



STATE OF CONNECTICUT  
*CONNECTICUT SITING COUNCIL*

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

Web Site: [portal.ct.gov/csc](http://portal.ct.gov/csc)

**VIA ELECTRONIC MAIL**

October 1, 2021

Denise Sabo  
Northeast Site Solutions  
54 Main Street, Unit 3  
Sturbridge, MA 01566-1359  
[denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)

RE: **EM-DISH-082-210819** - DISH Wireless, LLC notice of intent to modify an existing telecommunications facility located at 238 Meriden Road, Middlefield, Connecticut.

Dear Ms. Sabo:

The Connecticut Siting Council (Council) is in receipt of your correspondence of September 29, 2021 submitted in response to the Council's September 27, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

A handwritten signature in black ink, appearing to read 'Melanie Bachman'.

Melanie Bachman  
Executive Director

MB/FC/laf

**From:** Victoria Masse <victoria@northeastsitesolutions.com>  
**Sent:** Wednesday, September 29, 2021 11:32 AM  
**To:** Robidoux, Evan <Evan.Robidoux@ct.gov>; CSC-DL Siting Council <Siting.Council@ct.gov>  
**Cc:** Denise Sabo <denise@northeastsitesolutions.com>; Deborah Chase <deborah@northeastsitesolutions.com>  
**Subject:** Re: 876340 - FW: Council Incomplete Letter for EM-DISH-082-210819 (Meriden Road, Middlefield)

Good Morning Council,

Please see attached revised Exempt Mod filing for the site referenced below, we have included the corrected Mount Analysis report as well as the Town's original zoning email.

EM-DISH-082-210819: Meriden Road, Middlefield

Thank you

On Mon, Sep 27, 2021 at 9:18 PM Denise Sabo <[denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)> wrote:

Rich,

The mounts need to be corrected on this site -876340.

Thank you



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

August 11, 2021

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

RE: Exempt Modification Application  
238 Meriden Road, Middlefield CT 06457  
Latitude: 41.546000  
Longitude: -72.714972  
Dish Site #: 876340\_Crown Dish

Dear Ms. Bachman:

Based on the 2020 merger between T-Mobile and Sprint, and as part of the agreement, the DOJ required T-Mobile to divest some sites to Dish in order to create an additional wireless provider. This site is part of the agreement.

Dish Wireless LLC is requesting to file an exempt modification for an existing tower located at 238 Meriden Road, Middlefield CT 06457. Dish Wireless LLC proposes to install three (3) antennas at the 91-foot level of the existing 133-foot tower. The property is owned by James Kolman and the tower is owned by Crown Castle. This modification includes hardware that is 5G capable.

**Dish Wireless LLC Planned Modifications:**

Remove:

- (3) Antenna mount
- (3) APX18

Remove and Replace: NONE

Install New:

- (1) Commscope MC-PK8-DSH platform mount
- (3) LMA MX08FRO665-20 Antenna
- (3) TA08025-B604 RRU
- (3) TA08025-B605 RRU
- (1) Raycap
- (1) 1-5/8" Hybrid (Inside Pole)

Existing to Remain:  
NONE



Ground Work: (within existing compound)  
New H-Frame  
Equipment Cabinet  
Power/Telco Cabinet  
Ice Bridge  
7'x5' Steel Platform

The facility was approved by the Connecticut Siting Council TS-OCI-082-990816 on April 18,1999. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Edward Bailey, First Selectman, Elected Official and Jerry Russ, Zoning Enforcement Officer for the Town of Middlefield, as well as the property owner and the tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

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

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

Sincerely,

*Denise Sabo*

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



**NSS**

**NORTHEAST**  
SITE SOLUTIONS

*Turnkey Wireless Development*

Attachments cc:

Edward Bailey, First Selectman  
Town of Middlefield Selectman's Office  
393 Jackson Hill Road Middlefield, CT 06455  
860-349-7114

Jerry Russ, Zoning Enforcement Officer  
Town of Middlefield Land Use Department  
405 Main Street- Comm Center Middlefield, CT 06455  
860-349-7123

James Kolman, Property Owner  
15 Higby Road Middlefield, CT 06455

Crown Castle, Tower Owner

NORTHEAST SITE SOLUTIONS, LLC  
1053 FARMINGTON AVE STE G  
FARMINGTON, CT 06032

WEBSTER BANK  
51-7010/2111

4593

08/06/2021

PAY TO THE ORDER OF Connecticut Siting Council

\*625.00

\$

EXACTLY SIX HUNDRED TWENTY-FIVE DOLLARS

DOLLARS

Connecticut Siting Council  
10 Franklin Square  
New Britain CT 06051

MEMO

*Gisa Lisa Allen*  
AUTHORIZED SIGNATURE

⑈004593⑈ ⑆211170101⑆10 0010608887⑈

NORTHEAST SITE SOLUTIONS, LLC

4593

Check#: 4593 Date: 08/06/2021 Vendor#: 10023 Connecticut Siting Council Total: \*625.00

Invoice#	Invoice Date	Job/Description	Balance	Retain	Discount	This Check
876340 Crown Direct	08/06/2021	117 Crown Direct Z/P	625.00			625.00

NORTHEAST SITE SOLUTIONS, LLC

4593

Check#: 4593 Date: 08/06/2021 Vendor#: 10023 Connecticut Siting Council Total: \*625.00

Invoice#	Invoice Date	Job/Description	Balance	Retain	Discount	This Check
876340 Crown Direct	08/06/2021	117 Crown Direct Z/P	625.00			625.00

# Exhibit A

**From:** [Nancy Davidson](#)  
**To:** [Zsamba, Anne Marie](#)  
**Subject:** FW: Seeking Original Tower Approval: BU - 876340, Site Name - COE HILL, App ID - 479827, Customer Site ID - CT11309, Customer Site Name - Middlefield/Rt 66  
**Date:** Friday, August 30, 2019 11:09:10 AM

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**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Anne Marie unfortunately this is a huge file by Middlefield standards. You can see the First Selectmen's response. I only had time to go briefly through the old parts. I did not know exactly what you need but there is a lot of stuff in the file. Sorry I couldn't be of more help

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**From:** Edward Bailey  
**Sent:** Thursday, August 29, 2019 12:21 PM  
**To:** Nancy Davidson <[ndavidson@middlefieldct.org](mailto:ndavidson@middlefieldct.org)>  
**Cc:** Edward Bailey <[ebailey@middlefieldct.org](mailto:ebailey@middlefieldct.org)>; Edward Bailey <[ebailey@middlefieldct.org](mailto:ebailey@middlefieldct.org)>  
**Subject:** FW: Seeking Original Tower Approval: BU - 876340, Site Name - COE HILL, App ID - 479827, Customer Site ID - CT11309, Customer Site Name - Middlefield/Rt 66

Cell towers are under the jurisdiction of the Connecticut Siting Council and are not a matter for local jurisdiction, thus there would be no local approval.

## Edward P. Bailey, First Selectman

### Town of Middlefield

393 Jackson Hill Road

P.O. Box 179

Middlefield, CT 06455

860.349.7114

860.349.7115 fax

email: [ebailey@middlefieldct.org](mailto:ebailey@middlefieldct.org)

Website: <http://www.middlefieldct.org>





**From:** Nancy Davidson

**Sent:** Thursday, August 29, 2019 11:19 AM

**To:** Edward Bailey <[ebailey@middlefieldct.org](mailto:ebailey@middlefieldct.org)>

**Subject:** FW: Seeking Original Tower Approval: BU - 876340, Site Name - COE HILL, App ID - 479827, Customer Site ID - CT11309, Customer Site Name - Middlefield/Rt 66

I will go through the files here but if I remember correctly Joe use to have a drawer in the vault with this paperwork also.

---

**From:** Zsamba, Anne Marie [<mailto:AnneMarie.Zsamba@crowncastle.com>]

**Sent:** Thursday, August 29, 2019 8:17 AM

**To:** Jerry Russ <[juss@middlefieldct.org](mailto:juss@middlefieldct.org)>

**Cc:** Nancy Davidson <[ndavidson@middlefieldct.org](mailto:ndavidson@middlefieldct.org)>

**Subject:** Seeking Original Tower Approval: BU - 876340, Site Name - COE HILL, App ID - 479827, Customer Site ID - CT11309, Customer Site Name - Middlefield/Rt 66

Good morning Mr. Russ and Ms. Davidson,

I am seeking your assistance if at all possible in locating the original tower approval for the telecommunications facility located at 238 Meriden Road. I have been unable to locate the Town of Middlefield's decision in any Crown Castles files for this site. If the decision is on record in your office, would it be possible to have an electronic copy emailed to me? Please let me know either way, and I thank you in advance for your time and attention to this matter.

Best,

Anne Marie

**ANNE MARIE ZSAMBA**

Real Estate Specialist

T: (201) 236-9224

F: (724) 416-6112

**CROWN CASTLE**

3 Corporate Park Drive, Suite 101,

Clifton Park, NY 12065

[CrownCastle.com](http://CrownCastle.com)

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# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square  
New Britain, Connecticut 06051  
Phone: (860) 827-2935  
Fax: (860) 827-2950

August 18, 1999

Honorable Charles R. Augur  
First Selectman  
Town of Middlefield  
Town Administration Bldg.  
393 Jackson Hill Road, P.O. Box 179  
Middlefield, CT 06455

RE: TS-OCI-082-990816 – Omnipoint Communications request for an order to approve tower sharing at an existing telecommunications facility located at 238 Meriden Road in Middlefield, Connecticut.

Dear Mr. Augur:

The Connecticut Siting Council (Council) received this request for tower sharing, pursuant to Connecticut General Statutes § 16-50aa.

The Council will consider this item at the next meeting tentatively scheduled for Tuesday, August 31 1999, at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,

A handwritten signature in black ink, appearing to read "Joel M. Rinebold".

Joel M. Rinebold  
Executive Director

JMR/tsg

Enclosure: Notice of Tower Sharing



STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

Ten Franklin Square  
New Britain, Connecticut 06051  
Phone: (860) 827-2935  
Fax: (860) 827-2950

September 3, 1999

J. Brendan Sharkey, Esq.  
Omnipoint Communications, Inc.  
100 Filley Street  
Bloomfield, CT 06002

RE: TS-OCI-082-990816 – Omnipoint Communications request for an order to approve tower sharing at an existing telecommunications facility located at 238 Meriden Road in Middlefield, Connecticut.

Dear Mr. Sharkey:

At a public meeting held August 31, 1999, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures.

This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequency now used on this tower. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated August 16, 1999. Please notify the Council when all work is complete.

Very truly yours,

Mortimer A. Gelston  
Chairman

MAG/RKE/sll

cc: Honorable Charles R. Augur, First Selectman, Town of Middlefield  
Steve Kotfila, Site Development Manager, Sprint Spectrum, L.P.

# Exhibit B

# 238 MERIDEN RD & RT 66

**Location** 238 MERIDEN RD & RT 66

**Mblu** 2 / / 1 / /

**Acct#** 00131600

**Owner** KOLMAN JAMES

**Assessment** \$200,100

**PID** 1412

**Building Count** 1

## Current Value

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$55,100	\$145,000	\$200,100

## Owner of Record

**Owner** KOLMAN JAMES

**Sale Price** \$0

**Co-Owner** NORA L/U

**Certificate**

**Address** C/O 15 HIGBY RD

**Book & Page** 84/ 598

MIDDLEFIELD, CT 06455

**Sale Date** 06/27/1994

## Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
KOLMAN JAMES	\$0		84/ 598	06/27/1994

## Building Information

### Building 1 : Section 1

**Year Built:** 1850

**Living Area:** 2,390

**Replacement Cost:** \$183,494

**Building Percent** 30

**Good:**

**Replacement Cost**

**Less Depreciation:** \$55,000

Building Attributes	
Field	Description
Style	Old Style
Model	Residential
Grade:	Average +

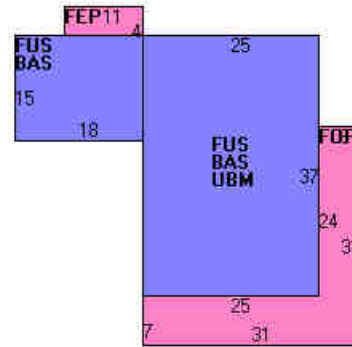
Stories:	2 Stories
Occupancy	1
Exterior Wall 1	Clapboard
Exterior Wall 2	
Roof Structure:	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Plastered
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil/Gas
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	6 Bedrooms
Total Bthrms:	1
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	12 Rooms
Bath Style:	Old Style
Kitchen Style:	Below Average
Whirlpool	
Interior	

### Building Photo



(<http://images.vgsi.com/photos/MiddlefieldCTPhotos//\01\00\11/>)

### Building Layout



(<http://images.vgsi.com/photos/MiddlefieldCTPhotos//Sketches/1>)

Building Sub-Areas (sq ft)			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	1,195	1,195	
FUS	Upper Story, Finished	1,195	1,195	
FEP	Porch, Enclosed	44	0	
FOP	Porch, Open	361	0	
UBM	Basement, Unfinished	925	0	
		3,720	2,390	

### Extra Features

Extra Features	Legend
No Data for Extra Features	

### Land

**Land Use**

**Use Code** 0101  
**Description** Single Fam MDL-01  
**Zone** DD1  
**Neighborhood** 0300  
**Alt Land Appr** No  
**Category**

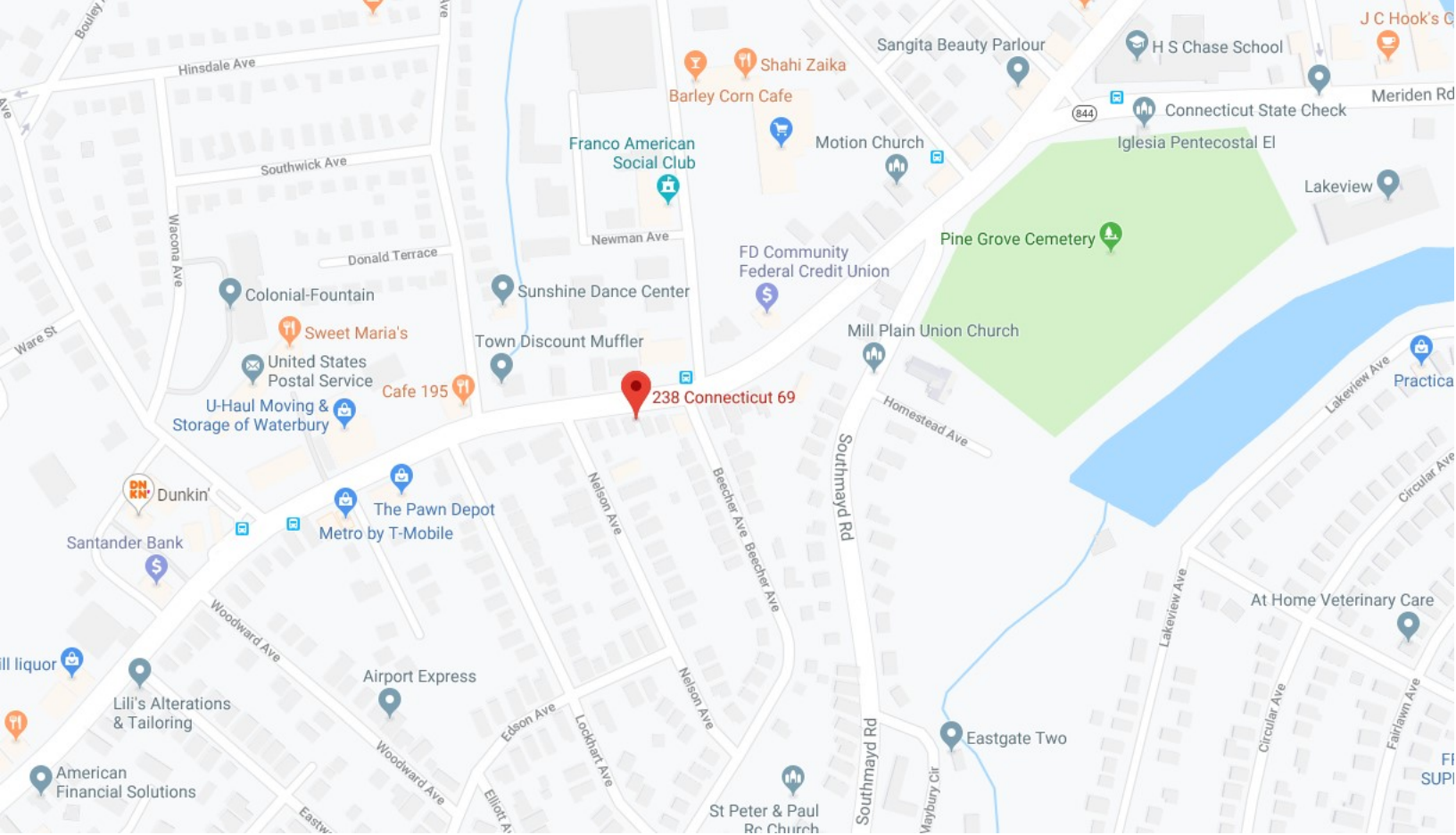
**Land Line Valuation**

**Size (Acres)** 24.54  
**Frontage**  
**Depth**  
**Assessed Value** \$145,000

**Outbuildings**

<b>Outbuildings</b>						<b><u>Legend</u></b>
<b>Code</b>	<b>Description</b>	<b>Sub Code</b>	<b>Sub Description</b>	<b>Size</b>	<b>Value</b>	<b>Bldg #</b>
BRN1	BARN - 1 STORY			4032 S.F.	\$14,500	1
BRN1	BARN - 1 STORY			2560 S.F.	\$9,200	1

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# Exhibit C



DISH WIRELESS, LLC. SITE ID:

**BOBDL00090A**

DISH WIRELESS, LLC. SITE ADDRESS:

**238 MERIDEN RD.  
MIDDLEFIELD, CT 06457**

**SCOPE OF WORK**

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

- TOWER SCOPE OF WORK:**
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
  - INSTALL (1) PROPOSED PLATFORM
  - INSTALL PROPOSED JUMPERS
  - INSTALL (6) PROPOSED RRU's (2 PER SECTOR)
  - INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
  - INSTALL (1) PROPOSED HYBRID CABLE
  - EXISTING EQUIPMENT AT CL 95' TO BE REMOVED

- GROUND SCOPE OF WORK:**
- INSTALL (1) PROPOSED METAL PLATFORM
  - INSTALL (1) PROPOSED ICE BRIDGE
  - INSTALL (1) PROPOSED PPC CABINET
  - INSTALL (1) PROPOSED EQUIPMENT CABINET
  - INSTALL (1) PROPOSED POWER CONDUIT
  - INSTALL (1) PROPOSED TELCO CONDUIT
  - INSTALL (1) PROPOSED TELCO-FIBER BOX
  - INSTALL (1) PROPOSED GPS UNIT
  - INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
  - INSTALL (1) PROPOSED CIENA BOX (IF REQUIRED)
  - EXISTING METER ON EXISTING H-FRAME TO BE UTILIZED

**SITE INFORMATION**

PROPERTY OWNER: CROWN CASTLE TOWERS 09 LLC (2)  
 ADDRESS: PO BOX 203469 C/O CROWN CASTLE INVESTMENT CORP SOLE HOUSTON, TX 77216-3469  
 TOWER TYPE: MONOPOLE  
 TOWER CO SITE ID: 876340  
 TOWER APP NUMBER: 553291  
 COUNTY: MIDDLESEX  
 LATITUDE (NAD 83): 41° 32' 45.60" N 41.548000 N  
 LONGITUDE (NAD 83): -72° 42' 53.90" W -72.714972 W  
 ZONING JURISDICTION: CONNECTICUT SITING COUNCIL  
 ZONING DISTRICT: TBD  
 PARCEL NUMBER: 21  
 OCCUPANCY GROUP: U  
 CONSTRUCTION TYPE: V-B  
 POWER COMPANY: CONNECTICUT LIGHT & POWER  
 TELEPHONE COMPANY: AT&T

**PROJECT DIRECTORY**

APPLICANT: DISH WIRELESS, LLC.  
 5701 SOUTH SANTA FE DRIVE  
 LITTLETON, CO 80120  
 TOWER OWNER: CROWN CASTLE  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
 (877) 486-9377  
 SITE DESIGNER: INFINIGY  
 2500 W. HIGGINS RD. STE. 500  
 HOFFMAN ESTATES, IL 60169  
 (847) 648-4068  
 SITE ACQUISITION: NICHOLAS CURRY  
 TBD  
 CONSTRUCTION MANAGER: JAVIER SOTO  
 TBD  
 RF ENGINEER: BOSSENER CHARLES



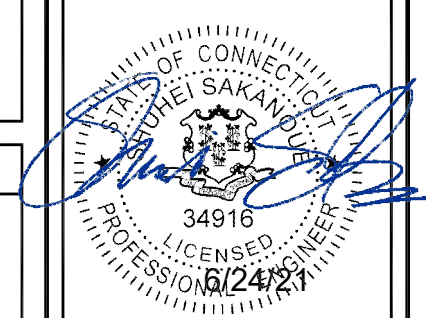
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



the solutions are endless  
 2500 W. HIGGINS RD. SUITE 500 J  
 HOFFMAN ESTATES, IL 60169  
 PHONE: 847-648-4068 | FAX: 518-690-0793  
 WWW.INFINIGY.COM



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: RCD CHECKED BY: SS APPROVED BY: CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

**SUBMITTALS**

REV	DATE	DESCRIPTION
0	06/17/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
 PROJECT INFORMATION  
 BOBDL00090A  
 238 MERIDEN RD.  
 MIDDLEFIELD, CT 06457

SHEET TITLE  
TITLE SHEET

SHEET NUMBER

**T-1**

**CONNECTICUT CODE COMPLIANCE**

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

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

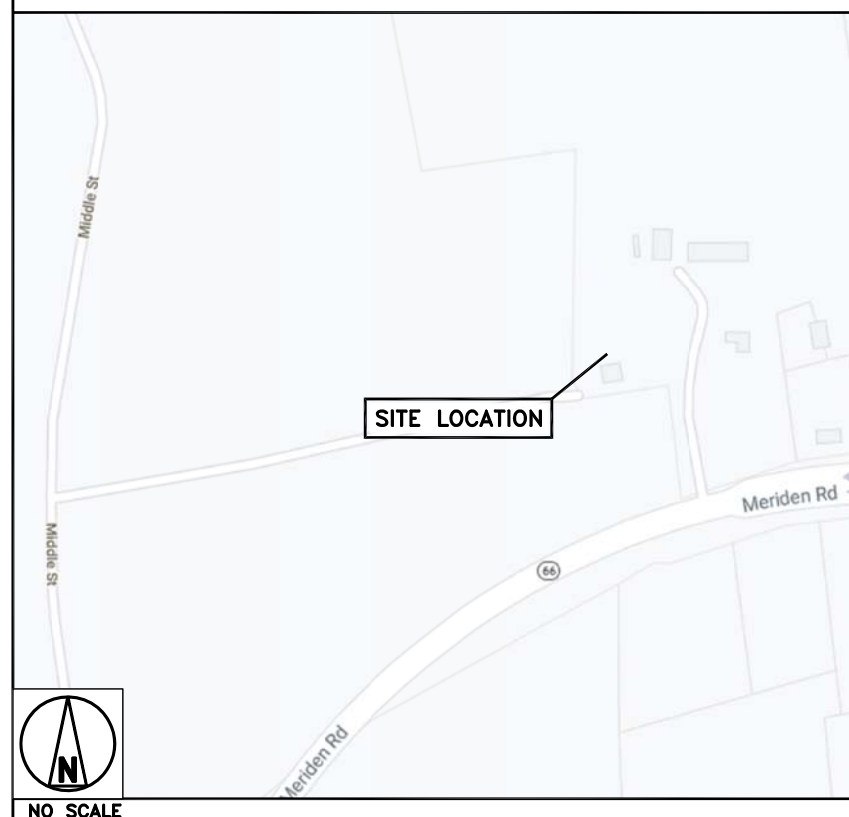
**SITE PHOTO**



**DIRECTIONS**

**DIRECTIONS FROM MERIDEN MARKHAM MUNICIPAL AIRPORT:**  
 HEAD NORTH ON EVANSVILLE AVE TOWARD BAKER AVE, TURN RIGHT ONTO BAKER AVE, ROAD NAME CHANGES TO CAMP ST, TURN RIGHT ONTO MILK ST, TURN LEFT ONTO GREGORY CT, TURN RIGHT ONTO CT-70 / MAIN ST, TURN LEFT ONTO HANOVER RD, ROAD NAME CHANGES TO HANOVER ST, TURN LEFT ONTO LINSLEY AVE, ROAD NAME CHANGES TO LEWIS AVE, TAKE THE RAMP ON THE RIGHT FOR I-691 EAST AND HEAD TOWARD MIDDLETOWN, KEEP STRAIGHT TO GET ONTO CT-66 E, TURN LEFT, ARRIVE AT 238 MERIDEN RD. MIDDLEFIELD, CT 06457

**VICINITY MAP**



UNDERGROUND SERVICE ALERT  
 UTILITY NOTIFICATION CENTER OF (STATE)  
 (XXX) XXX-XXXX  
 WWW.(WEBSITE).ORG  
 CALL # WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION



**GENERAL NOTES**

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

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

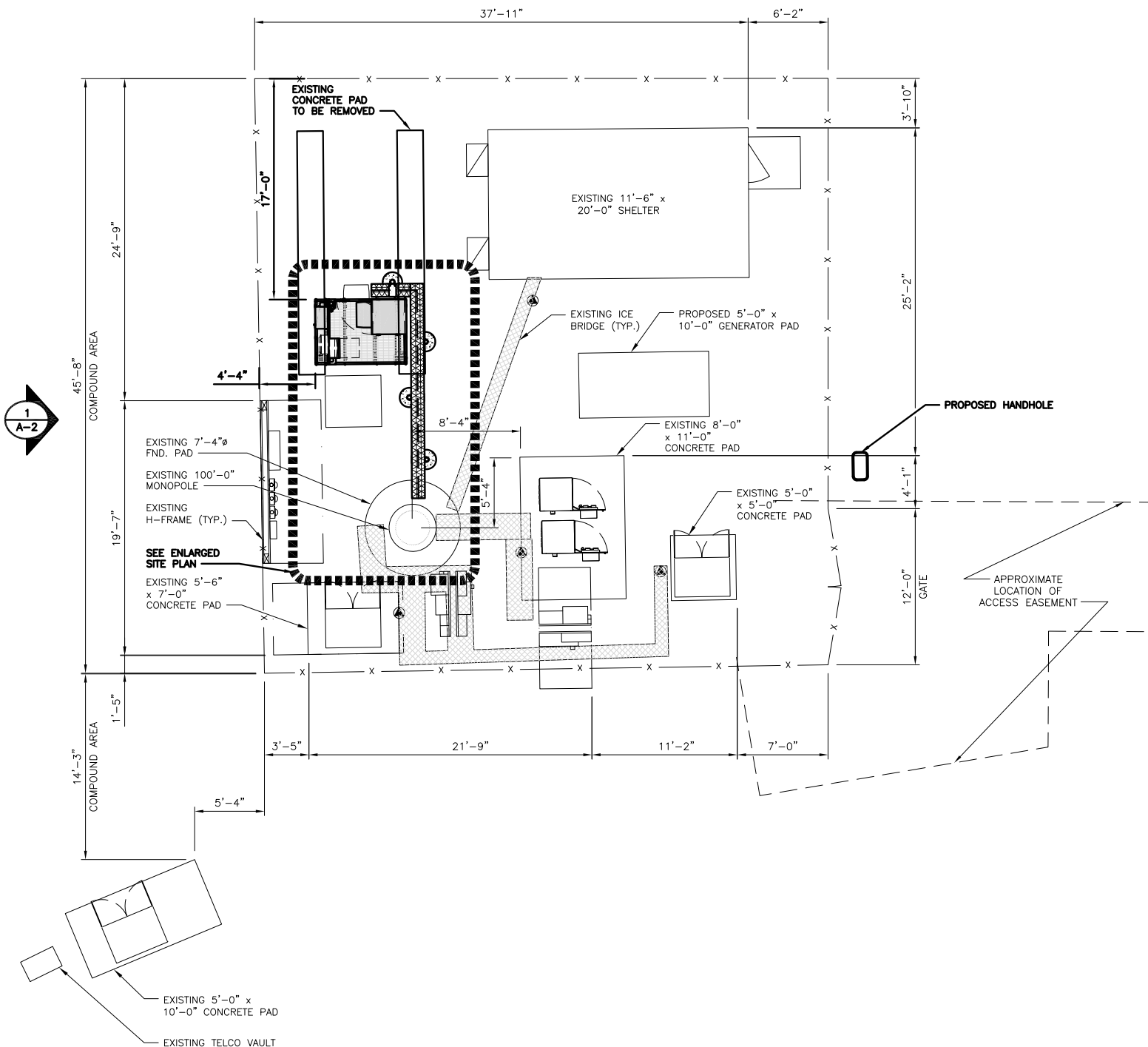
CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

**SHEET INDEX**

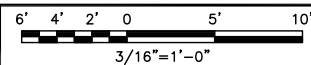
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE,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

**NOTES**

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



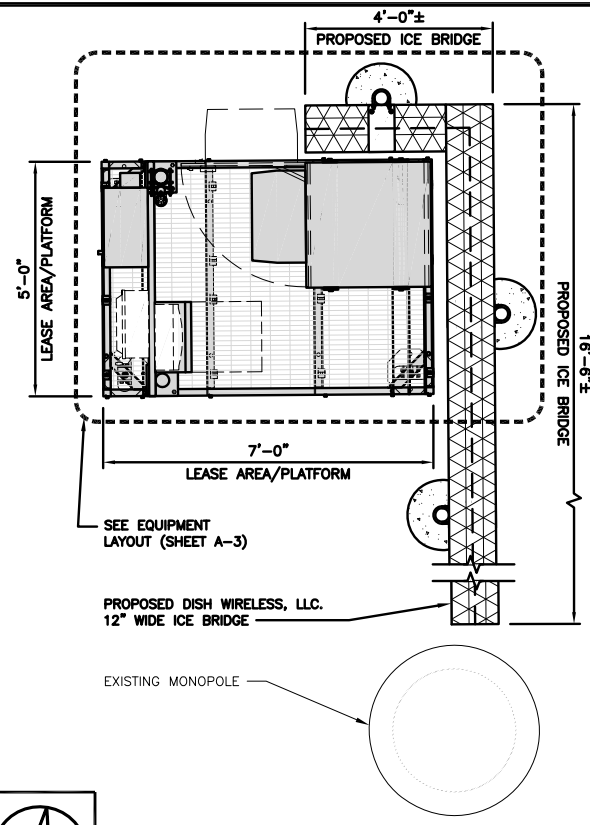
**COMPOUND PLAN**



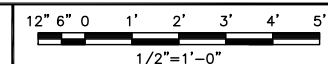
1

**NOTES**

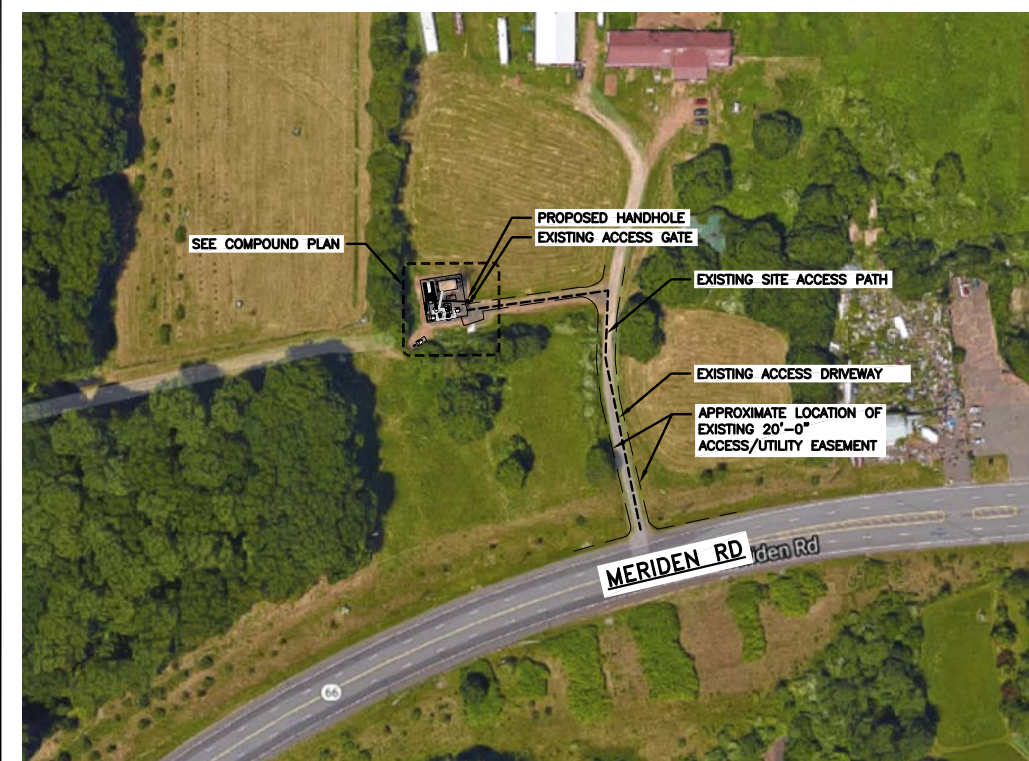
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



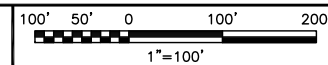
**ENLARGED SITE PLAN**



2



**SITE PLAN**



3



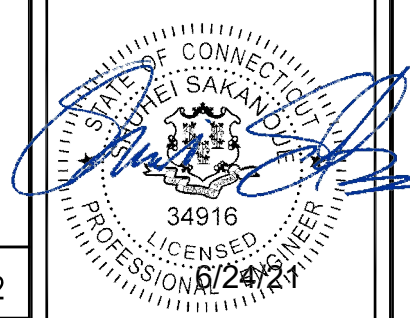
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



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DRAWN BY: RCD CHECKED BY: SS APPROVED BY: CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	06/17/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER  
2039-Z5555C

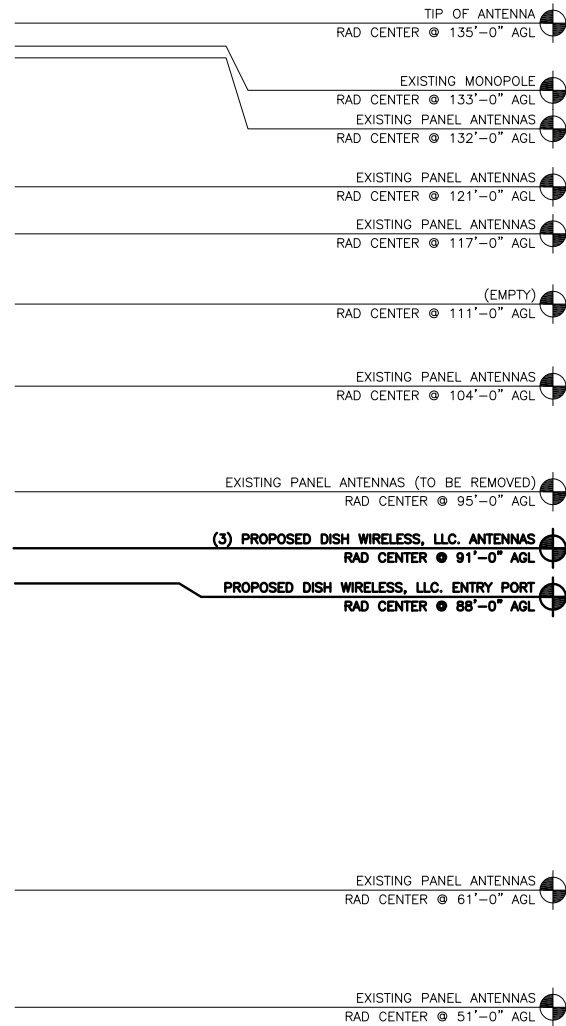
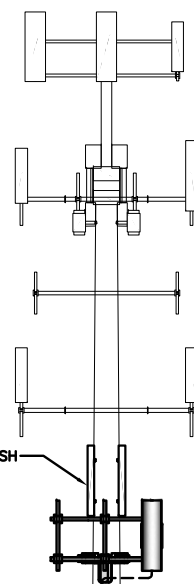
DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
OVERALL AND ENLARGED  
SITE PLAN

SHEET NUMBER  
**A-1**

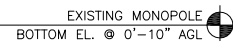
**NOTES**

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. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.

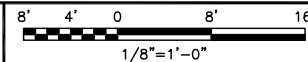


EXISTING VACANT CARRIER ANTENNAS AND ASSOCIATED EQUIPMENT TO BE REMOVED BY DISH

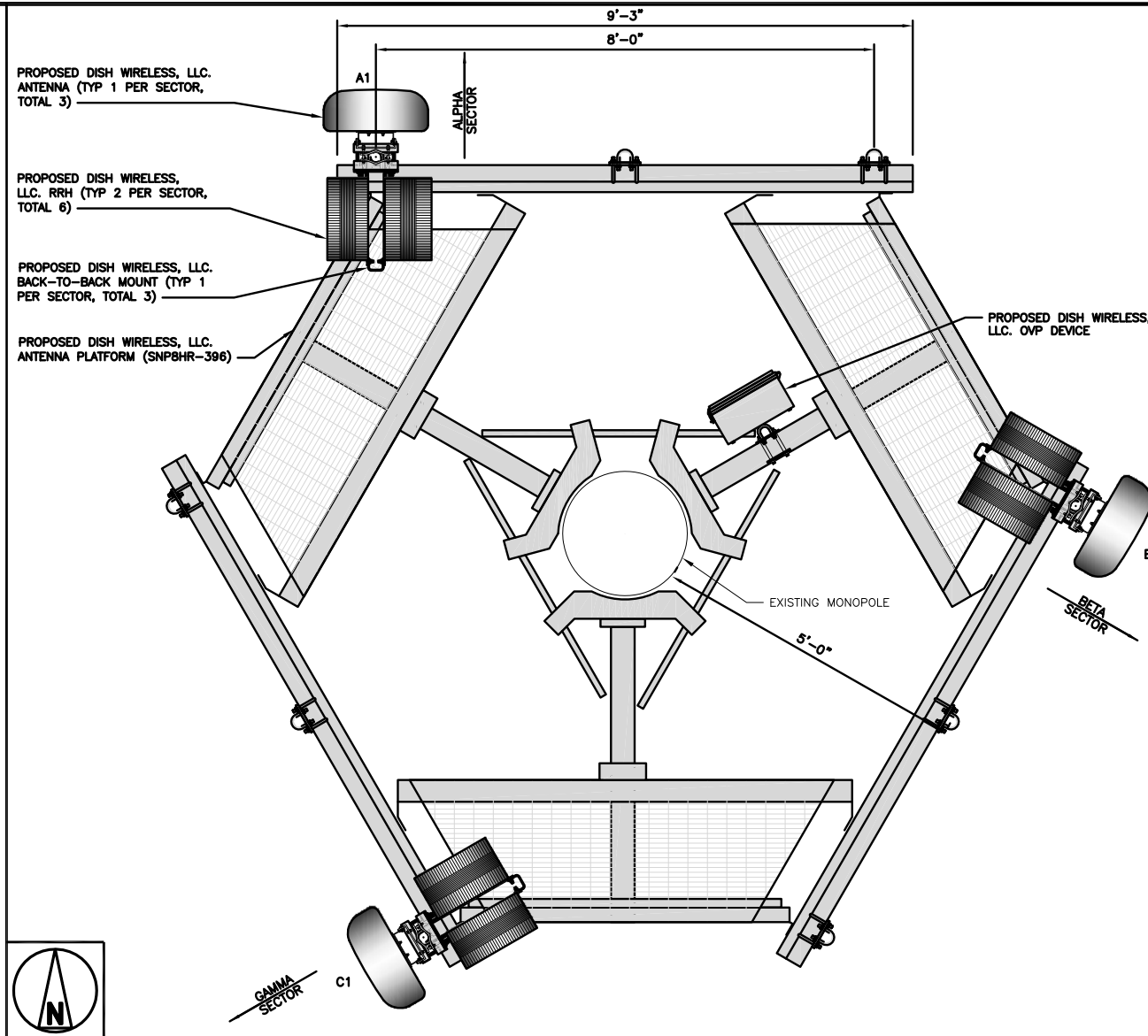
PROPOSED DISH WIRELESS, LLC. ICE BRIDGE  
 PROPOSED DISH WIRELESS, LLC. GPS UNIT  
 PROPOSED DISH WIRELESS, LLC. EQUIPMENT ON PROPOSED STEEL PLATFORM



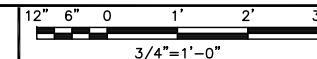
**PROPOSED WEST ELEVATION**



1



**ANTENNA LAYOUT**



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS - MX08FR0665-20	5G	72.0" x 20.0"	0°	91'-0"	(1) HIGH-CAPACITY HYBRID CABLE (141' LONG)
BETA	B1	PROPOSED	JMA WIRELESS - MX08FR0665-20	5G	72.0" x 20.0"	120°	91'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS - MX08FR0665-20	5G	72.0" x 20.0"	240°	91'-0"	

- NOTES**
1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
  2. ANTENNA OR 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.

