



Filed by:

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December 29, 2021

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

Application for Tower Share
160 West Street, Cromwell, CT
Latitude: 41.606000
Longitude: -72.670388
Dish Wireless #: BOBDL00133A

Dear Ms. Bachman:

RE: TS-DISH-033-210805

On September 9, 2021, the Council received an electronic mail with a property card for the above referenced address in the Town of Cromwell. On September 10, 2021, the Council acknowledged the response to the incomplete letter and rendered the request complete. However, upon further examination staff identified further deficiencies in the radio frequency emissions analysis (RF) report prepared by EBI Consulting and dated July 6, 2021. The RF report does not account for RF values from Verizon and T-Mobile's most recently approved exempt modification requests.

Therefore, the tower share request remains incomplete at this time. The Council recommends that SBA Communications provide an updated RF report that accounts for the latest RF values for Verizon and T-Mobile, on or before October 22, 2021. If additional time is needed to gather the requested information, please submit a written request for an extension of time prior to October 22, 2021. **Please provide an electronic version and one hard copy of the requested information for the incomplete tower share request to be rendered complete and processed. Please include the Council's tower share identification number referenced above with the submittal.**

Per your request and in accordance to the above referenced Letter, enclosed is a revised RF Report conducted by EBI Consulting dated December 16, 2021, which includes the two carriers aforementioned, Verizon and T-Mobile, as well as, Dish. One hard copy of this filing is also being sent to the Town of Cromwell's Mayor, Enzo Faienza, Stuart B. Popper, Director of Planning & Development, as well as, to the Property Owner, 160 West Street, LLC. Separate notice is not being sent to the Tower owner as it belongs to SBA.

Please accept this letter as notification pursuant to the Connecticut General Statutes § 16-50aa and R.C.S.A § 16-50j-88 of Dish Wireless' Application for Tower Sharing at the existing 76-foot Monopine Tower at **160 West Street., Cromwell, CT.**



- **The new antennas would support 5G services and would be installed at the 51-foot level of the tower.**

Per the requirements under R.C.S.A §16-50j-89 please find the following statements in support of Dish Wireless L.L.C.'s Application:

1. Facility and Proposed Modifications

A. Existing Facility and Appurtenances

This facility was originally approved by the Town of Cromwell under Permit# 19252 to construct a new 80" Monopine tower in a 32' x 62' compound for wireless communications use on August 12, 2010. The Monopine tower was later approved by the Connecticut Siting Council (CSC) at public meeting held on May 27, 2010 under Docket No. 338 for the Development & Management Plan (D&M) submitted on March 31, 2010 and revisions submitted May 14, 2010 with the condition that landscaping be installed on the west side of the compound and submit request for extension until December 29, 210 with the understanding that Council will be notified should the Certificate Holder decide not to proceed with construction with the following conditions:

- 1. As specified in the D&O the height of the monopine and antennas would not exceed 80 feet above ground level, however, the installation of simulated pine branches would bring the overall height to approximately 84 feet agl.
- 2. A 30-foot by 58-foot equipment compound enclosed by an eight-foot high chain link fence with privacy slats. Underground utilities will serve the compound. Access to the compound will be from the existing parking lot on the property.
- 3. A row of Arborvitae will be installed along the south side of the compound. Although the property to the west is wooded and currently undeveloped, staff recommends the installation of a row of Arborvitae along the west side of the compound.

- Latitude / Longitude: 41.606000 / -72.670388
- Height of Tower: 76'
- Owned/operated by: SBA Towers IV, LLC
- Property Owner: 160 West Street, LLC.
- Size/Components of existing equipment compound:
 - 30' x 58' fenced compound with 8' high chain link fence with privacy slats containing:
 - 76' monopine tower
 - T-Mobile 10' x 16' ground space [west of monopole w/in compound]
 - Verizon's 12' x 24' ground space [northwest of the monopine w/in compound]
 - Components of existing tower:

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	74.0	3	RFS APXVAALL24-43-U-NA20	(3) T-Arms w/ replaced new standoff, face horizontal and new support rail with end connection	(6) 7/8" (4) 1 5/8" Fiber (6) 3/8" RET	T-Mobile
2		3	Ericsson Air 32 KRD901146-1_B66A_B2A			
3		3	Ericsson AIR6449 B41			
4		3	Commscope SDX1926Q-43			
5		6	Andrew ATM200-A20			
6		3	Ericsson 4449 B71 + B85			
7		3	Ericsson 4415 B25			
8		3	Ericsson 4415 B66A			
9	64.0	6	Commscope JAHH-65B-R3B	(3) T-Arms (3) TBD VZWSMART-SFK4 (Mount Reinforcement) (3) Commscope BSAMNT-SBS-2-2 (side-by-side mounts)	(18) 1 5/8" Coax (2) 1 5/8" Hybrid	Verizon
10		3	Samsung Telecommunications VZS01			
11		4	Andrew DB846F65ZAXY			
12		2	Decibel DB846H80E-SX w/Mount Pipe			
13		3	Commscope CBC78T-DS-43-2X/E14F05P50			
14		3	Samsung B2/B66A RRH-BR049			
15		3	Samsung B5/B13 RRH-BR04C			
16		2	RFS DB-T1-6Z-8AB-OZ			

B. Nature and Extent of Proposed Modifications

Dish Wireless proposes to install (3) panel antennas at the 51' level of the existing 76'-foot monopine tower and occupy a ground lease area of 5'x7' within the existing 58' x 30' fenced compound. Dish Wireless' full proposed scope of work is as follows:

Remove:

- N/A

Remove and Replace:

- N/A

Install:

Tower:

At 51':

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
17	51.0	3	JMA Wireless MX08FRO665-21	Commscope MC-K6MHDX-9-96 T-Arms	(1) 1.6" Hybrid	Dish Wireless
18		3	Fujitsu TA08025-B605			
19		3	Fujitsu TA08025-B604			
20		1	Raycap RDIDC-9181-PF-48			

Ground (within existing compound):

- 5'x7' concrete pad
- Generator Plug (generator not installed)
- GPS unit
- Power protective cabinet



- H-Frame
- Safety Switch space
- Telco fiber enclosure
- Fiber ND (If required)
- Equipment platform
- Dish Equipment cabinet
- 18'- 6" L x 12" W Ice bridge

Existing Equipment to Remain: N/A

- C. This Proposal is technically, legally, environmentally, and economically feasible and meets public safety concerns per Connecticut General Statute Section 16-50aa.

Dish Wireless proposes to collocate at the above-referenced existing telecommunication facility rather than to require additional tower construction. The need for the site was dictated by the existing lack of, or extremely poor service, and projected future capacity and coverage requirements for this particular geographic area. Because new wireless telecommunications sites must function as an integral part of an existing network, their locations affect the services areas of all surrounding site. In order to use mobile communications services, users must be "handed-off" efficiently from one site to the next as they travel. To accomplish this goal, new sites must be placed on very exact, calculated locations.

When the need for a new site in the Cromwell area was established, SBA system engineers identified a target area in which to locate the facility. Within the general target area, there are no other tall structures that are suitable for this purpose. The Selection of this specific site location was determined by local topographic and geographic factors, mitigation of the antenna mounting structure's visual impact, compatibility with existing land use, and the ability to negotiate a mutually beneficial lease with a landlord. SBA engineers believe that the 160 West Street site is ideally suited for the proposed monopine tower facility. Two carriers are currently on the tower. With the addition of Dish Wireless, there will be a total of three carriers.

The approved facility is located in an office park consisting of two, single-story brick office buildings and associated parking areas. The site is located in the northwest corner of the property, approximately 38 feet from the north property line and immediately adjacent to the west property line. Consistent with the Council's Decision Order, the compound area was shifted approximately 20 feet to the south to increase the buffer to the northerly property line.

The 30-foot by 58-foot equipment compound is enclosed by an eight-foot high chain link fence with privacy slats. Access to the compound will be from the existing parking lot on the property.

The proposed collocation meets with all legal and technical requirements. This Application contains all required information and statements per R.C.S.A §16-50j-89 and the proposed installation has been drafted per current code, and studied with regard to structural feasibility and RF emissions output. Drawings and Reports are attached. Dish Wireless' proposed collocation presents no known material changes to environmental conditions from those as documented in the Council's original Findings of Fact and presents no known public safety concerns.



1. Engineering Drawings per the requirements under R.C.S.A. §16-50j-89 are enclosed herewith.
2. Engineering and Structural Analysis per the requirements under R.C.S.A. §16-50j-89 is enclosed herewith.
3. Engineering and Mount Analysis per the requirements under R.C.S.A. §16-50j-89 is enclosed herewith.
4. A Letter from SBA, as Owner of the Facility, agreeing to the proposed shared use of the facility, is enclosed herewith.
5. With regard to any potential environmental impact:
 - D. Dish Wireless' collocation will not have any significant adverse visual impact on the surrounding areas. The antennas should result in only marginal additional equipment visibility from areas that already have views of the existing tower. The proposed work would not require any Federal Aviation Administration obstruction marking or lighting.
 - E. The proposed collocation does not affect or alter the existing site with regard to wetlands, water resources or air quality. National Wetlands Inventory Maps indicated that the site was not within the 100 year floor zone.

The proposed work is not thought to have any substantial adverse environmental impact. Public Need for the additional coverage outweighs any minor environmental effects that would result from the construction, operation, and maintenance of the proposed collocation.

2. The operation of Dish Wireless' new antennas will not increase the total radio frequency electromagnetic power density at the site to a level at or above the applicable standards. The anticipated Maximum Composite contributions from the Dish Wireless facility are only 11.68% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 19.445% of the allowable FCC established general public limit sampled at the ground level. FCC guidelines state that if a site is to be out of compliance (over allowable thresholds), the carriers over 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold per the federal government. A Power Density / RF Report per the requirements under R.C.S.A. §16-50j-89 is enclosed herewith.
3. Per the Connecticut Siting Council's COVID 19 Guidelines, one original hard copy of this Tower Share Application is being submitted, along with check in the amount of \$625 for the filing fee per Conn. Gen. Stat. §4-189j; Regs., Conn. State Agencies §16-50v-1a.
 - A. A copy of this Application and all attachments is being sent to:
 - i. The Town of Cromwells's Mayor, Enzo Faienza
 - ii. The Town of Cromwells's Director of Planning & Development, Stuart B. Popper
 - iii. The Property Owner, 160 West Street, LLC
 - iv. (Separate notice is not being sent to tower owner, as it belongs to SBA)

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



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

Dish Wireless respectfully submits for the Council's review and approval this Application for Tower Share.

Sincerely,

G. Scott Shepherd

Site Development Specialist II
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3807 + T
508.366.2610 + F
508.868.6000 + C
GShepherd@sbsite.com

Attachments

cc: Enzo Faienza, Mayor, / with attachments
Town Hall 41 West St., Cromwell, CT 06416
Stuart B. Popper, Director of Planning & Development / with attachments
Town Hall 41 West St., Cromwell, CT 06416
160 West Street, LLC
162 West Street, Cromwell, CT 06416



EXHIBIT LIST

Exhibit 1	Copy of Check	X
Exhibit 2	Letter of Intent to Allow Shared Use of the Existing SBA Telecommunications Site	X
Exhibit 3	Notification Receipts	x
Exhibit 4	Property Card	x
Exhibit 5	Property Map	x
Exhibit 6	Original Zoning Approval	Town of Cromwell Permit No. 19252 (8/12/10), CSC Docket No. 338 (5/27/10)
Exhibit 7	EME Report	EBI Consulting 12/16/21
Exhibit 8	Structural Analysis	TES 6/3/21
Exhibit 9	Mount Analysis	B+T GRP 5/31/21
Exhibit 10	Construction Drawings	B+T GRP 6/14/21
Exhibit 11	Site Sketch (Ground)	SBA 4/7/21

EXHIBIT 1

Copy of check

EXHIBIT 2

Letter of Intent

December 29, 2021

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

RE: **Notice of Intent to Allow Shared Use of the Existing SBA Telecommunications Site**
Location: 160 West St., Cromwell, CT
Dish Wireless Site No: BOBDL00133A
SBA Site No: CT46122-A

Dear Ms. Bachman:

Please let the following serve as Evidence of Intent to allow Dish Wireless' shared use of the existing SBA telecommunications site at **160 West St., Cromwell, CT.**

SBA Towers IV, LLC ("Owner") and Dish Wireless ("Tenant") are entering into a Site Lease Agreement. Tenant will be provided ground space within the existing site compound for its base station equipment and space at the height of 51' for antennas and associated equipment.

Thank you,

Rick Woods

Site Development Manager
SBA COMMUNICATIONS CORPORATION
134 Flanders Road, Suite 125
Westboro, MA 01581

508.251.0720 x3800 + T
508.366.2610 + F
508.614.0389 + C
rwoods@sbsite.com

EXHIBIT 3

Fedex Labels

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RICK WOODS
SBA COMMUNICATIONS CORPORATION
134 FLANDERS RD
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

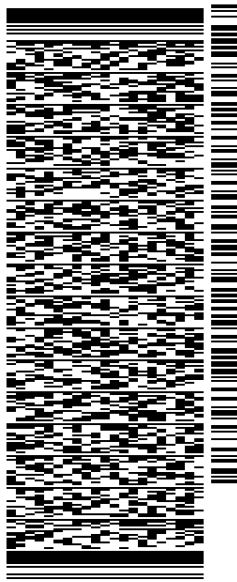
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CONNECTICUT SITING COUNCIL
TEN FRANKLIN SQUARE

NEW BRITAIN CT 06051

(508) 251-0720 X.3807 REF: 105692009-6089
INV# PO: DEPT:



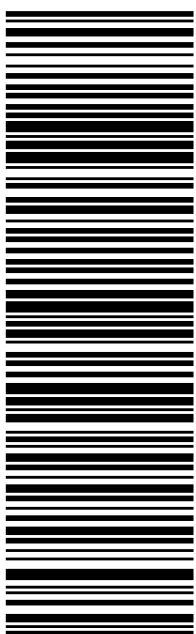
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TO

Melanie A. Bachman Exec. Dir

Connecticut Siting Council

Ten Franklin Square

NEW BRITAIN, CT US 06051

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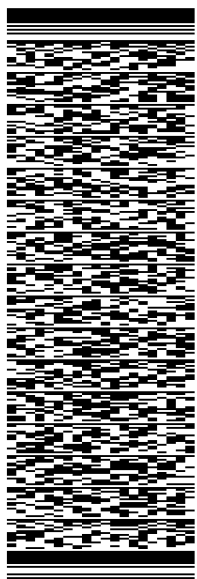
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(508) 251-0720 X 3807
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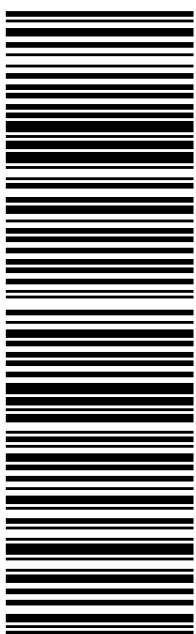
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TO

Enzo Faienza

Cromwell Town Hall

Mayor

41 West St

CROMWELL, CT US 06416

508-251-0720

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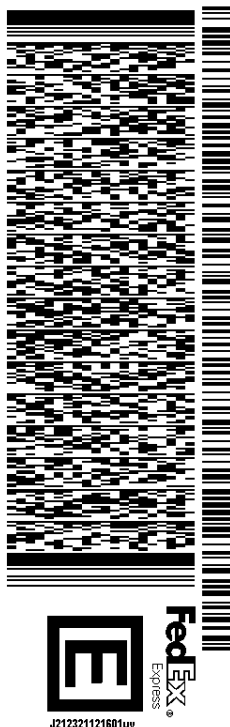
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SBA COMMUNICATIONS CORPORATION
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DIR. PLANNING & DEVELOPMENT

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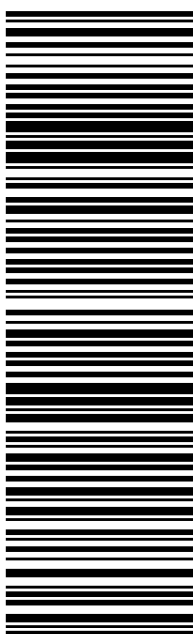
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TO

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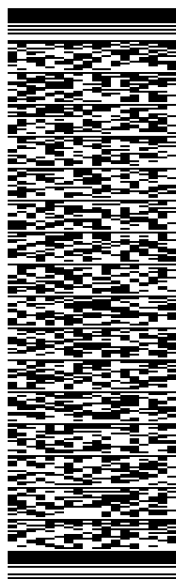
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160 WEST STREET, LLC
160 WEST ST

CROMWELL CT 06416

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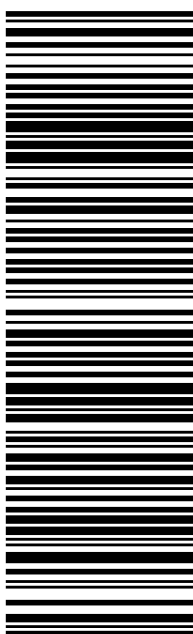
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After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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TRACK ANOTHER SHIPMENT

775616245380



[ADD NICKNAME](#)

ON TIME

Scheduled delivery:
Thursday, 12/30/2021 before 11:30 am



PICKED UP

FRAMINGHAM, MA

[GET STATUS UPDATES](#)

FROM

SBA COMMUNICATIONS CORPORATION
Rick Woods
134 Flanders Rd
Suite 125
WESTBOROUGH, MA US 01581
508-614-0389

TO

160 West Street, LLC
160 West St
CROMWELL, CT US 06416
508-251-0720

[MANAGE DELIVERY](#)

Travel History

Shipment Facts

Travel History

TIME ZONE

Local Scan Time

Wednesday, December 29, 2021

3:26 PM

FRAMINGHAM, MA

Picked up

3:24 PM

WESTBOROUGH, MA

Picked up
Tendered at FedEx Office

Tuesday, December 28, 2021

1:38 PM

Shipment information sent to FedEx

[Expand History](#)

Shipment Facts

TRACKING NUMBER 775616245380	SERVICE FedEx Priority Overnight	WEIGHT 0.5 lbs / 0.23 kgs
TOTAL PIECES 1	TOTAL SHIPMENT WEIGHT 0.5 lbs / 0.23 kgs	TERMS Shipper
SHIPPER REFERENCE 10-56-92009-6089	PACKAGING FedEx Envelope	SPECIAL HANDLING SECTION Deliver Weekday
ACTUAL PICK UP 12/29/21 ?	STANDARD TRANSIT 12/30/21 before 11:30 am ?	SCHEDULED DELIVERY 12/30/21 before 11:30 am

All (30)

Inbound (17)

Outbound (13)

Watch list (0)

EXHIBIT 4

Property Card



Patriot Properties Inc.

Parcel ID: 00033900 Location: 160 WEST STREET

Map-Lot 31-14A

Last Revaluation - October 1, 2017

Current Owner **Percent**
 160 WEST STREET LLC 100
 C/O ANDREW E BECKER
 162 WEST STREET
 CROMWELL CT 06416

Current Value Information

Use Code	Land Value	PA 490 Value	Override	Building Value	Outbuildings	Total Value	Total Assessed
201	356,300	0		1,850,400	43,300	2,250,000	1,575,000
TOTAL	356,300	0		1,850,400	43,300	2,250,000	1,575,000

Previous Owner(s)
 160 WEST STREET LIMITED PARTNE
 RSHIP

Previous Value Information

Tax Yr	Land Value	Bldg Value	Outbuildings	Total Value	Total Assessment
2020	356,300	1,850,400	43,300	2,250,000	1,575,000
2019	356,300	1,850,400	43,300	2,250,000	1,575,000
2018	356,300	1,850,400	43,300	2,250,000	1,575,000
2017	241,800	2,122,400	110,000	2,474,200	1,731,940
2016	356,290	1,635,220	43,320	2,034,830	1,424,390
2015	356,290	1,635,220	43,320	2,034,830	1,424,390

General Notes

MEDICAL OFFICE;

 Bldg #1 Middlesex Home Care + Supplies INC, Family Eye Care, Feet First

 Bldg # 2 Wildwood Property management, Great Blue Research, Beacon Services of CT

Sales Information

Grantee	Vol-Page	Type	SaleDate	SalePrice	Sale Verif	GeneralNotes
160 WEST STREET LLC	896-268		01/27/2003	0	Other	
160 WEST STREET LIMITE	546-322		12/29/1993	0	Other	

Property Factors

Census 5702
 Flood:
 Topo:
 Street: Paved
 Dev. Map
 Dev. Map

Zoning Data

Desc. %
 LB 100.00

Utilities

2 Public Water

BAA

17CS,17K

Activity Information

Date	Results	Visited By
10/13/2020	Mailing Address Change	Karen Vaiciulis
03/10/2020	Mailing Address Change	Lisa Ruggiero
12/27/2017	Informal Review No Change	John Valente
09/11/2017	Change - Value Change Company	John Valente
05/18/2017	No Change - Field Review	Dave Stannard
09/11/2014	Permit- Miscellaneous	Assessor Office
09/11/2014	Permit- Drive By	Mike Mordarski
09/09/2014	Permit- Miscellaneous	Assessor Office
09/11/2012	Permit - Int & Ext Inspect	
09/11/2012	Permit- Miscellaneous	Assessor Office

Building Permit Information

Date	Permit #	Description	Amount	% Comp	Visit Date	CO Date	GeneralNotes
04/22/2019	25994	Air Condition	3,000	100		29-Apr-2019	a/c
08/15/2014	22787	Electric	900	100	11-Sep-2014		Reception area
08/13/2014	22776	Other	4,800	100	09-Sep-2014	09-Sep-2014	Emrgncy repair to drywall
12/12/2011	20377	Other	3,000	100	11-Sep-2012	11-Sep-2012	Run gas line to new gener
11/16/2011	20315	Other	10,000	100	11-Sep-2012	11-Sep-2012	New cell site for Metro P
09/28/2011	20183	Propane Tank	2,850	100	11-Sep-2012	11-Sep-2012	Undergroundf gas line
09/19/2011	20156		35,000	100	11-Sep-2012	12-Jan-2012	Inst of cell site antenna
03/21/2006	15920	Remodel	33,000	100	28-Mar-2006		off & bth reno

Land Data

Use	Description	Units	Unit Type	Neigh	Land Adjustments	Special Land Calc	Appraised Value	PA 490 Asmt	Neigh Order	Notes
201	Commercial	43,560	SF	CJ			178,500	0	1200	
201	Commercial	2,530	AC	CJ			63,300	0	1200	

Total Area: 3.53 PA 490 Use Asmt: 0 Total Appraised: 241,800 Assessed Value: 169,260

ParcelID: 00033900

Location: 160 WEST STREET

Printed By: Tami

07/01/2021 8:48:06AM

Bldg Seq 1 Of 2

Exterior Information

Building Type: Office Bldg
Story Ht: 1 Story
Living Units: 0
Foundation:
Prim. Ext. Wall: Brick/Masonr
Sec. Ext. Wall:
Roof Type: Flat
Roof Cover: Asphalt Shin
Avg. Wall Ht: 18.00
Color:

Interior Information

Prime Wall: Drywall
Sec. Wall:
Floor Type: Carpet 50%
Sec. Floor: Vinyl 50%
Heat Fuel: Gas
Heat Type: Forced Air
Sec. Ht Type:
% A/C: 100
% Sprinkled: 0
Bsmt. Gar: 0
Kitchens: 0 Add. Kit: 0
Fireplaces: 0 Gas: 0
Int. Condition: Typical

Room Count

Total Rooms:
Bedrooms:

Bath Features

Full Baths: 0
Addl. Full Baths: 0
Half Baths: 0
Addl. Half Baths: 0
Full Bths Below: 0
Half Bths Below: 0
Other Fixtures: 0
Total Baths: 0,0



Condo Information

Name:
Style:
Location:
Tot Units:

General Information

Year Blt: 1985
Grade: C
Remodeled Yr:
Rem. Kitchen Yr:
Rem. Bath Yr:

Depreciation %

Phys Cond Average 24.00
Func 0.00
Econ 5.00
Spec 0.00
OV

Total %Dep: 27.80

Calculation

Basic \$/SQ 120.00
Replacement Cost 1,342,305
Depreciation 373,161
Depreciated Value 969,144
Final Total (Rounded) 969,100



Extra Features / Yard Items (1st 10 Lines Displayed)

Code	Description	Qty	Size	Cond.	Year	Unit Price	Dep%	UndepValue	Appraised Value	Assessment
LT1	Light 1	1	6	AV	2002	1,200.00	13	7,200	6,300	4,410
PAV1	Paving Asph.	1	38,400	AV	1985	3.60	25	138,240	103,700	72,590

Total Sp. Features: Total Yard Items: 110,000 Total Appraised: 110,000 Total Assessed Value: 77,000

Sub Area Detail

Code	Desc.	Living	Gross Area
FFL	First Floor	13,500	13,500
Total		13,500	13,500

ParcelID: 00033900

Location: 160 WEST STREET

Printed By: Tami

07/01/2021 8:48:06AM

Bldg Seq 2 Of 2

Exterior Information

Building Type: Office Bldg
Story Ht: 1 Story
Living Units: 0
Foundation:
Prim. Ext. Wall: Brick/Masonr
Sec. Ext. Wall:
Roof Type: Flat
Roof Cover: Asphalt Shin
Avg. Wall Ht: 18.00
Color:

Interior Information

Prime Wall: Drywall
Sec. Wall:
Floor Type: Carpet 50%
Sec. Floor: Vinyl 50%
Heat Fuel: Gas
Heat Type: Forced Air
Sec. Ht Type:
% A/C: 100
% Sprinkled: 0
Bsmt. Gar: 0
Kitchens: 0 Add. Kit: 0
Fireplaces: 0 Gas: 0
Int. Condition: Typical

Room Count

Total Rooms:
Bedrooms:

Bath Features

Full Baths: 0
Addl. Full Baths: 0
Half Baths: 0
Addl. Half Baths: 0
Full Bths Below: 0
Half Bths Below: 0
Other Fixtures: 0
Total Baths: 0,0



Condo Information

Name:
Style:
Location:
Tot Units:

General Information

Year Blt: 1985
Grade: C
Remodeled Yr:
Rem. Kitchen Yr:
Rem. Bath Yr:

Depreciation %

Phys Cond Average 24.00
Func 0.00
Econ 5.00
Spec 0.00
OV

Total %Dep: 27.80

Calculation

Basic \$/SQ 120.00
Replacement Cost 1,342,305
Depreciation 373,161
Depreciated Value 969,144
Final Total (Rounded) 969,100



Extra Features / Yard Items (1st 10 Lines Displayed)

Code	Description	Qty	Size	Cond.	Year	Unit Price	Dep%	UndepValue	Appraised Value	Assessment
------	-------------	-----	------	-------	------	------------	------	------------	-----------------	------------

Total Sp. Features:

Total Yard Items:

Total Appraised:

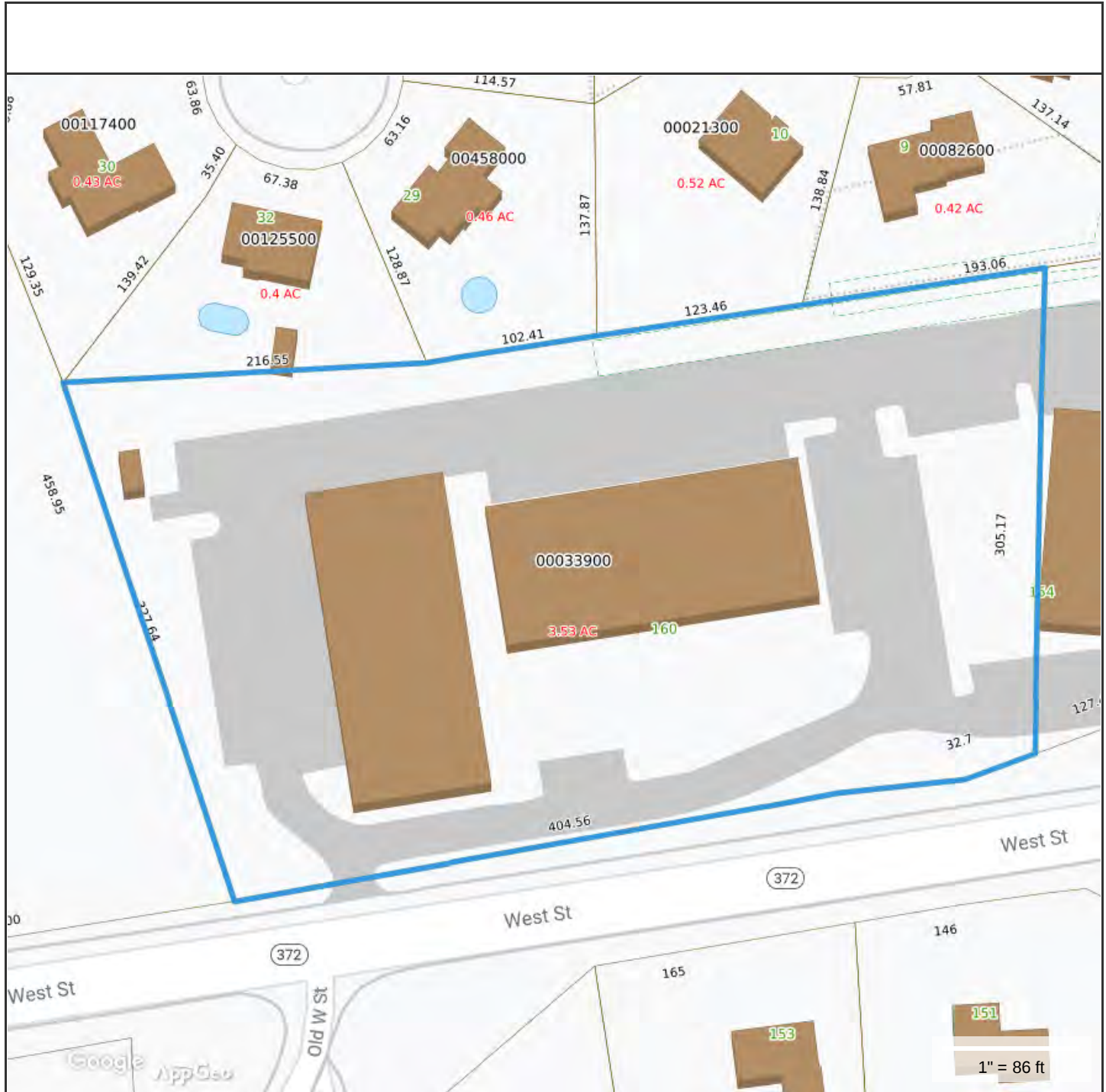
Total Assessed Value:

Sub Area Detail

Code	Desc.	Living	Gross Area
FFL	First Floor	13,500	13,500
Total		13,500	13,500

EXHIBIT 5

Property Map



Property Information

Property ID 00033900
Location 160 WEST STREE
Owner
Owner Address
Map Block Lot



**MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT**

Town of Cromwell, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 6/25/2021
Data updated on a daily basis

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.



Imagery ©2021 Maxar Technologies, U.S. Geological Survey, Map data ©2021 50 ft



160 West St

Cromwell, CT 06416



Directions



Save



Nearby



Send to your phone



Share

Directory

Shopping 3

Services 5

Health & Beauty 11

Other 2

Family Eyecare & Contact Lens Center

4.7 ★★★★★ (23)

Optometrist

Open until 5:30 PM



Feet First Foot Care Specialists, LLC

4.3 ★★★★★ (18)

Podiatrist

Open until 4:30 PM



A & M Chiropractic

5.0 ★★★★★ (14)

Chiropractor

Closed · Reopens at 3:00 PM



Directions

Center For Better Hearing, LLC

4.2 ★★★★★ (10)

Audiologist

Open until 4:00 PM



Directions

EXHIBIT 6

Zoning Approval

8/09/07
11/9/07 *
08/1/09 *



Town of Cromwell Building Permit

Permit No. 19262 Date 8/12 20 10

Estimated Cost of Construction: \$ 100,000.00 Unique I.D. # 00033900
(INCLUDING Value of Labor & Materials)

Building Fee: \$ 1,005.00 *December 31, 2005 State Building Code

Certificate Of Occupancy Fee: \$ _____ * State Building Code, Amended August 1, 2009

Plan Review Fee: \$ _____

State Education Fund Fee: \$ 26.00
(.22 x Total - 1,000)

Total Permit Fee: \$ 1,031.00

Address 160 West Street Lot No. _____ Zone _____

Owner of Building One Sixty-West Street LLC

Address 162 West Street, Cromwell, CT 06416

CT State Building Code _____ CT State Supplement _____

Use Classification _____ Construction Classification _____

Contractor White Mountain Communications Corp / Douglas Talmadge

Address 18 Glen Road, Gorham, N H. 03581

Purpose of this Permit: To build a new 80' Monopine tower in 32' x 62' compound for wireless communications
use.

Contractors	License Number
Plumbing _____	_____
HVAC _____	_____
Electrical _____	_____
Home Improvement _____	_____
Home Builder _____	_____

All work performed under this Permit shall conform to all the requirements of the Laws of the State of Connecticut, the Ordinances of the Town of Cromwell and any other applicable Laws or Regulations. The Building Official shall be notified for his approval of any alterations in the Plans and Specifications of the building for which this permit is issued. The Building Official is authorized to suspend or revoke this Permit issued under the provisions of the current State Building Code and its Supplement whenever the Permit is issued in error or on the basis of incorrect, inaccurate or incomplete information; or in violation of any ordinance or Regulation; or any provision of the current State Building Code and its Supplement.

Permit Approved 8/12 /2010
David J. Kelly
BUILDING OFFICIAL

Permit Revoked _____ 20 _____
BUILDING OFFICIAL

PLEASE NOTE!!!!

The owner, builder or acting agent shall be responsible for requesting all applicable inspections for your permitted project. A minimum twenty-four (24) hour advanced notice is needed when requesting an inspection.

It is also your responsibility to call for a final inspection upon completion (and prior to use) of your permitted project. If you are not sure about your required inspections, please call us. The building Department's telephone number is (860) 632-3428, 8:30 A.M. to 4:00 P.M., Monday through Friday or leave a message.

Please review the following code language **R105.5 – Expiration of Permit. (2003 I.R.C.)** and **105.5 Expiration of Permit (2003 I.B.C.)**.

R105.5-Expiration of Permit. Every permit issued shall become invalid unless the work authorized by such permits is commenced within 180 days after its issuance, or if the work authorized by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. The building official is authorized to grant, in writing, one or more extensions of time, for periods of not more than 180 days each. The extensions shall be requested in writing and justifiable cause shall be demonstrated.

Exception: The building official shall be permitted to specify an expiration date of not less than 30 days, nor more than 180 days, for commencement of work under permits issued to abate unsafe conditions pursuant to Section R115 of this code. Work performed under such permits shall be completed as expeditiously as possible.



Daniel F. Caruso
Chairman

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Internet: ct.gov/esc

May 28, 2010

Thomas M. Regan, Esq.
Brown Rudnick LLP
CityPlace I, 185 Asylum Street
Hartford, CT 06103

RE: **DOCKET NO. 338** – TowerCo, LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 160 West Street, Cromwell, Connecticut.

Dear Attorney Regan:


At a public meeting of the Connecticut Siting Council held on May 27, 2010, the Connecticut Siting Council (Council) considered and approved the Development and Management (D&M) Plan submitted for this project on March 31, 2010 and revisions submitted on May 14, 2010 with the condition that TowerCo install landscaping on the west side of the compound and submit a revised power density analysis to account for all three carriers. The Council also approved your request for extension until December 29, 2010 with the understanding that the Council will be notified should the Certificate Holder decide not to proceed with construction.

This approval applies only to the D&M Plan submitted on March 31, 2010 and revisions submitted on May 14, 2010. Any changes to the D&M Plan require advance Council notification and approval.

Please be advised that deviations from this plan are enforceable under the provisions of the Connecticut General Statutes § 16-50u. Enclosed is a copy of the staff report on this D&M Plan, dated May 27, 2010.

Thank you for your attention and cooperation.

Very truly yours,


Daniel F. Caruso
Chairman

DFC/RDM/laf

Enclosure: Staff Report, dated May 27, 2010

c: Parties and Intervenors

The Honorable John M. Flanders, First Selectman, Town of Cromwell
Frederic Curtin, Zoning Enforcement Officer, Town of Cromwell

DOCKET NO. 338 – TowerCo, LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 160 West Street, Cromwell, Connecticut.	} } }	Connecticut Siting Council May 27, 2010
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**Development and Management Plan
Staff Report**

On November 29, 2007, the Connecticut Siting Council (Council) issued a Certificate of Environmental Compatibility and Public Need (Certificate) to Sprint Nextel Corporation (Sprint) for the construction, maintenance, and operation of a wireless telecommunications facility located at 160 West Street in Cromwell, Connecticut. On March 13, 2009, the Council approved a transfer of the Certificate from Sprint to TowerCo, LLC (TowerCo) and granted an extension of time until June 4, 2010 to allow for the facility to be fully constructed. On March 31, 2010, TowerCo submitted a request for an extension of time to build the facility and a Development and Management (D&M) Plan. A revised D&M Plan was submitted on May 14, 2010. Copies of both submissions were mailed to the Town of Cromwell. No comment from the Town was received.

The approved facility is located in an office park consisting of two, single-story brick office buildings and associated parking areas. The site is located in the northwest corner of the property, approximately 38 feet from the north property line and immediately adjacent to the west property line. Consistent with the Council's Decision and Order, TowerCo shifted the compound area approximately 20 feet to the south to increase the buffer to the northerly property line. The site is in an open lawn area adjacent to a parking lot. Sprint, Verizon and Pocket Wireless (Pocket) will locate at the facility.

Consistent with the Council's Decision and Order, Verizon would construct a 77-foot telecommunications facility designed as a pine tree. As specified in the D&O, the height of the monopole and antennas would not exceed 80 feet above ground level (agl); however, the installation of simulated pine branches would bring the overall height to approximately 84 feet agl. Simulated pine branches would be installed from the top to the 42-foot level of the tower. The tower will be designed in accordance with the specifications of the Electronic Industries Association Standard ANSI/TIA-222-G "Structural Standards for Steel Antenna Towers and Antenna Support Structures" and can support four levels of antennas.

Sprint will install 12 panel antennas for their iDEN network (Nextel) on t-arms at a centerline height of 74 feet agl. Verizon will install 12 panel antennas on t-arm mounts at the 64-foot level and Pocket will install 12 panel antennas on t-arms at the 54-foot level. The 44-foot level of the tower is available for another carrier.

TowerCo will construct a 30-foot by 58-foot equipment compound enclosed by an eight-foot high chain link fence with privacy slats. Within in the compound, Verizon will install a 12-foot by 30-foot equipment shelter, Nextel will install a 12-foot by 20-foot equipment shelter, and Pocket will install an equipment cabinet on a concrete pad. Verizon will have a natural gas generator within its shelter whereas Nextel will install a natural gas generator on a concrete pad within the compound. Underground utilities will serve the compound. Access to the compound will be from the existing parking lot on the property.

Consistent with the Council's Decision and Order, the cumulative worst-case radio frequency power density level from the operation of Sprint's and Verizon's antennas at the base of the tower would be 30.7% of the applicable ANSI standard. Power density calculations for Pocket's equipment are pending.

The original application stated an eight-foot stockade fence would be used to enclose the compound and that the Nextel equipment shelter would feature a brick façade to match the existing on-site office buildings. It does not appear that the use of the now proposed chain link fence with privacy slats or the lack of the brick façade on the shelter would be a detriment to area visibility since the residential area to the north will be screened from existing pine trees along the north property line and from a row of Arborvitae that will be installed along the north and east sides of the compound. Views of the compound from West Street, located south of the site, are limited because the compound location is set back from the road, beyond an embankment. A row of Arborvitae will also be installed along the south side of the compound. Although the property to the west is wooded and currently undeveloped, staff recommends the installation of a row of Arborvitae along the west side of the compound.

LIST OF PARTIES AND INTERVENORS
SERVICE LIST

Status Granted	Status Holder (name, address & phone number)	Representative (name, address & phone number)
Certificate Holder as of 3/12/09	TowerCo, LLC (TowerCo)	Thomas J. Regan, Esq. Brown Rudnick Berlack Israels LLP CityPlace I, 185 Asylum Street Hartford, CT 06103 (860) 509-6522 (860) 509-6501 fax tregan@brownrudnick.com
Applicant	Sprint Nextel Corporation	Thomas J. Regan, Esq. Brown Rudnick Berlack Israels LLP CityPlace I, 185 Asylum Street Hartford, CT 06103 (860) 509-6522 (860) 509-6501 fax tregan@brownrudnick.com
Intervenor	Cellco Partnership d/b/a Verizon Wireless	Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103-3597 (860) 275-8200 (860) 275-8299 fax kbaldwin@rc.com
<i>Interested party (D&M Plan only)</i>	Jim Hite 30 High Ridge Road Cromwell, CT 06416	



TOWN OF CROMWELL

41 West Street,
Cromwell, CT 06416

- | | | |
|---|--|---|
| <input type="checkbox"/> Final Inspection-conditions | <input type="checkbox"/> Final Inspection | <input type="checkbox"/> Certificate of Occupancy |
| <input checked="" type="checkbox"/> Certificate of Approval | <input type="checkbox"/> Temporary Occupancy | <input type="checkbox"/> Partial Occupancy |
| <input type="checkbox"/> Demolition/Removal of Structure CGS-Sec 12-64A | | CO# _____ |

DATE: July 24, 2012

Building Permit No: 19252

Address of Structure: 160 West Street Unique ID# 00033900

Name and Address of Owner: 160 West Street LLC, 162 West Street, Cromwell, CT 06416

Building Permit Permittee: _____

Description: 80' Monopine Tower, 32'x62', compound

Name of Building Official: David Jolley *D.J.*

State Building Code Dated: 12-31-2005, amended 8-1-2009

Use and Occupancy: N/A

Type of Construction: N/A

Design Occupant Load: N/A

Is an Automatic Sprinkler Provided: Yes ___ No

Is Automatic Sprinkler Required: Yes ___ No

This is to certify that the above structure / mechanical appliance has been inspected for substantial compliance with the requirements of this code.

