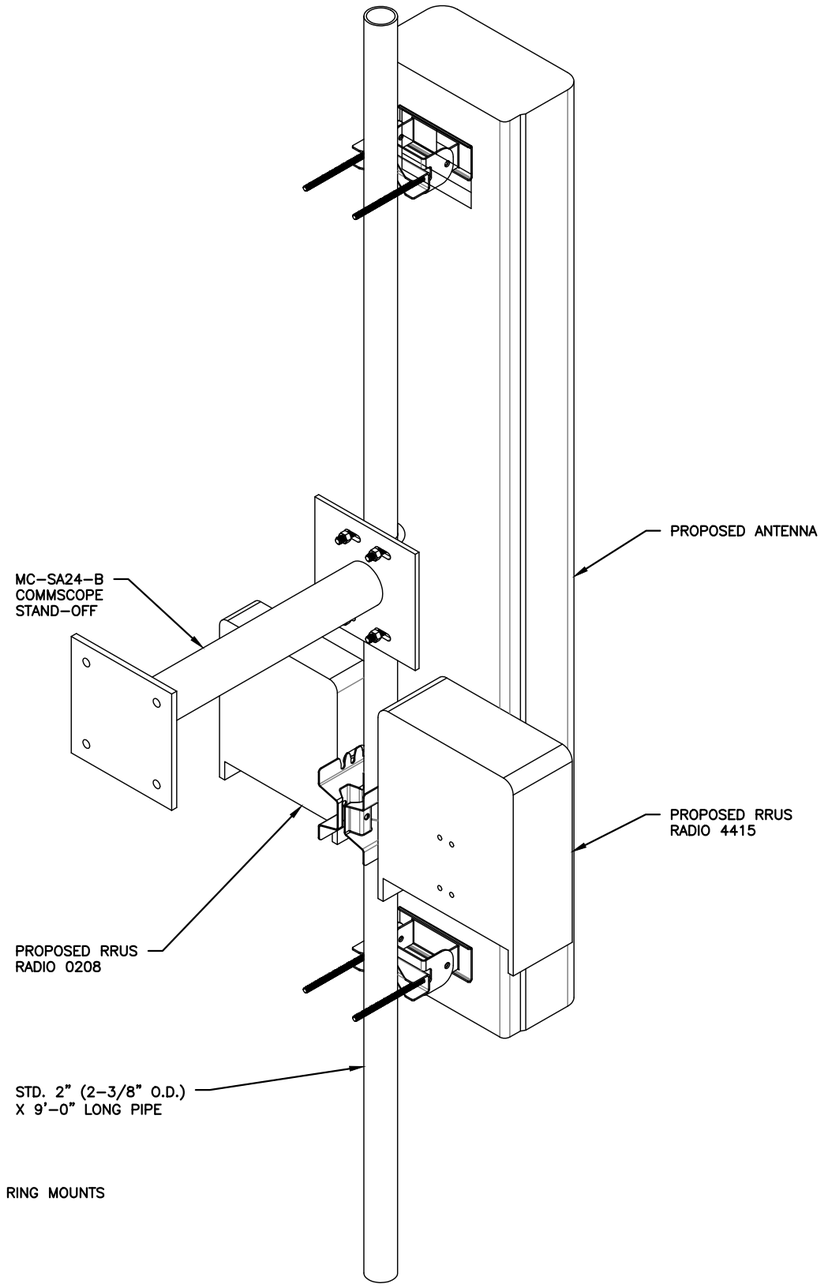


MC-SA24-B STAND-OFF SUPPORT
10" X 24-5/8" LONG
ONE 2-3/8" X 108" PIPE CONFIG.





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



SECTOR MOUNT DETAIL FOR MONOPOLE

SCALE: N.T.S

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 25851
LICENSED PROFESSIONAL ENGINEER

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

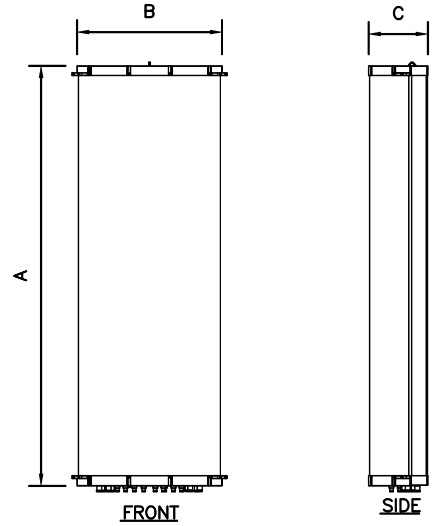
DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

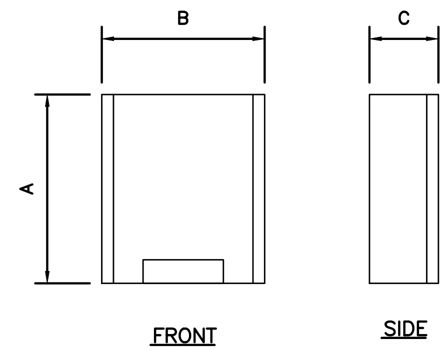
SHEET TITLE:
EQUIPMENT DETAILS

SHEET NUMBER:
C-4



NOTE:

ANTENNA'S, RRH'S, AND ANY RELATED MOUNTING HARDWARE WILL BE PAINTED TO MATCH.

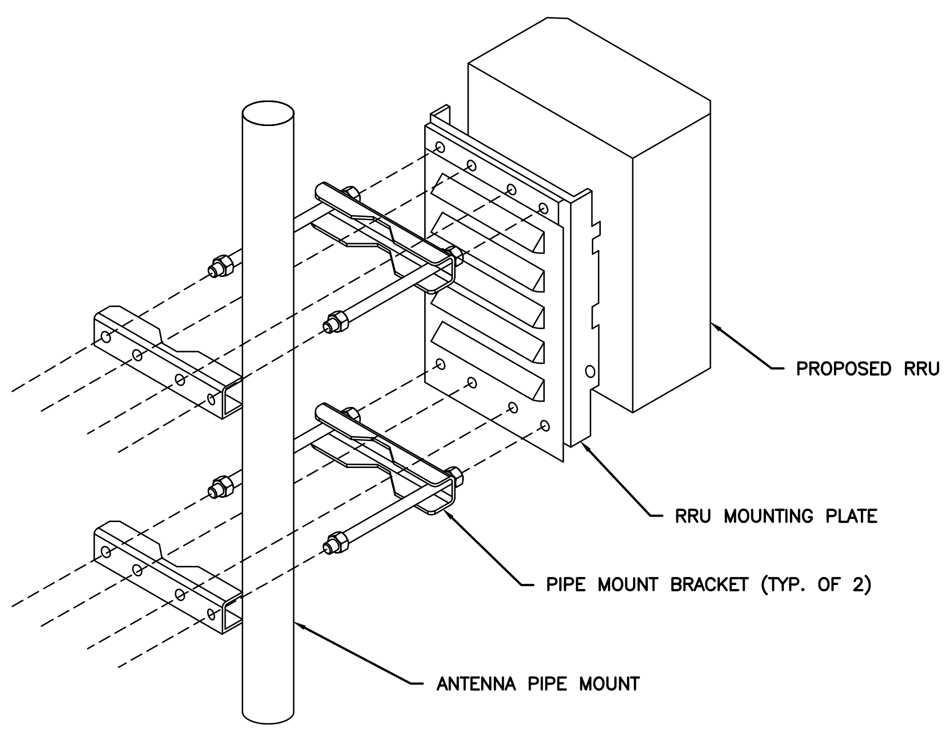


ANTENNA SPECIFICATIONS				
MODEL	LENGTH (A)	WIDTH (B)	DEPTH (C)	WEIGHT (lb)
COMBA – ODI–065R18K–GQ	53.5"	9.8"	2.4"	25.1

ANTENNA SPECIFICATIONS
SCALE: N.T.S

RADIO SPECIFICATIONS				
MODEL	LENGTH (A)	WIDTH (B)	DEPTH (C)	WEIGHT (lb)
ERICSSON – RADIO 4415	16.54"	13.64"	4.84"	44.09
ERICSSON – RADIO 0208	13.82"	11.73"	3.31"	18.52

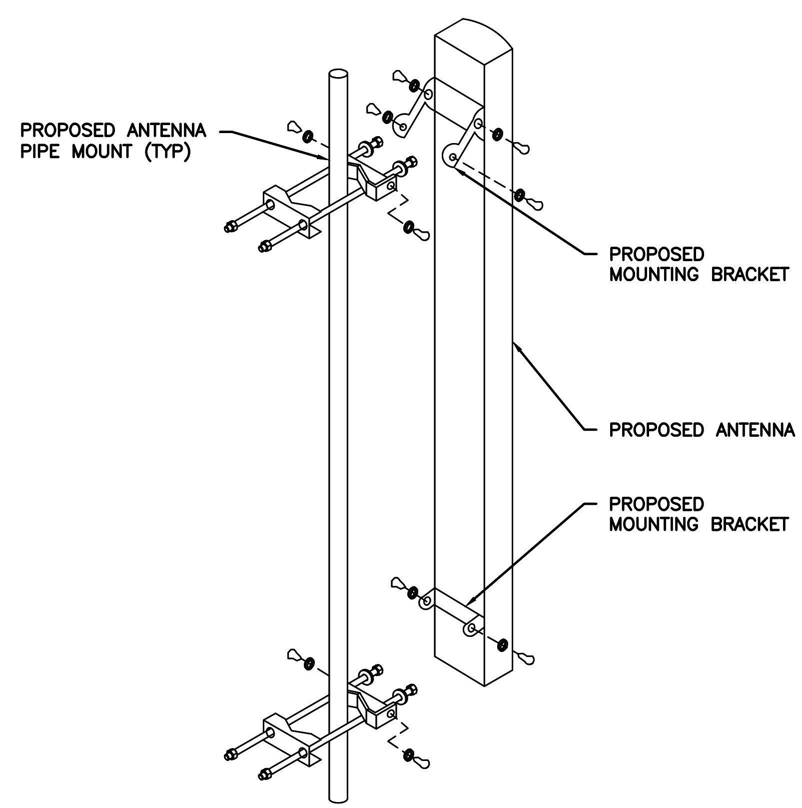
RADIO SPECIFICATIONS
SCALE: N.T.S



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

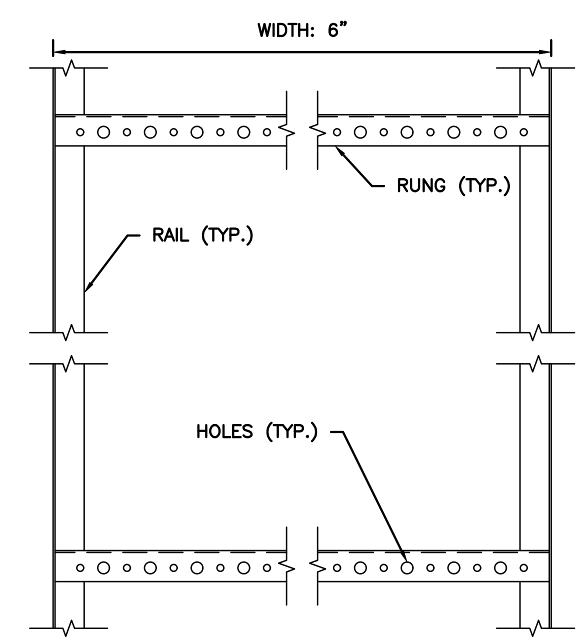
REMOTE RADIO UNIT (RRU) PIPE MOUNT
SCALE: N.T.S



ANTENNA MOUNTING
SCALE: N.T.S

LADDER NOTE:

1. LADDER TO BE PLACED ON TOWER IN 20'–0" SECTIONS UP TO PROPOSED DISH WIRELESS RAD CENTER.
2. GC TO VERIFY NEED WITH DISH WIRELESS CM. DISH WIRELESS PREFERS TO USE EXISTING CABLE SUPPORT SYSTEMS IF AVAILABLE.