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU - TA08025-B604	5G	1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.
	A1	FUJITSU - TA08025-B605	5G	
BETA	B1	FUJITSU - TA08025-B604	5G	
	B1	FUJITSU - TA08025-B605	5G	
GAMMA	C1	FUJITSU - TA08025-B604	5G	
	C1	FUJITSU - TA08025-B605	5G	

**ANTENNA SCHEDULE**

NO SCALE

3



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RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

**SUBMITTALS**

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A&E PROJECT NUMBER

2039-Z5555C

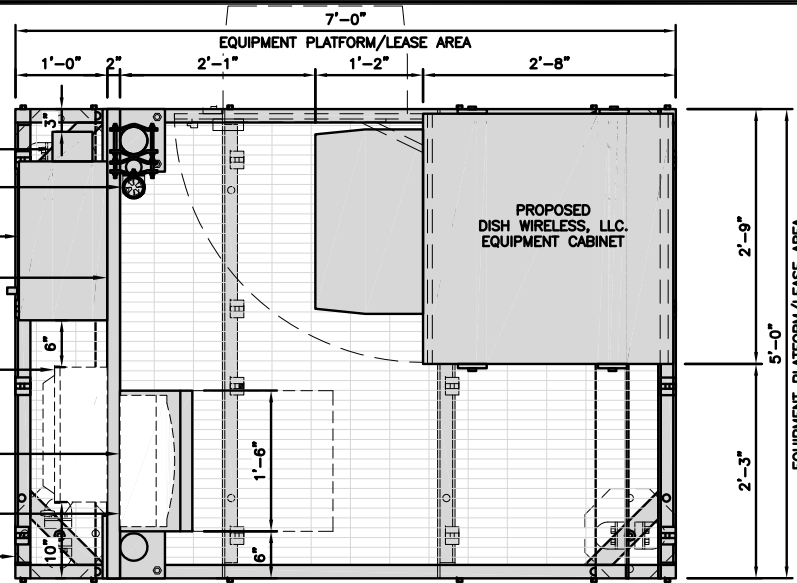
DISH WIRELESS, LLC.  
 PROJECT INFORMATION  
 BOBDL00090A  
 238 MERIDEN RD.  
 MIDDLEFIELD, CT 06457

SHEET TITLE  
 ELEVATION, ANTENNA  
 LAYOUT AND SCHEDULE

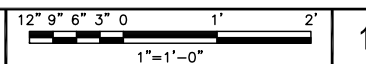
SHEET NUMBER

**A-2**

- PROPOSED DISH WIRELESS, LLC. GENERATOR PLUG
- PROPOSED DISH WIRELESS, LLC. GPS UNIT
- PROPOSED DISH WIRELESS, LLC. POWER PROTECTIVE CABINET
- PROPOSED DISH WIRELESS, LLC. H-FRAME
- PROPOSED DISH WIRELESS, LLC. SAFETY SWITCH. SPACE RESERVED FOR ADDITIONAL DISCONNECT IF REQUIRED.
- PROPOSED DISH WIRELESS, LLC. TELCO FIBER ENCLOSURE
- PROPOSED DISH WIRELESS, LLC. CIENA BOX. SPACE RESERVED IF REQUIRED
- PROPOSED DISH WIRELESS, LLC. EQUIPMENT PLATFORM



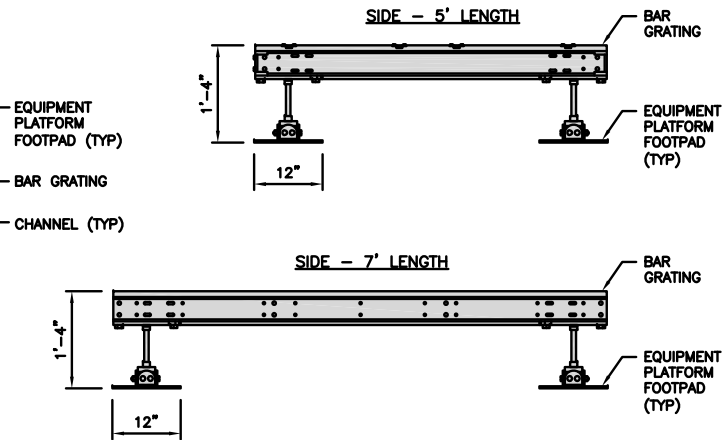
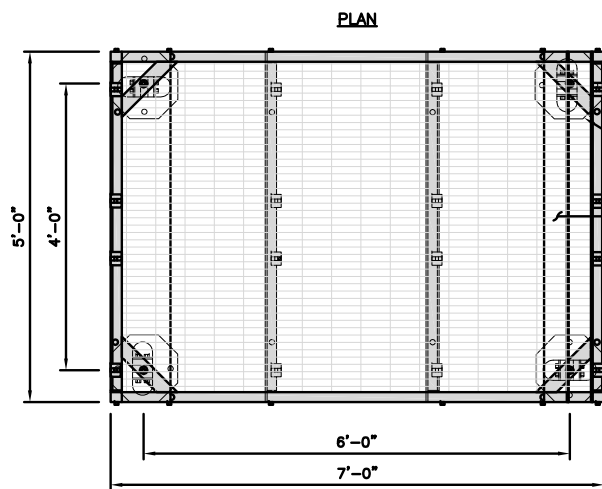
PLATFORM EQUIPMENT PLAN



1

COMMSCOPE MTC4045LP  
5X7 PLATFORM

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

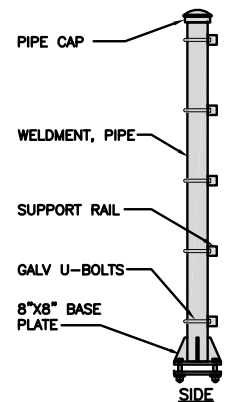
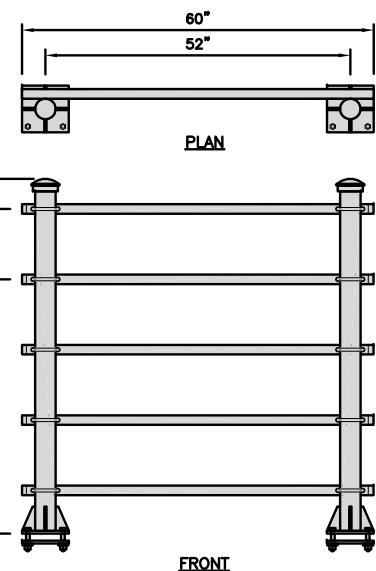


PLATFORM DETAIL

NO SCALE 2

KENWOOD T1701KT5-5S  
H-FRAME

UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS



H-FRAME DETAIL

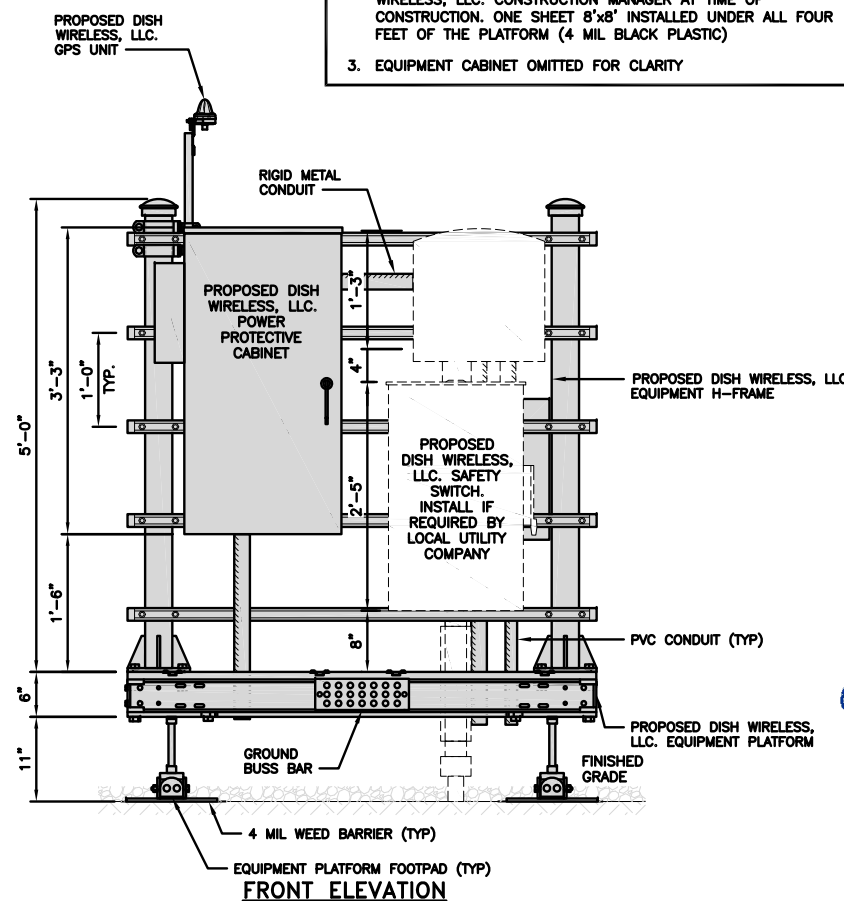
NO SCALE 3

NOT USED

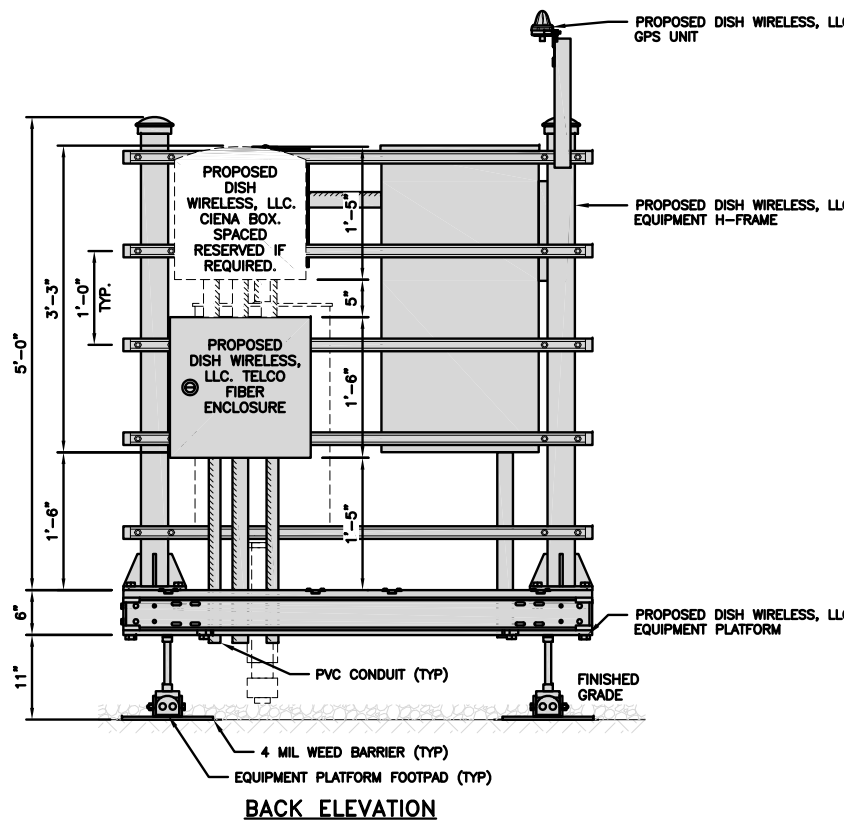
NO SCALE 4

NOTES

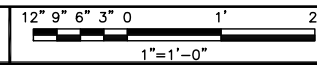
1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH WIRELESS, LLC. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8"x8" INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT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



FRONT ELEVATION



BACK ELEVATION



H-FRAME EQUIPMENT ELEVATION

5



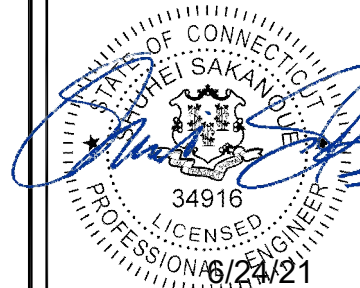
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RCD SS CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
EQUIPMENT PLATFORM AND  
H-FRAME DETAILS

SHEET NUMBER

A-3

CHARLES INDUSTRY HEX CUBE-PM369155N4	
DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	-48VDC ABB
TOTAL WEIGHT (EMPTY)	394 LBS

PLAN

SIDE BACK SIDE FRONT

**CABINET DETAIL** NO SCALE 1

RAYCAP RDIAC-6512-P-240-MTS POWER & TELCO PROTECTION CABINET	
DIMENSIONS (HxWxD)	40"x20"x10"
WEIGHT/ VOLUME	124 LBS
MANUAL TRANSFER SWITCH	200A
LOAD CENTER	30 POSITION
MAIN BREAKER	200A, 65kA AIC
GENERATOR RECEPTACLE	CAMLOCK
NEMA RATING	3R POWDER COATED ALUMINUM
SURGE PROTECTION DEVICE	UL 1449 4TH EDITION LISTED

PLAN

SIDE FRONT

**POWER PROTECTION CABINET (PPC) DETAIL** NO SCALE 2

SQUARE D SAFETY SWITCH D324NRB	
ENCLOSURE DIM (HxWxD)	29.25"x17.25"x8.25"
TOTAL WEIGHT (EMPTY)	45.33 LBS
MAX VOLTAGE/AMPS/WATT	240V/200A/48000W
ENCLOSURE RATING	OUTDOOR NEMA 3R

PLAN

SIDE BACK FRONT

**SAFETY SWITCH** NO SCALE 3

**NOT USED** NO SCALE 4

CIENA 3931 SERVICE DELIVERY SWITCH	
DIMENSIONS (HxWxD)	17.0"x16.8"x7.0" 431x427x178mm
WEIGHT	28.6 LBS/13.0 KG
POWER INPUT	60W MAX

PLAN

FRONT SIDE BACK

**CIENA DETAIL** NO SCALE 5

CHARLES FIBER TELCO ENCLOSURE CUBE-MP1818WB-A	
ENCLOSURE DIM (HxWxD)	18.0"x18.0"x9.25"
NEMA RATING	4X
THERMAL	SEALED
MOUNTING BACKBOARD	WOOD

PLAN

SIDE BACK FRONT

**FIBER TELCO ENCLOSURE DETAIL** NO SCALE 6

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT		INCLUDED PRODUCTS: WB-T12-3 TRAPEZE KIT, 3 RUNGS WB-LB12-3 SUPPORT BRACKET MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"
DIMENSIONS (HxL)	160"x10'	
WEIGHT/ VOLUME	325.0 LBS	
CABLE RUN (QTY)	12	

PLAN FRONT SIDE

**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

3" DIA SCH 40 PIPE

18" DIA DRILLED PIER FOUNDATION

A-A SECTION

**TYPICAL ICE BRIDGE CONCRETE PIER DETAIL** NO SCALE 8

PROPOSED ICE BRIDGE

PROPOSED X" DIA HYBRID CABLE (OPTION "A")

PROPOSED X" DIA HYBRID CABLE (OPTION "B")

PROPOSED CABLE CLAMP ● 3'-0" O.C.

HYBRID SUPPORT BRACKET AND BANDING ● 10'-0" O.C.

EXISTING ENTRY PORT

EXISTING MONOPOLE

**HYBRID CABLE RUN** NO SCALE 9

**dish wireless.**

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**CROWN CASTLE**

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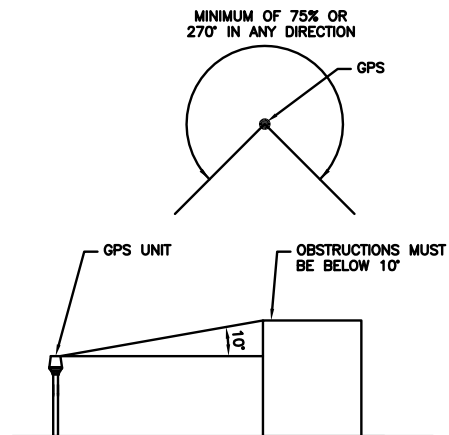
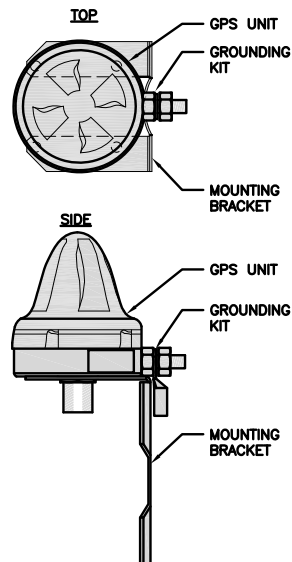
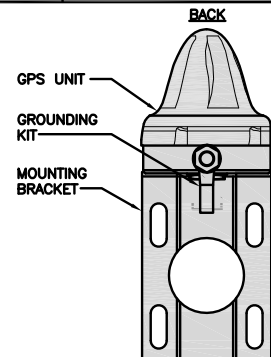
A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
**A-4**

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



GPS ANTENNA DETAIL

NO SCALE 1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE 2

NOT USED

NO SCALE 3

NOT USED

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9

**dish**  
wireless.

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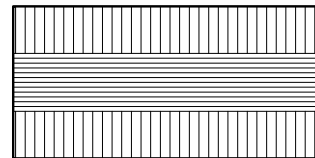
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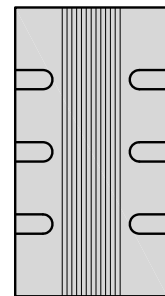
SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
**A-5**

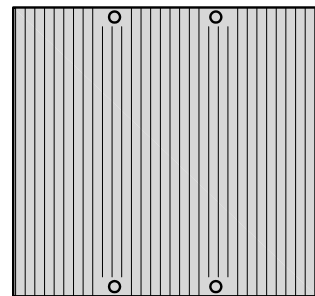
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN

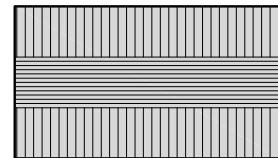


SIDE

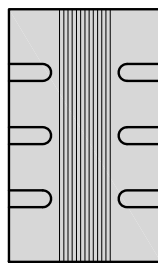


FRONT

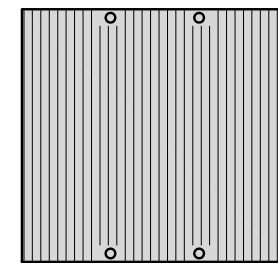
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



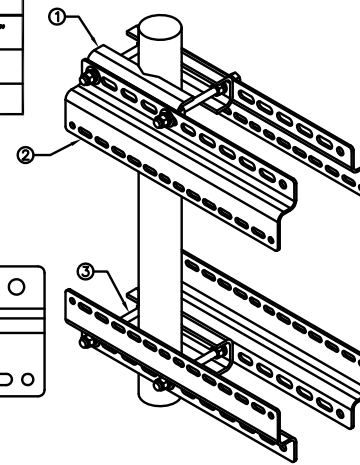
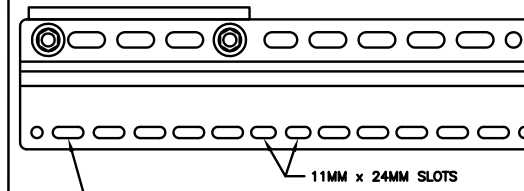
FRONT

**NOTES**  
FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

**NOTES**  
FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

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

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



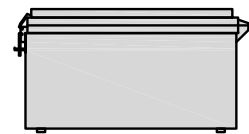
11MM x 30MM SLOTS  
40MM ON CENTER  
11MM x 24MM SLOTS

REMOTE RADIO MOUNT DETAIL NO SCALE 3

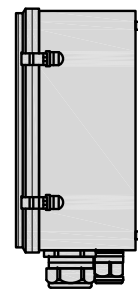
REMOTE RADIO HEAD DETAIL NO SCALE 1

REMOTE RADIO HEAD DETAIL NO SCALE 2

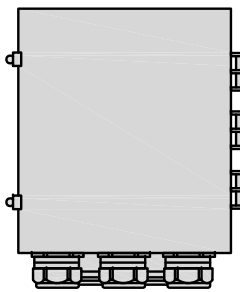
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



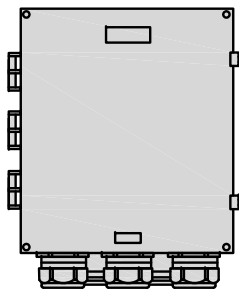
PLAN



SIDE



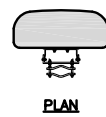
BACK



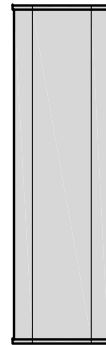
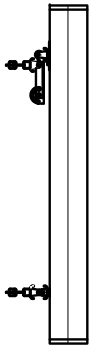
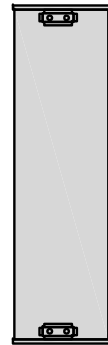
FRONT

SURGE SUPPRESSION DETAIL NO SCALE 4

JMA WIRELESS MX08FRO665-20 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

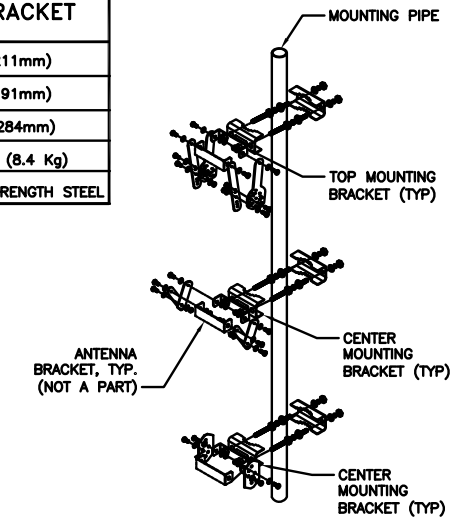


PLAN



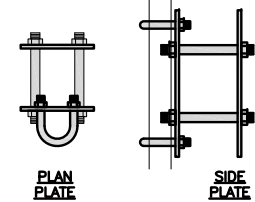
ANTENNA DETAIL NO SCALE 5

JMA 91900318 MOUNTING BRACKET	
WIDTH	8.3" (211mm)
DEPTH	7.5" (191mm)
HEIGHT	11.2" (284mm)
TOTAL WEIGHT (WITH BRACKETS)	18.5 LBS (8.4 Kg)
HOUSING MATERIAL	GALV. HIGH STRENGTH STEEL



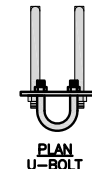
ANTENNA MOUNTING DETAIL NO SCALE 6

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



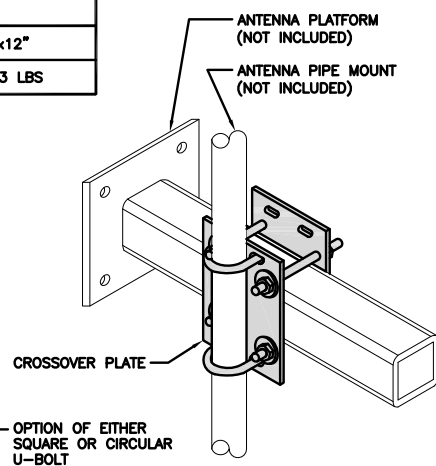
PLAN PLATE

SIDE PLATE



PLAN U-BOLT

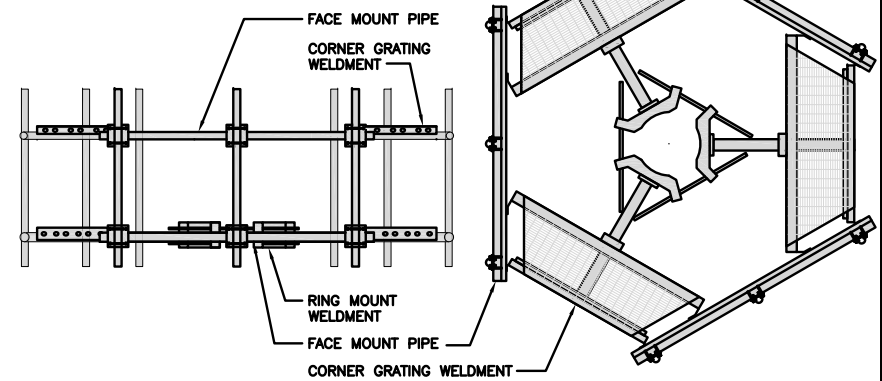
SIDE U-BOLT



CROSSOVER PLATE  
OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

RRH/OVP MOUNT DETAIL NO SCALE 7

SITEPRO1 SNP8HR-396 SNUB-NOSE PLATFORM	
FACE SIZE	8'-0"
WEIGHT	1786.28 LB
ANTENNA PIPE MOUNTS	(6) 2-3/8" O.D.



ANTENNA PLATFORM DETAIL NO SCALE 8

NOT USED NO SCALE 9



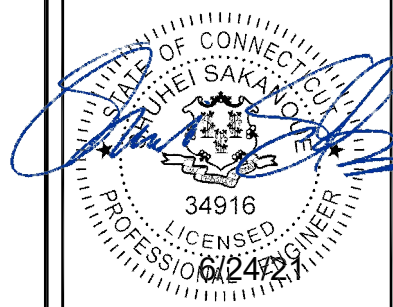
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RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	06/17/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER  
2039-Z5555C  
DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
A-6



**NOTES**

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

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

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

**dish**  
wireless.

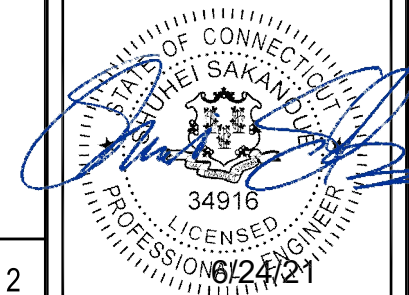
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RFDS REV #: N/A

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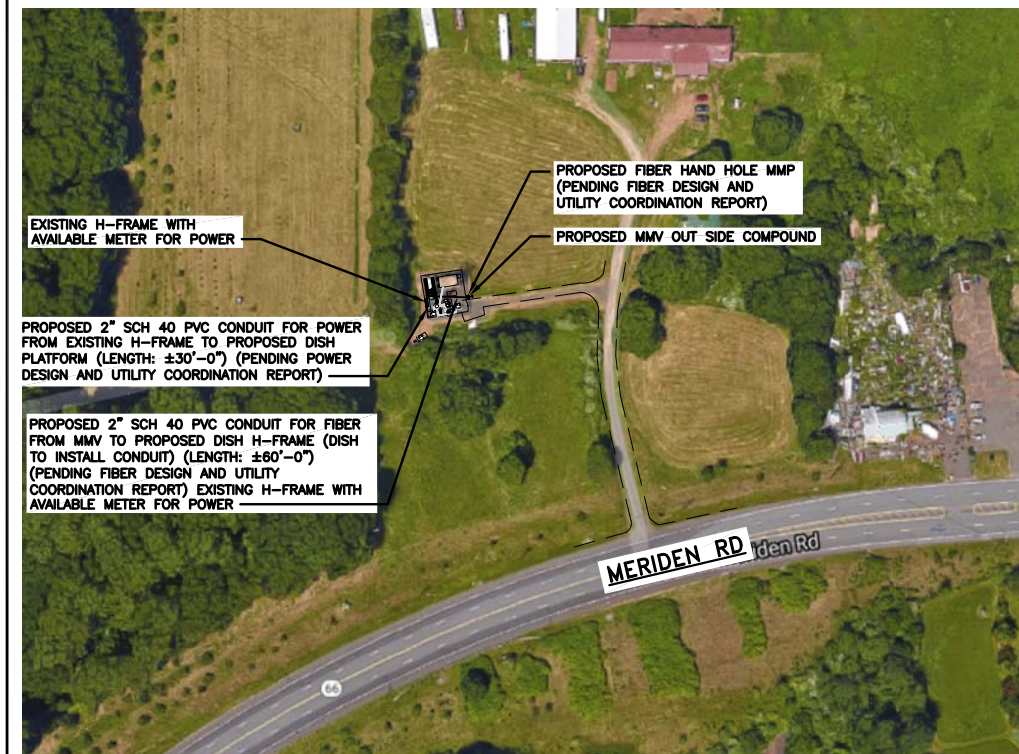
SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

SHEET NUMBER

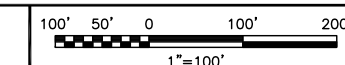
**E-1**

**ELECTRICAL NOTES**

2

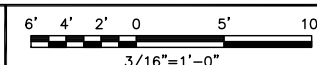


OVERALL UTILITY ROUTE PLAN

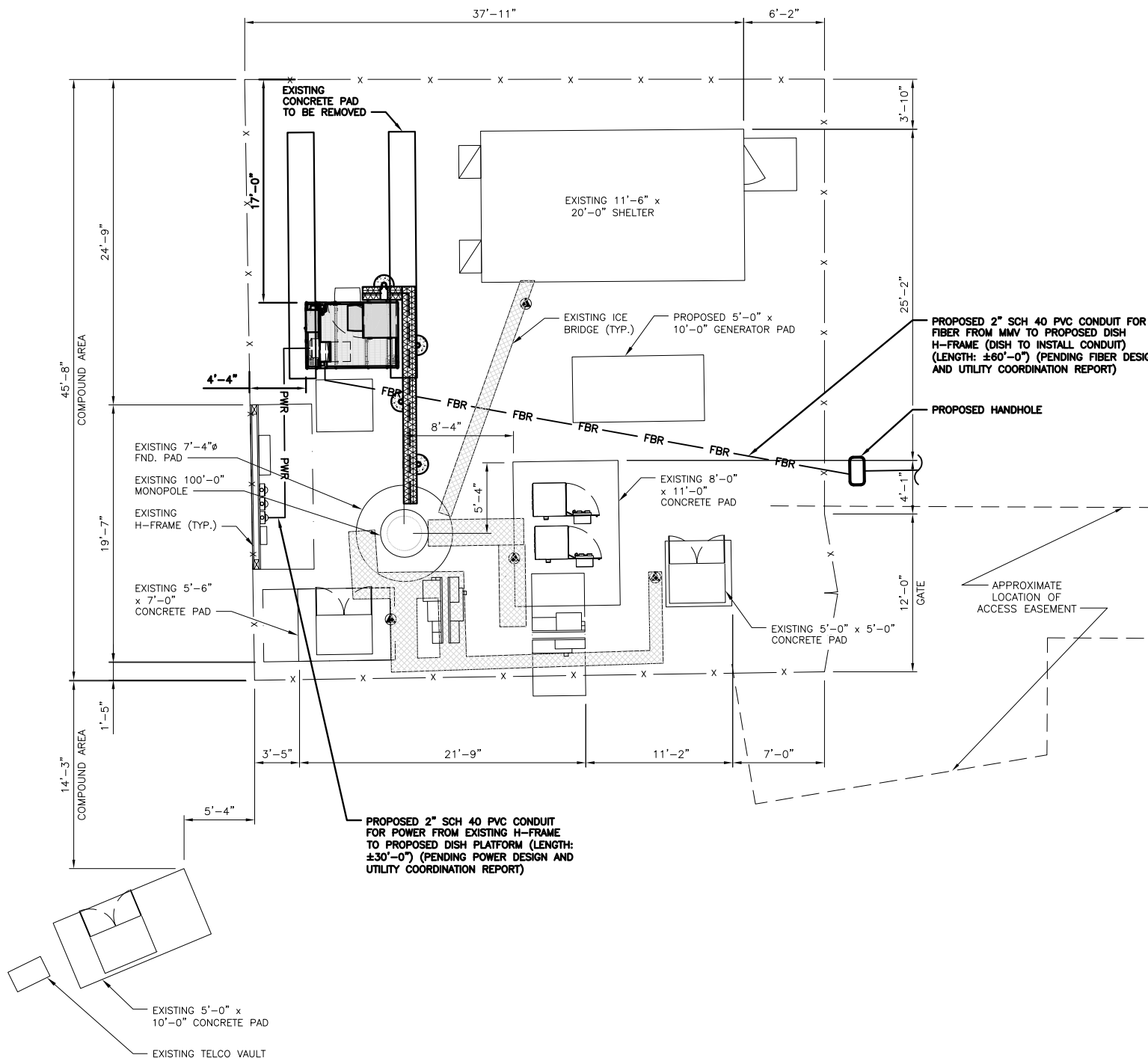


3

UTILITY ROUTE PLAN

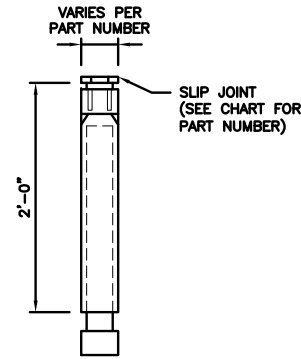


1



UTILITY ROUTE PLAN

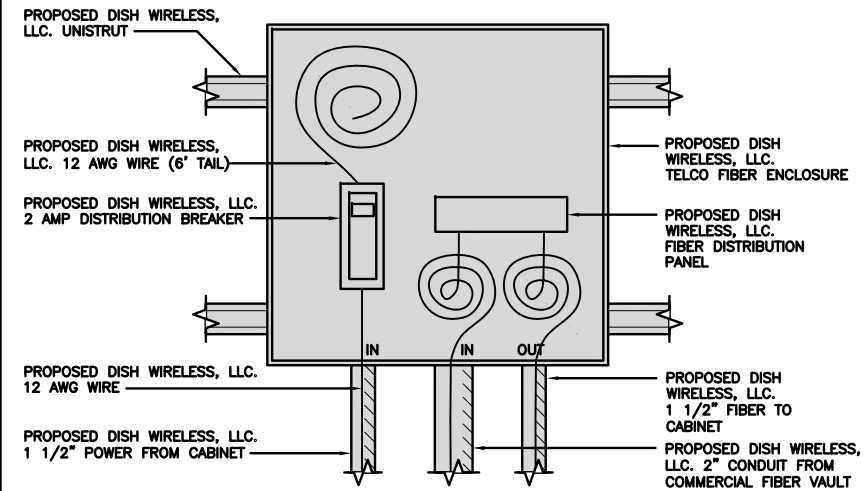
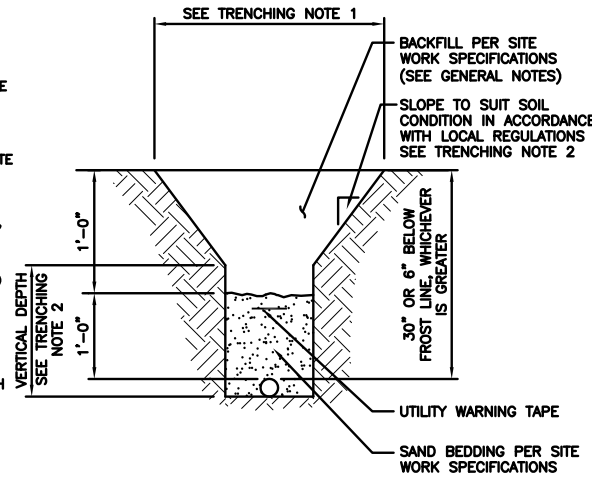
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"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

1. 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.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
3. 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.



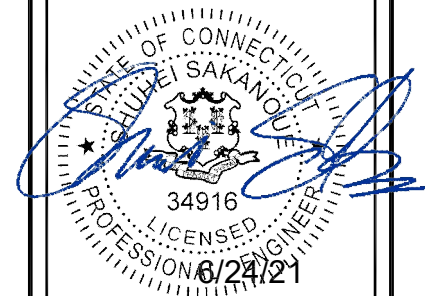
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RCD SS CJW

RFDS REV #: N/A

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DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
ELECTRICAL  
DETAILS

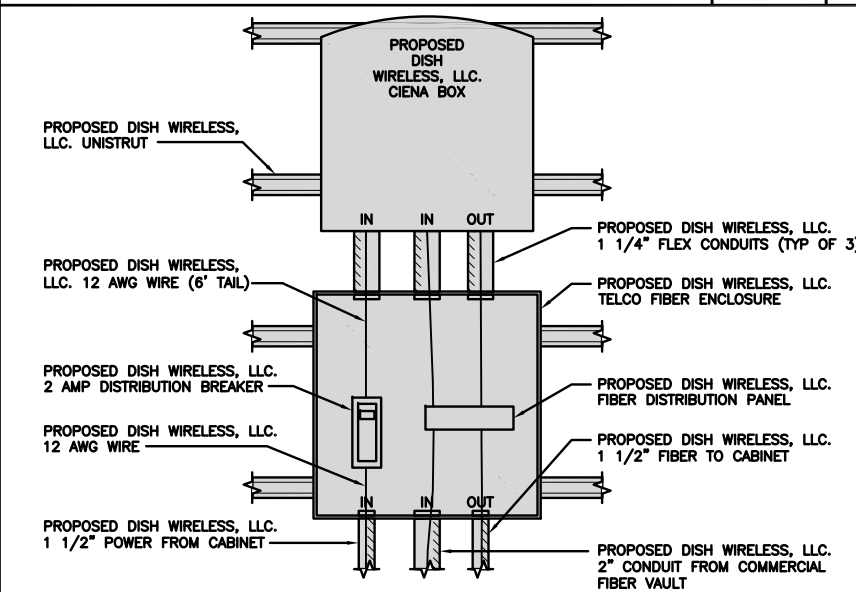
SHEET NUMBER

**E-2**

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 NO SCALE 4

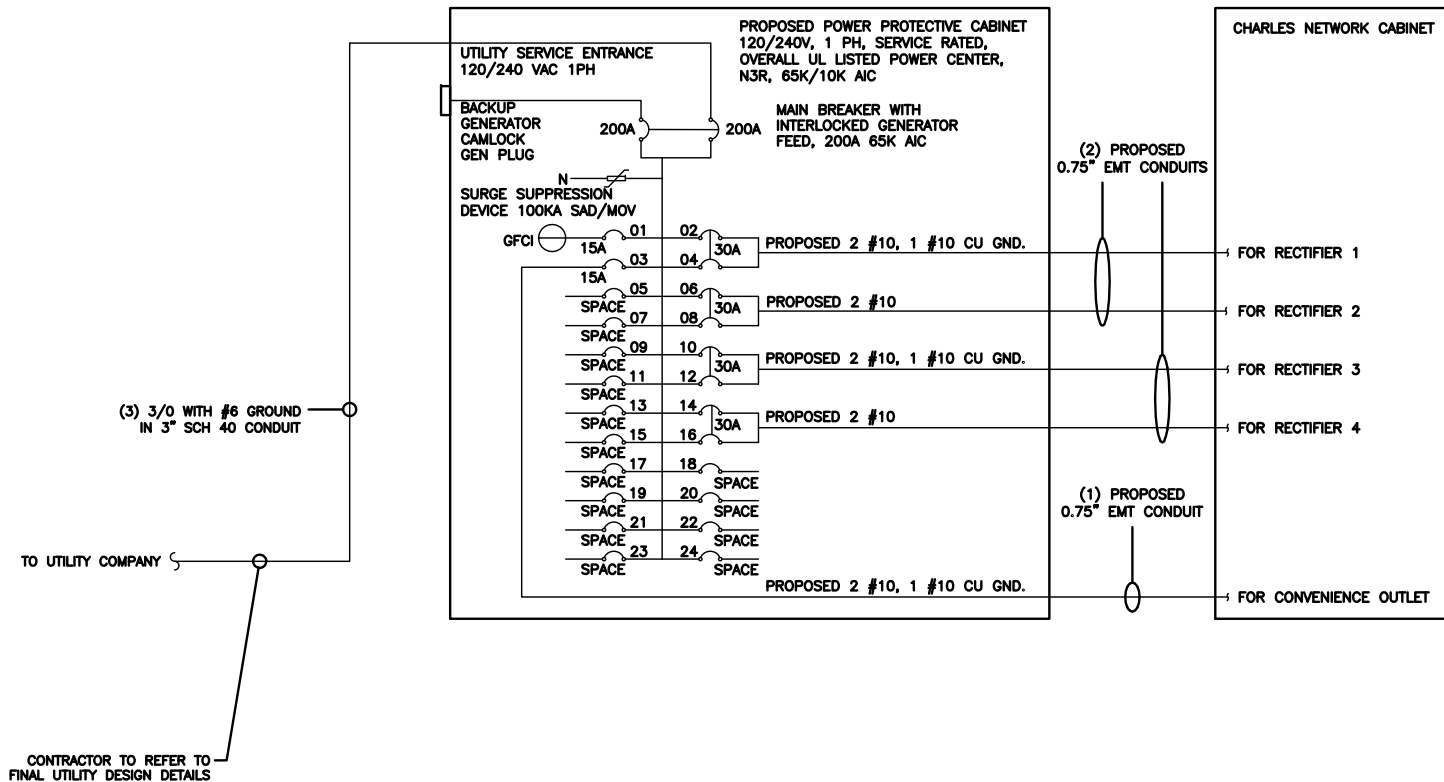
NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



**NOTES**

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUIT AND FEEDERS COMPLY WITH THE NEC (LISTED ON T-1) ARTICLE 210.19(A)(1) FPN NO. 4.

