

## PROJECT NARRATIVE

April 8, 2022

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  
16 Titicus Mountain Road, New Fairfield, CT 06812  
Latitude: 41°27'2.39" / Longitude: -73°30'57.56"

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 16 Titicus Mountain Road in New Fairfield (the "Property"). The existing 187-foot self-support tower is owned by American Tower Corporation ("ATC"). The underlying property is owned by American Towers Inc. DISH requests that the Council find that the proposed shared use of the ATC tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. A copy of this filing is being sent to Pat Del Monaco, First Selectman for the Town of New Fairfield, Eric J. Kist, Town of New Fairfield Building Official and American Towers Inc. as the property owner.

## **Background**

This facility was originally built in August 1967 according to an appraisal record letter by United Appraisal Company dated May 26, 1971 with no known conditions. A copy of this letter is included in this filing. The existing ATC facility consists of a 187-foot self-support tower located within an existing leased area. T-Mobile currently maintains antennas at the 193-foot level. Sprint/Nextel currently maintains antennas at the 167-foot level. AT&T Mobility currently maintains antennas at the 155 and 160-foot levels. Verizon Wireless currently maintains antennas at the 146-foot level and the U.S. Dept. of Homeland Security currently maintains antennas at the 80-foot level. Equipment associated with these antennas are located at various positions within the tower and compound.

DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and ATC have agreed to the proposed shared use of the 16 Titicus Mountain Road tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and ATC have agreed to the proposed installation of equipment cabinets on the ground within the existing compound. ATC has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.  
(See attached Letter of Authorization)

DISH proposes to install three (3) antennas, (1) Tower platform mount, (6) Remote radio units at the 137-foot level along with, (1) over voltage protection device (OVP) and (1) Hybrid cable. DISH will install an equipment cabinet on a 5'x7' equipment platform. DISH's Construction Drawings provide project specifications for all proposed site improvement locations.

The construction drawings also include specifications for DISH's proposed antenna and groundwork.

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 ATC 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 ATC 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 ATC 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 ATC facility other than periodic maintenance. The proposed shared use of the ATC 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 ATC 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, (1) Tower platform mount, (6) Remote radio units, (1) over voltage protection device (OVP) and (1) Hybrid cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing ATC tower.

### **Conclusion**

For the reasons discussed above, the proposed shared use of the existing ATC tower at 16 Titicus Mountain Road satisfies the criteria stated in C.G.S. §16-50aa and advances 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,

*David Hoogasian*

**David Hoogasian**  
*Project Manager*

## LETTER OF AUTHORIZATION



### LETTER OF AUTHORIZATION

I, Margaret Robinson, Senior Counsel for American Tower\*, owner/operator of the tower facility located at the address identified above (the “Tower Facility”), do hereby authorize **DISH WIRELESS L.L.C.**, its successors and assigns, and/or its agent, **NETWORK BUILDING + CONSULTING** (collectively, the “Licensee”) to act as American Tower’s non-exclusive agent for the sole purpose of filing and consummating any land-use or building permit application(s) as may be required by the applicable permitting authorities for Licensee’s telecommunications’ installation.

We understand that this application may be denied, modified or approved with conditions. The above authorization is limited to the acceptance by Licensee only of conditions related to Licensee’s installation and any such conditions of approval or modifications will be Licensee’s sole responsibility.

\*American Tower includes all affiliates and subsidiaries of American Tower Corporation.

Project Number	Site Address	Customer Site Number	Tower Number	Site Name
13685414	5 High Ridge Park Road, Stamford CT	NJER01080B	302515	SMFR - North
13685427	1069 Connecticut Avenue, Bridgeport CT	NJER01130A	302469	Bridgeport CT 2
13688395	25 Meridian Ridge Drive, Newton CT	NJER01081B	302518	Newtown CT 3
13699598	100 Old Redding Road, Redding CT	NJER01161A	302522	Redding
13699607	22 Titicus Mtn Road, New Fairfield CT	NJER01162A	88014	New Fairfield
13700310	2 SUNNY LANE, Westport CT	NJER01082B	411189	CRANBURYSU CT
13700315	515 Morehouse Road, Easton CT	NJER01097B	207956	Easton
13700320	100 Pocono Road, Brookfield CT	NJER01099B	209271	Brookfield 2
13700322	320 Old Stagecoach Road, Ridgefield CT	NJER01100B	209115	Ridgefield 2
13705673	20 Post Office Lane, Westport CT	NJER01139B	302511	WSPT - South



**AMERICAN TOWER®**  
CORPORATION

13709691	180A Bayberry Lane, Westport CT	NJER01140B	310968	WSPT- WESTPORT REBUILD CT
13709692	1000 Trumbull Avenue, Bridgeport CT	NJER01150B	383598	Tartaglia
13710333	168 Catoona Lane, Stamford CT	NJER01123B	88018	Stamford (Katoona)
13712876	23 Stonybrook Road, Stratford CT	NJER02048A	283420	STONEBROOK RD CT
13735391	15 Soundview Avenue, Shelton CT	NJER02055A	415438	Brownson Country Club CT

Print Name: Margaret Robinson  
Senior Counsel, American Tower\*

**LETTER OF AUTHORIZATION**

**DISH WIRELESS L.L.C., its successors and assigns, and/or its agent, NETWORK BUILDING + CONSULTING**

**NOTARY BLOCK**

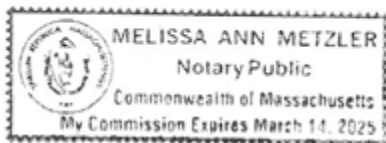
Commonwealth of MASSACHUSETTS

County of Middlesex

This instrument was acknowledged before me by Margaret Robinson, Senior Counsel for American Tower\*, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same.

WITNESS my hand and official seal, this 19<sup>th</sup> day of November 2021.

NOTARY SEAL



Notary Public   
My Commission Expires: March 14, 2025

## ORIGINAL FACILITY APPROVAL

27 2 7.1 & 7.3  
=

Robert Coe  
Tax Attorney



**AT&T Long Lines**

32 Ave. of the Americas  
New York, N.Y. 10013  
Phone (212) 393-6658

May 26, 1971

United Appraisal Company  
53 Connecticut Blvd.  
East Hartford, Connecticut 06108

Attention: Mr. Sherwood S. Vermilya, President

Dear Mr. Vermilya:

This is in response to your letter of May 19, 1971 pertaining to the micro-wave radio relay station owned by this Company in the Town of New Fairfield. The total real property owned is described below.

New Fairfield Radio Relay Station

Land: a parcel of 5.11615 acres purchased as 2 separate parcels as follows:

1. 91'x470' or 1.09124 acres purchased 8-15-66 from Rascke, recorded Book 90, Page 255.
2. 375'x470' or 4.02491 acres purchased 8-24-66 from Kovalik, Eason and the Campo Estate, recorded Book 90, Page 478.

Improvements:

Building: a one story reinforced concrete building structure, 56'10"x56'10"x15'8" high, outside dimensions, without basement, plumbing, water supply or fixtures, built to function as an unattended micro-wave radio relay route amplifying station. The building was completed July 1967 for about \$108,450.

Tower: a 187-1/2' lightweight antenna support skeletal steel tower on reinforced concrete foundation piers is built adjacent to the building, completed August 1967 for about \$39,950.

If you need any further information, please let me know.

Very truly yours,

will not disturb the normal peace and quiet of the area.

All equipment and structures shall be such as are incidental and appropriate for the specific activities of the club and subject to the rules and regulations enacted from time to time by the Planning and Zoning Commission.

P. The Commission shall have the power to issue construction or use permits to Public Utilities which are subject to governmental regulations provided that the Commission shall find that the location and character of the facility in question will not unduly injure the property in the area and will not disturb the safety, peace and quiet of the neighborhood.

No permit shall be issued for the erection of any such structure or facility without a Public Hearing being held by the Commission.

Q. Churches and eleemosynary institutions.

#### **ARTICLE V—Permit Requirements**

Section 1. No building shall be erected or altered in the Town of New Fairfield, and no septic tank, well or field shall be erected, relocated or extended contrary to the regulations of the Commission and no land shall be used for any restricted commercial use without securing a permit from the Commission.

Section 2. Except where Commission rules otherwise for special reason, lot side lines shall be approximately at right angles to straight street lines or radial to curving street lines.

Section 3. No building permit shall be issued until the Health Officer for the town has in writing approved the location as to health, sanitation and water supply and has specified the required water, sewage and sanitation installation. No certificate of occupancy shall be issued until said Health Officer has in writing approved the completed health, sanitation, water and sewage installations. The Health Officer may appoint a deputy to make necessary tests and inspections and report his findings to him.

Section 4. No lot in any zone shall be so reduced in size that any required open space will be smaller than is prescribed or so that any violation of these regulations will result, and no owner or occupant of any building or land shall take any action subsequent to the granting of any permit which results in any violation.

Section 5. No building permit or certificate of occupancy shall be issued for an inaccessible dwelling except subject to the following terms and conditions:

The permittee shall waive all claims against the Town of New Fairfield relating to Fire and Police protection.

Children within the age where school attendance is legally mandatory shall not be permitted to live in said dwelling during Public School sessions, unless the parents, guardians or other persons responsible for them, shall make provision for their attendance at regular school sessions except in cases of absences excused by the proper authority.

In the event of any violation, the Commission, after due notice and hearing of all parties directly interested, may revoke all outstanding building permits and certificates of occupancy and in lieu thereof and on proper application to it, shall issue a permit for seasonal occupancy only from the first day of May to the first day of November in each year.

If, as and when, any inaccessible dwelling shall cease to be an inaccessible dwelling, by reason of the establishment of a requisite road, the restrictions of this regulation shall automatically cease to apply.

In the event that this regulation or any part thereof shall be held invalid or inapplicable as to particular lot or lots, said holding shall not affect the validity or applicability of the regulations to any other property.

Section 6. No building shall be erected or altered for any purpose, and no land or building shall be used for any new restricted commercial purpose, without previously obtaining a permit as herein provided.

Section 7. All permits shall be issued in quadruplicate on prenumbered forms, one copy to be sent to the Board of Assessors, one to the State Health Officer of the Town, one for the Field Director and one for the applicant.

Section 8. No building or structure or part thereof shall be erected, converted, enlarged or moved without a Building permit from the said Commission or its agent, issued upon application, on which the plans and intended use indicate that the building is to conform in all respects with the provisions of these regulations. Nor shall any building or structure be razed without a building permit. A fee as determined by the Planning and Zoning Commission may be required.

Section 9. Every application for a Building Permit shall be accompanied by payment of fees as established by the Planning and Zoning Commission. Such fees may be retained by the Town

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# **Planning and Zoning Regulations of the Town of New Fairfield**

**CONNECTICUT**

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**Planning Regulations as Amended  
Effective February 2, 1970**

**Zoning Regulations as Amended  
Effective March, 1967**

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**\$1.00 per copy**

# ENGINEERING DRAWINGS



DISH Wireless L.L.C. SITE ID:

NJJER01162A

DISH Wireless L.L.C. SITE ADDRESS:

22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

#### 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 PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
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:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
  - INSTALL (3) PROPOSED ANTENNA MOUNTS (1 PER SECTOR)
  - 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:
- 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 FIBER NID (IF REQUIRED)

#### SITE PHOTO



UNDERGROUND SERVICE ALERT CBYD 811  
UTILITY NOTIFICATION CENTER OF CONNECTICUT  
(800) 922-4455  
WWW.CBYD.COM

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION



#### GENERAL NOTES

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

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

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

#### SITE INFORMATION

PROPERTY OWNER: AMERICAN TOWERS INC C/O  
ADDRESS: AMERICAN TOWER CORPORATION  
PO BOX 723597  
ATLANTA, GA 31139

TOWER TYPE: SELF-SUPPORT TOWER

TOWER CO SITE ID: 88014

TOWER APP NUMBER: 13699607

COUNTY: FAIRFIELD

LATITUDE (NAD 83): 41° 27' 2.39" N  
41.45066389 N

LONGITUDE (NAD 83): 73° 30' 57.56" W  
73.51598889 W

ZONING JURISDICTION: CONNECTICUT SITING COUNCIL

ZONING DISTRICT: COMMERCIAL

PARCEL NUMBER: 27/2/7.3

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: CT LIGHT & POWER CO

TELEPHONE COMPANY: CHARTER

#### PROJECT DIRECTORY

APPLICANT: DISH Wireless L.L.C.  
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

TOWER OWNER: AMERICAN TOWER CORPORATION  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801  
(781) 926-4500

SITE DESIGNER: B+T GROUP  
1717 S. BOULDER AVE, SUITE 300  
TULSA, OK 74119  
(918) 587-4630

SITE ACQUISITION: WILLIAM SNIDER  
WILLIAM.SNIDER@DISH.COM

CONSTR. MANAGER: MICHAEL NARDUCCI  
MICHAEL.NARDUCCI@DISH.COM

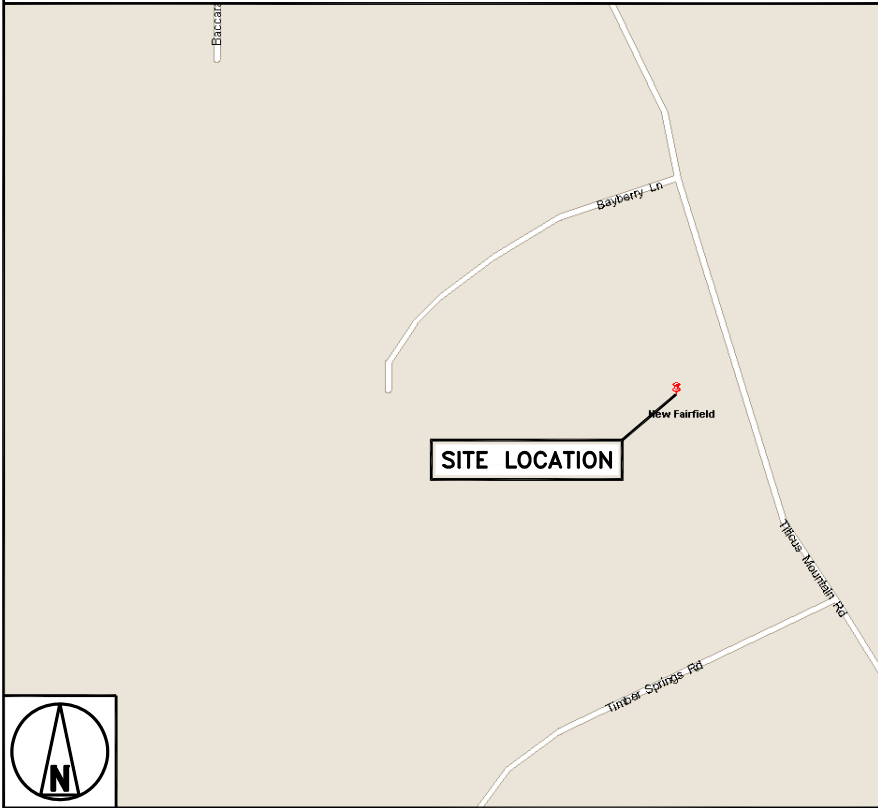
RF ENGINEER: MURUGABIRAN JAYAPAL  
MURUGABIRAN.JAYAPAL@DISH.COM

#### DIRECTIONS

##### DIRECTIONS FROM 3 ADP BLVD, ROSELAND NJ 07068:

TURN RIGHT ONTO CR-527 (LIVINGSTON AVE), TAKE RAMP BEARING RIGHT ONTO I-280 AT EXIT 17B, STAY ON I-280, TAKE RAMP ONTO I-95 (NJ TPKE) STAY ON I-95 NORTH, AT EXIT 73 STAY ON I-95 EAST (ENTERING NY) STAY ON I-95 EAST (US-1), AT EXIT 3 KEEP STRAIGHT ONTO RAMP, TAKE RAMP ONTO I-87 (MAJOR DEEGAN EXPY) AT EXIT 4 TAKE RAMP ONTO CENTRAL PARK AVE, KEEP RIGHT ONTO RAMP, TAKE RAMP ONTO CROSS COUNTRY PKWY, MERGE ONTO HUTCHINSON RIVER PKWY N, KEEP LEFT ONTO I-684, THROUGH CONNECTICUT TO NEW YORK, RD NAME CHANGES TO RT-22, TURN RIGHT ONTO CR-54 (MILLTOWN RD, ENTERING CONNECTICUT RD NAME CHANGES TO MILLTOWN RD, TURN RIGHT ONTO CT-39 (BALL POND RD), TURN LEFT ONTO OLD BALL POND RD, RD NAME CHANGES TO TITICUS MOUNTAIN RD, ARRIVE AT NJJER01162A.

#### VICINITY MAP



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



AMERICAN TOWER®  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801



B+T GRP  
1717 S. BOULDER  
SUITE 300  
TULSA, OK 74119  
PH: (918) 587-4630  
www.btgrp.com



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

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

DRAWN BY: CHECKED BY: APPROVED BY:

BLJ/CDW LS MP

RFDS REV #: 3

#### CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	8/11/21	ISSUED FOR REVIEW
0	9/3/21	ISSUED FOR CONSTRUCTION
1	9/9/21	ISSUED FOR CONSTRUCTION

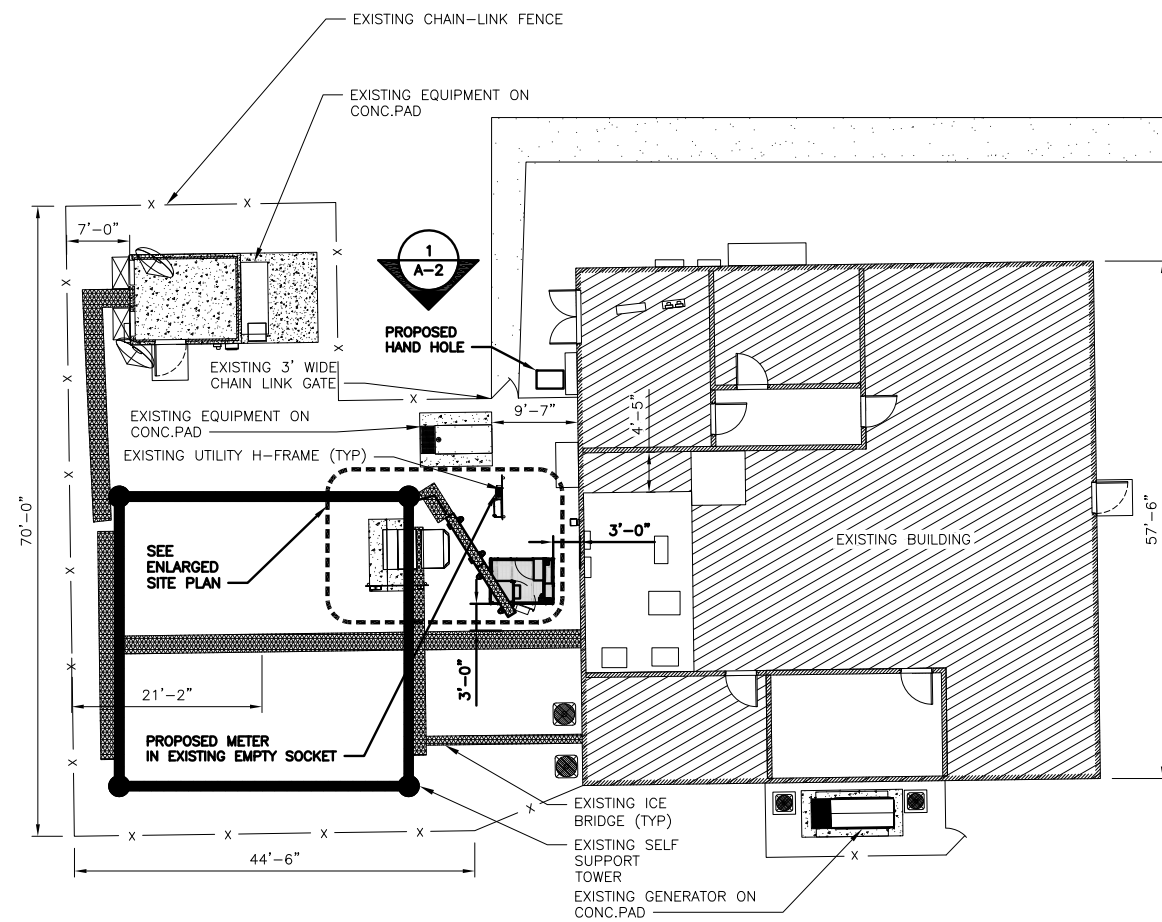
A&E PROJECT NUMBER  
153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
TITLE SHEET

SHEET NUMBER  
T-1

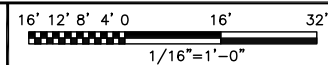
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



TITICUS MOUNTAIN RD

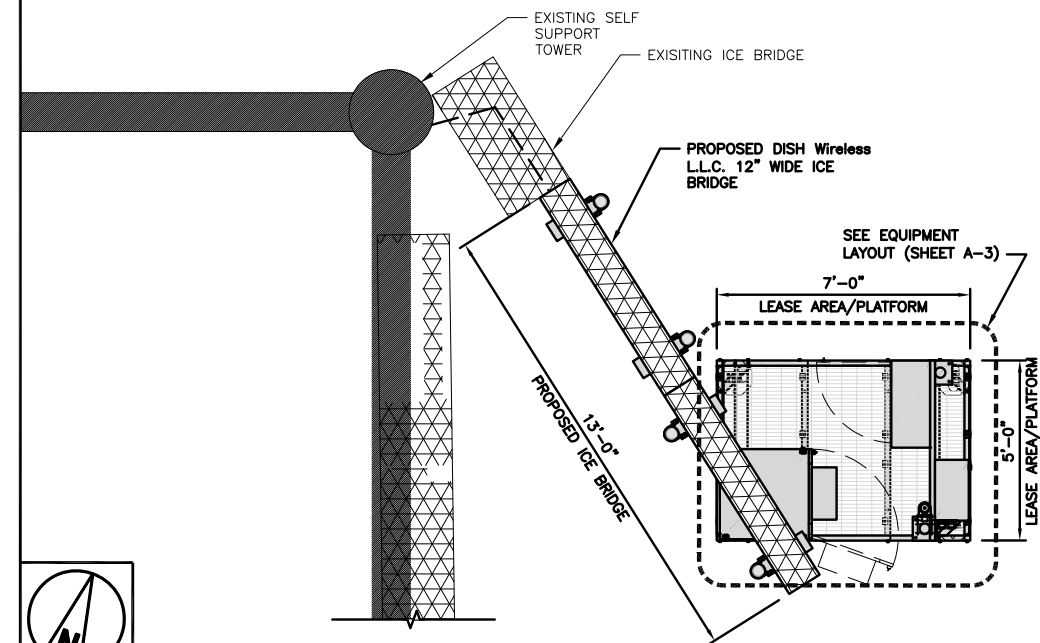


## OVERALL SITE PLAN

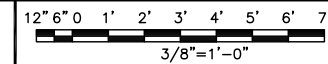


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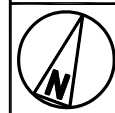
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN



2



AN EXISTING CONDITIONS SURVEY WAS NOT AVAILABLE AT THE TIME THIS  
DRAWING'S CREATION

AERIAL IMAGE

3

**dish**  
**wireless.**

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



**AMERICAN TOWER®**  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801



**B+T GRP**  
1717 S. BOULDER  
SUITE 300  
TULSA, OK 74119  
PH: (918) 587-4630  
[www.btgrp.com](http://www.btgrp.com)



9/9/21

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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
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BLJ/CDW	LS	MP
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RFDS REV #: 3

CONSTRUCTION  
DOCUMENTS

## SUBMITTALS

REV	DATE	DESCRIPTION
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A&amp;E PROJECT NUMBER

153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
OVERALL AND ENLARGED  
SITE PLAN

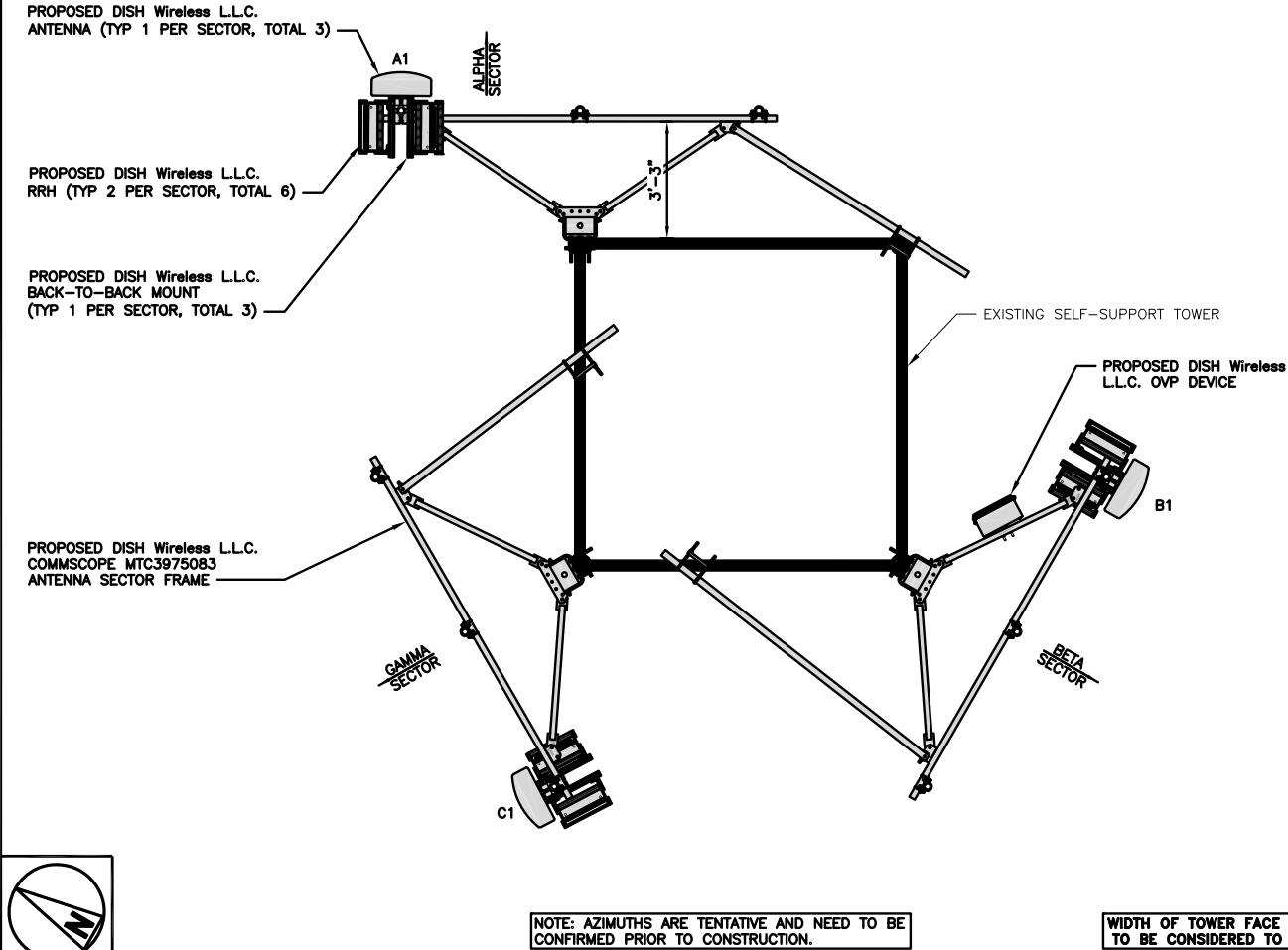
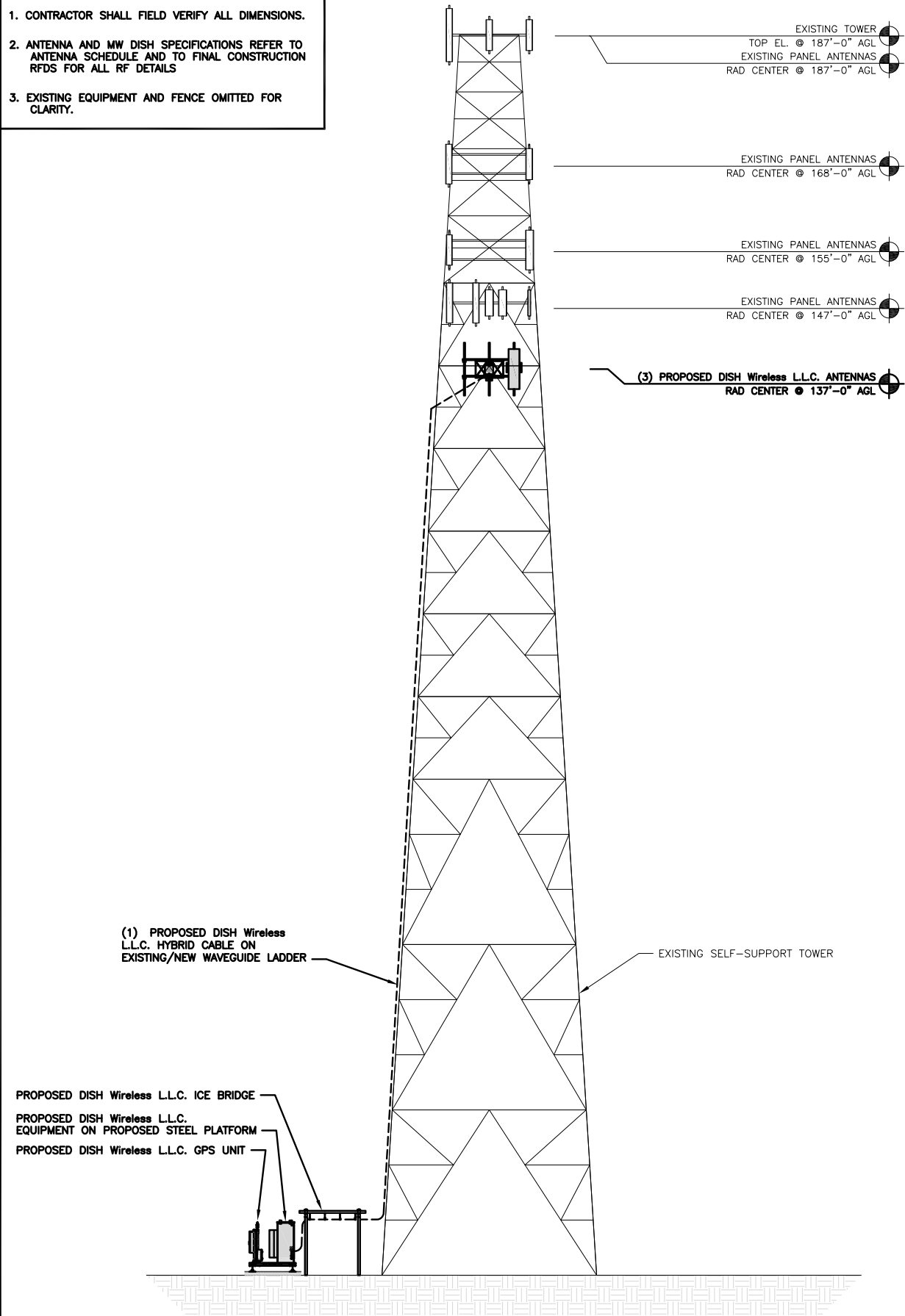
SHEET NUMBER

**A-1**

- NOTES
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.

2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS

3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.

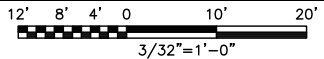


ANTENNA LAYOUT								
SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72" x 20"	60°	137'-0"	(1) HIGH-CAPACITY HYBRID CABLE (97' LONG)
BETA	B1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72" x 20"	180°	137'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72" x 20"	300°	137'-0"	

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

OVP		
EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	SIZE (HxWxD)
PROPOSED	RAYCAP-RDIDC-9181-PF-48	16"x14"x8"

PROPOSED NORTH ELEVATION



1

ANTENNA SCHEDULE

NO SCALE

3

dish  
wireless.