CABLE LADDER DETAIL (OPTIONAL) (DETAIL NOT USED)
SCALE: N.T.S

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HDG
HUDSON
Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:
CT0100004B

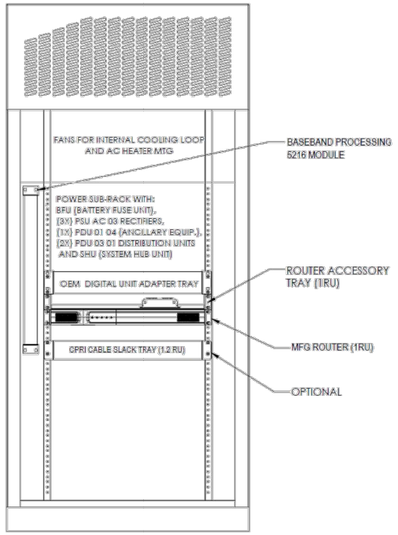
TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
EQUIPMENT DETAILS

SHEET NUMBER:
C-4a

REVISIONS					
ECO NO.	ITEM MASTER	REV	DESCRIPTION	DATE	BY
IC45181	219097	01	INITIAL RELEASE. CREATED FROM 217162. 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, X.XX ± .25, X.X ± .40, X. ± .75; HOLE DIA. ±.075; ANGLES ±.5°

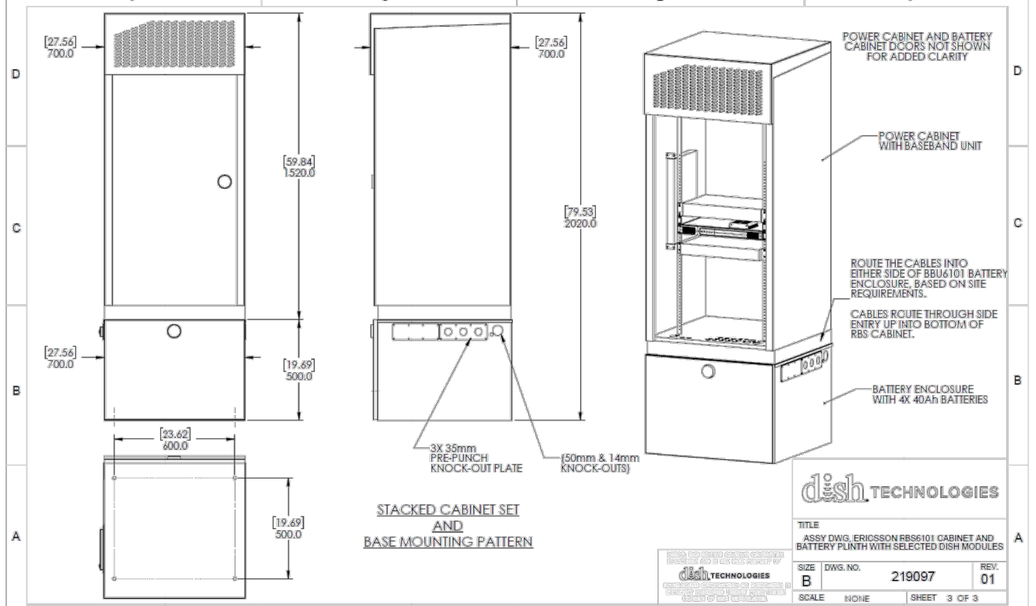
dish TECHNOLOGIES

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

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



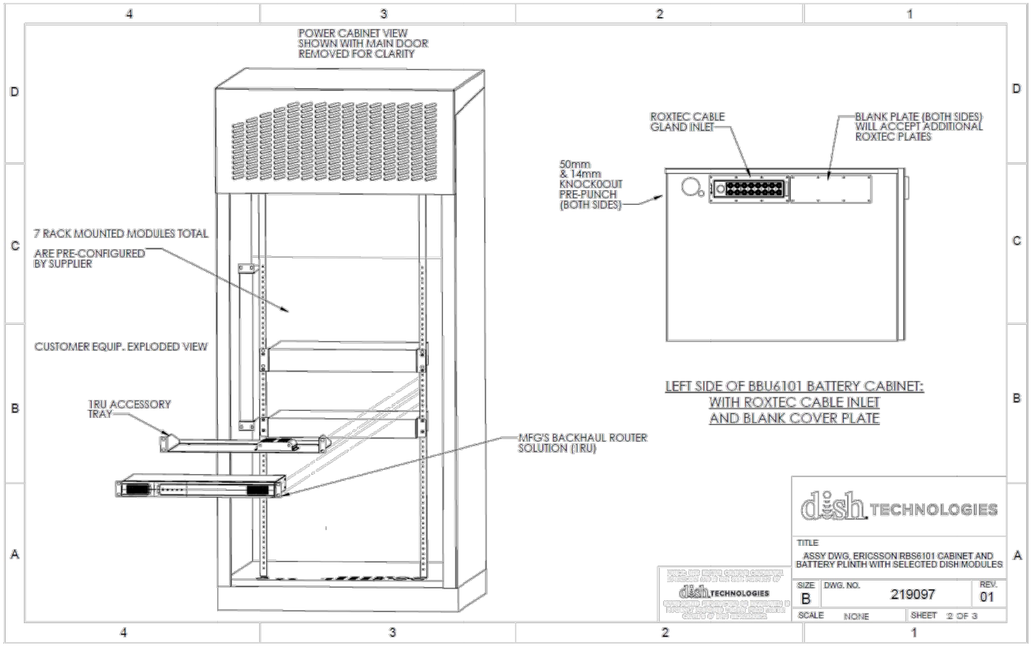
STACKED CABINET SET AND BASE MOUNTING PATTERN

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



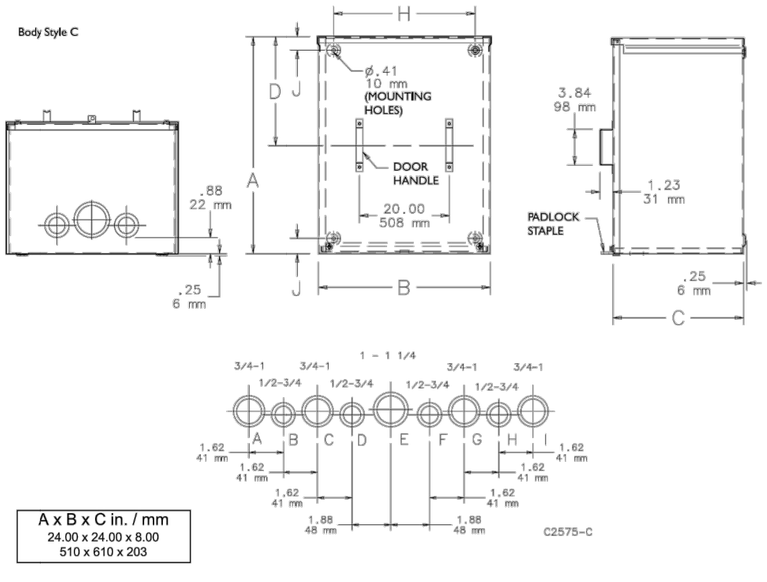
dish TECHNOLOGIES

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

ERICSSON CABINET DETAIL



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

P/N: A24R248

HOFFMAN BOX DETAIL

NOTE:

CONFIRM HOFFMAN BOX INSTALLATION WITH DISH CM PRIOR TO DRILLING OEM CABINET

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

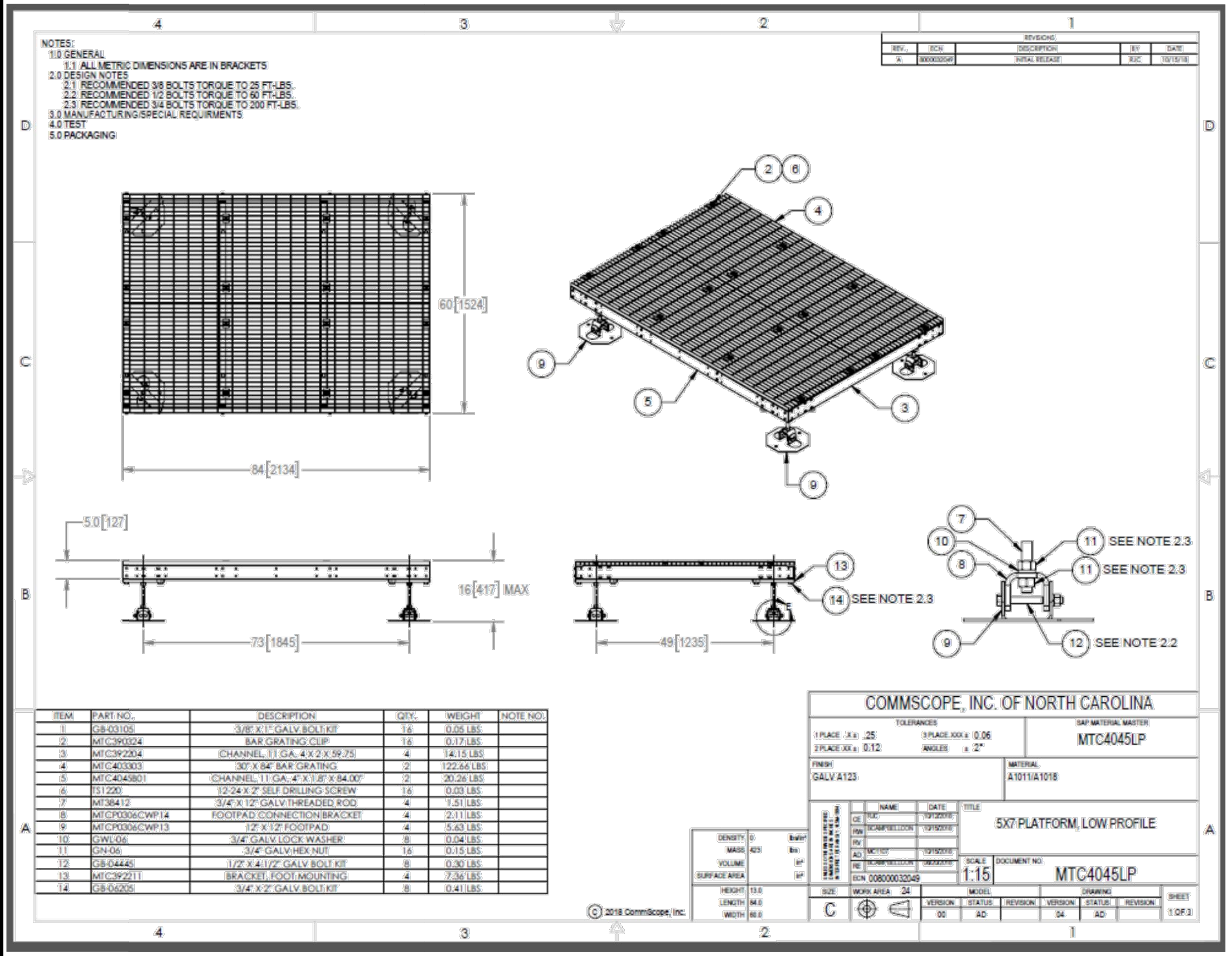
DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

