



Northeast Site Solutions  
Denise Sabo  
4 Angela's Way, Burlington CT 06013  
203-435-3640  
denise@northeastsitesolutions.com

November 16, 2022

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

RE: Petition No. 1528 – Request to Amend Application  
128 Mather Street, Wilton Ct 06897  
Latitude: 41.559500  
Longitude: -72.946900  
Site#: 806353\_ Crown\_DISH

Dear Ms. Bachman:

Dish Wireless received approval for Petition No. 1528 on September 16, 2022 to install three (3) new antenna at the 170-ft level of the existing 180-ft tower located at 128 Mather Street, Wilton CT 06897. The property is owned by the Town of Wilton and the tower is owned by Crown Castle. DISH is requesting to amend the application for the antenna to be moved to the 174-ft level of the existing 180-Ft tower. Please see the attached revised Structural analysis, construction drawing and power density reflecting the new revised RAD center.

Sincerely,

Denise Sabo  
Mobile: 203-435-3640  
Fax: 413-521-0558  
Office: 4 Angela's Way, Burlington CT 06013  
Email: denise@northeastsitesolutions.com



Attachments

cc:

Lynne Vanderslice, First Selectwoman & Property Owner  
Wilton Town Hall  
238 Danbury Road Wilton, CT 06897

Michael Wrinn, Director of Planning & Land Use  
Wilton Town Hall  
238 Danbury Road Wilton, CT 06897

Crown Castle – Tower Owner

# **ATTACHMENT 1**



6325 Ardrey Kell Rd, Suite 600  
Charlotte, NC 28277

Phone:  
www.crowncastle.com

### **Crown Castle Letter of Authorization**

#### **CT - CONNECTICUT SITING COUNCIL**

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

**Re: Tower Share Application**  
**Crown Castle telecommunications site at:**  
**128 MATHER STREET, WILTON, CT 06897**

CROWN ATLANTIC COMPANY LLC ("Crown Castle") hereby authorizes DISH NETWORK, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

**Crown Site ID/Name:** 806353/BRG 124 943066  
**Customer Site ID:** NJJER01086A/CT-CCI-T-806353  
**Site Address:** 128 MATHER STREET, WILTON, CT 06897

Crown Castle

By: Robin Cannizzaro Date: 04/07/2022  
Robin Cannizzaro  
Real Estate Specialist





# Town of Wilton, CT

## Property Listing Report

Map Block Lot

23-23

Account

006497

### Property Information

Property Location	MATHER ST
Owner	WILTON TOWN OF
Co-Owner	
Mailing Address	238 DANBURY RD WILTON CT 06897
Land Use	21V Ex Com MDL-00
Land Class	E
Zoning Code	R-2
Census Tract	
Sub Lot	
Neighborhood	4000
Acreage	74.12
Utilities	
Lot Setting/Desc	Rolling
Survey Map	
Foundation	3

### Photo



### Sketch



### Primary Construction Details

Year Built	0
Stories	
Building Style	
Building Use	
Building Condition	
Floors	Dirt/None
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Gable/Hip
Roof Cover	Enam Mtl Shing

Exterior Walls	Pre-finsh Metl
Interior Walls	Drywall
Heating Type	None
Heating Fuel	None
AC Type	None
Gross Bldg Area	1200
Total Living Area	1200



Town of Wilton, CT

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006497

Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	50000	35000
Extras	0	0
Outbuildings	0	0
Land	10254200	7177940
Total	10304200	7212940

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	1200	1200
Total Area		0

Outbuilding and Extra Items

Type	Description

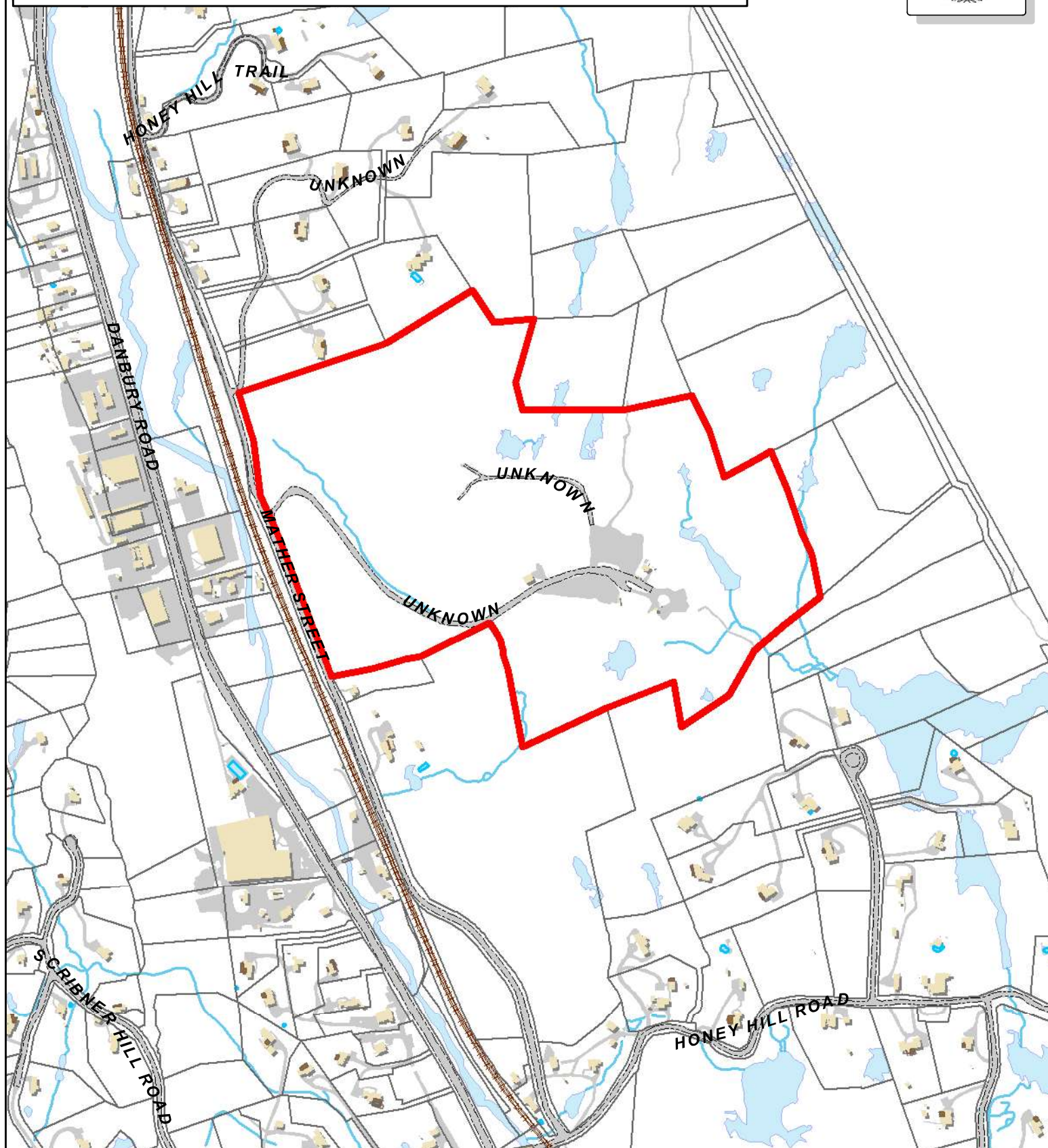
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
WILTON TOWN OF	1151/0195	2/2/1999	0
	0112/0179	5/1/1965	0

# Town of Wilton, Connecticut - Assessment Parcel Map

MBL: 23-23

Address: MATHER ST



Approximate Scale:

1 inch = 600 feet

Disclaimer:  
This map is for informational purposes only.  
All information is subject to verification by any user.  
The Town of Wilton and its mapping contractors  
assume no legal responsibility for the information contained herein.

Map Grand List Date: Oct 2017

0 350 700 1,050 Feet

## **ATTACHMENT 2**

DOCKET NO. 94 - AN APPLICATION OF METRO  
MOBILE CTS OF FAIRFIELD COUNTY, INC., FOR  
A CERTIFICATE OF ENVIRONMENTAL COMPATI-  
BILITY AND PUBLIC NEED FOR CELLULAR  
TELEPHONE ANTENNAS AND ASSOCIATED EQUIP-  
MENT IN THE TOWN OF WILTON, CONNECTICUT.

: Connecticut  
:  
: Siting  
:  
: Council  
May 3, 1988

#### DECISION AND ORDER

Pursuant to the foregoing opinion, the Connecticut Siting Council finds that the effects associated with the construction and operation of a cellular monopole structure at the alternative Mather Street site, including effects on the natural environment, ecological balance, public health and safety, scenic, historic and recreational values, forests and parks, air and water purity and fish and wildlife, are not significant either alone or cumulatively with other effects, are not in conflict with the policies of the state concerning such effects, and are not sufficient reason to deny the application, and therefore, directs that a Certificate of Environmental Compatibility and Public Need, as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to Metro Mobile CTS of Fairfield County, Inc. (Metro Mobile) for the construction, operation, and maintenance of a cellular telephone tower site and associated equipment at the "Wilton-D/AA" site on Mather Street in Wilton, Connecticut.

The proposed "D-Wilton" site on Richdale Drive and alternative "D/A Wilton" site on Quail Ridge Road are hereby denied.

The facility shall be constructed, operated, and maintained as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole or lattice tower, as determined by the Council in approving the development and management plan, and be no taller than necessary to provide the proposed service, and in no event shall exceed a total height of 193 feet, including antennas and associated equipment.
2. The facility shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations.

3. Unless necessary to comply with condition number two, above, no lights shall be installed on this tower.
4. The Certificate Holder shall prepare a development and management (d&m) plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The d&m plan shall provide monopole and lattice tower foundation design specifications and plans for permanent evergreen screening around the outside perimeter of the eight-foot chain link fence which will surround the site.
5. The Certificate Holder shall provide the Council with the results of additional subsurface reconnaissance at the proposed site prior to the commencement of any construction at this site.
6. The Certificate Holder or its successor shall notify the Council if and when directional antennas or any equipment other than that listed in this application are added to this facility.
7. The Certificate Holder or its successor shall permit public or private entities to share space on the tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
8. If this facility does not provide, or permanently ceases to provide, cellular service following the completion of construction, this Decision and Order shall be void, and the tower and all associated equipment in this application shall be dismantled and removed or reapplication for any new use shall be made to the Council before any such new use is made.
9. The Certificate Holder shall comply with any future radio frequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.

10. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the issuance of this Decision and Order, or within three years of the completion of any appeal taken in this Decision and Order.

Pursuant to Section 16-50p, we hereby direct that a copy of the Decision and Order be served on each person listed below. A notice of issuance shall be published in the Norwalk Hour and the Wilton Bulletin.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of State Agencies.

The parties or intervenors to this proceeding are:

Metro Mobile CTS of Fairfield County, Inc. (Party)  
50 Rockland Road  
South Norwalk, CT 06854  
Attn: Michael Riley

Howard L. Slater, Esq. (Its Attorney)  
Jennifer Young Gaudet, Esq.  
Byrne, Slater, Sandler,  
Shulman & Rouse, P.C.  
330 Main Street  
Hartford, CT 06103

Fleischman and Walsh, P.C. (Representative)  
1725 N. Street, N.W.  
Washington, D.C. 20036  
Attn: Richard Rubin, Esq.

PEACE, Inc. (Party)

Ann Caggiano (Representative)  
President  
PEACE, Inc.  
33 Honey Hill Trail  
Wilton, CT 06897

Town of Wilton	(Party)
Edward C. Desmond First Selectman Town of Wilton Town Hall 238 Danbury Road Wilton, CT 06897	(Representative)
Joseph C. Lee, Esq. Alice A. Bruno, Esq. Tyler Cooper & Alcorn 205 Church Street P.O. Box 1936 New Haven, CT 06509	(Its Attorney)
Margaret Doheny 21 Richdale Drive Wilton, CT 06897	(Party)
SNET Cellular, Inc.	(Intervenor)
Donald R. Chapman, Vice President Operations SNET Cellular, Inc. 555 Long Wharf Drive New Haven, CT 06511	(Representative)
Peter J. Tyrrell Senior Attorney SNET Cellular, Inc. 227 Church Street Room 1021 New Haven, CT 06506	(Its Attorney)
Ogden Bigelow 25 Hidden Lake Road Wilton, CT 06897	(Intervenor)



Docket 94  
Decision and Order  
Page Five

John Jordon  
32 Mayapple Road  
Wilton, CT 06897

(Party)

Veronica Tella  
41 Honey Hill Trail  
Wilton, CT 06897

(Party)

Betsy Mitchell  
125 Catalpa Road  
Wilton, CT 06897  
(SERVICE WAIVED)


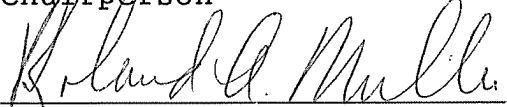
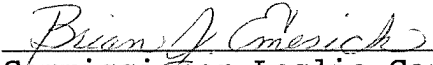
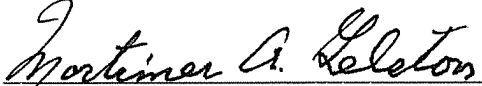
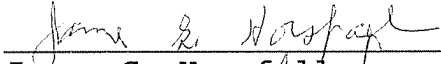
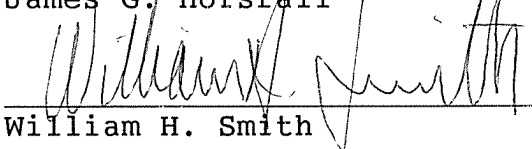
(Party)

1390E

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket 94 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 3rd day of May, 1988.

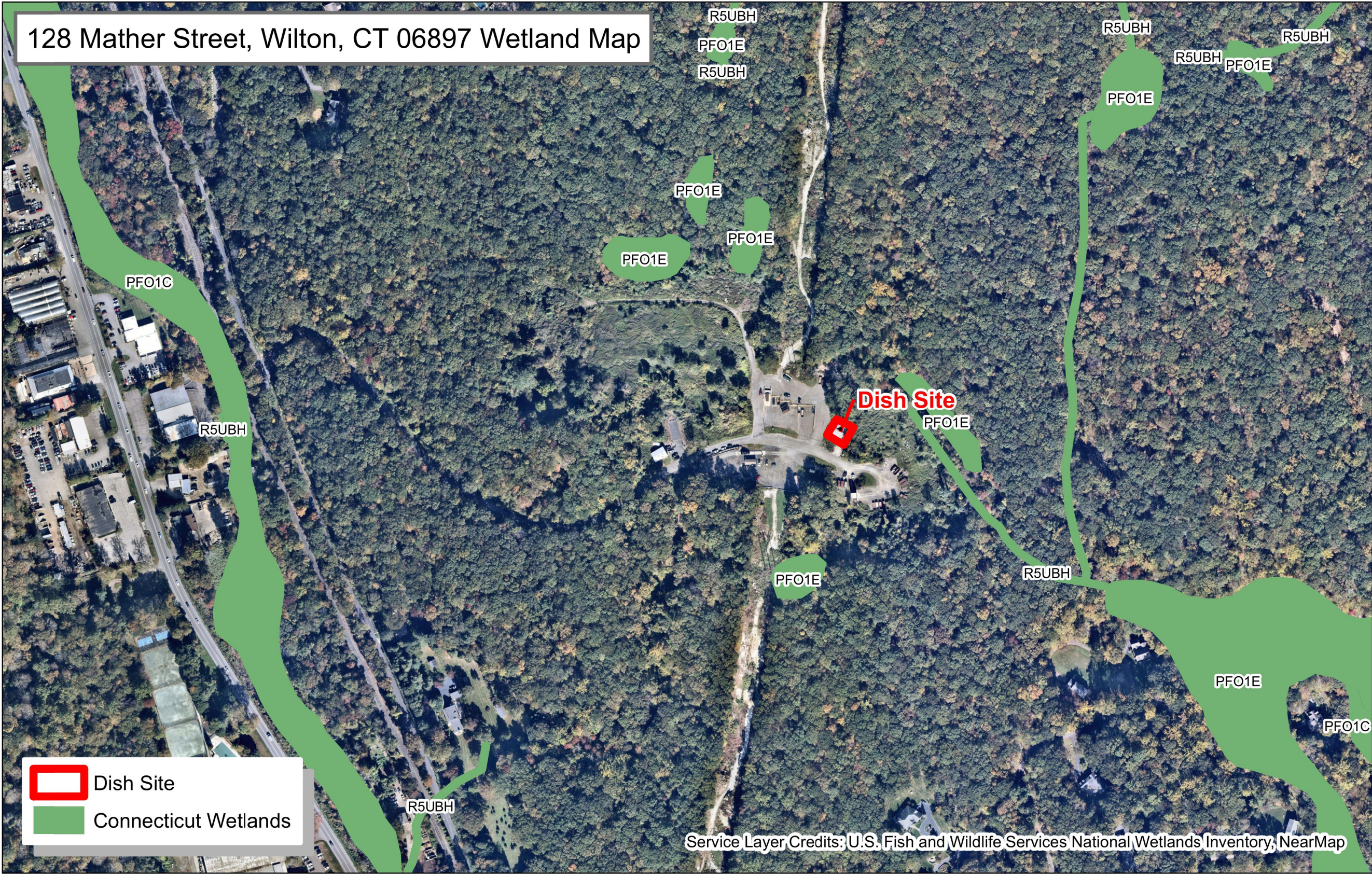
<u>Council Members</u>	<u>Vote Cast</u>
 Gloria Dibble Pond Chairperson	Yes
 Commissioner Peter Boucher Designee: Roland Miller	Yes
 Commissioner Leslie Carothers Designee: Brian Emerick	Yes
 Mortimer A. Gelston	Yes
 James G. Horsfall	Yes
 William H. Smith	Yes
 Colin C. Tait	Absent


## **ATTACHMENT 3**






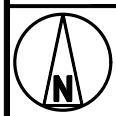
128 Mather Street, Wilton, CT 06897 Wetland Map



 Dish Site

 Connecticut Wetlands

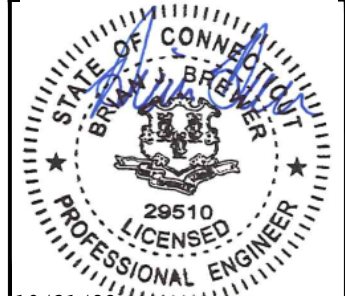
Service Layer Credits: U.S. Fish and Wildlife Services National Wetlands Inventory, NearMap



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



COA #: PEC.0000738  
421 FAYETTEVILLE ST, SUITE 600  
RALEIGH, NC 27601



10/31/22

Exp. 01/31/23

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:

SEW	MCK	---
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RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	10/01/2021	ISSUED FOR REVIEW
0	11/03/2021	ISSUED FOR CONSTRUCTION
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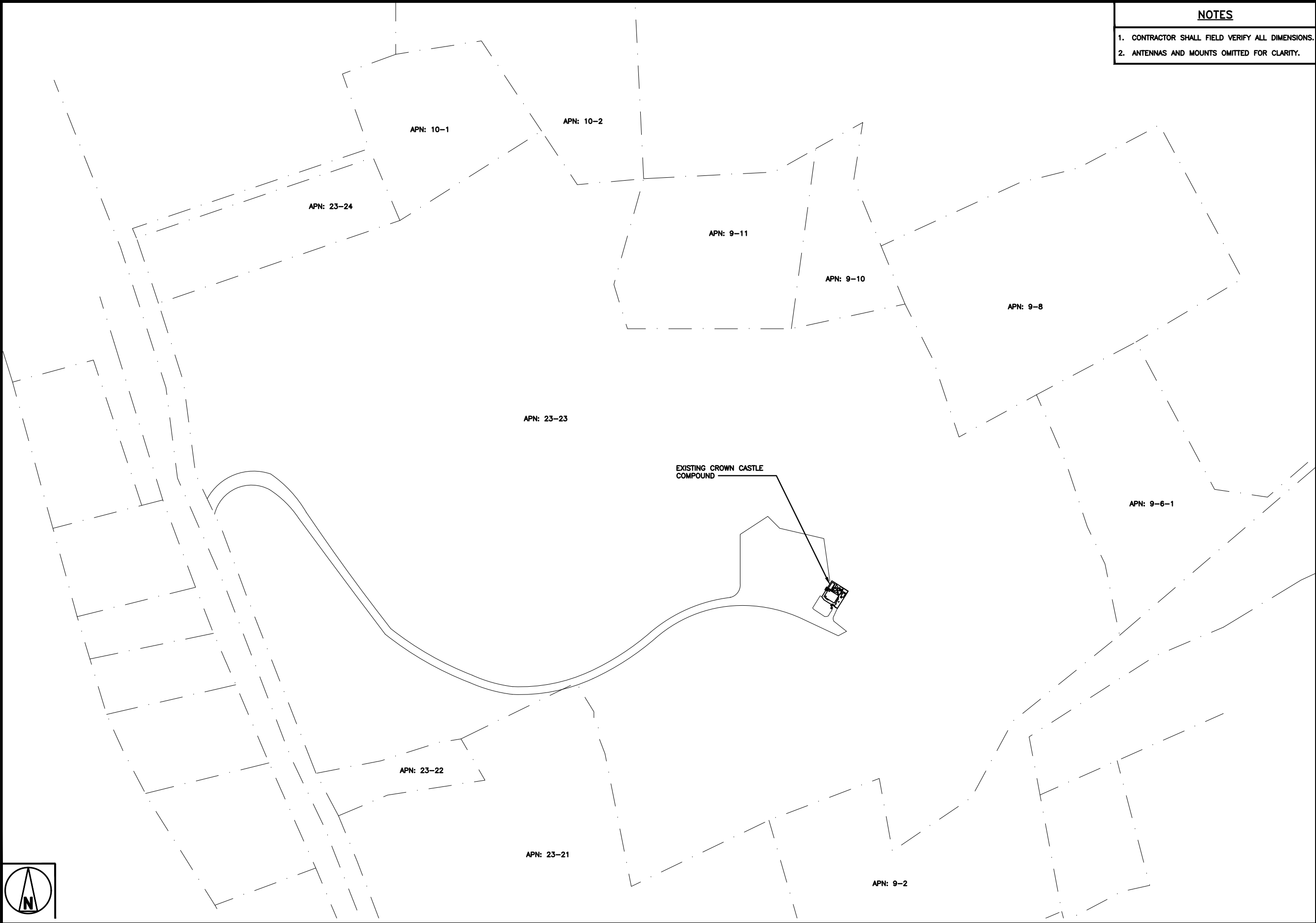
A&E PROJECT NUMBER  
KHCL-16448

DISH Wireless L.L.C.  
PROJECT INFORMATION  
  
NJJER01086A  
128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE  
WETLAND MAP

SHEET NUMBER  
**A-1.1**





- NOTES
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.

2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



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SEW MCK ---

RFDS REV #: ---

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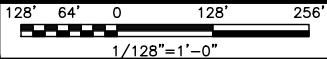
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128 MATHER STREET  
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SHEET TITLE  
ABUTTER MAP

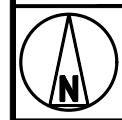
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**A-1.2**



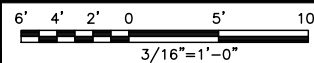
ABUTTER MAP



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

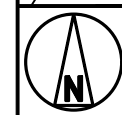


## OVERALL SITE PLAN

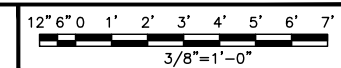


1

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



## OVERALL UTILITY ROUTE PLAN

NO SCALE

3

### A-1.3

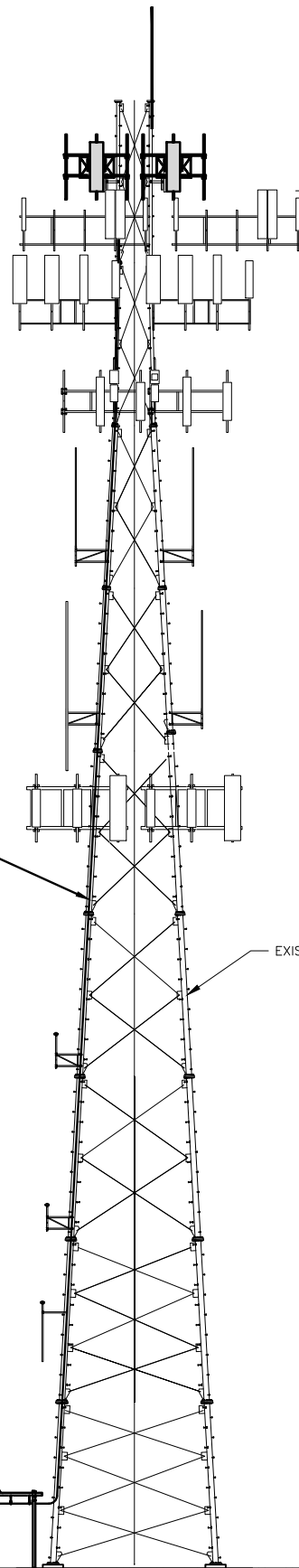


## NOTES

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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.
4. REMOVE EXISTING ANTENNAS AND MOUNTS @ 171'-0" AGL.

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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.
4. REMOVE EXISTING ANTENNAS AND MOUNTS @ 171'-0" AGL.



(1) PROPOSED DISH Wireless  
L.L.C. HYBRID CABLE ON EXISTING  
WAVEGUIDE LADDER \_\_\_\_\_

— EXISTING SELF-SUPPORT TOWER

PROPOSED DISH Wireless L.L.C. ICE BRIDGE

PROPOSED DISH Wireless L.L.C. GPS  
UNIT (BEHIND CABINET) \_\_\_\_\_

**PROPOSED DISH Wireless L.L.C.  
EQUIPMENT ON PROPOSED STEEL PLATFORM**

EXISTING LIGHTNING ROD  
TOP EL. @ 191'-6" AGL

EXISTING TOWER  
TOP EL. @ 180'-0" AGL

EXISTING EQUIPMENT  
TOP EL. @ 178'-0" AGL

**(3) PROPOSED DISH Wireless L.L.C. ANTENNAS**  
**RAD CENTER @ 174'-0" AGL**

EXISTING ANTENNAS AND MOUNTS TO BE REMOVED  
RAD CENTER @ 171'-0" AGL

TIP OF EXISTING ANTENNAS  
RAD CENTER @ 169'-0" AGL

EXISTING PANEL ANTENNAS  
TOP EL. @ 166'-0" AGL

EXISTING PANEL ANTENNAS  
RAD CENTER @ 158'-0" AGL

EXISTING PANEL ANTENNAS  
RAD CENTER @ 145'-0" AGL

EXISTING PANEL ANTENNAS  
RAD CENTER @ 143'-0" AGL

EXISTING EQUIPMENT  
RAD CENTER @ 124'-0" AGL

EXISTING EQUIPMENT  
RAD CENTER @ 104'-0" AGL

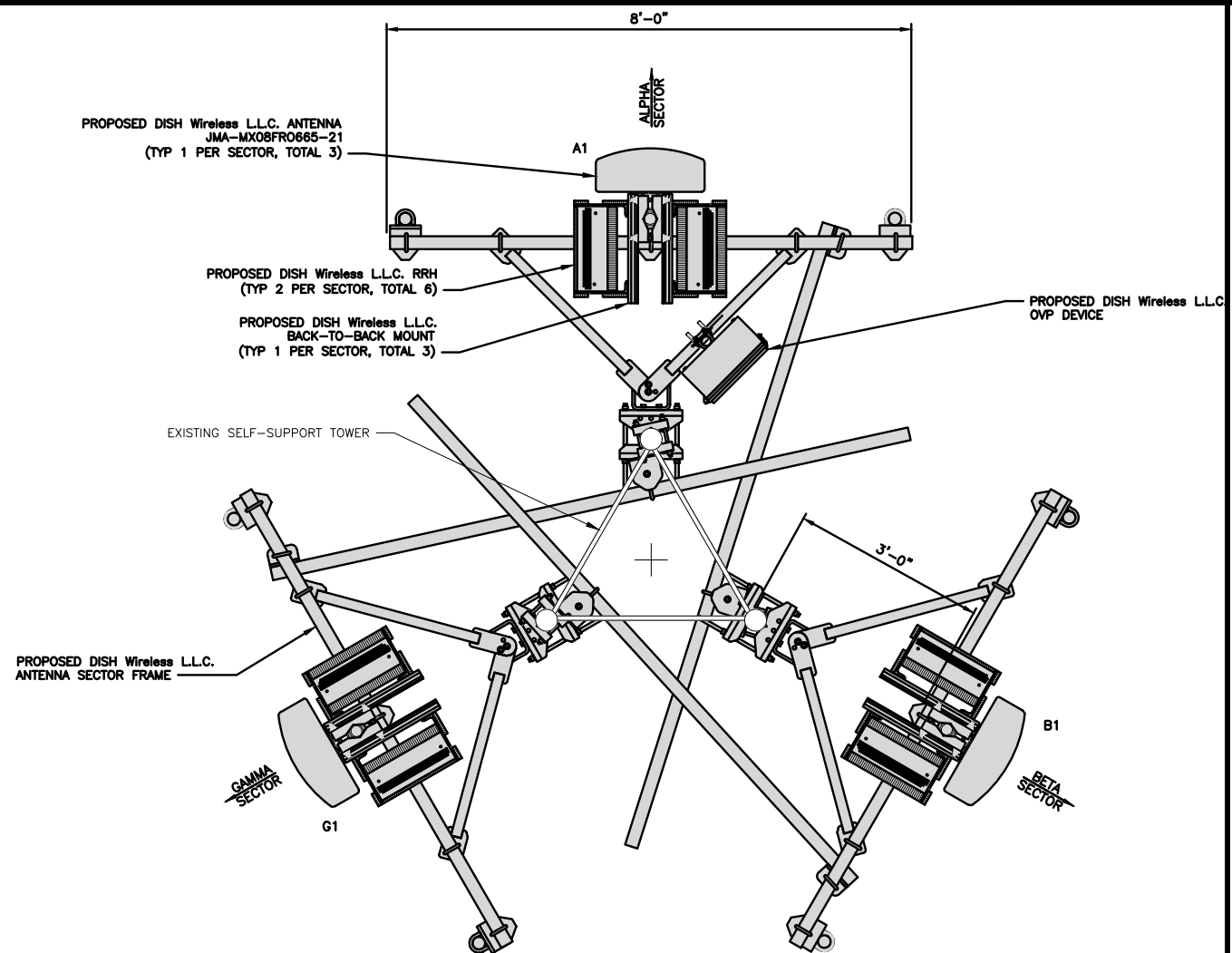
EXISTING PANEL ANTENNAS  
RAD CENTER @ 93'-0" AGL

SUPPORT TOWER

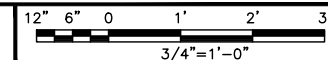
EXISTING EQUIPMENT  
RAD CENTER @ 62'-0" AGL

EXISTING EQUIPMENT  
RAD CENTER @ 42'-0" AGL

EXISTING EQUIPMENT  
RAD CENTER @ 31'-0" AGL



## 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 — MX08FR0665—21	5G	72.0" x 20.0"	0°	174'—0"	(1) HIGH-CAPACITY HYBRID CABLE (225'—0" LONG)
BETA	B1	PROPOSED	JMA — MX08FR0665—21	5G	72.0" x 20.0"	120°	174'—0"	
GAMMA	G1	PROPOSED	JMA — MX08FR0665—21	5G	72.0" x 20.0"	240°	174'—0"	

SECTOR	POSITION	OVP			
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)
ALPHA	A1	PROPOSED	RAYCAP – RDIDC-9181-PF-48	5G	18.98" x 14.39" x 8.15"

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025–B604	5G
	A1	FUJITSU – TA08025–B605	5G
BETA	B1	FUJITSU – TA08025–B604	5G
	B1	FUJITSU – TA08025–B605	5G
GAMMA	G1	FUJITSU – TA08025–B604	5G
	G1	FUJITSU – TA08025–B605	5G

## NOTES

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.

### ANTENNA SCHEDULE

NO SCALE

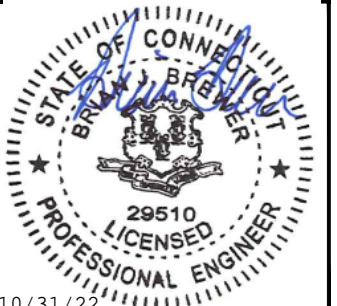
3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**Kimley»Horn**

COA #: PEC.0000738  
421 FAYETTEVILLE ST, SUITE 600  
RALEIGH, NC 27601



10/31/22

Exp. 01/31/23

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DRAWN BY:	CHECKED BY:	APPROVED BY:
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SEW

MCK

RFDS REV #:

CONSTRUCTION  
DOCUMENTS

## SUBMITTALS

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A&amp;E PROJECT NUMBER

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DISH Wireless L.L.C.  
PROJECT INFORMATION

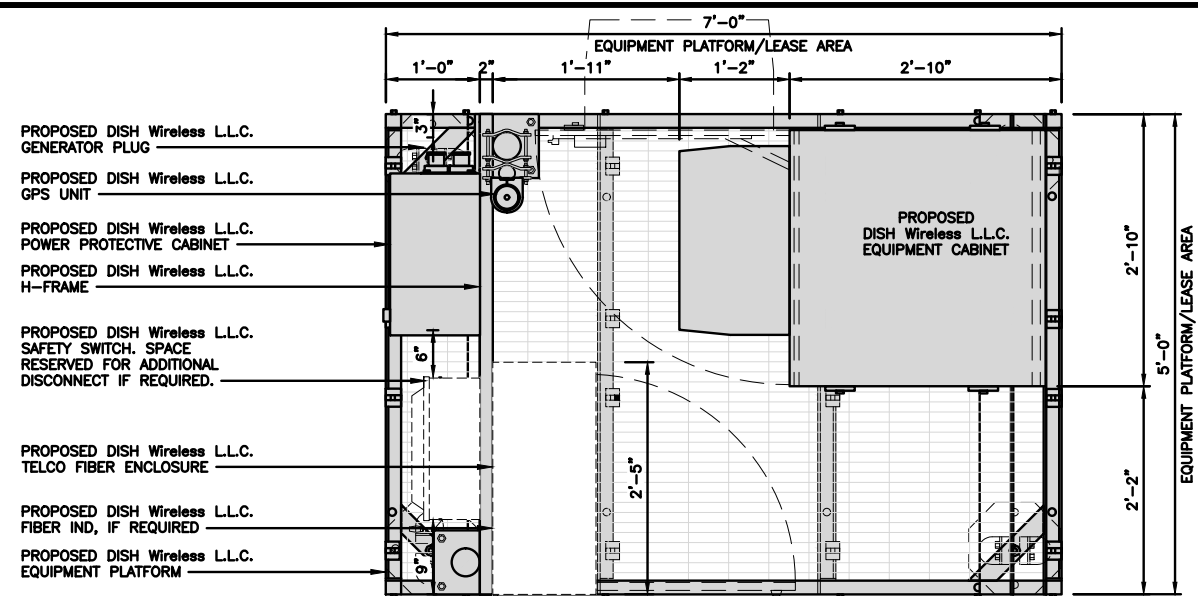
NJJER01086A  
128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE  
ELEVATION, ANTENNA  
LAYOUT AND SCHEDULE

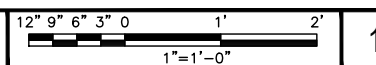
SHEET NUMBER

**A-2**



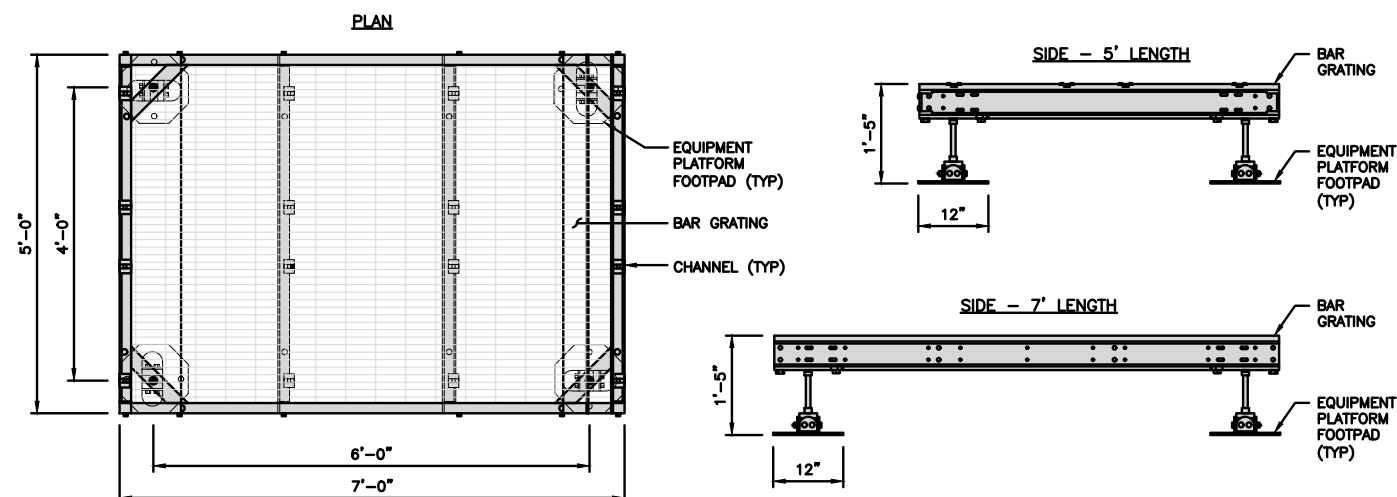


## PLATFORM EQUIPMENT PLAN



COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

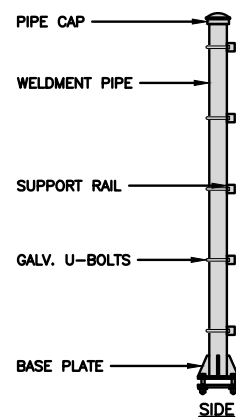
**NOTE:**  
1. GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"  
2. PLATFORM TO BE LEVEL WITHIN 1"



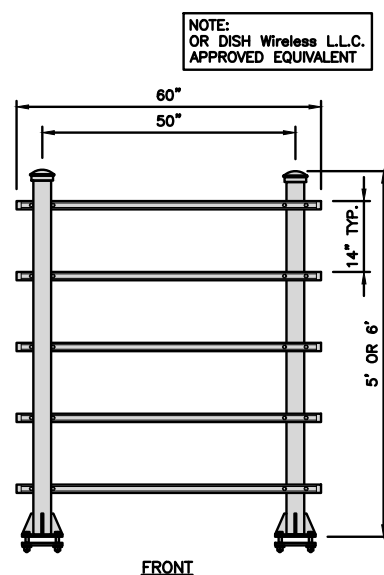
## PLATFORM DETAIL

NO SCALE	2
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COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