Special conditions and stipulations of the building permit _____

Modifications to the Permit by the State: Yes ___ No

Conditions: _____

EXHIBIT 7

EME Report

**RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS
(Revision #1)**

Dish Wireless Existing Facility

Site ID: BOBDL00133A

**160 West Street
Cromwell, Connecticut 06416**

December 16, 2021

EBI Project Number: 6221003253

Site Compliance Summary		
	PREDICTED ONLY	EXISTING + PREDICTED DISH CONTRIBUTION
Compliance Status	NONCOMPLIANT	COMPLIANT
Site total MPE% of FCC general population allowable limit:	108.60%	19.445%

December 16, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00133A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **160 West Street** in **Cromwell, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

This report includes two (2) separate evaluations of site compliance. The first analysis includes theoretical, worst-case calculations based upon information supplied by Dish and predicted emissions levels from other carriers collocated on the site, as reported to the Connecticut Siting Council (CSC). The second analysis includes the results of onsite RF emissions measurements collected at the site (to assess existing carrier contributions), plus the predicted worst-case emissions levels for the proposed Dish Wireless facility.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency

bands are approximately 400 $\mu\text{W}/\text{cm}^2$ and 467 $\mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless antenna facility located at 160 West Street in Cromwell, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 4 n71 channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 4 n66 channels (AWS Band - 2190 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated

- value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 5) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
 - 6) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
 - 7) The antenna mounting height centerline of the proposed antennas is 51 feet above ground level (AGL).
 - 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
 - 9) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz
Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd
Height (AGL):	51 feet	Height (AGL):	51 feet	Height (AGL):	51 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna AI MPE %:	11.68%	Antenna BI MPE %:	11.68%	Antenna CI MPE %:	11.68%

Site Composite MPE % (PREDICTIVE MODELING ONLY)	
Carrier	MPE %
Dish Wireless (Max at Sector A):	11.68%
Verizon	54.95%
T-Mobile	41.97%
Site Total MPE % :	108.6%

Site Composite MPE % (PREDICTIVE MODELING AND ONSITE RF MONITORING RESULTS)	
Carrier	MPE %
Dish Wireless (Max at Sector A):	11.68%
Verizon/T-Mobile	7.765%
Site Total MPE % :	19.445%

Dish Wireless MPE % Per Sector (PREDICTIVE MODELING ONLY)	
Dish Wireless Sector A Total:	11.68%
Dish Wireless Sector B Total:	11.68%
Dish Wireless Sector C Total:	11.68%
Site Total MPE % :	108.6%

Dish Wireless MPE % Per Sector (PREDICTIVE MODELING AND ONSITE MONITORING)	
Dish Wireless Sector A Total:	11.68%
Dish Wireless Sector B Total:	11.68%
Dish Wireless Sector C Total:	11.68%
Site Total MPE % :	19.445%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	51.0	15.88	600 MHz n71	400	3.97%
Dish Wireless 1900 MHz n70	4	542.70	51.0	38.54	1900 MHz n70	1000	3.85%
Dish Wireless 2190 MHz n66	4	542.70	51.0	38.54	2190 MHz n66	1000	3.85%
						Total:	11.68%

* NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

On-Site Measurements

EBI Consulting performed an RF emission survey on December 15, 2021 of the RF environment surrounding the existing facilities installed at this location. The facility consists of a monotree “stealth” telecommunications tower. Access to the facility compound is restricted to authorized personnel and facility management.

To measure the RF emissions within the vicinity, EBI Consulting utilized a NARDA E Field Probe Model NARD-EA5091 Standard Shaped probe S/N 1069, Frequency Range 300 KHz-50 GHz with NARDA Electromagnetic Survey Meter Model NARD-NMB-550 S/N E-0737. Probe calibration was performed on April 6, 2020 with meter calibration performed on April 6, 2020.

An RF emissions survey was performed at the wireless telecommunications facility. This survey included walking around the structure and noting the maximum average spatial readings encountered. The maximum value of the average spatial readings of RF emissions encountered on the was 1.5530% of the Occupational standard (7.765% of the FCC's General Population exposure limit). The survey results are summarized within Appendix A (EBI RF EME Field Form).

See Appendix B for the layout depicting the actual readings (% of the FCC MPE General Population standard limits) at various locations at the site. Various measurements were taken to indicate the RF emissions levels that can be encountered by an individual who gains access to areas directly adjacent to the structure.

Summary

While the worst-case theoretical calculations performed for this analysis yielded results that exceeded the allowable limits for general population exposure to RF emissions, on site measurements of existing carrier contributions, when added to the predicted emissions levels for the proposed Dish facility yielded results that are within allowable limits for general population exposure to RF emissions.

In our experience, the theoretical predicted levels of onsite carriers significantly overstate actual emissions; onsite measurements confirm that these predicted levels are not representative of onsite conditions. It should be noted that for each of the existing carriers, the bulk of the predicted RF emissions levels result from recently proposed 5G antennas that are “beamforming” antennas whose emissions patterns are dynamic (based upon user demand) and not static, as with the earlier generation of antennas. This is shown in Appendix C, taken from the CSC 9/14/21 Power Density Table for the site provided to EBI. As a result, the reported Effective Isotropically Radiated Power (EiRP) for these newer technology antennas result in elevated predicted RF emissions contributions that do not accurately account for the dynamic nature of these antenna radiation patterns. Therefore, the alternative methodology utilized here, involving the predicted Dish emissions to the onsite measured emissions, provides a more accurate assessment of RF compliance for this site.

In summary, based upon our onsite measurements, the anticipated maximum composite contributions from the Dish Wireless facility as well as the site composite emissions value with regards to compliance with FCC’s allowable limits for general population exposure to RF Emissions are shown here:

Dish Wireless Sector	Power Density Value (%)
Sector A:	11.68%
Sector B:	11.68%
Sector C:	11.68%
Dish Wireless Maximum MPE % (Sector A):	11.68%
Site Total:	19.445%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **19.445%** of the allowable FCC established general population limit sampled at the ground level. This is based upon predicted Dish Wireless contributions, added to onsite RF measurements completed for existing carriers on site.

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

APPENDICES

Appendix A: EBI RF-EME Field Form

Appendix B: Monitoring Plan Layout with RF Measurement Results

Appendix C: CSC Power Density Table for the site (9.14.21 data version)

Appendix D: Site Photos

EBI RF EME FIELD FORM FOR TOWER

Surveyor Name	David Keirstead	EBI #	6221003253
Survey Date	December 15, 2021	Client Site #	BOBDL00133A
Client	Dish Wireless	Client Site Name	N/A
Other Carriers Onsite?	Yes	Is Site Controlled?	yes
Address	160 West Street	How Many Other Carriers?	2
City	Cromwell	Other Carrier	T-Mobile
State	Connecticut	Other Carrier	Verizon
Zip	06416		
Scope of Work			

Final Report Should Be Named As Follows:

Dish Wireless Antennas				
Antenna	Frequency (MHz)	Z (feet)	Make/Model	Azimuth (°)
A1				
A2				
A3				
A4	NONE INSTALLED; DISH ANTENNAS ARE PROPOSED			
B1				
B2				
B3				
B4				
C1				
C2				
C3				
C4				
D1				
D2				
D3				
D4				
Notes -				

T-Mobile Antennas				
Antenna	Frequency (MHz)	Z (feet)	Make/Model	Azimuth (°)
A1	SEE APENDIX C: CSC POWER DENSITY TABLE		N/A	0
A2	SEE APENDIX C: CSC POWER DENSITY TABLE		N/A	0
A3	SEE APENDIX C: CSC POWER DENSITY TABLE		N/A	0
A4	SEE APENDIX C: CSC POWER DENSITY TABLE		N/A	0
B1	N/A	72	N/A	120
B2	N/A	72	N/A	120
B3	N/A	72	N/A	120
B4				
C1	N/A	72	N/A	240
C2	N/A	72	N/A	240
C3	N/A	72	N/A	240
C4				
D1				

EBI RF EME FIELD FORM FOR TOWER

MONITOR INFORMATION

Monitor Model #	NARD-NMB-550	Probe Model #	NARD-EA5091
Monitor Serial #	E-0737	Probe Serial #	1069
Calibration Date	04/06/20	Calibration Date	04/06/20
Next Recommended Calibration Date	04/05/22	Next Recommended Calibration Date	04/05/22

PROBE INFORMATION

CLIMATE INFORMATION

Temperature (°F)	45
Sunny / Overcast / Cloudy	Mostly Sunny
No Wind / Mild Breeze / Windy	No Wind
Rainy / Drizzle / Foggy / Snowy	N/A
Other Weather Factors that May Influence Readings	N/A

ACCESS INFORMATION

Type of Facility	Monotree
Property Owner / Contact Information	N/A
Who Manages Access (e.g. security, landlord, no one)	N/A
How is Access Managed? (e.g. lock, sign-in)	Lock
Ease of Access, In General (e.g. ease of breaching any access physical controls)	No Access to Compound

SIGNAGE INFORMATION

Describe All Existing Signage	Yellow Caution and Guidelines on Access Gate, SBA Site ID Sign
--------------------------------------	--

NON-PANEL ANTENNA / BARRIER INVENTORY

Antenna Type (Microwave / Yagi / Patch / Omni / Other)	Carrier	Z (feet)	Azimuth (°)
Barrier Description and Location (if applicable)			

* mark locations of all antennas and barriers on site plan.

D2				
D3				
D4				
Notes -				

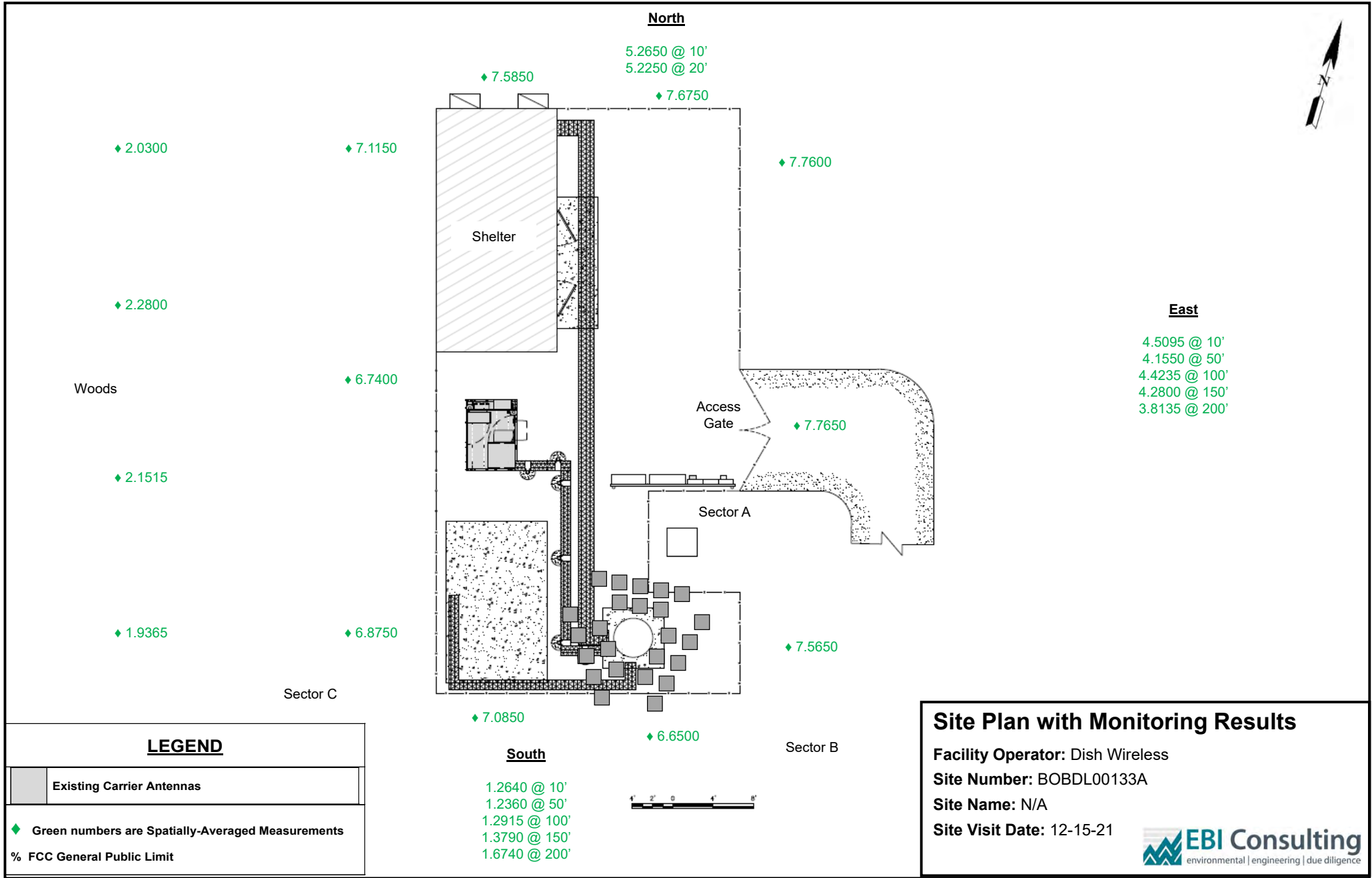
Verizon Wireless Antennas				
Antenna	Frequency (MHz)	Z (feet)	Make/Model	Azimuth (°)
A1	SEE APENDIX C: CSC POWER DENSITY TABLE	61	N/A	0
A2		61	N/A	0
A3		61	N/A	0
A4		61	N/A	0
A5		61	N/A	0
B1	N/A	61	N/A	120
B2	N/A	61	N/A	120
B3	N/A	61	N/A	120
B4	N/A	61	N/A	120
B5	N/A	61	N/A	120
C1	N/A	61	N/A	240
C2	N/A	61	N/A	240
C3	N/A	61	N/A	240
C4	N/A	61	N/A	240
C5	N/A	61	N/A	240
D1				
D2				
D3				
D4				
Notes -				

Inside Tower Compound / Perimeter			Spatial
% FCC MPE			
Averages			
Location Reference	% Occupational MPE	% General Population MPE	
SE of Compound (Outside)	1.5130	7.5650	
E of Compound (Outside)	1.5530	7.7650	
NE of Compound (Outside)	1.5520	7.7600	
N of Compound (Outside)	1.5350	7.6750	
N of Compound (Outside)	1.5170	7.5850	
NW of Compound (Outside)	1.4230	7.1150	
W of Compound (Outside)	1.3480	6.7400	
SW of Compound (Outside)	1.3750	6.8750	
S of Compound (Outside)	1.4170	7.0850	
S of Compound (Outside)	1.3300	6.6500	

Transmitting Direction of Antennas up to 200'			Spatial
% FCC MPE			
Averages			
Location Reference	% Occupational MPE	% General Population MPE	
10' North of Compound	1.0530	5.2650	
20' North of Compound	1.0450	5.2250	
10' East of Compound	0.9019	4.5095	
50' East of Compound	0.8310	4.1550	
100' East of Compound	0.8847	4.4235	
150' East of Compound	0.8560	4.2800	
200' East of Compound	0.7627	3.8135	
10' South of Compound	0.2528	1.2640	
50' South of Compound	0.2472	1.2360	
100' South of Compound	0.2583	1.2915	
150' South of Compound	0.2758	1.3790	
200' South of Compound	0.3348	1.6740	
Woods West of Compound	0.3873	1.9365	
Woods West of Compound	0.4303	2.1515	
Woods West of Compound	0.4560	2.2800	
Woods West of Compound	0.4060	2.0300	

Take a sufficient number of good photos of the following:

- Each sector or cluster of antennas
 - Access point(s)
 - Carrier equipment cabinets / shelters
 - All existing and installed signage
 - General overview photos showing monitoring locations
 - Elevation view / site overview (*think cover photo for report*)
- Directional photos in the transmitting directions of the antennas so that the areas impacted by the antennas are visible



LEGEND

Existing Carrier Antennas

◆ Green numbers are Spatially-Averaged Measurements
% FCC General Public Limit

Site Plan with Monitoring Results

Facility Operator: Dish Wireless
Site Number: BOBDL00133A
Site Name: N/A
Site Visit Date: 12-15-21



APPENDIX C (FROM CSC POWER DENSITY TABLE)

2.2222E+97	Cromwell - 160 West Street	DISH	4	224	51	600	0.1591	0.4000	3.98%	
TS-DISH-033-210805	Cromwell - 160 West Street	DISH	4	543	51	1900	0.3857	1.0000	3.86%	
TS-DISH-033-210805	Cromwell - 160 West Street	DISH	4	543	51	2190	0.3857	1.0000	3.86%	
EM-VER-033-210617	Cromwell - 160 West Street	Verizon	4	642	67	746	0.2482	0.4973	4.99%	
EM-VER-033-210617	Cromwell - 160 West Street	Verizon	2	369	67	869	0.0713	0.5793	1.02%	
EM-VER-033-210617	Cromwell - 160 West Street	Verizon	4	742	67	880	0.2868	0.5867	4.05%	
EM-VER-033-210617	Cromwell - 160 West Street	Verizon	4	1601	67	1970	0.6189	1.0000	5.13%	
EM-VER-033-210617	Cromwell - 160 West Street	Verizon	4	1618	67	2145	0.6255	1.0000	5.19%	
EM-VER-033-210617	Cromwell - 160 West Street	Verizon	1	43154	67	3700	4.1707	1.0000	34.57%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	2	2057	74	1900	0.3199	1.0000	2.70%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	2	2308	74	2100	0.3590	1.0000	3.03%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	2	592	74	600	0.0921	0.4000	1.94%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	1	1578	74	600	0.1227	0.4000	2.59%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	2	695	74	700	0.1081	0.4667	1.95%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	2	2105	74	1900	0.3274	1.0000	2.76%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	2	1325	74	2100	0.2061	1.0000	1.74%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	1	19239	74	2500	1.4963	1.0000	12.63%	
EM-T-MOBILE-033-210503	Cromwell - 160 West Street	T-Mobile	1	19239	74	2500	1.4963	1.0000	12.63%	108.61%



1. Site Overview



2. Locked Site Access Gate



3. Existing Signage on Access Gate



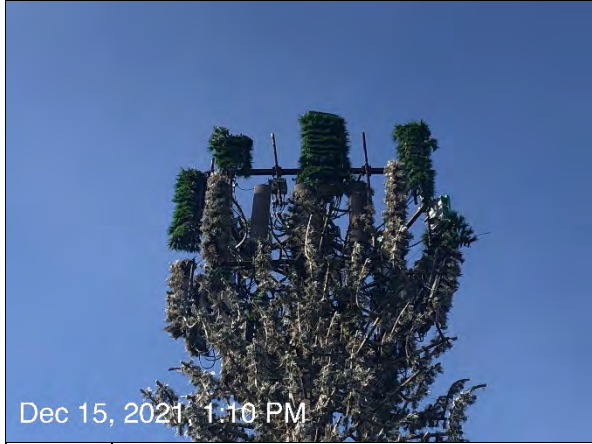
4. Existing T-Mobile and VZW Antennas – Sector A



5. Existing T-Mobile and VZW Antennas – Sector A



6. Existing T-Mobile and VZW Antennas – Sector B



Dec 15, 2021, 1:10 PM

7. Existing T-Mobile and VZW Antennas – Sector B



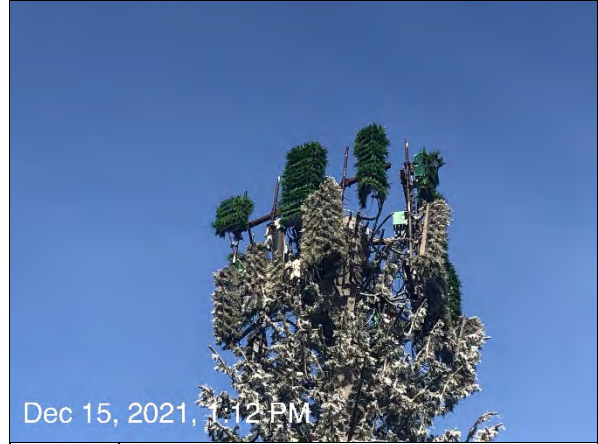
Dec 15, 2021, 1:12 PM

10. Existing T-Mobile and VZW Antennas – Sector C



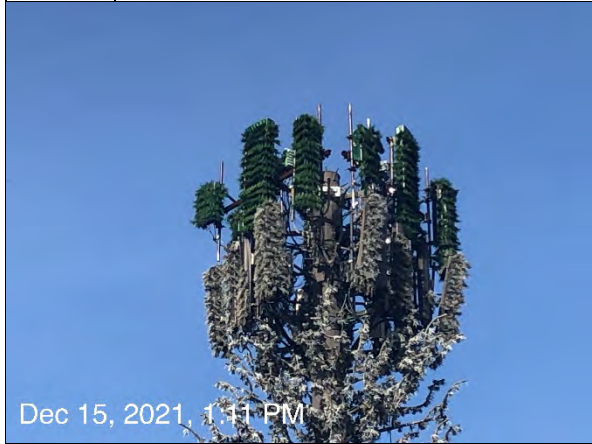
Dec 15, 2021, 1:11 PM

8. Existing T-Mobile and VZW Antennas – Sectors B and C



Dec 15, 2021, 1:12 PM

11. Existing T-Mobile and VZW Antennas – Sector C



Dec 15, 2021, 1:11 PM

9. Existing T-Mobile and VZW Antennas – Sectors B and C



Dec 15, 2021, 1:10 PM

12. Sector A Azimuth



Dec 15, 2021, 1:11 PM

13. Sector B Azimuth



Dec 15, 2021, 1:21 PM

16. Residential area North of Monotree



Dec 15, 2021, 1:12 PM

14. Sector C Azimuth



Dec 15, 2021, 1:11 PM

17. Existing Office Building East of Monotree



Dec 15, 2021, 1:21 PM

15. Monotree with area to the North



Dec 15, 2021, 1:19 PM

18. Existing Parking Lot East of Monotree



19. Existing Wooded area West of Monotree



22. Equipment Inside Monotree Compound



20. Other Carrier Equipment Shelter



21. Other Carrier Equipment Shelter

EXHIBIT 8

Structural Analysis



Tower Engineering Solutions

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

Structural Analysis Report

Existing 76 ft TransAmerican Monopole
Customer Name: SBA Communications Corp
Customer Site Number: CT46122-A
Customer Site Name: Middletown North
Carrier Name: Dish Wireless (App#: 153540, V2)
Carrier Site ID / Name: BOBDL00133A / 0
Site Location: 160 West Street
Cromwell, Connecticut
Middlesex County
Latitude: 41.606000
Longitude: -72.670388

Analysis Result:

Max Structural Usage: 69.9% [Pass]

Max Foundation Usage: 50.7% [Pass]

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



Report Prepared By : Delu Zhou

Introduction

The purpose of this report is to summarize the analysis results on the 76 ft TransAmerican 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	TransAmerican Power Products, Inc., Order #TP-8949 dated July 19, 2010
Foundation Drawing	Vertical Solutions, Project #100264.02 dated February 23, 2010
Geotechnical Report	Clarence Welti Association, Inc., Project Name: Transcend Wireless Tower dated February 1, 2010
Modification Drawings	N/A
Mount Analysis	N/A

Analysis Criteria

The feasibility analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2. 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 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	$S_5 = 0.181$, $S_1 = 0.063$

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
1	74.0	3	RFS APXVAALL24-43-U-NA20	(3) T-Arms w/ replaced new standoff, face horizontal and new support rail with end connection	(6) 7/8" (4) 1 5/8" Fiber (6) 3/8" RET	T-Mobile
2		3	Ericsson Air 32 KRD901146-1_B66A_B2A			
3		3	Ericsson AIR6449 B41			
4		3	Commscope SDX1926Q-43			
5		6	Andrew ATM200-A20			
6		3	Ericsson 4449 B71 + B85			
7		3	Ericsson 4415 B25			
8		3	Ericsson 4415 B66A			
9	64.0	6	Commscope JAHH-65B-R3B	(3) T-Arms (3) TBD VZWSMART-SFK4 (Mount Reinforcement) (3) Commscope BSAMNT-SBS-2-2 (side-by-side mounts)	(18) 1 5/8" Coax (2) 1 5/8" Hybrid	Verizon
10		3	Samsung Telecommunications VZS01			
11		4	Andrew DB846F65ZAXY			
12		2	Decibel DB846H80E-SX w/Mount Pipe			
13		3	Commscope CBC78T-DS-43-2X/E14F05P50			
14		3	Samsung B2/B66A RRH-BR049			
15		3	Samsung B5/B13 RRH-BR04C			
16		2	RFS DB-T1-6Z-8AB-OZ			

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
17	51.0	3	JMA Wireless MX08FRO665-21	Commscope MC-K6MHDX-9-96 T-Arms	(1) 1.6" Hybrid	Dish Wireless
18		3	Fujitsu TA08025-B605			
19		3	Fujitsu TA08025-B604			
20		1	Raycap RDIDC-9181-PF-48			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	69.5%	69.9%	41.8%
Pass/Fail	Pass	Pass	Pass

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	2800.0	52.0
Analysis Reactions	1916.5	32.7
Factored Reactions*	3780.0	70.2
% of Design Reactions	50.7%	46.6%

* 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.

No foundation drawing is available for the analysis of the existing foundation. Since the reactions calculated from the current analysis are less than those indicated on the original structural design drawing, the foundations are assumed to be adequate to resist the reactions from the current analysis.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.5372 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.
3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 69.49% at 28.3ft

Structure: CT46122-A-SBA
Site Name: Middletown North
Height: 76.00 (ft)
Base Elev: 0.000 (ft)

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

6/3/2021

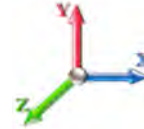


Page: 1

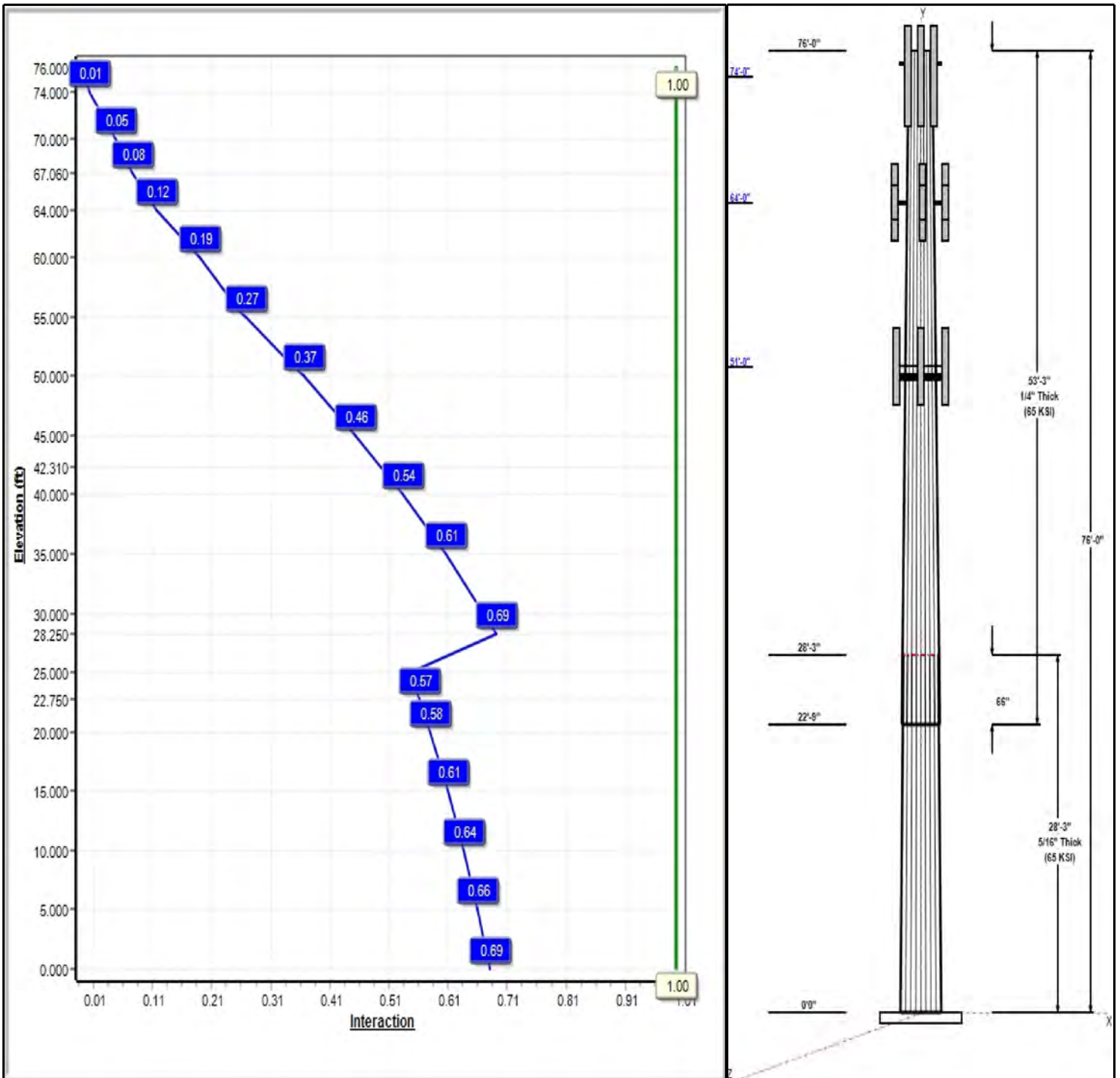
Dead Load Factor: 1.20
 Wind Load Factor: 1.60

Iterations: 17

Load Case : 1.2D + 1.6W 97 mph Wind



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Structure: CT46122-A-SBA

Type: Tapered
Site Name: Middletown North
Height: 76.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.32787

6/3/2021

Page: 2



Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	28.25	37.24	46.50	0.313		0.32787	65
2	53.25	22.08	39.54	0.250	Slip	0.32787	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
75.45	75.45	1	4' Branches	---
75.00	75.00	3	T-Arms	T-Mobile
74.00	74.00	1	Antenna Branches	---
74.00	74.00	3	RFS	T-Mobile
74.00	74.00	3	Air 32	T-Mobile
74.00	74.00	6	ATM200-A20	T-Mobile
74.00	74.00	3	Radio 4449 B71+B85	T-Mobile
74.00	74.00	3	Commscope	T-Mobile
74.00	74.00	3	AIR6449 B41	T-Mobile
74.00	74.00	3	RRUS 4415 B25	T-Mobile
74.00	74.00	3	Ericsson 4415 B66A	T-Mobile
74.00	74.00	1	(Handrail Kit w/end	T-Mobile
67.06	67.06	1	6' Branches	---
64.00	64.00	3	T-Arm	Verizon
64.00	64.00	4	DB846F65ZAXY	Verizon
64.00	64.00	2	DB846H80E-SX	Verizon
64.00	64.00	2	DB-T1-6Z-8AB-0Z	Verizon
64.00	64.00	6	JAHH-65B-R3B	Verizon
64.00	64.00	3	VZS01	Verizon
64.00	64.00	1	(3) VZWSMART-SFK4	Verizon
64.00	64.00	3	BSAMNT-SBS-1-2	Verizon
64.00	64.00	3	CBC78T-DS-43-2X/E14F0	Verizon
64.00	64.00	3	B2/B66A RRH-BR049	Verizon
64.00	64.00	3	B5/B13 RRH-BR04C	Verizon
55.44	55.44	1	8' Branches	---
51.00	51.00	1	MC-K6MHDX-9-96 (3	Dish Wireless
51.00	51.00	3	MX08FRO665-21	Dish Wireless
51.00	51.00	3	TA08025-B604	Dish Wireless
51.00	51.00	3	TA08025-B605	Dish Wireless
51.00	51.00	1	RDIDC-9181-OF-48	Dish Wireless
42.31	42.31	1	10' Branches	---

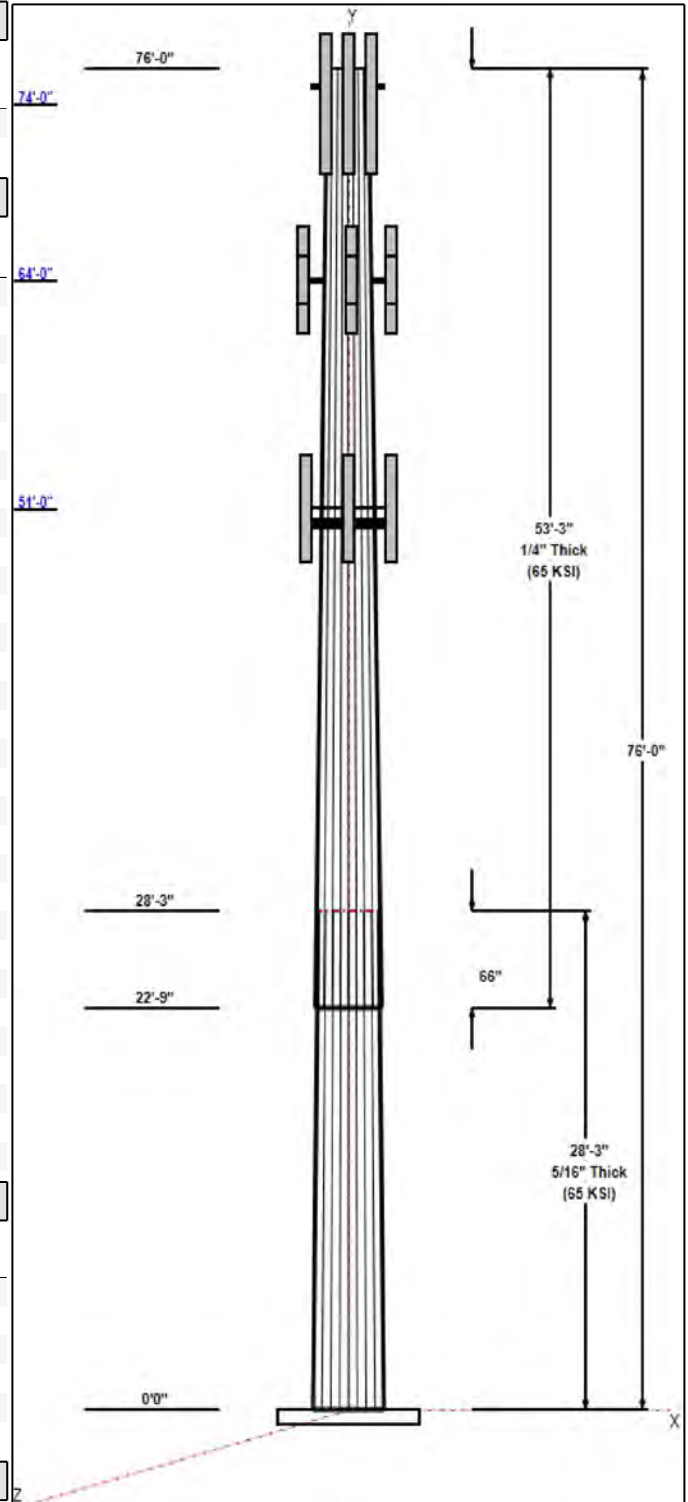
Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	75.00	Inside	1 5/8" Fiber	T-Mobile
0.00	75.00	Inside	3/8" RET	T-Mobile
0.00	75.00	Inside	7/8" Coax	T-Mobile
0.00	64.00	Inside	1 5/8" Coax	Verizon
0.00	64.00	Inside	1 5/8" Hybrid	Verizon
0.00	51.00	Inside	1.6" Hybrid	Dish Wireless

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
10	2.25" 18J	75.0	Radial

Base Plate



Structure: CT46122-A-SBA

Type: Tapered
Site Name: Middletown North
Height: 76.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.32787

6/3/2021

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Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.0000	60.0	60.0	Round

Reactions

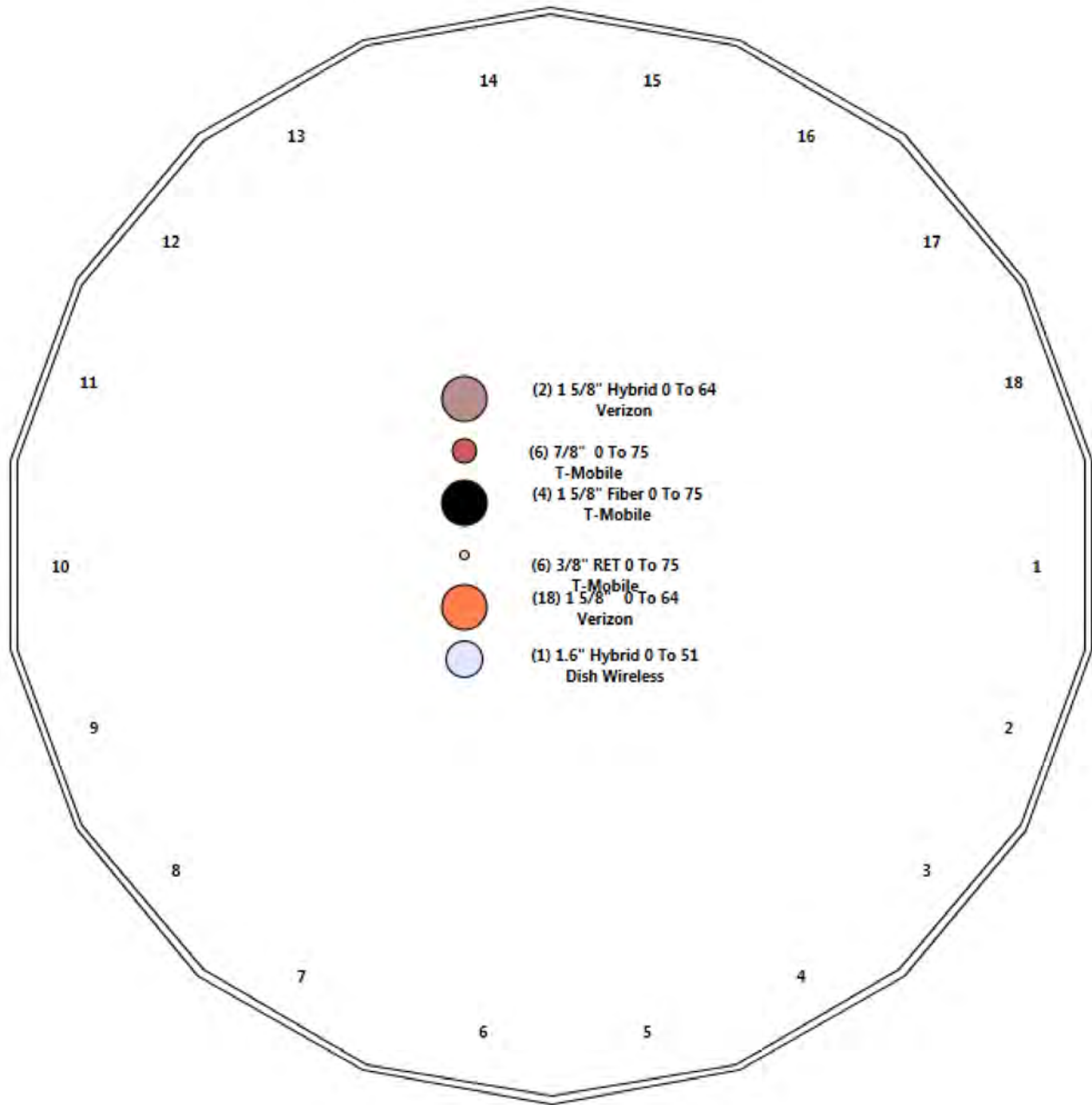
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	1916.5	32.7	24.2
0.9D + 1.6W 97 mph Wind	1910.2	32.7	18.1
1.2D + 1.0Di + 1.0Wi 50 mph Wind	562.0	9.6	48.0
1.2D + 1.0E	83.6	1.3	24.2
0.9D + 1.0E	83.3	1.3	18.2
1.0D + 1.0W 60 mph Wind	457.4	7.8	20.2

Structure: CT46122-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Middletown North
Height: 76.00 (ft)

6/3/2021

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Shaft Properties

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
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	28.250	0.3125	65		0.00	3,962
2	18	53.250	0.2500	65	Slip	66.00	4,394
Total Shaft Weight:							8,356

