



June 21, 2021

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

**RE: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower
65 Maple Avenue West (aka 109 Maple Ave), Haddam, CT 06441
Latitude: 41° 29' 4.54"/ Longitude: -72° 34' 20.81"**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes (“C.G.S.”) §16-50aa, as amended, DISH Wireless LLC (“DISH”) hereby requests an order from the Connecticut Siting Council (“Council”) to approve the shared use by DISH of an existing telecommunication tower at 65 (aka 109) Maple Avenue West in Haddam (the “Property”). The existing 116-foot monopole tower is owned by Crown Castle International Corp. (“Crown Castle”). The underlying property is owned by Diane and Michael Gondek. DISH requests that the Council find that the proposed shared use of the Crown Castle tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times. A copy of this filing is being sent to Mr. Robert McGarry, First Selectman, Town of Haddam, Gary Vivian, Building Official, as well as the property owner.

Background

The existing Crown Castle facility consists of a 116-foot monopole tower within a 10,000 square foot leased area. Verizon currently maintains antennas at the 117-foot level, the Haddam Volunteer Fire Company currently maintains antennas at the 104-foot level, AT&T currently maintains antennas at the 87-foot level, and Crown Castle currently maintains antennas at the 75-foot level. Verizon and the Haddam Volunteer Fire Company's equipment is located east of the tower, AT&T's equipment is located west of the tower, and Crown Castle's equipment is located south of the tower.

DISH is licensed by the Federal Communications Commission (“FCC”) to provide wireless services throughout the State of Connecticut. DISH and Crown Castle have agreed to the proposed shared use of the 65 Maple Avenue West tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and Crown Castle have agreed to the proposed installation of equipment cabinets on the ground on the northeast side of the tower within the existing compound. Crown Castle has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.

DISH proposes to install three (3) antennas, six (6) RRUs, one (1) antenna platform, and one (1) hybrid cable. In addition, DISH will install a ground equipment cabinet on a 5'x7' equipment platform. Included in the Construction Drawings are DISH's project specifications for locations of all proposed site improvements. The Construction Drawings also contain specifications for DISH's proposed antennas and ground work.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such a shared use." DISH respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing Crown Castle tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support DISH's proposed loading. A copy of the Structural Report has been included in this application.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue order approving the shared use of an existing tower such as the Crown Castle tower. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to the other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the Crown Castle tower would have a minimal environmental effect for the following reasons:

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this tower therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.
2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.
3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the

proposed installations would not generate any increased traffic to the Crown Castle facility other than periodic maintenance. The proposed shared use of the Crown Castle tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, DISH has entered into an agreement with Crown Castle for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting DISH's full array of three (3) antennas, six (6) RRUs, one (1) antenna platform, one (1) hybrid cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing Crown Castle tower

Conclusion

For the reasons discussed above, the proposed shared use of the existing Crown Castle tower at 65 Maple Avenue West satisfies the criteria stated in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Sincerely,



Richard Zajac
Site Acquisition Specialist
4545 East River Road, Suite 320
West Henrietta, NY 14586
(585) 445-5896
richard.zajac@crowncastle.com

Melanie A. Bachman

June 21, 2021

Page 4

CC:

Robert McGarry, First Selectman (*via email only to selectman@haddam.org*)

Town of Haddam

30 Field Park Drive

Haddam, CT 06438

Gary Vivian, Building Official (*via email only to building@haddam.org*)

Town of Haddam

30 Field Park Drive

Haddam, CT 06438

Diane & Michael Gondek

109 Maple Avenue West

Higganum, CT 06441

Zajac, Richard

From: Zajac, Richard
Sent: Monday, June 21, 2021 11:22 AM
To: selectman@haddam.org
Subject: Connecticut Siting Council Shared Use application notification
Attachments: CSC Shared Use Application - 65 Maple Ave West.pdf

Good morning,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 65 Maple Ave West in Haddam.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

RICH ZAJAC

Site Acquisition Specialist

T: (585) 445-5896 M: (607) 346-7212

F: (724) 416-4461

CROWN CASTLE

4545 East River Road, Suite 320

West Henrietta, NY 14586

Zajac, Richard

From: Zajac, Richard
Sent: Monday, June 21, 2021 11:23 AM
To: building@haddam.org
Subject: Connecticut Siting Council Shared Use application notification
Attachments: CSC Shared Use Application - 65 Maple Ave West.pdf

Good morning,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 65 Maple Ave West in Haddam.

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RICH ZAJAC

Site Acquisition Specialist

T: (585) 445-5896 M: (607) 346-7212

F: (724) 416-4461

CROWN CASTLE

4545 East River Road, Suite 320

West Henrietta, NY 14586

ORIGIN ID:ONHA
RICHARD ZAJAC
CROWN CASTLE
629 KAYLEIGH DR
WEBSTER, NY 14580
UNITED STATES US

(585) 445-5896

SHIP DATE: 21 JUN 21
ACTWGT: 1.00 LB
CAD: 112911304/INET4340
BILL SENDER

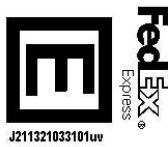
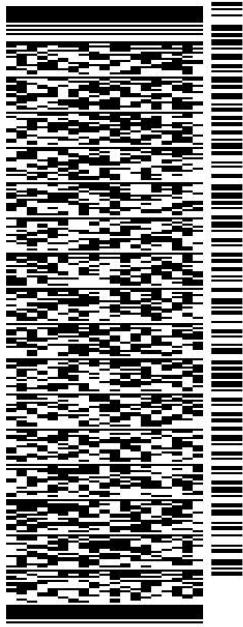
TO DIANE & MICHAEL GONDEK

109 MAPLE AVENUE WEST

HIGGANUM CT 06441

(585) 445-5896

REF: 799001 7680
INV:
PO:
DEPT:



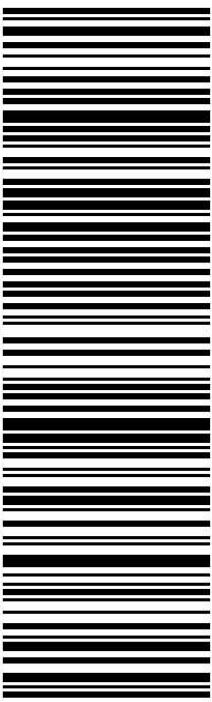
FedEx
Express

J211321033101uv

56DJ3/B387/FE4A

TRK# 0201 7740 5140 8839 TUE - 22 JUN 4:30P
STANDARD OVERNIGHT

XE RSPA 06441
CT-US BDL



After printing this label:

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

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

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



3 Corporate Dr, Suite 101
Clifton Park, NY 12065

Phone: (201) 236-9224
Fax: (724) 416-6112
www.crowncastle.com

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL

Re: Tower Share Application

Crown Castle telecommunications site at: 65 MAPLE AVE WEST, HADDAM, CT 06441

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

Crown Site ID/Name: 806367/HRT 046 943209

Customer Site ID: BOBDL00043A/CT-CCI-T-806367

Site Address: 65 MAPLE AVE WEST, HADDAM, CT 06441

Crown Castle USA Inc.

By: *AMZ* Date: *5/13/21*

Anne Marie Zsamba

Project Manager – Site Acquisition

Exhibit A

Original Facility Approval



CONNECTICUT SITING COUNCIL

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Executive Director**NOTICE TO USERS**

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DOCKET NO. 170 - An application of Metro Mobile CTS of Hartford, Inc. for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications facility located at 109 Maple Avenue West in the Higganum section of the Town of Haddam, Connecticut.

Connecticut Siting Council

November 15, 1995

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact, and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed prime site in the Higganum section of Haddam, Connecticut, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Bell Atlantic NYNEX Mobile, Inc. for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed prime site, located within an 88.85 acre parcel at 109 Maple Avenue West, Haddam, Connecticut. We find the effects on scenic resources and the environment from the alternate site to be more significant than the effects from the prime site, and therefore deny certification of the alternate site without prejudice.

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed communications service and sufficient to accommodate tower sharing, and not to exceed a total height of 120 feet above ground level.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include plans for the tower and tower foundation; specifications for the placement of all antennas to be attached to this tower; plans for the equipment building, security fence, emergency generator and fuel tank; plans for the access road and utility line installation from 109 Maple Avenue West; plans for site clearing and tree trimming; and plans for water drainage and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sedimentation Control, as amended.
3. Upon the establishment of any new State or federal radio frequency power density standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
4. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. If the facility does not initially provide, or permanently ceases to provide, cellular services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.
7. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.
8. The Certificate Holder shall notify the Council upon completion of construction and provide the final cost to construct the facility.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The

Hartford Courant and the Middletown Press.

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

The parties and intervenors to this proceeding are:

APPLICANT

Bell Atlantic NYNEX Mobile, Inc.

ITS REPRESENTATIVES

Brian C.S. Freeman, Esq.

Kenneth C. Baldwin, Esq.

Robinson & Cole

One Commercial Plaza

Hartford, CT 06103-3597

David S. Malko

General Manager - Engineering

Sandy M. Ranciato

Manager - Regulatory Services

Bell Atlantic NYNEX Mobile, Inc.

20 Alexander Drive

Wallingford, CT 06492

INTERVENOR

Town of Haddam

ITS REPRESENTATIVE

The Honorable Marjorie W. DeBold

First Selectman

Town of Haddam

30 Field Park Drive

Haddam, CT 06438

INTERVENOR

Springwich Cellular Limited Partnership

ITS REPRESENTATIVE

Peter J. Tyrrell, Esq.

General Counsel - Wireless

Springwich Cellular Limited Partnership

500 Enterprise Dr., 4th floor

Rocky Hill, CT 06067

Content Last Modified on 8/9/2002 11:34:46 AM

Ten Franklin Square New Britain, CT 06051 / 860-827-2935

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Exhibit B

Property Card

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2020.



Information on the Property Records for the Municipality of Haddam was last updated on 6/15/2021.

Parcel Information

| | | | | | |
|--------------------------|--------------------|-------------------|-------------|-------------------|-------------|
| Location: | 109 MAPLE AVE WEST | Property Use: | Residential | Primary Use: | Residential |
| Unique ID: | M0380800 | Map Block Lot: | 15 108 | Acres: | 3.01 |
| 490 Acres: | 0.00 | Zone: | R-2A | Volume / Page: | 0373/0540 |
| Developers Map / Lot: | | Census: | 5901 | | |

Value Information

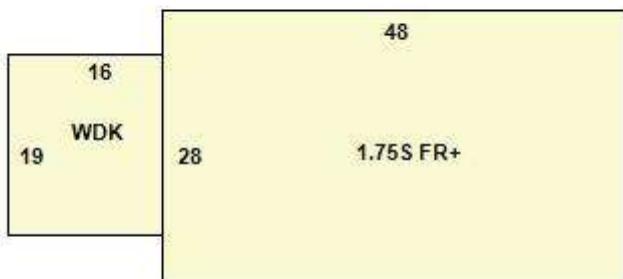
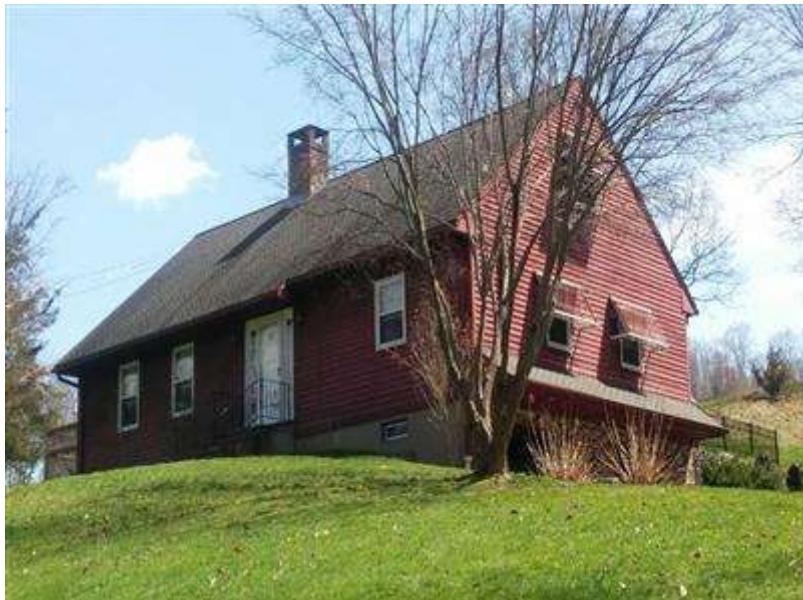
| | Appraised Value | Assessed Value |
|-----------------------|-----------------|----------------|
| Land | 97,530 | 68,270 |
| Buildings | 189,050 | 132,340 |
| Detached Outbuildings | 0 | 0 |
| Total | 286,580 | 200,610 |

Owner's Information

Owner's Data

GONDEK MICHAEL P & DIANE M
109 MAPLE AVE WEST
HIGGANUM, CT 06441

Building 1



| | | | | | |
|---------------|---------------|---------------|------------|--------------|-------|
| Building Use: | Single Family | Style: | Cape | Living Area: | 2,352 |
| Stories: | 1.75 | Construction: | Wood Frame | Year Built: | 1977 |
| Total Rooms: | 7 | Bedrooms: | 3 | Full Baths: | 2 |

| | | | | | |
|-------------------------|------------|-------------------|----|----------------|-----------|
| Half Baths: | 0 | Fireplaces: | 0 | Heating: | Hot Water |
| Fuel: | Oil | Cooling Percent: | 75 | Basement Area: | 1,344 |
| Basement Finished Area: | 0 | Basement Garages: | 2 | Roof Material: | Asphalt |
| Siding: | Clapboards | Units: | | | |

Special Features

Fireplace

1

Attached Components

| Type: | Year Built: | Area: |
|-----------|-------------|-------|
| Wood Deck | 1977 | 304 |

Owner History - Sales

| Owner Name | Volume | Page | Sale Date | Deed Type | Valid Sale | Sale Price |
|--|--------|------|------------|------------|------------|------------|
| GONDEK MICHAEL P & DIANE M | 0373 | 0540 | 06/29/2015 | Quit Claim | Yes | \$271,000 |
| DAMICO LOUIS W SR + LOUIS W JR TRUSTEES | 0336 | 0559 | 04/05/2010 | | No | \$0 |
| DAMICO LOUIS W SR + LOUIS W JR | 0305 | 0805 | 10/10/2006 | | No | \$0 |
| DAMICO LOUIS W & MARJORY C DAMICO FAMILY | 0256 | 0789 | 01/27/2003 | | No | \$0 |
| DAMICO LOUIS W | 0233 | 1040 | 12/21/2000 | | No | \$0 |

Building Permits

| Permit Number | Permit Type | Date Opened | Date Closed | Permit Status | Reason |
|---------------|-------------|-------------|-------------|---------------|--------|
| | | | | | |

| Permit Number | Permit Type | Date Opened | Date Closed | Permit Status | Reason |
|---------------|-------------|-------------|-------------|---------------|---|
| 11400 | Addition | 12/31/2012 | | Closed | 3 ANTENNAS+SUPPORT EQPT/1 CABINET TO EXST SHELTER |
| 6366 | Unknown | 03/30/1999 | | Closed | NEW BUILDING, VEHICLE STORAGE |

Information Published With Permission From The Assessor

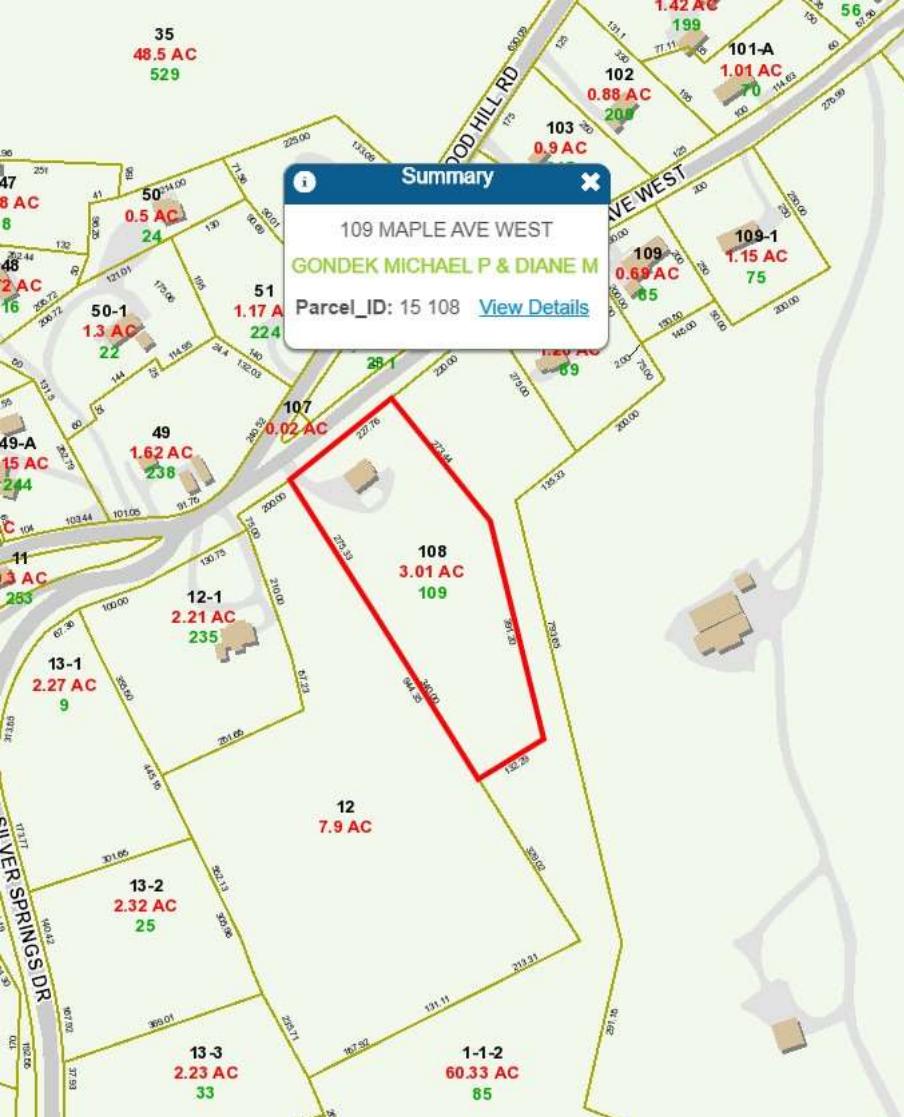


Exhibit C

Construction Drawings



DISH WIRELESS, LLC. SITE ID:

BOBTL00043A

DISH WIRELESS, LLC. SITE ADDRESS:

**65 MAPLE AVE WEST
HADDAM, CT 06441**

CONNECTICUT CODE COMPLIANCE

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

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

SHEET INDEX

| SHEET NO. | SHEET TITLE |
|-----------|---|
| T-1 | TITLE SHEET |
| A-1 | OVERALL AND ENLARGED SITE PLAN |
| A-2 | ELEVATION, ANTENNA LAYOUT AND SCHEDULE |
| A-3 | EQUIPMENT PLATEFROM 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 |

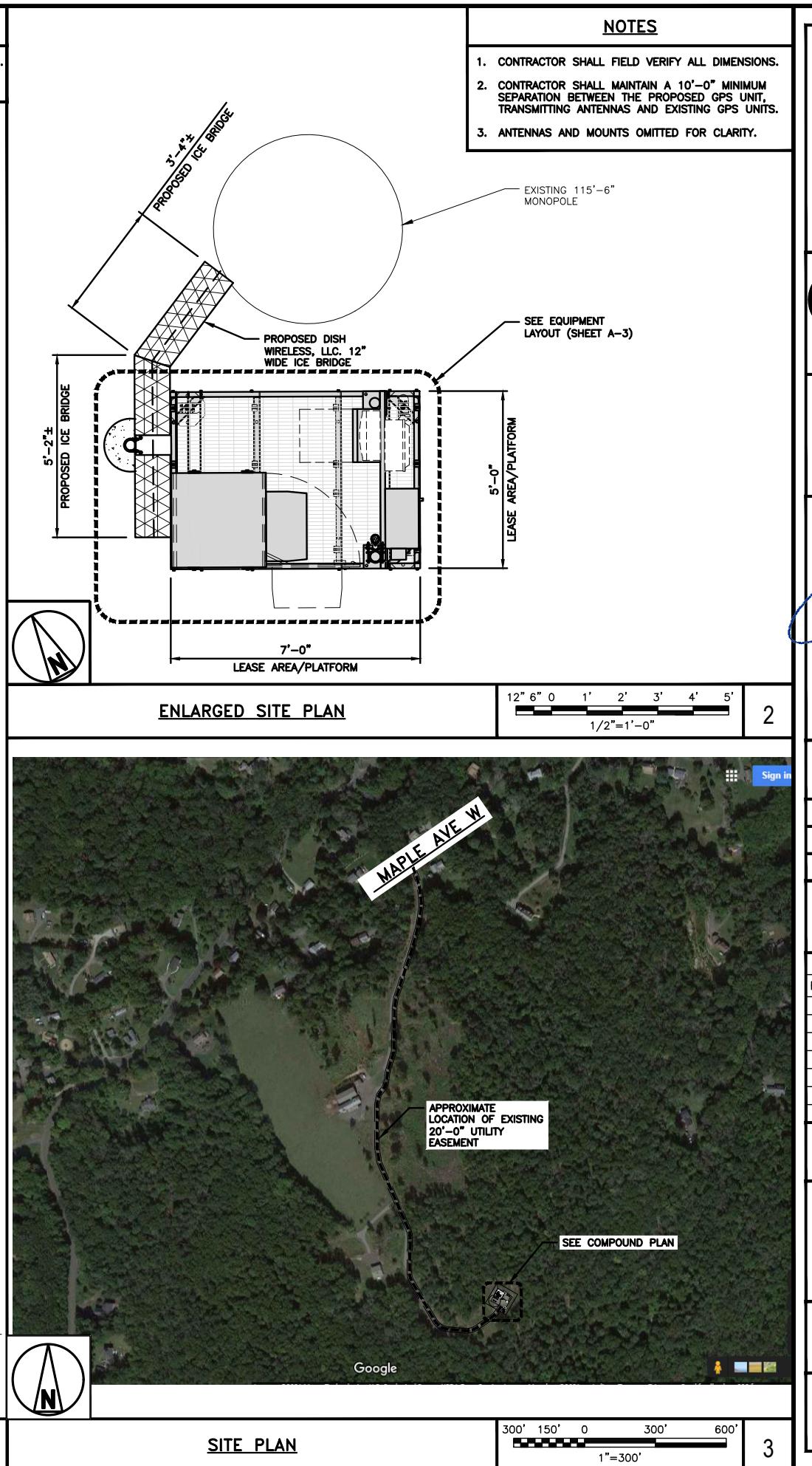
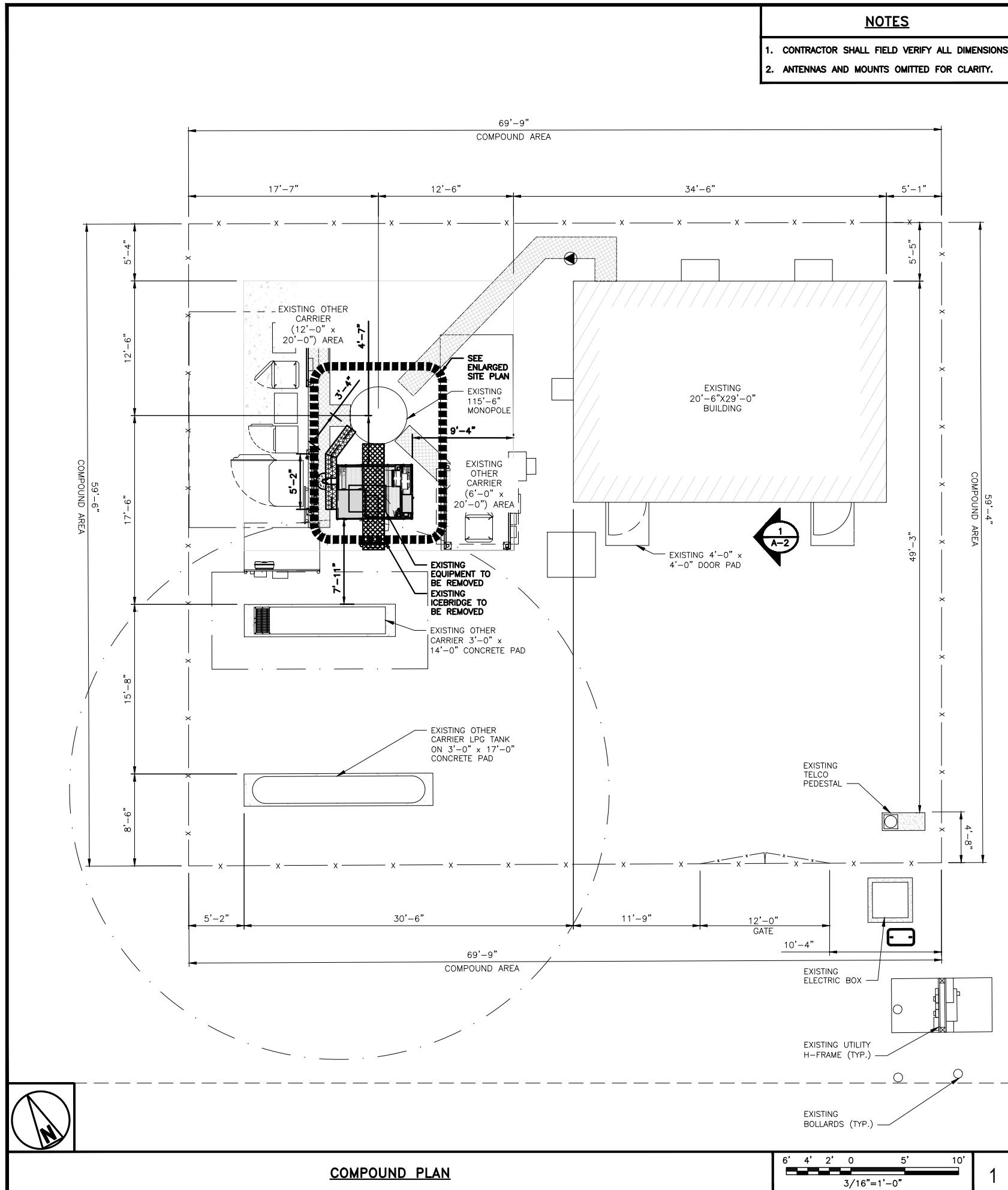
| SCOPE OF WORK | |
|---|--|
| THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING: | |
| TOWER SCOPE OF WORK: |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



| 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. | |

| SITE INFORMATION | | PROJECT DIRECTORY | |
|----------------------|-----------------------------------|-----------------------|------------------------------|
| PROPERTY OWNER: | GLOBAL SIGNAL ACQUISITIONS IV LLC | APPLICANT: | DISH WIRELESS, LLC. |
| ADDRESS: | PO BOX 277455 | | 5701 SOUTH SANTA FE DRIVE |
| | ATLANTA, GA 30384-7455 | | LITTLETON, CO 80120 |
| TOWER TYPE: | MONPOLE | TOWER OWNER: | CROWN CASTLE |
| TOWER CO SITE ID: | 806367 | | 2000 CORPORATE DRIVE |
| TOWER APP NUMBER: | 553284 | | CANONSBURG, PA 15317 |
| COUNTY: | MIDDLESEX | | (877) 486-9377 |
| LATITUDE (NAD 83): | 41° 29' 4.54" N | SITE DESIGNER: | INFINIGY |
| | 41.484594 N | | 2500 W. HIGGINS RD. STE. 500 |
| LONGITUDE (NAD 83): | -72° 34' 20.81" W | | HOFFMAN ESTATES, IL 60169 |
| | -72.57244722 W | | (847) 648-4068 |
| ZONING JURISDICTION: | CT - CONNECTICUT SITING COUNCIL | SITE ACQUISITION: | NICHOLAS CURRY |
| ZONING DISTRICT: | TBD | | TBD |
| PARCEL NUMBER: | HADD-000023-000001-000001 | CONSTRUCTION MANAGER: | JAVIER SOTO |
| OCCUPANCY GROUP: | U | | TBD |
| CONSTRUCTION TYPE: | V-B | RF ENGINEER: | BOSSENER CHARLES |
| POWER COMPANY: | CONNECTICUT LIGHT & POWER | | TBD |
| TELEPHONE COMPANY: | CROWN CASTLE | | |

| | | |
|--|-------------|-------------------------|
| dish wireless. | | |
| 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120 | | |
| CC CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 | | |
| INFINIGY® FROM ZERO TO INFINIGY the solutions are endless 2500 W. HIGGINS RD. SUITE 500 HOFFMAN ESTATES, IL 60169 PHONE: 847-648-4068 FAX: 518-690-0793 WWW.INFINIGY.COM | | |
| <p>PROFESSIONAL ENGINEER JUHEL SAKAN, PE 34916 5/18/21</p> <p>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.</p> | | |
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| RCD | SS | CJW |
| RFDS REV #: N/A | | |
| CONSTRUCTION DOCUMENTS | | |
| SUBMITTALS | | |
| REV | DATE | DESCRIPTION |
| A | 04/14/2021 | ISSUED FOR REVIEW |
| B | 05/17/2021 | ISSUED FOR CONSTRUCTION |
| A&E PROJECT NUMBER 2039-Z5555C | | |
| DISH WIRELESS, LLC. PROJECT INFORMATION BOBTL00043A 65 MAPLE AVE WEST HADDAM, CT 06441 | | |
| SHEET TITLE TITLE SHEET | | |
| SHEET NUMBER T-1 | | |



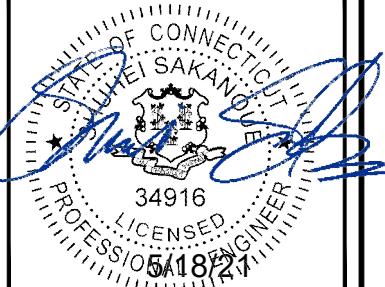
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wireless.