### H-FRAME DETAIL

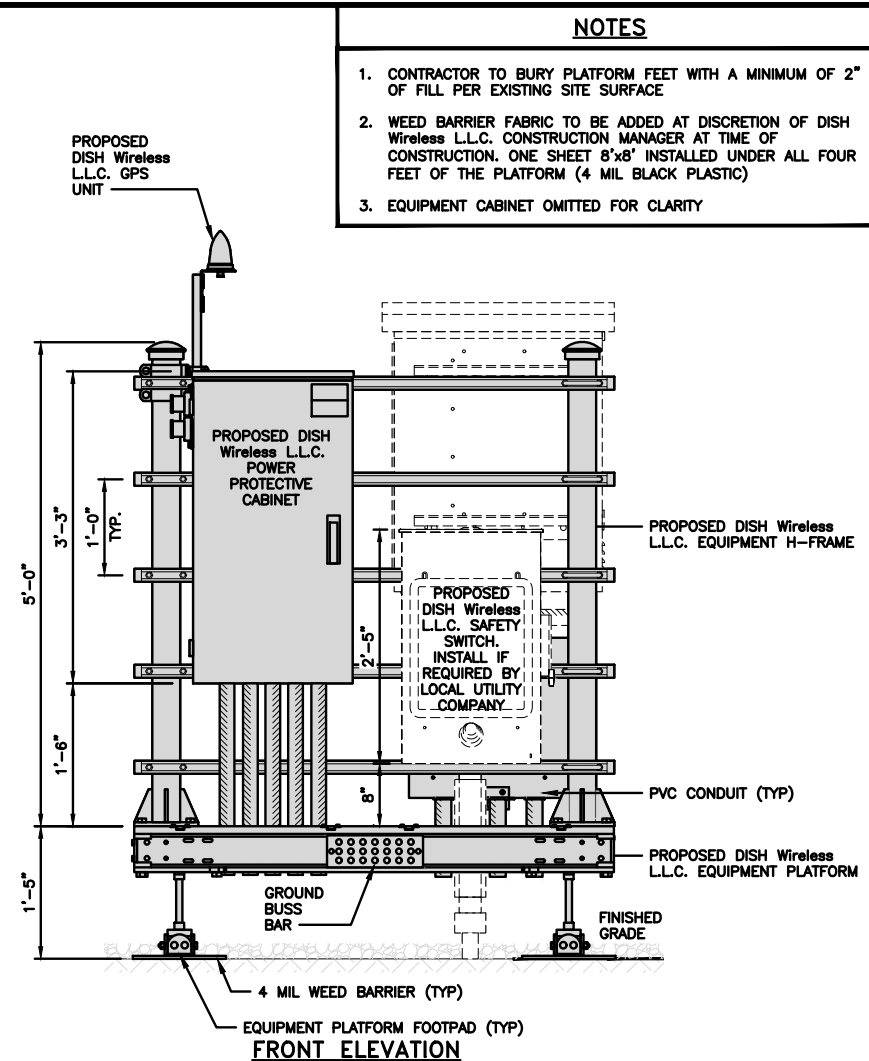


FRONT

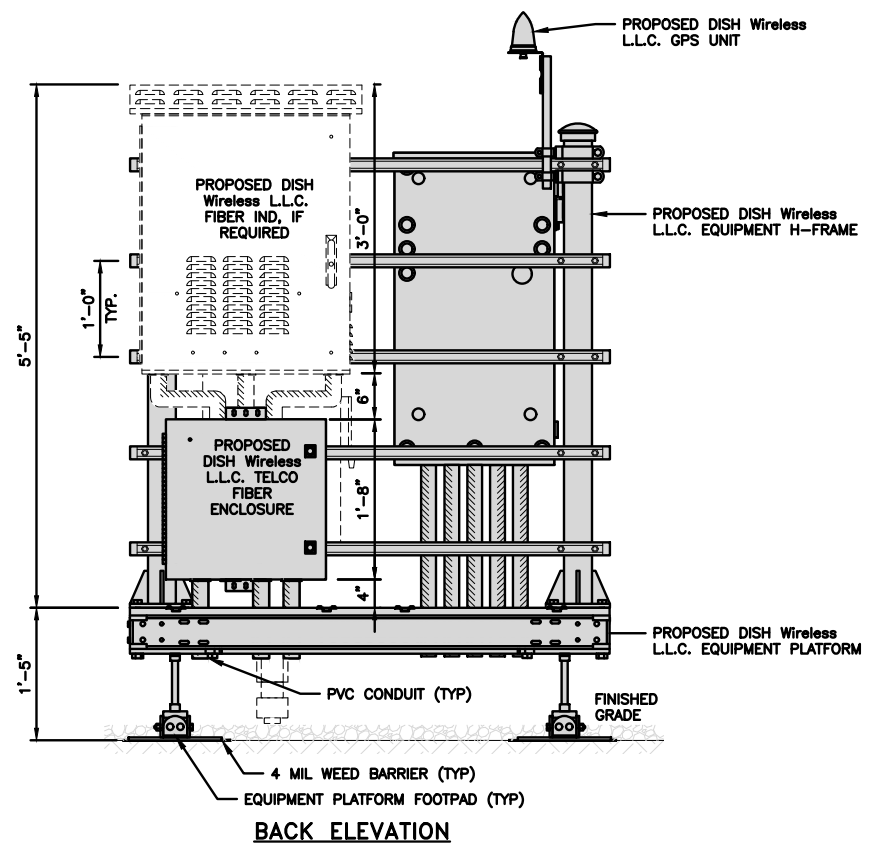
NO SCALE

3

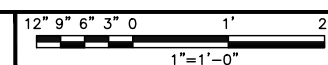
NOT USED

NO SCALE  $\angle$  $\Delta$ 

**FRONT ELEVATION**



### BACK ELEVATION



5

## 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 WHEELS LLC. CONSTRUCTION MANAGER AT THE DISCRETION OF CONSTRUCTION. ONE SHEET SHALL BE INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY

The logo for Dish Wireless, featuring the word "dish" in a bold, lowercase sans-serif font, with a stylized satellite dish icon integrated into the letter "i". Below "dish" is the word "wireless." in a smaller, lowercase sans-serif font.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**Kimley»Horn**

COA #: PEC.0000738  
421 FAYETTEVILLE ST, SUITE 600  
RALEIGH, NC 27601



10/31/22

Exp. 01/31/23

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OF A LICENSED PROFESSIONAL ENGINEER,  
TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
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SEW	MCK	---
-----	-----	-----

RFDS REV #: ---

CONSTRUCTION  
DOCUMENTS

## SUBMITTALS

REV	DATE	DESCRIPTION
A	10/01/2021	ISSUED FOR REVIEW
0	11/03/2021	ISSUED FOR CONSTRUCTION
1	05/04/2022	REVISED PER CLIENT
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3	10/31/2022	REVISED PER CLIENT

A&amp;E PROJECT NUMBER

KHCLE-16448

DISH Wireless L.L.C.  
PROJECT INFORMATION

N.J.JER01086A

128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE	
EQUIPMENT PLATFORM AND H-FRAME DETAILS	

SHEET NUMBER

**A-3**

ENERSYS HEX  
20000059996

DIMENSIONS (HxWxD)	73"x30"x32"
POWER SYSTEM	-48V ALPHA/600A
HEATER	800W
TOTAL WEIGHT (EMPTY)	376 lbs

BACK

SIDE

FRONT

PLAN

CABINET DETAIL

NO SCALE

1

RAYCAP PPC  
RDIAC-2465-P-240-MTS

ENCLOSURE DIMENSIONS (HxWxD)	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

BACK

SIDE

FRONT

SIDE

TOP

POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

2

SQUARE D SAFETY SWITCHES  
D224NRB

ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875

SIDE

FRONT

TOP

SAFETY SWITCH DETAIL

NO SCALE

3

CHARLES CFIT-PF2020DSH1  
FIBER TELCO ENCLOSURE

ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4

SIDE

BACK

FRONT

FRONT

FIBER TELCO ENCLOSURE DETAIL

NO SCALE

6

COMMSCOPE WB-K110-B  
WAVEGUIDE BRIDGE KIT

DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

PLAN

FRONT

SIDE

INCLUDED PRODUCTS:  
WB-T12-3 TRAPEZE KIT, 3 RUNGS  
WB-LB12-3 SUPPORT BRACKET  
MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"

ICE BRIDGE DETAIL

NO SCALE

7

FINISH SLOPE TO DRAIN

A-A

PROPOSED 3.5" DIA. SCH 40 PIPE GALVANIZED

PROPOSED 1'-6" DIA. CONCRETE PIER (TYP)

CONCRETE PIER

A-A SECTION

3" DIA SCH 40 PIPE

18" DIA DRILLED PIER FOUNDATION

1'-6"

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8

PROPOSED ICE BRIDGE

PROPOSED 1'-3/4" DIA HYBRID CABLE

PROPOSED CABLE CLAMP @ 3'-0" O.C.

EXISTING SELF SUPPORT TOWER

HYBRID CABLE RUN

NO SCALE

9

DISH Wireless L.L.C. TEMPLATE VERSION 43 - 09/17/2021

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

COA #: PEC.0000738  
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DISH Wireless L.L.C.  
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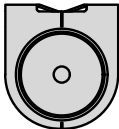
NJ01086A  
128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE  
EQUIPMENT DETAILS

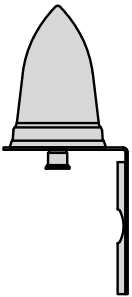
SHEET NUMBER

A-4

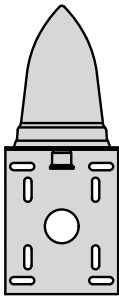
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



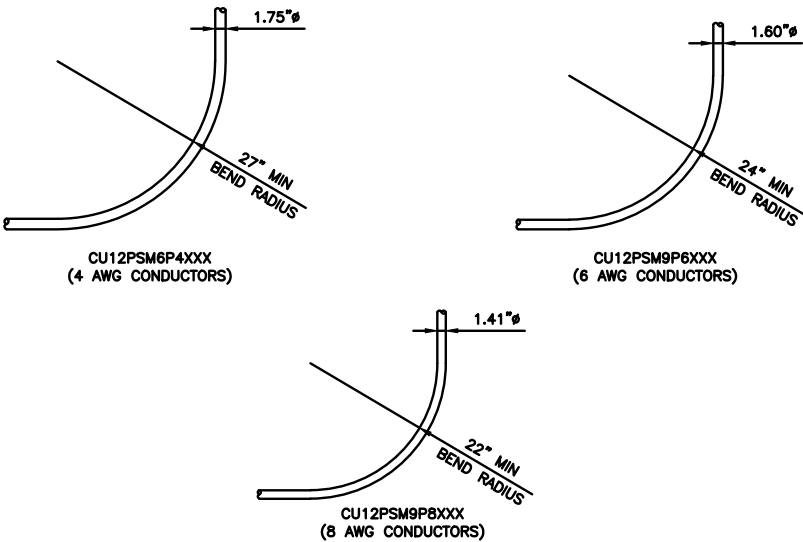
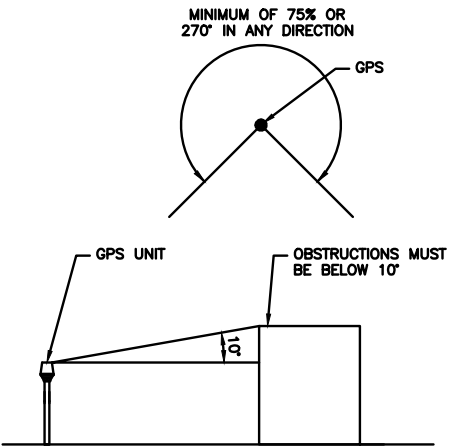
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE  
MINIMUM BEND RADIUSES

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

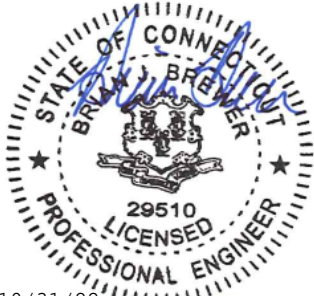
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128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER

A-5

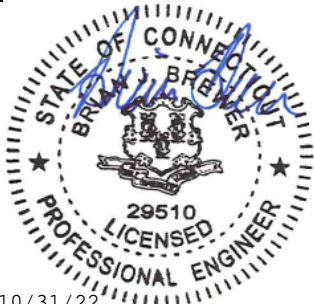
<table><tr><td colspan="2">FUJITSU TRIPLE BAND TA08025-B605</td></tr><tr><td>DIMENSIONS (HxWxD)</td><td>14.9"x15.7"x9"</td></tr><tr><td>WEIGHT</td><td>74.95 lbs</td></tr><tr><td>CONNECTOR TYPE</td><td>4.3-10 RF CONNECTOR</td></tr><tr><td>POWER SUPPLY</td><td>DC -58~-36V</td></tr></table> <div></div> <div></div> <div></div> <div>PLAN</div>	FUJITSU TRIPLE BAND TA08025-B605		DIMENSIONS (HxWxD)	14.9"x15.7"x9"	WEIGHT	74.95 lbs	CONNECTOR TYPE	4.3-10 RF CONNECTOR	POWER SUPPLY	DC -58~-36V	<table><tr><td colspan="2">FUJITSU DUAL BAND TA08025-B604</td></tr><tr><td>DIMENSIONS (HxWxD)</td><td>14.9"x15.7"x7.8"</td></tr><tr><td>WEIGHT</td><td>63.9 lbs</td></tr><tr><td>CONNECTOR TYPE</td><td>4.3-10 RF CONNECTOR</td></tr><tr><td>POWER SUPPLY</td><td>DC -58~-36V</td></tr></table> <div></div> <div></div> <div></div> <div>PLAN</div>	FUJITSU DUAL BAND TA08025-B604		DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"	WEIGHT	63.9 lbs	CONNECTOR TYPE	4.3-10 RF CONNECTOR	POWER SUPPLY	DC -58~-36V	<table><tr><td colspan="2">SABRE DOUBLE Z-BRACKET C10123155</td></tr><tr><td>DIMENSIONS (HxWxD) (1 BRACKET)</td><td>5"x20"x1-13/16"</td></tr><tr><td>WEIGHT (FULL ASSEMBLY)</td><td>35.79 lbs</td></tr><tr><td>PACKAGE QUANTITY</td><td>4</td></tr></table> <table><tr><td>#</td><td>DESCRIPTION</td></tr><tr><td>1</td><td>PLATE, CHANNEL BRACKET</td></tr><tr><td>2</td><td>RRH Z BRACKET, 3/16"</td></tr><tr><td>3</td><td>THREADED ROD ASSEMBLY 1/2"x12"</td></tr></table> <div></div> <div></div> <div>NOTE: OR DISH Wireless L.L.C. APPROVED EQUIVALENT</div>	SABRE DOUBLE Z-BRACKET C10123155		DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"	WEIGHT (FULL ASSEMBLY)	35.79 lbs	PACKAGE QUANTITY	4	#	DESCRIPTION	1	PLATE, CHANNEL BRACKET	2	RRH Z BRACKET, 3/16"	3	THREADED ROD ASSEMBLY 1/2"x12"	RRH DETAILNO SCALE1	RRH DETAILNO SCALE2	RRH MOUNT DETAILNO SCALE3
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SURGE SUPPRESSION DETAIL (OVP)NO SCALE4	ANTENNA DETAILNO SCALE5	NOT USEDNO SCALE6																																							
<table><tr><td colspan="2">JMA ANTENNA MOUNTING BRACKET #91900318</td></tr><tr><td>TOTAL WEIGHT (WITH BRACKETS)</td><td>18 lbs (8.18 Kg)</td></tr><tr><td>POLE DIAMETER RANGE</td><td>2.5 TO 4.5 INCHES</td></tr></table> <div></div> <div>NOTE: KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-, 6-, AND 8-FOOT ANTENNAS ANTENNA BRACKET NOT PART OF KIT</div>	JMA ANTENNA MOUNTING BRACKET #91900318		TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)	POLE DIAMETER RANGE	2.5 TO 4.5 INCHES	<table><tr><td colspan="2">COMMSCOPE V-FRAME MTC3975083</td></tr><tr><td>FACE SIZE</td><td>8'-0"</td></tr><tr><td>WEIGHT</td><td>352.136 lbs</td></tr></table> <div></div> <div></div> <div>NOTE: OR DISH Wireless L.L.C. APPROVED EQUIVALENT</div>	COMMSCOPE V-FRAME MTC3975083		FACE SIZE	8'-0"	WEIGHT	352.136 lbs	<table><tr><td colspan="2">SITEPRO1 T600 UNIVERSAL T-BRACKET</td></tr><tr><td>DIMENSIONS (HxWxD)</td><td>2.25"x10.0"x15.25"</td></tr><tr><td>WEIGHT/ VOLUME</td><td>5.60 LBS</td></tr></table> <div></div> <div></div>		SITEPRO1 T600 UNIVERSAL T-BRACKET		DIMENSIONS (HxWxD)	2.25"x10.0"x15.25"	WEIGHT/ VOLUME	5.60 LBS																				
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ANTENNA BRACKET DETAILNO SCALE7	ANTENNA FRAME DETAILNO SCALE8	VERTICAL CABLE SUPPORT DETAILNO SCALE9																																							



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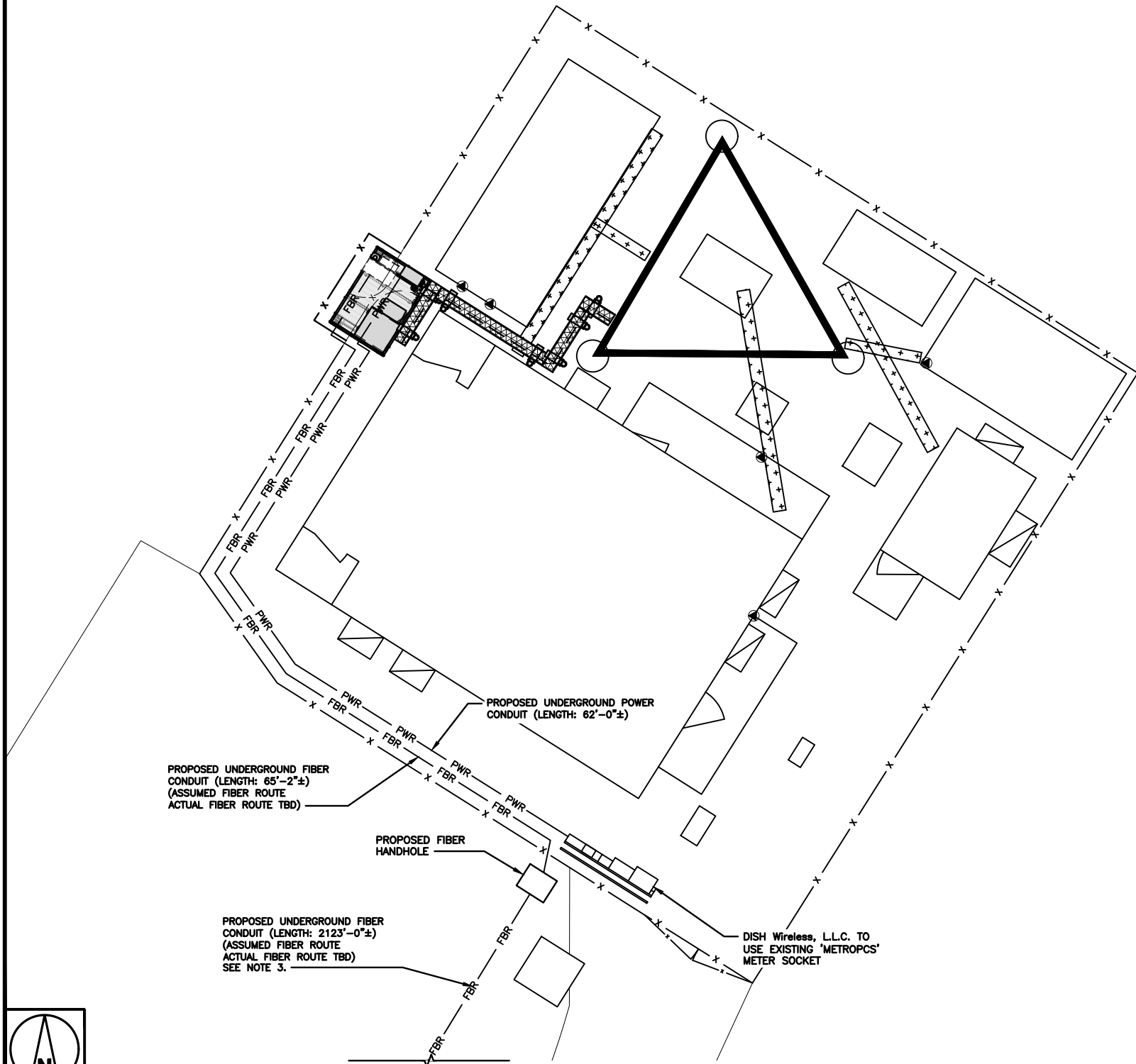
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A-6

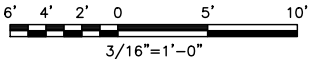


NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. DUE TO UTILITY EASEMENT RIGHTS SPECIFIED IN THE GROUND LEASE, CUSTOMER MAY INSTALL EQUIPMENT WITHIN SPECIFIED UTILITY EASEMENT AREA. "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 REPRESENT PLANNED ROUTING BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO A SURVEY, EXHIBITS, METES AND BOUNDS OF THE UTILITY EASEMENT, FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONSISTENT WITH "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 AND SAID VARIANCE IS NOT NOTED ON CDa, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN

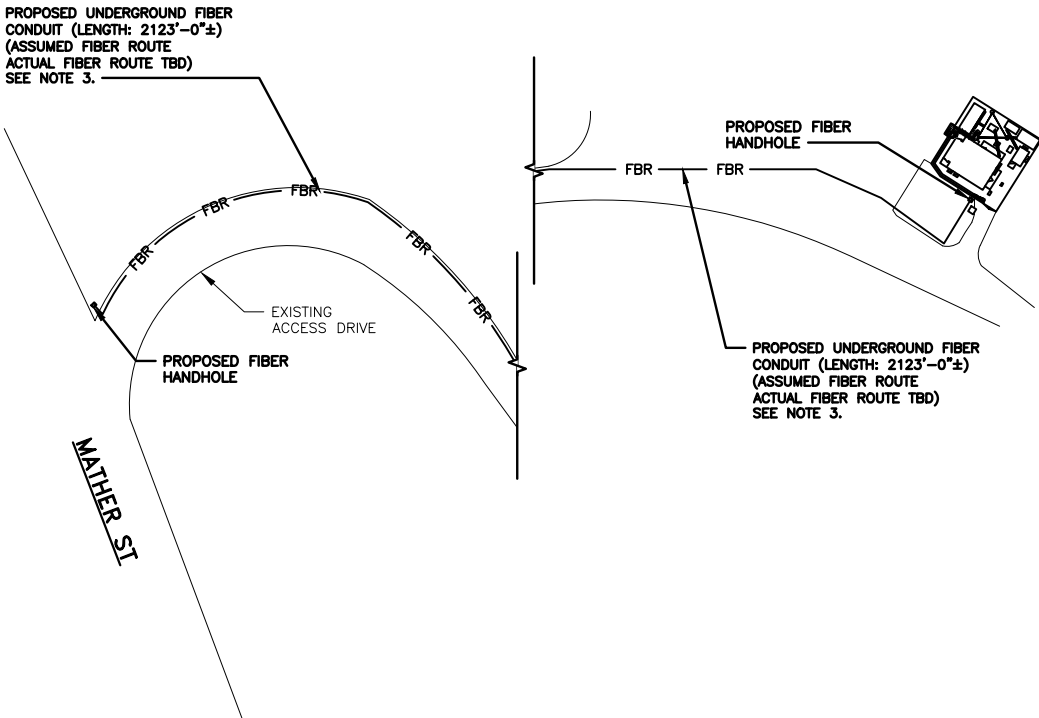


DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

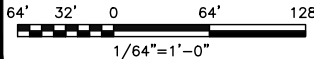
1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, 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 TO BE HAND DUG

ELECTRICAL NOTES

NO SCALE



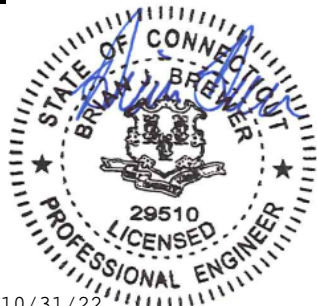
OVERALL UTILITY ROUTE PLAN



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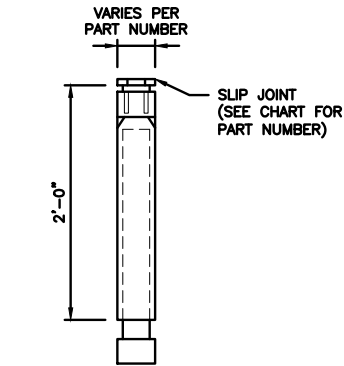
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WILTON, CT 06897

SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

SHEET NUMBER

E-1

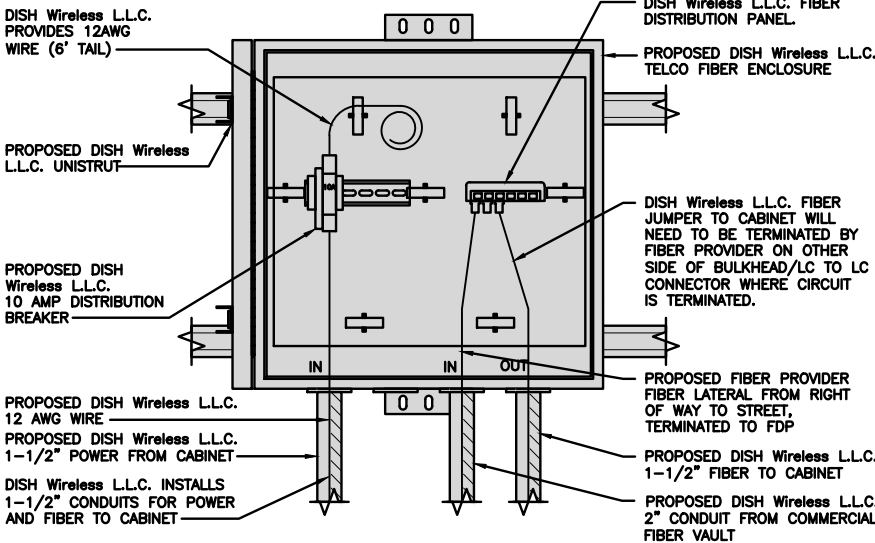
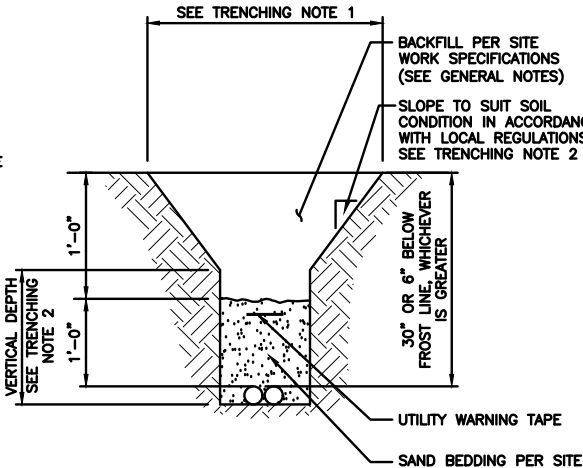
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
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

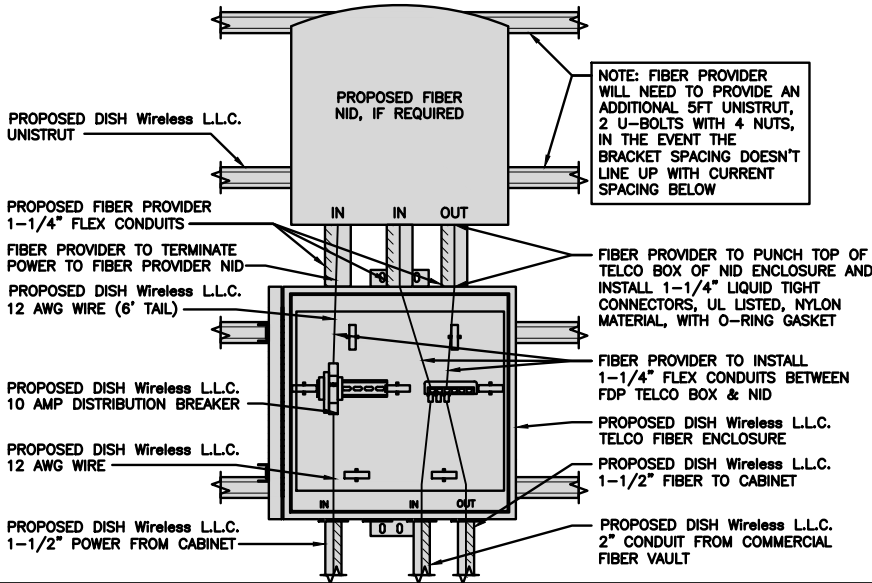
NO SCALE

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

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

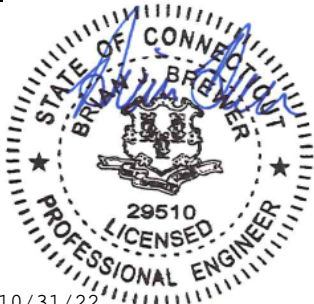
9



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



COA #: PEC.0000738  
421 FAYETTEVILLE ST, SUITE 600  
RALEIGH, NC 27601



10/31/22

Exp. 01/31/23

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DRAWN BY: CHECKED BY: APPROVED BY:

SEW MCK ---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
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A&E PROJECT NUMBER

KHCL-16448

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJJer01086A  
128 MATHER STREET  
WILTON, CT 06897

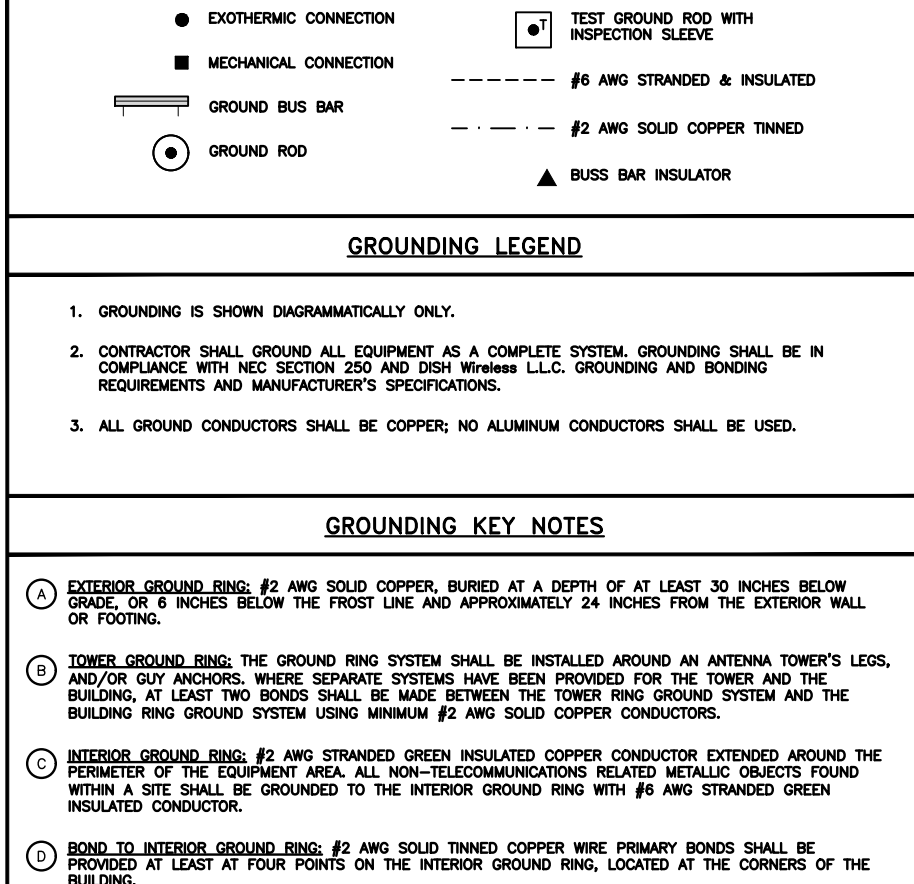
SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER

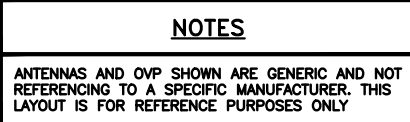
E-2





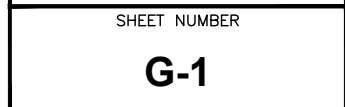


NO SCALE | 1

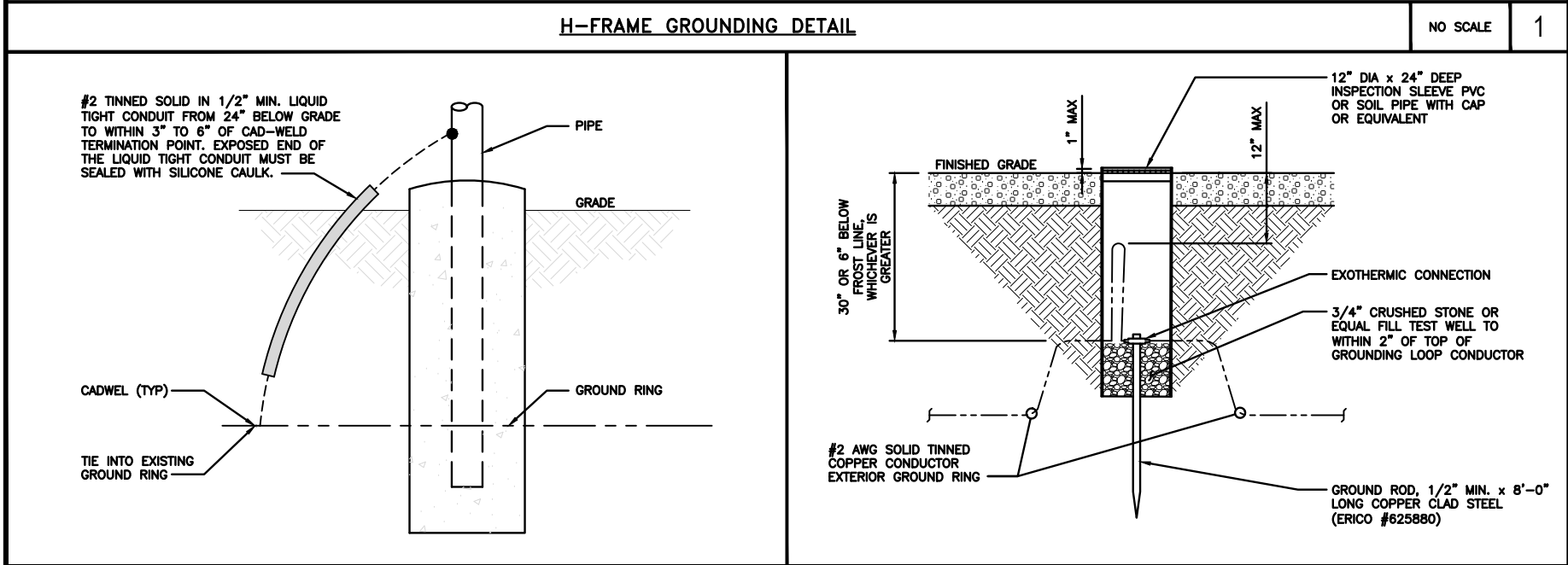
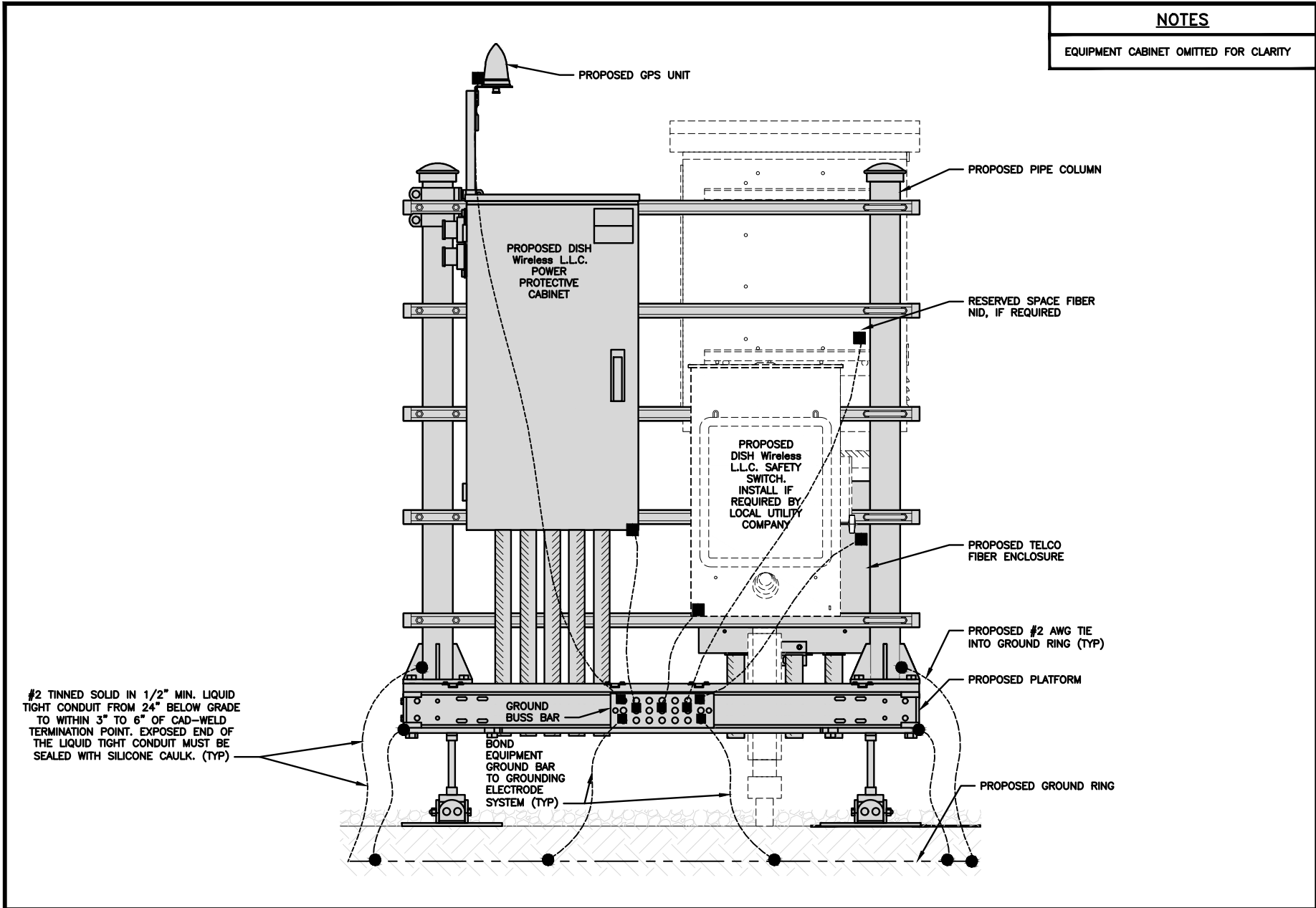