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	46.50	0.00	45.81	12347.18	24.83	148.80	37.24	28.25	36.62	6309.09	19.60	119.1	0.327865
2	39.54	22.75	31.18	6080.87	26.48	158.16	22.08	76.00	17.32	1043.23	14.16	88.33	0.327865

Load Summary

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
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	75.45	4' Branches	1	390.00	36.86	1.00	728.90	68.890	1.00	0.00	0.00
2	75.00	T-Arms	3	160.00	8.00	0.75	333.69	19.602	0.75	0.00	0.00
3	74.00	Antenna Branches	1	96.00	22.43	1.00	179.26	41.883	1.00	0.00	0.00
4	74.00	RFS APXVAALL24-43-U-NA20	3	128.00	20.24	0.70	663.34	22.622	0.70	0.00	0.00
5	74.00	Air 32 KRD901146-1_B66A_B2A	3	132.20	6.51	0.87	370.08	7.925	0.87	0.00	0.00
6	74.00	ATM200-A20	6	0.50	0.12	0.50	7.01	0.394	1.00	0.00	0.00
7	74.00	Radio 4449 B71+B85	3	71.00	1.97	0.67	137.32	2.650	0.67	0.00	0.00
8	74.00	Commscope SDX1926Q-43	3	7.00	0.72	0.67	24.82	1.505	0.67	0.00	0.00
9	74.00	AIR6449 B41	3	103.00	5.65	0.71	273.35	6.831	0.71	0.00	0.00
10	74.00	RRUS 4415 B25	3	46.00	1.64	0.67	97.07	2.280	0.67	0.00	0.00
11	74.00	Ericsson 4415 B66A	3	49.60	1.86	0.67	132.23	2.580	0.67	0.00	0.00
12	74.00	(Handrail Kit w/end connection)	1	261.72	6.75	1.00	647.60	14.946	1.00	0.00	0.00
13	67.06	6' Branches	1	400.00	83.63	1.00	743.51	55.450	1.00	0.00	0.00
14	64.00	T-Arm	3	320.00	8.00	0.75	593.53	16.548	0.75	0.00	0.00
15	64.00	DB846F65ZAXY	4	21.00	7.05	0.93	273.37	8.586	0.93	0.00	0.00
16	64.00	DB846H80E-SX	2	16.00	5.01	1.12	221.54	6.528	1.12	0.00	0.00
17	64.00	DB-T1-6Z-8AB-OZ	2	44.00	3.30	0.67	227.13	5.886	0.67	0.00	0.00
18	64.00	JAHH-65B-R3B	6	63.30	9.11	0.83	356.54	10.781	0.83	0.00	0.00
19	64.00	VZS01	3	87.10	4.30	0.69	229.72	5.397	0.69	0.00	0.00
20	64.00	(3) VZWSMART-SFK4	1	500.00	16.50	0.75	1226.57	36.245	0.75	0.00	0.00
21	64.00	BSAMNT-SBS-1-2	3	25.35	0.00	0.75	47.02	0.000	0.75	0.00	0.00
22	64.00	CBC78T-DS-43-2X/E14F05P50	3	21.80	0.37	0.67	50.00	0.733	0.67	0.00	0.00
23	64.00	B2/B66A RRH-BR049	3	84.40	1.64	0.67	152.29	2.272	0.67	0.00	0.00
24	64.00	B5/B13 RRH-BR04C	3	70.30	2.22	0.67	141.21	2.979	0.67	0.00	0.00
25	55.44	8' Branches	1	1638.00	150.70	1.00	3018.18	77.680	1.00	0.00	0.00
26	51.00	MC-K6MHDX-9-96 (3 Sectors)	1	899.00	20.95	0.75	1950.68	52.460	0.75	0.00	0.00
27	51.00	MX08FRO665-21	3	64.50	12.49	0.74	412.67	14.243	0.74	0.00	0.00
28	51.00	TA08025-B604	3	63.90	1.96	0.67	124.50	2.631	0.67	0.00	0.00
29	51.00	TA08025-B605	3	75.00	1.96	0.67	137.61	2.631	0.67	0.00	0.00
30	51.00	RDIDC-9181-OF-48	1	21.90	2.01	1.00	85.64	2.690	1.00	0.00	0.00
31	42.31	10' Branches	1	540.00	54.43	1.00	982.87	99.070	1.00	0.00	0.00
Totals:			80	9,860.87			25,496.65				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	75.00	(4) 1 5/8" Fiber	0.00	Inside
0.00	75.00	(6) 3/8" RET	0.00	Inside
0.00	75.00	(6) 7/8" Coax	0.00	Inside
0.00	64.00	(18) 1 5/8" Coax	0.00	Inside
0.00	64.00	(2) 1 5/8" Hybrid	0.00	Inside
0.00	51.00	(1) 1.6" Hybrid	0.00	Inside

Shaft Section Properties

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
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		0.3125	46.500	45.811	12347.2	24.83	148.80	72.2	523.0	0.0
5.00		0.3125	44.861	44.185	11078.6	23.90	143.55	73.3	486.4	765.6
10.00		0.3125	43.221	42.559	9900.0	22.98	138.31	74.4	451.1	737.9
15.00		0.3125	41.582	40.933	8808.1	22.05	133.06	75.5	417.2	710.3
20.00		0.3125	39.943	39.307	7799.6	21.13	127.82	76.6	384.6	682.6
22.75	Bot - Section 2	0.3125	39.041	38.413	7279.3	20.62	124.93	77.2	367.2	363.6
25.00		0.3125	38.303	37.681	6871.2	20.20	122.57	77.6	353.3	527.7
28.25	Top - Section 1	0.2500	37.738	29.746	5281.5	25.21	150.95	0.0	0.0	744.5
30.00		0.2500	37.164	29.290	5042.7	24.80	148.66	72.2	267.2	175.8
35.00		0.2500	35.525	27.989	4400.2	23.65	142.10	73.6	244.0	487.3
40.00		0.2500	33.885	26.689	3814.8	22.49	135.54	74.9	221.7	465.1
42.31		0.2500	33.128	26.088	3562.9	21.95	132.51	75.6	211.8	207.4
45.00		0.2500	32.246	25.388	3283.8	21.33	128.98	76.3	200.6	235.6
50.00		0.2500	30.607	24.087	2804.5	20.18	122.43	77.7	180.5	420.9
51.00		0.2500	30.279	23.827	2714.6	19.95	121.12	77.9	176.6	81.5
55.00		0.2500	28.967	22.786	2374.2	19.02	115.87	79.0	161.4	317.2
55.44		0.2500	28.823	22.672	2338.6	18.92	115.29	79.1	159.8	34.0
60.00		0.2500	27.328	21.486	1990.4	17.86	109.31	80.4	143.5	342.6
64.00		0.2500	26.017	20.445	1715.0	16.94	104.07	81.5	129.8	285.4
65.00		0.2500	25.689	20.185	1650.3	16.71	102.76	81.7	126.5	69.1
67.06		0.2500	25.013	19.649	1522.3	16.23	100.05	82.3	119.9	139.6
70.00		0.2500	24.049	18.884	1351.4	15.55	96.20	82.5	110.7	192.7
74.00		0.2500	22.738	17.844	1140.1	14.63	90.95	82.5	98.8	250.0
75.00		0.2500	22.410	17.583	1090.9	14.40	89.64	82.5	95.9	60.3
75.45		0.2500	22.263	17.466	1069.3	14.29	89.05	82.5	94.6	26.8
76.00		0.2500	22.082	17.323	1043.2	14.16	88.33	82.5	93.1	32.6

8356.2

Wind Loading - Shaft

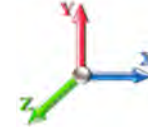
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Page: 8
	Struct Class: II	



Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 17

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	351.89	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	339.48	0.650	0.000	5.00	19.327	12.56	430.0	0.0	918.7
10.00		1.00	0.85	19.450	21.40	327.07	0.650	0.000	5.00	18.634	12.11	414.6	0.0	885.5
15.00		1.00	0.85	19.450	21.40	314.67	0.650	0.000	5.00	17.940	11.66	399.2	0.0	852.3
20.00		1.00	0.90	20.638	22.70	311.35	0.650	0.000	5.00	17.246	11.21	407.2	0.0	819.1
22.75	Bot - Section 2	1.00	0.93	21.205	23.33	308.48	0.650	0.000	2.75	9.190	5.97	222.9	0.0	436.4
25.00		1.00	0.95	21.630	23.79	305.67	0.650	0.000	2.25	7.458	4.85	184.6	0.0	633.3
28.25	Top - Section 1	1.00	0.97	22.194	24.41	301.01	0.650	0.000	3.25	10.525	6.84	267.2	0.0	893.4
30.00		1.00	0.98	22.477	24.72	302.32	0.650	0.000	1.75	5.546	3.60	142.6	0.0	210.9
35.00		1.00	1.01	23.218	25.54	293.72	0.650	0.000	5.00	15.377	10.00	408.4	0.0	584.7
40.00		1.00	1.04	23.880	26.27	284.13	0.650	0.000	5.00	14.684	9.54	401.1	0.0	558.2
42.31	Appurtenance(s)	1.00	1.06	24.164	26.58	279.42	0.650	0.000	2.31	6.550	4.26	181.1	0.0	248.9
45.00		1.00	1.07	24.479	26.93	273.76	0.650	0.000	2.69	7.440	4.84	208.4	0.0	282.7
50.00		1.00	1.09	25.029	27.53	262.74	0.650	0.000	5.00	13.296	8.64	380.7	0.0	505.1
51.00	Appurtenance(s)	1.00	1.10	25.133	27.65	260.46	0.650	0.000	1.00	2.576	1.67	74.1	0.0	97.8
55.00		1.00	1.12	25.536	28.09	251.17	0.650	0.000	4.00	10.027	6.52	292.9	0.0	380.7
55.44	Appurtenance(s)	1.00	1.12	25.579	28.14	250.13	0.650	0.000	0.44	1.076	0.70	31.5	0.0	40.8
60.00		1.00	1.14	26.008	28.61	239.14	0.650	0.000	4.56	10.833	7.04	322.3	0.0	411.1
64.00	Appurtenance(s)	1.00	1.15	26.364	29.00	229.21	0.650	0.000	4.00	9.028	5.87	272.3	0.0	342.4
65.00		1.00	1.16	26.450	29.09	226.69	0.650	0.000	1.00	2.188	1.42	66.2	0.0	83.0
67.06	Appurtenance(s)	1.00	1.16	26.624	29.29	221.46	0.650	0.000	2.06	4.419	2.87	134.6	0.0	167.5
70.00		1.00	1.17	26.866	29.55	213.89	0.650	0.000	2.94	6.103	3.97	187.6	0.0	231.3
74.00	Appurtenance(s)	1.00	1.19	27.182	29.90	203.41	0.650	0.000	4.00	7.918	5.15	246.2	0.0	299.9
75.00	Appurtenance(s)	1.00	1.19	27.259	29.98	200.76	0.650	0.000	1.00	1.910	1.24	59.6	0.0	72.3
75.45	Appurtenance(s)	1.00	1.19	27.293	30.02	199.57	0.650	0.000	0.45	0.851	0.55	26.6	0.0	32.2
76.00		1.00	1.19	27.335	30.07	198.10	0.650	0.000	0.55	1.032	0.67	32.3	0.0	39.1
Totals:									76.00			5,794.1		10,027.4

Discrete Appurtenance Forces

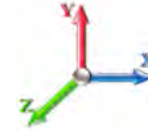
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



Iterations 17

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor 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	75.45	4' Branches	1	27.293	30.022	1.00	1.00	36.86	468.00	0.000	0.000	1770.61	0.00	0.00
2	75.00	T-Arms	3	27.259	29.985	0.56	0.75	13.50	576.00	0.000	0.000	647.67	0.00	0.00
3	74.00	Antenna Branches	1	27.182	29.900	1.00	1.00	22.43	115.20	0.000	0.000	1073.05	0.00	0.00
4	74.00	AIR6449 B41	3	27.182	29.900	0.57	0.80	9.63	370.80	0.000	0.000	460.59	0.00	0.00
5	74.00	RRUS 4415 B25	3	27.182	29.900	0.54	0.80	2.64	165.60	0.000	0.000	126.16	0.00	0.00
6	74.00	Ericsson 4415 B66A	3	27.182	29.900	0.54	0.80	2.99	178.56	0.000	0.000	143.08	0.00	0.00
7	74.00	(Handrail Kit w/end	1	27.182	29.900	1.00	1.00	6.75	314.06	0.000	0.000	322.92	0.00	0.00
8	74.00	RFS	3	27.182	29.900	0.56	0.80	34.00	460.80	0.000	0.000	1626.72	0.00	0.00
9	74.00	Air 32	3	27.182	29.900	0.70	0.80	13.59	475.92	0.000	0.000	650.29	0.00	0.00
10	74.00	ATM200-A20	6	27.182	29.900	0.40	0.80	0.29	3.60	0.000	0.000	13.78	0.00	0.00
11	74.00	Radio 4449 B71+B85	3	27.182	29.900	0.54	0.80	3.17	255.60	0.000	0.000	151.55	0.00	0.00
12	74.00	Commscope	3	27.182	29.900	0.54	0.80	1.16	25.20	0.000	0.000	55.39	0.00	0.00
13	67.06	6' Branches	1	26.624	29.287	1.00	1.00	83.63	480.00	0.000	0.000	3918.78	0.00	0.00
14	64.00	B5/B13 RRH-BR04C	3	26.364	29.000	0.54	0.80	3.57	253.08	0.000	0.000	165.64	0.00	0.00
15	64.00	B2/B66A RRH-BR049	3	26.364	29.000	0.54	0.80	2.64	303.84	0.000	0.000	122.36	0.00	0.00
16	64.00	CBC78T-DS-43-2X/E14F0	3	26.364	29.000	0.54	0.80	0.59	78.48	0.000	0.000	27.61	0.00	0.00
17	64.00	DB-T1-6Z-8AB-0Z	2	26.364	29.000	0.54	0.80	3.54	105.60	0.000	0.000	164.14	0.00	0.00
18	64.00	T-Arm	3	26.364	29.000	0.56	0.75	13.50	1152.00	0.000	0.000	626.40	0.00	0.00
19	64.00	DB846F65ZAXY	4	26.364	29.000	0.74	0.80	20.98	100.80	0.000	0.000	973.51	0.00	0.00
20	64.00	DB846H80E-SX	2	26.364	29.000	0.90	0.80	8.98	38.40	0.000	0.000	416.58	0.00	0.00
21	64.00	BSAMNT-SBS-1-2	3	26.364	29.000	0.56	0.75	0.00	91.26	0.000	0.000	0.00	0.00	0.00
22	64.00	JAHH-65B-R3B	6	26.364	29.000	0.66	0.80	36.29	455.76	0.000	0.000	1684.05	0.00	0.00
23	64.00	VZS01	3	26.364	29.000	0.55	0.80	7.12	313.56	0.000	0.000	330.41	0.00	0.00
24	64.00	(3) VZWSMART-SFK4	1	26.364	29.000	0.56	0.75	9.28	600.00	0.000	0.000	430.65	0.00	0.00
25	55.44	8' Branches	1	25.579	28.137	1.00	1.00	150.70	1965.60	0.000	0.000	6784.28	0.00	0.00
26	51.00	MC-K6MHDX-9-96 (3	1	25.133	27.646	0.56	0.75	11.78	1078.80	0.000	0.000	521.27	0.00	0.00
27	51.00	RDIDC-9181-OF-48	1	25.133	27.646	0.80	0.80	1.61	26.28	0.000	0.000	71.13	0.00	0.00
28	51.00	TA08025-B605	3	25.133	27.646	0.54	0.80	3.15	270.00	0.000	0.000	139.41	0.00	0.00
29	51.00	TA08025-B604	3	25.133	27.646	0.54	0.80	3.15	230.04	0.000	0.000	139.41	0.00	0.00
30	51.00	MX08FRO665-21	3	25.133	27.646	0.59	0.80	22.18	232.20	0.000	0.000	981.21	0.00	0.00
31	42.31	10' Branches	1	24.164	26.580	1.00	1.00	54.43	648.00	0.000	0.000	2314.82	0.00	0.00

Totals: 11,833.04 26,853.46

Total Applied Force Summary

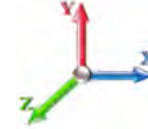
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



Iterations 17

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		430.05	1097.50	0.00	0.00
10.00		414.62	1064.30	0.00	0.00
15.00		399.18	1031.11	0.00	0.00
20.00		407.17	997.91	0.00	0.00
22.75		222.93	534.70	0.00	0.00
25.00		184.55	713.76	0.00	0.00
28.25		267.22	1009.62	0.00	0.00
30.00		142.60	273.51	0.00	0.00
35.00		408.44	763.53	0.00	0.00
40.00		401.13	736.97	0.00	0.00
42.31	(1) attachments	2495.87	979.51	0.00	0.00
45.00		208.36	378.90	0.00	0.00
50.00		380.71	683.86	0.00	0.00
51.00	(11) attachments	1926.51	1970.90	0.00	0.00
55.00		292.91	518.92	0.00	0.00
55.44	(1) attachments	6815.76	2021.64	0.00	0.00
60.00		322.32	568.70	0.00	0.00
64.00	(33) attachments	5213.63	3973.45	0.00	0.00
65.00		66.19	92.41	0.00	0.00
67.06	(1) attachments	4053.37	667.01	0.00	0.00
70.00		187.57	259.10	0.00	0.00
74.00	(29) attachments	4869.74	2703.11	0.00	0.00
75.00	(3) attachments	707.24	657.79	0.00	0.00
75.45	(1) attachments	1797.16	500.20	0.00	0.00
76.00		32.27	39.07	0.00	0.00
	Totals:	32,647.53	24,237.50	0.00	0.00

Calculated Forces

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.6W 97 mph Wind	Iterations 17
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	-24.17	-32.69	0.00	-1916.5	0.00	1916.52	2976.77	1488.39	5655.61	2832.01	0.00	0.000	0.000	0.685
5.00	-22.96	-32.35	0.00	-1753.0	0.00	1753.06	2914.38	1457.19	5339.22	2673.58	0.12	-0.211	0.000	0.664
10.00	-21.78	-32.01	0.00	-1591.3	0.00	1591.32	2848.80	1424.40	5025.69	2516.58	0.45	-0.426	0.000	0.640
15.00	-20.63	-31.68	0.00	-1431.2	0.00	1431.28	2780.04	1390.02	4715.67	2361.34	1.02	-0.643	0.000	0.614
20.00	-19.54	-31.32	0.00	-1272.8	0.00	1272.89	2708.10	1354.05	4409.79	2208.17	1.81	-0.862	0.000	0.584
22.75	-18.95	-31.12	0.00	-1186.7	0.00	1186.78	2667.17	1333.59	4243.56	2124.93	2.35	-0.985	0.000	0.566
25.00	-18.17	-30.96	0.00	-1116.7	0.00	1116.75	2632.97	1316.49	4108.71	2057.41	2.84	-1.086	0.000	0.550
28.25	-17.11	-30.71	0.00	-1016.1	0.00	1016.12	1920.92	960.46	2962.45	1483.43	3.63	-1.230	0.000	0.695
30.00	-16.75	-30.61	0.00	-962.38	0.00	962.38	1904.07	952.03	2891.21	1447.76	4.09	-1.308	0.000	0.675
35.00	-15.87	-30.25	0.00	-809.34	0.00	809.34	1853.76	926.88	2688.99	1346.49	5.60	-1.558	0.000	0.611
40.00	-15.06	-29.87	0.00	-658.09	0.00	658.09	1800.28	900.14	2489.19	1246.45	7.37	-1.795	0.000	0.537
42.31	-14.10	-27.37	0.00	-589.09	0.00	589.09	1774.49	887.25	2397.88	1200.72	8.26	-1.902	0.000	0.500
45.00	-13.66	-27.19	0.00	-515.46	0.00	515.46	1743.61	871.80	2292.47	1147.94	9.37	-2.021	0.000	0.458
50.00	-12.94	-26.81	0.00	-379.51	0.00	379.51	1683.75	841.88	2099.47	1051.30	11.60	-2.215	0.000	0.370
51.00	-11.00	-24.82	0.00	-352.70	0.00	352.70	1671.40	835.70	2061.38	1032.22	12.07	-2.252	0.000	0.349
55.00	-10.47	-24.52	0.00	-253.40	0.00	253.40	1620.72	810.36	1910.85	956.84	14.01	-2.379	0.000	0.272
55.44	-8.71	-17.64	0.00	-242.61	0.00	242.61	1615.02	807.51	1894.48	948.65	14.23	-2.392	0.000	0.262
60.00	-8.13	-17.31	0.00	-162.18	0.00	162.18	1554.50	777.25	1727.25	864.91	16.58	-2.504	0.000	0.193
64.00	-4.39	-11.92	0.00	-92.96	0.00	92.96	1499.23	749.61	1584.42	793.39	18.71	-2.577	0.000	0.120
65.00	-4.29	-11.85	0.00	-81.04	0.00	81.04	1485.09	742.54	1549.31	775.81	19.25	-2.592	0.000	0.108
67.06	-3.81	-7.78	0.00	-56.62	0.00	56.62	1455.57	727.78	1477.81	740.00	20.38	-2.616	0.000	0.079
70.00	-3.55	-7.58	0.00	-33.76	0.00	33.76	1403.00	701.50	1368.43	685.23	21.99	-2.641	0.000	0.052
74.00	-1.08	-2.59	0.00	-3.44	0.00	3.44	1325.69	662.84	1221.03	611.42	24.22	-2.657	0.000	0.006
75.00	-0.45	-1.85	0.00	-0.85	0.00	0.85	1306.36	653.18	1185.50	593.63	24.77	-2.657	0.000	0.002
75.45	-0.04	-0.03	0.00	-0.02	0.00	0.02	1297.66	648.83	1169.68	585.71	25.02	-2.657	0.000	0.000
76.00	0.00	-0.03	0.00	0.00	0.00	0.00	1287.03	643.52	1150.48	576.10	25.33	-2.657	0.000	0.000

Wind Loading - Shaft

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
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 17

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	351.89	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	339.48	0.650	0.000	5.00	19.327	12.56	430.0	0.0	689.0
10.00		1.00	0.85	19.450	21.40	327.07	0.650	0.000	5.00	18.634	12.11	414.6	0.0	664.1
15.00		1.00	0.85	19.450	21.40	314.67	0.650	0.000	5.00	17.940	11.66	399.2	0.0	639.2
20.00		1.00	0.90	20.638	22.70	311.35	0.650	0.000	5.00	17.246	11.21	407.2	0.0	614.3
22.75	Bot - Section 2	1.00	0.93	21.205	23.33	308.48	0.650	0.000	2.75	9.190	5.97	222.9	0.0	327.3
25.00		1.00	0.95	21.630	23.79	305.67	0.650	0.000	2.25	7.458	4.85	184.6	0.0	475.0
28.25	Top - Section 1	1.00	0.97	22.194	24.41	301.01	0.650	0.000	3.25	10.525	6.84	267.2	0.0	670.1
30.00		1.00	0.98	22.477	24.72	302.32	0.650	0.000	1.75	5.546	3.60	142.6	0.0	158.2
35.00		1.00	1.01	23.218	25.54	293.72	0.650	0.000	5.00	15.377	10.00	408.4	0.0	438.5
40.00		1.00	1.04	23.880	26.27	284.13	0.650	0.000	5.00	14.684	9.54	401.1	0.0	418.6
42.31	Appurtenance(s)	1.00	1.06	24.164	26.58	279.42	0.650	0.000	2.31	6.550	4.26	181.1	0.0	186.7
45.00		1.00	1.07	24.479	26.93	273.76	0.650	0.000	2.69	7.440	4.84	208.4	0.0	212.0
50.00		1.00	1.09	25.029	27.53	262.74	0.650	0.000	5.00	13.296	8.64	380.7	0.0	378.8
51.00	Appurtenance(s)	1.00	1.10	25.133	27.65	260.46	0.650	0.000	1.00	2.576	1.67	74.1	0.0	73.4
55.00		1.00	1.12	25.536	28.09	251.17	0.650	0.000	4.00	10.027	6.52	292.9	0.0	285.5
55.44	Appurtenance(s)	1.00	1.12	25.579	28.14	250.13	0.650	0.000	0.44	1.076	0.70	31.5	0.0	30.6
60.00		1.00	1.14	26.008	28.61	239.14	0.650	0.000	4.56	10.833	7.04	322.3	0.0	308.3
64.00	Appurtenance(s)	1.00	1.15	26.364	29.00	229.21	0.650	0.000	4.00	9.028	5.87	272.3	0.0	256.8
65.00		1.00	1.16	26.450	29.09	226.69	0.650	0.000	1.00	2.188	1.42	66.2	0.0	62.2
67.06	Appurtenance(s)	1.00	1.16	26.624	29.29	221.46	0.650	0.000	2.06	4.419	2.87	134.6	0.0	125.7
70.00		1.00	1.17	26.866	29.55	213.89	0.650	0.000	2.94	6.103	3.97	187.6	0.0	173.5
74.00	Appurtenance(s)	1.00	1.19	27.182	29.90	203.41	0.650	0.000	4.00	7.918	5.15	246.2	0.0	225.0
75.00	Appurtenance(s)	1.00	1.19	27.259	29.98	200.76	0.650	0.000	1.00	1.910	1.24	59.6	0.0	54.2
75.45	Appurtenance(s)	1.00	1.19	27.293	30.02	199.57	0.650	0.000	0.45	0.851	0.55	26.6	0.0	24.2
76.00		1.00	1.19	27.335	30.07	198.10	0.650	0.000	0.55	1.032	0.67	32.3	0.0	29.3
Totals:									76.00			5,794.1		7,520.5

Discrete Appurtenance Forces

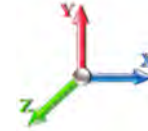
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



Iterations 17

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor 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	75.45	4' Branches	1	27.293	30.022	1.00	1.00	36.86	351.00	0.000	0.000	1770.61	0.00	0.00
2	75.00	T-Arms	3	27.259	29.985	0.56	0.75	13.50	432.00	0.000	0.000	647.67	0.00	0.00
3	74.00	Antenna Branches	1	27.182	29.900	1.00	1.00	22.43	86.40	0.000	0.000	1073.05	0.00	0.00
4	74.00	AIR6449 B41	3	27.182	29.900	0.57	0.80	9.63	278.10	0.000	0.000	460.59	0.00	0.00
5	74.00	RRUS 4415 B25	3	27.182	29.900	0.54	0.80	2.64	124.20	0.000	0.000	126.16	0.00	0.00
6	74.00	Ericsson 4415 B66A	3	27.182	29.900	0.54	0.80	2.99	133.92	0.000	0.000	143.08	0.00	0.00
7	74.00	(Handrail Kit w/end	1	27.182	29.900	1.00	1.00	6.75	235.55	0.000	0.000	322.92	0.00	0.00
8	74.00	RFS	3	27.182	29.900	0.56	0.80	34.00	345.60	0.000	0.000	1626.72	0.00	0.00
9	74.00	Air 32	3	27.182	29.900	0.70	0.80	13.59	356.94	0.000	0.000	650.29	0.00	0.00
10	74.00	ATM200-A20	6	27.182	29.900	0.40	0.80	0.29	2.70	0.000	0.000	13.78	0.00	0.00
11	74.00	Radio 4449 B71+B85	3	27.182	29.900	0.54	0.80	3.17	191.70	0.000	0.000	151.55	0.00	0.00
12	74.00	Commscope	3	27.182	29.900	0.54	0.80	1.16	18.90	0.000	0.000	55.39	0.00	0.00
13	67.06	6' Branches	1	26.624	29.287	1.00	1.00	83.63	360.00	0.000	0.000	3918.78	0.00	0.00
14	64.00	B5/B13 RRH-BR04C	3	26.364	29.000	0.54	0.80	3.57	189.81	0.000	0.000	165.64	0.00	0.00
15	64.00	B2/B66A RRH-BR049	3	26.364	29.000	0.54	0.80	2.64	227.88	0.000	0.000	122.36	0.00	0.00
16	64.00	CBC78T-DS-43-2X/E14F0	3	26.364	29.000	0.54	0.80	0.59	58.86	0.000	0.000	27.61	0.00	0.00
17	64.00	DB-T1-6Z-8AB-0Z	2	26.364	29.000	0.54	0.80	3.54	79.20	0.000	0.000	164.14	0.00	0.00
18	64.00	T-Arm	3	26.364	29.000	0.56	0.75	13.50	864.00	0.000	0.000	626.40	0.00	0.00
19	64.00	DB846F65ZAXY	4	26.364	29.000	0.74	0.80	20.98	75.60	0.000	0.000	973.51	0.00	0.00
20	64.00	DB846H80E-SX	2	26.364	29.000	0.90	0.80	8.98	28.80	0.000	0.000	416.58	0.00	0.00
21	64.00	BSAMNT-SBS-1-2	3	26.364	29.000	0.56	0.75	0.00	68.45	0.000	0.000	0.00	0.00	0.00
22	64.00	JAHH-65B-R3B	6	26.364	29.000	0.66	0.80	36.29	341.82	0.000	0.000	1684.05	0.00	0.00
23	64.00	VZS01	3	26.364	29.000	0.55	0.80	7.12	235.17	0.000	0.000	330.41	0.00	0.00
24	64.00	(3) VZWSMART-SFK4	1	26.364	29.000	0.56	0.75	9.28	450.00	0.000	0.000	430.65	0.00	0.00
25	55.44	8' Branches	1	25.579	28.137	1.00	1.00	150.70	1474.20	0.000	0.000	6784.28	0.00	0.00
26	51.00	MC-K6MHDX-9-96 (3	1	25.133	27.646	0.56	0.75	11.78	809.10	0.000	0.000	521.27	0.00	0.00
27	51.00	RDIDC-9181-OF-48	1	25.133	27.646	0.80	0.80	1.61	19.71	0.000	0.000	71.13	0.00	0.00
28	51.00	TA08025-B605	3	25.133	27.646	0.54	0.80	3.15	202.50	0.000	0.000	139.41	0.00	0.00
29	51.00	TA08025-B604	3	25.133	27.646	0.54	0.80	3.15	172.53	0.000	0.000	139.41	0.00	0.00
30	51.00	MX08FRO665-21	3	25.133	27.646	0.59	0.80	22.18	174.15	0.000	0.000	981.21	0.00	0.00
31	42.31	10' Branches	1	24.164	26.580	1.00	1.00	54.43	486.00	0.000	0.000	2314.82	0.00	0.00

Totals: **8,874.78** **26,853.46**

Total Applied Force Summary

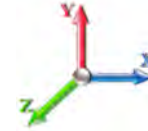
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



Iterations 17

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		430.05	823.13	0.00	0.00
10.00		414.62	798.23	0.00	0.00
15.00		399.18	773.33	0.00	0.00
20.00		407.17	748.43	0.00	0.00
22.75		222.93	401.03	0.00	0.00
25.00		184.55	535.32	0.00	0.00
28.25		267.22	757.22	0.00	0.00
30.00		142.60	205.13	0.00	0.00
35.00		408.44	572.65	0.00	0.00
40.00		401.13	552.73	0.00	0.00
42.31	(1) attachments	2495.87	734.63	0.00	0.00
45.00		208.36	284.18	0.00	0.00
50.00		380.71	512.89	0.00	0.00
51.00	(11) attachments	1926.51	1478.18	0.00	0.00
55.00		292.91	389.19	0.00	0.00
55.44	(1) attachments	6815.76	1516.23	0.00	0.00
60.00		322.32	426.53	0.00	0.00
64.00	(33) attachments	5213.63	2980.09	0.00	0.00
65.00		66.19	69.31	0.00	0.00
67.06	(1) attachments	4053.37	500.26	0.00	0.00
70.00		187.57	194.32	0.00	0.00
74.00	(29) attachments	4869.74	2027.33	0.00	0.00
75.00	(3) attachments	707.24	493.34	0.00	0.00
75.45	(1) attachments	1797.16	375.15	0.00	0.00
76.00		32.27	29.30	0.00	0.00
	Totals:	32,647.53	18,178.12	0.00	0.00

Calculated Forces

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 97 mph Wind

Iterations 17

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	-18.12	-32.68	0.00	-1910.1	0.00	1910.19	2976.77	1488.39	5655.61	2832.01	0.00	0.000	0.000	0.681
5.00	-17.17	-32.31	0.00	-1746.7	0.00	1746.78	2914.38	1457.19	5339.22	2673.58	0.11	-0.211	0.000	0.660
10.00	-16.26	-31.96	0.00	-1585.2	0.00	1585.22	2848.80	1424.40	5025.69	2516.58	0.45	-0.425	0.000	0.636
15.00	-15.37	-31.61	0.00	-1425.4	0.00	1425.44	2780.04	1390.02	4715.67	2361.34	1.02	-0.641	0.000	0.610
20.00	-14.53	-31.23	0.00	-1267.4	0.00	1267.40	2708.10	1354.05	4409.79	2208.17	1.81	-0.858	0.000	0.580
22.75	-14.08	-31.03	0.00	-1181.5	0.00	1181.51	2667.17	1333.59	4243.56	2124.93	2.34	-0.981	0.000	0.562
25.00	-13.48	-30.87	0.00	-1111.6	0.00	1111.68	2632.97	1316.49	4108.71	2057.41	2.83	-1.082	0.000	0.546
28.25	-12.67	-30.61	0.00	-1011.3	0.00	1011.37	1920.92	960.46	2962.45	1483.43	3.61	-1.225	0.000	0.689
30.00	-12.38	-30.50	0.00	-957.80	0.00	957.80	1904.07	952.03	2891.21	1447.76	4.08	-1.303	0.000	0.669
35.00	-11.69	-30.13	0.00	-805.31	0.00	805.31	1853.76	926.88	2688.99	1346.49	5.58	-1.551	0.000	0.605
40.00	-11.06	-29.74	0.00	-654.69	0.00	654.69	1800.28	900.14	2489.19	1246.45	7.34	-1.787	0.000	0.532
42.31	-10.35	-27.24	0.00	-585.99	0.00	585.99	1774.49	887.25	2397.88	1200.72	8.23	-1.894	0.000	0.495
45.00	-10.00	-27.05	0.00	-512.71	0.00	512.71	1743.61	871.80	2292.47	1147.94	9.33	-2.012	0.000	0.453
50.00	-9.45	-26.67	0.00	-377.45	0.00	377.45	1683.75	841.88	2099.47	1051.30	11.55	-2.205	0.000	0.366
51.00	-8.01	-24.70	0.00	-350.77	0.00	350.77	1671.40	835.70	2061.38	1032.22	12.02	-2.242	0.000	0.345
55.00	-7.61	-24.40	0.00	-251.97	0.00	251.97	1620.72	810.36	1910.85	956.84	13.95	-2.368	0.000	0.269
55.44	-6.35	-17.54	0.00	-241.23	0.00	241.23	1615.02	807.51	1894.48	948.65	14.17	-2.381	0.000	0.259
60.00	-5.91	-17.21	0.00	-161.27	0.00	161.27	1554.50	777.25	1727.25	864.91	16.51	-2.493	0.000	0.191
64.00	-3.16	-11.87	0.00	-92.45	0.00	92.45	1499.23	749.61	1584.42	793.39	18.63	-2.565	0.000	0.119
65.00	-3.09	-11.80	0.00	-80.58	0.00	80.58	1485.09	742.54	1549.31	775.81	19.17	-2.580	0.000	0.106
67.06	-2.77	-7.73	0.00	-56.28	0.00	56.28	1455.57	727.78	1477.81	740.00	20.29	-2.604	0.000	0.078
70.00	-2.58	-7.53	0.00	-33.56	0.00	33.56	1403.00	701.50	1368.43	685.23	21.90	-2.629	0.000	0.051
74.00	-0.78	-2.58	0.00	-3.42	0.00	3.42	1325.69	662.84	1221.03	611.42	24.11	-2.644	0.000	0.006
75.00	-0.32	-1.85	0.00	-0.85	0.00	0.85	1306.36	653.18	1185.50	593.63	24.66	-2.645	0.000	0.002
75.45	-0.03	-0.03	0.00	-0.02	0.00	0.02	1297.66	648.83	1169.68	585.71	24.91	-2.645	0.000	0.000
76.00	0.00	-0.03	0.00	0.00	0.00	0.00	1287.03	643.52	1150.48	576.10	25.22	-2.645	0.000	0.000

Wind Loading - Shaft

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
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 16

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	1.656	5.00	20.707	24.85	141.3	482.5	1401.2
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.775	5.00	20.113	24.14	137.2	500.2	1385.7
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.848	5.00	19.480	23.38	132.9	502.7	1355.0
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.902	5.00	18.832	22.60	136.3	498.5	1317.6
22.75	Bot - Section 2	1.00	0.93	5.634	6.20	0.00	1.200	1.927	2.75	10.073	12.09	74.9	271.9	708.3
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.945	2.25	8.188	9.83	62.1	223.4	856.7
28.25	Top - Section 1	1.00	0.97	5.897	6.49	0.00	1.200	1.969	3.25	11.591	13.91	90.2	318.3	1211.7
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.981	1.75	6.124	7.35	48.3	170.0	380.9
35.00		1.00	1.01	6.169	6.79	0.00	1.200	2.012	5.00	17.054	20.46	138.9	472.8	1057.6
40.00		1.00	1.04	6.345	6.98	0.00	1.200	2.039	5.00	16.383	19.66	137.2	458.6	1016.8
42.31	Appurtenance(s)	1.00	1.06	6.420	7.06	0.00	1.200	2.050	2.31	7.339	8.81	62.2	208.6	457.5
45.00		1.00	1.07	6.504	7.15	0.00	1.200	2.063	2.69	8.365	10.04	71.8	238.4	521.1
50.00		1.00	1.09	6.650	7.32	0.00	1.200	2.085	5.00	15.034	18.04	132.0	426.7	931.8
51.00	Appurtenance(s)	1.00	1.10	6.678	7.35	0.00	1.200	2.089	1.00	2.924	3.51	25.8	84.7	182.5
55.00		1.00	1.12	6.785	7.46	0.00	1.200	2.105	4.00	11.430	13.72	102.4	327.5	708.2
55.44	Appurtenance(s)	1.00	1.12	6.796	7.48	0.00	1.200	2.106	0.44	1.230	1.48	11.0	35.9	76.7
60.00		1.00	1.14	6.910	7.60	0.00	1.200	2.123	4.56	12.447	14.94	113.5	357.0	768.1
64.00	Appurtenance(s)	1.00	1.15	7.005	7.71	0.00	1.200	2.137	4.00	10.453	12.54	96.6	301.3	643.7
65.00		1.00	1.16	7.028	7.73	0.00	1.200	2.140	1.00	2.544	3.05	23.6	74.6	157.5
67.06	Appurtenance(s)	1.00	1.16	7.074	7.78	0.00	1.200	2.147	2.06	5.156	6.19	48.1	150.4	317.9
70.00		1.00	1.17	7.138	7.85	0.00	1.200	2.156	2.94	7.159	8.59	67.5	207.9	439.2
74.00	Appurtenance(s)	1.00	1.19	7.222	7.94	0.00	1.200	2.168	4.00	9.364	11.24	89.3	270.4	570.3
75.00	Appurtenance(s)	1.00	1.19	7.243	7.97	0.00	1.200	2.171	1.00	2.272	2.73	21.7	66.8	139.1
75.45	Appurtenance(s)	1.00	1.19	7.252	7.98	0.00	1.200	2.172	0.45	1.013	1.22	9.7	29.9	62.1
76.00		1.00	1.19	7.263	7.99	0.00	1.200	2.174	0.55	1.231	1.48	11.8	36.3	75.4
Totals:									76.00			1,986.3	16,742.6	

Discrete Appurtenance Forces

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

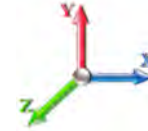


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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Iterations 16