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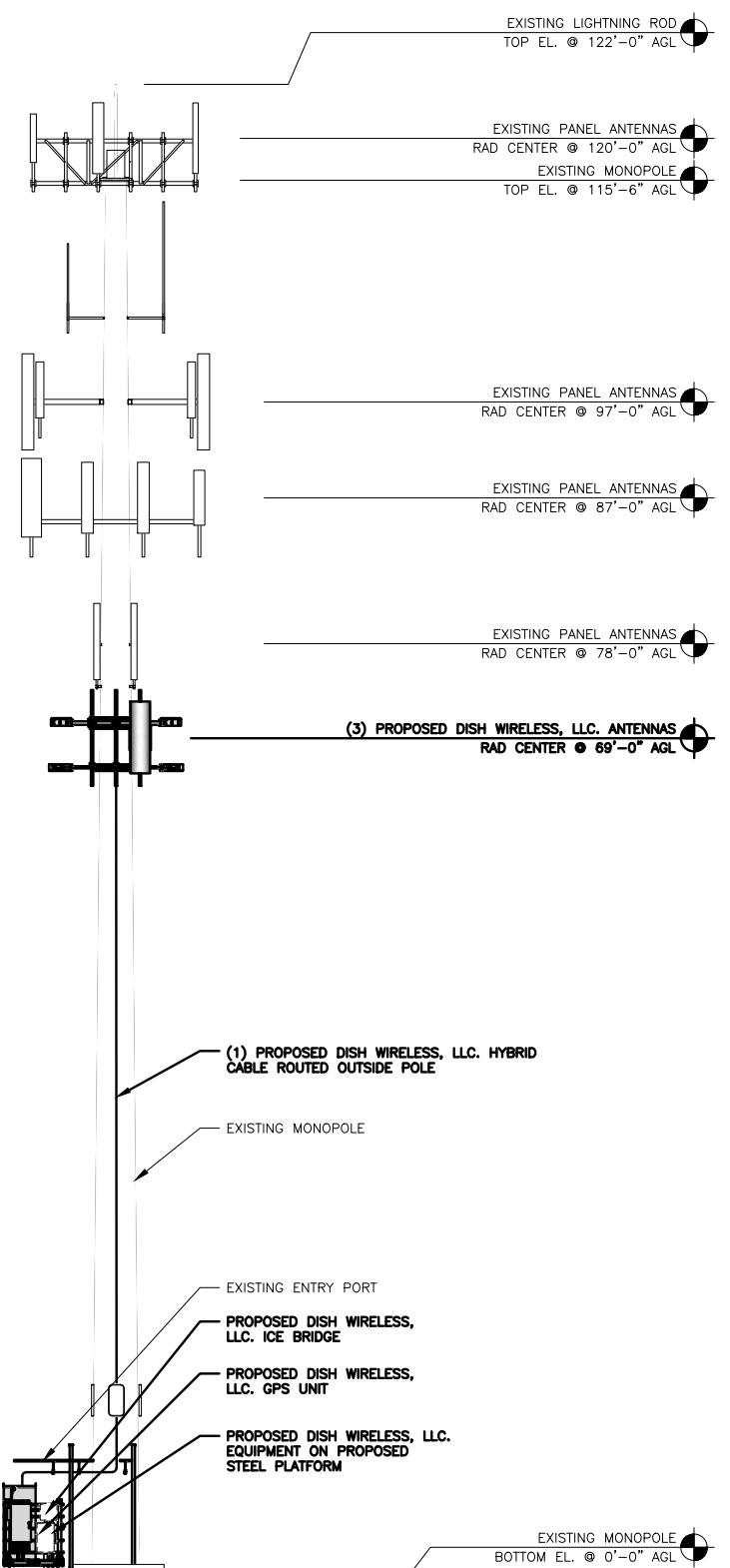
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER
A-1

NOTES

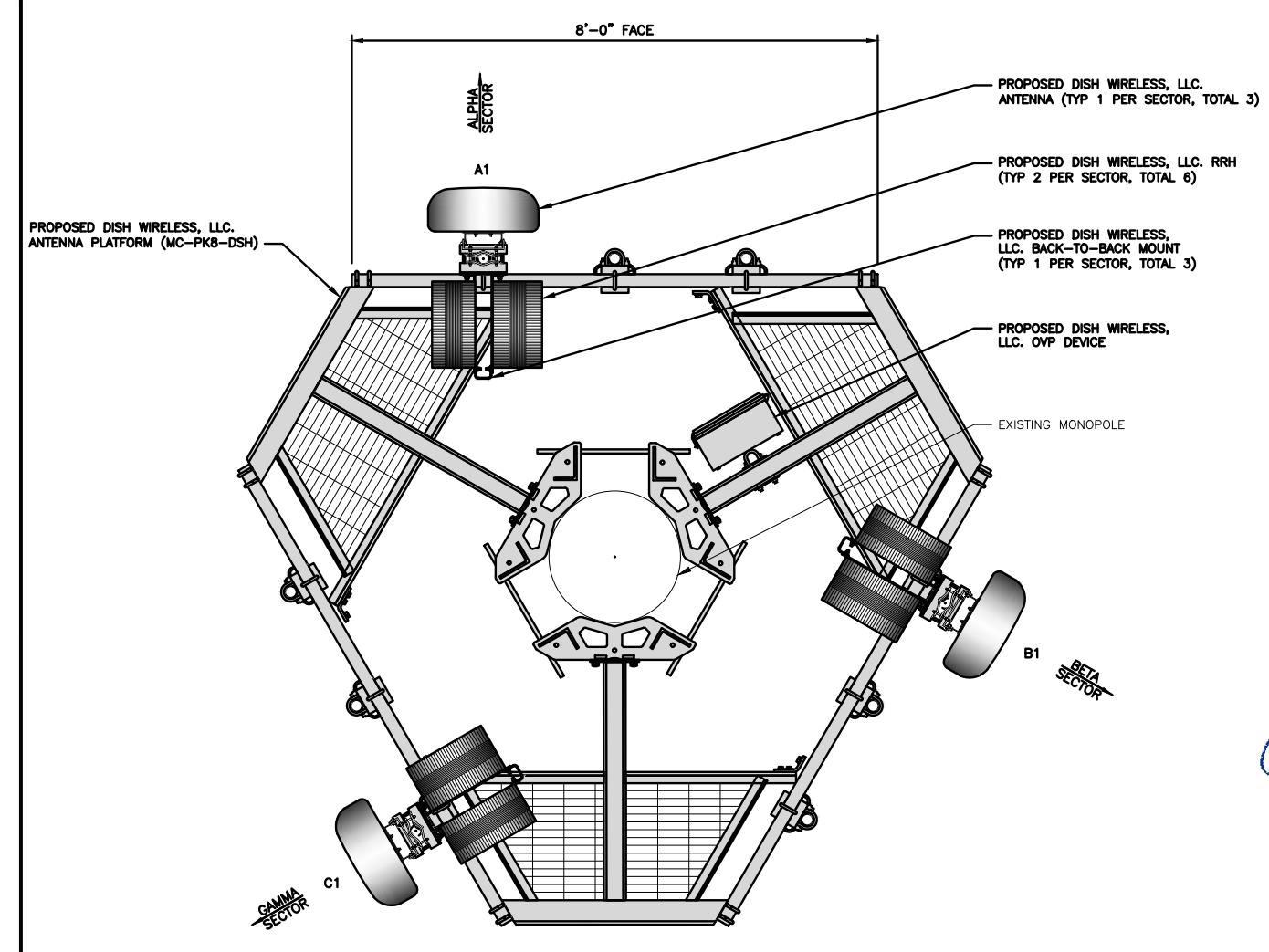
1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



PROPOSED EAST ELEVATION

8' 4' 0 8' 16'
1/8"=1'-0"

1



ANTENNA LAYOUT

12" 6" 0 1" 2" 3"
3/4"=1'-0"

2

| SECTOR | POSITION | ANTENNA | | | | | TRANSMISSION CABLE FEED LINE TYPE AND LENGTH |
|--------|----------|-------------------------|--------------------------------|------------|---------------|--------|--|
| | | EXISTING OR PROPOSED | MANUFACTURER - MODEL NUMBER | TECHNOLOGY | SIZE (HxW) | AZMUTH | |
| ALPHA | A1 | PROPOSED | JMA WIRELESS - MX08FR0665-20 | 5G | 72.0" x 20.0" | 0° | 69'-0" |
| BETA | B1 | PROPOSED | JMA WIRELESS - MX08FR0665-20 | 5G | 72.0" x 20.0" | 120° | 69'-0" |
| GAMMA | C1 | PROPOSED | JMA WIRELESS - MX08FR0665-20 | 5G | 72.0" x 20.0" | 240° | 69'-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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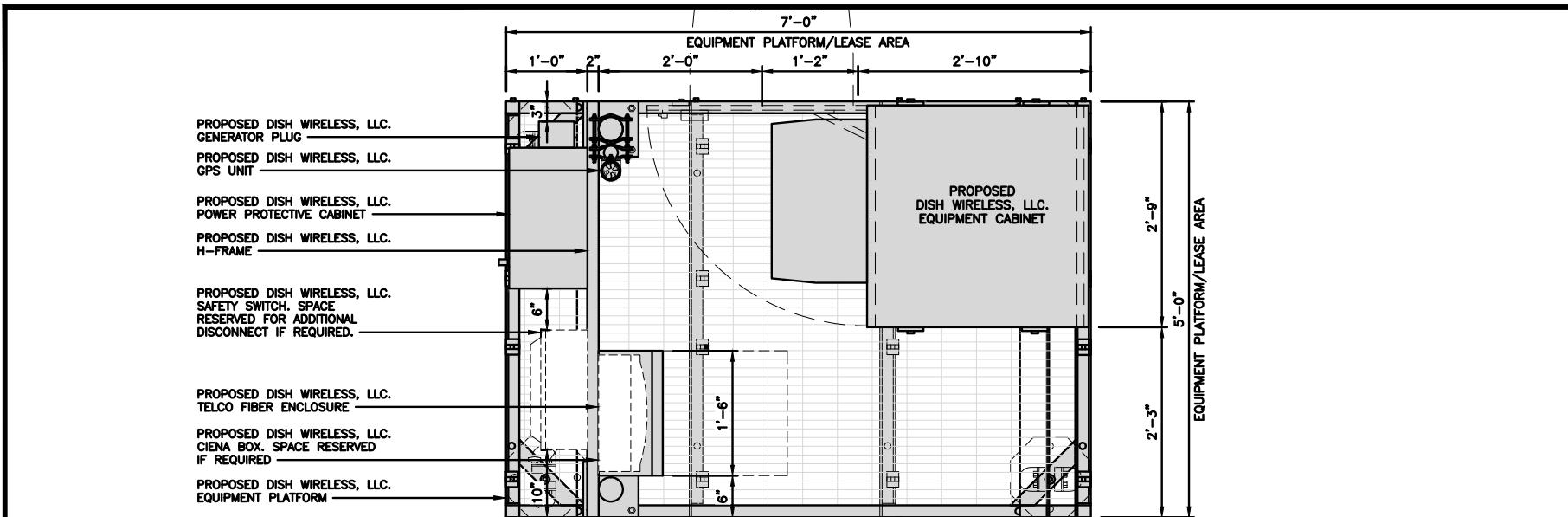
A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



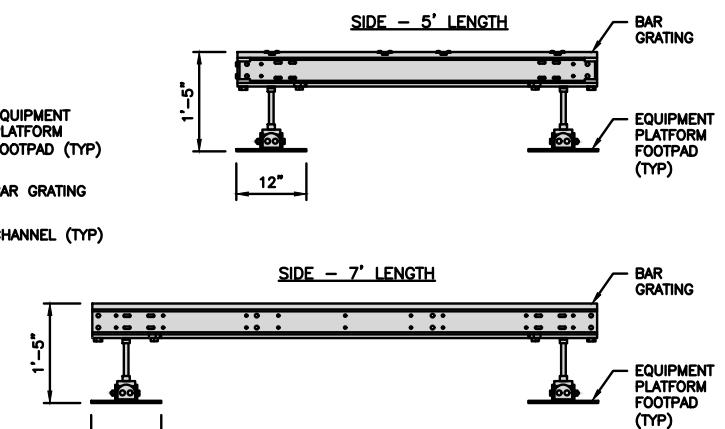
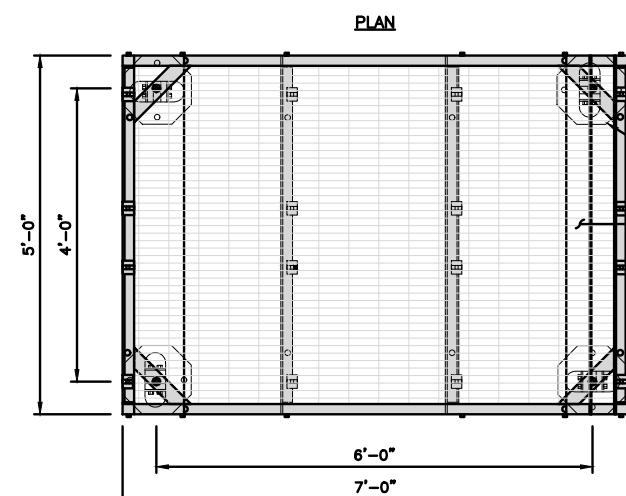
PLATFORM EQUIPMENT PLAN

12' 9" 6" 3" 0 1' 2'
1"=1'-0"

| 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 |

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

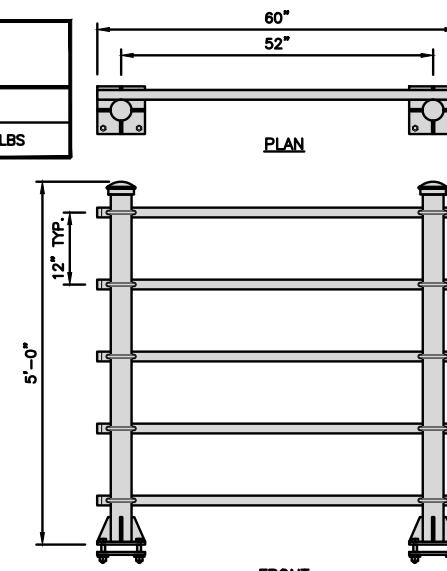
NOTE: GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"



PLATFORM DETAIL

NO SCALE 2

| KENWOOD T1701KT5-5S H-FRAME |
|-----------------------------|
| UNISTRUT/SUPPORT RAIL 5 |
| WEIGHT/ VOLUME 173.6 LBS |



H-FRAME DETAIL

NO SCALE 3

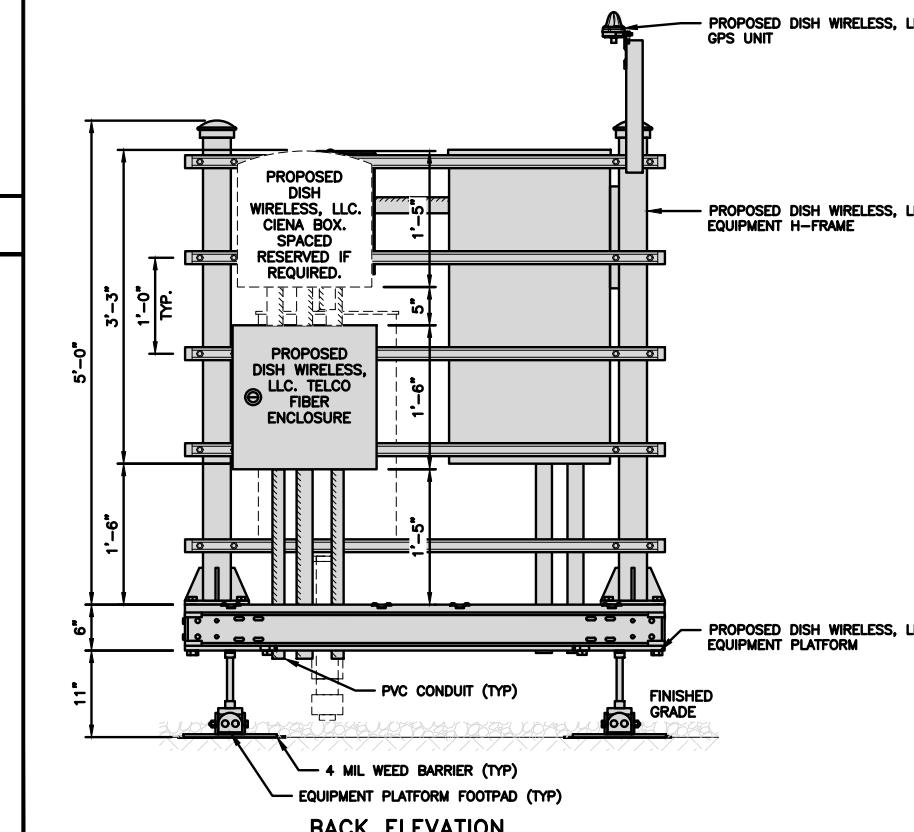
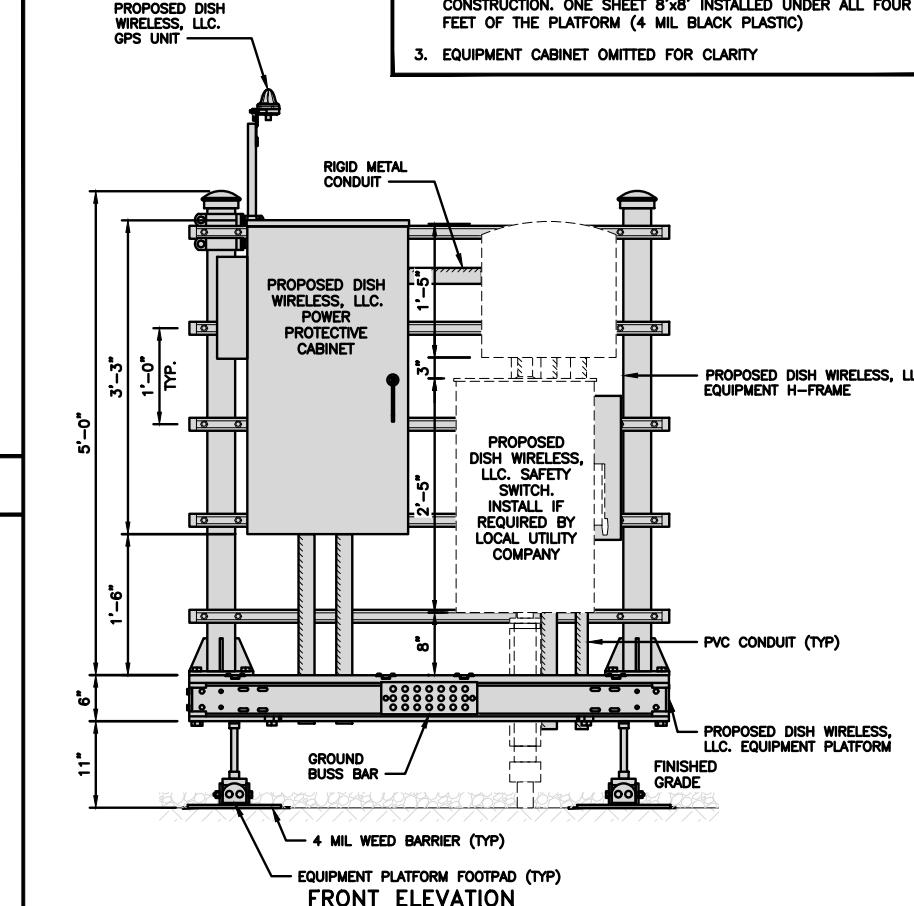
NOT USED

NO SCALE 4

H-FRAME EQUIPMENT ELEVATION

12' 9" 6" 3" 0 1' 2'
1"=1'-0"

5



BACK ELEVATION



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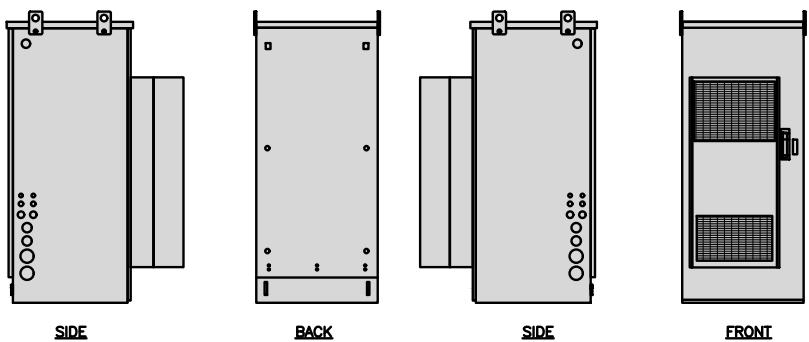
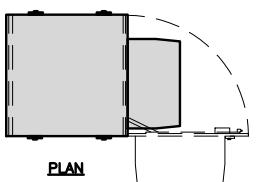
A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

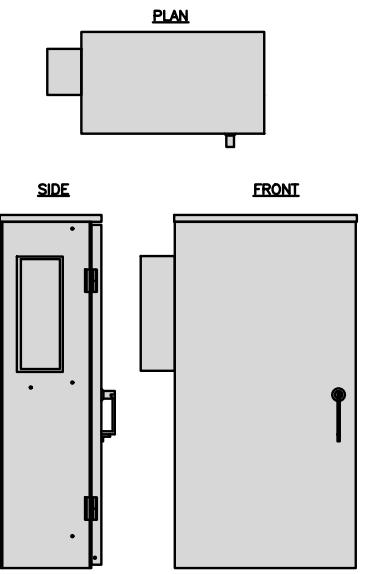
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER
A-3

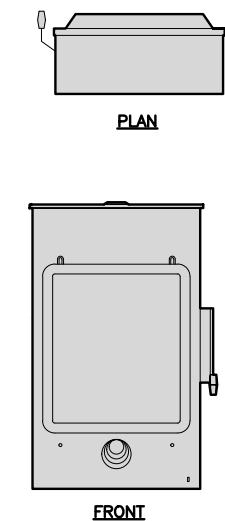
| | |
|---|-------------|
| CHARLES INDUSTRY HEX CUBE-PM369155N4 | |
| DIMENSIONS (HxWxD): | 74"x32"x32" |
| POWER PLANT: | -48VDC ABB |
| TOTAL WEIGHT (EMPTY) | 394 LBS |



| | |
|---|----------------------------|
| 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 |



| | |
|-----------------------------------|---------------------|
| 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 |



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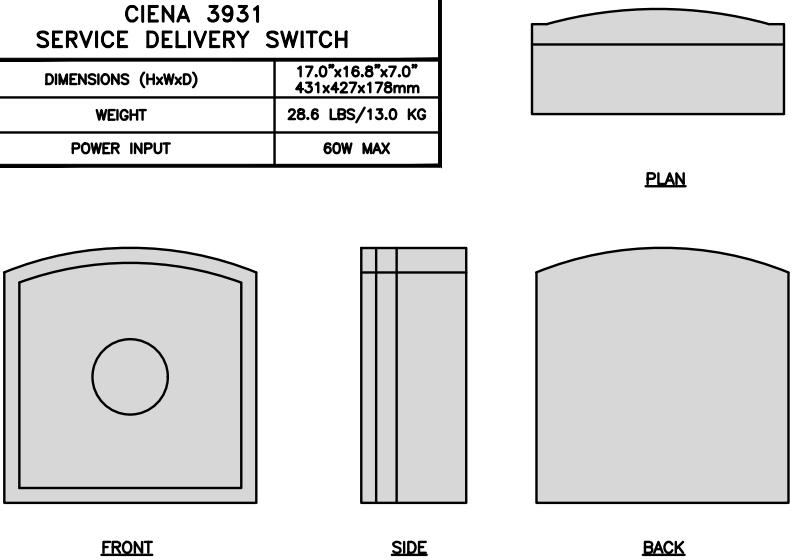
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