NO SCALE | 2

- |                            |                 |          |
|----------------------------|-----------------|----------|
| <b>GROUNDING KEY NOTES</b> | <b>NO SCALE</b> | <b>3</b> |
|----------------------------|-----------------|----------|

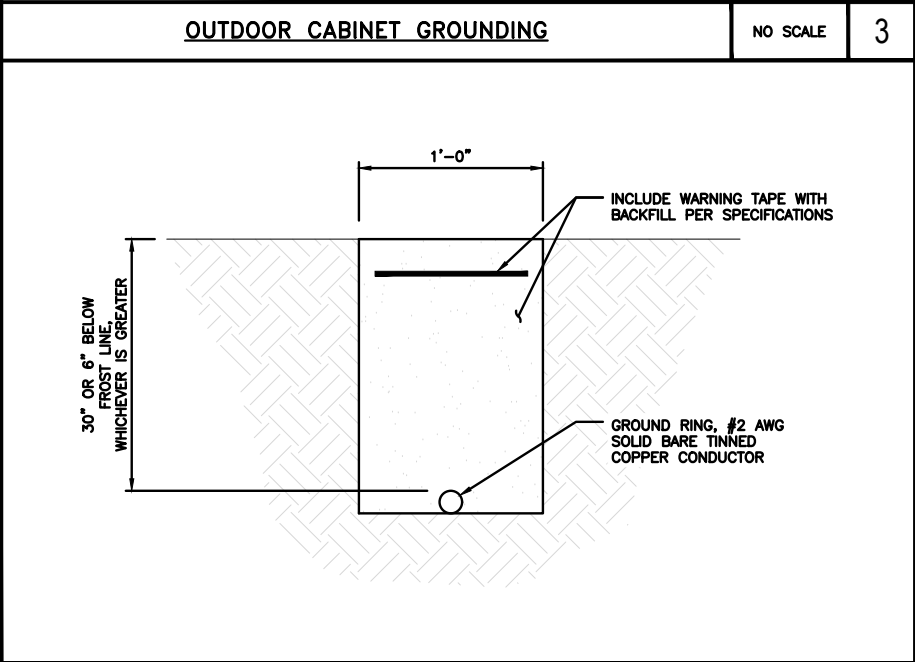
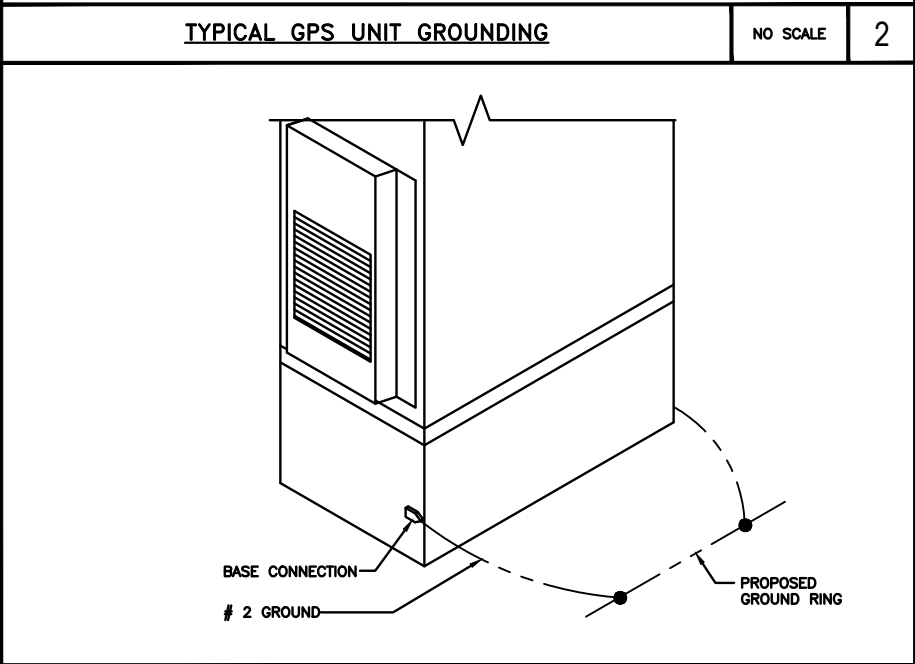
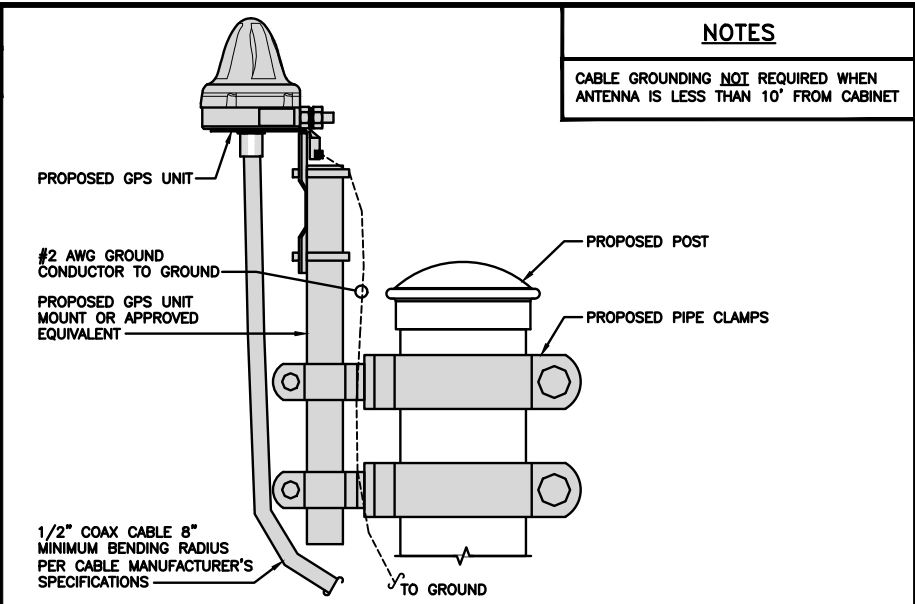






TRANSITIONING GROUND DETAIL NO SCALE 4

TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE NO SCALE 5



TYPICAL GROUND RING TRENCH NO SCALE 6

dish  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

Kimley»Horn

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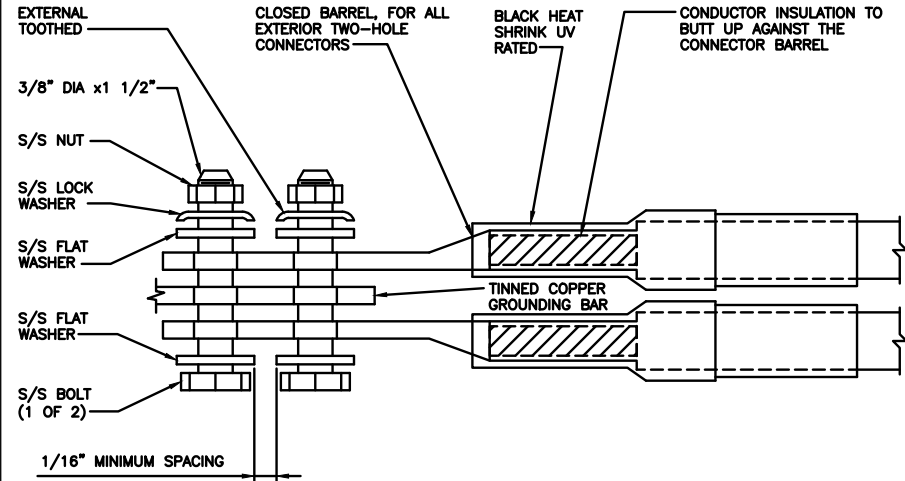
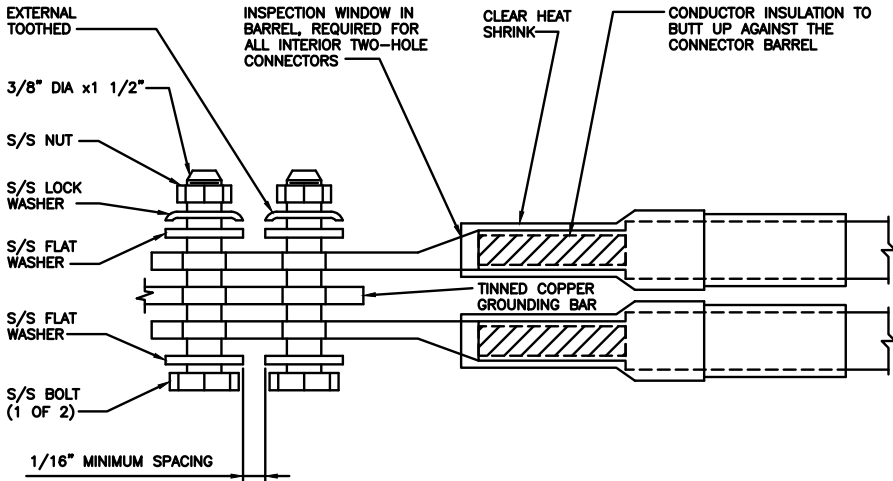
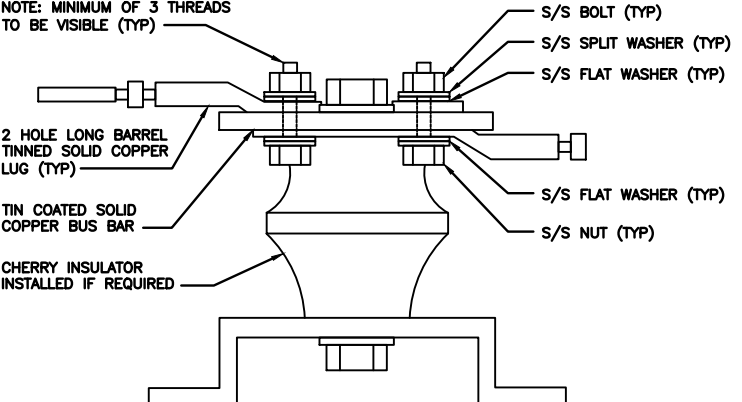
DISH Wireless L.L.C.  
PROJECT INFORMATION

NJ001086A  
128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER

G-2

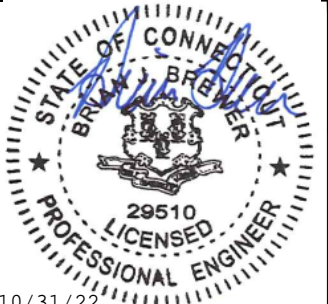
<div>1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.</div> <div>2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING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



5701 SOUTH SANTA FE DRIVE  
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COA #: PEC.0000738  
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KHCL-16448

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJJE01086A  
128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER

G-3

RF JUMPER COLOR CODING				3/4" TAPE WIDTHS WITH 3/4" SPACING								
LOW-BAND RRH – (600MHz N71 BASEBAND) + (850MHz N26 BAND) + (700MHz N29 BAND) – OPTIONAL PER MARKET	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	
MID-BAND RRH – (AWS BANDS N66+N70)	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		EXAMPLE 3							
	RED		RED		RED							
	BLUE		BLUE		ORANGE							
	GREEN		GREEN		PURPLE							
	ORANGE		YELLOW									
FIBER JUMPERS TO RRHs	LOW BAND RRH		HIGH BAND RRH		LOW BAND RRH		HIGH BAND RRH		LOW BAND RRH		HIGH BAND RRH	
	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	
	RED		RED		BLUE		BLUE		GREEN		GREEN	
			PURPLE				PURPLE				PURPLE	
RET MOTORS AT ANTENNAS	ANTENNA 1 LOW BAND/ "IN"		ANTENNA 1 HIGH BAND/ "IN"		ANTENNA 1 LOW BAND/ "IN"		ANTENNA 1 HIGH BAND/ "IN"		ANTENNA 1 LOW BAND/ "IN"		ANTENNA 1 HIGH BAND/ "IN"	
	RED		RED		BLUE		BLUE		GREEN		GREEN	
			PURPLE				PURPLE				PURPLE	
MICROWAVE RADIO LINKS	FORWARD AZIMUTH OF 0–120 DEGREES				FORWARD AZIMUTH OF 120–240 DEGREES				FORWARD AZIMUTH OF 240–360 DEGREES			
	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-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID'S			RED				BLUE				GREEN	
			WHITE				WHITE				WHITE	
			RED				BLUE				GREEN	
			WHITE				WHITE				WHITE	

RF CABLE COLOR CODES

NO SCALE

1

NOT USED

NO SCALE

4

LOW BANDS (N71+N26)  
OPTIONAL – (N29)

ORANGE

AWS  
(N66+N70+H-BLOCK)

PURPLE

CBRS TECH  
(3 GHz)

YELLOW

NEGATIVE SLANT PORT  
ON ANT/RRH

WHITE

ALPHA SECTOR

RED

BETA SECTOR

BLUE

GAMMA SECTOR

GREEN

COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

dish  
wireless.

5701 SOUTH SANTA FE DRIVE  
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Kimley»Horn

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A&E PROJECT NUMBER

KHCL-16448

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJER01086A  
128 MATHER STREET  
WILTON, CT 06897

SHEET TITLE  
RF  
CABLE COLOR CODE

SHEET NUMBER

RF-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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RFDS REV #: ---

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A&E PROJECT NUMBER  
  
KHCLC–16448

DISH Wireless L.L.C.  
PROJECT INFORMATION  
  
NJJER01086A  
128 MATHER STREET  
WILTON, CT 06897

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 90f 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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- | SUBMITTALS |            |                         |
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| 1          | 05/04/2022 | REVISED PER CLIENT      |
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| 3          | 10/31/2022 | REVISED PER CLIENT      |
|            |            |                         |
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- A&E PROJECT NUMBER
- KHCL-16448
- DISH Wireless L.L.C.  
PROJECT INFORMATION
- NJJER01086A  
128 MATHER STREET  
WILTON, CT 06897
- SHEET TITLE  
GENERAL NOTES
- SHEET NUMBER
- GN-3
- DISH Wireless L.L.C. TEMPLATE VERSION 43 – 09/17/2021

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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PROJECT INFORMATION

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SHEET TITLE  
GENERAL NOTES

SHEET NUMBER

GN-4

## **ATTACHMENT 4**



Date: **November 02, 2022**



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

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **DISH Network Co-Locate**  
**Site Number:** NJJER01086A  
**Site Name:** CT-CCI-T-806353

**Crown Castle Designation:** **BU Number:** 806353  
**Site Name:** BRG 124 943066  
**JDE Job Number:** 734579  
**Work Order Number:** 2177137  
**Order Number:** 637403 Rev. 0

**Engineering Firm Designation:** **B+T Group Project Number:** 102920.014.01.0001

**Site Data:** **128 Mather Street, Wilton, Fairfield County, CT**  
**Latitude 41° 14' 18.7", Longitude -73° 25' 26.9"**  
**180 Foot - Self Support Tower**

B+T Group is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

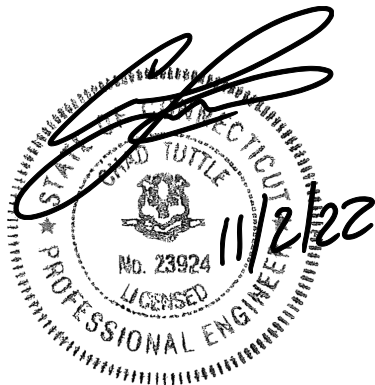
LC7: Proposed Equipment Configuration

**Sufficient Capacity – 94.4%**

This analysis utilizes an ultimate 3-second gust wind speed of 116 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Angela Ashwood

Respectfully submitted by: B+T Engineering, Inc.  
COA: PEC.0001564; Expires: 02/01/2023



Chad E. Tuttle, P.E.

tnxTower Report - version 8.1.1.0

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## 1) INTRODUCTION

This tower is a 180 ft. Self-Support tower designed by FWT Inc.

The tower has been modified multiple times to accommodate additional loading.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	116 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
170.0	174.0	3	Fujitsu	TA08025-B604	1	1-3/4
		3	Fujitsu	TA08025-B605		
		3	Jma Wireless	MX08FRO665-21		
		1	Raycap	RDIDC-9181-PF-48		
	170.0	1	Commscope	MTC3975083 (3)		

**Table 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
178.0	184.0	1	Rfs Celwave	PD10017	2	7/8
164.0	166.0	1	Rfs Celwave	DB-T1-6Z-8AB-0Z	7	1-5/8
		3	Samsung Telecomm.	RFV01U-D1A		
		3	Samsung Telecomm.	RFV01U-D2A		
		1	--	Sector Mount [SM 702-3](16')		
	162.0	6	Commscope	JAAH-65B-R3B		
		6	Rfs Celwave	APL868013		
		3	Samsung Telecomm.	CBRS		
		3	Samsung Telecomm.	MT6407-77A		
154.0	158.0	3	CCI Antennas	DMP65R-BU6D	12 6 2	1-5/8 5/8 3/8
		3	CCI Antennas	OPA65R-BU6D		
		3	Ericsson	RRUS 32 B2		
		3	Ericsson	RRUS 32 B30		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 4478 B14		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	Kaelus	DBC0061F1V51-2		
		3	Powerwave Tech.	7770.00		
		6	Powerwave Tech.	LGP21401		
		3	Quintel Tech.	QS66512-2		
		3	Raycap	DC6-48-60-18-8F		
	154.0	1	--	Sector Mount [SM 1303-3]		
145.0	146.0	3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER	--	--
		3	Alcatel Lucent	800MHZ 2X50W RRH		
		3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ		
143.0	143.0	3	Site Pro1	VFA12-HD Mount	3	1-5/8
		3	Commscope	VV-65B-R1_TMO		
		3	Ericsson	AIR 6419 B41_TMO		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	Ericsson	Radio 4480_TMOV2		
		3	Rfs Celwave	APXVAALL24_43-U-NA20_TMO		
124.0	131.0	2	Rfs Celwave	1142-2C	2	1/2
	124.0	2	--	Side Arm Mount [SO 303-1]		
104.0	111.0	1	Rfs Celwave	1142-2C	1 1	7/8 1/2
	108.0	1	Rfs Celwave	220-3BN		
	104.0	2	--	Side Arm Mount [SO 303-1]		
93.0	93.0	3	Ericsson	AIR 32 B2a/B66Aa	4 6	1-5/8 1-1/4
		3	Ericsson	ERICSSON AIR 21 B2A B4P		
		3	Ericsson	KRY 112 144/1		
		3	Ericsson	RADIO 4449 B12/B71		
		3	Rfs Celwave	APXVAARR24_43-U-NA20		
		1	--	Sector Mount [SM 404-3]		
62.0	65.0	1	Gps	GPS_A	1	1/2
	62.0	1	--	Side Arm Mount [SO 305-1]		
42.0	44.0	1	Gps	GPS_A	1	1/2
	42.0	1	--	Side Arm Mount [SO 305-1]		
31.0	32.0	1	Gps	GPS_A	1	1/2
	31.0	1	--	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	217757	CCI Sites
Tower Modification Drawing	3290324	CCI Sites
Tower Modification Drawing	801524	CCI Sites
Tower Modification Drawing	2434484	CCI Sites

Document	Reference	Source
Post Modification Inspection	2575710	CCI Sites
Tower Modification Drawing	6061656	CCI Sites
Post Modification Inspection	6515894	CCI Sites
Foundation Drawing	262285	CCI Sites
Geotech Report	262283	CCI Sites
Crown CAD Package	Date: 10/28/2022	CCI Sites

### 3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

### 3.2) Assumptions

- 1) The tower and structures were maintained in accordance with the - TIA-222 standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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 tower.

## 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	180 - 168	Leg	P2x0.154	2	-3.780	29.380	12.9	Pass
T2	168 - 160	Leg	P2x0.154 (GR)	26	-12.973	40.351	32.1	Pass
T3	160 - 140	Leg	P3x0.216 (GR)	41	-53.811	91.364	58.9	Pass
T4	140 - 120	Leg	P3.5x.318 (GR)	68	-90.931	128.240	70.9	Pass
T5	120 - 100	Leg	P4x.337 (GR)	89	-122.767	165.049	74.4	Pass
T6	100 - 80	Leg	P5x0.375 (GR)	109	127.920	202.153	63.3	Pass
T7	80 - 60	Leg	P6x0.432	131	-181.323	238.435	76.0	Pass
T8	60 - 40	Leg	P6x0.432	146	-209.631	238.435	87.9	Pass
T9	40 - 20	Leg	P6x0.432	160	-236.652	266.933	88.7	Pass
T10	20 - 0	Leg	P8x.5	181	-264.475	386.074	68.5	Pass
T1	180 - 168	Diagonal	L2x1 1/2x3/16	10	-0.827	15.935	5.2	Pass
T2	168 - 160	Diagonal	L2x1 1/2x3/16	30	-3.075	15.935	19.3	Pass
T3	160 - 140	Diagonal	L2x1 1/2x3/16	46	-4.382	10.157	43.1	Pass
T4	140 - 120	Diagonal	L2x2x3/16	70	-4.907	9.511	51.6	Pass
T5	120 - 100	Diagonal	L2 1/2x2x3/16	91	-5.029	9.472	53.1	Pass
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	112	-5.781	10.923	52.9	Pass
T7	80 - 60	Diagonal	L3x3x3/16	133	-6.832	11.950	57.2	Pass
T8	60 - 40	Diagonal	L3 1/2x3x1/4	148	-7.228	15.837	45.6	Pass
T9	40 - 20	Diagonal	L3 1/2x3x1/4	163	-8.300	12.837	64.7	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	184	-8.515	14.867	57.3	Pass
T9	40 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	171	-4.104	23.697	17.3	Pass
T1	180 - 168	Top Girt	L2x1 1/2x3/16	6	-0.140	10.904	1.3	Pass
							Summary	
						Leg (T9)	88.7	Pass
						Diagonal (T9)	64.7	Pass
						Secondary Horizontal (T9)	17.3	Pass
						Top Girt (T1)	1.3	Pass
						Bolt Checks	86.8	Pass
						Rating =	88.7	Pass

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	58.2	Pass
1,2	Base Foundation (Structure)	Base	94.4	Pass
1,2	Base Foundation (Soil Interaction)	Base	89.2	Pass

<b>Structure Rating (max from all components) =</b>	<b>94.4%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H Section 15.5.

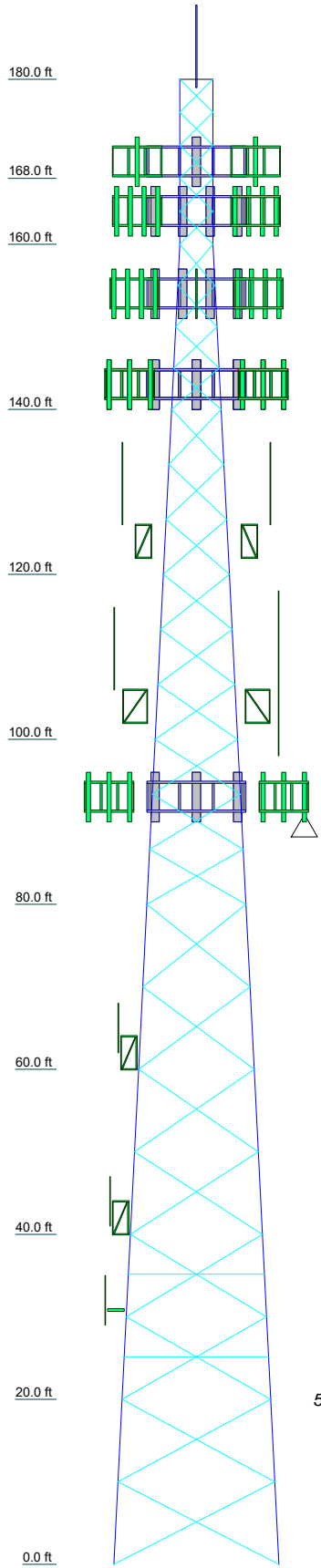
#### 4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

## **APPENDIX A**

### **TNXTOWER OUTPUT**

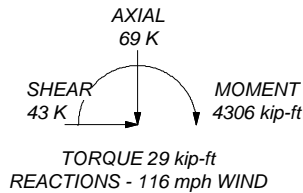
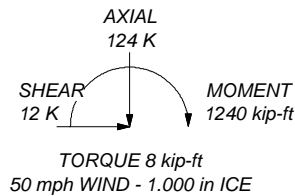
Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	
Legs	P2x0.154	A	P3x0.216 (GR)	P3.5x.318 (GR)	P4x.337 (GR)	P5x0.375 (GR)	P6x0.432			P8x.5	
Leg Grade						A53-B-35					
Diagonals						L2 1/2x3/16	L3x3x3/16	L3 1/2x3x1/4		L3 1/2x3 1/2x1/4	
Diagonal Grade						A36					
Top Girts											
Sec. Horizontals											
Face Width (ft)											
# Panels @ (ft)											
Weight (K)											



ALL REACTIONS  
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:  
DOWN: 271 K  
SHEAR: 27 K

UPLIFT: -225 K  
SHEAR: 23 K



## SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P2x0.154 (GR)		

## MATERIAL STRENGTH

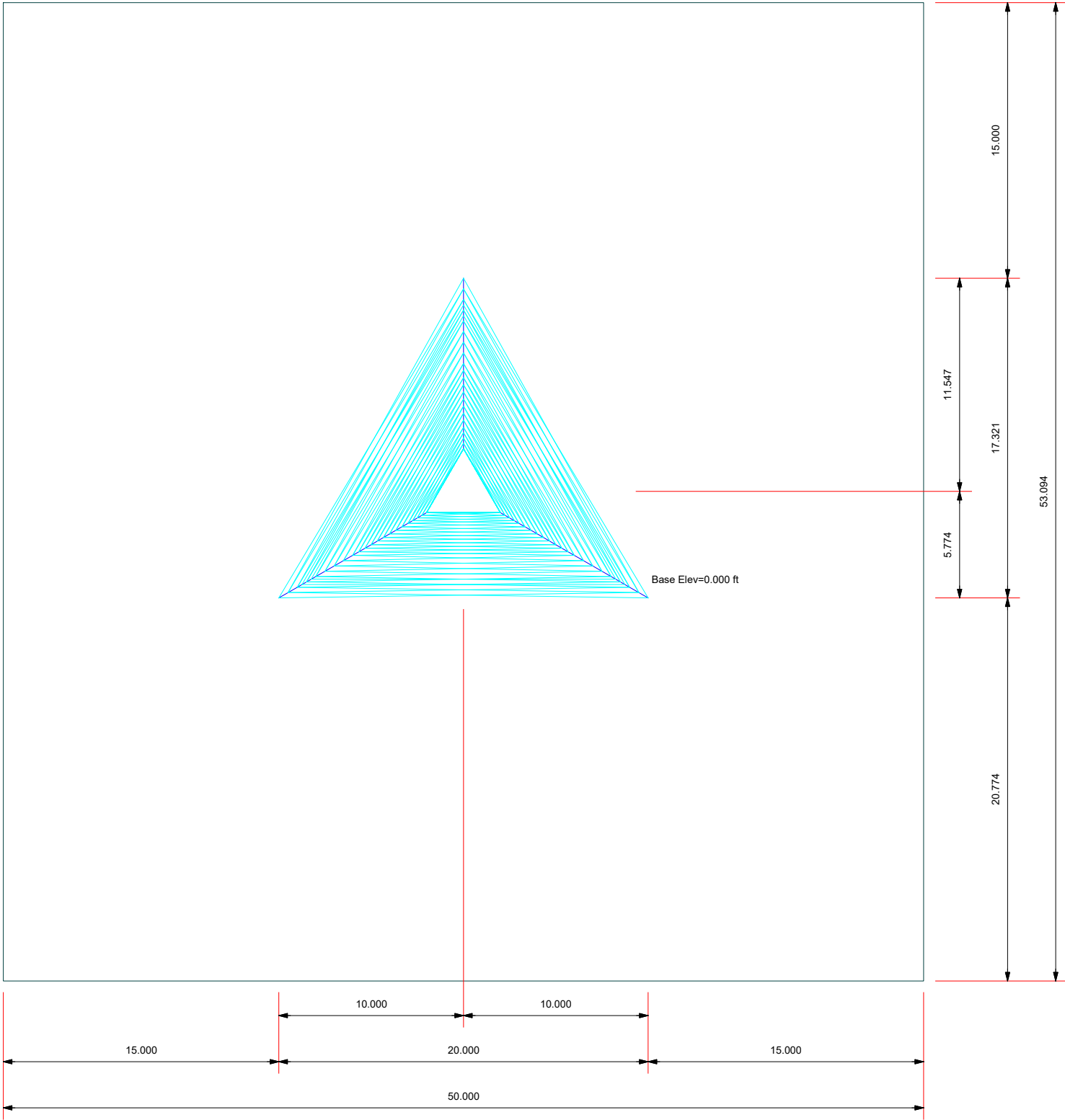
GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A36	36 ksi	58 ksi

## TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 116 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. Grouted pipe Fc is 7.000 ksi
9. TIA-222-H Annex S
10. TOWER RATING: 88.7%



**Plot Plan**  
**Total Area - 0.06 Acres**



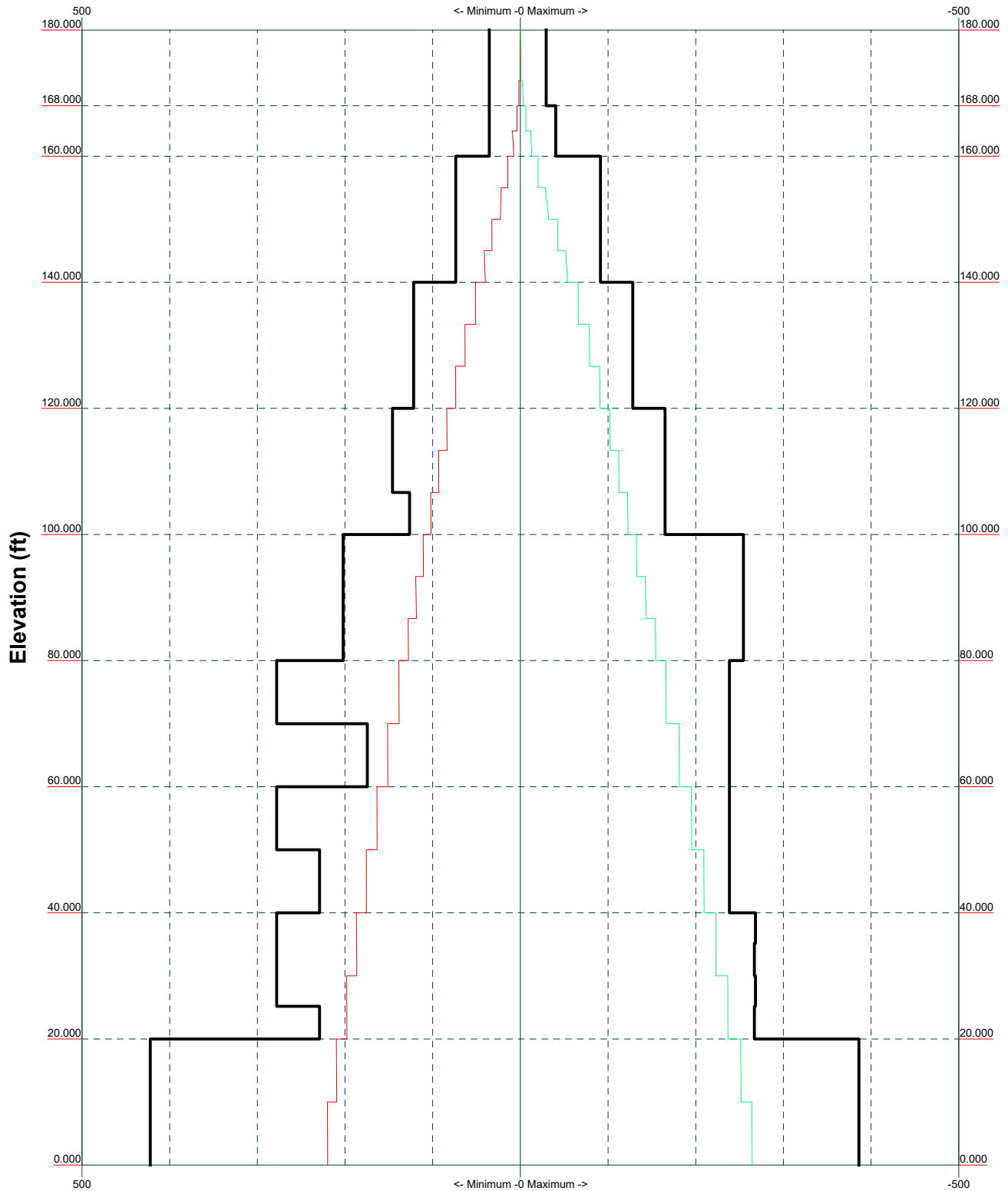
**B+T Group**  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
Phone: (918) 587-4630  
FAX: (918) 295-0265

Job: <b>102920.014.01.0001 - BRG 124 943066, CT (BU# 80635)</b>		
Project:		
Client: Crown Castle	Drawn by: Jayaraj B	App'd:
Code: TIA-222-H	Date: 11/02/22	Scale: NTS
Path:	Dwg No. E-2	

# TIA-222-H - 116 mph/50 mph 1.000 in Ice Exposure B

Leg Capacity ———

Leg Compression (K)



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Job: **102920.014.01.0001 - BRG 124 943066, CT (BU# 80635)**

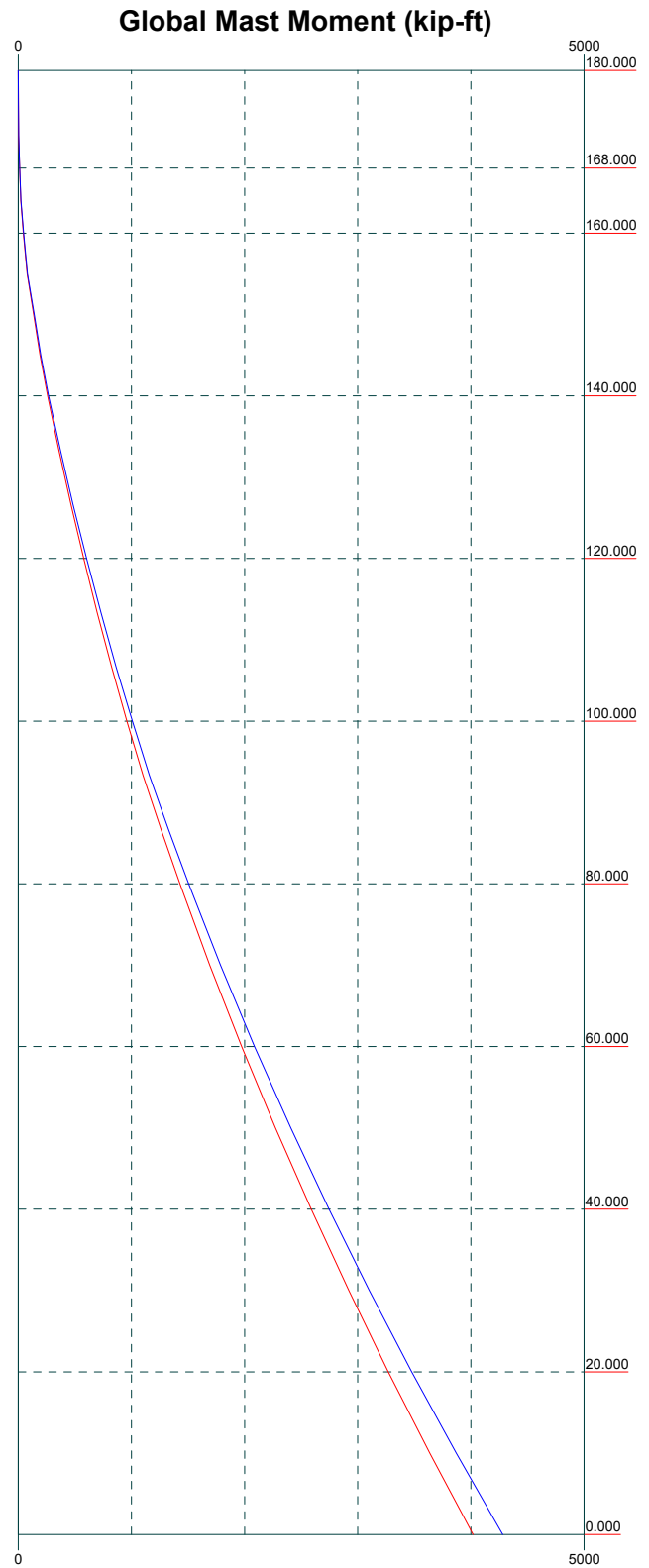
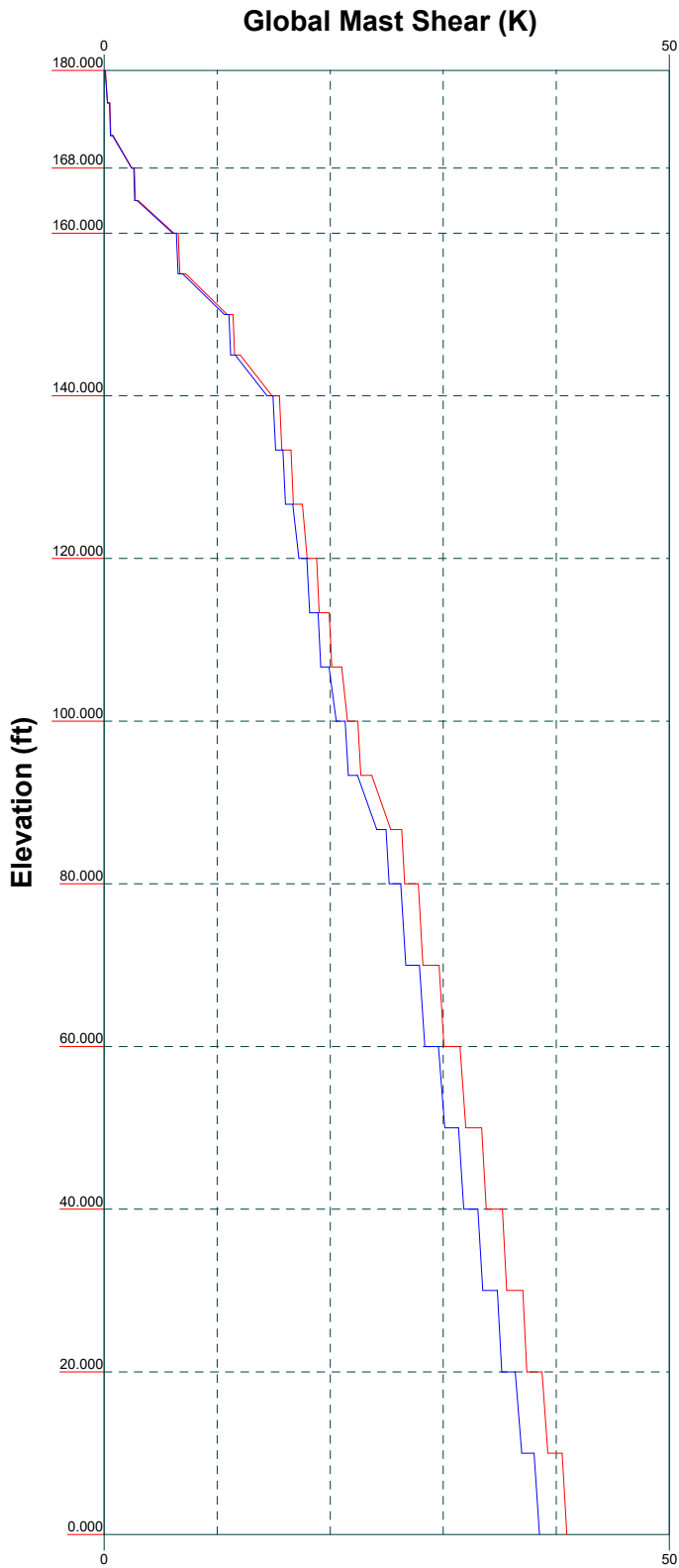
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Code: TIA-222-H	Date: 11/02/22	Scale: NTS	
Path:		Dwg No. E-3	