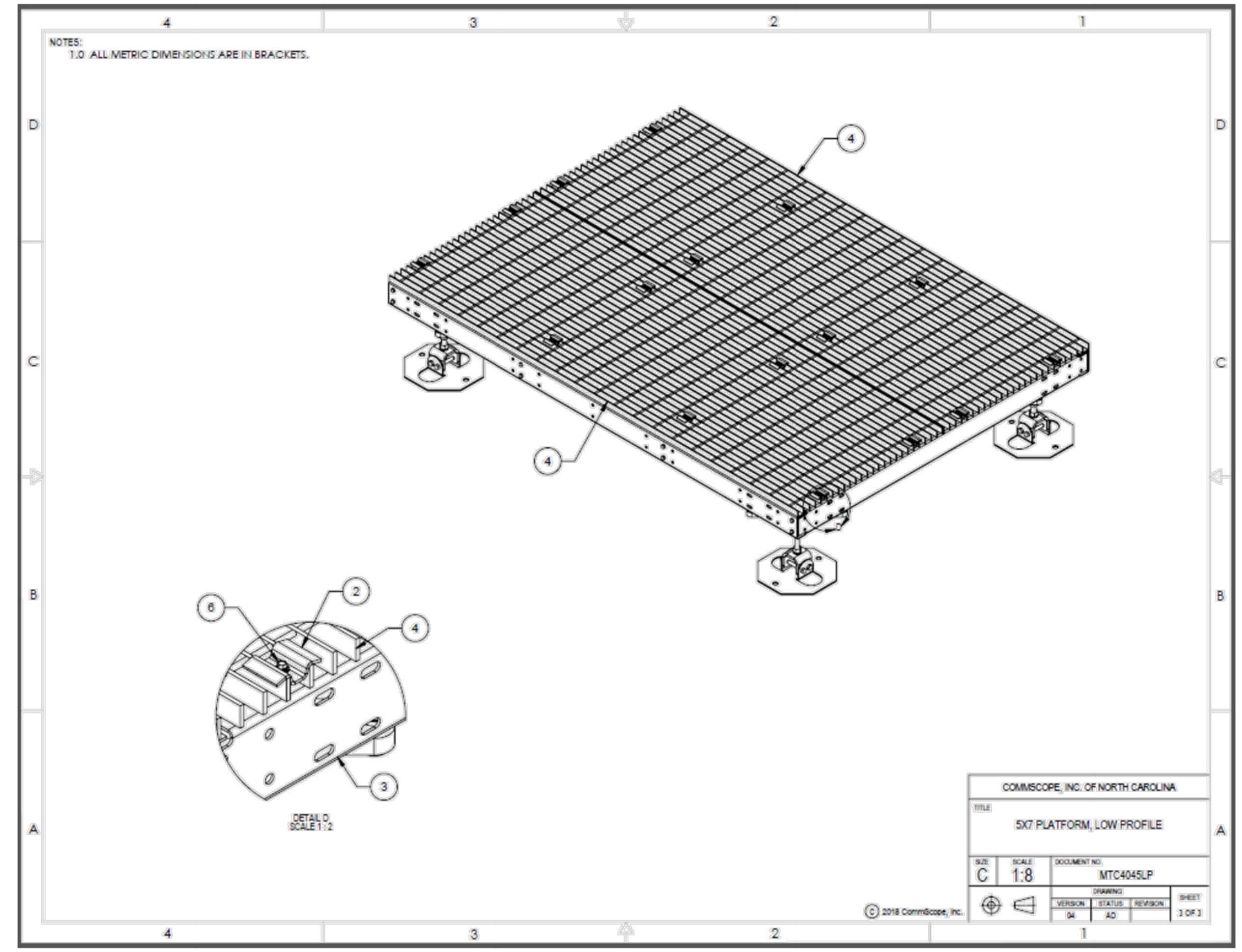
SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

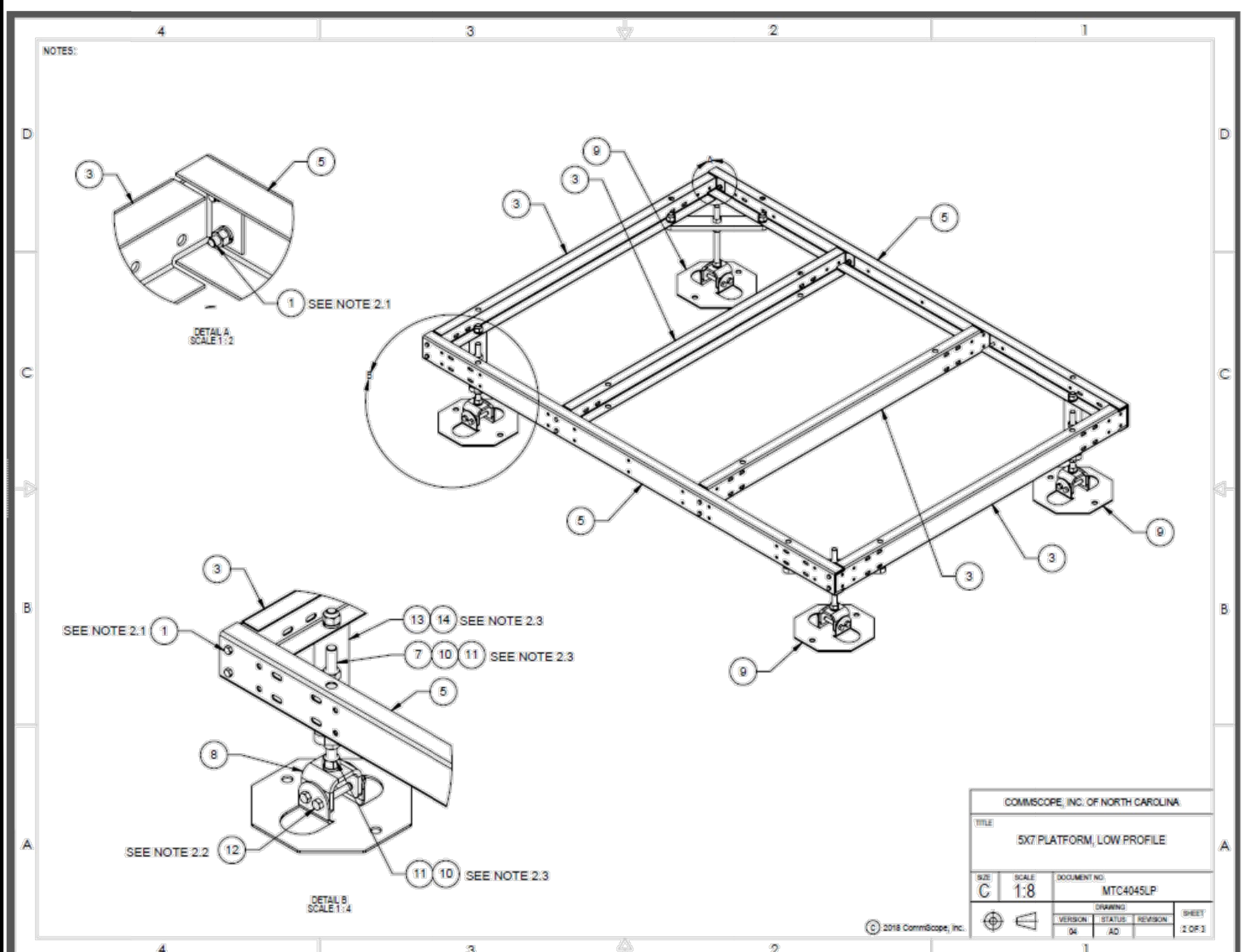
SHEET TITLE:
EQUIPMENT DETAILS

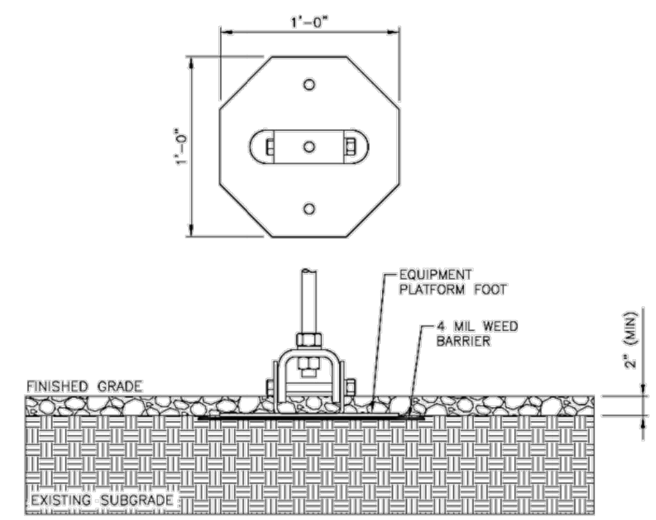
SHEET NUMBER:
C-5



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	GB-03105	3/8" X 1" GALV. BOLT KIT	16	0.05 LBS	
2	MTC390324	BAR GRATING CLIP	16	0.17 LBS	
3	MTC392204	CHANNEL, 11 GA, 4 X 2 X 59.75	4	14.15 LBS	
4	MTC403303	30" X 84" BAR GRATING	2	122.66 LBS	
5	MTC4045801	CHANNEL, 11 GA, 4" X 1.8" X 84.00"	2	20.26 LBS	
6	TS1220	12-24 X 2" SELF DRILLING SCREW	16	0.03 LBS	
7	MT38412	3/4" X 12" GALV THREADED ROD	4	1.51 LBS	
8	MTCP0306CWP14	FOOTPAD CONNECTION BRACKET	4	2.11 LBS	
9	MTCP0306CWP13	12" X 12" FOOTPAD	4	5.63 LBS	
10	GWL-06	3/4" GALV LOCK WASHER	8	0.04 LBS	
11	GN-06	3/4" GALV HEX NUT	16	0.15 LBS	
12	GB-04445	1/2" X 4-1/2" GALV BOLT KIT	8	0.30 LBS	
13	MTC392211	BRACKET, FOOT MOUNTING	4	7.36 LBS	
14	GB-06205	3/4" X 2" GALV BOLT KIT	8	0.41 LBS	







NOTE:

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL 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" X 8'-0" UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)

EQUIPMENT PLATFORM FOOT DETAIL
NOT TO SCALE

EQUIPMENT	DIMENSIONS	WEIGHT FULLY LOADED
CABINET	79.53" X 27.56" X 27.56"	738.7± lbs
DISH	3'-0"Ø	28.0 ± lbs

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
PLATFORM DETAILS

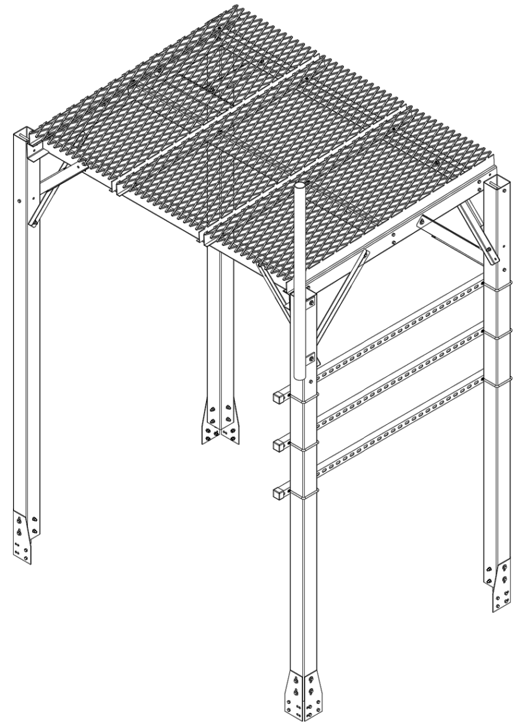
SHEET NUMBER:
C-6

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
PRE1	INITIAL RELEASE 800000032270	10/26/18	RJC



ITEM	PART NO.	DESCRIPTION	QTY	WEIGHT	NOTE NO.
1	MTC4045ICHK	HARDWARE KIT FOR MTC4045IC	1		
2	MTC4045ICSB	STEEL BUNDLE FOR MTC4045IC	1		

DENSITY	0.30	lbs/in³
MASS	562.34	lbs
VOLUME	1887.29	in³
SURFACE AREA		in²
HEIGHT		
LENGTH		
WIDTH		

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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET PER ANSI Y 14.5M-1994