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RFDS REV #: 3

CONSTRUCTION  
DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	8/11/21	ISSUED FOR REVIEW
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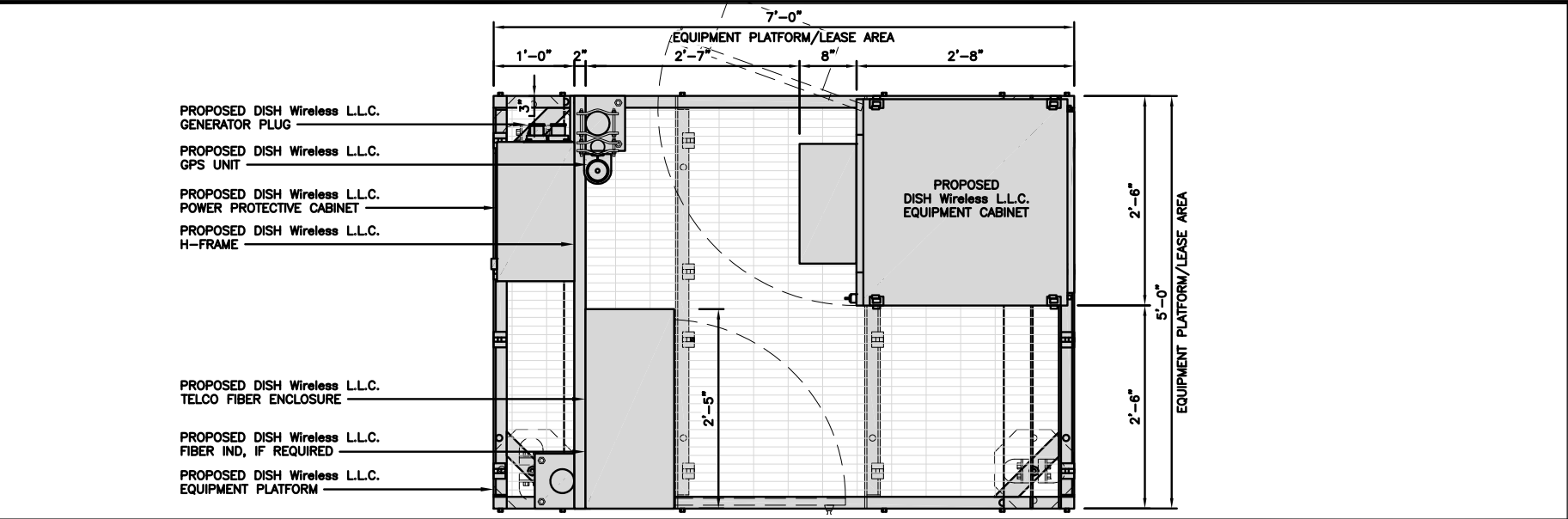
A&E PROJECT NUMBER  
153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

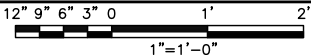
SHEET TITLE  
ELEVATION, ANTENNA  
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



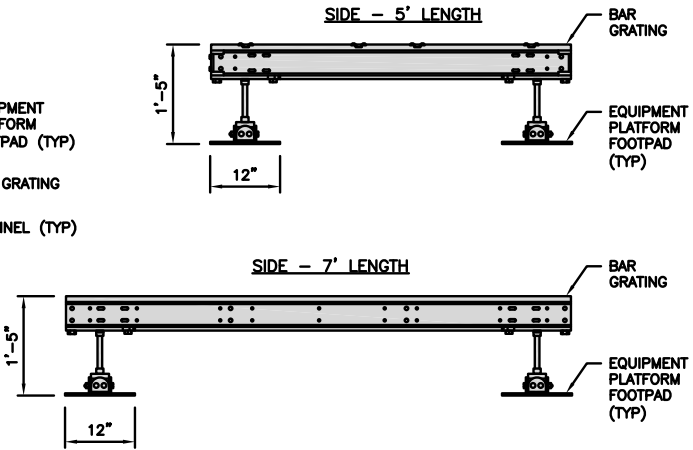
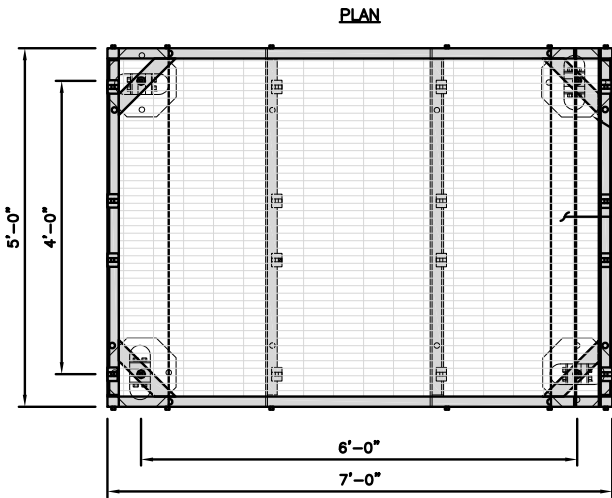
PLATFORM EQUIPMENT PLAN



1

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

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

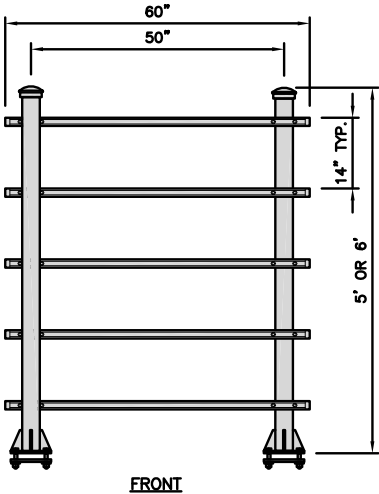
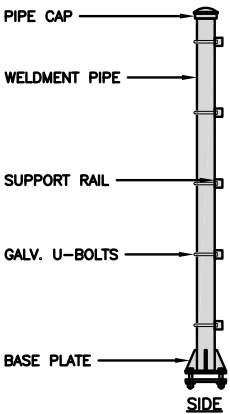


PLATFORM DETAIL

NO SCALE

2

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



H-FRAME DETAIL

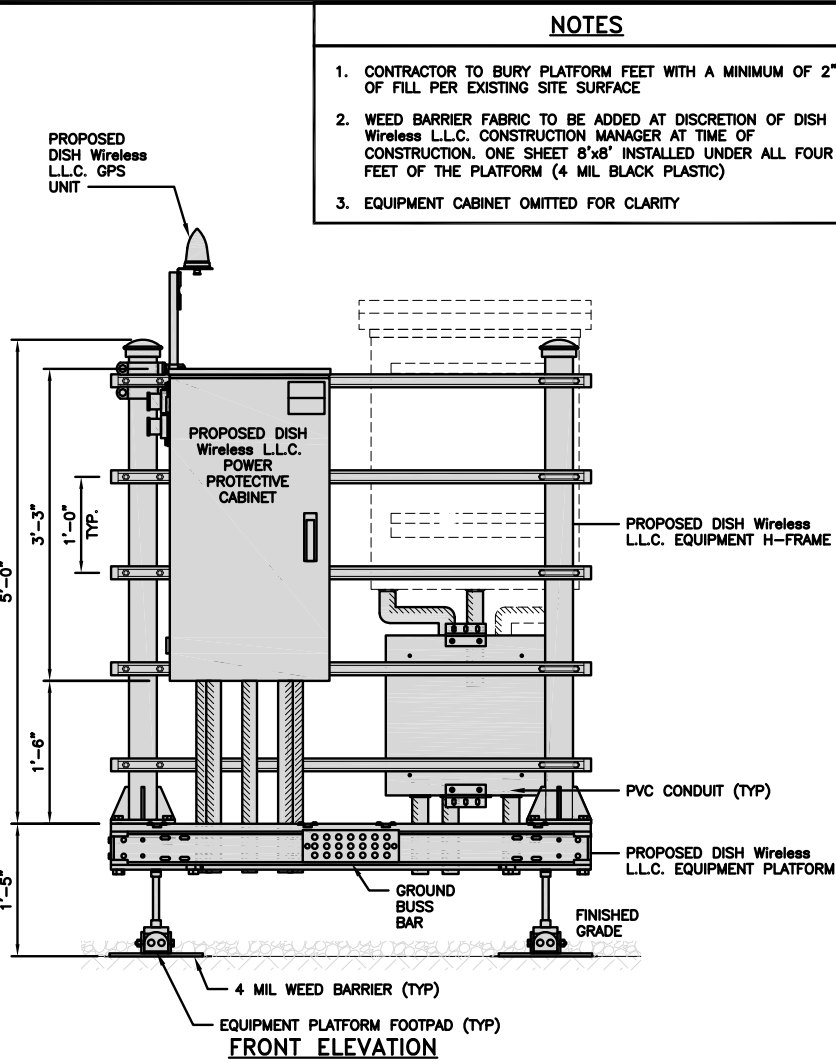
NO SCALE

3

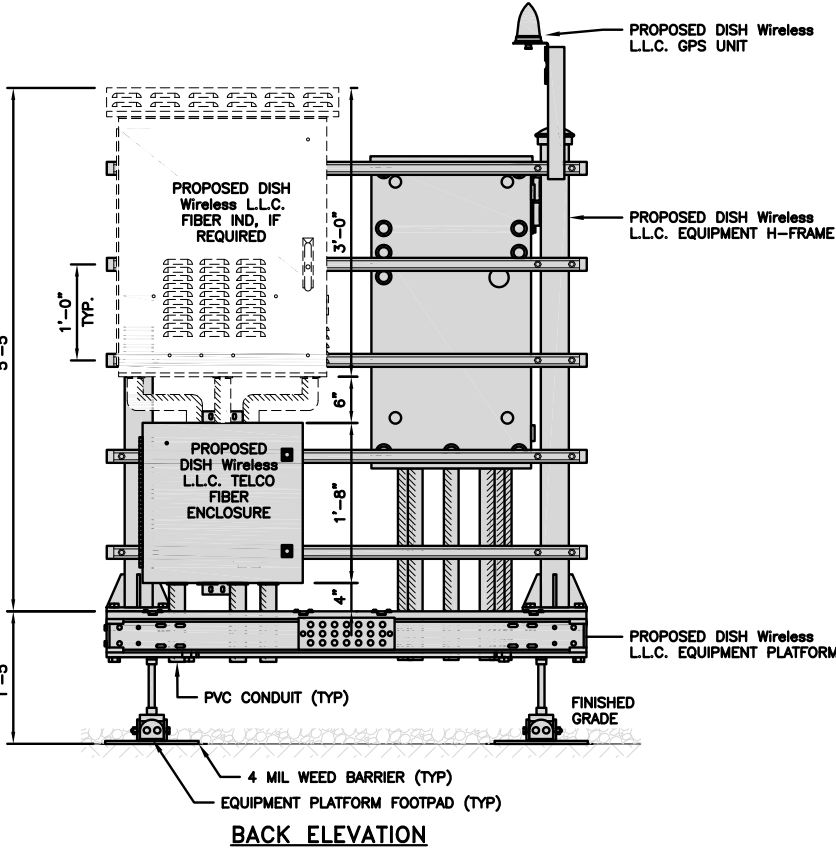
NOT USED

NO SCALE

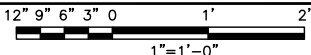
4



FRONT ELEVATION



BACK ELEVATION



5

NOTES

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



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NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
EQUIPMENT PLATFORM AND  
H-FRAME DETAILS

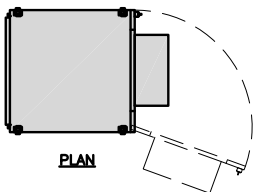
SHEET NUMBER

A-3

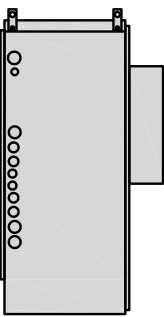
ENERSYS HVAC CABINET

200005995

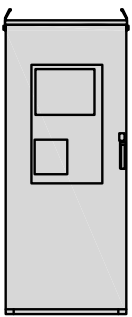
DIMENSIONS (HxWxD):	73"x30"x32"
WEIGHT EMPTY:	371 lbs
HVAC	600W
POWER SYSTEM	-48V ALPHA/600A



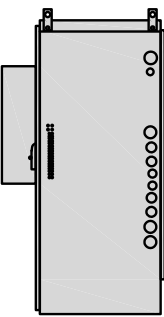
PLAN



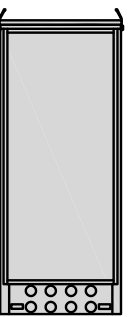
SIDE



FRONT



SIDE



BACK

CABINET DETAIL


NO SCALE

1

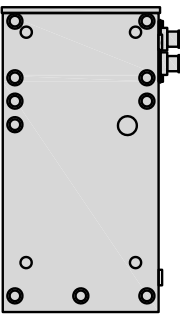
RAYCAP PPC

RDIAC-2465-P-240-MTS

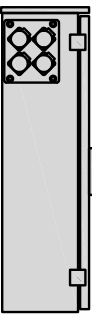
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G



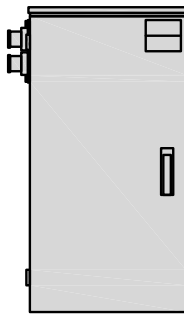
TOP



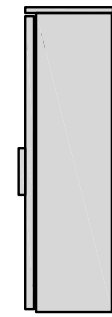
BACK



SIDE



FRONT



SIDE

POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

2

NOT USED

NOT USED

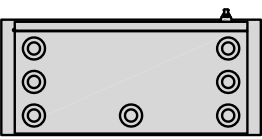
NO SCALE

3

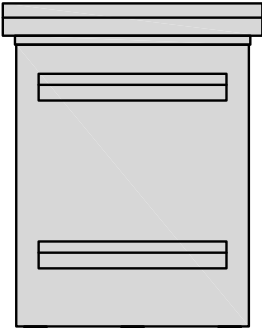
ZAYO 5RU (LEFT SWING DOOR)

FIBER NID ENCLOSURE

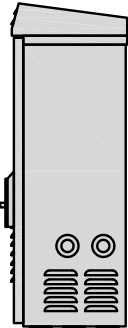
DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs



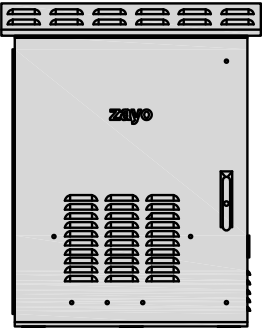
BOTTOM



BACK



SIDE



FRONT

FIBER NID ENCLOSURE DETAIL

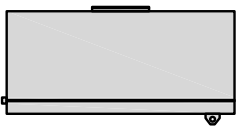
NO SCALE

5

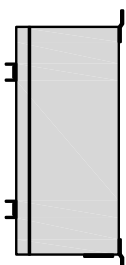
CHARLES CFIT-PF2020DSH1

FIBER TELCO ENCLOSURE

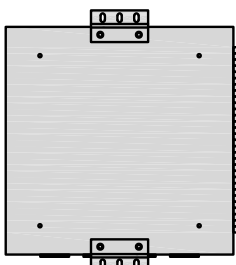
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



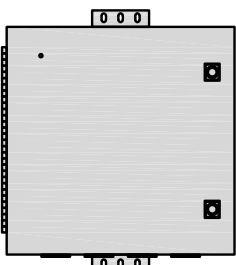
FRONT



SIDE



BACK



FRONT

FIBER TELCO ENCLOSURE DETAIL

NO SCALE

6

COMMSCOPE WB-K110-B

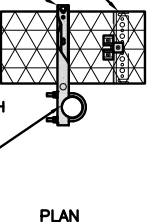
WAVEGUIDE BRIDGE KIT

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

TRAPEZE KIT (WB-T12-3)

SUPPORT BRACKET (WB-LB12-3)

3.5" DIA GALV SCH 40 PIPE (SPACED 9'-0" MAX) (MF-130)

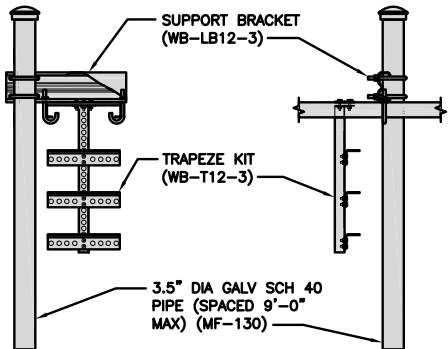


PLAN

SUPPORT BRACKET (WB-LB12-3)

TRAPEZE KIT (WB-T12-3)

3.5" DIA GALV SCH 40 PIPE (SPACED 9'-0" MAX) (MF-130)

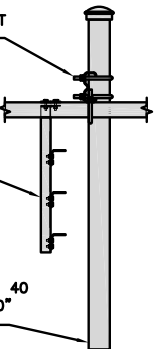


FRONT

SUPPORT BRACKET (WB-LB12-3)

TRAPEZE KIT (WB-T12-3)

3.5" DIA GALV SCH 40 PIPE (SPACED 9'-0" MAX) (MF-130)



SIDE

ICE BRIDGE DETAIL

NO SCALE

7

FINISH SLOPE TO DRAIN

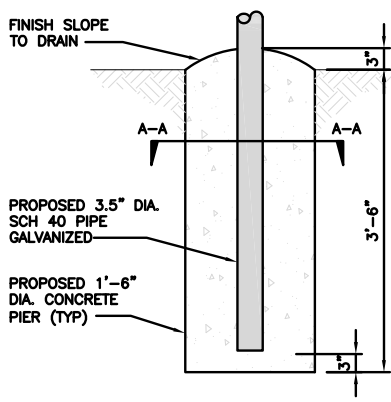
A-A

A-A

PROPOSED 3.5" DIA. SCH 40 PIPE GALVANIZED

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

CONCRETE PIER



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

3" DIA SCH 40 PIPE

18" DIA DRILLED PIER FOUNDATION

A-A SECTION

1'-6"

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

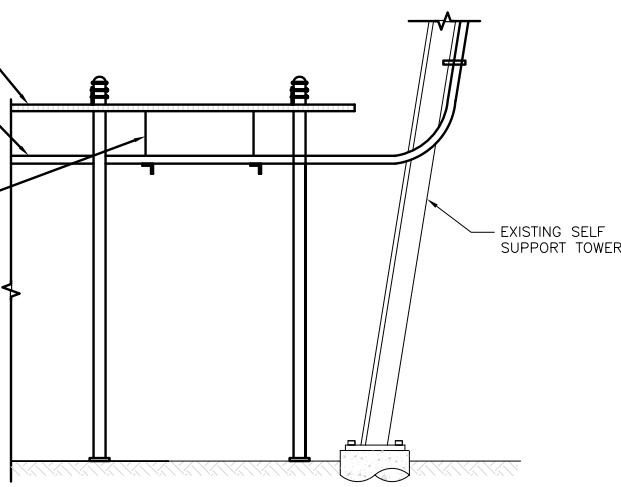
8

PROPOSED ICE BRIDGE

PROPOSED X" DIA HYBRID CABLE

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

EXISTING SELF SUPPORT TOWER



HYBRID CABLE RUN

HYBRID CABLE RUN

NO SCALE

9

dish

wireless.

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DISH Wireless L.L.C.  
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22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE

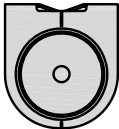
EQUIPMENT DETAILS

SHEET NUMBER

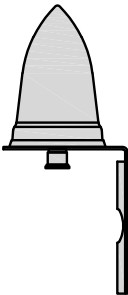
A-4

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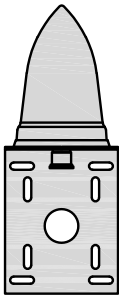
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



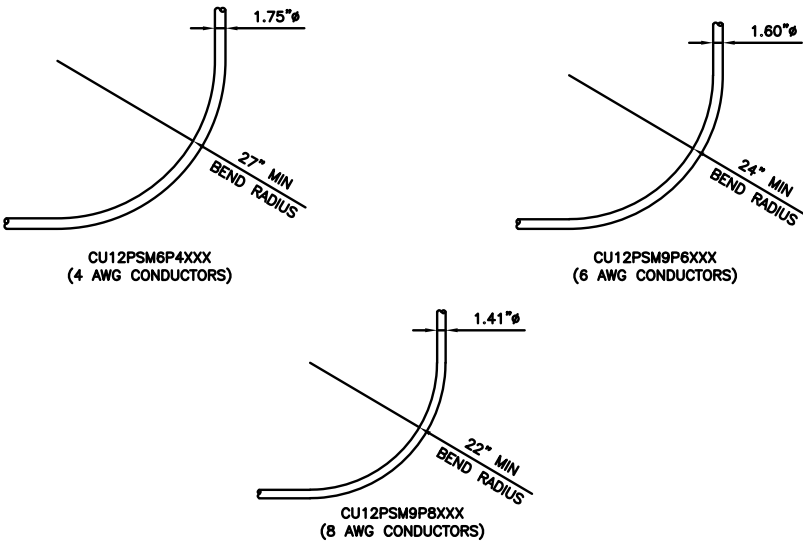
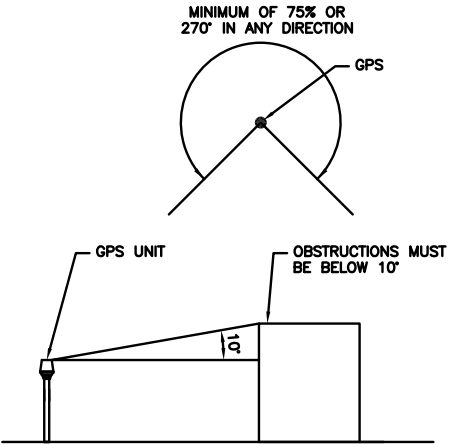
TOP



BACK



SIDE



GPS DETAIL	NO SCALE	1	GPS MINIMUM SKY VIEW REQUIREMENTS	NO SCALE	2	CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES	NO SCALE	3
------------	----------	---	-----------------------------------	----------	---	--	----------	---

NOT USED	NO SCALE	4
----------	----------	---

NOT USED	NO SCALE	5
----------	----------	---

NOT USED	NO SCALE	6
----------	----------	---

NOT USED	NO SCALE	7
----------	----------	---

NOT USED	NO SCALE	8
----------	----------	---

NOT USED	NO SCALE	9
----------	----------	---

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SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
**A-5**

FUJITSU TRIPLE BAND  
TA08025-B605

DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

PLAN

BACKSIDEFRONT

RRH DETAILNO SCALE1

FUJITSU DUAL BAND  
TA08025-B604

DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

PLAN

BACKSIDEFRONT

RRH DETAILNO SCALE2

COMMSCOPE  
RR-FA2 EXT

DIMENSIONS (HxWxD)	16.4"x8.5"x18"
WEIGHT	39.2 lbs

PLAN

NOTE:  
OR DISH Wireless L.L.C.  
APPROVED EQUIVALENT

RRH MOUNT DETAILNO SCALE3

JMA  
MX08FRO665-21

DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs

PLAN

SIDEFRONT

ANTENNA DETAILNO SCALE4

COMMSCOPE V-FRAME  
MTC3975083

FACE SIZE	8'-0"
WEIGHT	352.136 lbs

PLAN

NOTE:  
OR DISH Wireless L.L.C.  
APPROVED EQUIVALENT

ANTENNA FRAME DETAILNO SCALE8

SITEPRO1 T600  
UNIVERSAL T-BRACKET

DIMENSIONS (HxWxD)	2.25"x10.0"x15.25"
WEIGHT/ VOLUME	5.60 LBS

SIDE

ISOMETRIC

VERTICAL CABLE SUPPORT DETAILNO SCALE9

DESIGN NOTES:  
MOUNT WILL FIT LEGS UP TO:  
- 5.6" ROUND  
- 6.0" 60° ANGLE  
- 4.5" 90° ANGLE  
PLATES ALLOW 6.5" OF ADJUSTMENT PER  
SIDE FOR MOUNTING EQUIPMENT WITH  
DIFFERENT HOLE PATTERNS

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LITTLETON, CO 80120

10 PRESIDENTIAL WAY  
WOBBURN, MA 01801

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SHEET TITLE  
EQUIPMENT DETAILS

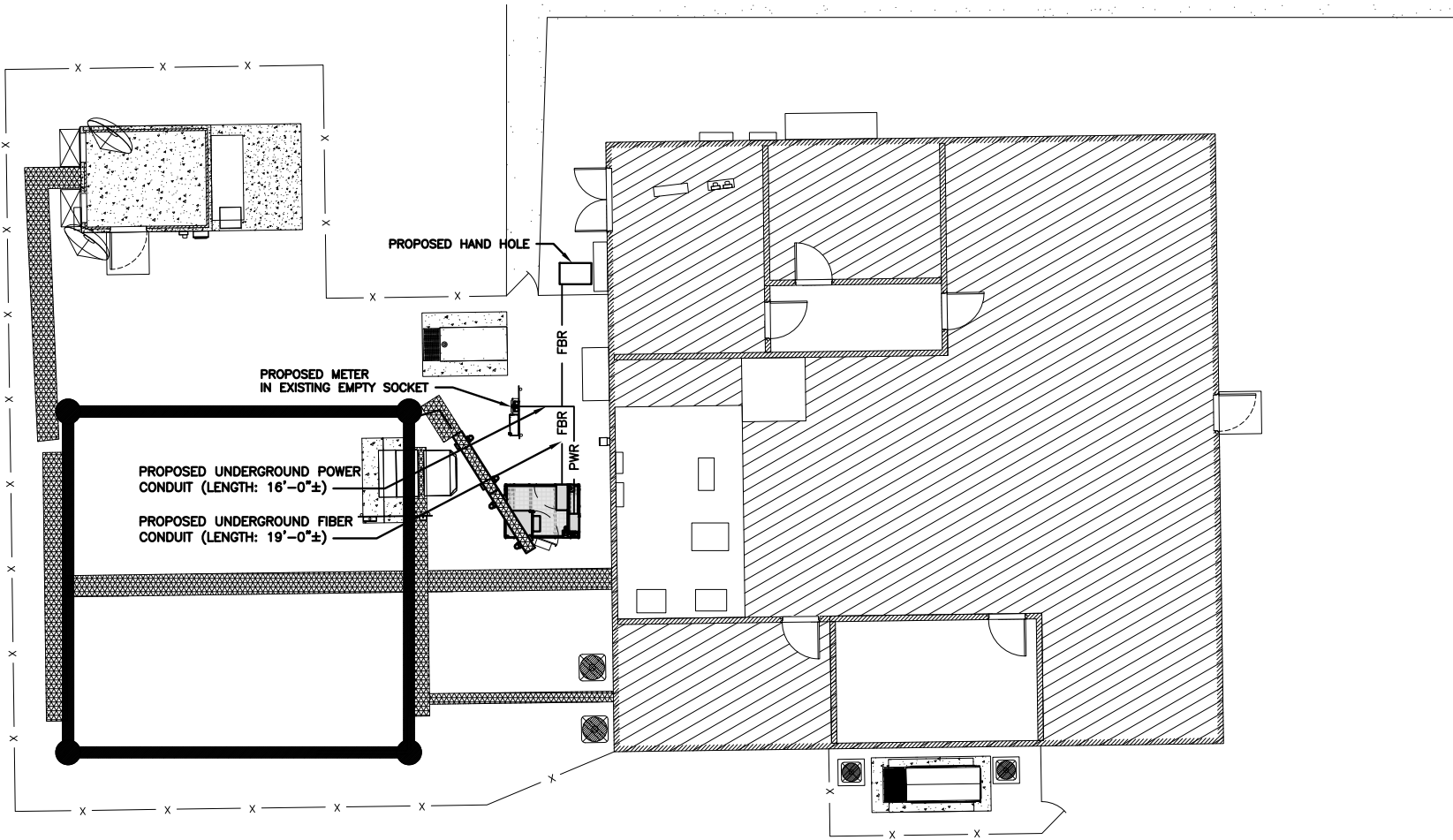
SHEET NUMBER  
A-6

DISH Wireless L.L.C. TEMPLATE VERSION 37 - 07/09/2021

FINAL POWER OR FIBER DESIGN  
NOT AVAILABLE AT TIME OF ISSUE

NOTES

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



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

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

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RFDS REV #: 3

CONSTRUCTION  
DOCUMENTS

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A&E PROJECT NUMBER  
153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
  
NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

SHEET NUMBER

E-1



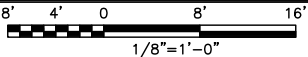
AN EXISTING CONDITIONS SURVEY WAS NOT AVAILABLE AT THE TIME THIS  
DRAWING'S CREATION

ELECTRICAL NOTES

NO SCALE

2

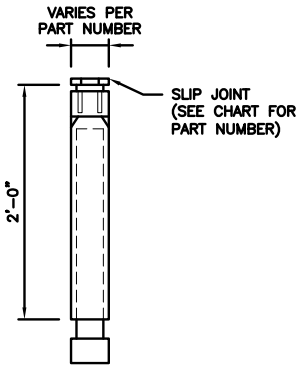
UTILITY ROUTE PLAN



1



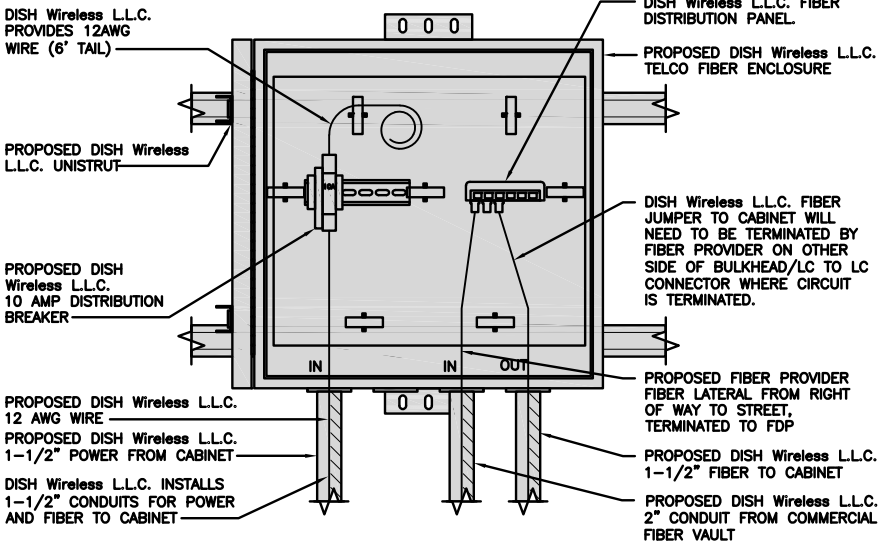
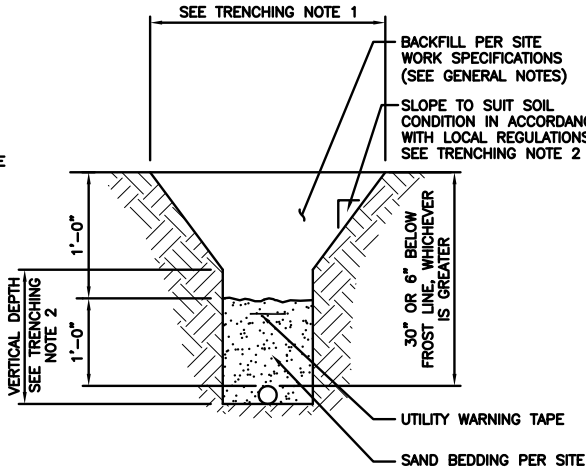
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"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



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

TRENCHING NOTES

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.