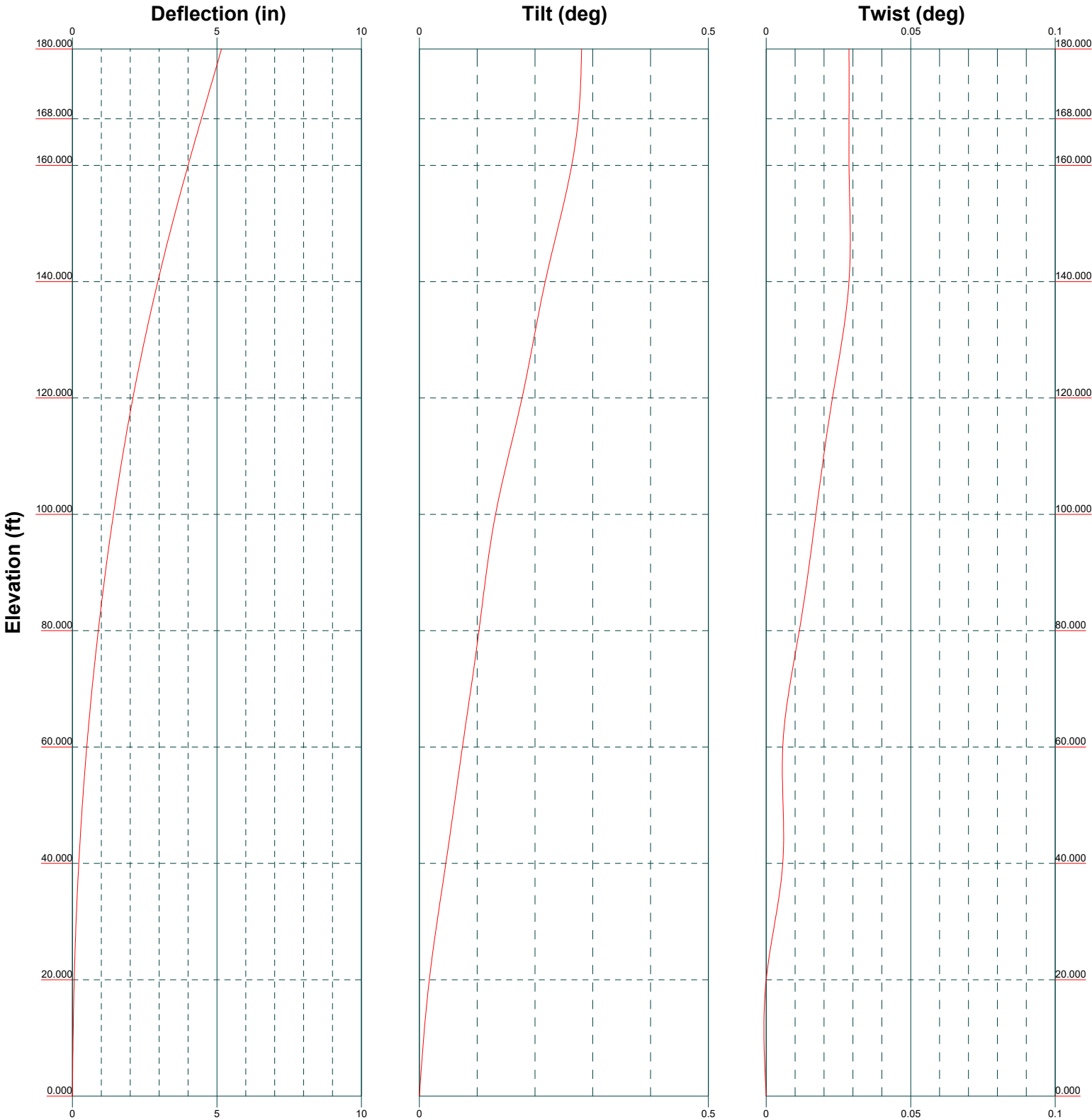
Vx

Vz

Mx

Mz





# Feed Line Distribution Chart

0' - 180'

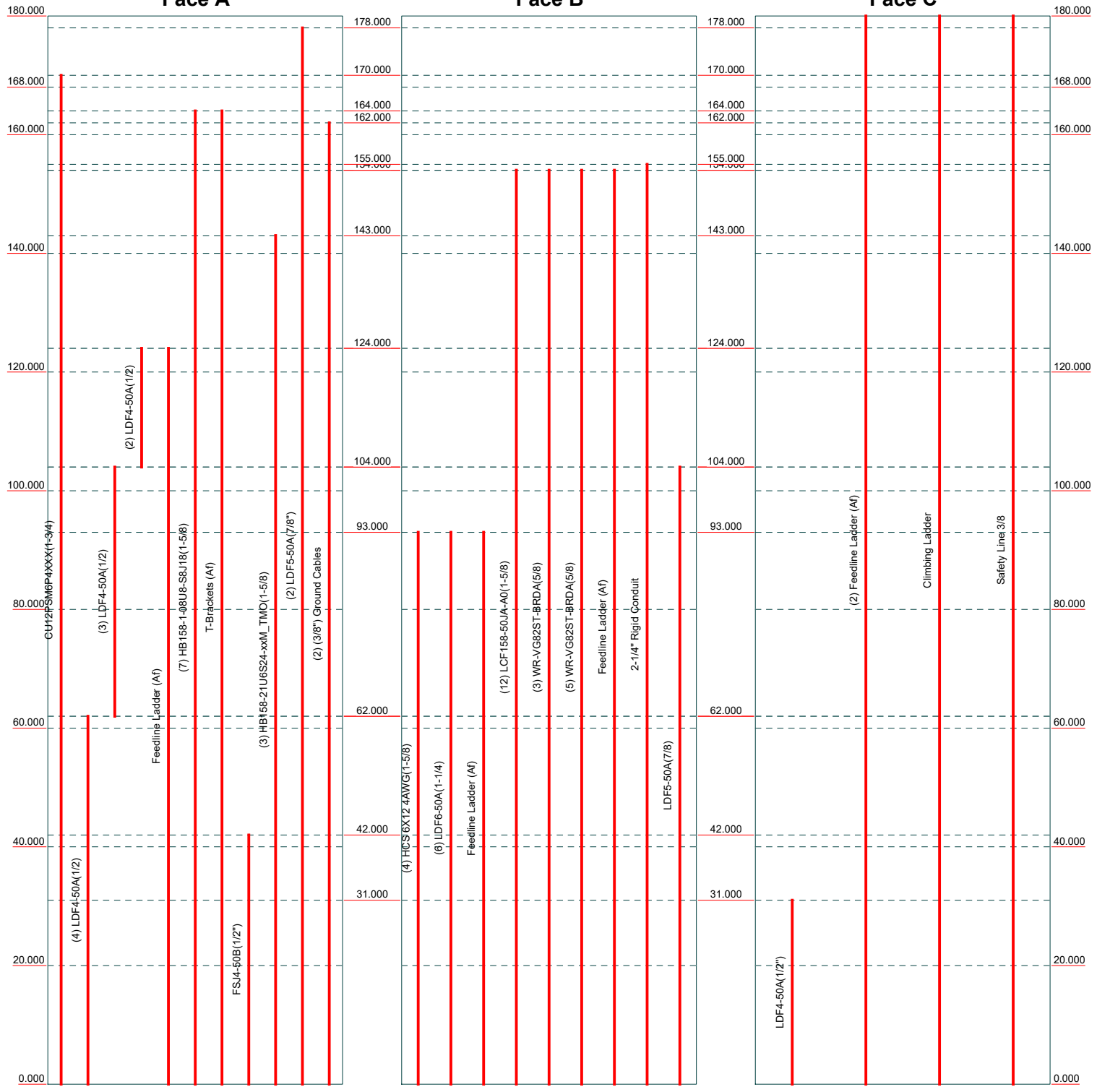
Round Flat App In Face App Out Face Truss Leg

## Face A

## Face B

## Face C

Elevation (ft)





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Job: 102920.014.01.0001 - BRG 124 943066, CT (BU# 80635)		
Project:		
Client: Crown Castle	Drawn by: Jayaraj B	App'd:
Code: TIA-222-H	Date: 11/02/22	Scale: NTS
Path:	Dwg No. E-7	

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	<b>Project</b>	<b>Date</b> 11:27:44 11/02/22
	<b>Client</b> Crown Castle	<b>Designed by</b> Jayaraj B

## Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.000 ft above the ground line.

The base of the tower is set at an elevation of 0.000 ft above the ground line.

The face width of the tower is 4.000 ft at the top and 20.000 ft at the base.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Tower base elevation above sea level: 427.000 ft.

Basic wind speed of 116 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.000 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 60 mph.

TIA-222-H Annex S.

Grouted pipe  $f'_c$  is 7.000 ksi.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .

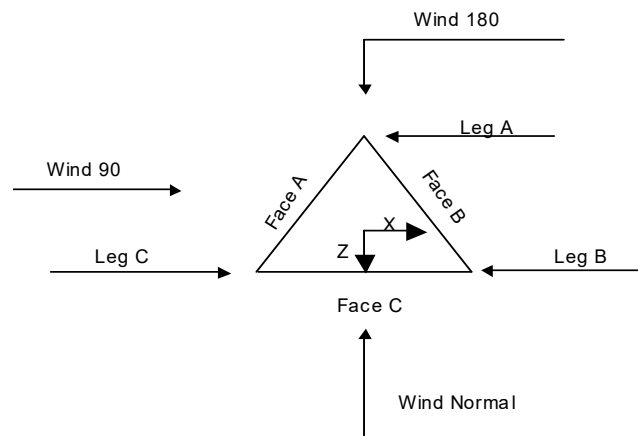
Maximum demand-capacity ratio is: 1.05.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA √ SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque √ Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <b>Poles</b> Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
--	---	---

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	<b>Project</b>	<b>Date</b> 11:27:44 11/02/22
	<b>Client</b> Crown Castle	<b>Designed by</b> Jayaraj B



**Triangular Tower**

## Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.000-168.000			4.000	1	12.000
T2	168.000-160.000			4.000	1	8.000
T3	160.000-140.000			4.000	1	20.000
T4	140.000-120.000			6.000	1	20.000
T5	120.000-100.000			8.000	1	20.000
T6	100.000-80.000			10.000	1	20.000
T7	80.000-60.000			12.000	1	20.000
T8	60.000-40.000			14.000	1	20.000
T9	40.000-20.000			16.000	1	20.000
T10	20.000-0.000			18.000	1	20.000

## Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	180.000-168.000	4.000	X Brace	No	No	0.000	0.000
T2	168.000-160.000	4.000	X Brace	No	No	0.000	0.000

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	<b>Project</b>	<b>Date</b>
	<b>Client</b>	<b>Designed by</b>
	Crown Castle	Jayaraj B

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T3	160.000-140.000	5.000	X Brace	No	No	0.000	0.000
T4	140.000-120.000	6.667	X Brace	No	No	0.000	0.000
T5	120.000-100.000	6.667	X Brace	No	No	0.000	0.000
T6	100.000-80.000	6.667	X Brace	No	No	0.000	0.000
T7	80.000-60.000	10.000	X Brace	No	No	0.000	0.000
T8	60.000-40.000	10.000	X Brace	No	No	0.000	0.000
T9	40.000-20.000	10.000	X Brace	No	Yes	0.000	0.000
T10	20.000-0.000	10.000	X Brace	No	No	0.000	0.000

### Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 180.000-168.000	Pipe	P2x0.154	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T2 168.000-160.000	Grouted Pipe	P2x0.154	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T3 160.000-140.000	Grouted Pipe	P3x0.216	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T4 140.000-120.000	Grouted Pipe	P3.5x.318	A53-B-35 (35 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T5 120.000-100.000	Grouted Pipe	P4x.337	A53-B-35 (35 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 100.000-80.000	Grouted Pipe	P5x0.375	A53-B-35 (35 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.000-60.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 60.000-40.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T9 40.000-20.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T10 20.000-0.000	Pipe	P8x.5	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

### Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1 180.000-168.000	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

### Tower Section Geometry (cont'd)



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	102920.014.01.0001 - BRG 124 943066, CT (BU# 806353)	4 of 35
	<b>Project</b>	<b>Date</b>
	<b>Client</b>	<b>Designed by</b>
	Crown Castle	Jayaraj B

<i>Tower Elevation</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
<i>ft</i>						
T9 40.000-20.000	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

### Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Gusset Area (per face)</i>	<i>Gusset Thickness</i>	<i>Gusset Grade</i>	<i>Adjust. Factor <math>A_f</math></i>	<i>Adjust. Factor <math>A_r</math></i>	<i>Weight Mult.</i>	<i>Double Angle Stitch Bolt Spacing Diagonals in</i>	<i>Double Angle Stitch Bolt Spacing Horizontals in</i>	<i>Double Angle Stitch Bolt Spacing Redundants in</i>
<i>ft</i>	<i>ft<sup>2</sup></i>	<i>in</i>							
T1 180.000-168.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 168.000-160.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T3 160.000-140.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T4 140.000-120.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T5 120.000-100.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T6 100.000-80.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T7 80.000-60.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T8 60.000-40.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T9 40.000-20.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T10 20.000-0.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt

### Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Calc K Single Angles</i>	<i>Calc K Solid Rounds</i>	<i>K Factors<sup>1</sup></i>							
			<i>Legs</i>	<i>X Brace Diags</i>	<i>K Brace Diags</i>	<i>Single Diags</i>	<i>Girts</i>	<i>Horiz.</i>	<i>Sec. Horiz.</i>	<i>Inner Brace</i>
				<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>
T1 180.000-168.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 168.000-160.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3	Yes	No	1	1	1	1	1	1	1	1



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Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T9 40.000-20.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 20.000-0.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.000-168.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 168.000-160.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 160.000-140.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 140.000-120.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 120.000-100.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 100.000-80.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 80.000-60.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 60.000-40.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 40.000-20.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 20.000-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

### Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.000-168.000	Flange	0.000 A325N	0	0.625 A325N	1	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0

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	Crown Castle	Jayaraj B

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T2 168.000-160.0 00	Flange	0.625 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T3 160.000-140.0 00	Flange	0.625 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T4 140.000-120.0 00	Flange	0.750 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T5 120.000-100.0 00	Flange	0.750 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T6 100.000-80.00 0	Flange	0.875 A490N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T7 80.000-60.000	Flange	0.875 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T8 60.000-40.000	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T9 40.000-20.000	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.500 A325N	1
T10 20.000-0.000	Flange	1.500 A36	0	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0

## Grouted Pipe Properties

Size	F <sub>y</sub> ksi	A <sub>s</sub> in <sup>2</sup>	A <sub>c</sub> in <sup>2</sup>	W <sub>t</sub> plf	E <sub>c</sub> ksi	E <sub>m</sub> ksi	F <sub>sym</sub> ksi
P2x0.154 (GR)	35.000	1.075	3.356	10.647	4768.962	40914.218	53.581
P3x0.216 (GR)	35.000	2.228	7.393	22.984	4768.962	41656.327	54.738
P3.5x.318 (GR)	35.000	3.678	8.888	31.033	4768.962	38218.387	49.377
P4x.337 (GR)	35.000	4.407	11.497	38.949	4768.962	38951.934	50.521
P5x0.375 (GR)	35.000	6.112	18.194	58.701	4768.962	40356.758	52.712

## Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF4-50A(1/ 2")	C	No	No	Ar (CaAa)	31.000 - 0.000	-1.000	-0.32	1	1	0.850 0.750	0.630		0.000
Feedline Ladder (Af) *	C	No	No	Af (CaAa)	180.000 - 0.000	-1.000	-0.33	2	1	3.000	3.000		0.008
Climbing Ladder	C	No	No	Af (CaAa)	180.000 - 0.000	0.000	0.025	1	1	3.000	3.000		0.008
Safety Line 3/8 *	C	No	No	Ar (CaAa)	180.000 - 0.000	0.000	0.025	1	1	0.375	0.375		0.000

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	<b>Client</b> Crown Castle	<b>Designed by</b> Jayaraj B

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
HCS 6X12 4AWG(1-5/8)	B	No	No	Ar (CaAa)	93.000 - 0.000	0.000	0.05	4	2	0.850 0.750	1.660		0.002
LDF6-50A(1- 1/4)	B	No	No	Ar (CaAa)	93.000 - 0.000	0.000	0.15	6	6	0.850 0.750	1.550		0.001
Feedline Ladder (Af) *	B	No	No	Af (CaAa)	93.000 - 0.000	0.000	0.1	1	1	3.000	3.000		0.008
LCF158-50JA -A0(1-5/8)	B	No	No	Ar (CaAa)	154.000 - 0.000	0.000	0.3	12	6	0.850 0.750	1.980		0.001
WR-VG82ST- BRDA(5/8)	B	No	No	Ar (CaAa)	154.000 - 0.000	0.000	0.365	3	2	0.500	0.645		0.000
WR-VG82ST- BRDA(5/8)	B	No	No	Ar (CaAa)	154.000 - 0.000	5.500	0.3	5	5	1.500 1.000	0.645		0.000
Feedline Ladder (Af)	B	No	No	Af (CaAa)	154.000 - 0.000	0.000	0.32	1	1	3.000	3.000		0.008
2-1/4" Rigid Conduit *	B	No	No	Ar (CaAa)	155.000 - 0.000	0.000	0.385	1	1	0.850 0.750	2.250		0.003
LDF5-50A(7/ 8) *	B	No	No	Ar (CaAa)	104.000 - 0.000	0.000	0.345	1	1	0.850 0.750	1.090		0.000
CU12PSM6P4 XXX(1-3/4)	A	No	No	Ar (CaAa)	170.000 - 0.000	0.000	-0.09	1	1	0.850 0.750	1.750		0.003
LDF4-50A(1/ 2)	A	No	No	Ar (CaAa)	62.000 - 0.000	0.000	-0.1	4	2	0.500	0.630		0.000
LDF4-50A(1/ 2)	A	No	No	Ar (CaAa)	104.000 - 62.000	0.000	-0.1	3	2	0.500	0.630		0.000
LDF4-50A(1/ 2)	A	No	No	Ar (CaAa)	124.000 - 104.000	0.000	-0.1	2	2	0.500	0.630		0.000
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	124.000 - 0.000	0.000	0	1	1	3.000	3.000		0.008
HB158-1-08U 8-S8J18(1-5/8 )	A	No	No	Ar (CaAa)	164.000 - 0.000	0.000	0.1	7	4	0.850 0.750	1.980		0.001
T-Brackets (Af) *	A	No	No	Af (CaAa)	164.000 - 0.000	0.000	0.1	1	1	1.000	1.000		0.008
FSJ4-50B(1/2" ) *	A	No	No	Ar (CaAa)	42.000 - 0.000	0.000	0.03	1	1	0.850 0.750	0.520		0.000
HB158-21U6S 24-xxM_TMO (1-5/8) *	A	No	No	Ar (CaAa)	143.000 - 0.000	0.000	0.14	3	2	0.850 0.750	1.996		0.003
LDF5-50A(7/ 8") *	A	No	No	Ar (CaAa)	178.000 - 0.000	5.500	0.1	2	2	0.850 0.750	1.090		0.000
(3/8") Ground Cables * * *	A	No	No	Ar (CaAa)	162.000 - 0.000	0.000	-0.15	2	2	0.500	0.440		0.000

**Feed Line/Linear Appurtenances - Entered As Area**

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		Jayaraj B

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight klf
*								
*								
*								

## Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
T1	180.000-168.000	A	0.000	0.000	2.530	0.000	0.012
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	18.450	0.000	0.305
T2	168.000-160.000	A	0.000	0.000	9.531	0.000	0.097
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	12.300	0.000	0.203
T3	160.000-140.000	A	0.000	0.000	42.470	0.000	0.443
		B	0.000	0.000	50.863	0.000	0.331
		C	0.000	0.000	30.750	0.000	0.508
T4	140.000-120.000	A	0.000	0.000	55.153	0.000	0.606
		B	0.000	0.000	72.340	0.000	0.469
		C	0.000	0.000	30.750	0.000	0.508
T5	120.000-100.000	A	0.000	0.000	65.421	0.000	0.745
		B	0.000	0.000	72.776	0.000	0.470
		C	0.000	0.000	30.750	0.000	0.508
T6	100.000-80.000	A	0.000	0.000	66.429	0.000	0.748
		B	0.000	0.000	101.742	0.000	0.757
		C	0.000	0.000	30.750	0.000	0.508
T7	80.000-60.000	A	0.000	0.000	66.555	0.000	0.748
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	30.750	0.000	0.508
T8	60.000-40.000	A	0.000	0.000	67.793	0.000	0.751
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	30.750	0.000	0.508
T9	40.000-20.000	A	0.000	0.000	68.729	0.000	0.754
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	31.443	0.000	0.510
T10	20.000-0.000	A	0.000	0.000	68.729	0.000	0.754
		B	0.000	0.000	116.400	0.000	0.908
		C	0.000	0.000	32.010	0.000	0.511

## Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
T1	180.000-168.000	A	1.004	0.000	0.000	8.143	0.000	0.064
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	28.086	0.000	0.547
T2	168.000-160.000	A	0.998	0.000	0.000	18.477	0.000	0.255
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	18.686	0.000	0.364

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	Crown Castle	Jayaraj B

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A<sub>R</sub> ft<sup>2</sup></i>	<i>A<sub>F</sub> ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> In Face ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> Out Face ft<sup>2</sup></i>	<i>Weight K</i>
T3	160.000-140.000	A	0.989	0.000	0.000	78.689	0.000	1.121
		B		0.000	0.000	79.352	0.000	1.113
		C		0.000	0.000	46.573	0.000	0.905
T4	140.000-120.000	A	0.975	0.000	0.000	103.572	0.000	1.468
		B		0.000	0.000	112.370	0.000	1.567
		C		0.000	0.000	46.348	0.000	0.897
T5	120.000-100.000	A	0.959	0.000	0.000	123.340	0.000	1.737
		B		0.000	0.000	113.129	0.000	1.563
		C		0.000	0.000	46.090	0.000	0.889
T6	100.000-80.000	A	0.940	0.000	0.000	123.903	0.000	1.734
		B		0.000	0.000	165.757	0.000	2.265
		C		0.000	0.000	45.785	0.000	0.880
T7	80.000-60.000	A	0.916	0.000	0.000	122.813	0.000	1.711
		B		0.000	0.000	190.696	0.000	2.594
		C		0.000	0.000	45.412	0.000	0.868
T8	60.000-40.000	A	0.886	0.000	0.000	121.855	0.000	1.695
		B		0.000	0.000	189.227	0.000	2.547
		C		0.000	0.000	44.927	0.000	0.853
T9	40.000-20.000	A	0.842	0.000	0.000	123.743	0.000	1.679
		B		0.000	0.000	187.090	0.000	2.480
		C		0.000	0.000	46.766	0.000	0.850
T10	20.000-0.000	A	0.754	0.000	0.000	119.304	0.000	1.589
		B		0.000	0.000	182.855	0.000	2.350
		C		0.000	0.000	47.097	0.000	0.819

### Feed Line Center of Pressure

<i>Section</i>	<i>Elevation ft</i>	<i>CP<sub>x</sub> in</i>	<i>CP<sub>z</sub> in</i>	<i>CP<sub>x</sub> Ice in</i>	<i>CP<sub>z</sub> Ice in</i>
T1	180.000-168.000	0.618	4.016	0.373	3.670
T2	168.000-160.000	-1.194	1.804	-1.696	1.557
T3	160.000-140.000	3.607	1.674	3.149	1.713
T4	140.000-120.000	5.020	1.435	4.621	1.631
T5	120.000-100.000	4.433	1.304	3.824	1.504
T6	100.000-80.000	8.011	0.920	7.677	1.252
T7	80.000-60.000	10.529	0.755	10.205	1.139
T8	60.000-40.000	10.981	0.849	10.996	1.298
T9	40.000-20.000	10.437	0.909	10.680	1.391
T10	20.000-0.000	12.685	1.223	12.630	1.865

### Shielding Factor Ka

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K<sub>a</sub> No Ice</i>	<i>K<sub>a</sub> Ice</i>
T1	4	Feedline Ladder (Af)	168.00 - 180.00	0.6000	0.5970
T1	6	Climbing Ladder	168.00 - 180.00	0.6000	0.5970
T1	7	Safety Line 3/8	168.00 - 180.00	0.6000	0.5970

<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 102920.014.01.0001 - BRG 124 943066, CT (BU# 806353)	<b>Page</b> 11 of 35
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	<b>Client</b> Crown Castle	<b>Designed by</b> Jayaraj B

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K<sub>a</sub> No Ice</i>	<i>K<sub>a</sub> Ice</i>
T1	23	CU12PSM6P4XXX(1-3/4)	168.00 - 170.00	0.6000	0.5970
T1	39	LDF5-50A(7/8")	168.00 - 178.00	0.6000	0.5970
T2	4	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.6000
T2	6	Climbing Ladder	160.00 - 168.00	0.6000	0.6000
T2	7	Safety Line 3/8	160.00 - 168.00	0.6000	0.6000
T2	23	CU12PSM6P4XXX(1-3/4)	160.00 - 168.00	0.6000	0.6000
T2	30	HB158-1-08U8-S8J18(1-5/8)	160.00 - 164.00	0.6000	0.6000
T2	31	T-Brackets (Af)	160.00 - 164.00	0.6000	0.6000
T2	39	LDF5-50A(7/8")	160.00 - 168.00	0.6000	0.6000
T2	41	(3/8") Ground Cables	160.00 - 162.00	0.6000	0.6000
T3	4	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	6	Climbing Ladder	140.00 - 160.00	0.6000	0.6000
T3	7	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T3	13	LCF158-50JA-A0(1-5/8)	140.00 - 154.00	0.6000	0.6000
T3	14	WR-VG82ST-BRDA(5/8)	140.00 - 154.00	0.6000	0.6000
T3	16	WR-VG82ST-BRDA(5/8)	140.00 - 154.00	0.6000	0.6000
T3	18	Feedline Ladder (Af)	140.00 - 154.00	0.6000	0.6000
T3	19	2-1/4" Rigid Conduit	140.00 - 155.00	0.6000	0.6000
T3	23	CU12PSM6P4XXX(1-3/4)	140.00 - 160.00	0.6000	0.6000
T3	30	HB158-1-08U8-S8J18(1-5/8)	140.00 - 160.00	0.6000	0.6000
T3	31	T-Brackets (Af)	140.00 - 160.00	0.6000	0.6000
T3	36	HB158-21U6S24-xxM_TMO (1-5/8)	140.00 - 143.00	0.6000	0.6000
T3	39	LDF5-50A(7/8")	140.00 - 160.00	0.6000	0.6000
T3	41	(3/8") Ground Cables	140.00 - 160.00	0.6000	0.6000
T4	4	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	6	Climbing Ladder	120.00 - 140.00	0.6000	0.6000
T4	7	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T4	13	LCF158-50JA-A0(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	14	WR-VG82ST-BRDA(5/8)	120.00 - 140.00	0.6000	0.6000
T4	16	WR-VG82ST-BRDA(5/8)	120.00 - 140.00	0.6000	0.6000
T4	18	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000



<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b>	<b>Page</b>
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	Crown Castle	Jayaraj B

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K<sub>a</sub> No Ice</i>	<i>K<sub>a</sub> Ice</i>
T4	19	2-1/4" Rigid Conduit	120.00 - 140.00	0.6000	0.6000
T4	23	CU12PSM6P4XXX(1-3/4)	120.00 - 140.00	0.6000	0.6000
T4	26	LDF4-50A(1/2)	120.00 - 124.00	0.6000	0.6000
T4	27	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.6000
T4	30	HB158-1-08U8-S8J18(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	31	T-Brackets (Af)	120.00 - 140.00	0.6000	0.6000
T4	36	HB158-21U6S24-xxM_TMO (1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	39	LDF5-50A(7/8")	120.00 - 140.00	0.6000	0.6000
T4	41	(3/8") Ground Cables	120.00 - 140.00	0.6000	0.6000
T5	4	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	6	Climbing Ladder	100.00 - 120.00	0.6000	0.6000
T5	7	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T5	13	LCF158-50JA-A0(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	14	WR-VG82ST-BRDA(5/8)	100.00 - 120.00	0.6000	0.6000
T5	16	WR-VG82ST-BRDA(5/8)	100.00 - 120.00	0.6000	0.6000
T5	18	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	19	2-1/4" Rigid Conduit	100.00 - 120.00	0.6000	0.6000
T5	21	LDF5-50A(7/8)	100.00 - 104.00	0.6000	0.6000
T5	23	CU12PSM6P4XXX(1-3/4)	100.00 - 120.00	0.6000	0.6000
T5	25	LDF4-50A(1/2)	100.00 - 104.00	0.6000	0.6000
T5	26	LDF4-50A(1/2)	104.00 - 120.00	0.6000	0.6000
T5	27	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	30	HB158-1-08U8-S8J18(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	31	T-Brackets (Af)	100.00 - 120.00	0.6000	0.6000
T5	36	HB158-21U6S24-xxM_TMO (1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	39	LDF5-50A(7/8")	100.00 - 120.00	0.6000	0.6000
T5	41	(3/8") Ground Cables	100.00 - 120.00	0.6000	0.6000
T6	4	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	6	Climbing Ladder	80.00 - 100.00	0.6000	0.6000
T6	7	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T6	9	HCS 6X12 4AWG(1-5/8)	80.00 - 93.00	0.6000	0.6000
T6	10	LDF6-50A(1-1/4)	80.00 - 93.00	0.6000	0.6000
T6	11	Feedline Ladder (Af)	80.00 - 93.00	0.6000	0.6000
T6	13	LCF158-50JA-A0(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	14	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.6000	0.6000

<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b>	<b>Page</b>
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	Crown Castle	Jayaraj B

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K<sub>a</sub> No Ice</i>	<i>K<sub>a</sub> Ice</i>
T6	16	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.6000	0.6000
T6	18	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	19	2-1/4" Rigid Conduit	80.00 - 100.00	0.6000	0.6000
T6	21	LDF5-50A(7/8)	80.00 - 100.00	0.6000	0.6000
T6	23	CU12PSM6P4XXX(1-3/4)	80.00 - 100.00	0.6000	0.6000
T6	25	LDF4-50A(1/2)	80.00 - 100.00	0.6000	0.6000
T6	27	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	30	HB158-1-08U8-S8J18(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	31	T-Brackets (Af)	80.00 - 100.00	0.6000	0.6000
T6	36	HB158-21U6S24-xxM_TMO (1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	39	LDF5-50A(7/8")	80.00 - 100.00	0.6000	0.6000
T6	41	(3/8") Ground Cables	80.00 - 100.00	0.6000	0.6000
T7	4	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	6	Climbing Ladder	60.00 - 80.00	0.6000	0.6000
T7	7	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	9	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	10	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.6000
T7	11	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	13	LCF158-50JA-A0(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	14	WR-VG82ST-BRDA(5/8)	60.00 - 80.00	0.6000	0.6000
T7	16	WR-VG82ST-BRDA(5/8)	60.00 - 80.00	0.6000	0.6000
T7	18	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	19	2-1/4" Rigid Conduit	60.00 - 80.00	0.6000	0.6000
T7	21	LDF5-50A(7/8)	60.00 - 80.00	0.6000	0.6000
T7	23	CU12PSM6P4XXX(1-3/4)	60.00 - 80.00	0.6000	0.6000
T7	24	LDF4-50A(1/2)	60.00 - 62.00	0.6000	0.6000
T7	25	LDF4-50A(1/2)	62.00 - 80.00	0.6000	0.6000
T7	27	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	30	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	31	T-Brackets (Af)	60.00 - 80.00	0.6000	0.6000
T7	36	HB158-21U6S24-xxM_TMO (1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	39	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	41	(3/8") Ground Cables	60.00 - 80.00	0.6000	0.6000
T8	4	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	6	Climbing Ladder	40.00 - 60.00	0.6000	0.6000
T8	7	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	9	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	10	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.6000
T8	11	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	13	LCF158-50JA-A0(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	14	WR-VG82ST-BRDA(5/8)	40.00 - 60.00	0.6000	0.6000
T8	16	WR-VG82ST-BRDA(5/8)	40.00 - 60.00	0.6000	0.6000
T8	18	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	19	2-1/4" Rigid Conduit	40.00 - 60.00	0.6000	0.6000
T8	21	LDF5-50A(7/8)	40.00 - 60.00	0.6000	0.6000
T8	23	CU12PSM6P4XXX(1-3/4)	40.00 - 60.00	0.6000	0.6000
T8	24	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.6000
T8	27	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	30	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	31	T-Brackets (Af)	40.00 - 60.00	0.6000	0.6000
T8	33	FSJ4-50B(1/2")	40.00 - 42.00	0.6000	0.6000
T8	36	HB158-21U6S24-xxM_TMO (1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	39	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	41	(3/8") Ground Cables	40.00 - 60.00	0.6000	0.6000
T9	3	LDF4-50A(1/2")	20.00 - 31.00	0.6000	0.6000
T9	4	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	6	Climbing Ladder	20.00 - 40.00	0.6000	0.6000
T9	7	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	9	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.6000



<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 102920.014.01.0001 - BRG 124 943066, CT (BU# 806353)	<b>Page</b> 15 of 35
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	<b>Client</b> Crown Castle	<b>Designed by</b> Jayaraj B

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C<sub>A</sub>A<sub>A</sub> Front ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> Side ft<sup>2</sup></i>	<i>Weight K</i>
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	8.009 8.518 9.038	4.233 4.689 5.156	0.108 0.194 0.292
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	8.009 8.518 9.038	4.233 4.689 5.156	0.108 0.194 0.292
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	8.009 8.518 9.038	4.233 4.689 5.156	0.108 0.194 0.292
TA08025-B604	A	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	0.981 1.112 1.250	0.064 0.081 0.100
TA08025-B604	B	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	0.981 1.112 1.250	0.064 0.081 0.100
TA08025-B604	C	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	0.981 1.112 1.250	0.064 0.081 0.100
TA08025-B605	A	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.129 1.267 1.411	0.075 0.093 0.114
TA08025-B605	B	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.129 1.267 1.411	0.075 0.093 0.114
TA08025-B605	C	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.129 1.267 1.411	0.075 0.093 0.114
RDIDC-9181-PF-48	A	From Leg	4.000 0.000 4.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	2.012 2.189 2.373	1.168 1.311 1.461	0.022 0.040 0.060
(2) 10' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	2.375 3.403 4.448	2.375 3.403 4.448	0.037 0.054 0.079
(2) 10' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	2.375 3.403 4.448	2.375 3.403 4.448	0.037 0.054 0.079
(2) 10' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	2.375 3.403 4.448	2.375 3.403 4.448	0.037 0.054 0.079
4' x 2" Pipe Mount	A	From Leg	2.000 0.000 0.000	0.000	170.000	No Ice 1/2" Ice 1" Ice	0.866 1.111 1.365	0.866 1.111 1.365	0.015 0.022 0.032
Commscope MTC3975083 (3)	C	None		0.000	170.000	No Ice 1/2" Ice 1" Ice	23.850 34.120 44.390	23.850 34.120 44.390	1.260 1.803 2.345
*									
*									
(2) RFV01U-D1A	A	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223	1.250 1.393 1.543	0.084 0.103 0.124
RFV01U-D1A	B	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223	1.250 1.393 1.543	0.084 0.103 0.124
RFV01U-D2A	A	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223	1.013 1.145 1.284	0.070 0.087 0.106
(2) RFV01U-D2A	B	From Leg	4.000	0.000	164.000	No Ice	1.875	1.013	0.070

<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b>	<b>Page</b>
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	<b>Client</b>	<b>Designed by</b>
	Crown Castle	Jayaraj B