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

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

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

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

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING THWN-2, CU.  
 #10 - 0.0211 SQ. IN X 4 = 0.0844 SQ. IN  
 #10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND  
 TOTAL = 0.1055 SQ. IN

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

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

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

**dish wireless.**

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STATE OF CONNECTICUT  
LUKEI SAKAWO  
34916  
LICENSED PROFESSIONAL ENGINEER  
6/24/21

**PPC ONE-LINE DIAGRAM**

NO SCALE 1

**PROPOSED CHARLES PANEL SCHEDULE**

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

**PANEL SCHEDULE**

NO SCALE 2

**NOT USED**

NO SCALE 3

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DRAWN BY: RCD    CHECKED BY: SS    APPROVED BY: CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS

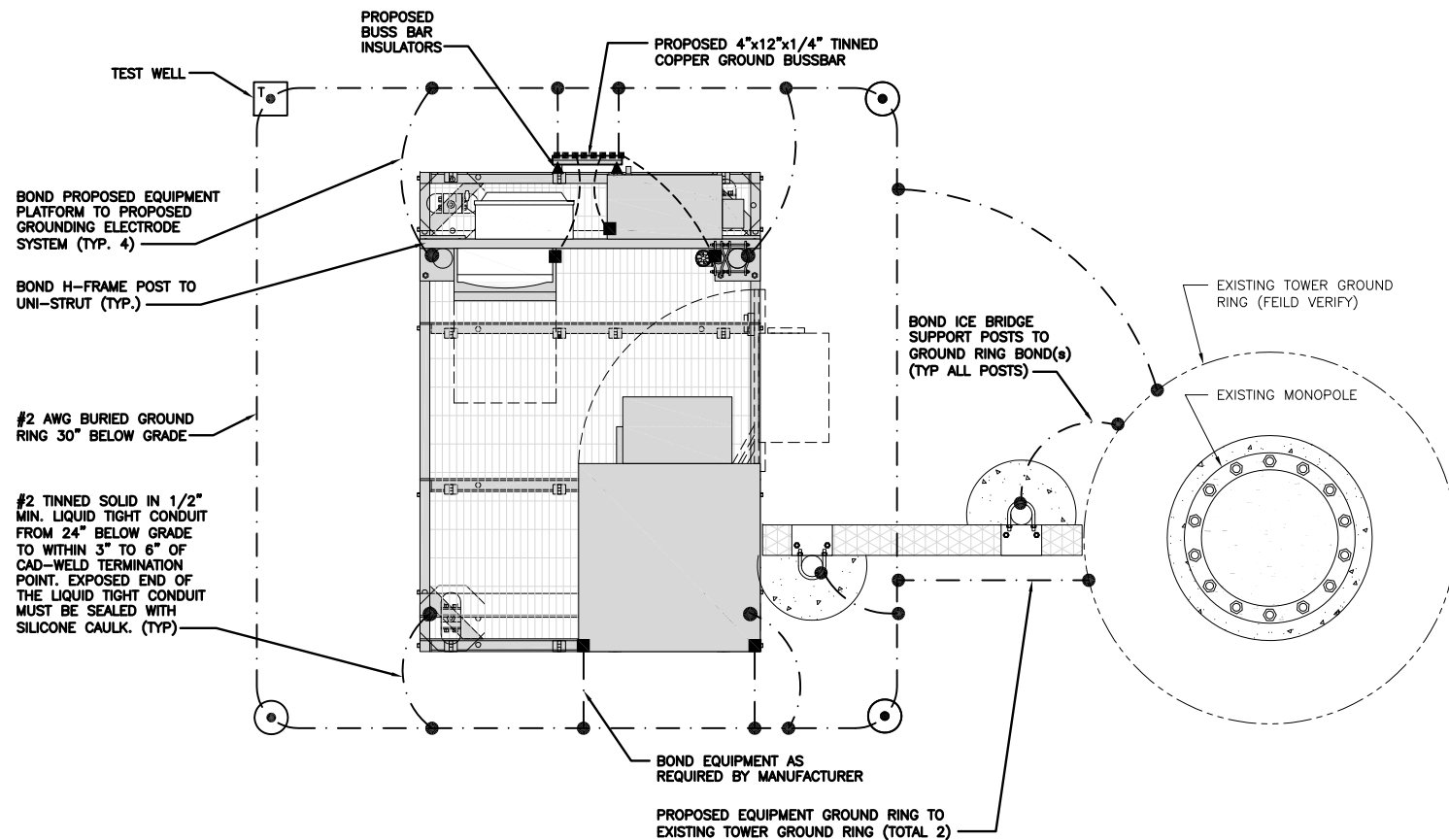
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A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

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

SHEET NUMBER  
**E-3**

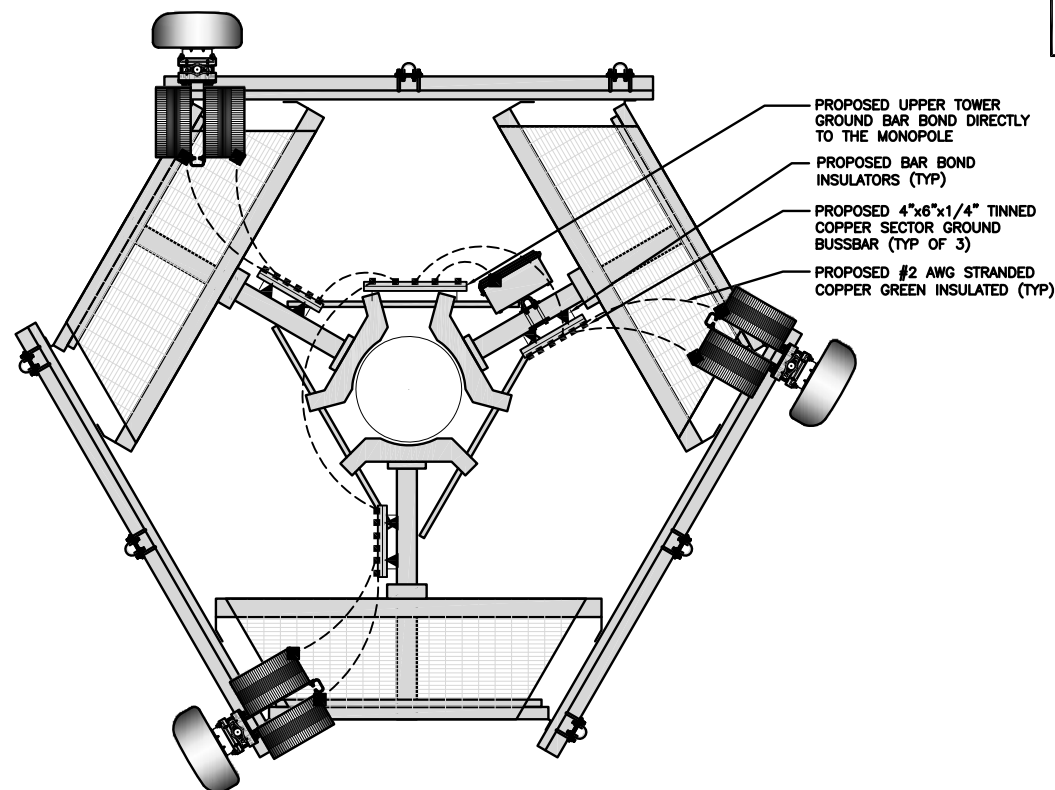


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

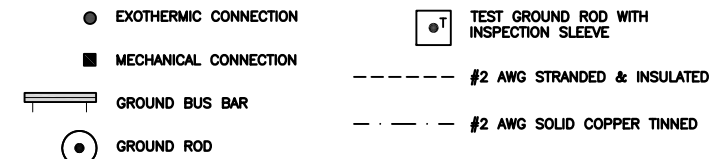
NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

- GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
- CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH WIRELESS, LLC. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
- ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

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

GROUNDING KEY NOTES

NO SCALE 3



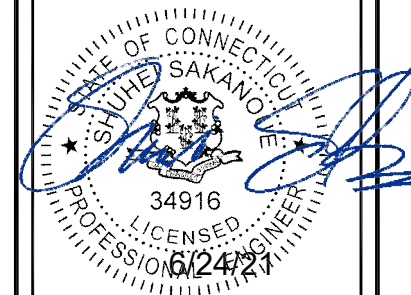
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RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

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A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

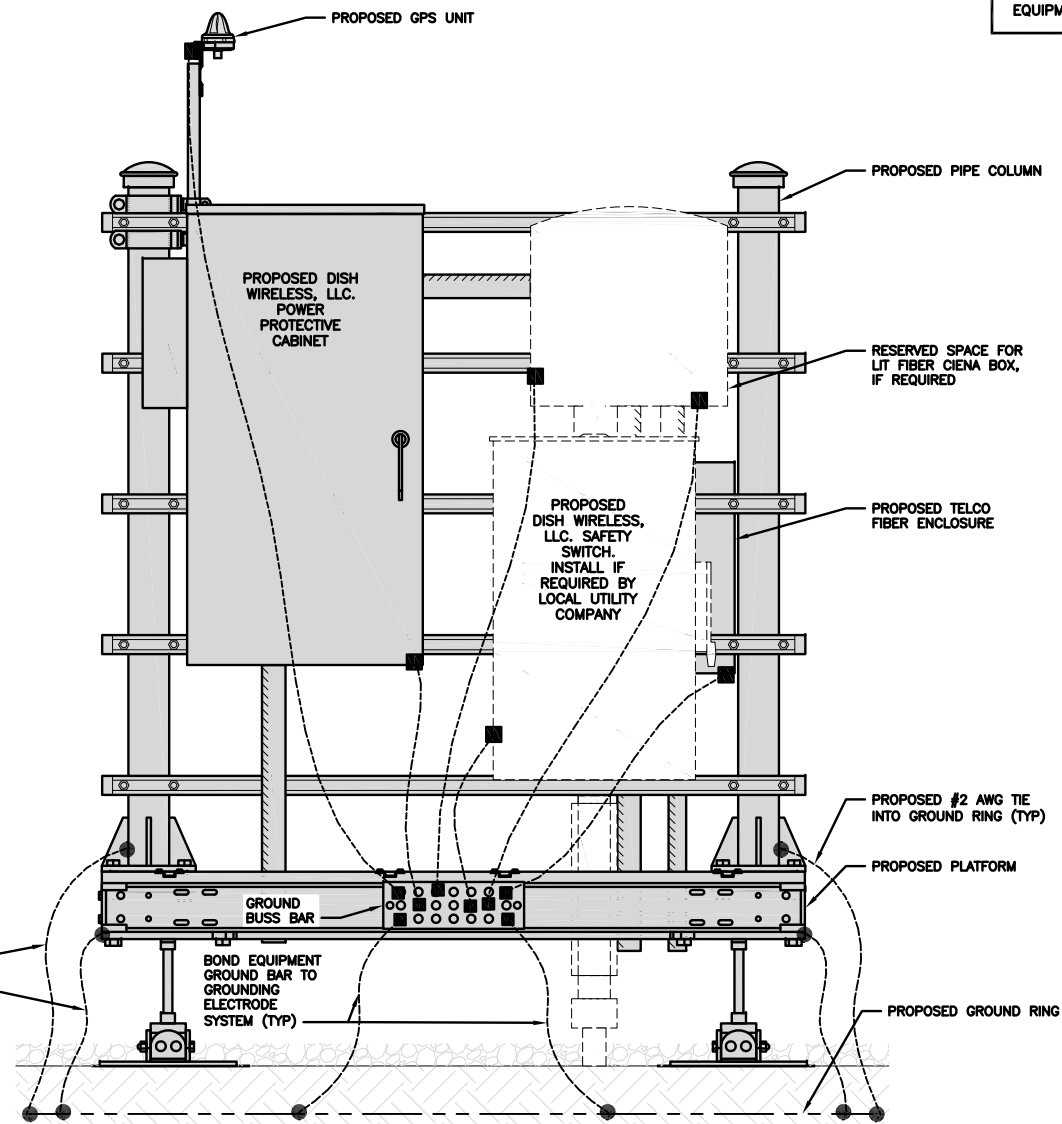
SHEET TITLE  
GROUNDING PLANS  
AND NOTES

SHEET NUMBER

G-1

**NOTES**

EQUIPMENT CABINET OMITTED FOR CLARITY



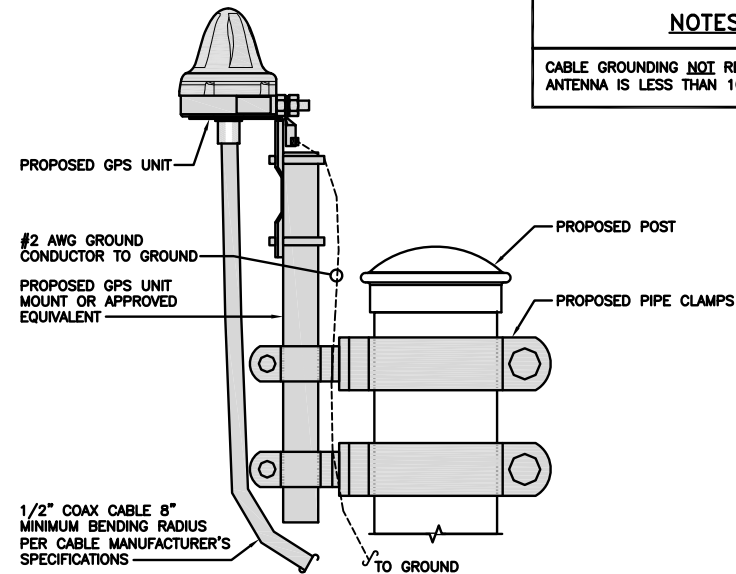
#2 TINNED SOLID IN 1/2" MIN. LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (TYP)

**H-FRAME GROUNDING DETAIL**

NO SCALE 1

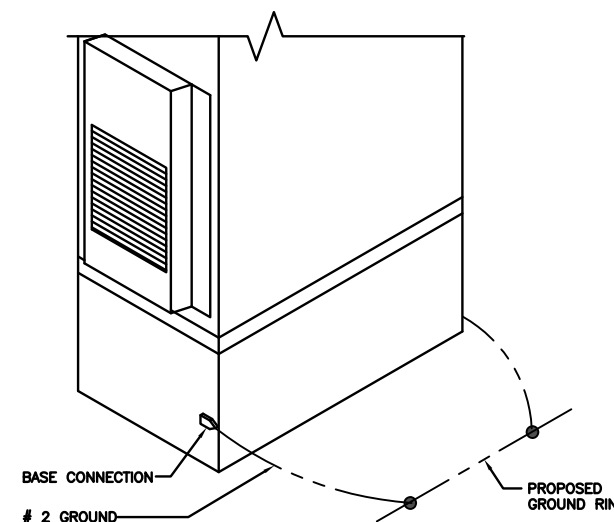
**NOTES**

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



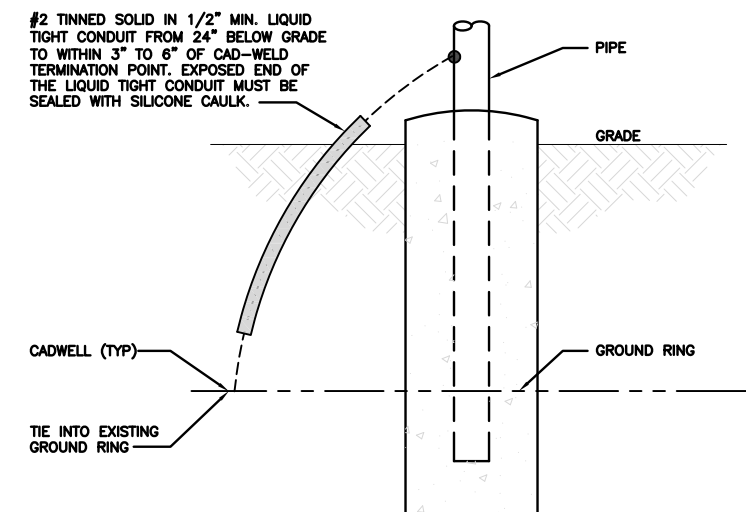
**TYPICAL GPS UNIT GROUNDING**

NO SCALE 2



**OUTDOOR CABINET GROUNDING**

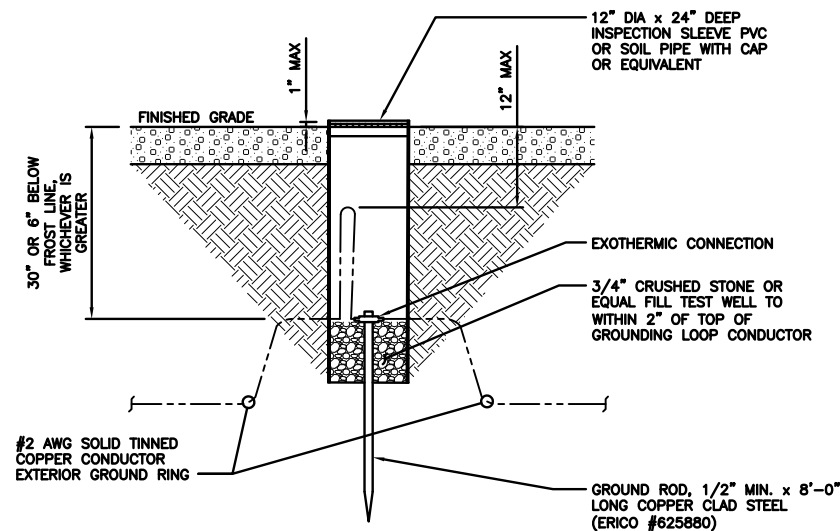
NO SCALE 3



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

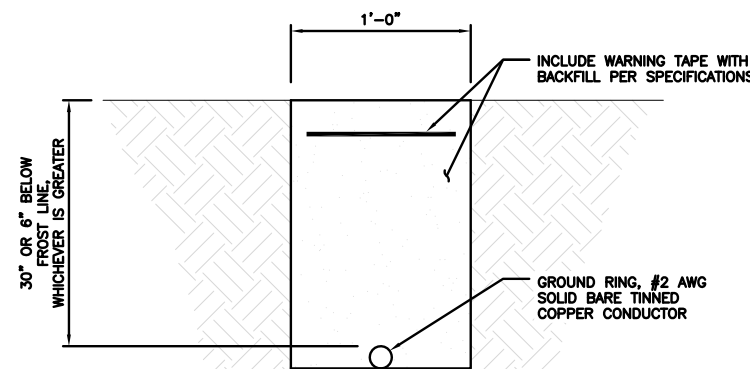
**TRANSITIONING GROUND DETAIL**

NO SCALE 4



**TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE**

NO SCALE 5



**TYPICAL GROUND RING TRENCH**

NO SCALE 6

**dish wireless.**

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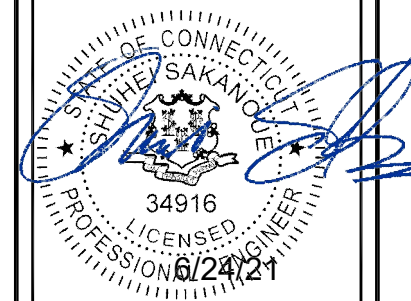
**CROWN CASTLE**

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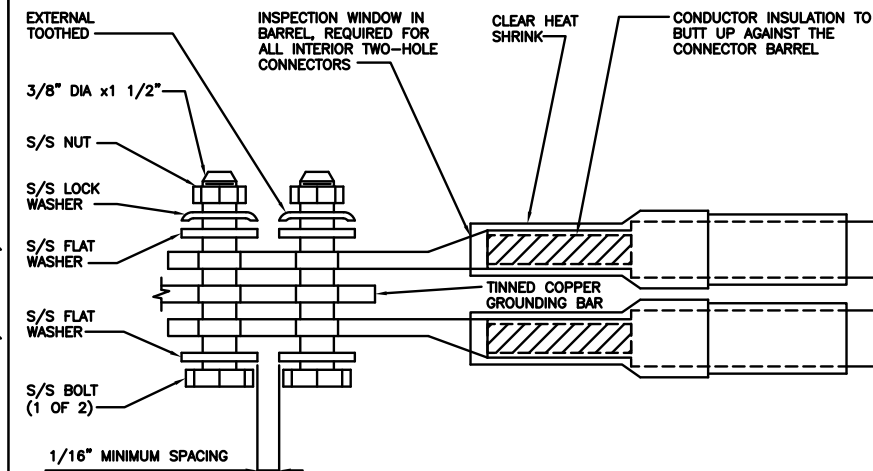
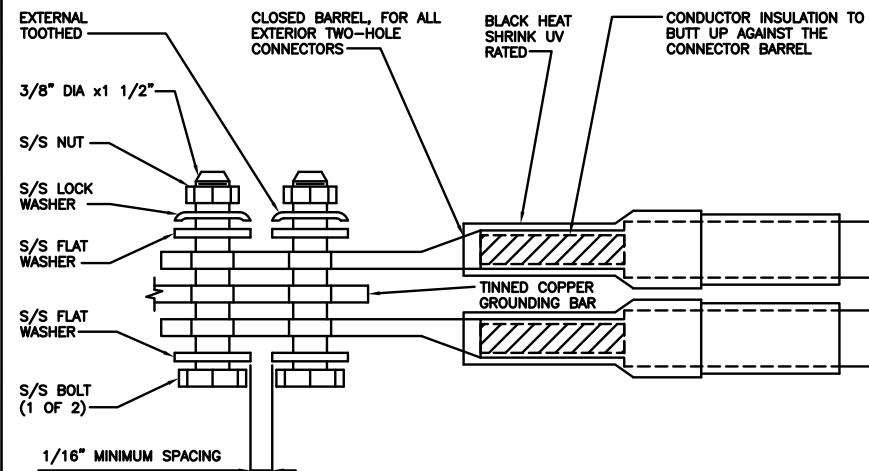
SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

**G-2**

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



TYPICAL GROUNDING NOTES

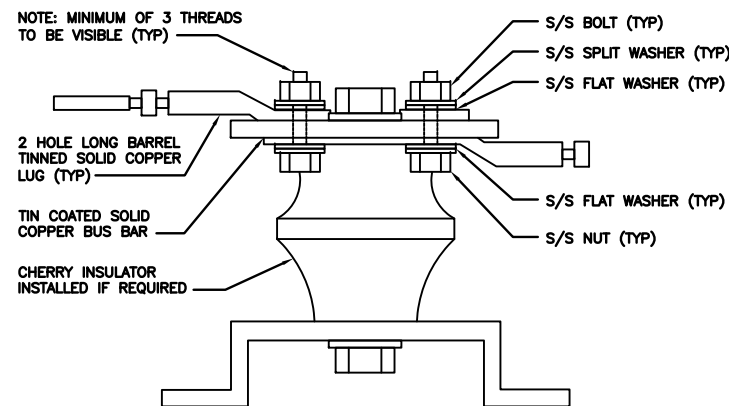
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9

**dish**  
wireless.

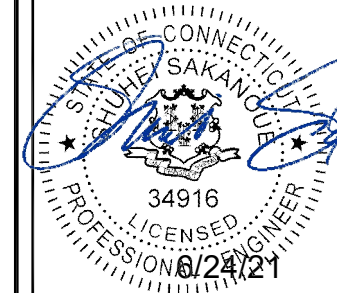
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MIDDLEFIELD, CT 06457

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER

**G-3**

**RF JUMPER COLOR CODING**

3/4" TAPE WIDTHS WITH 3/4" SPACING

<p>LOW-BAND RRH - (600MHz N71 BASEBAND) + (850MHz N26 BAND) + (700MHz N29 BAND) - OPTIONAL PER MARKET</p> <p>ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BANDS)</p>	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 (1) PORT	ORANGE	ORANGE		WHITE (1) PORT	ORANGE	ORANGE		WHITE (1) PORT	ORANGE	ORANGE	
			WHITE (1) PORT				WHITE (1) PORT				WHITE (1) PORT	
<p>MID-BAND RRH - (AWS BANDS N66+N70)</p> <p>ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BANDS)</p>	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 (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE
				WHITE (1) PORT			WHITE (1) PORT				WHITE (1) PORT	WHITE (1) PORT
<p><b>HYBRID/DISCREET CABLES</b></p> <p>INCLUDE SECTOR BANDS BEING SUPPORTED AM LONG WITH FREQUENCY BANDS</p> <p>EXAMPLE 1 - HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS</p> <p>EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS</p>	EXAMPLE 1	EXAMPLE 2										
	RED	RED										
BLUE	BLUE											
GREEN	GREEN											
ORANGE		YELLOW										
PURPLE												
<p><b>HYBRID/DISCREET CABLES</b></p> <p>LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY</p>	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH						
	RED	RED	BLUE	BLUE	GREEN	GREEN						
		PURPLE		PURPLE		PURPLE						
<p><b>POWER CABLES TO RRHs</b></p> <p>LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY</p>	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH						
	RED	RED	BLUE	BLUE	GREEN	GREEN						
		PURPLE		PURPLE		PURPLE						
<p><b>RET MOTORS AT ANTENNAS</b></p>	PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"									
	RED	BLUE	GREEN									
<p><b>MICROWAVE RADIO LINKS</b></p> <p>LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE. ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.</p> <p>MICROWAVE CABINETS WILL REQUIRE P-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID'S.</p>	PRIMARY	SECONDARY										
	WHITE	WHITE										
RED	RED											
WHITE	WHITE											
	RED											
	WHITE											

**RF CABLE COLOR CODES**

NO SCALE 1

NOT USED

NO SCALE 4

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

ORANGE

AWS  
(N65+N70+H-BLOCK)

PURPLE

CBRS TECH  
(3 GHz)

YELLOW

NEGATIVE SLANT PORT  
ON ANTRRH

WHITE

ALPHA SECTOR

RED

BETA SECTOR

BLUE

GAMMA SECTOR

GREEN

**COLOR IDENTIFIER**

NO SCALE 2

NOT USED

NO SCALE 3

NOT USED

NO SCALE 4



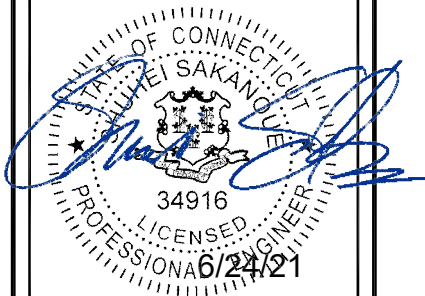
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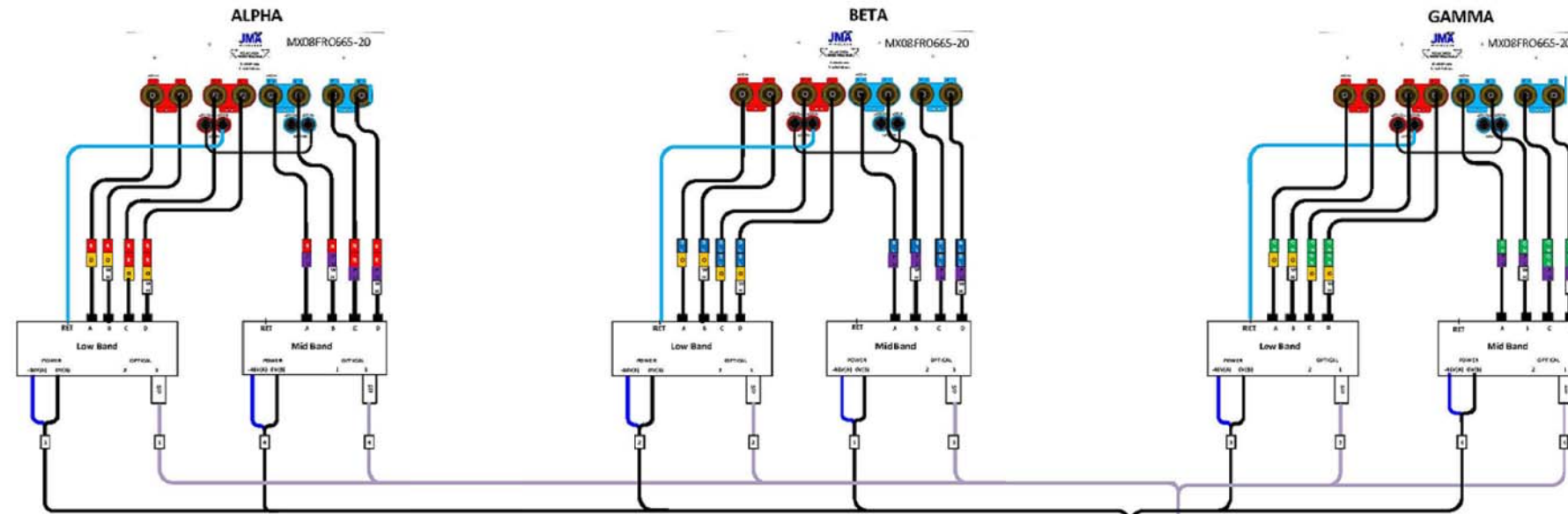
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2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
RF  
CABLE COLOR CODES

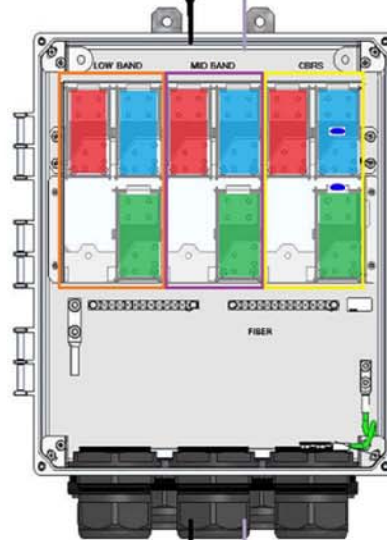
SHEET NUMBER

**RF-1**



Fiber Patch Panel

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



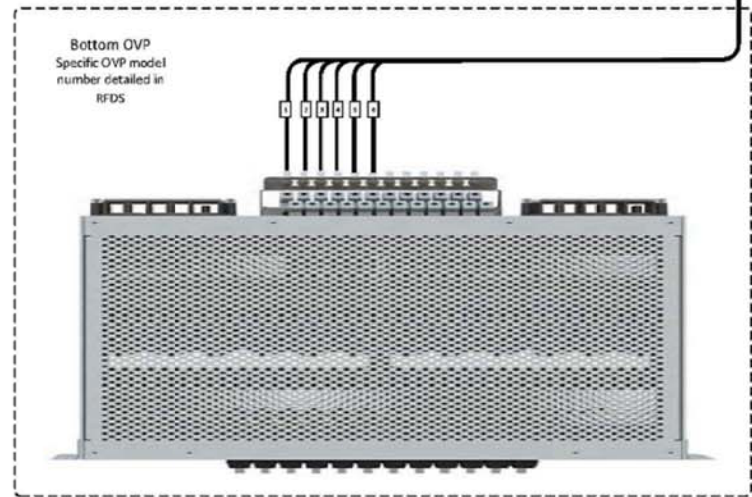
Port	Interface	Description
0	GO0/0/0	SiteBos
1	GO0/0/1	CBRS - Alpha
2	GO0/0/2	CBRS - Beta
3	GO0/0/3	CBRS - Gamma
4	Te0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/9	Fujitsu Mid-Band RU - Gamma
10	Te0/0/10	Fixed VNB
11	Te0/0/11	Fixed VNB
12	Te0/0/12	Fixed VNB
13	Te0/0/13	Fixed VNB
14	Te0/0/14	CBRS1
15	Te0/0/15	CBRS2
16	Te0/0/16	CBRS3
17	GO0/0/17	SM1 - BMC
18	GO0/0/18	SM2 - BMC
19	Te0/0/19	SM1 - Data 1
20	Te0/0/20	SM1 - Data 2
21	Te0/0/21	SM2 - Data 1
22	Te0/0/22	SM2 - Data 2
23	Te0/0/23	Reserved Uplink (EDC, LDC)
24	Te0/0/24	Blank/Future
25	Te0/0/25	Blank/Future
26	Te0/0/26	Fiber NLI
27	Te0/0/27	Fiber NLI
28	Te0/0/28	Blank/Future
29	Te0/0/29	Blank/Future

top

bottom

Bottom OVP Layout

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



	5G plumbing diagram JMA MX08FRO665-20			
	2-2-2(LB+MB)			
Issue No.	ISS	ISS DATE	ISS BY	REV
5-Jan-2023	1000	10/10/22	1000	3

PLUMBING DIAGRAM

NO SCALE 1



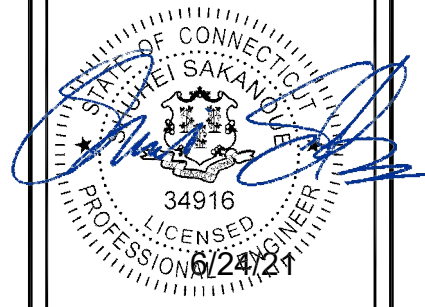
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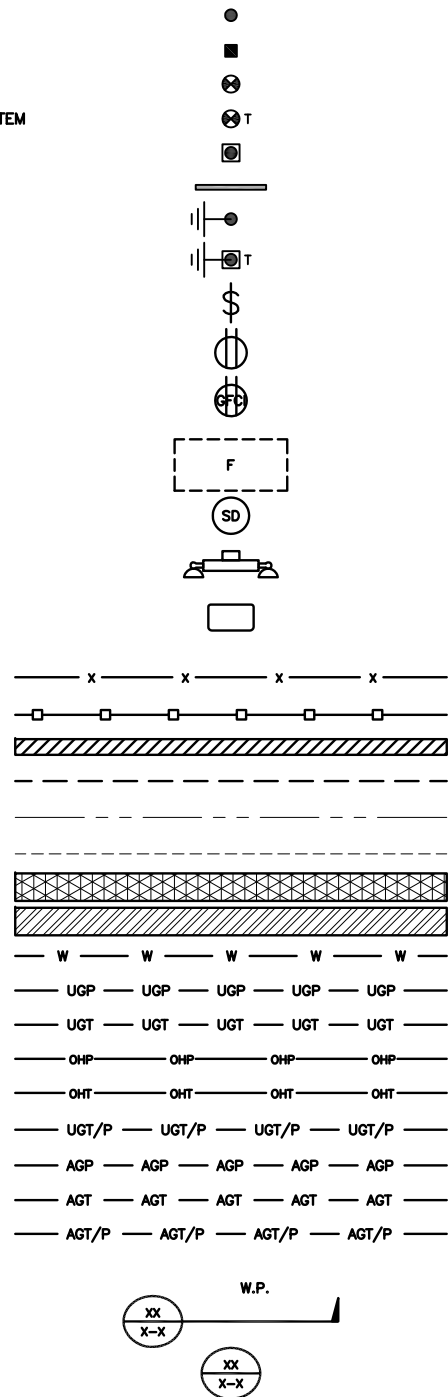
SHEET TITLE  
RF  
PLUMBING DIAGRAM

SHEET NUMBER

RF-2



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



**LEGEND**

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

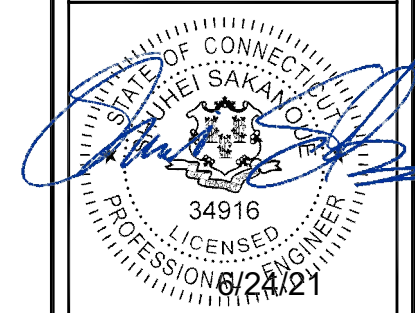
**ABBREVIATIONS**

**dish**  
 wireless.

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 LITTLETON, CO 80120

**CROWN**  
**CASTLE**  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317

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 TO ALTER THIS DOCUMENT.

DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION**  
**DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	06/17/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER  
 2039-Z5555C  
 DISH WIRELESS, LLC.  
 PROJECT INFORMATION  
 BOBDL00090A  
 238 MERIDEN RD.  
 MIDDLEFIELD, CT 06457

SHEET TITLE  
 LEGEND AND  
 ABBREVIATIONS

SHEET NUMBER

**GN-1**

**SITE ACTIVITY REQUIREMENTS:**

- 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, LLC. AND TOWER OWNER NOC & THE DISH WIRELESS, LLC. AND TOWER OWNER CONSTRUCTION MANAGER.
- "LOOK UP" – DISH WIRELESS, LLC. 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, LLC. AND DISH WIRELESS, LLC. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- 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.
- 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, LLC. 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).
- ALL SITE WORK TO COMPLY WITH DISH WIRELESS, LLC. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS, LLC. 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."
- 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, LLC. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 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.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- 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.
- 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, LLC. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
- 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.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- 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:**

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION  
CARRIER:DISH WIRELESS, LLC.  
TOWER OWNER:TOWER OWNER
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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.
- 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.
- 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, LLC. AND TOWER OWNER
- 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.
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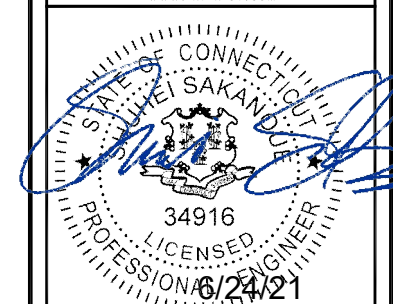


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DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS

REV	DATE	DESCRIPTION
0	06/17/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER

**GN-2**

**CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:**

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

**ELECTRICAL INSTALLATION NOTES:**

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

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIEMOLD 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, LLC. 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, LLC."
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



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DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	06/17/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-3**

**GROUNDING NOTES:**

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



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

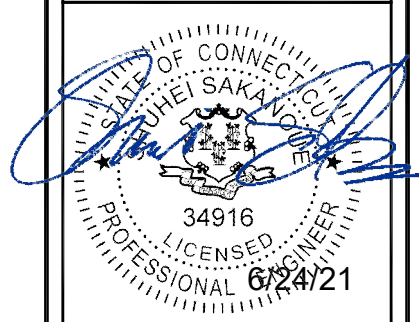


2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



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DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER

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DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00090A  
238 MERIDEN RD.  
MIDDLEFIELD, CT 06457

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

**GN-4**

# Exhibit D

Date: **April 26, 2021**



Crown Castle  
2000 Corporate Drive  
Canonsburg, PA  
(724) 416-2000

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

**Carrier Designation:** **DISH Network Co-Locate**  
**Site Number:** BOBDL00090A  
**Site Name:** CT-CCI-T-876340

**Crown Castle Designation:** **BU Number:** 876340  
**Site Name:** COE HILL  
**JDE Job Number:** 645181  
**Work Order Number:** 1945894  
**Order Number:** 553291 Rev. 0

**Engineering Firm Designation:** **Crown Castle Project Number:** 1945894

**Site Data:** **238 Meriden Rd., MIDDLEFIELD, MIDDLESEX County, CT**  
**Latitude 41° 32' 45.6", Longitude -72° 42' 53.9"**  
**133.5 Foot - Monopole Tower**

Crown Castle 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

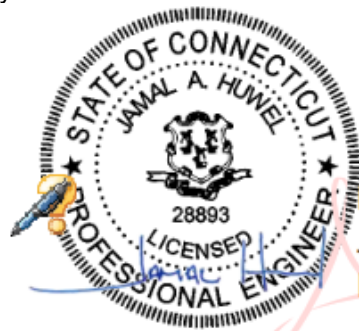
**Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Mishka Stueber

Respectfully submitted by:

Jamal A. Huwel, P.E.  
Director Engineering



Digitally signed by  
Jamal A Huwel  
Date: 2021.04.26  
17:45:25 -04'00'

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## 1) INTRODUCTION

This tower is a 133.5 ft Monopole tower designed by SUMMIT. 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>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1.5 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)
95.0	95.0	1	tower mounts	Commscope MC-PK8-DSH	1	1-1/2
	91.0	3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-20 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		

**Table 2 - Non-Carrier Equipment To Be Removed**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
95.0	95.0	3	rfs celwave	APXV18-206517S-ACU	-	-
		1	tower mounts	Pipe Mount [PM 602-3]		
		2	tower mounts	Side Arm Mount [SO 102-3]		

**Table 3 - 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)
131.0	132.0	1	cci antennas	DMP65R-BU4D w/ Mount Pipe	2 4 1 6 6 3	3/8 3/4 Conduit 1-1/4
		2	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU4D w/ Mount Pipe		
		2	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 8843 B2/B66A		
		6	kathrein	860 10025		
		6	powerwave technologies	CM1007-DBPXBC-003		
		3	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe		



Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
	131.0	1		HRK12-3HD		
		3	powerwave technologies	TT19-08BP111-001		
		2	raycap	DC6-48-60-18-8F		
		1	tower mounts	Platform Mount [LP 601-1]		
119.0	121.0	3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	1 3	7/8 1-5/8
		3	ericsson	RADIO 4415 B66A_CCIV3		
		3	ericsson	RADIO 4424 B25_TMOV1		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
	3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe			
	119.0	1	tower mounts	Platform Mount [LP 403-1]		
117.0	117.0	3	alcatel lucent	TME-800MHz 2X50W RRH W/FILTER	-	-
		3	alcatel lucent	TME-PCS 1900MHz 4x45W-65MHz		
		1	tower mounts	Side Arm Mount [SO 102-3]		
111.0	111.0	1	tower mounts	Platform Mount [LP 403-1]	-	-
101.0	104.0	3	commscope	SDX1926Q-43	6 4	1-1/4 1-5/8
		3	ericsson	AIR 32 B2A B66AA w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25		
	3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe			
	101.0	1	tower mounts	Platform Mount [LP 715-1_KCKR]		
95.0	95.0	-	-	-	6	1-5/8
60.0	61.0	1	symmetricom	58532A	1	1/2
	60.0	1	tower mounts	Side Arm Mount [SO 304-1]		
50.0	51.0	1	lucent	KS24019-L112A	1	1/2
	50.0	1	tower mounts	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1613531	CCISITES
4-POST-MODIFICATION INSPECTION	2427628	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1613597	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1533009	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2331830	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2642501	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.0.9.0), 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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are included in Appendix C.