	NAME	DATE
CE	RJC	10/26/18
RW		
RV		
AD		
RE		

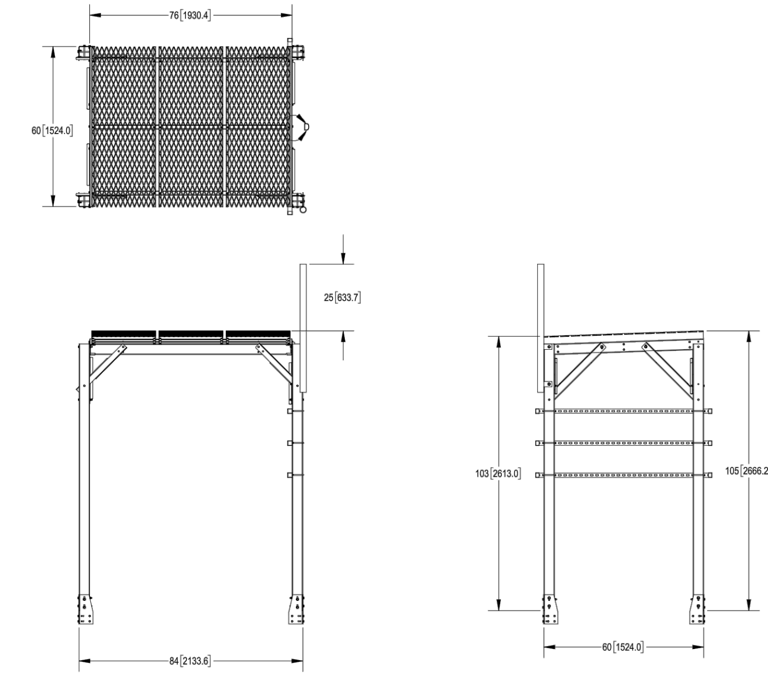
ECN 008000032270

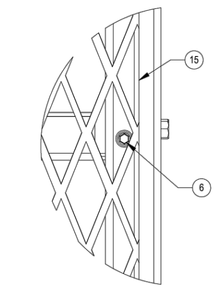
TITLE: ICE CANOPY 5X7 PLATFORM

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

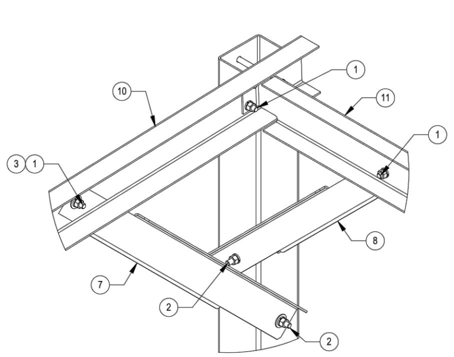
ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	GB-03105	3/8" X 1" GALV BOLT KIT	44	0.05 LBS	
2	GB-03505	3/8" X 5" GALV BOLT KIT	29	0.17 LBS	
3	GWF-03	3/8" GALV FLAT WASHER	30	0.01 LBS	
4	MTC997301	UNISTRUT 66"	3	10.30 LBS	
5	MTC371084	3/8" X 4" X 5" SQUARE U-BOLT	6	0.50 LBS	
6	MTC371531	1/4-14X7/8 SELF DRILLING HEX HEAD SCREW	18	0.02 LBS	
7	MTC3813C14	CANOPY BRACE, 11 GA, 30"	4	4.18 LBS	
8	MTC392212	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	1.64 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

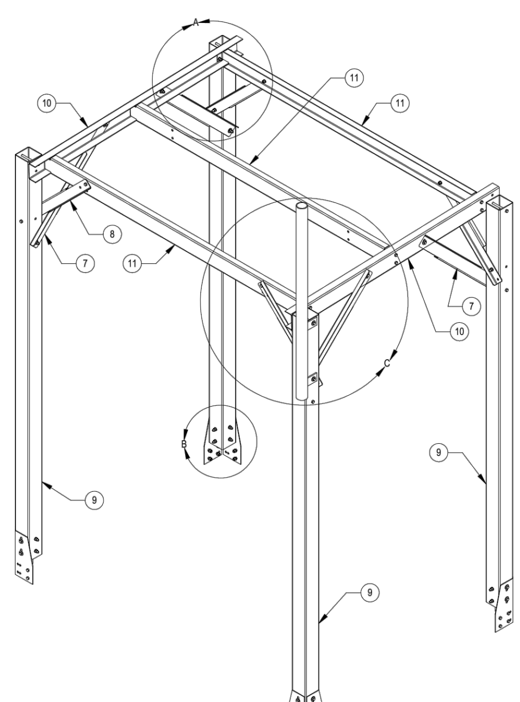
TITLE: ICE CANOPY 5X7 PLATFORM

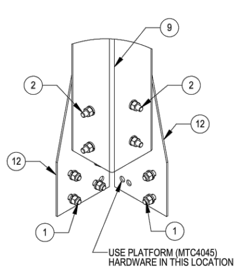
SIZE C — SCALE 1:22 — DOCUMENT NO. MTC4045GC — DRAWING: VERSION 00, STATUS IW, REVISION — SHEET 2 OF 4

NOTES:

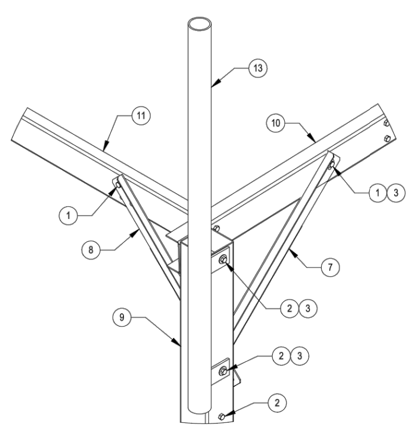


DETAIL A
SCALE 1 : 4





DETAIL B
SCALE 1 : 4



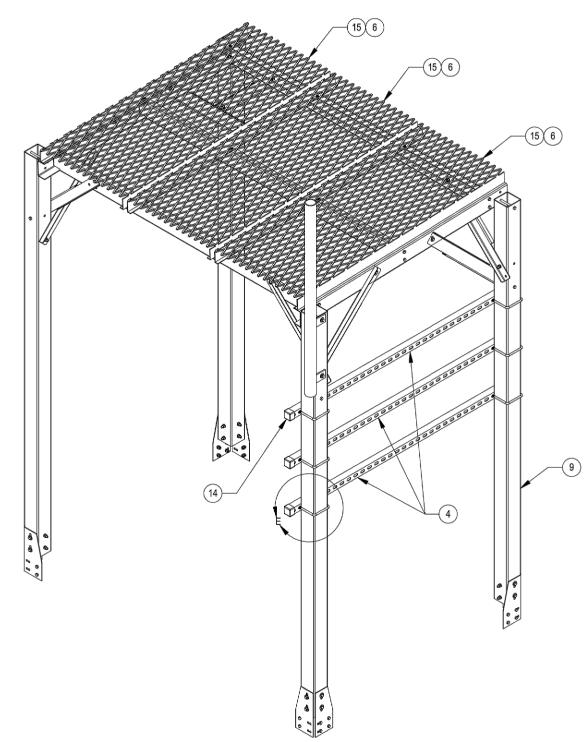
DETAIL C
SCALE 1 : 6

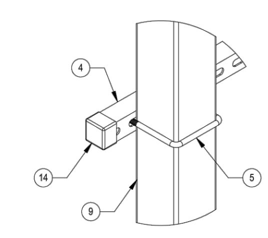
COMMSCOPE, INC. OF NORTH CAROLINA

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

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

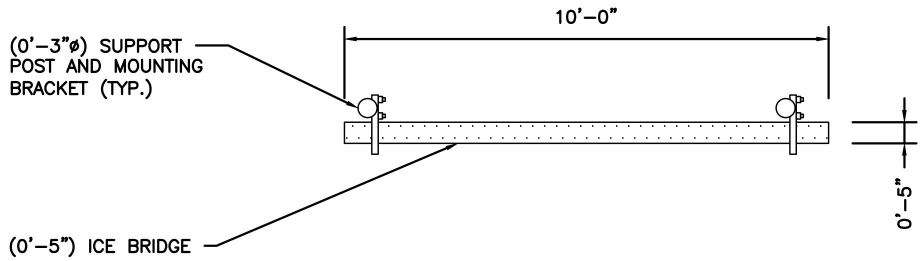
DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