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
DB-T1-6Z-8AB-0Z	B	From Leg	0.000	0.000	164.000	1/2" Ice	2.045	1.145	0.087
			2.000			1" Ice	2.223	1.284	0.106
			4.000			No Ice	4.800	2.000	0.044
			0.000			1/2" Ice	5.070	2.193	0.080
(2) APL868013 w/ Mount Pipe	A	From Leg	2.000	0.000	164.000	1" Ice	5.348	2.393	0.120
			4.000			No Ice	2.633	4.131	0.030
			0.000			1/2" Ice	3.074	4.603	0.064
			-2.000			1" Ice	3.530	5.091	0.106
(2) APL868013 w/ Mount Pipe	B	From Leg	4.000	0.000	164.000	No Ice	2.633	4.131	0.030
			0.000			1/2" Ice	3.074	4.603	0.064
			-2.000			1" Ice	3.530	5.091	0.106
			4.000			No Ice	2.633	4.131	0.030
(2) APL868013 w/ Mount Pipe	C	From Leg	0.000	0.000	164.000	1/2" Ice	3.074	4.603	0.064
			-2.000			1" Ice	3.530	5.091	0.106
			4.000			No Ice	2.633	4.131	0.030
			0.000			1/2" Ice	3.074	4.603	0.064
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Leg	4.000	0.000	164.000	No Ice	5.504	4.384	0.096
			0.000			1/2" Ice	5.972	4.837	0.169
			-2.000			1" Ice	6.451	5.301	0.254
			4.000			No Ice	5.504	4.384	0.096
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Leg	0.000	0.000	164.000	1/2" Ice	5.972	4.837	0.169
			-2.000			1" Ice	6.451	5.301	0.254
			4.000			No Ice	5.504	4.384	0.096
			0.000			1/2" Ice	5.972	4.837	0.169
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Leg	4.000	0.000	164.000	No Ice	5.504	4.384	0.096
			0.000			1/2" Ice	5.972	4.837	0.169
			-2.000			1" Ice	6.451	5.301	0.254
			4.000			No Ice	1.452	0.994	0.032
CBRS w/ Mount Pipe	A	From Leg	0.000	0.000	164.000	1/2" Ice	1.671	1.185	0.048
			-2.000			1" Ice	1.905	1.391	0.068
			4.000			No Ice	1.452	0.994	0.032
			0.000			1/2" Ice	1.671	1.185	0.048
CBRS w/ Mount Pipe	B	From Leg	4.000	0.000	164.000	No Ice	1.452	0.994	0.032
			0.000			1/2" Ice	1.671	1.185	0.048
			-2.000			1" Ice	1.905	1.391	0.068
			4.000			No Ice	1.452	0.994	0.032
CBRS w/ Mount Pipe	C	From Leg	0.000	0.000	164.000	1/2" Ice	1.671	1.185	0.048
			-2.000			1" Ice	1.905	1.391	0.068
			4.000			No Ice	1.452	0.994	0.032
			0.000			1/2" Ice	1.671	1.185	0.048
MT6407-77A w/ Mount Pipe	A	From Leg	4.000	0.000	164.000	No Ice	4.907	2.682	0.096
			0.000			1/2" Ice	5.256	3.145	0.136
			-2.000			1" Ice	5.615	3.624	0.180
			4.000			No Ice	4.907	2.682	0.096
MT6407-77A w/ Mount Pipe	B	From Leg	0.000	0.000	164.000	1/2" Ice	5.256	3.145	0.136
			-2.000			1" Ice	5.615	3.624	0.180
			4.000			No Ice	4.907	2.682	0.096
			0.000			1/2" Ice	5.256	3.145	0.136
MT6407-77A w/ Mount Pipe	C	From Leg	4.000	0.000	164.000	No Ice	4.907	2.682	0.096
			0.000			1/2" Ice	5.256	3.145	0.136
			-2.000			1" Ice	5.615	3.624	0.180
			4.000			No Ice	1.425	1.425	0.022
(2) 6' x 2" Mount Pipe	A	From Leg	0.000	0.000	164.000	1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
			4.000			No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
(2) 6' x 2" Mount Pipe	B	From Leg	0.000	0.000	164.000	1" Ice	2.294	2.294	0.048
			4.000			No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	164.000	No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
			Sector Mount [SM 702-3](16')			C	None		0.000
1/2" Ice	62.031	62.031	2.805						
1" Ice	76.025	76.025	3.959						
*									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	154.000	No Ice	3.385	2.323	0.055
			0.000			1/2" Ice	3.746	2.664	0.098
			4.000			1" Ice	4.117	3.016	0.149



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	Crown Castle	Jayaraj B

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C<sub>A</sub>A<sub>A</sub> Front ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> Side ft<sup>2</sup></i>	<i>Weight K</i>
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 3.385 1/2" Ice 3.746 1" Ice 4.117	2.323 2.664 3.016	0.055 0.098 0.149
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 3.385 1/2" Ice 3.746 1" Ice 4.117	2.323 2.664 3.016	0.055 0.098 0.149
QS66512-2 w/ Mount Pipe	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 4.035 1/2" Ice 4.421 1" Ice 4.816	4.181 4.569 4.966	0.137 0.206 0.287
QS66512-2 w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 4.035 1/2" Ice 4.421 1" Ice 4.816	4.181 4.569 4.966	0.137 0.206 0.287
QS66512-2 w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 4.035 1/2" Ice 4.421 1" Ice 4.816	4.181 4.569 4.966	0.137 0.206 0.287
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 12.248 1/2" Ice 12.998 1" Ice 13.764	6.047 6.710 7.388	0.089 0.176 0.275
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 12.248 1/2" Ice 12.998 1" Ice 13.764	6.047 6.710 7.388	0.089 0.176 0.275
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 12.248 1/2" Ice 12.998 1" Ice 13.764	6.047 6.710 7.388	0.089 0.176 0.275
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 11.961 1/2" Ice 12.703 1" Ice 13.461	5.969 6.627 7.300	0.115 0.201 0.298
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 11.961 1/2" Ice 12.703 1" Ice 13.461	5.969 6.627 7.300	0.115 0.201 0.298
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 11.961 1/2" Ice 12.703 1" Ice 13.461	5.969 6.627 7.300	0.115 0.201 0.298
(2) LGP21401	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1.104 1/2" Ice 1.239 1" Ice 1.381	0.207 0.274 0.348	0.014 0.021 0.030
(2) LGP21401	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1.104 1/2" Ice 1.239 1" Ice 1.381	0.207 0.274 0.348	0.014 0.021 0.030
(2) LGP21401	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1.104 1/2" Ice 1.239 1" Ice 1.381	0.207 0.274 0.348	0.014 0.021 0.030
RRUS 32 B30	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 2.692 1/2" Ice 2.912 1" Ice 3.138	1.573 1.756 1.945	0.060 0.080 0.104
RRUS 32 B30	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 2.692 1/2" Ice 2.912 1" Ice 3.138	1.573 1.756 1.945	0.060 0.080 0.104
RRUS 32 B30	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 2.692 1/2" Ice 2.912 1" Ice 3.138	1.573 1.756 1.945	0.060 0.080 0.104
RRUS 32 B2	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 2.731 1/2" Ice 2.953 1" Ice 3.182	1.668 1.855 2.049	0.053 0.074 0.098
RRUS 32 B2	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 2.731 1/2" Ice 2.953 1" Ice 3.182	1.668 1.855 2.049	0.053 0.074 0.098

<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b>	<b>Page</b>
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	Crown Castle	Jayaraj B

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C<sub>A</sub>A<sub>A</sub> Front ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> Side ft<sup>2</sup></i>	<i>Weight K</i>
RRUS 32 B2	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.731 2.953 3.182	1.668 1.855 2.049	0.053 0.074 0.098
DBC0061F1V51-2	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	0.433 0.518 0.609	0.413 0.496 0.586	0.025 0.031 0.038
DBC0061F1V51-2	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	0.433 0.518 0.609	0.413 0.496 0.586	0.025 0.031 0.038
DBC0061F1V51-2	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	0.433 0.518 0.609	0.413 0.496 0.586	0.025 0.031 0.038
RRUS 4478 B14	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.843 2.012 2.190	1.059 1.197 1.342	0.060 0.076 0.094
RRUS 4478 B14	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.843 2.012 2.190	1.059 1.197 1.342	0.060 0.076 0.094
RRUS 4478 B14	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.843 2.012 2.190	1.059 1.197 1.342	0.060 0.076 0.094
RRUS 4449 B5/B12	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.968 2.144 2.328	1.408 1.564 1.727	0.071 0.090 0.111
RRUS 4449 B5/B12	B	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.968 2.144 2.328	1.408 1.564 1.727	0.071 0.090 0.111
RRUS 4449 B5/B12	C	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.968 2.144 2.328	1.408 1.564 1.727	0.071 0.090 0.111
(3) DC6-48-60-18-8F	A	From Leg	4.000 0.000 4.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	0.850 1.356 1.532	0.850 1.356 1.532	0.019 0.036 0.055
(2) 5' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.188 1.496 1.807	1.188 1.496 1.807	0.018 0.027 0.040
(2) 5' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.188 1.496 1.807	1.188 1.496 1.807	0.018 0.027 0.040
(2) 5' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	1.188 1.496 1.807	1.188 1.496 1.807	0.018 0.027 0.040
12.5' x 2.375" Horizontal Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.980 4.250 5.550	0.010 0.050 0.100	0.046 0.068 0.981
12.5' x 2.375" Horizontal Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.980 4.250 5.550	0.010 0.050 0.100	0.046 0.068 0.981
12.5' x 2.375" Horizontal Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.980 4.250 5.550	0.010 0.050 0.100	0.046 0.068 0.981
Sector Mount [SM 1303-3]	C	None		0.000	154.000	No Ice 1/2" Ice 1" Ice	38.780 46.780 54.730	38.780 46.780 54.730	1.104 1.763 2.567
Pipe Mount [PM 601-3]	C	None		0.000	154.000	No Ice 1/2" Ice 1" Ice	3.170 3.790 4.420	3.170 3.790 4.420	0.195 0.232 0.279

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	Crown Castle	Jayaraj B

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment  °</i>	<i>Placement  ft</i>		<i>C<sub>AA</sub> Front  ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side  ft<sup>2</sup></i>	<i>Weight  K</i>
*									
800 EXTERNAL NOTCH FILTER	A	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER	B	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER	C	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.060 0.083 0.110
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.060 0.083 0.110
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.060 0.083 0.110
800MHZ 2X50W RRH	A	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.053 0.074 0.098
800MHZ 2X50W RRH	B	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.053 0.074 0.098
800MHZ 2X50W RRH	C	From Leg	1.000 0.000 1.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.053 0.074 0.098
*									
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	6.579 7.064 7.566	3.500 3.900 4.317	0.111 0.162 0.220
AIR 6419 B41_TMO w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	6.579 7.064 7.566	3.500 3.900 4.317	0.111 0.162 0.220
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	6.579 7.064 7.566	3.500 3.900 4.317	0.111 0.162 0.220
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	14.694 15.455 16.230	6.873 7.554 8.247	0.183 0.311 0.453
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	14.694 15.455 16.230	6.873 7.554 8.247	0.183 0.311 0.453
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	14.694 15.455 16.230	6.873 7.554 8.247	0.183 0.311 0.453
VV-65B-R1_TMO w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	5.817 6.374 6.944	3.479 4.003 4.540	0.067 0.122 0.187
VV-65B-R1_TMO w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	5.817 6.374 6.944	3.479 4.003 4.540	0.067 0.122 0.187
VV-65B-R1_TMO w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	5.817 6.374 6.944	3.479 4.003 4.540	0.067 0.122 0.187
Radio 4480_TMOV2	A	From Leg	4.000	0.000	143.000	No Ice	2.878	1.397	0.081

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	Crown Castle	Jayaraj B

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C<sub>A</sub>A<sub>A</sub> Front ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> Side ft<sup>2</sup></i>	<i>Weight K</i>		
Radio 4480_TMOV2	B	From Leg	0.000	0.000	143.000	1/2" Ice	3.091	1.558	0.103	
			0.000			1" Ice	3.312	1.727	0.128	
			4.000			No Ice	2.878	1.397	0.081	
			0.000			1/2" Ice	3.091	1.558	0.103	
Radio 4480_TMOV2	C	From Leg	0.000	0.000	143.000	1" Ice	3.312	1.727	0.128	
			4.000			No Ice	2.878	1.397	0.081	
			0.000			1/2" Ice	3.091	1.558	0.103	
			0.000			1" Ice	3.312	1.727	0.128	
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.000	0.000	143.000	No Ice	2.139	1.686	0.109	
			0.000			1/2" Ice	2.321	1.850	0.131	
			0.000			1" Ice	2.511	2.022	0.156	
			4.000			No Ice	2.139	1.686	0.109	
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.000	0.000	143.000	No Ice	2.139	1.686	0.109	
			0.000			1/2" Ice	2.321	1.850	0.131	
			0.000			1" Ice	2.511	2.022	0.156	
			4.000			No Ice	2.139	1.686	0.109	
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.000	0.000	143.000	No Ice	2.139	1.686	0.109	
			0.000			1/2" Ice	2.321	1.850	0.131	
			0.000			1" Ice	2.511	2.022	0.156	
			4.000			No Ice	2.375	2.375	0.037	
10' x 2" Mount Pipe	A	From Leg	4.000	0.000	143.000	No Ice	2.375	2.375	0.037	
			0.000			1/2" Ice	3.403	3.403	0.054	
			0.000			1" Ice	4.448	4.448	0.079	
			4.000			No Ice	2.375	2.375	0.037	
10' x 2" Mount Pipe	B	From Leg	4.000	0.000	143.000	No Ice	2.375	2.375	0.037	
			0.000			1/2" Ice	3.403	3.403	0.054	
			0.000			1" Ice	4.448	4.448	0.079	
			4.000			No Ice	2.375	2.375	0.037	
10' x 2" Mount Pipe	C	From Leg	4.000	0.000	143.000	No Ice	2.375	2.375	0.037	
			0.000			1/2" Ice	3.403	3.403	0.054	
			0.000			1" Ice	4.448	4.448	0.079	
			4.000			No Ice	1.425	1.425	0.022	
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	143.000	No Ice	1.425	1.425	0.022	
			0.000			1/2" Ice	1.925	1.925	0.033	
			0.000			1" Ice	2.294	2.294	0.048	
			4.000			No Ice	1.425	1.425	0.022	
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	143.000	No Ice	1.425	1.425	0.022	
			0.000			1/2" Ice	1.925	1.925	0.033	
			0.000			1" Ice	2.294	2.294	0.048	
			4.000			No Ice	1.425	1.425	0.022	
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	143.000	No Ice	1.425	1.425	0.022	
			0.000			1/2" Ice	1.925	1.925	0.033	
			0.000			1" Ice	2.294	2.294	0.048	
			4.000			No Ice	13.200	9.200	0.658	
Site Pro1 VFA12-HD Mount	A	From Leg	2.000	0.000	143.000	No Ice	13.200	9.200	0.658	
			0.000			1/2" Ice	19.500	14.600	0.804	
			0.000			1" Ice	25.800	19.500	1.015	
			2.000			No Ice	13.200	9.200	0.658	
Site Pro1 VFA12-HD Mount	B	From Leg	2.000	0.000	143.000	No Ice	13.200	9.200	0.658	
			0.000			1/2" Ice	19.500	14.600	0.804	
			0.000			1" Ice	25.800	19.500	1.015	
			2.000			No Ice	13.200	9.200	0.658	
Site Pro1 VFA12-HD Mount	C	From Leg	2.000	0.000	143.000	No Ice	13.200	9.200	0.658	
			0.000			1/2" Ice	19.500	14.600	0.804	
			0.000			1" Ice	25.800	19.500	1.015	
			2.000			No Ice	13.200	9.200	0.658	
*			0.000			1" Ice	25.800	19.500	1.015	
			0.000							
			0.000							
			0.000							
1142-2C	B	From Leg	6.000	0.000	124.000	No Ice	2.092	2.092	0.024	
			0.000			1/2" Ice	3.374	3.374	0.041	
			7.000			1" Ice	4.673	4.673	0.066	
			6.000			No Ice	2.092	2.092	0.024	
1142-2C	C	From Leg	6.000	0.000	124.000	No Ice	2.092	2.092	0.024	
			0.000			1/2" Ice	3.374	3.374	0.041	
			7.000			1" Ice	4.673	4.673	0.066	
			3.000			No Ice	1.080	5.310	0.115	
Side Arm Mount [SO 303-1]	B	From Leg	3.000	0.000	124.000	No Ice	1.080	5.310	0.115	
			0.000			1/2" Ice	1.630	7.570	0.158	
			0.000			1" Ice	2.210	9.930	0.217	
			3.000			No Ice	1.080	5.310	0.115	
Side Arm Mount [SO 303-1]	C	From Leg	3.000	0.000	124.000	No Ice	1.080	5.310	0.115	
			0.000			1/2" Ice	1.630	7.570	0.158	
			0.000			1" Ice	2.210	9.930	0.217	
			0.000							

<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 102920.014.01.0001 - BRG 124 943066, CT (BU# 806353)	<b>Page</b> 21 of 35
	<b>Project</b>	<b>Date</b> 11:27:44 11/02/22
	<b>Client</b> Crown Castle	<b>Designed by</b> Jayaraj B

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C<sub>A</sub>A<sub>A</sub> Front ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> Side ft<sup>2</sup></i>	<i>Weight K</i>
*									
220-3BN	B	From Leg	6.000 0.000 4.000	0.000	104.000	No Ice 1/2" Ice 1" Ice	5.720 7.831 9.959	5.720 7.831 9.959	0.024 0.066 0.120
1142-2C	C	From Leg	6.000 0.000 7.000	0.000	104.000	No Ice 1/2" Ice 1" Ice	2.092 3.374 4.673	2.092 3.374 4.673	0.024 0.041 0.066
Side Arm Mount [SO 303-1]	B	From Leg	3.000 0.000 0.000	0.000	104.000	No Ice 1/2" Ice 1" Ice	1.080 1.630 2.210	5.310 7.570 9.930	0.115 0.158 0.217
Side Arm Mount [SO 303-1]	C	From Leg	3.000 0.000 0.000	0.000	104.000	No Ice 1/2" Ice 1" Ice	1.080 1.630 2.210	5.310 7.570 9.930	0.115 0.158 0.217
*									
APXVAARR24_43-U-NA20	A	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	14.666 15.434 16.214	5.322 5.992 6.675	0.153 0.266 0.387
APXVAARR24_43-U-NA20	B	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	14.666 15.434 16.214	5.322 5.992 6.675	0.153 0.266 0.387
APXVAARR24_43-U-NA20	C	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	14.666 15.434 16.214	5.322 5.992 6.675	0.153 0.266 0.387
AIR 32 B2a/B66Aa	A	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	3.855 4.228 4.612	2.506 2.856 3.217	0.172 0.220 0.273
AIR 32 B2a/B66Aa	B	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	3.855 4.228 4.612	2.506 2.856 3.217	0.172 0.220 0.273
AIR 32 B2a/B66Aa	C	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	3.855 4.228 4.612	2.506 2.856 3.217	0.172 0.220 0.273
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	3.145 3.454 3.772	2.585 2.884 3.192	0.112 0.164 0.225
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	3.145 3.454 3.772	2.585 2.884 3.192	0.112 0.164 0.225
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	3.145 3.454 3.772	2.585 2.884 3.192	0.112 0.164 0.225
KRY 112 144/1	A	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	0.350 0.426 0.509	0.175 0.234 0.301	0.011 0.014 0.019
KRY 112 144/1	B	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	0.350 0.426 0.509	0.175 0.234 0.301	0.011 0.014 0.019
KRY 112 144/1	C	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	0.350 0.426 0.509	0.175 0.234 0.301	0.011 0.014 0.019
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 0.000	0.000	93.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109



<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 102920.014.01.0001 - BRG 124 943066, CT (BU# 806353)	<b>Page</b> 22 of 35
	<b>Project</b>	<b>Date</b> 11:27:44 11/02/22
	<b>Client</b> Crown Castle	<b>Designed by</b> Jayaraj B

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
Sector Mount [SM 404-3]	C	None	0.000	0.000	93.000	1/2" Ice	1.810	1.301	0.090
			0.000			1" Ice	1.978	1.447	0.109
						No Ice	20.430	20.430	0.920
						1/2" Ice	28.680	28.680	1.311
* GPS_A	C	From Leg	3.000	0.000	62.000	1" Ice	36.800	36.800	1.839
			0.000			No Ice	0.255	0.255	0.001
			0.000			1/2" Ice	0.320	0.320	0.005
			3.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 305-1]	C	From Leg	1.500	0.000	62.000	No Ice	0.530	1.520	0.030
			0.000			1/2" Ice	0.780	2.070	0.044
			0.000			1" Ice	1.060	2.660	0.064
* GPS_A	C	From Leg	3.000	0.000	42.000	No Ice	0.255	0.255	0.001
			0.000			1/2" Ice	0.320	0.320	0.005
			2.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 305-1]	C	From Leg	1.500	0.000	42.000	No Ice	0.530	1.520	0.030
			0.000			1/2" Ice	0.780	2.070	0.044
			0.000			1" Ice	1.060	2.660	0.064
* GPS_A	C	From Leg	3.000	0.000	31.000	No Ice	0.255	0.255	0.001
			0.000			1/2" Ice	0.320	0.320	0.005
			1.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	31.000	No Ice	0.850	1.670	0.065
			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
(2) 3'x8" Knife Plate	A	From Leg	0.000	0.000	20.000	No Ice	2.333	0.250	0.048
			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
(2) 3'x8" Knife Plate	B	From Leg	0.000	0.000	20.000	No Ice	2.333	0.250	0.048
			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
(2) 3'x8" Knife Plate	C	From Leg	0.000	0.000	20.000	No Ice	2.333	0.250	0.048
			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
(2) 3'x8" Knife Plate	A	From Leg	0.000	0.000	60.000	No Ice	2.333	0.250	0.048
			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
(2) 3'x8" Knife Plate	B	From Leg	0.000	0.000	60.000	No Ice	2.333	0.250	0.048
			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
(2) 3'x8" Knife Plate	C	From Leg	0.000	0.000	60.000	No Ice	2.333	0.250	0.048
			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
*									
*									
*									

## Load Combinations

<b><i>tnxTower</i></b>  <b><i>B+T Group</i></b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b>	<b>Page</b>
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	<b>Project</b>	<b>Date</b>
	<b>Client</b>	11:27:44 11/02/22
	Crown Castle	<b>Designed by</b>
		Jayaraj B

<i>Comb. No.</i>	<i>Description</i>
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

## Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
T1	180 - 168	Leg	Max Tension	7	1.723	-0.146	0.092
			Max. Compression	10	-3.780	-0.157	-0.105
			Max. Mx	8	-1.052	0.371	0.008

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	<b>Project</b>	<b>Date</b>
	<b>Client</b>	<b>Designed by</b>
	Crown Castle	Jayaraj B

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	168 - 160	Diagonal	Max. My	14	1.552	-0.001	0.367
			Max. Vy	20	-0.320	0.263	0.008
			Max. Vx	14	0.305	0.026	-0.241
			Max Tension	13	0.718	0.000	0.000
			Max. Compression	24	-0.827	0.000	0.000
			Max. Mx	16	0.286	0.011	0.001
			Max. My	24	0.693	0.007	-0.003
			Max. Vy	34	-0.011	0.011	0.000
			Max. Vx	24	-0.001	0.005	-0.003
			Max Tension	18	0.182	0.000	0.000
			Max. Compression	23	-0.140	0.000	0.000
			Max. Mx	26	0.049	-0.014	0.000
		Top Girt	Max. Vy	26	0.014	0.000	0.000
			Max Tension	7	9.029	-0.002	-0.000
			Max. Compression	10	-12.973	0.002	-0.002
			Max. Mx	20	-1.295	0.263	0.008
			Max. My	14	-3.681	0.026	-0.241
			Max. Vy	20	1.027	-0.022	0.049
			Max. Vx	2	1.068	0.059	-0.086
			Max Tension	25	2.917	0.000	0.000
			Max. Compression	12	-3.075	0.000	0.000
			Max. Mx	8	-1.856	-0.022	0.002
			Max. My	24	2.892	0.019	-0.005
			Max. Vy	33	-0.014	0.019	0.001
			Max. Vx	24	-0.002	0.010	-0.005
T3	160 - 140	Leg	Max Tension	7	41.234	-0.449	-0.013
			Max. Compression	10	-53.811	0.430	0.002
			Max. Mx	14	36.414	0.606	0.014
			Max. My	20	-5.142	-0.018	0.710
			Max. Vy	14	-1.010	-0.526	0.009
			Max. Vx	8	0.958	-0.031	0.251
		Diagonal	Max Tension	25	4.283	0.000	0.000
			Max. Compression	24	-4.382	0.000	0.000
			Max. Mx	10	3.157	0.027	0.002
			Max. My	24	-3.921	-0.012	-0.004
			Max. Vy	31	-0.015	0.021	-0.001
			Max. Vx	24	0.001	0.000	0.000
		Leg	Max Tension	7	73.853	-0.295	-0.064
			Max. Compression	10	-90.931	0.312	-0.036
			Max. Mx	22	49.175	-0.528	-0.004
			Max. My	4	-7.570	-0.053	-0.588
			Max. Vy	22	-0.098	-0.528	-0.004
			Max. Vx	19	0.152	-0.152	0.333
T4	140 - 120	Diagonal	Max Tension	20	5.238	0.000	0.000
			Max. Compression	20	-5.268	0.000	0.000
			Max. Mx	10	4.063	0.028	-0.001
			Max. My	28	1.075	0.021	-0.003
			Max. Vy	31	-0.020	0.027	-0.003
			Max. Vx	28	0.001	0.000	0.000
		Leg	Max Tension	7	102.119	-0.355	-0.079
			Max. Compression	10	-122.767	0.454	-0.029
			Max. Mx	2	-116.435	0.460	-0.044
			Max. My	16	-11.404	0.002	0.558
			Max. Vy	3	-0.105	0.459	-0.045
			Max. Vx	19	0.186	-0.186	0.453
T5	120 - 100	Diagonal	Max Tension	20	4.971	0.000	0.000
			Max. Compression	20	-5.029	0.000	0.000
			Max. Mx	10	3.982	0.043	-0.002
			Max. My	29	0.920	0.036	-0.005
			Max. Vy	31	-0.027	0.042	-0.004
			Max. Vx	29	0.002	0.000	0.000

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	<b>Project</b>	<b>Date</b>
	<b>Client</b>	<b>Designed by</b>
	Crown Castle	Jayaraj B

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T6	100 - 80	Leg	Max Tension	7	127.920	-0.470	-0.015
			Max. Compression	10	-154.435	0.822	0.023
			Max. Mx	18	-153.466	0.832	0.055
			Max. My	4	-13.900	0.010	-0.690
			Max. Vy	22	-0.571	-0.567	-0.021
		Diagonal	Max. Vx	16	0.515	-0.013	0.419
			Max Tension	20	5.817	0.000	0.000
			Max. Compression	20	-5.820	0.000	0.000
			Max. Mx	31	1.402	0.049	0.006
			Max. My	29	-1.274	0.040	-0.007
			Max. Vy	29	0.035	0.048	-0.006
			Max. Vx	29	0.002	0.000	0.000
			Max Tension	7	151.429	-0.699	-0.043
			Max. Compression	10	-181.323	1.082	0.029
			Max. Mx	18	-180.671	1.096	0.084
			Max. My	4	-15.227	-0.092	-1.070
			Max. Vy	18	-0.122	1.096	0.084
			Max. Vx	4	0.153	-0.092	-1.070
T7	80 - 60	Leg	Max Tension	7	151.429	-0.699	-0.043
			Max. Compression	10	-181.323	1.082	0.029
			Max. Mx	18	-180.671	1.096	0.084
			Max. My	4	-15.227	-0.092	-1.070
			Max. Vy	18	-0.122	1.096	0.084
		Diagonal	Max. Vx	4	0.153	-0.092	-1.070
			Max Tension	20	6.788	0.000	0.000
			Max. Compression	20	-6.833	0.000	0.000
			Max. Mx	31	1.578	0.086	0.011
			Max. My	34	1.595	0.082	0.012
			Max. Vy	29	0.047	0.083	-0.012
			Max. Vx	34	-0.003	0.000	0.000
			Max Tension	7	175.689	-0.933	-0.042
			Max. Compression	10	-209.631	-0.139	0.015
			Max. Mx	18	-194.791	1.096	0.084
			Max. My	4	-17.490	-0.074	-0.968
			Max. Vy	22	-0.175	-0.949	-0.029
			Max. Vx	4	0.130	-0.074	-0.968
T8	60 - 40	Leg	Max Tension	7	175.689	-0.933	-0.042
			Max. Compression	10	-209.631	-0.139	0.015
			Max. Mx	18	-194.791	1.096	0.084
			Max. My	4	-17.490	-0.074	-0.968
			Max. Vy	22	-0.175	-0.949	-0.029
		Diagonal	Max. Vx	4	0.130	-0.074	-0.968
			Max Tension	20	7.164	0.000	0.000
			Max. Compression	20	-7.228	0.000	0.000
			Max. Mx	10	5.593	0.133	0.010
			Max. My	34	1.802	0.118	0.017
			Max. Vy	29	0.064	0.120	0.015
			Max. Vx	34	-0.004	0.000	0.000
			Max Tension	7	198.079	1.514	-0.028
			Max. Compression	18	-236.652	-0.417	0.036
			Max. Mx	18	-222.817	3.342	-0.013
			Max. My	8	-17.680	-0.436	1.961
			Max. Vy	18	-1.179	3.275	-0.015
			Max. Vx	4	0.478	-0.453	-1.892
T9	40 - 20	Leg	Max Tension	7	198.079	1.514	-0.028
			Max. Compression	18	-236.652	-0.417	0.036
			Max. Mx	18	-222.817	3.342	-0.013
			Max. My	8	-17.680	-0.436	1.961
			Max. Vy	18	-1.179	3.275	-0.015
		Diagonal	Max. Vx	4	0.478	-0.453	-1.892
			Max Tension	21	7.474	0.103	-0.002
			Max. Compression	18	-8.300	0.000	0.000
			Max. Mx	31	0.960	0.160	-0.012
			Max. My	18	-7.835	0.012	0.015
			Max. Vy	29	0.069	0.130	-0.011
			Max. Vx	28	-0.003	0.000	0.000
			Max Tension	8	1.267	0.058	0.003
			Max. Compression	9	-1.050	0.051	0.020
			Max. Mx	36	0.016	0.135	0.027
			Max. My	30	0.259	0.102	0.029
			Max. Vy	36	-0.072	0.135	0.027
			Max. Vx	30	-0.005	0.000	0.000
T10	20 - 0	Leg	Max Tension	7	220.089	-1.721	-0.039
			Max. Compression	18	-264.475	0.000	-0.000
			Max. Mx	35	-105.396	4.097	-0.017
			Max. My	8	-21.110	-0.154	2.445
			Max. Vy	31	-0.729	-3.082	0.000
			Max. Vx	4	-0.343	-0.153	-2.367

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	20	7.958	0.000	0.000
			Max. Compression	18	-8.515	0.000	0.000
			Max. Mx	29	-0.064	0.206	-0.021
			Max. My	28	3.652	0.124	-0.025
			Max. Vy	29	0.080	0.206	-0.021
			Max. Vx	28	0.004	0.000	0.000

## Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	271.353	24.036	-13.044
	Max. H <sub>x</sub>	18	271.353	24.036	-13.044
	Max. H <sub>z</sub>	7	-225.467	-20.633	11.121
	Min. Vert	7	-225.467	-20.633	11.121
	Min. H <sub>x</sub>	7	-225.467	-20.633	11.121
	Min. H <sub>z</sub>	18	271.353	24.036	-13.044
Leg B	Max. Vert	10	270.062	-23.052	-13.566
	Max. H <sub>x</sub>	23	-219.250	19.599	11.554
	Max. H <sub>z</sub>	23	-219.250	19.599	11.554
	Min. Vert	23	-219.250	19.599	11.554
	Min. H <sub>x</sub>	10	270.062	-23.052	-13.566
	Min. H <sub>z</sub>	10	270.062	-23.052	-13.566
Leg A	Max. Vert	2	255.026	0.545	25.285
	Max. H <sub>x</sub>	20	23.169	2.482	1.722
	Max. H <sub>z</sub>	2	255.026	0.545	25.285
	Min. Vert	15	-207.671	-0.494	-21.350
	Min. H <sub>x</sub>	11	-106.506	-2.438	-11.332
	Min. H <sub>z</sub>	15	-207.671	-0.494	-21.350

## Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	57.584	0.000	0.000	5.468	-23.461	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	69.100	-0.070	-39.062	-4018.220	-19.240	17.774
0.9 Dead+1.0 Wind 0 deg - No Ice	51.825	-0.070	-39.062	-4019.861	-12.201	17.774
1.2 Dead+1.0 Wind 30 deg - No Ice	69.100	19.510	-34.066	-3495.821	-2032.209	28.583
0.9 Dead+1.0 Wind 30 deg - No Ice	51.825	19.510	-34.066	-3497.462	-2025.171	28.583
1.2 Dead+1.0 Wind 60 deg - No Ice	69.100	35.364	-20.495	-2093.552	-3652.226	24.433
0.9 Dead+1.0 Wind 60 deg - No Ice	51.825	35.364	-20.495	-2095.192	-3645.188	24.433
1.2 Dead+1.0 Wind 90 deg - No Ice	69.100	41.577	0.070	15.474	-4281.236	5.975
0.9 Dead+1.0 Wind 90 deg - No Ice	51.825	41.577	0.070	13.834	-4274.198	5.975



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<i>Load Combination</i>	<i>Vertical</i>	<i>Shear<sub>x</sub></i>	<i>Shear<sub>z</sub></i>	<i>Overturning Moment, M<sub>x</sub></i>	<i>Overturning Moment, M<sub>z</sub></i>	<i>Torque</i>
	<i>K</i>	<i>K</i>	<i>K</i>	<i>kip-ft</i>	<i>kip-ft</i>	<i>kip-ft</i>
1.2 Dead+1.0 Wind 120 deg - No Ice	69.100	35.836	20.848	2145.597	-3701.816	-7.159
0.9 Dead+1.0 Wind 120 deg - No Ice	51.825	35.836	20.848	2143.957	-3694.778	-7.159
1.2 Dead+1.0 Wind 150 deg - No Ice	69.100	18.679	32.487	3409.625	-1985.159	-8.375
0.9 Dead+1.0 Wind 150 deg - No Ice	51.825	18.679	32.487	3407.985	-1978.121	-8.375
1.2 Dead+1.0 Wind 180 deg - No Ice	69.100	0.070	37.334	3897.818	-37.066	-17.774
0.9 Dead+1.0 Wind 180 deg - No Ice	51.825	0.070	37.334	3896.178	-30.028	-17.774
1.2 Dead+1.0 Wind 210 deg - No Ice	69.100	-19.510	34.066	3508.944	1975.904	-28.583
0.9 Dead+1.0 Wind 210 deg - No Ice	51.825	-19.510	34.066	3507.304	1982.942	-28.583
1.2 Dead+1.0 Wind 240 deg - No Ice	69.100	-36.860	21.359	2173.437	3711.557	-24.433
0.9 Dead+1.0 Wind 240 deg - No Ice	51.825	-36.860	21.359	2171.796	3718.595	-24.433
1.2 Dead+1.0 Wind 270 deg - No Ice	69.100	-41.577	-0.070	-2.352	4224.931	-5.975
0.9 Dead+1.0 Wind 270 deg - No Ice	51.825	-41.577	-0.070	-3.992	4231.969	-5.975
1.2 Dead+1.0 Wind 300 deg - No Ice	69.100	-34.340	-19.984	-2065.712	3529.875	7.159
0.9 Dead+1.0 Wind 300 deg - No Ice	51.825	-34.340	-19.984	-2067.352	3536.913	7.159
1.2 Dead+1.0 Wind 330 deg - No Ice	69.100	-18.679	-32.487	-3396.503	1928.854	8.375
0.9 Dead+1.0 Wind 330 deg - No Ice	51.825	-18.679	-32.487	-3398.143	1935.892	8.375
1.2 Dead+1.0 Ice+1.0 Temp	124.390	0.000	0.000	10.503	-69.231	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	124.390	-0.016	-10.578	-1087.544	-67.358	4.588
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	124.390	5.411	-9.454	-962.650	-625.811	8.082
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	124.390	9.820	-5.698	-571.951	-1072.689	7.207
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	124.390	11.425	0.016	12.376	-1240.150	2.134
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	124.390	9.601	5.591	588.409	-1061.064	-1.303
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	124.390	5.157	8.983	953.022	-610.287	-2.129
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	124.390	0.016	10.287	1086.600	-71.104	-4.588
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	124.390	-5.411	9.454	983.656	487.349	-8.082
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	124.390	-10.072	5.844	603.932	953.236	-7.207
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	124.390	-11.425	-0.016	8.630	1101.688	-2.134
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	124.390	-9.348	-5.445	-556.427	903.593	1.303
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	124.390	-5.157	-8.983	-932.016	471.825	2.129
Dead+Wind 0 deg - Service	57.584	-0.020	-11.137	-1134.565	-20.950	5.005
Dead+Wind 30 deg - Service	57.584	5.563	-9.712	-986.566	-591.130	8.041
Dead+Wind 60 deg - Service	57.584	10.077	-5.840	-589.253	-1049.765	6.867
Dead+Wind 90 deg - Service	57.584	11.845	0.020	7.978	-1227.787	1.667

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		Jayaraj B

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead+Wind 120 deg - Service	57.584	10.210	5.939	611.150	-1063.730	-2.030
Dead+Wind 150 deg - Service	57.584	5.328	9.267	969.531	-577.879	-2.366
Dead+Wind 180 deg - Service	57.584	0.020	10.651	1107.897	-25.971	-5.005
Dead+Wind 210 deg - Service	57.584	-5.563	9.712	997.501	544.209	-8.041
Dead+Wind 240 deg - Service	57.584	-10.499	6.083	618.990	1035.409	-6.867
Dead+Wind 270 deg - Service	57.584	-11.845	-0.020	2.958	1180.866	-1.667
Dead+Wind 300 deg - Service	57.584	-9.789	-5.696	-581.413	984.244	2.030
Dead+Wind 330 deg - Service	57.584	-5.328	-9.267	-958.596	530.958	2.366