EXPANSION JOINT DETAIL

NO SCALE

1

TYPICAL UNDERGROUND TRENCH DETAIL

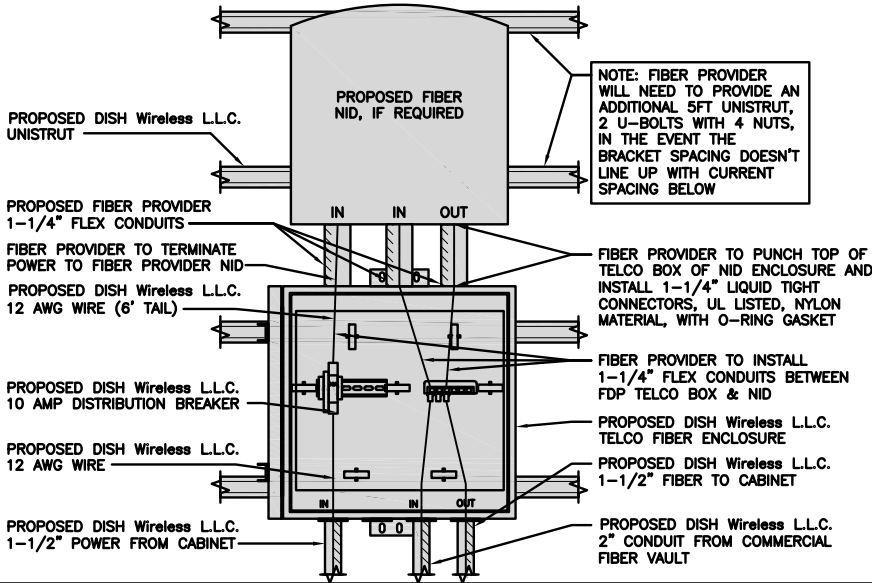
NO SCALE

2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE

3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9



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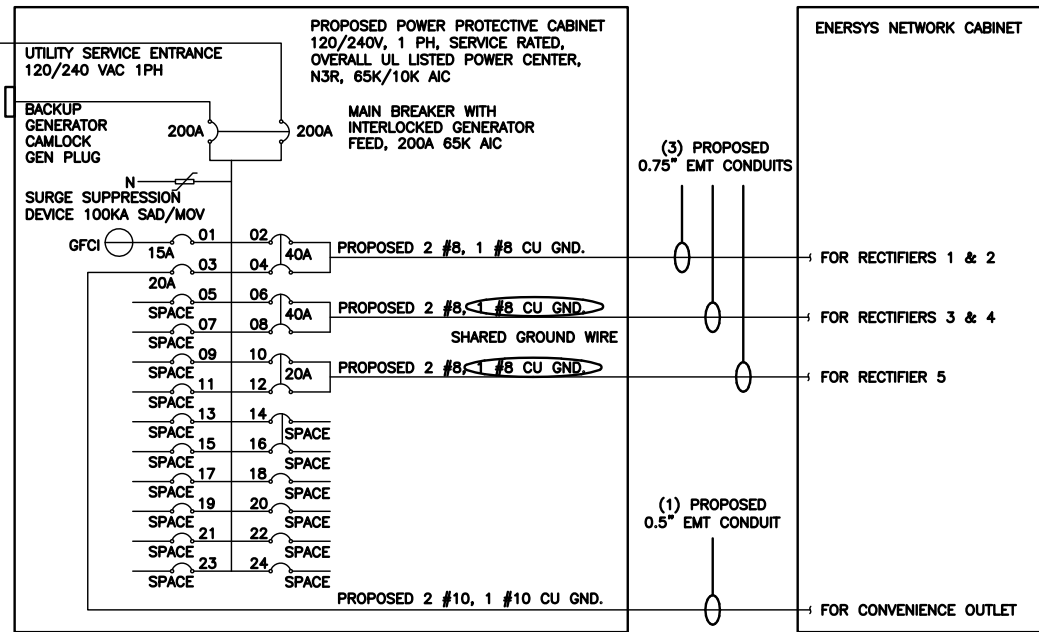
A&E PROJECT NUMBER  
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DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER

E-2



**BREAKERS REQUIRED:**  
 (2) 40A, 2P BREAKER - SQUARE D P/N:Q0240  
 (1) 20A, 2P BREAKER - SQUARE D P/N:Q0220  
 (1) 20A, 1P BREAKER - SQUARE D P/N:Q0120

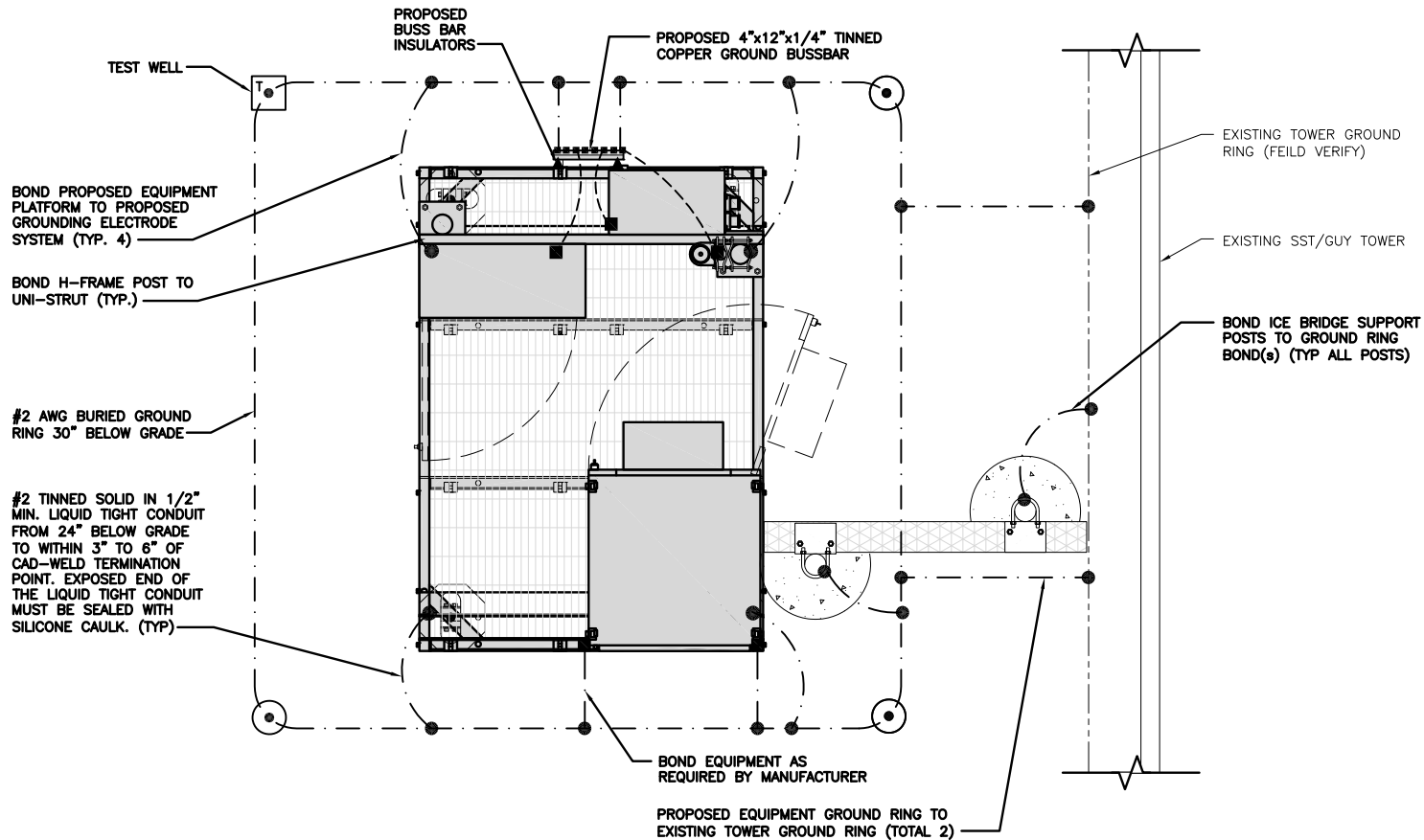
3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

1

**E-3**

2

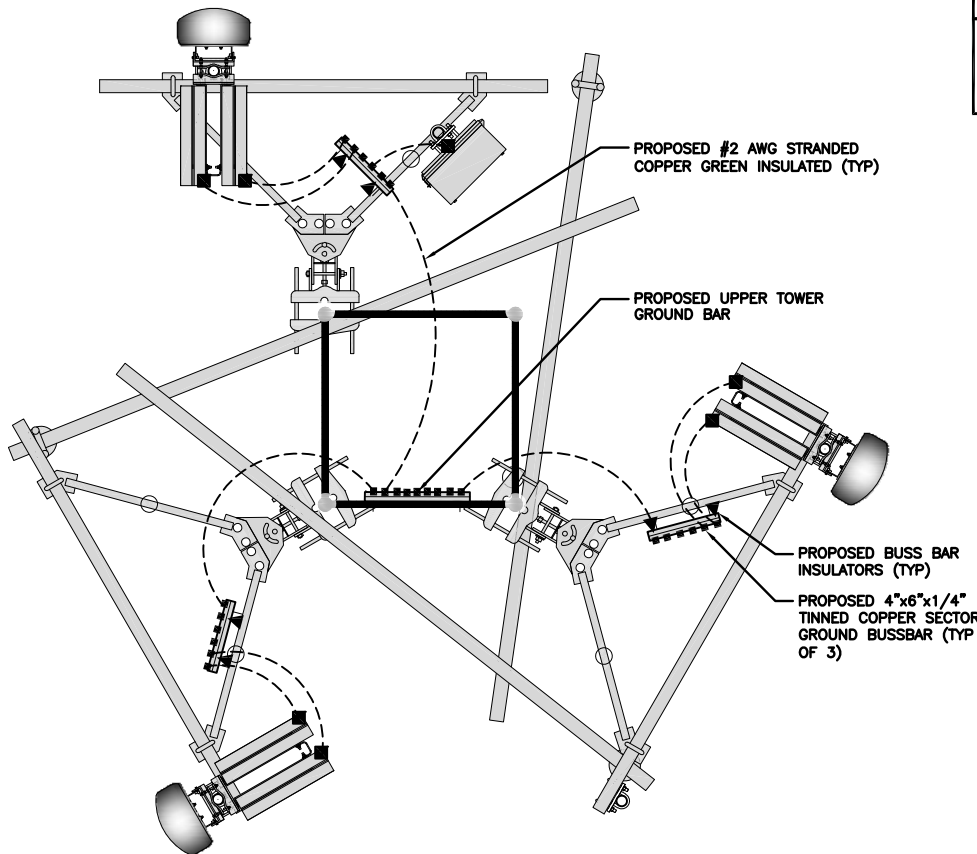
2



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE

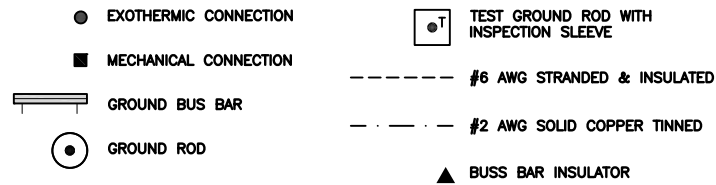
1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE

2



GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

GROUNDING KEY NOTES

NO SCALE

3

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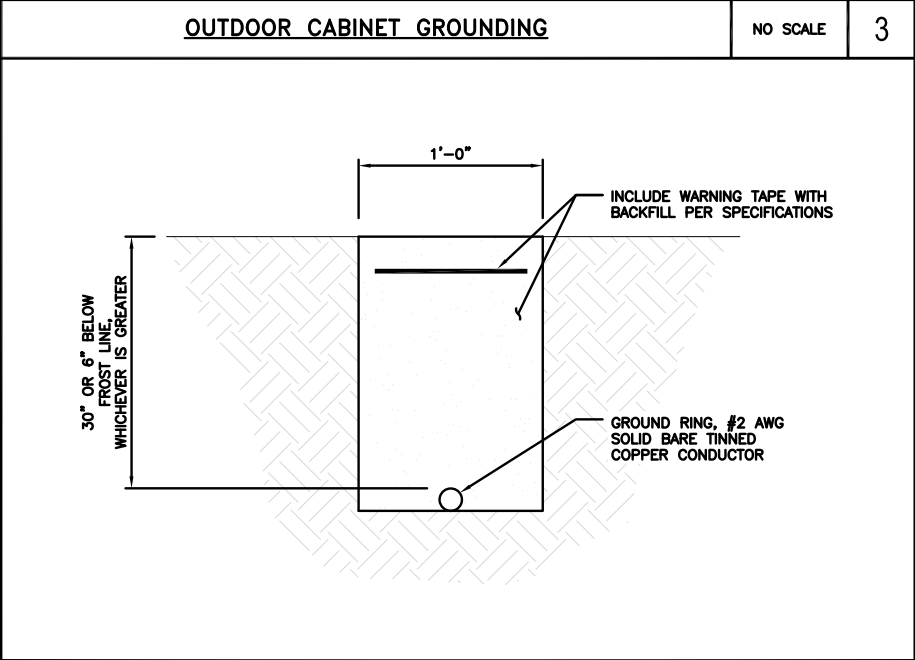
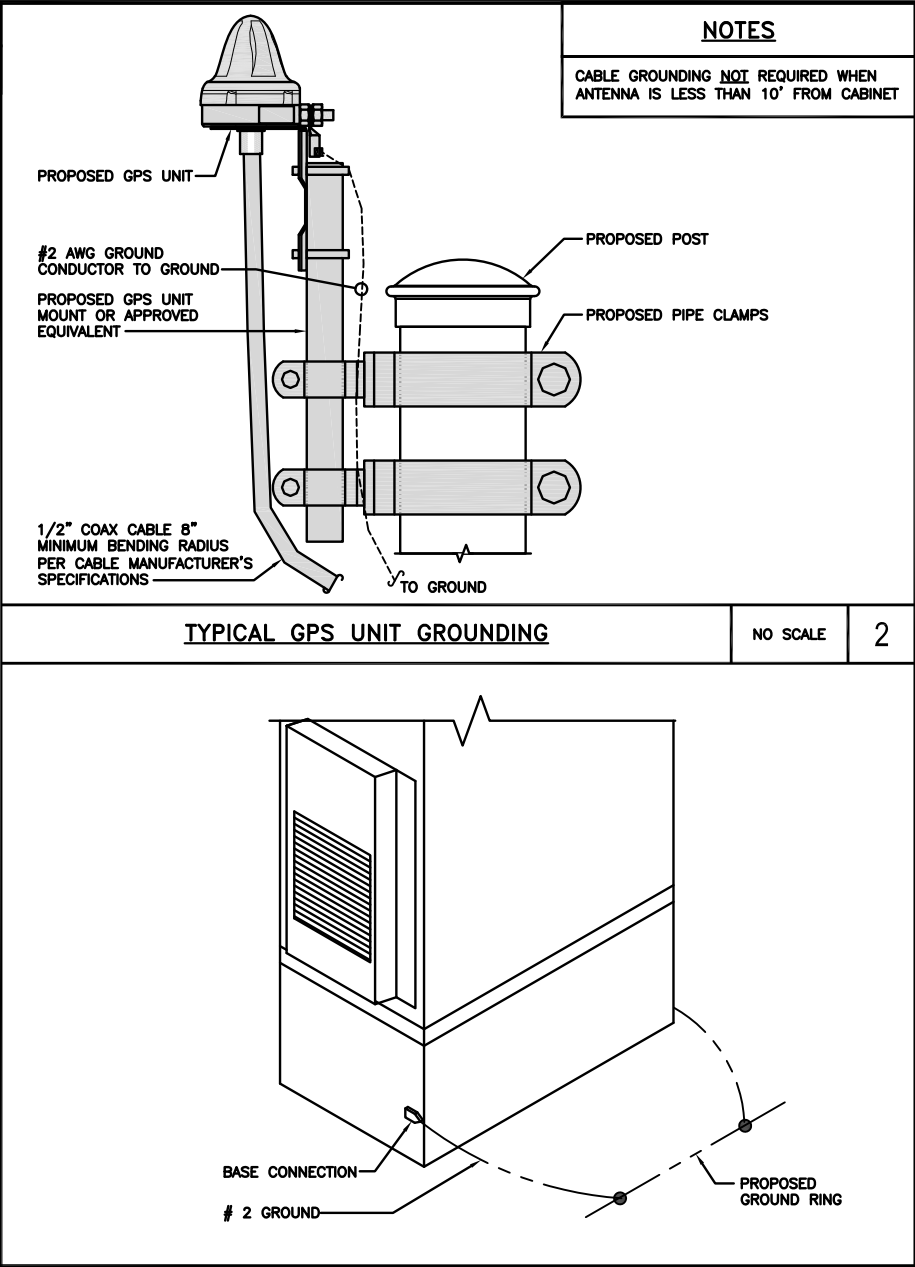
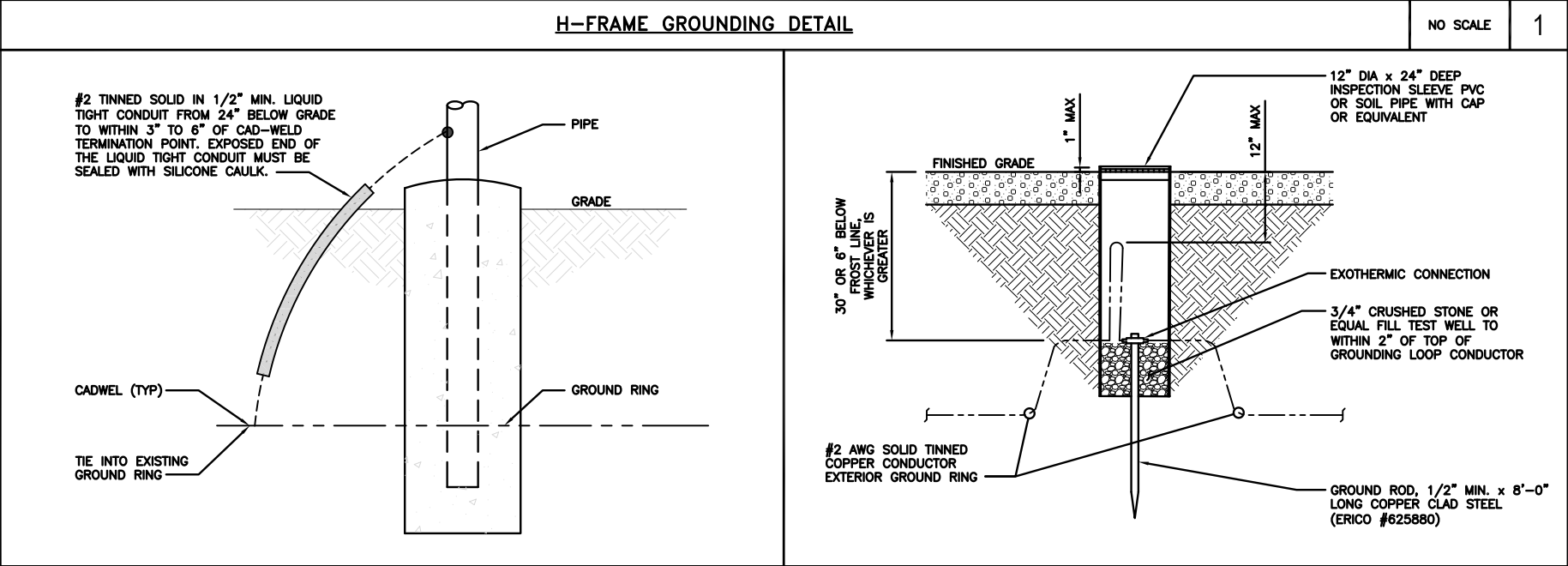
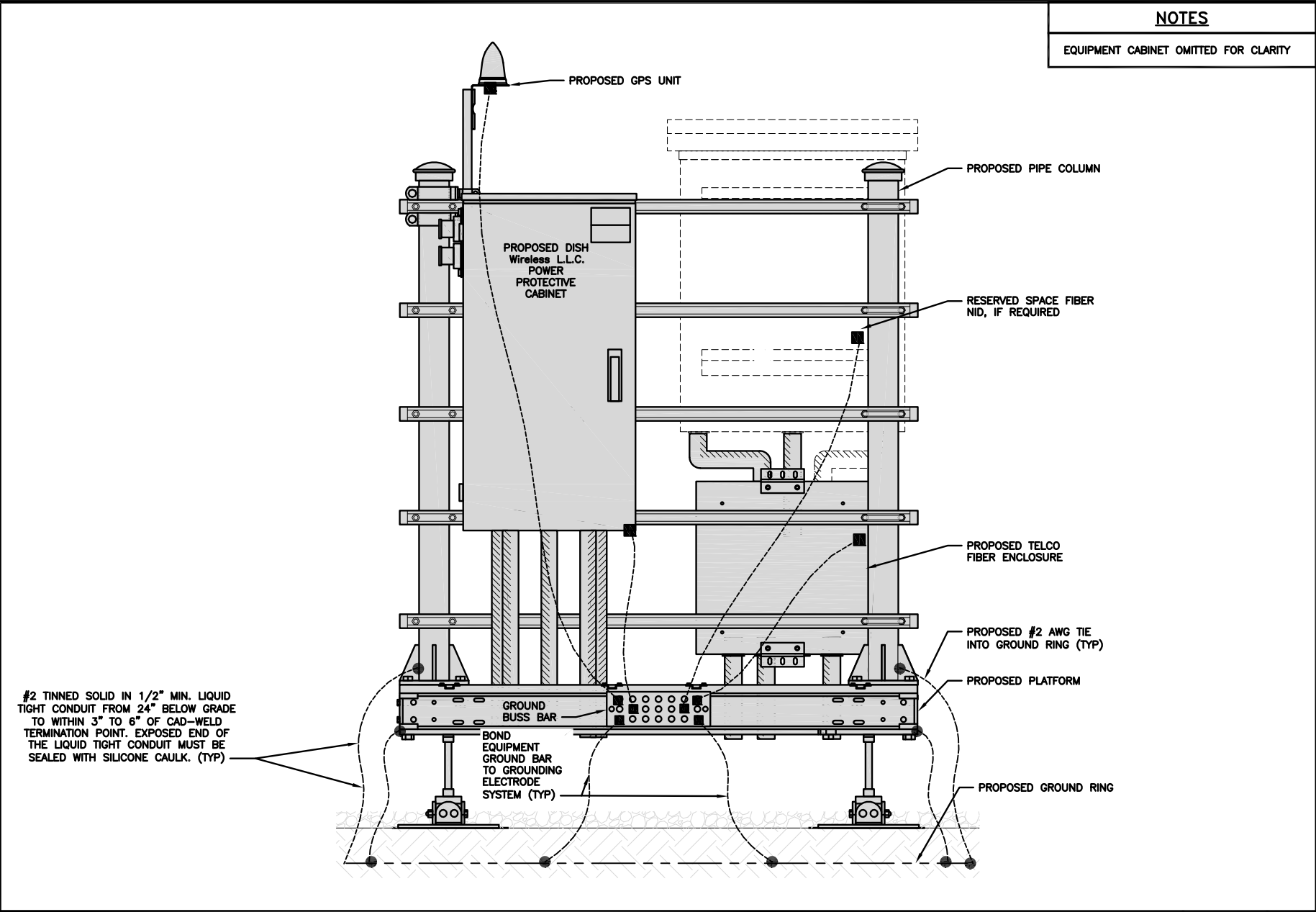
A&E PROJECT NUMBER  
153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
GROUNDING PLANS  
AND NOTES

SHEET NUMBER

G-1



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9/9/21

Professional Engineer

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NJJer01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-2

<div>1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.</div> <div>2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.</div> <div>3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.</div> <div>4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.</div> <div>5. NUT &amp; WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.</div> <div>6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.</div> <div>7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.</div> <div>8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).</div>			<div><div><div>EXTERNAL TOOTHED</div><div>3/8" DIA x1 1/2"</div><div>S/S NUT</div><div>S/S LOCK WASHER</div><div>S/S FLAT WASHER</div><div>S/S FLAT WASHER</div><div>S/S BOLT (1 OF 2)</div><div>1/16" MINIMUM SPACING</div></div><div><div>CLOSED BARREL, FOR ALL EXTERIOR TWO-HOLE CONNECTORS</div><div>BLACK HEAT SHRINK UV RATED</div><div>CONDUCTOR INSULATION TO BUTT UP AGAINST THE CONNECTOR BARREL</div><div>TINNED COPPER GROUNDING BAR</div></div></div>			<div><div><div>EXTERNAL TOOTHED</div><div>3/8" DIA x1 1/2"</div><div>S/S NUT</div><div>S/S LOCK WASHER</div><div>S/S FLAT WASHER</div><div>S/S FLAT WASHER</div><div>S/S BOLT (1 OF 2)</div><div>1/16" MINIMUM SPACING</div></div><div><div>INSPECTION WINDOW IN BARREL, REQUIRED FOR ALL INTERIOR TWO-HOLE CONNECTORS</div><div>CLEAR HEAT SHRINK</div><div>CONDUCTOR INSULATION TO BUTT UP AGAINST THE CONNECTOR BARREL</div><div>TINNED COPPER GROUNDING BAR</div></div></div>								
TYPICAL GROUNDING NOTES			NO SCALE	1	TYPICAL EXTERIOR TWO HOLE LUG			NO SCALE	2	TYPICAL INTERIOR TWO HOLE LUG			NO SCALE	3
<div><div>NOTE: MINIMUM OF 3 THREADS TO BE VISIBLE (TYP)</div><div>2 HOLE LONG BARREL TINNED SOLID COPPER LUG (TYP)</div><div>TIN COATED SOLID COPPER BUS BAR</div><div>CHERRY INSULATOR INSTALLED IF REQUIRED</div><div>S/S BOLT (TYP)</div><div>S/S SPLIT WASHER (TYP)</div><div>S/S FLAT WASHER (TYP)</div><div>S/S FLAT WASHER (TYP)</div><div>S/S NUT (TYP)</div></div>														
LUG DETAIL			NO SCALE	4	NOT USED			NO SCALE	5	NOT USED			NO SCALE	6
NOT USED			NO SCALE	7	NOT USED			NO SCALE	8	NOT USED			NO SCALE	9

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CONSTRUCTION DOCUMENTS

REV

DATE

DESCRIPTION

A

8/11/21

ISSUED FOR REVIEW

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9/3/21

ISSUED FOR CONSTRUCTION

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22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-3

RF JUMPER COLOR CODING				3/4" TAPE WIDTHS WITH 3/4" SPACING							
LOW-BAND RRH – (600MHz N71 BASEBAND) + (850MHz N26 BAND) + (700MHz N29 BAND) – OPTIONAL PER MARKET				ALPHA RRH				BETA RRH			
				PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT	PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT
ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BANDS)				RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE
				ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE
					WHITE (–) PORT	ORANGE	ORANGE		WHITE (–) PORT	ORANGE	ORANGE
							WHITE (–) PORT			WHITE (–) PORT	WHITE (–) PORT
MID-BAND RRH – (AWS BANDS N66+N70)				RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE
				PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE
ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BANDS)											
					WHITE (–) PORT	PURPLE	PURPLE		WHITE (–) PORT	PURPLE	PURPLE
							WHITE (–) PORT			WHITE (–) PORT	WHITE (–) PORT
HYBRID/DISCREET CABLES				EXAMPLE 1	EXAMPLE 2	EXAMPLE 3					
				RED	RED	RED					
INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS				BLUE	BLUE						
				GREEN	GREEN						
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS				ORANGE		ORANGE					
				PURPLE	YELLOW	PURPLE					
EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS											
FIBER JUMPERS TO RRHs				LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
				RED	RED	BLUE	BLUE	GREEN	GREEN		
LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY					PURPLE		PURPLE		PURPLE		PURPLE
POWER CABLES TO RRHs				LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
				RED	RED	BLUE	BLUE	GREEN	GREEN		
LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY					PURPLE		PURPLE		PURPLE		PURPLE
RET MOTORS AT ANTENNAS				ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"
				RED	RED	BLUE	BLUE	GREEN	GREEN		
					PURPLE		PURPLE		PURPLE		PURPLE
MICROWAVE RADIO LINKS				PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
				WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
LINKS WILL HAVE A 1.5–2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE. ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.				RED	RED	BLUE	BLUE	GREEN	GREEN		
				WHITE	WHITE	WHITE	WHITE	WHITE	WHITE		
MICROWAVE CABLES WILL REQUIRE P–TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID'S											
					WHITE		WHITE		WHITE		WHITE

RF CABLE COLOR CODES

NO SCALE

1

NOT USED

NO SCALE

4

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

ORANGE

AWS  
(N66+N70+H–BLOCK)

PURPLE

CBRS TECH  
(3 GHz)

YELLOW

NEGATIVE SLANT PORT  
ON ANT/RRH

WHITE

ALPHA SECTOR

RED

BETA SECTOR

BLUE

GAMMA SECTOR

GREEN

COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4

dish  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

AMERICAN TOWER®  
10 PRESIDENTIAL WAY  
WOBBURN, MA 01801

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

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DRAWN BY: CHECKED BY: APPROVED BY:

BLJ/CDW LS MP

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CONSTRUCTION  
DOCUMENTS

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A&E PROJECT NUMBER

153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJJer01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
RF  
CABLE COLOR CODE

SHEET NUMBER

RF-1



SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



5701 SOUTH SANTA FE DRIVE  
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**B&T ENGINEERING, INC.**  
**PEC.0001564**  
**Expires 2/10/22**

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DRAWN BY:	CHECKED BY:	APPROVED BY:
BLJ/CDW	LS	MP

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CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER  
  
153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
  
NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
  
GENERAL NOTES

SHEET NUMBER  
  
GN-2


CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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


ELECTRICAL INSTALLATION NOTES:

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


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




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9/9/21

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PEC.0001564  
Expires 2/10/22

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REV	DATE	DESCRIPTION
A	8/11/21	ISSUED FOR REVIEW
0	9/3/21	ISSUED FOR CONSTRUCTION
1	9/9/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

153934.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

DISH Wireless L.L.C. TEMPLATE VERSION 37 – 07/09/2021

GROUNDING NOTES:

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



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
BLJ/CDW	LS	MP

RFDS REV #: 3

CONSTRUCTION  
DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	8/11/21	ISSUED FOR REVIEW
0	9/3/21	ISSUED FOR CONSTRUCTION
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A&E PROJECT NUMBER  
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DISH Wireless L.L.C.  
PROJECT INFORMATION  
  
NJJER01162A  
22 TITICUS MTN ROAD  
NEW FAIRFIELD, CT 06812

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
GN-4

ENGINEERING:  
STRUCTURAL ANALYSIS  
MOUNT ANALYSIS



**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 188 ft Self Support Tower  
**ATC Site Name** : NEW FAIRFIELD, CT  
**ATC Site Number** : 88014  
**Engineering Number** : 13699607\_C3\_06  
**Proposed Carrier** : DISH WIRELESS L.L.C.  
**Carrier Site Name** : NJJER01162A  
**Carrier Site Number** : NJJER01162A  
**Site Location** : 22 Titicus Mtn Road  
New Fairfield, CT 06812-2565  
41.4507, -73.516  
**County** : Fairfield  
**Date** : September 27, 2021  
**Max Usage** : 73%  
**Result** : Pass

Prepared By:  
Lucas Santos  
Structural Engineer

Reviewed By:



**COA : PEC.0001553**

## **Table of Contents**

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## **Introduction**

The purpose of this report is to summarize results of a structural analysis performed on the 188 ft Self Support tower to reflect the change in loading by DISH WIRELESS L.L.C..

## **Supporting Documents**

<b>Tower Drawings</b>	Analysis by CSEI, ATC Eng. #26464321, dated August 21, 2006.
<b>Foundation Drawing</b>	Mapping By Geotel Report #E08-291-F, dated May 19, 2008
<b>Geotechnical Report</b>	Geotel Report #E08-291-G, dated May 19, 2008

## **Analysis**

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	115 mph (3-second gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-second gust) w/ 1.00" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
<b>Exposure Category:</b>	B
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 1
<b>Topographic Category:</b>	1
<b>Crest Height (H):</b>	0 ft
<b>Crest Length (L):</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.22$ , $S_i = 0.06$
<b>Site Class:</b>	D - Stiff Soil - Default

## **Conclusion**

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

### Existing and Reserved Equipment

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
193.0	3	Ericsson KRY 112 144/1	Square Low Profile Platform	(1) 1 5/8" (1.63"-41.3mm) Fiber (12) 1 5/8" Coax (1) 1/4" Coax (1) 1 1/4" (1.25"-31.8mm) Fiber	T-MOBILE
	3	Ericsson RRUS 11 B12			
	3	Ericsson AIR 21, 1.3M, B4A B2P			
	3	Ericsson AIR 21, 1.3 M, B2A B4P			
	1	RFS SC2-W100AB			
191.0	3	Commscope LNX-6515DS-VTM			
170.3	-	-	Catwalk	-	-
168.0	3	Alcatel-Lucent ALU 800MHz External Notch Filter	Sector Frame	(1) 1 1/4" (1.25"-31.8mm) Fiber (3) 1 1/4" Hybriflex Cable	SPRINT NEXTEL
167.0	3	RFS APXVSP18-C-A20			
	3	Alcatel-Lucent TD-RRH8x20-25 w/ Solar Shield			
	3	RFS APXV9TM14-ALU-I20*			
	3	Alcatel-Lucent 4x40W RRH (91 lb)			
	3	Alcatel-Lucent 2X50W RRH w/o Filter			
160.0	1	Raycap DC6-48-60-18-8F	Sector Frame	(1) 0.28" (7mm) Fiber (2) 0.74" (18.7mm) 8 AWG 7 (1) 3" conduit	AT&T MOBILITY
	3	Ericsson RRUS 32 B2			
155.0	3	Ericsson RRUS 11 (Band 12) (55 lb)	Sector Frame	(6) 1 5/8" Coax	
	6	Powerwave Allgon LGP21401			
	3	Allgon 7770.00			
	3	CCI HPA-65R-BUU-H6			
146.0	2	Commscope TD-850B-LTE78-43	Site Pro 1 VFA12-HD Sector Frame	(6) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
	1	Raycap RCMD6-6627-PF-48			
	3	Samsung B2/B66A RRH-BR049			
	3	Samsung MT6407-77A			
	6	JMA Wireless MX06FRO660-03			
	3	Samsung B5/B13 RRH-BR04C			
137.5	-	-	Empty Side Arm	-	-
	-	-	Rest Platform		
120.0	-	-	Empty Side Arm		
112.5	-	-	Empty Side Arm		
100.0	-	-	Empty Side Arm		
	-	-	Platform		
87.5	-	-	Rest Platform		
80.0	1	Andrew DB616E-BC	Side Arm	(1) 7/8" Coax	US DEPT OF HOMELAND SECURITY
50.0	-	-	Rest Platform	-	-
33.3	-	-	-	Coax Cage	

### Equipment to be Removed

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
No loading was considered as removed as part of this analysis.					

### **Proposed Equipment**

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
137.0	1	Commscope RDIDC-9181-PF-48	Sector Frame	(1) 1.75" (44.5mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B605			
	3	Fujitsu TA08025-B604			
	3	JMA Wireless MX08FRO665-21			

<sup>1</sup> Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines on the tower face with the least amount of existing lines.

