



January 8, 2018

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

Re: Notice of Exempt Modification – Antenna Swap Property
Address: 393 Jackson Hill Road, Middlefield, CT 06455
Applicant: AT&T Mobility, LLC

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16- 50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna centerline height of 98-feet on an existing 150-foot monopole, owned by SBA Communications Corporation at 8051 Congress Ave, Boca Raton, FL 33481. AT&T now intends to leave the current centerline of 98 feet and move to new centerline of 150-feet. AT&T also intends to replace (6) existing 4.6' Powerwave Panel Antennas, and (3) existing 6' KMW Panel Antennas with (9) new 7.7' CCI Panel Antenna, each swap will be occurring in positions [1&2&4] all sectors for a total of three (9) antennas being swapped. AT&T also wishes to add (1) RRUS-32, (1) Raycap Surge Suppressor, (1) Fiber cable and (4) DC Power cables on position [2] all sectors, and (1) RRUS-32 B2 on position [4] all sectors, for a total of (3) RRU-32, (3) RRUS-32 B2, (1) Raycap Surge Suppressor, (1) Fiber cable and (4) DC Power Cables at the 150-foot centerline.

The Land Use and Zoning office for the Town of Middlefield, Connecticut, attempted to locate the original filing at this site and was unsuccessful in finding the original decision. Nancy Davidson from the Zoning Office sent an email explaining her unsuccessful attempt at finding the original decision, said letter is attached.

In addition, attached is a summary of the planned modifications including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Jerry Russ, Zoning Enforcement Officer – Town of Middlefield, Zoning Office, 393 Jackson Hill Road, P.O. Box 179 Middlefield, CT 06455, and Edward P. Bailey – First Selectman, Selectman's Office, 393 Jackson Hill Road, P.O. Box 179 Middlefield, CT 06455. A copy of this letter is also being sent to the property owner Town of Middlefield, 393 Jackson Hill Road Middlefield, CT 06455, and to the tower company, SBA Communications Corporation, 8051 Congress Avenue Boca Raton, FL 33487.

The following is a list of subsequent decisions by the Connecticut Siting Council:

- **EM-AT&T-082-030415** – AT&T Wireless PCS, LLC d/b/a AT&T Wireless notice of intent to modify existing telecommunications facility located at 393 Jackson Hill Road, Middlefield, Connecticut.
- **EM-CING-082-090108** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 393 Jackson Hill Road, Middlefield, Connecticut.
- **EM-CING-082-120522** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 393 Jackson Hill Road, Middlefield, Connecticut.



The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 150-foot level of the 150-foot monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require an extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

A handwritten signature in blue ink, appearing to read 'Haleluya Haile'.

Haleluya Haile

Enclosures

CC w/enclosures:

First Selectman – Edward P. Bailey
Property Owner – Town of Middlefield
Structure Owner – SBA Communications Corporation
Zoning Officer - Jerry Russ

From: [Nancy](#)
To: [Haleluya Haile](#)
Subject: 393 Jackson Hill Rd
Date: Tuesday, January 9, 2018 11:11:13 AM

As requested I looked in the file for the cell tower at 393 Jackson Hill Rd. I could not find the copy of the Siting Council approval for that tower. There might be a copy at the Town Hall but I do not have a copy in the land use records.



MIDDLEFIELD, CT



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393 JACKSON HILL RD

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Location 393 JACKSON HILL RD

Mblu 11 / 242 / /

Acct# 00069300

Owner MIDDLEFIELD TOWN OF

Assessment \$659,300

PID 676

Building Count 4

Current Value

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$472,000	\$187,300	\$659,300

Owner of Record

Owner	MIDDLEFIELD TOWN OF	Sale Price	\$0
Co-Owner		Certificate	
Address	393 JACKSON HILL RD MIDDLEFIELD, CT 06455	Book & Page	/
		Sale Date	01/01/1900

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
MIDDLEFIELD TOWN OF	\$0		/	01/01/1900

Building Information

Building 1 : Section 1

Year Built: 1963
Living Area: 2,916
Replacement Cost: \$494,484

Building Photo

Building Percent 72

Good:

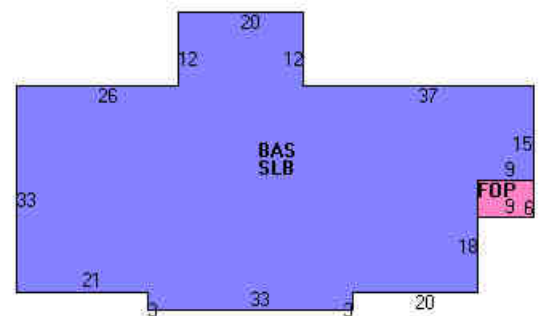
Replacement Cost

Less Depreciation: \$356,000

Building Attributes	
Field	Description
STYLE	City/Town Hall
MODEL	Comm/Ind
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Brick
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Electr Basebrd
AC Type	Central
Bldg Use	MUNICIPAL MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	903C
Heat/AC	HEAT/AC SPLIT
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	9
% Comn Wall	



Building Layout



Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	2,916	2,916
FOP	Porch, Open	54	0
SLB	Slab	2,916	0
		5,886	2,916

Building 2 : Section 1

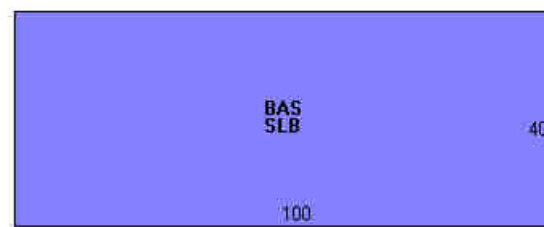
Year Built: 1978
Living Area: 4,000
Replacement Cost: \$168,916
Building Percent Good: 84
Replacement Cost Less Depreciation: \$141,900

Building Attributes : Bldg 2 of 4	
Field	Description
STYLE	Service Shop
MODEL	Ind/Comm
Grade	Average +
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	Vinyl Siding
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil/Gas
Heating Type	Hot Air-no Duc
AC Type	None
Bldg Use	MUNICIPAL MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	9030
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	NONE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	LIGHT
Wall Height	15
% Comn Wall	

Building Photo



Building Layout



Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	4,000	4,000
SLB	Slab	4,000	0
		8,000	4,000

Building 3 : Section 1

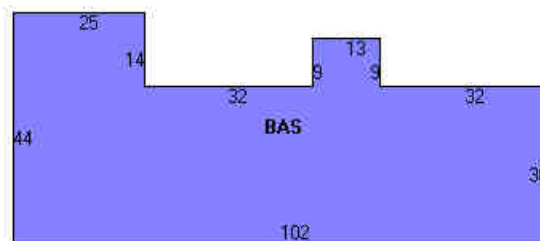
Year Built: 1941
Living Area: 3,527
Replacement Cost: \$181,842
Building Percent Good: 68
Replacement Cost Less Depreciation: \$123,700

Building Attributes : Bldg 3 of 4	
Field	Description
STYLE	Service Shop
MODEL	Ind/Comm
Grade	Average +
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	Brick
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil/Gas
Heating Type	Forced Air-Duc
AC Type	None
Bldg Use	MUNICIPAL MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	9030
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	18
% Comn Wall	

Building Photo



Building Layout



Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	3,527	3,527
		3,527	3,527

Building 4 : Section 1

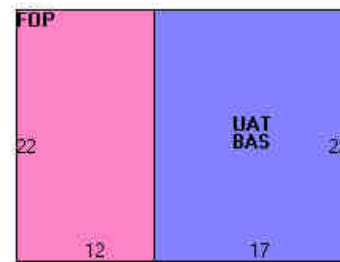
Year Built: 2000
Living Area: 374
Replacement Cost: \$16,698
Building Percent Good: 88
Replacement Cost Less Depreciation: \$14,700

Building Attributes : Bldg 4 of 4	
Field	Description
STYLE	Warehouse
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Wall Brd/Wood
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Coal or Wood
Heating Type	None
AC Type	None
Bldg Use	MUNICIPAL MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	9030
Heat/AC	NONE
Frame Type	WOOD FRAME
Baths/Plumbing	NONE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	9
% Comn Wall	

Building Photo



Building Layout



Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	374	374
FOP	Porch, Open	264	0
UAT	Attic, Unfinished	374	0
		1,012	374

Extra Features

Extra Features

No Data for Extra Features

Land

Land Use

Use Code 903C
Description MUNICIPAL MDL-94 ⓘ
Zone HD2
Neighborhood 0500
Alt Land Appr Category No

Land Line Valuation

Size (Acres) 5.47
Frontage
Depth
Assessed Value \$187,300

Outbuildings

Outbuildings						
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
KEN1	KENNEL-AVG			100 S.F.	\$600	1
FN3	FENCE-6' CHAIN			71 L.F.	\$500	1
BRN8	POLE BARN			2760 S.F.	\$14,500	1
BRN8	POLE BARN			648 S.F.	\$3,400	1
SHD7	COM MAS			140 S.F.	\$3,000	1
PAV1	PAVING-ASPHALT			30000 S.F.	\$15,800	1

All locations identified on Google, Yahoo, and Bing maps are approximate and may not be exact

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703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com



**Smartlink on behalf of AT&T
Mobility, LLC**

Site FA – 10071119

**Site ID – CT5504 (MRCTB024330-
MRCTB024506)**

USID – 26996

**Site Name – Middlefield Central
Site Compliance Report**

**393 Jackson Hill Rd
Middlefield, CT 06455**

Latitude: N41-31-02.97
Longitude: W72-42-52.92
Structure Type: Monopole

Report generated date: January 17, 2018
Report by: Kevin Bernstetter II, EI
Customer Contact: Haleluya Haile

**AT&T Mobility, LLC will be compliant when the
remediation recommended in Section 5.2 or
other appropriate remediation is implemented.**

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1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	Unknown
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit at Ground Level
FCC & AT&T Compliant?	Will Be Compliant

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CT5504_2018-Cell-Site-RF-Modifications_Rad-Cente...

CD's: 10071119_AE201_171130_CTL05504_REV2

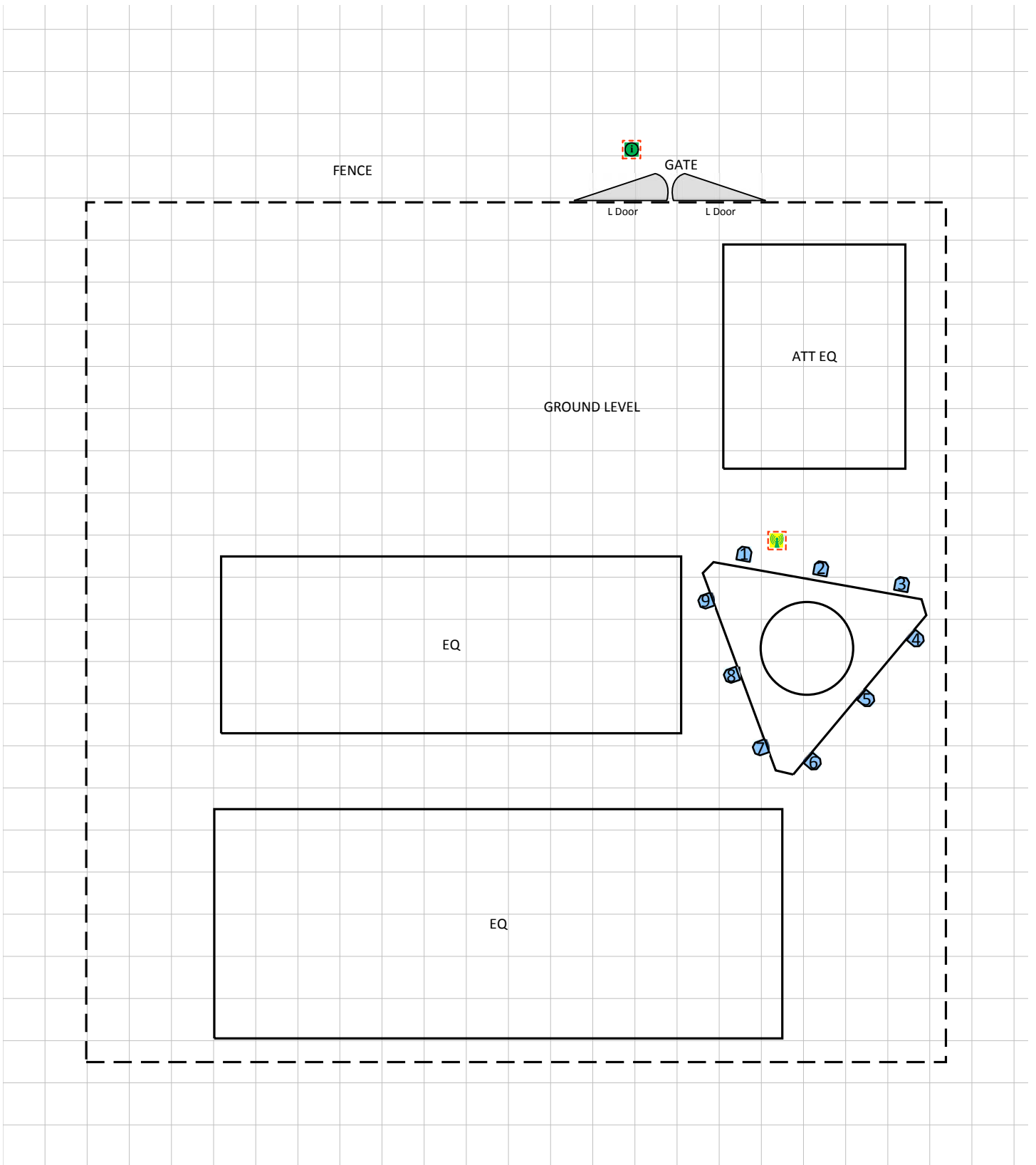
RF Powers Used: AT&T Engineering Defaults

2 Scale Maps of Site

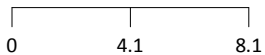
The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

Site Scale Map For: Middlefield Central



(Feet)



www.sitesafe.com
Site Name: Middlefield Central
1/17/2018 9:05:39 AM

Carrier Identification

- AT&T MOBILITY LLC (Blue circle)
- VERIZON WIRELESS (Red circle)
- T-MOBILE (Pink circle)
- SPRINT (Yellow circle)
- UNKNOWN CARRIER (White circle)

Sign Legend

- Caution 1 (Yellow square with antenna icon)
- Caution 2 (Yellow square with antenna icon)
- Notice 2 (Light blue square with antenna icon)
- Notice 1 (Dark blue square with antenna icon)
- Warning (Orange square with antenna icon)
- Info 1 (Green square with 'i' icon)
- Info 2 (Dark green square with 'i' icon)

Barrier (Red dashed line)

Proposed Barriers/ Signs (Red dashed line)

3 Antenna Inventory

The following antenna inventory on this and the following page, were obtained by the customer and were utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z AGL
1	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	850	10	58.1	7.7	14.46	0	2	0	2234	41.2'	45.2'	146.2'
2	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	2300	10	63.3	7.7	15.26	0	0	1	1285.3	45.8'	44.3'	146.2'
3	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	737	10	64.9	7.7	13.26	0	0	1	1475.7	50.6'	43.4'	146.2'
3	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	10	63.1	7.7	14.76	0	0	1	3664.4	50.6'	43.4'	146.2'
4	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	850	130	58.1	7.7	14.46	0	2	0	2234	51.5'	40.1'	146.2'
5	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	2300	130	63.3	7.7	15.26	0	0	1	1285.3	48.5'	36.5'	146.2'
6	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	737	130	64.9	7.7	13.26	0	0	1	1475.7	45.4'	32.8'	146.2'
6	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	130	63.1	7.7	14.76	0	0	1	3664.4	45.4'	32.8'	146.2'
7	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	850	250	58.1	7.7	14.46	0	2	0	2234	42.2'	33.6'	146.2'
8	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	2300	250	63.3	7.7	15.26	0	0	1	1285.3	40.5'	37.9'	146.2'
9	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	737	250	64.9	7.7	13.26	0	0	1	1475.7	39'	42.3'	146.2'
9	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	250	63.1	7.7	14.76	0	0	1	3664.4	39'	42.3'	146.2'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the ground level unless otherwise indicated. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed.

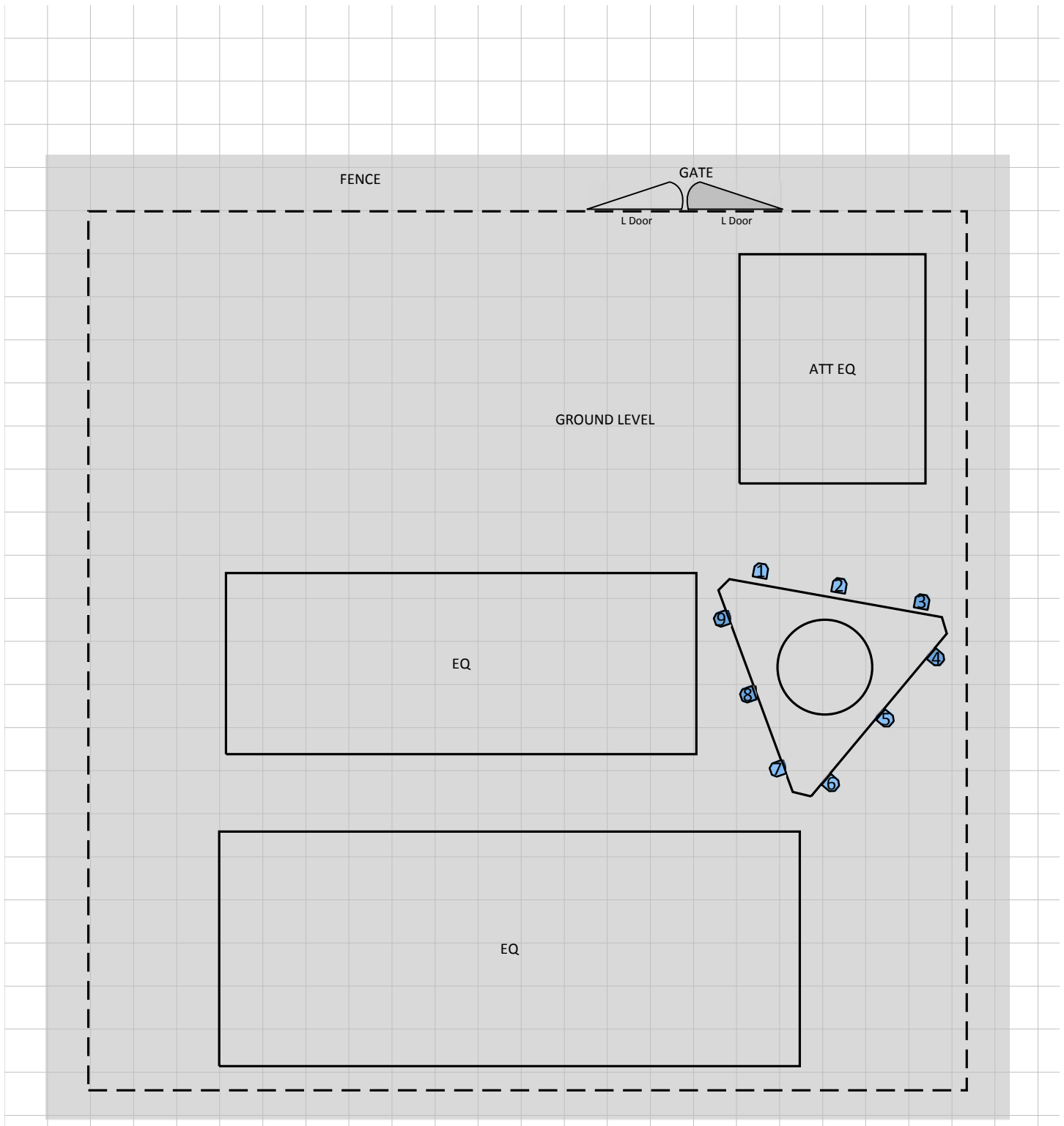
Note: Other operators exist on site but were not considered for this modeling as Sitesafe had no information on them.

4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

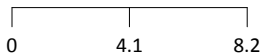
RF Exposure Simulation For: Middlefield Central



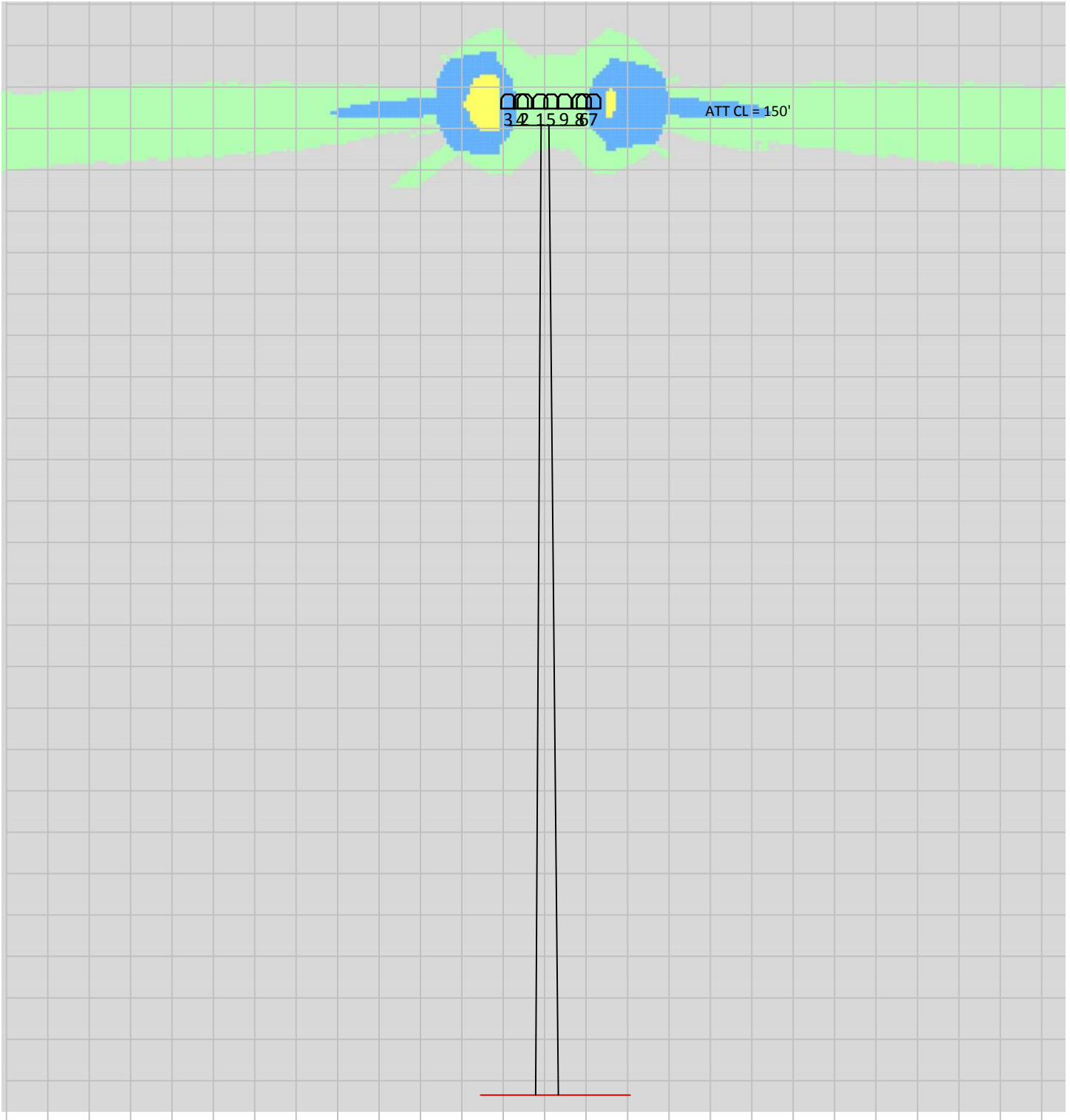
% of FCC Public Exposure Limit
Spatial average 0' - 6'



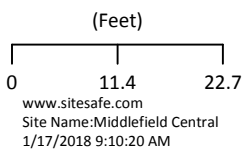
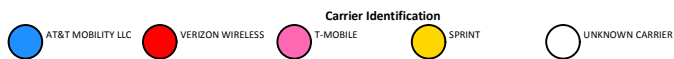
(Feet)



RF Exposure Simulation For: Middlefield Central Elevation View



% of FCC Public Exposure Limit
Spatial average 0' - 6'



5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Site Access Location

Yellow caution 2 sign required.

Gate Location

Information 1 sign required.

Notes:

- Signage may already exist on site. Sitesafe is recommending as a worst case scenario.

6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Kevin Bernstetter II, EI.

January 17, 2018

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 (“OET Bulletin 65”), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

FCC regulations define two separate tiers of exposure limits: Occupational or “Controlled environment” and General Public or “Uncontrolled environment”. The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

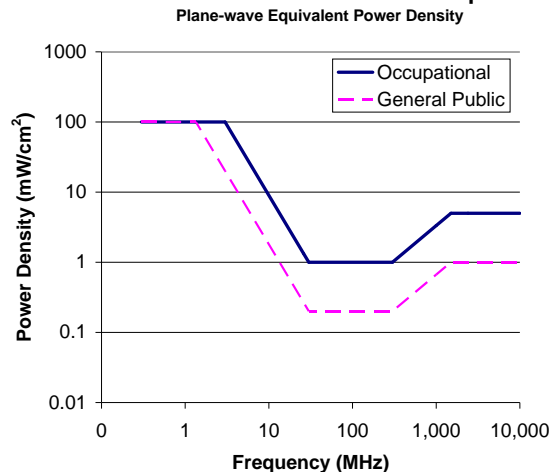
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:

FCC Limits for Maximum Permissible Exposure (MPE)



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

- (a) Each employer –
 - (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
 - (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit.**
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone.**
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers.**
- Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.**
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.

<http://www.sitesafe.com>

FCC Radio Frequency Safety

<http://www.fcc.gov/encyclopedia/radio-frequency-safety>

National Council on Radiation Protection and Measurements (NCRP)

<http://www.ncrponline.org>

Institute of Electrical and Electronics Engineers, Inc., (IEEE)

<http://www.ieee.org>

American National Standards Institute (ANSI)

<http://www.ansi.org>

Environmental Protection Agency (EPA)

<http://www.epa.gov/radtown/wireless-tech.html>

National Institutes of Health (NIH)

<http://www.niehs.nih.gov/health/topics/agents/emf/>

Occupational Safety and Health Agency (OSHA)

<http://www.osha.gov/SLTC/radiofrequencyradiation/>

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

<http://www.icnirp.org>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en/>

National Cancer Institute

<http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones>

American Cancer Society (ACS)

http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?sitearea=PED

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

http://ec.europa.eu/health/ph_risk/committees/04_scenihp/docs/scenihp_o_022.pdf

Fairfax County, Virginia Public School Survey

<http://www.fcps.edu/fts/safety-security/RFEESurvey/>

UK Health Protection Agency Advisory Group on Non-ionising Radiation

http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368

Norwegian Institute of Public Health

<http://www.fhi.no/dokumenter/545eea7147.pdf>



Tower Engineering Solutions

Phone (972) 483-0607, Fax (972) 975-9615
8445 Freepoint Parkway, Suite 375, Irving, Texas 75063

Structural Analysis Report

Existing 146 ft EEI Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT46135-A

Customer Site Name: Middlefield-jacson Hill Rd

Carrier Name: AT&T

Carrier Site ID / Name: CTL05504 / Middlefield Central

Site Location: 393 Jackson Hill Road

Middlefield, Connecticut

Middlesex County

Latitude: 41.517360

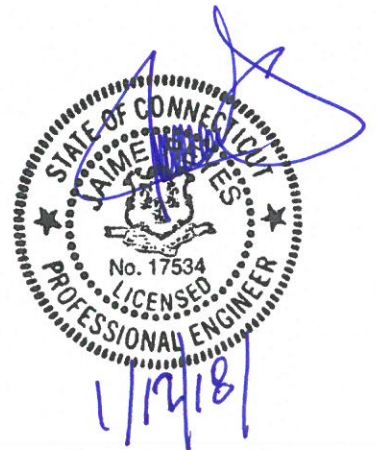
Longitude: -72.714167

Analysis Result:

Max Structural Usage: 78.2% [Pass]

Max Foundation Usage: 81.0% [Pass]

Report Prepared By: Saurav Devkota





Tower Engineering Solutions

Phone (972) 483-0607, Fax (972) 975-9615
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Analysis Result:

Max Structural Usage: 78.2% [Pass]

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Report Prepared By: Saurav Devkota

Introduction

The purpose of this report is to summarize the analysis results on the 146 ft EEI 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	Original structural design report & design drawings prepared by Engineered Endeavors Incorporated, Inc. Dated 05-28-1999. Drawing No GS51482. Job No 5072. Previous structural report prepared by Vertical Solutions, Inc. Dated 05-25-2012. Project No 120980, Rev 0.
Foundation Drawing	Original foundation design & drawings prepared by Engineered Endeavors Incorporated, Inc. Dated 05-28-1999. Drawing No 5072SPRD. Job No 5072.
Geotechnical Report	Geotechnical report prepared by Tectonic Engineering Consultants, P.C. Dated 05-20-1999. Project No W.O.1170.C942.
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 $V_{ult} = 125.0$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 97.0$ mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	$S_S = 0.181$, $S_1 = 0.063$

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
-	153.0	9	ALP 7130.16.33.00 - Panel	Platform w/ Hand Rails	(9) 1 1/4"	Sprint Nextel*
9	140.0	6	Commscope SBNHH-1D65B - Panel	Low Profile Platform	(10) 1 5/8"; (2) 1 5/8" Hybriflex	Verizon
10		6	Antel LPA-80063/4CF - Panel			
11	138.0	3	ALU B13 RRH4X30-4R			
12		3	ALU B25 RRH4x30-4R			
13		3	ALU B66 RRH4x45			
14		2	Raycap RC2DC-3315-PF-48			
15	109.0	1	14'x7" Cross Omni	Low Profile Platform	(1) 1/2"; (1) 7/8"	Town of Middlefield
16		1	8' Omni			
-	98.0	3	KMW AM-X-CD-16-65-00T-RET - Panel	Low Profile Platform**	(18) 1 1/4"; (3) DC Power Fiber line ²	AT&T
-		6	Powerwave 7770 - Panel			
-		6	Powerwave LGP21401			
-		6	Powerwave LGP21903			
-		6	Ericsson RRUS 11			
-		6	Powerwave 7020 RET			
-		1	Raycap DC6-48-60-18-8F			
17	88.0	3	RFS APXV18-206517S-C - Panel	Flush Mount	(6) 1 5/8"	T-Mobile

* Sprint Nextel terminated.