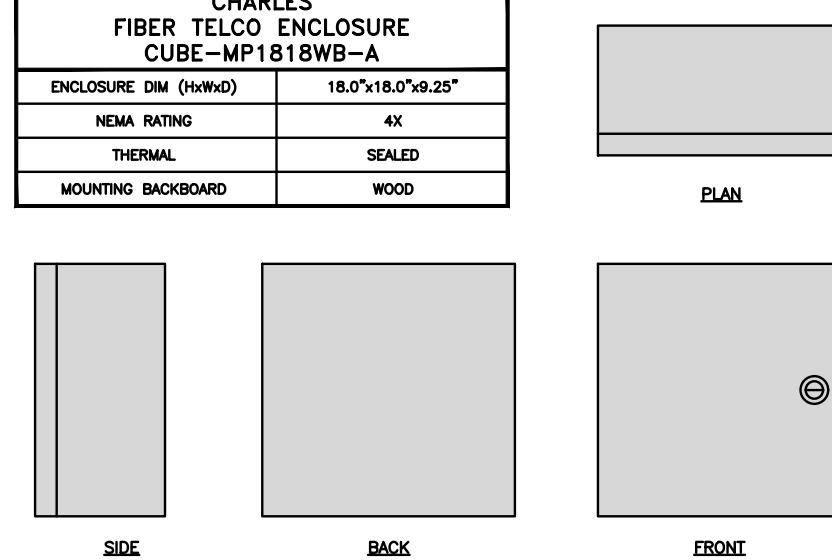
A-4

| | |
|---------------------------------------|-----------------------------------|
| 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 |



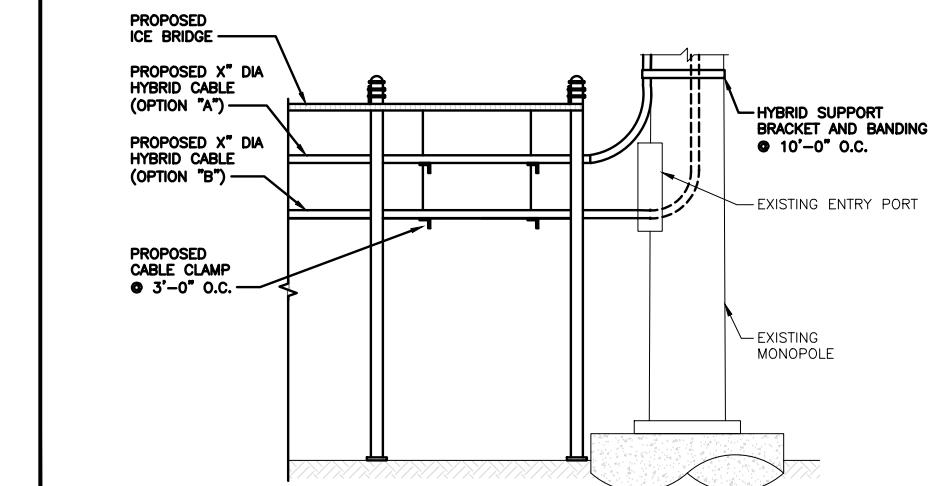
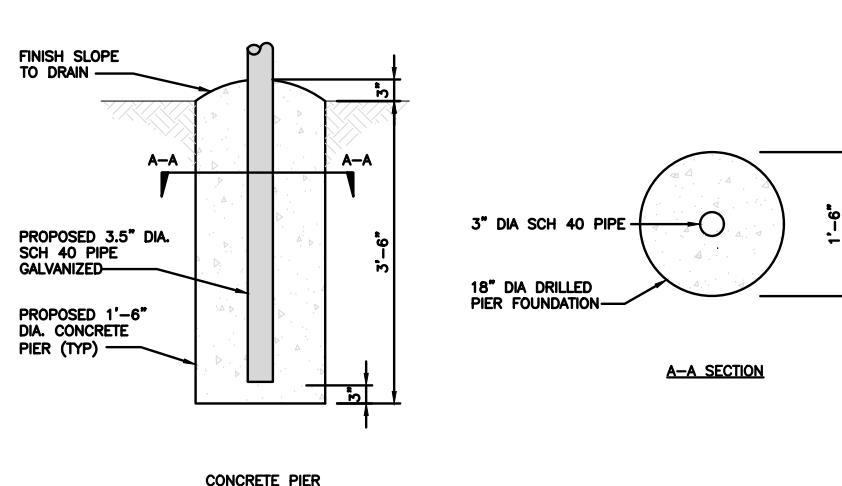
CIENA DETAIL

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



CIENA DETAIL

FIBER TELCO ENCLOSURE DETAIL



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

HYBRID CABLE RUN

NO SCALE

NO SCALE

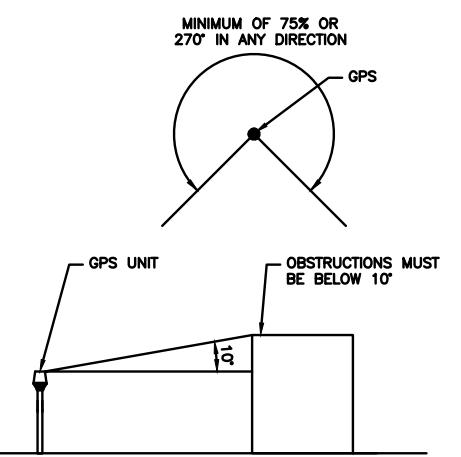
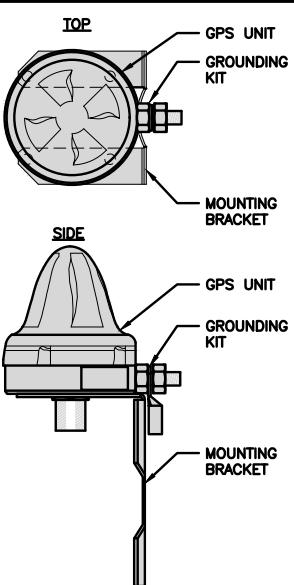
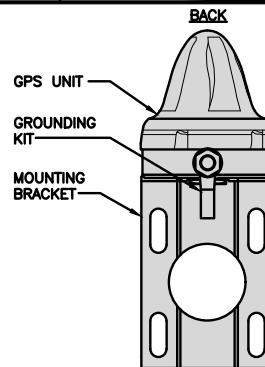
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8

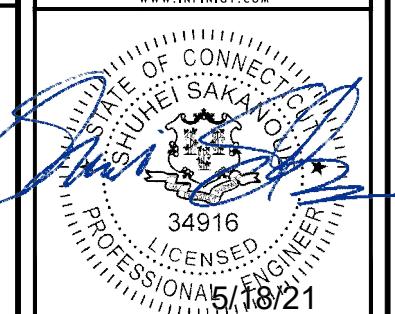
NO SCALE

9

| | |
|--|----------------------|
| 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 |



| | | | | | | | | |
|---------------------------|----------|---|--|----------|---|-----------------|----------|---|
| <u>GPS ANTENNA DETAIL</u> | NO SCALE | 1 | <u>GPS MINIMUM SKY VIEW REQUIREMENTS</u> | NO SCALE | 2 | <u>NOT USED</u> | NO SCALE | 3 |
|---------------------------|----------|---|--|----------|---|-----------------|----------|---|



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PROJECT INFORMATION
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65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

A-5

| | | | | | | | | |
|-----------------|----------|---|-----------------|----------|---|-----------------|----------|---|
| <u>NOT USED</u> | NO SCALE | 4 | <u>NOT USED</u> | NO SCALE | 5 | <u>NOT USED</u> | NO SCALE | 6 |
|-----------------|----------|---|-----------------|----------|---|-----------------|----------|---|

| | | | | | | | | |
|-----------------|----------|---|-----------------|----------|---|-----------------|----------|---|
| <u>NOT USED</u> | NO SCALE | 7 | <u>NOT USED</u> | NO SCALE | 8 | <u>NOT USED</u> | NO SCALE | 9 |
|-----------------|----------|---|-----------------|----------|---|-----------------|----------|---|

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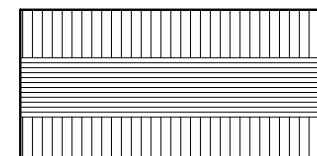
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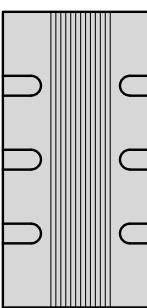
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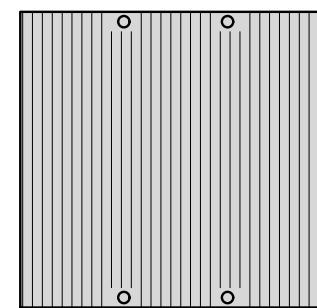
| | |
|---|------------------------------|
| FUJITSU TA08025-B604 RRH | |
| DIMENSIONS (HxWxD) (KG/IN) | 380x400x200/14.9"x15.7"x7.8" |
| WEIGHT(KG,LB)/ VOLUME | 29kg,63.9lb/ 30L |
| POWER SUPPLY | DC-58~36V |



PLAN



SIDE



FRONT

NOTES

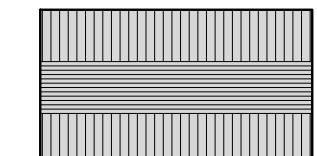
FINAL RRH SPECIFICATIONS
TO BE CONFIRMED BY GC

REMOTE RADIO HEAD DETAIL

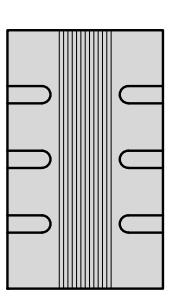
NO SCALE

1

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



PLAN



NOTES

FINAL RRH SPECIFICATIONS
TO BE CONFIRMED BY GC

REMOTE RADIO HEAD DETAIL

NO SCALE

2

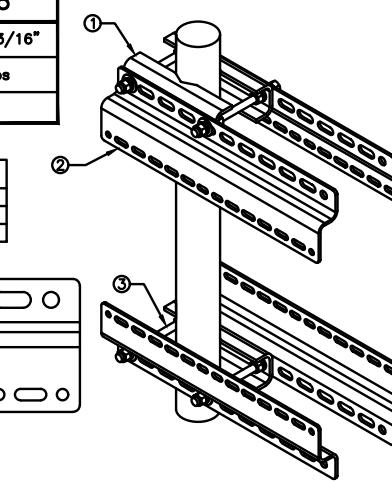
REMOTE RADIO MOUNT DETAIL

NO SCALE

3

| | |
|---|-----------------|
| 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 | RRU Z BRACKET, 3/16" |
| 3 | THREADED ROD ASSEMBLY 1/2"x12" |



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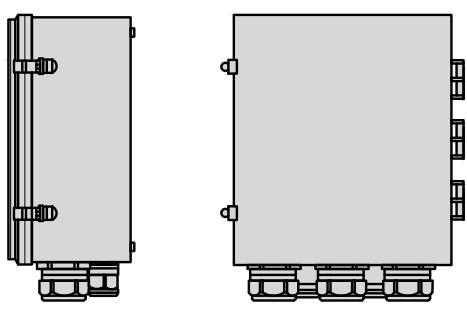
SHEET NUMBER

A-6

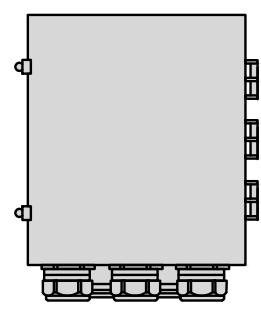
| | |
|---|---------------------|
| RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION | |
| DIMENSIONS (HxWxD) | 18.98"x14.39"x8.15" |
| WEIGHT | 21.82 LBS |



PLAN



SIDE



BACK

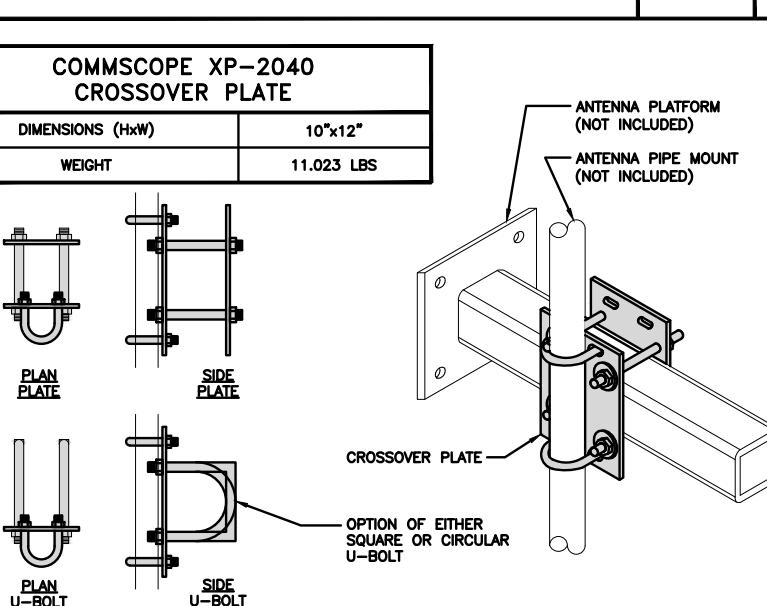
FRONT

SURGE SUPPRESSION DETAIL

NO SCALE

4

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

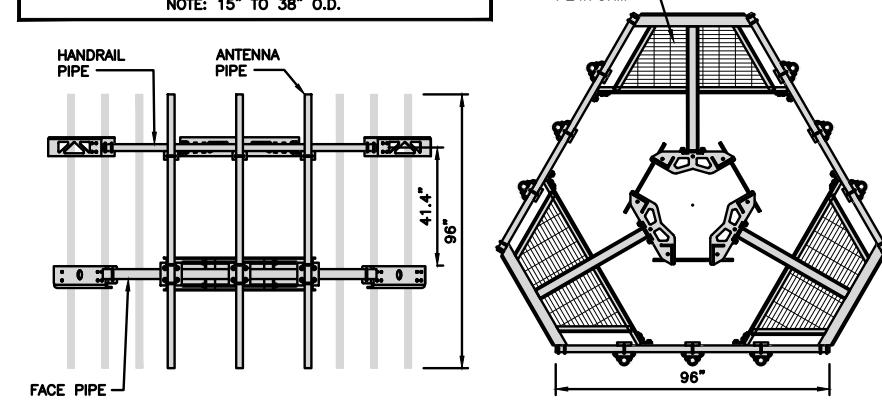


RRH/OVP MOUNT DETAIL

NO SCALE

7

| | |
|---------------------------------------|-------------|
| COMMSCOPE MC-PK8-DSH | |
| FACE WIDTH | 96" |
| WEIGHT | 1373.08 lbs |
| NOTE: 15" TO 38" O.D. | |



ANTENNA PLATFORM DETAIL

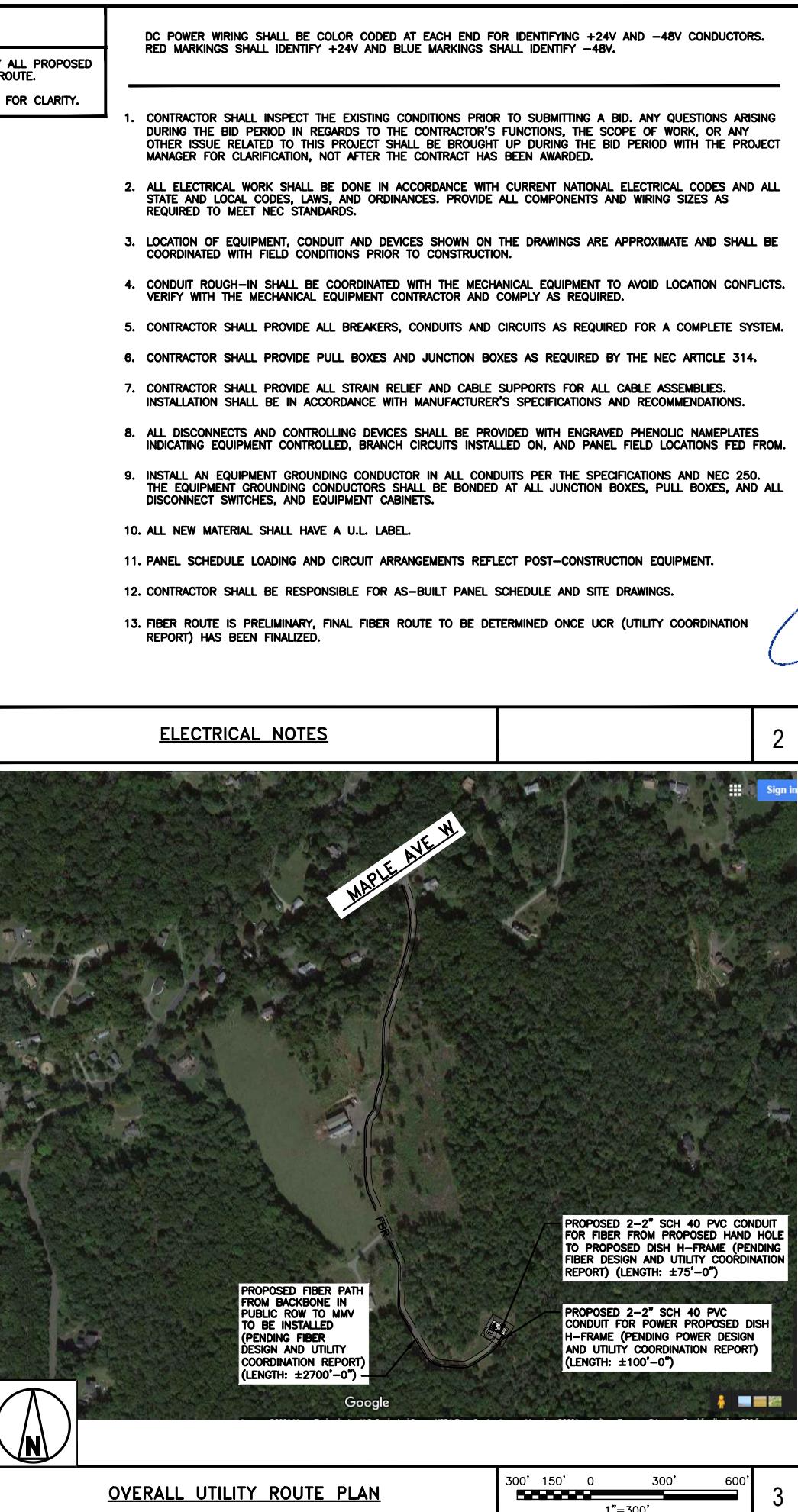
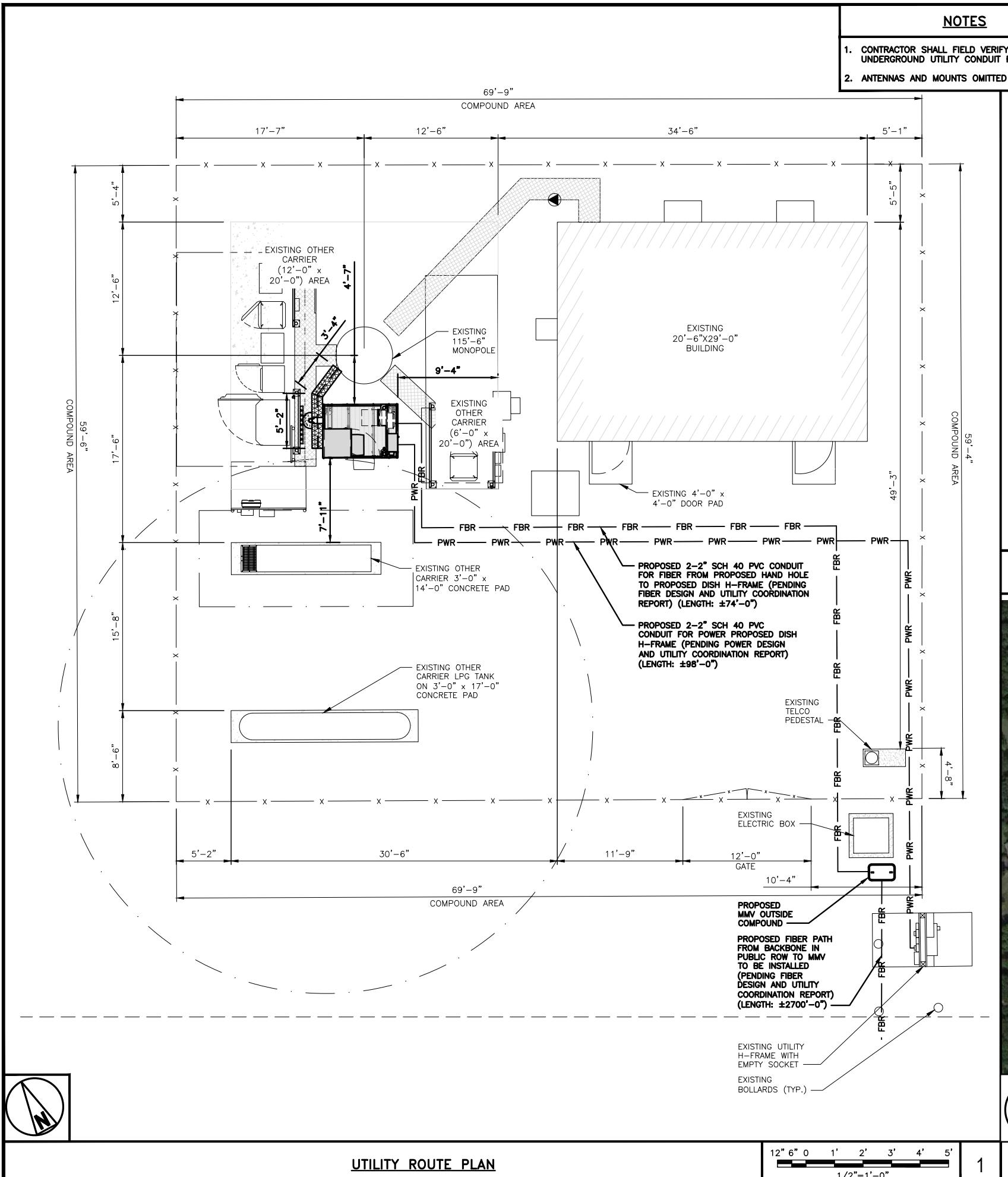
NO SCALE

8

NOT USED

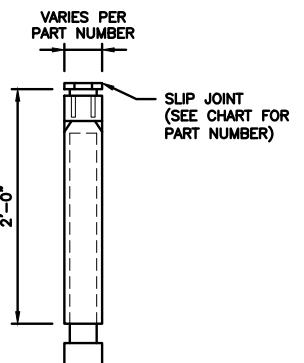
NO SCALE

9



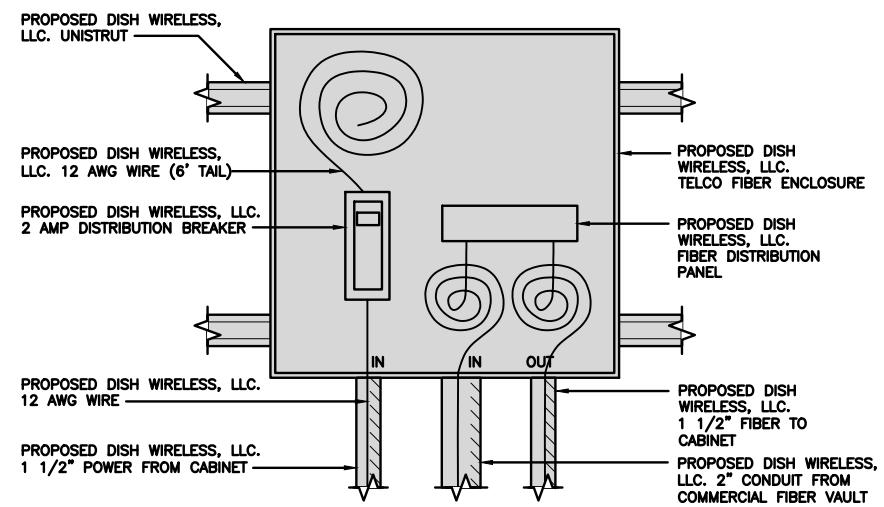
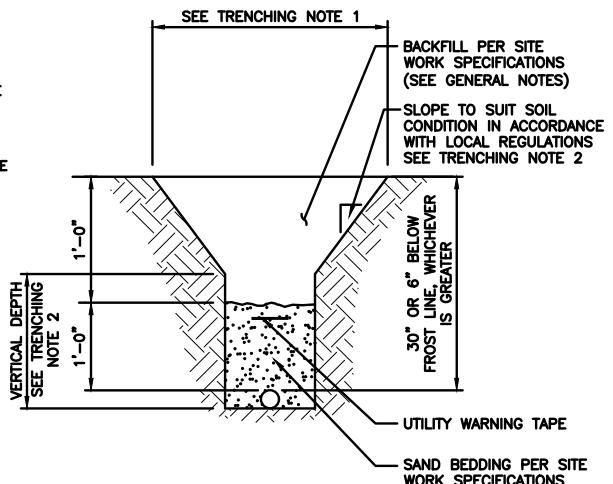
| CARLON EXPANSION FITTINGS | | | | |
|---------------------------|---------------------------------|--------|--------------|---------------|
| COUPLING END PART# | MALE TERMINAL ADAPTER END PART# | SIZE | STD CTN QTY. | TRAVEL LENGTH |
| E945D | E945DX | 1/2" | 20 | 4" |
| E945E | E945EX | 3/4" | 15 | 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.