Dead Load Factor 1.20
Wind Load Factor 1.00



No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor 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	75.45	4' Branches	1	7.252	7.977	1.00	1.00	68.89	468.00	0.000	0.000	549.54	0.00	0.00
2	75.00	T-Arms	3	7.243	7.967	0.56	0.75	33.08	977.07	0.000	0.000	263.54	0.00	0.00
3	74.00	Antenna Branches	1	7.222	7.945	1.00	1.00	41.88	294.46	0.000	0.000	332.74	0.00	0.00
4	74.00	AIR6449 B41	3	7.222	7.945	0.57	0.80	11.64	786.76	0.000	0.000	92.47	0.00	0.00
5	74.00	RRUS 4415 B25	3	7.222	7.945	0.54	0.80	3.67	290.60	0.000	0.000	29.13	0.00	0.00
6	74.00	Ericsson 4415 B66A	3	7.222	7.945	0.54	0.80	4.15	426.44	0.000	0.000	32.96	0.00	0.00
7	74.00	(Handrail Kit w/end	1	7.222	7.945	1.00	1.00	14.95	961.66	0.000	0.000	118.74	0.00	0.00
8	74.00	RFS	3	7.222	7.945	0.56	0.80	38.01	2066.82	0.000	0.000	301.93	0.00	0.00
9	74.00	Air 32	3	7.222	7.945	0.70	0.80	16.55	1189.56	0.000	0.000	131.47	0.00	0.00
10	74.00	ATM200-A20	6	7.222	7.945	0.80	0.80	1.89	33.66	0.000	0.000	15.03	0.00	0.00
11	74.00	Radio 4449 B71+B85	3	7.222	7.945	0.54	0.80	4.26	413.76	0.000	0.000	33.85	0.00	0.00
12	74.00	Commscope	3	7.222	7.945	0.54	0.80	2.42	66.37	0.000	0.000	19.23	0.00	0.00
13	67.06	6' Branches	1	7.074	7.782	1.00	1.00	155.45	1223.51	0.000	0.000	1209.64	0.00	0.00
14	64.00	B5/B13 RRH-BR04C	3	7.005	7.705	0.54	0.80	4.79	414.20	0.000	0.000	36.91	0.00	0.00
15	64.00	B2/B66A RRH-BR049	3	7.005	7.705	0.54	0.80	3.65	516.80	0.000	0.000	28.15	0.00	0.00
16	64.00	CBC78T-DS-43-2X/E14F0	3	7.005	7.705	0.54	0.80	1.18	163.09	0.000	0.000	9.08	0.00	0.00
17	64.00	DB-T1-6Z-8AB-0Z	2	7.005	7.705	0.54	0.80	6.31	471.85	0.000	0.000	48.62	0.00	0.00
18	64.00	T-Arm	3	7.005	7.705	0.56	0.75	27.92	1672.59	0.000	0.000	215.17	0.00	0.00
19	64.00	DB846F65ZAXY	4	7.005	7.705	0.74	0.80	25.55	1110.27	0.000	0.000	196.89	0.00	0.00
20	64.00	DB846H80E-SX	2	7.005	7.705	0.90	0.80	11.70	449.48	0.000	0.000	90.14	0.00	0.00
21	64.00	BSAMNT-SBS-1-2	3	7.005	7.705	0.56	0.75	0.00	152.82	0.000	0.000	0.00	0.00	0.00
22	64.00	JAHH-65B-R3B	6	7.005	7.705	0.66	0.80	42.95	2215.22	0.000	0.000	330.96	0.00	0.00
23	64.00	VZS01	3	7.005	7.705	0.55	0.80	8.94	741.42	0.000	0.000	68.87	0.00	0.00
24	64.00	(3) VZWSMART-SFK4	1	7.005	7.705	0.56	0.75	20.39	1176.57	0.000	0.000	157.10	0.00	0.00
25	55.44	8' Branches	1	6.796	7.476	1.00	1.00	277.68	4983.78	0.000	0.000	2075.92	0.00	0.00
26	51.00	MC-K6MHDX-9-96 (3	1	6.678	7.346	0.56	0.75	29.51	2029.48	0.000	0.000	216.76	0.00	0.00
27	51.00	RDIDC-9181-OF-48	1	6.678	7.346	0.80	0.80	2.15	77.32	0.000	0.000	15.81	0.00	0.00
28	51.00	TA08025-B605	3	6.678	7.346	0.54	0.80	4.23	420.02	0.000	0.000	31.08	0.00	0.00
29	51.00	TA08025-B604	3	6.678	7.346	0.54	0.80	4.23	375.55	0.000	0.000	31.08	0.00	0.00
30	51.00	MX08FRO665-21	3	6.678	7.346	0.59	0.80	25.30	1075.10	0.000	0.000	185.82	0.00	0.00
31	42.31	10' Branches	1	6.420	7.062	1.00	1.00	99.07	1630.87	0.000	0.000	699.68	0.00	0.00
Totals:									28,875.10			7,568.33		

Total Applied Force Summary

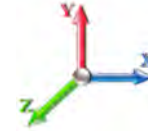
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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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 16

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		141.26	1579.99	0.00	0.00
10.00		137.20	1564.49	0.00	0.00
15.00		132.89	1533.84	0.00	0.00
20.00		136.31	1496.41	0.00	0.00
22.75		74.91	806.60	0.00	0.00
25.00		62.11	937.12	0.00	0.00
28.25		90.23	1327.87	0.00	0.00
30.00		48.27	443.47	0.00	0.00
35.00		138.87	1236.38	0.00	0.00
40.00		137.21	1195.57	0.00	0.00
42.31	(1) attachments	761.87	2171.02	0.00	0.00
45.00		71.82	617.32	0.00	0.00
50.00		131.97	1110.56	0.00	0.00
51.00	(11) attachments	506.33	4195.71	0.00	0.00
55.00		102.37	846.46	0.00	0.00
55.44	(1) attachments	2086.96	5075.71	0.00	0.00
60.00		113.54	925.69	0.00	0.00
64.00	(33) attachments	1278.55	9866.25	0.00	0.00
65.00		23.60	166.97	0.00	0.00
67.06	(1) attachments	1257.79	1560.90	0.00	0.00
70.00		67.46	467.04	0.00	0.00
74.00	(29) attachments	1196.82	7138.23	0.00	0.00
75.00	(3) attachments	285.26	1125.66	0.00	0.00
75.45	(1) attachments	559.24	530.10	0.00	0.00
76.00		11.80	75.37	0.00	0.00
	Totals:	9,554.66	47,994.72	0.00	0.00

Calculated Forces

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

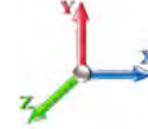


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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Iterations 16

Dead Load Factor 1.20
Wind Load Factor 1.00



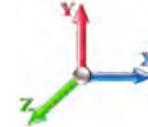
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-47.99	-9.58	0.00	-562.03	0.00	562.03	2976.77	1488.39	5655.61	2832.01	0.00	0.000	0.000	0.215
5.00	-46.40	-9.49	0.00	-514.13	0.00	514.13	2914.38	1457.19	5339.22	2673.58	0.03	-0.062	0.000	0.208
10.00	-44.82	-9.40	0.00	-466.69	0.00	466.69	2848.80	1424.40	5025.69	2516.58	0.13	-0.125	0.000	0.201
15.00	-43.28	-9.31	0.00	-419.69	0.00	419.69	2780.04	1390.02	4715.67	2361.34	0.30	-0.189	0.000	0.193
20.00	-41.78	-9.20	0.00	-373.14	0.00	373.14	2708.10	1354.05	4409.79	2208.17	0.53	-0.253	0.000	0.184
22.75	-40.97	-9.15	0.00	-347.83	0.00	347.83	2667.17	1333.59	4243.56	2124.93	0.69	-0.289	0.000	0.179
25.00	-40.02	-9.11	0.00	-327.25	0.00	327.25	2632.97	1316.49	4108.71	2057.41	0.83	-0.319	0.000	0.174
28.25	-38.69	-9.03	0.00	-297.65	0.00	297.65	1920.92	960.46	2962.45	1483.43	1.06	-0.361	0.000	0.221
30.00	-38.24	-9.01	0.00	-281.85	0.00	281.85	1904.07	952.03	2891.21	1447.76	1.20	-0.383	0.000	0.215
35.00	-36.99	-8.91	0.00	-236.79	0.00	236.79	1853.76	926.88	2688.99	1346.49	1.64	-0.457	0.000	0.196
40.00	-35.79	-8.79	0.00	-192.24	0.00	192.24	1800.28	900.14	2489.19	1246.45	2.16	-0.526	0.000	0.174
42.31	-33.62	-8.03	0.00	-171.92	0.00	171.92	1774.49	887.25	2397.88	1200.72	2.42	-0.557	0.000	0.162
45.00	-33.00	-7.98	0.00	-150.32	0.00	150.32	1743.61	871.80	2292.47	1147.94	2.75	-0.592	0.000	0.150
50.00	-31.89	-7.85	0.00	-110.42	0.00	110.42	1683.75	841.88	2099.47	1051.30	3.40	-0.648	0.000	0.124
51.00	-27.69	-7.31	0.00	-102.57	0.00	102.57	1671.40	835.70	2061.38	1032.22	3.54	-0.659	0.000	0.116
55.00	-26.85	-7.21	0.00	-73.32	0.00	73.32	1620.72	810.36	1910.85	956.84	4.11	-0.696	0.000	0.093
55.44	-21.79	-5.07	0.00	-70.15	0.00	70.15	1615.02	807.51	1894.48	948.65	4.17	-0.700	0.000	0.087
60.00	-20.87	-4.95	0.00	-47.05	0.00	47.05	1554.50	777.25	1727.25	864.91	4.86	-0.732	0.000	0.068
64.00	-11.02	-3.55	0.00	-27.24	0.00	27.24	1499.23	749.61	1584.42	793.39	5.48	-0.754	0.000	0.042
65.00	-10.85	-3.52	0.00	-23.69	0.00	23.69	1485.09	742.54	1549.31	775.81	5.64	-0.758	0.000	0.038
67.06	-9.31	-2.25	0.00	-16.44	0.00	16.44	1455.57	727.78	1477.81	740.00	5.97	-0.765	0.000	0.029
70.00	-8.84	-2.17	0.00	-9.84	0.00	9.84	1403.00	701.50	1368.43	685.23	6.44	-0.772	0.000	0.021
74.00	-1.72	-0.88	0.00	-1.15	0.00	1.15	1325.69	662.84	1221.03	611.42	7.09	-0.777	0.000	0.003
75.00	-0.60	-0.58	0.00	-0.27	0.00	0.27	1306.36	653.18	1185.50	593.63	7.25	-0.777	0.000	0.001
75.45	-0.08	-0.01	0.00	-0.01	0.00	0.01	1297.66	648.83	1169.68	585.71	7.33	-0.777	0.000	0.000
76.00	0.00	-0.01	0.00	0.00	0.00	0.00	1287.03	643.52	1150.48	576.10	7.42	-0.777	0.000	0.000

Seismic Segment Forces (Factored)

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



Load Case: 1.2D + 1.0E				Iterations 15
Gust Response Factor	1.10	Sds	0.19	Ss 0.18
Dead Load Factor	1.20	Seismic Load Factor	1.00	S1 0.06
Wind Load Factor	0.00	Structure Frequency (f1)	0.81	SA 0.08
				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		765.58	0.01	0.05	0.03	11.53	
10.00		737.92	0.03	0.07	0.04	15.14	
15.00		710.26	0.07	0.07	0.04	16.58	
20.00		682.59	0.13	0.07	0.03	17.71	
22.75	Bot - Section 2	363.63	0.17	0.07	0.03	9.95	
25.00		527.75	0.20	0.06	0.02	14.95	
28.25	Top - Section 1	744.50	0.26	0.05	0.02	21.71	
30.00		175.77	0.29	0.05	0.01	5.13	
35.00		487.28	0.40	0.02	0.01	13.03	
40.00		465.14	0.52	-0.02	0.01	9.51	
42.31	Appurtenance(s)	747.42	0.59	-0.05	0.01	12.47	
45.00		235.59	0.66	-0.07	0.02	2.92	
50.00		420.88	0.82	-0.11	0.06	3.43	
51.00	Appurtenance(s)	1612.6	0.85	-0.12	0.07	13.55	
55.00		317.23	0.99	-0.11	0.13	4.75	
55.44	Appurtenance(s)	1672.0	1.01	-0.11	0.13	27.28	
60.00		342.59	1.18	-0.02	0.24	13.31	
64.00	Appurtenance(s)	3196.0	1.34	0.18	0.37	232.26	
65.00		69.13	1.38	0.25	0.41	5.76	
67.06	Appurtenance(s)	539.61	1.47	0.43	0.51	58.26	
70.00		192.75	1.60	0.79	0.67	28.87	
74.00	Appurtenance(s)	2221.0	1.79	1.50	0.96	487.26	
75.00	Appurtenance(s)	540.28	1.84	1.73	1.05	129.17	
75.45	Appurtenance(s)	416.83	1.86	1.84	1.09	103.49	
76.00		32.55	1.89	1.98	1.14	8.46	
Totals:		18,217.0				1,266.5	Total Wind: 32,647.5

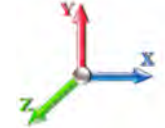
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E							Iterations 15
Gust Response Factor	1.10			Sds	0.19	Ss	0.18
Dead Load Factor	1.20	Seismic Load Factor	1.00	Sd1	0.10	S1	0.06
Wind Load Factor	0.00	Structure Frequency (f1)	0.81	SA	0.08	Seismic Importance Factor	1.00

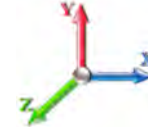
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-24.24	-1.27	0.00	-83.61	0.00	83.61	2976.77	1488.39	5655.61	2832.01	0.00	0.00	0.00	0.038
5.00	-23.14	-1.26	0.00	-77.28	0.00	77.28	2914.38	1457.19	5339.22	2673.58	0.01	-0.01	0.037	
10.00	-22.08	-1.25	0.00	-70.98	0.00	70.98	2848.80	1424.40	5025.69	2516.58	0.02	-0.02	0.036	
15.00	-21.04	-1.23	0.00	-64.74	0.00	64.74	2780.04	1390.02	4715.67	2361.34	0.04	-0.03	0.035	
20.00	-20.05	-1.22	0.00	-58.56	0.00	58.56	2708.10	1354.05	4409.79	2208.17	0.08	-0.04	0.034	
22.75	-19.51	-1.21	0.00	-55.21	0.00	55.21	2667.17	1333.59	4243.56	2124.93	0.10	-0.04	0.033	
25.00	-18.80	-1.20	0.00	-52.48	0.00	52.48	2632.97	1316.49	4108.71	2057.41	0.13	-0.05	0.033	
28.25	-17.79	-1.18	0.00	-48.59	0.00	48.59	1920.92	960.46	2962.45	1483.43	0.16	-0.06	0.042	
30.00	-17.51	-1.17	0.00	-46.54	0.00	46.54	1904.07	952.03	2891.21	1447.76	0.18	-0.06	0.041	
35.00	-16.75	-1.16	0.00	-40.67	0.00	40.67	1853.76	926.88	2688.99	1346.49	0.25	-0.07	0.039	
40.00	-16.01	-1.15	0.00	-34.86	0.00	34.86	1800.28	900.14	2489.19	1246.45	0.33	-0.08	0.037	
42.31	-15.03	-1.14	0.00	-32.19	0.00	32.19	1774.49	887.25	2397.88	1200.72	0.38	-0.09	0.035	
45.00	-14.65	-1.14	0.00	-29.11	0.00	29.11	1743.61	871.80	2292.47	1147.94	0.43	-0.10	0.034	
50.00	-13.97	-1.14	0.00	-23.41	0.00	23.41	1683.75	841.88	2099.47	1051.30	0.54	-0.11	0.031	
51.00	-12.00	-1.12	0.00	-22.27	0.00	22.27	1671.40	835.70	2061.38	1032.22	0.56	-0.11	0.029	
55.00	-11.48	-1.12	0.00	-17.78	0.00	17.78	1620.72	810.36	1910.85	956.84	0.65	-0.12	0.026	
55.44	-9.46	-1.09	0.00	-17.29	0.00	17.29	1615.02	807.51	1894.48	948.65	0.67	-0.12	0.024	
60.00	-8.89	-1.07	0.00	-12.33	0.00	12.33	1554.50	777.25	1727.25	864.91	0.78	-0.13	0.020	
64.00	-4.92	-0.83	0.00	-8.04	0.00	8.04	1499.23	749.61	1584.42	793.39	0.89	-0.13	0.013	
65.00	-4.82	-0.83	0.00	-7.21	0.00	7.21	1485.09	742.54	1549.31	775.81	0.92	-0.13	0.013	
67.06	-4.16	-0.77	0.00	-5.50	0.00	5.50	1455.57	727.78	1477.81	740.00	0.98	-0.14	0.010	
70.00	-3.90	-0.74	0.00	-3.25	0.00	3.25	1403.00	701.50	1368.43	685.23	1.07	-0.14	0.008	
74.00	-1.20	-0.24	0.00	-0.30	0.00	0.30	1325.69	662.84	1221.03	611.42	1.18	-0.14	0.001	
75.00	-0.54	-0.11	0.00	-0.06	0.00	0.06	1306.36	653.18	1185.50	593.63	1.21	-0.14	0.001	
75.45	-0.04	-0.01	0.00	0.00	0.00	0.00	1297.66	648.83	1169.68	585.71	1.23	-0.14	0.000	
76.00	0.00	-0.01	0.00	0.00	0.00	0.00	1287.03	643.52	1150.48	576.10	1.24	-0.14	0.000	

Seismic Segment Forces (Factored)

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



Load Case: 0.9D + 1.0E				Iterations 15
Gust Response Factor	1.10	Sds	0.19	Ss 0.18
Dead Load Factor	0.90	Seismic Load Factor	1.00	S1 0.06
Wind Load Factor	0.00	Structure Frequency (f1)	0.81	SA 0.08
				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		765.58	0.01	0.05	0.03	11.53	
10.00		737.92	0.03	0.07	0.04	15.14	
15.00		710.26	0.07	0.07	0.04	16.58	
20.00		682.59	0.13	0.07	0.03	17.71	
22.75	Bot - Section 2	363.63	0.17	0.07	0.03	9.95	
25.00		527.75	0.20	0.06	0.02	14.95	
28.25	Top - Section 1	744.50	0.26	0.05	0.02	21.71	
30.00		175.77	0.29	0.05	0.01	5.13	
35.00		487.28	0.40	0.02	0.01	13.03	
40.00		465.14	0.52	-0.02	0.01	9.51	
42.31	Appurtenance(s)	747.42	0.59	-0.05	0.01	12.47	
45.00		235.59	0.66	-0.07	0.02	2.92	
50.00		420.88	0.82	-0.11	0.06	3.43	
51.00	Appurtenance(s)	1612.6	0.85	-0.12	0.07	13.55	
55.00		317.23	0.99	-0.11	0.13	4.75	
55.44	Appurtenance(s)	1672.0	1.01	-0.11	0.13	27.28	
60.00		342.59	1.18	-0.02	0.24	13.31	
64.00	Appurtenance(s)	3196.0	1.34	0.18	0.37	232.26	
65.00		69.13	1.38	0.25	0.41	5.76	
67.06	Appurtenance(s)	539.61	1.47	0.43	0.51	58.26	
70.00		192.75	1.60	0.79	0.67	28.87	
74.00	Appurtenance(s)	2221.0	1.79	1.50	0.96	487.26	
75.00	Appurtenance(s)	540.28	1.84	1.73	1.05	129.17	
75.45	Appurtenance(s)	416.83	1.86	1.84	1.09	103.49	
76.00		32.55	1.89	1.98	1.14	8.46	
Totals:		18,217.0				1,266.5	Total Wind: 32,647.5

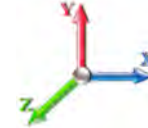
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E							Iterations 15
Gust Response Factor	1.10			Sds	0.19	Ss	0.18
Dead Load Factor	0.90	Seismic Load Factor	1.00	Sd1	0.10	S1	0.06
Wind Load Factor	0.00	Structure Frequency (f1)	0.81	SA	0.08	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	-18.18	-1.27	0.00	-83.31	0.00	83.31	2976.77	1488.39	5655.61	2832.01	0.00	0.00	0.00	0.036
5.00	-17.35	-1.26	0.00	-76.98	0.00	76.98	2914.38	1457.19	5339.22	2673.58	0.01	-0.01	0.035	
10.00	-16.56	-1.25	0.00	-70.69	0.00	70.69	2848.80	1424.40	5025.69	2516.58	0.02	-0.02	0.034	
15.00	-15.78	-1.23	0.00	-64.46	0.00	64.46	2780.04	1390.02	4715.67	2361.34	0.04	-0.03	0.033	
20.00	-15.03	-1.22	0.00	-58.30	0.00	58.30	2708.10	1354.05	4409.79	2208.17	0.08	-0.04	0.032	
22.75	-14.63	-1.21	0.00	-54.95	0.00	54.95	2667.17	1333.59	4243.56	2124.93	0.10	-0.04	0.031	
25.00	-14.10	-1.19	0.00	-52.24	0.00	52.24	2632.97	1316.49	4108.71	2057.41	0.13	-0.05	0.031	
28.25	-13.34	-1.17	0.00	-48.36	0.00	48.36	1920.92	960.46	2962.45	1483.43	0.16	-0.06	0.040	
30.00	-13.13	-1.17	0.00	-46.31	0.00	46.31	1904.07	952.03	2891.21	1447.76	0.18	-0.06	0.039	
35.00	-12.56	-1.16	0.00	-40.47	0.00	40.47	1853.76	926.88	2688.99	1346.49	0.25	-0.07	0.037	
40.00	-12.01	-1.15	0.00	-34.69	0.00	34.69	1800.28	900.14	2489.19	1246.45	0.33	-0.08	0.035	
42.31	-11.27	-1.14	0.00	-32.03	0.00	32.03	1774.49	887.25	2397.88	1200.72	0.37	-0.09	0.033	
45.00	-10.99	-1.13	0.00	-28.98	0.00	28.98	1743.61	871.80	2292.47	1147.94	0.43	-0.10	0.032	
50.00	-10.48	-1.13	0.00	-23.30	0.00	23.30	1683.75	841.88	2099.47	1051.30	0.53	-0.11	0.028	
51.00	-9.00	-1.12	0.00	-22.17	0.00	22.17	1671.40	835.70	2061.38	1032.22	0.56	-0.11	0.027	
55.00	-8.61	-1.11	0.00	-17.71	0.00	17.71	1620.72	810.36	1910.85	956.84	0.65	-0.12	0.024	
55.44	-7.09	-1.08	0.00	-17.22	0.00	17.22	1615.02	807.51	1894.48	948.65	0.66	-0.12	0.023	
60.00	-6.67	-1.07	0.00	-12.29	0.00	12.29	1554.50	777.25	1727.25	864.91	0.78	-0.13	0.018	
64.00	-3.69	-0.83	0.00	-8.01	0.00	8.01	1499.23	749.61	1584.42	793.39	0.89	-0.13	0.013	
65.00	-3.62	-0.82	0.00	-7.18	0.00	7.18	1485.09	742.54	1549.31	775.81	0.92	-0.13	0.012	
67.06	-3.12	-0.76	0.00	-5.49	0.00	5.49	1455.57	727.78	1477.81	740.00	0.98	-0.14	0.010	
70.00	-2.92	-0.74	0.00	-3.24	0.00	3.24	1403.00	701.50	1368.43	685.23	1.06	-0.14	0.007	
74.00	-0.90	-0.24	0.00	-0.30	0.00	0.30	1325.69	662.84	1221.03	611.42	1.18	-0.14	0.001	
75.00	-0.40	-0.11	0.00	-0.06	0.00	0.06	1306.36	653.18	1185.50	593.63	1.21	-0.14	0.000	
75.45	-0.03	-0.01	0.00	0.00	0.00	0.00	1297.66	648.83	1169.68	585.71	1.22	-0.14	0.000	
76.00	0.00	-0.01	0.00	0.00	0.00	0.00	1287.03	643.52	1150.48	576.10	1.24	-0.14	0.000	

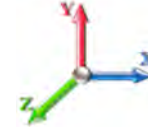
Wind Loading - Shaft

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 24



Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 16

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	217.66	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	209.99	0.650	0.000	5.00	19.327	12.56	102.8	0.0	765.6
10.00		1.00	0.85	7.442	8.19	202.31	0.650	0.000	5.00	18.634	12.11	99.1	0.0	737.9
15.00		1.00	0.85	7.442	8.19	194.64	0.650	0.000	5.00	17.940	11.66	95.5	0.0	710.3
20.00		1.00	0.90	7.896	8.69	192.59	0.650	0.000	5.00	17.246	11.21	97.4	0.0	682.6
22.75	Bot - Section 2	1.00	0.93	8.113	8.92	190.81	0.650	0.000	2.75	9.190	5.97	53.3	0.0	363.6
25.00		1.00	0.95	8.276	9.10	189.07	0.650	0.000	2.25	7.458	4.85	44.1	0.0	527.7
28.25	Top - Section 1	1.00	0.97	8.492	9.34	186.19	0.650	0.000	3.25	10.525	6.84	63.9	0.0	744.5
30.00		1.00	0.98	8.600	9.46	187.00	0.650	0.000	1.75	5.546	3.60	34.1	0.0	175.8
35.00		1.00	1.01	8.883	9.77	181.68	0.650	0.000	5.00	15.377	10.00	97.7	0.0	487.3
40.00		1.00	1.04	9.137	10.05	175.75	0.650	0.000	5.00	14.684	9.54	95.9	0.0	465.1
42.31	Appurtenance(s)	1.00	1.06	9.245	10.17	172.84	0.650	0.000	2.31	6.550	4.26	43.3	0.0	207.4
45.00		1.00	1.07	9.366	10.30	169.33	0.650	0.000	2.69	7.440	4.84	49.8	0.0	235.6
50.00		1.00	1.09	9.576	10.53	162.52	0.650	0.000	5.00	13.296	8.64	91.0	0.0	420.9
51.00	Appurtenance(s)	1.00	1.10	9.616	10.58	161.11	0.650	0.000	1.00	2.576	1.67	17.7	0.0	81.5
55.00		1.00	1.12	9.770	10.75	155.36	0.650	0.000	4.00	10.027	6.52	70.0	0.0	317.2
55.44	Appurtenance(s)	1.00	1.12	9.787	10.77	154.72	0.650	0.000	0.44	1.076	0.70	7.5	0.0	34.0
60.00		1.00	1.14	9.951	10.95	147.92	0.650	0.000	4.56	10.833	7.04	77.1	0.0	342.6
64.00	Appurtenance(s)	1.00	1.15	10.087	11.10	141.78	0.650	0.000	4.00	9.028	5.87	65.1	0.0	285.4
65.00		1.00	1.16	10.120	11.13	140.22	0.650	0.000	1.00	2.188	1.42	15.8	0.0	69.1
67.06	Appurtenance(s)	1.00	1.16	10.187	11.21	136.99	0.650	0.000	2.06	4.419	2.87	32.2	0.0	139.6
70.00		1.00	1.17	10.279	11.31	132.30	0.650	0.000	2.94	6.103	3.97	44.9	0.0	192.7
74.00	Appurtenance(s)	1.00	1.19	10.400	11.44	125.82	0.650	0.000	4.00	7.918	5.15	58.9	0.0	250.0
75.00	Appurtenance(s)	1.00	1.19	10.430	11.47	124.18	0.650	0.000	1.00	1.910	1.24	14.2	0.0	60.3
75.45	Appurtenance(s)	1.00	1.19	10.443	11.49	123.44	0.650	0.000	0.45	0.851	0.55	6.4	0.0	26.8
76.00		1.00	1.19	10.459	11.50	122.54	0.650	0.000	0.55	1.032	0.67	7.7	0.0	32.6
Totals:									76.00			1,385.6		8,356.2

Discrete Appurtenance Forces

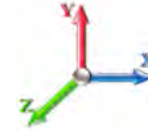
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 16

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor 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	75.45	4' Branches	1	10.443	11.487	1.00	1.00	36.86	390.00	0.000	0.000	423.41	0.00	0.00
2	75.00	T-Arms	3	10.430	11.473	0.56	0.75	13.50	480.00	0.000	0.000	154.88	0.00	0.00
3	74.00	Antenna Branches	1	10.400	11.440	1.00	1.00	22.43	96.00	0.000	0.000	256.60	0.00	0.00
4	74.00	AIR6449 B41	3	10.400	11.440	0.57	0.80	9.63	309.00	0.000	0.000	110.14	0.00	0.00
5	74.00	RRUS 4415 B25	3	10.400	11.440	0.54	0.80	2.64	138.00	0.000	0.000	30.17	0.00	0.00
6	74.00	Ericsson 4415 B66A	3	10.400	11.440	0.54	0.80	2.99	148.80	0.000	0.000	34.22	0.00	0.00
7	74.00	(Handrail Kit w/end	1	10.400	11.440	1.00	1.00	6.75	261.72	0.000	0.000	77.22	0.00	0.00
8	74.00	RFS	3	10.400	11.440	0.56	0.80	34.00	384.00	0.000	0.000	389.00	0.00	0.00
9	74.00	Air 32	3	10.400	11.440	0.70	0.80	13.59	396.60	0.000	0.000	155.50	0.00	0.00
10	74.00	ATM200-A20	6	10.400	11.440	0.40	0.80	0.29	3.00	0.000	0.000	3.29	0.00	0.00
11	74.00	Radio 4449 B71+B85	3	10.400	11.440	0.54	0.80	3.17	213.00	0.000	0.000	36.24	0.00	0.00
12	74.00	Commscope	3	10.400	11.440	0.54	0.80	1.16	21.00	0.000	0.000	13.24	0.00	0.00
13	67.06	6' Branches	1	10.187	11.205	1.00	1.00	83.63	400.00	0.000	0.000	937.11	0.00	0.00
14	64.00	B5/B13 RRH-BR04C	3	10.087	11.096	0.54	0.80	3.57	210.90	0.000	0.000	39.61	0.00	0.00
15	64.00	B2/B66A RRH-BR049	3	10.087	11.096	0.54	0.80	2.64	253.20	0.000	0.000	29.26	0.00	0.00
16	64.00	CBC78T-DS-43-2X/E14F0	3	10.087	11.096	0.54	0.80	0.59	65.40	0.000	0.000	6.60	0.00	0.00
17	64.00	DB-T1-6Z-8AB-0Z	2	10.087	11.096	0.54	0.80	3.54	88.00	0.000	0.000	39.25	0.00	0.00
18	64.00	T-Arm	3	10.087	11.096	0.56	0.75	13.50	960.00	0.000	0.000	149.79	0.00	0.00
19	64.00	DB846F65ZAXY	4	10.087	11.096	0.74	0.80	20.98	84.00	0.000	0.000	232.80	0.00	0.00
20	64.00	DB846H80E-SX	2	10.087	11.096	0.90	0.80	8.98	32.00	0.000	0.000	99.62	0.00	0.00
21	64.00	BSAMNT-SBS-1-2	3	10.087	11.096	0.56	0.75	0.00	76.05	0.000	0.000	0.00	0.00	0.00
22	64.00	JAHH-65B-R3B	6	10.087	11.096	0.66	0.80	36.29	379.80	0.000	0.000	402.71	0.00	0.00
23	64.00	VZS01	3	10.087	11.096	0.55	0.80	7.12	261.30	0.000	0.000	79.01	0.00	0.00
24	64.00	(3) VZWSMART-SFK4	1	10.087	11.096	0.56	0.75	9.28	500.00	0.000	0.000	102.98	0.00	0.00
25	55.44	8' Branches	1	9.787	10.765	1.00	1.00	150.70	1638.00	0.000	0.000	1622.34	0.00	0.00
26	51.00	MC-K6MHDX-9-96 (3	1	9.616	10.578	0.56	0.75	11.78	899.00	0.000	0.000	124.65	0.00	0.00
27	51.00	RDIDC-9181-OF-48	1	9.616	10.578	0.80	0.80	1.61	21.90	0.000	0.000	17.01	0.00	0.00
28	51.00	TA08025-B605	3	9.616	10.578	0.54	0.80	3.15	225.00	0.000	0.000	33.34	0.00	0.00
29	51.00	TA08025-B604	3	9.616	10.578	0.54	0.80	3.15	191.70	0.000	0.000	33.34	0.00	0.00
30	51.00	MX08FRO665-21	3	9.616	10.578	0.59	0.80	22.18	193.50	0.000	0.000	234.64	0.00	0.00
31	42.31	10' Branches	1	9.245	10.170	1.00	1.00	54.43	540.00	0.000	0.000	553.55	0.00	0.00

Totals: 9,860.87

6,421.54

Total Applied Force Summary

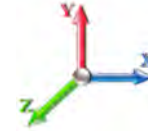
Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 16

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		102.84	914.58	0.00	0.00
10.00		99.15	886.92	0.00	0.00
15.00		95.46	859.26	0.00	0.00
20.00		97.37	831.59	0.00	0.00
22.75		53.31	445.58	0.00	0.00
25.00		44.13	594.80	0.00	0.00
28.25		63.90	841.35	0.00	0.00
30.00		34.10	227.92	0.00	0.00
35.00		97.67	636.28	0.00	0.00
40.00		95.92	614.14	0.00	0.00
42.31	(1) attachments	596.84	816.26	0.00	0.00
45.00		49.83	315.75	0.00	0.00
50.00		91.04	569.88	0.00	0.00
51.00	(11) attachments	460.69	1642.42	0.00	0.00
55.00		70.04	432.43	0.00	0.00
55.44	(1) attachments	1629.87	1684.70	0.00	0.00
60.00		77.08	473.92	0.00	0.00
64.00	(33) attachments	1246.75	3311.21	0.00	0.00
65.00		15.83	77.01	0.00	0.00
67.06	(1) attachments	969.29	555.85	0.00	0.00
70.00		44.85	215.91	0.00	0.00
74.00	(29) attachments	1164.52	2252.59	0.00	0.00
75.00	(3) attachments	169.12	548.16	0.00	0.00
75.45	(1) attachments	429.76	416.83	0.00	0.00
76.00		7.72	32.55	0.00	0.00
	Totals:	7,807.09	20,197.92	0.00	0.00

Calculated Forces

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

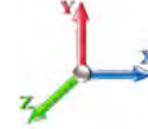


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Load Case: 1.0D + 1.0W 60 mph Wind

Iterations 16

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	-20.19	-7.82	0.00	-457.41	0.00	457.41	2976.77	1488.39	5655.61	2832.01	0.00	0.000	0.000	0.168
5.00	-19.27	-7.73	0.00	-418.34	0.00	418.34	2914.38	1457.19	5339.22	2673.58	0.03	-0.050	0.000	0.163
10.00	-18.38	-7.65	0.00	-379.69	0.00	379.69	2848.80	1424.40	5025.69	2516.58	0.11	-0.102	0.000	0.157
15.00	-17.51	-7.56	0.00	-341.46	0.00	341.46	2780.04	1390.02	4715.67	2361.34	0.24	-0.153	0.000	0.151
20.00	-16.68	-7.48	0.00	-303.64	0.00	303.64	2708.10	1354.05	4409.79	2208.17	0.43	-0.206	0.000	0.144
22.75	-16.23	-7.43	0.00	-283.08	0.00	283.08	2667.17	1333.59	4243.56	2124.93	0.56	-0.235	0.000	0.139
25.00	-15.63	-7.39	0.00	-266.37	0.00	266.37	2632.97	1316.49	4108.71	2057.41	0.68	-0.259	0.000	0.135
28.25	-14.79	-7.33	0.00	-242.35	0.00	242.35	1920.92	960.46	2962.45	1483.43	0.87	-0.293	0.000	0.171
30.00	-14.55	-7.30	0.00	-229.53	0.00	229.53	1904.07	952.03	2891.21	1447.76	0.98	-0.312	0.000	0.166
35.00	-13.91	-7.22	0.00	-193.01	0.00	193.01	1853.76	926.88	2688.99	1346.49	1.34	-0.372	0.000	0.151
40.00	-13.29	-7.13	0.00	-156.93	0.00	156.93	1800.28	900.14	2489.19	1246.45	1.76	-0.428	0.000	0.133
42.31	-12.48	-6.53	0.00	-140.47	0.00	140.47	1774.49	887.25	2397.88	1200.72	1.97	-0.454	0.000	0.124
45.00	-12.16	-6.48	0.00	-122.91	0.00	122.91	1743.61	871.80	2292.47	1147.94	2.24	-0.482	0.000	0.114
50.00	-11.58	-6.39	0.00	-90.49	0.00	90.49	1683.75	841.88	2099.47	1051.30	2.77	-0.528	0.000	0.093
51.00	-9.94	-5.92	0.00	-84.10	0.00	84.10	1671.40	835.70	2061.38	1032.22	2.88	-0.537	0.000	0.087
55.00	-9.51	-5.85	0.00	-60.42	0.00	60.42	1620.72	810.36	1910.85	956.84	3.34	-0.567	0.000	0.069
55.44	-7.84	-4.20	0.00	-57.84	0.00	57.84	1615.02	807.51	1894.48	948.65	3.40	-0.571	0.000	0.066
60.00	-7.37	-4.13	0.00	-38.67	0.00	38.67	1554.50	777.25	1727.25	864.91	3.95	-0.597	0.000	0.049
64.00	-4.07	-2.84	0.00	-22.17	0.00	22.17	1499.23	749.61	1584.42	793.39	4.46	-0.615	0.000	0.031
65.00	-3.99	-2.83	0.00	-19.32	0.00	19.32	1485.09	742.54	1549.31	775.81	4.59	-0.618	0.000	0.028
67.06	-3.45	-1.85	0.00	-13.50	0.00	13.50	1455.57	727.78	1477.81	740.00	4.86	-0.624	0.000	0.021
70.00	-3.23	-1.81	0.00	-8.05	0.00	8.05	1403.00	701.50	1368.43	685.23	5.25	-0.630	0.000	0.014
74.00	-0.99	-0.62	0.00	-0.82	0.00	0.82	1325.69	662.84	1221.03	611.42	5.78	-0.634	0.000	0.002
75.00	-0.44	-0.44	0.00	-0.20	0.00	0.20	1306.36	653.18	1185.50	593.63	5.91	-0.634	0.000	0.001
75.45	-0.03	-0.01	0.00	0.00	0.00	0.00	1297.66	648.83	1169.68	585.71	5.97	-0.634	0.000	0.000
76.00	0.00	-0.01	0.00	0.00	0.00	0.00	1287.03	643.52	1150.48	576.10	6.04	-0.634	0.000	0.000

Final Analysis Summary

Structure: CT46122-A-SBA	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 28



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	32.7	0.00	24.17	0.00	0.00	1916.52
0.9D + 1.6W 97 mph Wind	32.7	0.00	18.12	0.00	0.00	1910.19
1.2D + 1.0Di + 1.0Wi 50 mph Wind	9.6	0.00	47.99	0.00	0.00	562.03
1.2D + 1.0E	1.3	0.00	24.24	0.00	0.00	83.61
0.9D + 1.0E	1.3	0.00	18.18	0.00	0.00	83.31
1.0D + 1.0W 60 mph Wind	7.8	0.00	20.19	0.00	0.00	457.41

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 97 mph Wind	-17.11	-30.71	0.00	-1016.1	0.00	-1016.1	1920.92	960.46	2962.45	1483.43	28.25	0.695
0.9D + 1.6W 97 mph Wind	-12.67	-30.61	0.00	-1011.3	0.00	-1011.3	1920.92	960.46	2962.45	1483.43	28.25	0.689
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-38.69	-9.03	0.00	-297.65	0.00	-297.65	1920.92	960.46	2962.45	1483.43	28.25	0.221
1.2D + 1.0E	-17.79	-1.18	0.00	-48.59	0.00	-48.59	1920.92	960.46	2962.45	1483.43	28.25	0.042
0.9D + 1.0E	-13.34	-1.17	0.00	-48.36	0.00	-48.36	1920.92	960.46	2962.45	1483.43	28.25	0.040
1.0D + 1.0W 60 mph Wind	-14.79	-7.33	0.00	-242.35	0.00	-242.35	1920.92	960.46	2962.45	1483.43	28.25	0.171

Base Plate Summary

Structure: CT46122-A-SB	Code: EIA/TIA-222-G	6/3/2021
Site Name: Middletown North	Exposure: C	
Height: 76.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 29



Reactions	Base Plate	Anchor Bolts
Original Design	Yield (ksi): 60.00	Bolt Circle: 54.00
Moment (kip-ft): 2800.00	Width (in): 60.00	Number Bolts: 10.00
Axial (kip): 27.00	Style: Round	Bolt Type: 2.25" 18J
Shear (kip): 52.00	Polygon Sides: 0.00	Bolt Diameter (in): 2.25
Analysis (1.2D + 1.6W)	Clip Length (in): 0.00	Yield (ksi): 75.00
Moment (kip-ft): 1916.52	Effective Len (in): 29.11	Ultimate (ksi): 100.00
Axial (kip): 24.17	Moment (kip-in): 656.84	Arrangement: Radial
Shear (kip): 32.69	Allow Stress (ksi): 81.00	Cluster Dist (in): 0.00
	Applied Stress (ksi): 34.02	Start Angle (deg): 0.00
	Stress Ratio: 0.42	Compression
		Force (kip): 175.16
		Allowable (kip): 260.00
		Ratio: 0.70
		Tension
		Force (kip): 165.56
		Allowable (kip): 260.00
		Ratio: 0.66

EXHIBIT 9

Antenna Mount Analysis



May 31, 2021

Sherri Knapik
SBA Communications Corporation
134 Flanders Road, Suite 125
Westborough, MA 01581
(508) 251-0720 x 3805

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
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Subject: Appurtenance Mount Analysis Report

Carrier Designation: *Dish Wireless Co-Locate*
Site Number: BOBDL00133A

SBA Network Services Designation: **Site Number:** CT46122-A
Site Name: Middletown North
Application Number: 153540, v2

Engineering Firm Designation: **B+T Group Project Number:** 149482.004.01

Site Data: **160 West Street, Cromwell, CT, 06416, Middlesex County**
Latitude 41.60600°, Longitude -72.67038°
Monopole
7 ft. T-Arm Mount

Dear Ms. Knapik,

B+T Group is pleased to submit this “**Appurtenance Mount Analysis Report**” to determine the structural integrity of the antenna mount on the above-mentioned structure.

The purpose of the analysis is to determine acceptability of the mount’s stress level. Based on our analysis we have determined the stress level for the mount under the following load case to be:

Proposed Equipment
Note: See Table 1 for the final loading configuration

Sufficient Capacity
(Passing at 60.5%)

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with topographic factor 1 and Risk Category II were used in this analysis.