* Sprint Nextel all the antennas and coax lines need to be removed prior to the addition of AT&T proposed Antennas at the top coax lines and mount.

** All existing antenna, coax line and mount for the AT&T need to removed prior to the addition of the proposed antennas.

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

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	150.0	9	HPA-65R-BUU-H8 - Panel	Platform w/ Hand Rails	(2) 1 5/8" (2) 1/2" Ret (4) 3" DC (1) 3" Fiber	AT&T
2		6	Powerwave LGP21401 TMA			
3		6	Powerwave LGP219003			
4		6	Powerwave 7020.00 RET			
5		3	Ericsson RRUS-11			
6		3	Ericsson RRUS-32			
7		3	Ericsson RRUS 32 B2			
8		2	Raycap DC-6-48-60-18-8F			

All transmission lines are considered running inside of the pole shafts.

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:	78.2%	55.3%	72.6%
Pass/Fail	Pass	Pass	Pass

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	2626.9	23.1
Analysis Reactions	3171.3	27.4
Factored Reactions*	3546.4	31.2
% of Design Reactions	89.6%	87.8%

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

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

Operational Condition (Rigidity)

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 2.1807 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 analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.
4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.
5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.
6. 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.
7. 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.
8. 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.
9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 78.16% at 48.7ft

Structure: CT46135-A-SBA
Site Name: Middlefield-jacson Hill Rd
Height: 146.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-G
Exposure: C
Gh: 1.1

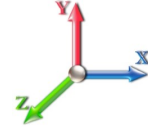
1/12/2018



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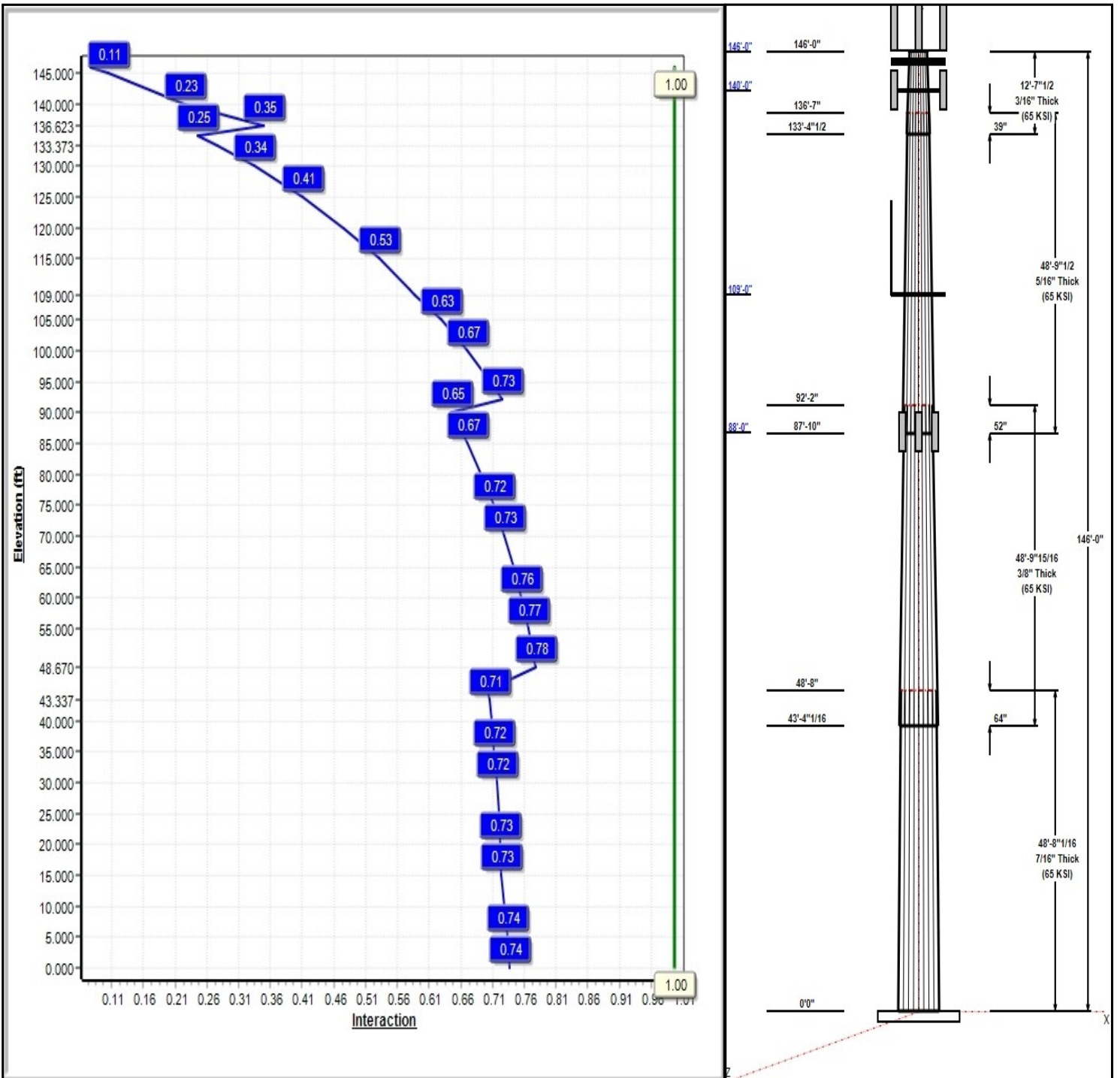
Dead Load Factor: 1.20
Wind Load Factor: 1.60

Load Case : 1.2D + 1.6W 97 mph Wind



Iterations: 26

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Structure: CT46135-A-SBA

Type: Tapered
Site Name: Middlefield-jacson Hill Rd
Height: 146.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.19692

1/12/2018

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Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.67	36.42	46.00	0.438		0.19692	65
2	48.83	28.60	38.22	0.375	Slip	0.19692	65
3	48.79	20.47	30.08	0.313	Slip	0.19692	65
4	12.63	19.00	21.49	0.188	Slip	0.19692	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
146.00	146.00	1	Beacon	---
146.00	149.50	1	Lightning Rod	---
146.00	150.00	9	HPA-65R-BUU-H8	AT&T
146.00	150.00	6	Powerwave LGP21401	AT&T
146.00	150.00	6	Powerwave LGP219003	AT&T
146.00	150.00	6	Powerwave 7020.00 RET	AT&T
146.00	150.00	3	Ericsson RRUS-11	AT&T
146.00	150.00	3	Ericsson RRUS-32	AT&T
146.00	150.00	3	Ericsson RRUS 32 B2	AT&T
146.00	150.00	2	Raycap DC-6-48-60-18-8F	AT&T
146.00	146.00	1	Platform w/ Hand Rails	AT&T
140.00	140.00	6	Commscope	Verizon
140.00	140.00	6	Antel LPA-80063/4CF	Verizon
140.00	138.00	3	ALU B13 RRH4X30-4R	Verizon
140.00	138.00	3	ALU B25 RRH4x30-4R	Verizon
140.00	138.00	3	ALU B66 RRH4x45	Verizon
140.00	138.00	2	Raycap	Verizon
140.00	140.00	1	Low Profile Platform	Verizon
109.00	116.00	1	14'x7" Cross Omni	Town of Middlefield
109.00	113.00	1	8' Omni	Town of Middlefield
109.00	109.00	1	Low Profile Platform	Town of Middlefield
88.00	88.00	3	RFS APXV18-206517S-C	T-Mobile
88.00	88.00	1	Flush Mount	T-Mobile

Linear Appurtenances

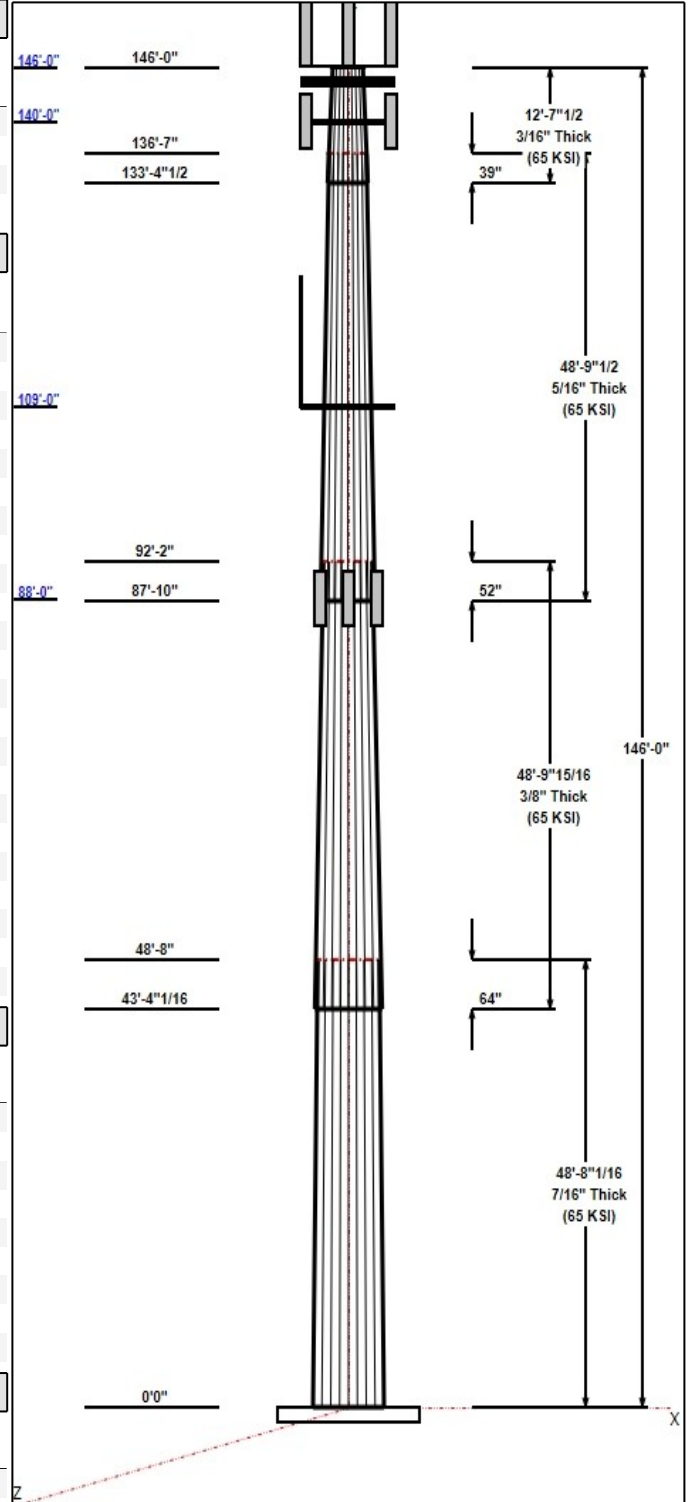
Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
3.00	146.00	Inside	1 5/8" Coax	AT&T
3.00	146.00	Inside	1/2" Ret	AT&T
3.00	146.00	Inside	3" DC	AT&T
3.00	146.00	Inside	3" Fiber	AT&T
3.00	140.00	Inside	1 5/8" Coax	Verizon
3.00	140.00	Inside	1 5/8" Hybriflex	Verizon
3.00	109.00	Inside	1/2" Coax	Town of Middlefield
3.00	109.00	Inside	7/8" Coax	Town of Middlefield
3.00	88.00	Inside	1 5/8" Coax	T-Mobile

Anchor Bolts

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

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry



Structure: CT46135-A-SBA

Type: Tapered
Site Name: Middlefield-jacson Hill Rd
Height: 146.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.19692

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2.2500 61.0 60.0 Round

Reactions

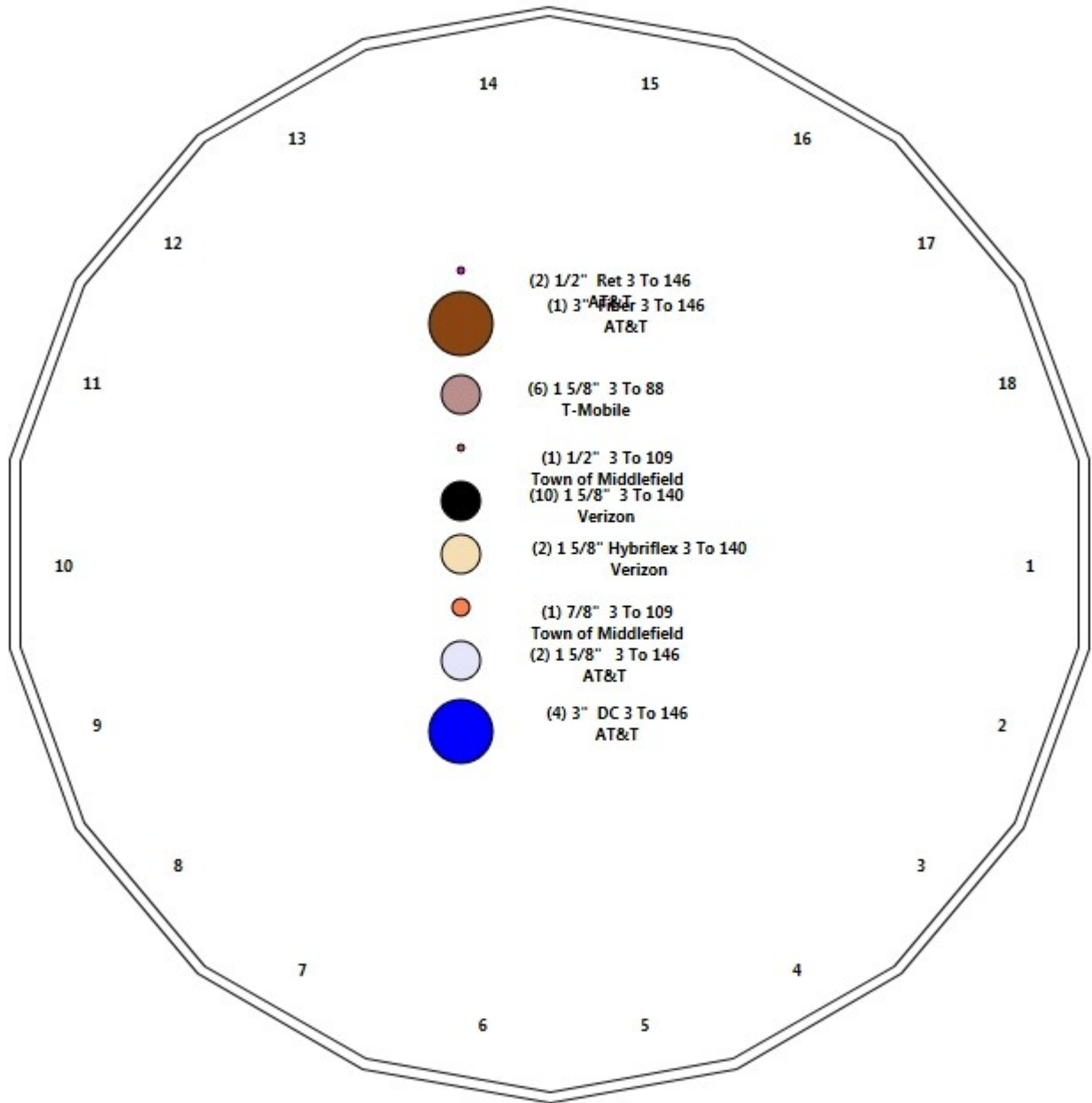
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	3171.3	27.4	38.3
0.9D + 1.6W 97 mph Wind	3126.1	27.3	28.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	879.4	7.6	58.9
1.2D + 1.0E	142.3	1.2	38.4
0.9D + 1.0E	140.2	1.2	28.8
1.0D + 1.0W 60 mph Wind	753.7	6.5	32.0

Structure: CT46135-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Middlefield-jacson Hill Rd
Height: 146.00 (ft)

1/12/2018

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Shaft Properties

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.670	0.4375	65		0.00	9,376
2	18	48.830	0.3750	65	Slip	64.00	6,533
3	18	48.790	0.3125	65	Slip	52.00	4,111
4	18	12.627	0.1875	65	Slip	39.00	513
Total Shaft Weight:							20,532

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	46.00	0.00	63.27	16593.77	17.13	105.14	36.42	48.67	49.96	8170.56	13.27	83.24	0.196918
2	38.22	43.34	45.04	8148.39	16.56	101.91	28.60	92.17	33.59	3381.52	12.04	76.27	0.196918
3	30.08	87.83	29.52	3305.07	15.56	96.25	20.47	136.62	19.99	1026.59	10.14	65.51	0.196918
4	21.49	133.3	12.68	726.47	18.80	114.59	19.00	146.00	11.20	500.59	16.46	101.3	0.196918

Load Summary

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	146.00	Beacon	1	15.00	2.40	1.00	32.41	2.400	1.00	0.00	0.00
2	146.00	Lightning Rod	1	35.00	1.05	1.00	66.33	3.417	1.00	0.00	3.50
3	146.00	HPA-65R-BUU-H8	9	68.00	12.98	0.79	358.13	14.591	0.79	0.00	4.00
4	146.00	Powerwave LGP21401 TMA	6	17.50	0.00	0.67	45.63	1.231	0.67	0.00	4.00
5	146.00	Powerwave LGP219003	6	5.30	0.34	1.00	14.77	0.793	1.00	0.00	4.00
6	146.00	Powerwave 7020.00 RET	6	2.20	0.40	0.65	12.41	0.883	0.65	0.00	4.00
7	146.00	Ericsson RRUS-11	3	50.70	2.52	0.71	139.60	3.169	0.71	0.00	4.00
8	146.00	Ericsson RRUS-32	3	77.00	1.65	0.70	125.32	2.228	0.70	0.00	4.00
9	146.00	Ericsson RRUS 32 B2	3	53.00	2.74	0.81	140.71	3.467	0.81	0.00	4.00
10	146.00	Raycap DC-6-48-60-18-8F	2	31.80	0.92	1.00	93.46	1.357	1.00	0.00	4.00
11	146.00	Platform w/ Hand Rails	1	1600.00	32.00	1.00	3694.18	59.848	1.00	0.00	0.00
12	140.00	Commscope SBNHH-1D65B	6	50.71	8.05	0.83	250.20	9.334	0.83	0.00	0.00
13	140.00	Antel LPA-80063/4CF	6	20.00	6.15	0.94	224.70	7.182	0.94	0.00	0.00
14	140.00	ALU B13 RRH4X30-4R	3	57.20	2.16	0.67	119.06	2.767	0.67	0.00	-2.00
15	140.00	ALU B25 RRH4x30-4R	3	51.00	2.14	0.67	108.35	2.744	0.67	0.00	-2.00
16	140.00	ALU B66 RRH4x45	3	56.80	2.54	0.67	140.21	3.229	0.67	0.00	-2.00
17	140.00	Raycap RC2DC-3315-PF-48	2	42.00	2.52	0.67	191.52	3.151	0.67	0.00	-2.00
18	140.00	Low Profile Platform	1	1500.00	22.00	1.00	2799.91	39.540	1.00	0.00	0.00
19	109.00	14'x7" Cross Omni	1	60.00	4.94	1.00	213.84	10.638	1.00	0.00	7.00
20	109.00	8' Omni	1	25.00	2.40	1.00	84.20	5.066	1.00	0.00	4.00
21	109.00	Low Profile Platform	1	1500.00	22.00	1.00	2767.78	39.107	1.00	0.00	0.00
22	88.00	RFS APXV18-206517S-C	3	26.40	5.17	0.79	114.43	7.421	0.79	0.00	0.00
23	88.00	Flush Mount	1	350.00	5.00	0.75	627.97	8.309	0.75	0.00	0.00
Totals:			72	7,535.16			20,029.01				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
3.00	146.00	(2) 1 5/8" Coax	0.00	Inside
3.00	146.00	(2) 1/2" Ret	0.00	Inside
3.00	146.00	(4) 3" DC	0.00	Inside
3.00	146.00	(1) 3" Fiber	0.00	Inside
3.00	140.00	(10) 1 5/8" Coax	0.00	Inside
3.00	140.00	(2) 1 5/8" Hybriflex	0.00	Inside
3.00	109.00	(1) 1/2" Coax	0.00	Inside
3.00	109.00	(1) 7/8" Coax	0.00	Inside
3.00	88.00	(6) 1 5/8" Coax	0.00	Inside

Shaft Section Properties

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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		0.4375	46.000	63.267	16593.8	17.13	105.14	81.3	710.5	0.0
5.00		0.4375	45.015	61.900	15541.1	16.73	102.89	81.7	680.0	1064.8
10.00		0.4375	44.031	60.533	14533.9	16.34	100.64	82.2	650.1	1041.5
15.00		0.4375	43.046	59.165	13571.2	15.94	98.39	82.5	621.0	1018.3
20.00		0.4375	42.062	57.798	12652.0	15.54	96.14	82.5	592.5	995.0
25.00		0.4375	41.077	56.431	11775.2	15.14	93.89	82.5	564.6	971.7
30.00		0.4375	40.092	55.064	10939.9	14.75	91.64	82.5	537.4	948.5
35.00		0.4375	39.108	53.697	10145.1	14.35	89.39	82.5	510.9	925.2
40.00		0.4375	38.123	52.330	9389.8	13.95	87.14	82.5	485.1	902.0
43.34	Bot - Section 2	0.4375	37.466	51.417	8907.2	13.69	85.64	82.5	468.3	589.0
45.00		0.4375	37.139	50.962	8672.9	13.56	84.89	82.5	460.0	543.5
48.67	Top - Section 1	0.3750	37.166	43.789	7488.6	16.07	99.11	0.0	0.0	1182.4
50.00		0.3750	36.904	43.477	7329.8	15.94	98.41	82.5	391.2	197.5
55.00		0.3750	35.920	42.305	6753.0	15.48	95.79	82.5	370.3	729.7
60.00		0.3750	34.935	41.133	6207.2	15.02	93.16	82.5	350.0	709.8
65.00		0.3750	33.950	39.962	5691.6	14.55	90.53	82.5	330.2	689.9
70.00		0.3750	32.966	38.790	5205.5	14.09	87.91	82.5	311.0	669.9
75.00		0.3750	31.981	37.618	4747.8	13.63	85.28	82.5	292.4	650.0
80.00		0.3750	30.997	36.446	4317.8	13.16	82.66	82.5	274.4	630.1
85.00		0.3750	30.012	35.274	3914.5	12.70	80.03	82.5	256.9	610.1
87.83	Bot - Section 3	0.3750	29.454	34.610	3697.6	12.44	78.54	82.5	247.3	336.9
88.00		0.3750	29.421	34.571	3685.1	12.42	78.46	82.5	246.7	36.4
90.00		0.3750	29.027	34.102	3537.2	12.24	77.41	82.5	240.0	433.1
92.17	Top - Section 2	0.3125	29.226	28.677	3028.9	15.08	93.52	0.0	0.0	462.5
95.00		0.3125	28.668	28.124	2856.9	14.77	91.74	82.5	196.3	273.8
100.00		0.3125	27.683	27.147	2569.5	14.21	88.59	82.5	182.8	470.2
105.00		0.3125	26.699	26.171	2302.1	13.65	85.44	82.5	169.8	453.6
109.00		0.3125	25.911	25.390	2102.0	13.21	82.92	82.5	159.8	350.9
110.00		0.3125	25.714	25.194	2053.9	13.10	82.28	82.5	157.3	86.1
115.00		0.3125	24.729	24.218	1824.2	12.54	79.13	82.5	145.3	420.3
120.00		0.3125	23.745	23.241	1612.3	11.99	75.98	82.5	133.7	403.7
125.00		0.3125	22.760	22.265	1417.5	11.43	72.83	82.5	122.7	387.1
130.00		0.3125	21.776	21.288	1239.0	10.88	69.68	82.5	112.1	370.5
133.37	Bot - Section 4	0.3125	21.111	20.629	1127.5	10.50	67.56	82.5	105.2	240.6
135.00		0.3125	20.791	20.311	1076.2	10.32	66.53	82.5	102.0	182.9
136.62	Top - Section 3	0.1875	20.846	12.294	662.9	18.19	111.18	0.0	0.0	179.8
140.00		0.1875	20.182	11.899	601.0	17.57	107.63	80.7	58.7	139.0
145.00		0.1875	19.197	11.313	516.5	16.64	102.38	81.8	53.0	197.5
146.00		0.1875	19.000	11.195	500.6	16.46	101.33	82.0	51.9	38.3