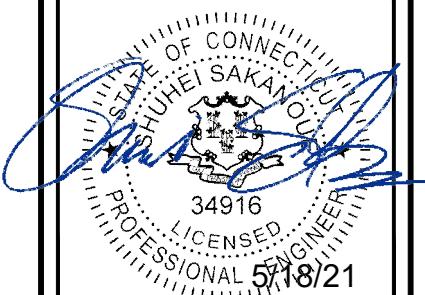


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| | | |

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER

E-2

EXPANSION JOINT DETAIL

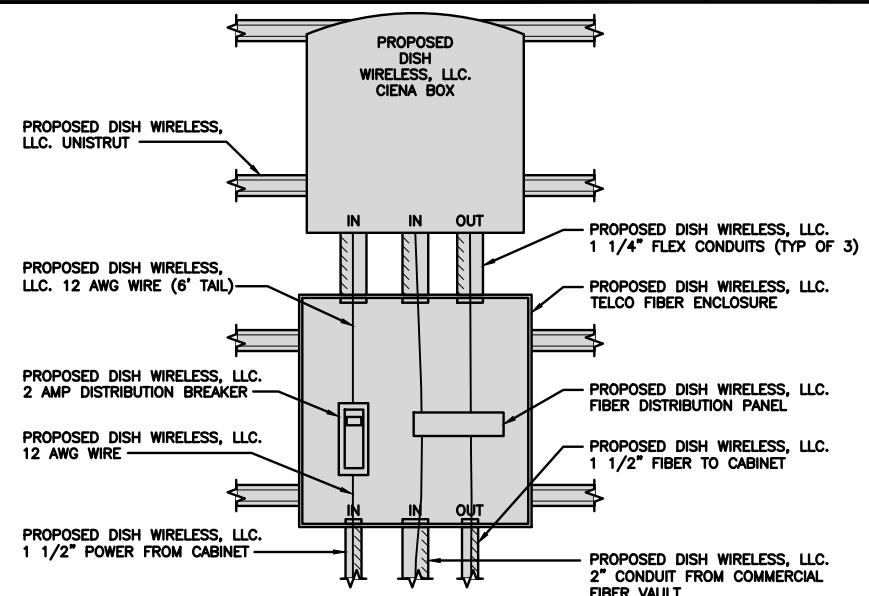
NO SCALE 1

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

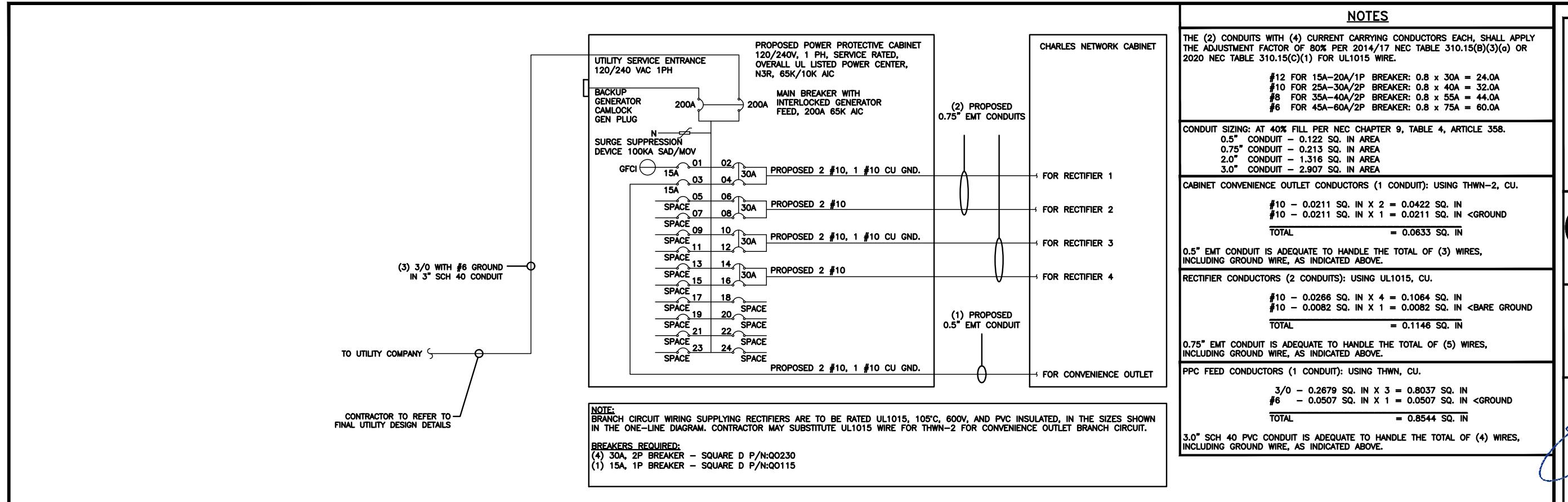
NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



PPC ONE-LINE DIAGRAM

NO SCALE 1

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STATE OF CONNECTICUT
SAKAMO
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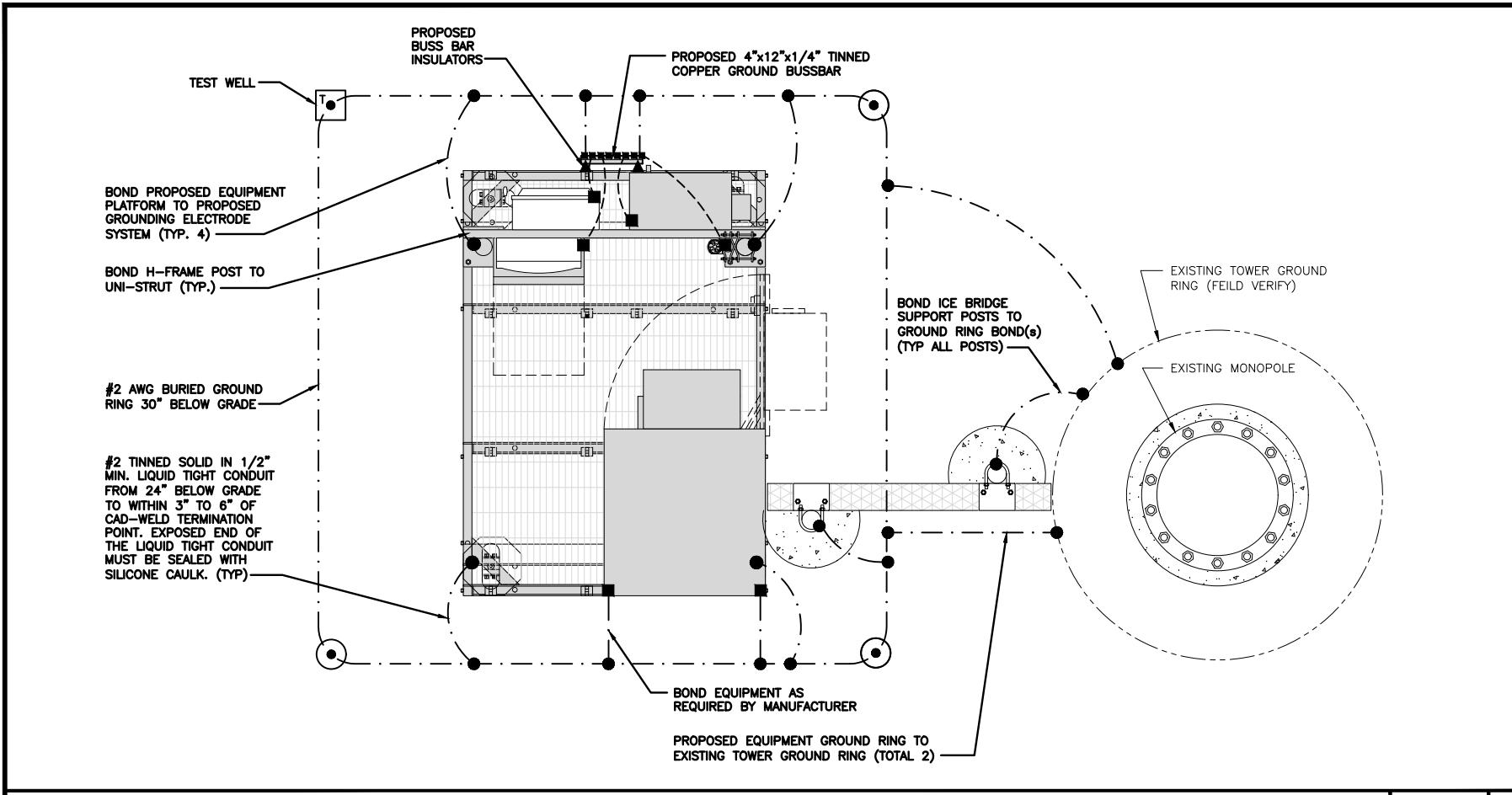
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDSL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

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

SHEET NUMBER

E-3

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

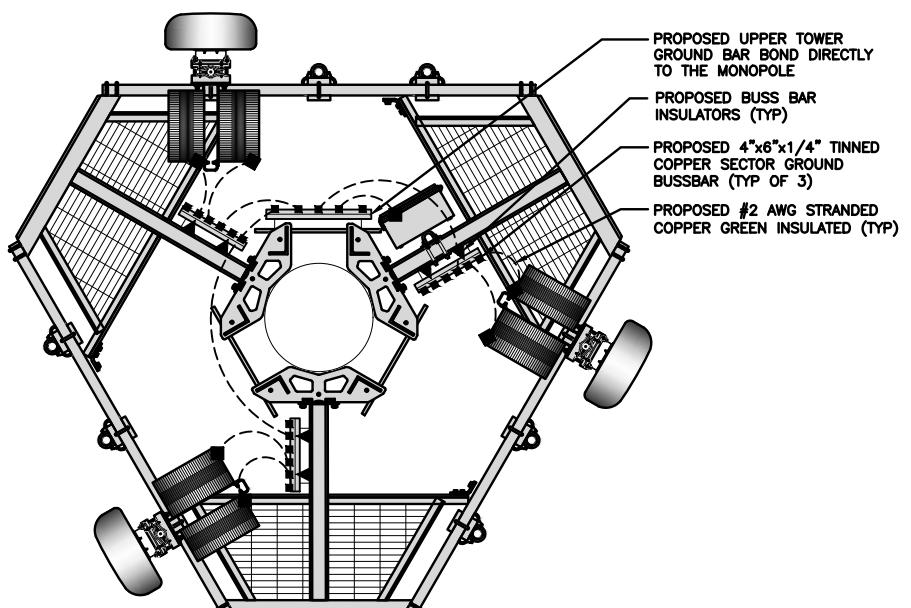


TYPICAL EQUIPMENT GROUNDING PLAN

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 KEY NOTES

| | | | |
|-------------------------|-------------------------|--------------|--|
| ● EXOTHERMIC CONNECTION | ■ MECHANICAL CONNECTION | ○ GROUND ROD | □ TEST GROUND ROD WITH INSPECTION SLEEVE |
| | | | — #2 AWG STRANDED & INSULATED |
| | | | - - - #2 AWG SOLID COPPER TINNED |

GROUNDING LEGEND

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

GROUNDING KEY NOTES

- (A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- (B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- (C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- (D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
- (E) GROUND ROD: UL LISTED COPPER CLAD STEEL MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
- (F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
- (G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
- (H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
- (I) ITELCO 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 EQUIPMENT'S METAL FRAMEWORK.
- (L) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITHIN 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.

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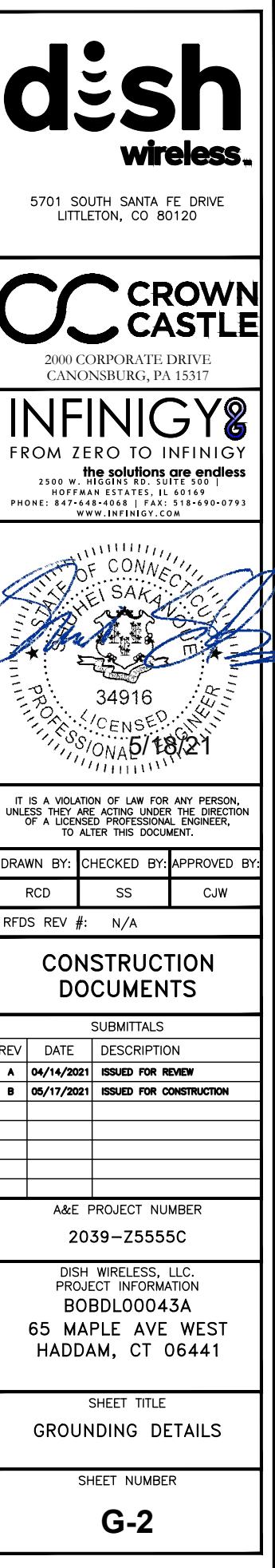
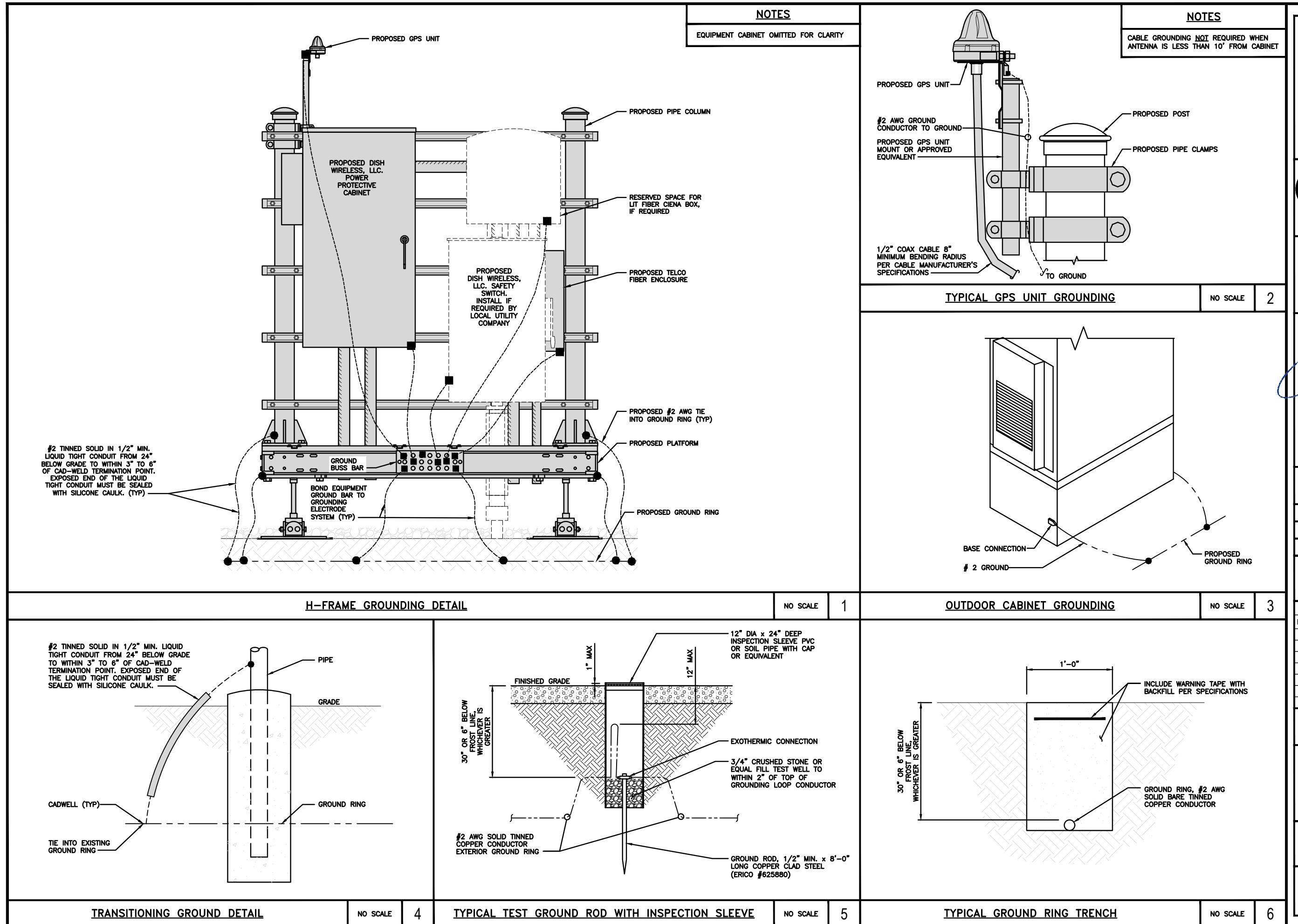
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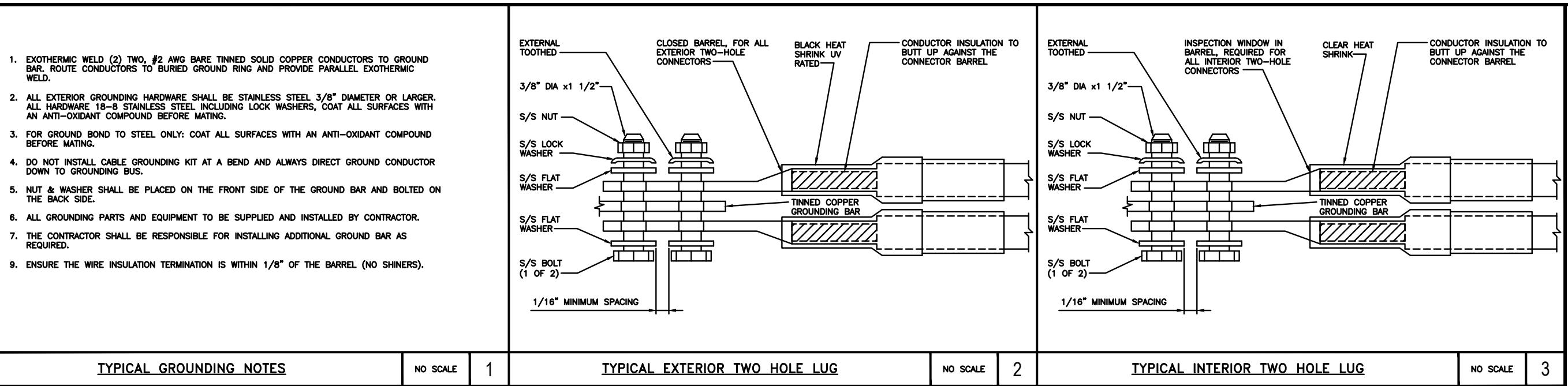
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER
G-1

NO SCALE 3





| | | | | | | | | |
|--------------------------------|----------|---|--------------------------------------|----------|---|--------------------------------------|----------|---|
| <u>TYPICAL GROUNDING NOTES</u> | NO SCALE | 1 | <u>TYPICAL EXTERIOR TWO HOLE LUG</u> | NO SCALE | 2 | <u>TYPICAL INTERIOR TWO HOLE LUG</u> | NO SCALE | 3 |
|--------------------------------|----------|---|--------------------------------------|----------|---|--------------------------------------|----------|---|

| | | | | | | | | |
|-------------------|----------|---|--|----------|---|-----------------|----------|---|
| <u>LUG DETAIL</u> | NO SCALE | 4 | | NO SCALE | 5 | <u>NOT USED</u> | NO SCALE | 6 |
|-------------------|----------|---|--|----------|---|-----------------|----------|---|

| | | | | | | | | |
|-----------------|----------|---|-----------------|----------|---|-----------------|----------|---|
| <u>NOT USED</u> | NO SCALE | 7 | <u>NOT USED</u> | NO SCALE | 8 | <u>NOT USED</u> | NO SCALE | 9 |
|-----------------|----------|---|-----------------|----------|---|-----------------|----------|---|

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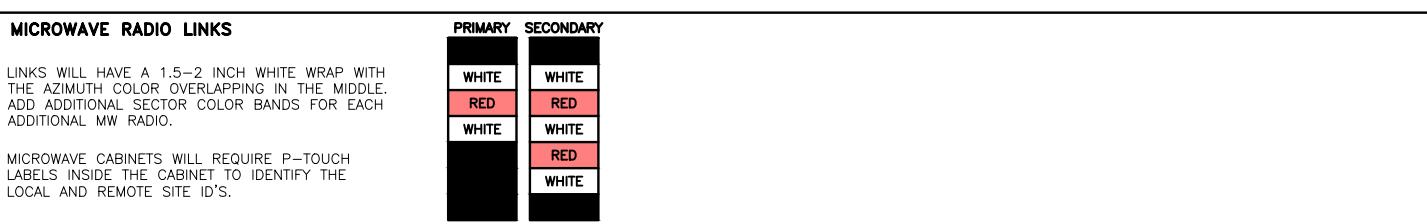
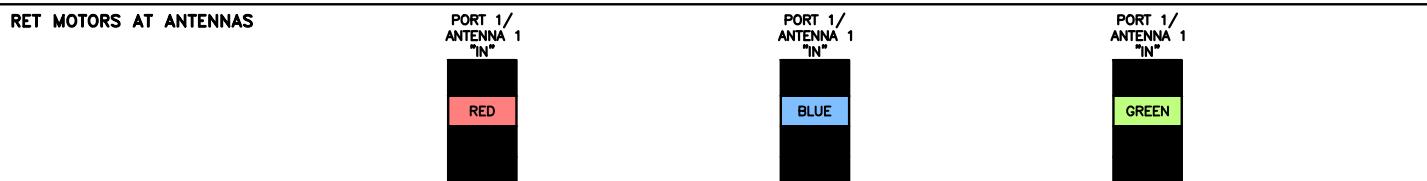
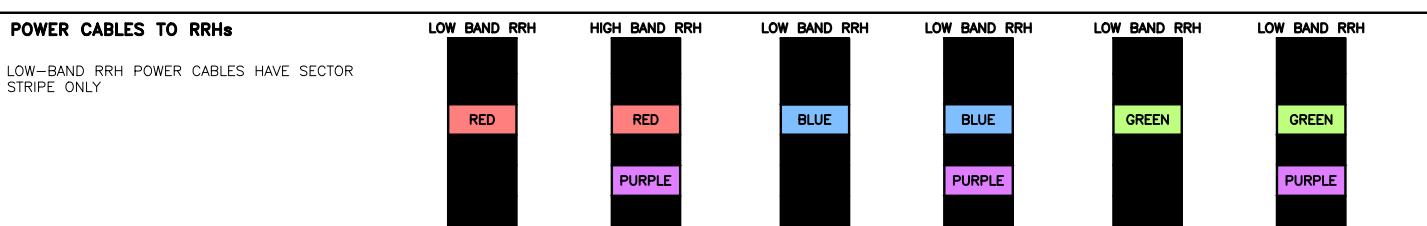
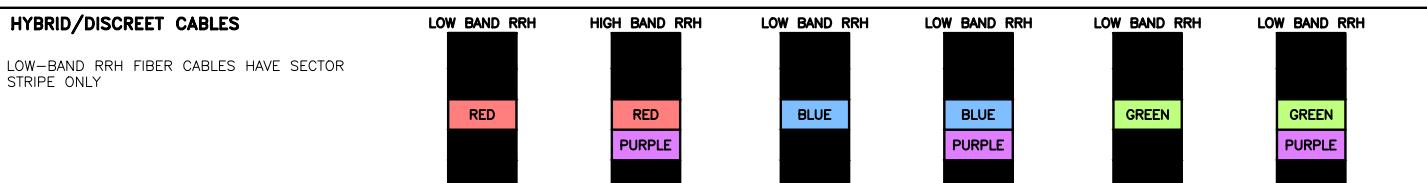
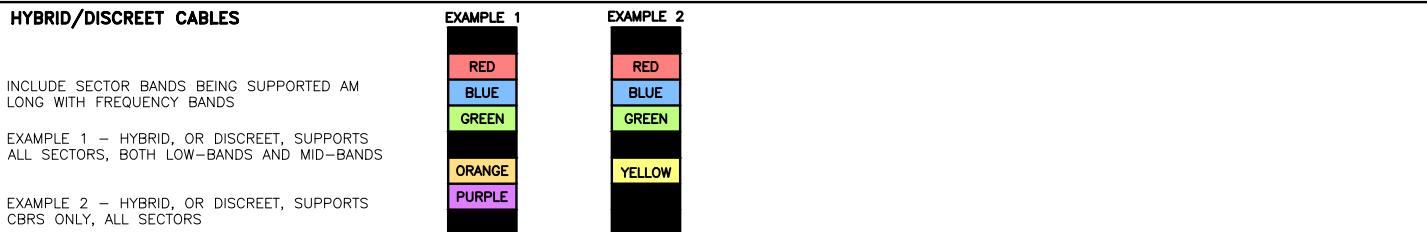
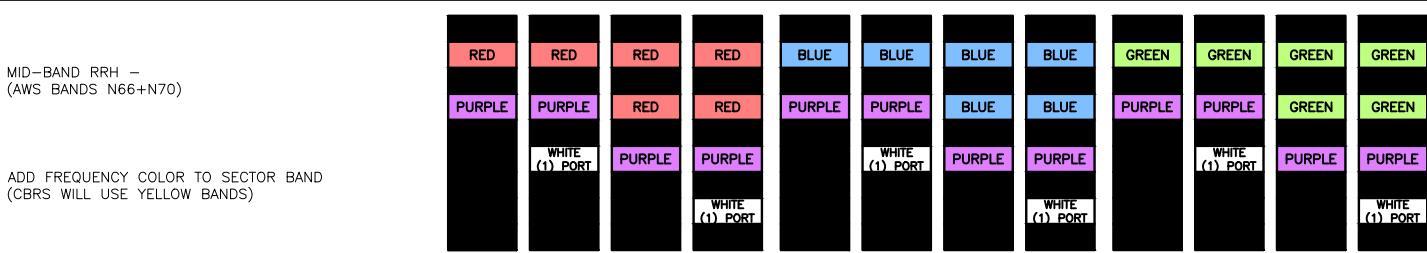
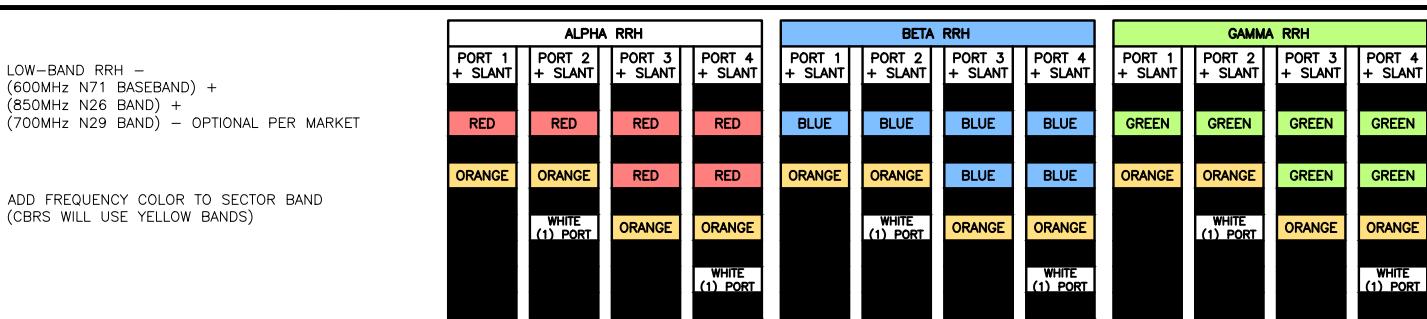
SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER

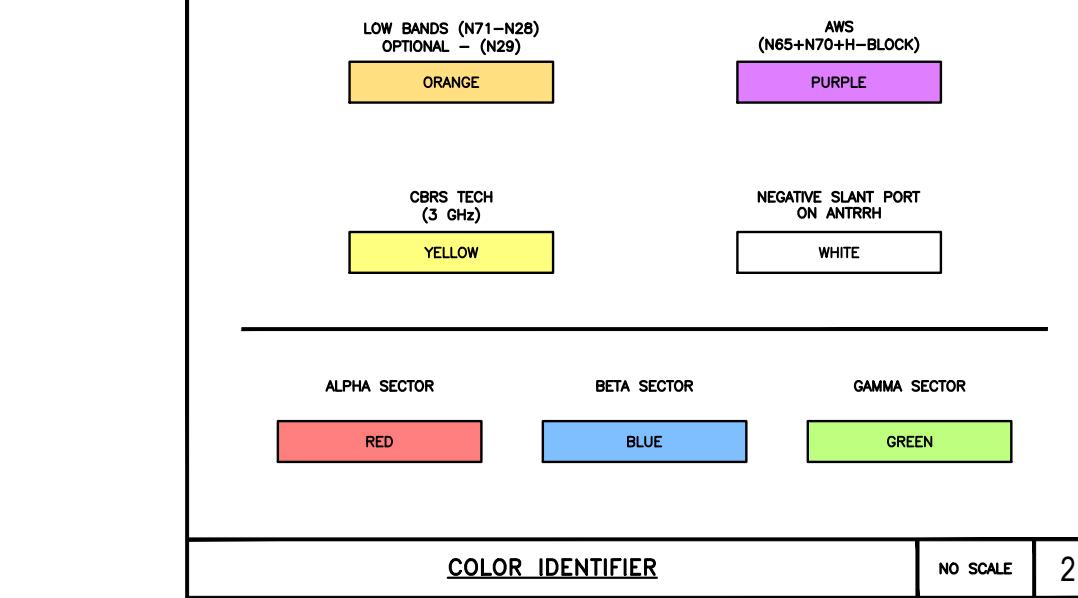
G-3

RF JUMPER COLOR CODING

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



RF CABLE COLOR CODES



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PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
RF
CABLE COLOR CODES