All the equipment proposed in this report shall be installed in accordance with the drawings for the determined available structural capacity to be effective.

We at B+T Group appreciate the opportunity of providing our continuing professional services to you and SBA Communications Corporation. If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by: Anne Delice

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2022

Chad E. Tuttle, P.E.

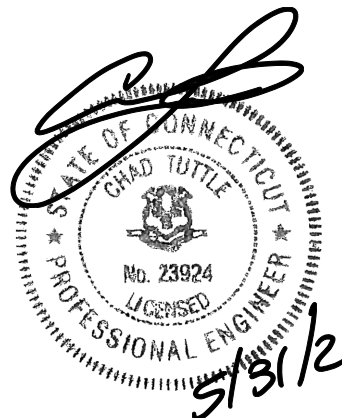


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Additional Calculations

1) INTRODUCTION

The appurtenance mount consists of Commscope T-Arm mounts, Part# MC-K6MHDX-9-96 at 51 ft., attached to monopole at 160 West Street, Cromwell, CT, 06416, Middlesex County. The proposed antenna loading information was obtained from SBA Communications Corporation. All information provided to B+T Group was assumed accurate and complete.

2) ANALYSIS CRITERIA

The structural analysis was performed for this mount in accordance with the ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures using a 3-second gust wind speed of 97 mph with no ice and 50 mph with 1 inch escalated ice thickness. Exposure Category C, Topographic Category 1 and Risk Category II were used in this analysis. In addition, the T-Arm mount has been analyzed for various live loading conditions consisting of a 250-lb man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust of 30 mph. The mount was analyzed under 30° increments in the wind direction. The analyzed loading is detailed in Table 1.

Table 1 – Proposed Equipment Information

Loading	RAD Center Elev. (ft.)	Position	Qty.	Description	Note
Proposed	51	1	3	JMA MX08FRO665-21	1
			3	Fujitsu TA08025-B605	2
			3	Fujitsu TA08025-B604	
		-	1	Raycap RDIDC-9181-PF-48	3

Note:

- (1) Proposed Antenna to be installed on the proposed Mount Pipe.
- (2) Proposed Equipment to be installed side by side with RRU support directly behind the Antenna.
- (3) Proposed Equipment to be installed on the mount.

Table 2 – Documents Provided

Documents	Remarks	Reference	Source
RFDS	Proposed Loading	Date: 03/28/2021	SBA Communications Corporation
SBA Application		Date: 05/21/2021	
CD's		Date: 05/20/2021	
Previous MA	B+T Group	Date: 05/13/2021	On File

3) ANALYSIS PROCEDURE

3.1) Analysis Method

RISA-3D (Version 19.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses and deflections for various loading cases. Selected output from the analysis is included in Appendix A.

Manufacturers drawing were used to create the model.

3.2) Assumptions

1. The mount was built in accordance with the manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. The configuration of antennas and other appurtenances are as specified in Table 1.

4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.

The following assumptions have been included in the analysis of the mount:

Component	Section	Length	Note
Raycap Pipe	2" Std. Pipe	4'-0"	Support Arm

6. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
7. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
8. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
9. The following material grades were assumed (Unless Noted Otherwise):
 - a) Connection Bolts : ASTM A325
 - b) Steel Pipe : ASTM A53 (GR. 35)
 - c) HSS (Round) : ASTM 500 (GR. B-42)
 - d) HSS (Rectangular) : ASTM 500 (GR. B-46)
 - e) Channel : ASTM A36 (GR. 36)
 - f) Steel Solid Rod : ASTM A36 (GR. 36)
 - g) Steel Plate : ASTM A36 (GR. 36)
 - h) Steel Angle : ASTM A36 (GR. 36)
 - i) UNISTRUT : ASTM A570 (GR. 33)

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 – Mount Component Stresses vs. Capacity

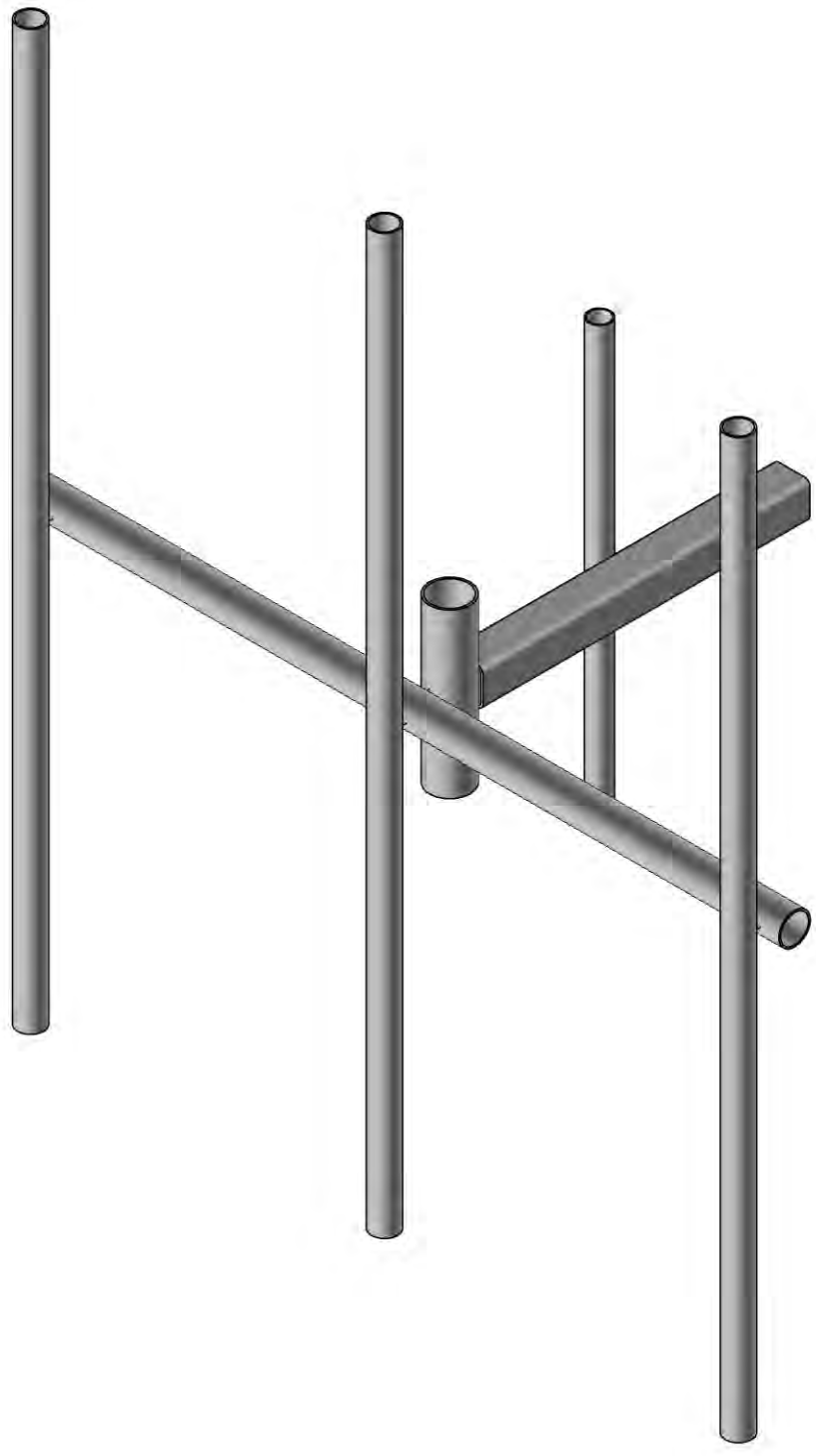
Notes	Component	Elevation (ft.)	% Capacity	Pass / Fail
-	Main Horizontals	51	60.5	Pass
-	Support Tubes	51	40.4	Pass
-	Mount Pipes	51	27.6	Pass
-	Connection Bolts	-	49.2	Pass

5) RECOMMENDATIONS

The Commscope T-Arm mounts, Part# MC-K6MHDX-9-96 has sufficient capacity to carry the proposed loads and is in compliance with the ANSI/TIA-222-G standard for the proposed loading. (Refer to the RISA output for the specific members).

APPENDIX A

(RISA-3D Output)



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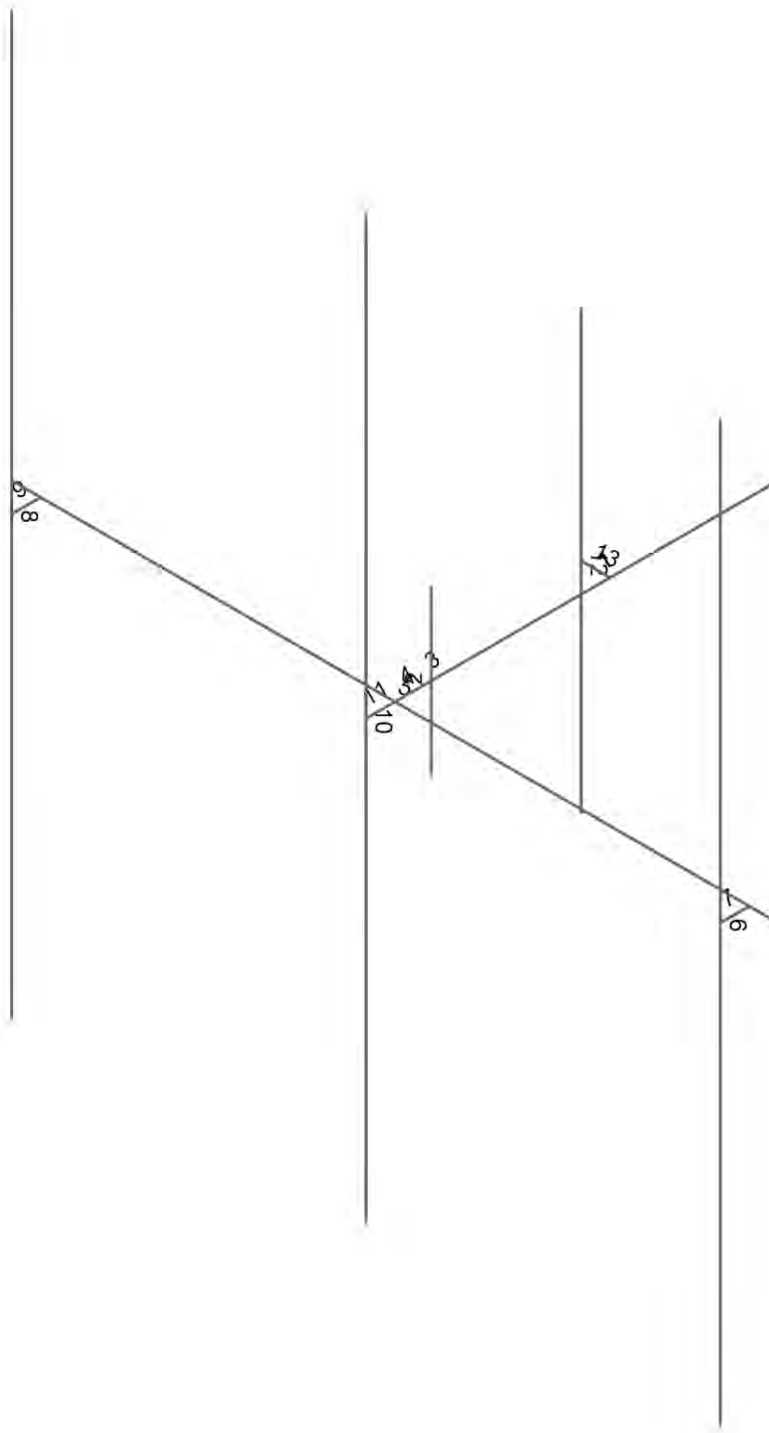
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CT46122-A - Middletown North

SK-1

May 26, 2021

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Envelope Only Solution

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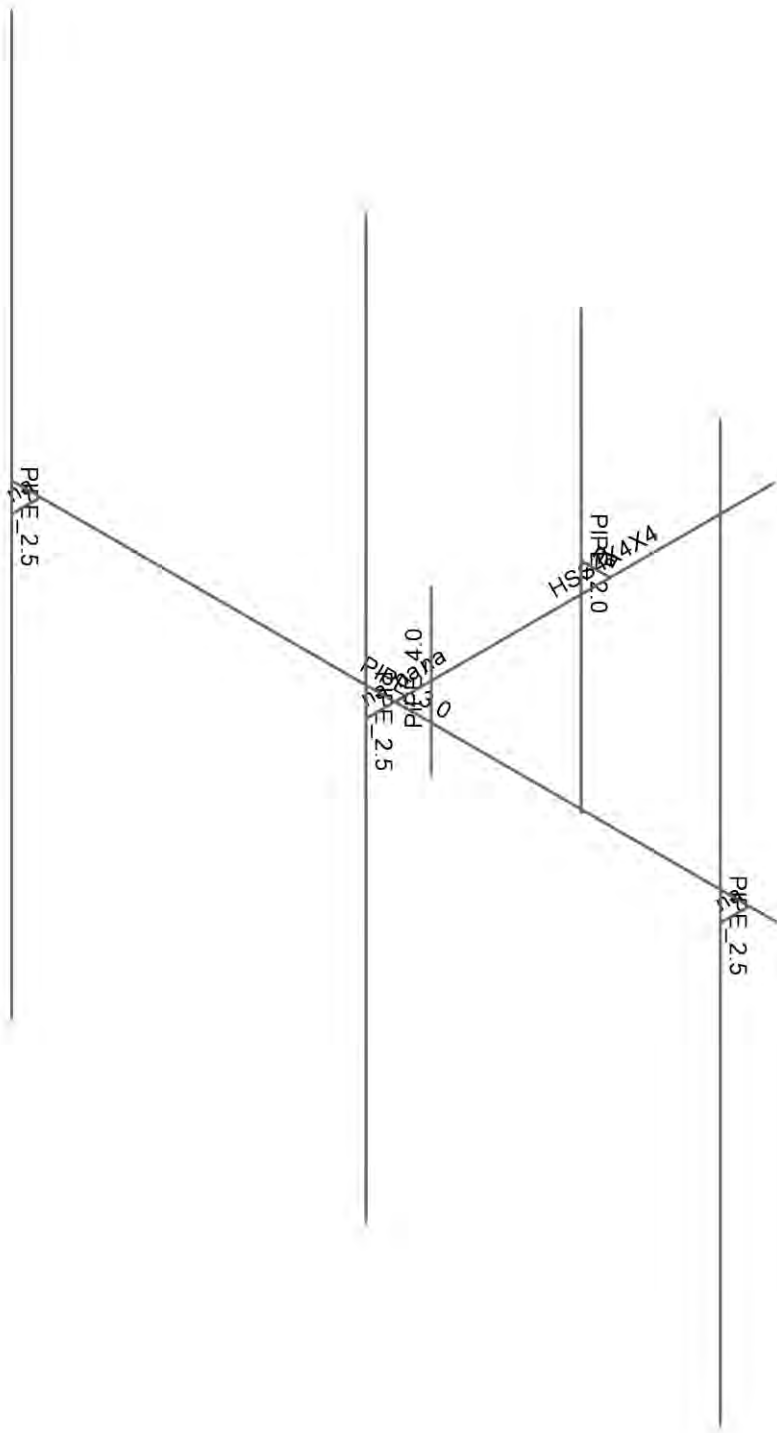
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CT46122-A - Middletown North

SK-2

May 26, 2021

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149482.004.01

CT46122-A - Middletown North

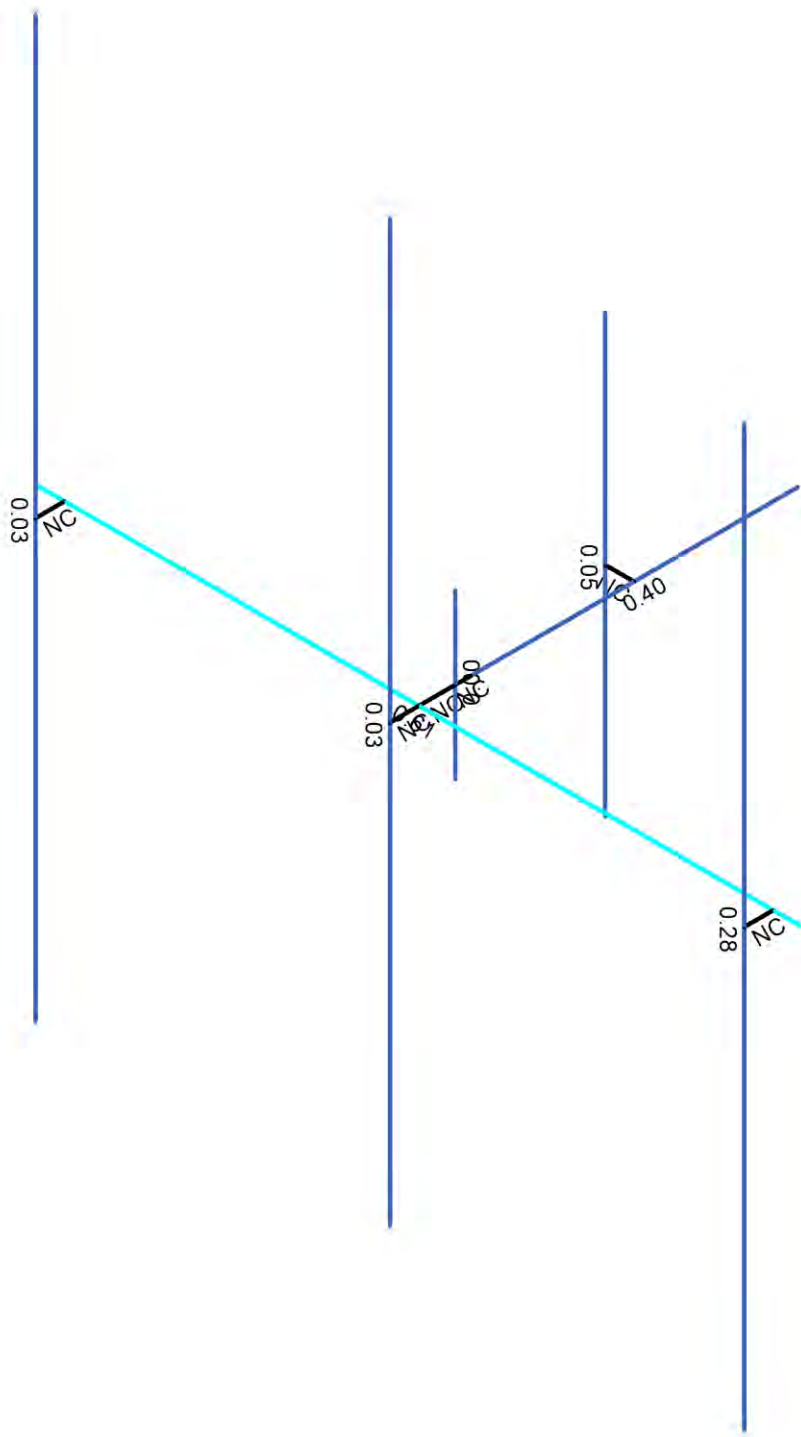
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May 26, 2021

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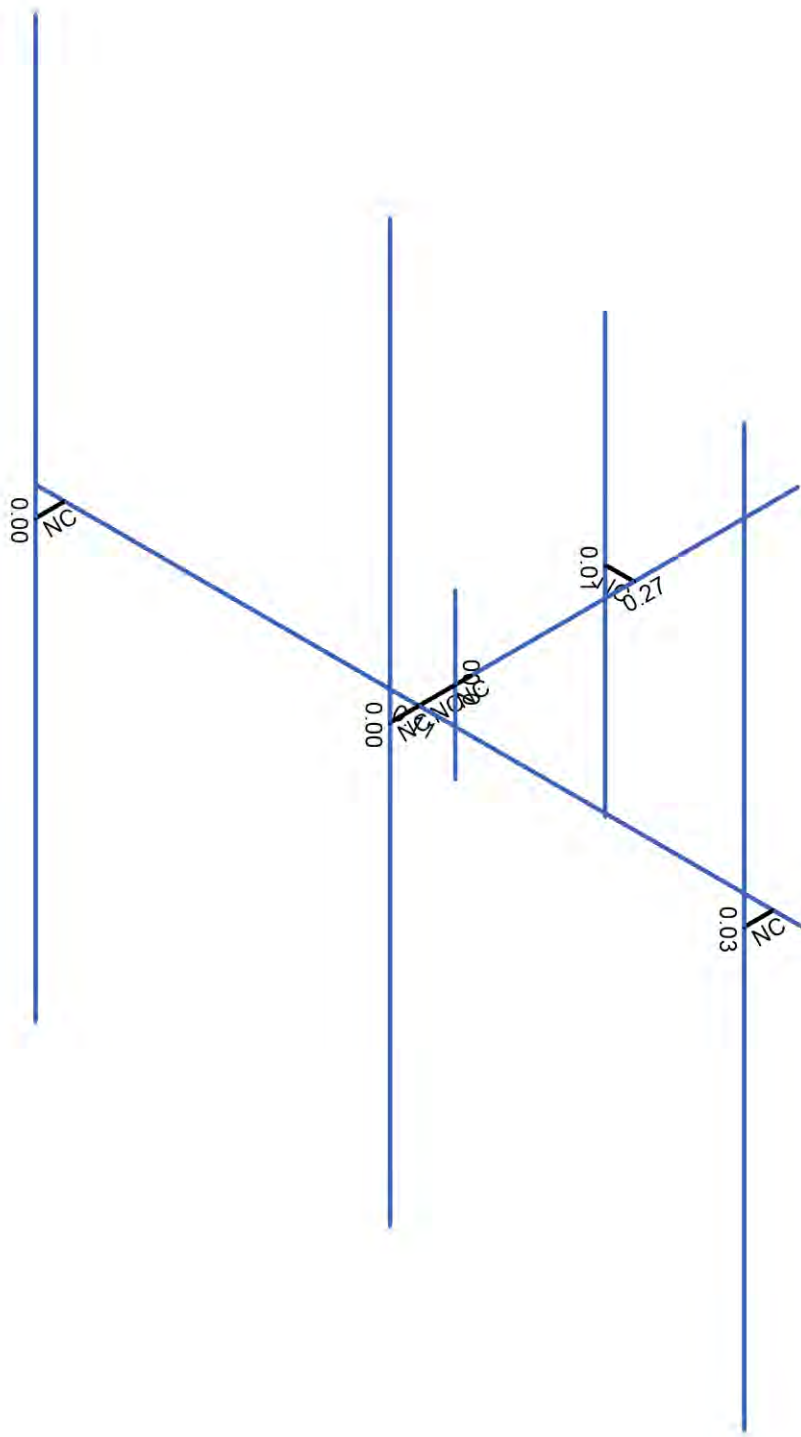
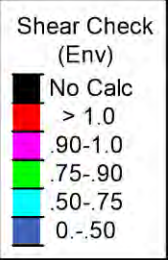


Code Check (Env)	
Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	CT46122-A - Middletown North	SK-4
KP		May 26, 2021
149482.004.01		149482_004_01_Middletown Nort...



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	CT46122-A - Middletown North	SK-5
KP		May 26, 2021
149482.004.01		149482_004_01_Middletown Nort...



Hot Rolled Steel Section Sets

Label	Shape	Type	Design List	Material	Design Rule	Area [in ²]	Iyy [in ⁴]	Izz [in ⁴]	J [in ⁴]
1 MF-H1	PIPE 3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2 SF-H1	HSS4X4X4	Beam	Tube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
3 MF-P1	PIPE 2.5	Column	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4 MF-CP	PIPE 4.0	Column	Pipe	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
5 MF-P2	PIPE 2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25

Member Primary Data

Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	1	2	SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
2	2	5	MF-CP	Column	Pipe	A53 Gr.B	Typical
3	3	3	RIGID	None	None	RIGID	Typical
4	4	6	RIGID	None	None	RIGID	Typical
5	5	8	MF-H1	Beam	Pipe	A53 Gr.B	Typical
6	6	11	MF-P1	Column	Pipe	A53 Gr.B	Typical
7	7	10	RIGID	None	None	RIGID	Typical
8	8	15	MF-P1	Column	Pipe	A53 Gr.B	Typical
9	9	14	RIGID	None	None	RIGID	Typical
10	10	18	MF-P1	Column	Pipe	A53 Gr.B	Typical
11	11	17	RIGID	None	None	RIGID	Typical
12	12	22	MF-P2	Column	Pipe	A53 Gr.B	Typical
13	13	20	RIGID	None	None	RIGID	Typical

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed
1	Dead	DL	-1		10	
2	0 Wind - No Ice	WLZ			10	7
3	90 Wind - No Ice	WLX			10	7
4	0 Wind - Ice	WLZ			10	7
5	90 Wind - Ice	WLX			10	7
6	0 Wind - Service	WLZ			10	7
7	90 Wind - Service	WLX			10	7
8	Ice	OL1			10	7
9	Live Load a	LL		1		
10	Live Load b	LL		1		
11	Live Load c	LL		1		
12	Live Load d	LL				
13	Maint LL 1	LL			1	
14	Maint LL 2	LL			1	
15	Maint LL 3	LL			1	
16	Maint LL 4	LL				
17	Maint LL 5	LL				
18	Maint LL 6	LL				

Load Combinations

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4 Dead	Yes	Y	1	1.4						
2	0.9 D + 1.6 - 0 W	Yes	Y	1	0.9	2	1.6				
3	0.9 D + 1.6 - 30 W	Yes	Y	1	0.9	2	1.386	3	0.8		
4	0.9 D + 1.6 - 60 W	Yes	Y	1	0.9	3	1.386	2	0.8		
5	0.9 D + 1.6 - 90 W	Yes	Y	1	0.9	3	1.6				
6	0.9 D + 1.6 - 120 W	Yes	Y	1	0.9	3	1.386	2	-0.8		
7	0.9 D + 1.6 - 150 W	Yes	Y	1	0.9	2	-1.386	3	0.8		
8	0.9 D + 1.6 - 180 W	Yes	Y	1	0.9	2	-1.6				
9	0.9 D + 1.6 - 210 W	Yes	Y	1	0.9	2	-1.386	3	-0.8		
10	0.9 D + 1.6 - 240 W	Yes	Y	1	0.9	3	-1.386	2	-0.8		
11	0.9 D + 1.6 - 270 W	Yes	Y	1	0.9	3	-1.6				
12	0.9 D + 1.6 - 300 W	Yes	Y	1	0.9	3	-1.386	2	0.8		



Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
13	0.9 D + 1.6 - 330 W	Yes	Y	1	0.9	2	1.386	3	-0.8		
14	1.2 D + 1.6 - 0 W	Yes	Y	1	1.2	2	1.6				
15	1.2 D + 1.6 - 30 W	Yes	Y	1	1.2	2	1.386	3	0.8		
16	1.2 D + 1.6 - 60 W	Yes	Y	1	1.2	3	1.386	2	0.8		
17	1.2 D + 1.6 - 90 W	Yes	Y	1	1.2	3	1.6				
18	1.2 D + 1.6 - 120 W	Yes	Y	1	1.2	3	1.386	2	-0.8		
19	1.2 D + 1.6 - 150 W	Yes	Y	1	1.2	2	-1.386	3	0.8		
20	1.2 D + 1.6 - 180 W	Yes	Y	1	1.2	2	-1.6				
21	1.2 D + 1.6 - 210 W	Yes	Y	1	1.2	2	-1.386	3	-0.8		
22	1.2 D + 1.6 - 240 W	Yes	Y	1	1.2	3	-1.386	2	-0.8		
23	1.2 D + 1.6 - 270 W	Yes	Y	1	1.2	3	-1.6				
24	1.2 D + 1.6 - 300 W	Yes	Y	1	1.2	3	-1.386	2	0.8		
25	1.2 D + 1.6 - 330 W	Yes	Y	1	1.2	2	1.386	3	-0.8		
26	0.9 D + 1.6 - 0 W/Ice	Yes	Y	1	0.9	4	1.6			8	1
27	0.9 D + 1.6 - 30 W/Ice	Yes	Y	1	0.9	4	1.386	5	0.8	8	1
28	0.9 D + 1.6 - 60 W/Ice	Yes	Y	1	0.9	5	1.386	4	0.8	8	1
29	0.9 D + 1.6 - 90 W/Ice	Yes	Y	1	0.9	5	1.6			8	1
30	0.9 D + 1.6 - 120 W/Ice	Yes	Y	1	0.9	5	1.386	4	-0.8	8	1
31	0.9 D + 1.6 - 150 W/Ice	Yes	Y	1	0.9	4	-1.386	5	0.8	8	1
32	0.9 D + 1.6 - 180 W/Ice	Yes	Y	1	0.9	4	-1.6			8	1
33	0.9 D + 1.6 - 210 W/Ice	Yes	Y	1	0.9	4	-1.386	5	-0.8	8	1
34	0.9 D + 1.6 - 240 W/Ice	Yes	Y	1	0.9	5	-1.386	4	-0.8	8	1
35	0.9 D + 1.6 - 270 W/Ice	Yes	Y	1	0.9	5	-1.6			8	1
36	0.9 D + 1.6 - 300 W/Ice	Yes	Y	1	0.9	5	-1.386	4	0.8	8	1
37	0.9 D + 1.6 - 330 W/Ice	Yes	Y	1	0.9	4	1.386	5	-0.8	8	1
38	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8	1
39	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.866	5	0.5	8	1
40	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.866	4	0.5	8	1
41	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8	1
42	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.866	4	-0.5	8	1
43	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.866	5	0.5	8	1
44	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8	1
45	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.866	5	-0.5	8	1
46	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.866	4	-0.5	8	1
47	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8	1
48	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.866	4	0.5	8	1
49	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.866	5	-0.5	8	1
50	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			9	1.5
51	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	9	1.5
52	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	9	1.5
53	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			9	1.5
54	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	9	1.5
55	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	9	1.5
56	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y	1	1.2	6	-1			9	1.5
57	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	9	1.5
58	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	9	1.5
59	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y	1	1.2	7	-1			9	1.5
60	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	9	1.5
61	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	9	1.5
62	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			10	1.5
63	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	10	1.5
64	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	10	1.5
65	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			10	1.5
66	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	10	1.5
67	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	10	1.5
68	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y	1	1.2	6	-1			10	1.5
69	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	10	1.5
70	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	10	1.5



Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
71	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y	1	1.2	7	-1			10	1.5
72	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	10	1.5
73	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	10	1.5
74	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			11	1.5
75	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	11	1.5
76	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	11	1.5
77	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			11	1.5
78	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	11	1.5
79	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	11	1.5
80	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y	1	1.2	6	-1			11	1.5
81	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	11	1.5
82	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	11	1.5
83	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y	1	1.2	7	-1			11	1.5
84	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	11	1.5
85	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	11	1.5
86	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			12	1.5
87	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	12	1.5
88	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	12	1.5
89	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			12	1.5
90	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	12	1.5
91	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	12	1.5
92	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y	1	1.2	6	-1			12	1.5
93	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	12	1.5
94	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	12	1.5
95	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y	1	1.2	7	-1			12	1.5
96	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	12	1.5
97	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	12	1.5
98	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					13	1.5
99	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					14	1.5
100	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					15	1.5
101	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					16	1.5
102	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					17	1.5
103	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					18	1.5

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.032	%15
2	6	Y	-0.032	%85
3	6	Y	-0.075	%25
4	6	Y	-0.064	%25
5	6	Y	0	0
6	12	Y	-0.022	%25
7	12	Y	0	0
8	12	Y	0	0
9	12	Y	0	0
10	12	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Z	-0.157	%15
2	6	Z	-0.157	%85
3	6	Z	-0.03	%25
4	6	Z	-0.026	%25
5	6	Z	0	0
6	12	Z	-0.028	%25
7	12	Z	0	0
8	12	Z	0	0



Member Point Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
9	12	Z	0	0
10	12	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	X	-0.063	%15
2	6	X	-0.063	%85
3	6	X	-0.049	%25
4	6	X	-0.049	%25
5	6	X	0	0
6	12	X	-0.051	%25
7	12	X	0	0
8	12	X	0	0
9	12	X	0	0
10	12	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Z	-0.053	%15
2	6	Z	-0.053	%85
3	6	Z	-0.015	%25
4	6	Z	-0.013	%25
5	6	Z	0	0
6	12	Z	-0.014	%25
7	12	Z	0	0
8	12	Z	0	0
9	12	Z	0	0
10	12	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	X	-0.027	%15
2	6	X	-0.027	%85
3	6	X	-0.021	%25
4	6	X	-0.021	%25
5	6	X	0	0
6	12	X	-0.022	%25
7	12	X	0	0
8	12	X	0	0
9	12	X	0	0
10	12	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Z	-0.015	%15
2	6	Z	-0.015	%85
3	6	Z	-0.003	%25
4	6	Z	-0.003	%25
5	6	Z	0	0
6	12	Z	-0.003	%25
7	12	Z	0	0
8	12	Z	0	0
9	12	Z	0	0
10	12	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	X	-0.006	%15
2	6	X	-0.006	%85
3	6	X	-0.005	%25
4	6	X	-0.005	%25
5	6	X	0	0
6	12	X	-0.005	%25
7	12	X	0	0
8	12	X	0	0
9	12	X	0	0
10	12	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.181	%15
2	6	Y	-0.181	%85
3	6	Y	-0.066	%25
4	6	Y	-0.064	%25
5	6	Y	0	0
6	12	Y	-0.066	%25
7	12	Y	0	0
8	12	Y	0	0
9	12	Y	0	0
10	12	Y	0	0

Member Point Loads (BLC 13 : Maint LL 1)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	5	Y	-0.25	%5

Member Point Loads (BLC 14 : Maint LL 2)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	5	Y	-0.25	%95

Member Point Loads (BLC 15 : Maint LL 3)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	1	Y	-0.25	%5

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.012	-0.012	0	%100
2	2	Z	-0.006	-0.006	0	%100
3	5	Z	-0.009	-0.009	0	%100
4	6	Z	-0.007	-0.007	0	%100
5	8	Z	-0.007	-0.007	0	%100
6	10	Z	-0.007	-0.007	0	%100
7	12	Z	-0.005	-0.005	0	%100

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.012	-0.012	0	%100
2	2	X	-0.006	-0.006	0	%100
3	5	X	-0.009	-0.009	0	%100
4	6	X	-0.007	-0.007	0	%100
5	8	X	-0.007	-0.007	0	%100
6	10	X	-0.007	-0.007	0	%100
7	12	X	-0.005	-0.005	0	%100



Member Distributed Loads (BLC 4 : 0 Wind - Ice)

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.007	-0.007	0 %100
2	2	Z	-0.003	-0.003	0 %100
3	5	Z	-0.003	-0.003	0 %100
4	6	Z	-0.003	-0.003	0 %100
5	8	Z	-0.003	-0.003	0 %100
6	10	Z	-0.003	-0.003	0 %100
7	12	Z	-0.002	-0.002	0 %100

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.007	-0.007	0 %100
2	2	X	-0.003	-0.003	0 %100
3	5	X	-0.003	-0.003	0 %100
4	6	X	-0.003	-0.003	0 %100
5	8	X	-0.003	-0.003	0 %100
6	10	X	-0.003	-0.003	0 %100
7	12	X	-0.002	-0.002	0 %100

Member Distributed Loads (BLC 6 : 0 Wind - Service)

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.001	-0.001	0 %100
2	2	Z	-0.0005	-0.0005	0 %100
3	5	Z	-0.0004	-0.0004	0 %100
4	6	Z	-0.0003	-0.0003	0 %100
5	8	Z	-0.0003	-0.0003	0 %100
6	10	Z	-0.0003	-0.0003	0 %100
7	12	Z	-0.0003	-0.0003	0 %100

Member Distributed Loads (BLC 7 : 90 Wind - Service)

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.001	-0.001	0 %100
2	2	X	-0.0005	-0.0005	0 %100
3	5	X	-0.0004	-0.0004	0 %100
4	6	X	-0.0003	-0.0003	0 %100
5	8	X	-0.0003	-0.0003	0 %100
6	10	X	-0.0003	-0.0003	0 %100
7	12	X	-0.0003	-0.0003	0 %100

Member Distributed Loads (BLC 8 : Ice)

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Y	-0.02	-0.02	0 %100
2	2	Y	-0.017	-0.017	0 %100
3	5	Y	-0.014	-0.014	0 %100
4	6	Y	-0.013	-0.013	0 %100
5	8	Y	-0.013	-0.013	0 %100
6	10	Y	-0.013	-0.013	0 %100
7	12	Y	-0.011	-0.011	0 %100

Node Loads and Enforced Displacements (BLC 9 : Live Load a)

Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
1	13	L	Y -0.5



Node Loads and Enforced Displacements (BLC 10 : Live Load b)

Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
1 6	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 11 : Live Load c)

Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s ² /ft, k*s ² *ft)]
1 9	L	Y	-0.5

Envelope Node Reactions

Node Label	X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1 1 max	0.92	5	1.663	45	1.117	2	-1.2	2	3.567	18	3.25	83
2 min	-0.92	23	0.425	3	-1.117	8	-5.649	44	-3.562	24	-1.68	53
3 Totals: max	0.92	5	1.663	45	1.117	2						
4 min	-0.92	23	0.425	3	-1.117	8						

Envelope AISC 13TH (360-05): LRFD Member Steel Code Checks

Member	Shape	Code Check	Loc[ft]	LC	Shear	Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1 1	HSS4X4X4	0.404	3	30	0.272	3	y	83	134.359	139.518	16.181	16.181	1.522	H1-1b	
2 2	PIPE 4.0	0	0.75	22	0	0.75		22	92.571	93.24	10.631	10.631	1.561	H1-1b	
3 5	PIPE 3.0	0.605	3.5	83	0.109	3.5		44	50.161	65.205	5.749	5.749	1.569	H1-1b	
4 6	PIPE 2.5	0.276	4	20	0.025	4		20	30.038	50.715	3.596	3.596	1.485	H1-1b	
5 8	PIPE 2.5	0.026	4	21	0.003	4		21	30.038	50.715	3.596	3.596	1.562	H1-1b	
6 10	PIPE 2.5	0.026	4	22	0.003	4		22	30.038	50.715	3.596	3.596	1.562	H1-1b	
7 12	PIPE 2.0	0.053	2	23	0.01	2		23	26.521	32.13	1.872	1.872	1.848	H1-1b	

APPENDIX B

(Additional Calculations)

PROJECT	149482.004.01 - Middletown North, C1 AD		
SUBJECT	T-Arm Mount Analysis	Beta	
DATE	05/31/21	PAGE	1 OF 1



[REF: AISC 360-05]

Reactions at Bolted Connection

Tension	:	1.117	k
Vertical Shear	:	1.663	k
Horizontal Shear	:	0.92	k
Torsion	:	3.25	k.ft
Moment from Horizontal Forces	:	3.567	k.ft
Moment from Vertical Forces	:	-1.2	k.ft

Bolt Parameters

Bolt Grade	:	A307	
Bolt Diameter	:	0.625	in
Nominal Bolt Area	:	0.307	in ²
Bolt spacing, Horizontal	:	6	in
Bolt spacing, Vertical	:	6	in
Bolt edge distance, plate height	:	1	in
Bolt edge distance, plate width	:	1	in
Total Number of Bolts	:	4	bolts

Summary of Forces

Shear Resultant Force	:	1.90	k
Force from Horz. Moment	:	6.46	k
Force from Vert. Moment	:	-2.17	k
Shear Load / Bolt	:	0.48	k
Tension Load / Bolt	:	0.28	k
Resultant from Moments / Bolt	:	3.41	k

Bolt Checks

Nominal Tensile Stress, F_{nt}	:	45.00	ksi	[AISC Table J3.2]
Available Tensile Stress, ΦR_{nt}	:	10.36	k/bolt	[Eq. J3-1]
Unity Check, Bolt Tension	:	35.59%		OKAY
Nominal Shear Stress, F_{nv}	:	24.00	ksi	[AISC Table J3.2]
Available Shear Stress, ΦR_{nv}	:	5.53	k/bolt	[Eq. J3-1]
Unity Check, Bolt Shear	:	13.65%		OKAY
Unity Check, Combined	:	49.24%		OKAY
Available Bearing Strength, ΦR_n	:	18.35	k/bolt	
Unity Check, Bolt Bearing	:	2.59%		OKAY

PROJECT	149482.004.01 - Middletown North, C1 AD		
SUBJECT	T-Arm Mount Analysis		
DATE	05/31/21	PAGE	1 OF 1



B+T Group
 1717 S. Boulder, Suite 300
 Tulsa, OK 74119
 (918) 587-4630

[REF: AISC 360-05]

Connecting Member Parameters

Plate Yield Strength, F_y	:	36.00	ksi	[AISC Table 2-5]
Plate Tensile Strength, F_u	:	58.00	ksi	[AISC Table 2-5]
Plate Height	:	8.00	in	
Plate Width	:	8.00	in	
Plate Thickness	:	0.50	in	
Edge Distance	:	0.56	in	
Gross Tension Area, A_{gt}	:	4.00	in ²	
Gross Shear Area, A_{gv}	:	0.5	in ²	
Net Area for tension, A_{nt}	:	3.66	in ²	
Net Area for shear, A_{nt}	:	2.50	in ²	

Plate Check

Available Tensile Yield	:	129.60	k	[Eq. J4-1]
Available Tensile Rupture	:	159.05	k	[Eq. J4-2]
Unity Check, Plate Tension	:	2.85%		OKAY
Available Shear Yield	:	10.80	k	[Eq. J4-3]
Available Shear Rupture	:	87.00	k	[Eq. J4-4]
Unity Check, Plate Shear	:	17.60%		OKAY
Available Block Shear, ΦR_n	:	62.48	k	[Eq. J4-5]
Unity Check, Block Shear	:	3.04%		OKAY

EXHIBIT 10

Construction Drawings



DISH Wireless L.L.C. SITE ID:

BOBDL00133A

DISH Wireless L.L.C. SITE ADDRESS:

**160 WEST STREET
CROMWELL, CT 06416**

SCOPE OF WORK	
THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:	
TOWER SCOPE OF WORK:	
<ul style="list-style-type: none"> • INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) • INSTALL (1) PROPOSED TOWER PLATFORM MOUNT • INSTALL PROPOSED JUMPERS • INSTALL (6) PROPOSED RRU_s (2 PER SECTOR) • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (1) PROPOSED HYBRID CABLE 	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> • INSTALL (1) PROPOSED METAL PLATFORM • INSTALL (1) PROPOSED ICE BRIDGE • INSTALL (1) PROPOSED PPC CABINET • INSTALL (1) PROPOSED EQUIPMENT CABINET • INSTALL (1) PROPOSED POWER CONDUIT • INSTALL (1) PROPOSED TELCO CONDUIT • INSTALL (1) PROPOSED TELCO-FIBER BOX • INSTALL (1) PROPOSED GPS UNIT • INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED) • INSTALL (1) PROPOSED ZAYO CABINET (IF REQUIRED) 	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: 160 WEST STREET LLC ADDRESS: 213 COURT STREET MIDDLETOWN, CT 06457	APPLICANT: DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER TYPE: MONOPINE	TOWER OWNER: SBA COMMUNICATIIONS CORP. 8051 CONGRESS AVENUE BOCA RATON, FL 33487 (800) 487-7483
TOWER CO SITE ID: CT46122-A	SITE DESIGNER: B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
TOWER APP NUMBER: 153540	SITE ACQUISITION: JEAN COTTRELL
COUNTY: MIDDLESEX	CONSTRUCTION MANAGER: JAMIER SOTO
LATITUDE (NAD 83): 41° 36' 21.6" N 41.6060 N	RF ENGINEER: BOSSENER CHARLES
LONGITUDE (NAD 83): -72° 40' 13.4" W -72.6704 W	
ZONING JURISDICTION: TOWN OF CROMWELL	
ZONING DISTRICT: LB	
PARCEL NUMBER: 00033900	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: V-B	
POWER COMPANY: EVERSOURCE	
TELEPHONE COMPANY: AT&T	



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



8051 CONGRESS AVENUE
BOCA RATON, FL 33487



1717 S. BOULDER
SUITE 300
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PH: (918) 587-4630
www.btgrp.com



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RFDS REV #: 1

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A&E PROJECT NUMBER
149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

CONNECTICUT CODE COMPLIANCE

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

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
LS1	SITE SURVEY
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
RF-2	RF PLUMBING DIAGRAM
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

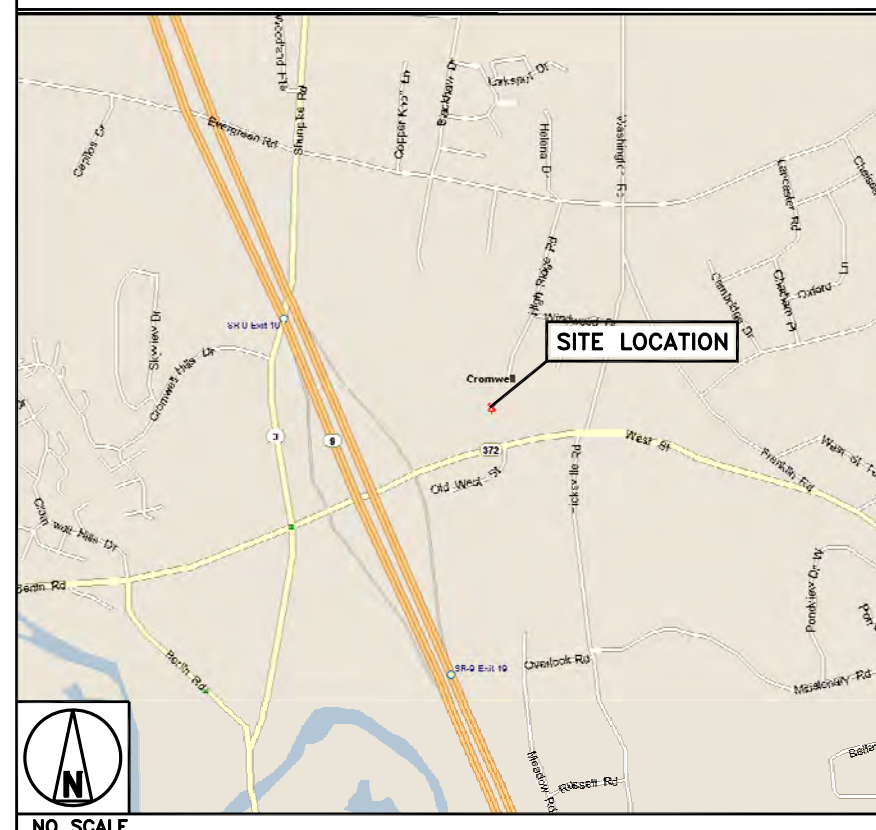
SITE PHOTO



DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:
DEPART BRADLEY INTERNATIONAL AIRPORT ON TERMINAL RD. ROAD NAME CHANGES TO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP (RIGHT) ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 22S, TAKE RAMP (LEFT) ONTO CT-9. AT EXIT 19, KEEP LEFT ONTO RAMP. TURN LEFT ONTO CT-372 [WEST ST]. TURN LEFT ONTO ACCESS ROAD AND ARRIVE AT BOBDL00133.