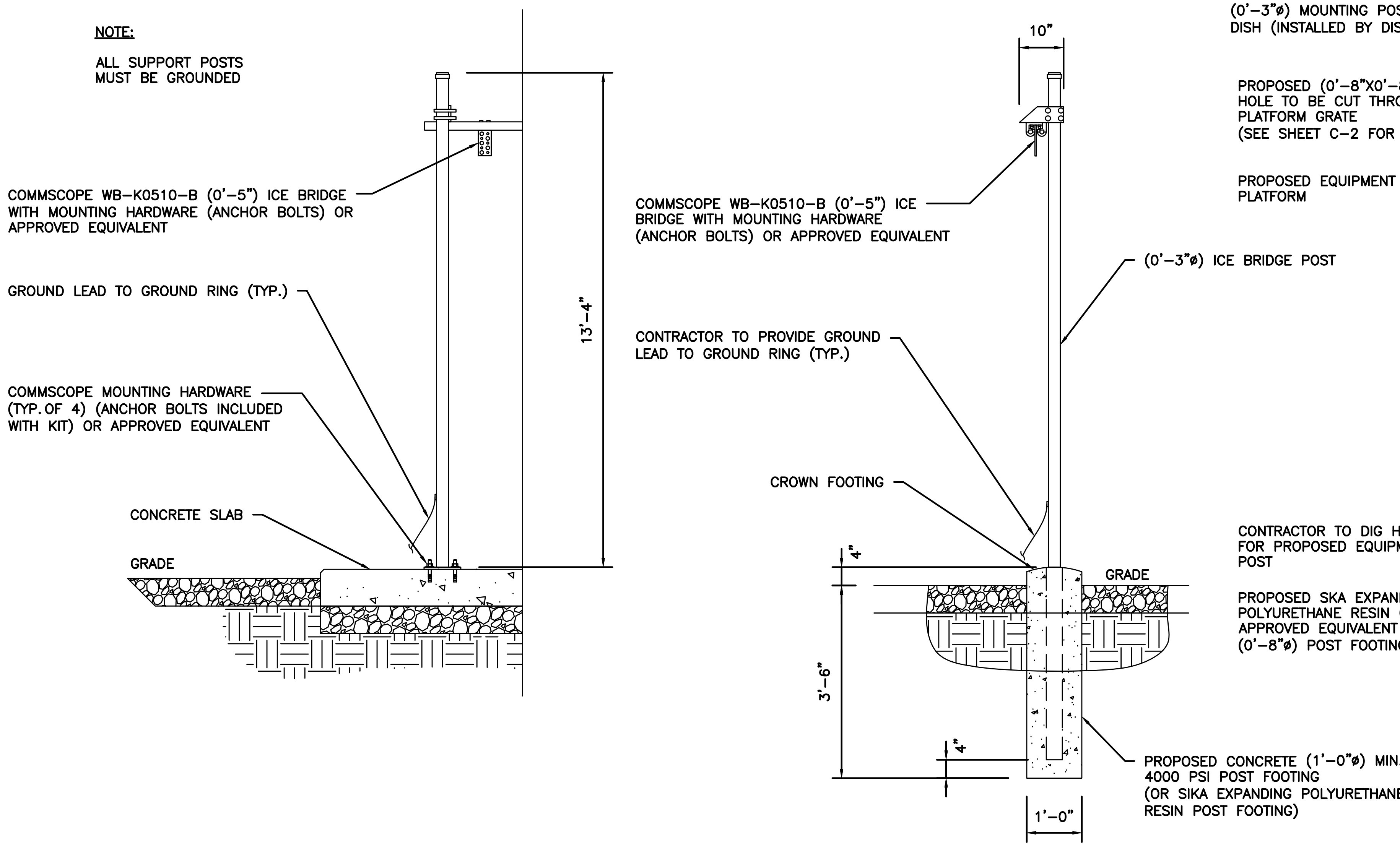
SHEET TITLE:
PLATFORM CANOPY DETAILS

SHEET NUMBER:
C-7



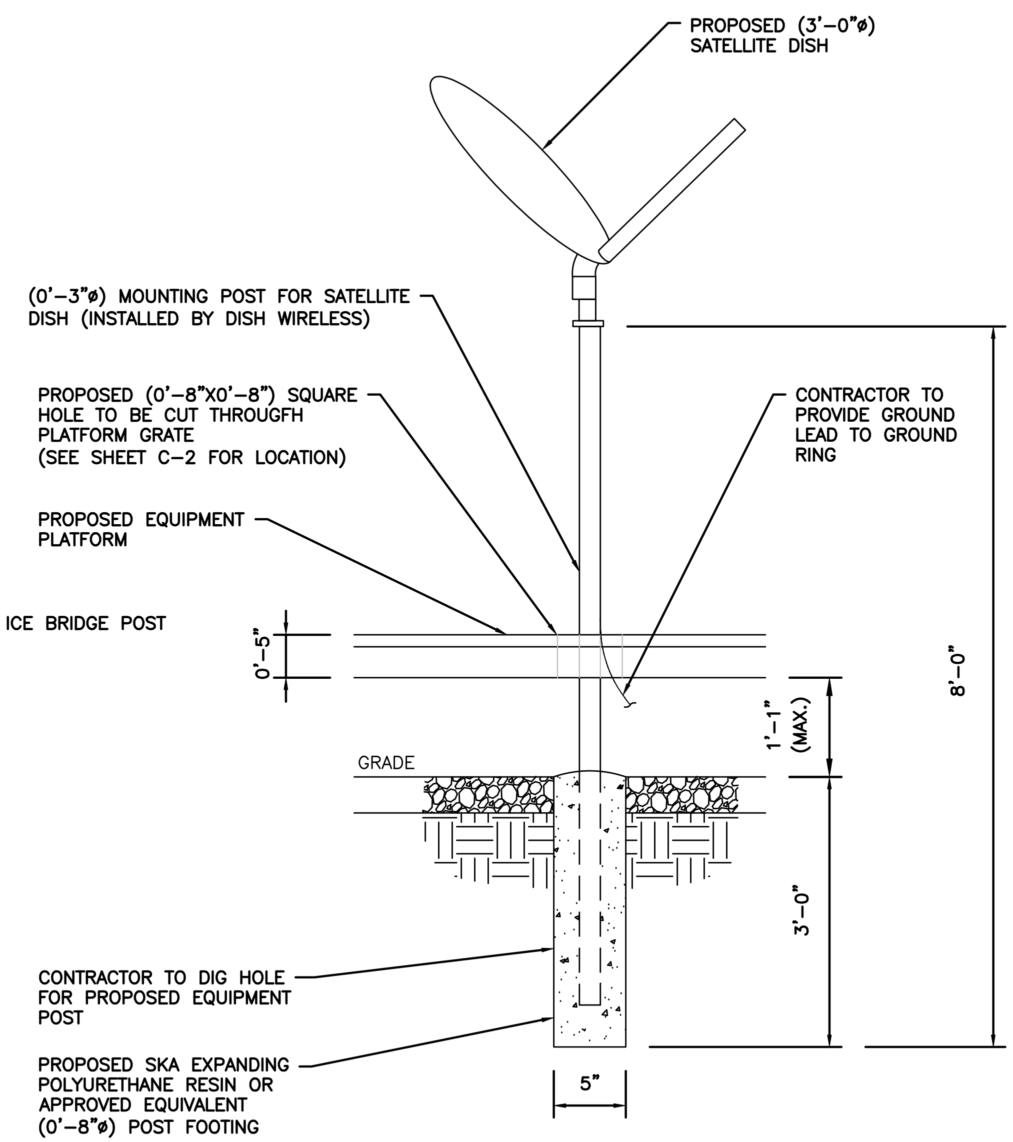
ICE BRIDGE PLAN VIEW

SCALE: N.T.S



ICE BRIDGE POST ELEVATIONS

SCALE: N.T.S



DISH ANTENNA POST ELEVATION

SCALE: N.T.S

PLANS PREPARED FOR:

dish WIRELESS

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45 BEECHWOOD DRIVE
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STATE OF CONNECTICUT DEREK J. CREASER LICENSED PROFESSIONAL ENGINEER

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

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TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

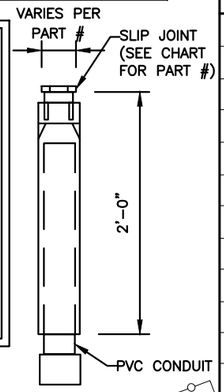
SHEET TITLE:
ICE BRIDGE DETAILS

SHEET NUMBER:
C-8

NOTE: CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

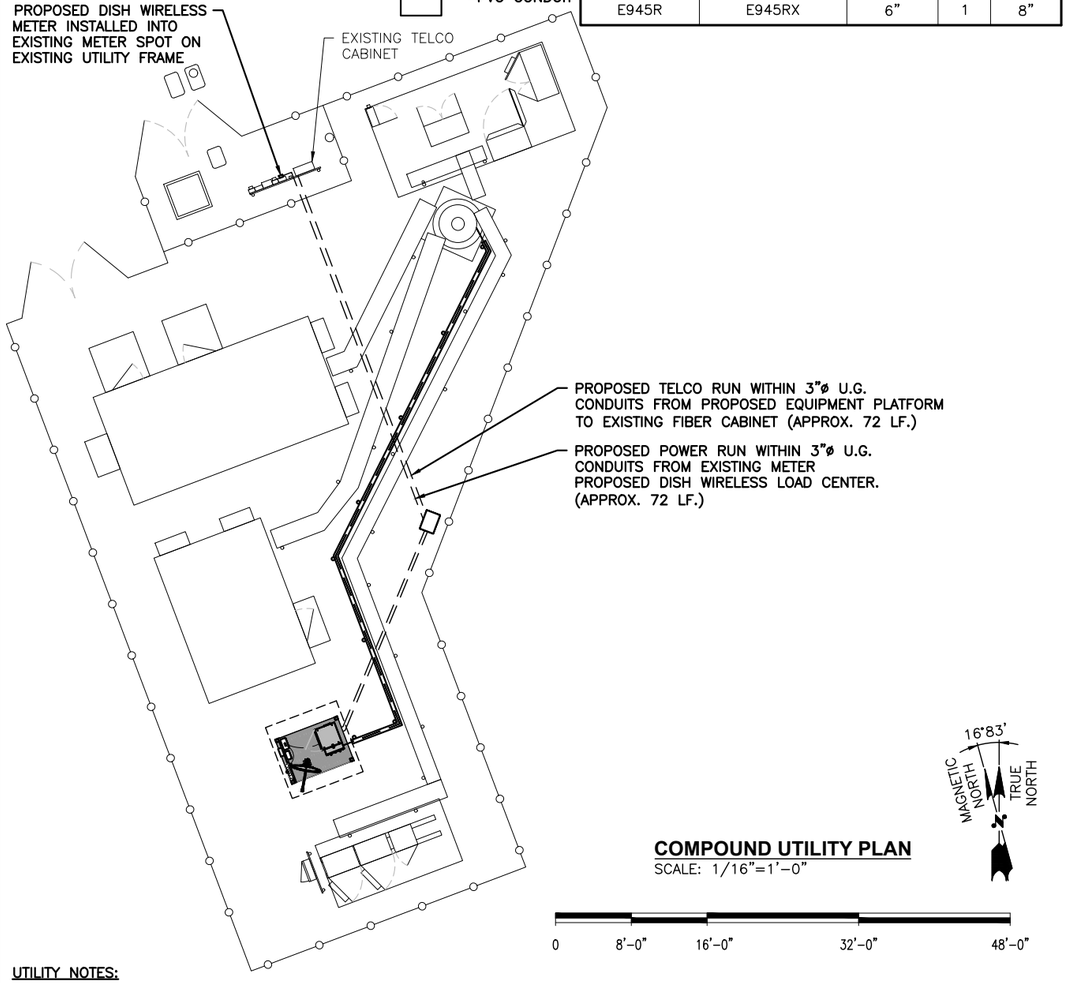
NOTES:

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"

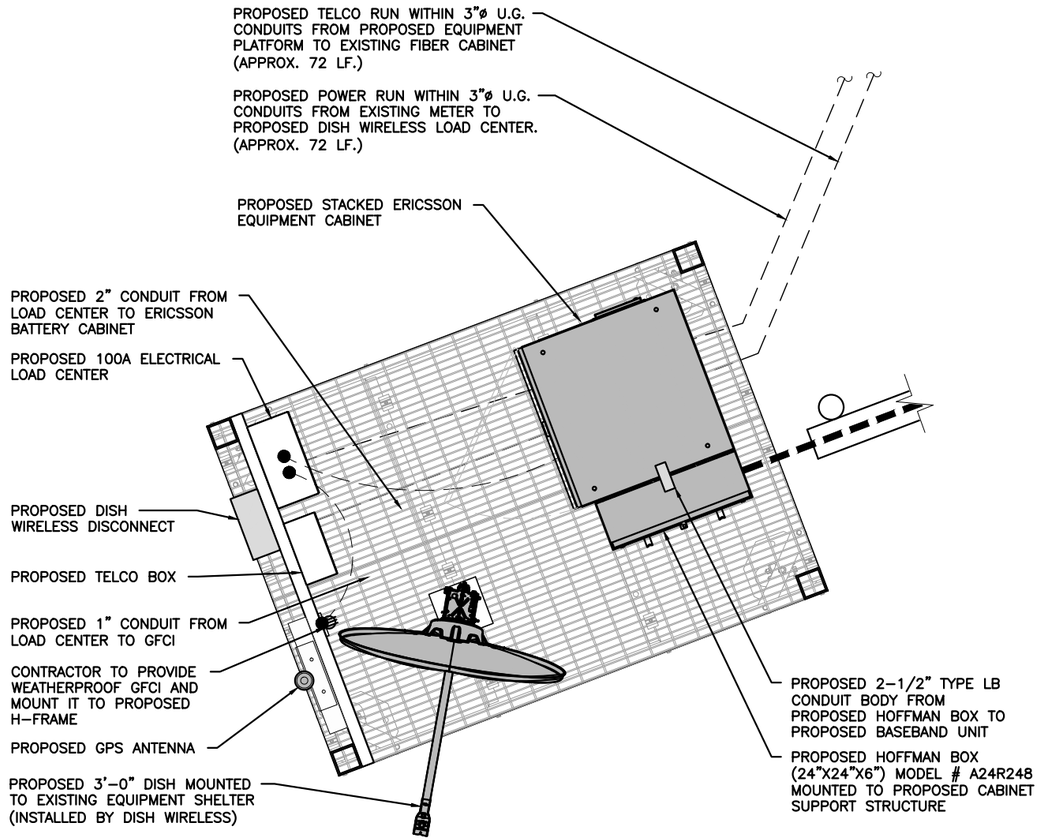


COMPOUND UTILITY PLAN

SCALE: 1/16"=1'-0"

UTILITY NOTES:

1. CONTRACTOR TO COORDINATE SERVICE ROUTING & CONNECTION WITH LOCAL TELEPHONE AND POWER COMPANIES.
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 W/ PULL-STRING FOR POTENTIAL FUTURE FIBER APPLICATIONS.



EQUIPMENT PLATFORM UTILITY PLAN

SCALE: N.T.S

NOTES:

1. ELECTRICAL ROUTING IS A SCHEMATIC. THE CONTRACTOR SHALL VERIFY EQUIPMENT LOCATION AND ELECTRICAL ROUTING PRIOR TO INSTALLATION.