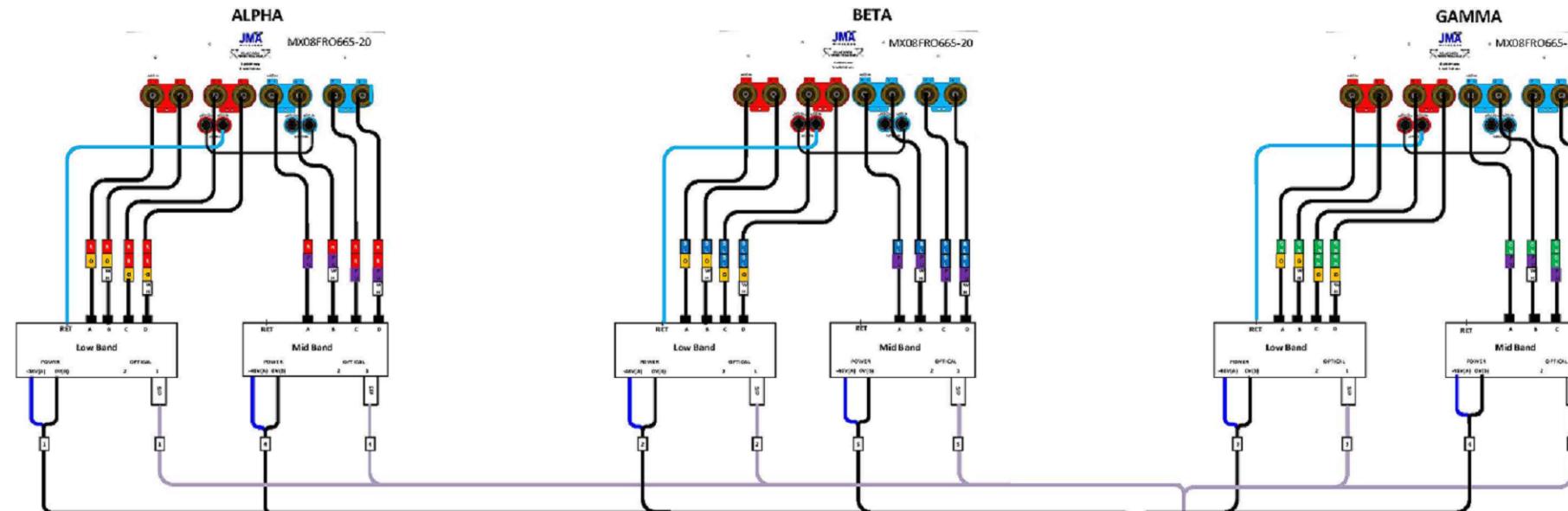
SHEET NUMBER

RF-1

NOT USED

NO SCALE

4



top

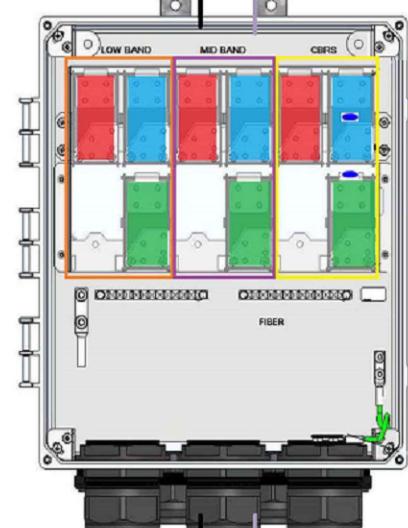
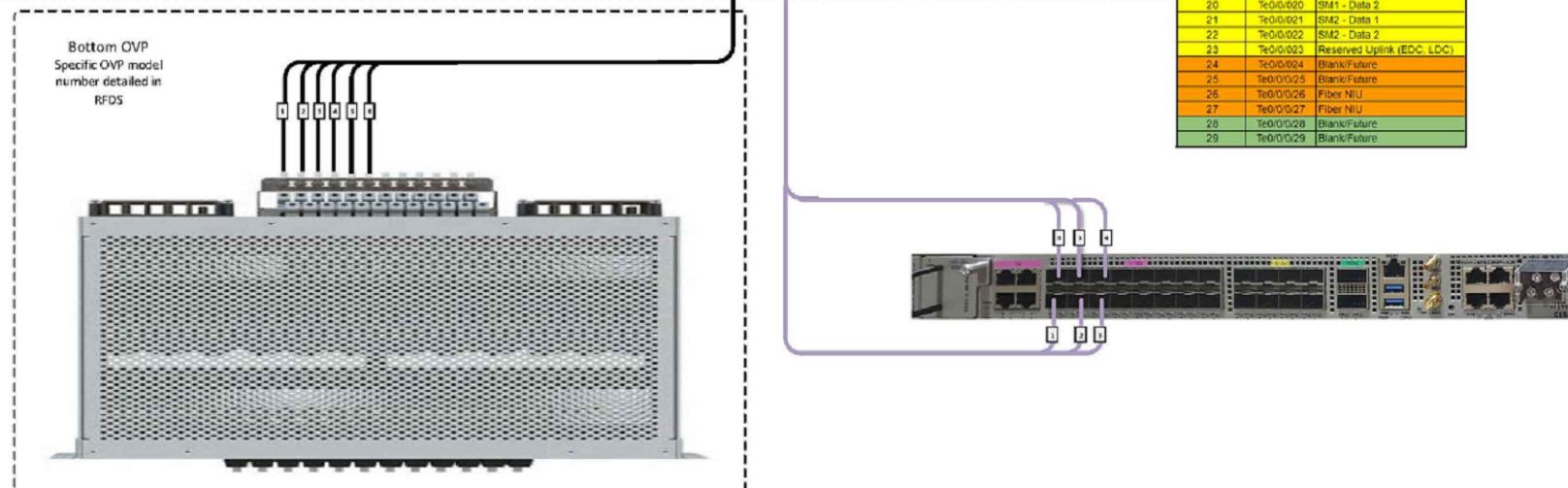
bottom

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 |

SG plumbing diagram JMA MX08FRO665-20
2-2-2(LB+MB)

| | | | | |
|------------|------|---------|--------|------|
| Quantum | JGL | ISDN NO | SWG NO | PEM |
| 5-Jan-2021 | None | None | None | None |



CSR NCS540

| Port | Interface | Description |
|------|-----------|-----------------------------|
| 0 | G10/0/0 | SiteBoss |
| 1 | G10/0/1 | CBRS - Alpha |
| 2 | G10/0/2 | CBRS - Beta |
| 3 | G10/0/3 | CBRS - Gamma |
| 4 | Te0/0/0 | 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 Wif |
| 11 | Te0/0/11 | Fixed Wif |
| 12 | Te0/0/12 | Fixed Wif |
| 13 | Te0/0/13 | Fixed Wif |
| 14 | Te0/0/14 | CBRS1 |
| 15 | Te0/0/15 | CBRS2 |
| 16 | Te0/0/16 | CBRS3 |
| 17 | G10/0/17 | SM1 - BMC |
| 18 | G10/0/18 | 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 NIU |
| 27 | Te0/0/27 | Fiber NIU |
| 28 | Te0/0/28 | Blank/Future |
| 29 | Te0/0/29 | Blank/Future |

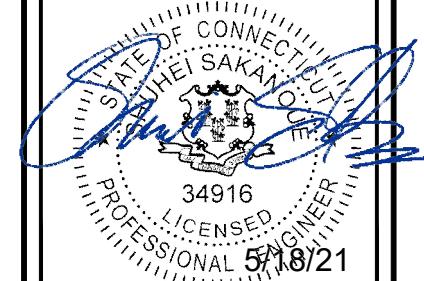
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DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER

2039-Z5555C

DISH WIRELESS, LLC. PROJECT INFORMATION

BOBDL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE

RF
PLUMBING DIAGRAM

SHEET NUMBER

RF-2

| | |
|---|-----------------------------------|
| EXOTHERMIC CONNECTION | ● |
| MECHANICAL CONNECTION | ■ |
| CHEMICAL ELECTROLYTIC GROUNDING SYSTEM | ●○ |
| TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM | ●○T |
| EXOTHERMIC WITH INSPECTION SLEEVE | ●○ |
| GROUNDING BAR | — |
| GROUND ROD | ● |
| TEST GROUND ROD WITH INSPECTION SLEEVE | ○T |
| SINGLE POLE SWITCH | \$ |
| DUPLEX RECEPTACLE | ○ |
| DUPLEX GFCI RECEPTACLE | ○GFCI |
| FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8 | F |
| SMOKE DETECTION (DC) | SD |
| EMERGENCY LIGHTING (DC) | EL |
| SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DBTXD | □ |
| CHAIN LINK FENCE | — x — x — x — x — |
| WOOD/WROUGHT IRON FENCE | —□□□□— |
| WALL STRUCTURE | |
| LEASE AREA | — - - - - |
| PROPERTY LINE (PL) | — - - - - |
| SETBACKS | — - - - - |
| ICE BRIDGE | |
| CABLE TRAY | |
| WATER LINE | — W — W — W — W — W — |
| UNDERGROUND POWER | — UGP — UGP — UGP — UGP — UGP — |
| UNDERGROUND TELCO | — UGT — UGT — UGT — UGT — UGT — |
| OVERHEAD POWER | — OHP — OHP — OHP — OHP — |
| OVERHEAD TELCO | — OHT — OHT — OHT — OHT — |
| UNDERGROUND TELCO/POWER | — UGT/P — UGT/P — UGT/P — UGT/P — |
| ABOVE GROUND POWER | — AGP — AGP — AGP — AGP — AGP — |
| ABOVE GROUND TELCO | — AGT — AGT — AGT — AGT — AGT — |
| ABOVE GROUND TELCO/POWER | — AGT/P — AGT/P — AGT/P — AGT/P — |
| WORKPOINT | W.P. |
| SECTION REFERENCE | XX — X-X — |
| DETAIL REFERENCE | XX — X-X — |



LEGEND

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

ABBREVIATIONS



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A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
LEGEND AND
ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH WIRELESS, LLC. AND TOWER OWNER NOC & THE DISH WIRELESS, LLC. AND TOWER OWNER CONSTRUCTION MANAGER.
2. "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.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH WIRELESS, 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).
5. 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."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH WIRELESS, LLC. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH WIRELESS, LLC. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

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

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STATE OF CONNECTICUT
SAKANAWAY
PROFESSIONAL ENGINEER
34916
LICENSED
5/18/21

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DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBBL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- 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.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- 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.
- 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.
- 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 (F_y) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
- 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"
- 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:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- 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.
- 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.
- 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).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- TIE WRAPS ARE NOT ALLOWED.
- 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.
- 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.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- 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.
- 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).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

- ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNTOWARDS (WIREMOLD SPECMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH WIRELESS, LLC.".
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

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RCD SS CJW

RFDS REV #: N/A

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| B | 05/17/2021 | ISSUED FOR CONSTRUCTION |
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A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00043A
65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

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

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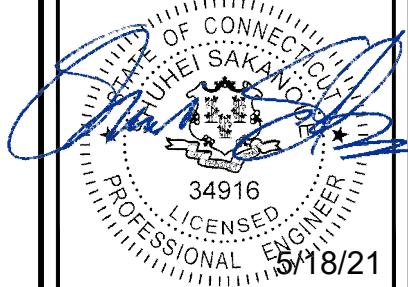
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DRAWN BY: CHECKED BY: APPROVED BY:
RCD SS CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER

2039-Z5555C

DISH WIRELESS, LLC.

PROJECT INFORMATION

BOBDSL00043A

65 MAPLE AVE WEST
HADDAM, CT 06441

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

Date: April 18, 2021



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: Structural Analysis Report

Carrier Designation: DISH Network Co-Locate

Site Number: BOBBL00043A
Site Name: CT-CCI-T-806367

Crown Castle Designation:

BU Number: 806367
Site Name: HRT 046 943209
JDE Job Number: 645110
Work Order Number: 1945836
Order Number: 553284 Rev. 0

Engineering Firm Designation: Crown Castle Project Number: 1945836

Site Data: 65 MAPLE AVE WEST, HADDAM, Middlesex County, CT
Latitude 41° 29' 4.54", Longitude -72° 34' 20.81"
115.5 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 – 59.9%

This analysis utilizes an ultimate 3-second gust wind speed of 130 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: Daniel Chen

Respectfully submitted by:

Jamal A. Huwel, P.E.
Director Engineering

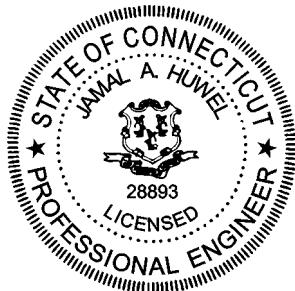


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1) INTRODUCTION

This tower is a 115.5 ft Monopole tower designed by FWT Inc.

2) ANALYSIS CRITERIA

| | |
|-----------------------------|-----------|
| TIA-222 Revision: | TIA-222-H |
| Risk Category: | II |
| Wind Speed: | 130 mph |
| Exposure Category: | B |
| Topographic Factor: | 1 |
| Ice Thickness: | 1.5 in |
| Wind Speed with Ice: | 50 mph |
| Seismic Ss: | 0.175 |
| Seismic S1: | 0.061 |
| Service Wind Speed: | 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) |
|---------------------|----------------------------|--------------------|----------------------|-----------------------------|----------------------|---------------------|
| 69.0 | 69.0 | 3 | fujitsu | TA08025-B604 | 1 | 1-3/8 |
| | | 3 | fujitsu | TA08025-B605 | | |
| | | 3 | jma wireless | MX08FRO665-20 w/ Mount Pipe | | |
| | | 1 | raycap | RDIDC-9181-PF-48 | | |
| | | 1 | tower mounts | Commscope MC-PK8-DSH | | |

Table 2 - Other Considered Equipment

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) |
|---------------------|----------------------------|--------------------|----------------------|--------------------------------|----------------------|---------------------|
| 117.0 | 119.0 | 3 | antel | BXA-171063-8BF-2 w/ Mount Pipe | 15 | 1-5/8 |
| | | 3 | antel | BXA-70063/6CF w/ Mount Pipe | | |
| | | 4 | antel | LPA-80063/6CF w/ Mount Pipe | | |
| | | 2 | antel | LPA-80080/6CF w/ Mount Pipe | | |
| | | 6 | rfs celwave | FD9R6004/2C-3L | | |
| | 117.0 | 1 | tower mounts | Platform Mount [LP 1001-1] | | |
| 104.0 | 109.0 | 2 | decibel | DB411-A | 3 | 7/8 |
| | 107.0 | 1 | maxrad | MFB4505 | | |
| | 104.0 | 1 | tower mounts | Side Arm Mount [SO 702-3] | | |
| 97.0 | 98.0 | 3 | ems wireless | RR90-17-02DP | 12 | 1-1/4 |
| | | 3 | ericsson | KRY 112 144/1 | | |
| | | 3 | ericsson | KRY 112 489/2 | | |
| | | 3 | ericsson | RADIO 4449 B12/B71 | | |
| | | 3 | rfs celwave | APXVAARR24_43-U-NA20 | | |
| | 97.0 | 1 | tower mounts | Platform Mount [LP 301-1] | | |
| 87.0 | 89.0 | 4 | cci antennas | HPA65R-BU6A w/ Mount Pipe | 12 | 7/8 |
| | | 2 | cci antennas | HPA65R-BU8A 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) |
|---------------------|----------------------------|--------------------|------------------------|---------------------------|----------------------|------------------------|
| | | 3 | ericsson | RRUS 4415 B25 | 2 | 3/8 7/16 Conduit |
| | | 3 | ericsson | RRUS 4449 B5/B12 | 2 | |
| | | 3 | ericsson | RRUS 8843 B2/B66A | 1 | |
| | | 2 | kathrein | 80010965 w/ Mount Pipe | | |
| | | 1 | kathrein | 80010966 w/ Mount Pipe | | |
| | | 3 | powerwave technologies | 7770.00 w/ Mount Pipe | | |
| | | 6 | powerwave technologies | LGP21401 | | |
| | | 2 | raycap | DC6-48-60-18-8C-EV | | |
| | | 1 | raycap | DC6-48-60-18-8F | | |
| | 87.0 | 1 | tower mounts | Platform Mount [LP 304-1] | | |
| 75.0 | 77.0 | 3 | kathrein | 742 213 | 6 | 1-5/8 |
| | 75.0 | 1 | tower mounts | Pipe Mount [PM 601-3] | | |

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document | Reference | Source |
|--|-----------|----------|
| 4-GEOTECHNICAL REPORTS | 2225355 | CCISITES |
| 4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS | 2200141 | CCISITES |
| 4-TOWER MANUFACTURER DRAWINGS | 997499 | CCISITES |
| 4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA | 2264019 | 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.

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 4 - Section Capacity (Summary)

| Section No. | Elevation (ft) | Component Type | Size | Critical Element | P (K) | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|----------------|----------------|------------------------|------------------|--------|----------------|------------|---------------------|
| L1 | 115.5 - 83.92 | Pole | TP40.829x32.25x0.25 | 1 | -10.88 | 1790.03 | 18.3 | Pass |
| L2 | 83.92 - 41.25 | Pole | TP51.92x38.8811x0.3125 | 2 | -27.90 | 2808.03 | 40.0 | Pass |
| L3 | 41.25 - 0 | Pole | TP62.5x49.4614x0.375 | 3 | -44.92 | 4073.37 | 48.8 | Pass |
| | | | | | | | | Summary |
| | | | | | | | | Pole (L3) 48.8 Pass |
| | | | | | | | | Rating = 48.8 Pass |

Table 5 - Tower Component Stresses vs. Capacity - LC7

| Notes | Component | Elevation (ft) | % Capacity | Pass / Fail |
|-------|------------------------------------|----------------|------------|-------------|
| 1 | Anchor Rods | 0 | 52.6 | Pass |
| 1 | Base Plate | 0 | 50.5 | Pass |
| 1 | Base Foundation (Structure) | 0 | 25.1 | Pass |
| 1 | Base Foundation (Soil Interaction) | 0 | 59.9 | Pass |

Structure Rating (max from all components) =

59.9%

Notes:

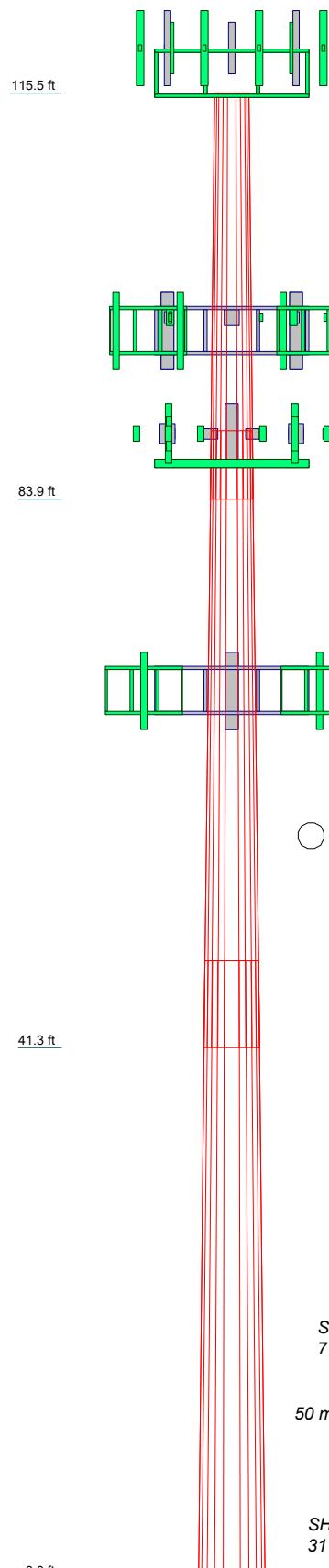
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

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



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

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 B to the TIA-222-H Standard.
3. Tower designed for a 130 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 0.00 ft
8. TOWER RATING: 48.8%

ALL REACTIONS
ARE FACORED

AXIAL
76 K
SHEAR
7 K
MOMENT
543 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL
45 K
SHEAR
31 K
MOMENT
2459 kip-ft
TORQUE 1 kip-ft
REACTIONS - 130 mph WIND

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: 515.00 ft.
- Basic wind speed of 130 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 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 | Distribute Leg Loads As Uniform | Use ASCE 10 X-Brace Ly Rules |
| Consider Moments - Horizontals | Assume Legs Pinned | Calculate Redundant Bracing Forces |
| Consider Moments - Diagonals | ✓ Assume Rigid Index Plate | Ignore Redundant Members in FEA |
| Use Moment Magnification | ✓ Use Clear Spans For Wind Area | SR Leg Bolts Resist Compression |
| ✓ Use Code Stress Ratios | Use Clear Spans For KL/r | All Leg Panels Have Same Allowable |
| ✓ Use Code Safety Factors - Guys | Retention Guys To Initial Tension | Offset Girt At Foundation |
| Escalate Ice | ✓ Bypass Mast Stability Checks | ✓ Consider Feed Line Torque |
| Always Use Max Kz | ✓ Use Azimuth Dish Coefficients | Include Angle Block Shear Check |
| Use Special Wind Profile | ✓ Project Wind Area of Appur. | Use TIA-222-H Bracing Resist. |
| Include Bolts In Member Capacity | Autocalc Torque Arm Areas | Exemption |
| Leg Bolts Are At Top Of Section | Add IBC .6D+W Combination | Use TIA-222-H Tension Splice |
| Secondary Horizontal Braces Leg | ✓ Sort Capacity Reports By Component | Exemption |
| Use Diamond Inner Bracing (4 Sided) | Triangulate Diamond Inner Bracing | Poles |
| SR Members Have Cut Ends | Treat Feed Line Bundles As Cylinder | ✓ Include Shear-Torsion Interaction |
| SR Members Are Concentric | Ignore KL/ry For 60 Deg. Angle Legs | 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 |

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 | 115.50-83.92 | 31.58 | 5.33 | 12 | 32.2500 | 40.8290 | 0.2500 | 1.0000 | A572-65 (65 ksi) |
| L2 | 83.92-41.25 | 48.00 | 6.75 | 12 | 38.8811 | 51.9200 | 0.3125 | 1.2500 | A572-65 (65 ksi) |
| L3 | 41.25-0.00 | 48.00 | | 12 | 49.4614 | 62.5000 | 0.3750 | 1.5000 | A572-65 (65 ksi) |

Tapered Pole Properties

| Section | Tip Dia. in | Area in ² | I in ⁴ | r in | C in | I/C in ³ | J in ⁴ | It/Q in ² | w in | w/t |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|-------------------------|---------|--------|
| L1 | 33.2995 | 25.7600 | 3366.9120 | 11.4560 | 16.7055 | 201.5451 | 6822.2765 | 12.6783 | 7.9730 | 31.892 |
| | 42.1811 | 32.6661 | 6865.7163 | 14.5273 | 21.1494 | 324.6290 | 13911.802 | 16.0773 | 10.2722 | 41.089 |
| L2 | 41.6413 | 38.8096 | 7368.7188 | 13.8075 | 20.1404 | 365.8678 | 14931.022 | 19.1009 | 9.5826 | 30.664 |
| | 53.6413 | 51.9300 | 17653.479 | 18.4755 | 26.8946 | 656.3959 | 35770.734 | 25.5584 | 13.0771 | 41.847 |
| L3 | 52.9722 | 59.2718 | 18228.737 | 17.5729 | 25.6210 | 711.4763 | 36936.364 | 29.1718 | 12.2507 | 32.668 |
| | 64.5725 | 75.0159 | 36954.922 | 22.2407 | 32.3750 | 1141.4648 | 74880.691 | 36.9206 | 15.7450 | 41.987 |

| Tower Elevation ft | Gusset Area (per face) ft ² | Gusset Thickness in | Gusset Grade | Adjust. Factor A _f | 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 |
|--------------------------|---|---------------------------|--------------|----------------------------------|-------------------------------------|--------------|---|---|--|
| L1 115.50- 83.92 | | | | 1 | 1 | 1 | | | |
| L2 83.92- 41.25 | | | | 1 | 1 | 1 | | | |
| L3 41.25-0.00 | | | | 1 | 1 | 1 | | | |

Feed Line/Linear Appurtenances - Entered As Round Or Flat

| Description | Sector | Exclude From Torque Calculation | Componen t Type | Placement ft | Total Number | Number Per Row | Start/En d Position | Width or Diamete r in | Perimete r in | Weight plf |
|--------------------------|--------|--|----------------------|------------------|-----------------|-------------------|------------------------|--------------------------------|---------------------|---------------|
| LCF78-50J(7/8") | B | No | Surface Ar (CaAa) | 104.00 - 0.00 | 2 | 2 | 0.000 0.042 | 1.1000 | | 0.53 |
| ** | | | | | | | | | | |
| 2" (Nominal) Conduit | A | No | Surface Ar (CaAa) | 87.00 - 0.00 | 1 | 1 | -0.125 -0.125 | 2.3750 | | 0.72 |
| LDF5-50A(7/8) | A | No | Surface Ar (CaAa) | 87.00 - 0.00 | 12 | 6 | 0.000 0.108 | 1.0900 | | 0.33 |
| FB-L98B-034-XXX(3/8) | A | No | Surface Ar (CaAa) | 87.00 - 0.00 | 1 | 1 | -0.108 -0.108 | 0.3937 | | 0.06 |
| WR-VG86ST-BRD(3/4) | A | No | Surface Ar (CaAa) | 87.00 - 0.00 | 4 | 4 | -0.100 0.000 | 0.7950 | | 0.58 |
| ** | | | | | | | | | | |
| CU12PSM9P8XXX(1- 3/8) | B | No | Surface Ar (CaAa) | 69.00 - 0.00 | 1 | 1 | -0.210 -0.200 | 1.4110 | | 1.66 |
| **** | | | | | | | | | | |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Exclude From Torque Calculation | Component Type | Placement ft | Total Number | CAA _A | Weight |
|------------------------|-------------|--------------|---------------------------------|----------------|---------------|--------------|--|------------------------------|
| | | | | | | | | |
| LDF7-50A(1-5/8") | C | No | No | Inside Pole | 115.50 - 0.00 | 15 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 0.82 0.82 0.82 0.82 |
| ** | | | | | | | | |
| LCF78-50J(7/8") | C | No | No | Inside Pole | 104.00 - 0.00 | 1 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 0.53 0.53 0.53 0.53 |
| ** | | | | | | | | |
| FLC 114-50J(1-1/4") | C | No | No | Inside Pole | 97.00 - 0.00 | 6 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 0.70 0.70 0.70 0.70 |
| AVA6-50(1-1/4) | C | No | No | Inside Pole | 97.00 - 0.00 | 6 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 0.46 0.46 0.46 0.46 |
| HCS 6X12 4AWG(1-5/8) | C | No | No | Inside Pole | 97.00 - 0.00 | 1 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 2.40 2.40 2.40 2.40 |
| FB-L98B-002-75000(3/8) | C | No | No | Inside Pole | 87.00 - 0.00 | 1 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 0.06 0.06 0.06 0.06 |
| WR-VG122ST-BRDA(7/16) | C | No | No | Inside Pole | 87.00 - 0.00 | 2 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 0.14 0.14 0.14 0.14 |
| ** | | | | | | | | |
| AVA7-50(1-5/8) | C | No | No | Inside Pole | 75.00 - 0.00 | 6 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.00 0.00 0.00 0.00 |
| | | | | | | | | 0.70 0.70 0.70 0.70 |
| **** | | | | | | | | |

Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation ft | Face | A _R ft ² | A _F ft ² | CAA _A In Face ft ² | CAA _A Out Face ft ² | Weight |
|---------------|--------------------|------|-----------------------------------|-----------------------------------|--|---|--------|
| L1 | 115.50-83.92 | A | 0.000 | 0.000 | 3.847 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 4.418 | 0.000 | 0.02 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.52 |
| L2 | 83.92-41.25 | A | 0.000 | 0.000 | 53.289 | 0.000 | 0.30 |
| | | B | 0.000 | 0.000 | 13.303 | 0.000 | 0.09 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 1.10 |
| L3 | 41.25-0.00 | A | 0.000 | 0.000 | 51.516 | 0.000 | 0.29 |
| | | B | 0.000 | 0.000 | 14.895 | 0.000 | 0.11 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 1.10 |

Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | A _R ft ² | A _F ft ² | CAA _A In Face ft ² | CAA _A Out Face ft ² | Weight |
|---------------|--------------------|-------------|------------------|-----------------------------------|-----------------------------------|--|---|--------|
| L1 | 115.50-83.92 | A | 1.423 | 0.000 | 0.000 | 8.541 | 0.000 | 0.11 |
| | | B | | 0.000 | 0.000 | 12.668 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.52 |

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | A_R ft 2 | A_F ft 2 | C_{AA} In Face ft 2 | C_{AA} Out Face ft 2 | Weight K |
|---------------|--------------------|-------------|------------------|---------------|---------------|--------------------------|---------------------------|----------|
| L2 | 83.92-41.25 | A | 1.358 | 0.000 | 0.000 | 118.323 | 0.000 | 1.54 |
| | | B | | 0.000 | 0.000 | 38.734 | 0.000 | 0.47 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 1.10 |
| L3 | 41.25-0.00 | A | 1.213 | 0.000 | 0.000 | 111.973 | 0.000 | 1.42 |
| | | B | | 0.000 | 0.000 | 42.381 | 0.000 | 0.52 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 1.10 |

Feed Line Center of Pressure

| Section | Elevation ft | CP_x in | CP_z in | CP_x Ice in | CP_z Ice in |
|---------|--------------|-----------|-----------|---------------|---------------|
| L1 | 115.50-83.92 | 0.0624 | -0.7647 | 0.3822 | -1.2005 |
| L2 | 83.92-41.25 | -3.7558 | -3.4582 | -4.0540 | -4.1347 |
| L3 | 41.25-0.00 | -3.7914 | -3.7798 | -4.1958 | -4.7566 |

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_a No Ice | K_a Ice |
|---------------|----------------------|----------------------|-------------------------|--------------|-----------|
| L1 | 4 | LCF78-50J(7/8") | 83.92 - 104.00 | 1.0000 | 1.0000 |
| L1 | 10 | 2" (Nominal) Conduit | 83.92 - 87.00 | 1.0000 | 1.0000 |
| L1 | 11 | LDF5-50A(7/8) | 83.92 - 87.00 | 1.0000 | 1.0000 |
| L1 | 14 | FB-L98B-034-XXX(3/8) | 83.92 - 87.00 | 1.0000 | 1.0000 |
| L1 | 15 | WR-VG86ST-BRD(3/4) | 83.92 - 87.00 | 1.0000 | 1.0000 |
| L2 | 4 | LCF78-50J(7/8") | 41.25 - 83.92 | 1.0000 | 1.0000 |
| L2 | 10 | 2" (Nominal) Conduit | 41.25 - 83.92 | 1.0000 | 1.0000 |
| L2 | 11 | LDF5-50A(7/8) | 41.25 - 83.92 | 1.0000 | 1.0000 |
| L2 | 14 | FB-L98B-034-XXX(3/8) | 41.25 - 83.92 | 1.0000 | 1.0000 |
| L2 | 15 | WR-VG86ST-BRD(3/4) | 41.25 - 83.92 | 1.0000 | 1.0000 |
| L2 | 19 | CU12PSM9P8XXX(1-3/8) | 41.25 - 69.00 | 1.0000 | 1.0000 |
| L3 | 4 | LCF78-50J(7/8") | 0.00 - 41.25 | 1.0000 | 1.0000 |
| L3 | 10 | 2" (Nominal) Conduit | 0.00 - 41.25 | 1.0000 | 1.0000 |
| L3 | 11 | LDF5-50A(7/8) | 0.00 - 41.25 | 1.0000 | 1.0000 |
| L3 | 14 | FB-L98B-034-XXX(3/8) | 0.00 - 41.25 | 1.0000 | 1.0000 |
| L3 | 15 | WR-VG86ST-BRD(3/4) | 0.00 - 41.25 | 1.0000 | 1.0000 |
| L3 | 19 | CU12PSM9P8XXX(1-3/8) | 0.00 - 41.25 | 1.0000 | 1.0000 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz ft | Azimuth Adjustmen t ° | Placement ft | C _A A _{Front} | C _A A _{Side} | Weight K |
|------------------------------------|-------------|-------------|----------------------|--------------------------------|-----------------|-----------------------------------|----------------------------------|-------------|
| | | | | | | | | |
| BXA-171063-8BF-2 w/ Mount Pipe | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 3.18 | 3.35 |
| | | | | | | 1/2" | 3.56 | 3.97 |
| | | | | | | Ice | 3.93 | 4.60 |
| | | | | | | 1" Ice | 4.69 | 5.89 |
| | | | | | | 2" Ice | | |
| BXA-171063-8BF-2 w/ Mount Pipe | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 3.18 | 3.35 |
| | | | | | | 1/2" | 3.56 | 3.97 |
| | | | | | | Ice | 3.93 | 4.60 |
| | | | | | | 1" Ice | 4.69 | 5.89 |
| | | | | | | 2" Ice | | |
| BXA-171063-8BF-2 w/ Mount Pipe | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 3.18 | 3.35 |
| | | | | | | 1/2" | 3.56 | 3.97 |
| | | | | | | Ice | 3.93 | 4.60 |
| | | | | | | 1" Ice | 4.69 | 5.89 |
| | | | | | | 2" Ice | | |
| BXA-70063/6CF w/ Mount Pipe | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 7.34 | 5.51 |
| | | | | | | 1/2" | 8.08 | 6.22 |
| | | | | | | Ice | 8.83 | 6.94 |
| | | | | | | 1" Ice | 10.38 | 8.44 |
| | | | | | | 2" Ice | | |
| BXA-70063/6CF w/ Mount Pipe | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 7.34 | 5.51 |
| | | | | | | 1/2" | 8.08 | 6.22 |
| | | | | | | Ice | 8.83 | 6.94 |
| | | | | | | 1" Ice | 10.38 | 8.44 |
| | | | | | | 2" Ice | | |
| BXA-70063/6CF w/ Mount Pipe | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 7.34 | 5.51 |
| | | | | | | 1/2" | 8.08 | 6.22 |
| | | | | | | Ice | 8.83 | 6.94 |
| | | | | | | 1" Ice | 10.38 | 8.44 |
| | | | | | | 2" Ice | | |
| (2) LPA-80080/6CF w/ Mount Pipe | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 4.56 | 10.26 |
| | | | | | | 1/2" | 5.11 | 11.43 |
| | | | | | | Ice | 5.61 | 12.31 |
| | | | | | | 1" Ice | 6.65 | 14.13 |
| | | | | | | 2" Ice | | |
| (2) LPA-80063/6CF w/ Mount Pipe | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 9.83 | 10.22 |
| | | | | | | 1/2" | 10.40 | 11.38 |
| | | | | | | Ice | 10.93 | 12.27 |
| | | | | | | 1" Ice | 12.03 | 14.09 |
| | | | | | | 2" Ice | | |
| (2) LPA-80063/6CF w/ Mount Pipe | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 9.83 | 10.22 |
| | | | | | | 1/2" | 10.40 | 11.38 |
| | | | | | | Ice | 10.93 | 12.27 |
| | | | | | | 1" Ice | 12.03 | 14.09 |
| | | | | | | 2" Ice | | |
| (2) FD9R6004/2C-3L | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 0.31 | 0.08 |
| | | | | | | 1/2" | 0.39 | 0.12 |
| | | | | | | Ice | 0.47 | 0.17 |
| | | | | | | 1" Ice | 0.65 | 0.29 |
| | | | | | | 2" Ice | | |
| (2) FD9R6004/2C-3L | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 0.31 | 0.08 |
| | | | | | | 1/2" | 0.39 | 0.12 |
| | | | | | | Ice | 0.47 | 0.17 |
| | | | | | | 1" Ice | 0.65 | 0.29 |
| | | | | | | 2" Ice | | |
| (2) FD9R6004/2C-3L | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 117.00 | No Ice | 0.31 | 0.08 |
| | | | | | | 1/2" | 0.39 | 0.12 |
| | | | | | | Ice | 0.47 | 0.17 |
| | | | | | | 1" Ice | 0.65 | 0.29 |
| | | | | | | 2" Ice | | |
| (3) 2.375" OD x 4' Mount Pipe | A | From Leg | 4.00 0.00 | 0.0000 | 117.00 | No Ice | 0.87 | 0.02 |
| | | | | | | 1/2" | 1.11 | 0.03 |

| Description | Face or Leg | Offset Type | Offsets: Horz Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | CaA _{Front} | CaA _{Side} | Weight |
|-------------------------------|----------------------|-------------|---|--------------------------------|-----------------|---|---|--|
| | | | 0.00 | | | Ice 1" Ice 2" Ice | 1.36 1.90 1.90 | 0.04 0.06 |
| (3) 2.375" OD x 4' Mount Pipe | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 117.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.87 1.11 1.36 1.90 1.90 | 0.02 0.03 0.04 0.06 |
| (3) 2.375" OD x 4' Mount Pipe | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 117.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.87 1.11 1.36 1.90 1.90 | 0.02 0.03 0.04 0.06 |
| Platform Mount [LP 1001-1] | C | None | | 0.0000 | 117.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 44.83 50.34 56.62 73.47 73.47 | 3.02 3.95 5.04 7.68 |
| ** | DB411-A | A | From Leg | 4.00 0.00 5.00 | 0.0000 | 104.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 1.50 2.70 3.90 6.30 6.30 |
| | DB411-A | C | From Leg | 4.00 0.00 5.00 | 0.0000 | 104.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 1.50 2.70 3.90 6.30 6.30 |
| MFB4505 | B | From Leg | 4.00 0.00 3.00 | 0.0000 | 104.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.84 1.50 2.13 2.94 2.94 | 0.00 0.01 0.02 0.06 |
| Side Arm Mount [SO 702-3] | C | None | | 0.0000 | 104.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 2.53 3.37 4.12 5.76 5.76 | 0.08 0.13 0.19 0.36 |
| **** | APXVAARR24_43-U-NA20 | A | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 14.67 15.43 16.21 17.81 8.08 |
| | APXVAARR24_43-U-NA20 | B | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 14.67 15.43 16.21 17.81 8.08 |
| | APXVAARR24_43-U-NA20 | C | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 14.67 15.43 16.21 17.81 8.08 |
| RR90-17-02DP | A | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 4.52 5.16 5.83 7.22 4.03 | 0.01 0.04 0.06 0.13 |
| RR90-17-02DP | B | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 4.52 5.16 5.83 7.22 4.03 | 0.01 0.04 0.06 0.13 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | C _A A _A | | Weight K | |
|-------------------------------|-------------|-------------|--|--------------------------------|-----------------|---|----------------------------------|----------------------------------|------------------------------|
| | | | | | | Front | Side | | |
| RR90-17-02DP | C | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 4.52 5.16 5.83 7.22 | 1.54 2.13 2.75 4.03 | 0.01 0.04 0.06 0.13 |
| RADIO 4449 B12/B71 | A | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 1.65 1.81 1.98 2.34 | 1.16 1.30 1.45 1.76 | 0.07 0.09 0.11 0.16 |
| RADIO 4449 B12/B71 | B | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 1.65 1.81 1.98 2.34 | 1.16 1.30 1.45 1.76 | 0.07 0.09 0.11 0.16 |
| RADIO 4449 B12/B71 | C | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 1.65 1.81 1.98 2.34 | 1.16 1.30 1.45 1.76 | 0.07 0.09 0.11 0.16 |
| (2) KRY 112 489/2 | A | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.56 0.66 0.76 1.00 | 0.37 0.45 0.54 0.75 | 0.02 0.02 0.03 0.05 |
| KRY 112 489/2 | C | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.56 0.66 0.76 1.00 | 0.37 0.45 0.54 0.75 | 0.02 0.02 0.03 0.05 |
| (2) KRY 112 144/1 | B | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.35 0.43 0.51 0.70 | 0.17 0.23 0.30 0.46 | 0.01 0.01 0.02 0.03 |
| KRY 112 144/1 | C | From Leg | 4.00 0.00 1.00 | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 0.35 0.43 0.51 0.70 | 0.17 0.23 0.30 0.46 | 0.01 0.01 0.02 0.03 |
| Platform Mount [LP 301-1] | C | None | | 0.0000 | 97.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 23.81 30.24 36.33 48.05 | 23.81 30.24 36.33 48.05 | 1.59 2.10 2.73 4.34 |
| ** | | | | | | | | | |
| 7770.00 w/ Mount Pipe | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 5.75 6.18 6.61 7.49 | 4.25 5.01 5.71 7.16 | 0.06 0.10 0.16 0.29 |
| 7770.00 w/ Mount Pipe | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 5.75 6.18 6.61 7.49 | 4.25 5.01 5.71 7.16 | 0.06 0.10 0.16 0.29 |
| 7770.00 w/ Mount Pipe | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 5.75 6.18 6.61 7.49 | 4.25 5.01 5.71 7.16 | 0.06 0.10 0.16 0.29 |
| (2) HPA65R-BU6A w/ Mount Pipe | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 5.83 6.40 6.99 8.19 | 5.00 5.56 6.13 7.32 | 0.08 0.14 0.22 0.40 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | C _A A _A | | Weight K |
|-------------------------------|-------------|-------------|--|--------------------------------|-----------------|-------------------------------|-------|-------------|
| | | | | | | Front | Side | |
| (2) HPA65R-BU6A w/ Mount Pipe | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 5.83 | 5.00 |
| | | | | | | 1/2" | 6.40 | 5.56 |
| | | | | | | Ice | 6.99 | 6.13 |
| | | | | | | 1" Ice | 8.19 | 7.32 |
| (2) HPA65R-BU8A w/ Mount Pipe | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 8.10 | 6.94 |
| | | | | | | 1/2" | 8.86 | 7.69 |
| | | | | | | Ice | 9.64 | 8.45 |
| | | | | | | 1" Ice | 11.24 | 10.03 |
| 80010965 w/ Mount Pipe | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 12.26 | 5.79 |
| | | | | | | 1/2" | 13.03 | 6.47 |
| | | | | | | Ice | 13.80 | 7.17 |
| | | | | | | 1" Ice | 15.41 | 8.60 |
| 80010965 w/ Mount Pipe | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 12.26 | 5.79 |
| | | | | | | 1/2" | 13.03 | 6.47 |
| | | | | | | Ice | 13.80 | 7.17 |
| | | | | | | 1" Ice | 15.41 | 8.60 |
| 80010966 w/ Mount Pipe | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 14.61 | 6.84 |
| | | | | | | 1/2" | 15.47 | 7.63 |
| | | | | | | Ice | 16.35 | 8.42 |
| | | | | | | 1" Ice | 18.14 | 10.06 |
| (4) LGP21401 | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.10 | 0.21 |
| | | | | | | 1/2" | 1.24 | 0.27 |
| | | | | | | Ice | 1.38 | 0.35 |
| | | | | | | 1" Ice | 1.69 | 0.52 |
| (2) LGP21401 | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.10 | 0.21 |
| | | | | | | 1/2" | 1.24 | 0.27 |
| | | | | | | Ice | 1.38 | 0.35 |
| | | | | | | 1" Ice | 1.69 | 0.52 |
| (2) RRUS 4415 B25 | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.64 | 0.68 |
| | | | | | | 1/2" | 1.80 | 0.79 |
| | | | | | | Ice | 1.97 | 0.91 |
| | | | | | | 1" Ice | 2.33 | 1.18 |
| RRUS 4415 B25 | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.64 | 0.68 |
| | | | | | | 1/2" | 1.80 | 0.79 |
| | | | | | | Ice | 1.97 | 0.91 |
| | | | | | | 1" Ice | 2.33 | 1.18 |
| (2) DC6-48-60-18-8C-EV | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.14 | 0.14 |
| | | | | | | 1/2" | 1.79 | 1.79 |
| | | | | | | Ice | 2.00 | 2.00 |
| | | | | | | 1" Ice | 2.45 | 2.45 |
| (2) RRUS 4449 B5/B12 | A | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.97 | 1.41 |
| | | | | | | 1/2" | 2.14 | 1.56 |
| | | | | | | Ice | 2.33 | 1.73 |
| | | | | | | 1" Ice | 2.72 | 2.07 |
| RRUS 4449 B5/B12 | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.97 | 1.41 |
| | | | | | | 1/2" | 2.14 | 1.56 |
| | | | | | | Ice | 2.33 | 1.73 |
| | | | | | | 1" Ice | 2.72 | 2.07 |
| (3) RRUS 8843 B2/B66A | C | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice | | |
| | | | | | | No Ice | 1.64 | 1.35 |
| | | | | | | 1/2" | 1.80 | 1.50 |
| | | | | | | Ice | 1.97 | 1.65 |
| | | | | | | 1" Ice | 2.32 | 1.99 |

| Description | Face or Leg | Offset Type | Offsets: Horz Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | C _A A _A | | Weight K |
|--------------------------------|-------------|-------------|---|--------------------------------|-----------------|--|--|--|
| | | | | | | Front | Side | |
| DC6-48-60-18-8F | B | From Leg | 4.00 0.00 2.00 | 0.0000 | 87.00 | 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 1.21 1.89 2.11 2.57 17.49 21.37 25.28 33.17 1.21 | 0.02 0.04 0.07 0.13 1.35 1.71 2.13 3.16 |
| Platform Mount [LP 304-1] | C | None | | 0.0000 | 87.00 | | | |
| 742 213 | A | From Leg | 1.00 0.00 2.00 | 0.0000 | 75.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 3.57 4.21 4.86 6.21 3.57 4.21 4.86 6.21 1.60 | 0.02 0.05 0.08 0.16 0.05 0.08 0.08 0.16 |
| 742 213 | B | From Leg | 1.00 0.00 2.00 | 0.0000 | 75.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 3.57 4.21 4.86 6.21 3.57 4.21 4.86 6.21 1.60 | 0.02 0.05 0.08 0.16 0.05 |
| 742 213 | C | From Leg | 1.00 0.00 2.00 | 0.0000 | 75.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 3.57 4.21 4.86 6.21 3.57 4.21 4.86 6.21 1.60 | 0.02 0.05 0.08 0.16 0.05 |
| Pipe Mount [PM 601-3] | C | None | | 0.0000 | 75.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 3.17 3.79 4.42 5.76 3.17 3.79 4.42 5.76 | 0.20 0.23 0.28 0.40 0.20 |
| MX08FRO665-20 w/ Mount Pipe | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 69.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 8.01 8.52 9.04 10.11 8.01 8.52 9.04 10.11 | 0.10 0.18 0.28 0.51 0.10 |
| MX08FRO665-20 w/ Mount Pipe | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 69.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 8.01 8.52 9.04 10.11 8.01 8.52 9.04 10.11 | 0.10 0.18 0.28 0.51 |
| MX08FRO665-20 w/ Mount Pipe | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 69.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 8.01 8.52 9.04 10.11 8.01 8.52 9.04 10.11 | 0.10 0.18 0.28 0.51 |
| RDIDC-9181-PF-48 | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 69.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 2.31 2.50 2.70 3.12 2.31 2.50 2.70 3.12 | 0.02 0.04 0.06 0.12 0.02 |
| TA08025-B604 | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 69.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 1.96 2.14 2.32 2.71 1.96 2.14 2.32 2.71 | 0.06 0.08 0.10 0.15 0.06 |
| TA08025-B604 | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 69.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice 1/2" Ice 1" Ice 2" Ice | 1.96 2.14 2.32 2.71 1.96 2.14 2.32 2.71 | 0.06 0.08 0.10 0.15 |
| TA08025-B604 | C | From Leg | 4.00 | 0.0000 | 69.00 | No Ice 1/2" Ice 1" Ice 2" Ice No Ice | 1.96 2.14 2.32 2.71 1.96 | 0.06 0.08 0.10 0.15 0.06 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | C _A A _{Front} | C _A A _{Side} | Weight K | |
|------------------------|------------------------|-------------|--|--------------------------------|-----------------|-----------------------------------|----------------------------------|-------------|------|
| | | | | | | ft ² | ft ² | | |
| TA08025-B605 | A | From Leg | 0.00 | | 1/2" | 2.14 | 1.11 | 0.08 | |
| | | | 0.00 | | Ice | 2.32 | 1.25 | 0.10 | |
| | | | | | 1" Ice | 2.71 | 1.55 | 0.15 | |
| | | | | | 2" Ice | | | | |
| | | | 4.00 | 0.0000 | 69.00 | No Ice | 1.96 | 1.13 | 0.08 |
| | B | From Leg | 0.00 | | 1/2" | 2.14 | 1.27 | 0.09 | |
| | | | 0.00 | | Ice | 2.32 | 1.41 | 0.11 | |
| | | | | | 1" Ice | 2.71 | 1.72 | 0.16 | |
| | | | | | 2" Ice | | | | |
| | | | 4.00 | 0.0000 | 69.00 | No Ice | 1.96 | 1.13 | 0.08 |
| TA08025-B605 | C | From Leg | 0.00 | | 1/2" | 2.14 | 1.27 | 0.09 | |
| | | | 0.00 | | Ice | 2.32 | 1.41 | 0.11 | |
| | | | | | 1" Ice | 2.71 | 1.72 | 0.16 | |
| | | | | | 2" Ice | | | | |
| | | | 4.00 | 0.0000 | 69.00 | No Ice | 1.96 | 1.13 | 0.08 |
| | (2) 8' x 2" Mount Pipe | From Leg | 0.00 | | 1/2" | 2.14 | 1.27 | 0.09 | |
| | | | 0.00 | | Ice | 2.32 | 1.41 | 0.11 | |
| | | | | | 1" Ice | 2.71 | 1.72 | 0.16 | |
| | | | | | 2" Ice | | | | |
| | | | 4.00 | 0.0000 | 69.00 | No Ice | 1.90 | 1.90 | 0.03 |
| (2) 8' x 2" Mount Pipe | A | From Leg | 0.00 | | 1/2" | 2.73 | 2.73 | 0.04 | |
| | | | 0.00 | | Ice | 3.40 | 3.40 | 0.06 | |
| | | | | | 1" Ice | 4.40 | 4.40 | 0.12 | |
| | | | | | 2" Ice | | | | |
| | | | 4.00 | 0.0000 | 69.00 | No Ice | 1.90 | 1.90 | 0.03 |
| | B | From Leg | 0.00 | | 1/2" | 2.73 | 2.73 | 0.04 | |
| | | | 0.00 | | Ice | 3.40 | 3.40 | 0.06 | |
| | | | | | 1" Ice | 4.40 | 4.40 | 0.12 | |
| | | | | | 2" Ice | | | | |
| | | | 4.00 | 0.0000 | 69.00 | No Ice | 1.90 | 1.90 | 0.03 |
| Commscope MC-PK8-DSH | C | None | 0.0000 | 69.00 | No Ice | 1/2" | 34.24 | 34.24 | 1.75 |
| | | | | | | Ice | 62.95 | 62.95 | 2.10 |
| | | | | | | 1" Ice | 91.66 | 91.66 | 2.45 |
| | | | | | | 2" Ice | 149.08 | 149.08 | 3.15 |

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 |

| Comb. No. | Description |
|--------------|--|
| 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

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|----------------|------------------|-------------------|------------------|-----------------------|------------|--------------------------------|--------------------------------|
| L1 | 115.5 - 83.92 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 26 | -22.85 | 0.10 | -0.57 |
| | | | Max. Mx | 20 | -10.88 | 252.76 | 0.20 |
| | | | Max. My | 2 | -10.90 | 0.19 | 238.81 |
| | | | Max. Vy | 20 | -12.47 | 252.76 | 0.20 |
| | | | Max. Vx | 2 | -12.00 | 0.19 | 238.81 |
| L2 | 83.92 - 41.25 | Pole | Max. Torque | 25 | | 1.02 | |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 26 | -52.75 | 3.87 | 0.19 |
| | | | Max. Mx | 20 | -27.90 | 1110.74 | 0.43 |
| | | | Max. My | 2 | -27.92 | 1.77 | 1077.35 |
| | | | Max. Vy | 20 | -24.97 | 1110.74 | 0.43 |
| L3 | 41.25 - 0 | Pole | Max. Vx | 2 | -24.55 | 1.77 | 1077.35 |
| | | | Max. Torque | 25 | | 1.51 | |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 26 | -75.99 | 6.17 | 2.99 |
| | | | Max. Mx | 20 | -44.92 | 2459.08 | 1.43 |
| | | | Max. My | 2 | -44.92 | 2.64 | 2405.76 |
| | | | Max. Vy | 20 | -31.21 | 2459.08 | 1.43 |
| | | | Max. Vx | 2 | -30.80 | 2.64 | 2405.76 |
| | | | Max. Torque | 25 | | 1.39 | |

Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| Pole | Max. Vert | 26 | 75.99 | 0.00 | 0.00 |
| | Max. H _x | 20 | 44.93 | 31.20 | 0.01 |
| | Max. H _z | 2 | 44.93 | 0.01 | 30.79 |
| | Max. M _x | 2 | 2405.76 | 0.01 | 30.79 |
| | Max. M _z | 8 | 2455.02 | -31.20 | -0.01 |
| | Max. Torsion | 25 | 1.39 | 15.60 | 26.66 |
| | Min. Vert | 13 | 33.70 | -15.60 | -26.66 |
| | Min. H _x | 8 | 44.93 | -31.20 | -0.01 |
| | Min. H _z | 14 | 44.93 | -0.01 | -30.79 |
| | Min. M _x | 14 | -2404.12 | -0.01 | -30.79 |
| | Min. M _z | 20 | -2459.08 | 31.20 | 0.01 |
| | Min. Torsion | 13 | -1.36 | -15.60 | -26.66 |

Tower Mast Reaction Summary

| Load Combination | Vertical K | Shear _x K | Shear _z K | Overspinning Moment, M _x kip-ft | Overspinning Moment, M _z kip-ft | Torque kip-ft |
|------------------------------------|------------|----------------------|----------------------|--|--|---------------|
| Dead Only | 37.44 | 0.00 | 0.00 | -0.68 | 1.66 | 0.00 |
| 1.2 Dead+1.0 Wind 0 deg - No Ice | 44.93 | -0.01 | -30.79 | -2405.76 | 2.64 | -1.32 |
| 0.9 Dead+1.0 Wind 0 deg - No Ice | 33.70 | -0.01 | -30.79 | -2396.68 | 2.12 | -1.32 |
| 1.2 Dead+1.0 Wind 30 deg - No Ice | 44.93 | 15.59 | -26.66 | -2083.25 | -1225.98 | -0.90 |
| 0.9 Dead+1.0 Wind 30 deg - No Ice | 33.70 | 15.59 | -26.66 | -2075.36 | -1221.94 | -0.90 |
| 1.2 Dead+1.0 Wind 60 deg - No Ice | 44.93 | 27.01 | -15.39 | -1202.76 | -2125.54 | -0.25 |
| 0.9 Dead+1.0 Wind 60 deg - No Ice | 33.70 | 27.01 | -15.39 | -1198.12 | -2118.17 | -0.25 |
| 1.2 Dead+1.0 Wind 90 deg - No Ice | 44.93 | 31.20 | 0.01 | -0.22 | -2455.02 | 0.46 |
| 0.9 Dead+1.0 Wind 90 deg - No Ice | 33.70 | 31.20 | 0.01 | -0.01 | -2446.43 | 0.46 |
| 1.2 Dead+1.0 Wind 120 deg - No Ice | 44.93 | 27.02 | 15.40 | 1202.17 | -2126.15 | 1.05 |
| 0.9 Dead+1.0 Wind 120 deg - No Ice | 33.70 | 27.02 | 15.40 | 1197.93 | -2118.77 | 1.05 |
| 1.2 Dead+1.0 Wind 150 deg - No Ice | 44.93 | 15.60 | 26.66 | 2082.21 | -1227.03 | 1.36 |
| 0.9 Dead+1.0 Wind 150 deg - No Ice | 33.70 | 15.60 | 26.66 | 2074.74 | -1222.99 | 1.36 |
| 1.2 Dead+1.0 Wind 180 deg - No Ice | 44.93 | 0.01 | 30.79 | 2404.12 | 1.43 | 1.32 |
| 0.9 Dead+1.0 Wind 180 deg - No Ice | 33.70 | 0.01 | 30.79 | 2395.45 | 0.91 | 1.32 |
| 1.2 Dead+1.0 Wind 210 deg - No Ice | 44.93 | -15.59 | 26.66 | 2081.61 | 1230.04 | 0.93 |
| 0.9 Dead+1.0 Wind 210 deg - No Ice | 33.70 | -15.59 | 26.66 | 2074.14 | 1224.97 | 0.93 |
| 1.2 Dead+1.0 Wind 240 deg - No Ice | 44.93 | -27.01 | 15.39 | 1201.12 | 2129.60 | 0.28 |
| 0.9 Dead+1.0 Wind 240 deg - No Ice | 33.70 | -27.01 | 15.39 | 1196.89 | 2121.20 | 0.28 |
| 1.2 Dead+1.0 Wind 270 deg - No Ice | 44.93 | -31.20 | -0.01 | -1.43 | 2459.08 | -0.46 |
| 0.9 Dead+1.0 Wind 270 deg - No Ice | 33.70 | -31.20 | -0.01 | -1.22 | 2449.46 | -0.46 |
| 1.2 Dead+1.0 Wind 300 deg - No Ice | 44.93 | -27.02 | -15.40 | -1203.81 | 2130.21 | -1.08 |

| Load Combination | Vertical | Shear _x | Shear _z | Overshooting Moment, M _x | Overshooting Moment, M _z | Torque |
|--|----------|--------------------|--------------------|-------------------------------------|-------------------------------------|--------|
| | K | K | K | kip-ft | kip-ft | kip-ft |
| 0.9 Dead+1.0 Wind 300 deg - No Ice | 33.70 | -27.02 | -15.40 | -1199.16 | 2121.80 | -1.08 |
| 1.2 Dead+1.0 Wind 330 deg - No Ice | 44.93 | -15.60 | -26.66 | -2083.86 | 1231.09 | -1.39 |
| 0.9 Dead+1.0 Wind 330 deg - No Ice | 33.70 | -15.60 | -26.66 | -2075.97 | 1226.02 | -1.39 |
| 1.2 Dead+1.0 Ice+1.0 Temp | 75.99 | 0.00 | 0.00 | -2.99 | 6.17 | 0.00 |
| 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp | 75.99 | -0.00 | -6.65 | -532.27 | 6.57 | -0.29 |
| 1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp | 75.99 | 3.35 | -5.76 | -461.27 | -261.96 | -0.21 |
| 1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp | 75.99 | 5.81 | -3.32 | -267.49 | -458.59 | -0.07 |
| 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp | 75.99 | 6.71 | 0.00 | -2.84 | -530.63 | 0.09 |
| 1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp | 75.99 | 5.81 | 3.33 | 261.76 | -458.77 | 0.22 |
| 1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp | 75.99 | 3.36 | 5.76 | 455.42 | -262.28 | 0.30 |
| 1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp | 75.99 | 0.00 | 6.65 | 526.23 | 6.21 | 0.29 |
| 1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp | 75.99 | -3.35 | 5.76 | 455.23 | 274.74 | 0.21 |
| 1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp | 75.99 | -5.81 | 3.32 | 261.45 | 471.37 | 0.07 |
| 1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp | 75.99 | -6.71 | -0.00 | -3.20 | 543.41 | -0.09 |
| 1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp | 75.99 | -5.81 | -3.33 | -267.80 | 471.55 | -0.22 |
| 1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp | 75.99 | -3.36 | -5.76 | -461.45 | 275.05 | -0.30 |
| Dead+Wind 0 deg - Service | 37.44 | -0.00 | -6.18 | -482.51 | 1.81 | -0.28 |
| Dead+Wind 30 deg - Service | 37.44 | 3.13 | -5.35 | -417.89 | -244.33 | -0.18 |
| Dead+Wind 60 deg - Service | 37.44 | 5.42 | -3.09 | -241.49 | -424.55 | -0.04 |
| Dead+Wind 90 deg - Service | 37.44 | 6.26 | 0.00 | -0.56 | -490.56 | 0.11 |
| Dead+Wind 120 deg - Service | 37.44 | 5.43 | 3.09 | 240.33 | -424.68 | 0.23 |
| Dead+Wind 150 deg - Service | 37.44 | 3.13 | 5.35 | 416.65 | -244.54 | 0.29 |
| Dead+Wind 180 deg - Service | 37.44 | 0.00 | 6.18 | 481.14 | 1.57 | 0.28 |
| Dead+Wind 210 deg - Service | 37.44 | -3.13 | 5.35 | 416.53 | 247.71 | 0.19 |
| Dead+Wind 240 deg - Service | 37.44 | -5.42 | 3.09 | 240.12 | 427.93 | 0.05 |
| Dead+Wind 270 deg - Service | 37.44 | -6.26 | -0.00 | -0.80 | 493.94 | -0.11 |
| Dead+Wind 300 deg - Service | 37.44 | -5.43 | -3.09 | -241.70 | 428.05 | -0.23 |
| Dead+Wind 330 deg - Service | 37.44 | -3.13 | -5.35 | -418.01 | 247.92 | -0.29 |

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 | -37.44 | 0.00 | 0.00 | 37.44 | 0.00 | 0.000% |
| 2 | -0.01 | -44.93 | -30.79 | 0.01 | 44.93 | 30.79 | 0.000% |
| 3 | -0.01 | -33.70 | -30.79 | 0.01 | 33.70 | 30.79 | 0.000% |
| 4 | 15.59 | -44.93 | -26.66 | -15.59 | 44.93 | 26.66 | 0.000% |
| 5 | 15.59 | -33.70 | -26.66 | -15.59 | 33.70 | 26.66 | 0.000% |
| 6 | 27.01 | -44.93 | -15.39 | -27.01 | 44.93 | 15.39 | 0.000% |
| 7 | 27.01 | -33.70 | -15.39 | -27.01 | 33.70 | 15.39 | 0.000% |
| 8 | 31.20 | -44.93 | 0.01 | -31.20 | 44.93 | -0.01 | 0.000% |
| 9 | 31.20 | -33.70 | 0.01 | -31.20 | 33.70 | -0.01 | 0.000% |

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|--------|--------|------------------|-------|--------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 10 | 27.02 | -44.93 | 15.40 | -27.02 | 44.93 | -15.40 | 0.000% |
| 11 | 27.02 | -33.70 | 15.40 | -27.02 | 33.70 | -15.40 | 0.000% |
| 12 | 15.60 | -44.93 | 26.66 | -15.60 | 44.93 | -26.66 | 0.000% |
| 13 | 15.60 | -33.70 | 26.66 | -15.60 | 33.70 | -26.66 | 0.000% |
| 14 | 0.01 | -44.93 | 30.79 | -0.01 | 44.93 | -30.79 | 0.000% |
| 15 | 0.01 | -33.70 | 30.79 | -0.01 | 33.70 | -30.79 | 0.000% |
| 16 | -15.59 | -44.93 | 26.66 | 15.59 | 44.93 | -26.66 | 0.000% |
| 17 | -15.59 | -33.70 | 26.66 | 15.59 | 33.70 | -26.66 | 0.000% |
| 18 | -27.01 | -44.93 | 15.39 | 27.01 | 44.93 | -15.39 | 0.000% |
| 19 | -27.01 | -33.70 | 15.39 | 27.01 | 33.70 | -15.39 | 0.000% |
| 20 | -31.20 | -44.93 | -0.01 | 31.20 | 44.93 | 0.01 | 0.000% |
| 21 | -31.20 | -33.70 | -0.01 | 31.20 | 33.70 | 0.01 | 0.000% |
| 22 | -27.02 | -44.93 | -15.40 | 27.02 | 44.93 | 15.40 | 0.000% |
| 23 | -27.02 | -33.70 | -15.40 | 27.02 | 33.70 | 15.40 | 0.000% |
| 24 | -15.60 | -44.93 | -26.66 | 15.60 | 44.93 | 26.66 | 0.000% |
| 25 | -15.60 | -33.70 | -26.66 | 15.60 | 33.70 | 26.66 | 0.000% |
| 26 | 0.00 | -75.99 | 0.00 | 0.00 | 75.99 | 0.00 | 0.000% |
| 27 | -0.00 | -75.99 | -6.65 | 0.00 | 75.99 | 6.65 | 0.000% |
| 28 | 3.35 | -75.99 | -5.76 | -3.35 | 75.99 | 5.76 | 0.000% |
| 29 | 5.81 | -75.99 | -3.32 | -5.81 | 75.99 | 3.32 | 0.000% |
| 30 | 6.71 | -75.99 | 0.00 | -6.71 | 75.99 | -0.00 | 0.000% |
| 31 | 5.81 | -75.99 | 3.33 | -5.81 | 75.99 | -3.33 | 0.000% |
| 32 | 3.36 | -75.99 | 5.76 | -3.36 | 75.99 | -5.76 | 0.000% |
| 33 | 0.00 | -75.99 | 6.65 | -0.00 | 75.99 | -6.65 | 0.000% |
| 34 | -3.35 | -75.99 | 5.76 | 3.35 | 75.99 | -5.76 | 0.000% |
| 35 | -5.81 | -75.99 | 3.32 | 5.81 | 75.99 | -3.32 | 0.000% |
| 36 | -6.71 | -75.99 | -0.00 | 6.71 | 75.99 | 0.00 | 0.000% |
| 37 | -5.81 | -75.99 | -3.33 | 5.81 | 75.99 | 3.33 | 0.000% |
| 38 | -3.36 | -75.99 | -5.76 | 3.36 | 75.99 | 5.76 | 0.000% |
| 39 | -0.00 | -37.44 | -6.18 | 0.00 | 37.44 | 6.18 | 0.000% |
| 40 | 3.13 | -37.44 | -5.35 | -3.13 | 37.44 | 5.35 | 0.000% |
| 41 | 5.42 | -37.44 | -3.09 | -5.42 | 37.44 | 3.09 | 0.000% |
| 42 | 6.26 | -37.44 | 0.00 | -6.26 | 37.44 | -0.00 | 0.000% |
| 43 | 5.43 | -37.44 | 3.09 | -5.43 | 37.44 | -3.09 | 0.000% |
| 44 | 3.13 | -37.44 | 5.35 | -3.13 | 37.44 | -5.35 | 0.000% |
| 45 | 0.00 | -37.44 | 6.18 | -0.00 | 37.44 | -6.18 | 0.000% |
| 46 | -3.13 | -37.44 | 5.35 | 3.13 | 37.44 | -5.35 | 0.000% |
| 47 | -5.42 | -37.44 | 3.09 | 5.42 | 37.44 | -3.09 | 0.000% |
| 48 | -6.26 | -37.44 | -0.00 | 6.26 | 37.44 | 0.00 | 0.000% |
| 49 | -5.43 | -37.44 | -3.09 | 5.43 | 37.44 | 3.09 | 0.000% |
| 50 | -3.13 | -37.44 | -5.35 | 3.13 | 37.44 | 5.35 | 0.000% |

Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1 | Yes | 4 | 0.00000001 | 0.00000001 |
| 2 | Yes | 4 | 0.00000001 | 0.00005007 |
| 3 | Yes | 4 | 0.00000001 | 0.00003213 |
| 4 | Yes | 4 | 0.00000001 | 0.00031479 |
| 5 | Yes | 4 | 0.00000001 | 0.00020155 |
| 6 | Yes | 4 | 0.00000001 | 0.00033731 |
| 7 | Yes | 4 | 0.00000001 | 0.00021613 |
| 8 | Yes | 4 | 0.00000001 | 0.00002323 |
| 9 | Yes | 4 | 0.00000001 | 0.00001373 |
| 10 | Yes | 4 | 0.00000001 | 0.00035428 |
| 11 | Yes | 4 | 0.00000001 | 0.00022745 |
| 12 | Yes | 4 | 0.00000001 | 0.00030895 |
| 13 | Yes | 4 | 0.00000001 | 0.00019771 |
| 14 | Yes | 4 | 0.00000001 | 0.00004972 |
| 15 | Yes | 4 | 0.00000001 | 0.00003190 |
| 16 | Yes | 4 | 0.00000001 | 0.00034658 |
| 17 | Yes | 4 | 0.00000001 | 0.00022237 |
| 18 | Yes | 4 | 0.00000001 | 0.00032971 |
| 19 | Yes | 4 | 0.00000001 | 0.00021079 |

| | | | | |
|----|-----|---|------------|------------|
| 20 | Yes | 4 | 0.00000001 | 0.00002301 |
| 21 | Yes | 4 | 0.00000001 | 0.00001355 |
| 22 | Yes | 4 | 0.00000001 | 0.00031681 |
| 23 | Yes | 4 | 0.00000001 | 0.00020219 |
| 24 | Yes | 4 | 0.00000001 | 0.00035670 |
| 25 | Yes | 4 | 0.00000001 | 0.00022907 |
| 26 | Yes | 4 | 0.00000001 | 0.00000001 |
| 27 | Yes | 4 | 0.00000001 | 0.00026654 |
| 28 | Yes | 4 | 0.00000001 | 0.00027232 |
| 29 | Yes | 4 | 0.00000001 | 0.00027349 |
| 30 | Yes | 4 | 0.00000001 | 0.00026712 |
| 31 | Yes | 4 | 0.00000001 | 0.00027348 |
| 32 | Yes | 4 | 0.00000001 | 0.00027204 |
| 33 | Yes | 4 | 0.00000001 | 0.00026599 |
| 34 | Yes | 4 | 0.00000001 | 0.00027702 |
| 35 | Yes | 4 | 0.00000001 | 0.00028076 |
| 36 | Yes | 4 | 0.00000001 | 0.00027545 |
| 37 | Yes | 4 | 0.00000001 | 0.00028116 |
| 38 | Yes | 4 | 0.00000001 | 0.00027771 |
| 39 | Yes | 4 | 0.00000001 | 0.00000001 |
| 40 | Yes | 4 | 0.00000001 | 0.00000482 |
| 41 | Yes | 4 | 0.00000001 | 0.00000516 |
| 42 | Yes | 4 | 0.00000001 | 0.00000001 |
| 43 | Yes | 4 | 0.00000001 | 0.00000583 |
| 44 | Yes | 4 | 0.00000001 | 0.00000490 |
| 45 | Yes | 4 | 0.00000001 | 0.00000001 |
| 46 | Yes | 4 | 0.00000001 | 0.00000562 |
| 47 | Yes | 4 | 0.00000001 | 0.00000504 |
| 48 | Yes | 4 | 0.00000001 | 0.00000001 |
| 49 | Yes | 4 | 0.00000001 | 0.00000492 |
| 50 | Yes | 4 | 0.00000001 | 0.00000609 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L1 | 115.5 - 83.92 | 4.711 | 48 | 0.3292 | 0.0006 |
| L2 | 89.25 - 41.25 | 2.976 | 48 | 0.2933 | 0.0006 |
| L3 | 48 - 0 | 0.904 | 48 | 0.1678 | 0.0002 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 117.00 | BXA-171063-8BF-2 w/ Mount Pipe | 48 | 4.711 | 0.3292 | 0.0006 | 152899 |
| 104.00 | DB411-A | 48 | 3.934 | 0.3165 | 0.0006 | 66478 |
| 97.00 | APXVAARR24_43-U-NA20 | 48 | 3.471 | 0.3070 | 0.0006 | 41324 |
| 87.00 | 7770.00 w/ Mount Pipe | 48 | 2.836 | 0.2886 | 0.0005 | 27173 |
| 75.00 | 742 213 | 48 | 2.133 | 0.2578 | 0.0005 | 19952 |
| 69.00 | MX08FRO665-20 w/ Mount Pipe | 48 | 1.813 | 0.2396 | 0.0004 | 17616 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L1 | 115.5 - 83.92 | 23.437 | 20 | 1.6375 | 0.0027 |

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L2 | 89.25 - 41.25 | 14.808 | 20 | 1.4588 | 0.0026 |
| L3 | 48 - 0 | 4.499 | 20 | 0.8355 | 0.0008 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 117.00 | BXA-171063-8BF-2 w/ Mount Pipe | 20 | 23.437 | 1.6375 | 0.0027 | 30840 |
| 104.00 | DB411-A | 20 | 19.574 | 1.5743 | 0.0028 | 13408 |
| 97.00 | APXVAARR24_43-U-NA20 | 20 | 17.272 | 1.5267 | 0.0028 | 8334 |
| 87.00 | 7770.00 w/ Mount Pipe | 20 | 14.113 | 1.4352 | 0.0026 | 5478 |
| 75.00 | 742 213 | 20 | 10.617 | 1.2822 | 0.0021 | 4018 |
| 69.00 | MX08FRO665-20 w/ Mount Pipe | 20 | 9.024 | 1.1917 | 0.0019 | 3546 |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L _u ft | Kl/r | A in ² | P _u K | ϕP _n K | Ratio P _u ϕP _n |
|-------------|----------------------|------------------------|---------|----------------------|------|----------------------|---------------------|----------------------|--|
| L1 | 115.5 - 83.92 (1) | TP40.829x32.25x0.25 | 31.58 | 0.00 | 0.0 | 31.500 5 | -10.88 | 1704.79 | 0.006 |
| L2 | 83.92 - 41.25 (2) | TP51.92x38.8811x0.3125 | 48.00 | 0.00 | 0.0 | 50.085 0 | -27.90 | 2674.31 | 0.010 |
| L3 | 41.25 - 0 (3) | TP62.5x49.4614x0.375 | 48.00 | 0.00 | 0.0 | 75.015 9 | -44.92 | 3879.40 | 0.012 |

Pole Bending Design Data

| Section No. | Elevation ft | Size | M _{ux} kip-ft | ϕM _{nx} kip-ft | Ratio M _{ux} ϕM _{nx} | M _{uy} kip-ft | ϕM _{ny} kip-ft | Ratio M _{uy} ϕM _{ny} |
|-------------|----------------------|------------------------|---------------------------|----------------------------|--|---------------------------|----------------------------|--|
| L1 | 115.5 - 83.92 (1) | TP40.829x32.25x0.25 | 252.76 | 1361.13 | 0.186 | 0.00 | 1361.13 | 0.000 |
| L2 | 83.92 - 41.25 (2) | TP51.92x38.8811x0.3125 | 1110.74 | 2716.25 | 0.409 | 0.00 | 2716.25 | 0.000 |
| L3 | 41.25 - 0 (3) | TP62.5x49.4614x0.375 | 2459.08 | 4919.18 | 0.500 | 0.00 | 4919.18 | 0.000 |

Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual V _u K | ϕV _n K | Ratio V _u ϕV _n | Actual T _u kip-ft | ϕT _n kip-ft | Ratio T _u ϕT _n |
|-------------|----------------------|------------------------|-------------------------------|----------------------|--|------------------------------------|---------------------------|--|
| L1 | 115.5 - 83.92 (1) | TP40.829x32.25x0.25 | 12.47 | 552.83 | 0.023 | 0.13 | 1902.90 | 0.000 |
| L2 | 83.92 - 41.25 (2) | TP51.92x38.8811x0.3125 | 24.97 | 878.99 | 0.028 | 0.46 | 3848.45 | 0.000 |

| Section No. | Elevation ft | Size | Actual V_u K | ϕV_n K | Ratio V_u / ϕV_n | Actual T_u kip-ft | ϕT_n kip-ft | Ratio T_u / ϕT_n |
|-------------|---------------|----------------------|----------------|--------------|--------------------------|---------------------|-------------------|--------------------------|
| L3 | 41.25 - 0 (3) | TP62.5x49.4614x0.375 | 31.21 | 1316.53 | 0.024 | 0.46 | 7194.44 | 0.000 |

Pole Interaction Design Data

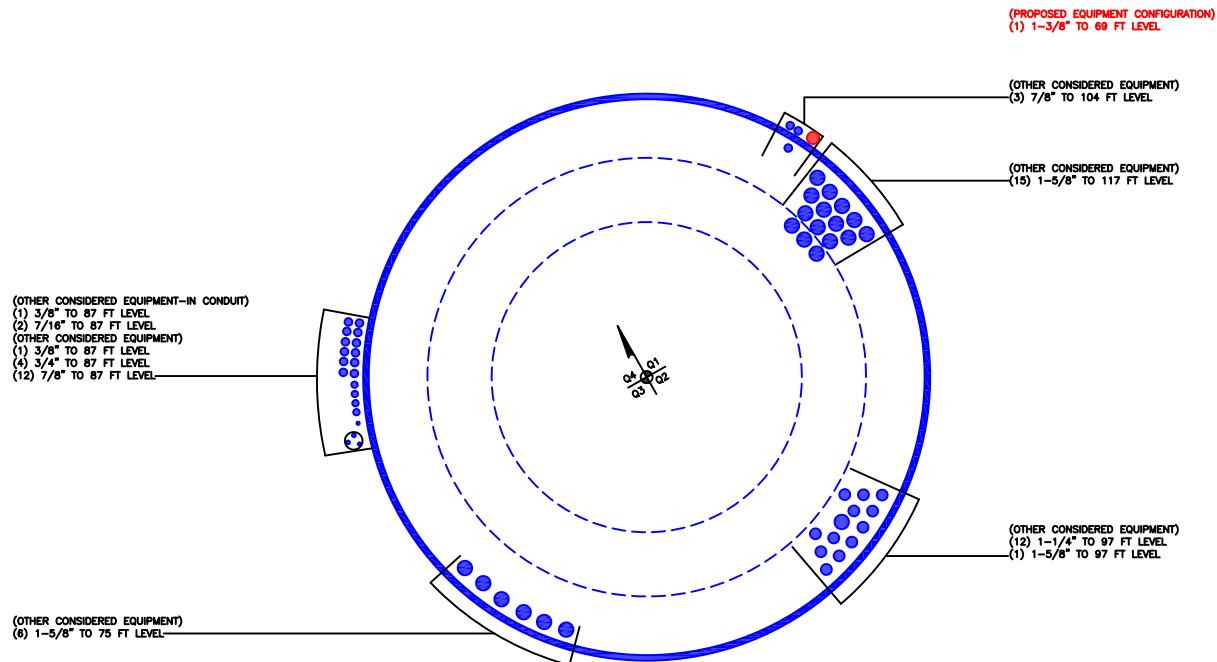
| Section No. | Elevation ft | Ratio P_u / ϕP_n | Ratio M_{ux} / ϕM_{nx} | Ratio M_{uy} / ϕM_{ny} | Ratio V_u / ϕV_n | Ratio T_u / ϕT_n | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|-------------------|--------------------------|--------------------------------|--------------------------------|--------------------------|--------------------------|--------------------|---------------------|----------|
| L1 | 115.5 - 83.92 (1) | 0.006 | 0.186 | 0.000 | 0.023 | 0.000 | 0.193 | 1.050 | 4.8.2 |
| L2 | 83.92 - 41.25 (2) | 0.010 | 0.409 | 0.000 | 0.028 | 0.000 | 0.420 | 1.050 | 4.8.2 |
| L3 | 41.25 - 0 (3) | 0.012 | 0.500 | 0.000 | 0.024 | 0.000 | 0.512 | 1.050 | 4.8.2 |

Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | ϕP_{allow} K | % Capacity | Pass Fail |
|-------------|---------------|----------------|------------------------|------------------|--------|--------------------|-------------|-------------|
| L1 | 115.5 - 83.92 | Pole | TP40.829x32.25x0.25 | 1 | -10.88 | 1790.03 | 18.3 | Pass |
| L2 | 83.92 - 41.25 | Pole | TP51.92x38.8811x0.3125 | 2 | -27.90 | 2808.03 | 40.0 | Pass |
| L3 | 41.25 - 0 | Pole | TP62.5x49.4614x0.375 | 3 | -44.92 | 4073.37 | 48.8 | Pass |
| | | | | | | Summary | | |
| | | | | | | Pole (L3) | 48.8 | Pass |
| | | | | | | RATING = | 48.8 | Pass |