### **Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Legs	45%	Pass
Diagonals	73%	Pass
Horizontals	34%	Pass
Anchor Bolts	51%	Pass

### **Foundations**

Reaction Component	Analysis Reactions	% of Usage
Uplift (Kips)	156.3	58%
Axial (kips)	217.3	25%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

### **Deflection, Twist, and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Twist (°)	Sway (Rotation) (°)
193.0	RFS SC2-W100AB	T-MOBILE	0.100	0.004	0.047
137.0	Commscope RDIDC-9181-PF-48	DISH WIRELESS L.L.C.	0.061	0.004	0.043
	Fujitsu TA08025-B604				
	Fujitsu TA08025-B605				
	JMA Wireless MX08FRO665-21				

\*Deflection, Twist, and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H

## **Standard Conditions**

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively “American Tower”) are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

Asset: 88014, NEW FAIRFIELD  
 Client: DISH WIRELESS L.L.C.  
 Code: ANSI/TIA-222-H

Height : 187.5 ft  
 Base Width : 32.45 ft  
 Shape : Square

Quadrant 1

187.50

Sect 12

178.92

Sect 11

170.34

Sect 10

160.17

Sect 9

150.00

Sect 8

137.50

Sect 7

125.00

Sect 6

112.50

Sect 5

87.50

Sect 4

75.00

Sect 3

50.00

Sect 2

25.00

Sect 1

#### SITE PARAMETERS

Nominal Wind : 115 mph wind with no ice Exposure : B Site Class : D  
 Ice Wind: 50 mph wind with 1" radial Topo Method: Method 1 Risk Cat : II  
 Service Wind : 60 mph Serviceability Topo Feature : S<sub>g</sub> : 0.224 S<sub>1</sub> : 0.056

#### SECTION PROPERTIES

Section	Leg Members	Diagonal Members	Horizontal Members
1	SAE 36 ksi 8X8X0.875	DAS 36 ksi 3.5X3X0.25	DAL 36 ksi 3X2.5X0.3125
2	SAE 36 ksi 8X8X0.75	DAS 36 ksi 3X2.5X0.25	DAL 36 ksi 3X2.5X0.25
3	SAE 36 ksi 8X8X0.75	DAS 36 ksi 3X2.5X0.25	DAE 36 ksi 2.5X2.5X0.25
4	SAE 36 ksi 6X6X0.875	DAE 36 ksi 2.5X2.5X0.25	DAE 36 ksi 2.5X2.5X0.25
5	SAE 36 ksi 6X6X0.75	DAE 36 ksi 2.5X2.5X0.25	DAE 36 ksi 2.5X2.5X0.25
6 - 7	SAE 36 ksi 6X6X0.5625	DAL 36 ksi 2.5X2X0.25	DAE 36 ksi 2.5X2.5X0.25
8	SAE 36 ksi 6X6X0.4375	DAL 36 ksi 2.5X2X0.25	DAE 36 ksi 2.5X2.5X0.25
9	SAE 36 ksi 5X5X0.4375	SAE 36 ksi 3.5x3.5x0.25	SAU 36 ksi 3X2.5X0.25
10	SAE 36 ksi 5X5X0.4375	SAE 36 ksi 3.5x3.5x0.25	DAL 36 ksi 3X2.5X0.25
11	SAE 36 ksi 5X5X0.3125	SAE 36 ksi 3X3X0.25	SAU 36 ksi 3X2.5X0.25
12	SAE 36 ksi 5X5X0.3125	SAE 36 ksi 3X3X0.25	CHN 36 ksi C8 x 11.5

#### REDUNDANT SECONDARY BRACING

Section	Sub Diag 1	Sub Horiz 1	Sub Diag 2	Sub Horiz 2	Sub Diag 3	Sub Horiz 3
1 - 3	D2.5X2X0.1875	S2.5X2.5X0.187	D2.5X2X0.1875	S2.5X2.5X0.187	-	-
4 - 8	D2.5X2X0.1875	S2.5X2.5X0.187	-	-	-	-
9 - 12	-	S2X2X0.25	-	-	-	-

#### DISCRETE APPURTENANCE

Elev (ft)	Type	Qty	Description
193.00	DISH-HP	1	RFS SC2-W100AB
193.00	PANEL	3	Ericsson AIR 21, 1.3M, B4A B2P
193.00	PANEL	3	Ericsson AIR 21, 1.3 M, B2A B4
193.00	RRU/RRH	3	Ericsson RRUS 11 B12
193.00	TTA	3	Ericsson KRY 112 144/1
191.00	PANEL	3	Commscope LNX-6515DS-VTM
187.50	T-Arm	6	Pipe Mount
187.50	Triangular Low Profile Platform	1	Platform
170.30	Triangular Low Profile Platform	1	Catwalk
168.00	Filter	3	Alcatel-Lucent ALU 800MHz Exte
167.00	PANEL	3	RFS APXVSP18-C-A20
167.00	PANEL	3	RFS APXV9TM14-ALU-I20*
167.00	RRU/RRH	3	Alcatel-Lucent 4x40W RRH (91 I
167.00	RRU/RRH	3	Alcatel-Lucent TD-RRH8x20-25 w
167.00	RRU/RRH	3	Alcatel-Lucent 2X50W RRH w/o F
167.00	Sector Frame	3	Generic Flat Light Sector Fram
160.00	BOB/SSB	1	Raycap DC6-48-60-18-8F
160.00	RRU/RRH	3	Ericsson RRUS 32 B2
160.00	Sector Frame	3	Generic Flat Light Sector Fram
155.00	PANEL	3	CCI HPA-65R-BUU-H6
155.00	PANEL	3	Allgon 7770.00
155.00	RRU/RRH	3	Ericsson RRUS 11 (Band 12) (55
155.00	TTA	6	Powerwave Allgon LGP21401
146.00	BOB/SSB	1	Raycap RCMDC-6627-PF-48

## JOB INFORMATION

Asset: 88014, NEW FAIRFIELD  
 Client: DISH WIRELESS L.L.C.  
 Code: ANSI/TIA-222-H

Height : 187.5 ft  
 Base Width : 32.45 ft  
 Shape : Square

## DISCRETE APPURTENANCE

Elev (ft)	Type	Qty	Description
146.00	DIPLEXER/DUAL COUPLER	2	Commscope TD-850B-LTE78-43
146.00	PANEL	3	Samsung MT6407-77A
146.00	PANEL	6	JMA Wireless MX06FRO660-03
146.00	RRU/RRH	3	Samsung B2/B66A RRH-BR049
146.00	RRU/RRH	3	Samsung B5/B13 RRH-BR04C
145.00	Other	3	Site Pro 1 VFA12-HD Sector Fra
137.50	Sector Frame	1	Rest Platform
137.50	Side Arm	1	Generic Flat Side Arm
137.00	BOB/SSB	1	Commscope RDIDC-9181-PF-48
137.00	PANEL	3	JMA Wireless MX08FRO665-21
137.00	RRU/RRH	3	Fujitsu TA08025-B605
137.00	RRU/RRH	3	Fujitsu TA08025-B604
137.00	Sector Frame	3	Generic Flat Light Sector Fram
120.00	Side Arm	1	Generic Flat Side Arm
112.50	Side Arm	1	Generic Flat Side Arm
100.00	Side Arm	1	Generic Flat Side Arm
100.00	Triangular Low Profile Platform	1	Platform
87.50	Sector Frame	1	Rest Platform
82.00	Side Arm	1	Generic Round Side Arm
80.00	OMNI	1	Andrew DB616E-BC
50.00	Sector Frame	1	Rest Platform

## LINEAR APPURTENANCE

Elev (ft)			Qty	Description
From	To			
10.00	193.00	1	1/4" Coax	
10.00	193.00	12	1 5/8" Coax	
0.00	193.00	1	1 5/8" (1.63"-41.3mm) Fiber	
0.00	192.00	1	1 1/4" (1.25"- 31.8mm) Fiber	
0.00	187.50	1	Waveguide	
0.00	187.50	1	Climbing Ladder	
0.00	182.00	1	Waveguide	
0.00	176.00	1	Waveguide	
10.00	167.00	3	1 1/4" Hybriflex Cable	
0.00	167.00	1	1 1/4" (1.25"- 31.8mm) Fiber	
0.00	160.00	1	Waveguide	
10.00	160.00	1	3" conduit	
10.00	160.00	2	0.74" (18.7mm) 8 AWG 7	
10.00	160.00	1	0.28" (7mm) Fiber	
10.00	155.00	6	1 5/8" Coax	
0.00	146.00	2	1 5/8" Hybriflex	
10.00	146.00	6	1 5/8" Coax	
0.00	145.00	1	Waveguide	
0.00	137.00	1	1.75" (44.5mm) Hybrid	
10.00	80.00	1	7/8" Coax	
8.30	33.30	4	Coax Cage	

## GLOBAL BASE FOUNDATION DESIGN LOADS

Load Case	Moment (k-ft)	Vertical (kip)	Horizontal (kip)
DL+WL	8374.5	139.14	75.51
DL+WL+IL	2488.9	245.08	22.58

JOB INFORMATION

Asset: 88014, NEW FAIRFIELD  
 Client: DISH WIRELESS L.L.C.  
 Code: ANSI/TIA-222-H

Height : 187.5 ft  
 Base Width : 32.45 ft  
 Shape : Square

GLOBAL BASE FOUNDATION DESIGN LOADS

Load Case	Moment (k-ft)	Vertical (kip)	Horizontal (kip)
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INDIVIDUAL BASE FOUNDATION DESIGN LOADS

Vertical (kip)	Uplift (kip)	Horizontal (kip)
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217.30	156.29	30.45
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ASSET: # 88014, NEW FAIRFIELD  
CUSTOMER DISH WIRELESS L.L.C.

STANDARD ANSI/TIA-222-H  
ENG NO.: 13699607\_C3\_06

#### ANALYSIS PARAMETERS

Location:	Fairfield County, CT	Height:	187.5 ft
Type and Shape:	Self Support, Square	Base Elevation:	0.00 ft
Manufacturer:	AT&T TAG	Bottom Face Width:	32.45 ft
Kd	0.85	Top Face Width:	9.00 ft
Ke:	0.97	Anchor Bolt Detail Type:	c

#### ICE & WIND PARAMETERS

Exposure Category:	B	Design Wind Speed Without Ice:	115 mph
Risk Category:	II	Design Wind Speed with Ice:	50 mph
Topographic Factor Procedure:	Method 1	Operational Windspeed:	60 mph
Topographic Category:	Flat	Design Ice Thickness:	1.00 in
Crest Height:	0 ft	HMSL:	890 ft

#### SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	D - Stiff Soil	Period Based on Rayleigh Method (sec):	0.67
T <sub>L</sub> (sec):	6	P:	1.3
S <sub>s</sub> :	0.224	S <sub>1</sub> :	0.056
F <sub>a</sub> :	1.600	F <sub>v</sub> :	2.400
S <sub>ds</sub> :	0.239	S <sub>d1</sub> :	0.090
		C <sub>s</sub> :	0.045
		C <sub>s</sub> , Max:	0.045
		C <sub>s</sub> , Min:	0.030

#### LOAD CASES

1.2D + 1.0W Normal	115 mph wind with no ice
1.2D + 1.0W 45°	115 mph wind with no ice
0.9D + 1.0W Normal	115 mph wind with no ice
0.9D + 1.0W 45°	115 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Normal	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 45°	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh Normal	Seismic
1.2D + 1.0Ev + 1.0Eh 45°	Seismic
0.9D - 1.0Ev + 1.0Eh Normal	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 45°	Seismic (Reduced DL)
1.0D + 1.0W Service Normal	60 mph Wind with No Ice
1.0D + 1.0W Service 45°	60 mph Wind with No Ice

ASSET: # 88014, NEW FAIRFIELD

STANDARD

ANSI/TIA-222-H

CUSTOMER DISH WIRELESS L.L.C.

ENG NO.:

13699607\_C3\_06

## TOWER LOADING

Discrete Appurtenance Properties 1.2D + 1.0W

Elev (ft)	Description	Qty	Wt. (lb)	EPA Length (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient Factor	Vert Ecc (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
193.0	Ericsson KRY 112 144/1	3	11	0.4	0.6	6.1	2.7	0.80	0.50	0.0	0.00	33.23	12	40
193.0	Ericsson RRUS 11 B12	3	51	2.8	1.6	17.0	7.2	0.80	0.67	0.0	0.00	33.23	127	183
193.0	RFS SC2-W100AB	1	22	4.8	2.2	26.4	11.5	1.00	1.00	0.0	0.00	33.23	135	26
193.0	Ericsson AIR 21, 1.3 M, B2A B4	3	83	6.0	4.7	12.0	8.0	0.80	0.71	0.0	0.00	33.23	291	299
193.0	Ericsson AIR 21, 1.3M, B4A B2P	3	82	6.1	4.7	12.1	7.9	0.80	0.70	0.0	0.00	33.23	289	293
191.0	Commscope LNX-6515DS-VTM	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.00	33.13	541	181
187.5	Pipe Mount	6	150	3.3	6.0	6.0	6.0	1.00	1.00	0.0	0.00	32.96	555	1080
187.5	Platform	1	8000	70.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	32.96	1961	9600
170.3	Catwalk	1	6500	55.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	32.06	1499	7800
168.0	Alcatel-Lucent ALU 800MHz Exte	3	9	0.7	0.8	8.0	3.0	0.80	0.50	0.0	0.00	31.94	22	32
167.0	Alcatel-Lucent 2X50W RRH w/o F	3	53	2.1	1.6	13.0	8.6	0.80	0.67	0.0	0.00	31.88	90	191
167.0	Alcatel-Lucent 4x40W RRH (91 I	3	91	3.3	1.9	13.0	17.3	0.80	0.67	0.0	0.00	31.88	143	328
167.0	Alcatel-Lucent TD-RRH8x20-25 w	3	70	4.0	2.2	18.6	6.7	0.80	0.67	0.0	0.00	31.88	176	252
167.0	RFS APXV9TM14-ALU-I20*	3	55	6.3	4.7	12.6	6.3	0.80	0.66	0.0	0.00	31.88	272	198
167.0	RFS APXVSPP18-C-A20	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.00	31.88	360	205
167.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	31.88	819	1440
160.0	Raycap DC6-48-60-18-8F	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.00	31.50	27	24
160.0	Ericsson RRUS 32 B2	3	53	2.7	2.3	12.1	7.0	0.80	0.67	0.0	0.00	31.50	118	191
160.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	31.50	809	1440
155.0	Powerwave Allgon LGP21401	6	14	1.1	1.2	9.2	2.6	0.80	0.50	0.0	0.00	31.21	70	102
155.0	Ericsson RRUS 11 (Band 12) (55	3	55	2.5	1.5	17.0	7.2	0.80	0.67	0.0	0.00	31.21	108	198
155.0	Allgon 7770.00	3	35	5.5	4.6	11.0	5.0	0.80	0.65	0.0	0.00	31.21	228	126
155.0	CCI HPA-65R-BUU-H6	3	51	9.7	6.0	14.8	9.0	0.80	0.69	0.0	0.00	31.21	424	184
146.0	Samsung B2/B66A RRH-BR049	3	84	1.9	1.3	15.0	10.0	0.80	0.50	0.0	0.00	30.68	59	304
146.0	Samsung B5/B13 RRH-BR04C	3	70	1.9	1.3	15.0	8.1	0.80	0.50	0.0	0.00	30.68	59	253
146.0	Commscope TD-850B-LTE78-43	2	53	2.0	1.3	15.3	6.4	0.80	0.50	0.0	0.00	30.68	41	127
146.0	Raycap RCMDC-6627-PF-48	1	32	4.1	2.5	16.5	12.6	0.80	0.67	0.0	0.00	30.68	57	38
146.0	Samsung MT6407-77A	3	82	4.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	30.68	180	294
146.0	JMA Wireless MX06FRO660-03	6	60	9.9	5.9	15.4	10.7	0.80	0.71	0.0	0.00	30.68	877	432
145.0	Site Pro 1 VFA12-HD Sector Fra	3	738	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	30.62	565	2657
137.5	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	30.16	162	225
137.5	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	30.16	385	600
137.0	Commscope RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	30.13	38	26
137.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	30.13	60	270
137.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	30.13	60	230
137.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	30.13	491	232
137.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	30.13	774	1440
120.0	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	29.01	155	225
112.5	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	28.48	153	225
100.0	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.54	147	225
100.0	Platform	1	5500	45.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.54	1053	6600
87.5	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	26.51	338	600
82.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	26.02	115	225
80.0	Andrew DB616E-BC	1	51	6.7	19.3	3.5	3.5	1.00	1.00	0.0	0.00	25.84	148	61
50.0	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	22.59	288	600
Totals		111	33,585	847.3									15,280	40,302

## TOWER LOADING

Discrete Appurtenance Properties 0.9D + 1.0W

Elev (ft)	Description	Qty	Wt. (lb)	EPA Length (sf)	Width (ft)	Depth (in)	K <sub>a</sub>	Orient Factor	Vert Ecc (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)	
193.0	Ericsson KRY 112 144/1	3	11	0.4	0.6	6.1	2.7	0.80	0.50	0.0	0.00	33.23	12	30
193.0	Ericsson RRUS 11 B12	3	51	2.8	1.6	17.0	7.2	0.80	0.67	0.0	0.00	33.23	127	137
193.0	RFS SC2-W100AB	1	22	4.8	2.2	26.4	11.5	1.00	1.00	0.0	0.00	33.23	135	20
193.0	Ericsson AIR 21, 1.3 M, B2A B4	3	83	6.0	4.7	12.0	8.0	0.80	0.71	0.0	0.00	33.23	291	224
193.0	Ericsson AIR 21, 1.3M, B4A B2P	3	82	6.1	4.7	12.1	7.9	0.80	0.70	0.0	0.00	33.23	289	220
191.0	Commscope LNX-6515DS-VTM	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.00	33.13	541	136
187.5	Pipe Mount	6	150	3.3	6.0	6.0	6.0	1.00	1.00	0.0	0.00	32.96	555	810
187.5	Platform	1	8000	70.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	32.96	1961	7200
170.3	Catwalk	1	6500	55.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	32.06	1499	5850
168.0	Alcatel-Lucent ALU 800MHz Exte	3	9	0.7	0.8	8.0	3.0	0.80	0.50	0.0	0.00	31.94	22	24
167.0	Alcatel-Lucent 2X50W RRH w/o F	3	53	2.1	1.6	13.0	8.6	0.80	0.67	0.0	0.00	31.88	90	143

Elev (ft)	Description	Qty	Wt. (lb)	EPA Length (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient Factor	Vert Ecc (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
167.0	Alcatel-Lucent 4x40W RRH (91 I	3	91	3.3	1.9	13.0	17.3	0.80	0.67	0.0	0.00	31.88	143	246
167.0	Alcatel-Lucent TD-RRH8x20-25 w	3	70	4.0	2.2	18.6	6.7	0.80	0.67	0.0	0.00	31.88	176	189
167.0	RFS APXV9TM14-ALU-I20*	3	55	6.3	4.7	12.6	6.3	0.80	0.66	0.0	0.00	31.88	272	149
167.0	RFS APXVSPP18-C-A20	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.00	31.88	360	154
167.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	31.88	819	1080
160.0	Raycap DC6-48-60-18-8F	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.00	31.50	27	18
160.0	Ericsson RRUS 32 B2	3	53	2.7	2.3	12.1	7.0	0.80	0.67	0.0	0.00	31.50	118	143
160.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	31.50	809	1080
155.0	Powerwave Allgon LGP21401	6	14	1.1	1.2	9.2	2.6	0.80	0.50	0.0	0.00	31.21	70	76
155.0	Ericsson RRUS 11 (Band 12) (55	3	55	2.5	1.5	17.0	7.2	0.80	0.67	0.0	0.00	31.21	108	148
155.0	Allgon 7770.00	3	35	5.5	4.6	11.0	5.0	0.80	0.65	0.0	0.00	31.21	228	94
155.0	CCI HPA-65R-BUU-H6	3	51	9.7	6.0	14.8	9.0	0.80	0.69	0.0	0.00	31.21	424	138
146.0	Samsung B2/B66A RRH-BR049	3	84	1.9	1.3	15.0	10.0	0.80	0.50	0.0	0.00	30.68	59	228
146.0	Samsung B5/B13 RRH-BR04C	3	70	1.9	1.3	15.0	8.1	0.80	0.50	0.0	0.00	30.68	59	190
146.0	Commscope TD-850B-LTE78-43	2	53	2.0	1.3	15.3	6.4	0.80	0.50	0.0	0.00	30.68	41	95
146.0	Raycap RCMDC-6627-PF-48	1	32	4.1	2.5	16.5	12.6	0.80	0.67	0.0	0.00	30.68	57	29
146.0	Samsung MT6407-77A	3	82	4.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	30.68	180	220
146.0	JMA Wireless MX06FRO660-03	6	60	9.9	5.9	15.4	10.7	0.80	0.71	0.0	0.00	30.68	877	324
145.0	Site Pro 1 VFA12-HD Sector Fra	3	738	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	30.62	565	1993
137.5	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	30.16	162	169
137.5	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	30.16	385	450
137.0	Commscope RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	30.13	38	20
137.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	30.13	60	202
137.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	30.13	60	173
137.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	30.13	491	174
137.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	30.13	774	1080
120.0	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	29.01	155	169
112.5	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	28.48	153	169
100.0	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.54	147	169
100.0	Platform	1	5500	45.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.54	1053	4950
87.5	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	26.51	338	450
82.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	26.02	115	169
80.0	Andrew DB616E-BC	1	51	6.7	19.3	3.5	3.5	1.00	1.00	0.0	0.00	25.84	148	46
50.0	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	22.59	288	450
Totals		111	33,585	847.3									15,280	30,226

## TOWER LOADING

Discrete Appurtenance Properties 1.2D + 1.0Di + 1.0Wi

Elev (ft)	Description	Qty	Ice Wt (lb)	Ice EPA (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient Factor	Vert Ecc (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
193.0	Ericsson KRY 112 144/1	3	18	0.6	0.6	6.1	2.7	0.80	0.50	0.0	0.00	6.28	4	62
193.0	Ericsson RRUS 11 B12	3	100	3.5	1.6	17.0	7.2	0.80	0.67	0.0	0.00	6.28	30	331
193.0	RFS SC2-W100AB	1	85	5.7	2.2	26.4	11.5	1.00	1.00	0.0	0.00	6.28	30	90
193.0	Ericsson AIR 21, 1.3 M, B2A B4	3	182	7.5	4.7	12.0	8.0	0.80	0.71	0.0	0.00	6.28	68	597
193.0	Ericsson AIR 21, 1.3M, B4A B2P	3	181	7.6	4.7	12.1	7.9	0.80	0.70	0.0	0.00	6.28	68	591
191.0	Commscope LNX-6515DS-VTM	3	207	13.6	8.0	11.9	7.1	0.80	0.70	0.0	0.00	6.26	122	650
187.5	Pipe Mount	6	328	4.9	6.0	6.0	6.0	1.00	1.00	0.0	0.00	6.23	155	2148
187.5	Platform	1	1191	90.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	6.23	482	13512
		2												
170.3	Catwalk	1	9616	73.4	0.0	0.0	0.0	1.00	1.00	0.0	0.00	6.06	378	10916
168.0	Alcatel-Lucent ALU 800MHz Exte	3	21	1.0	0.8	8.0	3.0	0.80	0.50	0.0	0.00	6.04	6	67
167.0	Alcatel-Lucent 2X50W RRH w/o F	3	96	2.7	1.6	13.0	8.6	0.80	0.67	0.0	0.00	6.03	22	320
167.0	Alcatel-Lucent 4x40W RRH (91 I	3	165	4.1	1.9	13.0	17.3	0.80	0.67	0.0	0.00	6.03	34	549
167.0	Alcatel-Lucent TD-RRH8x20-25 w	3	134	4.9	2.2	18.6	6.7	0.80	0.67	0.0	0.00	6.03	41	443
167.0	RFS APXV9TM14-ALU-I20*	3	148	7.8	4.7	12.6	6.3	0.80	0.66	0.0	0.00	6.03	63	477
167.0	RFS APXVSPP18-C-A20	3	173	9.9	6.0	11.8	7.0	0.80	0.69	0.0	0.00	6.03	84	554
167.0	Generic Flat Light Sector Fram	3	603	28.1	0.0	0.0	0.0	0.75	0.75	0.0	0.00	6.03	243	2049
160.0	Raycap DC6-48-60-18-8F	1	55	1.7	2.0	9.7	9.7	0.80	1.00	0.0	0.00	5.95	7	59
160.0	Ericsson RRUS 32 B2	3	102	3.5	2.3	12.1	7.0	0.80	0.67	0.0	0.00	5.95	29	339
160.0	Generic Flat Light Sector Fram	3	602	28.0	0.0	0.0	0.0	0.75	0.75	0.0	0.00	5.95	239	2045
155.0	Powerwave Allgon LGP21401	6	31	1.6	1.2	9.2	2.6	0.80	0.50	0.0	0.00	5.90	19	201
155.0	Ericsson RRUS 11 (Band 12) (55	3	100	3.2	1.5	17.0	7.2	0.80	0.67	0.0	0.00	5.90	26	332
155.0	Allgon 7770.00	3	118	6.2	4.6	11.0	5.0	0.80	0.65	0.0	0.00	5.90	48	375
155.0	CCI HPA-65R-BUU-H6	3	197	11.5	6.0	14.8	9.0	0.80	0.69	0.0	0.00	5.90	96	621
146.0	Samsung B2/B66A RRH-BR049	3	127	2.5	1.3	15.0	10.0	0.80	0.50	0.0	0.00	5.80	15	431
146.0	Samsung B5/B13 RRH-BR04C	3	108	2.5	1.3	15.0	8.1	0.80	0.50	0.0	0.00	5.80	15	367

Elev (ft)	Description	Qty	Ice Wt (lb)	Ice EPA (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient Factor	Vert Ecc (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
146.0	Commscope TD-850B-LTE78-43	2	88	2.6	1.3	15.3	6.4	0.80	0.50	0.0	0.00	5.80	10	198
146.0	Raycap RCMDC-6627-PF-48	1	117	5.0	2.5	16.5	12.6	0.80	0.67	0.0	0.00	5.80	13	123
146.0	Samsung MT6407-77A	3	149	5.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	5.80	41	497
146.0	JMA Wireless MX06FRO660-03	6	219	11.7	5.9	15.4	10.7	0.80	0.71	0.0	0.00	5.80	197	1389
145.0	Site Pro 1 VFA12-HD Sector Fra	3	1340	25.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	5.79	188	4463
137.5	Generic Flat Side Arm	1	275	8.4	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.70	40	313
137.5	Rest Platform	1	748	23.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.70	113	848
137.0	Commscope RDIDC-9181-PF-48	1	59	2.5	1.3	14.0	8.0	0.80	1.00	0.0	0.00	5.70	10	64
137.0	Fujitsu TA08025-B605	3	116	2.6	1.3	15.0	9.1	0.80	0.50	0.0	0.00	5.70	15	394
137.0	Fujitsu TA08025-B604	3	102	2.6	1.3	15.0	7.9	0.80	0.50	0.0	0.00	5.70	15	345
137.0	JMA Wireless MX08FRO665-21	3	234	14.3	6.0	20.0	8.0	0.80	0.64	0.0	0.00	5.70	107	740
137.0	Generic Flat Light Sector Fram	3	598	27.8	0.0	0.0	0.0	0.75	0.75	0.0	0.00	5.70	227	2035
120.0	Generic Flat Side Arm	1	274	8.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.48	39	312
112.5	Generic Flat Side Arm	1	273	8.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.38	38	310
100.0	Generic Flat Side Arm	1	273	8.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.21	37	310
100.0	Platform	1	8007	59.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.21	262	9107
87.5	Rest Platform	1	736	22.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.01	98	836
82.0	Generic Round Side Arm	1	245	6.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	4.92	29	282
80.0	Andrew DB616E-BC	1	152	10.9	19.3	3.5	3.5	1.00	1.00	0.0	0.00	4.88	45	163
50.0	Rest Platform	1	719	22.4	0.0	0.0	0.0	1.00	1.00	0.0	0.00	4.27	81	819
Totals		111	54,960	1154.1									3929	61,676

## TOWER LOADING

Discrete Appurtenance Properties 1.0D + 1.0W Service

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient Factor	Vert Ecc (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
193.0	Ericsson KRY 112 144/1	3	11	0.4	0.6	6.1	2.7	0.80	0.50	0.0	0.00	9.05	3	33
193.0	Ericsson RRUS 11 B12	3	51	2.8	1.6	17.0	7.2	0.80	0.67	0.0	0.00	9.05	35	152
193.0	RFS SC2-W100AB	1	22	4.8	2.2	26.4	11.5	1.00	1.00	0.0	0.00	9.05	37	22
193.0	Ericsson AIR 21, 1.3 M, B2A B4	3	83	6.0	4.7	12.0	8.0	0.80	0.71	0.0	0.00	9.05	79	249
193.0	Ericsson AIR 21, 1.3M, B4A B2P	3	82	6.1	4.7	12.1	7.9	0.80	0.70	0.0	0.00	9.05	79	244
191.0	Commscope LNX-6515DS-VTM	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.00	9.02	147	151
187.5	Pipe Mount	6	150	3.3	6.0	6.0	6.0	1.00	1.00	0.0	0.00	8.97	151	900
187.5	Platform	1	8000	70.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	8.97	534	8000
170.3	Catwalk	1	6500	55.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	8.73	408	6500
168.0	Alcatel-Lucent ALU 800MHz Exte	3	9	0.7	0.8	8.0	3.0	0.80	0.50	0.0	0.00	8.69	6	26
167.0	Alcatel-Lucent 2X50W RRH w/o F	3	53	2.1	1.6	13.0	8.6	0.80	0.67	0.0	0.00	8.68	24	159
167.0	Alcatel-Lucent 4x40W RRH (91 I	3	91	3.3	1.9	13.0	17.3	0.80	0.67	0.0	0.00	8.68	39	273
167.0	Alcatel-Lucent TD-RRH8x20-25 w	3	70	4.0	2.2	18.6	6.7	0.80	0.67	0.0	0.00	8.68	48	210
167.0	RFS APXV9TM14-ALU-I20*	3	55	6.3	4.7	12.6	6.3	0.80	0.66	0.0	0.00	8.68	74	165
167.0	RFS APXVSP18-C-A20	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.00	8.68	98	171
167.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	8.68	223	1200
160.0	Raycap DC6-48-60-18-8F	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.00	8.57	7	20
160.0	Ericsson RRUS 32 B2	3	53	2.7	2.3	12.1	7.0	0.80	0.67	0.0	0.00	8.57	32	159
160.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	8.57	220	1200
155.0	Powerwave Allgon LGP21401	6	14	1.1	1.2	9.2	2.6	0.80	0.50	0.0	0.00	8.50	19	85
155.0	Ericsson RRUS 11 (Band 12) (55	3	55	2.5	1.5	17.0	7.2	0.80	0.67	0.0	0.00	8.50	29	165
155.0	Allgon 7770.00	3	35	5.5	4.6	11.0	5.0	0.80	0.65	0.0	0.00	8.50	62	105
155.0	CCI HPA-65R-BUU-H6	3	51	9.7	6.0	14.8	9.0	0.80	0.69	0.0	0.00	8.50	115	153
146.0	Samsung B2/B66A RRH-BR049	3	84	1.9	1.3	15.0	10.0	0.80	0.50	0.0	0.00	8.35	16	253
146.0	Samsung B5/B13 RRH-BR04C	3	70	1.9	1.3	15.0	8.1	0.80	0.50	0.0	0.00	8.35	16	211
146.0	Commscope TD-850B-LTE78-43	2	53	2.0	1.3	15.3	6.4	0.80	0.50	0.0	0.00	8.35	11	106
146.0	Raycap RCMDC-6627-PF-48	1	32	4.1	2.5	16.5	12.6	0.80	0.67	0.0	0.00	8.35	15	32
146.0	Samsung MT6407-77A	3	82	4.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	8.35	49	245
146.0	JMA Wireless MX06FRO660-03	6	60	9.9	5.9	15.4	10.7	0.80	0.71	0.0	0.00	8.35	239	360
145.0	Site Pro 1 VFA12-HD Sector Fra	3	738	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	8.34	154	2214
137.5	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	8.21	44	188
137.5	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	8.21	105	500
137.0	Commscope RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	8.20	10	22
137.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	8.20	16	225
137.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	8.20	16	192
137.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	8.20	134	194
137.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	8.20	211	1200
120.0	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.90	42	188
112.5	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.75	42	188

Elev (ft)	Description	Qty	Wt. (lb)	EPA Length (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient Factor	Vert Ecc (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
100.0	Generic Flat Side Arm	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.50	40	188
100.0	Platform	1	5500	45.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.50	287	5500
87.5	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.22	92	500
82.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.08	31	188
80.0	Andrew DB616E-BC	1	51	6.7	19.3	3.5	3.5	1.00	1.00	0.0	0.00	7.03	40	51
50.0	Rest Platform	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	6.15	78	500
Totals		111	33,585	847.3									4,159	33,585

ASSET: # 88014, NEW FAIRFIELD  
 CUSTOMER DISH WIRELESS L.L.C.