INSTALLER NOTE:

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

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HUDSON Design Group LLC
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FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 25854
LICENSED PROFESSIONAL ENGINEER

DRAWN BY:	RP
CHECKED BY:	HC
APPV'D:	AT

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
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03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

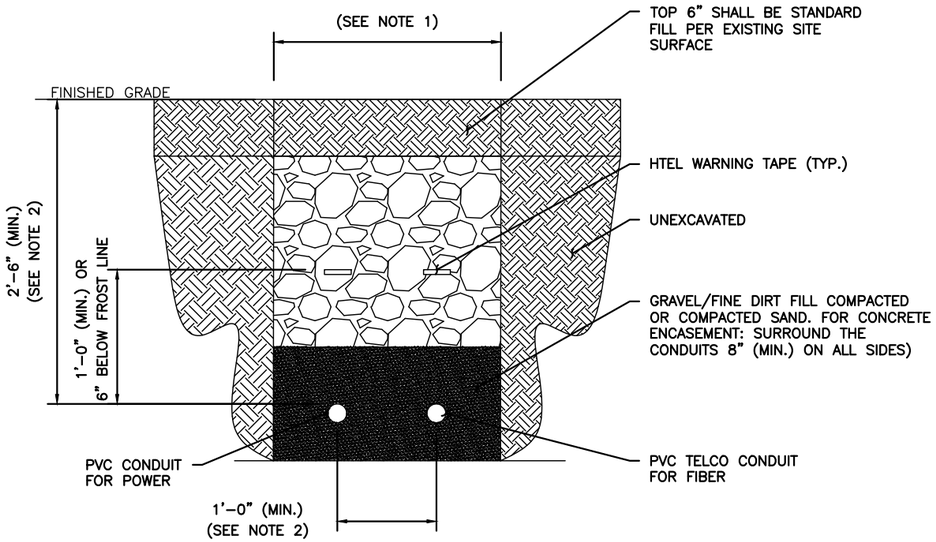
SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
UTILITY PLANS

SHEET NUMBER:
E-1

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.



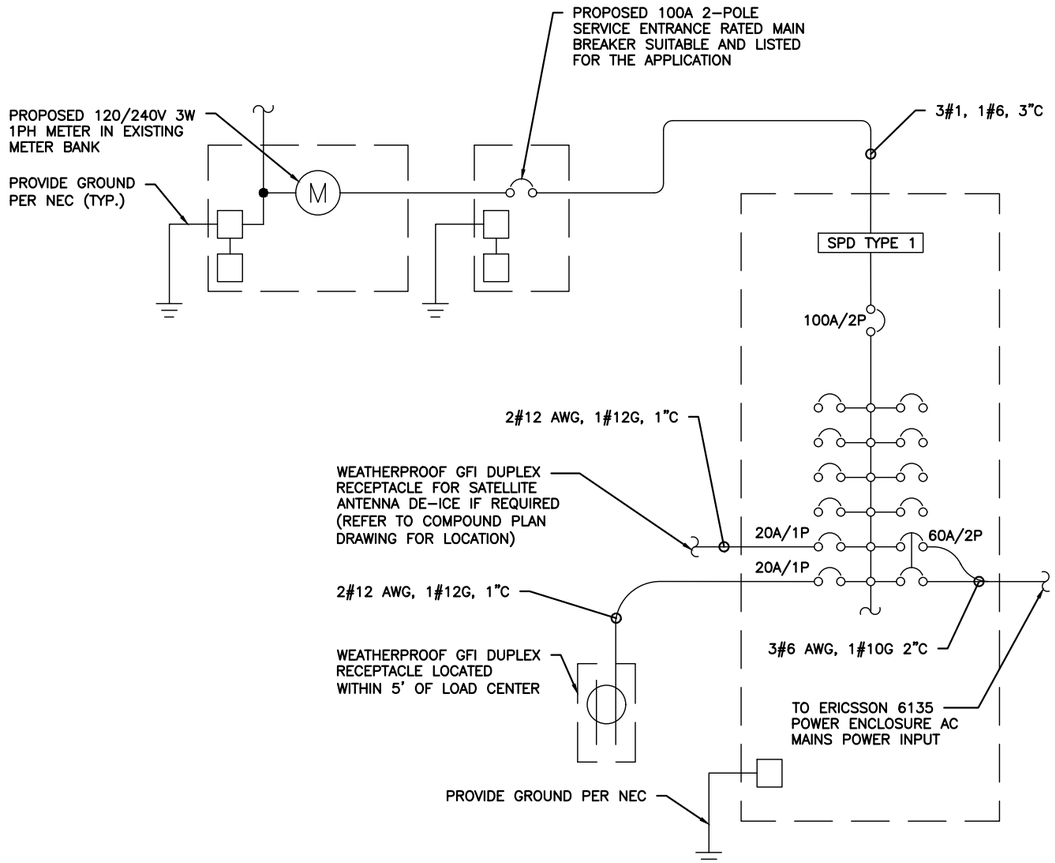
CONDUIT TRENCH DETAIL

SCALE: N.T.S

PROPOSED 100A, 120/240V POWER PANEL										
LOAD SERVED	VOLT AMPERES (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPERES (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
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 VOLT AMPERES				2180		2180		L2 VOLT AMPERES		
L1 AMPS				18.2		18.2		L2 AMPS		
				18.2				MAX AMPS		
				22.8				MAX AMPS x125%		

ELECTRICAL POWER PANEL SCHEDULE

SCALE: N.T.S



ELECTRICAL ONE-LINE DIAGRAM

SCALE: N.T.S

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dish WIRELESS

PLANS PREPARED BY:

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 25857
LICENSED PROFESSIONAL ENGINEER

DRAWN BY:	RP
CHECKED BY:	HC
APPV'D:	AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
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03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
ELECTRICAL DETAILS

SHEET NUMBER:
E-2

TOWER GROUNDING NOTE:

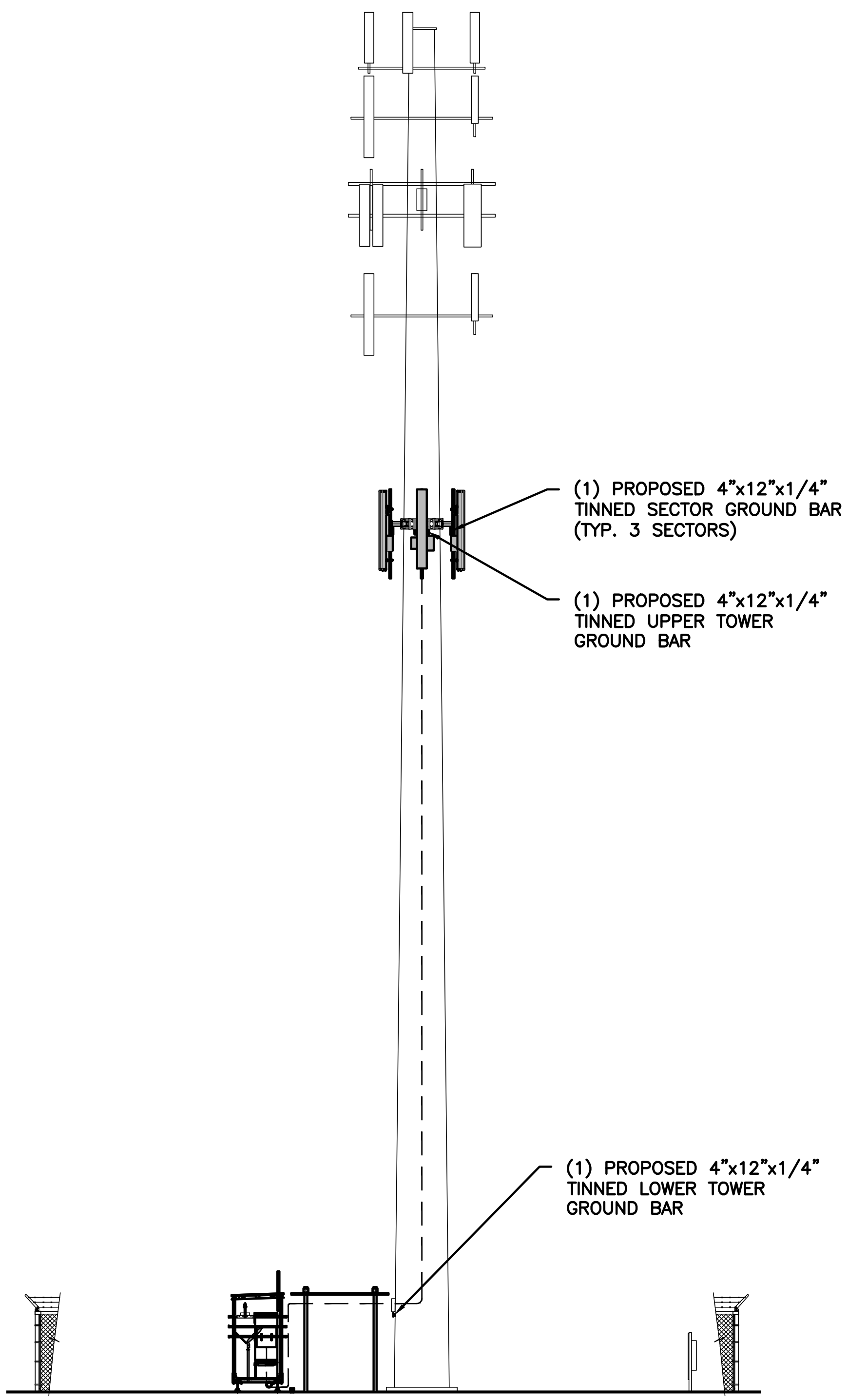
ALL CONNECTIONS TO BE MECHANICAL ON TOWER. EXOTHERMIC WELDS ARE NOT ALLOWED.

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.

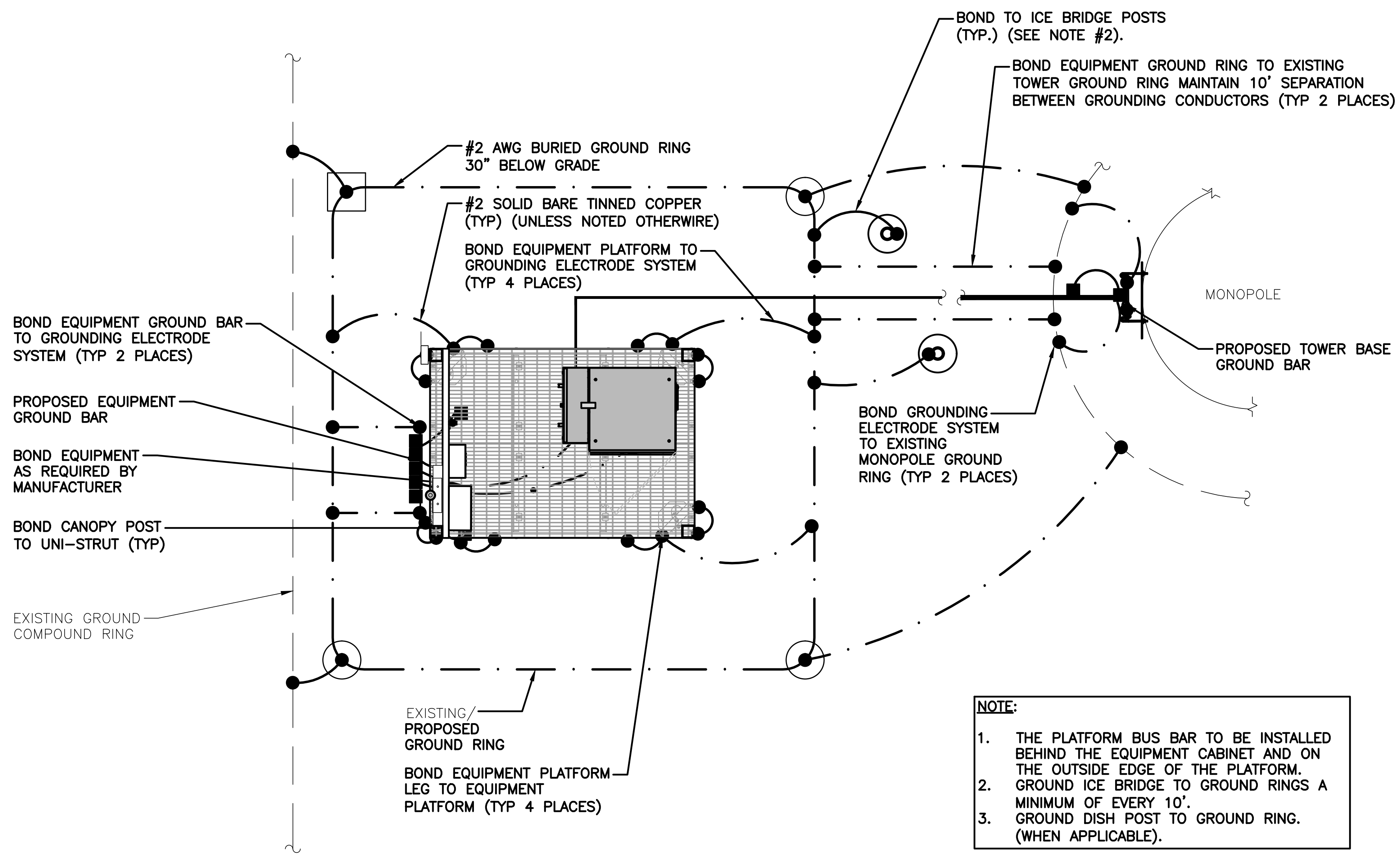
GROUNDING SYMBOL LEGEND

- GROUNDING CONDUCTOR - ABOVE GRADE
- GROUNDING CONDUCTOR - BELOW GRADE
- GROUNDING ELECTRODE SYSTEM
- 1'-6" PIGTAIL
- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND ROD
- GROUND INSPECTION/TEST WELL



TOWER ELEVATION GROUNDING

SCALE: N.T.S



NOTE:

1. THE PLATFORM BUS BAR TO BE INSTALLED BEHIND THE EQUIPMENT CABINET AND ON THE OUTSIDE EDGE OF THE PLATFORM.
2. GROUND ICE BRIDGE TO GROUND RINGS A MINIMUM OF EVERY 10'.
3. GROUND DISH POST TO GROUND RING. (WHEN APPLICABLE).