20532.0

Wind Loading - Shaft

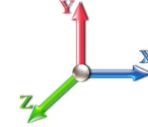
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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	348.10	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	340.65	0.650	0.000	5.00	19.254	12.52	428.4	0.0	1277.7
10.00		1.00	0.85	19.450	21.40	333.20	0.650	0.000	5.00	18.837	12.24	419.2	0.0	1249.8
15.00		1.00	0.85	19.450	21.40	325.75	0.650	0.000	5.00	18.421	11.97	409.9	0.0	1221.9
20.00		1.00	0.90	20.638	22.70	327.87	0.650	0.000	5.00	18.004	11.70	425.1	0.0	1194.0
25.00		1.00	0.95	21.630	23.79	327.80	0.650	0.000	5.00	17.588	11.43	435.2	0.0	1166.1
30.00		1.00	0.98	22.477	24.72	326.15	0.650	0.000	5.00	17.171	11.16	441.5	0.0	1138.2
35.00		1.00	1.01	23.218	25.54	323.34	0.650	0.000	5.00	16.755	10.89	445.0	0.0	1110.3
40.00		1.00	1.04	23.880	26.27	319.66	0.650	0.000	5.00	16.338	10.62	446.3	0.0	1082.4
43.34	Bot - Section 2	1.00	1.06	24.286	26.71	316.81	0.650	0.000	3.34	10.671	6.94	296.5	0.0	706.8
45.00		1.00	1.07	24.479	26.93	315.29	0.650	0.000	1.66	5.356	3.48	150.0	0.0	652.3
48.67	Top - Section 1	1.00	1.09	24.887	27.38	311.72	0.650	0.000	3.67	11.654	7.58	331.8	0.0	1418.9
50.00		1.00	1.09	25.029	27.53	316.79	0.650	0.000	1.33	4.168	2.71	119.3	0.0	237.0
55.00		1.00	1.12	25.536	28.09	311.45	0.650	0.000	5.00	15.406	10.01	450.0	0.0	875.7
60.00		1.00	1.14	26.008	28.61	305.70	0.650	0.000	5.00	14.989	9.74	446.0	0.0	851.8
65.00		1.00	1.16	26.450	29.09	299.60	0.650	0.000	5.00	14.572	9.47	440.9	0.0	827.8
70.00		1.00	1.17	26.866	29.55	293.19	0.650	0.000	5.00	14.156	9.20	435.1	0.0	803.9
75.00		1.00	1.19	27.259	29.98	286.51	0.650	0.000	5.00	13.739	8.93	428.4	0.0	780.0
80.00		1.00	1.21	27.632	30.39	279.58	0.650	0.000	5.00	13.323	8.66	421.1	0.0	756.1
85.00		1.00	1.22	27.987	30.79	272.43	0.650	0.000	5.00	12.906	8.39	413.2	0.0	732.1
87.83	Bot - Section 3	1.00	1.23	28.181	31.00	268.29	0.650	0.000	2.83	7.129	4.63	229.8	0.0	404.3
88.00	Appurtenance(s)	1.00	1.23	28.192	31.01	268.04	0.650	0.000	0.17	0.424	0.28	13.7	0.0	43.6
90.00		1.00	1.24	28.325	31.16	265.08	0.650	0.000	2.00	5.052	3.28	163.7	0.0	519.7
92.17	Top - Section 2	1.00	1.24	28.468	31.31	261.84	0.650	0.000	2.17	5.397	3.51	175.8	0.0	555.1
95.00		1.00	1.25	28.650	31.51	263.29	0.650	0.000	2.83	6.940	4.51	227.5	0.0	328.6
100.00		1.00	1.27	28.961	31.86	255.63	0.650	0.000	5.00	11.921	7.75	395.0	0.0	564.2
105.00		1.00	1.28	29.260	32.19	247.80	0.650	0.000	5.00	11.504	7.48	385.1	0.0	544.3
109.00	Appurtenance(s)	1.00	1.29	29.491	32.44	241.44	0.650	0.000	4.00	8.904	5.79	300.4	0.0	421.1
110.00		1.00	1.29	29.548	32.50	239.84	0.650	0.000	1.00	2.184	1.42	73.8	0.0	103.3
115.00		1.00	1.30	29.826	32.81	231.74	0.650	0.000	5.00	10.671	6.94	364.1	0.0	504.4
120.00		1.00	1.32	30.094	33.10	223.51	0.650	0.000	5.00	10.255	6.67	353.0	0.0	484.5
125.00		1.00	1.33	30.354	33.39	215.16	0.650	0.000	5.00	9.838	6.39	341.6	0.0	464.5
130.00		1.00	1.34	30.605	33.67	206.71	0.650	0.000	5.00	9.421	6.12	329.9	0.0	444.6
133.37	Bot - Section 4	1.00	1.34	30.771	33.85	200.94	0.650	0.000	3.37	6.121	3.98	215.5	0.0	288.7
135.00		1.00	1.35	30.850	33.93	198.15	0.650	0.000	1.63	2.935	1.91	103.6	0.0	219.5
136.62	Top - Section 3	1.00	1.35	30.927	34.02	195.35	0.650	0.000	1.62	2.886	1.88	102.1	0.0	215.7
140.00	Appurtenance(s)	1.00	1.36	31.087	34.20	193.07	0.650	0.000	3.38	5.861	3.81	208.5	0.0	166.8
145.00		1.00	1.37	31.317	34.45	184.34	0.650	0.000	5.00	8.330	5.41	298.5	0.0	236.9
146.00	Appurtenance(s)	1.00	1.37	31.362	34.50	182.58	0.650	0.000	1.00	1.616	1.05	58.0	0.0	46.0
Totals:								146.00			11,722.4	24,638.3		

Discrete Appurtenance Forces

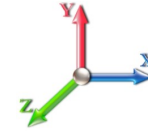
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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	146.00	Powerwave LGP219003	6	31.541	34.696	1.00	1.00	2.04	38.16	0.000	4.000	113.25	0.00	452.99	
2	146.00	Beacon	1	31.362	34.499	1.00	1.00	2.40	18.00	0.000	0.000	132.48	0.00	0.00	
3	146.00	Lightning Rod	1	31.519	34.671	1.00	1.00	1.05	42.00	0.000	3.500	58.25	0.00	203.87	
4	146.00	HPA-65R-BUU-H8	9	31.541	34.696	0.79	1.00	92.29	734.40	0.000	4.000	5123.17	0.00	20492.68	
5	146.00	Powerwave LGP21401	6	31.541	34.696	0.67	1.00	0.00	126.00	0.000	4.000	0.00	0.00	0.00	
6	146.00	Platform w/ Hand Rails	1	31.362	34.499	1.00	1.00	32.00	1920.00	0.000	0.000	1766.34	0.00	0.00	
7	146.00	Powerwave 7020.00 RET	6	31.541	34.696	0.65	1.00	1.56	15.84	0.000	4.000	86.60	0.00	346.40	
8	146.00	Ericsson RRUS-11	3	31.541	34.696	0.71	1.00	5.37	182.52	0.000	4.000	297.97	0.00	1191.89	
9	146.00	Ericsson RRUS-32	3	31.541	34.696	0.70	1.00	3.46	277.20	0.000	4.000	192.35	0.00	769.41	
10	146.00	Ericsson RRUS 32 B2	3	31.541	34.696	0.81	1.00	6.66	190.80	0.000	4.000	369.62	0.00	1478.47	
11	146.00	Raycap DC-6-48-60-18-8F	2	31.541	34.696	1.00	1.00	1.84	76.32	0.000	4.000	102.14	0.00	408.58	
12	140.00	Low Profile Platform	1	31.087	34.195	1.00	1.00	22.00	1800.00	0.000	0.000	1203.67	0.00	0.00	
13	140.00	ALU B13 RRH4X30-4R	3	30.993	34.092	0.54	0.80	3.47	205.92	0.000	-2.000	189.46	0.00	-378.91	
14	140.00	Commscope	6	31.087	34.195	0.66	0.80	32.07	365.11	0.000	0.000	1754.69	0.00	0.00	
15	140.00	Antel LPA-80063/4CF	6	31.087	34.195	0.75	0.80	27.75	144.00	0.000	0.000	1518.21	0.00	0.00	
16	140.00	Raycap	2	30.993	34.092	0.54	0.80	2.70	100.80	0.000	-2.000	147.36	0.00	-294.71	
17	140.00	ALU B25 RRH4x30-4R	3	30.993	34.092	0.54	0.80	3.44	183.60	0.000	-2.000	187.70	0.00	-375.41	
18	140.00	ALU B66 RRH4x45	3	30.993	34.092	0.54	0.80	4.08	204.48	0.000	-2.000	222.79	0.00	-445.57	
19	109.00	Low Profile Platform	1	29.491	32.440	1.00	1.00	22.00	1800.00	0.000	0.000	1141.89	0.00	0.00	
20	109.00	8' Omni	1	29.716	32.687	0.80	0.80	1.92	30.00	0.000	4.000	100.41	0.00	401.66	
21	109.00	14'x7" Cross Omni	1	29.880	32.868	0.80	0.80	3.95	72.00	0.000	7.000	207.83	0.00	1454.81	
22	88.00	Flush Mount	1	28.192	31.011	0.56	0.75	2.81	420.00	0.000	0.000	139.55	0.00	0.00	
23	88.00	RFS APXV18-206517S-C	3	28.192	31.011	0.63	0.80	9.80	95.04	0.000	0.000	486.37	0.00	0.00	
Totals:									9,042.19						15,542.09

Total Applied Force Summary

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

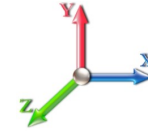


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Load Case: 1.2D + 1.6W 97 mph Wind

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		428.42	1351.71	0.00	0.00
10.00		419.16	1434.75	0.00	0.00
15.00		409.89	1406.84	0.00	0.00
20.00		425.07	1378.92	0.00	0.00
25.00		435.21	1351.01	0.00	0.00
30.00		441.53	1323.10	0.00	0.00
35.00		445.03	1295.18	0.00	0.00
40.00		446.33	1267.27	0.00	0.00
43.34		296.48	830.16	0.00	0.00
45.00		149.99	713.77	0.00	0.00
48.67		331.80	1554.58	0.00	0.00
50.00		119.34	286.15	0.00	0.00
55.00		450.04	1060.62	0.00	0.00
60.00		445.97	1036.69	0.00	0.00
65.00		440.94	1012.77	0.00	0.00
70.00		435.07	988.84	0.00	0.00
75.00		428.45	964.91	0.00	0.00
80.00		421.14	940.99	0.00	0.00
85.00		413.21	917.06	0.00	0.00
87.83		229.82	509.05	0.00	0.00
88.00	(4) attachments	639.59	564.83	0.00	0.00
90.00		163.69	578.66	0.00	0.00
92.17		175.78	618.96	0.00	0.00
95.00		227.46	412.15	0.00	0.00
100.00		394.95	711.71	0.00	0.00
105.00		385.09	691.77	0.00	0.00
109.00	(3) attachments	1750.52	2441.06	0.00	1856.47
110.00		73.83	131.96	0.00	0.00
115.00		364.11	647.81	0.00	0.00
120.00		353.04	627.88	0.00	0.00
125.00		341.62	607.94	0.00	0.00
130.00		329.87	588.00	0.00	0.00
133.37		215.47	385.44	0.00	0.00
135.00		103.60	266.18	0.00	0.00
136.62		102.09	262.27	0.00	0.00
140.00	(24) attachments	5432.33	3267.54	0.00	-1494.61
145.00		298.45	304.75	0.00	0.00
146.00	(41) attachments	8300.14	3680.75	0.00	25344.27
Totals:		27,264.53	38,414.03	0.00	25,706.14

Calculated Forces

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

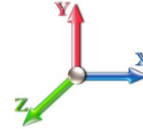


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Load Case: 1.2D + 1.6W 97 mph Wind

Iterations 26

Dead Load Factor 1.20
Wind Load Factor 1.60



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	-38.35	-27.35	0.00	-3171.3	0.00	3171.34	4626.62	2313.31	8646.87	4329.86	0.00	0.000	0.000	0.741
5.00	-36.87	-27.10	0.00	-3034.5	0.00	3034.57	4552.64	2276.32	8322.99	4167.68	0.14	-0.266	0.000	0.736
10.00	-35.31	-26.84	0.00	-2899.0	0.00	2899.09	4477.51	2238.76	8003.10	4007.50	0.57	-0.538	0.000	0.731
15.00	-33.78	-26.58	0.00	-2764.9	0.00	2764.91	4395.69	2197.85	7677.64	3844.53	1.28	-0.815	0.000	0.727
20.00	-32.28	-26.29	0.00	-2632.0	0.00	2632.04	4294.12	2147.06	7325.16	3668.02	2.28	-1.098	0.000	0.725
25.00	-30.81	-25.98	0.00	-2500.6	0.00	2500.60	4192.55	2096.27	6980.95	3495.66	3.58	-1.386	0.000	0.723
30.00	-29.36	-25.66	0.00	-2370.6	0.00	2370.69	4090.97	2045.49	6645.03	3327.46	5.19	-1.680	0.000	0.720
35.00	-27.95	-25.32	0.00	-2242.4	0.00	2242.41	3989.40	1994.70	6317.40	3163.39	7.11	-1.980	0.000	0.716
40.00	-26.59	-24.95	0.00	-2115.8	0.00	2115.82	3887.82	1943.91	5998.04	3003.48	9.35	-2.286	0.000	0.711
43.34	-25.70	-24.69	0.00	-2032.5	0.00	2032.58	3820.04	1910.02	5789.54	2899.07	11.02	-2.496	0.000	0.708
45.00	-24.92	-24.58	0.00	-1991.5	0.00	1991.53	3786.25	1893.12	5686.97	2847.71	11.91	-2.602	0.000	0.706
48.67	-23.32	-24.24	0.00	-1901.3	0.00	1901.33	3251.53	1625.77	4904.15	2455.72	14.00	-2.837	0.000	0.782
50.00	-22.94	-24.19	0.00	-1869.0	0.00	1869.09	3230.14	1615.07	4836.85	2422.02	14.80	-2.924	0.000	0.779
55.00	-21.76	-23.82	0.00	-1748.1	0.00	1748.12	3143.08	1571.54	4578.34	2292.57	18.05	-3.275	0.000	0.770
60.00	-20.61	-23.44	0.00	-1629.0	0.00	1629.02	3056.01	1528.01	4326.92	2166.68	21.67	-3.631	0.000	0.759
65.00	-19.48	-23.06	0.00	-1511.8	0.00	1511.81	2968.95	1484.47	4082.61	2044.34	25.66	-3.991	0.000	0.746
70.00	-18.38	-22.67	0.00	-1396.5	0.00	1396.51	2881.88	1440.94	3845.39	1925.55	30.03	-4.354	0.000	0.732
75.00	-17.31	-22.28	0.00	-1283.1	0.00	1283.16	2794.82	1397.41	3615.28	1810.32	34.79	-4.720	0.000	0.715
80.00	-16.27	-21.88	0.00	-1171.7	0.00	1171.77	2707.76	1353.88	3392.26	1698.65	39.92	-5.088	0.000	0.696
85.00	-15.29	-21.46	0.00	-1062.3	0.00	1062.36	2620.69	1310.35	3176.35	1590.53	45.44	-5.456	0.000	0.674
87.83	-14.76	-21.22	0.00	-1001.5	0.00	1001.54	2571.36	1285.68	3057.15	1530.84	48.74	-5.669	0.000	0.660
88.00	-14.24	-20.54	0.00	-998.00	0.00	998.00	2568.45	1284.23	3050.20	1527.37	48.93	-5.681	0.000	0.659
90.00	-13.62	-20.36	0.00	-956.92	0.00	956.92	2533.63	1266.81	2967.53	1485.97	51.34	-5.832	0.000	0.650
92.17	-12.96	-20.16	0.00	-912.80	0.00	912.80	2130.58	1065.29	2523.85	1263.80	54.02	-5.995	0.000	0.729
95.00	-12.46	-19.96	0.00	-855.67	0.00	855.67	2089.47	1044.73	2426.88	1215.24	57.64	-6.206	0.000	0.710
100.00	-11.66	-19.57	0.00	-755.87	0.00	755.87	2016.91	1008.46	2260.38	1131.87	64.34	-6.607	0.000	0.674
105.00	-10.91	-19.17	0.00	-658.01	0.00	658.01	1944.36	972.18	2099.80	1051.46	71.45	-6.999	0.000	0.632
109.00	-8.65	-17.16	0.00	-579.46	0.00	579.46	1886.32	943.16	1975.59	989.26	77.44	-7.305	0.000	0.591
110.00	-8.46	-17.10	0.00	-562.30	0.00	562.30	1871.81	935.90	1945.13	974.01	78.97	-7.382	0.000	0.582
115.00	-7.76	-16.71	0.00	-476.79	0.00	476.79	1799.25	899.63	1796.38	899.53	86.87	-7.742	0.000	0.535
120.00	-7.10	-16.31	0.00	-393.26	0.00	393.26	1726.70	863.35	1653.55	828.00	95.14	-8.081	0.000	0.479
125.00	-6.46	-15.92	0.00	-311.71	0.00	311.71	1654.15	827.07	1516.64	759.45	103.75	-8.392	0.000	0.415
130.00	-5.87	-15.53	0.00	-232.13	0.00	232.13	1581.59	790.80	1385.64	693.85	112.65	-8.665	0.000	0.339
133.37	-5.50	-15.27	0.00	-179.75	0.00	179.75	1532.65	766.32	1300.60	651.27	118.81	-8.825	0.000	0.280
135.00	-5.23	-15.13	0.00	-154.92	0.00	154.92	1509.04	754.52	1260.56	631.22	121.82	-8.893	0.000	0.249
136.62	-4.97	-14.99	0.00	-130.36	0.00	130.36	885.20	442.60	750.52	375.82	124.84	-8.955	0.000	0.354
140.00	-2.57	-9.12	0.00	-79.74	0.00	79.74	864.59	432.29	709.24	355.15	131.19	-9.053	0.000	0.228
145.00	-2.31	-8.78	0.00	-34.13	0.00	34.13	833.10	416.55	649.44	325.20	140.71	-9.188	0.000	0.108
146.00	0.00	-8.30	0.00	-25.34	0.00	25.34	826.66	413.33	637.68	319.32	142.63	-9.204	0.000	0.080

Wind Loading - Shaft

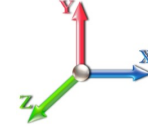
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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	348.10	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	340.65	0.650	0.000	5.00	19.254	12.52	428.4	0.0	958.3
10.00		1.00	0.85	19.450	21.40	333.20	0.650	0.000	5.00	18.837	12.24	419.2	0.0	937.4
15.00		1.00	0.85	19.450	21.40	325.75	0.650	0.000	5.00	18.421	11.97	409.9	0.0	916.4
20.00		1.00	0.90	20.638	22.70	327.87	0.650	0.000	5.00	18.004	11.70	425.1	0.0	895.5
25.00		1.00	0.95	21.630	23.79	327.80	0.650	0.000	5.00	17.588	11.43	435.2	0.0	874.6
30.00		1.00	0.98	22.477	24.72	326.15	0.650	0.000	5.00	17.171	11.16	441.5	0.0	853.6
35.00		1.00	1.01	23.218	25.54	323.34	0.650	0.000	5.00	16.755	10.89	445.0	0.0	832.7
40.00		1.00	1.04	23.880	26.27	319.66	0.650	0.000	5.00	16.338	10.62	446.3	0.0	811.8
43.34	Bot - Section 2	1.00	1.06	24.286	26.71	316.81	0.650	0.000	3.34	10.671	6.94	296.5	0.0	530.1
45.00		1.00	1.07	24.479	26.93	315.29	0.650	0.000	1.66	5.356	3.48	150.0	0.0	489.2
48.67	Top - Section 1	1.00	1.09	24.887	27.38	311.72	0.650	0.000	3.67	11.654	7.58	331.8	0.0	1064.1
50.00		1.00	1.09	25.029	27.53	316.79	0.650	0.000	1.33	4.168	2.71	119.3	0.0	177.7
55.00		1.00	1.12	25.536	28.09	311.45	0.650	0.000	5.00	15.406	10.01	450.0	0.0	656.8
60.00		1.00	1.14	26.008	28.61	305.70	0.650	0.000	5.00	14.989	9.74	446.0	0.0	638.8
65.00		1.00	1.16	26.450	29.09	299.60	0.650	0.000	5.00	14.572	9.47	440.9	0.0	620.9
70.00		1.00	1.17	26.866	29.55	293.19	0.650	0.000	5.00	14.156	9.20	435.1	0.0	602.9
75.00		1.00	1.19	27.259	29.98	286.51	0.650	0.000	5.00	13.739	8.93	428.4	0.0	585.0
80.00		1.00	1.21	27.632	30.39	279.58	0.650	0.000	5.00	13.323	8.66	421.1	0.0	567.1
85.00		1.00	1.22	27.987	30.79	272.43	0.650	0.000	5.00	12.906	8.39	413.2	0.0	549.1
87.83	Bot - Section 3	1.00	1.23	28.181	31.00	268.29	0.650	0.000	2.83	7.129	4.63	229.8	0.0	303.2
88.00	Appurtenance(s)	1.00	1.23	28.192	31.01	268.04	0.650	0.000	0.17	0.424	0.28	13.7	0.0	32.7
90.00		1.00	1.24	28.325	31.16	265.08	0.650	0.000	2.00	5.052	3.28	163.7	0.0	389.7
92.17	Top - Section 2	1.00	1.24	28.468	31.31	261.84	0.650	0.000	2.17	5.397	3.51	175.8	0.0	416.3
95.00		1.00	1.25	28.650	31.51	263.29	0.650	0.000	2.83	6.940	4.51	227.5	0.0	246.4
100.00		1.00	1.27	28.961	31.86	255.63	0.650	0.000	5.00	11.921	7.75	395.0	0.0	423.2
105.00		1.00	1.28	29.260	32.19	247.80	0.650	0.000	5.00	11.504	7.48	385.1	0.0	408.2
109.00	Appurtenance(s)	1.00	1.29	29.491	32.44	241.44	0.650	0.000	4.00	8.904	5.79	300.4	0.0	315.8
110.00		1.00	1.29	29.548	32.50	239.84	0.650	0.000	1.00	2.184	1.42	73.8	0.0	77.5
115.00		1.00	1.30	29.826	32.81	231.74	0.650	0.000	5.00	10.671	6.94	364.1	0.0	378.3
120.00		1.00	1.32	30.094	33.10	223.51	0.650	0.000	5.00	10.255	6.67	353.0	0.0	363.4
125.00		1.00	1.33	30.354	33.39	215.16	0.650	0.000	5.00	9.838	6.39	341.6	0.0	348.4
130.00		1.00	1.34	30.605	33.67	206.71	0.650	0.000	5.00	9.421	6.12	329.9	0.0	333.4
133.37	Bot - Section 4	1.00	1.34	30.771	33.85	200.94	0.650	0.000	3.37	6.121	3.98	215.5	0.0	216.5
135.00		1.00	1.35	30.850	33.93	198.15	0.650	0.000	1.63	2.935	1.91	103.6	0.0	164.6
136.62	Top - Section 3	1.00	1.35	30.927	34.02	195.35	0.650	0.000	1.62	2.886	1.88	102.1	0.0	161.8
140.00	Appurtenance(s)	1.00	1.36	31.087	34.20	193.07	0.650	0.000	3.38	5.861	3.81	208.5	0.0	125.1
145.00		1.00	1.37	31.317	34.45	184.34	0.650	0.000	5.00	8.330	5.41	298.5	0.0	177.7
146.00	Appurtenance(s)	1.00	1.37	31.362	34.50	182.58	0.650	0.000	1.00	1.616	1.05	58.0	0.0	34.5
Totals:									146.00			11,722.4		18,478.8

Discrete Appurtenance Forces

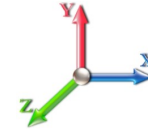
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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	146.00	Powerwave LGP219003	6	31.541	34.696	1.00	1.00	2.04	28.62	0.000	4.000	113.25	0.00	452.99	
2	146.00	Beacon	1	31.362	34.499	1.00	1.00	2.40	13.50	0.000	0.000	132.48	0.00	0.00	
3	146.00	Lightning Rod	1	31.519	34.671	1.00	1.00	1.05	31.50	0.000	3.500	58.25	0.00	203.87	
4	146.00	HPA-65R-BUU-H8	9	31.541	34.696	0.79	1.00	92.29	550.80	0.000	4.000	5123.17	0.00	20492.68	
5	146.00	Powerwave LGP21401	6	31.541	34.696	0.67	1.00	0.00	94.50	0.000	4.000	0.00	0.00	0.00	
6	146.00	Platform w/ Hand Rails	1	31.362	34.499	1.00	1.00	32.00	1440.00	0.000	0.000	1766.34	0.00	0.00	
7	146.00	Powerwave 7020.00 RET	6	31.541	34.696	0.65	1.00	1.56	11.88	0.000	4.000	86.60	0.00	346.40	
8	146.00	Ericsson RRUS-11	3	31.541	34.696	0.71	1.00	5.37	136.89	0.000	4.000	297.97	0.00	1191.89	
9	146.00	Ericsson RRUS-32	3	31.541	34.696	0.70	1.00	3.46	207.90	0.000	4.000	192.35	0.00	769.41	
10	146.00	Ericsson RRUS 32 B2	3	31.541	34.696	0.81	1.00	6.66	143.10	0.000	4.000	369.62	0.00	1478.47	
11	146.00	Raycap DC-6-48-60-18-8F	2	31.541	34.696	1.00	1.00	1.84	57.24	0.000	4.000	102.14	0.00	408.58	
12	140.00	Low Profile Platform	1	31.087	34.195	1.00	1.00	22.00	1350.00	0.000	0.000	1203.67	0.00	0.00	
13	140.00	ALU B13 RRH4X30-4R	3	30.993	34.092	0.54	0.80	3.47	154.44	0.000	-2.000	189.46	0.00	-378.91	
14	140.00	Commscope	6	31.087	34.195	0.66	0.80	32.07	273.83	0.000	0.000	1754.69	0.00	0.00	
15	140.00	Antel LPA-80063/4CF	6	31.087	34.195	0.75	0.80	27.75	108.00	0.000	0.000	1518.21	0.00	0.00	
16	140.00	Raycap	2	30.993	34.092	0.54	0.80	2.70	75.60	0.000	-2.000	147.36	0.00	-294.71	
17	140.00	ALU B25 RRH4x30-4R	3	30.993	34.092	0.54	0.80	3.44	137.70	0.000	-2.000	187.70	0.00	-375.41	
18	140.00	ALU B66 RRH4x45	3	30.993	34.092	0.54	0.80	4.08	153.36	0.000	-2.000	222.79	0.00	-445.57	
19	109.00	Low Profile Platform	1	29.491	32.440	1.00	1.00	22.00	1350.00	0.000	0.000	1141.89	0.00	0.00	
20	109.00	8' Omni	1	29.716	32.687	0.80	0.80	1.92	22.50	0.000	4.000	100.41	0.00	401.66	
21	109.00	14'x7" Cross Omni	1	29.880	32.868	0.80	0.80	3.95	54.00	0.000	7.000	207.83	0.00	1454.81	
22	88.00	Flush Mount	1	28.192	31.011	0.56	0.75	2.81	315.00	0.000	0.000	139.55	0.00	0.00	
23	88.00	RFS APXV18-206517S-C	3	28.192	31.011	0.63	0.80	9.80	71.28	0.000	0.000	486.37	0.00	0.00	
Totals:									6,781.64						15,542.09

Total Applied Force Summary

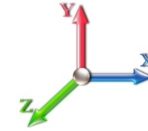
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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		428.42	1013.78	0.00	0.00
10.00		419.16	1076.06	0.00	0.00
15.00		409.89	1055.13	0.00	0.00
20.00		425.07	1034.19	0.00	0.00
25.00		435.21	1013.26	0.00	0.00
30.00		441.53	992.32	0.00	0.00
35.00		445.03	971.39	0.00	0.00
40.00		446.33	950.45	0.00	0.00
43.34		296.48	622.62	0.00	0.00
45.00		149.99	535.33	0.00	0.00
48.67		331.80	1165.94	0.00	0.00
50.00		119.34	214.61	0.00	0.00
55.00		450.04	795.46	0.00	0.00
60.00		445.97	777.52	0.00	0.00
65.00		440.94	759.57	0.00	0.00
70.00		435.07	741.63	0.00	0.00
75.00		428.45	723.69	0.00	0.00
80.00		421.14	705.74	0.00	0.00
85.00		413.21	687.80	0.00	0.00
87.83		229.82	381.79	0.00	0.00
88.00	(4) attachments	639.59	423.62	0.00	0.00
90.00		163.69	433.99	0.00	0.00
92.17		175.78	464.22	0.00	0.00
95.00		227.46	309.11	0.00	0.00
100.00		394.95	533.78	0.00	0.00
105.00		385.09	518.83	0.00	0.00
109.00	(3) attachments	1750.52	1830.80	0.00	1856.47
110.00		73.83	98.97	0.00	0.00
115.00		364.11	485.86	0.00	0.00
120.00		353.04	470.91	0.00	0.00
125.00		341.62	455.95	0.00	0.00
130.00		329.87	441.00	0.00	0.00
133.37		215.47	289.08	0.00	0.00
135.00		103.60	199.63	0.00	0.00
136.62		102.09	196.70	0.00	0.00
140.00	(24) attachments	5432.33	2450.66	0.00	-1494.61
145.00		298.45	228.56	0.00	0.00
146.00	(41) attachments	8300.14	2760.57	0.00	25344.27
Totals:		27,264.53	28,810.52	0.00	25,706.14

Calculated Forces

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

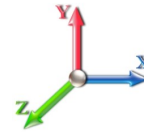


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Load Case: 0.9D + 1.6W 97 mph Wind