#### 3.2) Assumptions

- 1) 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. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary)**

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
133.5 - 128.5	Pole	TP10.75x10.75x0.188	Pole	19.5%	Pass
128.5 - 123.5	Pole	TP10.75x10.75x0.188	Pole	49.8%	Pass
123.5 - 121.5	Pole	TP10.75x10.75x0.188	Pole	62.1%	Pass
121.5 - 119	Pole	TP22x10.75x0.188	Pole	20.0%	Pass
119 - 114	Pole	TP22.95x22x0.25	Pole	22.2%	Pass
114 - 109	Pole	TP23.9x22.95x0.25	Pole	30.2%	Pass
109 - 104	Pole	TP24.85x23.9x0.25	Pole	37.9%	Pass
104 - 99	Pole	TP25.8x24.85x0.25	Pole	47.9%	Pass
99 - 94	Pole	TP26.75x25.8x0.25	Pole	58.1%	Pass
94 - 89	Pole	TP27.7x26.75x0.25	Pole	69.3%	Pass
89 - 85.25	Pole	TP28.413x27.7x0.25	Pole	77.1%	Pass
85.25 - 85	Pole + Reinf.	TP28.46x28.413x0.5125	Reinf. 2 Tension Rupture	65.7%	Pass

85 - 80	Pole + Reinf.	TP29.41x28.46x0.5	Reinf. 2 Tension Rupture	74.1%	Pass
80 - 78.75	Pole + Reinf.	TP30.36x29.41x0.5	Reinf. 2 Tension Rupture	76.1%	Pass
78.75 - 74	Pole	TP30.05x29.148x0.3125	Pole	73.8%	Pass
74 - 69	Pole	TP31.001x30.05x0.3125	Pole	79.6%	Pass
69 - 68.25	Pole	TP31.143x31.001x0.3125	Pole	80.4%	Pass
68.25 - 68	Pole + Reinf.	TP31.191x31.143x0.575	Reinf. 1 Tension Rupture	60.4%	Pass
68 - 63	Pole + Reinf.	TP32.141x31.191x0.575	Reinf. 1 Tension Rupture	64.6%	Pass
63 - 58	Pole + Reinf.	TP33.091x32.141x0.5625	Reinf. 1 Tension Rupture	68.5%	Pass
58 - 53	Pole + Reinf.	TP34.042x33.091x0.55	Reinf. 1 Tension Rupture	72.1%	Pass
53 - 48	Pole + Reinf.	TP34.992x34.042x0.5438	Reinf. 1 Tension Rupture	75.5%	Pass
48 - 43	Pole + Reinf.	TP35.942x34.992x0.5375	Reinf. 1 Tension Rupture	78.7%	Pass
43 - 42.5	Pole + Reinf.	TP36.94x35.942x0.5375	Reinf. 1 Tension Rupture	79.0%	Pass
42.5 - 37.5	Pole + Reinf.	TP36.363x35.412x0.6	Reinf. 1 Tension Rupture	75.5%	Pass
37.5 - 32.5	Pole + Reinf.	TP37.313x36.363x0.5875	Reinf. 1 Tension Rupture	77.9%	Pass
32.5 - 27.5	Pole + Reinf.	TP38.263x37.313x0.5875	Reinf. 1 Tension Rupture	80.1%	Pass
27.5 - 22.5	Pole + Reinf.	TP39.214x38.263x0.575	Reinf. 1 Tension Rupture	82.2%	Pass
22.5 - 17.5	Pole + Reinf.	TP40.164x39.214x0.575	Reinf. 1 Tension Rupture	84.1%	Pass
17.5 - 12.5	Pole + Reinf.	TP41.114x40.164x0.5688	Reinf. 1 Tension Rupture	85.8%	Pass
12.5 - 7.5	Pole + Reinf.	TP42.065x41.114x0.5625	Reinf. 1 Tension Rupture	87.5%	Pass
7.5 - 2.5	Pole + Reinf.	TP43.015x42.065x0.5625	Reinf. 1 Tension Rupture	89.0%	Pass
2.5 - 0	Pole + Reinf.	TP43.49x43.015x0.5563	Reinf. 1 Tension Rupture	89.7%	Pass
				Summary	
			Pole	80.4%	Pass
			Reinforcement	89.7%	Pass
			Overall	89.7%	Pass

**Table 6 - Tower Component Stresses vs. Capacity - LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1, 2	Flange Connection	119.0	34.8	Pass
1	Anchor Rods	0	66.9	Pass
1	Base Plate	0	63.2	Pass
1	Base Foundation (Structure)	0	77.5	Pass
1	Base Foundation (Soil Interaction)	0	66.0	Pass

<b>Structure Rating (max from all components) =</b>	<b>89.7%</b>
---	--------------

Notes:

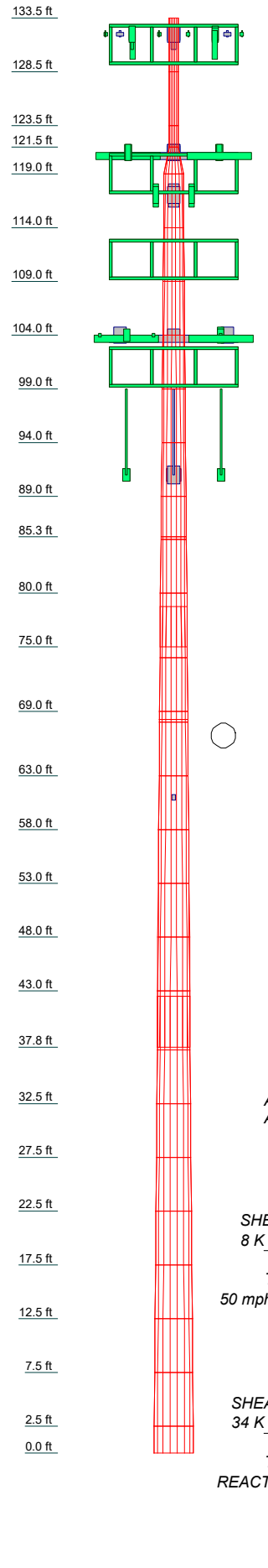
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Flange connection capacity determined by comparing analysis reactions with last analysis on file.

**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**

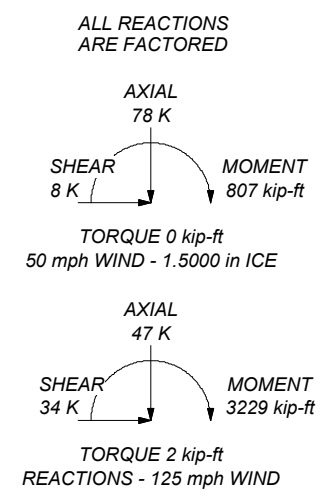
Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
Length (ft)	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	2.500	
Number of Sides	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
Thickness (in)	0.1880	0.1880	0.1880	0.1880	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500		
Socket Length (ft)																																		
Top Dia (in)	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500		
Bot Dia (in)	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500	10.7500		
Grade																																		
Weight (K)	0.1	0.1	0.0	0.1	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.7	0.7	0.5	0.5	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	0.6	



### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

- ### TOWER DESIGN NOTES
1. Tower is located in Middlesex County, Connecticut.
  2. Tower designed for Exposure C to the TIA-222-H Standard.
  3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
  4. Tower is also designed for a 50 mph basic wind with 1.50 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. TOWER RATING: 89.7%



<b>Crown Castle</b>			Job: <b>876340</b>		
2000 Corporate Drive			Project:		
Canonsburg, PA			Client: CCI		Drawn by: Mishka Stueber
The Pathway to Possible			Code: TIA-222-H		Date: 04/26/21
Phone: (724) 416-2000			Path:		Scale: NTS
FAX:					Dwg No. E-1

## Tower Input Data

The tower is a monopole.  
 This tower is designed using the TIA-222-H standard.  
 The following design criteria apply:

- Tower is located in Middlesex County, Connecticut.
- Tower base elevation above sea level: 444.000 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole 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  <div style="text-align: center; background-color: #e0e0e0; padding: 2px;"><b>Poles</b></div> ✓ 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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## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	133.500-128.500	5.000	0.00	Round	10.7500	10.7500	0.1880		A572-65 (65 ksi)
L2	128.500-123.500	5.000	0.00	Round	10.7500	10.7500	0.1880		A572-65 (65 ksi)
L3	123.500-121.500	2.000	0.00	Round	10.7500	10.7500	0.1880		A572-65 (65 ksi)
L4	121.500-119.000	2.500	0.00	Round	10.7500	22.0000	0.1880		A572-65 (65 ksi)
L5	119.000-114.000	5.000	0.00	12	22.0000	22.9500	0.2500	1.0000	A572-65 (65 ksi)
L6	114.000-109.000	5.000	0.00	12	22.9500	23.9000	0.2500	1.0000	A572-65 (65 ksi)
L7	109.000-104.000	5.000	0.00	12	23.9000	24.8500	0.2500	1.0000	A572-65 (65 ksi)
L8	104.000-99.000	5.000	0.00	12	24.8500	25.8000	0.2500	1.0000	A572-65 (65 ksi)
L9	99.000-94.000	5.000	0.00	12	25.8000	26.7500	0.2500	1.0000	A572-65 (65 ksi)
L10	94.000-89.000	5.000	0.00	12	26.7500	27.7000	0.2500	1.0000	A572-65 (65 ksi)
L11	89.000-85.250	3.750	0.00	12	27.7000	28.4125	0.2500	1.0000	A572-65 (65 ksi)
L12	85.250-85.000	0.250	0.00	12	28.4125	28.4600	0.5125	2.0500	A572-65 (65 ksi)
L13	85.000-80.000	5.000	0.00	12	28.4600	29.4100	0.5000	2.0000	A572-65 (65 ksi)
L14	80.000-75.000	5.000	3.75	12	29.4100	30.3600	0.5000	2.0000	A572-65 (65 ksi)
L15	75.000-74.000	4.750	0.00	12	29.1475	30.0503	0.3125	1.2500	A572-65 (65 ksi)
L16	74.000-69.000	5.000	0.00	12	30.0503	31.0006	0.3125	1.2500	A572-65 (65 ksi)
L17	69.000-68.250	0.750	0.00	12	31.0006	31.1431	0.3125	1.2500	A572-65 (65 ksi)
L18	68.250-68.000	0.250	0.00	12	31.1431	31.1907	0.5750	2.3000	A572-65 (65 ksi)
L19	68.000-63.000	5.000	0.00	12	31.1907	32.1410	0.5750	2.3000	A572-65 (65 ksi)
L20	63.000-58.000	5.000	0.00	12	32.1410	33.0913	0.5625	2.2500	A572-65 (65 ksi)
L21	58.000-53.000	5.000	0.00	12	33.0913	34.0416	0.5500	2.2000	A572-65 (65 ksi)
L22	53.000-48.000	5.000	0.00	12	34.0416	34.9919	0.5437	2.1750	A572-65 (65 ksi)
L23	48.000-43.000	5.000	0.00	12	34.9919	35.9422	0.5375	2.1500	A572-65 (65 ksi)
L24	43.000-37.750	5.250	4.75	12	35.9422	36.9400	0.5375	2.1500	A572-65 (65 ksi)
L25	37.750-37.500	5.000	0.00	12	35.4122	36.3625	0.6000	2.4000	A572-65 (65 ksi)
L26	37.500-32.500	5.000	0.00	12	36.3625	37.3129	0.5875	2.3500	A572-65 (65 ksi)
L27	32.500-27.500	5.000	0.00	12	37.3129	38.2632	0.5875	2.3500	A572-65 (65 ksi)
L28	27.500-22.500	5.000	0.00	12	38.2632	39.2135	0.5750	2.3000	A572-65 (65 ksi)
L29	22.500-17.500	5.000	0.00	12	39.2135	40.1639	0.5750	2.3000	A572-65 (65 ksi)
L30	17.500-12.500	5.000	0.00	12	40.1639	41.1142	0.5687	2.2750	A572-65 (65 ksi)
L31	12.500-7.500	5.000	0.00	12	41.1142	42.0645	0.5625	2.2500	A572-65 (65 ksi)
L32	7.500-2.500	5.000	0.00	12	42.0645	43.0148	0.5625	2.2500	A572-65 (65 ksi)
L33	2.500-0.000	2.500		12	43.0148	43.4900	0.5563	2.2250	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	10.7500	6.2381	87.0149	3.7348	5.3750	16.1888	174.0299	3.1172	0.0000	0
	10.7500	6.2381	87.0149	3.7348	5.3750	16.1888	174.0299	3.1172	0.0000	0
L2	10.7500	6.2381	87.0149	3.7348	5.3750	16.1888	174.0299	3.1172	0.0000	0
	10.7500	6.2381	87.0149	3.7348	5.3750	16.1888	174.0299	3.1172	0.0000	0
L3	10.7500	6.2381	87.0149	3.7348	5.3750	16.1888	174.0299	3.1172	0.0000	0
	10.7500	6.2381	87.0149	3.7348	5.3750	16.1888	174.0299	3.1172	0.0000	0
L4	10.7500	6.2381	87.0149	3.7348	5.3750	16.1888	174.0299	3.1172	0.0000	0
	22.0000	12.8826	766.1900	7.7120	11.0000	69.6536	1532.3799	6.4375	0.0000	0
L5	22.6879	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	23.6714	18.2735	1201.8753	8.1266	11.8881	101.0990	2435.3252	8.9937	5.4806	21.922
L6	23.6714	18.2735	1201.8753	8.1266	11.8881	101.0990	2435.3252	8.9937	5.4806	21.922
	24.6549	19.0383	1359.1746	8.4667	12.3802	109.7862	2754.0563	9.3700	5.7352	22.941
L7	24.6549	19.0383	1359.1746	8.4667	12.3802	109.7862	2754.0563	9.3700	5.7352	22.941
	25.6384	19.8030	1529.6327	8.8068	12.8723	118.8313	3099.4505	9.7464	5.9898	23.959
L8	25.6384	19.8030	1529.6327	8.8068	12.8723	118.8313	3099.4505	9.7464	5.9898	23.959
	26.6219	20.5678	1713.7779	9.1469	13.3644	128.2346	3472.5787	10.1228	6.2444	24.978
L9	26.6219	20.5678	1713.7779	9.1469	13.3644	128.2346	3472.5787	10.1228	6.2444	24.978
	27.6054	21.3325	1912.1390	9.4870	13.8565	137.9958	3874.5120	10.4992	6.4990	25.996
L10	27.6054	21.3325	1912.1390	9.4870	13.8565	137.9958	3874.5120	10.4992	6.4990	25.996
	28.5890	22.0972	2125.2444	9.8271	14.3486	148.1151	4306.3213	10.8756	6.7536	27.014
L11	28.5890	22.0972	2125.2444	9.8271	14.3486	148.1151	4306.3213	10.8756	6.7536	27.014
	29.3266	22.6708	2295.0674	10.0822	14.7177	155.9395	4650.4288	11.1579	6.9446	27.778
L12	29.3266	22.6708	2295.0674	10.0822	14.7177	155.9395	4650.4288	11.1579	6.9446	27.778
	29.2340	46.0420	4574.5492	9.9882	14.7177	310.8201	9269.2769	22.6605	6.2411	12.178
L13	29.2340	46.0420	4574.5492	9.9882	14.7177	310.8201	9269.2769	22.6605	6.2411	12.178
	29.2832	46.1204	4597.9536	10.0052	14.7423	311.8889	9316.7006	22.6990	6.2538	12.202
L13	29.2832	46.1204	4597.9536	10.0052	14.7423	311.8889	9316.7006	22.6990	6.2538	12.202
	29.2876	45.0156	4491.8302	10.0097	14.7423	304.6903	9101.6657	22.1553	6.2873	12.575
L13	29.2876	45.0156	4491.8302	10.0097	14.7423	304.6903	9101.6657	22.1553	6.2873	12.575
	30.2711	46.5451	4965.4213	10.3498	15.2344	325.9352	10061.289	22.9081	6.5419	13.084
L14	30.2711	46.5451	4965.4213	10.3498	15.2344	325.9352	10061.289	22.9081	6.5419	13.084
	31.2546	48.0746	5471.1829	10.6899	15.7265	347.8962	11086.099	23.6609	6.7965	13.593
L15	31.2546	48.0746	5471.1829	10.6899	15.7265	347.8962	11086.099	23.6609	6.7965	13.593
	30.8033	29.0152	3079.2979	10.3229	15.0984	203.9486	6239.4925	14.2804	6.9740	22.317
L15	30.8033	29.0152	3079.2979	10.3229	15.0984	203.9486	6239.4925	14.2804	6.9740	22.317
	31.0001	29.9237	3377.6754	10.6461	15.5661	216.9899	6844.0861	14.7275	7.2160	23.091
L16	31.0001	29.9237	3377.6754	10.6461	15.5661	216.9899	6844.0861	14.7275	7.2160	23.091
	31.9839	30.8799	3711.9459	10.9863	16.0583	231.1542	7521.4087	15.1981	7.4707	23.906
L16	31.9839	30.8799	3711.9459	10.9863	16.0583	231.1542	7521.4087	15.1981	7.4707	23.906
	31.9839	30.8799	3711.9459	10.9863	16.0583	231.1542	7521.4087	15.1981	7.4707	23.906
L17	31.9839	30.8799	3711.9459	10.9863	16.0583	231.1542	7521.4087	15.1981	7.4707	23.906
	32.1315	31.0233	3763.9120	11.0374	16.1321	233.3175	7626.7062	15.2687	7.5089	24.028
L17	32.1315	31.0233	3763.9120	11.0374	16.1321	233.3175	7626.7062	15.2687	7.5089	24.028
	32.0389	56.5969	6750.2010	10.9434	16.1321	418.4317	13677.737	27.8553	6.8054	11.835
L18	32.0389	56.5969	6750.2010	10.9434	16.1321	418.4317	13677.737	27.8553	6.8054	11.835
	32.0881	56.6849	6781.7275	10.9604	16.1568	419.7455	13741.618	27.8986	6.8181	11.858
L18	32.0881	56.6849	6781.7275	10.9604	16.1568	419.7455	13741.618	27.8986	6.8181	11.858
	33.0719	58.4444	7433.0435	11.3006	16.6490	446.4554	15061.361	28.7645	7.0728	12.3
L19	33.0719	58.4444	7433.0435	11.3006	16.6490	446.4554	15061.361	28.7645	7.0728	12.3
	33.0763	57.1965	7280.0974	11.3051	16.6490	437.2689	14751.451	28.1504	7.1063	12.633
L19	33.0763	57.1965	7280.0974	11.3051	16.6490	437.2689	14751.451	28.1504	7.1063	12.633
	34.0602	58.9177	7957.3246	11.6453	17.1413	464.2201	16123.696	28.9975	7.3610	13.086
L20	34.0602	58.9177	7957.3246	11.6453	17.1413	464.2201	16123.696	28.9975	7.3610	13.086
	34.0646	57.6306	7789.4682	11.6498	17.1413	454.4276	15783.574	28.3640	7.3945	13.444
L20	34.0646	57.6306	7789.4682	11.6498	17.1413	454.4276	15783.574	28.3640	7.3945	13.444
	35.0484	59.3136	8492.0204	11.9900	17.6335	481.5836	17207.135	29.1923	7.6491	13.908
L21	35.0484	59.3136	8492.0204	11.9900	17.6335	481.5836	17207.135	29.1923	7.6491	13.908
	35.0506	58.6505	8400.2213	11.9922	17.6335	476.3777	17021.125	28.8660	7.6659	14.098
L21	35.0506	58.6505	8400.2213	11.9922	17.6335	476.3777	17021.125	28.8660	7.6659	14.098
	36.0344	60.3144	9135.6164	12.3324	18.1258	504.0120	18511.235	29.6849	7.9206	14.567
L22	36.0344	60.3144	9135.6164	12.3324	18.1258	504.0120	18511.235	29.6849	7.9206	14.567
	36.0366	59.6319	9035.5256	12.3347	18.1258	498.4900	18308.424	29.3490	7.9373	14.767
L22	36.0366	59.6319	9035.5256	12.3347	18.1258	498.4900	18308.424	29.3490	7.9373	14.767
	37.0205	61.2766	9803.9776	12.6749	18.6180	526.5846	19865.516	30.1585	8.1920	15.241
L23	37.0205	61.2766	9803.9776	12.6749	18.6180	526.5846	19865.516	30.1585	8.1920	15.241
	37.0205	61.2766	9803.9776	12.6749	18.6180	526.5846	19865.516	30.1585	8.1920	15.241
L24	37.0205	61.2766	9803.9776	12.6749	18.6180	526.5846	19865.516	30.1585	8.1920	15.241
	38.0535	63.0036	10656.483	13.0321	19.1349	556.9129	21592.924	31.0085	8.4594	15.738
L24	38.0535	63.0036	10656.483	13.0321	19.1349	556.9129	21592.924	31.0085	8.4594	15.738
	37.3844	67.2572	10403.700	12.4628	18.3435	567.1593	21080.718	33.1019	7.8825	13.137
L25	37.3844	67.2572	10403.700	12.4628	18.3435	567.1593	21080.718	33.1019	7.8825	13.137



Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
	37.4336	69.0932	11279.195 9	12.8030	18.8358	598.8170	22854.707 5	34.0056	8.1372	13.562
L26	37.4380	67.6774	11055.796 0	12.8075	18.8358	586.9567	22402.041 0	33.3088	8.1707	13.908
	38.4219	69.4752	11960.466 6	13.1477	19.3281	618.8135	24235.148 3	34.1936	8.4253	14.341
L27	38.4219	69.4752	11960.466 7	13.1477	19.3281	618.8135	24235.148 2	34.1936	8.4253	14.341
	39.4057	71.2730	12913.189 1	13.4879	19.8203	651.5122	26165.622 0	35.0784	8.6800	14.775
L28	39.4101	69.7797	12651.024 1	13.4924	19.8203	638.2851	25634.404 6	34.3434	8.7135	15.154
	40.3940	71.5392	13632.365 3	13.8326	20.3126	671.1284	27622.868 1	35.2094	8.9682	15.597
L29	40.3940	71.5392	13632.365 3	13.8326	20.3126	671.1284	27622.868 1	35.2094	8.9682	15.597
	41.3778	73.2988	14663.186 5	14.1728	20.8049	704.7957	29711.591 2	36.0754	9.2229	16.04
L30	41.3800	72.5135	14510.674 4	14.1750	20.8049	697.4651	29402.560 3	35.6889	9.2397	16.246
	42.3639	74.2539	15580.771 7	14.5153	21.2971	731.5897	31570.867 6	36.5455	9.4944	16.693
L31	42.3661	73.4492	15416.681 6	14.5175	21.2971	723.8849	31238.376 5	36.1495	9.5111	16.909
	43.3500	75.1705	16526.149 5	14.8577	21.7894	758.4485	33486.459 4	36.9966	9.7658	17.361
L32	43.3500	75.1705	16526.149 5	14.8577	21.7894	758.4485	33486.459 4	36.9966	9.7658	17.361
	44.3338	76.8918	17687.608 9	15.1979	22.2817	793.8183	35839.891 0	37.8438	10.0205	17.814
L33	44.3360	76.0486	17498.806 4	15.2002	22.2817	785.3448	35457.325 9	37.4288	10.0372	18.044
	44.8279	76.8997	18092.905 5	15.3703	22.5278	803.1361	36661.131 8	37.8477	10.1646	18.273

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 133.500- 128.500				1	1	1			
L2 128.500- 123.500				1	1	1			
L3 123.500- 121.500				1	1	1			
L4 121.500- 119.000				1	1	1			
L5 119.000- 114.000				1	1	1			
L6 114.000- 109.000				1	1	1			
L7 109.000- 104.000				1	1	1			
L8 104.000- 99.000				1	1	1			
L9 99.000- 94.000				1	1	1			
L10 94.000- 89.000				1	1	1			
L11 89.000- 85.250				1	1	1			
L12 85.250- 85.000				1	1	0.925525			
L13 85.000- 80.000				1	1	0.93351			
L14 80.000- 75.000				1	1	0.929978			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_r$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L15 75.000-74.000				1	1	1			
L16 74.000-69.000				1	1	1			
L17 69.000-68.250				1	1	1			
L18 68.250-68.000				1	1	0.947405			
L19 68.000-63.000				1	1	0.935245			
L20 63.000-58.000				1	1	0.943961			
L21 58.000-53.000				1	1	0.953783			
L22 53.000-48.000				1	1	0.953811			
L23 48.000-43.000				1	1	0.954438			
L24 43.000-37.750				1	1	0.953439			
L25 37.750-37.500				1	1	0.956495			
L26 37.500-32.500				1	1	0.967753			
L27 32.500-27.500				1	1	0.959443			
L28 27.500-22.500				1	1	0.971913			
L29 22.500-17.500				1	1	0.964238			
L30 17.500-12.500				1	1	0.967289			
L31 12.500-7.500				1	1	0.970759			
L32 7.500-2.500				1	1	0.963952			
L33 2.500-0.000				1	1	0.971314			

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

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
*****										
MP3-05 Reinforcement	A	No	Surface Af (CaAa)	70.500 - 0.500	1	1	0.000 0.000	5.3300	14.8400	0.00
MP3-05 Reinforcement	C	No	Surface Af (CaAa)	70.500 - 0.500	1	1	0.250 0.250	5.3300	14.8400	0.00
MP3-05 Reinforcement	C	No	Surface Af (CaAa)	70.500 - 0.500	1	1	-0.500 -0.500	5.3300	14.8400	0.00
MP3-05 Reinforcement	B	No	Surface Af (CaAa)	70.500 - 0.500	1	1	-0.250 -0.250	5.3300	14.8400	0.00
MP3-08.5 Reinforcement	A	No	Surface Af (CaAa)	87.000 - 77.000	1	1	0.000 0.000	3.8420	13.2900	0.00
MP3-08.5 Reinforcement	C	No	Surface Af (CaAa)	87.000 - 77.000	1	1	0.250 0.250	3.8420	13.2900	0.00
MP3-08.5 Reinforcement	C	No	Surface Af (CaAa)	87.000 - 77.000	1	1	-0.500 -0.500	3.8420	13.2900	0.00
MP3-08.5 Reinforcement	B	No	Surface Af (CaAa)	87.000 - 77.000	1	1	-0.250 -0.250	3.8420	13.2900	0.00

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
*****										
*****										

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		CAAA ft <sup>2</sup> /ft	Weight plf	
LCF114-50J(1-1/4)	B	No	No	Inside Pole	131.000 - 0.000	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.70 0.70 0.70 0.70	
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	131.000 - 0.000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.58 0.58 0.58 0.58	
FB-L98B-002-50000(3/8)	B	No	No	Inside Pole	131.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.06 0.06 0.06 0.06	
FB-L98B-002-50000(3/8)	B	No	No	Inside Pole	131.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.06 0.06 0.06 0.06	
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	131.000 - 0.000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.58 0.58 0.58 0.58	
2" (Nominal) Conduit	B	No	No	Inside Pole	131.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.72 0.72 0.72 0.72	
*****										
**										
HB158-1-08U8-S8F18(1-5/8)	C	No	No	Inside Pole	119.000 - 0.000	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	1.70 1.70 1.70 1.70	
LDF5-50A(7/8)	C	No	No	Inside Pole	119.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.33 0.33 0.33 0.33	
*** 101 P ***										
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	C	No	No	Inside Pole	101.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	1.07 1.07 1.07 1.07	
LDF6-50A(1-1/4)	C	No	No	Inside Pole	101.000 - 0.000	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.60 0.60 0.60 0.60	
HCS 6X12 4AWG(1-5/8)	C	No	No	Inside Pole	101.000 - 0.000	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	2.40 2.40 2.40 2.40	
*****										
**										
CU12PSM9P6XXX (1-1/2)	A	No	No	Inside Pole	95.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	2.35 2.35 2.35 2.35	
*****										
**										
LDF4-50A(1/2)	C	No	No	Inside Pole	60.000 - 0.000	1	No Ice	0.000	0.15	

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
							1/2" Ice	0.000	0.15
							1" Ice	0.000	0.15
							2" Ice	0.000	0.15
*****									
**									
LDF4-50A(1/2)	B	No	No	Inside Pole	50.000 - 0.000	1	No Ice	0.000	0.15
							1/2" Ice	0.000	0.15
							1" Ice	0.000	0.15
							2" Ice	0.000	0.15
*****									
*****									

**Feed Line/Linear Appurtenances Section Areas**

Tower Section n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	133.500-128.500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L2	128.500-123.500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L3	123.500-121.500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L4	121.500-119.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L5	119.000-114.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.03
L6	114.000-109.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.03
L7	109.000-104.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.03
L8	104.000-99.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.05
L9	99.000-94.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.09
L10	94.000-89.000	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.09
L11	89.000-85.250	A	0.000	0.000	1.121	0.000	0.01
		B	0.000	0.000	1.121	0.000	0.03
		C	0.000	0.000	2.241	0.000	0.06
L12	85.250-85.000	A	0.000	0.000	0.160	0.000	0.00
		B	0.000	0.000	0.160	0.000	0.00
		C	0.000	0.000	0.320	0.000	0.00
L13	85.000-80.000	A	0.000	0.000	3.202	0.000	0.01
		B	0.000	0.000	3.202	0.000	0.04
		C	0.000	0.000	6.403	0.000	0.09
L14	80.000-75.000	A	0.000	0.000	1.921	0.000	0.01
		B	0.000	0.000	1.921	0.000	0.04
		C	0.000	0.000	3.842	0.000	0.09
L15	75.000-74.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.02

Tower Sectio n	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
L16	74.000-69.000	A	0.000	0.000	1.333	0.000	0.01
		B	0.000	0.000	1.333	0.000	0.04
		C	0.000	0.000	2.665	0.000	0.09
L17	69.000-68.250	A	0.000	0.000	0.666	0.000	0.00
		B	0.000	0.000	0.666	0.000	0.01
		C	0.000	0.000	1.333	0.000	0.01
L18	68.250-68.000	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.444	0.000	0.00
L19	68.000-63.000	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L20	63.000-58.000	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L21	58.000-53.000	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L22	53.000-48.000	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L23	48.000-43.000	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L24	43.000-37.750	A	0.000	0.000	4.664	0.000	0.01
		B	0.000	0.000	4.664	0.000	0.04
		C	0.000	0.000	9.328	0.000	0.09
L25	37.750-37.500	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.444	0.000	0.00
L26	37.500-32.500	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L27	32.500-27.500	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L28	27.500-22.500	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L29	22.500-17.500	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L30	17.500-12.500	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L31	12.500-7.500	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L32	7.500-2.500	A	0.000	0.000	4.442	0.000	0.01
		B	0.000	0.000	4.442	0.000	0.04
		C	0.000	0.000	8.883	0.000	0.09
L33	2.500-0.000	A	0.000	0.000	1.777	0.000	0.01
		B	0.000	0.000	1.777	0.000	0.02
		C	0.000	0.000	3.553	0.000	0.04

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

Tower Sectio n	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
L1	133.500-128.500	A	1.463	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
L2	128.500-123.500	A	1.458	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.00

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
L3	123.500-121.500	A	1.454	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L4	121.500-119.000	A	1.451	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
L5	119.000-114.000	A	1.446	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.03
L6	114.000-109.000	A	1.440	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.03
L7	109.000-104.000	A	1.433	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.03
L8	104.000-99.000	A	1.427	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.05
L9	99.000-94.000	A	1.419	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.09
L10	94.000-89.000	A	1.412	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.09
L11	89.000-85.250	A	1.405	0.000	0.000	1.409	0.000	0.03
		B		0.000	0.000	1.409	0.000	0.05
		C		0.000	0.000	2.818	0.000	0.10
L12	85.250-85.000	A	1.402	0.000	0.000	0.201	0.000	0.00
		B		0.000	0.000	0.201	0.000	0.00
		C		0.000	0.000	0.402	0.000	0.01
L13	85.000-80.000	A	1.397	0.000	0.000	4.021	0.000	0.06
		B		0.000	0.000	4.021	0.000	0.09
		C		0.000	0.000	8.043	0.000	0.19
L14	80.000-75.000	A	1.389	0.000	0.000	2.410	0.000	0.04
		B		0.000	0.000	2.410	0.000	0.07
		C		0.000	0.000	4.820	0.000	0.15
L15	75.000-74.000	A	1.383	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.02
L16	74.000-69.000	A	1.377	0.000	0.000	1.746	0.000	0.03
		B		0.000	0.000	1.746	0.000	0.05
		C		0.000	0.000	3.491	0.000	0.12
L17	69.000-68.250	A	1.372	0.000	0.000	0.872	0.000	0.01
		B		0.000	0.000	0.872	0.000	0.01
		C		0.000	0.000	1.744	0.000	0.03
L18	68.250-68.000	A	1.371	0.000	0.000	0.291	0.000	0.00
		B		0.000	0.000	0.291	0.000	0.00
		C		0.000	0.000	0.581	0.000	0.01
L19	68.000-63.000	A	1.365	0.000	0.000	5.807	0.000	0.06
		B		0.000	0.000	5.807	0.000	0.09
		C		0.000	0.000	11.614	0.000	0.19
L20	63.000-58.000	A	1.355	0.000	0.000	5.796	0.000	0.06
		B		0.000	0.000	5.796	0.000	0.09
		C		0.000	0.000	11.593	0.000	0.19
L21	58.000-53.000	A	1.343	0.000	0.000	5.785	0.000	0.06
		B		0.000	0.000	5.785	0.000	0.09
		C		0.000	0.000	11.569	0.000	0.19
L22	53.000-48.000	A	1.330	0.000	0.000	5.772	0.000	0.06
		B		0.000	0.000	5.772	0.000	0.09
		C		0.000	0.000	11.544	0.000	0.19
L23	48.000-43.000	A	1.317	0.000	0.000	5.758	0.000	0.06
		B		0.000	0.000	5.758	0.000	0.09
		C		0.000	0.000	11.517	0.000	0.19
L24	43.000-37.750	A	1.301	0.000	0.000	6.030	0.000	0.06
		B		0.000	0.000	6.030	0.000	0.09
		C		0.000	0.000	12.059	0.000	0.20
L25	37.750-37.500	A	1.292	0.000	0.000	0.287	0.000	0.00
		B		0.000	0.000	0.287	0.000	0.00
		C		0.000	0.000	0.574	0.000	0.01

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
L26	37.500-32.500	A	1.282	0.000	0.000	5.724	0.000	0.06
		B		0.000	0.000	5.724	0.000	0.09
		C		0.000	0.000	11.448	0.000	0.19
L27	32.500-27.500	A	1.263	0.000	0.000	5.705	0.000	0.06
		B		0.000	0.000	5.705	0.000	0.09
		C		0.000	0.000	11.409	0.000	0.18
L28	27.500-22.500	A	1.240	0.000	0.000	5.682	0.000	0.06
		B		0.000	0.000	5.682	0.000	0.08
		C		0.000	0.000	11.363	0.000	0.18
L29	22.500-17.500	A	1.213	0.000	0.000	5.654	0.000	0.06
		B		0.000	0.000	5.654	0.000	0.08
		C		0.000	0.000	11.309	0.000	0.18
L30	17.500-12.500	A	1.178	0.000	0.000	5.620	0.000	0.06
		B		0.000	0.000	5.620	0.000	0.08
		C		0.000	0.000	11.240	0.000	0.18
L31	12.500-7.500	A	1.131	0.000	0.000	5.573	0.000	0.05
		B		0.000	0.000	5.573	0.000	0.08
		C		0.000	0.000	11.146	0.000	0.17
L32	7.500-2.500	A	1.056	0.000	0.000	5.497	0.000	0.05
		B		0.000	0.000	5.497	0.000	0.08
		C		0.000	0.000	10.994	0.000	0.16
L33	2.500-0.000	A	0.919	0.000	0.000	2.144	0.000	0.02
		B		0.000	0.000	2.144	0.000	0.03
		C		0.000	0.000	4.288	0.000	0.07

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	133.500-128.500	0.0000	0.0000	0.0000	0.0000
L2	128.500-123.500	0.0000	0.0000	0.0000	0.0000
L3	123.500-121.500	0.0000	0.0000	0.0000	0.0000
L4	121.500-119.000	0.0000	0.0000	0.0000	0.0000
L5	119.000-114.000	0.0000	0.0000	0.0000	0.0000
L6	114.000-109.000	0.0000	0.0000	0.0000	0.0000
L7	109.000-104.000	0.0000	0.0000	0.0000	0.0000
L8	104.000-99.000	0.0000	0.0000	0.0000	0.0000
L9	99.000-94.000	0.0000	0.0000	0.0000	0.0000
L10	94.000-89.000	0.0000	0.0000	0.0000	0.0000
L11	89.000-85.250	-0.4429	-1.6529	-0.4150	-1.5489
L12	85.250-85.000	-0.6832	-2.5498	-0.6518	-2.4326
L13	85.000-80.000	-0.6894	-2.5727	-0.6578	-2.4550
L14	80.000-75.000	-0.5256	-1.9617	-0.4959	-1.8508
L15	75.000-74.000	0.0000	0.0000	0.0000	0.0000
L16	74.000-69.000	-0.4229	-1.5782	-0.4090	-1.5263
L17	69.000-68.250	-0.8293	-3.0950	-0.8132	-3.0348
L18	68.250-68.000	-0.8318	-3.1043	-0.8155	-3.0437
L19	68.000-63.000	-0.8395	-3.1329	-0.8232	-3.0720
L20	63.000-58.000	-0.8538	-3.1863	-0.8373	-3.1247
L21	58.000-53.000	-0.8677	-3.2384	-0.8510	-3.1758
L22	53.000-48.000	-0.8813	-3.2892	-0.8642	-3.2254
L23	48.000-43.000	-0.8946	-3.3388	-0.8771	-3.2734
L24	43.000-37.750	-0.9080	-3.3886	-0.8898	-3.3209
L25	37.750-37.500	-0.9068	-3.3843	-0.8888	-3.3172
L26	37.500-32.500	-0.9135	-3.4092	-0.8945	-3.3382
L27	32.500-27.500	-0.9261	-3.4561	-0.9061	-3.3817
L28	27.500-22.500	-0.9383	-3.5017	-0.9172	-3.4230
L29	22.500-17.500	-0.9503	-3.5464	-0.9277	-3.4621
L30	17.500-12.500	-0.9620	-3.5901	-0.9373	-3.4981
L31	12.500-7.500	-0.9734	-3.6328	-0.9457	-3.5295
L32	7.500-2.500	-0.9846	-3.6746	-0.9518	-3.5521
L33	2.500-0.000	-0.8819	-3.2911	-0.8401	-3.1352

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L11	26	MP3-08.5 Reinforcement	85.25 - 87.00	1.0000	1.0000
L11	27	MP3-08.5 Reinforcement	85.25 - 87.00	1.0000	1.0000
L11	28	MP3-08.5 Reinforcement	85.25 - 87.00	1.0000	1.0000
L11	29	MP3-08.5 Reinforcement	85.25 - 87.00	1.0000	1.0000
L12	26	MP3-08.5 Reinforcement	85.00 - 85.25	1.0000	1.0000
L12	27	MP3-08.5 Reinforcement	85.00 - 85.25	1.0000	1.0000
L12	28	MP3-08.5 Reinforcement	85.00 - 85.25	1.0000	1.0000
L12	29	MP3-08.5 Reinforcement	85.00 - 85.25	1.0000	1.0000
L13	26	MP3-08.5 Reinforcement	80.00 - 85.00	1.0000	1.0000
L13	27	MP3-08.5 Reinforcement	80.00 - 85.00	1.0000	1.0000
L13	28	MP3-08.5 Reinforcement	80.00 - 85.00	1.0000	1.0000
L13	29	MP3-08.5 Reinforcement	80.00 - 85.00	1.0000	1.0000
L14	26	MP3-08.5 Reinforcement	77.00 - 80.00	1.0000	1.0000
L14	27	MP3-08.5 Reinforcement	77.00 - 80.00	1.0000	1.0000
L14	28	MP3-08.5 Reinforcement	77.00 - 80.00	1.0000	1.0000
L14	29	MP3-08.5 Reinforcement	77.00 - 80.00	1.0000	1.0000
L16	22	MP3-05 Reinforcement	69.00 - 70.50	1.0000	1.0000
L16	23	MP3-05 Reinforcement	69.00 - 70.50	1.0000	1.0000
L16	24	MP3-05 Reinforcement	69.00 - 70.50	1.0000	1.0000
L16	25	MP3-05 Reinforcement	69.00 - 70.50	1.0000	1.0000
L17	22	MP3-05 Reinforcement	68.25 - 69.00	1.0000	1.0000
L17	23	MP3-05 Reinforcement	68.25 - 69.00	1.0000	1.0000
L17	24	MP3-05 Reinforcement	68.25 - 69.00	1.0000	1.0000
L17	25	MP3-05 Reinforcement	68.25 - 69.00	1.0000	1.0000
L18	22	MP3-05 Reinforcement	68.00 - 68.25	1.0000	1.0000
L18	23	MP3-05 Reinforcement	68.00 - 68.25	1.0000	1.0000
L18	24	MP3-05 Reinforcement	68.00 - 68.25	1.0000	1.0000
L18	25	MP3-05 Reinforcement	68.00 - 68.25	1.0000	1.0000
L19	22	MP3-05 Reinforcement	63.00 - 68.00	1.0000	1.0000
L19	23	MP3-05 Reinforcement	63.00 - 68.00	1.0000	1.0000



Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L19	24	MP3-05 Reinforcement	68.00 63.00 -	1.0000	1.0000
L19	25	MP3-05 Reinforcement	68.00 63.00 -	1.0000	1.0000
L20	22	MP3-05 Reinforcement	68.00 58.00 -	1.0000	1.0000
L20	23	MP3-05 Reinforcement	63.00 58.00 -	1.0000	1.0000
L20	24	MP3-05 Reinforcement	63.00 58.00 -	1.0000	1.0000
L20	25	MP3-05 Reinforcement	63.00 58.00 -	1.0000	1.0000
L21	22	MP3-05 Reinforcement	53.00 - 58.00	1.0000	1.0000
L21	23	MP3-05 Reinforcement	53.00 - 58.00	1.0000	1.0000
L21	24	MP3-05 Reinforcement	53.00 - 58.00	1.0000	1.0000
L21	25	MP3-05 Reinforcement	53.00 - 58.00	1.0000	1.0000
L22	22	MP3-05 Reinforcement	48.00 - 53.00	1.0000	1.0000
L22	23	MP3-05 Reinforcement	48.00 - 53.00	1.0000	1.0000
L22	24	MP3-05 Reinforcement	48.00 - 53.00	1.0000	1.0000
L22	25	MP3-05 Reinforcement	48.00 - 53.00	1.0000	1.0000
L23	22	MP3-05 Reinforcement	43.00 - 48.00	1.0000	1.0000
L23	23	MP3-05 Reinforcement	43.00 - 48.00	1.0000	1.0000
L23	24	MP3-05 Reinforcement	43.00 - 48.00	1.0000	1.0000
L23	25	MP3-05 Reinforcement	43.00 - 48.00	1.0000	1.0000
L24	22	MP3-05 Reinforcement	37.75 - 43.00	1.0000	1.0000
L24	23	MP3-05 Reinforcement	37.75 - 43.00	1.0000	1.0000
L24	24	MP3-05 Reinforcement	37.75 - 43.00	1.0000	1.0000
L24	25	MP3-05 Reinforcement	37.75 - 43.00	1.0000	1.0000
L25	22	MP3-05 Reinforcement	37.50 - 37.75	1.0000	1.0000
L25	23	MP3-05 Reinforcement	37.50 - 37.75	1.0000	1.0000
L25	24	MP3-05 Reinforcement	37.50 - 37.75	1.0000	1.0000
L25	25	MP3-05 Reinforcement	37.50 - 37.75	1.0000	1.0000
L26	22	MP3-05 Reinforcement	32.50 - 37.50	1.0000	1.0000
L26	23	MP3-05 Reinforcement	32.50 - 37.50	1.0000	1.0000
L26	24	MP3-05 Reinforcement	32.50 - 37.50	1.0000	1.0000
L26	25	MP3-05 Reinforcement	32.50 - 37.50	1.0000	1.0000
L27	22	MP3-05 Reinforcement	27.50 - 32.50	1.0000	1.0000
L27	23	MP3-05 Reinforcement	27.50 - 32.50	1.0000	1.0000
L27	24	MP3-05 Reinforcement	27.50 - 32.50	1.0000	1.0000
L27	25	MP3-05 Reinforcement	27.50 - 32.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L28	22	MP3-05 Reinforcement	22.50 - 27.50	1.0000	1.0000
L28	23	MP3-05 Reinforcement	22.50 - 27.50	1.0000	1.0000
L28	24	MP3-05 Reinforcement	22.50 - 27.50	1.0000	1.0000
L28	25	MP3-05 Reinforcement	22.50 - 27.50	1.0000	1.0000
L29	22	MP3-05 Reinforcement	17.50 - 22.50	1.0000	1.0000
L29	23	MP3-05 Reinforcement	17.50 - 22.50	1.0000	1.0000
L29	24	MP3-05 Reinforcement	17.50 - 22.50	1.0000	1.0000
L29	25	MP3-05 Reinforcement	17.50 - 22.50	1.0000	1.0000
L30	22	MP3-05 Reinforcement	12.50 - 17.50	1.0000	1.0000
L30	23	MP3-05 Reinforcement	12.50 - 17.50	1.0000	1.0000
L30	24	MP3-05 Reinforcement	12.50 - 17.50	1.0000	1.0000
L30	25	MP3-05 Reinforcement	12.50 - 17.50	1.0000	1.0000
L31	22	MP3-05 Reinforcement	7.50 - 12.50	1.0000	1.0000
L31	23	MP3-05 Reinforcement	7.50 - 12.50	1.0000	1.0000
L31	24	MP3-05 Reinforcement	7.50 - 12.50	1.0000	1.0000
L31	25	MP3-05 Reinforcement	7.50 - 12.50	1.0000	1.0000
L32	22	MP3-05 Reinforcement	2.50 - 7.50	1.0000	1.0000
L32	23	MP3-05 Reinforcement	2.50 - 7.50	1.0000	1.0000
L32	24	MP3-05 Reinforcement	2.50 - 7.50	1.0000	1.0000
L32	25	MP3-05 Reinforcement	2.50 - 7.50	1.0000	1.0000
L33	22	MP3-05 Reinforcement	0.50 - 2.50	1.0000	1.0000
L33	23	MP3-05 Reinforcement	0.50 - 2.50	1.0000	1.0000
L33	24	MP3-05 Reinforcement	0.50 - 2.50	1.0000	1.0000
L33	25	MP3-05 Reinforcement	0.50 - 2.50	1.0000	1.0000

**Effective Width of Flat Linear Attachments / Feed Lines**

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L11	26	MP3-08.5 Reinforcement	85.25 - 87.00	Auto	0.0000
L11	27	MP3-08.5 Reinforcement	85.25 - 87.00	Auto	0.0000
L11	28	MP3-08.5 Reinforcement	85.25 - 87.00	Auto	0.0000
L11	29	MP3-08.5 Reinforcement	85.25 - 87.00	Auto	0.0000
L12	26	MP3-08.5 Reinforcement	85.00 - 85.25	Auto	0.0000
L12	27	MP3-08.5 Reinforcement	85.00 - 85.25	Auto	0.0000
L12	28	MP3-08.5 Reinforcement	85.00 - 85.25	Auto	0.0000
L12	29	MP3-08.5 Reinforcement	85.00 - 85.25	Auto	0.0000
L13	26	MP3-08.5 Reinforcement	80.00 - 85.00	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L13	27	MP3-08.5 Reinforcement	80.00 - 85.00	Auto	0.0000
L13	28	MP3-08.5 Reinforcement	80.00 - 85.00	Auto	0.0000
L13	29	MP3-08.5 Reinforcement	80.00 - 85.00	Auto	0.0000
L14	26	MP3-08.5 Reinforcement	77.00 - 80.00	Auto	0.0000
L14	27	MP3-08.5 Reinforcement	77.00 - 80.00	Auto	0.0000
L14	28	MP3-08.5 Reinforcement	77.00 - 80.00	Auto	0.0000
L14	29	MP3-08.5 Reinforcement	77.00 - 80.00	Auto	0.0000
L16	22	MP3-05 Reinforcement	69.00 - 70.50	Auto	0.0000
L16	23	MP3-05 Reinforcement	69.00 - 70.50	Auto	0.0000
L16	24	MP3-05 Reinforcement	69.00 - 70.50	Auto	0.0000
L16	25	MP3-05 Reinforcement	69.00 - 70.50	Auto	0.0000
L17	22	MP3-05 Reinforcement	68.25 - 69.00	Auto	0.0000
L17	23	MP3-05 Reinforcement	68.25 - 69.00	Auto	0.0000
L17	24	MP3-05 Reinforcement	68.25 - 69.00	Auto	0.0000
L17	25	MP3-05 Reinforcement	68.25 - 69.00	Auto	0.0000
L18	22	MP3-05 Reinforcement	68.00 - 68.25	Auto	0.0000
L18	23	MP3-05 Reinforcement	68.00 - 68.25	Auto	0.0000
L18	24	MP3-05 Reinforcement	68.00 - 68.25	Auto	0.0000
L18	25	MP3-05 Reinforcement	68.00 - 68.25	Auto	0.0000
L19	22	MP3-05 Reinforcement	63.00 - 68.00	Auto	0.0000
L19	23	MP3-05 Reinforcement	63.00 - 68.00	Auto	0.0000
L19	24	MP3-05 Reinforcement	63.00 - 68.00	Auto	0.0000
L19	25	MP3-05 Reinforcement	63.00 - 68.00	Auto	0.0000
L20	22	MP3-05 Reinforcement	58.00 - 63.00	Auto	0.0000
L20	23	MP3-05 Reinforcement	58.00 - 63.00	Auto	0.0000
L20	24	MP3-05 Reinforcement	58.00 - 63.00	Auto	0.0000
L20	25	MP3-05 Reinforcement	58.00 - 63.00	Auto	0.0000
L21	22	MP3-05 Reinforcement	53.00 - 58.00	Auto	0.0000
L21	23	MP3-05 Reinforcement	53.00 - 58.00	Auto	0.0000
L21	24	MP3-05 Reinforcement	53.00 - 58.00	Auto	0.0000
L21	25	MP3-05 Reinforcement	53.00 - 58.00	Auto	0.0000
L22	22	MP3-05 Reinforcement	48.00 - 53.00	Auto	0.0000
L22	23	MP3-05 Reinforcement	48.00 - 53.00	Auto	0.0000
L22	24	MP3-05 Reinforcement	48.00 - 53.00	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L22	25	MP3-05 Reinforcement	48.00 - 53.00	Auto	0.0000
L23	22	MP3-05 Reinforcement	43.00 - 48.00	Auto	0.0000
L23	23	MP3-05 Reinforcement	43.00 - 48.00	Auto	0.0000
L23	24	MP3-05 Reinforcement	43.00 - 48.00	Auto	0.0000
L23	25	MP3-05 Reinforcement	43.00 - 48.00	Auto	0.0000
L24	22	MP3-05 Reinforcement	37.75 - 43.00	Auto	0.0000
L24	23	MP3-05 Reinforcement	37.75 - 43.00	Auto	0.0000
L24	24	MP3-05 Reinforcement	37.75 - 43.00	Auto	0.0000
L24	25	MP3-05 Reinforcement	37.75 - 43.00	Auto	0.0000
L25	22	MP3-05 Reinforcement	37.50 - 37.75	Auto	0.0000
L25	23	MP3-05 Reinforcement	37.50 - 37.75	Auto	0.0000
L25	24	MP3-05 Reinforcement	37.50 - 37.75	Auto	0.0000
L25	25	MP3-05 Reinforcement	37.50 - 37.75	Auto	0.0000
L26	22	MP3-05 Reinforcement	32.50 - 37.50	Auto	0.0000
L26	23	MP3-05 Reinforcement	32.50 - 37.50	Auto	0.0000
L26	24	MP3-05 Reinforcement	32.50 - 37.50	Auto	0.0000
L26	25	MP3-05 Reinforcement	32.50 - 37.50	Auto	0.0000
L27	22	MP3-05 Reinforcement	27.50 - 32.50	Auto	0.0000
L27	23	MP3-05 Reinforcement	27.50 - 32.50	Auto	0.0000
L27	24	MP3-05 Reinforcement	27.50 - 32.50	Auto	0.0000
L27	25	MP3-05 Reinforcement	27.50 - 32.50	Auto	0.0000
L28	22	MP3-05 Reinforcement	22.50 - 27.50	Auto	0.0000
L28	23	MP3-05 Reinforcement	22.50 - 27.50	Auto	0.0000
L28	24	MP3-05 Reinforcement	22.50 - 27.50	Auto	0.0000
L28	25	MP3-05 Reinforcement	22.50 - 27.50	Auto	0.0000
L29	22	MP3-05 Reinforcement	17.50 - 22.50	Auto	0.0000
L29	23	MP3-05 Reinforcement	17.50 - 22.50	Auto	0.0000
L29	24	MP3-05 Reinforcement	17.50 - 22.50	Auto	0.0000
L29	25	MP3-05 Reinforcement	17.50 - 22.50	Auto	0.0000
L30	22	MP3-05 Reinforcement	12.50 - 17.50	Auto	0.0000
L30	23	MP3-05 Reinforcement	12.50 - 17.50	Auto	0.0000
L30	24	MP3-05 Reinforcement	12.50 - 17.50	Auto	0.0000
L30	25	MP3-05 Reinforcement	12.50 - 17.50	Auto	0.0000
L31	22	MP3-05 Reinforcement	7.50 - 12.50	Auto	0.0000
L31	23	MP3-05 Reinforcement	7.50 - 12.50	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L31	24	MP3-05 Reinforcement	7.50 - 12.50	Auto	0.0000
L31	25	MP3-05 Reinforcement	7.50 - 12.50	Auto	0.0000
L32	22	MP3-05 Reinforcement	2.50 - 7.50	Auto	0.0000
L32	23	MP3-05 Reinforcement	2.50 - 7.50	Auto	0.0000
L32	24	MP3-05 Reinforcement	2.50 - 7.50	Auto	0.0000
L32	25	MP3-05 Reinforcement	2.50 - 7.50	Auto	0.0000
L33	22	MP3-05 Reinforcement	0.50 - 2.50	Auto	0.0000
L33	23	MP3-05 Reinforcement	0.50 - 2.50	Auto	0.0000
L33	24	MP3-05 Reinforcement	0.50 - 2.50	Auto	0.0000
L33	25	MP3-05 Reinforcement	0.50 - 2.50	Auto	0.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	CAAA Front ft²	CAAA Side ft²	Weight K	
*** 131 ***									
P65-15-XLH-RR w/ Mount Pipe	A	From Leg	4.000	0.0000	131.000	No Ice	3.930	2.800	0.06
			0.00			1/2"	4.330	3.170	0.10
			1.00			Ice	4.730	3.550	0.15
						1" Ice	5.590	4.360	0.29
						2" Ice			
P65-15-XLH-RR w/ Mount Pipe	B	From Leg	4.000	0.0000	131.000	No Ice	3.930	2.800	0.06
			0.00			1/2"	4.330	3.170	0.10
			1.00			Ice	4.730	3.550	0.15
						1" Ice	5.590	4.360	0.29
						2" Ice			
P65-15-XLH-RR w/ Mount Pipe	C	From Leg	4.000	0.0000	131.000	No Ice	3.930	2.800	0.06
			0.00			1/2"	4.330	3.170	0.10
			1.00			Ice	4.730	3.550	0.15
						1" Ice	5.590	4.360	0.29
						2" Ice			
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.000	0.0000	131.000	No Ice	11.960	5.970	0.11
			0.00			1/2"	12.700	6.630	0.20
			1.00			Ice	13.460	7.300	0.30
						1" Ice	15.020	8.690	0.53
						2" Ice			
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.000	0.0000	131.000	No Ice	11.960	5.970	0.11
			0.00			1/2"	12.700	6.630	0.20
			1.00			Ice	13.460	7.300	0.30
						1" Ice	15.020	8.690	0.53
						2" Ice			
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000	0.0000	131.000	No Ice	12.250	6.050	0.09
			0.00			1/2"	13.000	6.710	0.18
			1.00			Ice	13.760	7.390	0.27
						1" Ice	15.340	8.790	0.51
						2" Ice			
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.000	0.0000	131.000	No Ice	12.250	6.050	0.09
			0.00			1/2"	13.000	6.710	0.18
			1.00			Ice	13.760	7.390	0.27
						1" Ice	15.340	8.790	0.51
						2" Ice			
OPA65R-BU4D w/ Mount Pipe	C	From Leg	4.000	0.0000	131.000	No Ice	8.100	4.030	0.08
			0.00			1/2"	8.650	4.500	0.14
			1.00			Ice	9.210	4.980	0.21
						1" Ice	10.390	5.980	0.38
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
DMP65R-BU4D w/ Mount Pipe	C	From Leg	4.000	0.0000	131.000	No Ice	7.530	3.790	0.09
			0.00			1/2"	8.040	4.230	0.16
			1.00			Ice	8.570	4.680	0.22
						1" Ice	9.680	5.630	0.39
						2" Ice			
TT19-08BP111-001	A	From Leg	4.000	0.0000	131.000	No Ice	0.545	0.442	0.02
			0.00			1/2"	0.641	0.530	0.02
			0.00			Ice	0.743	0.626	0.03
						1" Ice	0.971	0.840	0.05
						2" Ice			
TT19-08BP111-001	B	From Leg	4.000	0.0000	131.000	No Ice	0.545	0.442	0.02
			0.00			1/2"	0.641	0.530	0.02
			0.00			Ice	0.743	0.626	0.03
						1" Ice	0.971	0.840	0.05
						2" Ice			
TT19-08BP111-001	C	From Leg	4.000	0.0000	131.000	No Ice	0.545	0.442	0.02
			0.00			1/2"	0.641	0.530	0.02
			0.00			Ice	0.743	0.626	0.03
						1" Ice	0.971	0.840	0.05
						2" Ice			
(2) CM1007-DBPXBC-003	A	From Leg	4.000	0.0000	131.000	No Ice	0.367	0.134	0.01
			0.00			1/2"	0.448	0.183	0.01
			1.00			Ice	0.536	0.240	0.01
						1" Ice	0.735	0.375	0.03
						2" Ice			
(2) CM1007-DBPXBC-003	B	From Leg	4.000	0.0000	131.000	No Ice	0.367	0.134	0.01
			0.00			1/2"	0.448	0.183	0.01
			1.00			Ice	0.536	0.240	0.01
						1" Ice	0.735	0.375	0.03
						2" Ice			
(2) CM1007-DBPXBC-003	C	From Leg	4.000	0.0000	131.000	No Ice	0.367	0.134	0.01
			0.00			1/2"	0.448	0.183	0.01
			1.00			Ice	0.536	0.240	0.01
						1" Ice	0.735	0.375	0.03
						2" Ice			
(2) 860 10025	A	From Leg	4.000	0.0000	131.000	No Ice	0.142	0.121	0.00
			0.00			1/2"	0.196	0.173	0.00
			1.00			Ice	0.259	0.231	0.01
						1" Ice	0.408	0.376	0.01
						2" Ice			
(2) 860 10025	B	From Leg	4.000	0.0000	131.000	No Ice	0.142	0.121	0.00
			0.00			1/2"	0.196	0.173	0.00
			1.00			Ice	0.259	0.231	0.01
						1" Ice	0.408	0.376	0.01
						2" Ice			
(2) 860 10025	C	From Leg	4.000	0.0000	131.000	No Ice	0.142	0.121	0.00
			0.00			1/2"	0.196	0.173	0.00
			1.00			Ice	0.259	0.231	0.01
						1" Ice	0.408	0.376	0.01
						2" Ice			
RRUS 4449 B5/B12	A	From Leg	4.000	0.0000	131.000	No Ice	1.968	1.408	0.07
			0.00			1/2"	2.144	1.564	0.09
			1.00			Ice	2.328	1.727	0.11
						1" Ice	2.718	2.075	0.16
						2" Ice			
RRUS 4449 B5/B12	B	From Leg	4.000	0.0000	131.000	No Ice	1.968	1.408	0.07
			0.00			1/2"	2.144	1.564	0.09
			1.00			Ice	2.328	1.727	0.11
						1" Ice	2.718	2.075	0.16
						2" Ice			
RRUS 4449 B5/B12	C	From Leg	4.000	0.0000	131.000	No Ice	1.968	1.408	0.07
			0.00			1/2"	2.144	1.564	0.09
			1.00			Ice	2.328	1.727	0.11
						1" Ice	2.718	2.075	0.16
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
RRUS 8843 B2/B66A	A	From Leg	4.000		0.0000	131.000	No Ice	1.639	1.353	0.07
			0.00				1/2"	1.799	1.500	0.09
			1.00				Ice	1.966	1.655	0.11
							1" Ice	2.323	1.986	0.16
							2" Ice			
RRUS 8843 B2/B66A	B	From Leg	4.000		0.0000	131.000	No Ice	1.639	1.353	0.07
			0.00				1/2"	1.799	1.500	0.09
			1.00				Ice	1.966	1.655	0.11
							1" Ice	2.323	1.986	0.16
							2" Ice			
RRUS 8843 B2/B66A	C	From Leg	4.000		0.0000	131.000	No Ice	1.639	1.353	0.07
			0.00				1/2"	1.799	1.500	0.09
			1.00				Ice	1.966	1.655	0.11
							1" Ice	2.323	1.986	0.16
							2" Ice			
DC6-48-60-18-8F	B	From Leg	4.000		0.0000	131.000	No Ice	1.212	1.212	0.02
			0.00				1/2"	1.892	1.892	0.04
			0.00				Ice	2.105	2.105	0.07
							1" Ice	2.570	2.570	0.13
							2" Ice			
DC6-48-60-18-8F	C	From Leg	4.000		0.0000	131.000	No Ice	1.212	1.212	0.02
			0.00				1/2"	1.892	1.892	0.04
			0.00				Ice	2.105	2.105	0.07
							1" Ice	2.570	2.570	0.13
							2" Ice			
HRK12-3HD	C	None			0.0000	131.000	No Ice	4.560	4.560	0.25
							1/2"	6.390	6.390	0.31
							Ice	8.180	8.180	0.40
							1" Ice	11.660	11.660	0.66
							2" Ice			
Platform Mount [LP 601-1]	C	None			0.0000	131.000	No Ice	28.500	28.500	1.12
							1/2"	31.690	31.690	1.68
							Ice	34.870	34.870	2.28
							1" Ice	41.230	41.230	3.65
							2" Ice			
*** 119 R *** AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000		0.0000	119.000	No Ice	5.190	2.710	0.13
			0.00				1/2"	5.590	3.040	0.17
			2.00				Ice	6.020	3.380	0.23
							1" Ice	6.900	4.120	0.35
							2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.000		0.0000	119.000	No Ice	5.190	2.710	0.13
			0.00				1/2"	5.590	3.040	0.17
			2.00				Ice	6.020	3.380	0.23
							1" Ice	6.900	4.120	0.35
							2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000		0.0000	119.000	No Ice	5.190	2.710	0.13
			0.00				1/2"	5.590	3.040	0.17
			2.00				Ice	6.020	3.380	0.23
							1" Ice	6.900	4.120	0.35
							2" Ice			
APXVAALL24_43-U- NA20_TMO w/ Mount Pipe	A	From Leg	4.000		0.0000	119.000	No Ice	14.690	6.870	0.18
			0.00				1/2"	15.460	7.550	0.31
			2.00				Ice	16.230	8.250	0.45
							1" Ice	17.820	9.670	0.78
							2" Ice			
APXVAALL24_43-U- NA20_TMO w/ Mount Pipe	B	From Leg	4.000		0.0000	119.000	No Ice	14.690	6.870	0.18
			0.00				1/2"	15.460	7.550	0.31
			2.00				Ice	16.230	8.250	0.45
							1" Ice	17.820	9.670	0.78
							2" Ice			
APXVAALL24_43-U- NA20_TMO w/ Mount Pipe	C	From Leg	4.000		0.0000	119.000	No Ice	14.690	6.870	0.18
			0.00				1/2"	15.460	7.550	0.31
			2.00				Ice	16.230	8.250	0.45
							1" Ice	17.820	9.670	0.78
							2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Leg	4.000 0.00 2.00	0.0000	119.000	2" Ice			
						No Ice	6.290	2.760	0.06
						1/2"	6.860	3.270	0.11
						Ice	7.450	3.790	0.16
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Leg	4.000 0.00 2.00	0.0000	119.000	1" Ice	8.680	4.900	0.29
						2" Ice			
						No Ice	6.290	2.760	0.06
						1/2"	6.860	3.270	0.11
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Leg	4.000 0.00 2.00	0.0000	119.000	Ice	7.450	3.790	0.16
						1" Ice	8.680	4.900	0.29
						2" Ice			
						No Ice	6.290	2.760	0.06
RADIO 4415 B66A_CCIV3	A	From Leg	4.000 0.00 2.00	0.0000	119.000	1/2"	1.799	0.789	0.06
						Ice	1.966	0.911	0.07
						1" Ice	2.323	1.181	0.11
						2" Ice			
RADIO 4415 B66A_CCIV3	B	From Leg	4.000 0.00 2.00	0.0000	119.000	No Ice	1.639	0.677	0.05
						1/2"	1.799	0.789	0.06
						Ice	1.966	0.911	0.07
						1" Ice	2.323	1.181	0.11
RADIO 4415 B66A_CCIV3	C	From Leg	4.000 0.00 2.00	0.0000	119.000	2" Ice			
						No Ice	1.639	0.677	0.05
						1/2"	1.799	0.789	0.06
						Ice	1.966	0.911	0.07
RADIO 4424 B25_TMOV1	A	From Leg	4.000 0.00 2.00	0.0000	119.000	1" Ice	2.323	1.181	0.11
						2" Ice			
						No Ice	2.052	1.610	0.10
						1/2"	2.231	1.772	0.12
RADIO 4424 B25_TMOV1	B	From Leg	4.000 0.00 2.00	0.0000	119.000	Ice	2.417	1.941	0.14
						1" Ice	2.811	2.301	0.20
						2" Ice			
						No Ice	2.052	1.610	0.10
RADIO 4424 B25_TMOV1	C	From Leg	4.000 0.00 2.00	0.0000	119.000	1/2"	2.231	1.772	0.12
						Ice	2.417	1.941	0.14
						1" Ice	2.811	2.301	0.20
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.000 0.00 2.00	0.0000	119.000	No Ice	1.970	1.587	0.07
						1/2"	2.147	1.749	0.09
						Ice	2.331	1.918	0.12
						1" Ice	2.721	2.280	0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.000 0.00 2.00	0.0000	119.000	2" Ice			
						No Ice	1.970	1.587	0.07
						1/2"	2.147	1.749	0.09
						Ice	2.331	1.918	0.12
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.000 0.00 2.00	0.0000	119.000	1" Ice	2.721	2.280	0.17
						2" Ice			
						No Ice	1.970	1.587	0.07
						1/2"	2.147	1.749	0.09
Platform Mount [LP 403-1]	C	None		0.0000	119.000	Ice	2.331	1.918	0.12
						1" Ice	2.721	2.280	0.17
						2" Ice			
						No Ice	18.940	18.940	1.50
						1/2"	23.310	23.310	1.90
						Ice	27.740	27.740	2.37
						1" Ice	36.770	36.770	3.53
						2" Ice			



Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
						2" Ice			
*****									
TME-PCS 1900MHz 4x45W-65MHz	A	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	2.322 2.527 2.739 3.185	2.238 2.441 2.651 3.093	0.06 0.08 0.11 0.17
TME-PCS 1900MHz 4x45W-65MHz	B	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	2.322 2.527 2.739 3.185	2.238 2.441 2.651 3.093	0.06 0.08 0.11 0.17
TME-PCS 1900MHz 4x45W-65MHz	C	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	2.322 2.527 2.739 3.185	2.238 2.441 2.651 3.093	0.06 0.08 0.11 0.17
TME-800MHz 2X50W RRH W/FILTER	A	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.06 0.09 0.11 0.17
TME-800MHz 2X50W RRH W/FILTER	B	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.06 0.09 0.11 0.17
TME-800MHz 2X50W RRH W/FILTER	C	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.06 0.09 0.11 0.17
Side Arm Mount [SO 102-3]	C	None		0.0000	117.000	No Ice 1/2" Ice 1" 2"	3.600 4.180 4.750 5.900	3.600 4.180 4.750 5.900	0.07 0.11 0.14 0.20
2.375" OD x 6' Mount Pipe	A	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.03 0.04 0.05 0.09
2.375" OD x 6' Mount Pipe	B	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.03 0.04 0.05 0.09
2.375" OD x 6' Mount Pipe	C	From Leg	1.000 0.00 0.00	0.0000	117.000	No Ice 1/2" Ice 1" 2"	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.03 0.04 0.05 0.09
*****									
Platform Mount [LP 403-1]	C	None		0.0000	111.000	No Ice 1/2" Ice 1" 2"	18.940 23.310 27.740 36.770	18.940 23.310 27.740 36.770	1.50 1.90 2.37 3.53
*** 101 P ***									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 1" 2"	5.190 5.590 6.020 6.900	2.710 3.040 3.380 4.120	0.13 0.17 0.23 0.35
AIR6449 B41_T-MOBILE	B	From Leg	4.000	0.0000	101.000	No Ice	5.190	2.710	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
w/ Mount Pipe			0.00 3.00			1/2" Ice 6.020 3.380 0.17	5.590 6.020 3.380 0.23	0.17
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	5.190 5.590 6.020 3.380 0.23	0.13
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	14.690 15.460 16.230 8.250 0.46	0.19
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	14.690 15.460 16.230 8.250 0.46	0.19
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	14.690 15.460 16.230 8.250 0.46	0.19
AIR 32 B2A B66AA w/ Mount Pipe	A	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	3.760 4.120 3.490 0.25	0.19
AIR 32 B2A B66AA w/ Mount Pipe	B	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	3.760 4.120 3.490 0.25	0.19
AIR 32 B2A B66AA w/ Mount Pipe	C	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	3.760 4.120 3.490 0.25	0.19
(2) KRY 112 144/1	A	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	0.350 0.426 0.234 0.01	0.01
KRY 112 144/1	B	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	0.350 0.426 0.234 0.01	0.01
(2) RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	1.970 2.147 1.749 0.09	0.07
RADIO 4449 B71 B85A_T- MOBILE	B	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	1.970 2.147 1.749 0.09	0.07
RRUS 4415 B25	A	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	1.644 1.804 0.791 0.06	0.04
RRUS 4415 B25	B	From Leg	4.000 0.00 3.00	0.0000	101.000	No Ice 1/2" Ice 6.020 3.380 0.17	1.644 1.804 0.791 0.06	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			0.00			1/2"	1.804	0.791	0.06
			3.00			Ice	1.972	0.913	0.07
						1" Ice	2.329	1.183	0.11
						2" Ice			
RRUS 4415 B25	C	From Leg	4.000	0.0000	101.000	No Ice	1.644	0.679	0.04
			0.00			1/2"	1.804	0.791	0.06
			3.00			Ice	1.972	0.913	0.07
						1" Ice	2.329	1.183	0.11
						2" Ice			
SDX1926Q-43	B	From Leg	4.000	0.0000	101.000	No Ice	0.241	0.101	0.01
			0.00			1/2"	0.306	0.144	0.01
			3.00			Ice	0.379	0.195	0.01
						1" Ice	0.547	0.318	0.02
						2" Ice			
(2) SDX1926Q-43	C	From Leg	4.000	0.0000	101.000	No Ice	0.241	0.101	0.01
			0.00			1/2"	0.306	0.144	0.01
			3.00			Ice	0.379	0.195	0.01
						1" Ice	0.547	0.318	0.02
						2" Ice			
Platform Mount [LP 715-1_KCKR]	C	None		0.0000	101.000	No Ice	57.990	57.990	2.05
						1/2"	64.470	64.470	3.30
						Ice	71.360	71.360	4.69
						1" Ice	86.460	86.460	7.90
						2" Ice			
*** 95 P ***									
MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.000	0.0000	95.000	No Ice	8.010	4.230	0.10
			0.00			1/2"	8.520	4.690	0.18
			-4.00			Ice	9.040	5.160	0.28
						1" Ice	10.110	6.120	0.51
						2" Ice			
MX08FRO665-20 w/ Mount Pipe	B	From Leg	4.000	0.0000	95.000	No Ice	8.010	4.230	0.10
			0.00			1/2"	8.520	4.690	0.18
			-4.00			Ice	9.040	5.160	0.28
						1" Ice	10.110	6.120	0.51
						2" Ice			
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.000	0.0000	95.000	No Ice	8.010	4.230	0.10
			0.00			1/2"	8.520	4.690	0.18
			-4.00			Ice	9.040	5.160	0.28
						1" Ice	10.110	6.120	0.51
						2" Ice			
TA08025-B604	A	From Leg	4.000	0.0000	95.000	No Ice	1.964	0.981	0.06
			0.00			1/2"	2.138	1.112	0.08
			-4.00			Ice	2.320	1.250	0.10
						1" Ice	2.705	1.548	0.15
						2" Ice			
TA08025-B604	B	From Leg	4.000	0.0000	95.000	No Ice	1.964	0.981	0.06
			0.00			1/2"	2.138	1.112	0.08
			-4.00			Ice	2.320	1.250	0.10
						1" Ice	2.705	1.548	0.15
						2" Ice			
TA08025-B604	C	From Leg	4.000	0.0000	95.000	No Ice	1.964	0.981	0.06
			0.00			1/2"	2.138	1.112	0.08
			-4.00			Ice	2.320	1.250	0.10
						1" Ice	2.705	1.548	0.15
						2" Ice			
TA08025-B605	A	From Leg	4.000	0.0000	95.000	No Ice	1.964	1.129	0.08
			0.00			1/2"	2.138	1.267	0.09
			-4.00			Ice	2.320	1.411	0.11
						1" Ice	2.705	1.723	0.16
						2" Ice			
TA08025-B605	B	From Leg	4.000	0.0000	95.000	No Ice	1.964	1.129	0.08
			0.00			1/2"	2.138	1.267	0.09
			-4.00			Ice	2.320	1.411	0.11
						1" Ice	2.705	1.723	0.16
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
TA08025-B605	C	From Leg	4.000 0.00 -4.00	0.0000	95.000	No Ice	1.964	1.129	0.08
						1/2" Ice	2.138	1.267	0.09
						Ice	2.320	1.411	0.11
						1" Ice	2.705	1.723	0.16
						2" Ice			
RDIDC-9181-PF-48	A	From Leg	4.000 0.00 -4.00	0.0000	95.000	No Ice	2.312	1.293	0.02
						1/2" Ice	2.502	1.448	0.04
						Ice	2.700	1.610	0.06
						1" Ice	3.118	1.957	0.12
						2" Ice			
(2) 8' x 2" Mount Pipe	A	From Leg	4.000 0.00 0.00	0.0000	95.000	No Ice	1.900	1.900	0.03
						1/2" Ice	2.728	2.728	0.04
						Ice	3.401	3.401	0.06
						1" Ice	4.396	4.396	0.12
						2" Ice			
(2) 8' x 2" Mount Pipe	B	From Leg	4.000 0.00 0.00	0.0000	95.000	No Ice	1.900	1.900	0.03
						1/2" Ice	2.728	2.728	0.04
						Ice	3.401	3.401	0.06
						1" Ice	4.396	4.396	0.12
						2" Ice			
(2) 8' x 2" Mount Pipe	C	From Leg	4.000 0.00 0.00	0.0000	95.000	No Ice	1.900	1.900	0.03
						1/2" Ice	2.728	2.728	0.04
						Ice	3.401	3.401	0.06
						1" Ice	4.396	4.396	0.12
						2" Ice			
Commscope MC-PK8-DSH	C	None		0.0000	95.000	No Ice	34.240	34.240	1.75
						1/2" Ice	62.950	62.950	2.10
						Ice	91.660	91.660	2.45
						1" Ice	149.080	149.080	3.15
						2" Ice			
*****									
*****									
58532A	A	From Leg	1.000 0.00 1.00	0.0000	60.000	No Ice	0.189	0.189	0.00
						1/2" Ice	0.248	0.248	0.00
						Ice	0.315	0.315	0.01
						1" Ice	0.470	0.470	0.02
						2" Ice			
Side Arm Mount [SO 304-1]	A	From Leg	0.000 0.00 0.00	0.0000	60.000	No Ice	0.310	0.880	0.02
						1/2" Ice	0.500	1.260	0.03
						Ice	0.730	1.670	0.05
						1" Ice	1.290	2.580	0.09
						2" Ice			
*** 50 *** KS24019-L112A	A	From Leg	1.000 0.00 1.00	0.0000	50.000	No Ice	0.100	0.100	0.01
						1/2" Ice	0.180	0.180	0.01
						Ice	0.260	0.260	0.01
						1" Ice	0.420	0.420	0.01
						2" Ice			
Side Arm Mount [SO 701-1]	A	From Leg	0.500 0.00 0.00	0.0000	50.000	No Ice	0.850	1.670	0.07
						1/2" Ice	1.140	2.340	0.08
						Ice	1.430	3.010	0.09
						1" Ice	2.010	4.350	0.12
						2" Ice			
*****									
***									

**Load Combinations**

Comb. No.	Description
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

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	133.5 - 128.5	Pole	Max Tension	8	0.00	0.00	-0.00
			Max. Compression	26	-8.34	-0.79	0.02
			Max. Mx	8	-2.71	-17.27	-0.37
			Max. My	14	-2.69	-0.37	-17.54
			Max. Vy	8	5.60	-17.27	-0.37
			Max. Vx	2	-5.70	0.27	17.48
			Max. Torque	25			-0.76
L2	128.5 - 123.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.62	-0.81	0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	123.5 - 121.5	Pole	Max. Mx	8	-2.91	-45.60	-0.83
			Max. My	14	-2.89	-0.84	-46.39
			Max. Vy	8	5.73	-45.60	-0.83
			Max. Vx	2	-5.84	0.72	46.33
			Max. Torque	25			-0.76
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.73	-0.81	0.02
			Max. Mx	8	-3.00	-57.10	-1.01
			Max. My	14	-2.99	-1.03	-58.11
			Max. Vy	8	5.78	-57.10	-1.01
L4	121.5 - 119	Pole	Max. Vx	2	-5.89	0.90	58.05
			Max. Torque	25			-0.76
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.93	-0.82	0.03
			Max. Mx	8	-3.13	-71.66	-1.24
			Max. My	14	-3.12	-1.26	-72.93
			Max. Vy	8	5.89	-71.66	-1.24
			Max. Vx	2	-5.99	1.13	72.87
			Max. Torque	25			-0.76
			Max Tension	1	0.00	0.00	0.00
L5	119 - 114	Pole	Max. Compression	26	-18.95	-0.83	0.04
			Max. Mx	8	-7.58	-132.75	-1.70
			Max. My	14	-7.56	-1.74	-134.56
			Max. Vy	8	11.66	-132.75	-1.70
			Max. Vx	2	-11.77	1.59	134.51
			Max. Torque	3			-0.76
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.81	-0.85	0.05
			Max. Mx	8	-9.71	-194.57	-2.16
			Max. My	14	-9.69	-2.23	-196.92
L6	114 - 109	Pole	Max. Vy	8	13.30	-194.57	-2.16
			Max. Vx	2	-13.41	2.06	196.87
			Max. Torque	3			-0.76
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.52	-0.87	0.07
			Max. Mx	8	-10.19	-262.30	-2.63
			Max. My	14	-10.17	-2.72	-265.20
			Max. Vy	8	13.80	-262.30	-2.63
			Max. Vx	2	-13.91	2.52	265.15
			Max. Torque	3			-0.76
L7	109 - 104	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.74	-1.59	1.31
			Max. Mx	8	-14.94	-352.38	-2.51
			Max. My	2	-14.91	2.67	356.20
			Max. Vy	8	20.17	-352.38	-2.51
			Max. Vx	2	-20.31	2.67	356.20
			Max. Torque	24			-1.32
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.33	-1.62	1.79
			Max. Mx	8	-18.48	-453.48	-2.92
L8	104 - 99	Pole	Max. My	2	-18.45	3.18	458.00
			Max. Vy	8	24.17	-453.48	-2.92
			Max. Vx	2	-24.35	3.18	458.00
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.19	-1.64	1.81
			Max. Mx	8	-19.19	-575.43	-3.44
			Max. My	2	-19.16	3.70	580.84
			Max. Vy	8	24.64	-575.43	-3.44
			Max. Vx	2	-24.82	3.70	580.84
L9	99 - 94	Pole	Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.92	-1.65	1.81
			Max. Mx	8	-19.74	-668.42	-3.82
			Max. My	2	-19.72	4.09	674.51
			Max. Vy	8	24.99	-668.42	-3.82
			Max. Vx	2	-25.17	4.09	674.51
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.92	-1.65	1.81
L10	94 - 89	Pole	Max. Mx	8	-19.74	-668.42	-3.82
			Max. My	2	-19.72	4.09	674.51
			Max. Vy	8	24.99	-668.42	-3.82
			Max. Vx	2	-25.17	4.09	674.51
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.92	-1.65	1.81
			Max. Mx	8	-19.74	-668.42	-3.82
			Max. My	2	-19.72	4.09	674.51
			Max. Vy	8	24.99	-668.42	-3.82
L11	89 - 85.25	Pole	Max. Vx	2	-25.17	4.09	674.51
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.92	-1.65	1.81
			Max. Mx	8	-19.74	-668.42	-3.82
			Max. My	2	-19.72	4.09	674.51
			Max. Vy	8	24.99	-668.42	-3.82
			Max. Vx	2	-25.17	4.09	674.51
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L12	85.25 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.00	-1.66	1.82
			Max. Mx	8	-19.82	-674.67	-3.85
			Max. My	2	-19.79	4.11	680.80
			Max. Vy	8	25.01	-674.67	-3.85
			Max. Vx	2	-25.19	4.11	680.80
L13	85 - 80	Pole	Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.50	-1.69	1.79
			Max. Mx	8	-20.90	-801.04	-4.36
			Max. My	2	-20.87	4.62	808.06
			Max. Vy	8	25.56	-801.04	-4.36
L14	80 - 75	Pole	Max. Vx	2	-25.74	4.62	808.06
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.86	-1.69	1.78
			Max. Mx	8	-21.17	-833.07	-4.49
			Max. My	2	-21.15	4.75	840.31
L15	75 - 74	Pole	Max. Vy	8	25.70	-833.07	-4.49
			Max. Vx	2	-25.88	4.75	840.31
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.81	-1.70	1.76
			Max. Mx	8	-22.62	-956.51	-4.97
L16	74 - 69	Pole	Max. My	2	-22.59	5.24	964.59
			Max. Vy	8	26.27	-956.51	-4.97
			Max. Vx	2	-26.45	5.24	964.59
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.94	-1.70	1.75
L17	69 - 68.25	Pole	Max. Mx	8	-23.55	-1088.93	-5.49
			Max. My	2	-23.53	5.76	1097.90
			Max. Vy	8	26.73	-1088.93	-5.49
			Max. Vx	2	-26.91	5.76	1097.90
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
L18	68.25 - 68	Pole	Max. Compression	26	-49.13	-1.70	1.74
			Max. Mx	8	-23.70	-1108.99	-5.56
			Max. My	2	-23.68	5.83	1118.10
			Max. Vy	8	26.79	-1108.99	-5.56
			Max. Vx	2	-26.97	5.83	1118.10
			Max. Torque	12			1.45
L19	68 - 63	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.22	-1.71	1.75
			Max. Mx	8	-23.78	-1115.69	-5.59
			Max. My	2	-23.76	5.86	1124.84
			Max. Vy	8	26.82	-1115.69	-5.59
			Max. Vx	2	-27.00	5.86	1124.84
L20	63 - 58	Pole	Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.97	-1.72	1.69
			Max. Mx	8	-25.11	-1251.11	-6.10
			Max. My	2	-25.09	6.37	1261.14
			Max. Vy	8	27.37	-1251.11	-6.10
L21	58 - 53	Pole	Max. Vx	2	-27.55	6.37	1261.14
			Max. Torque	12			1.45
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.83	-1.73	1.76
			Max. Mx	8	-26.50	-1389.38	-6.57
			Max. My	2	-26.48	6.88	1400.28
L21	58 - 53	Pole	Max. Vy	8	27.97	-1389.38	-6.57
			Max. Vx	2	-28.12	6.88	1400.28
			Max. Torque	10			1.51
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.63	-1.74	1.71
			Max. Mx	8	-27.90	-1530.49	-7.08
L21	58 - 53	Pole	Max. My	2	-27.88	7.39	1542.16
			Max. Vy	8	28.51	-1530.49	-7.08
			Max. Vx	2	-28.66	7.39	1542.16