VICINITY MAP



UNDERGROUND SERVICE ALERT CBYD 811
UTILITY NOTIFICATION CENTER OF CONNECTICUT
(800) 922-4455
WWW.CBYD.COM
CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION



GENERAL NOTES

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

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.



NO SCALE



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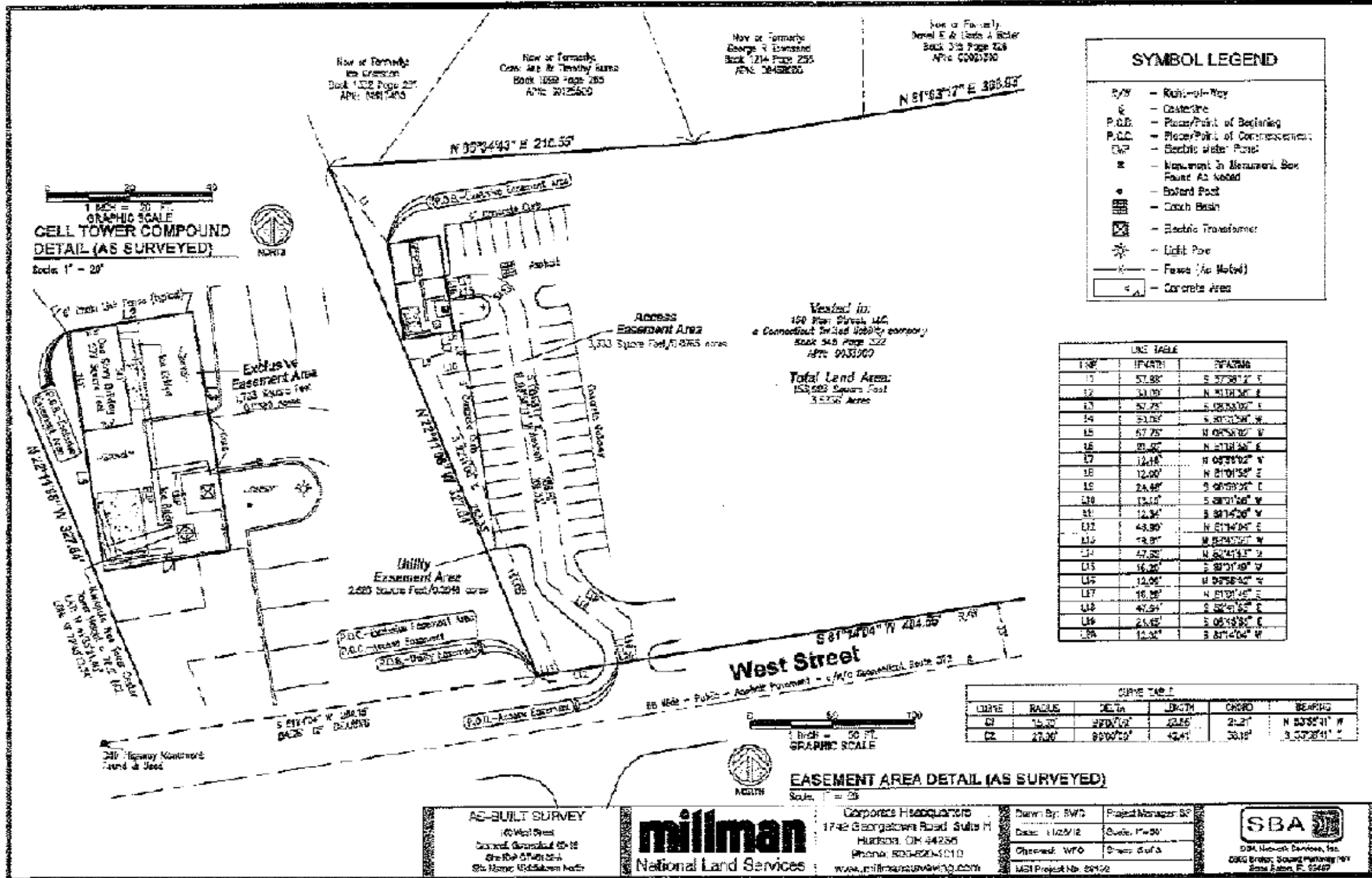
A&E PROJECT NUMBER
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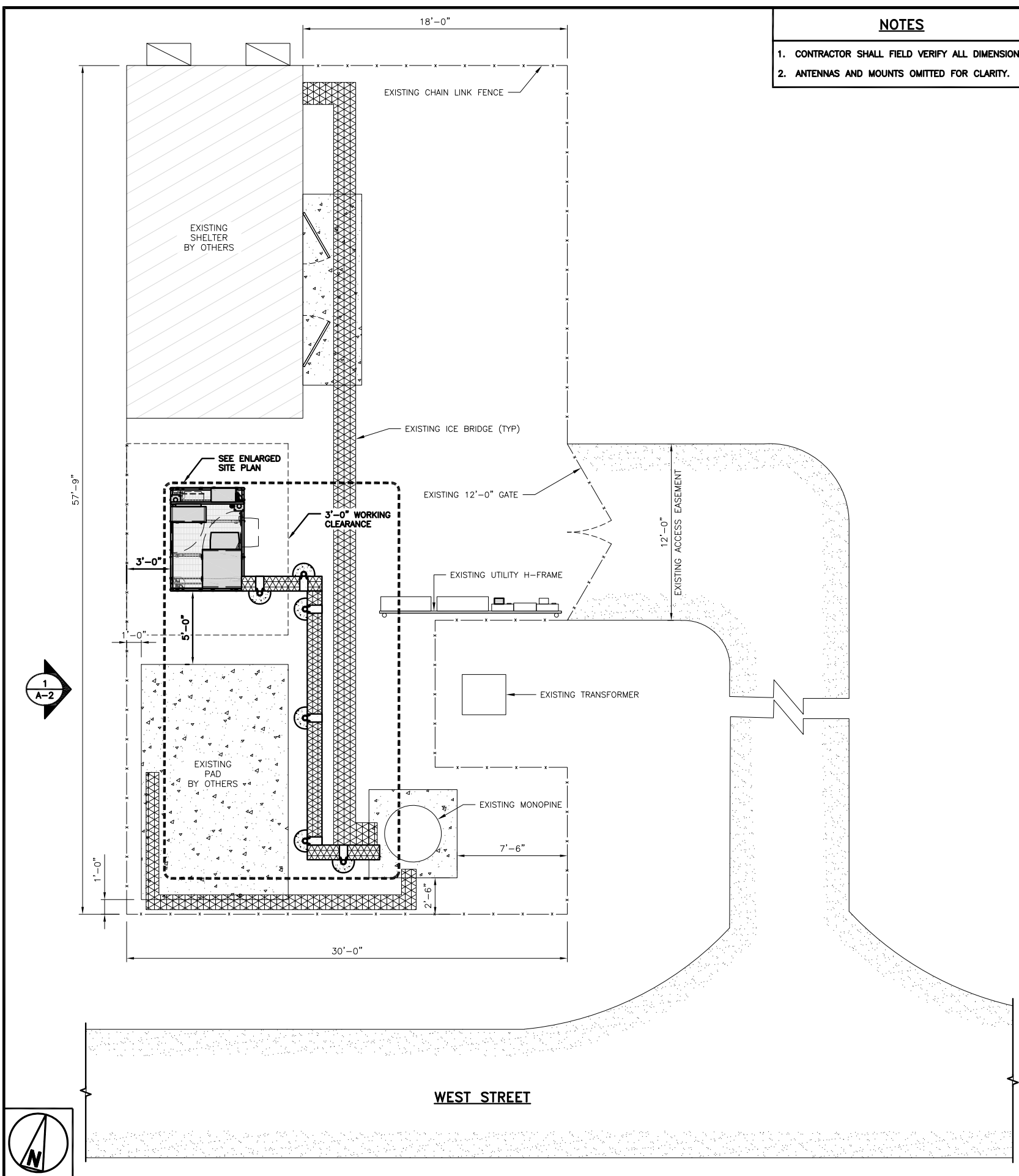
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER
A-1

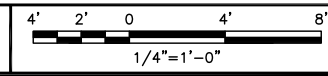




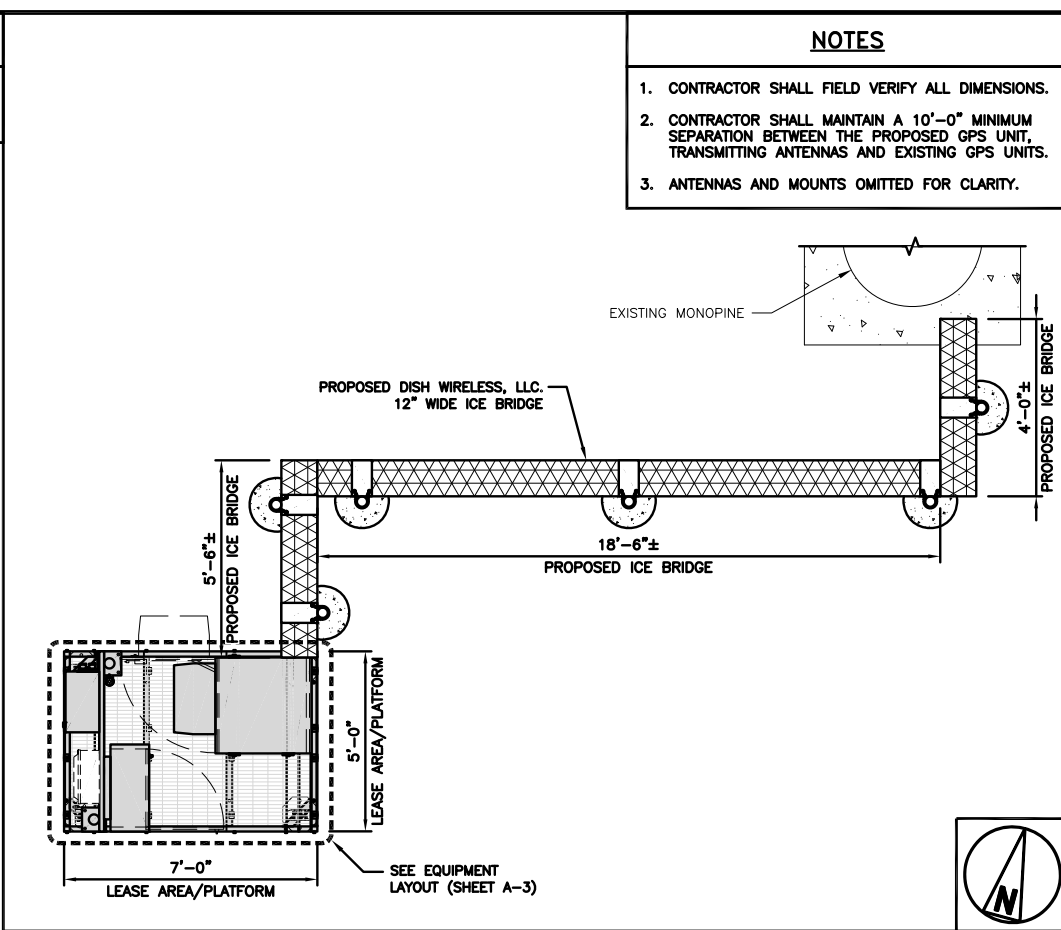
NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

OVERALL SITE PLAN



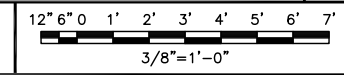
1



NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.


ENLARGED SITE PLAN




2

NOT USED


3




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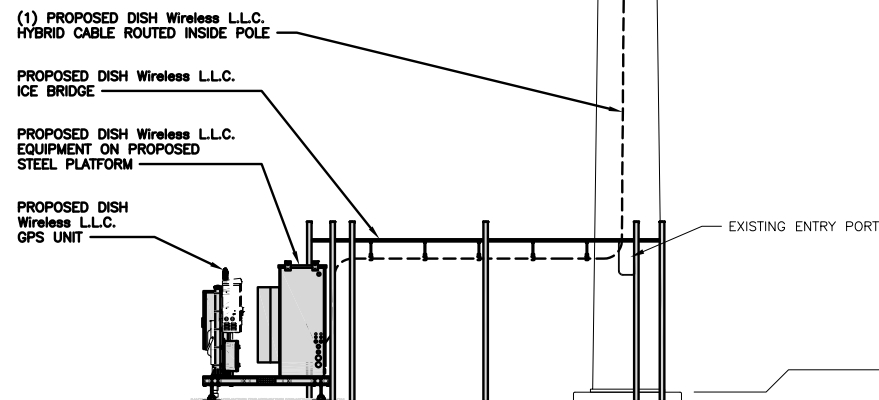
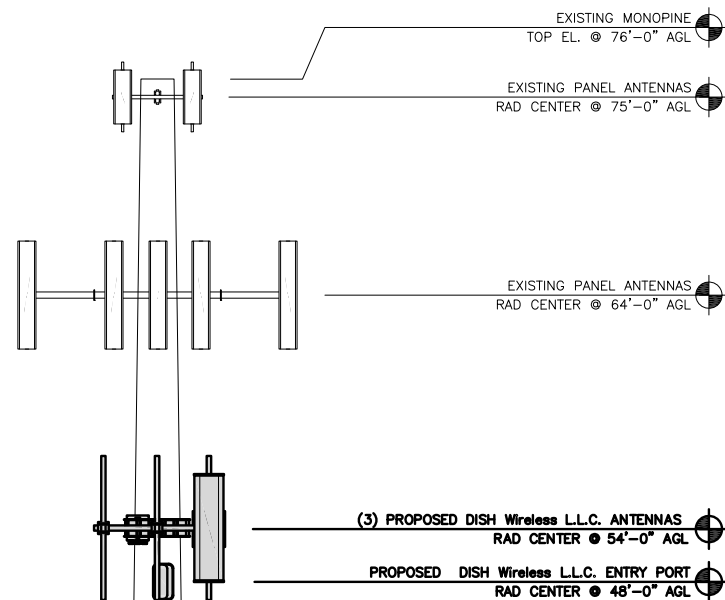
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SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

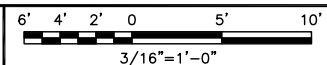
SHEET NUMBER
A-1

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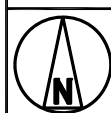
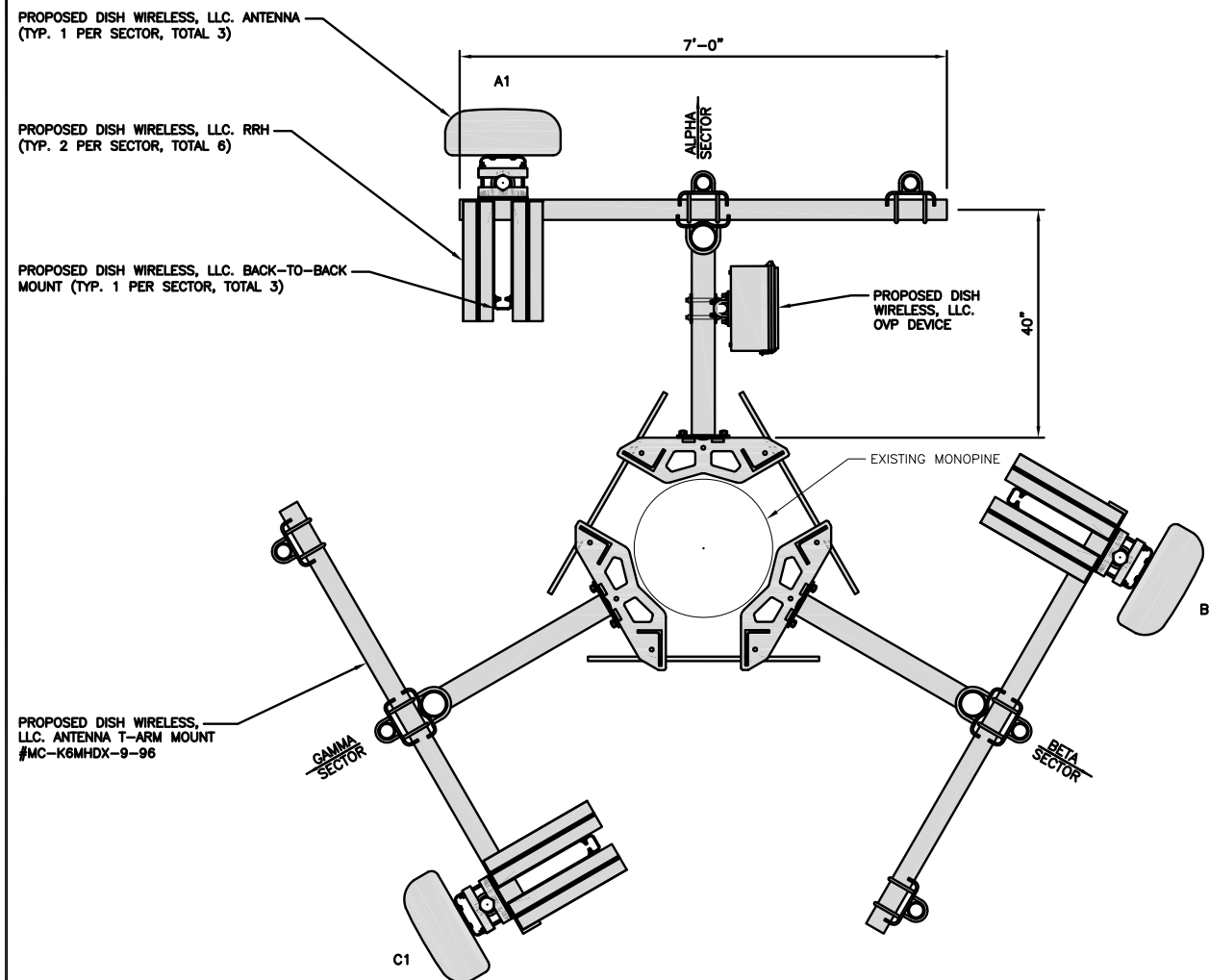
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



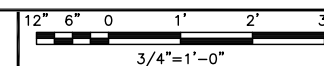
PROPOSED WEST ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS-MX08FR0665-21	5G	72.0" x 20.0"	0°	54'-0"	(1) HIGH-CAPACITY HYBRID CABLE (102' LONG)
BETA	B1	PROPOSED	JMA WIRELESS-MX08FR0665-21	5G	72.0" x 20.0"	120°	54'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS-MX08FR0665-21	5G	72.0" x 20.0"	240°	54'-0"	
SECTOR	POSITION	RRH		NOTES				
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY					
ALPHA	A1	FUJITSU - TA08025-B604	5G	1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.				
	A1	FUJITSU - TA08025-B605	5G					
BETA	B1	FUJITSU - TA08025-B604	5G					
	B1	FUJITSU - TA08025-B605	5G					
GAMMA	C1	FUJITSU - TA08025-B604	5G					
	C1	FUJITSU - TA08025-B605	5G					

ANTENNA SCHEDULE

NO SCALE

3



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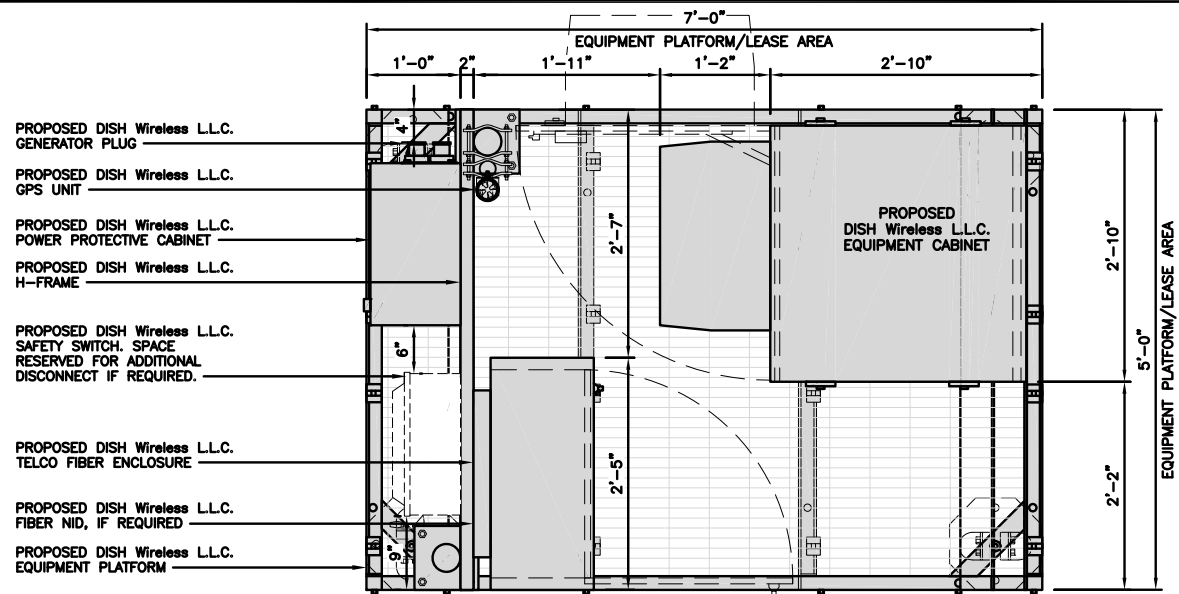
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DISH Wireless L.L.C.
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CROMWELL, CT 06416

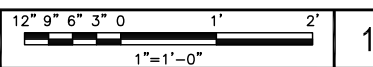
SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



PLATFORM EQUIPMENT PLAN

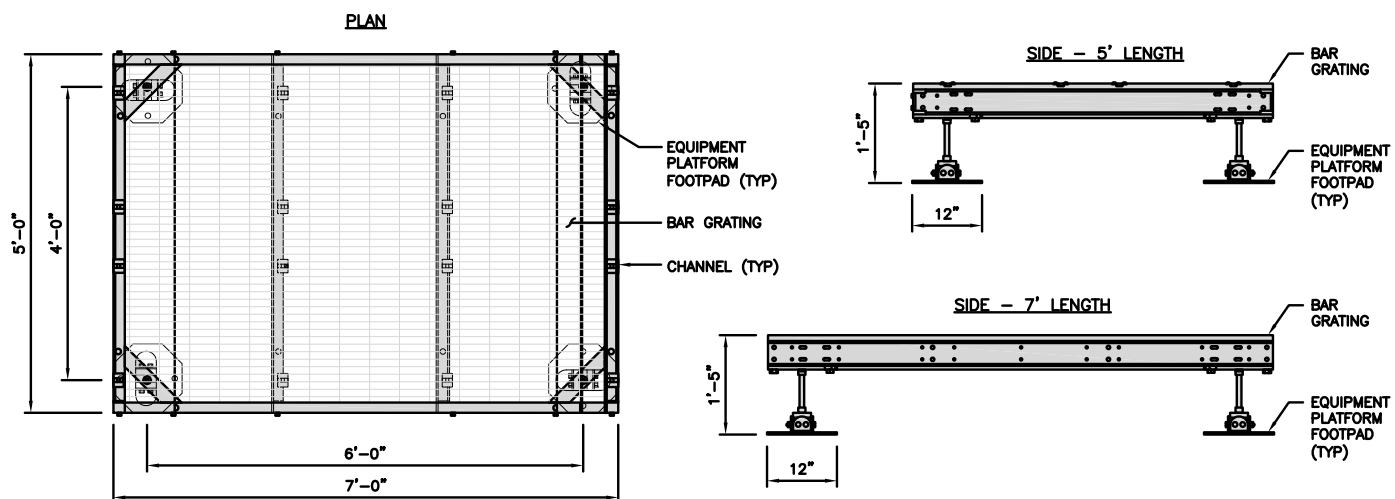


1

COMMSCOPE MTC4045LP
5X7 PLATFORM

DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

NOTE:
GC TO PROVIDE EXTENDED
THREAD FOR PLATFORM IF
REQUIRED HEIGHT EXCEEDS 17"

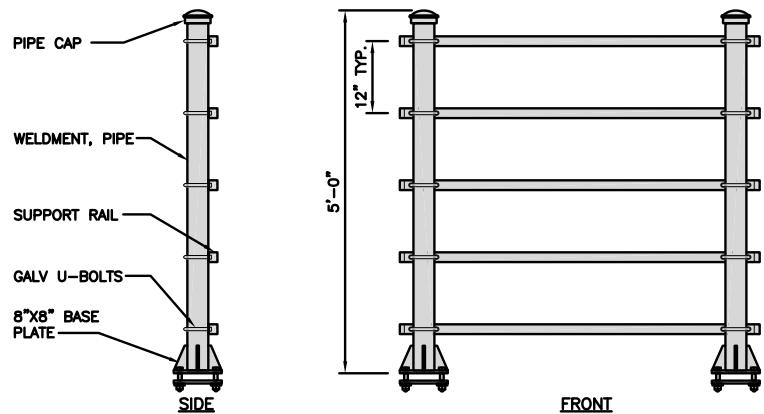


PLATFORM DETAIL

NO SCALE 2

KENWOOD T1701KT5-5S
H-FRAME

UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS



H-FRAME DETAIL

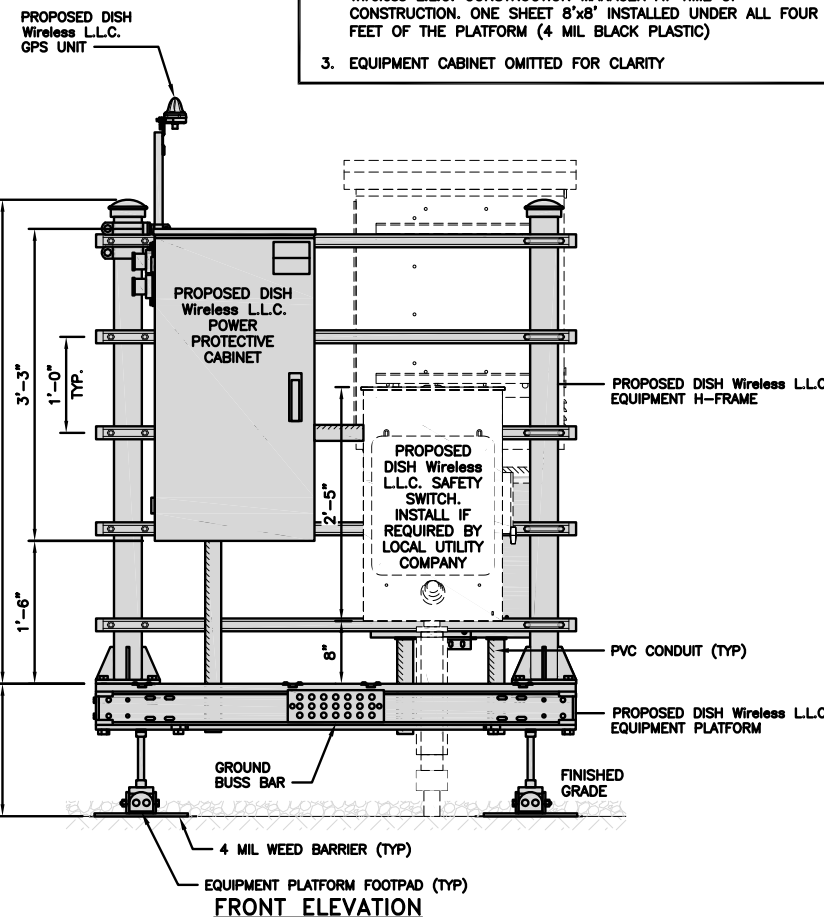
NO SCALE 3

NOT USED

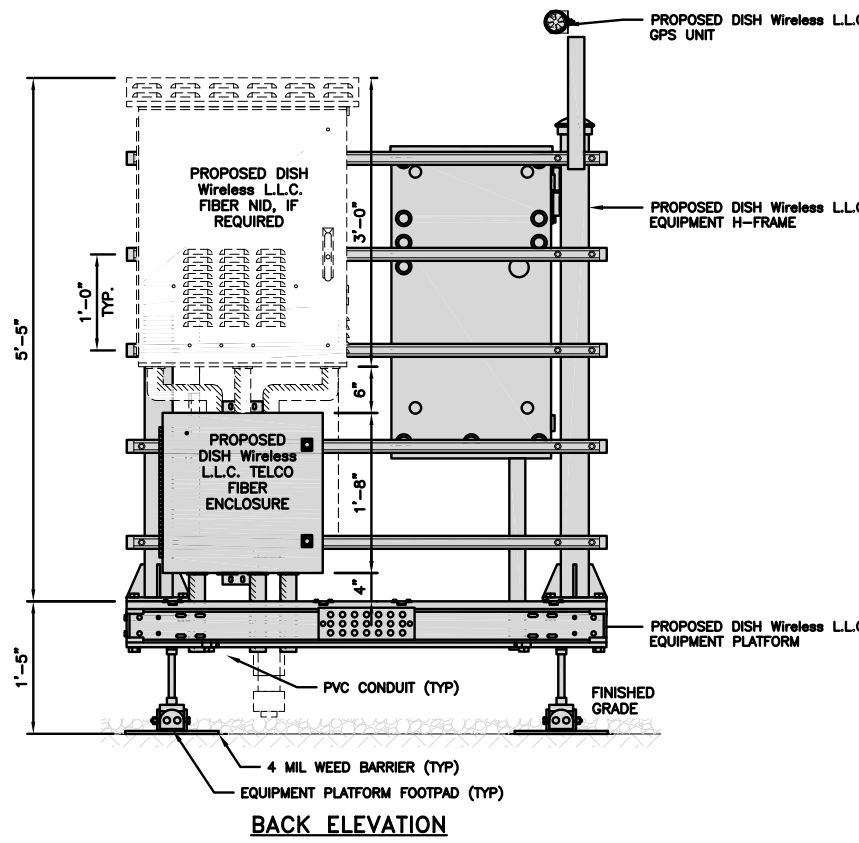
NO SCALE 4

NOTES

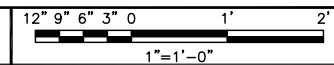
1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION



5



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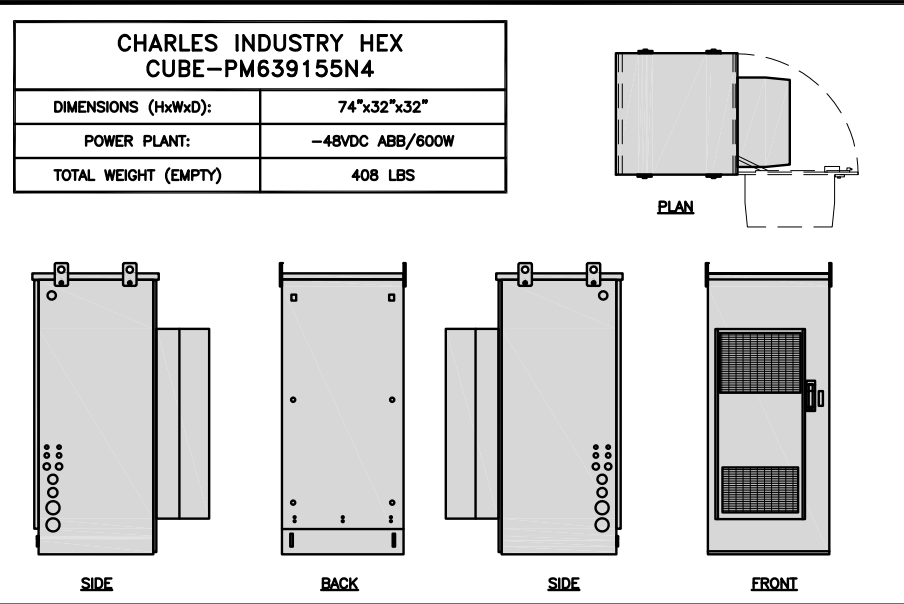
DISH Wireless L.L.C.
PROJECT INFORMATION

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160 WEST STREET
CROMWELL, CT 06416

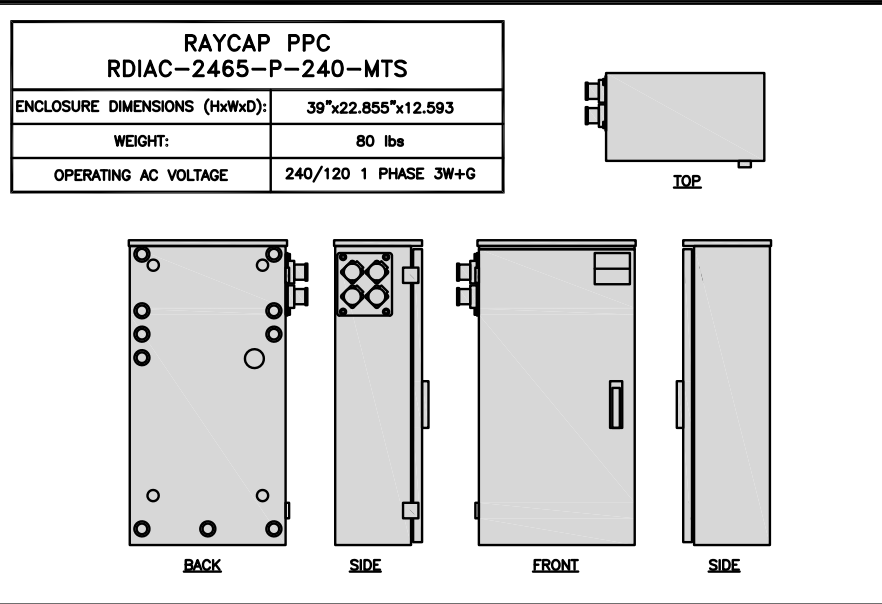
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