Iterations 26

Dead Load Factor 0.90
Wind Load Factor 1.60



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	-28.75	-27.33	0.00	-3126.1	0.00	3126.13	4626.62	2313.31	8646.87	4329.86	0.00	0.000	0.000	0.728
5.00	-27.61	-27.03	0.00	-2989.4	0.00	2989.48	4552.64	2276.32	8322.99	4167.68	0.14	-0.262	0.000	0.724
10.00	-26.41	-26.73	0.00	-2854.3	0.00	2854.34	4477.51	2238.76	8003.10	4007.50	0.56	-0.530	0.000	0.718
15.00	-25.23	-26.43	0.00	-2720.7	0.00	2720.71	4395.69	2197.85	7677.64	3844.53	1.26	-0.802	0.000	0.714
20.00	-24.08	-26.10	0.00	-2588.5	0.00	2588.58	4294.12	2147.06	7325.16	3668.02	2.25	-1.081	0.000	0.711
25.00	-22.95	-25.76	0.00	-2458.0	0.00	2458.07	4192.55	2096.27	6980.95	3495.66	3.53	-1.364	0.000	0.709
30.00	-21.84	-25.40	0.00	-2329.2	0.00	2329.27	4090.97	2045.49	6645.03	3327.46	5.11	-1.654	0.000	0.706
35.00	-20.75	-25.04	0.00	-2202.2	0.00	2202.25	3989.40	1994.70	6317.40	3163.39	7.00	-1.948	0.000	0.702
40.00	-19.71	-24.64	0.00	-2077.0	0.00	2077.06	3887.82	1943.91	5998.04	3003.48	9.20	-2.248	0.000	0.697
43.34	-19.03	-24.37	0.00	-1994.8	0.00	1994.84	3820.04	1910.02	5789.54	2899.07	10.85	-2.454	0.000	0.693
45.00	-18.43	-24.25	0.00	-1954.3	0.00	1954.30	3786.25	1893.12	5686.97	2847.71	11.72	-2.559	0.000	0.691
48.67	-17.22	-23.92	0.00	-1865.2	0.00	1865.28	3251.53	1625.77	4904.15	2455.72	13.78	-2.789	0.000	0.765
50.00	-16.92	-23.85	0.00	-1833.4	0.00	1833.48	3230.14	1615.07	4836.85	2422.02	14.57	-2.874	0.000	0.762
55.00	-16.01	-23.46	0.00	-1714.2	0.00	1714.23	3143.08	1571.54	4578.34	2292.57	17.76	-3.219	0.000	0.753
60.00	-15.12	-23.06	0.00	-1596.9	0.00	1596.95	3056.01	1528.01	4326.92	2166.68	21.31	-3.567	0.000	0.742
65.00	-14.25	-22.66	0.00	-1481.6	0.00	1481.67	2968.95	1484.47	4082.61	2044.34	25.24	-3.920	0.000	0.730
70.00	-13.40	-22.25	0.00	-1368.3	0.00	1368.39	2881.88	1440.94	3845.39	1925.55	29.53	-4.276	0.000	0.716
75.00	-12.58	-21.85	0.00	-1257.1	0.00	1257.12	2794.82	1397.41	3615.28	1810.32	34.20	-4.635	0.000	0.699
80.00	-11.77	-21.44	0.00	-1147.8	0.00	1147.88	2707.76	1353.88	3392.26	1698.65	39.24	-4.995	0.000	0.680
85.00	-11.02	-21.03	0.00	-1040.6	0.00	1040.65	2620.69	1310.35	3176.35	1590.53	44.66	-5.356	0.000	0.659
87.83	-10.62	-20.78	0.00	-981.08	0.00	981.08	2571.36	1285.68	3057.15	1530.84	47.89	-5.564	0.000	0.645
88.00	-10.24	-20.12	0.00	-977.62	0.00	977.62	2568.45	1284.23	3050.20	1527.37	48.09	-5.577	0.000	0.644
90.00	-9.77	-19.94	0.00	-937.38	0.00	937.38	2533.63	1266.81	2967.53	1485.97	50.45	-5.725	0.000	0.635
92.17	-9.26	-19.75	0.00	-894.18	0.00	894.18	2130.58	1065.29	2523.85	1263.80	53.08	-5.884	0.000	0.712
95.00	-8.87	-19.54	0.00	-838.24	0.00	838.24	2089.47	1044.73	2426.88	1215.24	56.63	-6.091	0.000	0.694
100.00	-8.26	-19.14	0.00	-740.56	0.00	740.56	2016.91	1008.46	2260.38	1131.87	63.21	-6.484	0.000	0.659
105.00	-7.67	-18.74	0.00	-644.86	0.00	644.86	1944.36	972.18	2099.80	1051.46	70.19	-6.867	0.000	0.618
109.00	-6.02	-16.80	0.00	-568.03	0.00	568.03	1886.32	943.16	1975.59	989.26	76.06	-7.167	0.000	0.578
110.00	-5.86	-16.74	0.00	-551.23	0.00	551.23	1871.81	935.90	1945.13	974.01	77.57	-7.243	0.000	0.569
115.00	-5.33	-16.35	0.00	-467.53	0.00	467.53	1799.25	899.63	1796.38	899.53	85.32	-7.596	0.000	0.523
120.00	-4.82	-15.96	0.00	-385.80	0.00	385.80	1726.70	863.35	1653.55	828.00	93.43	-7.929	0.000	0.469
125.00	-4.34	-15.58	0.00	-305.99	0.00	305.99	1654.15	827.07	1516.64	759.45	101.88	-8.234	0.000	0.406
130.00	-3.90	-15.20	0.00	-228.09	0.00	228.09	1581.59	790.80	1385.64	693.85	110.62	-8.502	0.000	0.332
133.37	-3.62	-14.96	0.00	-176.80	0.00	176.80	1532.65	766.32	1300.60	651.27	116.66	-8.659	0.000	0.274
135.00	-3.42	-14.83	0.00	-152.48	0.00	152.48	1509.04	754.52	1260.56	631.22	119.61	-8.726	0.000	0.244
136.62	-3.22	-14.70	0.00	-128.41	0.00	128.41	885.20	442.60	750.52	375.82	122.58	-8.787	0.000	0.346
140.00	-1.61	-8.96	0.00	-78.77	0.00	78.77	864.59	432.29	709.24	355.15	128.81	-8.883	0.000	0.224
145.00	-1.42	-8.63	0.00	-33.97	0.00	33.97	833.10	416.55	649.44	325.20	138.15	-9.017	0.000	0.107
146.00	0.00	-8.30	0.00	-25.34	0.00	25.34	826.66	413.33	637.68	319.32	140.04	-9.033	0.000	0.080

Wind Loading - Shaft

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

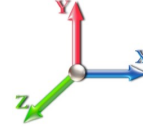


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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Iterations 25

Dead Load Factor 1.20
Wind Load Factor 1.00



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	20.289	24.35	138.4	359.9	1637.6
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	19.947	23.94	136.1	378.2	1628.1
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	19.576	23.49	133.5	385.8	1607.7
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	19.193	23.03	138.9	388.6	1582.6
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	18.804	22.56	142.6	388.7	1554.8
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	18.409	22.09	145.1	386.9	1525.1
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	18.012	21.61	146.7	383.8	1494.1
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	17.612	21.13	147.5	379.7	1462.1
43.34	Bot - Section 2	1.00	1.06	6.453	7.10	0.00	1.200	1.541	3.34	11.528	13.83	98.2	251.3	958.1
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	1.66	5.785	6.94	49.7	127.1	779.4
48.67	Top - Section 1	1.00	1.09	6.613	7.27	0.00	1.200	1.559	3.67	12.608	15.13	110.0	277.6	1696.5
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	1.33	4.515	5.42	39.6	100.2	337.2
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	5.00	16.721	20.07	149.8	370.7	1246.4
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	16.316	19.58	148.8	364.3	1216.0
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	15.910	19.09	147.6	357.4	1185.3
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	15.504	18.60	146.1	350.2	1154.1
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	15.096	18.12	144.3	342.7	1122.7
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	14.689	17.63	142.3	334.9	1091.0
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	14.280	17.14	140.2	326.9	1059.0
87.83	Bot - Section 3	1.00	1.23	7.488	8.24	0.00	1.200	1.654	2.83	7.910	9.49	78.2	182.6	586.9
88.00	Appurtenance(s)	1.00	1.23	7.491	8.24	0.00	1.200	1.655	0.17	0.470	0.56	4.6	10.9	54.6
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	2.00	5.604	6.73	55.7	130.0	649.7
92.17	Top - Section 2	1.00	1.24	7.564	8.32	0.00	1.200	1.662	2.17	5.998	7.20	59.9	139.3	694.4
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	2.83	7.727	9.27	77.6	179.5	508.0
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	5.00	13.317	15.98	135.3	308.1	872.3
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	12.908	15.49	132.5	299.3	843.6
109.00	Appurtenance(s)	1.00	1.29	7.836	8.62	0.00	1.200	1.690	4.00	10.030	12.04	103.7	233.7	654.8
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	1.00	2.466	2.96	25.6	58.1	161.3
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	12.087	14.50	126.4	281.2	785.6
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	5.00	11.677	14.01	123.2	271.9	756.4
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	11.266	13.52	119.9	262.5	727.1
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	5.00	10.855	13.03	116.5	253.0	697.6
133.37	Bot - Section 4	1.00	1.34	8.176	8.99	0.00	1.200	1.725	3.37	7.091	8.51	76.5	166.3	455.0
135.00		1.00	1.35	8.197	9.02	0.00	1.200	1.727	1.63	3.404	4.08	36.8	80.5	300.0
136.62	Top - Section 3	1.00	1.35	8.217	9.04	0.00	1.200	1.729	1.62	3.353	4.02	36.4	79.3	295.0
140.00	Appurtenance(s)	1.00	1.36	8.260	9.09	0.00	1.200	1.733	3.38	6.837	8.20	74.5	160.6	327.3
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	5.00	9.780	11.74	107.4	227.9	464.9
146.00	Appurtenance(s)	1.00	1.37	8.333	9.17	0.00	1.200	1.741	1.00	1.906	2.29	21.0	45.2	91.1
								Totals:	146.00			3,957.4	34,263.4	

Discrete Appurtenance Forces

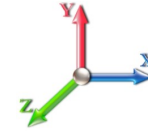
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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	146.00	Powerwave LGP219003	6	8.381	9.219	1.00	1.00	4.76	78.79	0.000	4.000	43.85	0.00	175.41
2	146.00	Beacon	1	8.333	9.166	1.00	1.00	2.40	30.41	0.000	0.000	22.00	0.00	0.00
3	146.00	Lightning Rod	1	8.375	9.212	1.00	1.00	3.42	64.33	0.000	3.500	31.48	0.00	110.18
4	146.00	HPA-65R-BUU-H8	9	8.381	9.219	0.79	1.00	103.74	3345.58	0.000	4.000	956.34	0.00	3825.38
5	146.00	Powerwave LGP21401	6	8.381	9.219	0.67	1.00	4.95	294.75	0.000	4.000	45.62	0.00	182.47
6	146.00	Platform w/ Hand Rails	1	8.333	9.166	1.00	1.00	59.85	3414.18	0.000	0.000	548.59	0.00	0.00
7	146.00	Powerwave 7020.00 RET	6	8.381	9.219	0.65	1.00	3.44	59.69	0.000	4.000	31.73	0.00	126.93
8	146.00	Ericsson RRUS-11	3	8.381	9.219	0.71	1.00	6.75	449.22	0.000	4.000	62.23	0.00	248.94
9	146.00	Ericsson RRUS-32	3	8.381	9.219	0.70	1.00	4.68	422.15	0.000	4.000	43.13	0.00	172.52
10	146.00	Ericsson RRUS 32 B2	3	8.381	9.219	0.81	1.00	8.42	453.93	0.000	4.000	77.66	0.00	310.63
11	146.00	Raycap DC-6-48-60-18-8F	2	8.381	9.219	1.00	1.00	2.71	164.24	0.000	4.000	25.02	0.00	100.07
12	140.00	Low Profile Platform	1	8.260	9.086	1.00	1.00	39.54	2799.91	0.000	0.000	359.25	0.00	0.00
13	140.00	ALU B13 RRH4X30-4R	3	8.235	9.058	0.54	0.80	4.45	345.61	0.000	-2.000	40.30	0.00	-80.59
14	140.00	Commscope	6	8.260	9.086	0.66	0.80	37.19	1562.07	0.000	0.000	337.87	0.00	0.00
15	140.00	Antel LPA-80063/4CF	6	8.260	9.086	0.75	0.80	32.40	1372.20	0.000	0.000	294.41	0.00	0.00
16	140.00	Raycap	2	8.235	9.058	0.54	0.80	3.38	369.84	0.000	-2.000	30.59	0.00	-61.19
17	140.00	ALU B25 RRH4x30-4R	3	8.235	9.058	0.54	0.80	4.41	313.95	0.000	-2.000	39.97	0.00	-79.93
18	140.00	ALU B66 RRH4x45	3	8.235	9.058	0.54	0.80	5.19	454.70	0.000	-2.000	47.03	0.00	-94.07
19	109.00	Low Profile Platform	1	7.836	8.619	1.00	1.00	39.11	2767.78	0.000	0.000	337.08	0.00	0.00
20	109.00	8' Omni	1	7.896	8.685	0.80	0.80	4.05	71.70	0.000	4.000	35.20	0.00	140.80
21	109.00	14'x7" Cross Omni	1	7.939	8.733	0.80	0.80	8.51	215.54	0.000	7.000	74.32	0.00	520.27
22	88.00	Flush Mount	1	7.491	8.240	0.56	0.75	4.67	597.97	0.000	0.000	38.51	0.00	0.00
23	88.00	RFS APXV18-206517S-C	3	7.491	8.240	0.63	0.80	14.07	279.32	0.000	0.000	115.94	0.00	0.00
Totals:									19,927.85			3,638.13		

Total Applied Force Summary

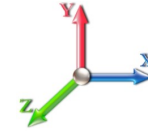
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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		138.41	1711.61	0.00	0.00
10.00		136.07	1813.00	0.00	0.00
15.00		133.54	1792.65	0.00	0.00
20.00		138.92	1767.55	0.00	0.00
25.00		142.65	1739.70	0.00	0.00
30.00		145.12	1710.01	0.00	0.00
35.00		146.68	1679.02	0.00	0.00
40.00		147.51	1647.02	0.00	0.00
43.34		98.20	1081.46	0.00	0.00
45.00		49.67	840.90	0.00	0.00
48.67		110.05	1832.19	0.00	0.00
50.00		39.63	386.36	0.00	0.00
55.00		149.76	1431.33	0.00	0.00
60.00		148.83	1400.96	0.00	0.00
65.00		147.59	1370.18	0.00	0.00
70.00		146.08	1339.06	0.00	0.00
75.00		144.33	1307.62	0.00	0.00
80.00		142.35	1275.91	0.00	0.00
85.00		140.17	1243.95	0.00	0.00
87.83		78.18	691.65	0.00	0.00
88.00	(4) attachments	159.10	938.02	0.00	0.00
90.00		55.68	708.70	0.00	0.00
92.17		59.88	758.27	0.00	0.00
95.00		77.65	591.61	0.00	0.00
100.00		135.27	1019.77	0.00	0.00
105.00		132.46	991.03	0.00	0.00
109.00	(3) attachments	550.35	3827.76	0.00	661.07
110.00		25.56	190.02	0.00	0.00
115.00		126.44	929.00	0.00	0.00
120.00		123.25	899.81	0.00	0.00
125.00		119.94	870.49	0.00	0.00
130.00		116.52	841.04	0.00	0.00
133.37		76.52	551.78	0.00	0.00
135.00		36.83	346.69	0.00	0.00
136.62		36.37	341.59	0.00	0.00
140.00	(24) attachments	1223.96	7642.47	0.00	-315.78
145.00		107.42	532.66	0.00	0.00
146.00	(41) attachments	1908.63	8881.96	0.00	5252.52
	Totals:	7,595.56	58,924.79	0.00	5,597.81

Calculated Forces

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 19
	Struct Class: II	

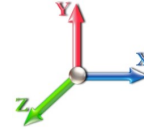


Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Iterations 25

Dead Load Factor 1.20

Wind Load 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	-58.92	-7.63	0.00	-879.40	0.00	879.40	4626.62	2313.31	8646.87	4329.86	0.00	0.000	0.000	0.216
5.00	-57.20	-7.57	0.00	-841.24	0.00	841.24	4552.64	2276.32	8322.99	4167.68	0.04	-0.074	0.000	0.214
10.00	-55.38	-7.50	0.00	-803.40	0.00	803.40	4477.51	2238.76	8003.10	4007.50	0.16	-0.149	0.000	0.213
15.00	-53.57	-7.44	0.00	-765.89	0.00	765.89	4395.69	2197.85	7677.64	3844.53	0.35	-0.226	0.000	0.211
20.00	-51.80	-7.36	0.00	-728.71	0.00	728.71	4294.12	2147.06	7325.16	3668.02	0.63	-0.304	0.000	0.211
25.00	-50.05	-7.28	0.00	-691.91	0.00	691.91	4192.55	2096.27	6980.95	3495.66	0.99	-0.384	0.000	0.210
30.00	-48.33	-7.19	0.00	-655.53	0.00	655.53	4090.97	2045.49	6645.03	3327.46	1.44	-0.465	0.000	0.209
35.00	-46.64	-7.10	0.00	-619.59	0.00	619.59	3989.40	1994.70	6317.40	3163.39	1.97	-0.548	0.000	0.208
40.00	-44.99	-6.99	0.00	-584.11	0.00	584.11	3887.82	1943.91	5998.04	3003.48	2.59	-0.633	0.000	0.206
43.34	-43.90	-6.91	0.00	-560.80	0.00	560.80	3820.04	1910.02	5789.54	2899.07	3.05	-0.691	0.000	0.205
45.00	-43.06	-6.88	0.00	-549.31	0.00	549.31	3786.25	1893.12	5686.97	2847.71	3.30	-0.720	0.000	0.204
48.67	-41.22	-6.78	0.00	-524.05	0.00	524.05	3251.53	1625.77	4904.15	2455.72	3.88	-0.785	0.000	0.226
50.00	-40.83	-6.78	0.00	-515.03	0.00	515.03	3230.14	1615.07	4836.85	2422.02	4.10	-0.809	0.000	0.225
55.00	-39.39	-6.68	0.00	-481.13	0.00	481.13	3143.08	1571.54	4578.34	2292.57	5.00	-0.905	0.000	0.222
60.00	-37.98	-6.57	0.00	-447.75	0.00	447.75	3056.01	1528.01	4326.92	2166.68	6.00	-1.003	0.000	0.219
65.00	-36.60	-6.46	0.00	-414.90	0.00	414.90	2968.95	1484.47	4082.61	2044.34	7.10	-1.102	0.000	0.215
70.00	-35.25	-6.35	0.00	-382.60	0.00	382.60	2881.88	1440.94	3845.39	1925.55	8.31	-1.202	0.000	0.211
75.00	-33.94	-6.24	0.00	-350.86	0.00	350.86	2794.82	1397.41	3615.28	1810.32	9.62	-1.302	0.000	0.206
80.00	-32.65	-6.12	0.00	-319.68	0.00	319.68	2707.76	1353.88	3392.26	1698.65	11.04	-1.402	0.000	0.200
85.00	-31.41	-5.99	0.00	-289.08	0.00	289.08	2620.69	1310.35	3176.35	1590.53	12.56	-1.503	0.000	0.194
87.83	-30.71	-5.91	0.00	-272.11	0.00	272.11	2571.36	1285.68	3057.15	1530.84	13.47	-1.560	0.000	0.190
88.00	-29.78	-5.74	0.00	-271.12	0.00	271.12	2568.45	1284.23	3050.20	1527.37	13.53	-1.564	0.000	0.189
90.00	-29.07	-5.68	0.00	-259.65	0.00	259.65	2533.63	1266.81	2967.53	1485.97	14.19	-1.605	0.000	0.186
92.17	-28.30	-5.63	0.00	-247.33	0.00	247.33	2130.58	1065.29	2523.85	1263.80	14.93	-1.649	0.000	0.209
95.00	-27.71	-5.57	0.00	-231.39	0.00	231.39	2089.47	1044.73	2426.88	1215.24	15.92	-1.706	0.000	0.204
100.00	-26.68	-5.46	0.00	-203.52	0.00	203.52	2016.91	1008.46	2260.38	1131.87	17.77	-1.814	0.000	0.193
105.00	-25.69	-5.33	0.00	-176.24	0.00	176.24	1944.36	972.18	2099.80	1051.46	19.73	-1.920	0.000	0.181
109.00	-21.88	-4.67	0.00	-154.24	0.00	154.24	1886.32	943.16	1975.59	989.26	21.37	-2.001	0.000	0.168
110.00	-21.68	-4.66	0.00	-149.57	0.00	149.57	1871.81	935.90	1945.13	974.01	21.79	-2.022	0.000	0.165
115.00	-20.75	-4.54	0.00	-126.26	0.00	126.26	1799.25	899.63	1796.38	899.53	23.96	-2.117	0.000	0.152
120.00	-19.85	-4.41	0.00	-103.58	0.00	103.58	1726.70	863.35	1653.55	828.00	26.23	-2.207	0.000	0.137
125.00	-18.98	-4.28	0.00	-81.54	0.00	81.54	1654.15	827.07	1516.64	759.45	28.58	-2.289	0.000	0.119
130.00	-18.14	-4.15	0.00	-60.14	0.00	60.14	1581.59	790.80	1385.64	693.85	31.02	-2.360	0.000	0.098
133.37	-17.59	-4.06	0.00	-46.15	0.00	46.15	1532.65	766.32	1300.60	651.27	32.70	-2.401	0.000	0.082
135.00	-17.24	-4.01	0.00	-39.55	0.00	39.55	1509.04	754.52	1260.56	631.22	33.52	-2.419	0.000	0.074
136.62	-16.90	-3.97	0.00	-33.04	0.00	33.04	885.20	442.60	750.52	375.82	34.35	-2.434	0.000	0.107
140.00	-9.32	-2.42	0.00	-19.65	0.00	19.65	864.59	432.29	709.24	355.15	36.08	-2.459	0.000	0.066
145.00	-8.79	-2.29	0.00	-7.55	0.00	7.55	833.10	416.55	649.44	325.20	38.67	-2.491	0.000	0.034
146.00	0.00	-1.91	0.00	-5.25	0.00	5.25	826.66	413.33	637.68	319.32	39.19	-2.495	0.000	0.016

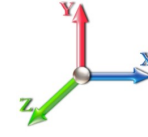
Seismic Segment Forces (Factored)

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E					Iterations 23
Gust Response Factor	1.10	Sds	0.12	Ss	0.18
Dead Load Factor	1.20	Seismic Load Factor	1.00	Sd1	0.04
Wind Load Factor	0.00	Structure Frequency	0.33	SA	0.01
					Seismic Importance Factor 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50	
0.00		0.00	0.00	0.00	0.00	0.00		
5.00		1064.7	0.00	0.03	0.02	15.97		
10.00		1041.5	0.01	0.05	0.03	21.24		
15.00		1018.2	0.02	0.06	0.04	23.24		
20.00		995.00	0.04	0.07	0.04	23.90		
25.00		971.74	0.06	0.07	0.04	24.04		
30.00		948.48	0.08	0.07	0.04	24.05		
35.00		925.22	0.11	0.07	0.04	24.09		
40.00		901.96	0.14	0.07	0.03	24.15		
43.34	Bot - Section 2	588.97	0.17	0.07	0.03	16.02		
45.00		543.55	0.18	0.07	0.03	14.87		
48.67	Top - Section 1	1182.3	0.21	0.06	0.02	32.51		
50.00		197.47	0.22	0.06	0.02	5.42		
55.00		729.75	0.27	0.05	0.02	19.25		
60.00		709.81	0.32	0.04	0.01	16.55		
65.00		689.87	0.37	0.03	0.01	11.84		
70.00		669.93	0.43	0.01	0.01	4.93		
75.00		650.00	0.50	-0.02	0.01	-3.26		
80.00		630.06	0.57	-0.04	0.01	-10.73		
85.00		610.12	0.64	-0.07	0.02	-15.80		
87.83	Bot - Section 3	336.88	0.68	-0.08	0.03	-9.80		
88.00	Appurtenance(s)	465.55	0.69	-0.08	0.03	-13.61		
90.00		433.05	0.72	-0.09	0.03	-13.26		
92.17	Top - Section 2	462.54	0.75	-0.10	0.04	-14.52		
95.00		273.82	0.80	-0.11	0.05	-8.58		
100.00		470.19	0.89	-0.12	0.08	-13.39		
105.00		453.57	0.98	-0.11	0.12	-10.12		
109.00	Appurtenance(s)	1935.9	1.05	-0.09	0.16	-29.28		
110.00		86.06	1.07	-0.08	0.17	-1.12		
115.00		420.34	1.17	-0.02	0.23	-0.25		
120.00		403.73	1.28	0.09	0.32	6.05		
125.00		387.11	1.39	0.26	0.42	13.08		
130.00		370.50	1.50	0.50	0.54	20.72		
133.37	Bot - Section 4	240.58	1.58	0.71	0.64	17.51		
135.00		182.94	1.62	0.83	0.69	14.90		
136.62	Top - Section 3	179.76	1.66	0.96	0.75	16.27		
140.00	Appurtenance(s)	2642.2	1.74	1.27	0.87	292.06		
145.00		197.46	1.86	1.85	1.09	28.28		
146.00	Appurtenance(s)	3055.9	1.89	1.98	1.14	459.06		
Totals:		28,067.1				1,026.2	Total Wind:	27,264.5

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

Calculated Forces

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E							Iterations 23
Gust Response Factor	1.10			Sds	0.12		Ss 0.18
Dead Load Factor	1.20	Seismic Load Factor	1.00	Sd1	0.04		S1 0.06
Wind Load Factor	0.00	Structure Frequency	0.33	SA	0.01	Seismic Importance Factor	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-38.41	-1.17	0.00	-142.31	0.00	142.31	4626.62	2313.31	8646.87	4329.86	0.00	0.00	0.00	0.041
5.00	-37.06	-1.16	0.00	-136.45	0.00	136.45	4552.64	2276.32	8322.99	4167.68	0.01	-0.01	0.041	
10.00	-35.63	-1.15	0.00	-130.62	0.00	130.62	4477.51	2238.76	8003.10	4007.50	0.03	-0.02	0.041	
15.00	-34.22	-1.13	0.00	-124.87	0.00	124.87	4395.69	2197.85	7677.64	3844.53	0.06	-0.04	0.040	
20.00	-32.84	-1.12	0.00	-119.20	0.00	119.20	4294.12	2147.06	7325.16	3668.02	0.10	-0.05	0.040	
25.00	-31.49	-1.10	0.00	-113.61	0.00	113.61	4192.55	2096.27	6980.95	3495.66	0.16	-0.06	0.040	
30.00	-30.17	-1.08	0.00	-108.12	0.00	108.12	4090.97	2045.49	6645.03	3327.46	0.23	-0.08	0.040	
35.00	-28.87	-1.06	0.00	-102.72	0.00	102.72	3989.40	1994.70	6317.40	3163.39	0.32	-0.09	0.040	
40.00	-27.60	-1.04	0.00	-97.41	0.00	97.41	3887.82	1943.91	5998.04	3003.48	0.42	-0.10	0.040	
43.34	-26.77	-1.03	0.00	-93.94	0.00	93.94	3820.04	1910.02	5789.54	2899.07	0.50	-0.11	0.039	
45.00	-26.06	-1.01	0.00	-92.23	0.00	92.23	3786.25	1893.12	5686.97	2847.71	0.54	-0.12	0.039	
48.67	-24.50	-0.98	0.00	-88.51	0.00	88.51	3251.53	1625.77	4904.15	2455.72	0.63	-0.13	0.044	
50.00	-24.22	-0.98	0.00	-87.21	0.00	87.21	3230.14	1615.07	4836.85	2422.02	0.67	-0.13	0.044	
55.00	-23.16	-0.96	0.00	-82.31	0.00	82.31	3143.08	1571.54	4578.34	2292.57	0.82	-0.15	0.043	
60.00	-22.12	-0.95	0.00	-77.49	0.00	77.49	3056.01	1528.01	4326.92	2166.68	0.98	-0.17	0.043	
65.00	-21.11	-0.94	0.00	-72.73	0.00	72.73	2968.95	1484.47	4082.61	2044.34	1.17	-0.18	0.043	
70.00	-20.12	-0.94	0.00	-68.01	0.00	68.01	2881.88	1440.94	3845.39	1925.55	1.37	-0.20	0.042	
75.00	-19.15	-0.94	0.00	-63.31	0.00	63.31	2794.82	1397.41	3615.28	1810.32	1.59	-0.22	0.042	
80.00	-18.21	-0.95	0.00	-58.59	0.00	58.59	2707.76	1353.88	3392.26	1698.65	1.83	-0.24	0.041	
85.00	-17.29	-0.95	0.00	-53.86	0.00	53.86	2620.69	1310.35	3176.35	1590.53	2.09	-0.26	0.040	
87.83	-16.79	-0.95	0.00	-51.18	0.00	51.18	2571.36	1285.68	3057.15	1530.84	2.24	-0.27	0.040	
88.00	-16.22	-0.94	0.00	-51.03	0.00	51.03	2568.45	1284.23	3050.20	1527.37	2.25	-0.27	0.040	
90.00	-15.64	-0.94	0.00	-49.14	0.00	49.14	2533.63	1266.81	2967.53	1485.97	2.37	-0.28	0.039	
92.17	-15.02	-0.94	0.00	-47.09	0.00	47.09	2130.58	1065.29	2523.85	1263.80	2.49	-0.28	0.044	
95.00	-14.61	-0.95	0.00	-44.42	0.00	44.42	2089.47	1044.73	2426.88	1215.24	2.67	-0.29	0.044	
100.00	-13.90	-0.95	0.00	-39.70	0.00	39.70	2016.91	1008.46	2260.38	1131.87	2.99	-0.32	0.042	
105.00	-13.21	-0.95	0.00	-34.96	0.00	34.96	1944.36	972.18	2099.80	1051.46	3.33	-0.34	0.040	
109.00	-10.76	-0.93	0.00	-31.18	0.00	31.18	1886.32	943.16	1975.59	989.26	3.62	-0.35	0.037	
110.00	-10.63	-0.94	0.00	-30.24	0.00	30.24	1871.81	935.90	1945.13	974.01	3.69	-0.36	0.037	
115.00	-9.98	-0.93	0.00	-25.57	0.00	25.57	1799.25	899.63	1796.38	899.53	4.07	-0.38	0.034	
120.00	-9.36	-0.93	0.00	-20.89	0.00	20.89	1726.70	863.35	1653.55	828.00	4.48	-0.39	0.031	
125.00	-8.75	-0.91	0.00	-16.26	0.00	16.26	1654.15	827.07	1516.64	759.45	4.90	-0.41	0.027	
130.00	-8.16	-0.89	0.00	-11.69	0.00	11.69	1581.59	790.80	1385.64	693.85	5.34	-0.42	0.022	
133.37	-7.78	-0.87	0.00	-8.70	0.00	8.70	1532.65	766.32	1300.60	651.27	5.64	-0.43	0.018	
135.00	-7.51	-0.85	0.00	-7.28	0.00	7.28	1509.04	754.52	1260.56	631.22	5.79	-0.44	0.017	
136.62	-7.25	-0.84	0.00	-5.90	0.00	5.90	885.20	442.60	750.52	375.82	5.94	-0.44	0.024	
140.00	-3.98	-0.52	0.00	-3.08	0.00	3.08	864.59	432.29	709.24	355.15	6.25	-0.44	0.013	
145.00	-3.68	-0.49	0.00	-0.49	0.00	0.49	833.10	416.55	649.44	325.20	6.72	-0.45	0.006	
146.00	0.00	-0.46	0.00	0.00	0.00	0.00	826.66	413.33	637.68	319.32	6.81	-0.45	0.000	