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-57.584	0.000	-0.000	57.584	0.000	0.000%
2	-0.070	-69.100	-39.062	0.070	69.100	39.062	0.000%
3	-0.070	-51.825	-39.062	0.070	51.825	39.062	0.000%
4	19.510	-69.100	-34.066	-19.510	69.100	34.066	0.000%
5	19.510	-51.825	-34.066	-19.510	51.825	34.066	0.000%
6	35.364	-69.100	-20.495	-35.364	69.100	20.495	0.000%
7	35.364	-51.825	-20.495	-35.364	51.825	20.495	0.000%
8	41.577	-69.100	0.070	-41.577	69.100	-0.070	0.000%
9	41.577	-51.825	0.070	-41.577	51.825	-0.070	0.000%
10	35.836	-69.100	20.848	-35.836	69.100	-20.848	0.000%
11	35.836	-51.825	20.848	-35.836	51.825	-20.848	0.000%
12	18.679	-69.100	32.487	-18.679	69.100	-32.487	0.000%
13	18.679	-51.825	32.487	-18.679	51.825	-32.487	0.000%
14	0.070	-69.100	37.334	-0.070	69.100	-37.334	0.000%
15	0.070	-51.825	37.334	-0.070	51.825	-37.334	0.000%
16	-19.510	-69.100	34.066	19.510	69.100	-34.066	0.000%
17	-19.510	-51.825	34.066	19.510	51.825	-34.066	0.000%
18	-36.860	-69.100	21.359	36.860	69.100	-21.359	0.000%
19	-36.860	-51.825	21.359	36.860	51.825	-21.359	0.000%
20	-41.577	-69.100	-0.070	41.577	69.100	0.070	0.000%
21	-41.577	-51.825	-0.070	41.577	51.825	0.070	0.000%
22	-34.340	-69.100	-19.984	34.340	69.100	19.984	0.000%
23	-34.340	-51.825	-19.984	34.340	51.825	19.984	0.000%
24	-18.679	-69.100	-32.487	18.679	69.100	32.487	0.000%
25	-18.679	-51.825	-32.487	18.679	51.825	32.487	0.000%
26	0.000	-124.390	0.000	-0.000	124.390	-0.000	0.000%
27	-0.016	-124.390	-10.578	0.016	124.390	10.578	0.000%
28	5.411	-124.390	-9.454	-5.411	124.390	9.454	0.000%
29	9.820	-124.390	-5.698	-9.820	124.390	5.698	0.000%
30	11.425	-124.390	0.016	-11.425	124.390	-0.016	0.000%
31	9.601	-124.390	5.591	-9.601	124.390	-5.591	0.000%
32	5.157	-124.390	8.983	-5.157	124.390	-8.983	0.000%
33	0.016	-124.390	10.287	-0.016	124.390	-10.287	0.000%
34	-5.411	-124.390	9.454	5.411	124.390	-9.454	0.000%
35	-10.072	-124.390	5.844	10.072	124.390	-5.844	0.000%
36	-11.425	-124.390	-0.016	11.425	124.390	0.016	0.000%
37	-9.348	-124.390	-5.445	9.348	124.390	5.445	0.000%
38	-5.157	-124.390	-8.983	5.157	124.390	8.983	0.000%
39	-0.020	-57.584	-11.137	0.020	57.584	11.137	0.000%
40	5.563	-57.584	-9.712	-5.563	57.584	9.712	0.000%
41	10.077	-57.584	-5.840	-10.077	57.584	5.840	0.000%
42	11.845	-57.584	0.020	-11.845	57.584	-0.020	0.000%
43	10.210	-57.584	5.939	-10.210	57.584	-5.939	0.000%
44	5.328	-57.584	9.267	-5.328	57.584	-9.267	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
45	0.020	-57.584	10.651	-0.020	57.584	-10.651	0.000%
46	-5.563	-57.584	9.712	5.563	57.584	-9.712	0.000%
47	-10.499	-57.584	6.083	10.499	57.584	-6.083	0.000%
48	-11.845	-57.584	-0.020	11.845	57.584	0.020	0.000%
49	-9.789	-57.584	-5.696	9.789	57.584	5.696	0.000%
50	-5.328	-57.584	-9.267	5.328	57.584	9.267	0.000%

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	5.160	43	0.278	0.031
T2	168 - 160	4.461	43	0.275	0.031
T3	160 - 140	4.002	43	0.263	0.030
T4	140 - 120	2.954	43	0.219	0.027
T5	120 - 100	2.093	43	0.175	0.023
T6	100 - 80	1.420	43	0.133	0.018
T7	80 - 60	0.895	43	0.103	0.013
T8	60 - 40	0.496	42	0.075	0.008
T9	40 - 20	0.221	42	0.047	0.005
T10	20 - 0	0.062	47	0.018	0.003

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.000	PD10017	43	5.043	0.278	0.031	554908
170.000	MX08FRO665-21 w/ Mount Pipe	43	4.578	0.276	0.031	244197
164.000	(2) RFV01U-D1A	43	4.230	0.270	0.031	59964
154.000	7770.00 w/ Mount Pipe	43	3.670	0.251	0.030	30468
145.000	800 EXTERNAL NOTCH FILTER	43	3.200	0.231	0.028	26166
143.000	AIR 6419 B41_TMO w/ Mount Pipe	43	3.100	0.226	0.028	25375
124.000	1142-2C	43	2.249	0.184	0.024	24544
104.000	220-3BN	43	1.541	0.141	0.019	30880
93.000	APXVAARR24_43-U-NA20	43	1.221	0.121	0.016	35243
62.000	GPS_A	42	0.531	0.078	0.009	37956
60.000	(2) 3'x8" Knife Plate	42	0.496	0.075	0.008	37917
42.000	GPS_A	42	0.243	0.050	0.006	41714
31.000	GPS_A	47	0.135	0.033	0.004	41504
20.000	(2) 3'x8" Knife Plate	47	0.062	0.018	0.003	42399

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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	Crown Castle	Jayaraj B

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	18.027	10	0.966	0.109
T2	168 - 160	15.598	10	0.956	0.110
T3	160 - 140	13.999	10	0.915	0.109
T4	140 - 120	10.335	10	0.766	0.096
T5	120 - 100	7.341	19	0.612	0.081
T6	100 - 80	4.989	19	0.466	0.064
T7	80 - 60	3.153	19	0.358	0.045
T8	60 - 40	1.751	19	0.262	0.030
T9	40 - 20	0.782	19	0.164	0.019
T10	20 - 0	0.220	19	0.065	0.009

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.000	PD10017	10	17.621	0.967	0.110	184656
170.000	MX08FRO665-21 w/ Mount Pipe	10	16.002	0.961	0.110	80075
164.000	(2) RFV01U-D1A	10	14.793	0.939	0.110	18461
154.000	7770.00 w/ Mount Pipe	10	12.841	0.874	0.106	9086
145.000	800 EXTERNAL NOTCH FILTER	10	11.195	0.806	0.100	7566
143.000	AIR 6419 B41_TMO w/ Mount Pipe	10	10.846	0.790	0.099	7302
124.000	1142-2C	19	7.886	0.643	0.084	7022
104.000	220-3BN	19	5.414	0.492	0.067	8829
93.000	APXVAARR24_43-U-NA20	19	4.294	0.424	0.057	10069
62.000	GPS_A	19	1.872	0.272	0.031	10830
60.000	(2) 3'x8" Knife Plate	19	1.751	0.262	0.030	10820
42.000	GPS_A	19	0.860	0.174	0.020	11945
31.000	GPS_A	19	0.479	0.117	0.015	11881
20.000	(2) 3'x8" Knife Plate	19	0.220	0.065	0.009	12109

### Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325N	0.625	1	0.718	7.875	0.091	✓	Member Block Shear
		Top Girt	A325N	0.625	1	0.182	7.875	0.023	✓	Member Block Shear
T2	168	Leg	A325N	0.625	4	1.919	20.340	0.094	✓	Bolt Tension
		Diagonal	A325N	0.625	1	2.917	7.875	0.370	✓	Member Block Shear
T3	160	Leg	A325N	0.625	4	10.297	20.340	0.506	✓	Bolt Tension
		Diagonal	A325N	0.625	1	4.283	7.875	0.544	✓	Member Block Shear
T4	140	Leg	A325N	0.750	4	18.463	30.101	0.613	✓	Bolt Tension
		Diagonal	A325N	0.625	1	5.238	7.875	0.665	✓	Member Block Shear

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	Crown Castle	Jayaraj B

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T5	120	Leg	A325N	0.750	4	25.530	30.101	0.848 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	4.971	9.914	0.501 ✓	1.05	Member Block Shear
T6	100	Leg	A490N	0.875	4	31.980	51.945	0.616 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	5.817	9.914	0.587 ✓	1.05	Member Block Shear
T7	80	Leg	A325N	0.875	4	37.857	41.556	0.911 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	6.788	10.934	0.621 ✓	1.05	Member Block Shear
T8	60	Leg	A325N	1.000	4	43.922	54.517	0.806 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	7.228	13.806	0.524 ✓	1.05	Bolt Shear
T9	40	Leg	A325N	1.000	4	49.469	54.517	0.907 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	8.300	13.806	0.601 ✓	1.05	Bolt Shear
		Secondary Horizontal	A325N	0.500	1	4.104	8.836	0.464 ✓	1.05	Bolt Shear
T10	20	Diagonal	A325N	0.625	1	8.515	13.806	0.617 ✓	1.05	Bolt Shear

## Compression Checks

## Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	P2x0.154	12.000	4.000	61.0 K=1.00	1.075	-3.780	27.981	0.135 <sup>1</sup> ✓
T2	168 - 160	P2x0.154 (GR)	8.000	4.000	61.0 K=1.00	1.075	-12.973	38.430	0.338 <sup>1</sup> ✓
T3	160 - 140	P3x0.216 (GR)	20.033	5.008	51.7 K=1.00	2.228	-53.811	87.013	0.618 <sup>1</sup> ✓
T4	140 - 120	P3.5x.318 (GR)	20.033	6.678	61.3 K=1.00	3.678	-90.931	122.133	0.745 <sup>1</sup> ✓
T5	120 - 100	P4x.337 (GR)	20.033	6.678	54.3 K=1.00	4.407	-122.767	157.190	0.781 <sup>1</sup> ✓
T6	100 - 80	P5x0.375 (GR)	20.033	6.678	43.6 K=1.00	6.112	-154.435	242.300	0.637 <sup>1</sup> ✓
T7	80 - 60	P6x0.432	20.033	10.017	54.8 K=1.00	8.405	-181.323	227.081	0.798 <sup>1</sup> ✓
T8	60 - 40	P6x0.432	20.033	10.017	54.8 K=1.00	8.405	-209.631	227.081	0.923 <sup>1</sup> ✓
T9	40 - 20	P6x0.432	20.033	5.151	28.2 K=1.00	8.405	-236.652	254.222	0.931 <sup>1</sup> ✓
T10	20 - 0	P8x.5	20.033	10.017	41.8 K=1.00	12.763	-264.475	367.690	0.719 <sup>1</sup> ✓



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<sup>1</sup>  $P_u / \phi P_n$  controls

### Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KL/r	A in <sup>2</sup>	P <sub>u</sub> K	$\phi P_n$ K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	5.657	2.543	101.1 K=1.07	0.621	-0.827	15.177	0.054 <sup>1</sup> ✓
T2	168 - 160	L2x1 1/2x3/16	5.657	2.543	101.1 K=1.07	0.621	-3.075	15.177	0.203 <sup>1</sup> ✓
T3	160 - 140	L2x1 1/2x3/16	7.621	3.637	135.6 K=1.00	0.621	-4.382	9.673	0.453 <sup>1</sup> ✓
T4	140 - 120	L2x2x3/16	10.162	4.935	150.3 K=1.00	0.715	-4.907	9.058	0.542 <sup>1</sup> ✓
T5	120 - 100	L2 1/2x2x3/16	11.744	5.701	160.2 K=1.00	0.809	-5.029	9.021	0.557 <sup>1</sup> ✓
T6	100 - 80	L2 1/2x2 1/2x3/16	13.438	6.498	157.5 K=1.00	0.902	-5.781	10.403	0.556 <sup>1</sup> ✓
T7	80 - 60	L3x3x3/16	16.803	8.223	165.6 K=1.00	1.090	-6.832	11.381	0.600 <sup>1</sup> ✓
T8	60 - 40	L3 1/2x3x1/4	18.448	9.047	172.1 K=1.00	1.560	-7.228	15.083	0.479 <sup>1</sup> ✓
T9	40 - 20	L3 1/2x3x1/4	20.158	10.049	191.1 K=1.00	1.560	-8.300	12.226	0.679 <sup>1</sup> ✓
T10	20 - 0	L3 1/2x3 1/2x1/4	21.916	10.690	184.8 K=1.00	1.690	-8.515	14.159	0.601 <sup>1</sup> ✓

<sup>1</sup>  $P_u / \phi P_n$  controls

### Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KL/r	A in <sup>2</sup>	P <sub>u</sub> K	$\phi P_n$ K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3 1/2x1/4	17.486	8.467	146.4 K=1.00	1.690	-4.104	22.568	0.182 <sup>1</sup> ✓

<sup>1</sup>  $P_u / \phi P_n$  controls

### Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KL/r	A in <sup>2</sup>	P <sub>u</sub> K	$\phi P_n$ K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	4.000	3.510	130.8 K=1.00	0.621	-0.140	10.385	0.013 <sup>1</sup> ✓

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
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<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

## Tension Checks

### Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	P2x0.154	12.000	4.000	61.0	1.075	1.723	33.848	0.051 <sup>1</sup>
T2	168 - 160	P2x0.154 (GR)	8.000	4.000	61.0	1.075	7.675	33.848	0.227 <sup>1</sup>
T3	160 - 140	P3x0.216 (GR)	20.033	5.008	51.7	2.228	41.189	70.197	0.587 <sup>1</sup>
T4	140 - 120	P3.5x.318 (GR)	20.033	6.678	61.3	3.678	73.853	115.870	0.637 <sup>1</sup>
T5	120 - 100	P4x.337 (GR)	20.033	6.678	54.3	4.407	102.119	138.834	0.736 <sup>1</sup>
T6	100 - 80	P5x0.375 (GR)	20.033	6.678	43.6	6.112	127.920	192.527	0.664 <sup>1</sup>
T7	80 - 60	P6x0.432	20.033	10.017	54.8	8.405	151.429	264.756	0.572 <sup>1</sup>
T8	60 - 40	P6x0.432	20.033	10.017	54.8	8.405	175.689	264.756	0.664 <sup>1</sup>
T9	40 - 20	P6x0.432	20.033	4.865	26.6	8.405	198.079	264.756	0.748 <sup>1</sup>
T10	20 - 0	P8x.5	20.033	10.017	41.8	12.763	220.089	402.026	0.547 <sup>1</sup>

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	5.657	2.543	73.4	0.360	0.718	15.675	0.046 <sup>1</sup>
T2	168 - 160	L2x1 1/2x3/16	5.657	2.543	73.4	0.360	2.917	15.675	0.186 <sup>1</sup>
T3	160 - 140	L2x1 1/2x3/16	7.621	3.637	103.3	0.360	4.283	15.675	0.273 <sup>1</sup>
T4	140 - 120	L2x2x3/16	9.197	4.474	89.9	0.431	5.238	18.739	0.280 <sup>1</sup>

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T5	120 - 100	L2 1/2x2x3/16	11.744	5.701	117.0	0.501	4.971	21.806	0.228 <sup>1</sup> ✓
T6	100 - 80	L2 1/2x2 1/2x3/16	13.438	6.498	102.5	0.571	5.817	24.840	0.234 <sup>1</sup> ✓
T7	80 - 60	L3x3x3/16	16.803	8.223	107.0	0.712	6.788	30.973	0.219 <sup>1</sup> ✓
T8	60 - 40	L3 1/2x3x1/4	18.448	9.047	120.8	1.029	7.164	44.778	0.160 <sup>1</sup> ✓
T9	40 - 20	L3 1/2x3x1/4	20.158	10.049	132.1	1.029	7.474	44.778	0.167 <sup>1</sup> ✓
T10	20 - 0	L3 1/2x3 1/2x1/4	21.916	10.690	119.3	1.127	7.958	49.019	0.162 <sup>1</sup> ✓

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3 1/2x1/4	17.486	8.467	186.4	1.150	4.104	50.039	0.082 <sup>1</sup> ✓

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	4.000	3.510	103.8	0.360	0.182	15.675	0.012 <sup>1</sup> ✓

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

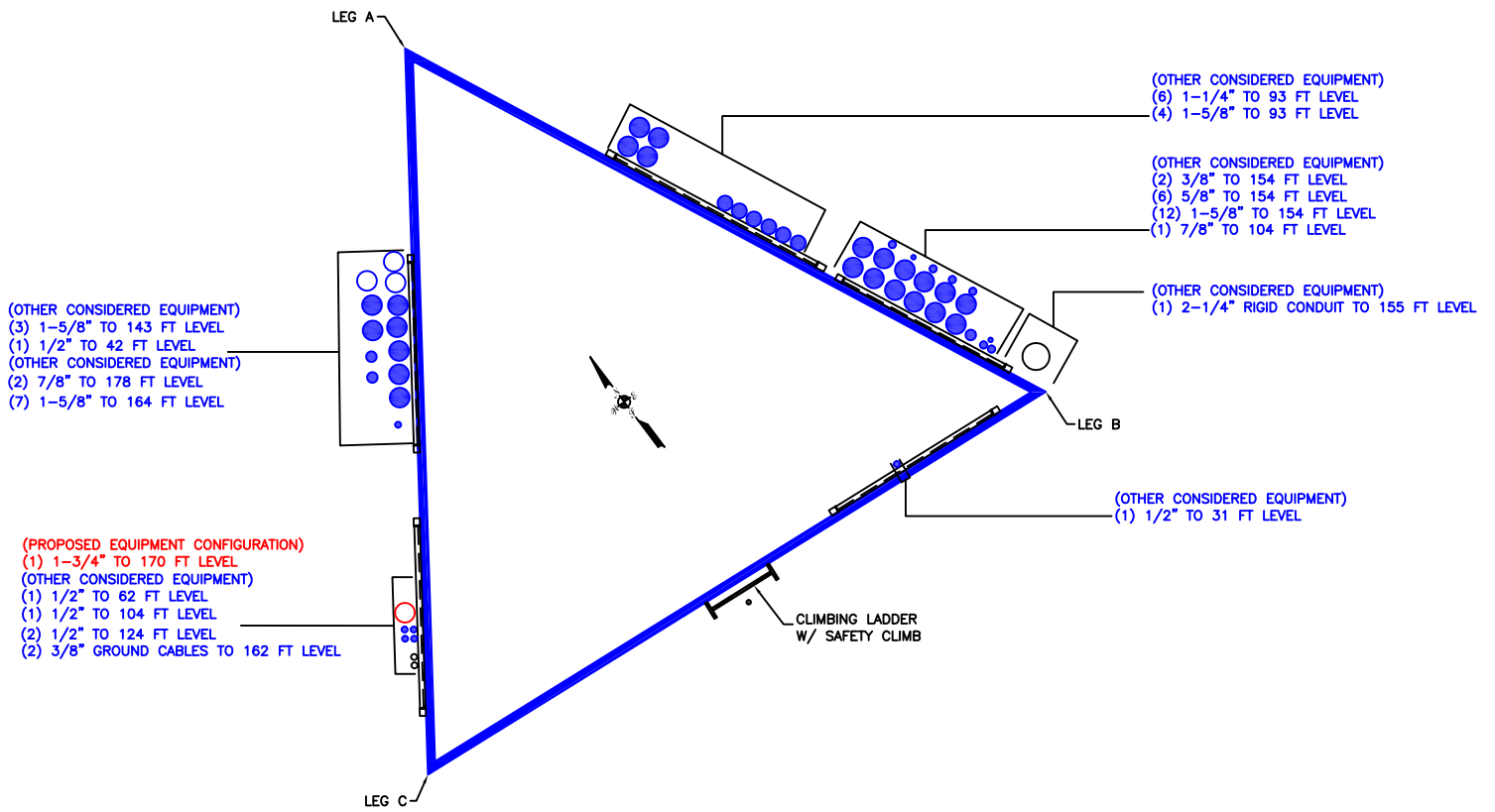
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP <sub>allow</sub> K	% Capacity	Pass Fail
T1	180 - 168	Leg	P2x0.154	2	-3.780	29.380	12.9	Pass
T2	168 - 160	Leg	P2x0.154 (GR)	26	-12.973	40.351	32.1	Pass
T3	160 - 140	Leg	P3x0.216 (GR)	41	-53.811	91.364	58.9	Pass
T4	140 - 120	Leg	P3.5x.318 (GR)	68	-90.931	128.240	70.9	Pass

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	Crown Castle	Jayaraj B

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
T5	120 - 100	Leg	P4x.337 (GR)	89	-122.767	165.049	74.4	Pass
T6	100 - 80	Leg	P5x0.375 (GR)	109	127.920	202.153	63.3	Pass
T7	80 - 60	Leg	P6x0.432	131	-181.323	238.435	76.0	Pass
T8	60 - 40	Leg	P6x0.432	146	-209.631	238.435	87.9	Pass
T9	40 - 20	Leg	P6x0.432	160	-236.652	266.933	88.7	Pass
T10	20 - 0	Leg	P8x.5	181	-264.475	386.074	68.5	Pass
T1	180 - 168	Diagonal	L2x1 1/2x3/16	10	-0.827	15.935	5.2	Pass
T2	168 - 160	Diagonal	L2x1 1/2x3/16	30	-3.075	15.935	19.3	Pass
T3	160 - 140	Diagonal	L2x1 1/2x3/16	46	-4.382	10.157	43.1	Pass
T4	140 - 120	Diagonal	L2x2x3/16	70	-4.907	9.511	51.6	Pass
T5	120 - 100	Diagonal	L2 1/2x2x3/16	91	-5.029	9.472	53.1	Pass
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	112	-5.781	10.923	52.9	Pass
T7	80 - 60	Diagonal	L3x3x3/16	133	-6.832	11.950	57.2	Pass
T8	60 - 40	Diagonal	L3 1/2x3x1/4	148	-7.228	15.837	45.6	Pass
T9	40 - 20	Diagonal	L3 1/2x3x1/4	163	-8.300	12.837	64.7	Pass
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	184	-8.515	14.867	57.3	Pass
T9	40 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	171	-4.104	23.697	17.3	Pass
T1	180 - 168	Top Girt	L2x1 1/2x3/16	6	-0.140	10.904	1.3	Pass
Summary								
Leg (T9)							88.7	Pass
Diagonal (T9)							64.7	Pass
Secondary Horizontal (T9)							17.3	Pass
Top Girt (T1)							1.3	Pass
Bolt Checks							86.8	Pass
<b>RATING =</b>							<b>88.7</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



BUSINESS UNIT: 806353



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

Self Support Anchor Rod Capacity

Site Info	
BU #	806353
Site Name	BRG 124 943066, CT
Order #	637403, Rev# 0

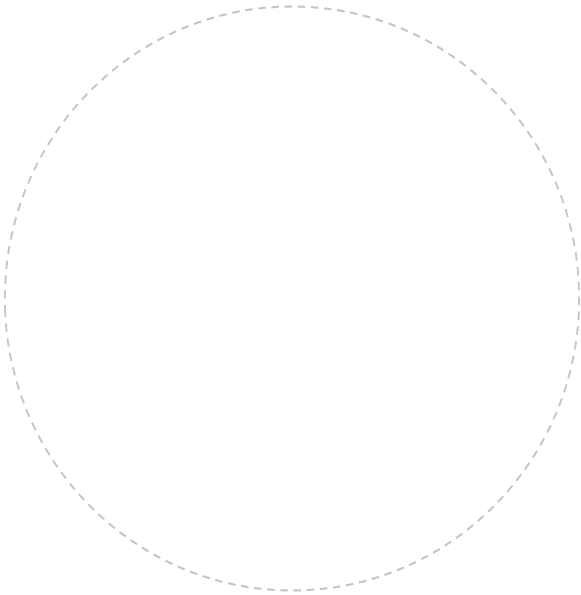
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
$l_{ar}$ (in)	0

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	271.00	225.00
Shear Force (kips)	27.00	23.00

\*TIA-222-H Section 15.5 Applied

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

\*Anchor Rod Eccentricity Applied



Connection Properties		Analysis Results	
<b>Anchor Rod Data</b>		<b>Anchor Rod Summary</b> <span>(units of kips, kip-in)</span>	
(6) 1-1/2" $\varnothing$ bolts (A36 N; Fy=36 ksi, Fu=58 ksi)		Pu_t = 37.5	$\phi Pn_t$ = 61.34
$l_{ar}$ (in): 0		Vu = 3.83	$\phi Vn$ = 38.44
		Mu = n/a	$\phi Mn$ = n/a
			<b>Stress Rating</b>
			<b>58.2%</b>
			<b>Pass</b>

## Drilled Pier Foundation

BU # :	806353
Site Name:	BRG 124 943066, CT
Order Number:	637403,Rev# 0
TIA-222 Revision:	H
Tower Type:	Self Support



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)		
Axial Force (kips)	271	225
Shear Force (kips)	27	23

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	13.2	ft
Ext. Above Grade	0.3	ft
Pier Section 1		
From 0.3' above grade to 13.2' below grade		
Pier Diameter	2.5	ft
Rebar Quantity	14	
Rebar Size	8	
Clear Cover to Ties	4	in
Tie Size	4	
Tie Spacing	16	in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

### Analysis Results

Soil Lateral Check	Compression	Uplift
D <sub>v=0</sub> (ft from TOC)	7.52	7.52
Soil Safety Factor	7.74	9.09
Max Moment (kip-ft)	184.76	157.39
Rating*	16.4%	13.9%

Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	191.24	191.24
End Bearing (kips)	206.28	-
Weight of Concrete (kips)	11.93	8.95
Total Capacity (kips)	397.52	267.34
Axial (kips)	372.46	225.00
Rating*	89.2%	80.2%

Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	7.53	7.14
Critical Moment (kip-ft)	184.76	156.13
Critical Moment Capacity	505.90	355.87
Rating*	34.8%	41.8%

Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	10.51	10.51
Critical Shear (kip)	61.79	52.63
Critical Shear Capacity	126.78	53.09
Rating*	46.4%	94.4%

Tie Spacing Requirements Not Met

Structural Foundation Rating*	94.4%
Soil Interaction Rating*	89.2%

\*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Shear Design Options	
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Soil Profile													
Groundwater Depth		N/A		# of Layers		3							

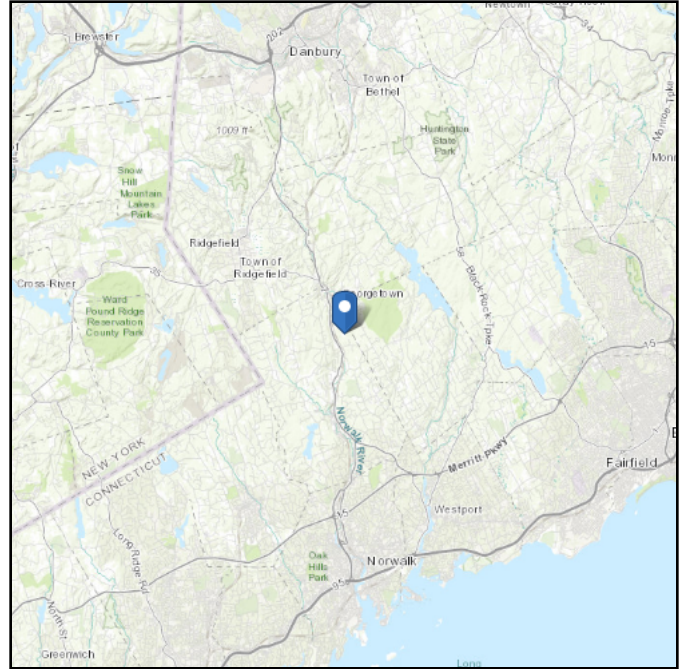
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y <sub>soil</sub> (pcf)	Y <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	5	6	1	110	150	0	30	0.000	0.000	0.77	0.77			Cohesionless
3	6	13.2	7.2	140	150	8	0	3.600	3.600	4.40	4.40	56.03		Cohesive

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Default (see  
Section 11.4.3)

**Elevation:** 427.44 ft (NAVD 88)  
**Latitude:** 41.238528  
**Longitude:** -73.424139



## Wind

### Results:

Wind Speed	116 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
Date Accessed: Tue Nov 01 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

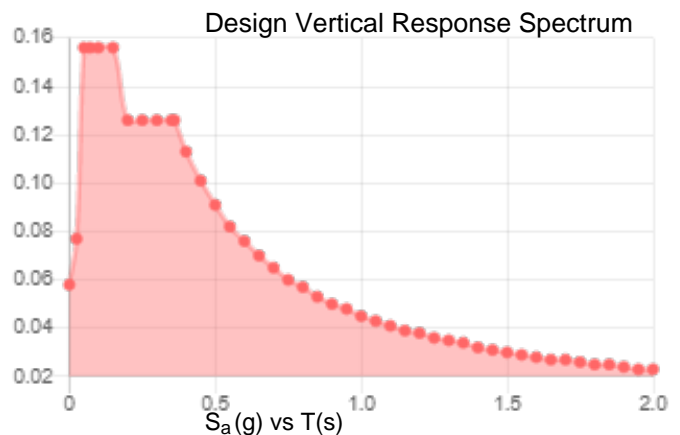
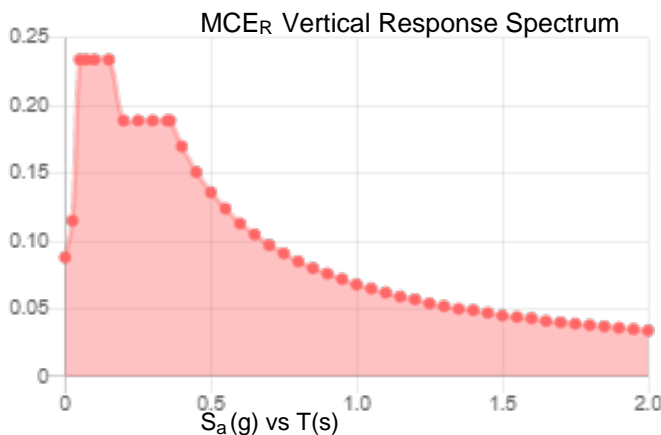
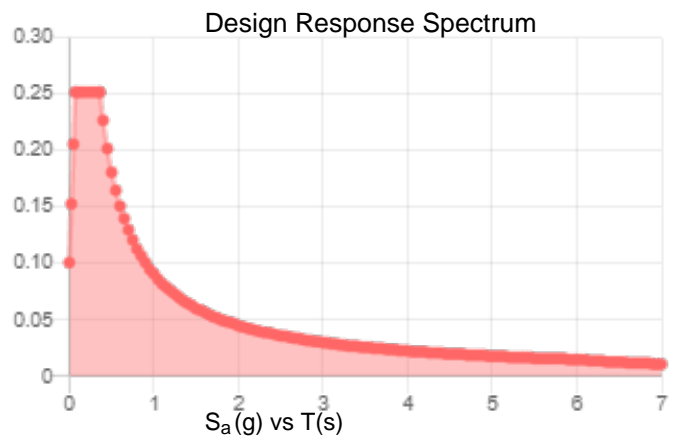
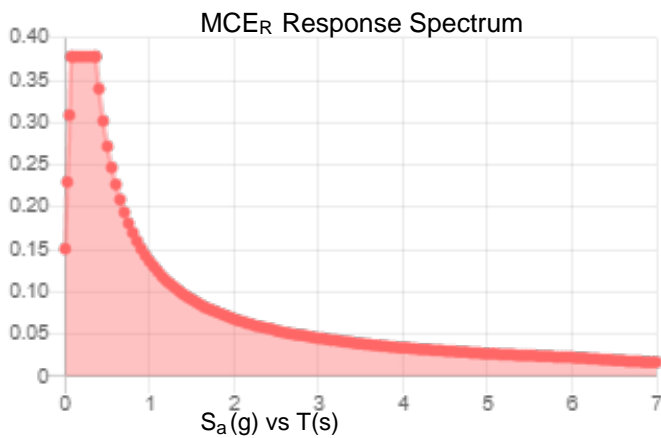
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Default (see Section 11.4.3)

**Results:**

$S_S$ :	0.236	$S_{D1}$ :	0.091
$S_1$ :	0.057	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.139
$F_v$ :	2.4	PGA <sub>M</sub> :	0.211
$S_{MS}$ :	0.378	$F_{PGA}$ :	1.523
$S_{M1}$ :	0.136	$I_e$ :	1
$S_{DS}$ :	0.252	$C_v$ :	0.773

**Seismic Design Category** B



**Data Accessed:** Tue Nov 01 2022

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Tue Nov 01 2022

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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## **ATTACHMENT 5**

Date: **March 9, 2022**



Kimley-Horn and Associates, Inc.  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601  
(919) 677-2000  
CrownMounts@kimley-horn.com

**Subject:** Mount Analysis - Conditional Passing Report

**Carrier Designation:** DISH Wireless L.L.C. Equipment Change-Out  
**Carrier Site Number:** NJJER01086A  
**Carrier Site Name:** CT-CCI-T-806353

**Crown Castle Designation:** **BU Number:** 806353  
**Site Name:** BRG 124 943066  
**JDE Job Number:** 640163  
**Order Number:** 548867, Rev. 2

**Engineering Firm Designation:** Kimley-Horn Project Number: 019558058

**Site Data:** 128 Mather Street, Wilton, Fairfield County, CT 06897  
Latitude 41° 14' 18.70" Longitude -73° 25' 26.90"

**Structure Information:** **Tower Height & Type:** 180 ft Self-Supporting Tower  
**Mount Elevation:** 170 ft  
**Mount Type:** 8 ft Sector Frames

Kimley-Horn is pleased to submit this “**Mount Analysis - Conditional Passing Report**” to determine the structural integrity of DISH Wireless L.L.C.’s antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

**Sector Frames (Typical)**

**Sufficient**

\* See Section 4.1 for loading and structural modifications required for the mount to support the loading listed in Table 1.

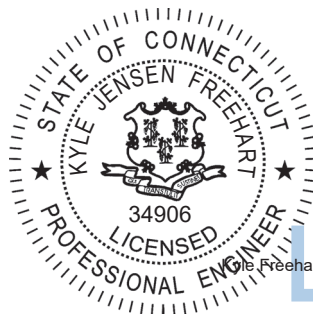
This analysis utilizes an ultimate 3-second gust wind speed of 116 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Saja Alkhafaji, E.I.

Respectfully Submitted by:

Kyle Freehart, P.E.

Lic. #PEN.0034906, Exp. 1/31/2022  
Kimley-Horn and Associates, Inc. COA #PEC.0000738



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### **4) ANALYSIS RESULTS**

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Table 4 - Tieback Connection Data Table

4.1) Recommendations

### **5) APPENDIX A**

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### **6) APPENDIX B**

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Supplemental Drawings

## 1) INTRODUCTION

The mounting configuration consists of (3) proposed 8 ft Sector Frames designed by CommScope.

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2018 Connecticut State Building Code
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	116 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor at Base:</b>	1.0
<b>Topographic Factor at Mount:</b>	1.0
<b>Ice Thickness:</b>	1 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Live Loading Wind Speed:</b>	30 mph
<b>Man Live Load at Mid/End-Points:</b>	250 lb
<b>Man Live Load at Mount Pipes:</b>	500 lb

Table 1 – Proposed Equipment Configuration

Elevation (ft)		Antennas			Mount / Modification Details
Mount	Centerline	#	Manufacturer	Model	
170	170	3	Fujitsu	TA08025-B604	(3) Proposed 8 ft Sector Frames designed by CommScope
		3	Fujitsu	TA08025-B605	
		3	JMA	MX08FRO665-21	
		1	Raycap	RDIDC-9181-PF-48	

### 3) ANALYSIS PROCEDURE

Table 2 – Documents Provided

Document	Remarks	Reference	Source
Mount Design Drawings	CommScope	MTC3975083	On File

#### 3.1) Analysis Method

RISA-3D (v. 17.02.00), a commercially-available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A proprietary tool internally developed by Kimley-Horn was used to calculate wind loading on all appurtenances, dishes and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Mount Analysis* (Rev. E).

#### 3.2) Assumptions

- 1) The antenna mounting system (including any considered modifications) was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the provided reference information.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected members unless otherwise specified in this report.
- 4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members that could not be verified at this time.
- 5) Any referenced prior structural modifications to the tower mounting system are assumed to be installed as shown per available data unless noted otherwise.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (Gr. 36)
HSS (Rectangular)	ASTM A36 (Gr. 36)
Pipe	ASTM A53 (Gr. 35)
Connection Bolts	ASTM A325
U-Bolts	ASTM A36 (Gr. 36)
Threaded Rods	ASTM A36 (Gr. 36)

If any assumptions are not valid or have been made in error, Kimley-Horn 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	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Connections	-	170	32%	Pass
1, 2	Stand Off Horizontals	M15		25%	Pass
1, 2	Mount Pipes	M45		10%	Pass
1, 2	Face Horizontals	M26		10%	Pass
1, 2	Stiff Arms	M48		9%	Pass

**Structure Rating (max from all components) =**

**32%**

Notes:

- 1) See additional documentation in Appendix C and Appendix D for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H, Section 15.5.
- 3) All sectors are typical.

**Table 4 – Tieback Connection Data Table**

Tower Connection Node No.	Existing / Proposed	Resultant End Reaction (lb)	Connected Member Type	Connected Member Size	Member Compressive Capacity (lb) <sup>3</sup>	Notes
N84	Proposed	1356	Leg	P2x0.154	1469	1

Notes:

- 1) Tieback connection point is within 25% of either end of the connected tower member.
- 2) Tieback connection point is NOT within 25% of either end of the connected tower member.
- 3) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances*.

#### 4.1) Recommendations

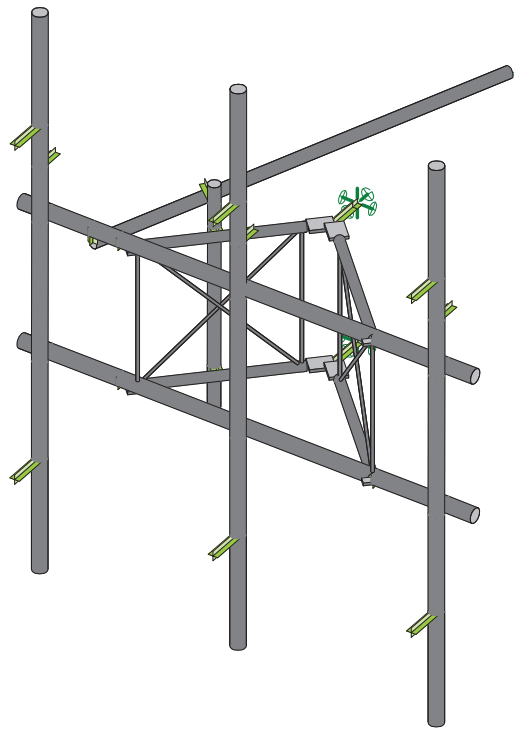
The mounting configuration will have sufficient capacity to carry the referenced loading once the following modifications are completed:

- **Install (3) CommScope MTC3975083 sector frame kits. Vertically center antennas and mount pipes on mount face. Attach included tie-back to right side of upper face horizontal pipe (looking at back of mount) and to adjacent tower leg within 12" of a tower bracing point.**

No additional modifications are required at this time provided that the above-listed changes are completed.



**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**



Envelope Only Solution

Kimley-Horn and Associates, Inc.