APPENDIX B

BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

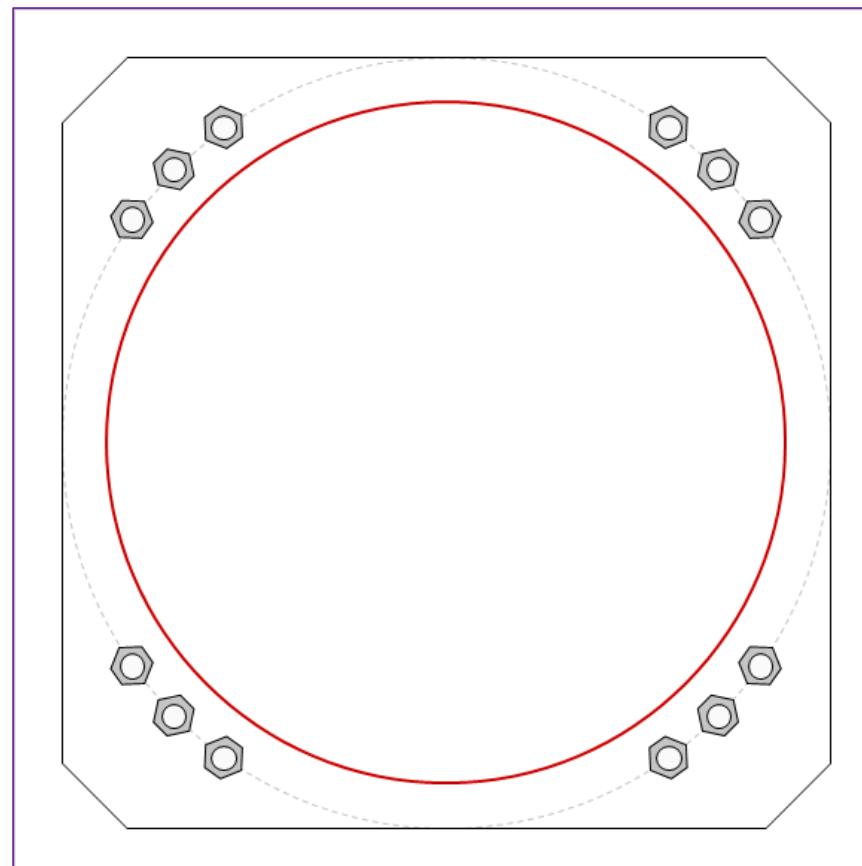


| Site Info | |
|-----------|----------------|
| BU # | 806367 |
| Site Name | HRT 046 943209 |
| Order # | 553284 Rev 0 |

| Analysis Considerations | |
|-------------------------|------|
| TIA-222 Revision | H |
| Grout Considered: | No |
| I_{ar} (in) | 1.75 |

| Applied Loads | |
|--------------------|---------|
| Moment (kip-ft) | 2459.08 |
| Axial Force (kips) | 44.92 |
| Shear Force (kips) | 31.21 |

*TIA-222-H Section 15.5 Applied



Connection Properties

Anchor Rod Data

(12) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 71" BC

Anchor Spacing: 6 in

Base Plate Data

71" W x 2.5" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi); Clip: 6 in

Stiffener Data

N/A

Pole Data

62.5" x 0.375" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Analysis Results

| Anchor Rod Summary | (units of kips, kip-in) | Stress Rating |
|--------------------|-------------------------|---------------|
| $P_{u,t} = 134.74$ | $\phi P_{n,t} = 243.75$ | 52.6% |
| $V_u = 2.6$ | $\phi V_n = 149.1$ | Pass |
| $M_u = n/a$ | $\phi M_n = n/a$ | |

Base Plate Summary

| | | |
|-------------------------|-------|------------|
| Max Stress (ksi): | 28.65 | (Flexural) |
| Allowable Stress (ksi): | 54 | |
| Stress Rating: | 50.5% | Pass |

Pier and Pad Foundation

| | |
|--------------|----------------|
| BU # : | 806367 |
| Site Name: | HRT 046 943209 |
| App. Number: | 553284 Rev 0 |



| | |
|-------------------|----------|
| TIA-222 Revision: | H |
| Tower Type: | Monopole |

| | |
|----------------------------------|-------------------------------------|
| Top & Bot. Pad Rein. Different?: | <input type="checkbox"/> |
| Block Foundation?: | <input checked="" type="checkbox"/> |
| Rectangular Pad?: | <input type="checkbox"/> |

| Superstructure Analysis Reactions | | |
|---|-------|---------|
| Compression, P_{comp} : | 45 | kips |
| Base Shear, V_{u_comp} : | 31 | kips |
| | | |
| Moment, M_u : | 2459 | ft-kips |
| Tower Height, H : | 115.5 | ft |
| | | |
| BP Dist. Above Fdn, bp_{dist} : | 6 | in |
| Bolt Circle / Bearing Plate Width, BC : | 71 | in |

| Foundation Analysis Checks | | | | |
|---------------------------------------|----------|---------|---------|-------|
| | Capacity | Demand | Rating* | Check |
| <i>Lateral (Sliding) (kips)</i> | 116.41 | 31.00 | 25.4% | Pass |
| <i>Bearing Pressure (ksf)</i> | 9.00 | 1.63 | 18.1% | Pass |
| <i>Overspinning (kip*ft)</i> | 4334.77 | 2598.50 | 59.9% | Pass |
| | | | | |
| <i>Pad Flexure (kip*ft)</i> | 3946.25 | 1038.91 | 25.1% | Pass |
| <i>Pad Shear - 1-way (kips)</i> | 1072.17 | 138.62 | 12.3% | Pass |
| <i>Pad Shear - 2-way (Comp) (ksi)</i> | 0.164 | 0.002 | 1.4% | Pass |
| <i>Flexural 2-way (Comp) (kip*ft)</i> | 3730.81 | 0.00 | 0.0% | Pass |

*Rating per TIA-222-H Section 15.5

| | |
|---------------------|--------------|
| Soil Rating*: | 59.9% |
| Structural Rating*: | 25.1% |

| Pad Properties | | |
|--|-----|----|
| Depth, D : | 3.5 | ft |
| Pad Width, W_1 : | 25 | ft |
| Pad Thickness, T : | 4 | ft |
| Pad Rebar Size (Bottom dir. 2), Sp_2 : | 8 | |
| Pad Rebar Quantity (Bottom dir. 2), mp_2 : | 26 | |
| Pad Clear Cover, cc_{pad} : | 3 | in |

| Material Properties | | |
|---|-----|-----|
| Rebar Grade, F_y : | 60 | ksi |
| Concrete Compressive Strength, F'_c : | 3 | ksi |
| Dry Concrete Density, δ_c : | 150 | pcf |

| Soil Properties | | |
|-------------------------------------|--------|---------|
| Total Soil Unit Weight, γ : | 120 | pcf |
| Ultimate Gross Bearing, Q_{ult} : | 12.000 | ksf |
| Cohesion, C_u : | | ksf |
| Friction Angle, φ : | 36 | degrees |
| SPT Blow Count, N_{blows} : | 33 | |
| Base Friction, μ : | 0.4 | |
| Neglected Depth, N : | 3.33 | ft |
| Foundation Bearing on Rock? | No | |
| Groundwater Depth, gw : | 8 | ft |

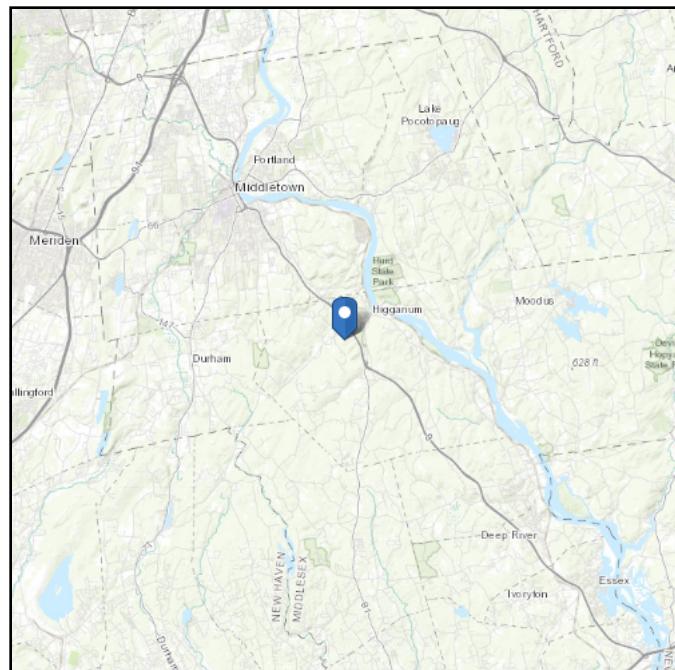
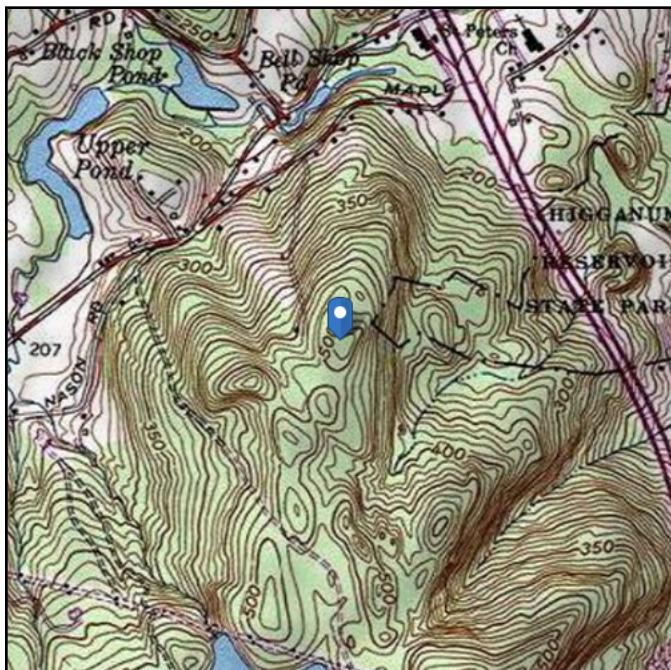
<--Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 514.59 ft (NAVD 88)
Latitude: 41.484594
Longitude: -72.572447



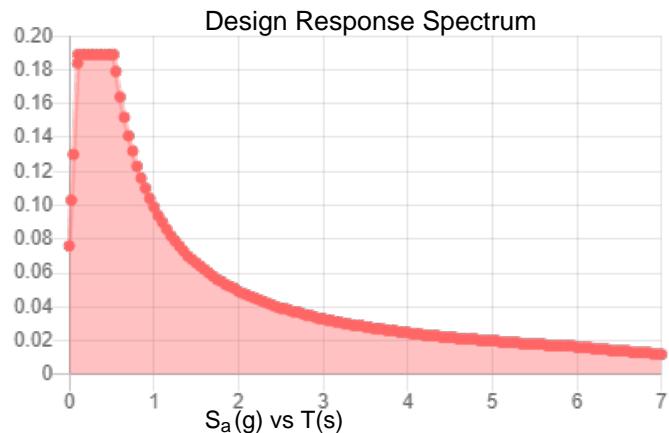
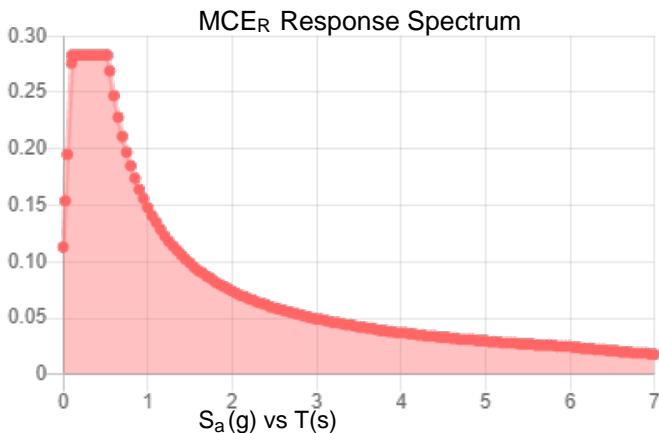
Seismic

Site Soil Class: D - Stiff Soil

Results:

| | | | |
|------------|-------|--------------------|-------|
| | | S_{DS} : | 0.189 |
| | | S_{D1} : | 0.099 |
| F_a : | 1.6 | T_L : | 6 |
| F_v : | 2.4 | PGA : | 0.09 |
| S_{MS} : | 0.283 | PGA _M : | 0.144 |
| S_{M1} : | 0.148 | F_{PGA} : | 1.6 |
| | | I_e : | 1 |

Seismic Design Category B



Data Accessed:

Wed Nov 18 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.

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: Wed Nov 18 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.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Exhibit E

Power Density/RF Emissions Report



RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of Dish Wireless

Crown Castle Site Name: HRT 046 943209

Crown Castle Site BU Number: 806367

Dish Wireless Site Name: CT-CCI-T-806367

Dish Wireless Site ID: BOBDL00043A

Application ID: 553284

65 Maple Avenue W

Haddam, CT

5/27/2021

Report Status:

Dish Wireless Is Compliant



Michael Fischer, P.E.
Registered Professional Engineer (Electrical)
Connecticut License Number 33928
Expires January 31, 2022

Signed 27 May 2021

Prepared By:

Site Safe, LLC

Engineering Statement in Re:
Electromagnetic Energy Analysis
Crown Castle
Haddam, 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 "HRT 046 943209" ("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 4.441% 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 19.632% 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.

Note: Crown Castle also currently has (1) panel antenna (Kathrein 742 213) on each of three sectors ((3) total antennas) spaced with azimuths of 30/150/270 degrees at a centerline of 77' above ground level. These antennas have an "abandoned" status in the CCI database and are therefore not active and were not included in this analysis.

**Crown Castle
HRT 046 943209
Site Summary**

| Carrier | Area Maximum Percentage MPE |
|-------------------------------|------------------------------------|
| AT&T Mobility, LLC | 1.080 % |
| AT&T Mobility, LLC | 1.327 % |
| AT&T Mobility, LLC | 1.101 % |
| AT&T Mobility, LLC | 2.376 % |
| AT&T Mobility, LLC | 1.350 % |
| Dish Wireless (Proposed) | 1.174 % |
| Dish Wireless (Proposed) | 1.174 % |
| Dish Wireless (Proposed) | 2.093 % |
| Haddam Volunteer Fire Company | 0.770 % |
| T-Mobile | 0.673 % |
| T-Mobile | 0.640 % |
| T-Mobile | 0.521 % |
| T-Mobile | 0.236 % |
| Verizon Wireless | 2.754 % |
| Verizon Wireless | 0.588 % |
| Verizon Wireless | 0.621 % |
| Verizon Wireless | 0.486 % |
| Verizon Wireless | 0.668 % |
| Composite Site MPE: | 19.633 % |

AT&T Mobility, LLC
HRT 046 943209
Carrier Summary

Frequency: 737 MHz
Maximum Permissible Exposure (MPE): 491.33 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 5.30543 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 1.07980 %

| 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 |
| Kathrein-Scala | 800-10965 | 89 | 0 | 2959 | 3.125104 | 0.636046 | 3.982956 | 0.810642 |
| Kathrein-Scala | 800-10965 | 89 | 120 | 2959 | 3.125104 | 0.636046 | 3.982956 | 0.810642 |
| Kathrein-Scala | 800-10966 | 89 | 240 | 3623 | 2.965391 | 0.60354 | 4.887382 | 0.994718 |

AT&T Mobility, LLC
HRT 046 943209
Carrier Summary

Frequency: 2100 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 13.27041 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 1.32704 %

| 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 | HPA65R-BU6A | 89 | 0 | 5497 | 9.373131 | 0.937313 | 12.755176 | 1.275518 |
| CCI Antennas | HPA65R-BU6A | 89 | 120 | 5497 | 9.373131 | 0.937313 | 12.755176 | 1.275518 |
| CCI Antennas | HPA65R-BU8A | 89 | 240 | 5372 | 13.190116 | 1.319012 | 13.190116 | 1.319012 |

AT&T Mobility, LLC
HRT 046 943209
Carrier Summary

Frequency: 763 MHz
Maximum Permissible Exposure (MPE): 508.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 5.60084 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 1.10108 %

| 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 | HPA65R-BU6A | 89 | 0 | 2819 | 2.934511 | 0.576903 | 3.018866 | 0.593486 |
| CCI Antennas | HPA65R-BU6A | 89 | 120 | 2819 | 2.934511 | 0.576903 | 3.018866 | 0.593486 |
| CCI Antennas | HPA65R-BU8A | 89 | 240 | 3312 | 2.583212 | 0.507840 | 5.104862 | 1.003577 |

AT&T Mobility, LLC
HRT 046 943209
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 23.76308 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 2.37631 %

| 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 | HPA65R-BU6A | 89 | 0 | 4788 | 15.489655 | 1.548966 | 18.008101 | 1.800810 |
| Kathrein-Scala | 800-10965 | 89 | 0 | 6168 | 3.496753 | 0.349675 | 7.639125 | 0.763912 |
| CCI Antennas | HPA65R-BU6A | 89 | 120 | 4788 | 15.489655 | 1.548966 | 18.008101 | 1.800810 |
| Kathrein-Scala | 800-10965 | 89 | 120 | 6168 | 3.496753 | 0.349675 | 7.639125 | 0.763912 |
| CCI Antennas | HPA65R-BU8A | 89 | 240 | 4679 | 15.201153 | 1.520115 | 15.201154 | 1.520115 |
| Kathrein-Scala | 800-10966 | 89 | 240 | 6168 | 3.997074 | 0.399707 | 8.558865 | 0.855886 |

AT&T Mobility, LLC
HRT 046 943209
Carrier Summary

Frequency: 850 MHz
 Maximum Permissible Exposure (MPE): 566.67 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 7.65272 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 1.35048 %

| 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 | 7770 | 89 | 0 | 547 | 0.706931 | 0.124753 | 1.093005 | 0.192883 |
| Kathrein-Scala | 800-10965 | 89 | 0 | 3607 | 2.991768 | 0.527959 | 3.074177 | 0.542502 |
| Powerwave | 7770 | 89 | 120 | 547 | 0.706931 | 0.124753 | 1.093005 | 0.192883 |
| Kathrein-Scala | 800-10965 | 89 | 120 | 3607 | 2.991768 | 0.527959 | 3.074177 | 0.542502 |
| Powerwave | 7770 | 89 | 240 | 547 | 0.706931 | 0.124753 | 1.093005 | 0.192883 |
| Kathrein-Scala | 800-10966 | 89 | 240 | 4287 | 2.914126 | 0.514258 | 6.374673 | 1.124942 |

Dish Wireless (Proposed)
HRT 046 943209
Carrier Summary

Frequency: 2100 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 11.74448 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 1.17445 %

| 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 | 69 | 0 | 6904 | 5.083289 | 0.508329 | 11.504982 | 1.150498 |
| JMA Wireless | MX08FRO665-20 | 69 | 120 | 6904 | 5.083289 | 0.508329 | 11.504982 | 1.150498 |
| JMA Wireless | MX08FRO665-20 | 69 | 240 | 6904 | 5.083289 | 0.508329 | 11.504982 | 1.150498 |

Dish Wireless (Proposed)
HRT 046 943209
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 11.74448 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 1.17445 %

| 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 | 69 | 0 | 6904 | 5.083289 | 0.508329 | 11.504982 | 1.150498 |
| JMA Wireless | MX08FRO665-20 | 69 | 120 | 6904 | 5.083289 | 0.508329 | 11.504982 | 1.150498 |
| JMA Wireless | MX08FRO665-20 | 69 | 240 | 6904 | 5.083289 | 0.508329 | 11.504982 | 1.150498 |

Dish Wireless (Proposed)
HRT 046 943209
Carrier Summary

Frequency: 600 MHz
Maximum Permissible Exposure (MPE): 400 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 8.37226 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 2.09306 %

| 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 | 69 | 0 | 3229 | 4.938994 | 1.234748 | 8.005541 | 2.001385 |
| JMA Wireless | MX08FRO665-20 | 69 | 120 | 3229 | 4.938994 | 1.234748 | 8.005541 | 2.001385 |
| JMA Wireless | MX08FRO665-20 | 69 | 240 | 3229 | 4.938994 | 1.234748 | 8.005541 | 2.001385 |

Haddam Volunteer Fire Company
HRT 046 943209
Carrier Summary

Frequency: 450 MHz
Maximum Permissible Exposure (MPE): 300 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.30889 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.76963 %

| 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 |
| MAXRAD | MFB4505 | 107 | 0 | 100 | 0.959270 | 0.319757 | 0.959270 | 0.319757 |
| ANDREW | DB411-A | 109 | 180 | 100 | 0.554707 | 0.184902 | 0.867411 | 0.289137 |
| ANDREW | DB411-A | 109 | 300 | 100 | 0.554707 | 0.184902 | 0.867411 | 0.289137 |

T-Mobile
HRT 046 943209
Carrier Summary

Frequency: 2100 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 6.72526 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.67253 %

| 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 | 98 | 30 | 8632 | 3.548872 | 0.354887 | 6.672802 | 0.667280 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 150 | 8632 | 3.548872 | 0.354887 | 6.672802 | 0.667280 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 270 | 8632 | 3.548872 | 0.354887 | 6.672802 | 0.667280 |

T-Mobile
HRT 046 943209
Carrier Summary

Frequency: 700 MHz
Maximum Permissible Exposure (MPE): 466.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.98492 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.63963 %

| 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 | 98 | 30 | 3484 | 2.387972 | 0.511708 | 2.561404 | 0.548872 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 150 | 3484 | 2.387972 | 0.511708 | 2.561404 | 0.548872 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 270 | 3484 | 2.387972 | 0.511708 | 2.561404 | 0.548872 |

T-Mobile
HRT 046 943209
Carrier Summary

Frequency: 600 MHz
Maximum Permissible Exposure (MPE): 400 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.08533 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.52133 %

| 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 | 98 | 30 | 1251 | 0.917075 | 0.229269 | 0.917075 | 0.229269 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 30 | 1251 | 0.917075 | 0.229269 | 0.917075 | 0.229269 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 150 | 1251 | 0.917075 | 0.229269 | 0.917075 | 0.229269 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 150 | 1251 | 0.917075 | 0.229269 | 0.917075 | 0.229269 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 270 | 1251 | 0.917075 | 0.229269 | 0.917075 | 0.229269 |
| RFS | APXVAARR24_43-U-NA20 | 98 | 270 | 1251 | 0.917075 | 0.229269 | 0.917075 | 0.229269 |

T-Mobile
HRT 046 943209
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.36045 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.23604 %

| 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 |
| EMS | RR90-17-02DPL | 98 | 30 | 1653 | 1.187527 | 0.118753 | 1.908045 | 0.190804 |
| EMS | RR90-17-02DPL | 98 | 150 | 1653 | 1.187527 | 0.118753 | 1.908045 | 0.190804 |
| EMS | RR90-17-02DPL | 98 | 270 | 1653 | 1.187527 | 0.118753 | 1.908045 | 0.190804 |

Verizon Wireless
HRT 046 943209
Carrier Summary

Frequency: 3700 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 27.54129 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 2.75413 %

| 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 |
| Samsung | MT6407-77A | 120 | 40 | 43155 | 8.916468 | 0.891647 | 22.346575 | 2.234658 |
| Samsung | MT6407-77A | 120 | 150 | 43155 | 8.916468 | 0.891647 | 22.346575 | 2.234658 |
| Samsung | MT6407-77A | 120 | 270 | 43155 | 8.916468 | 0.891647 | 22.346575 | 2.234658 |

Verizon Wireless
HRT 046 943209
Carrier Summary

Frequency: 2100 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 5.87583 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.58758 %

| 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 |
| Commscope | JAHH-65B-R3B | 120 | 40 | 6069 | 3.153684 | 0.315368 | 5.560254 | 0.556025 |
| Commscope | JAHH-65B-R3B | 120 | 150 | 6069 | 3.153684 | 0.315368 | 5.560254 | 0.556025 |
| Commscope | JAHH-65B-R3B | 120 | 270 | 6069 | 3.153684 | 0.315368 | 5.560254 | 0.556025 |

Verizon Wireless
HRT 046 943209
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 6.21174 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.62117 %

| 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 |
| Commscope | JAHH-65B-R3B | 120 | 40 | 5890 | 3.680165 | 0.368016 | 5.764500 | 0.576450 |
| Commscope | JAHH-65B-R3B | 120 | 150 | 5890 | 3.680165 | 0.368016 | 5.764500 | 0.576450 |
| Commscope | JAHH-65B-R3B | 120 | 270 | 5890 | 3.680165 | 0.368016 | 5.764500 | 0.576450 |

Verizon Wireless
HRT 046 943209
Carrier Summary

Frequency: 751 MHz
Maximum Permissible Exposure (MPE): 500.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.43178 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.48571 %

| 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 |
| Commscope | JAHH-65B-R3B | 120 | 40 | 2661 | 1.329943 | 0.265634 | 1.892686 | 0.378033 |
| Commscope | JAHH-65B-R3B | 120 | 150 | 2661 | 1.329943 | 0.265634 | 1.892686 | 0.378033 |
| Commscope | JAHH-65B-R3B | 120 | 270 | 2661 | 1.329943 | 0.265634 | 1.892686 | 0.378033 |

Verizon Wireless
HRT 046 943209
Carrier Summary

Frequency: 850 MHz
Maximum Permissible Exposure (MPE): 566.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 3.78758 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.66840 %

| 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 |
| Antel | LPA-80080-6CF | 120 | 30 | 1005 | 0.400728 | 0.070717 | 0.731491 | 0.129087 |
| Commscope | JAHH-65B-R3B | 120 | 40 | 3120 | 1.333415 | 0.235309 | 2.145345 | 0.378590 |
| Antel | LPA-80080-6CF | 120 | 30 | 1005 | 0.400728 | 0.070717 | 0.731491 | 0.129087 |
| Antel | LPA-80063-6CF | 120 | 150 | 1127 | 0.550915 | 0.097220 | 0.566055 | 0.099892 |
| Commscope | JAHH-65B-R3B | 120 | 150 | 3120 | 1.333415 | 0.235309 | 2.145345 | 0.378590 |
| Antel | LPA-80063-6CF | 120 | 150 | 1127 | 0.550915 | 0.097220 | 0.566055 | 0.099892 |
| Antel | LPA-80063-6CF | 120 | 270 | 1127 | 0.550915 | 0.097220 | 0.566055 | 0.099892 |
| Commscope | JAHH-65B-R3B | 120 | 270 | 3120 | 1.333415 | 0.235309 | 2.145345 | 0.378590 |
| Antel | LPA-80063-6CF | 120 | 270 | 1127 | 0.550915 | 0.097220 | 0.566055 | 0.099892 |