TYPICAL GROUNDING PLAN (SCHEMATIC)

SCALE: N.T.S

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dish WIRELESS

PLANS PREPARED BY:

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CT13549-S

SITE ADDRESS:

52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:

GROUNDING NOTES & DETAILS

SHEET NUMBER:

G-1

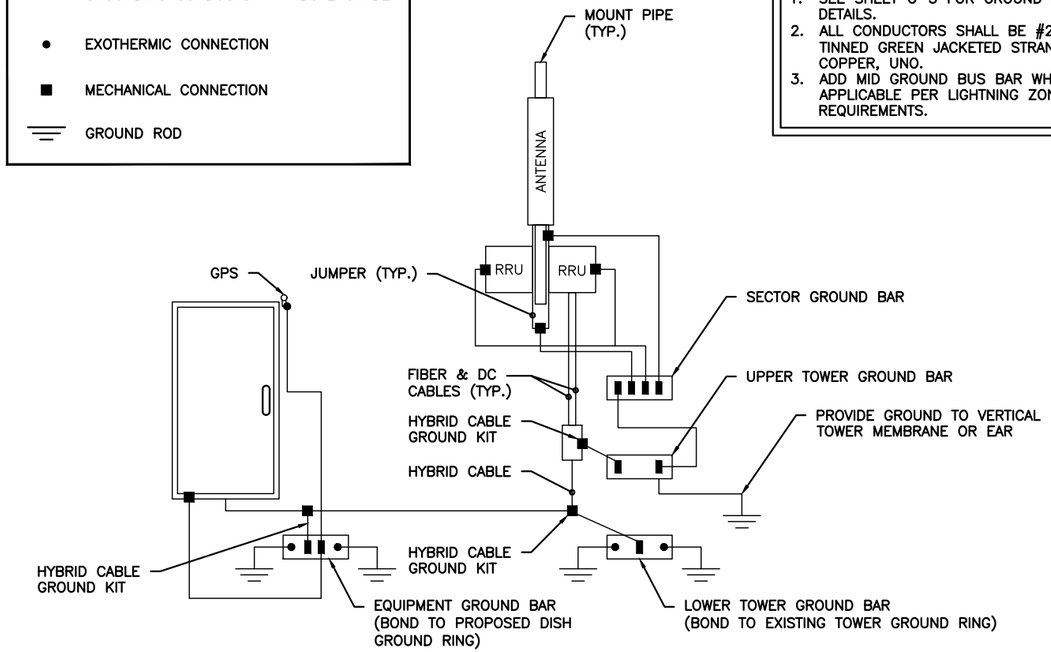
LEGEND	
———	GROUNDING CONDUCTOR – ABOVE GRADE
●	EXOTHERMIC CONNECTION
■	MECHANICAL CONNECTION
⏚	GROUND ROD

NOTE:

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

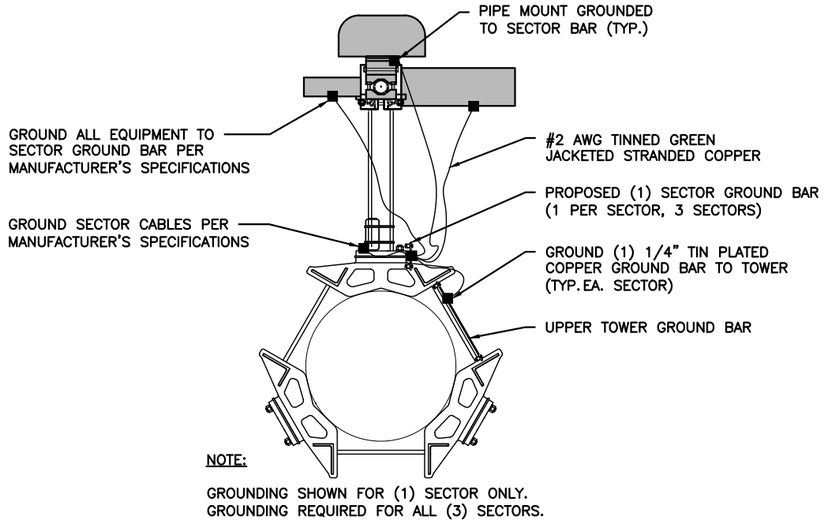
GROUNDING NOTE:

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



GROUNDING RISER DIAGRAM (TYP. PER SECTOR)

SCALE: N.T.S

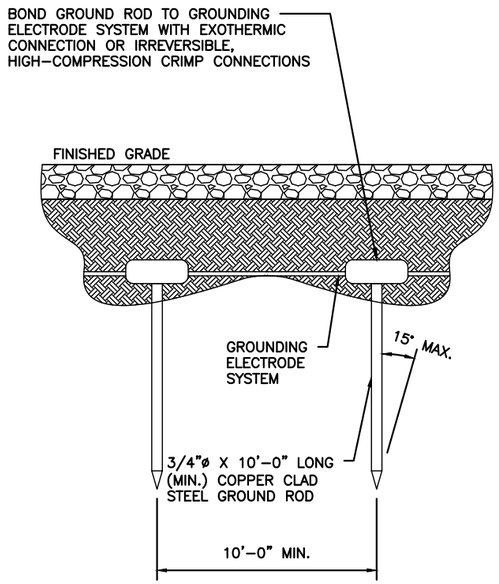


NOTE:

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

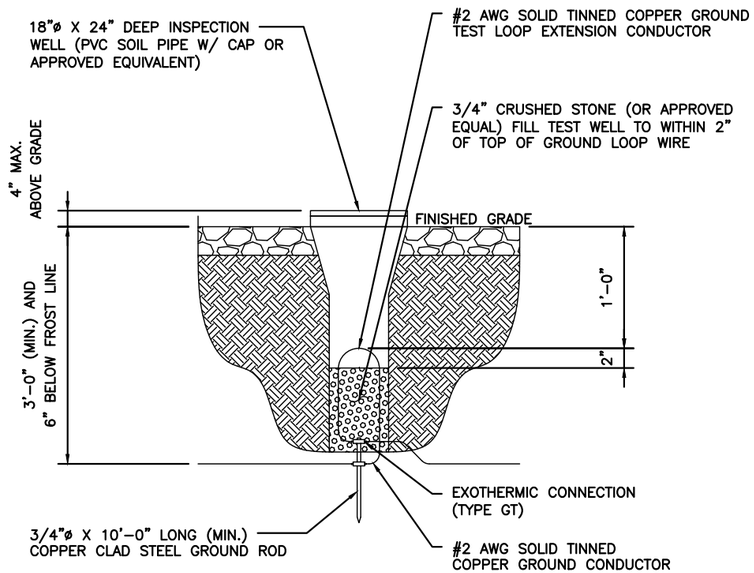
GROUND BAR AT MOUNT

SCALE: N.T.S



GROUND ROD DETAIL

SCALE: N.T.S



TEST WELL DETAIL

SCALE: N.T.S

PLANS PREPARED FOR:

dish WIRELESS

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STATE OF CONNECTICUT
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52 STADLEY ROUGH ROAD
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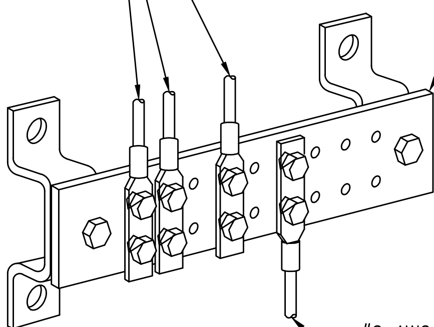
SHEET TITLE:
GROUNDING NOTES & DETAILS

SHEET NUMBER:
G-2

ERICSSON CONFIGURATION

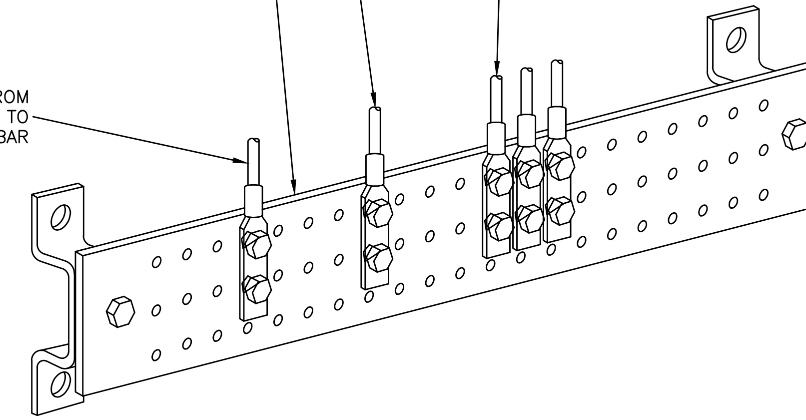
NOTES:

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 AND COAT ALL SURFACE WITH KOPR–SHIELD.
3. USE A THIN COAT OF NO–OX OR UL LISTED ANTIOXIDANT COMPOUND BETWEEN CONNECTIONS.