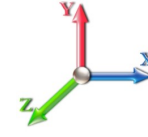
Seismic Segment Forces (Factored)

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E					Iterations 23
Gust Response Factor	1.10	Sds	0.12	Ss	0.18
Dead Load Factor	0.90	Seismic Load Factor	1.00	Sd1	0.04
Wind Load Factor	0.00	Structure Frequency	0.33	SA	0.01
					Seismic Importance Factor 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1064.7	0.00	0.03	0.02	15.97	
10.00		1041.5	0.01	0.05	0.03	21.24	
15.00		1018.2	0.02	0.06	0.04	23.24	
20.00		995.00	0.04	0.07	0.04	23.90	
25.00		971.74	0.06	0.07	0.04	24.04	
30.00		948.48	0.08	0.07	0.04	24.05	
35.00		925.22	0.11	0.07	0.04	24.09	
40.00		901.96	0.14	0.07	0.03	24.15	
43.34	Bot - Section 2	588.97	0.17	0.07	0.03	16.02	
45.00		543.55	0.18	0.07	0.03	14.87	
48.67	Top - Section 1	1182.3	0.21	0.06	0.02	32.51	
50.00		197.47	0.22	0.06	0.02	5.42	
55.00		729.75	0.27	0.05	0.02	19.25	
60.00		709.81	0.32	0.04	0.01	16.55	
65.00		689.87	0.37	0.03	0.01	11.84	
70.00		669.93	0.43	0.01	0.01	4.93	
75.00		650.00	0.50	-0.02	0.01	-3.26	
80.00		630.06	0.57	-0.04	0.01	-10.73	
85.00		610.12	0.64	-0.07	0.02	-15.80	
87.83	Bot - Section 3	336.88	0.68	-0.08	0.03	-9.80	
88.00	Appurtenance(s)	465.55	0.69	-0.08	0.03	-13.61	
90.00		433.05	0.72	-0.09	0.03	-13.26	
92.17	Top - Section 2	462.54	0.75	-0.10	0.04	-14.52	
95.00		273.82	0.80	-0.11	0.05	-8.58	
100.00		470.19	0.89	-0.12	0.08	-13.39	
105.00		453.57	0.98	-0.11	0.12	-10.12	
109.00	Appurtenance(s)	1935.9	1.05	-0.09	0.16	-29.28	
110.00		86.06	1.07	-0.08	0.17	-1.12	
115.00		420.34	1.17	-0.02	0.23	-0.25	
120.00		403.73	1.28	0.09	0.32	6.05	
125.00		387.11	1.39	0.26	0.42	13.08	
130.00		370.50	1.50	0.50	0.54	20.72	
133.37	Bot - Section 4	240.58	1.58	0.71	0.64	17.51	
135.00		182.94	1.62	0.83	0.69	14.90	
136.62	Top - Section 3	179.76	1.66	0.96	0.75	16.27	
140.00	Appurtenance(s)	2642.2	1.74	1.27	0.87	292.06	
145.00		197.46	1.86	1.85	1.09	28.28	
146.00	Appurtenance(s)	3055.9	1.89	1.98	1.14	459.06	
Totals:		28,067.1				1,026.2	Total Wind: 27,264.5

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

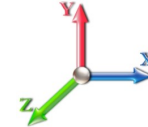
Calculated Forces

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E										Iterations 23
Gust Response Factor	1.10						Sds	0.12		Ss 0.18
Dead Load Factor	0.90	Seismic Load Factor	1.00	Sd1	0.04					S1 0.06
Wind Load Factor	0.00	Structure Frequency	0.33	SA	0.01	Seismic Importance Factor	1.00			



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-28.81	-1.17	0.00	-140.18	0.00	140.18	4626.62	2313.31	8646.87	4329.86	0.00	0.00	0.00	0.039
5.00	-27.80	-1.16	0.00	-134.31	0.00	134.31	4552.64	2276.32	8322.99	4167.68	0.01	-0.01	0.038	
10.00	-26.72	-1.15	0.00	-128.51	0.00	128.51	4477.51	2238.76	8003.10	4007.50	0.03	-0.02	0.038	
15.00	-25.66	-1.13	0.00	-122.78	0.00	122.78	4395.69	2197.85	7677.64	3844.53	0.06	-0.04	0.038	
20.00	-24.63	-1.11	0.00	-117.14	0.00	117.14	4294.12	2147.06	7325.16	3668.02	0.10	-0.05	0.038	
25.00	-23.62	-1.09	0.00	-111.59	0.00	111.59	4192.55	2096.27	6980.95	3495.66	0.16	-0.06	0.038	
30.00	-22.62	-1.07	0.00	-106.15	0.00	106.15	4090.97	2045.49	6645.03	3327.46	0.23	-0.07	0.037	
35.00	-21.65	-1.05	0.00	-100.80	0.00	100.80	3989.40	1994.70	6317.40	3163.39	0.32	-0.09	0.037	
40.00	-20.70	-1.03	0.00	-95.56	0.00	95.56	3887.82	1943.91	5998.04	3003.48	0.42	-0.10	0.037	
43.34	-20.08	-1.01	0.00	-92.14	0.00	92.14	3820.04	1910.02	5789.54	2899.07	0.49	-0.11	0.037	
45.00	-19.54	-1.00	0.00	-90.45	0.00	90.45	3786.25	1893.12	5686.97	2847.71	0.53	-0.12	0.037	
48.67	-18.38	-0.97	0.00	-86.78	0.00	86.78	3251.53	1625.77	4904.15	2455.72	0.62	-0.13	0.041	
50.00	-18.16	-0.96	0.00	-85.50	0.00	85.50	3230.14	1615.07	4836.85	2422.02	0.66	-0.13	0.041	
55.00	-17.37	-0.95	0.00	-80.68	0.00	80.68	3143.08	1571.54	4578.34	2292.57	0.80	-0.15	0.041	
60.00	-16.59	-0.93	0.00	-75.94	0.00	75.94	3056.01	1528.01	4326.92	2166.68	0.97	-0.16	0.040	
65.00	-15.83	-0.92	0.00	-71.27	0.00	71.27	2968.95	1484.47	4082.61	2044.34	1.15	-0.18	0.040	
70.00	-15.09	-0.92	0.00	-66.65	0.00	66.65	2881.88	1440.94	3845.39	1925.55	1.35	-0.20	0.040	
75.00	-14.36	-0.92	0.00	-62.04	0.00	62.04	2794.82	1397.41	3615.28	1810.32	1.56	-0.22	0.039	
80.00	-13.66	-0.93	0.00	-57.43	0.00	57.43	2707.76	1353.88	3392.26	1698.65	1.80	-0.23	0.039	
85.00	-12.97	-0.93	0.00	-52.80	0.00	52.80	2620.69	1310.35	3176.35	1590.53	2.05	-0.25	0.038	
87.83	-12.59	-0.92	0.00	-50.18	0.00	50.18	2571.36	1285.68	3057.15	1530.84	2.20	-0.26	0.038	
88.00	-12.16	-0.92	0.00	-50.03	0.00	50.03	2568.45	1284.23	3050.20	1527.37	2.21	-0.26	0.037	
90.00	-11.73	-0.92	0.00	-48.18	0.00	48.18	2533.63	1266.81	2967.53	1485.97	2.32	-0.27	0.037	
92.17	-11.27	-0.92	0.00	-46.18	0.00	46.18	2130.58	1065.29	2523.85	1263.80	2.45	-0.28	0.042	
95.00	-10.96	-0.92	0.00	-43.56	0.00	43.56	2089.47	1044.73	2426.88	1215.24	2.62	-0.29	0.041	
100.00	-10.42	-0.93	0.00	-38.94	0.00	38.94	2016.91	1008.46	2260.38	1131.87	2.93	-0.31	0.040	
105.00	-9.90	-0.93	0.00	-34.31	0.00	34.31	1944.36	972.18	2099.80	1051.46	3.27	-0.33	0.038	
109.00	-8.07	-0.92	0.00	-30.61	0.00	30.61	1886.32	943.16	1975.59	989.26	3.55	-0.35	0.035	
110.00	-7.97	-0.92	0.00	-29.69	0.00	29.69	1871.81	935.90	1945.13	974.01	3.62	-0.35	0.035	
115.00	-7.49	-0.92	0.00	-25.10	0.00	25.10	1799.25	899.63	1796.38	899.53	4.00	-0.37	0.032	
120.00	-7.02	-0.91	0.00	-20.52	0.00	20.52	1726.70	863.35	1653.55	828.00	4.39	-0.39	0.029	
125.00	-6.56	-0.90	0.00	-15.97	0.00	15.97	1654.15	827.07	1516.64	759.45	4.81	-0.40	0.025	
130.00	-6.12	-0.87	0.00	-11.49	0.00	11.49	1581.59	790.80	1385.64	693.85	5.24	-0.42	0.020	
133.37	-5.83	-0.85	0.00	-8.55	0.00	8.55	1532.65	766.32	1300.60	651.27	5.54	-0.42	0.017	
135.00	-5.63	-0.84	0.00	-7.16	0.00	7.16	1509.04	754.52	1260.56	631.22	5.68	-0.43	0.015	
136.62	-5.43	-0.82	0.00	-5.80	0.00	5.80	885.20	442.60	750.52	375.82	5.83	-0.43	0.022	
140.00	-2.99	-0.51	0.00	-3.03	0.00	3.03	864.59	432.29	709.24	355.15	6.13	-0.43	0.012	
145.00	-2.76	-0.48	0.00	-0.48	0.00	0.48	833.10	416.55	649.44	325.20	6.59	-0.44	0.005	
146.00	0.00	-0.46	0.00	0.00	0.00	0.00	826.66	413.33	637.68	319.32	6.68	-0.44	0.000	

Wind Loading - Shaft

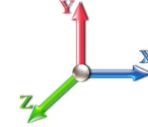
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	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	215.32	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	210.71	0.650	0.000	5.00	19.254	12.52	102.5	0.0	1064.8
10.00		1.00	0.85	7.442	8.19	206.10	0.650	0.000	5.00	18.837	12.24	100.2	0.0	1041.5
15.00		1.00	0.85	7.442	8.19	201.49	0.650	0.000	5.00	18.421	11.97	98.0	0.0	1018.3
20.00		1.00	0.90	7.896	8.69	202.81	0.650	0.000	5.00	18.004	11.70	101.6	0.0	995.0
25.00		1.00	0.95	8.276	9.10	202.77	0.650	0.000	5.00	17.588	11.43	104.1	0.0	971.7
30.00		1.00	0.98	8.600	9.46	201.74	0.650	0.000	5.00	17.171	11.16	105.6	0.0	948.5
35.00		1.00	1.01	8.883	9.77	200.01	0.650	0.000	5.00	16.755	10.89	106.4	0.0	925.2
40.00		1.00	1.04	9.137	10.05	197.73	0.650	0.000	5.00	16.338	10.62	106.7	0.0	902.0
43.34	Bot - Section 2	1.00	1.06	9.292	10.22	195.97	0.650	0.000	3.34	10.671	6.94	70.9	0.0	589.0
45.00		1.00	1.07	9.366	10.30	195.03	0.650	0.000	1.66	5.356	3.48	35.9	0.0	543.5
48.67	Top - Section 1	1.00	1.09	9.522	10.47	192.82	0.650	0.000	3.67	11.654	7.58	79.3	0.0	1182.4
50.00		1.00	1.09	9.576	10.53	195.96	0.650	0.000	1.33	4.168	2.71	28.5	0.0	197.5
55.00		1.00	1.12	9.770	10.75	192.65	0.650	0.000	5.00	15.406	10.01	107.6	0.0	729.7
60.00		1.00	1.14	9.951	10.95	189.09	0.650	0.000	5.00	14.989	9.74	106.6	0.0	709.8
65.00		1.00	1.16	10.120	11.13	185.32	0.650	0.000	5.00	14.572	9.47	105.4	0.0	689.9
70.00		1.00	1.17	10.279	11.31	181.35	0.650	0.000	5.00	14.156	9.20	104.0	0.0	669.9
75.00		1.00	1.19	10.430	11.47	177.22	0.650	0.000	5.00	13.739	8.93	102.5	0.0	650.0
80.00		1.00	1.21	10.572	11.63	172.93	0.650	0.000	5.00	13.323	8.66	100.7	0.0	630.1
85.00		1.00	1.22	10.708	11.78	168.51	0.650	0.000	5.00	12.906	8.39	98.8	0.0	610.1
87.83	Bot - Section 3	1.00	1.23	10.782	11.86	165.95	0.650	0.000	2.83	7.129	4.63	55.0	0.0	336.9
88.00	Appurtenance(s)	1.00	1.23	10.787	11.87	165.80	0.650	0.000	0.17	0.424	0.28	3.3	0.0	36.4
90.00		1.00	1.24	10.838	11.92	163.97	0.650	0.000	2.00	5.052	3.28	39.1	0.0	433.1
92.17	Top - Section 2	1.00	1.24	10.892	11.98	161.96	0.650	0.000	2.17	5.397	3.51	42.0	0.0	462.5
95.00		1.00	1.25	10.962	12.06	162.86	0.650	0.000	2.83	6.940	4.51	54.4	0.0	273.8
100.00		1.00	1.27	11.081	12.19	158.12	0.650	0.000	5.00	11.921	7.75	94.4	0.0	470.2
105.00		1.00	1.28	11.195	12.31	153.28	0.650	0.000	5.00	11.504	7.48	92.1	0.0	453.6
109.00	Appurtenance(s)	1.00	1.29	11.284	12.41	149.35	0.650	0.000	4.00	8.904	5.79	71.8	0.0	350.9
110.00		1.00	1.29	11.305	12.44	148.35	0.650	0.000	1.00	2.184	1.42	17.7	0.0	86.1
115.00		1.00	1.30	11.412	12.55	143.34	0.650	0.000	5.00	10.671	6.94	87.1	0.0	420.3
120.00		1.00	1.32	11.514	12.67	138.25	0.650	0.000	5.00	10.255	6.67	84.4	0.0	403.7
125.00		1.00	1.33	11.614	12.78	133.09	0.650	0.000	5.00	9.838	6.39	81.7	0.0	387.1
130.00		1.00	1.34	11.710	12.88	127.86	0.650	0.000	5.00	9.421	6.12	78.9	0.0	370.5
133.37	Bot - Section 4	1.00	1.34	11.773	12.95	124.29	0.650	0.000	3.37	6.121	3.98	51.5	0.0	240.6
135.00		1.00	1.35	11.803	12.98	122.57	0.650	0.000	1.63	2.935	1.91	24.8	0.0	182.9
136.62	Top - Section 3	1.00	1.35	11.833	13.02	120.83	0.650	0.000	1.62	2.886	1.88	24.4	0.0	179.8
140.00	Appurtenance(s)	1.00	1.36	11.894	13.08	119.43	0.650	0.000	3.38	5.861	3.81	49.8	0.0	139.0
145.00		1.00	1.37	11.982	13.18	114.02	0.650	0.000	5.00	8.330	5.41	71.4	0.0	197.5
146.00	Appurtenance(s)	1.00	1.37	12.000	13.20	112.93	0.650	0.000	1.00	1.616	1.05	13.9	0.0	38.3
Totals:									146.00			2,803.2		20,532.0

Discrete Appurtenance Forces

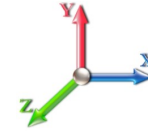
Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 25

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	146.00	Powerwave LGP219003	6	12.068	13.275	1.00	1.00	2.04	31.80	0.000	4.000	27.08	0.00	108.32	
2	146.00	Beacon	1	12.000	13.200	1.00	1.00	2.40	15.00	0.000	0.000	31.68	0.00	0.00	
3	146.00	Lightning Rod	1	12.060	13.266	1.00	1.00	1.05	35.00	0.000	3.500	13.93	0.00	48.75	
4	146.00	HPA-65R-BUU-H8	9	12.068	13.275	0.79	1.00	92.29	612.00	0.000	4.000	1225.12	0.00	4900.47	
5	146.00	Powerwave LGP21401	6	12.068	13.275	0.67	1.00	0.00	105.00	0.000	4.000	0.00	0.00	0.00	
6	146.00	Platform w/ Hand Rails	1	12.000	13.200	1.00	1.00	32.00	1600.00	0.000	0.000	422.39	0.00	0.00	
7	146.00	Powerwave 7020.00 RET	6	12.068	13.275	0.65	1.00	1.56	13.20	0.000	4.000	20.71	0.00	82.84	
8	146.00	Ericsson RRUS-11	3	12.068	13.275	0.71	1.00	5.37	152.10	0.000	4.000	71.25	0.00	285.02	
9	146.00	Ericsson RRUS-32	3	12.068	13.275	0.70	1.00	3.46	231.00	0.000	4.000	46.00	0.00	183.99	
10	146.00	Ericsson RRUS 32 B2	3	12.068	13.275	0.81	1.00	6.66	159.00	0.000	4.000	88.39	0.00	353.55	
11	146.00	Raycap DC-6-48-60-18-8F	2	12.068	13.275	1.00	1.00	1.84	63.60	0.000	4.000	24.43	0.00	97.70	
12	140.00	Low Profile Platform	1	11.894	13.084	1.00	1.00	22.00	1500.00	0.000	0.000	287.84	0.00	0.00	
13	140.00	ALU B13 RRH4X30-4R	3	11.858	13.044	0.54	0.80	3.47	171.60	0.000	-2.000	45.31	0.00	-90.61	
14	140.00	Commscope	6	11.894	13.084	0.66	0.80	32.07	304.26	0.000	0.000	419.61	0.00	0.00	
15	140.00	Antel LPA-80063/4CF	6	11.894	13.084	0.75	0.80	27.75	120.00	0.000	0.000	363.05	0.00	0.00	
16	140.00	Raycap	2	11.858	13.044	0.54	0.80	2.70	84.00	0.000	-2.000	35.24	0.00	-70.48	
17	140.00	ALU B25 RRH4x30-4R	3	11.858	13.044	0.54	0.80	3.44	153.00	0.000	-2.000	44.89	0.00	-89.77	
18	140.00	ALU B66 RRH4x45	3	11.858	13.044	0.54	0.80	4.08	170.40	0.000	-2.000	53.28	0.00	-106.55	
19	109.00	Low Profile Platform	1	11.284	12.412	1.00	1.00	22.00	1500.00	0.000	0.000	273.06	0.00	0.00	
20	109.00	8' Omni	1	11.370	12.507	0.80	0.80	1.92	25.00	0.000	4.000	24.01	0.00	96.05	
21	109.00	14'x7" Cross Omni	1	11.432	12.576	0.80	0.80	3.95	60.00	0.000	7.000	49.70	0.00	347.89	
22	88.00	Flush Mount	1	10.787	11.865	0.56	0.75	2.81	350.00	0.000	0.000	33.37	0.00	0.00	
23	88.00	RFS APXV18-206517S-C	3	10.787	11.865	0.63	0.80	9.80	79.20	0.000	0.000	116.31	0.00	0.00	
Totals:									7,535.16						3,716.62

Total Applied Force Summary

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

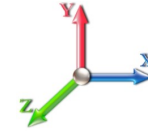


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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		102.45	1126.43	0.00	0.00
10.00		100.23	1195.63	0.00	0.00
15.00		98.02	1172.36	0.00	0.00
20.00		101.65	1149.10	0.00	0.00
25.00		104.07	1125.84	0.00	0.00
30.00		105.58	1102.58	0.00	0.00
35.00		106.42	1079.32	0.00	0.00
40.00		106.73	1056.06	0.00	0.00
43.34		70.90	691.80	0.00	0.00
45.00		35.87	594.81	0.00	0.00
48.67		79.34	1295.49	0.00	0.00
50.00		28.54	238.46	0.00	0.00
55.00		107.62	883.85	0.00	0.00
60.00		106.65	863.91	0.00	0.00
65.00		105.44	843.97	0.00	0.00
70.00		104.04	824.03	0.00	0.00
75.00		102.46	804.10	0.00	0.00
80.00		100.71	784.16	0.00	0.00
85.00		98.81	764.22	0.00	0.00
87.83		54.96	424.21	0.00	0.00
88.00	(4) attachments	152.95	470.69	0.00	0.00
90.00		39.14	482.21	0.00	0.00
92.17		42.03	515.80	0.00	0.00
95.00		54.39	343.46	0.00	0.00
100.00		94.45	593.09	0.00	0.00
105.00		92.09	576.47	0.00	0.00
109.00	(3) attachments	418.61	2034.22	0.00	443.94
110.00		17.66	109.96	0.00	0.00
115.00		87.07	539.84	0.00	0.00
120.00		84.42	523.23	0.00	0.00
125.00		81.69	506.61	0.00	0.00
130.00		78.88	490.00	0.00	0.00
133.37		51.53	321.20	0.00	0.00
135.00		24.77	221.82	0.00	0.00
136.62		24.41	218.56	0.00	0.00
140.00	(24) attachments	1299.05	2722.95	0.00	-357.41
145.00		71.37	253.96	0.00	0.00
146.00	(41) attachments	1984.84	3067.29	0.00	6060.64
Totals:		6,519.84	32,011.69	0.00	6,147.18

Calculated Forces

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



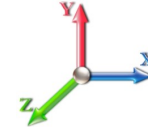
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Load Case: 1.0D + 1.0W 60 mph Wind

Iterations 25

Dead Load Factor 1.00

Wind Load 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	-32.01	-6.54	0.00	-753.70	0.00	753.70	4626.62	2313.31	8646.87	4329.86	0.00	0.000	0.000	0.181
5.00	-30.87	-6.47	0.00	-721.01	0.00	721.01	4552.64	2276.32	8322.99	4167.68	0.03	-0.063	0.000	0.180
10.00	-29.67	-6.40	0.00	-688.67	0.00	688.67	4477.51	2238.76	8003.10	4007.50	0.13	-0.128	0.000	0.178
15.00	-28.49	-6.33	0.00	-656.67	0.00	656.67	4395.69	2197.85	7677.64	3844.53	0.30	-0.194	0.000	0.177
20.00	-27.34	-6.26	0.00	-625.01	0.00	625.01	4294.12	2147.06	7325.16	3668.02	0.54	-0.261	0.000	0.177
25.00	-26.20	-6.18	0.00	-593.72	0.00	593.72	4192.55	2096.27	6980.95	3495.66	0.85	-0.329	0.000	0.176
30.00	-25.09	-6.10	0.00	-562.82	0.00	562.82	4090.97	2045.49	6645.03	3327.46	1.23	-0.399	0.000	0.175
35.00	-24.01	-6.01	0.00	-532.33	0.00	532.33	3989.40	1994.70	6317.40	3163.39	1.69	-0.470	0.000	0.174
40.00	-22.95	-5.92	0.00	-502.26	0.00	502.26	3887.82	1943.91	5998.04	3003.48	2.22	-0.543	0.000	0.173
43.34	-22.25	-5.86	0.00	-482.50	0.00	482.50	3820.04	1910.02	5789.54	2899.07	2.62	-0.593	0.000	0.172
45.00	-21.65	-5.83	0.00	-472.76	0.00	472.76	3786.25	1893.12	5686.97	2847.71	2.83	-0.618	0.000	0.172
48.67	-20.36	-5.75	0.00	-451.35	0.00	451.35	3251.53	1625.77	4904.15	2455.72	3.33	-0.674	0.000	0.190
50.00	-20.11	-5.74	0.00	-443.70	0.00	443.70	3230.14	1615.07	4836.85	2422.02	3.52	-0.694	0.000	0.189
55.00	-19.22	-5.65	0.00	-415.01	0.00	415.01	3143.08	1571.54	4578.34	2292.57	4.29	-0.778	0.000	0.187
60.00	-18.35	-5.56	0.00	-386.77	0.00	386.77	3056.01	1528.01	4326.92	2166.68	5.15	-0.862	0.000	0.185
65.00	-17.50	-5.46	0.00	-358.99	0.00	358.99	2968.95	1484.47	4082.61	2044.34	6.10	-0.948	0.000	0.182
70.00	-16.67	-5.37	0.00	-331.67	0.00	331.67	2881.88	1440.94	3845.39	1925.55	7.14	-1.034	0.000	0.178
75.00	-15.86	-5.28	0.00	-304.82	0.00	304.82	2794.82	1397.41	3615.28	1810.32	8.26	-1.121	0.000	0.174
80.00	-15.07	-5.18	0.00	-278.43	0.00	278.43	2707.76	1353.88	3392.26	1698.65	9.49	-1.208	0.000	0.169
85.00	-14.30	-5.09	0.00	-252.52	0.00	252.52	2620.69	1310.35	3176.35	1590.53	10.80	-1.296	0.000	0.164
87.83	-13.88	-5.03	0.00	-238.11	0.00	238.11	2571.36	1285.68	3057.15	1530.84	11.58	-1.346	0.000	0.161
88.00	-13.41	-4.87	0.00	-237.27	0.00	237.27	2568.45	1284.23	3050.20	1527.37	11.63	-1.349	0.000	0.161
90.00	-12.92	-4.83	0.00	-227.54	0.00	227.54	2533.63	1266.81	2967.53	1485.97	12.20	-1.385	0.000	0.158
92.17	-12.41	-4.78	0.00	-217.08	0.00	217.08	2130.58	1065.29	2523.85	1263.80	12.84	-1.424	0.000	0.178
95.00	-12.06	-4.73	0.00	-203.54	0.00	203.54	2089.47	1044.73	2426.88	1215.24	13.70	-1.474	0.000	0.173
100.00	-11.46	-4.64	0.00	-179.87	0.00	179.87	2016.91	1008.46	2260.38	1131.87	15.29	-1.569	0.000	0.165
105.00	-10.88	-4.55	0.00	-156.67	0.00	156.67	1944.36	972.18	2099.80	1051.46	16.99	-1.663	0.000	0.155
109.00	-8.86	-4.08	0.00	-138.03	0.00	138.03	1886.32	943.16	1975.59	989.26	18.41	-1.736	0.000	0.144
110.00	-8.74	-4.06	0.00	-133.95	0.00	133.95	1871.81	935.90	1945.13	974.01	18.78	-1.754	0.000	0.142
115.00	-8.20	-3.97	0.00	-113.63	0.00	113.63	1799.25	899.63	1796.38	899.53	20.66	-1.840	0.000	0.131
120.00	-7.67	-3.88	0.00	-93.77	0.00	93.77	1726.70	863.35	1653.55	828.00	22.63	-1.921	0.000	0.118
125.00	-7.17	-3.79	0.00	-74.37	0.00	74.37	1654.15	827.07	1516.64	759.45	24.68	-1.995	0.000	0.102
130.00	-6.68	-3.70	0.00	-55.41	0.00	55.41	1581.59	790.80	1385.64	693.85	26.81	-2.060	0.000	0.084
133.37	-6.36	-3.64	0.00	-42.93	0.00	42.93	1532.65	766.32	1300.60	651.27	28.28	-2.098	0.000	0.070
135.00	-6.13	-3.61	0.00	-37.01	0.00	37.01	1509.04	754.52	1260.56	631.22	29.00	-2.114	0.000	0.063
136.62	-5.91	-3.58	0.00	-31.15	0.00	31.15	885.20	442.60	750.52	375.82	29.72	-2.129	0.000	0.090
140.00	-3.24	-2.18	0.00	-19.06	0.00	19.06	864.59	432.29	709.24	355.15	31.23	-2.152	0.000	0.057
145.00	-2.99	-2.10	0.00	-8.16	0.00	8.16	833.10	416.55	649.44	325.20	33.51	-2.185	0.000	0.029
146.00	0.00	-1.98	0.00	-6.06	0.00	6.06	826.66	413.33	637.68	319.32	33.96	-2.189	0.000	0.019

Final Analysis Summary

Structure: CT46135-A-SBA	Code: EIA/TIA-222-G	1/12/2018
Site Name: Middlefield-jacson Hill Rd	Exposure: C	
Height: 146.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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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	27.4	0.00	38.35	0.00	0.00	3171.34
0.9D + 1.6W 97 mph Wind	27.3	0.00	28.75	0.00	0.00	3126.13
1.2D + 1.0Di + 1.0Wi 50 mph Wind	7.6	0.00	58.92	0.00	0.00	879.40
1.2D + 1.0E	1.2	0.00	38.41	0.00	0.00	142.31
0.9D + 1.0E	1.2	0.00	28.81	0.00	0.00	140.18
1.0D + 1.0W 60 mph Wind	6.5	0.00	32.01	0.00	0.00	753.70

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 97 mph Wind	-23.32	-24.24	0.00	-1901.3	0.00	-1901.3	3251.53	1625.7	4904.15	2455.72	48.67	0.782
0.9D + 1.6W 97 mph Wind	-17.22	-23.92	0.00	-1865.2	0.00	-1865.2	3251.53	1625.7	4904.15	2455.72	48.67	0.765
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-41.22	-6.78	0.00	-524.05	0.00	-524.05	3251.53	1625.7	4904.15	2455.72	48.67	0.226
1.2D + 1.0E	-15.02	-0.94	0.00	-47.09	0.00	-47.09	2130.58	1065.2	2523.85	1263.80	92.17	0.044
0.9D + 1.0E	-11.27	-0.92	0.00	-46.18	0.00	-46.18	2130.58	1065.2	2523.85	1263.80	92.17	0.042
1.0D + 1.0W 60 mph Wind	-20.36	-5.75	0.00	-451.35	0.00	-451.35	3251.53	1625.7	4904.15	2455.72	48.67	0.190



Monopole Mat Foundation Design

Date

1/12/2018

Customer Name:	AT&T	EIA/TIA Standard:	EIA-222-G
Site Name:		Structure Height (Ft.):	146
Site Number:	CT46135-A-SBA	Engineer Name:	H. You
Engr. Number:	44314	Engineer Login ID:	

Foundation Info Obtained from:

Drawings/Calculations

Structure Type:

Monopole

Analysis or Design?