SSA

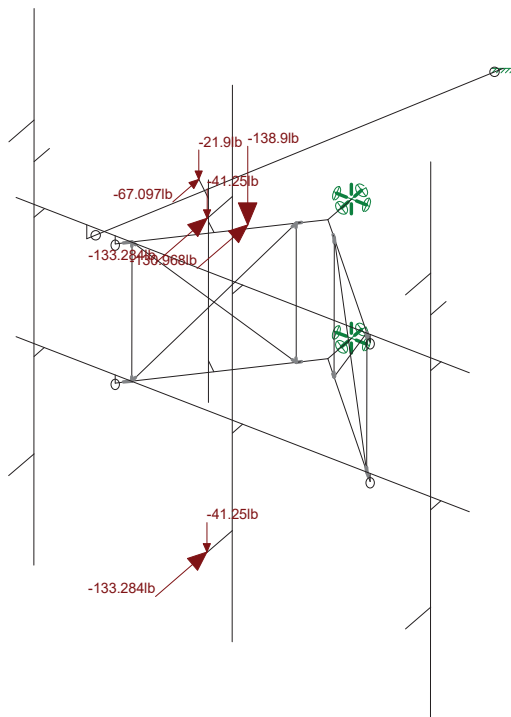
019558058

806353

SK - 2

Mar 9, 2022 at 1:38 PM

806353.r3d



Loads: LC 1, Summary: 1.0D + 1.0W  
Envelope Only Solution

Kimley-Horn and Associates, Inc.

SSA

019558058

806353

SK - 1

Mar 9, 2022 at 1:38 PM

806353.r3d

**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

General Criteria	
TIA Standard	H
IBC Edition	2015
Structure Class	-
Risk Category	II

Site-Specific Criteria	
Exposure Category	B
Topographic Factor, $K_{zt}$	1.00
Structure Base Elev. (AMSL), $z_s$ (ft)	427.44
Ground Effect Factor, $K_e$	0.98

Mount & Structure Criteria	
Mount Elevation (AGL) (ft)	170.00
Structure Height (ft)	180.00
Structure Type	Self-Supporting Tower

Constants	
Wind Direction Probability Factor, $K_d$	0.95
Gust Effect Factor, $G_h$	1
Shielding Factor, $K_a$ (antenna)	0.9
Shielding Factor, $K_a$ (mount)	0.9

Wind Summary	
Basic Wind Speed w/o Ice, V (mph)	116.00
Velocity Pressure Coeff., $K_z$	1.15
Velocity Pressure, $q_z$ (w/o Ice) (psf)	37.06

Ice Load Summary	
Basic Wind Speed w/ Ice, $V_i$ (mph)	50.00
Design Ice Thick. (ASCE 7-10) , $t_i$ (in)	0.5
Velocity Pressure, $q_z$ (w/ Ice) (psf)	6.88
Escalated Ice Thick. @ Mount, $t_{iz}$ (in)	1.18

Seismic Load Summary	
Spectral Response (Short Periods), $S_s$	-
Spectral Response (1-Sec. Period), $S_1$	-
Site Class	-
Seismic Design Category	-
Seismic Risk Category	-

Snow Load Summary	
Ground Snow Load, $p_g$ (psf)	-
Snow Load on Flat Roofs, $p_f$ (psf)	-



Date	March 09, 2022
Client	Crown Castle
Site #	806353
Site Name	BRG 124 943066
Project #	19558058

Antenna Name	Qty	Shape	Dimensions (in)			Weight (lb)	Joint Labels								EPA (ft²)		Wind Force, $F_A$ (lb)			
																	No Ice		With Ice	
			H	W	D		Alpha	Beta	Gamma	Delta					Front	Side	Front	Side	Front	Side
MX08FRO665-21	3	Flat	72	20	8	82.5	A2B	A2T							7.99	3.23	266.57	107.61	56.61	25.62
TA08025-B604	3	Flat	15	15.8	7.9	63.9	A2R								1.96	0.98	65.48	32.72	16.19	9.14
TA08025-B605	3	Flat	15	15.8	9.1	75	A2R								1.96	1.13	65.48	37.67	16.19	10.21
RDIDC-9181-PF-48	1	Flat	16.6	14.6	8.5	21.9	RC								2.01	1.17	67.1	38.96	16.54	10.57

# ASCE 7 Hazards Report

**Address:**

No Address at This  
Location

**Standard:**

ASCE/SEI 7-16

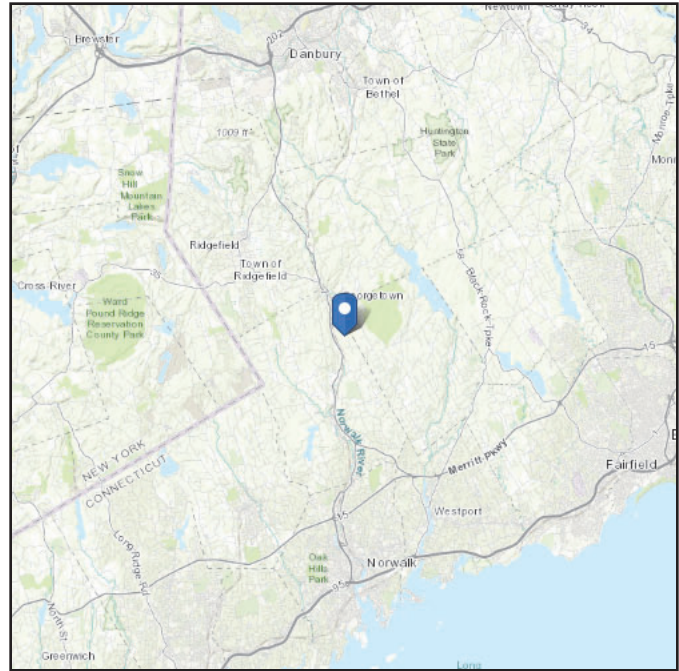
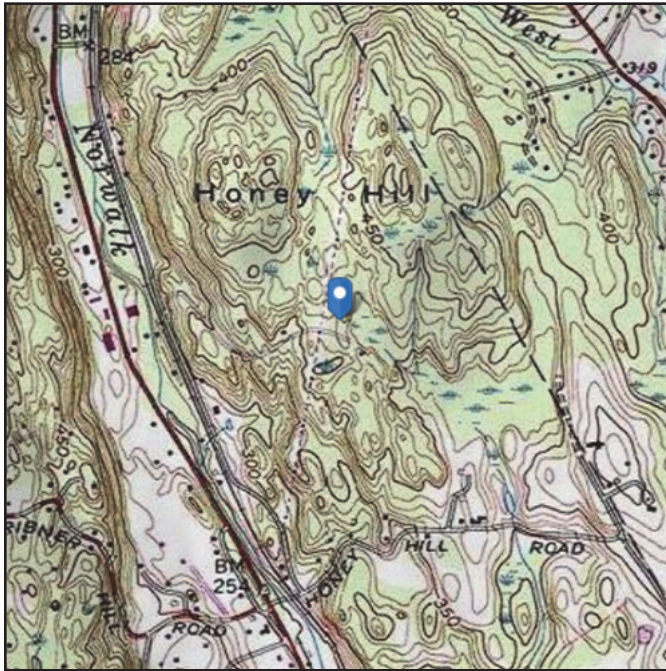
**Risk Category:** II**Soil Class:**

D - Stiff Soil

**Elevation:** 427.44 ft (NAVD 88)

**Latitude:** 41.238528

**Longitude:** -73.424139



## Wind

**Results:**

Wind Speed	116 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source:

ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed:

Mon Mar 07 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

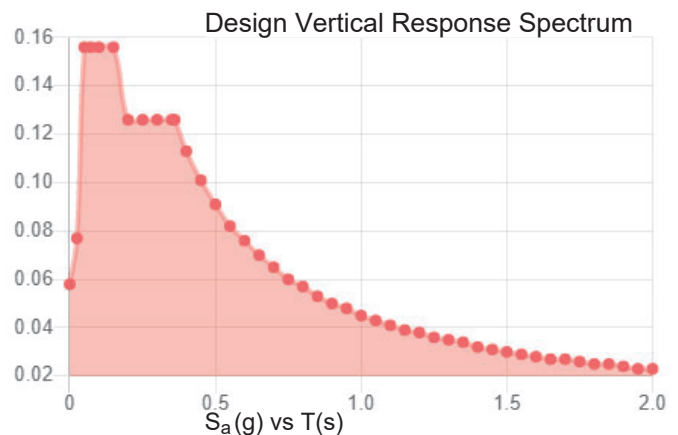
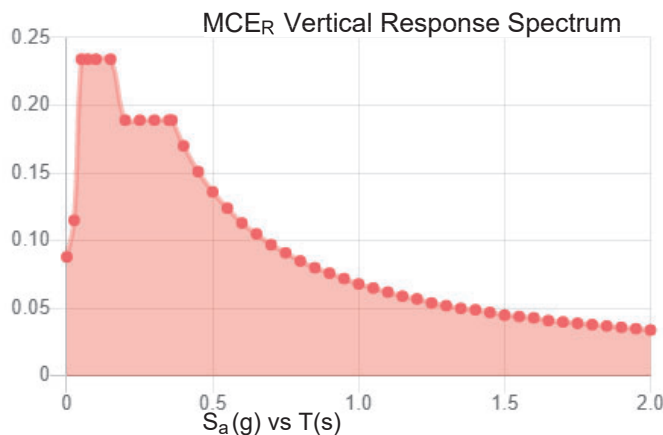
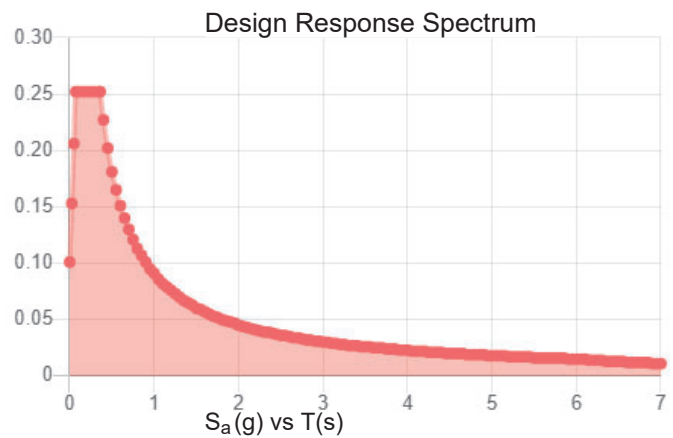
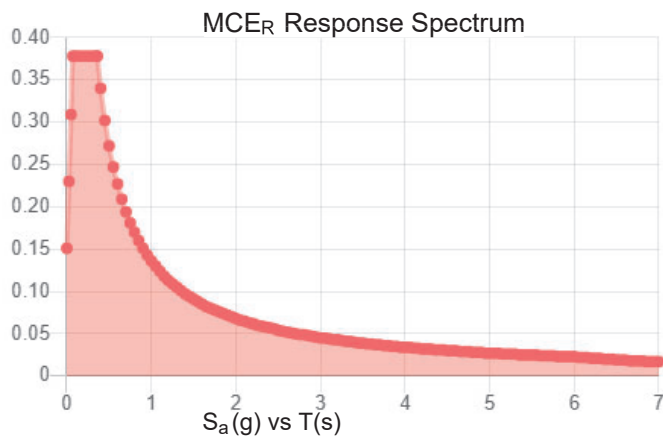


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.236	$S_{D1}$ :	0.091
$S_1$ :	0.057	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.139
$F_v$ :	2.4	PGA <sub>M</sub> :	0.211
$S_{MS}$ :	0.378	$F_{PGA}$ :	1.523
$S_{M1}$ :	0.136	$I_e$ :	1
$S_{DS}$ :	0.252	$C_v$ :	0.773

**Seismic Design Category** B



**Data Accessed:** Mon Mar 07 2022

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Mon Mar 07 2022

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**

Company : Kimley-Horn and Associates, Inc.  
 Designer : SSA  
 Job Number : 019558058  
 Model Name : 806353

Mar 9, 2022  
 1:38 PM  
 Checked By: ZAM

### Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[lb/f...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	490	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	490	50	1.4	65	1.3
8	A913 Gr.65	29000	11154	.3	.65	490	65	1.1	80	1.1
9	A529 Gr. 50	29000	11154	.3	.65	490	50	1.5	65	1.2
10	A500 Gr. C RND	29000	11154	.3	.65	490	46	1.5	62	1.2
11	Q235	29000	11154	.3	.65	490	35	1.5	58	1.2

### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Stand-Off Rear Knife Pla...	PL3-1/2x5/8	Beam	None	A572 Gr.50	Typical	2.188	.071	2.233	.253
2	Stand-Off Horiz	HSS1.900X0....	Beam	None	A500 Gr.B RND	Typical	.624	.251	.251	.501
3	Stand-Off Front Knife Pl...	PL4-1/4x5/8	Beam	None	A572 Gr.50	Typical	2.656	.086	3.998	.314
4	Stand-Off Diag Bracing	SR1/2	Beam	None	A529 Gr. 50	Typical	.196	.003	.003	.006
5	Stand-Off Vert Bracing	SR5/8	Column	None	A529 Gr. 50	Typical	.307	.007	.007	.015
6	Face Horiz	HSS2.875X0....	Beam	None	A500 Gr. C R...	Typical	1.59	1.45	1.45	2.89
7	Mount Pipe	HSS2.875X0....	Column	None	A500 Gr. C R...	Typical	1.59	1.45	1.45	2.89
8	Stiff Arm	HSS2.375x0.1...	Beam	None	A500 Gr. C R...	Typical	.85	.542	.542	1.084
9	Raycap Pipe	PIPE 2.0	Column	None	A53 Gr.B	Typical	1.02	.627	.627	1.25

### Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M11	Stand-Off R...	5.694			Lbyy						Lateral
2	M12	Stand-Off H...	31	28.5								Lateral
3	M13	Stand-Off F...	3			Lbyy						Lateral
4	M14	Stand-Off R...	5.694			Lbyy						Lateral
5	M15	Stand-Off H...	31	28.5								Lateral
6	M16	Stand-Off F...	3			Lbyy						Lateral
7	M17	Stand-Off D...	42.067	20.771	20.771				.65	.65		Lateral
8	M18	Stand-Off D...	42.067	20.771	20.771				.65	.65		Lateral
9	M19	Stand-Off V...	30			Lbyy			.65	.65		Lateral
10	M20	Stand-Off V...	30			Lbyy			.65	.65		Lateral
11	M38A	Stand-Off R...	5.694			Lbyy						Lateral
12	M39A	Stand-Off H...	31	28.5								Lateral
13	M40A	Stand-Off F...	3			Lbyy						Lateral
14	M41A	Stand-Off R...	5.694			Lbyy						Lateral
15	M42A	Stand-Off H...	31	28.5								Lateral
16	M43A	Stand-Off F...	3			Lbyy						Lateral
17	M44A	Stand-Off D...	42.067	20.771	20.771				.65	.65		Lateral
18	M45A	Stand-Off D...	42.067	20.771	20.771				.65	.65		Lateral
19	M46A	Stand-Off V...	30			Lbyy			.65	.65		Lateral
20	M47	Stand-Off V...	30			Lbyy			.65	.65		Lateral
21	M25	Face Horiz	96	54	Segment			Segme...				Lateral
22	M26	Face Horiz	96	54	Segment			Segme...				Lateral

Company : Kimley-Horn and Associates, Inc.  
 Designer : SSA  
 Job Number : 019558058  
 Model Name : 806353

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### Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
23	M44	Mount Pipe	120			Lbyy						Lateral
24	M45	Mount Pipe	120			Lbyy						Lateral
25	M46	Mount Pipe	120			Lbyy						Lateral
26	M48	Stiff Arm	88.894			Lbyy						Lateral
27	M53A	Raycap Pipe	48									Lateral

### Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me... Surface(...
1	Dead	DL			-1	5			
2	Dead of Ice	RL				5		27	
4	Structure Wind (0)	None						54	
5	Structure Wind (30)	None						54	
6	Structure Wind (45)	None						54	
7	Structure Wind (60)	None						54	
8	Structure Wind (90)	None						54	
9	Structure Wind (120)	None						54	
10	Structure Wind (135)	None						54	
11	Structure Wind (150)	None						54	
12	Structure Wind w/ Ice (0)	None						54	
13	Structure Wind w/ Ice (30)	None						54	
14	Structure Wind w/ Ice (45)	None						54	
15	Structure Wind w/ Ice (60)	None						54	
16	Structure Wind w/ Ice (90)	None						54	
17	Structure Wind w/ Ice (120)	None						54	
18	Structure Wind w/ Ice (135)	None						54	
19	Structure Wind w/ Ice (150)	None						54	
20	Antenna Wind (0)	None				10			
21	Antenna Wind (30)	None				10			
22	Antenna Wind (45)	None				10			
23	Antenna Wind (60)	None				10			
24	Antenna Wind (90)	None				10			
25	Antenna Wind (120)	None				10			
26	Antenna Wind (135)	None				10			
27	Antenna Wind (150)	None				10			
28	Antenna Wind w/ Ice (0)	None				10			
29	Antenna Wind w/ Ice (30)	None				10			
30	Antenna Wind w/ Ice (45)	None				10			
31	Antenna Wind w/ Ice (60)	None				10			
32	Antenna Wind w/ Ice (90)	None				10			
33	Antenna Wind w/ Ice (120)	None				10			
34	Antenna Wind w/ Ice (135)	None				10			
35	Antenna Wind w/ Ice (150)	None				10			
36	Maintenance Live Lm (1)	OL1				1			
37	Maintenance Live Lm (2)	OL2				1			
38	Maintenance Live Lm (3)	OL3				1			
41	Maintenance Live Lv (1)	OL6					1		
42	Maintenance Live Lv (2)	OL7					1		

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## Load Combinations

	Description	So..P...	SRSS	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
1	Summary: 1.0D + 1.0W	Yes	Y		DL	1	20	1												
2	1.4D	Yes	Y		DL	1.4														
3	1.2D + 1.0W(0)	Yes	Y		DL	1.2	4	1	20	1										
4	1.2D + 1.0W(30)	Yes	Y		DL	1.2	5	1	21	1										
5	1.2D + 1.0W(45)	Yes	Y		DL	1.2	6	1	22	1										
6	1.2D + 1.0W(60)	Yes	Y		DL	1.2	7	1	23	1										
7	1.2D + 1.0W(90)	Yes	Y		DL	1.2	8	1	24	1										
8	1.2D + 1.0W(120)	Yes	Y		DL	1.2	9	1	25	1										
9	1.2D + 1.0W(135)	Yes	Y		DL	1.2	10	1	26	1										
10	1.2D + 1.0W(150)	Yes	Y		DL	1.2	11	1	27	1										
11	1.2D + 1.0W(180)	Yes	Y		DL	1.2	4	-1	20	-1										
12	1.2D + 1.0W(210)	Yes	Y		DL	1.2	5	-1	21	-1										
13	1.2D + 1.0W(225)	Yes	Y		DL	1.2	6	-1	22	-1										
14	1.2D + 1.0W(240)	Yes	Y		DL	1.2	7	-1	23	-1										
15	1.2D + 1.0W(270)	Yes	Y		DL	1.2	8	-1	24	-1										
16	1.2D + 1.0W(300)	Yes	Y		DL	1.2	9	-1	25	-1										
17	1.2D + 1.0W(315)	Yes	Y		DL	1.2	10	-1	26	-1										
18	1.2D + 1.0W(330)	Yes	Y		DL	1.2	11	-1	27	-1										
19	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	12	1	28	1								
20	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	13	1	29	1								
21	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	14	1	30	1								
22	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	15	1	31	1								
23	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	16	1	32	1								
24	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	17	1	33	1								
25	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	18	1	34	1								
26	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	19	1	35	1								
27	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	12	-1	28	-1								
28	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	13	-1	39	-1								
29	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	14	-1	30	-1								
30	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	15	-1	31	-1								
31	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	16	-1	32	-1								
32	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	17	-1	33	-1								
33	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	18	-1	34	-1								
34	1.2D + 1.0Di + 1.0W	Yes	Y		DL	1.2	RL	1	19	-1	35	-1								
35	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	4	.067	20	.067	OL1	1.5								
36	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	5	.067	21	.067	OL1	1.5								
37	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	6	.067	22	.067	OL1	1.5								
38	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	7	.067	23	.067	OL1	1.5								
39	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	8	.067	24	.067	OL1	1.5								
40	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	9	.067	25	.067	OL1	1.5								
41	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	10	.067	26	.067	OL1	1.5								
42	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	11	.067	27	.067	OL1	1.5								
43	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	4	-.067	20	-.067	OL1	1.5								
44	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	5	-.067	21	-.067	OL1	1.5								
45	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	6	-.067	22	-.067	OL1	1.5								
46	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	7	-.067	23	-.067	OL1	1.5								
47	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	8	-.067	24	-.067	OL1	1.5								
48	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	9	-.067	25	-.067	OL1	1.5								
49	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	10	-.067	26	-.067	OL1	1.5								
50	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	11	-.067	27	-.067	OL1	1.5								
51	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	4	.067	20	.067	OL2	1.5								



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### Load Combinations (Continued)

	Description	So..P...	SRSS	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
52	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	5	.067	21	.067	OL2	1.5									
53	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	6	.067	22	.067	OL2	1.5									
54	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	7	.067	23	.067	OL2	1.5									
55	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	8	.067	24	.067	OL2	1.5									
56	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	9	.067	25	.067	OL2	1.5									
57	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	10	.067	26	.067	OL2	1.5									
58	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	11	.067	27	.067	OL2	1.5									
59	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	4	-.067	20	-.067	OL2	1.5									
60	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	5	-.067	21	-.067	OL2	1.5									
61	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	6	-.067	22	-.067	OL2	1.5									
62	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	7	-.067	23	-.067	OL2	1.5									
63	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	8	-.067	24	-.067	OL2	1.5									
64	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	9	-.067	25	-.067	OL2	1.5									
65	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	10	-.067	26	-.067	OL2	1.5									
66	1.2D + 1.5Lm(2) + ...	Yes	Y		DL 1.2	11	-.067	27	-.067	OL2	1.5									
67	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	4	.067	20	.067	OL3	1.5									
68	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	5	.067	21	.067	OL3	1.5									
69	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	6	.067	22	.067	OL3	1.5									
70	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	7	.067	23	.067	OL3	1.5									
71	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	8	.067	24	.067	OL3	1.5									
72	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	9	.067	25	.067	OL3	1.5									
73	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	10	.067	26	.067	OL3	1.5									
74	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	11	.067	27	.067	OL3	1.5									
75	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	4	-.067	20	-.067	OL3	1.5									
76	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	5	-.067	21	-.067	OL3	1.5									
77	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	6	-.067	22	-.067	OL3	1.5									
78	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	7	-.067	23	-.067	OL3	1.5									
79	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	8	-.067	24	-.067	OL3	1.5									
80	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	9	-.067	25	-.067	OL3	1.5									
81	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	10	-.067	26	-.067	OL3	1.5									
82	1.2D + 1.5Lm(3) + ...	Yes	Y		DL 1.2	11	-.067	27	-.067	OL3	1.5									
83	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	4	.067	20	.067	OL6	1.5									
84	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	5	.067	21	.067	OL6	1.5									
85	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	6	.067	22	.067	OL6	1.5									
86	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	7	.067	23	.067	OL6	1.5									
87	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	8	.067	24	.067	OL6	1.5									
88	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	9	.067	25	.067	OL6	1.5									
89	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	10	.067	26	.067	OL6	1.5									
90	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	11	.067	27	.067	OL6	1.5									
91	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	4	-.067	20	-.067	OL6	1.5									
92	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	5	-.067	21	-.067	OL6	1.5									
93	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	6	-.067	22	-.067	OL6	1.5									
94	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	7	-.067	23	-.067	OL6	1.5									
95	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	8	-.067	24	-.067	OL6	1.5									
96	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	9	-.067	25	-.067	OL6	1.5									
97	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	10	-.067	26	-.067	OL6	1.5									
98	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL 1.2	11	-.067	27	-.067	OL6	1.5									
99	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	4	.067	20	.067	OL7	1.5									
100	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	5	.067	21	.067	OL7	1.5									
101	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	6	.067	22	.067	OL7	1.5									
102	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	7	.067	23	.067	OL7	1.5									
103	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	8	.067	24	.067	OL7	1.5									

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### Load Combinations (Continued)

	Description	So..P...	SRSS	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
104	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	9	.067	25	.067	OL7	1.5								
105	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	10	.067	26	.067	OL7	1.5								
106	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	11	.067	27	.067	OL7	1.5								
107	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	4	-.067	20	-.067	OL7	1.5								
108	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	5	-.067	21	-.067	OL7	1.5								
109	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	6	-.067	22	-.067	OL7	1.5								
110	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	7	-.067	23	-.067	OL7	1.5								
111	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	8	-.067	24	-.067	OL7	1.5								
112	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	9	-.067	25	-.067	OL7	1.5								
113	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	10	-.067	26	-.067	OL7	1.5								
114	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL 1.2	11	-.067	27	-.067	OL7	1.5								

### Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	LEG	max	866.369	5	969.452	16	732.832	29	224.075	40	-232.155	1	0	114
2		min	-1958.934	13	-905.993	8	283.677	1	-254.285	80	-632.872	43	0	1
3	N75B	max	1248.559	19	832.26	47	718.317	68	228.805	40	-246.907	1	0	114
4		min	251.677	11	-891.456	71	292.754	1	-254.178	81	-617.343	36	0	1
5	N83	max	0	114	0	114	0	114	0	114	0	114	0	114
6		min	0	1	0	1	0	1	0	1	0	1	0	1
7	N84	max	1262.878	16	475.312	8	37.977	24	24.872	41	13.905	81	.526	81
8		min	-1270.077	8	-476.791	16	-6.563	16	-34.758	81	-9.95	41	-.377	41
9	Totals:	max	1036.482	3	679.559	16	1455.486	24						
10		min	-1036.482	11	-679.558	8	585.979	1						

### Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[...Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...Cb	Egn
1	M15	HSS1.900...	.255	.816	16	.097	15.5	80	20368...	23587.2	1121.4	1121.4	1...H1-1b
2	M12	HSS1.900...	.247	.816	70	.095	15.5	80	20368...	23587.2	1121.4	1121.4	1...H1-1b
3	M42A	HSS1.900...	.235	.816	16	.033	30.1...	37	20368...	23587.2	1121.4	1121.4	1...H1-1b
4	M14	PL3-1/2x5/8	.232	0	78	.093	4.694 y	81	93684...	98437.5	1281.7...	7177.7...	1...H1-1b
5	M11	PL3-1/2x5/8	.229	0	69	.092	0 y	80	93684...	98437.5	1281.7...	7177.7...	1...H1-1b
6	M41A	PL3-1/2x5/8	.208	0	40	.037	4.694 y	77	93684...	98437.5	1281.7...	7177.7...	1...H1-1b
7	M38A	PL3-1/2x5/8	.205	0	49	.039	0 y	41	93684...	98437.5	1281.7...	7177.7...	1...H1-1b
8	M39A	HSS1.900...	.203	.816	48	.038	30.1...	44	20368...	23587.2	1121.4	1121.4	2...H1-1b
9	M17	SR1/2	.118	40.167	77	.013	0	16	3765.3...	8835.75	73.632	73.632	2...H1-1b*
10	M44A	SR1/2	.114	40.167	44	.011	0	6	3765.3...	8835.75	73.632	73.632	2...H1-1b*
11	M45	HSS2.875...	.103	75.158	3	.020	74.5...	72	22748...	65826	4726.5	4726.5	4...H1-1b
12	M25	HSS2.875...	.096	21.221	14	.088	20.7...	14	53086...	65826	4726.5	4726.5	1...H1-1b
13	M26	HSS2.875...	.093	48	57	.049	75.2...	44	53086...	65826	4726.5	4726.5	1...H1-1b
14	M48	HSS2.375...	.088	88.894	16	.021	0	81	15286...	35194...	2107.1...	2107.1...	1...H1-1b*
15	M47	SR5/8	.062	28.1	41	.039	0	80	5072.1...	13805...	143.811	143.811	2...H1-1b
16	M46	HSS2.875...	.062	74.526	42	.017	74.5...	42	22748...	65826	4726.5	4726.5	4...H1-1b
17	M44	HSS2.875...	.062	74.526	74	.022	74.5...	8	22748...	65826	4726.5	4726.5	4...H1-1b
18	M53A	PIPE 2.0	.062	9.095	37	.032	38.9...	78	26521...	32130	1871.6...	1871.6...	1...H1-1b
19	M40A	PL4-1/4x5/8	.059	0	44	.022	1.5 z	43	118928...	119531...	1556.3...	10583...	1...H1-1b
20	M13	PL4-1/4x5/8	.057	0	74	.038	0 y	17	118928...	119531...	1556.3...	10583...	1...H1-1b
21	M16	PL4-1/4x5/8	.053	0	3	.044	0 y	77	118928...	119531...	1556.3...	10583...	1...H1-1b
22	M20	SR5/8	.052	0	81	.038	0	80	5072.1...	13805...	143.811	143.811	2...H1-1b

Company : Kimley-Horn and Associates, Inc.  
 Designer : SSA  
 Job Number : 019558058  
 Model Name : 806353

Mar 9, 2022  
 1:38 PM  
 Checked By: ZAM

### ***Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)***

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc...Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...Cb	Eqn
23	M43A	PL4-1/4x5/8	.051	0	3	.017	1.5 z	35	118928...	119531...	1556.3...	10583...	1... H1-1b
24	M19	SR5/8	.040	0	17	.021	28.1	80	5072.1...	13805...	143.811	143.811	3... H1-1b*
25	M46A	SR5/8	.031	28.1	43	.022	0	80	5072.1...	13805...	143.811	143.811	2... H1-1b
26	M18	SR1/2	.000	0	114	.013	40.1...	8	3765.3...	8835.75	73.632	73.632	2 H1-1a
27	M45A	SR1/2	.000	0	114	.011	40.1...	14	3765.3...	8835.75	73.632	73.632	1... H1-1a

**APPENDIX D**  
**ADDITIONAL CALCULATIONS**

# CONNECTION SLIP RESISTANCE



DESIGN LOADS	
Factored Axial, $P_u$ (lb)	1356
Factored Moment, $M_u$ (lb-ft)	

☒ *Normalize usages per TIA-222-H Sec. 15.5*

BOLT PROPERTIES	
Bolt Type	Thru Bolts
# of Bolts	2
Hole Type	Standard
Bolt Grade	A36
Bolt Diameter, $d$ (in)	0.5
Leg Width, $W_{leg}$ (in)	
Bolt Torque Override, $T$ (lb-ft)	
Bolt Pretension Stress Override (ksi)	
Bolt Ultimate Strength, $F_u$ (ksi)	58
Specified Torque, $T$ (lb-ft)	49.82
Clamping Force per Bolt, $P_u$ (lb)	5978.84
Bolt Pretension Stress (ksi)	30.45
Tensile Strength per Bolt, $\phi P_n$ (lb)	6405.90
Axial Slip Resistance per Bolt, $\phi P_n$ (lb)	2026.83
Total Axial Slip Resistance, $\phi P_n$ (lb)	4053.66
Rotational Slip Resistance per Bolt, $\phi M_n$ (lb-ft)	0.00
Total Rotational Slip Resistance, $\phi M_n$ (lb-ft)	0.00
Axial Slip Usage, $P_u / \phi P_n$	31.9%

Using Turn-of-Nut!

Normalized

FACTORS	
Nut Factor, $K$	0.20
$\Phi_{(BOLT\ TENSION)}$	0.75
$\Phi_{(SLIP-CRITICAL)}$	1.00
Mean Slip Coefficient, $\mu$	0.30
Installed Pretension Ratio, $D_u$	1.13
Turn-of-Nut Pretension Factor	0.70

Rule-of-thumb estimate  
AISC 15th, J3.6  
AISC 15th, J3.8  
AISC 15th, J3.8  
AISC 15th, J3.8  
AISC 15th, Table J3.1[a]

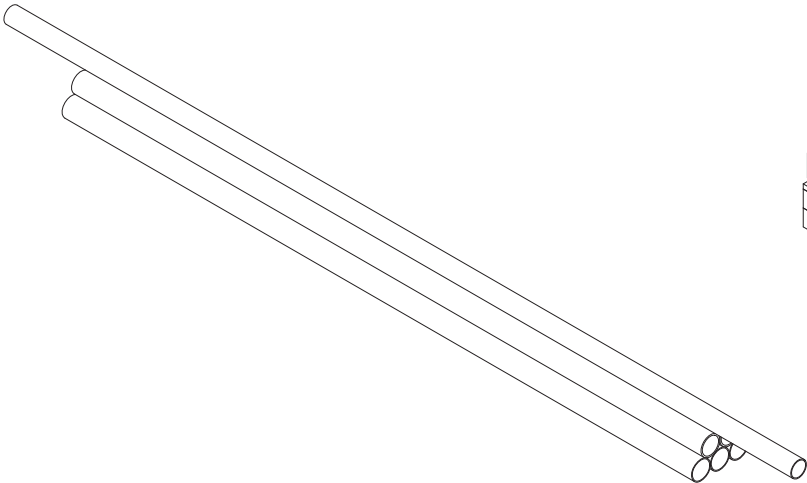
**APPENDIX E**  
**SUPPLEMENTAL DRAWINGS**



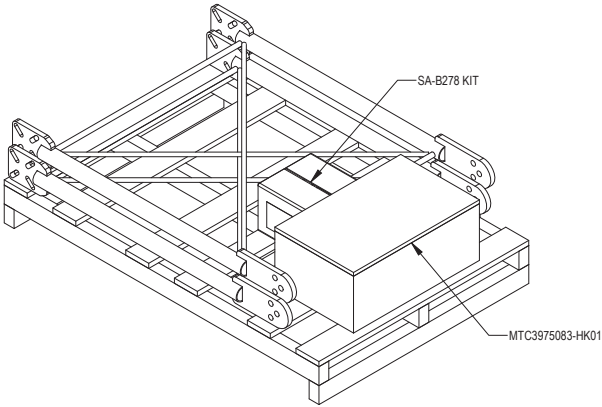
NOTES:

- 1.0 GENERAL
- 1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS
- 1.2 FOR PATENT INFO :<https://www.cs-pat.com>
- 2.0 DESIGN NOTES
- 2.1 DESIGN SURVIVAL WIND SPEED: 180 MPH, 3 SEC GUST WITH EQUIPMENT MOUNTED AS SHOWN
- 3.0 MANUFACTURING/SPECIAL REQUIREMENTS
- 3.1 TORQUE HARDWARE ACCORDING TO SIZE AS NOTED BELOW:
- ALL HARDWARE 1/4" DIAMETER: TORQUE 7 FT-LBS
- ALL HARDWARE 3/8" DIAMETER: TORQUE 12 FT-LBS
- ALL HARDWARE 1/2" DIAMETER OR LARGER SHALL BE TIGHTENED SNUG TIGHT, DEFINED AS THE CONDITION OBTAINED WITH A FEW IMPACTS ON AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
- 4.0 TEST
- 5.0 PACKAGING
- 5.1 PACKAGING SHALL MEET COMMScope REQUIREMENTS PER DOCUMENT IS-PL-3005
- 5.2 PRINTED DOCUMENT TO BE PLACED INSIDE POLYBAG AND THEN IN SHIPPING CONTAINER
- 5.3 EXTRA HARDWARE MAY BE SUPPLIED, BAGGED AND SHIPPED.