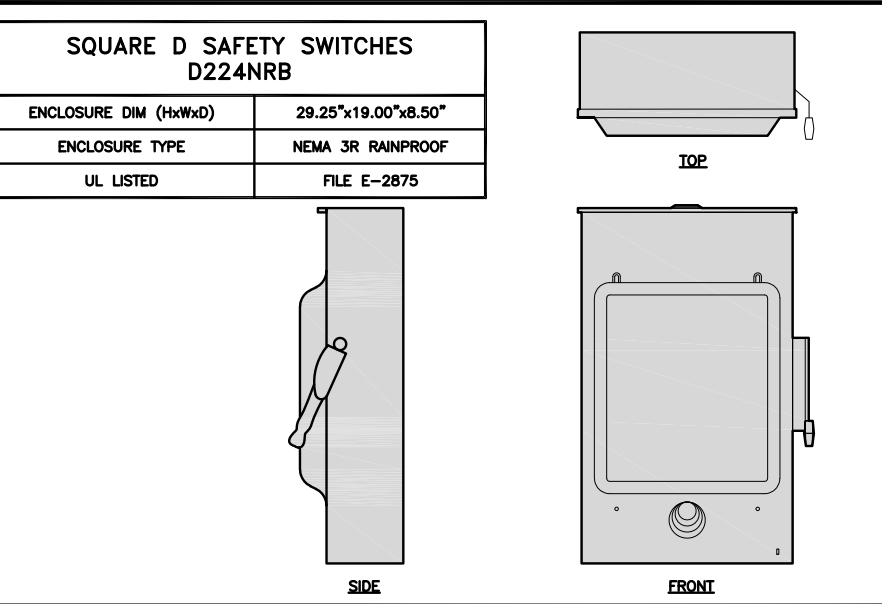
A-3



CABINET DETAIL NO SCALE 1



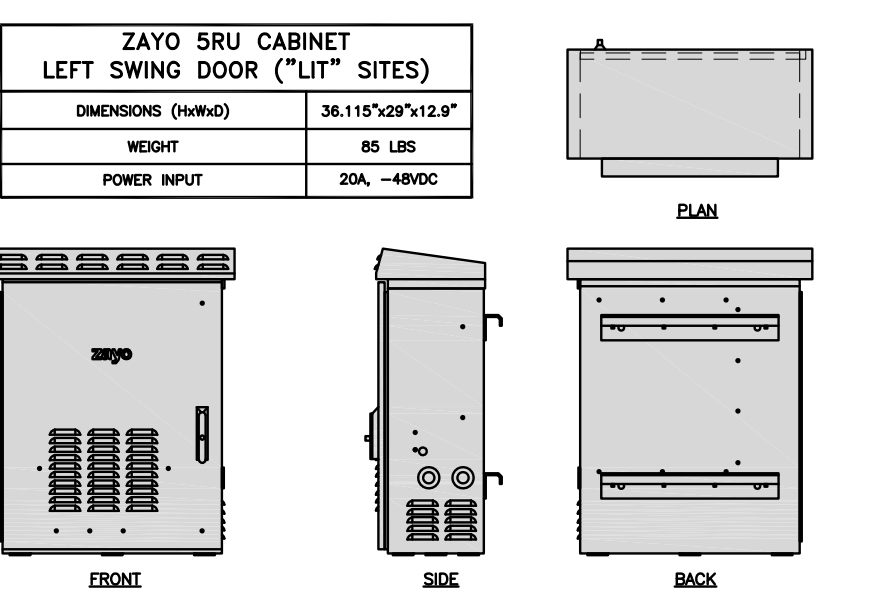
POWER PROTECTION CABINET (PPC) DETAIL NO SCALE 2



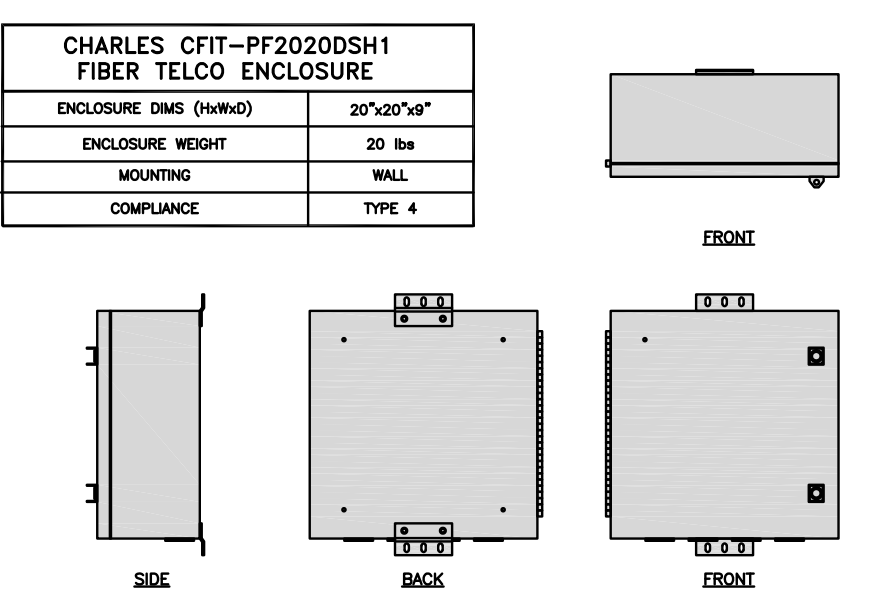
SAFETY SWITCH DETAIL NO SCALE 3



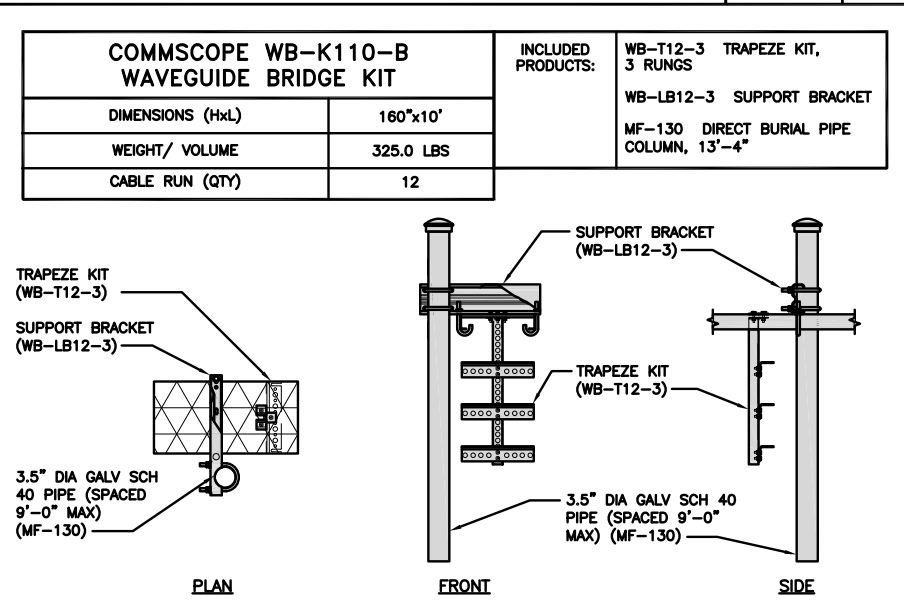
NOT USED NO SCALE 4



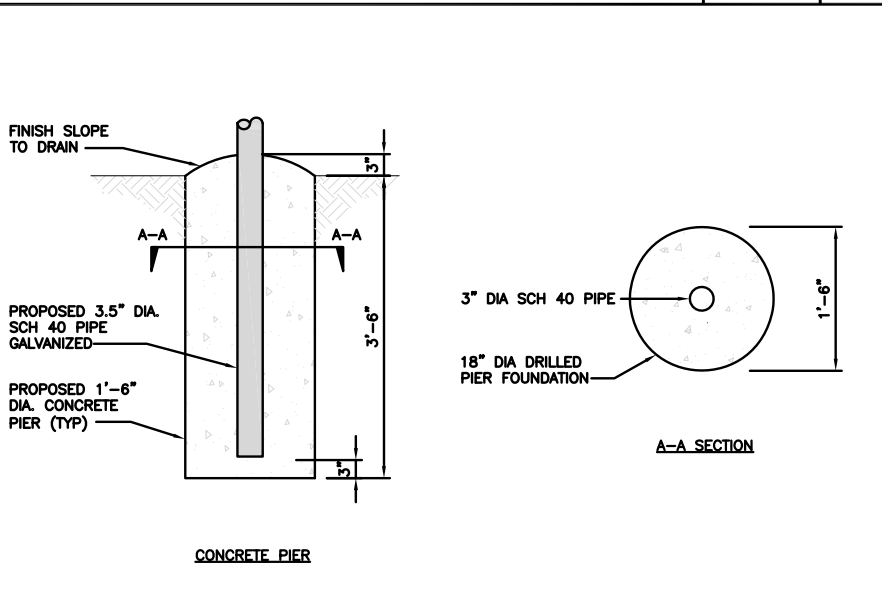
NETWORK INTERFACE UNIT DETAIL NO SCALE 5



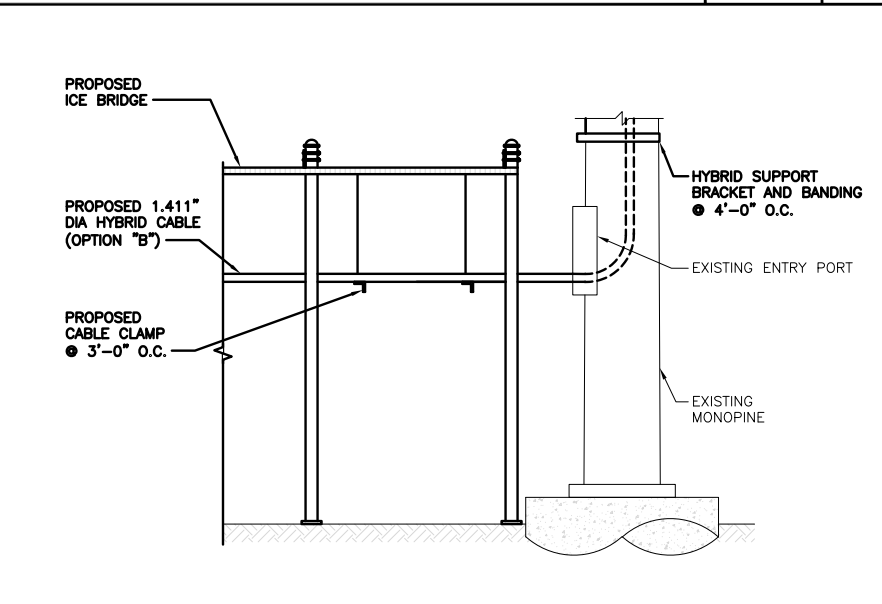
FIBER TELCO ENCLOSURE DETAIL NO SCALE 6



ICE BRIDGE DETAIL NO SCALE 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL NO SCALE 8



HYBRID CABLE RUN NO SCALE 9

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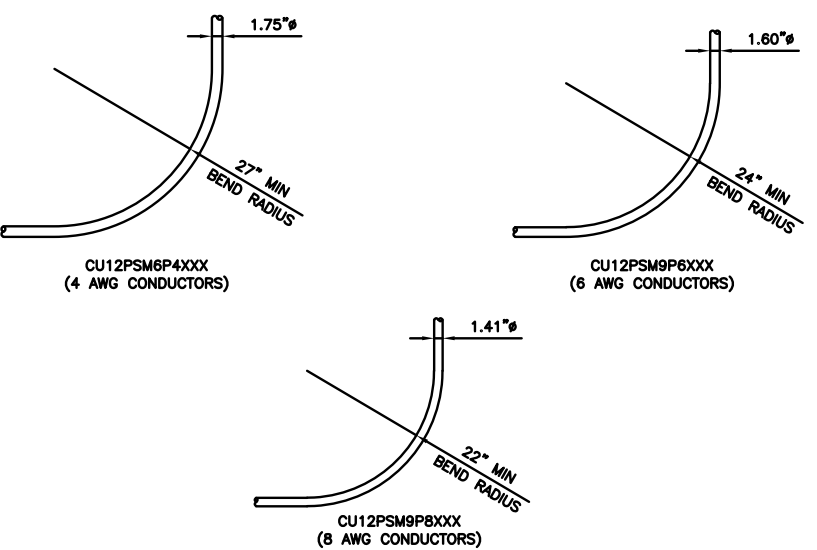
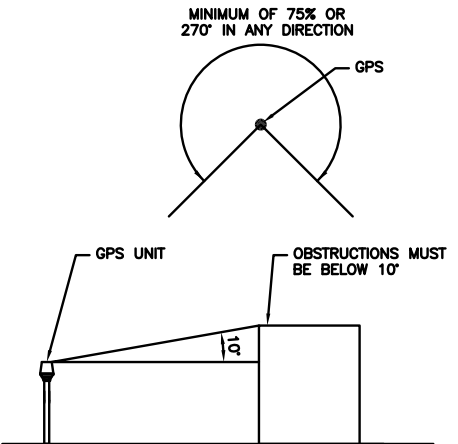
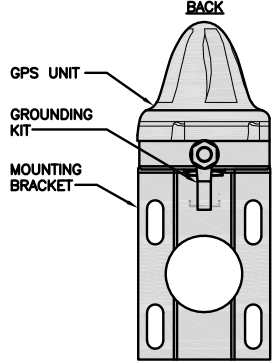
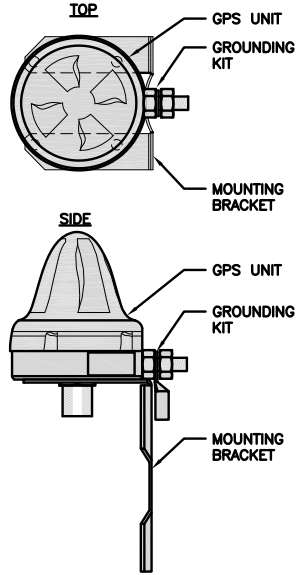
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA DETAIL NO SCALE 1

GPS MINIMUM SKY VIEW REQUIREMENTS NO SCALE 2

CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUS NO SCALE 3

NOT USED NO SCALE 4

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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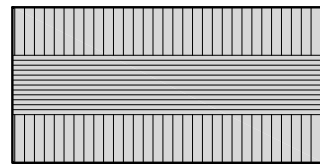
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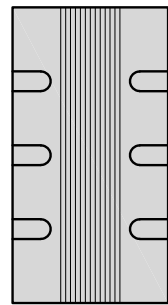
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

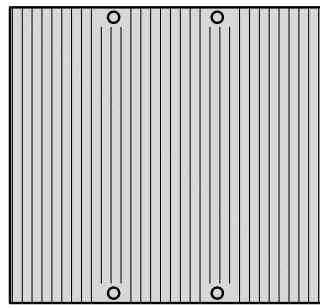
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



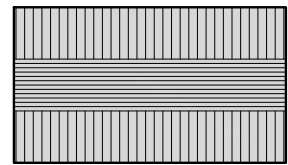
FRONT

REMOTE RADIO HEAD DETAIL

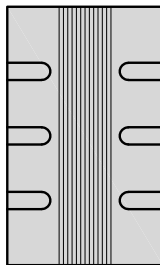
NO SCALE

1

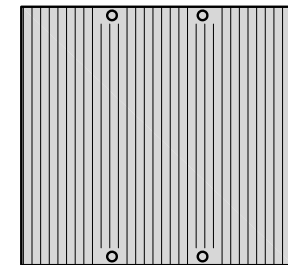
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

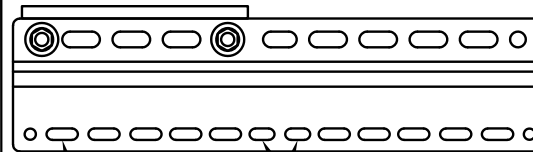
REMOTE RADIO HEAD DETAIL

NO SCALE

2

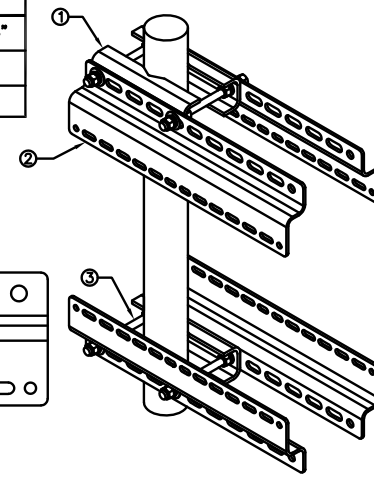
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

ITEM#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



11MM x 30MM SLOTS
40MM ON CENTER

11MM x 24MM SLOTS

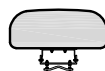


REMOTE RADIO MOUNT DETAIL

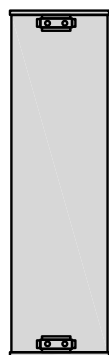
NO SCALE

3

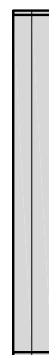
JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



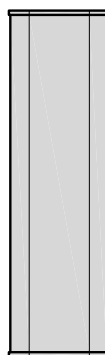
PLAN



BACK



SIDE



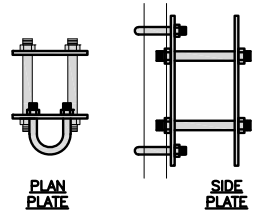
FRONT

ANTENNA DETAIL

NO SCALE

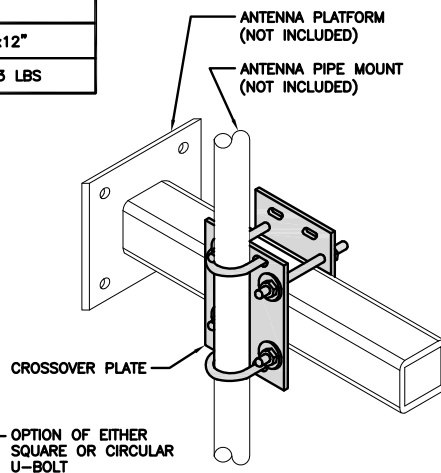
4

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS



PLAN
U-BOLT

SIDE
U-BOLT



ANTENNA PLATFORM (NOT INCLUDED)

ANTENNA PIPE MOUNT (NOT INCLUDED)

CROSSOVER PLATE

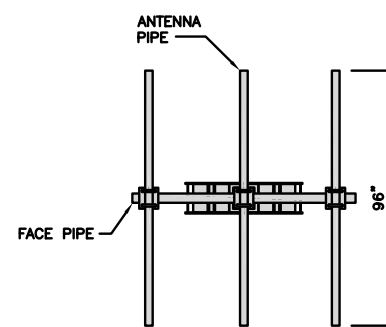
OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

RRH/OVP MOUNT DETAIL

NO SCALE

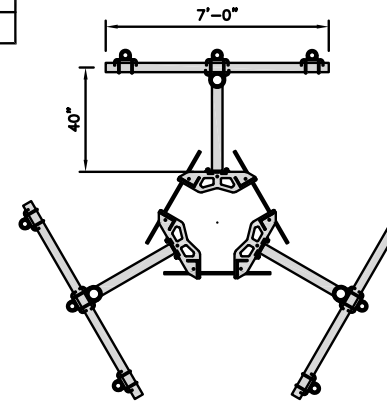
8

COMMSCOPE MC-K6MHDX-9-96	
FACE WIDTH	7'-0"
WEIGHT	1203.31 lbs
NOTE: 15" TO 50" O.D.	



ANTENNA PIPE

FACE PIPE

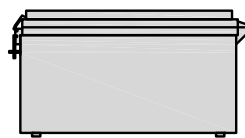


ANTENNA PLATFORM DETAIL

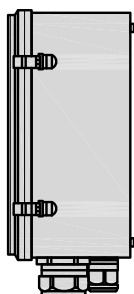
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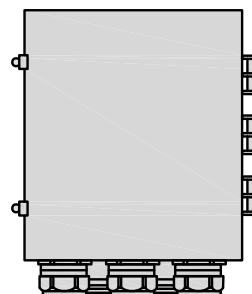
RAYCAP RDIC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



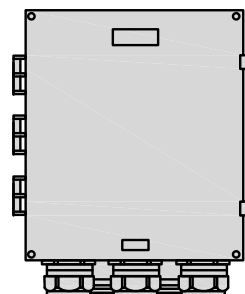
PLAN



SIDE



BACK



FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7



5701 SOUTH SANTA FE DRIVE
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CONSTRUCTION DOCUMENTS

SUBMITTALS		
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149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

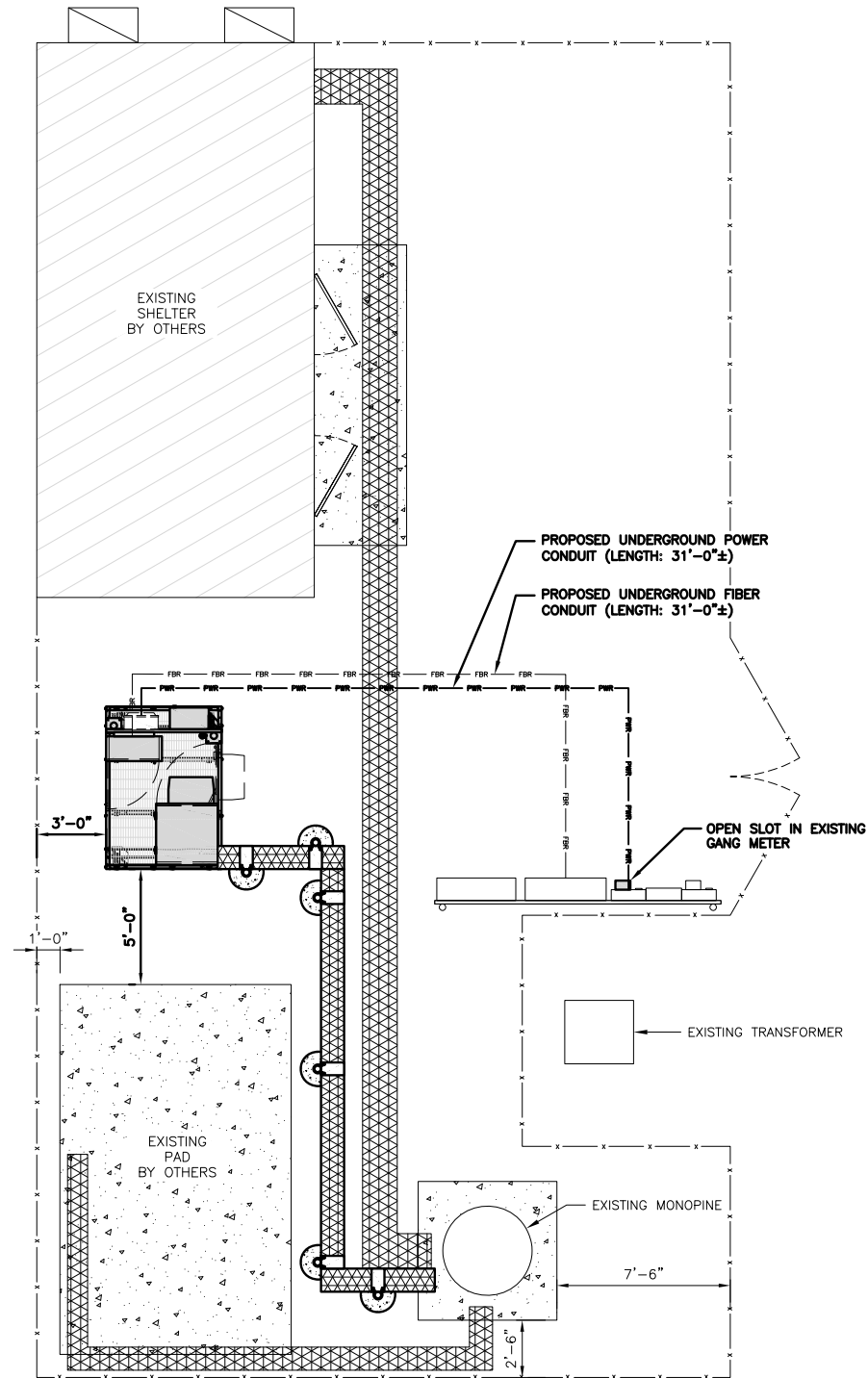
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

A-6

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
2. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
3. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
5. CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
6. CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
7. CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
9. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, AND EQUIPMENT CABINETS.
10. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
11. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
13. ALL TRENCHES IN COMPOUND ARE TO BE HAND DUG.



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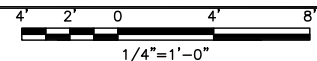
A&E PROJECT NUMBER
149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

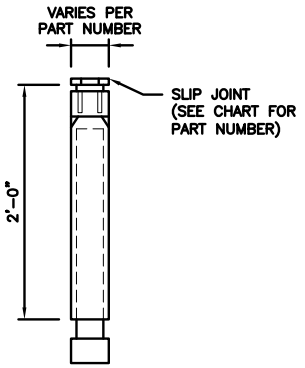
SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER
E-1



CARLON EXPANSION FITTINGS

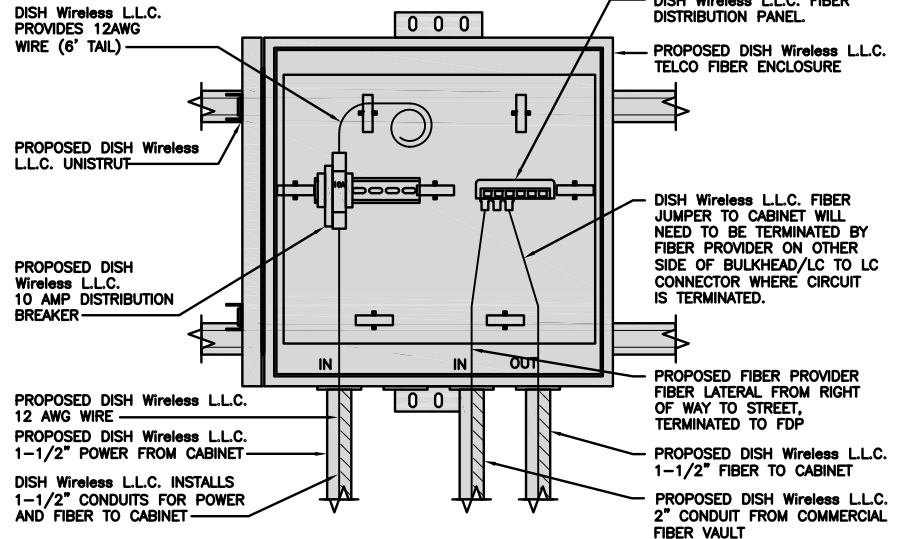
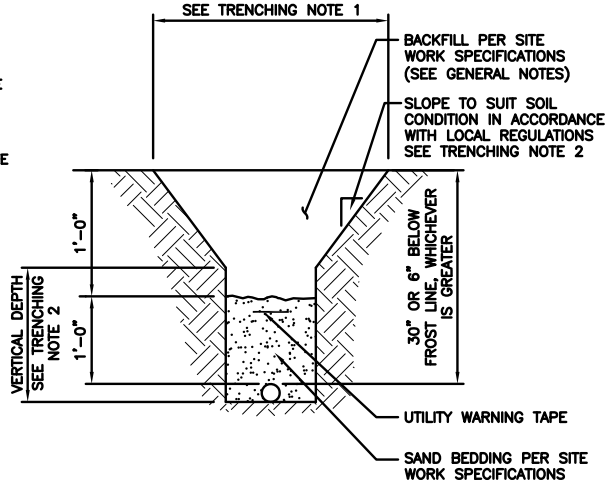
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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



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

TRENCHING NOTES

- CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
- TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
- ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.



EXPANSION JOINT DETAIL

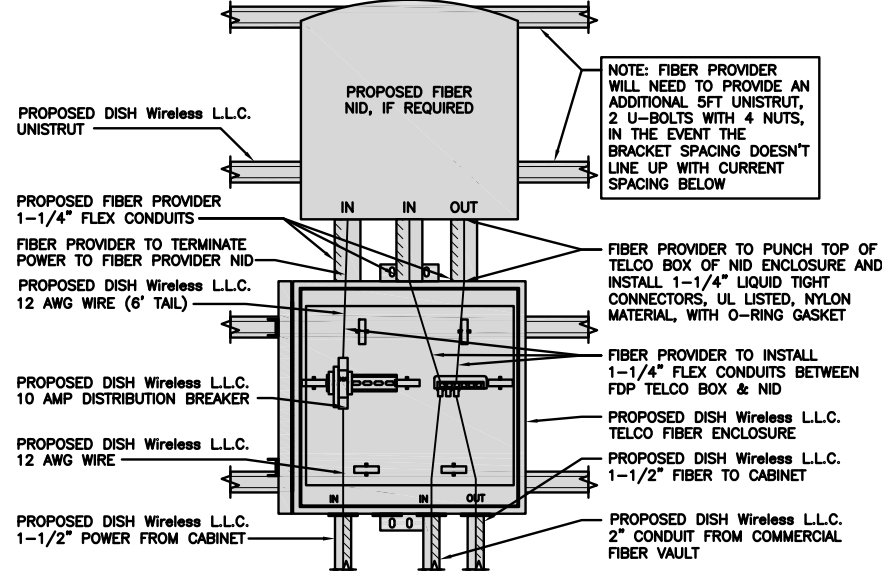
NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL

NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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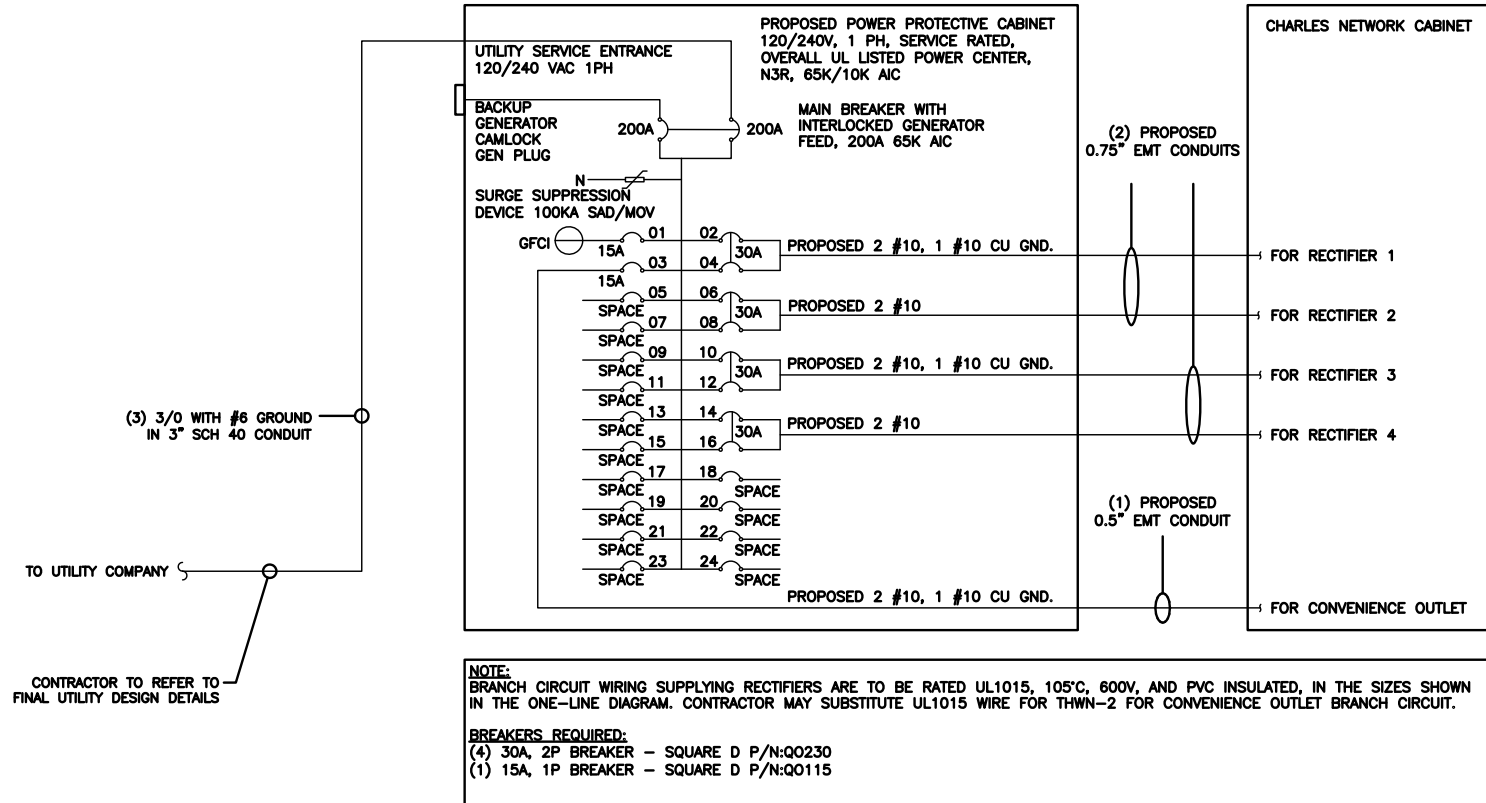
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A&E PROJECT NUMBER
149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2



NOTES

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(g) OR 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE.

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A
 #10 FOR 25A-30A/2P BREAKER: 0.8 x 40A = 32.0A
 #8 FOR 35A-40A/2P BREAKER: 0.8 x 55A = 44.0A
 #6 FOR 45A-60A/2P BREAKER: 0.8 x 75A = 60.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.
 0.5" CONDUIT - 0.122 SQ. IN AREA
 0.75" CONDUIT - 0.213 SQ. IN AREA
 2.0" CONDUIT - 1.316 SQ. IN AREA
 3.0" CONDUIT - 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.
 #10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
 #10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
 TOTAL = 0.0633 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.
 #10 - 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
 #10 - 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
 TOTAL = 0.1146 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.
 3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
 #6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
 TOTAL = 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.



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CROMWELL, CT 06416

SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

PPC ONE-LINE DIAGRAM

NO SCALE 1

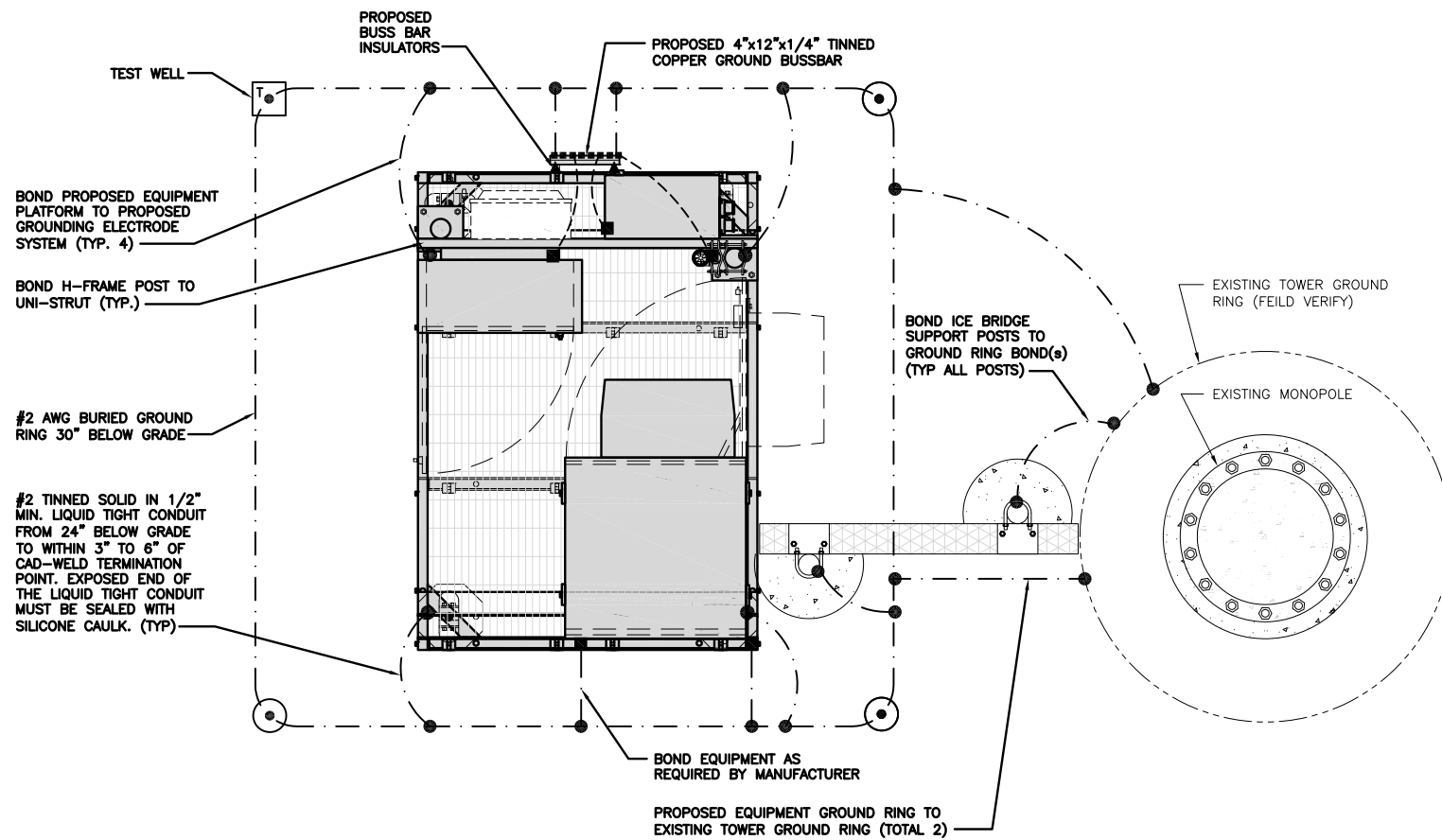
PROPOSED CHARLES PANEL SCHEDULE											
LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED	
	L1	L2						L1	L2		
PPC GFCI OUTLET	180	180	15A	1	A	2	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1	
CHARLES GFCI OUTLET			15A	3	B	4	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1	
-SPACE-				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2	
-SPACE-				7	B	8	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2	
-SPACE-				9	A	10	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3	
-SPACE-				11	B	12	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3	
-SPACE-				13	A	14	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4	
-SPACE-				15	B	16	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4	
-SPACE-				17	A	18				-SPACE-	
-SPACE-				19	B	20				-SPACE-	
-SPACE-				21	A	22				-SPACE-	
-SPACE-				23	B	24				-SPACE-	
VOLTAGE AMPS		180	180			11520	11520				
200A MCB, 1φ, 24 SPACE, 120/240V				L1	L2						
MB RATING: 65,000 AIC				11700	11700	VOLTAGE AMPS					
				98	98	AMPS					
				98		MAX AMPS					
				123		MAX 125%					

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3

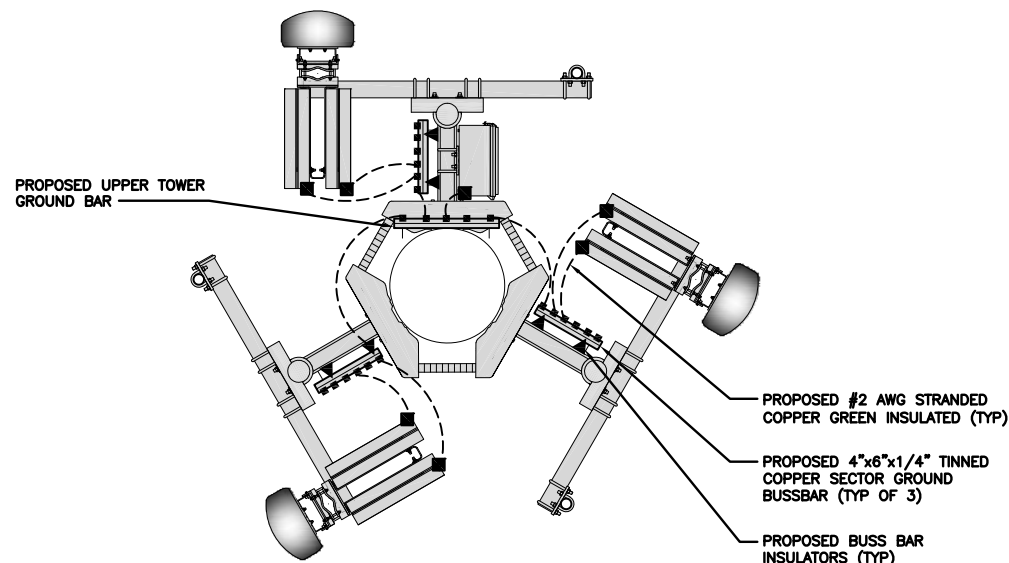


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

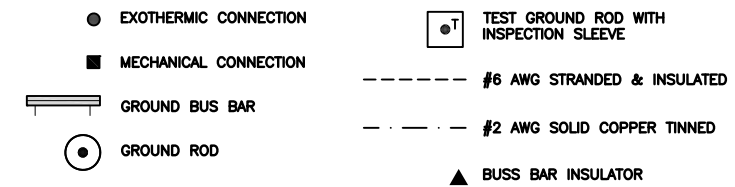
NOTES

1. ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE ONLY



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

- (A) **EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- (B) **TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- (C) **INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- (D) **BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
- (E) **GROUND ROD:** UL LISTED COPPER CLAD STEEL MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
- (F) **CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
- (G) **HATCH PLATE GROUND BAR:** BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
- (H) **EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
- (I) **TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- (J) **FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- (K) **INTERIOR UNIT BONDS:** METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.
- (L) **FENCE AND GATE GROUNDING:** METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
- (M) **EXTERIOR UNIT BONDS:** METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE
- (N) **ICE BRIDGE SUPPORTS:** EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.
- (O) **DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR**
- (P) **TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH Wireless L.L.C. GROUNDING NOTES.**

GROUNDING KEY NOTES

NO SCALE 3



5701 SOUTH SANTA FE DRIVE
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8051 CONGRESS AVENUE
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1717 S. BOULDER
SUITE 300
TULSA, OK 74119
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www.btgrp.com



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A&E PROJECT NUMBER
149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