Analysis

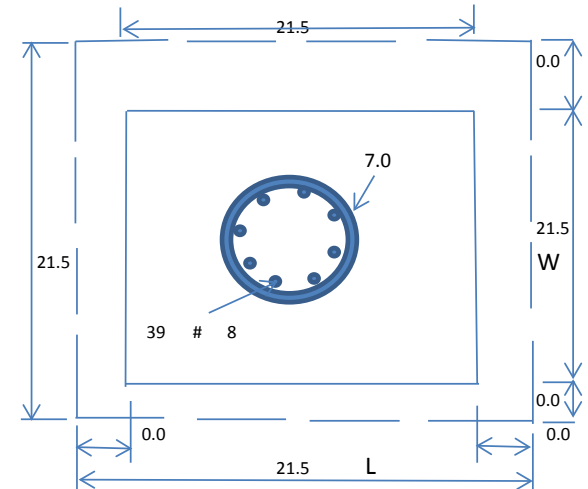
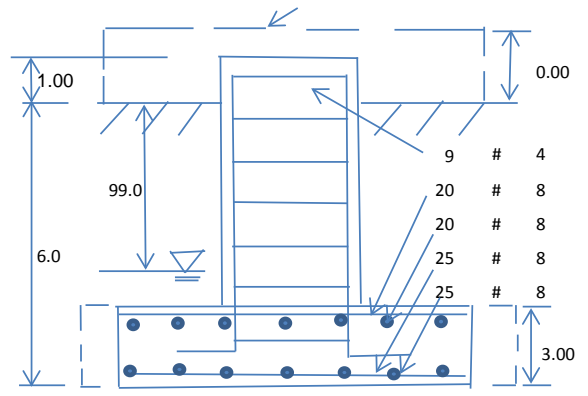
Base Reactions (Factored):

Axial Load (Kips):	38.3	Shear Force (Kips):	27.4
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3171.3

Allowable overstress %: 5.0%

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	3.00
Length of Pad (ft.):	21.5	Width of Pad (ft.):	21.5
Final Length of pad (ft)	21.5	Final width of pad (ft):	21.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Rebar Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	39	Tie Spacing (in):	10.5	
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):	25	Qty. of Rebar in Pad (W):	25	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	20	Qty. of Rebar in Pad (W):	20	

Apply 1.35 factor for e/w Per G: 1.35

Soil Design Parameters:

Soil Unit Weight (pcf):	110.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	40000	Ultimate Skin Friction:	175	Psf
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No	
Consider soil hor. resist. for OTM.:	Yes	Reduction factor on the maximum soil bearing pressure:	1.00	
		Angle from Top of Pad:	30	
		Angle from Bottm of Pad:	25	
		Angle from Bottm of Pad:	25	

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	1271.30	Total Dry Soil Weight (Kips):	139.84
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	139.84	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1540.69	Total Dry Concrete Weight (Kips):	231.10
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	231.10	Total Vertical Load on Base (Kips):	409.25

Check Soil Capacities:

Calculated Maxium Net Soil Pressure under the base (psf):	3942	<	Allowable Factored Soil Bearing (psf):	30000	0.13	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	4000.6	>	Design Factored Momont (kips-ft):	3240	0.81	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.23					OK!

Load/
Capacity
Ratio

Check the capacities of Reinforcing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

Load/
Capacity
Ratio

(1) Concrete Pier:

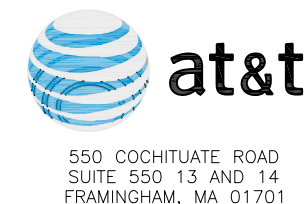
Vertical Steel Rebar Area (sq. in./each):	0.79	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	5049.6	> Design Factored Moment (Mu, Kips-Ft)	3280.9	0.65	OK!
Calculated Shear Capacity (Kips):	679.3	> Design Factored Shear (Kips):	27.4	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	1663.7	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9743.4	> Design Factored Axial Load (Pu Kips):	38.3	0.00	OK!
Moment & Axial Strength Combination:	0.65	OK! Check Tie Spacing (Design/Required):		0.875	OK!
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	795.5	> One-Way Factored Shear (L-D. Kips):	204.2	0.26	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	795.5	> One-Way Factored Shear (W-D., Kips)	204.2	0.26	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	866.0	> One-Way Factored Shear (C-C, Kips):	207.9	0.24	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0024	OK! Lower Steel Pad Reinf. Ratio (W-Direct	0.0024		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	2828.4	> Moment at Bottom (L-Direct. K-Ft):	463.8	0.16	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	2828.4	> Moment at Bottom (W-Direct. K-Ft):	463.8	0.16	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	3974.6	> Moment at Bottom (C-C Dir. K-Ft):	655.9	0.17	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0019	OK! Upper Steel Reinf. Ratio (W-Direct.):	0.0019		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	2272.3	> Moment at the top (L-Dir Kips-Ft):	57.9	0.03	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	2272.3	> Moment at the top (W-Dir Kips-Ft):	57.9	0.03	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	3197.3	> Moment at the top (C-C Direc. K-Ft):	337.5	0.11	OK!



PROJECT: LTE 2C/3C
SITE NUMBER: CTL05504
FA NUMBER: 10071119
PTN NUMBER: 1051A0BGER/2051A0BFN8
PACE NUMBER: MRCTB024330/MRCTB024506
SBA#: CT46135
SITE NAME: MIDDLEFIELD CENTRAL
SITE ADDRESS: 393 JACKSON HILL ROAD
 MIDDLEFIELD, CT 06455



PROJECT INFORMATION

SITE NAME: MIDDLEFIELD CENTRAL
SITE NUMBER: CTL05504
SITE ADDRESS: 393 JACKSON HILL ROAD
 MIDDLEFIELD, CT 06455
 10071119
FA NUMBER: 1051A0BGER/2051A0BFN8
PTN NUMBER: MRCTB024330/MRCTB024506
PACE NUMBER: 26996
USID NUMBER: CT46135
SBA NUMBER:
APPLICANT: AT&T WIRELESS
 550 COCHITUATE ROAD SUITE 550 13 AND 14
 FRAMINGHAM, MA 01701
TOWER OWNER: SBA COMMUNICATIONS CORPORATION
 8051 CONGRESS AVENUE
 BOCA RATON, FL 33487
JURISDICTION: MIDDLESEX COUNTY
COUNTY: MIDDLESEX
SITE COORDINATES FROM (RFDS):
LATITUDE: 41.5174919°
LONGITUDE: -72.7146989°
GROUND ELEV.: 266'
PROPOSED USE: TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER: DEEPAK RATHORE
PHONE: (860) 965-3068
EMAIL: dr701e@att.com

SCOPE OF WORK

LTE 850 WILL BE 2C/3C AT THE SITE WITH BRONZE CONFIGURATION.
 PROPOSED 2C/3C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1978307, VERSION 1.00
 LAST UPDATED 10/03/17.

- (9) NEW ANTENNAS TO REPLACE (9) EXISTING ANTENNAS
- (6) NEW RRUS-32
- (1) NEW RAYCAP UNIT
- (1) NEW FIBER CABLE AND (4) DC POWER CABLES
- (6) NEW COAX CABLES
- REPLACE BBU WITH 5216
- (1) NEW XMU

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

APPLICABLE BUILDING CODES AND STANDARDS

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.

BUILDING CODE: 2012 INTERNATIONAL BUILDING CODE
 2016 CONNECTICUT STATE BUILDING CODE SUPPLEMENT

ELECTRICAL CODE: 2014 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

REV	DATE	DESCRIPTION	BY
0	10/25/17	90% REVIEW	EB
1	11/17/17	FOR PERMIT	EB
2	11/30/17	MOUNT MODIFICATION	AD

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE LOCATION MAP



DRAWING INDEX

T1	TITLE SHEET
SP1	NOTES AND SPECIFICATIONS
SP2	NOTES AND SPECIFICATIONS
A1	COMPOUND PLAN
A2	EQUIPMENT PLAN
A3	ELEVATIONS
A4	ANTENNA PLANS
A5	EQUIPMENT DETAILS
A6	ANTENNA & CABLE CONFIGURATION
A7	CABLE NOTES AND COLOR CODING
A8	GROUNDING DETAILS
S1	STRUCTURAL NOTES
S2	STRUCTURAL DETAILS

PROJECT CONSULTANTS

PROJECT MANAGER: SMARTLINK
 85 RANGEWAY ROAD, SUITE 102
 NORTH BILLERICA, MA 01862
CONTACT: EDWARD WEISSMAN (917) 528-1857
EMAIL: Edward.Weissman@smartlinkllc.com
SITE ACQUISITION: SMARTLINK
 85 RANGEWAY ROAD, SUITE 102
 NORTH BILLERICA, MA 01862
CONTACT: SHARON KEEFE (978) 930-3918
EMAIL: Sharon.Keefe@smartlinkllc.com
ENGINEER/ARCHITECT: FULLERTON ENGINEERING
 1100 E. WOODFIELD ROAD, SUITE 500
 SCHAUMBURG, IL 60173
CONTACT: MILEN DIMITROV (847) 908-8439
EMAIL: MDimitrov@FullertonEngineering.com
CONSTRUCTION: SMARTLINK
 85 RANGEWAY ROAD, SUITE 102
 NORTH BILLERICA, MA 01862
CONTACT: MARK DONNELLY (617) 515-2080
EMAIL: mark.donnely@smartlinkllc.com

DIRECTIONS

SCAN QR CODE FOR LINK TO SITE LOCATION MAP



NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

SITE NAME
MIDDLEFIELD CENTRAL

SITE NUMBER:
CTL05504

SITE ADDRESS
**393 JACKSON HILL ROAD
MIDDLEFIELD, CT 06455**

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

THESE DRAWINGS ARE THE PROPERTY OF FULLERTON ENGINEERING CONSULTANTS, INC. IT IS FOR THE EXCLUSIVE USE OF THIS PROJECT. ANY RE-USE OF THIS DRAWING WITHOUT THE EXPRESSED WRITTEN CONSENT OF FULLERTON ENGINEERING CONSULTANTS, INC. IS PROHIBITED.

GENERAL CONSTRUCTION

- FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR/CM – SMARTLINK
OWNER – AT&T WIRELESS
- ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
- GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
- GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
- GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
- ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
- SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
- WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.

- THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
- THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A OT 2-A:10-B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
- THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE-APPROVED BY THE LOCAL JURISDICTION.
- ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
- ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
- CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS-BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
- CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
- THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
- OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
- NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
- ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
- CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION, IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
- CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
- INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

- DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANS/TIA-222 OR APPLICABLE LOCAL CODES.

- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
 - ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
 - DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
 - ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
 - CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
 - ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
 - PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND-00246.
 - JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
 - CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
 - TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.
- TORQUE REQUIREMENTS**
- ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
 - ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

- THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
- THE TYPE TC-ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC-ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
- WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC-ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

- TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
- CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
- CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
- ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".

- ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" OC.
- CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
- CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
- CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

- CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
- ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
- ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE-HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
- IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
A. TEMPERATURE SHALL BE ABOVE 50° F.
B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
- ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
A. GROUNDING AT THE ANTENNA LEVEL.
B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'-0", ADDITIONAL CABLE GROUNDING REQUIRED.
C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
- ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.



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SITE NAME
MIDDLEFIELD CENTRAL

SITE NUMBER:
CTL05504

SITE ADDRESS
**393 JACKSON HILL ROAD
MIDDLEFIELD, CT 06455**

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

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NOTICE

Beyond This Point you are entering a controlled area where RF emissions *may exceed* the FCC General Population Exposure Limits.

Follow all posted signs and site guidelines for working in a RF environment.

Ref: 47CFR 1.1307(b)

CAUTION

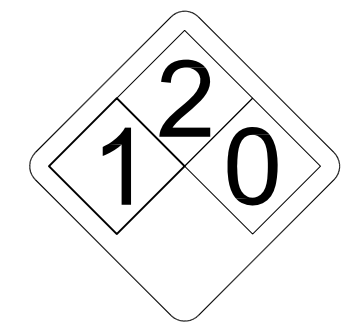
Beyond This Point you are entering a controlled area where RF emissions *may exceed* the FCC Occupational Exposure Limits.

Obey all posted signs and site guidelines for working in a RF environment.

Ref: 47CFR 1.1307(b)



ALERTING SIGN
(FOR CELL SITE BATTERIES)



ALERTING SIGN
(FOR DIESEL FUEL)



ALERTING SIGN
(FOR PROPANE)

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ALERTING SIGNS

WARNING!

DANGER DO NOT TOUCH TOWER!

SERIOUS "RF" BURN HAZARD!

MAINTAIN AN ADEQUATE CLEARANCE BETWEEN TOWER SUPPORTS AND GUY WIRES

FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN A RADIO FREQUENCY ENVIRONMENT COULD RESULT IN SERIOUS INJURY. CONTACT CURRENT MAY EXCEED LIMITS PRESCRIBED IN ANSI, IEEE C95.1-1992 FOR CONTROLLED ENVIRONMENTS.

PROPERTY OF AT&T

AUTHORIZED PERSONNEL ONLY

IN CASE OF EMERGENCY, OR PRIOR TO PERFORMING MAINTENANCE ON THIS SITE, CALL 800-638-2822 AND REFERENCE CELL SITE NUMBER _____

ALERTING SIGN

INFO SIGN #4

INFORMATION

AT&T operates telecommunications antennas at this location. Remain at least 3 feet away from any antenna and obey all posted signs.

Contact the owner(s) of the antenna(s) before working closer than 3 feet from the antenna.

Contact AT&T at _____ prior to performing any maintenance or repairs near AT&T antennas. This is Site # _____

Contact the management office if this door/hatch/gate is found unlocked.

INFORMACION

En esta propiedad se ubican antenas de telecomunicaciones operadas por AT&T. Favor mantener una distancia de no menos de 3 pies y obedecer todos los avisos.

Comuníquese con el propietario o los propietarios de las antenas antes de trabajar o caminar a una distancia de menos de 3 pies de la antena.

Comuníquese con AT&T _____ antes de realizar cualquier mantenimiento o reparaciones cerca de la antena de AT&T.

Esta es la estación base maestra. _____

Favor comunicarse con la oficina de la administración del edificio si esta puerta o compuerta se encuentra sin candado.

INFORMATION

ACTIVE ANTENNAS ARE MOUNTED

ON THE OUTSIDE OF THIS BUILDING

BEHIND THIS PANEL

ON THIS STRUCTURE

STAY BACK A MINIMUM OF 3 FEET FROM THESE ANTENNAS

Contact AT&T at _____ and follow their instructions prior to performing any maintenance or repairs closer than 3 feet from the antennas.

This is AT&T site # _____

INFO SIGN #1

INFO SIGN #2

INFO SIGN #3

STAY BACK 3 FEET FROM ANTENNA

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%; CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND; ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH							
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

- EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
- IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
- SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

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SITE NAME

MIDDLEFIELD CENTRAL

SITE NUMBER:

CTL05504

SITE ADDRESS

**393 JACKSON HILL ROAD
MIDDLEFIELD, CT 06455**

SHEET NAME

NOTES AND SPECIFICATIONS

SHEET NUMBER

SP2

SIGNAGE GUIDELINES CHART

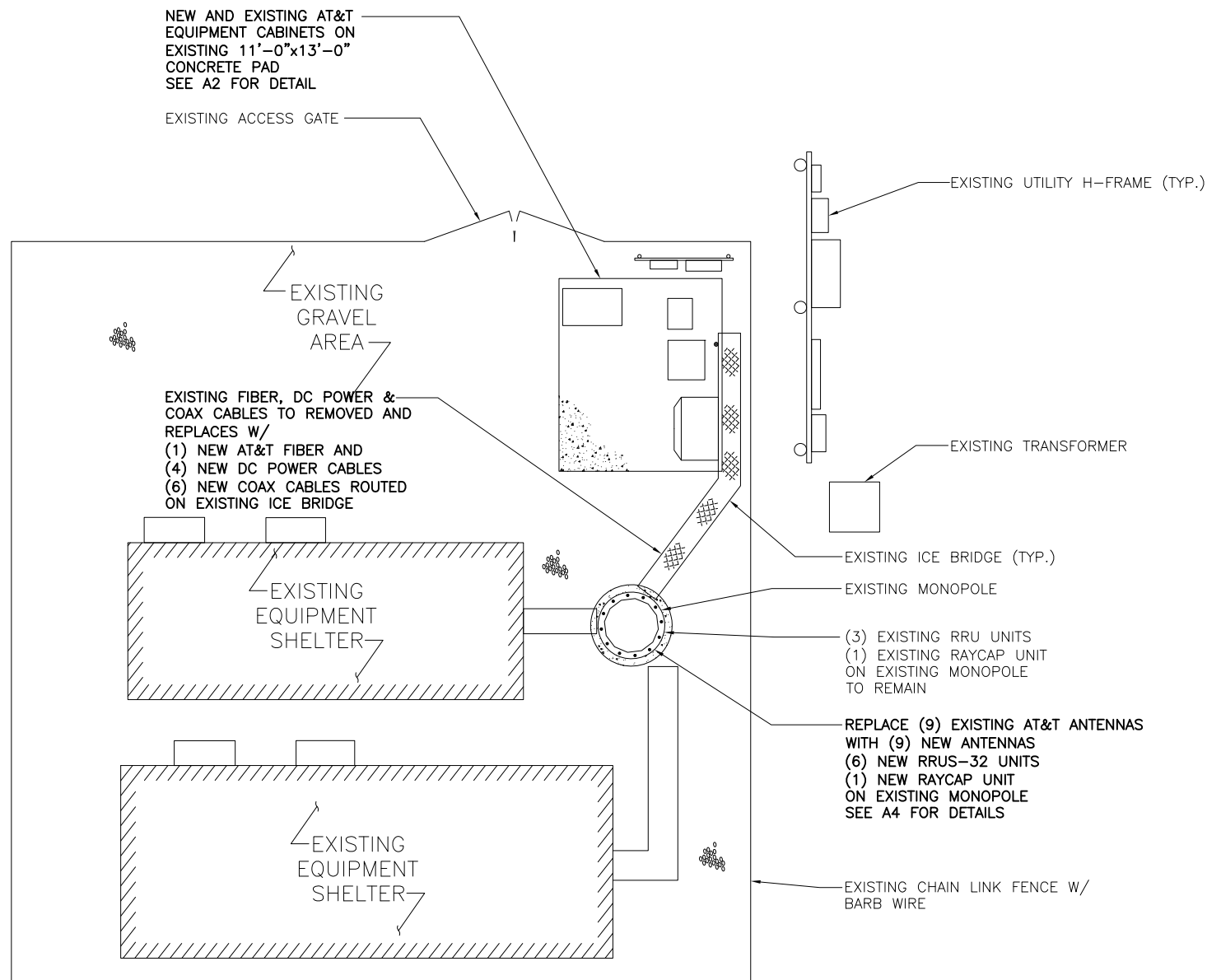
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ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
CL	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERTY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

SYMBOLS

	REVISION
	WORK POINT
	UTILITY POLE
	COMPRESSED STONE
	BRICK
	CONCRETE
	EARTH
	GRAVEL
	MASONRY
	STEEL
	CENTERLINE
	PROPERTY LINE
	LEASE LINE
	EASEMENT LINE
	CHAIN LINK FENCE
	WOOD FENCE
	BELOW GRADE ELECTRIC
	BELOW GRADE TELEPHONE
	OVERHEAD ELECTRIC/TELEPHONE
	SECTION REFERENCE



SITE PHOTO 1 SCALE: N.T.S. 2



SITE PHOTO 2 SCALE: N.T.S. 3



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MIDDLEFIELD CENTRAL

SITE NUMBER:
CTL05504

SITE ADDRESS
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MIDDLEFIELD, CT 06455**

SHEET NAME
COMPOUND PLAN

SHEET NUMBER
A1

COMPOUND PLAN

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



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SITE NAME

**MIDDLEFIELD
CENTRAL**

SITE NUMBER:

CTL05504

SITE ADDRESS

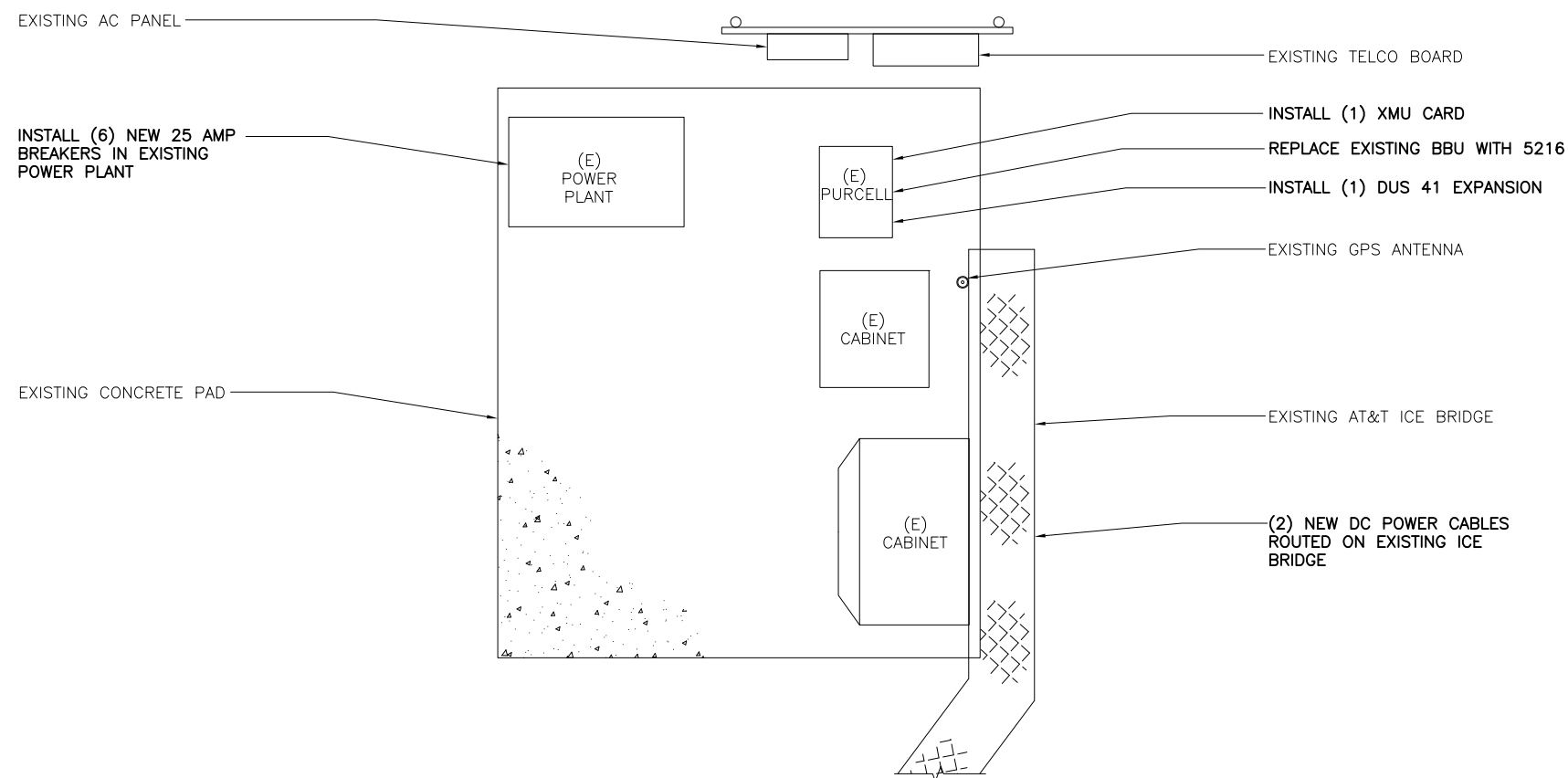
**393 JACKSON HILL ROAD
MIDDLEFIELD, CT 06455**