STANDARD ANSI/TIA-222-H  
 ENG NO.: 13699607\_C3\_06

# TOWER LOADING

## Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	% In Wind	Spread On Faces	Bundling	Cluster Dia (in)	Out of Zone	Spacing (in)	Orient Factor	K <sub>a</sub> Override
10.0	193.0	1/4" Coax	1	0.34	0.06	100	3	Individual	0.00	N	1.00	1.00	0.00
10.0	193.0	1 5/8" Coax	12	1.98	0.82	75	3	Block	0.00	N	1.00	1.00	0.00
10.0	167.0	1 1/4" Hybriflex Cable	3	1.54	1.00	100	4	Individual	0.00	N	1.00	1.00	0.00
10.0	160.0	0.74" (18.7mm) 8 AWG 7	2	0.74	0.49	100	3	Individual	0.00	N	1.00	1.00	0.01
10.0	160.0	0.28" (7mm) Fiber	1	0.28	0.04	100	3	Individual	0.00	N	1.00	1.00	0.01
10.0	160.0	3" conduit	1	3.50	7.58	100	3	Individual	0.00	N	1.00	1.00	0.00
10.0	155.0	1 5/8" Coax	6	1.98	0.82	100	3	Individual	0.00	N	1.00	1.00	0.00
10.0	146.0	1 5/8" Coax	6	1.98	0.82	100	1	Individual	0.00	N	1.00	1.00	0.00
10.0	80.0	7/8" Coax	1	1.09	0.33	100	1	Individual	0.00	N	1.00	1.00	0.00
8.3	33.3	Coax Cage	4	12.00	25.00	100	1,2,3,4	Individual	0.00	N	1.00	1.00	0.00
0.0	193.0	1 5/8" (1.63"-41.3mm) Fiber	1	1.63	1.61	100	3	Individual	0.00	N	1.00	1.00	0.00
0.0	192.0	1 1/4" (1.25"- 31.8mm) Fiber	1	1.25	1.05	100	3	Individual	0.00	N	1.00	1.00	0.00
0.0	187.5	Waveguide	1	2.00	6.00	100	3	Individual	0.00	N	1.00	1.00	0.00
0.0	187.5	Climbing Ladder	1	2.00	6.90	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	182.0	Waveguide	1	2.00	6.00	100	4	Individual	0.00	N	1.00	1.00	0.00
0.0	176.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	167.0	1 1/4" (1.25"- 31.8mm) Fiber	1	1.25	1.05	100	4	Individual	0.00	N	1.00	1.00	0.00
0.0	160.0	Waveguide	1	2.00	6.00	100	3	Individual	0.00	N	1.00	1.00	0.00
0.0	146.0	1 5/8" Hybriflex	2	1.98	1.30	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	145.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	137.0	1.75" (44.5mm) Hybrid	1	1.75	2.72	100	2	Individual	0.00	N	1.00	1.00	0.00

## SECTION FORCES

1.2D + 1.0W Normal  
115 mph wind with no ice

Gust Response Factor (Gh): 0.85  
Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q <sub>z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
12	183	32.74	21.735	0.000	0.00	0.254	2.76	1.00	1.00	0.0	21.74	59.94	0.00	2409	0	1668	499	2167	
11	175	32.29	18.878	0.000	0.00	0.200	2.98	1.00	1.00	0.0	18.88	56.30	0.00	2047	0	1545	554	2099	
10	165	31.79	23.088	0.000	0.00	0.186	3.04	1.00	1.00	0.0	23.09	70.20	0.00	3189	0	1897	730	2626	
9	155	31.22	24.221	0.000	0.00	0.177	3.08	1.00	1.00	0.0	24.22	74.65	0.00	3105	0	1981	989	2969	
8	144	30.55	26.817	0.000	0.00	0.143	3.24	1.00	1.00	0.0	26.82	86.80	0.00	4939	0	2254	1558	3812	
7	131	29.76	27.593	0.000	0.00	0.134	3.28	1.00	1.00	0.0	27.59	90.60	0.00	5542	0	2292	1672	3964	
6	119	28.92	28.388	0.000	0.00	0.126	3.32	1.00	1.00	0.0	28.39	94.32	0.00	5742	0	2319	1626	3945	
5	100	27.54	59.230	0.000	0.00	0.116	3.37	1.00	1.00	0.0	59.23	199.60	0.00	13277	0	4672	3014	7686	
4	81	25.95	30.837	0.000	0.00	0.108	3.41	1.00	1.00	0.0	30.84	105.10	0.00	7233	0	2318	1427	3746	
3	62	24.08	82.186	0.000	0.00	0.130	3.30	1.00	1.00	0.0	82.19	271.28	0.00	14847	0	5552	2669	8221	
2	38	20.81	86.518	0.000	0.00	0.122	3.34	1.00	1.00	0.0	86.52	289.05	0.00	16628	0	5112	2659	7771	
1	12	19.51	92.567	0.000	0.00	0.117	3.36	1.00	1.00	0.0	92.57	311.27	0.00	19880	0	5161	2293	7454	
														98,838	0				56,460

1.2D + 1.0W 45°  
115 mph wind with no ice

Gust Response Factor (Gh): 0.85  
Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
12	183	32.74	21.735	0.000	0.00	0.254	2.76	1.19	1.19	0.0	25.88	71.38	0.00	2409	0	1986	499	2485	
11	175	32.29	18.878	0.000	0.00	0.200	2.98	1.15	1.15	0.0	21.70	64.72	0.00	2047	0	1776	554	2330	
10	165	31.79	23.088	0.000	0.00	0.186	3.04	1.14	1.14	0.0	26.31	80.00	0.00	3189	0	2161	730	2891	
9	155	31.22	24.221	0.000	0.00	0.177	3.08	1.13	1.13	0.0	27.43	84.55	0.00	3105	0	2243	989	3232	
8	144	30.55	26.817	0.000	0.00	0.143	3.24	1.11	1.11	0.0	29.70	96.13	0.00	4939	0	2496	1558	4054	
7	131	29.76	27.593	0.000	0.00	0.134	3.28	1.10	1.10	0.0	30.36	99.68	0.00	5542	0	2522	1672	4193	
6	119	28.92	28.388	0.000	0.00	0.126	3.32	1.09	1.09	0.0	31.06	103.20	0.00	5742	0	2537	1626	4163	
5	100	27.54	59.230	0.000	0.00	0.116	3.37	1.09	1.09	0.0	64.38	216.95	0.00	13277	0	5078	3014	8092	
4	81	25.95	30.837	0.000	0.00	0.108	3.41	1.08	1.08	0.0	33.34	113.63	0.00	7233	0	2506	1427	3934	
3	62	24.08	82.186	0.000	0.00	0.130	3.30	1.10	1.10	0.0	90.20	297.72	0.00	14847	0	6093	2669	8762	
2	38	20.81	86.518	0.000	0.00	0.122	3.34	1.09	1.09	0.0	94.42	315.45	0.00	16628	0	5579	2659	8238	
1	12	19.51	92.567	0.000	0.00	0.117	3.36	1.09	1.09	0.0	100.72	338.67	0.00	19880	0	5615	2259	7874	
														98,838	0				60,249

0.9D + 1.0W Normal  
115 mph wind with no ice

Gust Response Factor (Gh): 0.85  
Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q <sub>z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
12	183	32.74	21.735	0.000	0.00	0.254	2.76	1.00	1.00	0.0	21.74	59.94	0.00	1807	0	1668	499	2167	
11	175	32.29	18.878	0.000	0.00	0.200	2.98	1.00	1.00	0.0	18.88	56.30	0.00	1535	0	1545	554	2099	
10	165	31.79	23.088	0.000	0.00	0.186	3.04	1.00	1.00	0.0	23.09	70.20	0.00	2391	0	1897	730	2626	
9	155	31.22	24.221	0.000	0.00	0.177	3.08	1.00	1.00	0.0	24.22	74.65	0.00	2329	0	1981	989	2969	
8	144	30.55	26.817	0.000	0.00	0.143	3.24	1.00	1.00	0.0	26.82	86.80	0.00	3704	0	2254	1558	3812	
7	131	29.76	27.593	0.000	0.00	0.134	3.28	1.00	1.00	0.0	27.59	90.60	0.00	4157	0	2292	1672	3964	
6	119	28.92	28.388	0.000	0.00	0.126	3.32	1.00	1.00	0.0	28.39	94.32	0.00	4306	0	2319	1626	3945	
5	100	27.54	59.230	0.000	0.00	0.116	3.37	1.00	1.00	0.0	59.23	199.60	0.00	9957	0	4672	3014	7686	
4	81	25.95	30.837	0.000	0.00	0.108	3.41	1.00	1.00	0.0	30.84	105.10	0.00	5425	0	2318	1427	3746	
3	62	24.08	82.186	0.000	0.00	0.130	3.30	1.00	1.00	0.0	82.19	271.28	0.00	11136	0	5552	2669	8221	
2	38	20.81	86.518	0.000	0.00	0.122	3.34	1.00	1.00	0.0	86.52	289.05	0.00	12471	0	5112	2659	7771	
1	12	19.51	92.567	0.000	0.00	0.117	3.36	1.00	1.00	0.0	92.57	311.27	0.00	14910	0	5161	2259	7419	
														74,128	0				56,425

0.9D + 1.0W 45°

Gust Response Factor (Gh): 0.85

ASSET: # 88014, NEW FAIRFIELD

STANDARD

ANSI/TIA-222-H

CUSTOMER DISH WIRELESS L.L.C.

ENG NO.:

13699607\_C3\_06

## SECTION FORCES

115 mph wind with no ice

Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q <sub>z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)
12	183	32.74	21.735	0.000	0.00	0.254	2.76	1.19	1.19	0.0	25.88	71.38	0.00	1807	0	1986	499	2485
11	175	32.29	18.878	0.000	0.00	0.200	2.98	1.15	1.15	0.0	21.70	64.72	0.00	1535	0	1776	554	2330
10	165	31.79	23.088	0.000	0.00	0.186	3.04	1.14	1.14	0.0	26.31	80.00	0.00	2391	0	2161	730	2891
9	155	31.22	24.221	0.000	0.00	0.177	3.08	1.13	1.13	0.0	27.43	84.55	0.00	2329	0	2243	989	3232
8	144	30.55	26.817	0.000	0.00	0.143	3.24	1.11	1.11	0.0	29.70	96.13	0.00	3704	0	2496	1558	4054
7	131	29.76	27.593	0.000	0.00	0.134	3.28	1.10	1.10	0.0	30.36	99.68	0.00	4157	0	2522	1672	4193
6	119	28.92	28.388	0.000	0.00	0.126	3.32	1.09	1.09	0.0	31.06	103.20	0.00	4306	0	2537	1626	4163
5	100	27.54	59.230	0.000	0.00	0.116	3.37	1.09	1.09	0.0	64.38	216.95	0.00	9957	0	5078	3014	8092
4	81	25.95	30.837	0.000	0.00	0.108	3.41	1.08	1.08	0.0	33.34	113.63	0.00	5425	0	2506	1427	3934
3	62	24.08	82.186	0.000	0.00	0.130	3.30	1.10	1.10	0.0	90.20	297.72	0.00	11136	0	6093	2669	8762
2	38	20.81	86.518	0.000	0.00	0.122	3.34	1.09	1.09	0.0	94.42	315.45	0.00	12471	0	5579	2659	8238
1	12	19.51	92.567	0.000	0.00	0.117	3.36	1.09	1.09	0.0	100.72	338.67	0.00	14910	0	5615	2259	7874
															74,128	0		60,249

1.2D + 1.0Di + 1.0Wi Normal  
50 mph wind with 1" radial iceGust Response Factor (Gh): 0.85  
Wind Importance Factor (Iw): 1.00Ice Importance Factor: 1.00  
Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q <sub>z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)
12	183	6.19	21.735	10.271	10.27	0.368	2.37	1.00	1.00	1.2	32.01	75.92	10.27	4923	2514	399	172	571
11	175	6.10	18.878	10.754	10.75	0.308	2.56	1.00	1.00	1.2	29.63	75.96	10.75	4369	2322	394	197	591
10	165	6.01	23.088	12.279	12.28	0.281	2.66	1.00	1.00	1.2	35.37	94.06	12.28	6389	3200	480	277	757
9	155	5.90	24.221	12.831	12.83	0.267	2.71	1.00	1.00	1.2	37.05	100.46	12.83	6511	3406	504	383	886
8	144	5.77	26.817	13.152	13.15	0.211	2.93	1.00	1.00	1.2	39.97	117.26	13.15	10298	5359	576	667	1243
7	131	5.63	27.593	13.493	13.49	0.196	3.00	1.00	1.00	1.1	41.09	123.05	13.49	11250	5708	588	736	1324
6	119	5.47	28.388	13.825	13.83	0.185	3.05	1.00	1.00	1.1	42.21	128.62	13.83	11568	5827	598	719	1316
5	100	5.21	59.230	28.592	28.59	0.170	3.11	1.00	1.00	1.1	87.82	273.23	28.59	25364	12087	1209	1372	2581
4	81	4.91	30.837	14.710	14.71	0.159	3.16	1.00	1.00	1.1	45.55	144.14	14.71	13421	6187	601	652	1253
3	62	4.55	82.186	23.059	23.06	0.165	3.13	1.00	1.00	1.1	105.24	329.86	23.06	27601	12753	1276	1205	2481
2	38	3.93	86.518	22.694	22.69	0.153	3.19	1.00	1.00	1.0	109.21	348.60	22.69	29872	13244	1165	1159	2324
1	12	3.69	92.567	21.054	21.05	0.143	3.24	1.00	1.00	0.9	113.62	367.72	21.05	31839	11959	1152	930	2082
															183,405	84,567		17,410

1.2D + 1.0Di + 1.0Wi 45°  
50 mph wind with 1" radial iceGust Response Factor (Gh): 0.85  
Wind Importance Factor (Iw): 1.00Ice Importance Factor: 1.00  
Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q <sub>z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)
12	183	6.19	21.735	10.271	10.27	0.368	2.37	1.20	1.20	1.2	38.41	91.11	10.27	4923	2514	479	172	651
11	175	6.10	18.878	10.754	10.75	0.308	2.56	1.20	1.20	1.2	35.56	91.15	10.75	4369	2322	473	197	670
10	165	6.01	23.088	12.279	12.28	0.281	2.66	1.20	1.20	1.2	42.44	112.87	12.28	6389	3200	577	277	853
9	155	5.90	24.221	12.831	12.83	0.267	2.71	1.20	1.20	1.2	44.46	120.55	12.83	6511	3406	605	383	987
8	144	5.77	26.817	13.152	13.15	0.211	2.93	1.16	1.16	1.2	46.29	135.81	13.15	10298	5359	667	667	1334
7	131	5.63	27.593	13.493	13.49	0.196	3.00	1.15	1.15	1.1	47.14	141.19	13.49	11250	5708	675	736	1411
6	119	5.47	28.388	13.825	13.83	0.185	3.05	1.14	1.14	1.1	48.06	146.43	13.83	11568	5827	681	719	1399
5	100	5.21	59.230	28.592	28.59	0.170	3.11	1.13	1.13	1.1	99.04	308.13	28.59	25364	12087	1363	1372	2736
4	81	4.91	30.837	14.710	14.71	0.159	3.16	1.12	1.12	1.1	50.97	161.29	14.71	13421	6187	673	652	1324
3	62	4.55	82.186	23.059	23.06	0.165	3.13	1.12	1.12	1.1	118.29	370.75	23.06	27601	12753	1434	1205	2639
2	38	3.93	86.518	22.694	22.69	0.153	3.19	1.11	1.11	1.0	121.73	388.54	22.69	29872	13244	1299	1159	2458
1	12	3.69	92.567	21.054	21.05	0.143	3.24	1.11	1.11	0.9	125.84	407.26	21.05	31839	11959	1276	930	2206
															183,405	84,567		18,668

1.0D + 1.0W Service Normal  
60 mph Wind with No IceGust Response Factor (Gh): 0.85  
Wind Importance Factor (Iw): 1.00

ASSET: # 88014, NEW FAIRFIELD

STANDARD

ANSI/TIA-222-H

CUSTOMER DISH WIRELESS L.L.C.

ENG NO.:

13699607\_C3\_06

## SECTION FORCES

Sect #	Elev (ft)	Q <sub>z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)
12	183	8.91	21.735	0.000	0.00	0.254	2.76	1.00	1.00	0.0	21.74	59.94	0.00	2008	0	454	136	590
11	175	8.79	18.878	0.000	0.00	0.200	2.98	1.00	1.00	0.0	18.88	56.30	0.00	1706	0	421	151	571
10	165	8.65	23.088	0.000	0.00	0.186	3.04	1.00	1.00	0.0	23.09	70.20	0.00	2657	0	516	199	715
9	155	8.50	24.221	0.000	0.00	0.177	3.08	1.00	1.00	0.0	24.22	74.65	0.00	2588	0	539	259	798
8	144	8.31	26.817	0.000	0.00	0.143	3.24	1.00	1.00	0.0	26.82	86.80	0.00	4115	0	613	412	1025
7	131	8.10	27.593	0.000	0.00	0.134	3.28	1.00	1.00	0.0	27.59	90.60	0.00	4619	0	624	443	1067
6	119	7.87	28.388	0.000	0.00	0.126	3.32	1.00	1.00	0.0	28.39	94.32	0.00	4785	0	631	431	1062
5	100	7.50	59.230	0.000	0.00	0.116	3.37	1.00	1.00	0.0	59.23	199.60	0.00	11064	0	1272	820	2092
4	81	7.06	30.837	0.000	0.00	0.108	3.41	1.00	1.00	0.0	30.84	105.10	0.00	6028	0	631	389	1020
3	62	6.55	82.186	0.000	0.00	0.130	3.30	1.00	1.00	0.0	82.19	271.28	0.00	12373	0	1511	726	2238
2	38	5.66	86.518	0.000	0.00	0.122	3.34	1.00	1.00	0.0	86.52	289.05	0.00	13857	0	1392	779	2171
1	12	5.31	92.567	0.000	0.00	0.117	3.36	1.00	1.00	0.0	92.57	311.27	0.00	16566	0	1405	699	2104
															82,365	0		15,453

1.0D + 1.0W Service 45°  
60 mph Wind with No IceGust Response Factor (G<sub>h</sub>): 0.85  
Wind Importance Factor (I<sub>w</sub>): 1.00

Sect #	Elev (ft)	Q <sub>z</sub> (psf)	A <sub>f</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>f</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt. (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)
12	183	8.91	21.735	0.000	0.00	0.254	2.76	1.19	1.19	0.0	25.88	71.38	0.00	2008	0	541	136	677
11	175	8.79	18.878	0.000	0.00	0.200	2.98	1.15	1.15	0.0	21.70	64.72	0.00	1706	0	484	151	634
10	165	8.65	23.088	0.000	0.00	0.186	3.04	1.14	1.14	0.0	26.31	80.00	0.00	2657	0	588	199	787
9	155	8.50	24.221	0.000	0.00	0.177	3.08	1.13	1.13	0.0	27.43	84.55	0.00	2588	0	611	259	870
8	144	8.31	26.817	0.000	0.00	0.143	3.24	1.11	1.11	0.0	29.70	96.13	0.00	4115	0	679	412	1091
7	131	8.10	27.593	0.000	0.00	0.134	3.28	1.10	1.10	0.0	30.36	99.68	0.00	4619	0	686	443	1129
6	119	7.87	28.388	0.000	0.00	0.126	3.32	1.09	1.09	0.0	31.06	103.20	0.00	4785	0	691	431	1122
5	100	7.50	59.230	0.000	0.00	0.116	3.37	1.09	1.09	0.0	64.38	216.95	0.00	11064	0	1382	820	2203
4	81	7.06	30.837	0.000	0.00	0.108	3.41	1.08	1.08	0.0	33.34	113.63	0.00	6028	0	682	389	1071
3	62	6.55	82.186	0.000	0.00	0.130	3.30	1.10	1.10	0.0	90.20	297.72	0.00	12373	0	1659	726	2385
2	38	5.66	86.518	0.000	0.00	0.122	3.34	1.09	1.09	0.0	94.42	315.45	0.00	13857	0	1519	779	2298
1	12	5.31	92.567	0.000	0.00	0.117	3.36	1.09	1.09	0.0	100.72	338.67	0.00	16566	0	1528	699	2228
															82,365	0		16,494

ASSET: # 88014, NEW FAIRFIELD  
 CUSTOMER DISH WIRELESS L.L.C.

STANDARD ANSI/TIA-222-H  
 ENG NO.: 13699607\_C3\_06

#### EQUIVALENT LATERAL FORCE METHOD

Spectral Response Acceleration for Short Period ( $S_S$ ):	0.22
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.06
Long-Period Transition Period ( $T_L$ – Seconds):	6
Importance Factor ( $I_e$ ):	1.00
Site Coefficient $F_a$ :	1.60
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	3.00
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.24
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.09
Seismic Response Coefficient ( $C_s$ ):	0.04
Upper Limit $C_s$ :	0.04
Lower Limit $C_s$ :	0.03
Period based on Rayleigh Method (sec):	0.67
Redundancy Factor ( $p$ ):	1.30
Seismic Force Distribution Exponent ( $k$ ):	1.08
Total Unfactored Dead Load:	115.95 k
Seismic Base Shear (E):	6.74 k

#### SEISMIC

Load Case: 0.9D - 1.0Ev + 1.0Eh

Seismic

Section	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
12	183.21	2,008	569,499	0.033	223	1,711
11	174.63	1,706	459,289	0.027	180	1,454
10	165.26	2,657	673,979	0.039	264	2,264
9	155.08	2,588	612,672	0.036	240	2,205
8	143.75	4,115	897,469	0.052	351	3,507
7	131.25	4,619	912,601	0.053	357	3,936
6	118.75	4,785	848,290	0.049	332	4,078
5	100.00	11,064	1,628,092	0.094	637	9,429
4	81.25	6,028	708,266	0.041	277	5,137
3	62.50	12,373	1,093,957	0.064	428	10,544
2	37.50	13,857	704,261	0.041	276	11,809
1	12.50	16,566	255,950	0.015	100	14,118
Ericsson KRY 112 144/1	187.50	33	9,598	0.001	4	28
Ericsson RRUS 11 B12	187.50	152	44,239	0.003	17	130
RFS SC2-W100AB	187.50	22	6,399	0.000	3	19
Ericsson AIR 21, 1.3 M, B2A B4P	187.50	249	72,423	0.004	28	212
Ericsson AIR 21, 1.3M, B4A B2P	187.50	244	71,114	0.004	28	208
Commscope LNX-6515DS-VTM	187.50	151	43,890	0.002	17	129
Pipe Mount	187.50	900	261,769	0.015	102	767
Platform	187.50	8,000	2,326,835	0.135	910	6,818
Catwalk	170.30	6,500	1,703,323	0.099	666	5,539
Alcatel-Lucent ALU 800MHz External Notch Filter	168.00	26	6,817	0.000	3	22
Alcatel-Lucent 2X50W RRH w/o Filter	167.00	159	40,792	0.002	16	136
Alcatel-Lucent 4x40W RRH (91 lb)	167.00	273	70,038	0.004	27	233
Alcatel-Lucent TD-RRH8x20-25 w/ Solar Shield	167.00	210	53,876	0.003	21	179
RFS APXV9TM14-ALU-I20*	167.00	165	42,408	0.002	17	141
RFS APXVSP18-C-A20	167.00	171	43,870	0.002	17	146
Generic Flat Light Sector Frame	167.00	1,200	307,860	0.018	120	1,023
Raycap DC6-48-60-18-8F	160.00	20	4,898	0.000	2	17
Ericsson RRUS 32 B2	160.00	159	38,942	0.002	15	136
Generic Flat Light Sector Frame	160.00	1,200	293,899	0.017	115	1,023
Powerwave Allgon LGP21401	155.00	85	20,019	0.001	8	72

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Ericsson RRUS 11 (Band 12) (55 lb)	155.00	165	39,044	0.002	15	141
Allgon 7770.00	155.00	105	24,846	0.001	10	89
CCI HPA-65R-BUU-H6	155.00	153	36,205	0.002	14	130
Samsung B2/B66A RRH-BR049	146.00	253	56,153	0.003	22	216
Samsung B5/B13 RRH-BR04C	146.00	211	46,772	0.003	18	180
Commscope TD-850B-LTE78-43	146.00	106	23,508	0.001	9	90
Raycap RCMDC-6627-PF-48	146.00	32	7,097	0.000	3	27
Samsung MT6407-77A	146.00	245	54,291	0.003	21	209
JMA Wireless MX06FRO660-03	146.00	360	79,839	0.005	31	307
Site Pro 1 VFA12-HD Sector Frame	145.00	2,214	487,432	0.028	191	1,887
Generic Flat Side Arm	137.50	188	38,965	0.002	15	160
Rest Platform	137.50	500	103,908	0.006	41	426
Commscope RDIDC-9181-PF-48	137.00	22	4,533	0.000	2	19
Fujitsu TA08025-B605	137.00	225	46,574	0.003	18	192
Fujitsu TA08025-B604	137.00	192	39,681	0.002	16	163
JMA Wireless MX08FRO665-21	137.00	194	40,054	0.002	16	165
Generic Flat Light Sector Frame	137.00	1,200	248,396	0.014	97	1,023
Generic Flat Side Arm	120.00	188	33,620	0.002	13	160
Generic Flat Side Arm	112.50	188	31,349	0.002	12	160
Generic Flat Side Arm	100.00	188	27,591	0.002	11	160
Platform	100.00	5,500	809,349	0.047	317	4,687
Rest Platform	87.50	500	63,663	0.004	25	426
Generic Round Side Arm	82.00	188	22,251	0.001	9	160
Andrew DB616E-BC	80.00	51	5,893	0.000	2	43
Rest Platform	50.00	500	34,710	0.002	14	426
Totals		115,949	17,233,058	1.000	6,742	98,814

## SEISMIC

Load Case: 1.2D + 1.0Ev + 1.0Eh

Seismic

Section	Height Above Base (ft)	Weight (lb)	W <sub>Z</sub> (lb-ft)	C <sub>v</sub>	Horizontal Force (lb)	Vertical Force (lb)
12	183.21	2,008	569,499	0.033	223	2,505
11	174.63	1,706	459,289	0.027	180	2,128
10	165.26	2,657	673,979	0.039	264	3,316
9	155.08	2,588	612,672	0.036	240	3,229
8	143.75	4,115	897,469	0.052	351	5,135
7	131.25	4,619	912,601	0.053	357	5,763
6	118.75	4,785	848,290	0.049	332	5,971
5	100.00	11,064	1,628,092	0.094	637	13,805
4	81.25	6,028	708,266	0.041	277	7,522
3	62.50	12,373	1,093,957	0.064	428	15,439
2	37.50	13,857	704,261	0.041	276	17,290
1	12.50	16,566	255,950	0.015	100	20,671
Ericsson KRY 112 144/1	187.50	33	9,598	0.001	4	41
Ericsson RRUS 11 B12	187.50	152	44,239	0.003	17	190
RFS SC2-W100AB	187.50	22	6,399	0.000	3	27
Ericsson AIR 21, 1.3 M, B2A B4P	187.50	249	72,423	0.004	28	311
Ericsson AIR 21, 1.3M, B4A B2P	187.50	244	71,114	0.004	28	305
Commscope LNX-6515DS-VTM	187.50	151	43,890	0.002	17	188
Pipe Mount	187.50	900	261,769	0.015	102	1,123
Platform	187.50	8,000	2,326,835	0.135	910	9,982
Catwalk	170.30	6,500	1,703,323	0.099	666	8,111
Alcatel-Lucent ALU 800MHz External Notch Filter	168.00	26	6,817	0.000	3	33
Alcatel-Lucent 2X50W RRH w/o Filter	167.00	159	40,792	0.002	16	198
Alcatel-Lucent 4x40W RRH (91 lb)	167.00	273	70,038	0.004	27	341
Alcatel-Lucent TD-RRH8x20-25 w/ Solar Shield	167.00	210	53,876	0.003	21	262
RFS APXV9TM14-ALU-I20*	167.00	165	42,408	0.002	17	206
RFS APXVSP18-C-A20	167.00	171	43,870	0.002	17	213
Generic Flat Light Sector Frame	167.00	1,200	307,860	0.018	120	1,497
Raycap DC6-48-60-18-8F	160.00	20	4,898	0.000	2	25
Ericsson RRUS 32 B2	160.00	159	38,942	0.002	15	198
Generic Flat Light Sector Frame	160.00	1,200	293,899	0.017	115	1,497
Powerwave Allgon LGP21401	155.00	85	20,019	0.001	8	106
Ericsson RRUS 11 (Band 12) (55 lb)	155.00	165	39,044	0.002	15	206
Allgon 7770.00	155.00	105	24,846	0.001	10	131
CCI HPA-65R-BUU-H6	155.00	153	36,205	0.002	14	191
Samsung B2/B66A RRH-BR049	146.00	253	56,153	0.003	22	316
Samsung B5/B13 RRH-BR04C	146.00	211	46,772	0.003	18	263
Commscope TD-850B-LTE78-43	146.00	106	23,508	0.001	9	132

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Raycap RCMD-6627-PF-48	146.00	32	7,097	0.000	3	40
Samsung MT6407-77A	146.00	245	54,291	0.003	21	305
JMA Wireless MX06FRO660-03	146.00	360	79,839	0.005	31	449
Site Pro 1 VFA12-HD Sector Frame	145.00	2,214	487,432	0.028	191	2,763
Generic Flat Side Arm	137.50	188	38,965	0.002	15	234
Rest Platform	137.50	500	103,908	0.006	41	624
Commscope RDIDC-9181-PF-48	137.00	22	4,533	0.000	2	27
Fujitsu TA08025-B605	137.00	225	46,574	0.003	18	281
Fujitsu TA08025-B604	137.00	192	39,681	0.002	16	239
JMA Wireless MX08FRO665-21	137.00	194	40,054	0.002	16	241
Generic Flat Light Sector Frame	137.00	1,200	248,396	0.014	97	1,497
Generic Flat Side Arm	120.00	188	33,620	0.002	13	234
Generic Flat Side Arm	112.50	188	31,349	0.002	12	234
Generic Flat Side Arm	100.00	188	27,591	0.002	11	234
Platform	100.00	5,500	809,349	0.047	317	6,863
Rest Platform	87.50	500	63,663	0.004	25	624
Generic Round Side Arm	82.00	188	22,251	0.001	9	234
Andrew DB616E-BC	80.00	51	5,893	0.000	2	64
Rest Platform	50.00	500	34,710	0.002	14	624
Totals		115,949	17,233,058	1.000	6,742	144,680

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## FORCE/STRESS SUMMARY

## Section 1 – Bolt Elevation 0.0 (ft) and Height 25.00 (ft)

Max Compression	Pu		Len	Bracing %			F'y	Φc Pn	Shear	Bear	#	#	Use		
	(kip)	Load Case		(ft)	X	Y			Z	KL/R				(ksi)	(kip)
L SAE - 8X8X0.875	-190.25	1.2D + 1.0W 45°	25.098	33	33	33	63.30	36.0	416.27	0.00	0.00	0	0	45	Member Z
H DAL - 3X2.5X0.3125	-9.77	1.2D + 1.0W N	14.66	100	100	17	171.66	36.0	31.47	0.00	0.00	0	0	31	Member X
D DAS - 3.5X3X0.25	-20.81	1.2D + 1.0W N	29.843	33	66	8	145.04	36.0	42.58	0.00	0.00	0	0	48	Member Y

						Shear	Bear	Blk Shear				
	Pu		Fy	Fu	ΦcPn	ΦRnv	ΦRn	Φt Pn	#	#	Use	
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls
L SAE - 8X8X0.875	134.81	0.9D + 1.0W 45°	36.0	58	428.65	0.00	0.00		0	0	31	Member
H DAL - 3X2.5X0.3125	10.53	1.2D + 1.0W N	36.0	58	104.98	0.00	0.00	0.00	0	0	10	Member
D DAS - 3.5X3X0.25	18.51	1.2D + 1.0W N	36.0	58	101.41	0.00	0.00	0.00	0	0	18	Member

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Top Tension	133.91	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	159.01	0.9D + 1.0W 45°	565.10	8	4	2.25" A36
Bot Compression	217.43	1.2D + 1.0W 45°	467.67	51	0	

## Section 2 – Bolt Elevation 25.0 (ft) and Height 25.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F' <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear	Bear	# Bolt	# Hole	Use %	Controls
				X	Y	Z				Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)				
L SAE - 8X8X0.75	-159.49	1.2D + 1.0W 45°	25.098	33	33	33	62.90	36.0	360.60	0.00	0.00	0	0	44	Member Z
H DAL - 3X2.5X0.25	-9.49	1.2D + 1.0W N	13.097	100	100	17	155.33	36.0	31.20	0.00	0.00	0	0	30	Member X
D DAS - 3X2.5X0.25	-22.41	1.2D + 1.0W N	29.023	33	65	8	156.72	36.0	30.65	0.00	0.00	0	0	73	Member Y

						Shear	Bear	Blk Shear				
	Pu		Fy	Fu	ΦcPn	ΦRnv	ΦRn	Φt Pn	#	#	Use	
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls
L SAE - 8X8X0.75	110.65	0.9D + 1.0W 45°	36.0	58	370.66	0.00	0.00		0	0	29	Member
H DAL - 3X2.5X0.25	9.99	1.2D + 1.0W N	36.0	58	85.21	0.00	0.00	0.00	0	0	11	Member
D DAS - 3X2.5X0.25	19.61	1.2D + 1.0W N	36.0	58	85.21	0.00	0.00	0.00	0	0	23	Member

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Top Tension	109.78	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	133.91	0.9D + 1.0W 45°	0.00	0	0	

## Section 3 – Bolt Elevation 50.0 (ft) and Height 25.00 (ft)

Max Compression	Pu	Load Case	Len (ft)	Bracing %			F'y (ksi)	Φc Pn (kip)	Shear	Bear	# Bolt	# Hole	Use %	Controls	
	(kip)			ΦRnv (kip)	ΦRn (kip)										
L SAE - 8X8X0.75	-127.66	1.2D + 1.0W 45°	25.098	33	33	33	62.90	36.0	360.60	0.00	0.00	0	0	35	Member Z
H DAE - 2.5X2.5X0.25	-8.56	1.2D + 1.0W N	11.534	100	100	17	165.75	36.0	24.80	0.00	0.00	0	0	34	Member X
D DAS - 3X2.5X0.25	-22.34	1.2D + 1.0W N	28.266	33	66	8	155.01	36.0	31.33	0.00	0.00	0	0	71	Member Y