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L22	53 - 48	Pole	Max. Torque	10			1.51
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.58	-1.76	1.91
			Max. Mx	8	-29.40	-1674.44	-7.43
			Max. My	2	-29.39	7.90	1686.95
			Max. Vy	8	29.11	-1674.44	-7.43
			Max. Vx	2	-29.23	7.90	1686.95
L23	48 - 43	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.43	-1.77	1.86
			Max. Mx	8	-30.86	-1821.23	-7.93
			Max. My	2	-30.84	8.41	1834.32
			Max. Vy	8	29.63	-1821.23	-7.93
			Max. Vx	2	-29.75	8.41	1834.32
L24	43 - 37.75	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.62	-1.78	1.85
			Max. Mx	8	-31.01	-1836.05	-7.98
			Max. My	2	-31.00	8.46	1849.20
			Max. Vy	8	29.68	-1836.05	-7.98
			Max. Vx	2	-29.79	8.46	1849.20
L25	37.75 - 37.5	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.06	-1.80	1.81
			Max. Mx	8	-33.71	-1985.97	-8.49
			Max. My	2	-33.70	8.96	1999.69
			Max. Vy	8	30.31	-1985.97	-8.49
			Max. Vx	2	-30.42	8.96	1999.69
L26	37.5 - 32.5	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.08	-1.81	1.75
			Max. Mx	8	-35.33	-2138.64	-8.99
			Max. My	2	-35.32	9.47	2152.93
			Max. Vy	8	30.80	-2138.64	-8.99
			Max. Vx	2	-30.91	9.47	2152.93
L27	32.5 - 27.5	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.13	-1.82	1.70
			Max. Mx	8	-37.00	-2293.72	-9.49
			Max. My	2	-36.99	9.97	2308.57
			Max. Vy	8	31.27	-2293.72	-9.49
			Max. Vx	2	-31.38	9.97	2308.57
L28	27.5 - 22.5	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.19	-1.84	1.65
			Max. Mx	8	-38.69	-2451.09	-9.99
			Max. My	2	-38.68	10.47	2466.51
			Max. Vy	20	-31.72	2450.03	12.06
			Max. Vx	2	-31.83	10.47	2466.51
L29	22.5 - 17.5	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.27	-1.85	1.60
			Max. Mx	8	-40.41	-2610.64	-10.49
			Max. My	2	-40.41	10.97	2626.62
			Max. Vy	20	-32.14	2609.59	12.56
			Max. Vx	2	-32.25	10.97	2626.62
L30	17.5 - 12.5	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.37	-1.87	1.55
			Max. Mx	8	-42.16	-2772.22	-10.99
			Max. My	2	-42.16	11.47	2788.75
			Max. Vy	20	-32.53	2771.17	13.05
			Max. Vx	14	32.64	-12.57	-2786.74
L31	12.5 - 7.5	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.48	-1.88	1.50
			Max. Mx	8	-43.94	-2935.74	-11.48
			Max. Vy	20	-43.93	11.96	2952.82
Max. Vx	20	-32.92	2934.69	13.54			



Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L32	7.5 - 2.5	Pole	Max. Vx	14	33.03	-13.06	-2950.81
			Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.58	-1.89	1.46
			Max. Mx	8	-45.74	-3101.19	-11.97
			Max. My	2	-45.74	12.45	3118.81
			Max. Vy	20	-33.30	3100.14	14.03
			Max. Vx	14	33.41	-13.55	-3116.81
L33	2.5 - 0	Pole	Max. Torque	10			1.64
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.60	-1.90	1.44
			Max. Mx	8	-46.65	-3184.65	-12.21
			Max. My	2	-46.65	12.69	3202.53
			Max. Vy	20	-33.50	3183.60	14.27
			Max. Vx	14	33.61	-13.79	-3200.53
			Max. Torque	10			1.64

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	77.60	0.00	-0.00
	Max. H <sub>x</sub>	21	35.00	33.48	0.10
	Max. H <sub>z</sub>	3	35.00	0.10	33.58
	Max. M <sub>x</sub>	2	3202.53	0.10	33.58
	Max. M <sub>z</sub>	8	3184.65	-33.48	-0.10
	Max. Torsion	10	1.64	-29.42	-17.09
	Min. Vert	3	35.00	0.10	33.58
	Min. H <sub>x</sub>	9	35.00	-33.48	-0.10
	Min. H <sub>z</sub>	15	35.00	-0.10	-33.59
	Min. M <sub>x</sub>	14	-3200.53	-0.10	-33.58
	Min. M <sub>z</sub>	20	-3183.60	33.48	0.10
	Min. Torsion	22	-1.62	29.42	17.09

### 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	38.89	-0.00	0.00	-0.81	-0.43	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	46.67	-0.10	-33.58	-3202.53	12.69	1.07
0.9 Dead+1.0 Wind 0 deg - No Ice	35.00	-0.10	-33.58	-3165.64	12.65	1.06
1.2 Dead+1.0 Wind 30 deg - No Ice	46.67	16.87	-29.42	-2791.85	-1595.44	0.30
0.9 Dead+1.0 Wind 30 deg - No Ice	35.00	16.87	-29.42	-2759.72	-1577.13	0.31
1.2 Dead+1.0 Wind 60 deg - No Ice	46.67	28.94	-16.71	-1590.44	-2751.58	-0.56
0.9 Dead+1.0 Wind 60 deg - No Ice	35.00	28.94	-16.71	-1571.98	-2719.97	-0.54
1.2 Dead+1.0 Wind 90 deg - No Ice	46.67	33.48	0.10	12.21	-3184.65	-1.27
0.9 Dead+1.0 Wind 90 deg - No Ice	35.00	33.48	0.10	12.30	-3148.12	-1.25
1.2 Dead+1.0 Wind 120 deg - No Ice	46.67	29.42	17.09	1625.51	-2789.41	-1.64
0.9 Dead+1.0 Wind 120 deg - No Ice	35.00	29.42	17.09	1607.18	-2757.44	-1.62

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
1.2 Dead+1.0 Wind 150 deg - No Ice	46.67	16.82	29.13	2778.25	-1604.07	-1.56
0.9 Dead+1.0 Wind 150 deg - No Ice	35.00	16.82	29.13	2746.68	-1585.56	-1.54
1.2 Dead+1.0 Wind 180 deg - No Ice	46.67	0.10	33.58	3200.53	-13.79	-1.06
0.9 Dead+1.0 Wind 180 deg - No Ice	35.00	0.10	33.59	3164.16	-13.46	-1.05
1.2 Dead+1.0 Wind 210 deg - No Ice	46.67	-16.87	29.42	2789.77	1594.33	-0.28
0.9 Dead+1.0 Wind 210 deg - No Ice	35.00	-16.87	29.42	2758.19	1576.32	-0.28
1.2 Dead+1.0 Wind 240 deg - No Ice	46.67	-28.94	16.71	1588.36	2750.46	0.57
0.9 Dead+1.0 Wind 240 deg - No Ice	35.00	-28.94	16.71	1570.46	2719.15	0.55
1.2 Dead+1.0 Wind 270 deg - No Ice	46.67	-33.48	-0.10	-14.27	3183.60	1.26
0.9 Dead+1.0 Wind 270 deg - No Ice	35.00	-33.48	-0.10	-13.82	3147.34	1.24
1.2 Dead+1.0 Wind 300 deg - No Ice	46.67	-29.42	-17.09	-1627.56	2788.30	1.62
0.9 Dead+1.0 Wind 300 deg - No Ice	35.00	-29.42	-17.09	-1608.69	2756.63	1.60
1.2 Dead+1.0 Wind 330 deg - No Ice	46.67	-16.82	-29.13	-2780.32	1602.97	1.55
0.9 Dead+1.0 Wind 330 deg - No Ice	35.00	-16.82	-29.13	-2748.20	1584.75	1.53
1.2 Dead+1.0 Ice+1.0 Temp	77.60	-0.00	0.00	-1.44	-1.90	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	77.60	-0.02	-7.98	-806.79	0.16	0.22
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	77.60	3.97	-6.90	-697.78	-401.47	0.04
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	77.60	6.89	-3.98	-402.24	-696.10	-0.15
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	77.60	7.97	0.02	0.64	-804.77	-0.30
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	77.60	6.91	4.00	402.92	-698.37	-0.38
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	77.60	4.00	6.92	696.79	-405.41	-0.35
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	77.60	0.02	7.98	803.52	-4.39	-0.22
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	77.60	-3.97	6.90	694.51	397.24	-0.04
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	77.60	-6.89	3.98	398.97	691.87	0.15
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	77.60	-7.97	-0.02	-3.91	800.54	0.30
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	77.60	-6.91	-4.00	-406.18	694.14	0.37
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	77.60	-4.00	-6.92	-700.05	401.18	0.34
Dead+Wind 0 deg - Service	38.89	-0.02	-7.31	-694.15	2.39	0.23
Dead+Wind 30 deg - Service	38.89	3.67	-6.40	-605.26	-345.88	0.07
Dead+Wind 60 deg - Service	38.89	6.30	-3.64	-345.08	-596.26	-0.12
Dead+Wind 90 deg - Service	38.89	7.29	0.02	1.99	-689.99	-0.27
Dead+Wind 120 deg - Service	38.89	6.40	3.72	351.39	-604.45	-0.35
Dead+Wind 150 deg - Service	38.89	3.66	6.34	601.05	-347.74	-0.34
Dead+Wind 180 deg - Service	38.89	0.02	7.31	692.43	-3.32	-0.23
Dead+Wind 210 deg - Service	38.89	-3.67	6.40	603.54	344.95	-0.07
Dead+Wind 240 deg - Service	38.89	-6.30	3.64	343.36	595.33	0.12
Dead+Wind 270 deg - Service	38.89	-7.29	-0.02	-3.71	689.06	0.27

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - Service	38.89	-6.40	-3.72	-353.10	603.53	0.35
Dead+Wind 330 deg - Service	38.89	-3.66	-6.34	-602.77	346.81	0.34

## 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	0.00	-38.89	0.00	0.00	38.89	-0.00	0.000%
2	-0.10	-46.67	-33.59	0.10	46.67	33.58	0.002%
3	-0.10	-35.00	-33.59	0.10	35.00	33.58	0.002%
4	16.87	-46.67	-29.42	-16.87	46.67	29.42	0.000%
5	16.87	-35.00	-29.42	-16.87	35.00	29.42	0.000%
6	28.94	-46.67	-16.71	-28.94	46.67	16.71	0.000%
7	28.94	-35.00	-16.71	-28.94	35.00	16.71	0.000%
8	33.48	-46.67	0.10	-33.48	46.67	-0.10	0.002%
9	33.48	-35.00	0.10	-33.48	35.00	-0.10	0.002%
10	29.42	-46.67	17.09	-29.42	46.67	-17.09	0.000%
11	29.42	-35.00	17.09	-29.42	35.00	-17.09	0.000%
12	16.82	-46.67	29.13	-16.82	46.67	-29.13	0.000%
13	16.82	-35.00	29.13	-16.82	35.00	-29.13	0.000%
14	0.10	-46.67	33.59	-0.10	46.67	-33.58	0.001%
15	0.10	-35.00	33.59	-0.10	35.00	-33.59	0.001%
16	-16.87	-46.67	29.42	16.87	46.67	-29.42	0.000%
17	-16.87	-35.00	29.42	16.87	35.00	-29.42	0.000%
18	-28.94	-46.67	16.71	28.94	46.67	-16.71	0.000%
19	-28.94	-35.00	16.71	28.94	35.00	-16.71	0.000%
20	-33.48	-46.67	-0.10	33.48	46.67	0.10	0.001%
21	-33.48	-35.00	-0.10	33.48	35.00	0.10	0.001%
22	-29.42	-46.67	-17.09	29.42	46.67	17.09	0.000%
23	-29.42	-35.00	-17.09	29.42	35.00	17.09	0.000%
24	-16.82	-46.67	-29.13	16.82	46.67	29.13	0.000%
25	-16.82	-35.00	-29.13	16.82	35.00	29.13	0.000%
26	0.00	-77.60	0.00	0.00	77.60	-0.00	0.001%
27	-0.02	-77.60	-7.98	0.02	77.60	7.98	0.000%
28	3.97	-77.60	-6.90	-3.97	77.60	6.90	0.000%
29	6.89	-77.60	-3.98	-6.89	77.60	3.98	0.000%
30	7.97	-77.60	0.02	-7.97	77.60	-0.02	0.000%
31	6.91	-77.60	4.00	-6.91	77.60	-4.00	0.000%
32	4.00	-77.60	6.92	-4.00	77.60	-6.92	0.000%
33	0.02	-77.60	7.98	-0.02	77.60	-7.98	0.000%
34	-3.97	-77.60	6.90	3.97	77.60	-6.90	0.000%
35	-6.89	-77.60	3.98	6.89	77.60	-3.98	0.000%
36	-7.97	-77.60	-0.02	7.97	77.60	0.02	0.000%
37	-6.91	-77.60	-4.00	6.91	77.60	4.00	0.000%
38	-4.00	-77.60	-6.92	4.00	77.60	6.92	0.000%
39	-0.02	-38.89	-7.31	0.02	38.89	7.31	0.003%
40	3.67	-38.89	-6.40	-3.67	38.89	6.40	0.001%
41	6.30	-38.89	-3.64	-6.30	38.89	3.64	0.001%
42	7.29	-38.89	0.02	-7.29	38.89	-0.02	0.002%
43	6.40	-38.89	3.72	-6.40	38.89	-3.72	0.001%
44	3.66	-38.89	6.34	-3.66	38.89	-6.34	0.001%
45	0.02	-38.89	7.31	-0.02	38.89	-7.31	0.003%
46	-3.67	-38.89	6.40	3.67	38.89	-6.40	0.001%
47	-6.30	-38.89	3.64	6.30	38.89	-3.64	0.001%
48	-7.29	-38.89	-0.02	7.29	38.89	0.02	0.002%
49	-6.40	-38.89	-3.72	6.40	38.89	3.72	0.001%
50	-3.66	-38.89	-6.34	3.66	38.89	6.34	0.001%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	17	0.00002347	0.00011213
3	Yes	17	0.00000001	0.00008359
4	Yes	22	0.00000001	0.00011869
5	Yes	22	0.00000001	0.00008098
6	Yes	22	0.00000001	0.00011725
7	Yes	22	0.00000001	0.00008012
8	Yes	17	0.00002349	0.00012589
9	Yes	17	0.00000001	0.00009283
10	Yes	22	0.00000001	0.00011816
11	Yes	22	0.00000001	0.00008052
12	Yes	22	0.00000001	0.00012206
13	Yes	22	0.00000001	0.00008338
14	Yes	18	0.00000001	0.00010705
15	Yes	18	0.00000001	0.00007945
16	Yes	22	0.00000001	0.00011710
17	Yes	22	0.00000001	0.00007992
18	Yes	22	0.00000001	0.00011531
19	Yes	22	0.00000001	0.00007886
20	Yes	18	0.00000001	0.00011347
21	Yes	18	0.00000001	0.00008352
22	Yes	22	0.00000001	0.00012317
23	Yes	22	0.00000001	0.00008402
24	Yes	22	0.00000001	0.00011726
25	Yes	22	0.00000001	0.00007998
26	Yes	9	0.00000001	0.00009568
27	Yes	20	0.00000001	0.00009045
28	Yes	20	0.00000001	0.00011225
29	Yes	20	0.00000001	0.00011215
30	Yes	20	0.00000001	0.00009014
31	Yes	20	0.00000001	0.00011167
32	Yes	20	0.00000001	0.00011269
33	Yes	20	0.00000001	0.00008962
34	Yes	20	0.00000001	0.00010985
35	Yes	20	0.00000001	0.00010960
36	Yes	20	0.00000001	0.00008914
37	Yes	20	0.00000001	0.00011237
38	Yes	20	0.00000001	0.00011170
39	Yes	15	0.00000001	0.00006253
40	Yes	17	0.00000001	0.00008286
41	Yes	17	0.00000001	0.00008165
42	Yes	15	0.00000001	0.00006343
43	Yes	17	0.00000001	0.00007762
44	Yes	17	0.00000001	0.00008852
45	Yes	15	0.00000001	0.00006602
46	Yes	17	0.00000001	0.00007872
47	Yes	17	0.00000001	0.00007704
48	Yes	15	0.00000001	0.00006708
49	Yes	17	0.00000001	0.00008968
50	Yes	17	0.00000001	0.00007688

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133.5 - 128.5	21.1226	43	1.5750	0.0098
L2	128.5 - 123.5	19.4777	43	1.5554	0.0081
L3	123.5 - 121.5	17.9007	43	1.4407	0.0047
L4	121.5 - 119	17.3128	43	1.3659	0.0033
L5	119 - 114	16.6090	43	1.3318	0.0028
L6	114 - 109	15.2302	43	1.3027	0.0026
L7	109 - 104	13.8877	43	1.2627	0.0023
L8	104 - 99	12.5920	43	1.2131	0.0021
L9	99 - 94	11.3527	43	1.1545	0.0019

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L10	94 - 89	10.1802	43	1.0849	0.0016
L11	89 - 85.25	9.0854	49	1.0052	0.0013
L12	85.25 - 85	8.3215	49	0.9397	0.0011
L13	85 - 80	8.2724	49	0.9374	0.0011
L14	80 - 75	7.3159	49	0.8890	0.0010
L15	78.75 - 74	7.0849	49	0.8764	0.0010
L16	74 - 69	6.2294	49	0.8346	0.0009
L17	69 - 68.25	5.4021	49	0.7450	0.0008
L18	68.25 - 68	5.2862	49	0.7314	0.0007
L19	68 - 63	5.2479	49	0.7289	0.0007
L20	63 - 58	4.5116	49	0.6772	0.0007
L21	58 - 53	3.8306	49	0.6233	0.0006
L22	53 - 48	3.2070	49	0.5676	0.0005
L23	48 - 43	2.6424	49	0.5107	0.0004
L24	43 - 37.75	2.1378	49	0.4530	0.0004
L25	42.5 - 37.5	2.0906	49	0.4472	0.0004
L26	37.5 - 32.5	1.6369	49	0.4177	0.0003
L27	32.5 - 27.5	1.2287	49	0.3619	0.0003
L28	27.5 - 22.5	0.8788	49	0.3064	0.0002
L29	22.5 - 17.5	0.5875	49	0.2501	0.0002
L30	17.5 - 12.5	0.3548	49	0.1943	0.0001
L31	12.5 - 7.5	0.1807	49	0.1385	0.0001
L32	7.5 - 2.5	0.0649	49	0.0827	0.0001
L33	2.5 - 0	0.0072	49	0.0276	0.0000

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
131.000	P65-15-XLH-RR w/ Mount Pipe	43	20.2967	1.5713	0.0091	4412
119.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	43	16.6090	1.3318	0.0028	4643
117.000	TME-PCS 1900MHz 4x45W-65MHz	43	16.0542	1.3204	0.0027	8107
111.000	Platform Mount [LP 403-1]	43	14.4195	1.2802	0.0024	6894
101.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	43	11.8410	1.1794	0.0020	4776
95.000	MX08FRO665-20 w/ Mount Pipe	43	10.4088	1.0992	0.0017	3953
60.000	58532A	49	4.0963	0.6450	0.0006	5290
50.000	KS24019-L112A	49	2.8611	0.5335	0.0005	5042

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133.5 - 128.5	97.3081	10	7.2565	0.0457
L2	128.5 - 123.5	89.7709	10	7.1693	0.0378
L3	123.5 - 121.5	82.5356	10	6.6436	0.0218
L4	121.5 - 119	79.8342	10	6.2995	0.0154
L5	119 - 114	76.5977	10	6.1429	0.0130
L6	114 - 109	70.2538	10	6.0091	0.0118
L7	109 - 104	64.0744	10	5.8252	0.0107
L8	104 - 99	58.1085	10	5.5968	0.0098
L9	99 - 94	52.3989	10	5.3285	0.0087
L10	94 - 89	46.9949	10	5.0099	0.0074
L11	89 - 85.25	41.9463	22	4.6447	0.0061
L12	85.25 - 85	38.4222	22	4.3422	0.0052
L13	85 - 80	38.1955	22	4.3317	0.0052
L14	80 - 75	33.7821	22	4.1081	0.0046

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L15	78.75 - 74	32.7158	22	4.0499	0.0045
L16	74 - 69	28.7676	22	3.8571	0.0041
L17	69 - 68.25	24.9485	22	3.4431	0.0034
L18	68.25 - 68	24.4131	22	3.3802	0.0033
L19	68 - 63	24.2366	22	3.3685	0.0033
L20	63 - 58	20.8370	22	3.1294	0.0030
L21	58 - 53	17.6923	22	2.8806	0.0027
L22	53 - 48	14.8124	22	2.6228	0.0023
L23	48 - 43	12.2047	22	2.3601	0.0020
L24	43 - 37.75	9.8739	22	2.0931	0.0017
L25	42.5 - 37.5	9.6562	22	2.0664	0.0017
L26	37.5 - 32.5	7.5606	22	1.9301	0.0015
L27	32.5 - 27.5	5.6751	22	1.6721	0.0013
L28	27.5 - 22.5	4.0590	22	1.4154	0.0011
L29	22.5 - 17.5	2.7133	22	1.1553	0.0008
L30	17.5 - 12.5	1.6388	22	0.8974	0.0006
L31	12.5 - 7.5	0.8343	22	0.6395	0.0004
L32	7.5 - 2.5	0.2997	22	0.3818	0.0003
L33	2.5 - 0	0.0333	22	0.1273	0.0001

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
131.000	P65-15-XLH-RR w/ Mount Pipe	10	93.5244	7.2410	0.0425	1008
119.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	10	76.5977	6.1429	0.0130	1045
117.000	TME-PCS 1900MHz 4x45W-65MHz	10	74.0453	6.0904	0.0125	1820
111.000	Platform Mount [LP 403-1]	10	66.5228	5.9056	0.0113	1539
101.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	10	54.6489	5.4421	0.0095	1059
95.000	MX08FRO665-20 w/ Mount Pipe	10	48.0489	5.0753	0.0080	875
60.000	58532A	22	18.9189	2.9805	0.0029	1152
50.000	KS24019-L112A	22	13.2149	2.4653	0.0022	1095

**Compression Checks**

**Pole Design Data**

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	133.5 - 128.5	TP10.75x10.75x0.188	5.000	0.000	0.0	6.2381	-2.68	353.12	0.008
L2	128.5 - 123.5	TP10.75x10.75x0.188	5.000	0.000	0.0	6.2381	-2.88	353.12	0.008
L3	123.5 - 121.5	TP10.75x10.75x0.188	2.000	0.000	0.0	6.2381	-2.98	353.12	0.008
L4	121.5 - 119	TP22x10.75x0.188	2.500	0.000	0.0	6.2381	-2.99	353.12	0.008
L5	119 - 114 (5)	TP22.95x22x0.25	5.000	0.000	0.0	18.273 5	-7.55	1069.00	0.007
L6	114 - 109 (6)	TP23.9x22.95x0.25	5.000	0.000	0.0	19.038 2	-9.68	1113.74	0.009
L7	109 - 104 (7)	TP24.85x23.9x0.25	5.000	0.000	0.0	19.803 0	-10.16	1158.48	0.009

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 P <sub>u</sub> φP <sub>n</sub>
L8	104 - 99 (8)	TP25.8x24.85x0.25	5.000	0.000	0.0	20.567 8	-14.90	1203.21	0.012
L9	99 - 94 (9)	TP26.75x25.8x0.25	5.000	0.000	0.0	21.332 5	-18.44	1247.95	0.015
L10	94 - 89 (10)	TP27.7x26.75x0.25	5.000	0.000	0.0	22.097 2	-19.15	1292.69	0.015
L11	89 - 85.25 (11)	TP28.4125x27.7x0.25	3.750	0.000	0.0	22.670 8	-19.71	1326.24	0.015
L12	85.25 - 85 (12)	TP28.46x28.4125x0.5125	0.250	0.000	0.0	46.120 4	-19.78	2698.04	0.007
L13	85 - 80 (13)	TP29.41x28.46x0.5	5.000	0.000	0.0	46.545 1	-20.87	2722.89	0.008
L14	80 - 75 (14)	TP30.36x29.41x0.5	5.000	0.000	0.0	46.927 5	-21.14	2745.26	0.008
L15	75 - 74 (15)	TP30.0503x29.1475x0.31 25	4.750	0.000	0.0	29.923 7	-22.59	1750.53	0.013
L16	74 - 69 (16)	TP31.0006x30.0503x0.31 25	5.000	0.000	0.0	30.879 9	-23.52	1806.47	0.013
L17	69 - 68.25 (17)	TP31.1431x31.0006x0.31 25	0.750	0.000	0.0	31.023 3	-23.67	1814.86	0.013
L18	68.25 - 68 (18)	TP31.1907x31.1431x0.57 5	0.250	0.000	0.0	56.684 9	-23.75	3316.07	0.007
L19	68 - 63 (19)	TP32.141x31.1907x0.575	5.000	0.000	0.0	58.444 4	-25.08	3419.00	0.007
L20	63 - 58 (20)	TP33.0913x32.141x0.562 5	5.000	0.000	0.0	58.917 7	-26.48	3446.69	0.008
L21	58 - 53 (21)	TP34.0416x33.0913x0.55	5.000	0.000	0.0	59.313 6	-27.86	3469.84	0.008
L22	53 - 48 (22)	TP34.9919x34.0416x0.54 38	5.000	0.000	0.0	60.314 4	-29.37	3528.39	0.008
L23	48 - 43 (23)	TP35.9422x34.9919x0.53 75	5.000	0.000	0.0	61.276 6	-30.82	3584.68	0.009
L24	43 - 37.75 (24)	TP36.94x35.9422x0.5375	5.250	0.000	0.0	61.441 1	-30.98	3594.31	0.009
L25	37.75 - 37.5 (25)	TP36.3625x35.4122x0.6	5.000	0.000	0.0	69.093 2	-33.68	4041.95	0.008
L26	37.5 - 32.5 (26)	TP37.3129x36.3625x0.58 75	5.000	0.000	0.0	69.475 2	-35.31	4064.30	0.009
L27	32.5 - 27.5 (27)	TP38.2632x37.3129x0.58 75	5.000	0.000	0.0	71.273 0	-36.97	4169.47	0.009
L28	27.5 - 22.5 (28)	TP39.2135x38.2632x0.57 5	5.000	0.000	0.0	71.539 2	-38.67	4185.04	0.009
L29	22.5 - 17.5 (29)	TP40.1639x39.2135x0.57 5	5.000	0.000	0.0	73.298 8	-40.39	4287.98	0.009
L30	17.5 - 12.5 (30)	TP41.1142x40.1639x0.56 88	5.000	0.000	0.0	74.253 9	-42.15	4343.85	0.010
L31	12.5 - 7.5 (31)	TP42.0645x41.1142x0.56 25	5.000	0.000	0.0	75.170 5	-43.93	4397.48	0.010
L32	7.5 - 2.5 (32)	TP43.0148x42.0645x0.56 25	5.000	0.000	0.0	76.891 8	-45.74	4498.17	0.010
L33	2.5 - 0 (33)	TP43.49x43.0148x0.5563	2.500	0.000	0.0	76.899 7	-46.65	4498.63	0.010

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>nx</sub> kip-ft	Ratio M <sub>ux</sub> φM <sub>nx</sub>	M <sub>uy</sub> kip-ft	φM <sub>ny</sub> kip-ft	Ratio M <sub>uy</sub> φM <sub>ny</sub>
L1	133.5 - 128.5 (1)	TP10.75x10.75x0.188	17.78	91.67	0.194	0.00	91.67	0.000
L2	128.5 - 123.5 (2)	TP10.75x10.75x0.188	46.90	91.67	0.512	0.00	91.67	0.000
L3	123.5 - 121.5 (3)	TP10.75x10.75x0.188	58.72	91.67	0.641	0.00	91.67	0.000
L4	121.5 - 119	TP22x10.75x0.188	58.72	91.67	0.641	0.00	91.67	0.000

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{nx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	$M_{uy}$ kip-ft	$\phi M_{ny}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	(4)							
L5	119 - 114 (5)	TP22.95x22x0.25	135.58	601.62	0.225	0.00	601.62	0.000
L6	114 - 109 (6)	TP23.9x22.95x0.25	198.21	644.17	0.308	0.00	644.17	0.000
L7	109 - 104 (7)	TP24.85x23.9x0.25	266.77	687.34	0.388	0.00	687.34	0.000
L8	104 - 99 (8)	TP25.8x24.85x0.25	357.63	731.05	0.489	0.00	731.05	0.000
L9	99 - 94 (9)	TP26.75x25.8x0.25	459.72	775.20	0.593	0.00	775.20	0.000
L10	94 - 89 (10)	TP27.7x26.75x0.25	582.80	819.71	0.711	0.00	819.71	0.000
L11	89 - 85.25	TP28.4125x27.7x0.25	676.64	853.27	0.793	0.00	853.27	0.000
	(11)							
L12	85.25 - 85	TP28.46x28.4125x0.5125	682.94	1915.78	0.356	0.00	1915.78	0.000
	(12)							
L13	85 - 80 (13)	TP29.41x28.46x0.5	810.44	2002.06	0.405	0.00	2002.06	0.000
L14	80 - 75 (14)	TP30.36x29.41x0.5	842.74	2035.37	0.414	0.00	2035.37	0.000
L15	75 - 74 (15)	TP30.0503x29.1475x0.3125	967.25	1270.52	0.761	0.00	1270.52	0.000
L16	74 - 69 (16)	TP31.0006x30.0503x0.3125	1100.78	1338.04	0.823	0.00	1338.04	0.000
L17	69 - 68.25	TP31.1431x31.0006x0.3125	1121.02	1348.22	0.831	0.00	1348.22	0.000
	(17)							
L18	68.25 - 68	TP31.1907x31.1431x0.575	1127.77	2578.28	0.437	0.00	2578.28	0.000
	(18)							
L19	68 - 63 (19)	TP32.141x31.1907x0.575	1264.30	2742.35	0.461	0.00	2742.35	0.000
L20	63 - 58 (20)	TP33.0913x32.141x0.5625	1403.68	2851.47	0.492	0.00	2851.47	0.000
L21	58 - 53 (21)	TP34.0416x33.0913x0.55	1546.36	2958.13	0.523	0.00	2958.13	0.000
L22	53 - 48 (22)	TP34.9919x34.0416x0.5438	1692.60	3095.89	0.547	0.00	3095.89	0.000
L23	48 - 43 (23)	TP35.9422x34.9919x0.5375	1841.81	3234.54	0.569	0.00	3234.54	0.000
L24	43 - 37.75	TP36.94x35.9422x0.5375	1856.88	3252.07	0.571	0.00	3252.07	0.000
	(24)							
L25	37.75 - 37.5	TP36.3625x35.4122x0.625	2009.33	3678.23	0.546	0.00	3678.23	0.000
	(25)							
L26	37.5 - 32.5	TP37.3129x36.3625x0.5875	2164.64	3801.06	0.569	0.00	3801.06	0.000
	(26)							
L27	32.5 - 27.5	TP38.2632x37.3129x0.5875	2322.43	4001.92	0.580	0.00	4001.92	0.000
	(27)							
L28	27.5 - 22.5	TP39.2135x38.2632x0.575	2482.56	4122.41	0.602	0.00	4122.41	0.000
	(28)							
L29	22.5 - 17.5	TP40.1639x39.2135x0.575	2644.88	4329.21	0.611	0.00	4329.21	0.000
	(29)							
L30	17.5 - 12.5	TP41.1142x40.1639x0.5688	2809.24	4493.79	0.625	0.00	4493.79	0.000
	(30)							
L31	12.5 - 7.5 (31)	TP42.0645x41.1142x0.5625	2975.53	4658.77	0.639	0.00	4658.77	0.000
L32	7.5 - 2.5 (32)	TP43.0148x42.0645x0.5625	3143.73	4876.02	0.645	0.00	4876.02	0.000
L33	2.5 - 0 (33)	TP43.49x43.0148x0.5563	3228.56	4933.27	0.654	0.00	4933.27	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	133.5 - 128.5	TP10.75x10.75x0.188	5.76	109.48	0.053	0.76	101.66	0.007
	(1)							
L2	128.5 - 123.5	TP10.75x10.75x0.188	5.89	109.48	0.054	0.76	101.66	0.007
	(2)							
L3	123.5 - 121.5	TP10.75x10.75x0.188	5.94	109.48	0.054	0.76	101.66	0.007
	(3)							
L4	121.5 - 119	TP22x10.75x0.188	5.98	119.71	0.050	0.75	101.66	0.007
	(4)							
L5	119 - 114 (5)	TP22.95x22x0.25	11.82	320.70	0.037	0.75	640.36	0.001
L6	114 - 109 (6)	TP23.9x22.95x0.25	13.46	334.12	0.040	0.75	695.08	0.001
L7	109 - 104 (7)	TP24.85x23.9x0.25	13.97	347.54	0.040	0.75	752.04	0.001



Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $V_u$ $\phi V_n$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $T_u$ $\phi T_n$
L8	104 - 99 (8)	TP25.8x24.85x0.25	20.37	360.96	0.056	1.32	811.25	0.002
L9	99 - 94 (9)	TP26.75x25.8x0.25	24.39	374.38	0.065	1.44	872.70	0.002
L10	94 - 89 (10)	TP27.7x26.75x0.25	24.86	387.81	0.064	1.44	936.39	0.002
L11	89 - 85.25 (11)	TP28.4125x27.7x0.25	25.21	397.87	0.063	1.44	985.63	0.001
L12	85.25 - 85 (12)	TP28.46x28.4125x0.5125	25.25	809.41	0.031	1.44	1989.82	0.001
L13	85 - 80 (13)	TP29.41x28.46x0.5	25.79	816.87	0.032	1.44	2077.30	0.001
L14	80 - 75 (14)	TP30.36x29.41x0.5	25.93	823.58	0.031	1.44	2111.57	0.001
L15	75 - 74 (15)	TP30.0503x29.1475x0.3125	26.50	525.16	0.050	1.44	1373.72	0.001
L16	74 - 69 (16)	TP31.0006x30.0503x0.3125	26.95	541.94	0.050	1.44	1462.93	0.001
L17	69 - 68.25 (17)	TP31.1431x31.0006x0.3125	27.02	544.46	0.050	1.44	1476.55	0.001
L18	68.25 - 68 (18)	TP31.1907x31.1431x0.575	27.05	994.82	0.027	1.44	2679.09	0.001
L19	68 - 63 (19)	TP32.141x31.1907x0.575	27.59	1025.70	0.027	1.44	2847.99	0.001
L20	63 - 58 (20)	TP33.0913x32.141x0.5625	28.17	1034.01	0.027	1.48	2958.63	0.000
L21	58 - 53 (21)	TP34.0416x33.0913x0.55	28.95	1040.95	0.028	1.51	3066.67	0.000
L22	53 - 48 (22)	TP34.9919x34.0416x0.5438	29.58	1058.52	0.028	1.62	3207.47	0.001
L23	48 - 43 (23)	TP35.9422x34.9919x0.5375	30.13	1075.41	0.028	1.62	3349.13	0.000
L24	43 - 37.75 (24)	TP36.94x35.9422x0.5375	30.18	1078.29	0.028	1.62	3367.14	0.000
L25	37.75 - 37.5 (25)	TP36.3625x35.4122x0.6	30.82	1212.59	0.025	1.62	3814.53	0.000
L26	37.5 - 32.5 (26)	TP37.3129x36.3625x0.5875	31.33	1219.29	0.026	1.62	3938.88	0.000
L27	32.5 - 27.5 (27)	TP38.2632x37.3129x0.5875	31.82	1250.84	0.025	1.62	4145.37	0.000
L28	27.5 - 22.5 (28)	TP39.2135x38.2632x0.575	32.27	1255.51	0.026	1.62	4267.18	0.000
L29	22.5 - 17.5 (29)	TP40.1639x39.2135x0.575	32.70	1286.39	0.025	1.62	4479.68	0.000
L30	17.5 - 12.5 (30)	TP41.1142x40.1639x0.5688	33.08	1303.16	0.025	1.62	4647.70	0.000
L31	12.5 - 7.5 (31)	TP42.0645x41.1142x0.5625	33.47	1319.24	0.025	1.62	4816.07	0.000
L32	7.5 - 2.5 (32)	TP43.0148x42.0645x0.5625	33.85	1349.45	0.025	1.62	5039.17	0.000
L33	2.5 - 0 (33)	TP43.49x43.0148x0.5563	34.05	1349.59	0.025	1.62	5096.83	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	133.5 - 128.5 (1)	0.008	0.194	0.000	0.053	0.007	0.205	1.050	4.8.2
L2	128.5 - 123.5 (2)	0.008	0.512	0.000	0.054	0.007	0.524	1.050	4.8.2
L3	123.5 - 121.5 (3)	0.008	0.641	0.000	0.054	0.007	0.653	1.050	4.8.2
L4	121.5 - 119 (4)	0.008	0.641	0.000	0.050	0.007	0.652	1.050	4.8.2
L5	119 - 114 (5)	0.007	0.225	0.000	0.037	0.001	0.234	1.050	4.8.2
L6	114 - 109 (6)	0.009	0.308	0.000	0.040	0.001	0.318	1.050	4.8.2
L7	109 - 104 (7)	0.009	0.388	0.000	0.040	0.001	0.399	1.050	4.8.2
L8	104 - 99 (8)	0.012	0.489	0.000	0.056	0.002	0.505	1.050	4.8.2
L9	99 - 94 (9)	0.015	0.593	0.000	0.065	0.002	0.612	1.050	4.8.2

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_u$	$M_{ux}$	$M_{uy}$	$V_u$	$T_u$			
L10	94 - 89 (10)	0.015	0.711	0.000	0.064	0.002	0.730	1.050	4.8.2
L11	89 - 85.25 (11)	0.015	0.793	0.000	0.063	0.001	0.812	1.050	4.8.2
L12	85.25 - 85 (12)	0.007	0.356	0.000	0.031	0.001	0.365	1.050	4.8.2
L13	85 - 80 (13)	0.008	0.405	0.000	0.032	0.001	0.414	1.050	4.8.2
L14	80 - 75 (14)	0.008	0.414	0.000	0.031	0.001	0.423	1.050	4.8.2
L15	75 - 74 (15)	0.013	0.761	0.000	0.050	0.001	0.777	1.050	4.8.2
L16	74 - 69 (16)	0.013	0.823	0.000	0.050	0.001	0.838	1.050	4.8.2
L17	69 - 68.25 (17)	0.013	0.831	0.000	0.050	0.001	0.847	1.050	4.8.2
L18	68.25 - 68 (18)	0.007	0.437	0.000	0.027	0.001	0.445	1.050	4.8.2
L19	68 - 63 (19)	0.007	0.461	0.000	0.027	0.001	0.469	1.050	4.8.2
L20	63 - 58 (20)	0.008	0.492	0.000	0.027	0.000	0.501	1.050	4.8.2
L21	58 - 53 (21)	0.008	0.523	0.000	0.028	0.000	0.532	1.050	4.8.2
L22	53 - 48 (22)	0.008	0.547	0.000	0.028	0.001	0.556	1.050	4.8.2
L23	48 - 43 (23)	0.009	0.569	0.000	0.028	0.000	0.579	1.050	4.8.2
L24	43 - 37.75 (24)	0.009	0.571	0.000	0.028	0.000	0.580	1.050	4.8.2
L25	37.75 - 37.5 (25)	0.008	0.546	0.000	0.025	0.000	0.555	1.050	4.8.2
L26	37.5 - 32.5 (26)	0.009	0.569	0.000	0.026	0.000	0.579	1.050	4.8.2
L27	32.5 - 27.5 (27)	0.009	0.580	0.000	0.025	0.000	0.590	1.050	4.8.2
L28	27.5 - 22.5 (28)	0.009	0.602	0.000	0.026	0.000	0.612	1.050	4.8.2
L29	22.5 - 17.5 (29)	0.009	0.611	0.000	0.025	0.000	0.621	1.050	4.8.2
L30	17.5 - 12.5 (30)	0.010	0.625	0.000	0.025	0.000	0.636	1.050	4.8.2
L31	12.5 - 7.5 (31)	0.010	0.639	0.000	0.025	0.000	0.649	1.050	4.8.2
L32	7.5 - 2.5 (32)	0.010	0.645	0.000	0.025	0.000	0.656	1.050	4.8.2
L33	2.5 - 0 (33)	0.010	0.654	0.000	0.025	0.000	0.665	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	133.5 - 128.5	Pole	TP10.75x10.75x0.188	1	-2.68	370.78	19.5	Pass
L2	128.5 - 123.5	Pole	TP10.75x10.75x0.188	2	-2.88	370.78	49.9	Pass
L3	123.5 - 121.5	Pole	TP10.75x10.75x0.188	3	-2.98	370.78	62.2	Pass
L4	121.5 - 119	Pole	TP22x10.75x0.188	4	-2.99	370.78	62.1	Pass
L5	119 - 114	Pole	TP22.95x22x0.25	5	-7.55	1122.45	22.3	Pass
L6	114 - 109	Pole	TP23.9x22.95x0.25	6	-9.68	1169.43	30.3	Pass
L7	109 - 104	Pole	TP24.85x23.9x0.25	7	-10.16	1216.40	38.0	Pass
L8	104 - 99	Pole	TP25.8x24.85x0.25	8	-14.90	1263.37	48.1	Pass
L9	99 - 94	Pole	TP26.75x25.8x0.25	9	-18.44	1310.35	58.3	Pass
L10	94 - 89	Pole	TP27.7x26.75x0.25	10	-19.15	1357.32	69.5	Pass
L11	89 - 85.25	Pole	TP28.4125x27.7x0.25	11	-19.71	1392.55	77.3	Pass
L12	85.25 - 85	Pole	TP28.46x28.4125x0.5125	12	-19.78	2832.94	34.7	Pass
L13	85 - 80	Pole	TP29.41x28.46x0.5	13	-20.87	2859.03	39.4	Pass
L14	80 - 75	Pole	TP30.36x29.41x0.5	14	-21.14	2882.52	40.3	Pass
L15	75 - 74	Pole	TP30.0503x29.1475x0.3125	15	-22.59	1838.06	74.0	Pass
L16	74 - 69	Pole	TP31.0006x30.0503x0.3125	16	-23.52	1896.79	79.8	Pass
L17	69 - 68.25	Pole	TP31.1431x31.0006x0.3125	17	-23.67	1905.60	80.7	Pass
L18	68.25 - 68	Pole	TP31.1907x31.1431x0.575	18	-23.75	3481.87	42.4	Pass
L19	68 - 63	Pole	TP32.141x31.1907x0.575	19	-25.08	3589.95	44.7	Pass
L20	63 - 58	Pole	TP33.0913x32.141x0.5625	20	-26.48	3619.02	47.7	Pass
L21	58 - 53	Pole	TP34.0416x33.0913x0.55	21	-27.86	3643.33	50.6	Pass
L22	53 - 48	Pole	TP34.9919x34.0416x0.5438	22	-29.37	3704.81	52.9	Pass