SHEET NAME

**EQUIPMENT
PLAN**

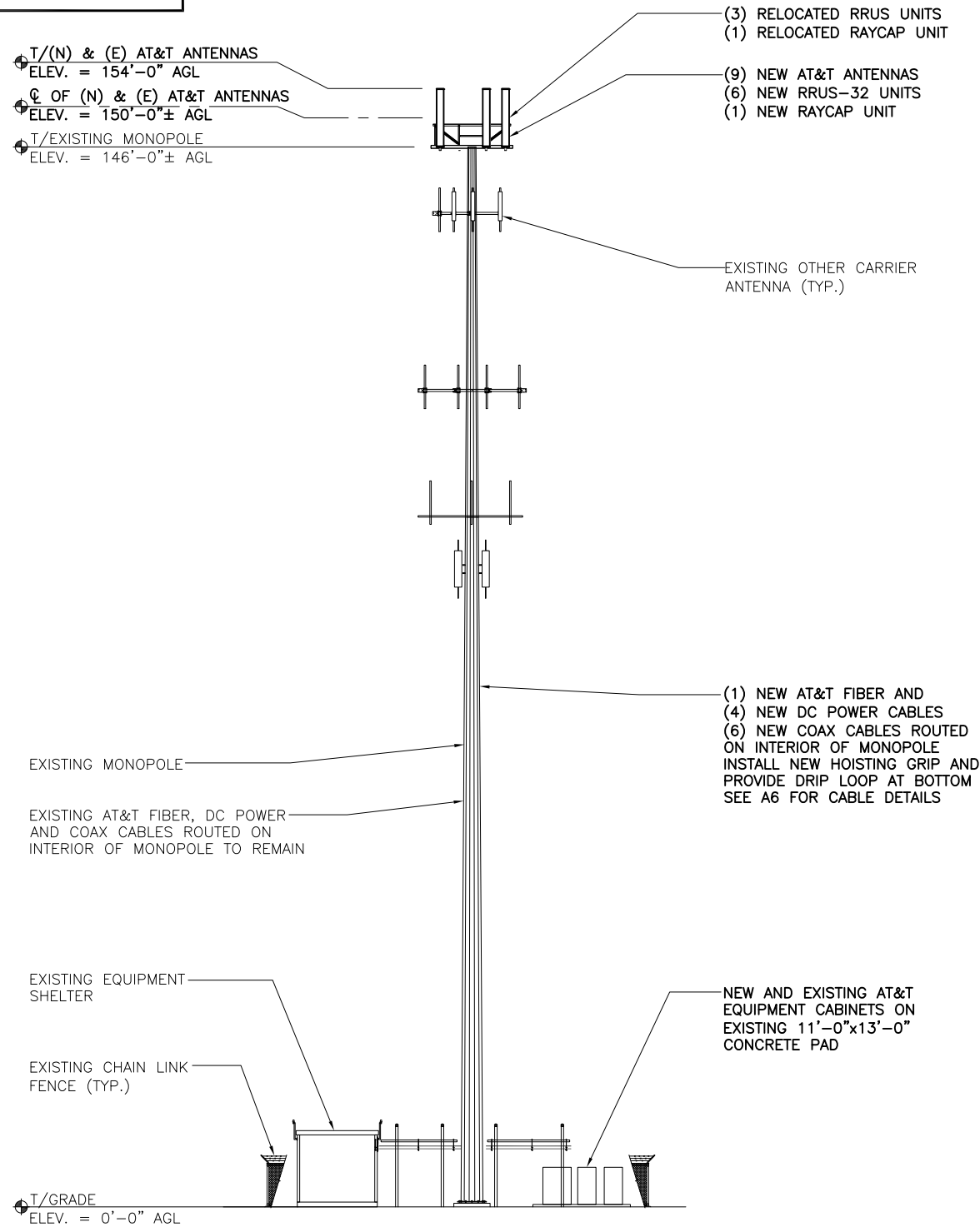
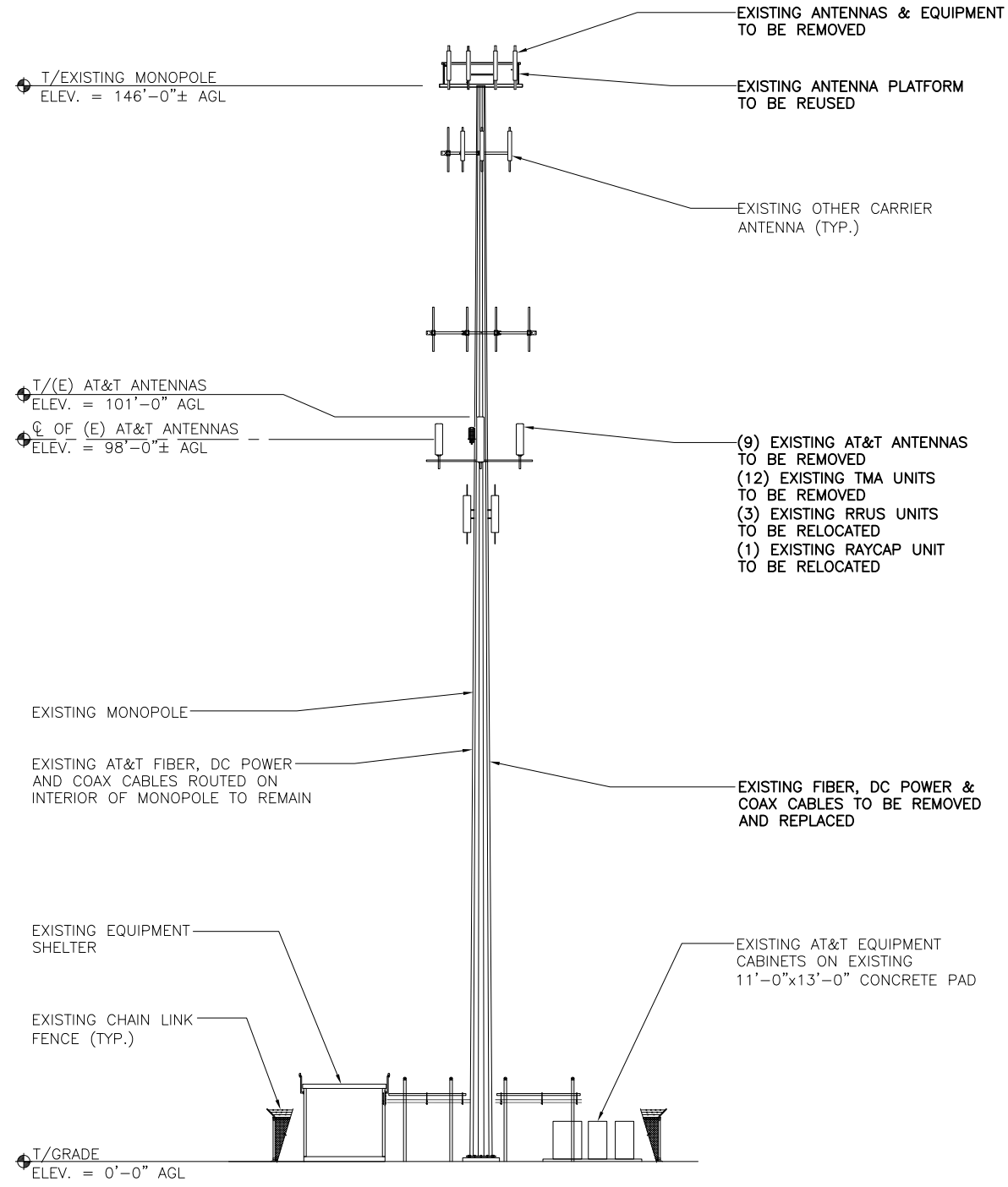
SHEET NUMBER

A2



- NOTES:**
1. CALCULATIONS FOR THE STRUCTURE WERE PREPARED BY OTHERS AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
 2. CALCULATIONS FOR THE ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
 3. CABLES NOT SHOWN FOR CLARITY

APPROVED



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SITE NUMBER:
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SITE ADDRESS
**393 JACKSON HILL ROAD
MIDDLEFIELD, CT 06455**

SHEET NAME
ELEVATIONS

SHEET NUMBER
A3

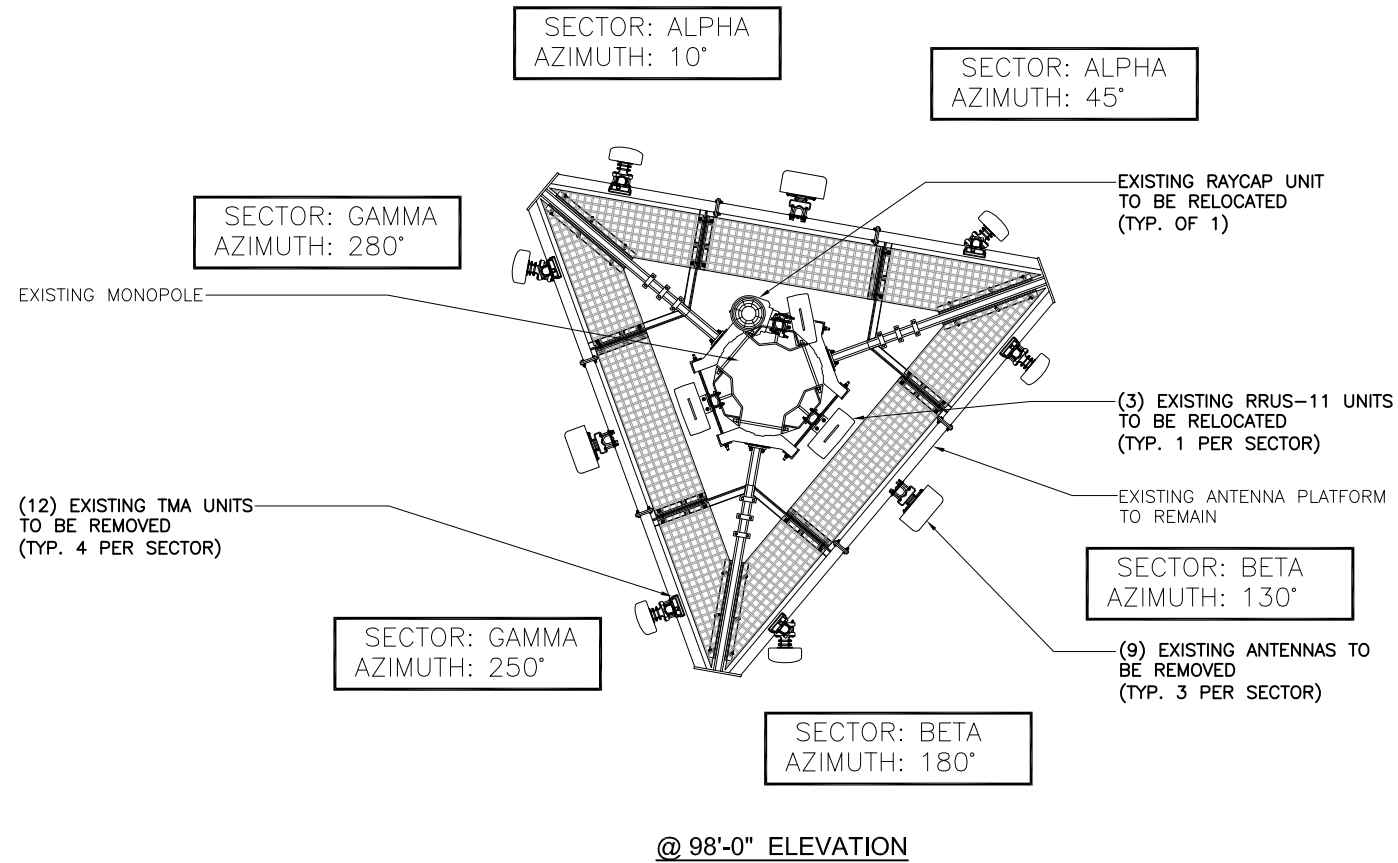
EXISTING ELEVATION

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

NEW ELEVATION

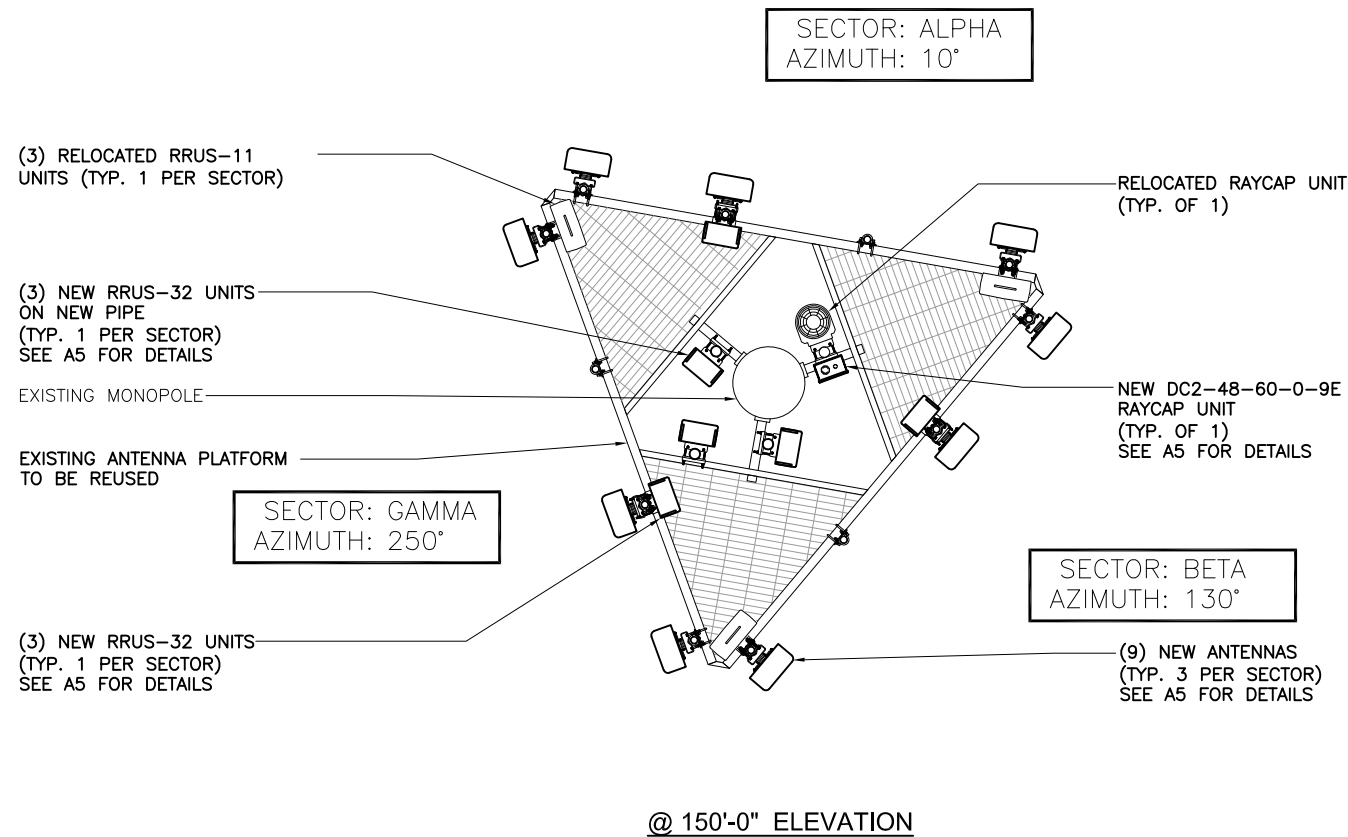
SCALE: 1/16" = 1'-0" 2

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EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'-0" | 1



FINAL ANTENNA PLAN

SCALE: 3/16" = 1'-0" | 2


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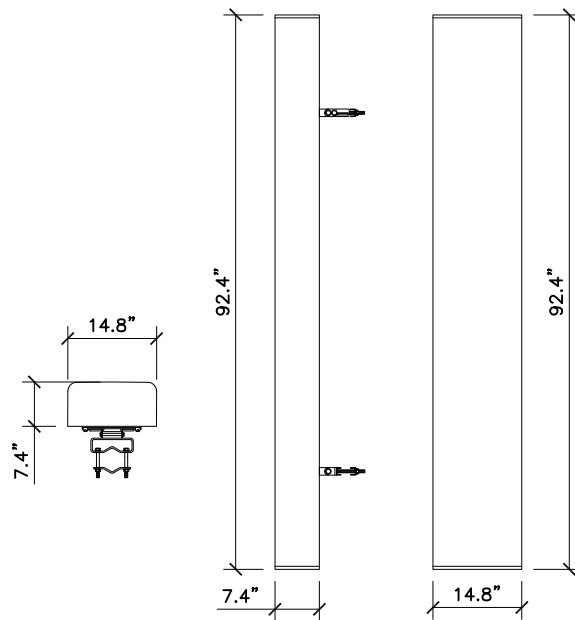
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SITE ADDRESS
**393 JACKSON HILL ROAD
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SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

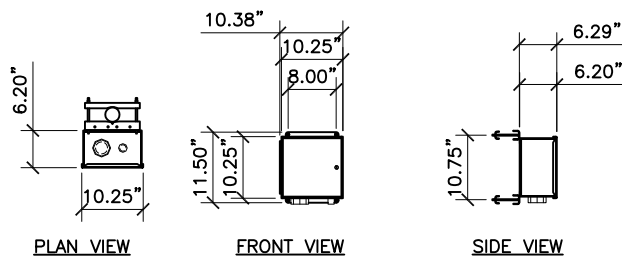
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PLAN VIEW SIDE VIEW FRONT VIEW

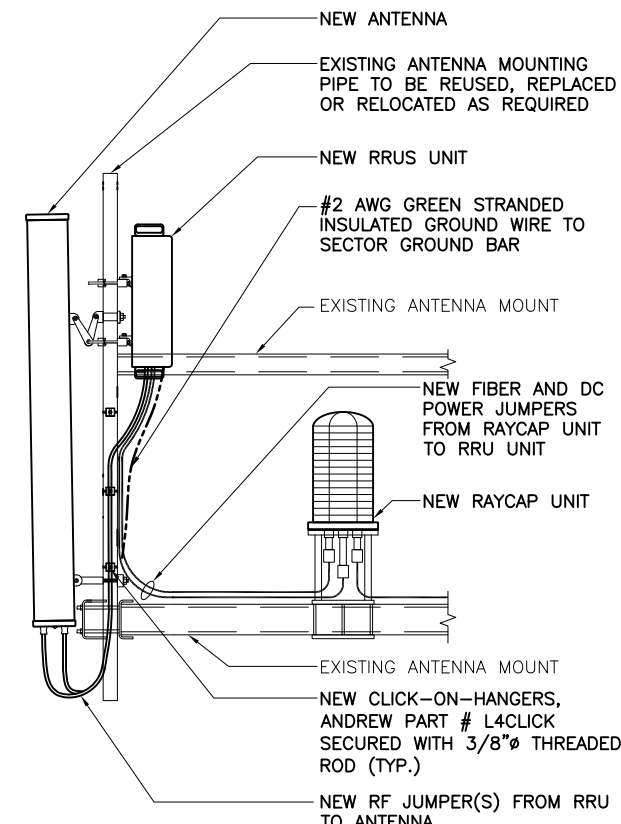
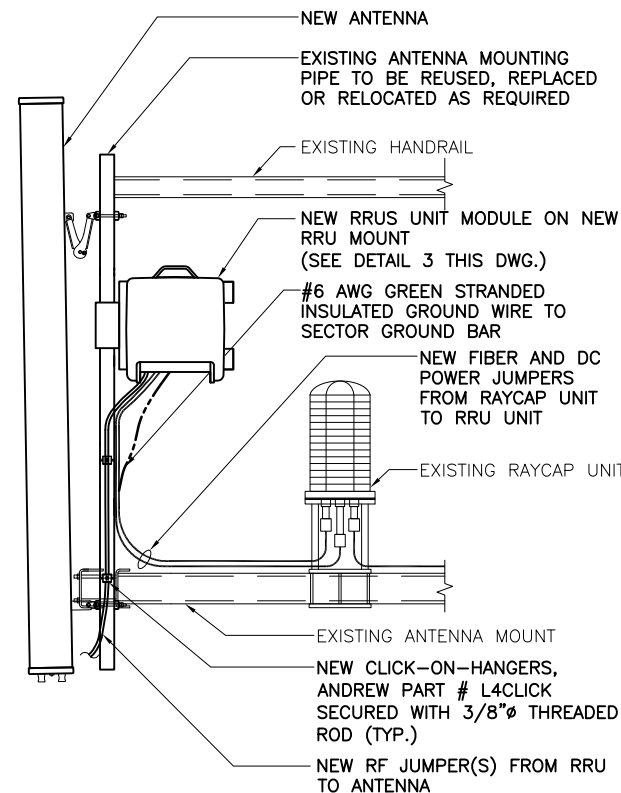
CCI - HPA-65R-BUU-H8

HEXPOR MULTI-BAND ANTENNA
 FREQUENCY RANGE 698-806 MHz
 824-894 MHz
 1850-1990 MHz
 1710-1755/2110-2170 MHz
 2305-2360 MHz
 ANTENNA WITH BRACKET 68 Lbs
 78 Lbs



RAYCAP - DC2-48-60-0-9E

TOWER DC OVER VOLTAGE PROTECTION POWER CONNECTION SOLUTION
 WEIGHT W/OUT BRACKETS: 16 lbs

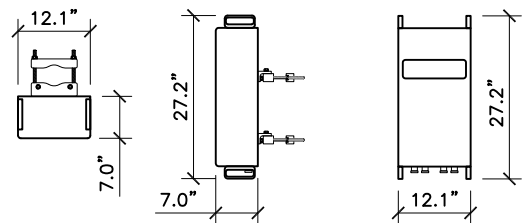


ANTENNA SPEC SCALE: N.T.S. 1

RAYCAP SPEC SCALE: N.T.S. 2

ANTENNA SCHEMATIC SCALE: N.T.S. 3

ANTENNA SCHEMATIC SCALE: N.T.S. 4



PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON - RRUS 32 B30

UNIT WEIGHT 60 Lbs

RRU SPEC SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

NOT USED SCALE: N.T.S. 7

NOT USED SCALE: N.T.S. 8



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2	11/30/17	MOUNT MODIFICATION	AD

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SITE NAME
MIDDLEFIELD CENTRAL

SITE NUMBER:
CTL05504

SITE ADDRESS
**393 JACKSON HILL ROAD
MIDDLEFIELD, CT 06455**

SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A5

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SITE NUMBER:

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MIDDLEFIELD, CT 06455

SHEET NAME

**ANTENNA &
CABLE
CONFIGURATION**

SHEET NUMBER

A6

**FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (10/03/17)**

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER		RAYCAP UNIT
								TYPE	LENGTH	
ALPHA	A-1	(E) UMTS ANTENNA	HPA-65R-BUU-H8	CCI	-	10°	150'-0"	(N) 1-5/8"Ø LDF7-50A	200'-0"	(1) (E) DC6-48-60-18-8F UNIT (1) (N) DC2-48-60-0-9E UNIT
	A-2	(N) LTE3C ANTENNA	HPA-65R-BUU-H8	CCI	(1) NEW RRUS-32 UNIT	10°	150'-0"	SEE ANTENNA A-4 FOR FIBER CABLE	200'-0"	
	A-3	-	-	-	-	-	-	-	-	
	A-4	(E) LTE1C & (N) 2C ANTENNA	HPA-65R-BUU-H8	CCI	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-32 UNIT	10°	150'-0"	(1) NEW FIBER CABLE	200'-0"	
BETA	B-1	(E) UMTS ANTENNA	HPA-65R-BUU-H8	CCI	-	150°	150'-0"	(N) 1-5/8"Ø LDF7-50A	200'-0"	
	B-2	(N) LTE3C ANTENNA	HPA-65R-BUU-H8	CCI	(1) NEW RRUS-32 UNIT	150°	150'-0"	SEE ANTENNA A-2 FOR CABLE TYPE AND LENGTH	200'-0"	
	B-3	=	=	=	=	=	=	=	=	
	B-4	(E) LTE1C & (N) 2C ANTENNA	HPA-65R-BUU-H8	CCI	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-32 UNIT	150°	150'-0"	SEE ANTENNA A-4 FOR CABLE TYPE AND LENGTH	200'-0"	
GAMMA	C-1	(E) UMTS ANTENNA	HPA-65R-BUU-H8	CCI	-	260°	150'-0"	(N) 1-5/8"Ø LDF7-50A	200'-0"	
	C-2	(N) LTE3C ANTENNA	HPA-65R-BUU-H8	CCI	(1) NEW RRUS-32 UNIT	260°	150'-0"	SEE ANTENNA A-2 FOR CABLE TYPE AND LENGTH	200'-0"	
	C-3	-	-	-	-	-	-	-	-	
	C-4	(E) LTE1C & (N) 2C ANTENNA	HPA-65R-BUU-H8	CCI	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-32 UNIT	260°	150'-0"	SEE ANTENNA A-4 FOR CABLE TYPE AND LENGTH	200'-0"	

LEGEND

(N) - NEW
(E) - EXISTING

- CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
- THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
- CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
- VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
- UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
- ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
- CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
- SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
- CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
- CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

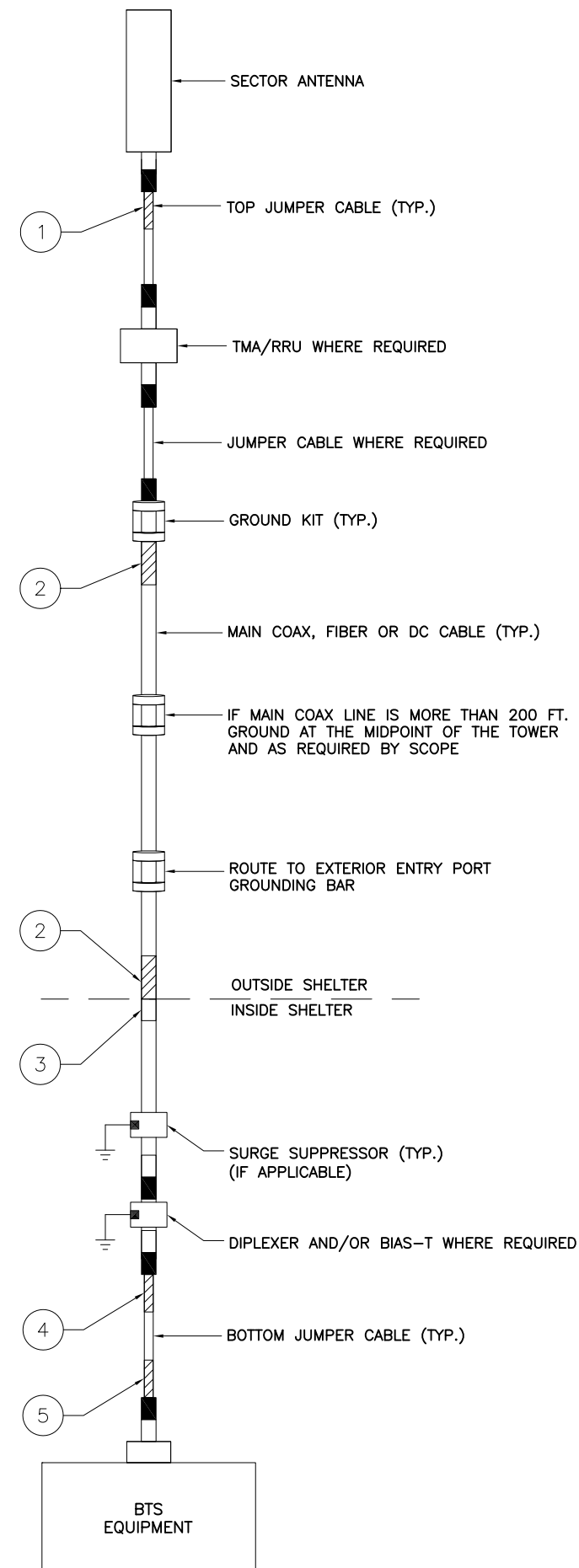
CABLE MARKING DIAGRAM

SCALE: N.T.S. 2

- THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
- THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
- USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
- WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
- ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
- ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
- ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
- IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. 4



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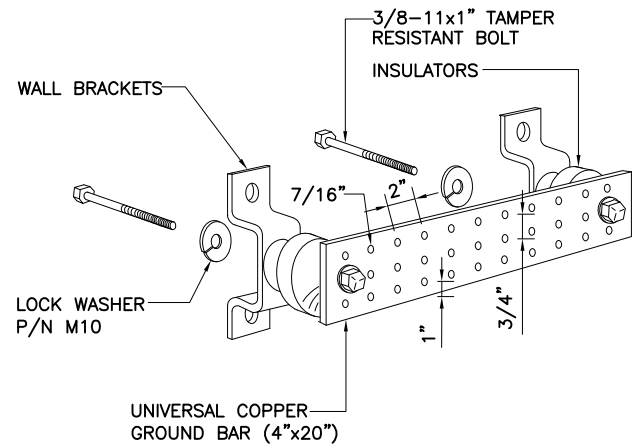
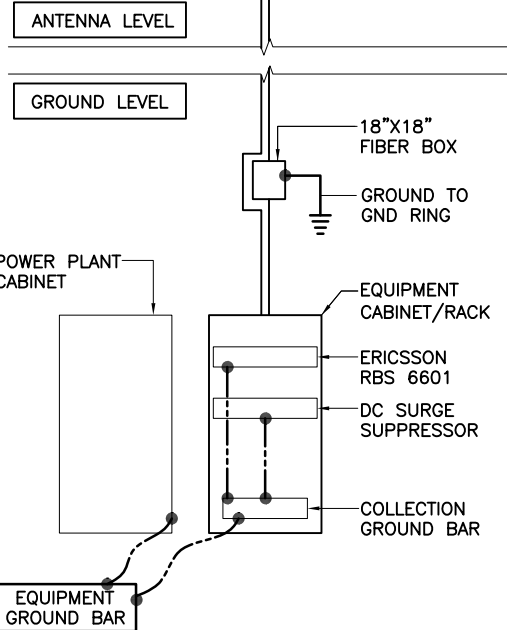
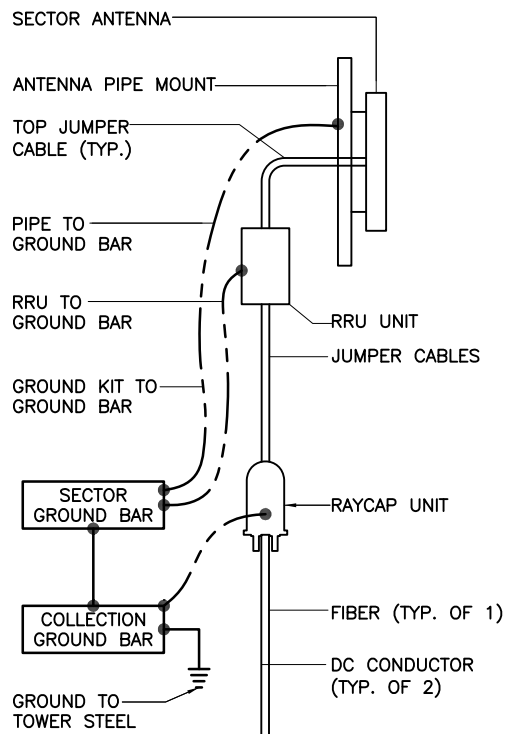
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CABLE NOTES AND COLOR CODING