	Pu		F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	Shear ΦR <sub>nv</sub>	Bear ΦR <sub>n</sub>	Blk Shear Φ <sub>t</sub> P <sub>n</sub>	#	#	Use	
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls
L SAE - 8X8X0.75	86.03	0.9D + 1.0W 45°	36.0	58	370.66	0.00	0.00		0	0	23	Member
H DAE - 2.5X2.5X0.25	9.10	1.2D + 1.0W N	36.0	58	77.11	0.00	0.00	0.00	0	0	11	Member
D DAS - 3X2.5X0.25	20.48	0.9D + 1.0W N	36.0	58	85.21	0.00	0.00	0.00	0	0	24	Member

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Top Tension	85.25	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	109.78	0.9D + 1.0W 45°	0.00	0	0	

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## Section 4 – Bolt Elevation 75.0 (ft) and Height 12.50 (ft)

								Shear		Bear					
	Pu		Len	Bracing %				F <sub>y</sub>	Φ <sub>c</sub> P <sub>n</sub>	ΦR <sub>nv</sub>	ΦR <sub>n</sub>	#	#	Use	
Max Compression	(kip)	Load Case	(ft)	X	Y	Z	KL/R	(ksi)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls
L SAE - 6X6X0.875	-111.64	1.2D + 1.0W 45°	12.549	50	50	50	64.35	36.0	304.67	0.00	0.00	0	0	36	Member Z
H DAE - 2.5X2.5X0.25	-7.63	1.2D + 1.0W N	10.752	100	100	20	156.45	36.0	27.83	0.00	0.00	0	0	27	Member X
D DAE - 2.5X2.5X0.25	-12.95	1.2D + 1.0W N	17.026	50	100	12	167.07	36.0	24.41	0.00	0.00	0	0	53	Member Y
								Shear		Bear		Blk Shear			
	Pu		F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	ΦR <sub>nv</sub>	ΦR <sub>n</sub>	Φ <sub>t</sub> P <sub>n</sub>	#	#	Use				
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls			
L SAE - 6X6X0.875	74.87	0.9D + 1.0W 45°	36.0	58	315.25	0.00	0.00		0	0	23	Member			
H DAE - 2.5X2.5X0.25	8.14	1.2D + 1.0W N	36.0	58	77.11	0.00	0.00	0.00	0	0	10	Member			
D DAE - 2.5X2.5X0.25	11.72	1.2D + 1.0W N	36.0	58	77.11	0.00	0.00	0.00	0	0	15	Member			
	Pu		ΦR <sub>nt</sub>	Use	Num										
Max Splice Forces	(kip)	Load Case	(kip)	%	Bolts	Bolt Type									
Top Tension	74.18	0.9D + 1.0W 45°	0.00	0	0										
Bot Tension	85.25	0.9D + 1.0W 45°	0.00	0	0										

## Section 5 – Bolt Elevation 87.5 (ft) and Height 25.00 (ft)

								Shear		Bear					
	Pu		Len	Bracing %			F <sub>y</sub>	Φ <sub>c</sub> P <sub>n</sub>	ΦR <sub>nv</sub>	ΦR <sub>n</sub>	#	#	Use		
Max Compression	(kip)	Load Case	(ft)	X	Y	Z	KL/R	(ksi)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls
L SAE - 6X6X0.75	-96.36	1.2D + 1.0W 45°	12.549	50	50	50	64.35	36.0	264.27	0.00	0.00	0	0	36	Member Z
H DAE - 2.5X2.5X0.25	-7.24	1.2D + 1.0W N	9.971	100	100	20	147.16	36.0	31.46	0.00	0.00	0	0	23	Member X
D DAE - 2.5X2.5X0.25	-12.62	1.2D + 1.0W N	16.507	50	100	12	162.80	36.0	25.70	0.00	0.00	0	0	49	Member Y
								Shear		Bear		Blk Shear			
	Pu		F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	ΦR <sub>nv</sub>	ΦR <sub>n</sub>	Φ <sub>t</sub> P <sub>n</sub>	#	#	Use				
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls			
L SAE - 6X6X0.75	62.99	0.9D + 1.0W 45°	36.0	58	273.46	0.00	0.00		0	0	23	Member			
H DAE - 2.5X2.5X0.25	7.52	1.2D + 1.0W N	36.0	58	77.11	0.00	0.00	0.00	0	0	9	Member			
D DAE - 2.5X2.5X0.25	11.64	0.9D + 1.0W N	36.0	58	77.11	0.00	0.00	0.00	0	0	15	Member			
	Pu		ΦR <sub>nt</sub>	Use	Num										
Max Splice Forces	(kip)	Load Case	(kip)	%	Bolts	Bolt Type									
Top Tension	51.86	0.9D + 1.0W 45°	0.00	0	0										
Bot Tension	74.18	0.9D + 1.0W 45°	0.00	0	0										

## Section 6 – Bolt Elevation 112.5 (ft) and Height 12.50 (ft)

				Bracing %					Shear		Bear					
	Pu (kip)	Load Case	Len (ft)	X	Y	Z	KL/R	F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	ΦR <sub>nv</sub> (kip)	ΦR <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls	
Max Compression																
L SAE - 6X6X0.5625	-65.05	1.2D + 1.0W 45°	12.549	50	50	50	63.81	36.0	201.85	0.00	0.00	0	0	32	Member Z	
H DAE - 2.5X2.5X0.25	-6.08	1.2D + 1.0W N	8.408	100	100	25	128.58	36.0	41.21	0.00	0.00	0	0	14	Member X	
D DAL - 2.5X2X0.25	-11.82	1.2D + 1.0W N	15.534	50	100	12	188.07	36.0	17.24	0.00	0.00	0	0	68	Member Y	
				Bracing %					Shear		Bear					
	Pu (kip)	Load Case		F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)		ΦR <sub>nv</sub> (kip)	ΦR <sub>n</sub> (kip)	Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls		
Max Tension Member																
L SAE - 6X6X0.5625	40.34	0.9D + 1.0W 45°		36.0	58	208.33		0.00	0.00		0	0	19	Member		
H DAE - 2.5X2.5X0.25	6.39	1.2D + 1.0W N		36.0	58	77.11		0.00	0.00	0.00	0	0	8	Member		
D DAL - 2.5X2X0.25	10.46	1.2D + 1.0W N		36.0	58	69.01		0.00	0.00	0.00	0	0	15	Member		
	Pu (kip)	Load Case		ΦR <sub>nt</sub> (kip)	Use %	Num Bolts	Bolt Type									
Max Splice Forces																
Top Tension	39.79	0.9D + 1.0W 45°		0.00	0	0										
Bot Tension	51.86	0.9D + 1.0W 45°		0.00	0	0										

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## Section 7 – Bolt Elevation 125.0 (ft) and Height 12.50 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F'y (ksi)	Φc Pn (kip)	Shear	Bear	# Bolt	# Hole	Use %	Controls	
				X	Y	Z			KL/R	ΦRnv (kip)					ΦRn (kip)
L SAE - 6X6X0.5625	-50.15	1.2D + 1.0W 45°	12.549	50	50	50	63.81	36.0	201.85	0.00	0.00	0	0	24	Member Z
H DAE - 2.5X2.5X0.25	-5.76	1.2D + 1.0W N	7.626	100	120	25	119.01	36.0	47.52	0.00	0.00	0	0	12	Member X
D DAL - 2.5X2X0.25	-11.70	1.2D + 1.0W N	15.085	50	100	12	183.42	36.0	18.12	0.00	0.00	0	0	64	Member Y

	Pu		F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	Shear ΦR <sub>nv</sub>	Bear ΦR <sub>n</sub>	Blk Shear Φ <sub>t</sub> P <sub>n</sub>	#	#	Use	
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls
L SAE - 6X6X0.5625	27.90	0.9D + 1.0W 45°	36.0	58	208.33	0.00	0.00		0	0	13	Member
H DAE - 2.5X2.5X0.25	5.89	1.2D + 1.0W N	36.0	58	77.11	0.00	0.00	0.00	0	0	7	Member
D DAL - 2.5X2X0.25	10.86	1.2D + 1.0W N	36.0	58	69.01	0.00	0.00	0.00	0	0	15	Member

Max Splice Forces	Pu (kip)	Load Case	ΦR <sub>nt</sub> (kip)	Use %	Num Bolts	Bolt Type
Top Tension	27.38	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	39.79	0.9D + 1.0W 45°	0.00	0	0	

## Section 8 – Bolt Elevation 137.5 (ft) and Height 12.50 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing %				F'y (ksi)	Φc Pn (kip)	Shear	Bear	# Bolt	# Hole	Use %	Controls
				X	Y	Z	KL/R			ΦRnv (kip)	ΦRn (kip)				
L SAE - 6X6X0.4375	-35.42	1.2D + 1.0W 45°	12.549	50	50	50	63.27	36.0	159.23	0.00	0.00	0	0	22	Member Z
H DAE - 2.5X2.5X0.25	-4.44	0.9D + 1.0W N	6.845	100	107	25	106.81	36.0	54.94	0.00	0.00	0	0	8	Member X
D DAL - 2.5X2X0.25	-10.43	1.2D + 1.0W N	14.664	50	100	12	179.07	36.0	19.01	0.00	0.00	0	0	54	Member Y

	Pu		F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	Shear ΦR <sub>nv</sub>	Bear ΦR <sub>n</sub>	Blk Shear Φ <sub>t</sub> P <sub>n</sub>	#	#	Use	
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	Controls
L SAE - 6X6X0.4375	16.95	0.9D + 1.0W 45°	36.0	58	163.94	0.00	0.00		0	0	10	Member
H DAE - 2.5X2.5X0.25	5.28	1.2D + 1.0W N	36.0	58	77.11	0.00	0.00	0.00	0	0	6	Member
D DAL - 2.5X2X0.25	9.70	1.2D + 1.0W N	36.0	58	69.01	0.00	0.00	0.00	0	0	14	Member

Max Splice Forces	Pu (kip)	Load Case	ΦR <sub>nt</sub> (kip)	Use %	Num Bolts	Bolt Type
Top Tension	16.46	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	27.38	0.9D + 1.0W 45°	0.00	0	0	

## Section 9 – Bolt Elevation 150.0 (ft) and Height 10.17 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F'y (ksi)	Φc Pn (kip)	ΦRnv (kip)	ΦRn (kip)	Shear		Bear		# Bolt	# Hole	Use %	Controls
				X	Y	Z					KL/R							
L SAE - 5X5X0.4375	-26.93	1.2D + 1.0W 45°	10.206	50	50	50	62.11	36.0	132.23	0.00	0.00			0	0	20	Member Z	
H SAU - 3X2.5X0.25	-0.95	0.9D + 1.0W N	12.418	50	100	50	167.91	36.0	13.30	0.00	0.00			0	0	7	Member Y	
D SAE - 3.5x3.5x0.25	-5.55	1.2D + 1.0W N	16.558	50	50	50	138.63	36.0	25.17	0.00	0.00			0	0	22	Member Z	

Max Tension Member	Pu	Load Case	F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	Shear ΦR <sub>nv</sub>	Bear ΦR <sub>n</sub>	Blk Shear Φ <sub>t</sub> P <sub>n</sub>	#	#	Use	Controls
	(kip)		(ksi)	(ksi)	(kip)	(kip)	(kip)	(kip)	Bolt	Hole	%	
L SAE - 5X5X0.4375	13.83	0.9D + 1.0W 45°	36.0	58	135.43	0.00	0.00		0	0	10	Member
H SAU - 3X2.5X0.25	2.12	1.2D + 1.0W N	36.0	58	42.44	0.00	0.00	0.00	0	0	4	Member
D SAE - 3.5x3.5x0.25	3.88	1.2D + 1.0W N	36.0	58	54.76	0.00	0.00	0.00	0	0	7	Member

Max Splice Forces	Pu (kip)	Load Case	ΦR <sub>nt</sub> (kip)	Use %	Num Bolts	Bolt Type
Top Tension	9.48	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	16.46	0.9D + 1.0W 45°	0.00	0	0	

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 CUSTOMER DISH WIRELESS L.L.C.

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# FORCE/STRESS SUMMARY

## Section 10 – Bolt Elevation 160.2 (ft) and Height 10.17 (ft)

Max Compression	Pu		Len (ft)	Bracing %				F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		# Bolt	# Hole	Use %	Controls
	(kip)	Load Case		X	Y	Z	KL/R			Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>t</sub> P <sub>n</sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)				
L SAE - 5X5X0.4375	-17.98	1.2D + 1.0W 45°	10.206	50	50	50	62.11	36.0	132.23	0.00	0.00		0.00	0	0	13	Member Z
H DAL - 3X2.5X0.25	-0.39	1.2D + 1.0W N	11.147	50	100	50	172.39	36.0	25.33	0.00	0.00		0.00	0	0	1	Member Y
D SAE - 3.5x3.5x0.25	-4.86	1.2D + 1.0W N	15.576	50	50	50	132.10	36.0	27.72	0.00	0.00		0.00	0	0	17	Member Z

	Pu		F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	Shear	Bear	Blk Shear	#	#	Use	
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	ΦR <sub>nv</sub> (kip)	ΦR <sub>n</sub> (kip)	Φ <sub>t</sub> P <sub>n</sub> (kip)	Bolt	Hole	%	Controls
L SAE - 5X5X0.4375	6.84	0.9D + 1.0W 45°	36.0	58	135.43	0.00	0.00		0	0	5	Member
H DAL - 3X2.5X0.25	1.28	1.2D + 1.0W N	36.0	58	85.21	0.00	0.00	0.00	0	0	1	Member
D SAE - 3.5x3.5x0.25	3.42	0.9D + 1.0W N	36.0	58	54.76	0.00	0.00	0.00	0	0	6	Member

Max Splice Forces	Pu		Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
	(kip)	Load Case				
Top Tension	2.43	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	9.48	0.9D + 1.0W 45°	0.00	0	0	

## Section 11 – Bolt Elevation 170.3 (ft) and Height 8.58 (ft)

Max Compression	Pu		Len (ft)	Bracing %				F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		# Bolt	# Hole	Use %	Controls
	(kip)	Load Case		X	Y	Z	KL/R			Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>t</sub> P <sub>n</sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)				
L SAE - 5X5X0.3125	-9.14	1.2D + 1.0W 45°	8.617	50	50	50	52.01	35.9	99.52	0.00	0.00		0.00	0	0	9	Member Z
H SAU - 3X2.5X0.25	-0.03	1.2D + 1.0W N	10.074	50	100	50	144.93	36.0	17.85	0.00	0.00		0.00	0	0	0	Member Y
D SAE - 3X3X0.25	-2.80	1.2D + 1.0W N	13.658	50	50	50	134.08	36.0	22.93	0.00	0.00		0.00	0	0	12	Member Z

	Pu		F <sub>y</sub>	F <sub>u</sub>	Φ <sub>c</sub> P <sub>n</sub>	Shear	Bear	Blk Shear	#	#	Use	
Max Tension Member	(kip)	Load Case	(ksi)	(ksi)	(kip)	Φ <sub>R<sub>nv</sub></sub>	Φ <sub>R<sub>n</sub></sub>	Φ <sub>t</sub> P <sub>n</sub>	Bolt	Hole	%	Controls
L SAE - 5X5X0.3125	3.10	0.9D + 1.0W 45°	36.0	58	98.17	0.00	0.00		0	0	3	Member
H SAU - 3X2.5X0.25	0.82	1.2D + 1.0W N	36.0	58	42.44	0.00	0.00	0.00	0	0	1	Member
D SAE - 3X3X0.25	1.88	1.2D + 1.0W N	36.0	58	46.66	0.00	0.00	0.00	0	0	4	Member

Max Splice Forces	Pu		Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
	(kip)	Load Case				
Top Tension	0.71	0.9D + 1.0W 45°	0.00	0	0	
Bot Tension	2.43	0.9D + 1.0W 45°	0.00	0	0	

## Section 12 – Bolt Elevation 178.9 (ft) and Height 8.58 (ft)

Max Compression	Pu		Len (ft)	Bracing %				F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		# Bolt	# Hole	Use %	Controls
	(kip)	Load Case		X	Y	Z	KL/R			Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>t</sub> P <sub>n</sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)				
L SAE - 5X5X0.3125	-5.08	1.2D + 1.0Di + 1.0Wi N	8.617	50	50	50	52.01	35.9	99.52	0.00	0.00		0.00	0	0	5	Member Z
H CHN - C8 x 11.5	-0.03	1.2D + 1.0W N	9.001	100	100	100	160.28	36.0	37.66	0.00	0.00		0.00	0	0	0	Member Y
D SAE - 3X3X0.25	-2.47	1.2D + 1.0W N	12.842	50	50	50	127.78	36.0	25.24	0.00	0.00		0.00	0	0	9	Member Z

Max Tension Member	Pu		Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear	Bear	Blk Shear	# Bolt	# Hole	Use %	Controls
	(kip)	Load Case				ΦRnv (kip)	ΦRn (kip)	Φt Pn (kip)				
H CHN - C8 x 11.5	0.11	1.2D + 1.0W N	36.0	58	109.51	0.00	0.00	0.00	0	0	0	Member
D SAE - 3X3X0.25	1.44	1.2D + 1.0W N	36.0	58	46.66	0.00	0.00	0.00	0	0	3	Member

Max Splice Forces	Pu		Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
	(kip)	Load Case				
Bot Tension	0.71	0.9D + 1.0W 45°	0.00	0	0	

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# DETAILED REACTIONS

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	*(-) Uplift and (+) Down		
					*Fx (kip)	*Fy (kip)	*Fz (kip)
1.2D + 1.0W Normal	22.94	0.00	45	1	-10.12	157.45	-20.52
	22.94	0.00	135	1a	5.01	-87.34	-15.50
	22.94	0.00	225	1b	-5.16	-87.87	-15.37
	22.94	0.00	315	1c	10.28	156.90	-20.33
1.2D + 1.0W 45°	22.94	0.00	45	1	-21.41	217.30	-21.66
	22.94	0.00	135	1a	-10.34	35.32	-5.18
	22.94	0.00	225	1b	-16.66	-147.72	-16.47
	22.94	0.00	315	1c	-4.99	34.23	-10.08
0.9D + 1.0W Normal	22.94	0.00	45	1	-9.48	148.66	-19.87
	22.94	0.00	135	1a	5.64	-96.08	-16.13
	22.94	0.00	225	1b	-5.80	-96.48	-16.00
	22.94	0.00	315	1c	9.64	148.25	-19.69
0.9D + 1.0W 45°	22.94	0.00	45	1	-20.77	208.48	-21.01
	22.94	0.00	135	1a	-9.70	26.49	-5.83
	22.94	0.00	225	1b	-17.30	-156.29	-17.10
	22.94	0.00	315	1c	-5.63	25.67	-9.45
1.2D + 1.0Di + 1.0Wi Normal	22.94	0.00	45	1	-6.66	97.45	-9.82
	22.94	0.00	135	1a	-2.23	26.05	-0.88
	22.94	0.00	225	1b	2.19	25.11	-0.90
	22.94	0.00	315	1c	6.69	96.47	-9.72
1.2D + 1.0Di + 1.0Wi 45°	22.94	0.00	45	1	-10.06	115.51	-10.18
	22.94	0.00	135	1a	-6.79	62.22	2.15
	22.94	0.00	225	1b	-1.25	7.05	-1.25
	22.94	0.00	315	1c	2.15	60.30	-6.68
1.2D + 1.0Ev + 1.0Eh Normal	22.94	0.00	45	1	-3.56	48.94	-4.33
	22.94	0.00	135	1a	-1.75	19.95	0.99
	22.94	0.00	225	1b	1.75	19.95	0.99
	22.94	0.00	315	1c	3.56	48.94	-4.33
1.2D + 1.0Ev + 1.0Eh 45°	22.94	0.00	45	1	-4.48	54.94	-4.48
	22.94	0.00	135	1a	-3.20	34.45	2.12
	22.94	0.00	225	1b	0.84	13.95	0.84
	22.94	0.00	315	1c	2.12	34.45	-3.20
0.9D - 1.0Ev + 1.0Eh Normal	22.94	0.00	45	1	-2.72	38.01	-3.49
	22.94	0.00	135	1a	-0.91	9.05	0.15
	22.94	0.00	225	1b	0.91	9.05	0.15
	22.94	0.00	315	1c	2.72	38.01	-3.49
0.9D - 1.0Ev + 1.0Eh 45°	22.94	0.00	45	1	-3.64	44.00	-3.64
	22.94	0.00	135	1a	-2.36	23.53	1.28
	22.94	0.00	225	1b	-0.01	3.05	-0.01
	22.94	0.00	315	1c	1.28	23.53	-2.36
1.0D + 1.0W Service Normal	22.94	0.00	45	1	-4.18	62.30	-7.06
	22.94	0.00	135	1a	-0.09	-3.87	-2.78
	22.94	0.00	225	1b	0.04	-4.32	-2.77
	22.94	0.00	315	1c	4.22	61.84	-6.99
1.0D + 1.0W Service 45°	22.94	0.00	45	1	-7.28	78.56	-7.37
	22.94	0.00	135	1a	-4.28	29.43	0.01
	22.94	0.00	225	1b	-3.09	-20.57	-3.05
	22.94	0.00	315	1c	0.05	28.53	-4.19

Max Uplift:	156.29 (kip)	Moment Ice:	2488.9 (kip-ft)	Moment:	8374.50 (kip-ft)
Max Down:	217.3 (kip)	Total Down Ice:	245.08 (kip)	Total Down:	139.14 (kip)
Max Shear:	30.45 (kip)	Total Shear Ice:	22.58 (kip)	Total Shear:	75.51(kip)
1.2D + 1.0W 45°					

## DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0W Normal 115 mph wind with no ice	50.00	0.0417	0.0050	0.0791	0.0793
1.2D + 1.0W Normal 115 mph wind with no ice	75.00	0.0813	0.0059	0.0939	0.0941
1.2D + 1.0W Normal 115 mph wind with no ice	87.50	0.1021	0.0062	0.0983	0.0985
1.2D + 1.0W Normal 115 mph wind with no ice	100.00	0.1253	0.0071	0.1121	0.1123
1.2D + 1.0W Normal 115 mph wind with no ice	112.50	0.1511	0.0078	0.1234	0.1237
1.2D + 1.0W Normal 115 mph wind with no ice	125.00	0.1799	0.0087	0.1385	0.1388
1.2D + 1.0W Normal 115 mph wind with no ice	137.50	0.2116	0.0094	0.1492	0.1495
1.2D + 1.0W Normal 115 mph wind with no ice	150.00	0.2449	0.0096	0.1529	0.1532
1.2D + 1.0W Normal 115 mph wind with no ice	160.17	0.2722	0.0098	0.1561	0.1564
1.2D + 1.0W Normal 115 mph wind with no ice	170.33	0.3003	0.0101	0.1604	0.1607
1.2D + 1.0W Normal 115 mph wind with no ice	187.50	0.3485	0.0102	0.1621	0.1624
1.2D + 1.0W 45° 115 mph wind with no ice	50.00	0.0441	0.0074	0.0838	0.0842
1.2D + 1.0W 45° 115 mph wind with no ice	75.00	0.086	0.0088	0.0994	0.0998
1.2D + 1.0W 45° 115 mph wind with no ice	87.50	0.1079	0.0092	0.1040	0.1044
1.2D + 1.0W 45° 115 mph wind with no ice	100.00	0.1325	0.0105	0.1185	0.119
1.2D + 1.0W 45° 115 mph wind with no ice	112.50	0.1598	0.0116	0.1306	0.1311
1.2D + 1.0W 45° 115 mph wind with no ice	125.00	0.1903	0.0130	0.1466	0.1471
1.2D + 1.0W 45° 115 mph wind with no ice	137.50	0.2239	0.0140	0.1581	0.1584
1.2D + 1.0W 45° 115 mph wind with no ice	150.00	0.2592	-0.0143	0.1636	0.1636
1.2D + 1.0W 45° 115 mph wind with no ice	160.17	0.2881	-0.0147	0.1664	0.1671
1.2D + 1.0W 45° 115 mph wind with no ice	170.33	0.3182	-0.0151	0.1711	0.1718
1.2D + 1.0W 45° 115 mph wind with no ice	187.50	0.3695	-0.0152	0.1728	0.173
0.9D + 1.0W Normal 115 mph wind with no ice	50.00	0.0417	0.0050	0.0790	0.0792
0.9D + 1.0W Normal 115 mph wind with no ice	75.00	0.0813	0.0059	0.0938	0.094
0.9D + 1.0W Normal 115 mph wind with no ice	87.50	0.102	0.0062	0.0982	0.0984
0.9D + 1.0W Normal 115 mph wind with no ice	100.00	0.1253	0.0071	0.1120	0.1122
0.9D + 1.0W Normal 115 mph wind with no ice	112.50	0.1511	0.0078	0.1234	0.1236
0.9D + 1.0W Normal 115 mph wind with no ice	125.00	0.1799	0.0087	0.1385	0.1387
0.9D + 1.0W Normal 115 mph wind with no ice	137.50	0.2116	0.0094	0.1492	0.1495
0.9D + 1.0W Normal 115 mph wind with no ice	150.00	0.2449	0.0096	0.1530	0.1533
0.9D + 1.0W Normal 115 mph wind with no ice	160.17	0.2723	0.0098	0.1563	0.1566
0.9D + 1.0W Normal 115 mph wind with no ice	170.33	0.3004	0.0101	0.1605	0.1609
0.9D + 1.0W Normal 115 mph wind with no ice	187.50	0.3487	0.0102	0.1622	0.1626
0.9D + 1.0W 45° 115 mph wind with no ice	50.00	0.0441	0.0074	0.0838	0.0841
0.9D + 1.0W 45° 115 mph wind with no ice	75.00	0.0859	0.0088	0.0993	0.0997
0.9D + 1.0W 45° 115 mph wind with no ice	87.50	0.1078	0.0092	0.1039	0.1043
0.9D + 1.0W 45° 115 mph wind with no ice	100.00	0.1324	0.0105	0.1184	0.1188
0.9D + 1.0W 45° 115 mph wind with no ice	112.50	0.1597	0.0115	0.1305	0.131
0.9D + 1.0W 45° 115 mph wind with no ice	125.00	0.1902	0.0130	0.1464	0.147
0.9D + 1.0W 45° 115 mph wind with no ice	137.50	0.2237	0.0139	0.1578	0.1583
0.9D + 1.0W 45° 115 mph wind with no ice	150.00	0.259	-0.0143	0.1633	0.1633
0.9D + 1.0W 45° 115 mph wind with no ice	160.17	0.2878	-0.0147	0.1662	0.1669
0.9D + 1.0W 45° 115 mph wind with no ice	170.33	0.3179	-0.0151	0.1709	0.1716
0.9D + 1.0W 45° 115 mph wind with no ice	187.50	0.3692	-0.0152	0.1724	0.1728
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	50.00	0.015	0.0015	0.0245	0.0245
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	75.00	0.0263	0.0018	0.0283	0.0284
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	87.50	0.0322	0.0018	0.0286	0.0287
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	100.00	0.0387	0.0021	0.0324	0.0325
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	112.50	0.0459	0.0022	0.0352	0.0352
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	125.00	0.0538	0.0025	0.0390	0.0391
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	137.50	0.0624	0.0027	0.0412	0.0413
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	150.00	0.0712	0.0027	0.0412	0.0413
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	160.17	0.0782	-0.0028	0.0416	0.0416
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	170.33	0.0856	0.0028	0.0429	0.043
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	187.50	0.0981	0.0028	0.0433	0.0433
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	50.00	0.0164	0.0022	0.0261	0.0261
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	75.00	0.0285	0.0026	0.0305	0.0305
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	87.50	0.0347	0.0027	0.0310	0.031
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	100.00	0.0418	0.0031	0.0353	0.0353
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	112.50	0.0495	0.0034	0.0384	0.0384
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	125.00	0.0582	0.0037	0.0430	0.043
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	137.50	0.0677	0.0040	0.0460	0.046
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	150.00	0.0775	0.0041	0.0469	0.047
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	160.17	0.0855	-0.0042	0.0477	0.0477

## DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	170.33	0.0939	-0.0043	0.0491	0.0491
1.2D + 1.0Di + 1.0Wi 45° 50 mph wind with 1" radial ice	187.50	0.1082	-0.0043	0.0499	0.0499
1.2D + 1.0Ev + 1.0Eh Normal Seismic	50.00	0.004	0.0006	0.0092	0.0092
1.2D + 1.0Ev + 1.0Eh Normal Seismic	75.00	0.0087	0.0007	0.0120	0.012
1.2D + 1.0Ev + 1.0Eh Normal Seismic	87.50	0.0115	0.0008	0.0136	0.0136
1.2D + 1.0Ev + 1.0Eh Normal Seismic	100.00	0.0147	0.0010	0.0158	0.0158
1.2D + 1.0Ev + 1.0Eh Normal Seismic	112.50	0.0182	0.0011	0.0176	0.0176
1.2D + 1.0Ev + 1.0Eh Normal Seismic	125.00	0.0223	0.0012	0.0199	0.0199
1.2D + 1.0Ev + 1.0Eh Normal Seismic	137.50	0.0269	0.0014	0.0221	0.0222
1.2D + 1.0Ev + 1.0Eh Normal Seismic	150.00	0.0319	0.0014	0.0233	0.0234
1.2D + 1.0Ev + 1.0Eh Normal Seismic	160.17	0.0362	0.0015	0.0249	0.0249
1.2D + 1.0Ev + 1.0Eh Normal Seismic	170.33	0.0406	0.0016	0.0258	0.0258
1.2D + 1.0Ev + 1.0Eh Normal Seismic	187.50	0.0483	0.0016	0.0267	0.0267
1.2D + 1.0Ev + 1.0Eh 45° Seismic	50.00	0.0041	0.0008	0.0093	0.0093
1.2D + 1.0Ev + 1.0Eh 45° Seismic	75.00	0.0088	0.0010	0.0120	0.012
1.2D + 1.0Ev + 1.0Eh 45° Seismic	87.50	0.0116	0.0012	0.0136	0.0136
1.2D + 1.0Ev + 1.0Eh 45° Seismic	100.00	0.0147	0.0014	0.0159	0.0159
1.2D + 1.0Ev + 1.0Eh 45° Seismic	112.50	0.0182	0.0015	0.0177	0.0177
1.2D + 1.0Ev + 1.0Eh 45° Seismic	125.00	0.0223	0.0017	0.0200	0.02
1.2D + 1.0Ev + 1.0Eh 45° Seismic	137.50	0.0269	0.0019	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 45° Seismic	150.00	0.0319	0.0020	0.0236	0.0236
1.2D + 1.0Ev + 1.0Eh 45° Seismic	160.17	0.0363	0.0022	0.0250	0.025
1.2D + 1.0Ev + 1.0Eh 45° Seismic	170.33	0.0406	0.0022	0.0258	0.0258
1.2D + 1.0Ev + 1.0Eh 45° Seismic	187.50	0.0483	0.0023	0.0269	0.0269
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	50.00	0.004	0.0006	0.0091	0.0091
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	75.00	0.0087	0.0007	0.0119	0.0119
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	87.50	0.0115	0.0008	0.0135	0.0135
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	100.00	0.0146	0.0010	0.0156	0.0157
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	112.50	0.0182	0.0011	0.0174	0.0175
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	125.00	0.0223	0.0012	0.0198	0.0198
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	137.50	0.0268	0.0014	0.0220	0.022
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	150.00	0.0318	0.0014	0.0233	0.0233
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	160.17	0.0361	0.0015	0.0247	0.0248
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	170.33	0.0405	0.0016	0.0256	0.0256
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	187.50	0.0482	0.0016	0.0264	0.0265
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	50.00	0.004	0.0008	0.0091	0.0091
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	75.00	0.0087	0.0010	0.0119	0.0119
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	87.50	0.0115	0.0012	0.0135	0.0135
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	100.00	0.0147	0.0014	0.0157	0.0157
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	112.50	0.0182	0.0015	0.0175	0.0175
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	125.00	0.0223	0.0017	0.0198	0.0198
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	137.50	0.0268	0.0019	0.0221	0.0221
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	150.00	0.0319	0.0020	0.0235	0.0235
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	160.17	0.0362	0.0022	0.0249	0.0249
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	170.33	0.0406	0.0022	0.0256	0.0256
0.9D - 1.0Ev + 1.0Eh 45° Seismic (Reduced DL)	187.50	0.0482	0.0023	0.0266	0.0266
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	50.00	0.0114	0.0014	0.0216	0.0217
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	75.00	0.0221	0.0016	0.0255	0.0255
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	87.50	0.0277	0.0017	0.0266	0.0267
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	100.00	0.0339	0.0019	0.0303	0.0303
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	112.50	0.0409	0.0021	0.0332	0.0333
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	125.00	0.0486	0.0024	0.0373	0.0373
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	137.50	0.057	0.0025	0.0400	0.04
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	150.00	0.0659	0.0026	0.0407	0.0407
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	160.17	0.0732	0.0027	0.0415	0.0416
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	170.33	0.0806	0.0027	0.0428	0.0428
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	187.50	0.0933	0.0028	0.0433	0.0434
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	50.00	0.012	0.0020	0.0227	0.0228
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	75.00	0.0234	0.0024	0.0269	0.027
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	87.50	0.0293	0.0025	0.0282	0.0283
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	100.00	0.036	0.0028	0.0322	0.0322
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	112.50	0.0434	0.0031	0.0354	0.0355
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	125.00	0.0516	0.0035	0.0399	0.0399
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	137.50	0.0607	0.0038	0.0430	0.043
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	150.00	0.0703	0.0039	0.0445	0.0445
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	160.17	0.0781	0.0040	0.0453	0.0453
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	170.33	0.0863	0.0041	0.0466	0.0466
1.0D + 1.0W Service 45° 60 mph Wind with No Ice	187.50	0.1002	0.0041	0.0474	0.0474



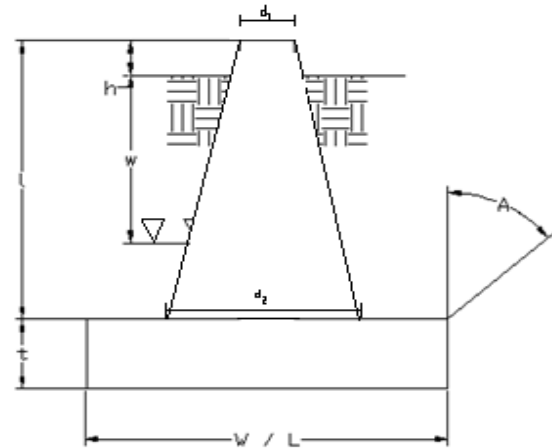
Site No.:	88014
Engineer:	Lucas Santos
Date:	Monday, September 27, 2021
Carrier:	New Fairfield

## Pyramidal Pad & Pier

### Design Loads (Unfactored)

Compression/Leg:	217.30	k
Uplift/Leg:	156.29	k

Face Width @ Top of Pier ( $d_1$ ):	3.58	ft
Face Width @ Bottom of Pier ( $d_2$ ):	6.00	ft
Total Length of Pier (l):	6.50	ft
Height of Pedestal Above Ground (h):	0.630	ft
Width of Pad (W):	16.00	ft
Length of Pad (L):	16.00	ft
Thickness of Pad (t):	3.00	ft
Water Table Depth (w):	99.00	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil (Above Water Table):	120.0	pcf
Unit Weight of Soil (Below Water Table):	57.6	pcf
Friction Angle of Uplift (A):	22	°
Allowable Compressive Bearing Pressure:	4500	psf



Volume Pier Above Gnd:	8.61	ft <sup>3</sup>
Pier & Soil Below WT:	0.00	ft
Pier FW @ WT:	6.00	ft
Soil Pyramid Projection @ Surface:	2.37	ft
Soil Pyramid Projection @ WT:	0.00	ft
Pad Below WT:	0.00	ft
Volume Pier:	152.31	ft <sup>3</sup>
Volume Pad:	768.00	ft <sup>3</sup>
Volume Soil:	1839.09	ft <sup>3</sup>
Volume Pier (Buoyant):	0.00	ft <sup>3</sup>
Volume Pad (Buoyant):	0.00	ft <sup>3</sup>
Volume Soil (Buoyant):	0.00	ft <sup>3</sup>
Weight Pier:	22.85	k
Weight Pad:	115.20	k
Weight Soil:	220.69	k

### Uplift Resistance

$\phi_s$ Uplift (k)	269.05	0.58	OK
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### Axial Resistance

$\phi_s$ Axial (k)	864.00	0.25	OK
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**AMERICAN TOWER®**  
C O R P O R A T I O N

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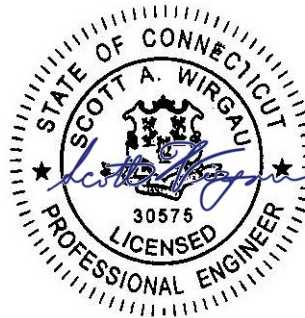
## Mount Analysis Report

**ATC Site Name** : NEW FAIRFIELD, CT  
**ATC Site Number** : 88014  
**Engineering Number** : 13699607\_C8\_07  
**Mount Elevation** : 137 ft  
**Carrier** : Dish Wireless L.L.C.  
**Carrier Site Name** : NJJER01162A  
**Carrier Site Number** : NJJER01162A  
**Site Location** : 22 Titicus Mtn Road  
New Fairfield, CT 06812-2565  
41.4506863 , -73.51595683  
**County** : Fairfield  
**Date** : March 23, 2022  
**Max Usage** : 75%  
**Result** : Pass

Prepared By:  
Garrett Williams  
Structural Engineer I

*Garrett Williams*

Reviewed By:



**COA: PEC.0001553**



## **Table of Contents**

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Calculations .....	Attached



## Introduction

The purpose of this report is to summarize results of the mount analysis performed for Dish Wireless L.L.C. at 137 ft.