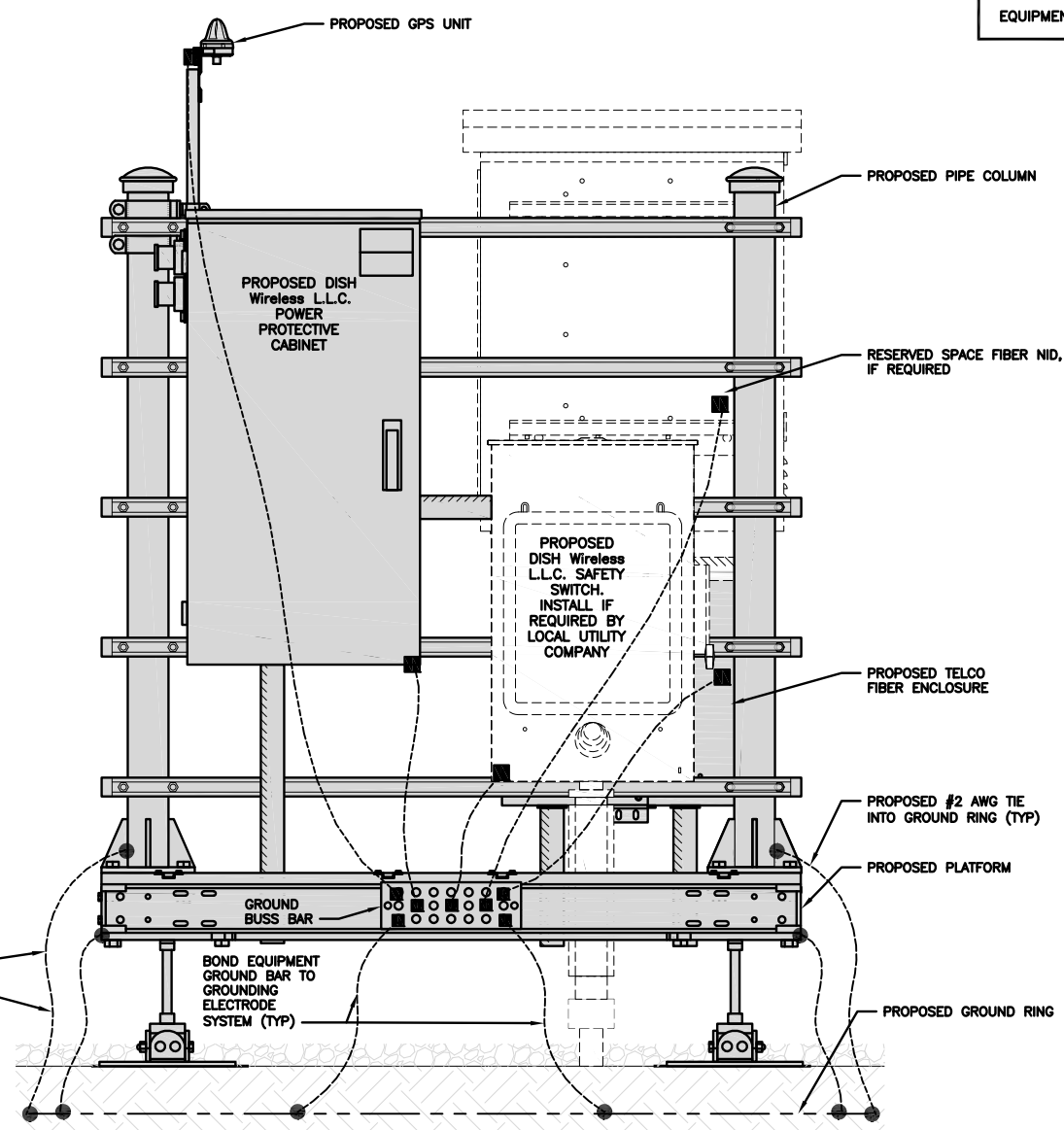
BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY

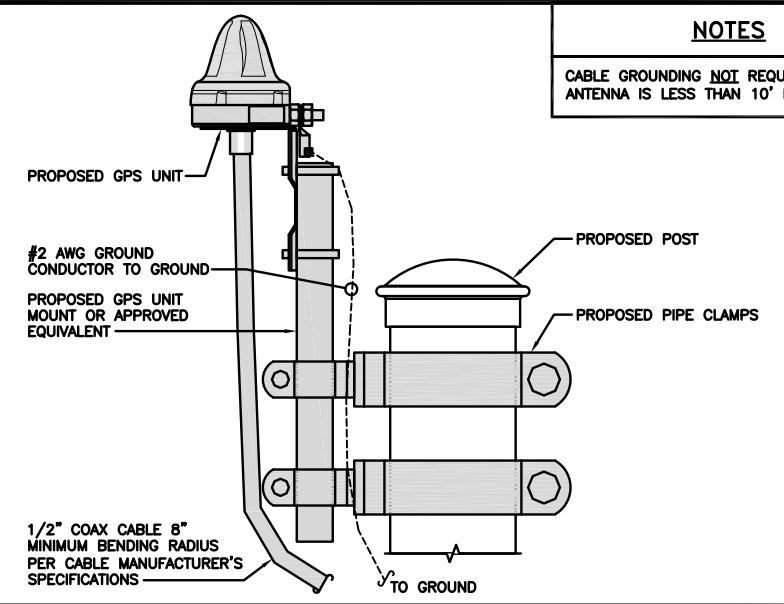


#2 TINNED SOLID IN 1/2" MIN. LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (TYP)

H-FRAME GROUNDING DETAIL

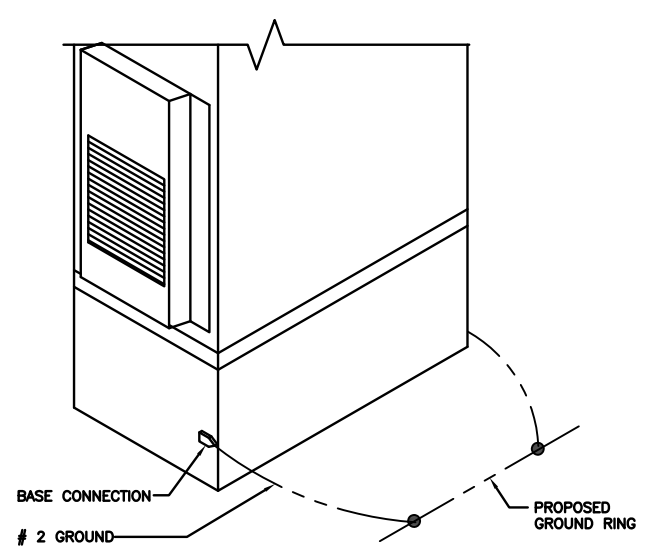
NO SCALE 1

NOTES
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



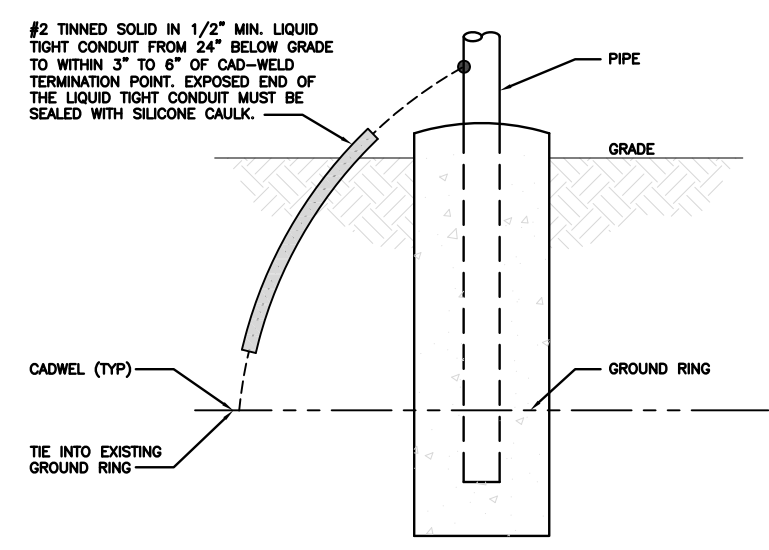
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



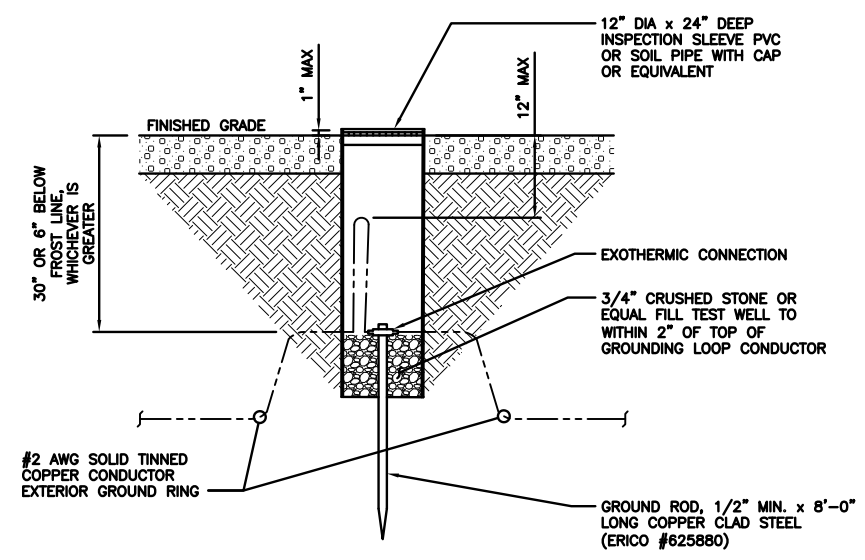
OUTDOOR CABINET GROUNDING

NO SCALE 3



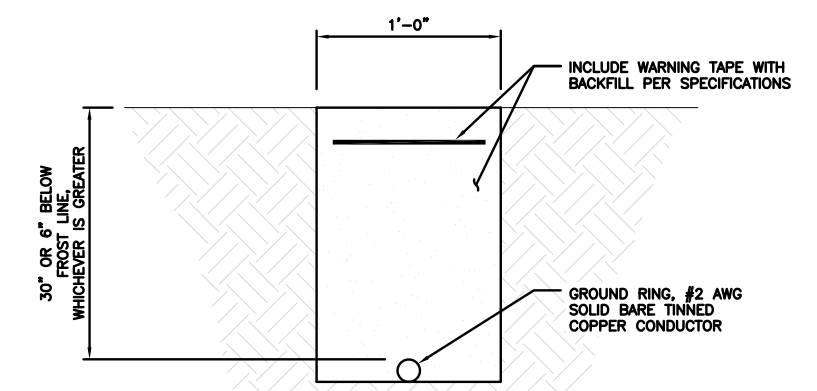
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6



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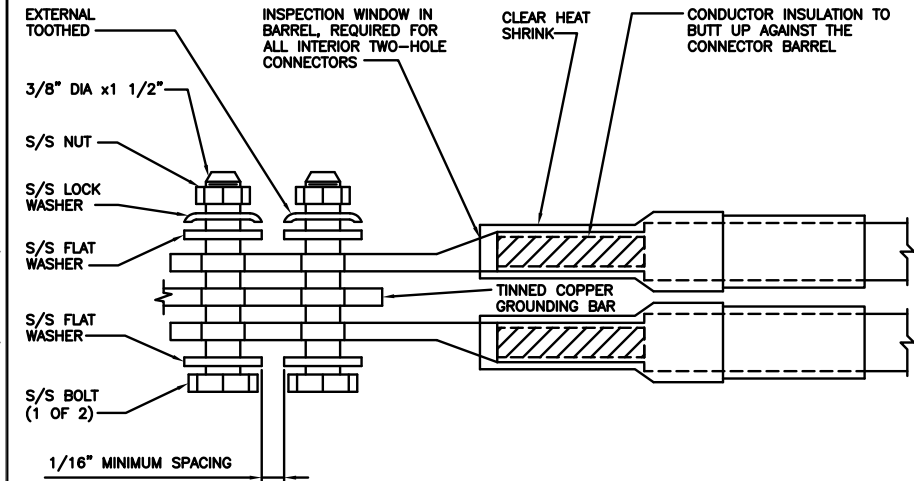
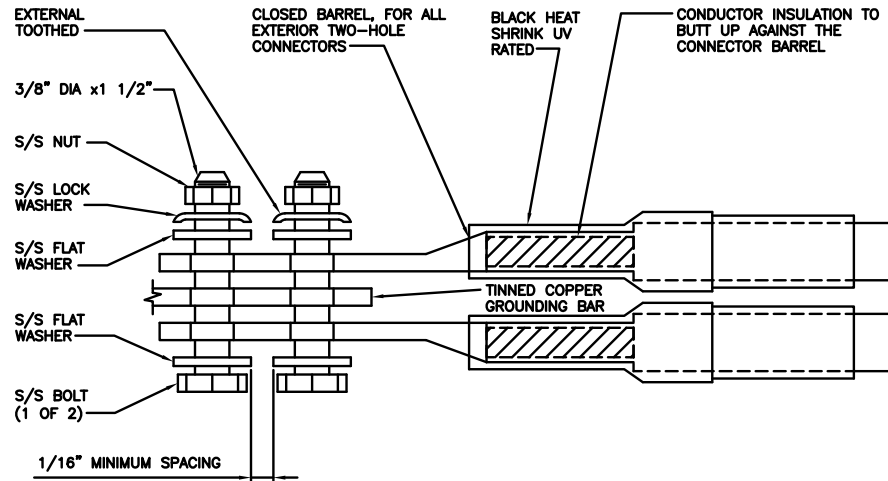
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PROJECT INFORMATION
BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.
6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).



TYPICAL GROUNDING NOTES

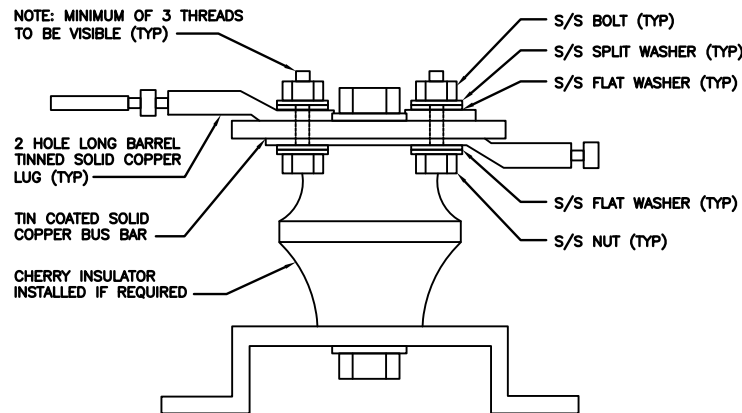
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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LITTLETON, CO 80120



8051 CONGRESS AVENUE
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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

RF Cable Color Codes	Low Bands (N71+N28) Optional - (N29)	AWS (N66+N70+H-BLOCK)	CBRS Tech (3 GHz)	Negative Slant Port on Ant/RRH																																																																								
	ORANGE	PURPLE	YELLOW	WHITE																																																																								
RF Jumper Color Coding 3/4" tape widths with 3/4" spacing																																																																												
	<table border="1"> <thead> <tr> <th colspan="4">ALPHA RRH</th> <th colspan="4">BETA RRH</th> <th colspan="4">GAMMA RRH</th> </tr> <tr> <th>Port 1 + slant</th> <th>Port 2 - slant</th> <th>Port 3 + slant</th> <th>Port 4 - slant</th> <th>Port 1 + slant</th> <th>Port 2 - slant</th> <th>Port 3 + slant</th> <th>Port 4 - slant</th> <th>Port 1 + slant</th> <th>Port 2 - slant</th> <th>Port 3 + slant</th> <th>Port 4 - slant</th> </tr> </thead> <tbody> <tr> <td>RED</td><td>RED</td><td>RED</td><td>RED</td> <td>BLUE</td><td>BLUE</td><td>BLUE</td><td>BLUE</td> <td>GREEN</td><td>GREEN</td><td>GREEN</td><td>GREEN</td> </tr> <tr> <td>ORANGE</td><td>ORANGE</td><td>RED</td><td>RED</td> <td>ORANGE</td><td>ORANGE</td><td>BLUE</td><td>BLUE</td> <td>ORANGE</td><td>ORANGE</td><td>GREEN</td><td>GREEN</td> </tr> <tr> <td></td><td>WHITE (+ Port)</td><td>ORANGE</td><td>ORANGE</td> <td></td><td>WHITE (- Port)</td><td>ORANGE</td><td>ORANGE</td> <td></td><td>WHITE (- Port)</td><td>ORANGE</td><td>ORANGE</td> </tr> <tr> <td></td><td></td><td></td><td>WHITE (- Port)</td> <td></td><td></td><td></td><td>WHITE (- Port)</td> <td></td><td></td><td></td><td>WHITE (- Port)</td> </tr> </tbody> </table>				ALPHA RRH				BETA RRH				GAMMA RRH				Port 1 + slant	Port 2 - slant	Port 3 + slant	Port 4 - slant	Port 1 + slant	Port 2 - slant	Port 3 + slant	Port 4 - slant	Port 1 + slant	Port 2 - slant	Port 3 + slant	Port 4 - slant	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN		WHITE (+ Port)	ORANGE	ORANGE		WHITE (- Port)	ORANGE	ORANGE		WHITE (- Port)	ORANGE	ORANGE				WHITE (- Port)				WHITE (- Port)				WHITE (- Port)
ALPHA RRH				BETA RRH				GAMMA RRH																																																																				
Port 1 + slant	Port 2 - slant	Port 3 + slant	Port 4 - slant	Port 1 + slant	Port 2 - slant	Port 3 + slant	Port 4 - slant	Port 1 + slant	Port 2 - slant	Port 3 + slant	Port 4 - slant																																																																	
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN																																																																	
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN																																																																	
	WHITE (+ Port)	ORANGE	ORANGE		WHITE (- Port)	ORANGE	ORANGE		WHITE (- Port)	ORANGE	ORANGE																																																																	
			WHITE (- Port)				WHITE (- Port)				WHITE (- Port)																																																																	
Low-Band RRH - (600MHz N71 baseband) + (850MHz N28 band) + (700MHz N29 band) - optional per market																																																																												
Add Frequency Color to Sector Band (CBRS will use Yellow bands)																																																																												
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN																																																																
	PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN																																																																
		WHITE (+ Port)	PURPLE	PURPLE		WHITE (- Port)	PURPLE	PURPLE		WHITE (- Port)	PURPLE	PURPLE																																																																
			WHITE (- Port)				WHITE (- Port)				WHITE (- Port)																																																																	
Mid-band RRH - (AWS bands N66+N70)																																																																												
Add Frequency Color to Sector Band (CBRS will use Yellow bands)																																																																												
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN																																																																
	PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN																																																																
		WHITE (+ Port)	PURPLE	PURPLE		WHITE (- Port)	PURPLE	PURPLE		WHITE (- Port)	PURPLE	PURPLE																																																																
			WHITE (- Port)				WHITE (- Port)				WHITE (- Port)																																																																	
Hybrid/Discreet Cables	Example 1	Example 2																																																																										
Include sector bands being supported along with frequency bands:	RED	RED																																																																										
	BLUE	BLUE																																																																										
	GREEN	GREEN																																																																										
Example 1 - Hybrid, or discreet, supports all sectors, both low-bands and mid-bands	ORANGE	YELLOW																																																																										
	PURPLE																																																																											
Example 2 - Hybrid, or discreet, supports CBRS only, all sectors																																																																												
Fiber Jumpers to RRHs	Low Band RRH	High Band RRH	Low Band RRH	High Band RRH	Low Band RRH	High Band RRH																																																																						
Low Band RRH fiber cables have sector stripes only	RED	RED	BLUE	BLUE	GREEN	GREEN																																																																						
		PURPLE		PURPLE		PURPLE																																																																						
Power Cables to RRHs	Low Band RRH	High Band RRH	Low Band RRH	High Band RRH	Low Band RRH	High Band RRH																																																																						
Low Band RRH power cables have sector stripe only	RED	RED	BLUE	BLUE	GREEN	GREEN																																																																						
		PURPLE		PURPLE		PURPLE																																																																						
RET motors at Antennas	Port 1/ Antenna 1 IN	Port 1/ Antenna 1 OUT	Port 1/ Antenna 1 IN	Port 1/ Antenna 1 OUT	Port 1/ Antenna 1 IN	Port 1/ Antenna 1 OUT																																																																						
If Daisy-chained between sectors, include 'IN' colors and 'OUT' color, signifying what sector it connects to.	RED	RED	BLUE	BLUE	GREEN	BLUE																																																																						
		BLUE		GREEN																																																																								
Example here shows daisy-chain sector configuration. Second antenna on each sector would display two sector color stripes																																																																												
Microwave Radio Links	Forward azimuth of 0-120 degrees		Forward azimuth of 120-240 degrees		Forward azimuth of 240-359 degrees																																																																							
Links will have a 1.5-2 inch white wrap with the azimuth color overlapping in the middle. Add additional sector color bands for each additional MW radio.	Primary	Secondary	Primary	Secondary	Primary	Secondary																																																																						
	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE																																																																						
	RED	RED	BLUE	BLUE	GREEN	GREEN																																																																						
	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE																																																																						
Microwave cables will require P-4ouch labels inside the cabinet to identify the local and remote Site ID's.	RED	RED	BLUE	BLUE	GREEN	GREEN																																																																						
		WHITE		WHITE		WHITE																																																																						

RF CABLE COLOR CODES

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. FINAL RFDS IS IN NEXYSONE.

LOW BANDS (N71-N28)
OPTIONAL - (N29)



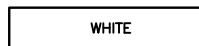
AWS
(N65+N70+H-BLOCK)



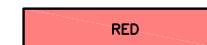
CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANTRRH



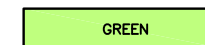
ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



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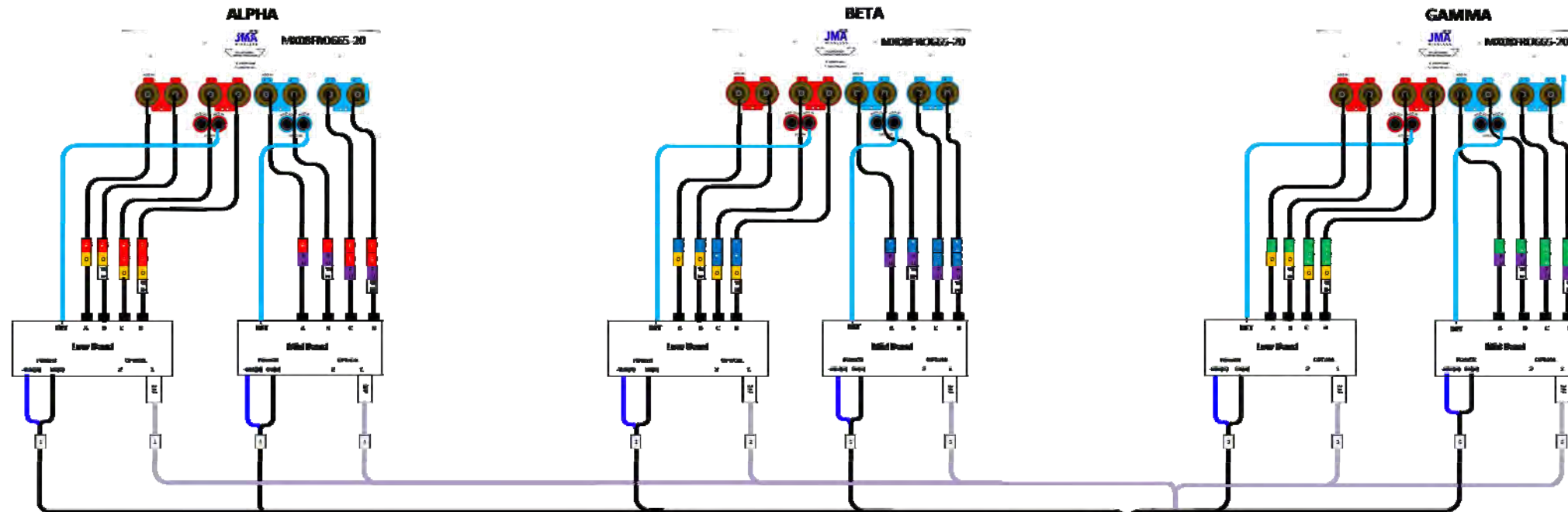
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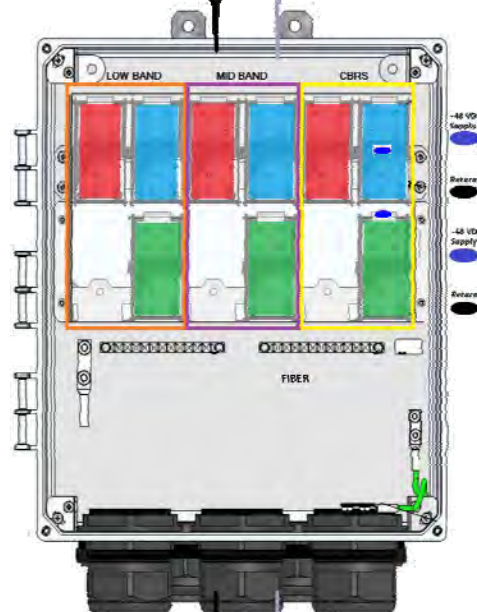
SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1



Fiber Patch Panel

Bottom Row	Pair 1	Pair 2	Pair 3	Pair 10	Open	Open
Middle Row	Pair 4	Pair 5	Pair 6	Pair 11	Open	Open
Top Row	Pair 7	Pair 8	Pair 9	Pair 12	Open	Open



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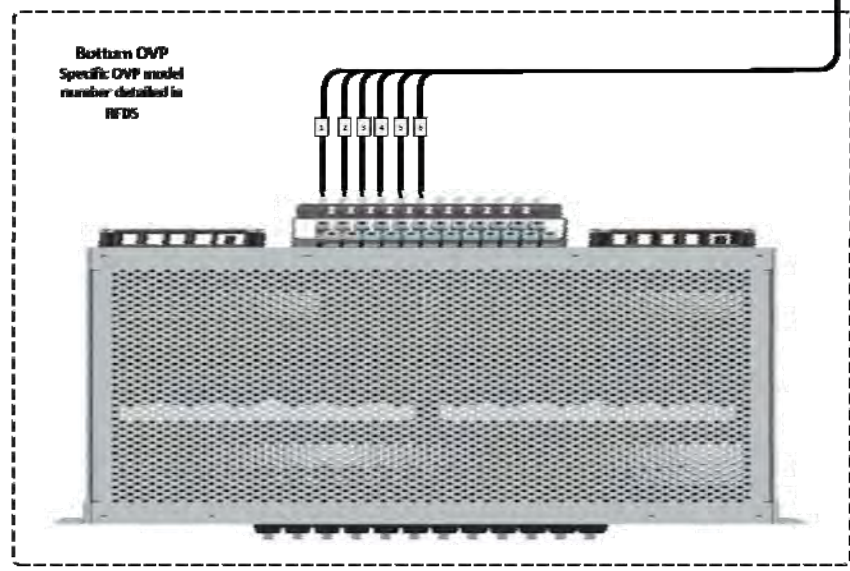
CSR NCS540

Part	Interface	Description
0	C0/0/0/0	SiloBoss
1	C0/0/0/1	CHHN - Alpha
2	G0/0/0/2	CDRS - Beta
3	G0/0/0/3	CDRS - Gamma
4	T0/0/0/4	Fujitsu Low Band RU - Alpha
5	T0/0/0/5	Fujitsu Mid-Band RU - Alpha
6	T0/0/0/6	Fujitsu Low-Band RU - Beta
7	T0/0/0/7	Fujitsu Mid-Band RU - Beta
8	T0/0/0/8	Fujitsu Low-Band RU - Gamma
9	T0/0/0/9	Fujitsu Mid-Band RU - Gamma
10	T0/0/0/10	Fixed Wifi
11	T0/0/0/11	Fixed Wifi
12	T0/0/0/12	Fixed Wifi
13	T0/0/0/13	Fixed Wifi
14	T0/0/0/14	CDRS1
15	T0/0/0/15	CDRS2
16	T0/0/0/16	CHHN3
17	G0/0/0/17	SM1 - DMC
18	G0/0/0/18	SM2 - BMC
19	T0/0/0/19	SM1 - Data 1
20	T0/0/0/20	SM1 - Data 2
21	T0/0/0/21	SM2 - Data 1
22	T0/0/0/22	SM2 - Data 2
23	T0/0/0/23	Reserved Uplink (EDC, LDC)
24	T0/0/0/24	Blank/Future
25	T0/0/0/25	Blank/Future
26	T0/0/0/26	Fiber Nil
27	T0/0/0/27	Fiber Nil
28	T0/0/0/28	Blank/Future
29	T0/0/0/29	Blank/Future

top

Bottom OVP Layout

Circuit 1	Alpha Low Band
Circuit 2	Beta Low Band
Circuit 3	Gamma Low Band
Circuit 4	Alpha Mid Band
Circuit 5	Beta Mid Band
Circuit 6	Gamma Mid Band
Circuit 7	Alpha CDRS
Circuit 8	Beta CDRS
Circuit 9	Gamma CDRS
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open



5G plumbing diagram, IMA MDRBF0625-20 2-2-2(LB+MB)

Issue No	REV	DATE	BY	CHKD	APPD
1	1	06/14/2021			

PLUMBING DIAGRAM



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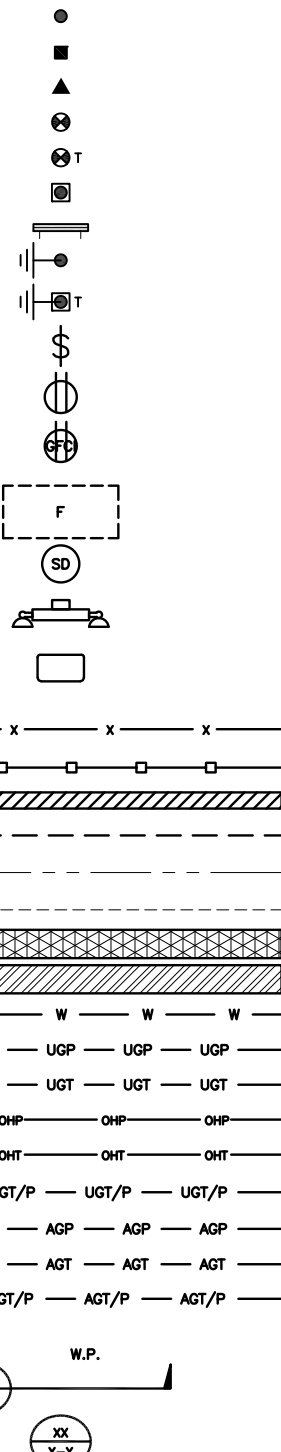
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SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

EXOTHERMIC CONNECTION
 MECHANICAL CONNECTION
 BUSS BAR INSULATOR
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 EXOTHERMIC WITH INSPECTION SLEEVE
 GROUNDING BAR
 GROUND ROD
 TEST GROUND ROD WITH INSPECTION SLEEVE
 SINGLE POLE SWITCH
 DUPLEX RECEPTACLE
 DUPLEX GFCI RECEPTACLE
 FLUORESCENT LIGHTING FIXTURE
 (2) TWO LAMPS 48-T8
 SMOKE DETECTION (DC)
 EMERGENCY LIGHTING (DC)
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
 LED-1-25A400/51K-SR4-120-PE-DBTDX
 CHAIN LINK FENCE
 WOOD/WROUGHT IRON FENCE
 WALL STRUCTURE
 LEASE AREA
 PROPERTY LINE (PL)
 SETBACKS
 ICE BRIDGE
 CABLE TRAY
 WATER LINE
 UNDERGROUND POWER
 UNDERGROUND TELCO
 OVERHEAD POWER
 OVERHEAD TELCO
 UNDERGROUND TELCO/POWER
 ABOVE GROUND POWER
 ABOVE GROUND TELCO
 ABOVE GROUND TELCO/POWER
 WORKPOINT
 SECTION REFERENCE
 DETAIL REFERENCE



LEGEND

AB	ANCHOR BOLT	IN	INCH	INT	INTERIOR
ABV	ABOVE	LB(S)	POUND(S)	LF	LINEAR FEET
AC	ALTERNATING CURRENT	LTE	LONG TERM EVOLUTION	MAS	MASONRY
ADDL	ADDITIONAL	MAX	MAXIMUM	MCH	MECHANICAL
AFF	ABOVE FINISHED FLOOR	MB	MACHINE BOLT	MFR	MANUFACTURER
AFG	ABOVE FINISHED GRADE	MGB	MASTER GROUND BAR	MIN	MINIMUM
AGL	ABOVE GROUND LEVEL	MISC	MISCELLANEOUS	MTL	METAL
AIC	AMPERAGE INTERRUPTION CAPACITY	MTS	MANUAL TRANSFER SWITCH	MW	MICROWAVE
ALUM	ALUMINUM	NEC	NATIONAL ELECTRIC CODE	NM	NEWTON METERS
ALT	ALTERNATE	NO.	NUMBER	#	NUMBER
ANT	ANTENNA	NTS	NOT TO SCALE	OC	ON-CENTER
APPROX	APPROXIMATE	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	OPNG	OPENING
ARCH	ARCHITECTURAL	P/C	PRECAST CONCRETE	PCS	PERSONAL COMMUNICATION SERVICES
ATS	AUTOMATIC TRANSFER SWITCH	PCU	PRIMARY CONTROL UNIT	PRC	PRIMARY RADIO CABINET
AWG	AMERICAN WIRE GAUGE	PP	POLARIZING PRESERVING	PSF	POUNDS PER SQUARE FOOT
BATT	BATTERY	PSI	POUNDS PER SQUARE INCH	PT	PRESSURE TREATED
BLDG	BUILDING	PWR	POWER CABINET	QTY	QUANTITY
BLK	BLOCK	RAD	RADIUS	RECT	RECTIFIER
BLKG	BLOCKING	REF	REFERENCE	REINF	REINFORCEMENT
BM	BEAM	REQ'D	REQUIRED	RET	REMOTE ELECTRIC TILT
BTC	BARE TINNED COPPER CONDUCTOR	RF	RADIO FREQUENCY	RMC	RIGID METALLIC CONDUIT
BOF	BOTTOM OF FOOTING	RRH	REMOTE RADIO HEAD	RRU	REMOTE RADIO UNIT
CAB	CABINET	RWY	RACEWAY	SCH	SCHEDULE
CANT	CANTILEVERED	SHT	SHEET	SIAD	SMART INTEGRATED ACCESS DEVICE
CHG	CHARGING	SIM	SIMILAR	SPEC	SPECIFICATION
CLG	CEILING	SQ	SQUARE	SS	STAINLESS STEEL
CLR	CLEAR	STD	STANDARD	STL	STEEL
COL	COLUMN	TEMP	TEMPORARY	THK	THICKNESS
COMM	COMMON	TMA	TOWER MOUNTED AMPLIFIER	TN	TOE NAIL
CONC	CONCRETE	TOA	TOP OF ANTENNA	TOC	TOP OF CURB
CONSTR	CONSTRUCTION	TOF	TOP OF FOUNDATION	TOP	TOP OF PLATE (PARAPET)
DBL	DOUBLE	TOS	TOP OF STEEL	TOW	TOP OF WALL
DC	DIRECT CURRENT	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION	TYP	TYPICAL
DEPT	DEPARTMENT	UG	UNDERGROUND	UL	UNDERWRITERS LABORATORY
DF	DOUGLAS FIR	UNO	UNLESS NOTED OTHERWISE	UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
DIA	DIAMETER	UPS	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)	VIF	VERIFIED IN FIELD
DIAG	DIAGONAL	W	WIDE	W	WITH
DIM	DIMENSION	WD	WOOD	WP	WEATHERPROOF
DWG	DRAWING	WT	WEIGHT		
DWL	DOWEL				
EA	EACH				
EC	ELECTRICAL CONDUCTOR				
EL	ELEVATION				
ELEC	ELECTRICAL				
EMT	ELECTRICAL METALLIC TUBING				
ENG	ENGINEER				
EQ	EQUAL				
EXP	EXPANSION				
EXT	EXTERIOR				
EW	EACH WAY				
FAB	FABRICATION				
FF	FINISH FLOOR				
FG	FINISH GRADE				
FIF	FACILITY INTERFACE FRAME				
FIN	FINISH(ED)				
FLR	FLOOR				
FDN	FOUNDATION				
FOC	FACE OF CONCRETE				
FOM	FACE OF MASONRY				
FOS	FACE OF STUD				
FOW	FACE OF WALL				
FS	FINISH SURFACE				
FT	FOOT				
FTG	FOOTING				
GA	GAUGE				
GEN	GENERATOR				
GFCI	GROUND FAULT CIRCUIT INTERRUPTER				
GLB	GLUE LAMINATED BEAM				
GLV	GALVANIZED				
GPS	GLOBAL POSITIONING SYSTEM				
GND	GROUND				
GSM	GLOBAL SYSTEM FOR MOBILE				
HDG	HOT DIPPED GALVANIZED				
HDR	HEADER				
HGR	HANGER				
HVAC	HEAT/VENTILATION/AIR CONDITIONING				
HT	HEIGHT				
IGR	INTERIOR GROUND RING				

ABBREVIATIONS



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



8051 CONGRESS AVENUE
BOCA RATON, FL 33487



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

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DRAWN BY:	CHECKED BY:	APPROVED BY:
BLB	BLB	JW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	5/20/21	ISSUED FOR REVIEW
0	6/14/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.
2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. 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 THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. 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 WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. 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 OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER: DISH Wireless L.L.C.
TOWER OWNER: TOWER OWNER
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. 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 THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. 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 DISH Wireless L.L.C. AND TOWER OWNER
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.



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CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	5/20/21	ISSUED FOR REVIEW
0	6/14/21	ISSUED FOR CONSTRUCTION

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149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 - CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 BARS AND LARGER 2"
 - #5 BARS AND SMALLER 1-1/2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLAB AND WALLS 3/4"
 - BEAMS AND COLUMNS 1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. TIE WRAPS ARE NOT ALLOWED.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



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B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
BLB	BLB	JW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	5/20/21	ISSUED FOR REVIEW
0	6/14/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149482.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00133A
160 WEST STREET
CROMWELL, CT 06416

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.



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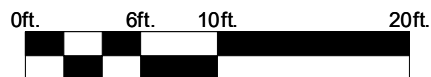
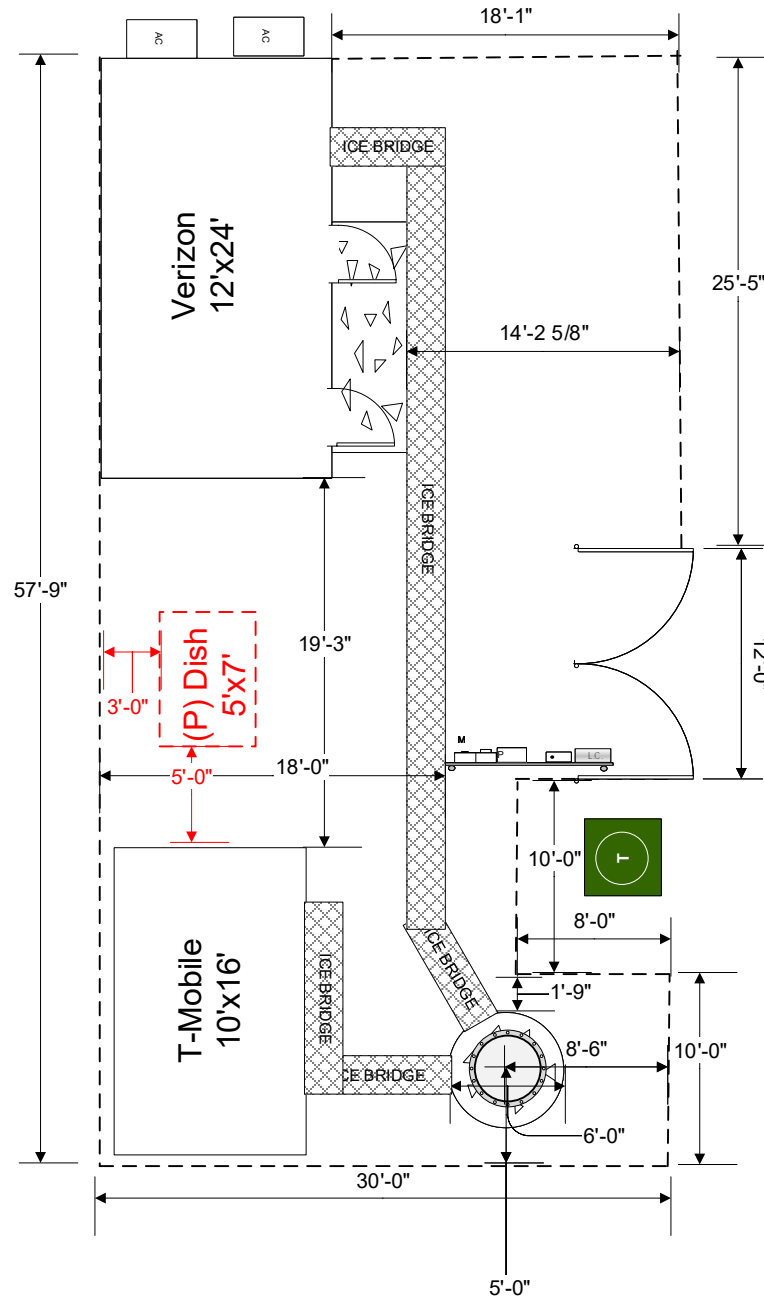
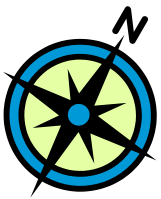
SHEET TITLE
GENERAL NOTES


SHEET NUMBER

GN-4

EXHIBIT 11

Site Sketch (Ground)



SBA Communications 		Middletown North	
<h1>COMPOUND DRAWING</h1>			
By: Stephen Roth sroth@sbasite.com		DATE: 4/7/2021	SITE NUMBER: CT46122-A
			STATE: CT