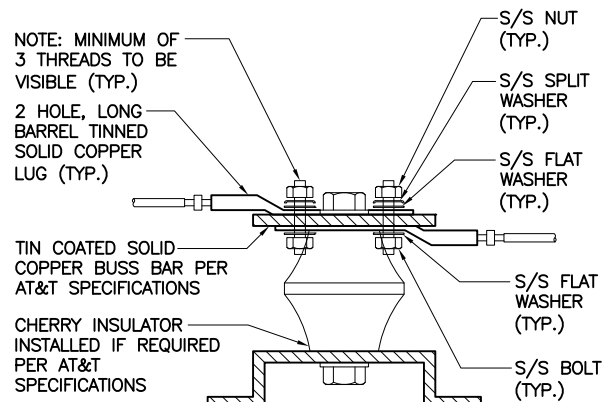
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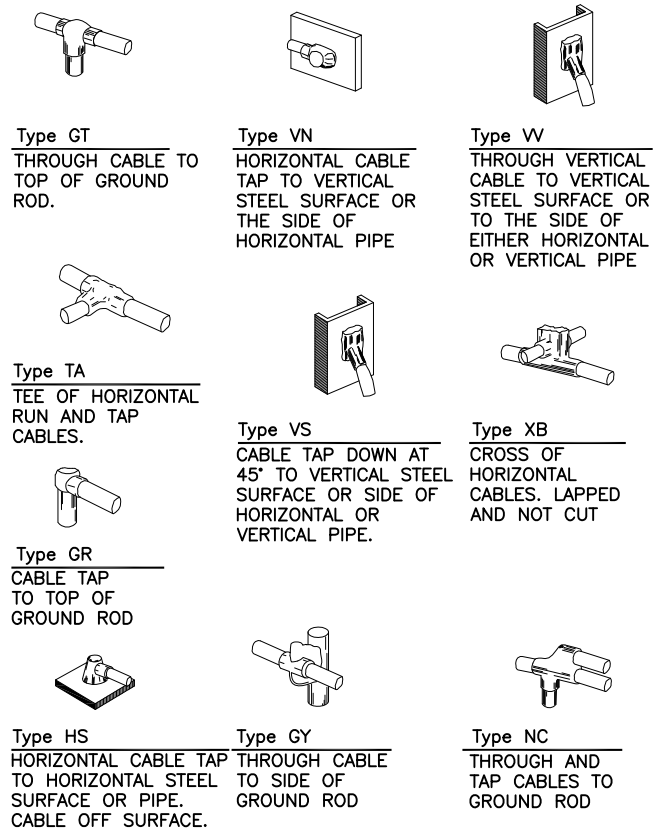


GROUND BAR DETAIL SCALE: N.T.S. 2

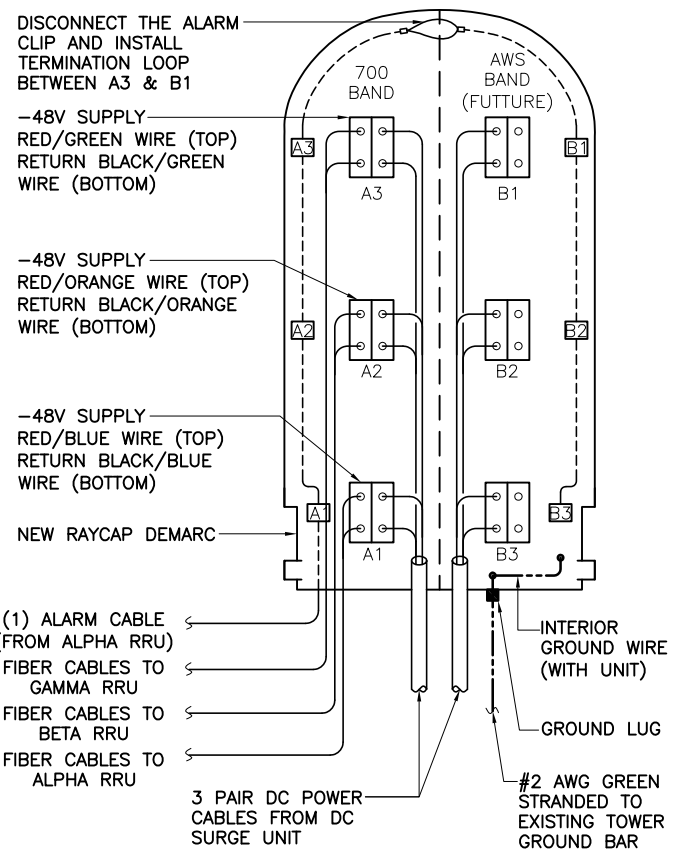


- NOTE: MINIMUM OF 3 THREADS TO BE VISIBLE (TYP.)
 2 HOLE, LONG BARREL TINNED SOLID COPPER LUG (TYP.)
- TIN COATED SOLID COPPER BUSS BAR PER AT&T SPECIFICATIONS
- CHERRY INSULATOR INSTALLED IF REQUIRED PER AT&T SPECIFICATIONS
- NOTES:
- ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
 - COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
 - APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6



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SHEET NAME

GROUNDING DETAILS

SHEET NUMBER

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GROUNDING SCHEMATIC SCALE: N.T.S. 1

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STRUCTURAL NOTES:

1.0 APPLICABLE CODES

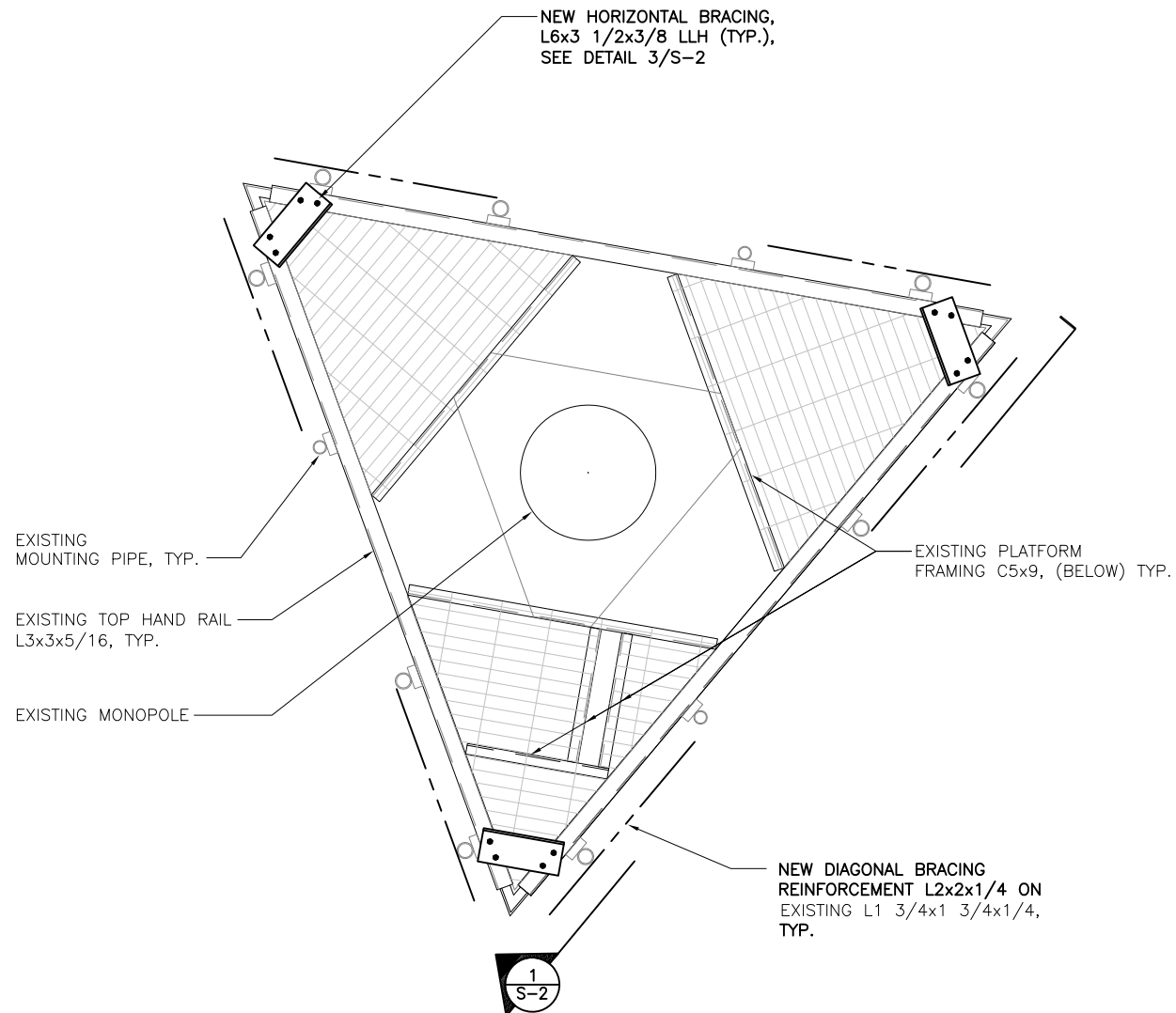
- 1.1 DESIGN & CONSTRUCTION OF ALL WORK SHALL CONFORM TO THE FOLLOWING CODES:
- 2012 INTERNATIONAL BUILDING CODE
 - TIA-222-G

2.0 GENERAL NOTES

- 2.1 STRUCTURAL DRAWINGS ARE INTENDED TO BE USED WITH DESIGN DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE REQUIREMENTS OF ALL DRAWINGS INTO THEIR SHOP DRAWINGS AND WORK.
- 2.2 NO CHANGE IN SIZE OR DIMENSION OF STRUCTURAL MEMBERS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE CAPACITY OF THE FRAMING AT THE TIME THE LOADS ARE IMPOSED.
- 2.3 THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE CONTRACTOR SHALL FURNISH ALL TEMPORARY BRACING AND/OR SUPPORTS REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES.
- 2.4 DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS.
- 2.5 THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY FOR SUCH DEVIATION BY THE ENGINEER'S APPROVAL OF SHOP DRAWINGS, PRODUCT DATA, ETC., UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE ENGINEER OF SUCH DEVIATION AT THE TIME OF SUBMISSION, AND THE ENGINEER HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.
- 2.6 ALL THINGS WHICH, IN THE OPINION OF THE CONTRACTOR, APPEAR TO BE DEFICIENCIES, OMISSIONS, CONTRADICTIONS AND AMBIGUITIES, IN THE PLANS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. PLANS AND/OR SPECIFICATIONS WILL BE CORRECTED, OR A WRITTEN INTERPRETATION OF THE ALLEGED DEFICIENCY, OMISSION, CONTRADICTION OR AMBIGUITY WILL BE MADE BY THE ENGINEER BEFORE THE AFFECTED WORK PROCEEDS.
- 2.7 ALL EXISTING DIMENSIONS AND CONDITIONS MUST BE FIELD VERIFIED PRIOR TO FABRICATION.
- 2.8 ALL WORK PRESENTED ON THESE DRAWINGS SHALL BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.
- 2.9 THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER AND OTHER APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.

3.0 STRUCTURAL STEEL NOTES:

- 3.1 STRUCTURAL STEEL MATERIALS (HANDRAILS, PLATFORMS, STAIRS, H-FRAMES, ETC.): CONFORM TO THE LATEST EDITION OF APPLICABLE STANDARDS AND TO ALL APPLICABLE CODES AND REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION, WHICHEVER IS MORE STRINGENT. ALL STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE LATEST APPLICABLE REQUIREMENTS OF AISC, ASTM, ACI, CRSI, AWS AND ALL OTHER APPLICABLE STANDARDS.
- A. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 UNLESS NOTED ON THE CONSTRUCTION DRAWINGS.
 - B. ROLLED STEEL SHAPES, PLATES AND BARS SHALL BE NO LESS THAN 3/16 INCHES IN THICKNESS AND SHALL COMPLY WITH ASTM A-36 AS A MINIMUM.
 - C. STEEL PIPE SHALL COMPLY WITH ASTM A-501 OR ASTM A-53, TYPE E OR S, GRADE B. A-500 GRADE B STEEL MAY BE SUBSTITUTED.
 - D. GALVANIZED STEEL GRATING SHALL BE A MINIMUM 1-1/4 INCH X 1/8 INCH AT 3/16 INCHES ON CENTER.
- 3.2 STRUCTURAL STEEL FABRICATION: ALL SHOP FABRICATION AND ASSEMBLY OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH AISC SPECIFICATIONS AND AS INDICATED ON THE DRAWINGS. ALL MATERIALS SHALL BE PROPERLY MARKED FOR FIELD ASSEMBLY AND FOR IDENTIFICATION AS TO THE LOCATION FOR WHICH IT IS INTENDED. MATERIALS SHALL BE FABRICATED AND DELIVERED IN AN ORDER TO EXPEDITE ERECTION AND MINIMIZE FIELD HANDLING OF MATERIALS.
- 3.3 CONNECTIONS:
- A. CONTRACTOR SHALL PROVIDE ALL HARDWARE REQUIRED TO COMPLETE FIELD ERECTION OF STRUCTURE AS INDICATED BY CONTRACT DOCUMENTS OR THESE SPECIFICATIONS.
 - B. HIGH STRENGTH THREADED FASTENERS SHALL BE INSTALLED IN ACCORDANCE WITH AISC SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A-325 BOLTS. USE A-325N BEARING-TYPE CONNECTION BOLTS UNLESS NOTED OTHERWISE.
- 3.4 REPAIR: REPAIR ALL DAMAGED GALVANIZED STEEL WITH "GALVANOX," "DRY GALV," OR "ZINC-IT.", OR APPROVED EQUAL, PER THE MANUFACTURER'S INSTRUCTIONS.
- 3.5 INSPECTION: ANY DEFICIENCIES IN STRUCTURAL STEEL WORK NOT COMPLYING WITH SPECIFIED REQUIREMENTS ACCORDING TO INSPECTIONS AND TEST RECORDS SHALL BE CORRECTED AT NO ADDITIONAL COST, AND ADDITIONAL TESTS REQUIRED FOR COMPLIANCE OF THE ORIGINAL WORK AND TO INDICATE COMPLIANCE OF CORRECTED WORK SHALL BE AT NO ADDITIONAL COST TO THE COMPANY.



MOUNT MODIFICATION PLAN

SCALE: 3/8" = 1'-0"

1



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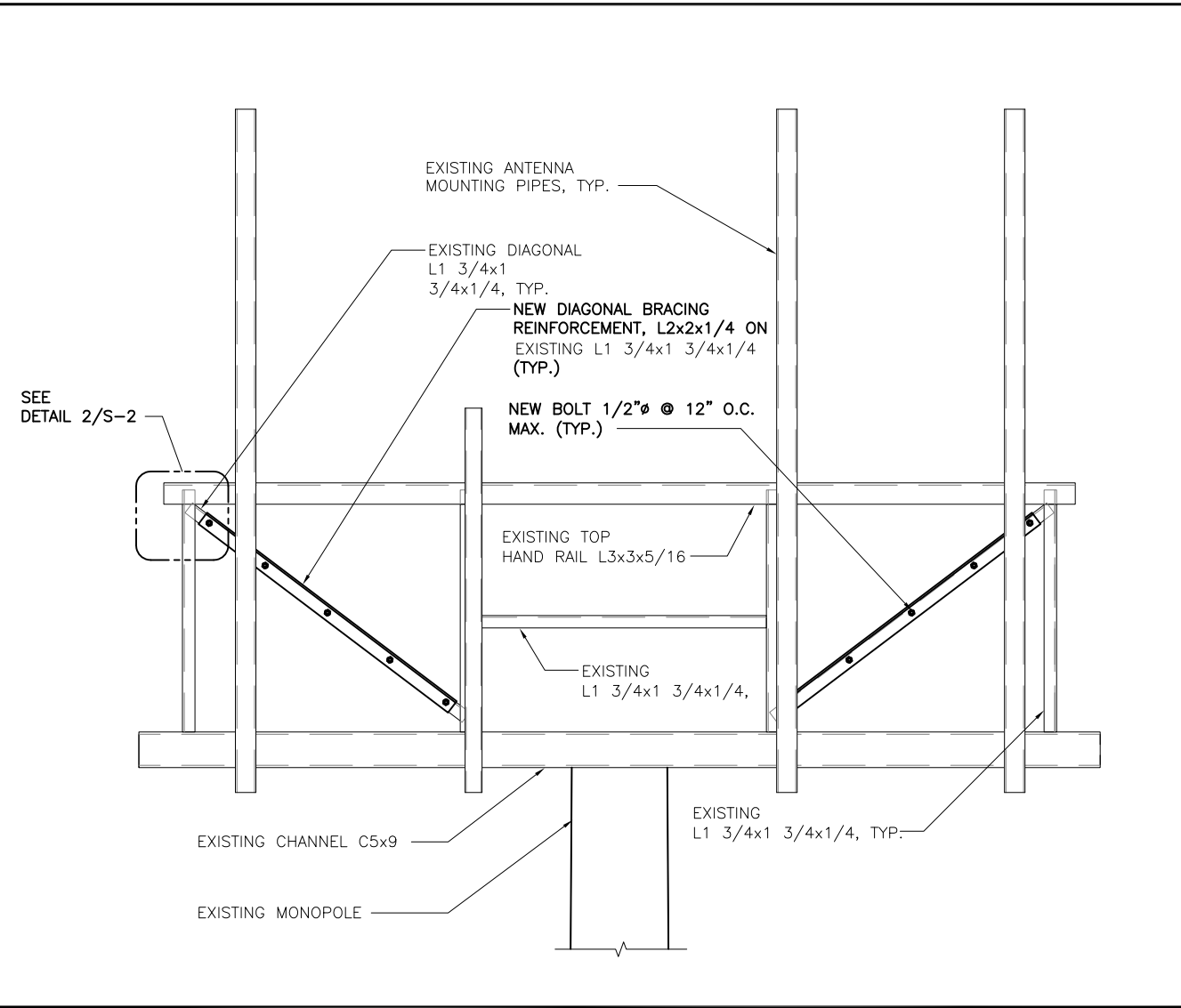
SHEET NAME

**STRUCTURAL
NOTES**

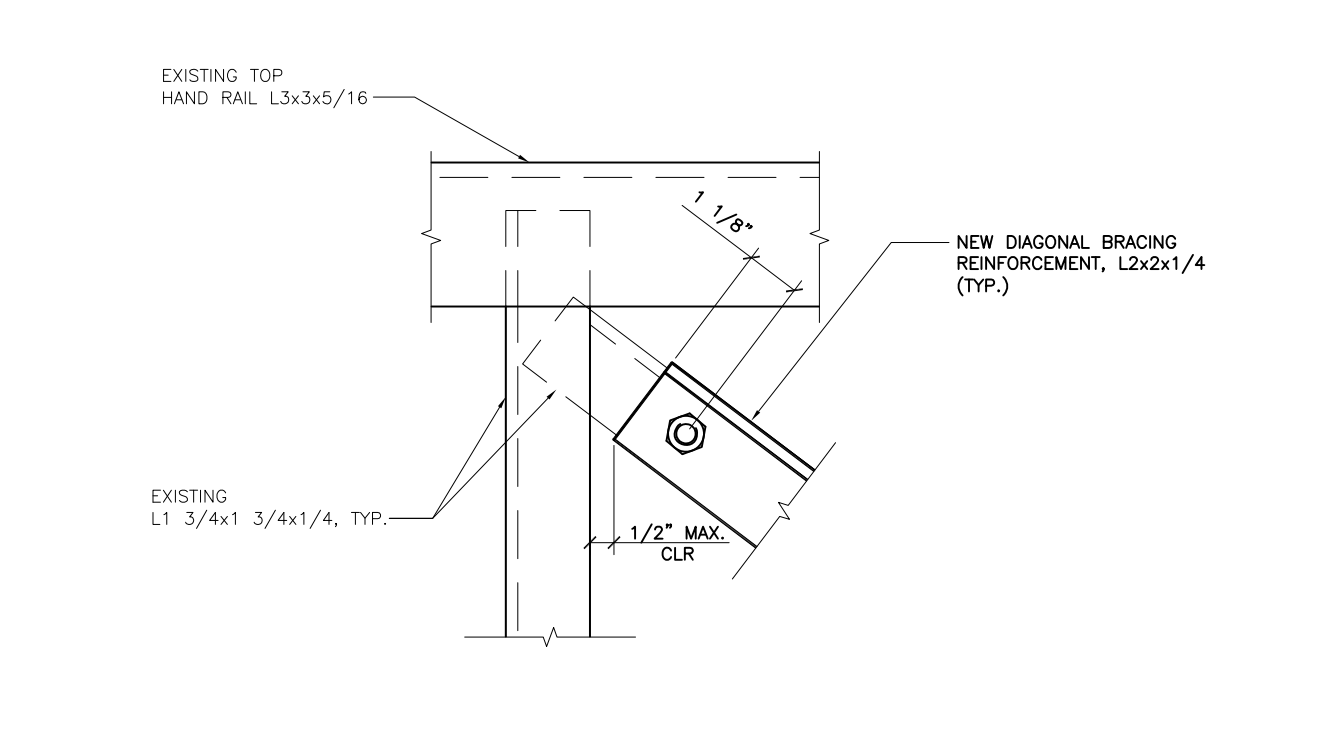
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S1

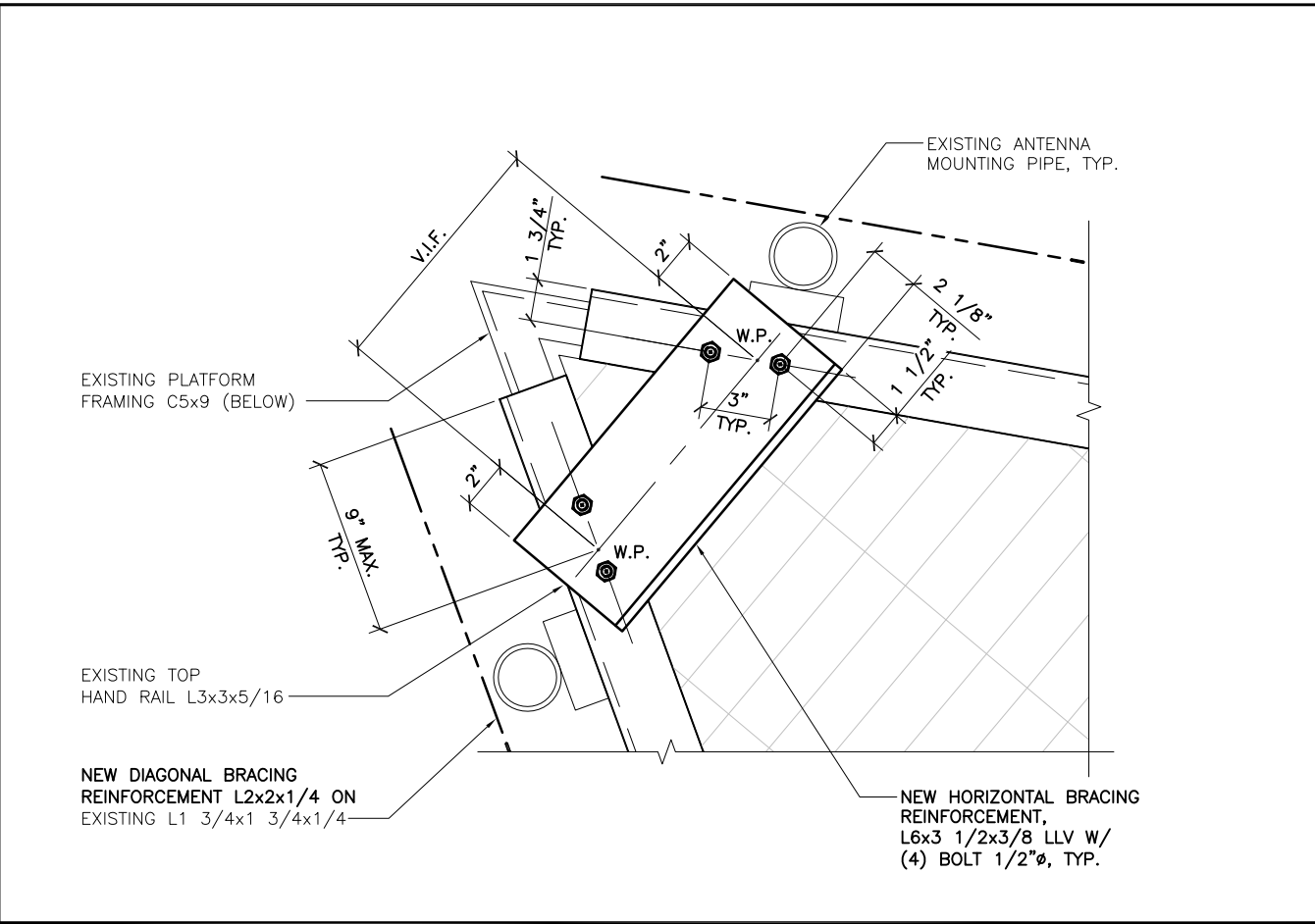
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MOUNT MODIFICATION ELEVATION SCALE: 1/2" = 1'-0" 1



MOUNT MODIFICATION DETAIL SCALE: 3" = 1'-0" 2



MOUNT MODIFICATION DETAIL SCALE: 1-1/2" = 1'-0" 3

NOT USED



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MONDAY

22 JANUARY 2018

by 8:00pm

Status

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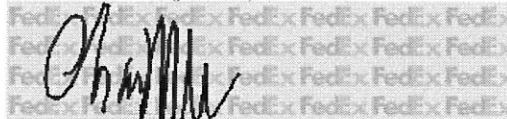
Fri 1/19/2018

Smartlink LLC
Hateleya Haite
Bldg #3, Suite 102
85 Rangeway Rd
NORTH BILLERICA, MA US 01862
978 235-6131



Delivered

Signed for by: C MILLER



Actual delivery:

Tue 1/23/2018 10:06 am

8051 Congress Avenue
BOCA RATON, FL US 33487

Travel History

▲ Date/Time	Activity	Location
- 1/23/2018 - Tuesday		
10:06 am	Delivered	BOCA RATON, FL
8:45 am	On FedEx vehicle for delivery	BOCA RATON, FL
7:37 am	At local FedEx facility	BOCA RATON, FL
- 1/22/2018 - Monday		
6:25 pm	At local FedEx facility	BOCA RATON, FL
8:37 am	At local FedEx facility	BOCA RATON, FL
	Package not due for delivery	
7:48 am	At local FedEx facility	BOCA RATON, FL
- 1/21/2018 - Sunday		
9:25 pm	At destination sort facility	FORT LAUDERDALE, FL
6:32 pm	Departed FedEx location	MEMPHIS, TN
- 1/19/2018 - Friday		
8:05 pm	Left FedEx origin facility	WILMINGTON, MA
6:58 pm	Picked up	WILMINGTON, MA
9:51 am	Shipment information sent to FedEx	

Shipment Facts

Tracking Number	771260756667	Service	FedEx 2Day
Reference	CTL05504	Weight	1 lbs / 0.45 kgs
Delivery attempts	1	Delivered To	Shipping/Receiving
Total pieces	1	Total shipment weight	1 lbs / 0.45 kgs
Terms	Not Available	Shipper reference	CTL05504
Packaging	FedEx Envelope	Special handling section	Deliver Weekday

IMPORTANT!

FedEx will be operating in the Minneapolis metro area during Super Bowl LII. [Learn More](#)



771260864576

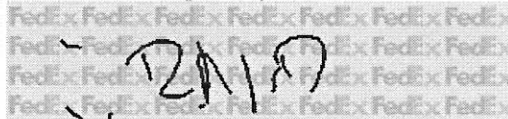
Ship date:
Fri 1/19/2018

Smartlink LLC
Haleluya Haile
Bldg #3, Suite 102
85 Rangeway Rd
NORTH BILLERICA, MA US 01862
978 235-6131



Delivered

Signed for by: R.RAND



Actual delivery:
Mon 1/22/2018 1:44 pm

393 Jackson Hill Road
MIDDLEFIELD, CT US 06455

Travel History

▲ Date/Time	Activity	Location
- 1/22/2018 - Monday		
1:44 pm	Delivered	MIDDLEFIELD, CT
8:03 am	On FedEx vehicle for delivery	NORTH HAVEN, CT
7:37 am	At local FedEx facility	NORTH HAVEN, CT
- 1/21/2018 - Sunday		
7:29 pm	At destination sort facility	EAST GRANBY, CT
4:11 pm	Departed FedEx location	MEMPHIS, TN
- 1/19/2018 - Friday		
8:05 pm	Left FedEx origin facility	WILMINGTON, MA
6:58 pm	Picked up	WILMINGTON, MA
10:02 am	Shipment information sent to FedEx	

Shipment Facts

Tracking Number	771260864576	Service	FedEx 2Day
Reference	CTL05504	Weight	1 lbs / 0.45 kgs
Delivery attempts	1	Delivered To	Receptionist/Front Desk
Total pieces	1	Total shipment weight	1 lbs / 0.45 kgs
Terms	Not Available	Shipper reference	CTL05504
Packaging	FedEx Envelope	Special handling section	Deliver Weekday
Standard transit	1/23/2018 by 4:30 pm		