REVISIONS				
REV.	IPS	DESCRIPTION	BY	DATE
A	10191PC	NEW RELEASED.	RJC	3/17/2021





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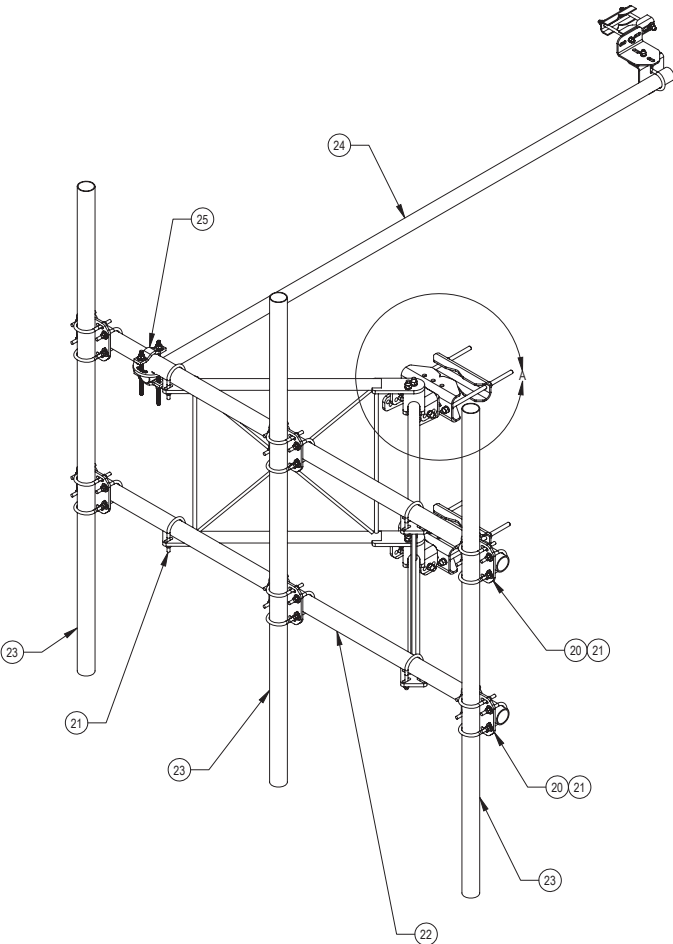
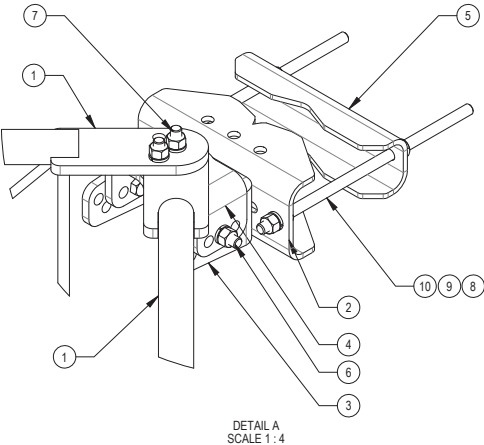
MTC3975083-PK01

ITEM	PART NO.	DESCRIPTION	QTY
1	MTC3975083-PK01	PACK KIT, MTC3975083, 1 SCTR, 3 ANT PIPE	1
2	PB01TEA0308B0208K	PIPE BUNDLE	1

DENSITY	MASS	352.136	lbs/in <sup>3</sup>
	VOLUME	2431.173	in <sup>3</sup>
	SURFACE AREA	19715.555	in <sup>2</sup>
HEIGHT	LENGTH		
	WIDTH		


COMMSCOPE, INC. OF NORTH CAROLINA											
TOLERANCES					SAP MATERIAL MASTER						
0 PLACE X ± .25		2 PLACE XX ± 0.06			MTC3975083						
1 PLACE X ± 0.12		ANGLES ± 2°									
FINISH GALV A123					MATERIAL SEE BOM						
UNLESS OTHERWISE SPECIFIED INTERPRET FOR WIND 17-18-19-18	NAME		DATE		TITLE						
	CE XZ1054		03/02/2021		SECTOR FRAME, TW, SFG21, 8FT, 3 ANT PIPE						
	RW SCAMPBELL.COM		03/17/2021								
	AD TECH 101		03/17/2021								
	RE SCROSS		03/17/2021								
	ECN 10191PC				SCALE 1:8		DOCUMENT NO. MTC3975083				
SIZE		Auth Group		INSL		MODEL		DRAWING		SHEET 1 OF 7	
C						VERSION		STATUS			
		00		RE		A		00		RE	

NOTES:

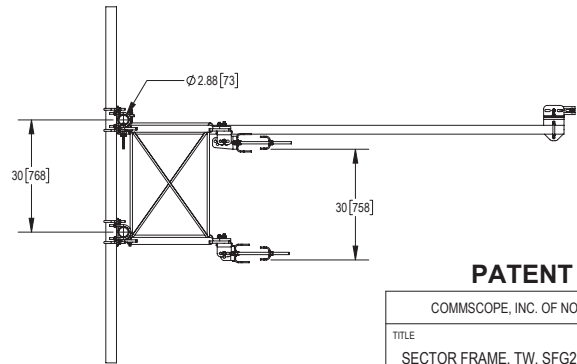
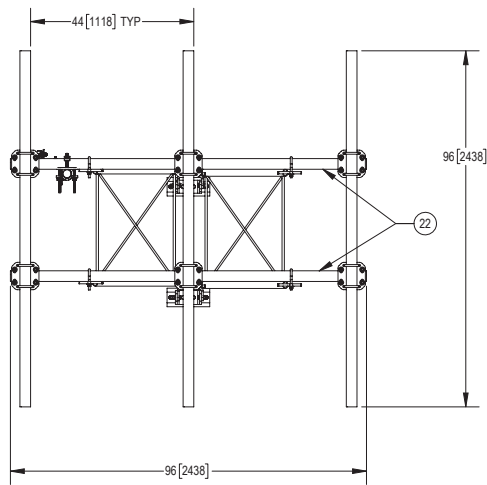
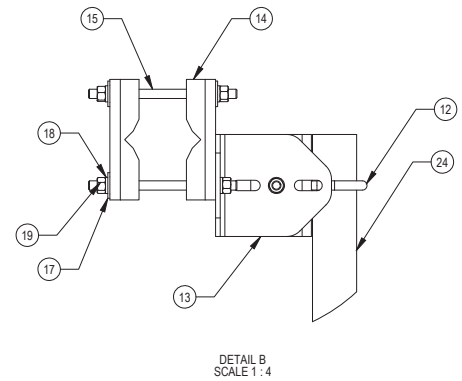
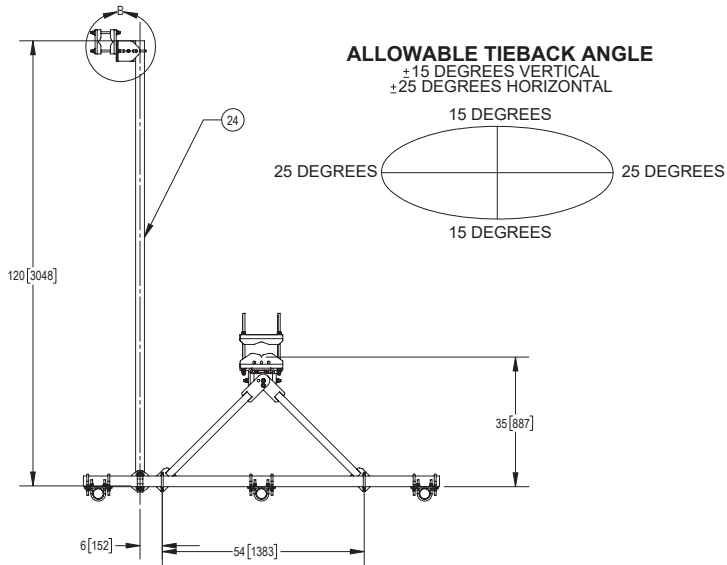


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	NOTE NO.
1	SFV01	WELDMENT, SF-V STANDOFF ARM	2	
2	MTC397522	CLAMP, FRONT MOUNTING	2	
3	SFV03	SFV TAPER BRACKET	1	
4	SFV02	SFV AZIMUTH BRACKET	3	
5	MTC397521	CLAMP, BACK	2	
6	GB-05225	5/8" X 2-1/4" GALV BOLT KIT	8	
7	GB-05305	5/8" X 3" GALV BOLT KIT	4	
8	GWL-05	5/8" GALV LOCK WASHER	8	
9	GN-05	5/8" GALV HEX NUT	12	
10	MT-382-16	5/8" X 16" GALV THREADED ROD	4	
11	GWFL-05	5/8" GALV FLAT WASHER, 1.70D	6	
12	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	1	
13	XAU01	ANGLE, CROSSOVER, 1.9-3.5" X 1.9-3.5" OD	2	
14	SAB01	FORMED CLAMP	2	
15	MT-379-8	1/2" X 8" GALV THREADED ROD	2	
16	GB-04145	1/2" X 1-1/2" GALV BOLT KIT	1	
17	GWFL-04	1/2" GALV FLAT WASHER	52	
18	GWL-04	1/2" GALV LOCK WASHER	41	
19	GN-04	1/2" GALV HEX NUT	41	
20	XPU01	PLATE, CROSSOVER, 1.9-3.5" X 1.9-3.5" OD	6	
21	GUB-4352	1/2" X 3" X 5-1/4" GALV U-BOLT	28	
22	MTS4696	Ø 2.875" O.D. X 96" PIPE	2	
23	MTS4696120	Ø 2.88" X 96" GALV PIPE	3	
24	MT-451-120	2.375" OD X 120" PIPE	1	
25	XP-R	CROSSOVER PLATE, ROUND, UP TO 3.5" OD	1	

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COMMSCOPE, INC. OF NORTH CAROLINA					
TITLE					
SECTOR FRAME, TW, SFG21, 8FT, 3 ANT PIPE					
SIZE	SCALE	DOCUMENT NO.			
C	1:12	MTC3975083			
		DRAWING		SHEET 2 OF 7	
		VERSION	STATUS		REVISION
		00	RE		A


NOTES:



**PATENT PENDING**

COMMScope, INC. OF NORTH CAROLINA

TITLE  
SECTOR FRAME, TW, SFG21, 8FT, 3 ANT PIPE

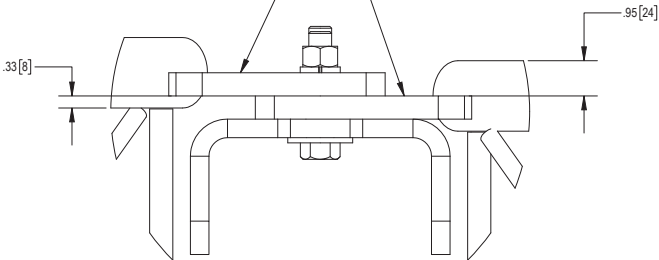
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		VERSION	STATUS	REVISION	
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NOTES:

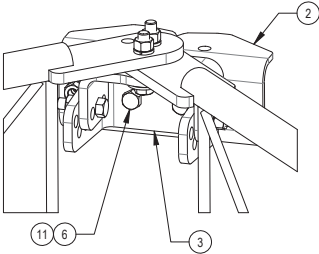
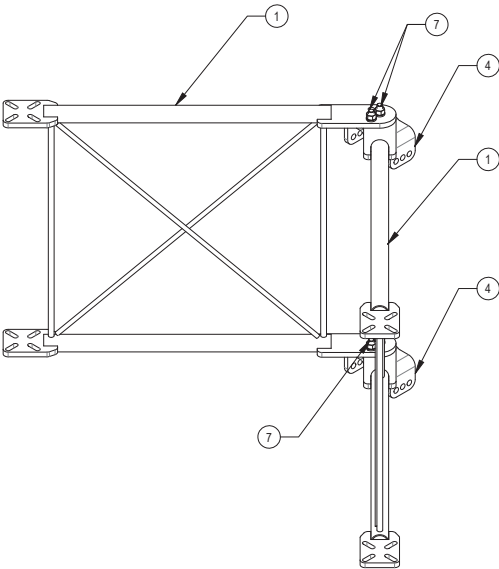
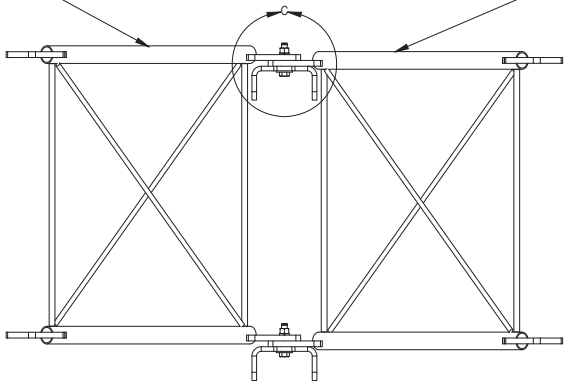
STEP1: ATTACH STANDOFF ARMS (SFV01) TO AZIMUTH BRACKETS (SFV02) USING BOLT KITS (GB-05305)

LOWER ARM "UPSIDE DOWN"      UPPER ARM "RIGHT SIDE UP"




DETAIL C  
SCALE 1:2

STANDOFF ARM ORIENTATION IS CRITICAL!  
WHEN ASSEMBLED, ARMS SHOULD BE LEVEL  
WITH EACH OTHER. ALSO SEE DETAIL C ABOVE



ISO ROTATED VIEW

PATENT PENDING

COMMSCOPE, INC. OF NORTH CAROLINA					
TITLE					
SECTOR FRAME, TW, SFG21, 8FT, 3 ANT PIPE					
SIZE		DOCUMENT NO.			
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		DRAWING		SHEET 4 OF 7	
		VERSION	STATUS		REVISION
		00	RE		A

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3

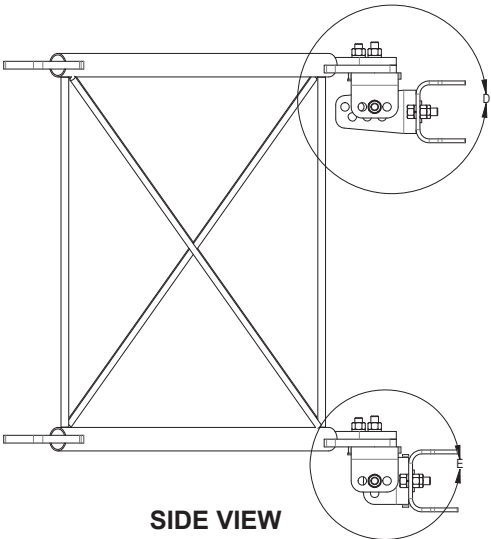
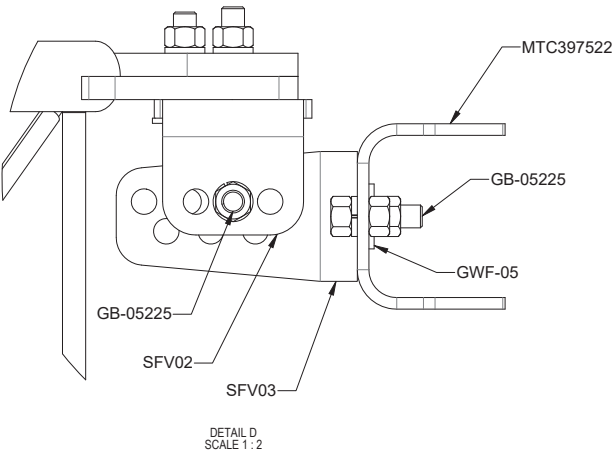
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NOTES:

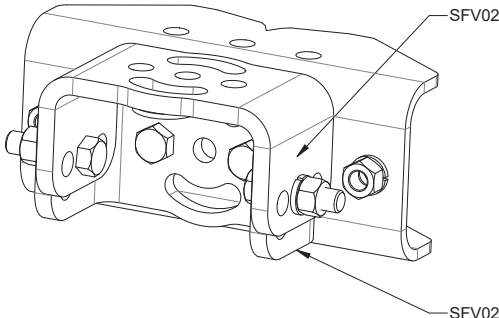
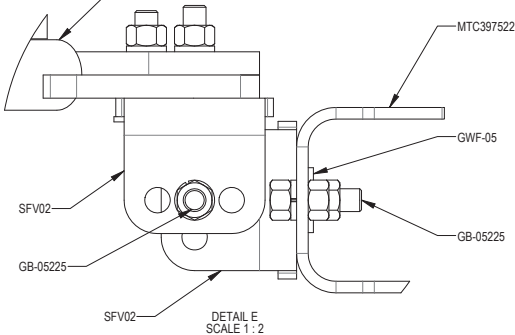
**STEP 2A: ON TOP, ATTACH TAPER BRACKET (SFV03) TO AZIMUTH BRACKET (SFV02) USING BOLT KITS (GB-05225). SEE ISO ROTATED VIEW. ATTACH TAPER BRACKET (SFV03) TO CLAMP, FRONT MTG (MTC397522) USING BOLT KITS (GB-05225).**

**STEP 2B: ON BOTTOM, ATTACH AZIMUTH BRACKET (SFV02) TO AZIMUTH BRACKET (SFV02) USING BOLT KITS (GB-05225). ATTACH AZIMUTH BRACKET (SFV02) TO CLAMP, FRONT MTG (MTC397522) USING BOLT KITS(GB-05225).**




SIDE VIEW

**STANDOFF ARM ORIENTATION IS CRITICAL! WHEN ASSEMBLED, PIPES SHOULD BE LEVEL**



ISO ROTATED VIEW

**PATENT PENDING**

COMMSCOPE, INC. OF NORTH CAROLINA					
TITLE					
SECTOR FRAME, TW, SFG21, 8FT, 3 ANT PIPE					
SIZE	SCALE	DOCUMENT NO.			
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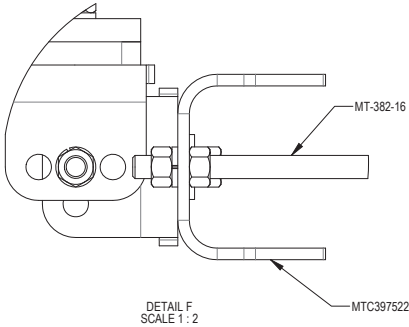
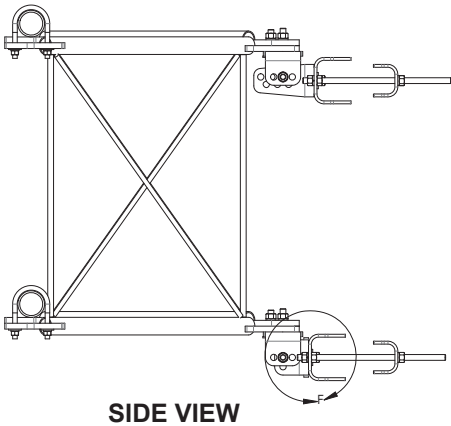
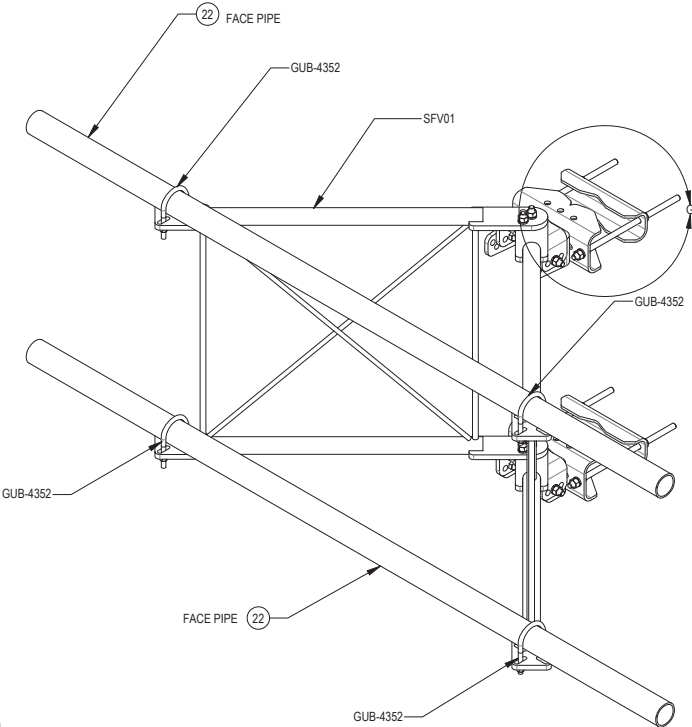
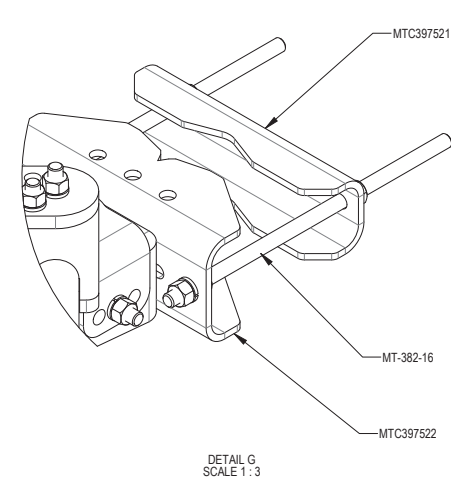
3

2

1


NOTES:

STEP 3: ATTACH FACE PIPES TO STANDOFF ARMS (SFV01) USING U-BOLTS (GUB-4240).



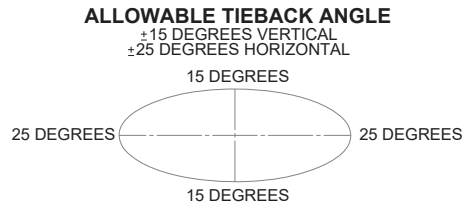
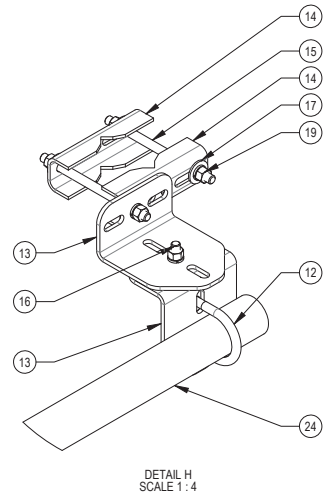
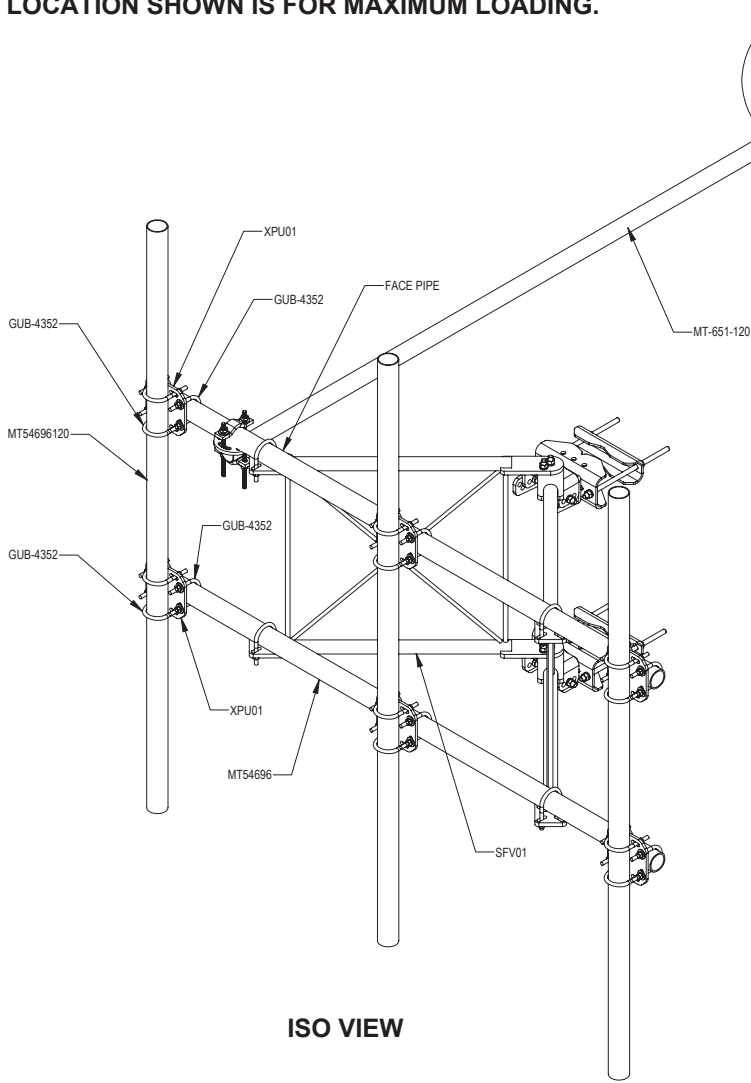
ISO VIEW

PATENT PENDING


COMMSCOPE, INC. OF NORTH CAROLINA							
TITLE							
SECTOR FRAME, TW, SFG21, 8FT, 3 ANT PIPE							
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C		1:8		MTC3975083			
				DRAWING		SHEET 6 OF 7	
				VERSION	STATUS		REVISION
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NOTES:

**STEP 4: ATTACH ANTENNA PIPES & TIE BACK PIPE (MT-651-120) TO FACE PIPES USING CROSSOVER BRACKETS (XAU01) AND U-BOLTS (GUB-4240). LOCATION SHOWN IS FOR MAXIMUM LOADING.**



**PATENT PENDING**

COMMSCOPE, INC. OF NORTH CAROLINA					
TITLE					
SECTOR FRAME, TW, SFG21, 8FT, 3 ANT PIPE					
SIZE	SCALE	DOCUMENT NO.			
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		DRAWING		SHEET 7 OF 7	
		VERSION	STATUS		REVISION
		00	RE		A

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## **ATTACHMENT 7**



# EBI Consulting

environmental | engineering | due diligence

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

Dish Existing Facility

Site ID: 806353

NJER01086A  
128 Mather Street  
Wilton, Connecticut 06897

**November 12, 2022**

**EBI Project Number: 6222003432**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>25.23%</b>



November 12, 2022

Dish

Attn:

,

## Emissions Analysis for Site: 806353 - NJJER01086A

EBI Consulting was directed to analyze the proposed Dish facility located at **128 Mather Street** in **Wilton, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 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 128 Mather Street in Wilton, Connecticut using the equipment information listed below. Modeling of the antennas and associated equipment was completed using RoofMaster™ software, which is a widely-used predictive modeling program that has been developed to predict RF power density values for rooftop and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. Using the computational methods set forth in Federal Communications (FCC) Office of Engineering & Technology (OET) Bulletin 65, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields” (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

Since Dish 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, telecommunications equipment was modeled 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 - 2007 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 - 2100 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 10 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 02DT 600 for the 600 MHz / 600 MHz / 2007 MHz channel(s) in Sector A, the JMA MX08FRO665-21 02DT 600 for the 600 MHz / 2007 MHz / 2100 MHz channel(s) in Sector B, the JMA MX08FRO665-21 02DT 600 for the 600 MHz / 2007 MHz / 2100 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 174 feet above ground level (AGL).
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database or documents available on the Connecticut Siting Council website



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(<https://portal.ct.gov/CSC>). Values in the database are provided by the individual carriers themselves.

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



## Dish Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	JMA MX08FRO665-2I 02DT 600	Make / Model:	JMA MX08FRO665-2I 02DT 600	Make / Model:	JMA MX08FRO665-2I 02DT 600
Frequency Bands:	600 MHz / 600 MHz / 2007 MHz	Frequency Bands:	600 MHz / 2007 MHz / 2100 MHz	Frequency Bands:	600 MHz / 2007 MHz / 2100 MHz
Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd	Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd	Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd
Height (AGL):	174 feet	Height (AGL):	174 feet	Height (AGL):	174 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440.00 Watts	Total TX Power (W):	440.00 Watts	Total TX Power (W):	440.00 Watts
ERP (W):	13,566.01	ERP (W):	13,566.01	ERP (W):	13,566.01
Antenna AI MPE %:	2.01%	Antenna BI MPE %:	2.01%	Antenna CI MPE %:	2.01%





Site Composite MPE %	
Carrier	MPE %
Dish (Combined Sectors):	0.01%
T-Mobile	8.61%
Verizon	7.25%
AT&T	4.37%
Metro PCS	0.18%
Nextel	0.19%
Town	4.62%
Site Total MPE % :	25.23%

Dish MPE % Per Sector	
Dish Sector A Total:	0.01%
Dish Sector B Total:	0.01%
Dish Sector C Total:	0.01%
Dish Total MPE % :	0.01%

Dish Maximum MPE Power Values (Sector A)							
Dish 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 600 MHz n71	4	364.8558002	174	1.858999291	600 MHz n71	400.0	0.46%
Dish 2007 MHz n70	4	1339.861757	174	6.826812275	2007 MHz n70	1000.0	0.68%
Dish 2100 MHz n66	4	1686.786014	174	8.594447454	2100 MHz n66	1000.0	0.86%
						Dish Total:	0.01%

- NOTE: Total Dish MPE values reflect all Dish antennas as reported by RoofMaster™ combined modeling.
- NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.



## Summary

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

The anticipated maximum composite contributions from the Dish 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 Sector	Power Density Value (%)
Sector A:	0.01%
Sector B:	0.01%
Sector C:	0.01%
Dish Maximum MPE % (Sector A):	0.01%
Dish Combined Sectors MPE %:	0.01%
Site Total:	25.23%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **25.23%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions or documents available on the Connecticut Siting Council website.

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.

## **CERTIFICATION OF SERVICE**

I hereby certify that on the 29th day of June 2022, DISH Wireless, LLC provided notice of its intent to file a Petition for a declaratory ruling that a Certificate of Environmental Compatibility and Public Need is not required for the modification of a wireless telecommunications facility at 128 Mather Street in Wilton, Connecticut, to the following:

### **Abutters**

Sardan, Sanjay Kumar (APN: 23-24)  
150 Mather Street  
Wilton, CT 06897

Astacio, Yahdira & Richard (APN: 10-2)  
148 Mather Street  
Wilton, CT 06897

Town of Wilton (APN: 10-2, 9-11 & 9-8)  
238 Danbury Road  
Wilton, CT 06897

The Conn Light & Power Co (APN: 9-10)  
PO Box 270  
Hartford, CT 06141

Honey Hill Holdings, LLC (APN: 9-6-1)  
75 East Meadow Road  
Wilton, CT 06897

Aspetuck Land Trust Inc. (APN: 9-2)  
18 Cold Spring Road  
Easton, CT 06612

Daulaire per Ola Revocable Trust (APN: 23-21)  
74 Mather Street  
Wilton, CT 06897

Alexander, Corey & Malysa (APN: 23-22)  
94 Mather Street  
Wilton, CT 06897

### **Owner**

Town of Wilton  
238 Danbury Road  
Wilton, CT 06897

Respectfully Submitted,

Victoria Masse  
Northeast Site Solutions  
420 Main Street #2  
Sturbridge, MA 01566

June 29, 2022

***VIA USPS CERTIFIED MAIL/  
RETURN RECEIPT REQUESTED***

Town of Wilton  
238 Danbury Road  
Wilton, CT 06897

**RE:                    Proposed Modification to Existing Wireless Telecommunications Facility at 128  
                         Mather Street in Wilton, Connecticut**

To Whom It May Concern:

I am writing to you on behalf of DISH Wireless, LLC ("DISH"). DISH intends to file with the Connecticut Siting Council ("Council") a petition for declaratory ruling ("Petition") that a Certificate of Environmental Compatibility and Public Need is not required.

The Petition will provide details of the Existing Facility modification and explain why it will have no significant adverse environmental effect.

This letter serves as notice to you as an abutting property owner pursuant to § 16-50j-40 of the Regulations of Connecticut State Agencies. DISH will file the Petition on or about June 29, 2022 and will request that the Council place the Petition on some future agenda.

You may review the Petition at the office of the Council, which is located at Ten Franklin Square, New Britain, Connecticut, 06051, or at the Office of the Town Clerk at the Wilton Town Hall. All inquiries should be addressed to Council or to the undersigned.

Sincerely,

Victoria Masse  
Northeast Site Solutions  
420 Main Street #2  
Sturbridge, MA 01566



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Sent To Richard /Yahidra Astacio  
 Street and Apt. No., or PO Box No. 148 Mather St  
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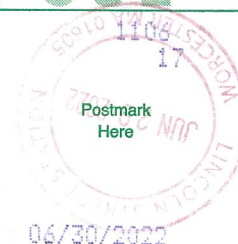
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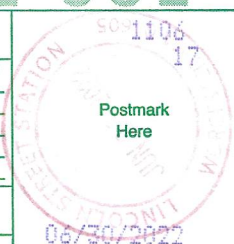
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Postage \$0.58  
 \$  
 Total Postage and Fees \$7.38

Sent To Corey /Malysa Alexander  
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 City, State, ZIP+4® Wilton, CT 06897



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 Street and Apt. No., or PO Box No. 14 Mather St  
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 Total Postage and Fees \$7.38

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Postage \$0.58  
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 Total Postage and Fees \$7.38

Sent To Aspetuck Land Trust Inc  
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First-Class Mail® Letter	1		\$0.58
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 Weight: 0 lb 0.40 oz  
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Total Postage and Fees

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Letter  
Hartford, CT 06141  
Weight: 0 lb 0.40 oz  
Estimated Delivery Date  
Sat 07/02/2022  
Certified Mail®  
Tracking #: \$3.75  
70212720000157462075  
Return Receipt \$3.05  
Tracking #: 9590 9402 7040 1225 8324 64  
Total \$7.38

First-Class Mail® 1 \$0.58  
Letter  
Wilton, CT 06897  
Weight: 0 lb 0.40 oz  
Estimated Delivery Date  
Tue 07/05/2022  
Certified Mail®  
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First-Class Mail® 1 \$0.58  
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Wilton, CT 06897  
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Tue 07/05/2022  
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Total \$7.38

First-Class Mail® 1 \$0.58  
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Wilton, CT 06897  
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Estimated Delivery Date  
Tue 07/05/2022  
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Tracking #: \$3.75  
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Return Receipt \$3.05  
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Total \$7.38

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ADDRESS: WA 01908-1052

200 LINCOLN ST STE 8

LINCOLN WA



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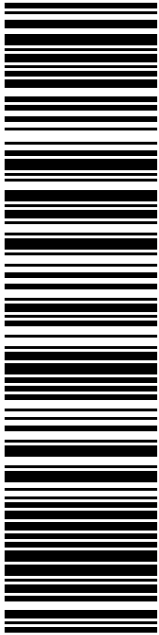
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DEBORAH CHASE NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359		Expected Delivery Date: 11/18/22 Ref#: DS-806353 <b>0000</b>	
 LYNNE VANDERSLICE FIRST SELCTWOMAN 238 DANBURY RD WILTON CT 06897-4008		<div style="border: 1px solid black; padding: 5px; display: inline-block;"><b>C005</b></div>	
<b>USPS TRACKING #</b>			
			
<b>9405 5036 9930 0396 8853 89</b>			
Electronic Rate Approved #038555749			


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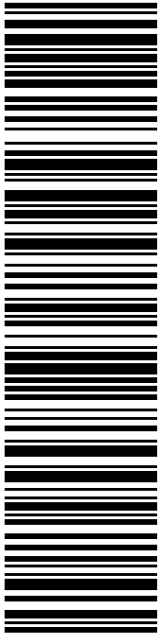

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Trans. #: 575886161 Print Date: 11/16/2022 Ship Date: 11/16/2022 Expected Delivery Date: 11/18/2022	Priority Mail® Postage: <b>\$9.90</b> Total: <b>\$9.90</b>
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359	
<b>To:</b> LYNNE VANDERSLICE FIRST SELCTWOMAN 238 DANBURY RD WILTON CT 06897-4008	
Ref#: DS-806353	
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11/16/2022		Mailed from 01566 986776555291033	
<b>PRIORITY MAIL®</b>		Expected Delivery Date: 11/18/22 Ref#: DS-806353 <b>0000</b>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359		 MICHAEL WRINN DIRECTOR OF PLANNING & LAND USE 238 DANBURY RD WILTON CT 06897-4008	
		<b>USPS TRACKING #</b>	
<b>9405 5036 9930 0396 8854 02</b>		<b>C005</b>	
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 Total: **\$9.90**

**From:** DEBORAH CHASE  
 NORTHEAST SITE SOLUTIONS  
 STE 1  
 420 MAIN ST  
 STURBRIDGE MA 01566-1359




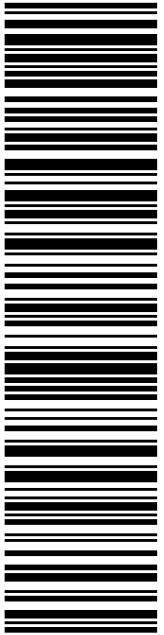
Ref#: DS-806353

**To:** MICHAEL WRINN  
 DIRECTOR OF PLANNING & LAND USE  
 238 DANBURY RD  
 WILTON CT 06897-4008

\* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



Thank you for shipping with the United States Postal Service!  
 Check the status of your shipment on the USPS Tracking® page at usps.com

 <b>UNITED STATES POSTAL SERVICE®</b>		<b>Click-N-Ship®</b>	
		<small>usps.com</small> 9405 5036 9930 0396 8854 33 0099 0000 0031 4586 <b>US POSTAGE</b> Flat Rate Env <b>U.S. POSTAGE PAID</b> <small>Click-N-Ship®</small>	
11/16/2022		Mailed from 01566 986776555290554	
<b>PRIORITY MAIL®</b>		Expected Delivery Date: 11/18/22 Ref#: DS-806353 <b>0000</b>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359		 RICH ZAJAC CROWN CASTLE STE 320 4545 E RIVER RD W HENRIETTA NY 14586-9024	
		<b>USPS TRACKING #</b>	
9405 5036 9930 0396 8854 33		Electronic Rate Approved #038555749	

✂ ————— Cut on dotted line.

## Instructions

- Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
- Place your label so it does not wrap around the edge of the package.
- Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
- To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
- Mail your package on the "Ship Date" you selected when creating this label.

## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b> <b>9405 5036 9930 0396 8854 33</b>	
Trans. #: 575886161 Print Date: 11/16/2022 Ship Date: 11/16/2022 Expected Delivery Date: 11/18/2022	Priority Mail® Postage: <b>\$9.90</b> Total: <b>\$9.90</b>
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359	
<b>To:</b> RICH ZAJAC CROWN CASTLE STE 320 4545 E RIVER RD W HENRIETTA NY 14586-9024	
Ref#: DS-806353	
<small>* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.</small>	



Thank you for shipping with the United States Postal Service!  
 Check the status of your shipment on the USPS Tracking® page at usps.com



## Shipment Confirmation Acceptance Notice

### A. Mailer Action

**Note To Mailer:** The labels and volume associated to this form online, **must** match the labeled packages being presented to the USPS® employee with this form.

Shipment Date: 11/16/22

Shipped From:

DEBORAH CHASE  
NORTHEAST SITE SOLUTIONS  
420 MAIN ST  
STE 1  
STURBRIDGE MA 01566-1359

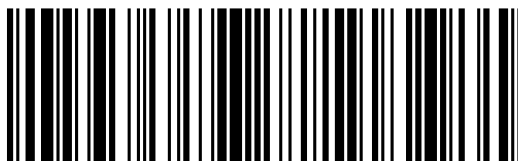
Type of Mail	Volume
Priority Mail®	3
Priority Mail Express™*	0
International Mail*	0
First-Class Package Service - Retail™	0
Parcel Select® Ground	0
Other	0
Total Volume	3

\*Start time for products with service guarantees will begin when mail arrives at the local Post Office™ and items receive individual processing and acceptance scans.



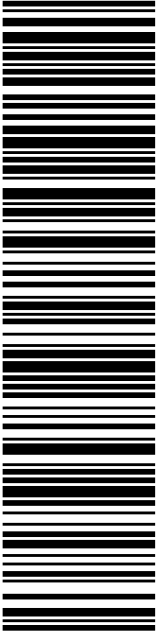
### B. USPS Action

- USPS EMPLOYEE: Please scan upon pickup or receipt of mail. Leave form with customer or in customer's mail receptacle. Employee verifies the package volume count on the Package Pickup Carrier Manifest.
  - If the volume on the manifest matches the volume being collected from the customer, the employee should make the **1:YES** selection by pressing the number 1 on the keypad of the handheld scanner, or on the keyboard of the POS ONE terminal.
  - If the volume on the manifest does not match the volume being collected from the customer, the employee should make the **2:NO** selection. The mail should still be collected and dispatched as normal.

**USPS SCAN**



**9475 7036 9930 0414 5566 90**

 <b>UNITED STATES POSTAL SERVICE®</b>		<b>Click-N-Ship®</b>	
<b>P</b>		<small>usps.com</small> <b>US POSTAGE</b> <small>Flat Rate Env</small> <b>U.S. POSTAGE PAID</b> <small>Click-N-Ship®</small>	
<b>PRIORITY MAIL®</b>		<small>11/16/2022</small> <small>Mailed from 01566</small> <small>986776555016915</small>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359		Expected Delivery Date: 11/18/22 Re#: DS-806353 <b>0000</b>	
 LISA MATTHEWS CT SITING COUNCIL 10 FRANKLIN SQ NEW BRITAIN CT 06051-2655		<b>C006</b>	
<b>USPS TRACKING #</b>			
			
<b>9405 5036 9930 0396 8910 21</b>			
Electronic Rate Approved #038555749			

✂ ————— Cut on dotted line.

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- Mail your package on the "Ship Date" you selected when creating this label.

## Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0396 8910 21**

Trans. #: 575886816  
Print Date: 11/16/2022  
Ship Date: 11/16/2022  
Expected  
Delivery Date: 11/18/2022

Priority Mail® Postage: **\$9.90**  
Total: **\$9.90**

**From:** DEBORAH CHASE  
NORTHEAST SITE SOLUTIONS  
STE 1  
420 MAIN ST  
STURBRIDGE MA 01566-1359

Re#: DS-806353

**To:** LISA MATTHEWS  
CT SITING COUNCIL  
10 FRANKLIN SQ  
NEW BRITAIN CT 06051-2655

\* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



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