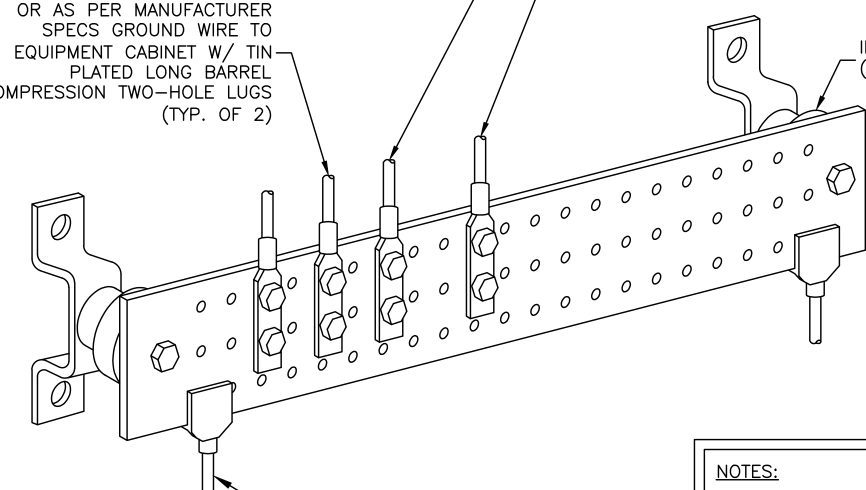
SECTOR GROUND BAR DETAIL

NOT TO SCALE



UPPER TOWER GROUND BAR DETAIL

NOT TO SCALE



EQUIPMENT GROUND BAR DETAIL

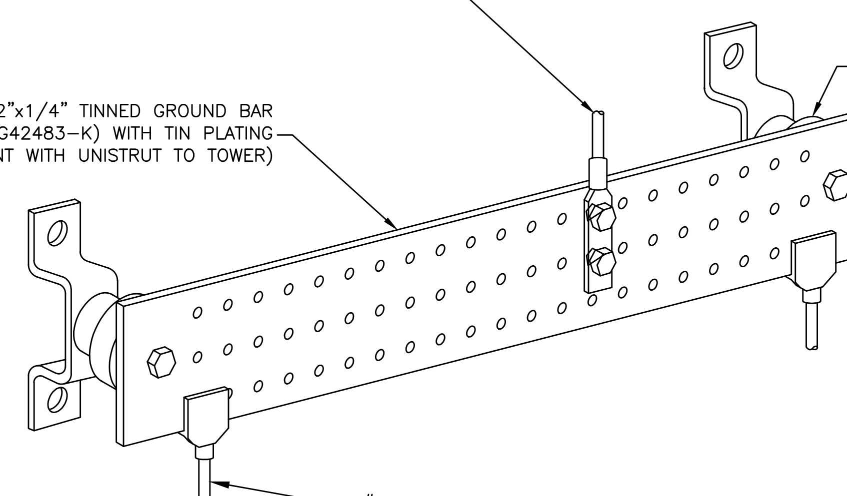
NOT TO SCALE

NOTES:

1. #2 AWG SOLID BARE TINNED COPPER WIRE FROM EACH ICE BRIDGE POST TO EXTERNAL GROUNDING SYSTEM USING EXOTHERMIC WELDS.
2. IN CASES OF SHEATHED STRANDED WIRES, CONNECTOR SHALL HAVE INSPECTION WINDOW AND NO MORE THAN 1/8" GAP BETWEEN CONNECTOR BODY AND SHEATH.

NOTE:

GROUND FROM SATELLITE DISH TO EQUIPMENT GROUND RING WHEN APPLICABLE



LOWER TOWER GROUND BAR DETAIL

NOT TO SCALE

NOTE:

#2 AWG SOLID TINNED COPPER GROUND CONDUCTOR FROM ICE BRIDGE POSTS TO BURIED GROUND RING USING EXOTHERMIC WELDS.

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dish WIRELESS

PLANS PREPARED BY:

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CT0100004B

TOWER OWNER SITE ID:

CT13549-S

SITE ADDRESS:

52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:

GROUNDING NOTES & DETAILS

SHEET NUMBER:

G-3

dish

RF Design Data Sheet

Site Information			
State	CT	Site ID	CT0100004B
Site Name	CT13549-S	Tower Type	Monopole
Address	52 Stadley Rough Rd	City	Danbury
Latitude (degrees)	41.43310211	Zip	06811
Longitude (degrees)	-73.431916	Tower Owner	SBA
RFDS Revision	0.0	Issue Date	1/17/2019
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	CT0100004B_1	CT0100004B_2	CT0100004B_3
Antenna Center Line (ft)	87	87	87
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)	1	1	1
Antenna Downtilt 700 (Electrical)	NA	NA	NA
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....			

NOTE:

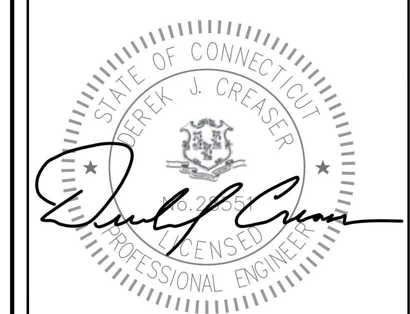
1. CONTRACTOR TO REFER TO, AND VALIDATE, THE LATEST RFDS PRIOR TO CONSTRUCTION.

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



DRAWN BY: RP

CHECKED BY: HC

APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

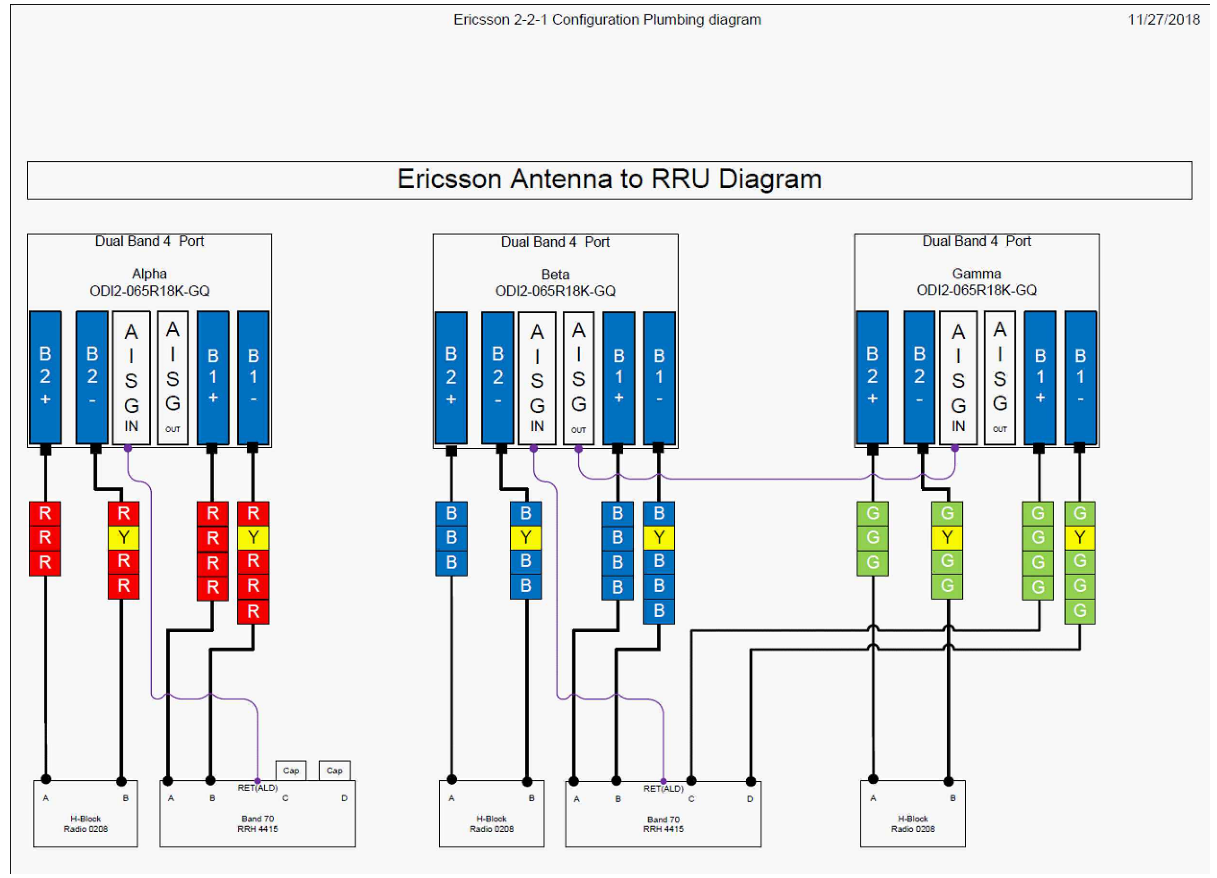
DISH WIRELESS SITE ID:
CT0100004B

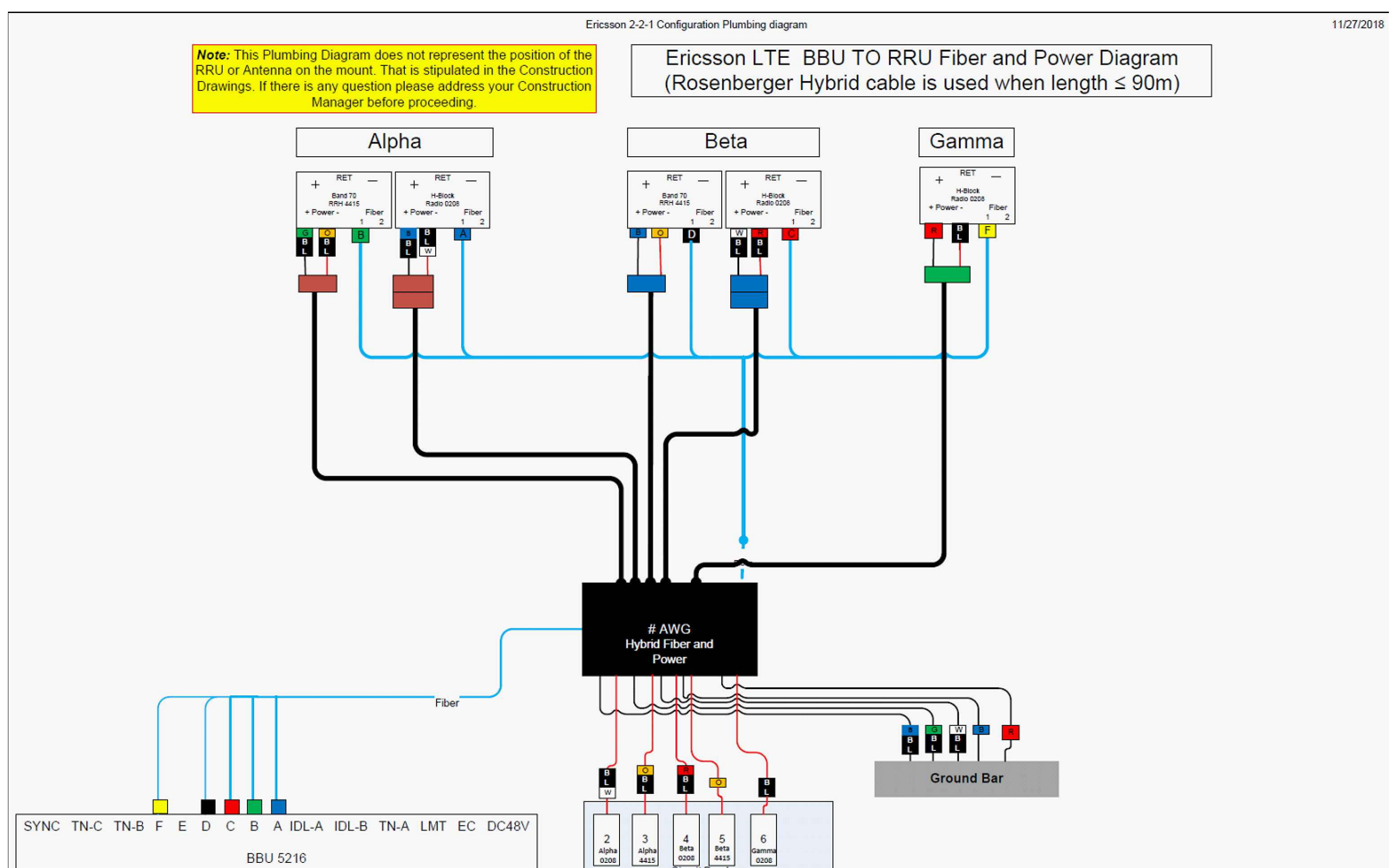
TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
RF DATA SHEET

SHEET NUMBER:
RF-1





NOTE:

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

PLANS PREPARED FOR:

dish WIRELESS

PLANS PREPARED BY:

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT – DEREK J. CREASER – LICENSED PROFESSIONAL ENGINEER

DRAWN BY: RP
CHECKED BY: HC
APPV'D: AT

SUBMITTALS			
DATE	DESCRIPTION	REV	ISSUED BY
03/01/19	FOR REVIEW	A	RP
03/19/19	FOR REVIEW	1	RP
03/25/19	FOR CONSTRUCTION	2	ET

DISH WIRELESS SITE ID:
CT0100004B

TOWER OWNER SITE ID:
CT13549-S

SITE ADDRESS:
52 STADLEY ROUGH ROAD
DANBURY, CT 06811

SHEET TITLE:
PLUMBING DIAGRAM

SHEET NUMBER:
RF-2