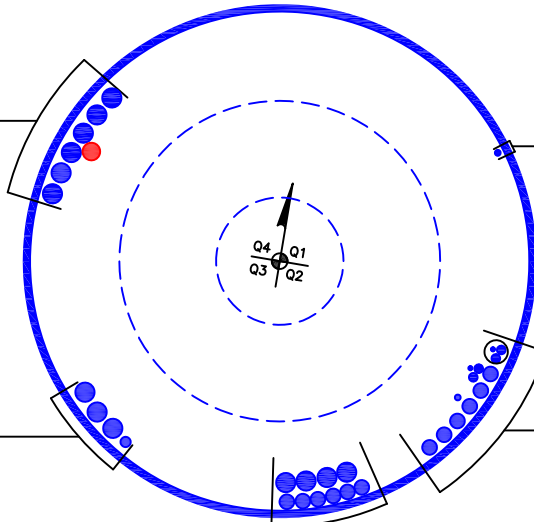
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L23	48 - 43	Pole	TP35.9422x34.9919x0.5375	23	-30.82	3763.91	55.1	Pass	
L24	43 - 37.75	Pole	TP36.94x35.9422x0.5375	24	-30.98	3774.03	55.3	Pass	
L25	37.75 - 37.5	Pole	TP36.3625x35.4122x0.6	25	-33.68	4244.05	52.9	Pass	
L26	37.5 - 32.5	Pole	TP37.3129x36.3625x0.5875	26	-35.31	4267.51	55.1	Pass	
L27	32.5 - 27.5	Pole	TP38.2632x37.3129x0.5875	27	-36.97	4377.94	56.2	Pass	
L28	27.5 - 22.5	Pole	TP39.2135x38.2632x0.575	28	-38.67	4394.29	58.3	Pass	
L29	22.5 - 17.5	Pole	TP40.1639x39.2135x0.575	29	-40.39	4502.38	59.1	Pass	
L30	17.5 - 12.5	Pole	TP41.1142x40.1639x0.5688	30	-42.15	4561.04	60.5	Pass	
L31	12.5 - 7.5	Pole	TP42.0645x41.1142x0.5625	31	-43.93	4617.35	61.8	Pass	
L32	7.5 - 2.5	Pole	TP43.0148x42.0645x0.5625	32	-45.74	4723.08	62.4	Pass	
L33	2.5 - 0	Pole	TP43.49x43.0148x0.5563	33	-46.65	4723.56	63.4	Pass	
							Summary		
							Pole (L17)	80.7	Pass
							<b>RATING =</b>	<b>80.7</b>	<b>Pass</b>

**\*NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

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



(PROPOSED EQUIPMENT CONFIGURATION)  
(1) 1-1/2" TO 95 FT LEVEL  
(OTHER CONSIDERED EQUIPMENT)  
(6) 1-5/8" TO 95 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)  
(1) 1/2" TO 50 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(1) 7/8" TO 119 FT LEVEL  
(3) 1-5/8" TO 119 FT LEVEL

(OTHER CONSIDERED EQUIPMENT—IN CONDUIT)  
(1) 3/8" TO 131 FT LEVEL  
(2) 3/4" TO 131 FT LEVEL  
(OTHER CONSIDERED EQUIPMENT)  
(1) 1/2" TO 60 FT LEVEL  
(1) 3/8" TO 131 FT LEVEL  
(2) 3/4" TO 131 FT LEVEL  
(6) 1-1/4" TO 131 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(6) 1-1/4" TO 101 FT LEVEL  
(4) 1-5/8" TO 101 FT LEVEL

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

Site BU: 876340  
Work Order: 1945894



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**Pole Geometry**

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	133.5	12	0	0	10.75	10.75	0.188		A572-65
2	121.5	2.5	0	0	10.75	22	0.188		A572-65
3	119	44	3.75	12	22.00	30.36	0.25	Auto	A572-65
4	78.75	41	4.75	12	29.15	36.94	0.3125	Auto	A572-65
5	42.5	42.5	0	12	35.41	43.49	0.375	Auto	A572-65

**Reinforcement Configuration**

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	68.25	channel	MP3-05 (1.1875in)	4												
2	78.75	85.25	plate	MP3-08.5 (1.1875")	4												
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

**Reinforcement Details**

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
2	3.82714	1.31853	4.98698	0.957	PC 8.8 - M20 (100)	23	PC 8.8 - M20 (100)	23.000	18.000	3.438	1.1875	A572-65

**Connection Details for Custom Reinforcements**

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
MP3-08.5 (1.1875")	Top	8	N	3	2	-	-	-	-	-	-	-	-	-
	Bottom	8	N	3	2	-	-	-	-	-	-	-	-	-

# TNX Geometry Input

Increment (ft):  [Export to TNX](#)

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	133.5 - 128.5	5		0	10.750	10.750	0.188	A572-65	1.000
2	128.5 - 123.5	5		0	10.750	10.750	0.188	A572-65	1.000
3	123.5 - 121.5	2	0	0	10.750	10.750	0.188	A572-65	1.000
4	121.5 - 119	2.5	0	0	10.750	22.000	0.188	A572-65	1.000
5	119 - 114	5		12	22.000	22.950	0.25	A572-65	1.000
6	114 - 109	5		12	22.950	23.900	0.25	A572-65	1.000
7	109 - 104	5		12	23.900	24.850	0.25	A572-65	1.000
8	104 - 99	5		12	24.850	25.800	0.25	A572-65	1.000
9	99 - 94	5		12	25.800	26.750	0.25	A572-65	1.000
10	94 - 89	5		12	26.750	27.700	0.25	A572-65	1.000
11	89 - 85.25	3.75		12	27.700	28.413	0.25	A572-65	1.000
12	85.25 - 85	0.25		12	28.413	28.460	0.5125	A572-65	0.926
13	85 - 80	5		12	28.460	29.410	0.5	A572-65	0.934
14	80 - 78.75	5	3.75	12	29.410	30.360	0.5	A572-65	0.930
15	78.75 - 74	4.75		12	29.148	30.050	0.3125	A572-65	1.000
16	74 - 69	5		12	30.050	31.001	0.3125	A572-65	1.000
17	69 - 68.25	0.75		12	31.001	31.143	0.3125	A572-65	1.000
18	68.25 - 68	0.25		12	31.143	31.191	0.575	A572-65	0.947
19	68 - 63	5		12	31.191	32.141	0.575	A572-65	0.935
20	63 - 58	5		12	32.141	33.091	0.5625	A572-65	0.944
21	58 - 53	5		12	33.091	34.042	0.55	A572-65	0.954
22	53 - 48	5		12	34.042	34.992	0.54375	A572-65	0.954
23	48 - 43	5		12	34.992	35.942	0.5375	A572-65	0.954
24	43 - 42.5	5.25	4.75	12	35.942	36.940	0.5375	A572-65	0.953
25	42.5 - 37.5	5		12	35.412	36.363	0.6	A572-65	0.956
26	37.5 - 32.5	5		12	36.363	37.313	0.5875	A572-65	0.968
27	32.5 - 27.5	5		12	37.313	38.263	0.5875	A572-65	0.959
28	27.5 - 22.5	5		12	38.263	39.214	0.575	A572-65	0.972
29	22.5 - 17.5	5		12	39.214	40.164	0.575	A572-65	0.964
30	17.5 - 12.5	5		12	40.164	41.114	0.56875	A572-65	0.967
31	12.5 - 7.5	5		12	41.114	42.065	0.5625	A572-65	0.971
32	7.5 - 2.5	5		12	42.065	43.015	0.5625	A572-65	0.964
33	2.5 - 0	2.5		12	43.015	43.490	0.55625	A572-65	0.971



## TNX Section Forces

Increment (ft):		TNX Output				
	5	Section Height (ft)		$P_u$ (K)	$M_{ux}$ (kip-ft)	$V_u$ (K)
1		133.5 - 128.5	2.68	17.78	5.76	
2		128.5 - 123.5	2.88	46.90	5.89	
3		123.5 - 121.5	2.98	58.72	5.94	
4		121.5 - 119	3.11	73.67	6.04	
5		119 - 114	7.55	135.58	11.82	
6		114 - 109	9.68	198.21	13.46	
7		109 - 104	10.16	266.77	13.97	
8		104 - 99	14.90	357.63	20.37	
9		99 - 94	18.44	459.72	24.39	
10		94 - 89	19.15	582.80	24.86	
11		89 - 85.25	19.71	676.64	25.21	
12		85.25 - 85	19.78	682.94	25.25	
13		85 - 80	20.87	810.44	25.79	
14		80 - 78.75	21.14	842.75	25.93	
15		78.75 - 74	22.59	967.25	26.50	
16		74 - 69	23.52	1100.79	26.95	
17		69 - 68.25	23.67	1121.01	27.02	
18		68.25 - 68	23.75	1127.77	27.05	
19		68 - 63	25.08	1264.30	27.59	
20		63 - 58	26.48	1403.68	28.17	
21		58 - 53	27.86	1546.36	28.95	
22		53 - 48	29.37	1692.60	29.58	
23		48 - 43	30.82	1841.81	30.13	
24		43 - 42.5	30.98	1856.88	30.18	
25		42.5 - 37.5	33.68	2009.34	30.82	
26		37.5 - 32.5	35.31	2164.64	31.33	
27		32.5 - 27.5	36.97	2322.43	31.82	
28		27.5 - 22.5	38.67	2482.56	32.27	
29		22.5 - 17.5	40.39	2644.89	32.70	
30		17.5 - 12.5	42.15	2809.24	33.08	
31		12.5 - 7.5	43.93	2975.53	33.47	
32		7.5 - 2.5	45.74	3143.73	33.85	
33		2.5 - 0	46.65	3228.56	34.05	

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
133.5 - 128.5	Pole	TP10.75x10.75x0.188	Pole	19.5%	Pass
128.5 - 123.5	Pole	TP10.75x10.75x0.188	Pole	49.8%	Pass
123.5 - 121.5	Pole	TP10.75x10.75x0.188	Pole	62.1%	Pass
121.5 - 119	Pole	TP22x10.75x0.188	Pole	20.0%	Pass
119 - 114	Pole	TP22.95x22x0.25	Pole	22.2%	Pass
114 - 109	Pole	TP23.9x22.95x0.25	Pole	30.2%	Pass
109 - 104	Pole	TP24.85x23.9x0.25	Pole	37.9%	Pass
104 - 99	Pole	TP25.8x24.85x0.25	Pole	47.9%	Pass
99 - 94	Pole	TP26.75x25.8x0.25	Pole	58.1%	Pass
94 - 89	Pole	TP27.7x26.75x0.25	Pole	69.3%	Pass
89 - 85.25	Pole	TP28.413x27.7x0.25	Pole	77.1%	Pass
85.25 - 85	Pole + Reinf.	TP28.46x28.413x0.5125	Reinf. 2 Tension Rupture	65.7%	Pass
85 - 80	Pole + Reinf.	TP29.41x28.46x0.5	Reinf. 2 Tension Rupture	74.1%	Pass
80 - 78.75	Pole + Reinf.	TP30.36x29.41x0.5	Reinf. 2 Tension Rupture	76.1%	Pass
78.75 - 74	Pole	TP30.05x29.148x0.3125	Pole	73.8%	Pass
74 - 69	Pole	TP31.001x30.05x0.3125	Pole	79.6%	Pass
69 - 68.25	Pole	TP31.143x31.001x0.3125	Pole	80.4%	Pass
68.25 - 68	Pole + Reinf.	TP31.191x31.143x0.575	Reinf. 1 Tension Rupture	60.4%	Pass
68 - 63	Pole + Reinf.	TP32.141x31.191x0.575	Reinf. 1 Tension Rupture	64.6%	Pass
63 - 58	Pole + Reinf.	TP33.091x32.141x0.5625	Reinf. 1 Tension Rupture	68.5%	Pass
58 - 53	Pole + Reinf.	TP34.042x33.091x0.55	Reinf. 1 Tension Rupture	72.1%	Pass
53 - 48	Pole + Reinf.	TP34.992x34.042x0.5438	Reinf. 1 Tension Rupture	75.5%	Pass
48 - 43	Pole + Reinf.	TP35.942x34.992x0.5375	Reinf. 1 Tension Rupture	78.7%	Pass
43 - 42.5	Pole + Reinf.	TP36.94x35.942x0.5375	Reinf. 1 Tension Rupture	79.0%	Pass
42.5 - 37.5	Pole + Reinf.	TP36.363x35.412x0.6	Reinf. 1 Tension Rupture	75.5%	Pass
37.5 - 32.5	Pole + Reinf.	TP37.313x36.363x0.5875	Reinf. 1 Tension Rupture	77.9%	Pass
32.5 - 27.5	Pole + Reinf.	TP38.263x37.313x0.5875	Reinf. 1 Tension Rupture	80.1%	Pass
27.5 - 22.5	Pole + Reinf.	TP39.214x38.263x0.575	Reinf. 1 Tension Rupture	82.2%	Pass
22.5 - 17.5	Pole + Reinf.	TP40.164x39.214x0.575	Reinf. 1 Tension Rupture	84.1%	Pass
17.5 - 12.5	Pole + Reinf.	TP41.114x40.164x0.5688	Reinf. 1 Tension Rupture	85.8%	Pass
12.5 - 7.5	Pole + Reinf.	TP42.065x41.114x0.5625	Reinf. 1 Tension Rupture	87.5%	Pass
7.5 - 2.5	Pole + Reinf.	TP43.015x42.065x0.5625	Reinf. 1 Tension Rupture	89.0%	Pass
2.5 - 0	Pole + Reinf.	TP43.49x43.015x0.5563	Reinf. 1 Tension Rupture	89.7%	Pass
				Summary	
			Pole	80.4%	Pass
			Reinforcement	89.7%	Pass
			Overall	89.7%	Pass

## Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity*		
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2
133.5 - 128.5	87	n/a	87	6.24	n/a	6.24	19.5%		
128.5 - 123.5	87	n/a	87	6.24	n/a	6.24	49.8%		
123.5 - 121.5	87	n/a	87	6.24	n/a	6.24	62.1%		
121.5 - 119	766	n/a	766	12.88	n/a	12.88	20.0%		
119 - 114	1204	n/a	1204	18.25	n/a	18.25	22.2%		
114 - 109	1361	n/a	1361	19.01	n/a	19.01	30.2%		
109 - 104	1532	n/a	1532	19.77	n/a	19.77	37.9%		
104 - 99	1716	n/a	1716	20.54	n/a	20.54	47.9%		
99 - 94	1915	n/a	1915	21.30	n/a	21.30	58.1%		
94 - 89	2128	n/a	2128	22.07	n/a	22.07	69.3%		
89 - 85.25	2298	n/a	2298	22.64	n/a	22.64	77.1%		
85.25 - 85	2310	2314	4624	22.68	19.95	42.62	37.5%		66.1%
85 - 80	2551	2460	5011	23.44	19.95	43.39	43.0%		74.6%
80 - 78.75	2614	2498	5112	23.63	19.95	43.58	44.3%		76.6%
78.75 - 74	3382	n/a	3382	29.88	n/a	29.88	73.8%		
74 - 69	3717	n/a	3717	30.84	n/a	30.84	79.6%		
69 - 68.25	3769	n/a	3769	30.98	n/a	30.98	80.4%		
68.25 - 68	3786	3048	6835	31.03	22.60	53.63	43.2%	60.4%	
68 - 63	4147	3227	7374	31.98	22.60	54.58	46.8%	64.6%	
63 - 58	4530	3410	7940	32.94	22.60	55.54	50.2%	68.5%	
58 - 53	4935	3599	8534	33.89	22.60	56.49	53.6%	72.1%	
53 - 48	5364	3793	9157	34.85	22.60	57.45	56.8%	75.5%	
48 - 43	5817	3992	9809	35.80	22.60	58.40	60.0%	78.7%	
43 - 42.5	5864	4012	9876	35.90	22.60	58.50	60.3%	79.0%	
42.5 - 37.5	7193	4081	11274	43.39	22.60	65.99	53.8%	75.5%	
37.5 - 32.5	7778	4288	12066	44.54	22.60	67.14	56.1%	77.9%	
32.5 - 27.5	8394	4499	12893	45.68	22.60	68.28	58.3%	80.1%	
27.5 - 22.5	9042	4716	13757	46.83	22.60	69.43	60.4%	82.2%	
22.5 - 17.5	9722	4937	14659	47.98	22.60	70.58	62.5%	84.1%	
17.5 - 12.5	10435	5164	15599	49.12	22.60	71.72	64.4%	85.8%	
12.5 - 7.5	11182	5396	16578	50.27	22.60	72.87	66.4%	87.5%	
7.5 - 2.5	11965	5632	17597	51.41	22.60	74.01	68.2%	89.0%	
2.5 - 0	12369	5753	18122	51.99	22.60	74.59	69.1%	89.7%	

Note: Section capacity checked using 5 degree increments.  
Rating per TIA-222-H Section 15.5.

# Monopole Base Plate Connection

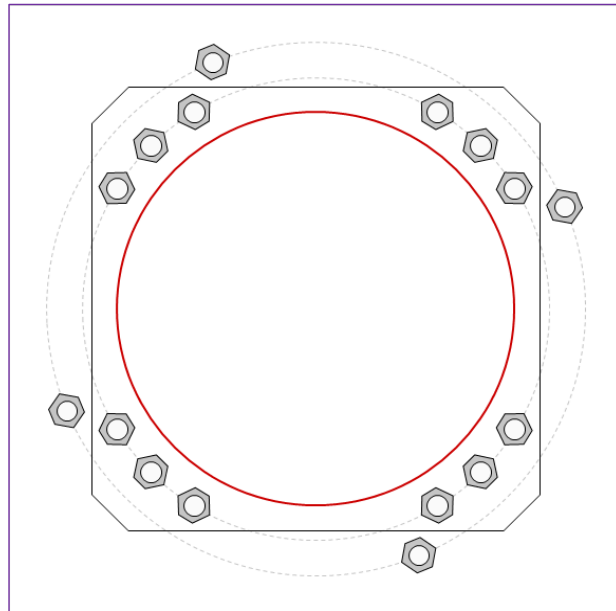


Site Info	
BU #	876340
Site Name	COE HILL
Order #	553291 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
$I_{ar}$ (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	3228.56
Axial Force (kips)	46.65
Shear Force (kips)	34.05

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
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Anchor Rod Data
GROUP 1: (12) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 51" BC <i>Anchor Spacing: 6 in</i>
GROUP 2: (4) 2-1/4" $\phi$ bolts (Dywidag N; $F_y=120$ ksi, $F_u=125$ ksi) on 58.99" BC
Base Plate Data
49" W x 3" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi); Clip: 4 in
Stiffener Data
N/A
Pole Data
43.49" x 0.375" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>		
GROUP 1:	$P_{u,t} = 171.11$	$\phi P_{n,t} = 243.75$	<b>Stress Rating</b>
	$V_u = 2.84$	$\phi V_n = 149.1$	<b>66.9%</b>
	$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
GROUP 2:	$P_{u,t} = 202.22$	$\phi P_{n,t} = 304.69$	<b>Stress Rating</b>
	$V_u = 0$	$\phi V_n = 186.38$	<b>63.2%</b>
	$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
Base Plate Summary			
Max Stress (ksi):	29.85	(Flexural)	
Allowable Stress (ksi):	45		
Stress Rating:	<b>63.2%</b>		<b>Pass</b>

# CCIplate

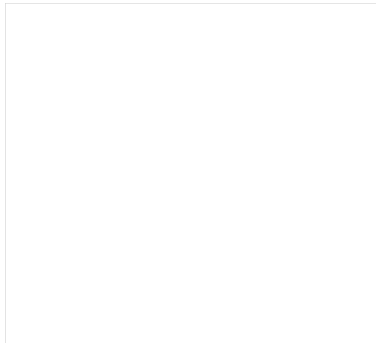
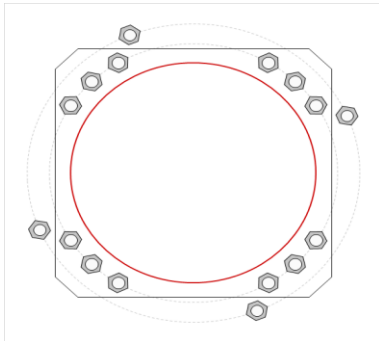
Elevation (ft) 0 (Base)

note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	No	No	No	No	No	

Custom Bolt Connection										
Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, n:	$l_{ar}$ (in):	Thread Type	Area Override, in <sup>2</sup>	Tension Only
1	1	31.4873459	2.25	A615-75	51	0.5	0.75	N-Included		No
2	1	45	2.25	A615-75	51	0.5	0.75	N-Included		No
3	1	58.5126541	2.25	A615-75	51	0.5	0.75	N-Included		No
4	1	121.487346	2.25	A615-75	51	0.5	0.75	N-Included		No
5	1	135	2.25	A615-75	51	0.5	0.75	N-Included		No
6	1	148.512654	2.25	A615-75	51	0.5	0.75	N-Included		No
7	1	211.487346	2.25	A615-75	51	0.5	0.75	N-Included		No
8	1	225	2.25	A615-75	51	0.5	0.75	N-Included		No
9	1	238.512654	2.25	A615-75	51	0.5	0.75	N-Included		No
10	1	301.487346	2.25	A615-75	51	0.5	0.75	N-Included		No
11	1	315	2.25	A615-75	51	0.5	0.75	N-Included		No
12	1	328.512654	2.25	A615-75	51	0.5	0.75	N-Included		No
13	2	22.5	2.25	Dywidag	58.99	0.5	0	N-Included		No
14	2	112.5	2.25	Dywidag	58.99	0.5	0	N-Included		No
15	2	202.5	2.25	Dywidag	58.99	0.5	0	N-Included		No
16	2	292.5	2.25	Dywidag	58.99	0.5	0	N-Included		No

## Plot Graphic



## Drilled Pier Foundation

BU #:	876340
Site Name:	COE HILL
Order Number:	529721 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	3228.56	
Axial Force (kips)	46.67	
Shear Force (kips)	34.02	

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

Pier Design Data	
Depth	21 ft
Ext. Above Grade	0.5 ft
Pier Section 1	
<i>From 0.5' above grade to 21' below grade</i>	
Pier Diameter	7 ft
Rebar Quantity	24
Rebar Size	11
Clear Cover to Ties	4 in
Tie Size	5
Tie Spacing	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
<b>Soil Lateral Check</b>		
	Compression	Uplift
D <sub>v=0</sub> (ft from TOC)	6.05	-
Soil Safety Factor	1.92	-
Max Moment (kip-ft)	3475.36	-
Rating*	66.0%	-
<b>Soil Vertical Check</b>		
	Compression	Uplift
Skin Friction (kips)	428.11	-
End Bearing (kips)	432.95	-
Weight of Concrete (kips)	148.94	-
Total Capacity (kips)	861.06	-
Axial (kips)	195.61	-
Rating*	21.6%	-
<b>Reinforced Concrete Flexure</b>		
	Compression	Uplift
Critical Depth (ft from TOC)	5.88	-
Critical Moment (kip-ft)	3475.04	-
Critical Moment Capacity	5847.86	-
Rating*	56.6%	-
<b>Reinforced Concrete Shear</b>		
	Compression	Uplift
Critical Depth (ft from TOC)	15.95	-
Critical Shear (kip)	494.91	-
Critical Shear Capacity	608.54	-
Rating*	77.5%	-

<b>Soil Interaction Rating*</b>	<b>66.0%</b>
<b>Structural Foundation Rating*</b>	<b>77.5%</b>

\*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"/>
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	4

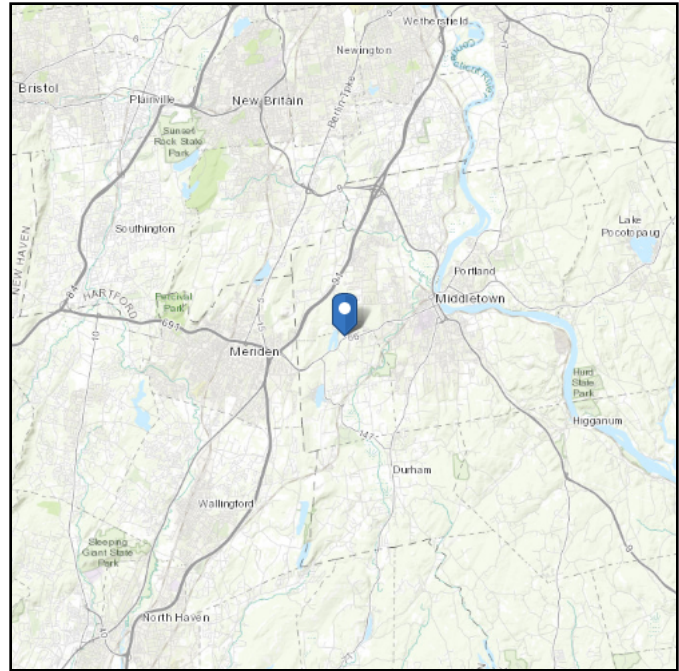
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y <sub>soil</sub> (pcf)	Y <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	100	150	0	0	0.000	0.000					Cohesionless
2	2	3.5	1.5	120	150	0	0	0.000	0.000					Cohesionless
3	3.5	6	2.5	120	150		30	0.639	0.639				47	Cohesionless
4	6	21	15	125	150		35	1.624	1.624			15	41	Cohesionless

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 444.26 ft (NAVD 88)  
**Latitude:** 41.546  
**Longitude:** -72.714972



## Wind

### Results:

Wind Speed:	125 Vmph per jurisdiction requirement
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	102 Vmph

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Thu Oct 08 2020

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 7-10 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 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

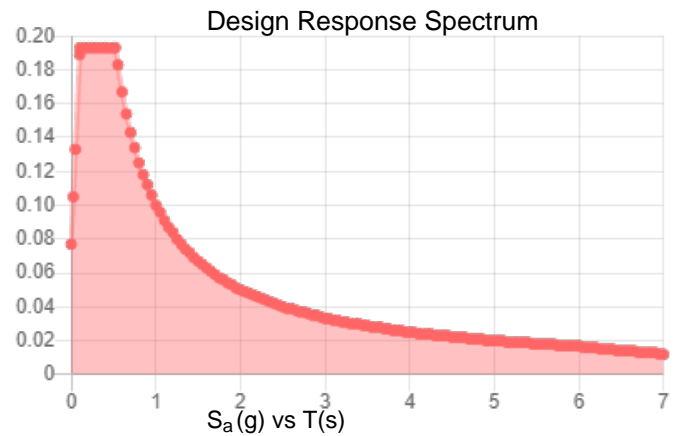
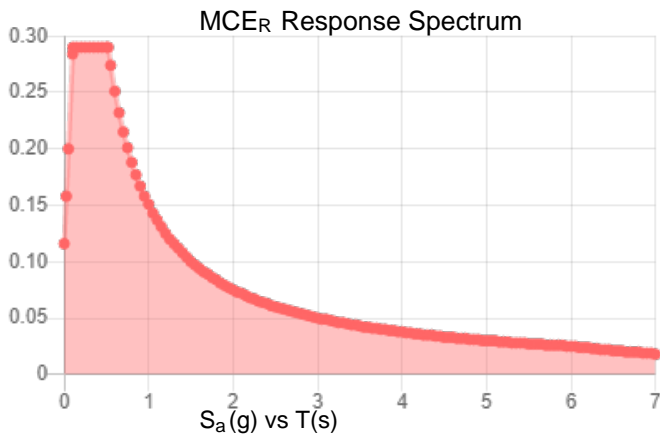
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

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

**Results:**

$S_S$ :	0.181	$S_{DS}$ :	0.193
$S_1$ :	0.063	$S_{D1}$ :	0.1
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.093
$S_{MS}$ :	0.29	PGA <sub>M</sub> :	0.148
$S_{M1}$ :	0.151	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Thu Oct 08 2020

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.



## Ice

---

**Results:**

Ice Thickness: 0.75 in.  
Concurrent Temperature: 15 F  
Gust Speed: 50 mph

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

**Date Accessed:** Thu Oct 08 2020

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 50-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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# Exhibit E

Date: **July 23, 2021**

Darcy Tarr  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277  
(704) 405-6589



Trylon  
1825 W. Walnut Hill Lane,  
Suite 302  
Irving, TX 75038  
214-930-1730

**Subject:** **Mount Replacement Analysis Report**

**Carrier Designation:** **Dish Network Equipment Change Out**  
**Carrier Site Number:** BOBDL00090A  
**Carrier Site Name:** CT-CCI-T-876340

**Crown Castle Designation:** **Crown Castle BU Number:** 876340  
**Crown Castle Site Name:** Coe Hill  
**Crown Castle JDE Job Number:** 645181  
**Crown Castle Order Number:** 553291 Rev. 1

**Engineering Firm Designation:** **Trylon Report Designation:** 188198

**Site Data:** **238 Meriden Rd., Middlefield, Middlesex County, CT, 06457**  
**Latitude 41°32'45.60" Longitude -72°42'53.90"**

**Structure Information:** **Tower Height & Type:** **133.0 ft Monopole**  
**Mount Elevation:** **95.0 ft**  
**Mount Type:** **8.0 ft Platform**

Dear Darcy Tarr,

Trylon is pleased to submit this "**Mount Replacement Analysis Report**" to determine the structural integrity of Dish Network'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:

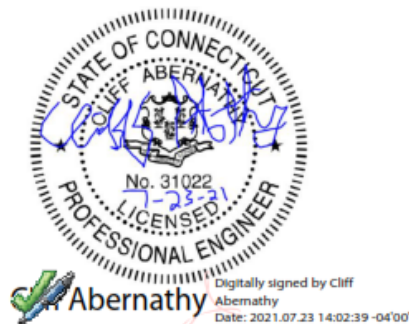
**Platform**

**Sufficient**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Bryan P. Mawhinney

Respectfully Submitted by:  
Cliff Abernathy, P.E.



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### 4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity

4.1) Recommendations

### 5) APPENDIX A

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### 6) APPENDIX B

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### 7) APPENDIX C

Software Analysis Output

### 8) APPENDIX D

Additional Calculations

### 9) APPENDIX E

Supplemental Drawings

## 1) INTRODUCTION

This is a proposed 3 sector 8.0 ft Platform, designed by Commscope.

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2015 IBC
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor at Base:</b>	1.0
<b>Topographic Factor at Mount:</b>	1.0
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Seismic S<sub>s</sub>:</b>	0.181
<b>Seismic S<sub>1</sub>:</b>	0.063
<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**

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
95.0	91.0	3	JMA WIRELESS	MX08FRO665-20	8.0 ft Platform [Commscope MC- PK8-DSH]
		3	FUJITSU	TA08025-B604	
		3	FUJITSU	TA08025-B605	
		1	RAYCAP	RDIDC-9181-PF-48	

## 3) ANALYSIS PROCEDURE

**Table 2 - Documents Provided**

Document	Remarks	Reference	Source
Crown Application	Dish Network Application	553291 Rev. 1	CCI Sites
Construction Drawings	Infinigy	Site ID: BOBDL00090A	TSA
Mount Manufacturer Drawings	Commscope	MC-PK8-DSH	TSA

### 3.1) Analysis Method

RISA-3D (Version 17.0.4), 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 tool internally developed, using Microsoft Excel, by Trylon 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 *Tower Mount Analysis* (Revision B).

**3.2) Assumptions**

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 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.
- 5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
- 6) Steel grades have been assumed as follows, unless noted otherwise:
 

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

**4) ANALYSIS RESULTS**

**Table 3(a) - Mount Component Stresses vs. Capacity (Platform, Alpha Sector)**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP4	95.0	28.4	Pass
	Horizontal(s)	H2		8.8	Pass
	Standoff(s)	M95		38.6	Pass
	Bracing(s)	M17		59.0	Pass
	Handrail(s)	M28		38.5	Pass
	Mount Connection(s)	--		30.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>59.0%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H, Section 15.5

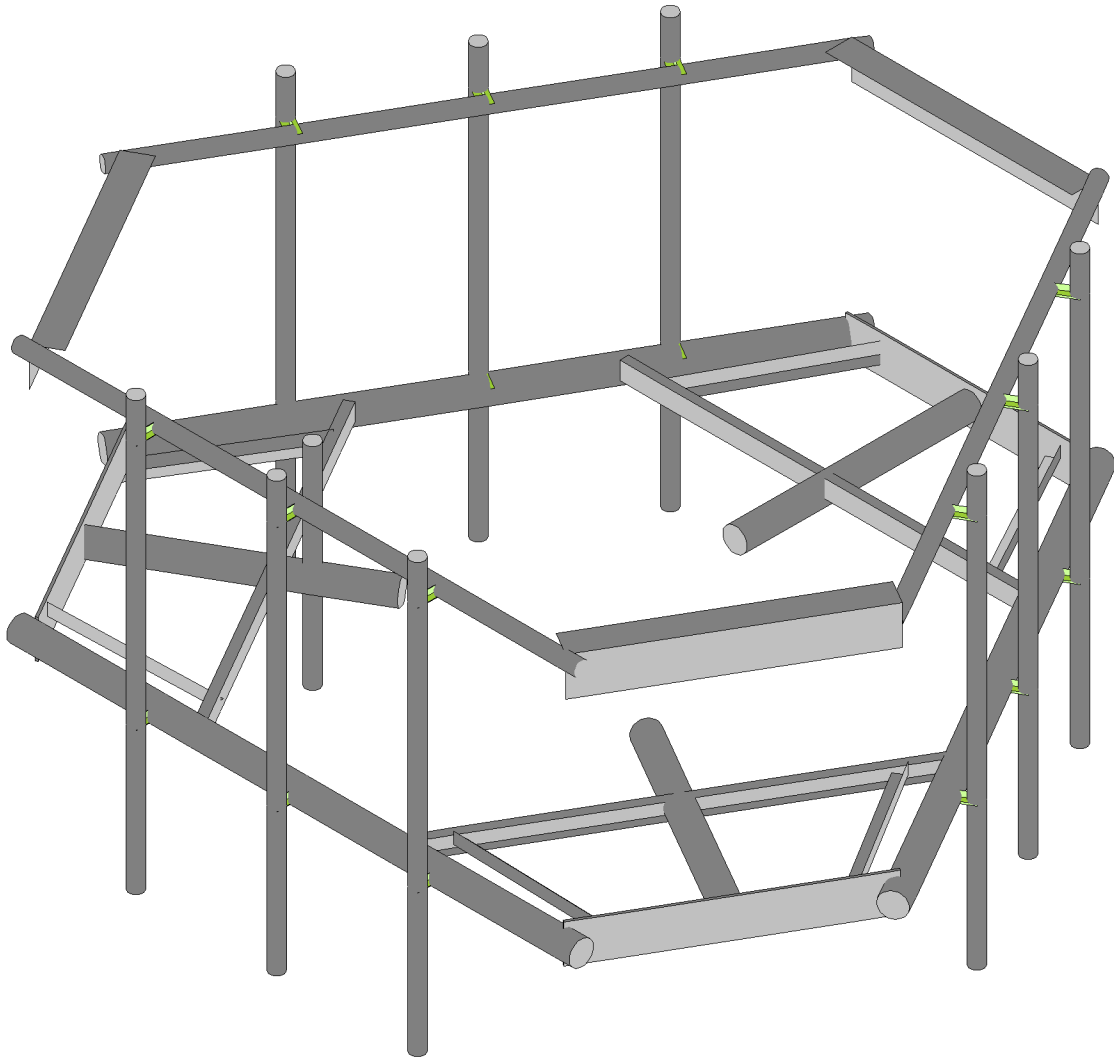
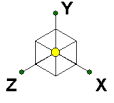
**4.1) Recommendations**

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope MC-PK8-DSH.

No structural modifications are required at this time, provided that the above-listed changes are implemented.

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




MC-PK8-C

SK - 2

July 23, 2021 at 12:46 PM

MC-PK8-C\_loaded.r3d





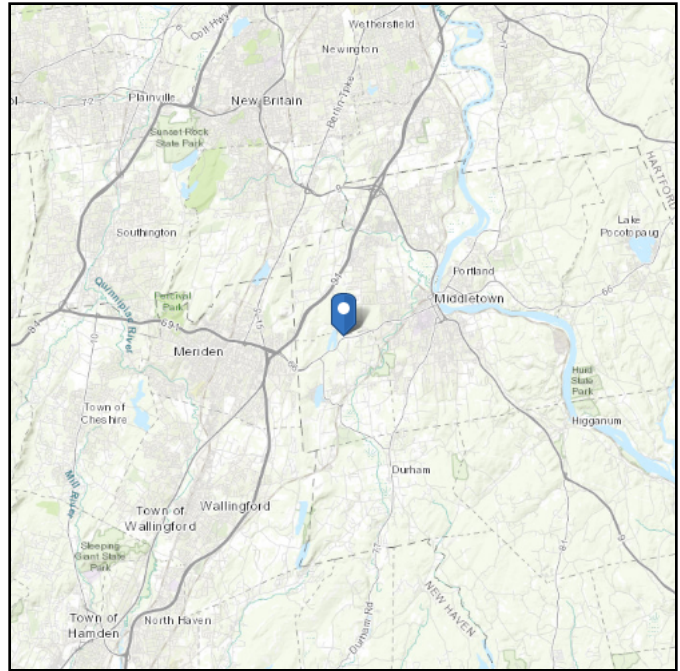
**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 444.26 ft (NAVD 88)  
**Latitude:** 41.546  
**Longitude:** -72.714972



## Ice

### Results:

Ice Thickness: 0.75 in.  
Concurrent Temperature: 15 F  
Gust Speed: 50 mph

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

**Date Accessed:** Tue Jul 20 2021

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 50-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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# Trylon

1825 W. Walnut Hill Lane Suite 120  
Irving, TX 75038

## TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	188198
Carrier Site ID:	BOBDL00090A
Carrier Site Name:	BOBDL00090A

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	0
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	95.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	133.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Default	--
Ground Elevation:	444	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor ( $K_{zt}$ ):	1.00	--
Mount Topo Factor ( $K_{zt}$ ):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	125	mph
Wind Escalation Factor ( $K_s$ ):	1.00	--
Velocity Coefficient ( $K_z$ ):	1.25	--
Directionality Factor ( $K_d$ ):	0.95	--
Gust Effect Factor (G <sub>h</sub> ):	1.00	--
Shielding Factor ( $K_a$ ):	0.90	--
Velocity Pressure ( $q_z$ ):	46.82	psf

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness ( $t_i$ ):	1.50	in
Importance Factor ( $I_i$ ):	1.00	--
Ice Velocity Pressure ( $q_{iz}$ ):	46.82	psf
Mount Ice Thickness ( $t_{iz}$ ):	1.67	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	84.27	psf
Round Member Pressure:	50.56	psf
Ice Wind Pressure:	7.18	psf

SEISMIC PARAMETERS		
Importance Factor ( $I_e$ ):	1.00	--
Short Period Accel. ( $S_s$ ):	0.18	g
1 Second Accel. ( $S_1$ ):	0.06	g
Short Period Des. ( $S_{DS}$ ):	0.19	g
1 Second Des. ( $S_{D1}$ ):	0.10	g
Short Period Coeff. ( $F_a$ ):	1.60	--
1 Second Coeff. ( $F_v$ ):	2.40	--
Response Coefficient ( $C_s$ ):	0.10	--
Amplification Factor ( $A_S$ ):	1.20	--

## LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

\*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site















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























































## A Ya Vyf'8 ]g[f]Vi HYX' @ UXg'f6 @ '% : ÷WĜfi Wī fy'K }p'X'LL'f' cb]bi YXL

	T^{ à!/Áããˆ}	Öã^&čã}	ÚčáoT̄ æ} æ à^ ĴãDãÖ} áÁ æ} æ à^ ĴãDãÖ} ÚčáoŮ{ &čã} Žã Ē á	Ó) áÁŮ{ &čã} Žã Ē á		
Í H	ÜUWF	ÜY	ĚÍ ĚĪ	ĚÍ ĚĪ	€	Á FĚĚ

## A Ya Vyf'8 ]g[f]Vi HYX' @ UXg'f6 @ ' ( : 6 @ '%HfUbg]Ybh5 fYU@ UXgk

	T^{ à!/Áããˆ}	Öã^&čã}	ÚčáoT̄ æ} æ à^ ĴãDãÖ} áÁ æ} æ à^ ĴãDãÖ} ÚčáoŮ{ &čã} Žã Ē á	Ó) áÁŮ{ &čã} Žã Ē á		
F	T FG	Ÿ	ĚÍ ĚĚĜ	ĚÍ ĚĚĜ	€	ĜĚ ĴÍ
G	T FH	Ÿ	ĚĚÍ H	ĚĚÍ H	HĚ Ĝ	Ĝ ĚĴÍ
H	T FI	Ÿ	ĚĚÍ H	ĚĚÍ H	HĚ Ĝ	Ĝ ĚĴÍ
I	T Ī	Ÿ	ĚÍ ĚĚĜ	ĚÍ ĚĚĜ	€	ĜĚ ĴÍ
Í	T Ì	Ÿ	ĚĚÍ H	ĚĚÍ H	HĚ Ĝ	Ĝ ĚĴÍ
Î	T J	Ÿ	ĚĚÍ H	ĚĚÍ H	HĚ Ĝ	Ĝ ĚĴÍ
Ī	T G	Ÿ	ĚÍ ĚĚĜ	ĚÍ ĚĚĜ	€	ĜĚ ĴÍ
Ì	T H	Ÿ	ĚĚÍ H	ĚĚÍ H	HĚ Ĝ	Ĝ ĚĴÍ
J	T I	Ÿ	ĚĚÍ H	ĚĚÍ H	HĚ Ĝ	Ĝ ĚĴÍ

## A Ya Vyf'8 ]g[f]Vi HYX' @ UXg'f6 @ ' ) : 6 @ '%HfUbg]Ybh5 fYU@ UXgk

	T^{ à!/Áããˆ}	Öã^&čã}	ÚčáoT̄ æ} æ à^ ĴãDãÖ} áÁ æ} æ à^ ĴãDãÖ} ÚčáoŮ{ &čã} Žã Ē á	Ó) áÁŮ{ &čã} Žã Ē á		
F	T FG	Ÿ	ĚĜ ĚĴÍ	ĚĜ ĚĴÍ	€	ĜĚ ĴÍ
G	T FH	Ÿ	ĚÍ ĚĚĴ	ĚÍ ĚĚĴ	HĚ Ĝ	Ĝ ĚĴÍ
H	T FI	Ÿ	ĚÍ ĚĚĴ	ĚÍ ĚĚĴ	HĚ Ĝ	Ĝ ĚĴÍ
I	T Ī	Ÿ	ĚĜ ĚĴÍ	ĚĜ ĚĴÍ	€	ĜĚ ĴÍ
Í	T Ì	Ÿ	ĚÍ ĚĚĴ	ĚÍ ĚĚĴ	HĚ Ĝ	Ĝ ĚĴÍ
Î	T J	Ÿ	ĚÍ ĚĚĴ	ĚÍ ĚĚĴ	HĚ Ĝ	Ĝ ĚĴÍ
Ī	T G	Ÿ	ĚĜ ĚĴÍ	ĚĜ ĚĴÍ	€	ĜĚ ĴÍ
Ì	T H	Ÿ	ĚÍ ĚĚĴ	ĚÍ ĚĚĴ	HĚ Ĝ	Ĝ ĚĴÍ
J	T I	Ÿ	ĚÍ ĚĚĴ	ĚÍ ĚĚĴ	HĚ Ĝ	Ĝ ĚĴÍ

## A Ya Vyf'5 fYU@ UXg'f6 @ '% GYZK Y] \ Ĥ

	R̄ã áĚ	R̄ã áÓ	R̄ã áŌ	R̄ã áÖ	Öã^&čã}	Öã dãˆ čã}	T̄ æ} æ à^ Ĵ• á
F	pH	pĤ	pH	pH	Ÿ	V, [ Á æ	ĚĚ
G	pĜ	pĜ	pĜ	pĜ	Ÿ	V, [ Á æ	ĚĚ
H	pFF	pFG	pJ	pFĚ	Ÿ	V, [ Á æ	ĚĚ

## A Ya Vyf'5 fYU@ UXg'f6 @ '% ÷WĶ Y] \ Ĥ

	R̄ã áĚ	R̄ã áÓ	R̄ã áŌ	R̄ã áÖ	Öã^&čã}	Öã dãˆ čã}	T̄ æ} æ à^ Ĵ• á
F	pH	pĤ	pH	pH	Ÿ	V, [ Á æ	ĚÍ Ě
G	pĜ	pĜ	pĜ	pĜ	Ÿ	V, [ Á æ	ĚÍ Ě
H	pFF	pFG	pJ	pFĚ	Ÿ	V, [ Á æ	ĚÍ Ě

## 6 Ug]W@ UX'7 UgYg

	ÓŠÓ/Ö•&āčã}	Öæ* [ ! ˆ	Ÿ/Ō!æç	Ÿ/Ō!æç	Z/Ō!æç	R̄ã ç	Ú[ ā ç	Öã dãˆ ç á ĚH^æŮ Ĥ ĚŮ : ! æ^ŮĚ	
F	Ů^ [ Á ^ ā @	ÖŠ		Ě			FH	H	
G	Ůdˆ &ç! ^ Á ā Ě	Ÿ ŠZ						Í H	
H	Ůdˆ &ç! ^ Á ā Á	Ÿ ŠŸ						Í H	
I	Ÿ ā áÁ æ^ Á ŮZQ	Ÿ ŠZ					Ĝ		
Í	Ÿ ā áÁ æ^ Á Ĥ ŮZQ	p[ ] ^					Ĝ		
Î	Ÿ ā áÁ æ^ Á Ī ŮZQ	p[ ] ^					Ĝ		
Ī	Ÿ ā áÁ æ^ Á Ĭ ŮZQ	p[ ] ^					Ĝ		















**APPENDIX D**  
**ADDITIONAL CALCUATIONS**

**BOLT TOOL 1.5.2**

Project Data	
Job Code:	188200
Carrier Site ID:	BOBDL00090A
Carrier Site Name:	BOBDL00090A

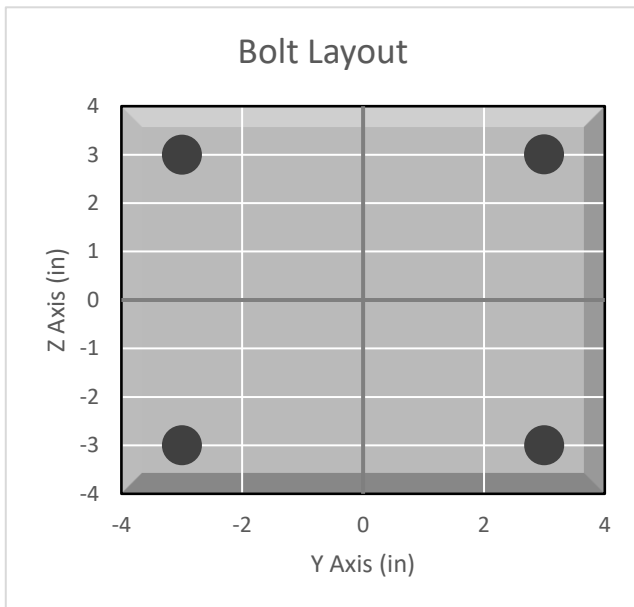
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in

Connection Description
Mount Standoff to Collar

Bolt Check*		
Tensile Capacity ( $\phi T_n$ ):	20340.1	lbs
Shear Capacity ( $\phi V_n$ ):	13805.8	lbs
Tension Force ( $T_u$ ):	5037.6	lbs
Shear Force ( $V_u$ ):	956.1	lbs
Tension Usage:	23.6%	--
Shear Usage:	6.6%	--
Interaction:	23.6%	Pass
Controlling Member:	M91	--
Controlling LC:	233	--

\*Rating per TIA-222-H Section 15.5



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

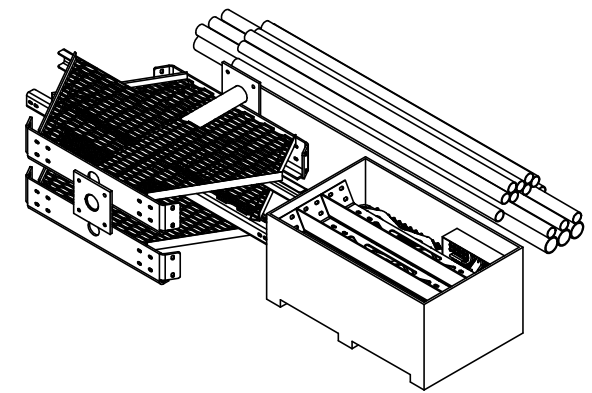


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	MTC3006SB	STEEL BUNDLE FOR SNUB NOSE PLATFORM	1	402.64 LBS	
2	MCPK8CSB	PIPE STEEL BUNDLE FOR MC-PK8-C	1	464.27 LBS	
3	MCPK8CHWK	HARDWARE KIT FOR MC-PK8-C	1	543.22 LBS	




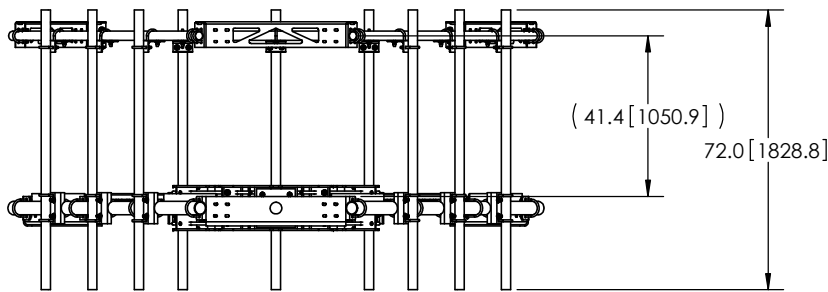
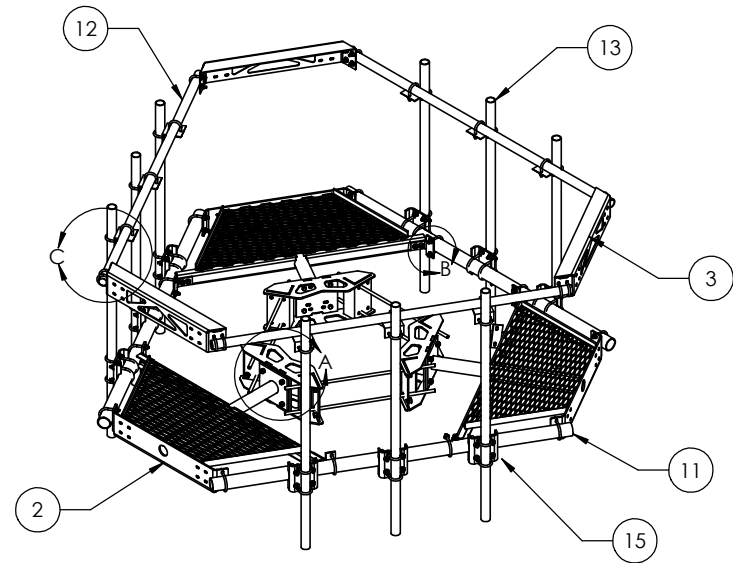
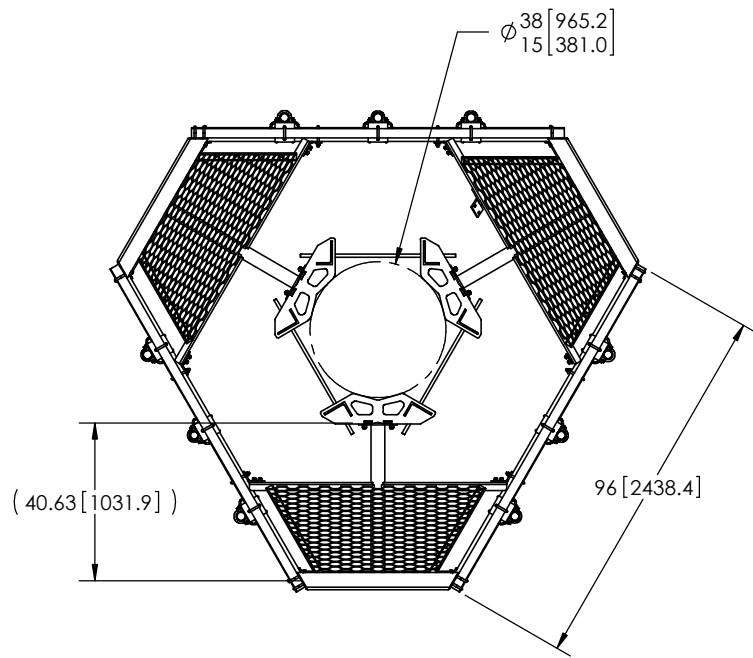
REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	DRR	12/27/11
B	8000005979	CHANGE NOSE CORNER BRKT, ADD GUB-4240	MSM	11/25/14
C	8000007579	NEW RINGMOUNT WELDMENT DESIGN	RJC	04/07/15

FOR BOM ENTRY ONLY



NOTES:  
1. CUSTOMER ASSEMBLY SHEETS 2-3.

<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			<small>DRAWN BY:</small> MSM	<small>SHEET:</small> 1 of 3	<small>PART NUMBER:</small> MC-PK8-C
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small>			<small>CHECKED BY:</small> TP	<small>SCALE:</small> NTS	<small>DESCRIPTION:</small> LOW PROFILE PLATFORM KIT 8' FACE
<small>.X = ± .12      ANGLES      ±2° .XX = ± .06      FRACTIONS      ±1/32 .XXX = ± .03</small>			<small>DATE:</small> 10/18/11	<small>MATERIAL:</small> A36, A500	<small>DRAWING TYPE:</small> ASSEMBLY DRAWING
<small>REMOVE BURRS AND BREAK EDGES .005</small>			<small>REVISION:</small> C	<small>FINISH:</small> GALV A123	 WESTCHESTER, IL. 60154 U.S.A.
<small>DO NOT SCALE THIS PRINT</small>				<small>WEIGHT:</small> 1410.14 LBS	



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	18	0.82 LBS
6	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12	0.71 LBS
7	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	48	0.56 LBS
8	GB-04145	1/2" X 1-1/2" GALV BOLT KIT	12	0.13 LBS
9	GWF-04	1/2" GALV FLAT WASHER	24	0.03 LBS
10	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12	0.27 LBS
11	MT54796	3.50" OD X 96" GALV PIPE	3	60.28 LBS
12	MT-651-96	Ø2.375" OD X 96" PIPE	3	29.07 LBS
13	MT-651	2.375" OD x 72" PIPE	9	21.80 LBS
14	MT19617	MT196 Pipe Mount Plate	6	2.49 LBS
15	MT21701	PIPE MOUNT PLATE	9	7.93 LBS

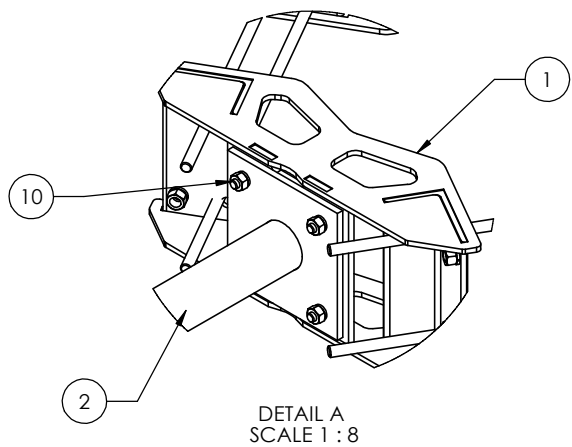
<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small> .X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .03 <small>REMOVE BURRS AND BREAK EDGES .005</small> DO NOT SCALE THIS PRINT	<small>DRAWN BY:</small> MSM <small>CHECKED BY:</small> TP <small>DATE:</small> 10/18/11 <small>REVISION:</small> C	<small>SHEET:</small> 2 of 3 <small>SCALE:</small> NTS <small>DATE:</small> 10/18/11 <small>REVISION:</small> C	<small>PART NUMBER:</small> MC-PK8-C <small>DESCRIPTION:</small> 25" OD Snub Nose MT-196 <small>MATERIAL:</small> A36, A53 <small>DRAWING TYPE:</small> ASSEMBLY DRAWING <small>WEIGHT:</small> 1361.27 LBS

NOTES:

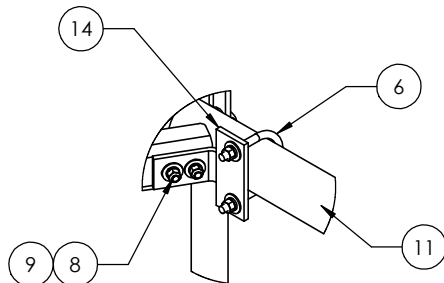
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
2. WILL FIT MONOPOLES 15"-38" OD.



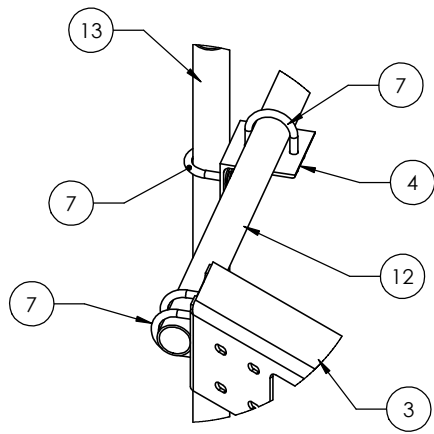
8 7 6 5 4 3 2 1



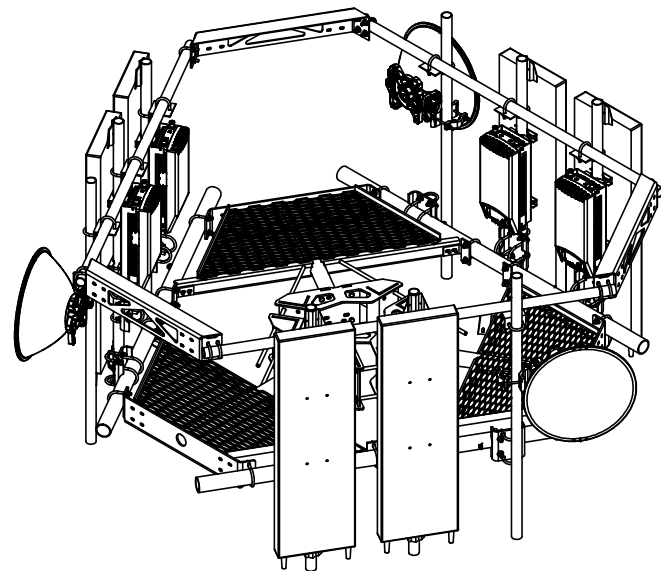
DETAIL A  
SCALE 1 : 8



DETAIL B  
SCALE 1 : 8




DETAIL C  
SCALE 1 : 8



**WITH ANTENNAS**

NOTES:  
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>		
DRAWN BY: MSM	SHEET: 3 of 3	PART NUMBER: MC-PK8-C
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 25" OD Snub Nose MT-196
DATE: 10/18/11	MATERIAL: A36, A53	DRAWING TYPE: ASSEMBLY DRAWING
REVISION: C	FINISH: GALV A123	 WESTCHESTER, IL. 60154 U.S.A.
REMOVE BURRS AND BREAK EDGES .005 DO NOT SCALE THIS PRINT	WEIGHT: 1361.27 LBS	

8 7 6 5 4 3 2 1

# Exhibit F



## **RF EMISSIONS COMPLIANCE REPORT**

### **Crown Castle on behalf of Dish Wireless**

**Crown Castle Site Name: COE HILL  
Crown Castle Site BU Number: 876340  
Dish Wireless Site Name: CT-CCI-T-76340  
Dish Wireless Site ID: BOBDL00090A  
238 Meriden Road  
Middlefield, CT  
6/8/2021**

### **Report Status:**

**Dish Wireless is Compliant**

Signed 08 June 2021

**Prepared By:**

**Site Safe, LLC**

Engineering Statement in Re:  
Electromagnetic Energy Analysis  
Crown Castle  
Middlefield, CT

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Site Safe, LLC in Vienna, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle on behalf of Dish Wireless (see attached Site Summary and Carrier documents) and that Dish Wireless' installation involves communications equipment, antennas and associated technical equipment at a location referred to as "COE HILL" ("the site"); and

That Dish Wireless proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by Dish Wireless and shown on the worksheet and that worst-case 100% duty cycle has been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio frequency energy must utilize the standards set by the FCC, which is the federal agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," which defines situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and 2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of Dish Wireless' operating frequencies as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed T-Mobile operation is no more than 3.415% of the maximum permissible exposure limits in any accessible area on the ground; and

That it is understood per FCC Guidelines and OET 65 Appendix A, that regardless of the existent radio frequency environment, only those licensees whose contributions exceed 5% of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 23.849% of the maximum in any accessible area up to two meters above the ground per OET 65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET 65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier(s) and frequency range(s) indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding radio frequency safety; and

In summary, it is stated here that the proposed operation at the site will not result in exposure of the public to excessive levels of radio frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307(b), and that Dish Wireless' proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals and approved contractor personnel trained in radio frequency safety and that this instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower or in the immediate proximity of the antennas.

**Crown Castle  
COE HILL  
Site Summary**

<b>Carrier</b>	<b>Area Maximum Percentage MPE</b>
AT&T Mobility, LLC	0.648 %
AT&T Mobility, LLC	0.673 %
AT&T Mobility, LLC	0.318 %
AT&T Mobility, LLC	0.586 %
Dish Wireless (Proposed)	1.419 %
Dish Wireless (Proposed)	1.494 %
Dish Wireless (Proposed)	0.502 %
Sprint (T-Mobile)	0.635 %
Sprint (T-Mobile)	0.975 %
Sprint (T-Mobile)	0.461 %
Sprint (T-Mobile)	0.620 %
Sprint (T-Mobile)	5.541 %
T-Mobile	0.983 %
T-Mobile	1.028 %
T-Mobile	0.563 %
T-Mobile	0.612 %
T-Mobile	6.791 %
<b>Composite Site MPE:</b>	<b>23.849 %</b>



**AT&T Mobility, LLC  
COE HILL  
Carrier Summary**

Frequency: 2100 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 6.47632  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.64763 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
CCI	OPA65R-BU6D	132	10	4562	4.546959	0.454696	6.355809	0.635581
CCI	OPA65R-BU6D	132	130	4562	4.546959	0.454696	6.355809	0.635581
CCI	OPA65R-BU4D	132	260	4066	4.873423	0.487342	5.951813	0.595181

**AT&T Mobility, LLC  
COE HILL  
Carrier Summary**

**Frequency:** 1900 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 6.72814  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.67281 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
CCI Antennas	DMP65R-BU6D	132	10	4075	5.506328	0.550633	6.672968	0.667297
CCI Antennas	DMP65R-BU6D	132	130	4075	5.506328	0.550633	6.672968	0.667297
CCI Antennas	DMP65R-BU4D	132	260	3541	4.295347	0.429535	5.441787	0.544179

**AT&T Mobility, LLC  
COE HILL  
Carrier Summary**

**Frequency:** 737 MHz  
**Maximum Permissible Exposure (MPE):** 491.33  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 1.56407  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.31833 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
CCI Antennas	DMP65R-BU6D	132	10	2400	1.090154	0.221877	1.405305	0.286019
CCI Antennas	DMP65R-BU6D	132	130	2400	1.090154	0.221877	1.405305	0.286019
CCI Antennas	DMP65R-BU4D	132	260	1582	1.179165	0.239993	1.233279	0.251006

**AT&T Mobility, LLC  
COE HILL  
Carrier Summary**

**Frequency:** 850 MHz  
**Maximum Permissible Exposure (MPE):** 566.67  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 3.32178  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.58620 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Powerwave	P65-15-XLH-RR	132	10	728	1.914758	0.337898	1.935690	0.341592
CCI Antennas	DMP65R-BU6D	132	10	1120	0.507915	0.089632	0.922808	0.162849
CCI Antennas	DMP65R-BU6D	132	10	1120	0.507915	0.089632	0.922808	0.162849
Powerwave	P65-15-XLH-RR	132	130	728	1.914758	0.337898	1.935690	0.341592
CCI Antennas	DMP65R-BU6D	132	130	1120	0.507915	0.089632	0.922808	0.162849
CCI Antennas	DMP65R-BU6D	132	130	1120	0.507915	0.089632	0.922808	0.162849
Powerwave	P65-15-XLH-RR	132	260	728	1.914758	0.337898	1.935690	0.341592
CCI Antennas	DMP65R-BU4D	132	260	847	0.592364	0.104535	0.624756	0.110251
CCI Antennas	DMP65R-BU4D	132	260	847	0.592364	0.104535	0.624756	0.110251

**Dish Wireless (Proposed)  
COE HILL  
Carrier Summary**

Frequency: 2100 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 14.18923  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 1.41892 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
JMA Wireless	MX08FRO665-20	91	0	11861	8.772501	0.877250	14.112852	1.411285
JMA Wireless	MX08FRO665-20	91	120	11861	8.772501	0.877250	14.112852	1.411285
JMA Wireless	MX08FRO665-20	91	240	11861	8.772501	0.877250	14.112852	1.411285

**Dish Wireless (Proposed)  
COE HILL  
Carrier Summary**

Frequency: 1900 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 14.94166  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 1.49417 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
JMA Wireless	MX08FRO665-20	91	0	9866	7.954158	0.795416	14.829199	1.482920
JMA Wireless	MX08FRO665-20	91	120	9866	7.954158	0.795416	14.829199	1.482920
JMA Wireless	MX08FRO665-20	91	240	9866	7.954158	0.795416	14.829199	1.482920

**Dish Wireless (Proposed)  
COE HILL  
Carrier Summary**

Frequency: 600 MHz  
 Maximum Permissible Exposure (MPE): 400  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 2.00765  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.50191 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
JMA Wireless	MX08FRO665-20	91	0	1304	1.510063	0.377516	1.903152	0.475788
JMA Wireless	MX08FRO665-20	91	120	1304	1.510063	0.377516	1.903152	0.475788
JMA Wireless	MX08FRO665-20	91	240	1304	1.510063	0.377516	1.903152	0.475788

**Sprint (T-Mobile)  
COE HILL  
Carrier Summary**

Frequency: 2100 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 6.35194  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.63519 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APX16DWV-16DWVS-C-A20	121	0	6763	6.066754	0.606675	6.198692	0.619869
RFS	APX16DWV-16DWVS-C-A20	121	120	6763	6.066754	0.606675	6.198692	0.619869
RFS	APX16DWV-16DWVS-C-A20	121	240	6763	6.066754	0.606675	6.198692	0.619869



**Sprint (T-Mobile)  
COE HILL  
Carrier Summary**

Frequency: 1900 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 9.75111  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.97511 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAALL24_43-U-NA20	121	0	1340	0.662848	0.066285	1.199581	0.119958
RFS	APXVAALL24_43-U-NA20	121	0	1340	0.662848	0.066285	1.199581	0.119958
RFS	APXVAALL24_43-U-NA20	121	0	8039	3.977103	0.397710	7.197514	0.719751
RFS	APXVAALL24_43-U-NA20	121	120	1340	0.662848	0.066285	1.199581	0.119958
RFS	APXVAALL24_43-U-NA20	121	120	1340	0.662848	0.066285	1.199581	0.119958
RFS	APXVAALL24_43-U-NA20	121	120	8039	3.977103	0.397710	7.197514	0.719751
RFS	APXVAALL24_43-U-NA20	121	240	1340	0.662848	0.066285	1.199581	0.119958
RFS	APXVAALL24_43-U-NA20	121	240	1340	0.662848	0.066285	1.199581	0.119958
RFS	APXVAALL24_43-U-NA20	121	240	8039	3.977103	0.397710	7.197514	0.719751

**Sprint (T-Mobile)  
COE HILL  
Carrier Summary**

Frequency: 700 MHz  
 Maximum Permissible Exposure (MPE): 466.67  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 2.15001  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.46072 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAALL24_43-U-NA20	121	0	3794	1.632457	0.349812	2.056106	0.440594
RFS	APXVAALL24_43-U-NA20	121	120	3794	1.632457	0.349812	2.056106	0.440594
RFS	APXVAALL24_43-U-NA20	121	240	3794	1.632457	0.349812	2.056106	0.440594

**Sprint (T-Mobile)  
COE HILL  
Carrier Summary**

Frequency: 600 MHz  
 Maximum Permissible Exposure (MPE): 400  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 2.48150  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.62037 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAALL24_43-U-NA20	121	0	1730	0.765999	0.191500	1.181467	0.295367
RFS	APXVAALL24_43-U-NA20	121	0	1730	0.765999	0.191500	1.181467	0.295367
RFS	APXVAALL24_43-U-NA20	121	120	1730	0.765999	0.191500	1.181467	0.295367
RFS	APXVAALL24_43-U-NA20	121	120	1730	0.765999	0.191500	1.181467	0.295367
RFS	APXVAALL24_43-U-NA20	121	240	1730	0.765999	0.191500	1.181467	0.295367
RFS	APXVAALL24_43-U-NA20	121	240	1730	0.765999	0.191500	1.181467	0.295367

**Sprint (T-Mobile)  
COE HILL  
Carrier Summary**

**Frequency:** 2500 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 55.40656  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 5.54066 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Ericsson	AIR6449	121	0	27612	9.817436	0.981744	16.103622	1.610362
Ericsson	AIR6449	121	0	27612	9.817436	0.981744	16.103622	1.610362
Ericsson	AIR6449	121	120	27612	9.817436	0.981744	16.103622	1.610362
Ericsson	AIR6449	121	120	27612	9.817436	0.981744	16.103622	1.610362
Ericsson	AIR6449	121	240	27612	9.817436	0.981744	16.103622	1.610362
Ericsson	AIR6449	121	240	27612	9.817436	0.981744	16.103622	1.610362

## T-Mobile COE HILL Carrier Summary

**Frequency:** 2100 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 9.83440  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.98344 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Ericsson	AIR 32 B2A B66AA	104	0	4626	9.266103	0.926610	9.266103	0.926610
Ericsson	AIR 32 B2A B66AA	104	120	4626	9.266103	0.926610	9.266103	0.926610
Ericsson	AIR 32 B2A B66AA	104	240	4626	9.266103	0.926610	9.266103	0.926610

# T-Mobile COE HILL Carrier Summary

**Frequency:** 1900 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 10.27588  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 1.02759 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAARR24_43-U-NA20	104	0	1236	0.863601	0.086360	1.530220	0.153022
RFS	APXVAARR24_43-U-NA20	104	0	4945	3.454405	0.345440	6.120879	0.612088
Ericsson	AIR 32 B2A B66AA	104	0	2313	1.075567	0.107557	1.229774	0.122977
Ericsson	AIR 32 B2A B66AA	104	0	2313	1.075567	0.107557	1.229774	0.122977
RFS	APXVAARR24_43-U-NA20	104	120	1236	0.863601	0.086360	1.530220	0.153022
RFS	APXVAARR24_43-U-NA20	104	120	4945	3.454405	0.345440	6.120879	0.612088
Ericsson	AIR 32 B2A B66AA	104	120	2313	1.075567	0.107557	1.229774	0.122977
Ericsson	AIR 32 B2A B66AA	104	120	2313	1.075567	0.107557	1.229774	0.122977
RFS	APXVAARR24_43-U-NA20	104	240	1236	0.863601	0.086360	1.530220	0.153022
RFS	APXVAARR24_43-U-NA20	104	240	4945	3.454405	0.345440	6.120879	0.612088
Ericsson	AIR 32 B2A B66AA	104	240	2313	1.075567	0.107557	1.229774	0.122977
Ericsson	AIR 32 B2A B66AA	104	240	2313	1.075567	0.107557	1.229774	0.122977

## T-Mobile COE HILL Carrier Summary

**Frequency:** 700 MHz  
**Maximum Permissible Exposure (MPE):** 466.67  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 2.62717  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.56296 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAARR24_43-U-NA20	104	0	3484	2.132205	0.456901	2.256447	0.483524
RFS	APXVAARR24_43-U-NA20	104	120	3484	2.132205	0.456901	2.256447	0.483524
RFS	APXVAARR24_43-U-NA20	104	240	3484	2.132205	0.456901	2.256447	0.483524

## T-Mobile COE HILL Carrier Summary

**Frequency:** 600 MHz  
**Maximum Permissible Exposure (MPE):** 400  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 2.44731  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.61183 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAARR24_43-U-NA20	104	0	1668	1.105789	0.276447	1.105789	0.276447
RFS	APXVAARR24_43-U-NA20	104	0	1668	1.105789	0.276447	1.105789	0.276447
RFS	APXVAARR24_43-U-NA20	104	120	1668	1.105789	0.276447	1.105789	0.276447
RFS	APXVAARR24_43-U-NA20	104	120	1668	1.105789	0.276447	1.105789	0.276447
RFS	APXVAARR24_43-U-NA20	104	240	1668	1.105789	0.276447	1.105789	0.276447
RFS	APXVAARR24_43-U-NA20	104	240	1668	1.105789	0.276447	1.105789	0.276447




**T-Mobile  
COE HILL  
Carrier Summary**

**Frequency:** 2500 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 67.91470  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 6.79147 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Ericsson	AIR6449	104	0	27612	12.166749	1.216675	20.033169	2.003317
Ericsson	AIR6449	104	0	27612	12.166749	1.216675	20.033169	2.003317
Ericsson	AIR6449	104	120	27612	12.166749	1.216675	20.033169	2.003317
Ericsson	AIR6449	104	120	27612	12.166749	1.216675	20.033169	2.003317
Ericsson	AIR6449	104	240	27612	12.166749	1.216675	20.033169	2.003317
Ericsson	AIR6449	104	240	27612	12.166749	1.216675	20.033169	2.003317

# Exhibit G



**UNITED STATES  
POSTAL SERVICE®**

**Click-N-Ship®**

**P**

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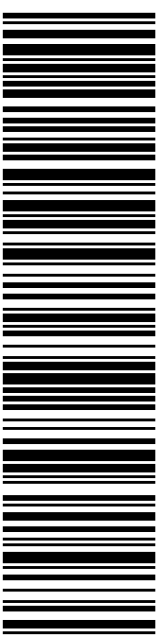
**PRIORITY MAIL 2-DAY™**

Expected Delivery Date: 08/21/21  
 Re#: DS-876340  
**0006**

**R013**

SHIP TO: RICH ZAJAC  
 CROWN CASTLE  
 4545 E RIVER RD  
 STE 320  
 W HENRIETTA NY 14586-9024

**USPS TRACKING #**



**9405 5036 9930 0477 7329 84**

Electronic Rate Approved #038555749



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### Instructions

1. 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.
2. Place your label so it does not wrap around the edge of the package.
3. 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.
4. 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.
5. Mail your package on the "Ship Date" you selected when creating this label.

### Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0477 7329 84**

Trans. #: 541118388	Priority Mail® Postage: <b>\$7.95</b>
Print Date: 08/18/2021	Total: <b>\$7.95</b>
Ship Date: 08/18/2021	
Expected Delivery Date: 08/21/2021	

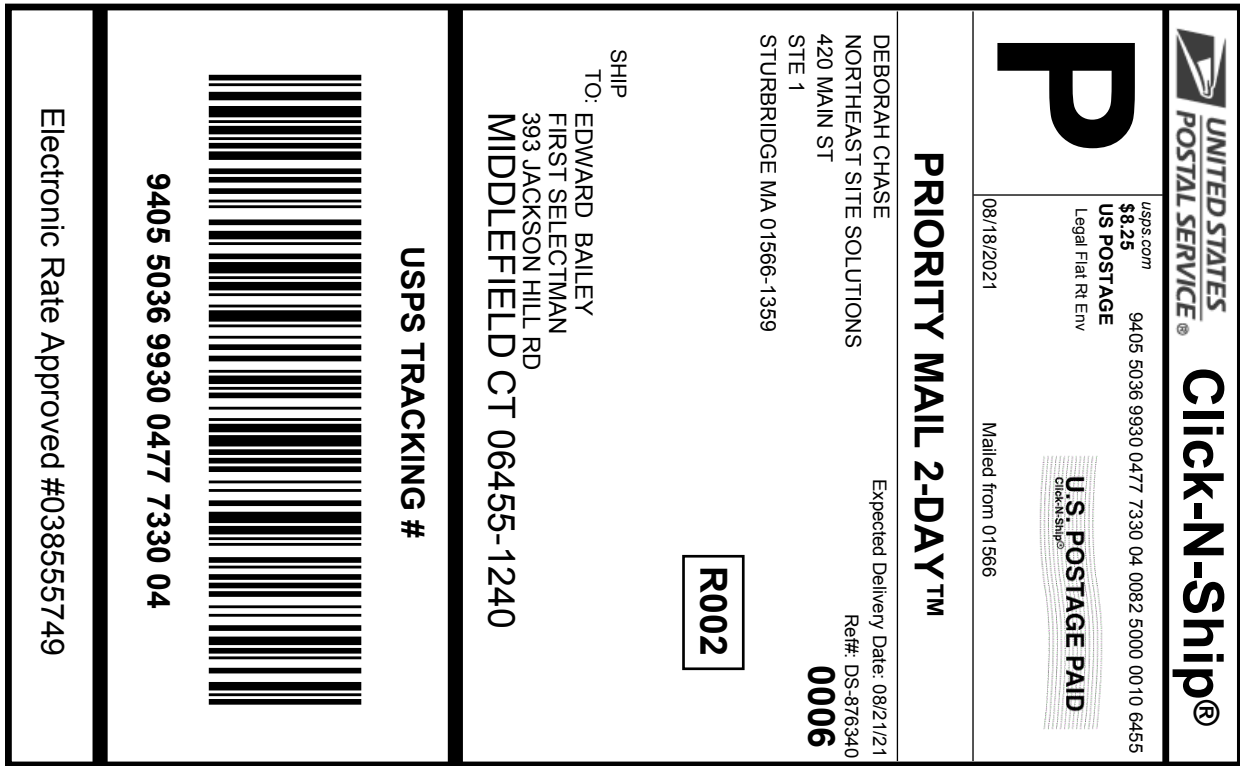
**From:** DEBORAH CHASE      Re#: DS-876340  
 NORTHEAST SITE SOLUTIONS  
 420 MAIN ST  
 STE 1  
 STURBRIDGE MA 01566-1359

**To:** RICH ZAJAC  
 CROWN CASTLE  
 4545 E RIVER RD  
 STE 320  
 W HENRIETTA NY 14586-9024

\* 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



Cut on dotted line.

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### Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0477 7330 04**

Trans. #:	541118388	Priority Mail® Postage:	<b>\$8.25</b>
Print Date:	08/18/2021	Total:	<b>\$8.25</b>
Ship Date:	08/18/2021		
Expected			
Delivery Date:	08/21/2021		

**From:** DEBORAH CHASE  
 NORTHEAST SITE SOLUTIONS  
 420 MAIN ST  
 STE 1  
 STURBRIDGE MA 01566-1359  
 Re#: DS-876340




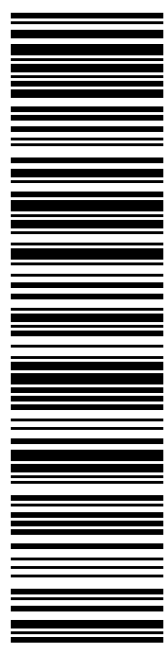
**To:** EDWARD BAILEY  
 FIRST SELECTMAN  
 393 JACKSON HILL RD  
 MIDDLEFIELD CT 06455-1240

\* 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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 <b>UNITED STATES POSTAL SERVICE®</b>			
		<small>usps.com</small> <b>US POSTAGE</b> Legal Flat Rate Env <b>U.S. POSTAGE PAID</b> <small>click-n-ship®</small>	
08/18/2021		Mailed from 01566	
<b>PRIORITY MAIL 2-DAY™</b>		Expected Delivery Date: 08/21/21 Ref#: DS-876340 <b>0006</b>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359			
<div style="border: 1px solid black; padding: 5px; display: inline-block;"><b>R002</b></div>			
SHIP TO: JERRY RUSS ZONING OFFICER 405 MAIN ST MIDDLEFIELD CT 06455-1268			
<b>USPS TRACKING #</b>			
			
<b>9405 5036 9930 0477 7330 11</b>			
Electronic Rate Approved #038555749			



Cut on dotted line.

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<b>USPS TRACKING # :</b> <b>9405 5036 9930 0477 7330 11</b>			
Trans. #:	541118388	Priority Mail® Postage:	<b>\$8.25</b>
Print Date:	08/18/2021	Total:	<b>\$8.25</b>
Ship Date:	08/18/2021		
Expected Delivery Date:	08/21/2021		
<b>From:</b>	DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	<b>Ref#:</b>	DS-876340
<b>To:</b>	JERRY RUSS ZONING OFFICER 405 MAIN ST MIDDLEFIELD CT 06455-1268		
<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>			



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**UNITED STATES  
POSTAL SERVICE®**

**Click-N-Ship®**

**P**

usps.com 9405 5036 9930 0477 7330 28 0082 5000 0010 6455  
**US POSTAGE**  
 Legal Flat Rate Env

U.S. POSTAGE PAID  
Click-N-Ship®

08/18/2021 Mailed from 01566


**PRIORITY MAIL 2-DAY™**

Expected Delivery Date: 08/21/21  
 Re#: DS-876340  
**0006**

**R002**

SHIP TO:  
 JAMES KOLMAN  
 15 HIGBY RD  
 MIDDLEFIELD CT 06455-2065

**USPS TRACKING #**



**9405 5036 9930 0477 7330 28**

Electronic Rate Approved #038555749



Cut on dotted line.

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### Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0477 7330 28**

Trans. #: 541118388	Priority Mail® Postage: <b>\$8.25</b>
Print Date: 08/18/2021	Total: <b>\$8.25</b>
Ship Date: 08/18/2021	
Expected Delivery Date: 08/21/2021	

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

Re#: DS-876340

**To:** JAMES KOLMAN  
 15 HIGBY RD  
 MIDDLEFIELD CT 06455-2065

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876340



FISKDALE  
458 MAIN ST  
FISKDALE, MA 01518-9998  
(800)275-8777

08/18/2021

04:15 PM

Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
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West Henrietta, NY 14586

Weight: 0 lb 2.00 oz

Acceptance Date:

Wed 08/18/2021

Tracking #:

9405 5036 9930 0477 7329 84

Prepaid Mail	1		\$0.00
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Middlefield, CT 06455

Weight: 2 lb 4.60 oz

Acceptance Date:

Wed 08/18/2021

Tracking #:

9405 5036 9930 0477 7330 28

Prepaid Mail	1		\$0.00
--------------	---	--	--------

Middlefield, CT 06455

Weight: 2 lb 4.60 oz

Acceptance Date:

Wed 08/18/2021

Tracking #:

9405 5036 9930 0477 7330 28

Prepaid Mail	1		\$0.00
--------------	---	--	--------

Middlefield, CT 06455

Weight: 2 lb 4.70 oz

Acceptance Date:

Wed 08/18/2021

Tracking #:

9405 5036 9930 0477 7330 11

Prepaid Mail	1		\$0.00
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Middlefield, CT 06455

Weight: 2 lb 5.00 oz

Acceptance Date:

Wed 08/18/2021