## Supporting Documents

<b>Specifications Sheet</b>	Commscope MTC3975083, dated March 17, 2021
<b>Radio Frequency Data Sheet</b>	RFDS ID #NJER01162A, dated June 16, 2021

## Analysis

This mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

<b>Basic Wind Speed:</b>	115 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1.00" radial ice concurrent
<b>Codes:</b>	ANSI/TIA-222-H
<b>Exposure Category:</b>	B
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 2
<b>Feature:</b>	Flat
<b>Crest Height (H):</b>	0 ft
<b>Crest Length (L):</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.224$ , $S_1 = 0.056$
<b>Site Class:</b>	D - Stiff Soil
<b>Live Loads:</b>	$L_m = 500$ lbs, $L_v = 250$ lbs

## Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above. The mount can support the equipment as described in this report.

- Analysis is based on new Commscope MTC3975083 sector frames.

If you have any questions or require additional information, please contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

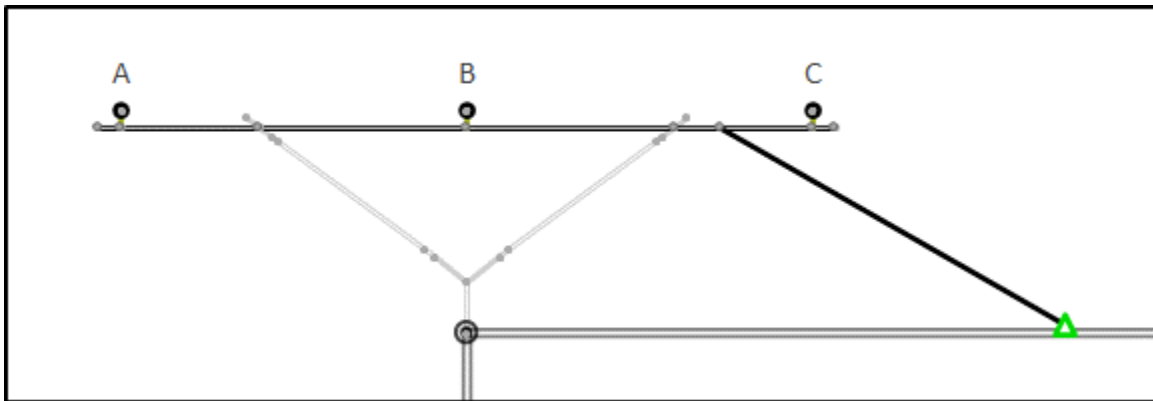
**Application Loading**

Mount Centerline (ft)	Equipment Centerline (ft)	Qty	Equipment Manufacturer & Model
137.0	137.0	3	JMA Wireless MX08FRO665-21
		1	Commscope RDIDC-9181-PF-48
		3	Fujitsu TA08025-B605
		3	Fujitsu TA08025-B604

**Structure Usages**

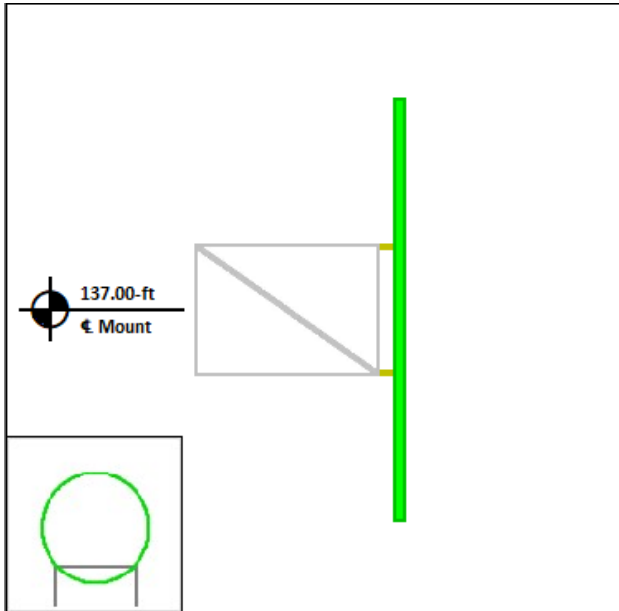
Structural Component	Controlling Usage	Pass/Fail
Horizontals	67%	Pass
Verticals	75%	Pass
Diagonals	23%	Pass
Tie-Backs	2%	Pass
Mount Pipes	8%	Pass

**Mount Layout**

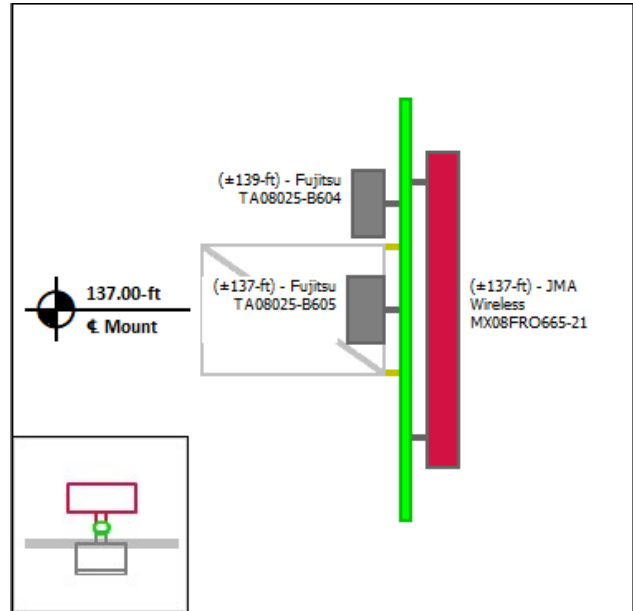


## Equipment Layout

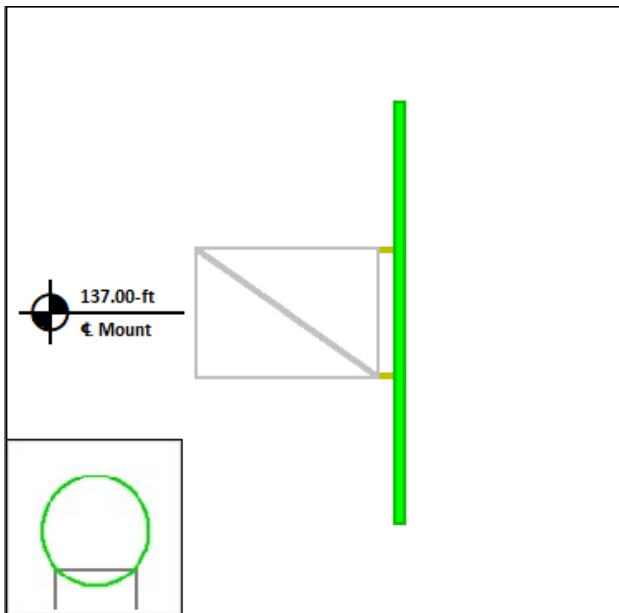
Mount Pipe A



Mount Pipe B



Mount Pipe C





### **Standard Conditions**

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding equipment, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

Installation of all equipment and steel should be confirmed not to cause tower conflicts nor impede the tower climbing pegs.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Site Number: 88014  
 Project Number: 13699607\_C8\_07  
 Carrier: Dish Wireless L.L.C.  
 Mount Elevation: 137 ft  
 Date: 3/23/2022

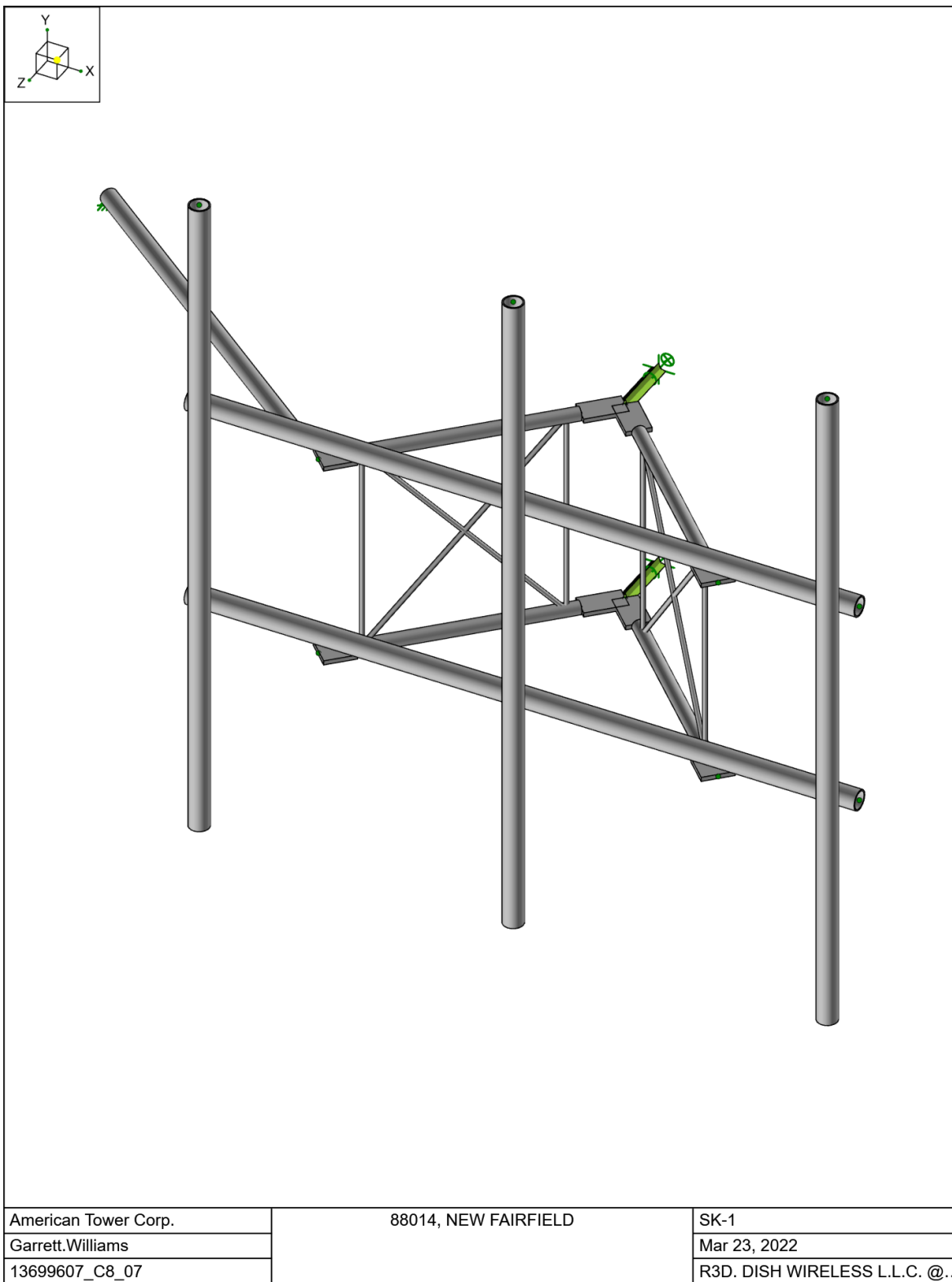
## Mount Analysis Force Calculations

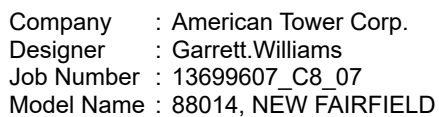
Wind & Ice Load Calculations			
Velocity Pressure Coefficient	$K_z$	1.08	
Topographic Factor	$K_{zt}$	1.00	
Rooftop Wind Speed-up Factor	$K_s$	1.00	
Shielding Factor	$K_a$	0.90	
Ground Elevation Factor	$K_e$	0.97	
Wind Direction Probability Factor	$K_d$	0.95	
Basic Wind Speed	$V$	115	mph
Velocity Pressure	$q_z$	33.7	psf
Height Escalation Factor	$K_{iz}$	1.15	
Thickness of Radial Glaze Ice	$T_{iz}$	1.15	in

Seismic Load Calculations			
Short Period DSRAP	$S_{Ds}$	0.239	
1 Second DSRAP	$S_{D1}$	0.090	
Importance Factor	$I$	1.0	
Response Modification Coefficient	$R$	2.0	
Seismic Response Coefficient	$C_s$	0.119	
Amplification Factor	$A$	1.0	
Total Weight	$W$	538.3	lbs
Total Shear Force	$V_s$	64.3	lbs
Horizontal Seismic Load	$E_h$	64.3	lbs
Vertical Seismic Load	$E_v$	25.7	lbs

Antenna Calculations (Elevations per Application/RFDS)*								
Equipment	Height	Width	Depth	Weight	$EPA_N$	$EPA_T$	$EPA_{Ni}$	$EPA_{Ti}$
Model #	in	in	in	lbs	sqft	sqft	sqft	sqft
JMA Wireless MX08FRO665-21	72.0	20.0	8.0	64.5	12.49	2.40	14.37	3.19
Commscope RDIDC-9181-PF-48	16.0	14.0	8.0	21.9	N/A	N/A	N/A	N/A
Fujitsu TA08025-B605	15.7	15.0	9.1	75.0	1.96	1.19	2.60	1.71
Fujitsu TA08025-B604	15.7	15.0	7.9	63.9	1.96	1.03	2.60	1.53

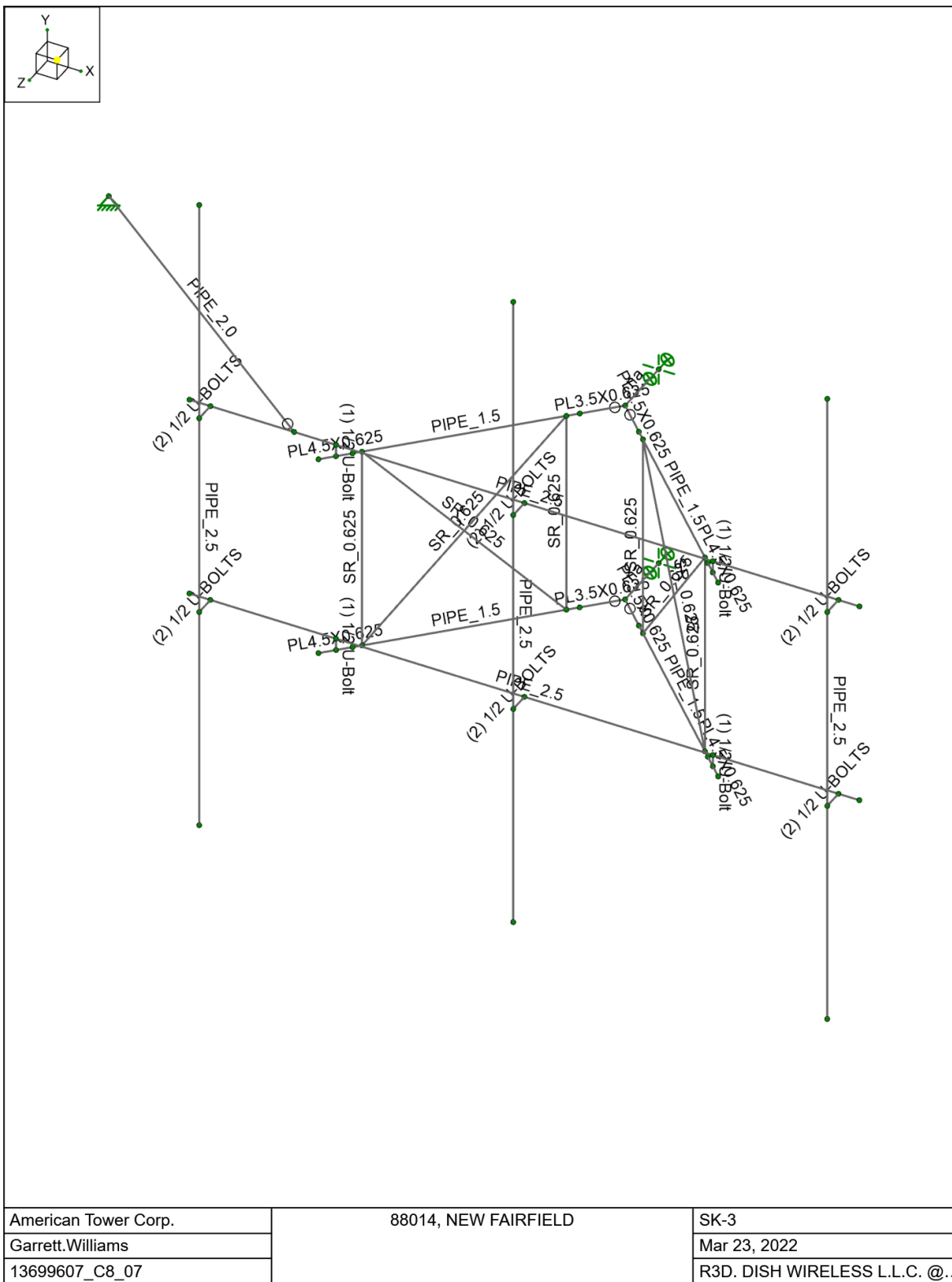
\* Equipment with EPA values N/A were not considered in the mount analysis

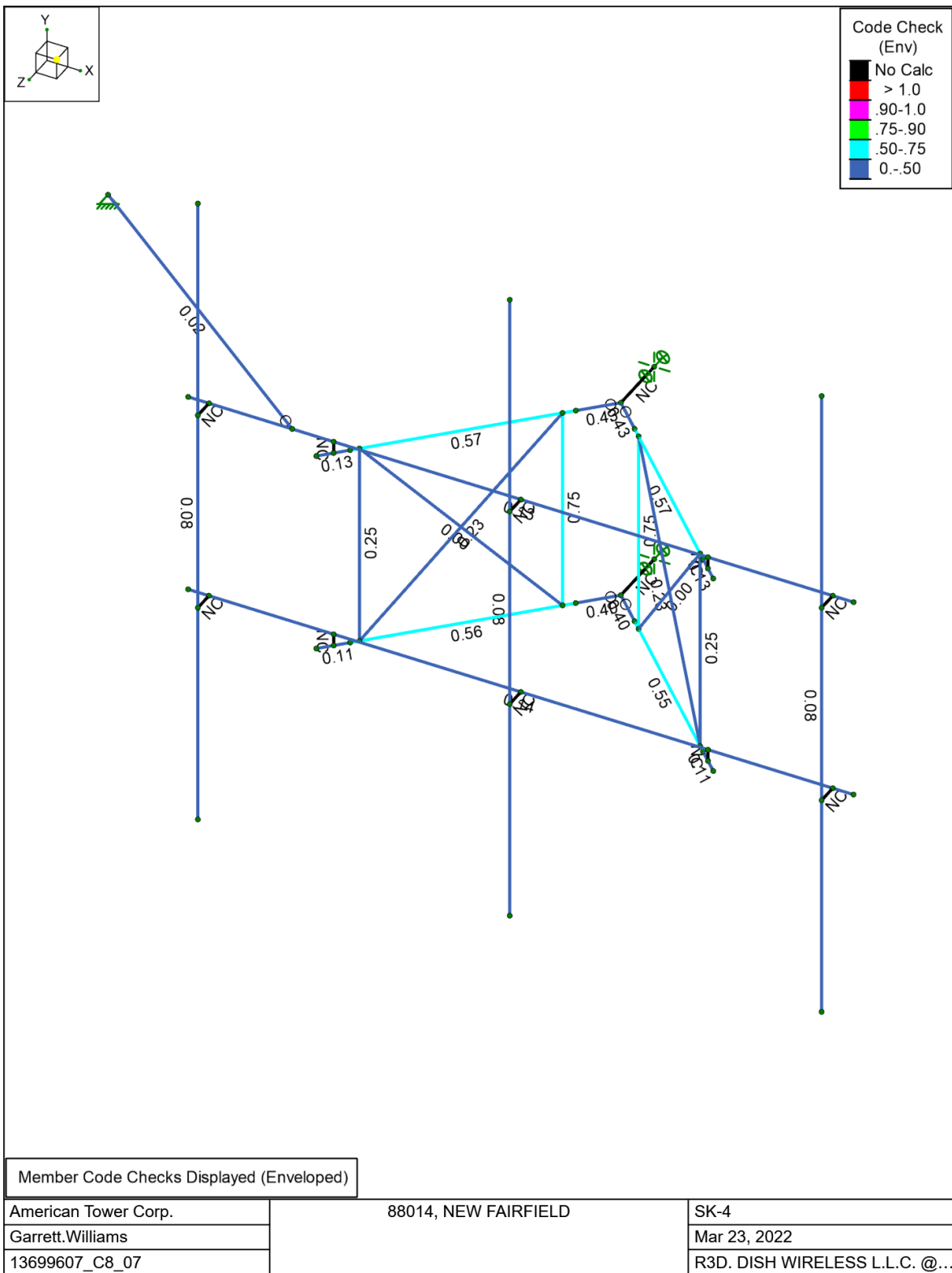


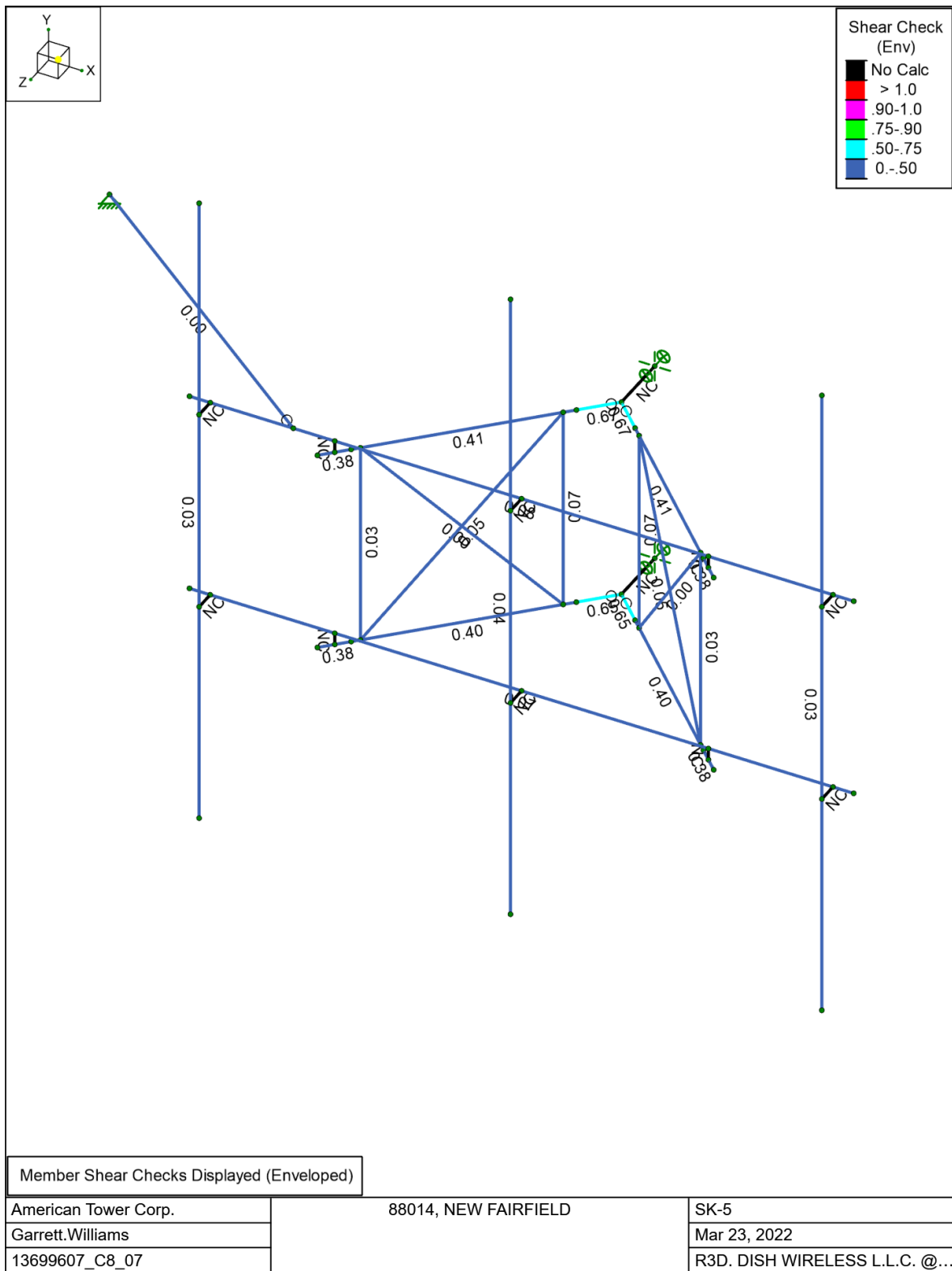


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Checked By : -











Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 13699607\_C8\_07  
 Model Name : 88014, NEW FAIRFIELD

3/23/2022  
 11:52:20 AM  
 Checked By : -

### Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed
1	D	DL	-1		4	
2	Di	IL			4	26
3	W 0	WL			4	37
4	W 30	WL			8	73
5	W 60	WL			8	73
6	W 90	WL			4	38
7	W 120	WL			8	73
8	W 150	WL			8	73
9	W 180	WL			4	37
10	W 210	WL			8	73
11	W 240	WL			8	73
12	W 270	WL			4	38
13	W 300	WL			8	73
14	W 330	WL			8	73
15	Wi 0	WL			4	37
16	Wi 30	WL			8	73
17	Wi 60	WL			8	73
18	Wi 90	WL			4	38
19	Wi 120	WL			8	73
20	Wi 150	WL			8	73
21	Wi 180	WL			4	37
22	Wi 210	WL			8	73
23	Wi 240	WL			8	73
24	Wi 270	WL			4	38
25	Wi 300	WL			8	73
26	Wi 330	WL			8	73
27	Ws 0	WL			4	37
28	Ws 30	WL			8	73
29	Ws 60	WL			8	73
30	Ws 90	WL			4	38
31	Ws 120	WL			8	73
32	Ws 150	WL			8	73
33	Ws 180	WL			4	37
34	Ws 210	WL			8	73
35	Ws 240	WL			8	73
36	Ws 270	WL			4	38
37	Ws 300	WL			8	73
38	Ws 330	WL			8	73
39	Ev -Y	ELY				26
40	Eh -Z	ELZ				26
41	Eh -X	ELX				26
42	Lv (1)	LL			1	
43	Lv (2)	LL			1	
44	Lv (3)	LL			1	
45	Lv (4)	LL			1	
46	Lv (5)	LL			1	
47	Lv (6)	LL			1	
48	Lv (7)	LL			1	
49	Lv (8)	LL			1	
50	Lv (9)	LL			1	
51	Lv (10)	LL			1	
52	Lv (11)	LL		1		
53	Lv (12)	LL		1		
54	Lm (1)	LL		1		
55	Lm (2)	LL		1		



Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 13699607\_C8\_07  
 Model Name : 88014, NEW FAIRFIELD

3/23/2022  
 11:52:20 AM  
 Checked By : -

### Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed
56	Lm (3)	LL		1		

### Node Boundary Conditions

	Node Label	X [lb/in]	Y [lb/in]	Z [lb/in]	Z Rot [k-in/rad]
1	N001	Reaction	Reaction	Reaction	Reaction
2	N007	Reaction	Reaction	Reaction	Reaction
3	N030	Reaction	Reaction	Reaction	

### Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	H001	N001	N002		RIGID	None	None	RIGID	Typical
2	H002	N019	N022		PIPE 1.5	Beam	None	A500 Gr. C	Typical
3	H003	N013	N016		PIPE 1.5	Beam	None	A500 Gr. C	Typical
4	H004	N005	N006		PIPE 2.5	Beam	None	A500 Gr. C	Typical
5	H005	N007	N008		RIGID	None	None	RIGID	Typical
6	H006	N020	N021		PIPE 1.5	Beam	None	A500 Gr. C	Typical
7	H007	N014	N015		PIPE 1.5	Beam	None	A500 Gr. C	Typical
8	H008	N011	N012		PIPE 2.5	Beam	None	A500 Gr. C	Typical
9	H009	N002	N019	90	PL3.5X0.625	Beam	None	A36	Typical
10	H010	N002	N013	90	PL3.5X0.625	Beam	None	A36	Typical
11	H011	N008	N020	90	PL3.5X0.625	Beam	None	A36	Typical
12	H012	N008	N014	90	PL3.5X0.625	Beam	None	A36	Typical
13	H013	N021	N024	90	PL4.5X0.625	Beam	None	A36	Typical
14	H014	N015	N018	90	PL4.5X0.625	Beam	None	A36	Typical
15	H015	N022	N023	90	PL4.5X0.625	Beam	None	A36	Typical
16	H016	N016	N017	90	PL4.5X0.625	Beam	None	A36	Typical
17	V017	N025	N003		(1) 1/2 U-Bolt	Column	None	A36	Typical
18	V018	N026	N004		(1) 1/2 U-Bolt	Column	None	A36	Typical
19	V019	N027	N009		(1) 1/2 U-Bolt	Column	None	A36	Typical
20	V020	N028	N010		(1) 1/2 U-Bolt	Column	None	A36	Typical
21	TB021	N030	N029		PIPE 2.0	Beam	None	A500 Gr. C	Typical
22	U022	N031	N034		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
23	U023	N035	N036		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
24	MP024	N037	N038		PIPE 2.5	Column	None	A500 Gr. C	Typical
25	U025	N033	N039		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
26	U026	N040	N041		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
27	MP027	N042	N043		PIPE 2.5	Column	None	A500 Gr. C	Typical
28	U028	N032	N044		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
29	U029	N045	N046		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
30	MP030	N047	N048		PIPE 2.5	Column	None	A500 Gr. C	Typical
31	V031	N050	N049		SR 0.625	Column	None	A36	Typical
32	V032	N052	N051		SR 0.625	Column	None	A36	Typical
33	V033	N053	N054		SR 0.625	Column	None	A36	Typical
34	D034	N053	N049		SR 0.625	Column	None	A36	Typical
35	D035	N050	N054		SR 0.625	Column	None	A36	Typical
36	V036	N056	N055		SR 0.625	Column	None	A36	Typical
37	D037	N056	N051		SR 0.625	Column	None	A36	Typical
38	D038	N052	N055		SR 0.625	Column	None	A36	Typical



Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 13699607\_C8\_07  
 Model Name : 88014, NEW FAIRFIELD

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### Member Advanced Data

	Label	I Release	J Release	T/C Only	Physical	Deflection Ratio Options	Activation	Seismic DR
1	H001				Yes	** NA **		None
2	H002				Yes	N/A		None
3	H003				Yes	N/A		None
4	H004				Yes	N/A		None
5	H005				Yes	** NA **		None
6	H006				Yes	N/A		None
7	H007				Yes	N/A		None
8	H008				Yes	N/A		None
9	H009	OOOOXO			Yes	Default		None
10	H010	OOOOXO			Yes	Default		None
11	H011	OOOOXO			Yes	Default		None
12	H012	OOOOXO			Yes	Default		None
13	H013				Yes	N/A		None
14	H014				Yes	N/A		None
15	H015				Yes	N/A		None
16	H016				Yes	N/A		None
17	V017				Yes	** NA **	Exclude	None
18	V018				Yes	** NA **	Exclude	None
19	V019				Yes	** NA **	Exclude	None
20	V020				Yes	** NA **	Exclude	None
21	TB021		BenPIN		Yes	N/A		None
22	U022				Yes	N/A	Exclude	None
23	U023				Yes	N/A	Exclude	None
24	MP024				Yes	** NA **		None
25	U025				Yes	N/A	Exclude	None
26	U026				Yes	N/A	Exclude	None
27	MP027				Yes	** NA **		None
28	U028				Yes	N/A	Exclude	None
29	U029				Yes	N/A	Exclude	None
30	MP030				Yes	** NA **		None
31	V031				Yes	** NA **		None
32	V032				Yes	** NA **		None
33	V033				Yes	** NA **		None
34	D034			Tension Only	Yes	** NA **		None
35	D035			Tension Only	Yes	** NA **		None
36	V036				Yes	** NA **		None
37	D037			Tension Only	Yes	** NA **		None
38	D038			Tension Only	Yes	** NA **		None

### Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
1	H002	PIPE 1.5	30				Lbyy	0.8	1	Lateral
2	H003	PIPE 1.5	30				Lbyy	0.8	1	Lateral
3	H004	PIPE 2.5	96				Lbyy	1	1	Lateral
4	H006	PIPE 1.5	30				Lbyy	0.8	1	Lateral
5	H007	PIPE 1.5	30				Lbyy	0.8	1	Lateral
6	H008	PIPE 2.5	96				Lbyy	1	1	Lateral
7	H009	PL3.5X0.625	6				Lbyy	2.1	2.1	Lateral
8	H010	PL3.5X0.625	6				Lbyy	2.1	2.1	Lateral
9	H011	PL3.5X0.625	6				Lbyy	2.1	2.1	Lateral
10	H012	PL3.5X0.625	6				Lbyy	2.1	2.1	Lateral
11	H013	PL4.5X0.625	4.5				Lbyy	2.1	2.1	Lateral
12	H014	PL4.5X0.625	4.5				Lbyy	2.1	2.1	Lateral
13	H015	PL4.5X0.625	4.5				Lbyy	2.1	2.1	Lateral



Company : American Tower Corp.  
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### Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
14	H016	PL4.5X0.625	4.5			Lbyy		2.1	2.1	Lateral
15	V017	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
16	V018	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
17	V019	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
18	V020	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
19	TB021	PIPE 2.0	56.703			Lbyy		1	1	Lateral
20	U022	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
21	U023	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
22	MP024	PIPE 2.5	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
23	U025	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
24	U026	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
25	MP027	PIPE 2.5	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
26	U028	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
27	U029	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
28	MP030	PIPE 2.5	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
29	V031	SR 0.625	30			Lbyy		0.65	0.65	Lateral
30	V032	SR 0.625	30			Lbyy		0.65	0.65	Lateral
31	V033	SR 0.625	30			Lbyy		0.65	0.65	Lateral
32	D034	SR 0.625	40.361			Lbyy		0.65	0.65	Lateral
33	D035	SR 0.625	40.361			Lbyy		0.65	0.65	Lateral
34	V036	SR 0.625	30			Lbyy		0.65	0.65	Lateral
35	D037	SR 0.625	40.361			Lbyy		0.65	0.65	Lateral
36	D038	SR 0.625	40.361			Lbyy		0.65	0.65	Lateral

### Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e <sup>6</sup> F <sup>-1</sup> ]	Density [lb/ft <sup>3</sup> ]	Yield [psi]	Ry	Fu [psi]	Rt
1	A36	2.9e+07	1.115e+07	0.3	0.65	490	36000	1.5	58000	1.2
2	A500 Gr. C	2.9e+07	1.115e+07	0.3	0.65	490	46000	1.4	62000	1.3
3	A53 Gr. B	2.9e+07	1.115e+07	0.3	0.65	490	35000	1.6	60000	1.2

### Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N001	max	1070.827	102	765.269	90	145.567	25	0	109	0	109	91.365	76
2		min	-1049.721	84	239.847	21	-1764.389	79	0	1	0	1	-93.06	108
3	N007	max	1063.449	76	606.262	84	1741.325	74	0	109	0	109	89.36	76
4		min	-1083.496	106	218.368	15	219.526	20	0	1	0	1	-90.993	108
5	N030	max	403.129	6	384.84	73	298.287	4	0	109	0	109	0	109
6		min	-403.457	12	6.336	16	-298.142	10	0	1	0	1	0	1
7	Totals:	max	657.261	6	1377.478	109	907.229	14						
8		min	-657.261	24	470.607	14	-907.229	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	H002	PIPE 1.5	0.566	1.563	78	0.411	0		75	26562.555	31008.6	1452.45	1452.45	2.095	H3-6
2	H003	PIPE 1.5	0.571	1.563	105	0.413	0		108	26562.555	31008.6	1452.45	1452.45	2.095	H3-6
3	H004	PIPE 2.5	0.131	48	90	0.077	75		105	33487.322	66654	4726.5	4726.5	1.743	H1-1b
4	H006	PIPE 1.5	0.552	1.563	76	0.395	0		76	26562.555	31008.6	1452.45	1452.45	2.076	H3-6
5	H007	PIPE 1.5	0.558	1.563	108	0.397	0		108	26562.555	31008.6	1452.45	1452.45	2.076	H3-6
6	H008	PIPE 2.5	0.139	75	108	0.068	75		106	33487.322	66654	4726.5	4726.5	2.336	H1-1b
7	H009	PL3.5X0.625	0.427	6	78	0.666	6	y	75	54826.037	70875	922.852	5167.969	1.109	H1-1b
8	H010	PL3.5X0.625	0.431	6	106	0.668	6	y	109	54826.037	70875	922.852	5167.969	1.108	H1-1b
9	H011	PL3.5X0.625	0.399	6	76	0.653	0.188	y	75	54826.037	70875	922.852	5167.969	1.094	H1-1b



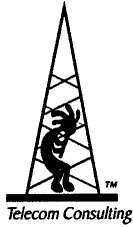
Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 13699607\_C8\_07  
 Model Name : 88014, NEW FAIRFIELD

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**Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)**

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
10	H012	PL3.5X0.625	0.403	6	108	0.655	6	y	108	54826.037	70875	922.852	5167.969	1.093	H1-1b
11	H013	PL4.5X0.625	0.107	0	85	0.381	2.156	y	76	78870.627	91125	1186.523	8542.969	2.597	H1-1b
12	H014	PL4.5X0.625	0.109	0	100	0.382	2.156	y	108	78870.627	91125	1186.523	8542.969	2.597	H1-1b
13	H015	PL4.5X0.625	0.128	0	80	0.376	2.156	y	75	78870.627	91125	1186.523	8542.969	2.601	H1-1b
14	H016	PL4.5X0.625	0.129	0	103	0.378	2.156	y	109	78870.627	91125	1186.523	8542.969	2.605	H1-1b
15	TB021	PIPE 2.0	0.017	0	6	0.002	56.703		31	29702.625	42228	2459.85	2459.85	1.136	H1-1b*
16	MP024	PIPE 2.5	0.079	33	79	0.027	33		79	46563.382	66654	4726.5	4726.5	3	H1-1b
17	MP027	PIPE 2.5	0.076	33	7	0.045	33		106	46563.382	66654	4726.5	4726.5	3	H1-1b
18	MP030	PIPE 2.5	0.08	33	105	0.027	33		102	46563.382	66654	4726.5	4726.5	3	H1-1b
19	V031	SR 0.625	0.748	0	75	0.067	30		76	4378.243	9940.196	103.544	103.544	2.268	H1-1b
20	V032	SR 0.625	0.752	0	109	0.068	30		106	4378.243	9940.196	103.544	103.544	2.268	H1-1b
21	V033	SR 0.625	0.25	30	78	0.027	0		84	4378.243	9940.196	103.544	103.544	2.277	H1-1b
22	D034	SR 0.625	0.231	40.361	78	0.047	0		76	2458.567	9940.196	103.544	103.544	1.982	H1-1a*
23	D035	SR 0.625	0	40.361	109	0	40.361		109	2458.567	9940.196	103.544	103.544	1	H1-1a
24	V036	SR 0.625	0.252	30	106	0.028	0		100	4378.243	9940.196	103.544	103.544	2.278	H1-1b
25	D037	SR 0.625	0.233	40.361	106	0.047	0		108	2458.567	9940.196	103.544	103.544	1.983	H1-1a*
26	D038	SR 0.625	0	40.361	109	0	40.361		109	2458.567	9940.196	103.544	103.544	1	H1-1a

## POWER DENSITY STUDY



# PINNACLE TELECOM GROUP

*Professional and Technical Services*

## ANTENNA SITE FCC RF COMPLIANCE ASSESSMENT AND REPORT FOR MUNICIPAL SUBMISSION



***PREPARED FOR:***

Dish Wireless, LLC

***SITE ID:***

NJER01162A

***SITE ADDRESS:***

22 Titicus Mountain Road  
New Fairfield, CT

***LATITUDE:***

N 41.45066389

***LONGITUDE:***

W 73.51598889

***STRUCTURE TYPE:***

Lattice Tower

***REPORT DATE:***

MARCH 17, 2022

***COMPLIANCE CONCLUSION:***

Dish Wireless, LLC will be in compliance with the rules and regulations as described in OET Bulletin 65, following the implementation of the proposed mitigation as detailed in the report.

14 Ridgedale Avenue - Suite 260 • Cedar Knolls, NJ 07927 • 973-451-1630

# CONTENTS

<b>INTRODUCTION AND SUMMARY</b>	<b>3</b>
<b>ANTENNA AND TRANSMISSION DATA</b>	<b>5</b>
<b>COMPLIANCE ANALYSIS</b>	<b>11</b>
<b>COMPLIANCE CONCLUSION</b>	<b>18</b>

## **CERTIFICATION**

**Appendix A. DOCUMENTS USED TO PREPARE THE ANALYSIS**

**Appendix B. BACKGROUND ON THE FCC MPE LIMIT**

**Appendix C. PROPOSED SIGNAGE**

**Appendix D. SUMMARY OF EXPERT QUALIFICATIONS**

## **INTRODUCTION AND SUMMARY**

At the request of Dish Wireless, LLC (“Dish”), Pinnacle Telecom Group has performed an independent expert assessment of radiofrequency (RF) levels and related FCC compliance for proposed wireless base station antenna operations on an existing lattice tower located at 22 Titicus Mountain Road in New Fairfield, CT. Dish refers to the antenna site by the code “NJJER01162A”, and its proposed operation involves directional panel antennas and transmission in the 600 MHz, 2000 MHz and 2100 MHz frequency bands licensed to it by the FCC.

The FCC requires all wireless antenna operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC’s regulations. In this case, the compliance assessment needs to take into account the RF effects of other existing antenna operations at the site by AT&T, Sprint, T-Mobile and Verizon Wireless. Note that while the site drawings indicate there may be other antennas at the site, a search of FCC records indicates there are no other licensed transmitting antenna operations to include in the compliance assessment for the site. FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

This report describes a mathematical analysis of RF levels resulting around the site in areas of unrestricted public access, that is, at street level around the site. The compliance analysis employs a standard FCC formula for calculating the effects of the antennas in a very conservative manner, in order to overstate the RF levels and to ensure “safe-side” conclusions regarding compliance with the FCC limit for safe continuous exposure of the general public.

The results of a compliance assessment can be described in layman’s terms by expressing the calculated RF levels as simple percentages of the FCC MPE limit. If the normalized reference for that limit is 100 percent, then calculated RF levels higher than 100 percent indicate the MPE limit is exceeded and there is a need to mitigate the potential exposure. On the other hand, calculated RF levels

consistently below 100 percent serve as a clear and sufficient demonstration of compliance with the MPE limit. We can (and will) also describe the overall worst-case result via the “plain-English” equivalent “times-below-the-limit” factor.

The result of the RF compliance assessment in this case is as follows:

- ❑ At street level, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations at the site is 1.7736 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance. In other words, the worst-case calculated RF level – intentionally and significantly overstated by the calculations – is still more than 56 times below the FCC limit for safe, continuous exposure of the general public.
- ❑ A supplemental analysis of the RF levels at the same height as the Dish antennas indicate that the FCC MPE limit is potentially exceeded. Therefore, it is recommended that four Caution signs be installed six feet below the antennas. In addition, NOC Information signs are to be installed at the base of the tower.
- ❑ The results of the calculations, along with the proposed mitigation, combine to satisfy the FCC requirements and associated guidelines on RF compliance at street level around the site and on the subject roof. Moreover, because of the significant conservatism incorporated in the analysis, RF levels actually caused by the antennas will be lower than these calculations indicate.

The remainder of this report provides the following:

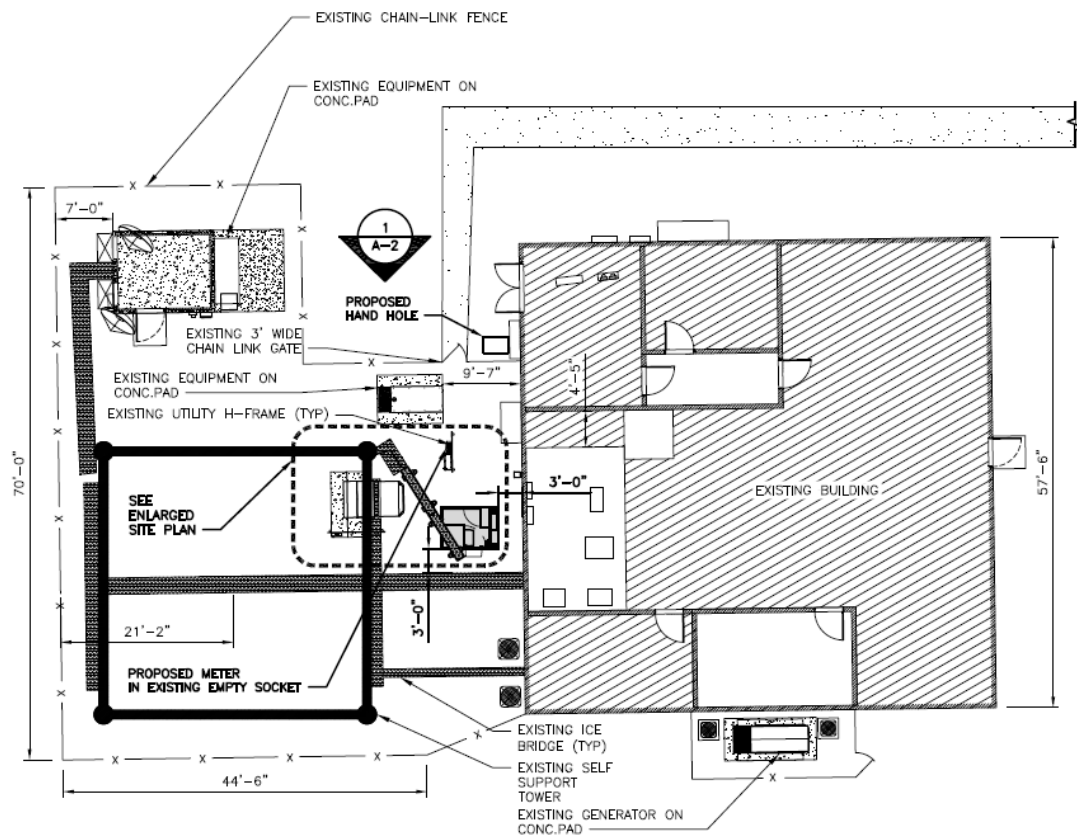
- ❑ relevant technical data on the proposed Dish antenna operations at the site, as well as on the other existing antenna operations;
- ❑ a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- ❑ analysis of the results of the calculations against the FCC MPE limit, and the compliance conclusion for the site.

In addition, four Appendices are included. Appendix A provides information on the documents used to prepare the analysis. Appendix B provides background on the FCC MPE limit. Appendix C details the proposed mitigation to satisfy the FCC requirements and associated guidelines on RF compliance. Appendix D provides a summary of the qualifications of the expert certifying FCC compliance for this site.

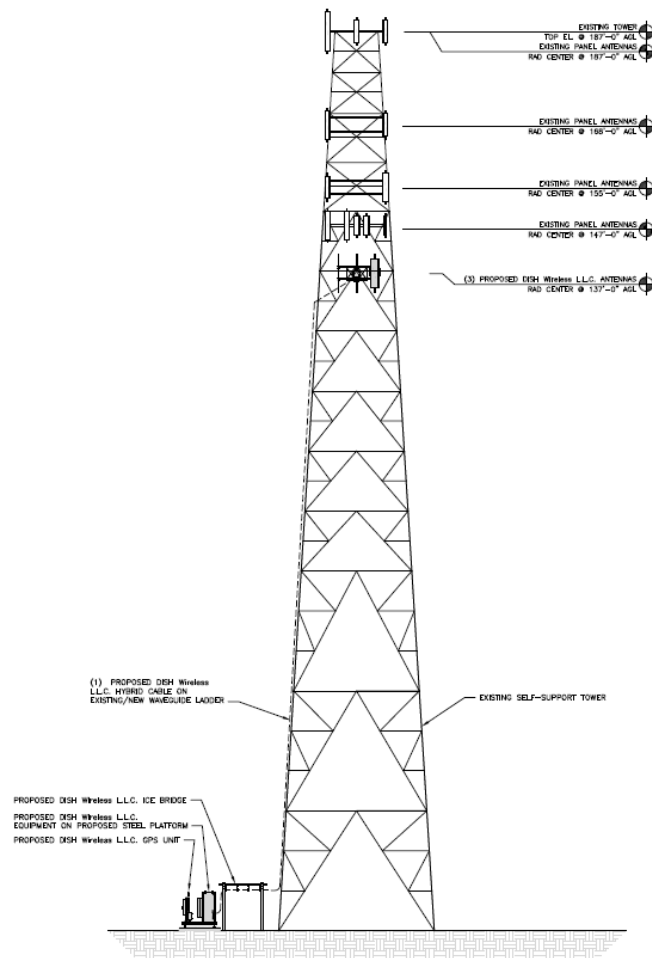
## ANTENNA AND TRANSMISSION DATA

The plan and elevation views that follow, extracted from the site drawings, illustrate the mounting positions of the Dish antennas at the site.

### Plan View:



Elevation View:



The table that follows summarizes the relevant data for the proposed Dish antenna operations. Note that the “Z” height references the centerline of the antenna.

<b>Ant. ID</b>	<b>Carrier</b>	<b>Antenna Manufacturer</b>	<b>Antenna Model</b>	<b>Type</b>	<b>Freq (MHz)</b>	<b>Ant. Dim. (ft.)</b>	<b>Total Input Power (watts)</b>	<b>Total ERP (watts)</b>	<b>Z AGL (ft)</b>	<b>Ant. Gain (dBd)</b>	<b>B/W</b>	<b>Azimuth</b>	<b>EDT</b>	<b>MDT</b>
❶	Dish	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	137	12.46	64	60	2	0
❶	Dish	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	137	16.66	67	60	2	0
❶	Dish	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	137	16.66	67	60	2	0
❷	Dish	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	137	12.46	64	180	2	0
❷	Dish	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	137	16.66	67	180	2	0
❷	Dish	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	137	16.66	67	180	2	0
❸	Dish	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	137	12.46	64	300	2	0
❸	Dish	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	137	16.66	67	300	2	0
❸	Dish	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	137	16.66	67	300	2	0

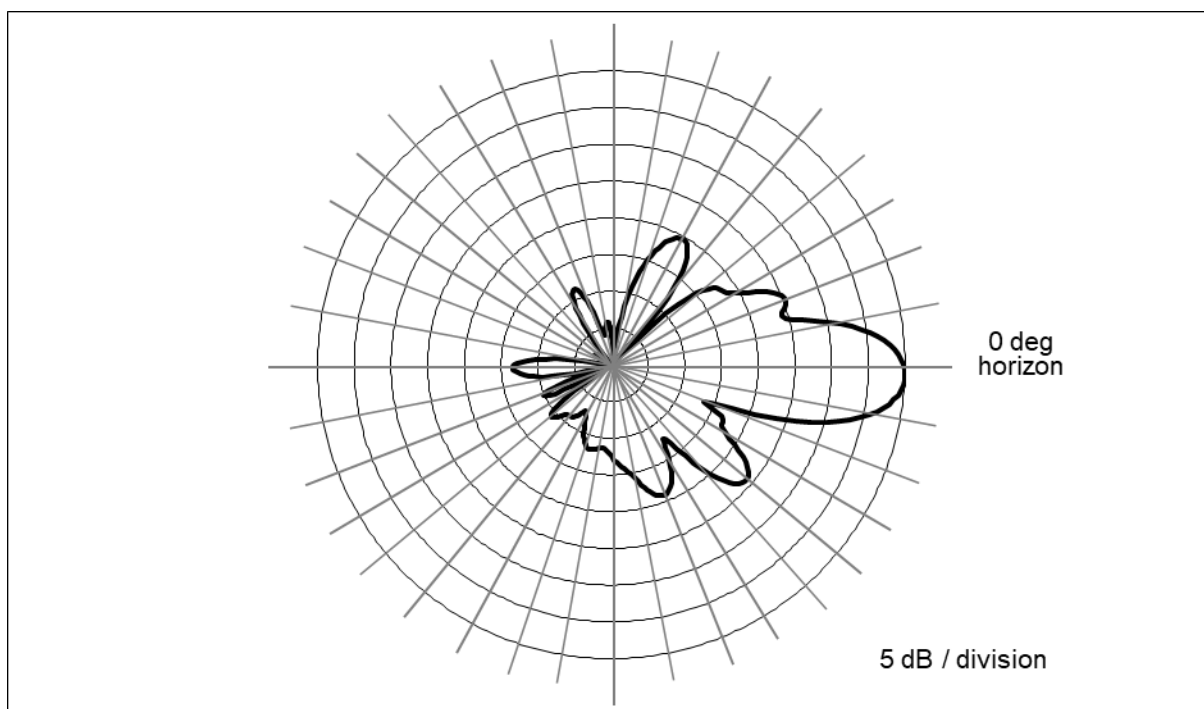
The area below the antennas, at street level, is of interest in terms of potential “uncontrolled” exposure of the general public, so the antenna’s vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the “downward” direction.

By way of illustration, Figure 1 that follows shows the vertical-plane radiation pattern of the proposed antenna model in the 600 MHz frequency band. In this type of antenna radiation pattern diagram, the antenna is effectively pointed at the three o’clock position (the horizon) and the relative strength of the pattern at different angles is described using decibel units.

Note that the use of a decibel scale to describe the relative pattern at different angles actually serves to significantly understate the actual focusing effects of the antenna. Where the antenna pattern reads 20 dB the relative RF energy emitted at the corresponding downward angle is  $1/100^{\text{th}}$  of the maximum that occurs in the main beam (at 0 degrees); at 30 dB, the energy is only  $1/1000^{\text{th}}$  of the maximum.

Finally, note that the automatic pattern-scaling feature of our internal software may skew side-by-side visual comparisons of different antenna models, or even different parties’ depictions of the same antenna model.

**Figure 1. Commscope FFVV-65B-R2 – 600 MHz Vertical-plane Pattern**



As noted at the outset, there are other existing wireless antenna operations to include in the compliance assessment. For each of the wireless operators, we will conservatively assume operation with maximum channel capacity and at maximum transmitter power per channel to be used by each wireless operator in each of their respective FCC-licensed frequency bands.

The table that follows summarizes the relevant data for the collocated antenna operations.

<i>Carrier</i>	<i>Antenna Manufacturer</i>	<i>Antenna Model</i>	<i>Type</i>	<i>Freq (MHz)</i>	<i>Total ERP (watts)</i>	<i>Ant. Gain (dBd)</i>	<i>Azimuth</i>
AT&T	Generic	Generic	Panel	700	4945	11.26	N/A
AT&T	Generic	Generic	Panel	850	2400	11.76	N/A
AT&T	Generic	Generic	Panel	1900	5756	15.56	N/A
AT&T	Generic	Generic	Panel	2100	5890	15.66	N/A
AT&T	Generic	Generic	Panel	2300	4131	16.16	N/A
Sprint	Generic	Generic	Panel	800	2168	13.36	N/A
Sprint	Generic	Generic	Panel	1900	6168	15.86	N/A
Sprint	Generic	Generic	Panel	2500	4669	15.90	N/A
T-Mobile	Generic	Generic	Panel	600	3163	12.96	N/A
T-Mobile	Generic	Generic	Panel	700	867	13.36	N/A
T-Mobile	Generic	Generic	Panel	1900	4123	15.36	N/A
T-Mobile	Generic	Generic	Panel	1900	1452	15.60	N/A
T-Mobile	Generic	Generic	Panel	2100	4626	15.86	N/A
T-Mobile	Generic	Generic	Panel	1900	1419	15.50	N/A
T-Mobile	Generic	Generic	Panel	2500	12804	22.35	N/A
Verizon Wireless	Generic	Generic	Panel	746	2400	11.76	N/A
Verizon Wireless	Generic	Generic	Panel	869	5166	12.36	N/A
Verizon Wireless	Generic	Generic	Panel	1900	5372	15.26	N/A
Verizon Wireless	Generic	Generic	Panel	2100	5625	15.46	N/A

## Compliance Analysis

FCC Office of Engineering and Technology Bulletin 65 (“OET Bulletin 65”) provides guidelines for mathematical models to calculate the RF levels at various points around transmitting antennas. Different models apply in different areas around antennas, with one model applying to street level around a site, and another applying to the rooftop near the antennas. We will address each area of interest in turn in the subsections that follow.

### ***Street Level Analysis***

At street-level around an antenna site (in what is called the “far field” of the antennas), the RF levels are directly proportional to the total antenna input power and the relative antenna gain in the downward direction of interest – and the levels are otherwise inversely proportional to the square of the straight-line distance to the antenna.

Conservative calculations also assume the potential RF exposure is enhanced by reflection of the RF energy from the intervening ground. Our calculations will assume a 100% “perfect”, mirror-like reflection, which is the absolute worst-case scenario.

The formula for street-level compliance assessment for any given wireless antenna operation is as follows:

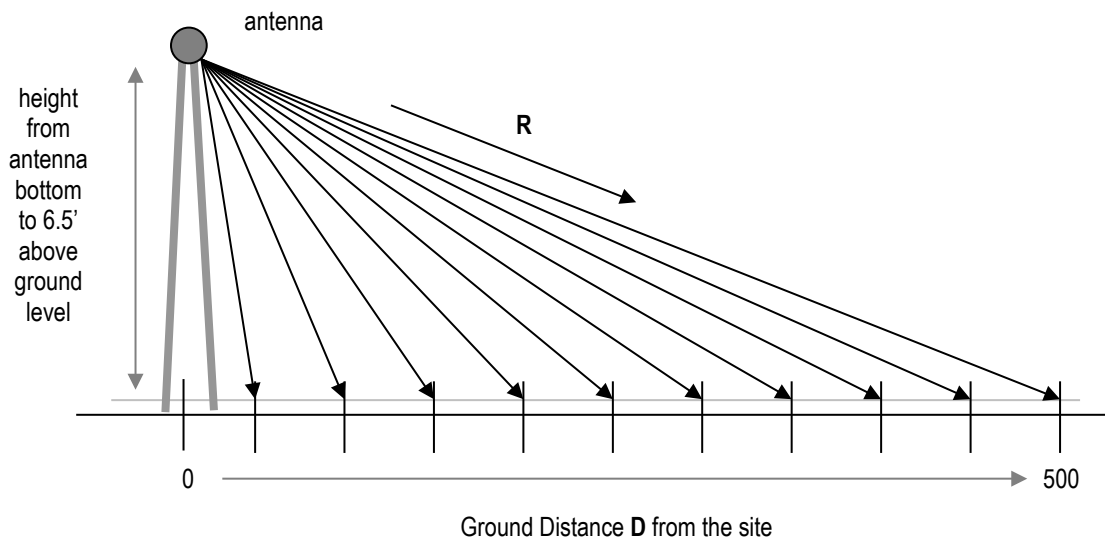
$$\text{MPE\%} = (100 * \text{Chans} * \text{TxPower} * 10^{(\text{Gmax} - \text{Vdisc}/10)} * 4) / (\text{MPE} * 4\pi * R^2)$$

where

MPE%	=	RF level, expressed as a percentage of the MPE limit applicable to continuous exposure of the general public
100	=	factor to convert the raw result to a percentage
Chans	=	maximum number of RF channels per sector
TxPower	=	maximum transmitter power per channel, in milliwatts

- 10<sup>(Gmax-Vdisc/10)</sup> = numeric equivalent of the relative antenna gain in the downward direction of interest; data on the antenna vertical-plane pattern is taken from manufacturer specifications
- 4 = factor to account for a 100-percent-efficient energy reflection from the ground, and the squared relationship between RF field strength and power density ( $2^2 = 4$ )
- MPE = FCC general population MPE limit
- R = straight-line distance from the RF source to the point of interest, centimeters

The MPE% calculations are performed out to a distance of 500 feet from the facility to points 6.5 feet (approximately two meters, the FCC-recommended standing height) off the ground, as illustrated in Figure 2, below.



**Figure 2. Street-level MPE% Calculation Geometry**

It is popularly understood that the farther away one is from an antenna, the lower the RF level – which is generally but not universally correct. The results of MPE% calculations fairly close to the site will reflect the variations in the vertical-plane antenna pattern as well as the variation in straight-line distance to the antenna.

Therefore, RF levels may actually increase slightly with increasing distance within the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF levels become primarily distance-controlled and, as a result, the RF levels generally decrease with increasing distance. In any case, the RF levels more than 500 feet from a wireless antenna site are well understood to be sufficiently low to be comfortably in compliance.

According to the FCC, when directional antennas (such as panels) are used, compliance assessments are based on the RF effect of a single (facing) antenna sector, as the effects of directional antennas pointed away from the point(s) of interest are considered insignificant. If the different parameters apply in the different sectors, compliance is based on the worst-case parameters.

Street level FCC compliance for a collocated antenna site is assessed in the following manner. At each distance point along the ground, an MPE% calculation is made for each antenna operation (including each frequency band), and the sum of the individual MPE% contributions at each point is compared to 100 percent, the normalized reference for compliance with the MPE limit. We refer to the sum of the individual MPE% contributions as “total MPE%”, and any calculated total MPE% result exceeding 100 percent is, by definition, higher than the FCC limit and represents non-compliance and a need to mitigate the potential exposure. If all results are consistently below 100 percent, on the other hand, that set of results serves as a clear and sufficient demonstration of compliance with the MPE limit.

Note that the following conservative methodology and assumptions are incorporated into the MPE% calculations on a general basis:

1. The antennas are assumed to be operating continuously at maximum power and maximum channel capacity.
2. The power-attenuation effects of shadowing or other obstructions to the line-of-sight path from the antenna to the point of interest are ignored.
3. The calculations intentionally minimize the distance factor (R) by assuming a 6'6" human and performing the calculations from the bottom (rather than

the centerline) of each operator’s lowest-mounted antenna, as applicable.

4. The calculations also conservatively take into account, when applicable, the different technical characteristics and related RF effects of the use of multiple antennas for transmission in the same frequency band.
5. The RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a “perfect” field reflection from the intervening ground.

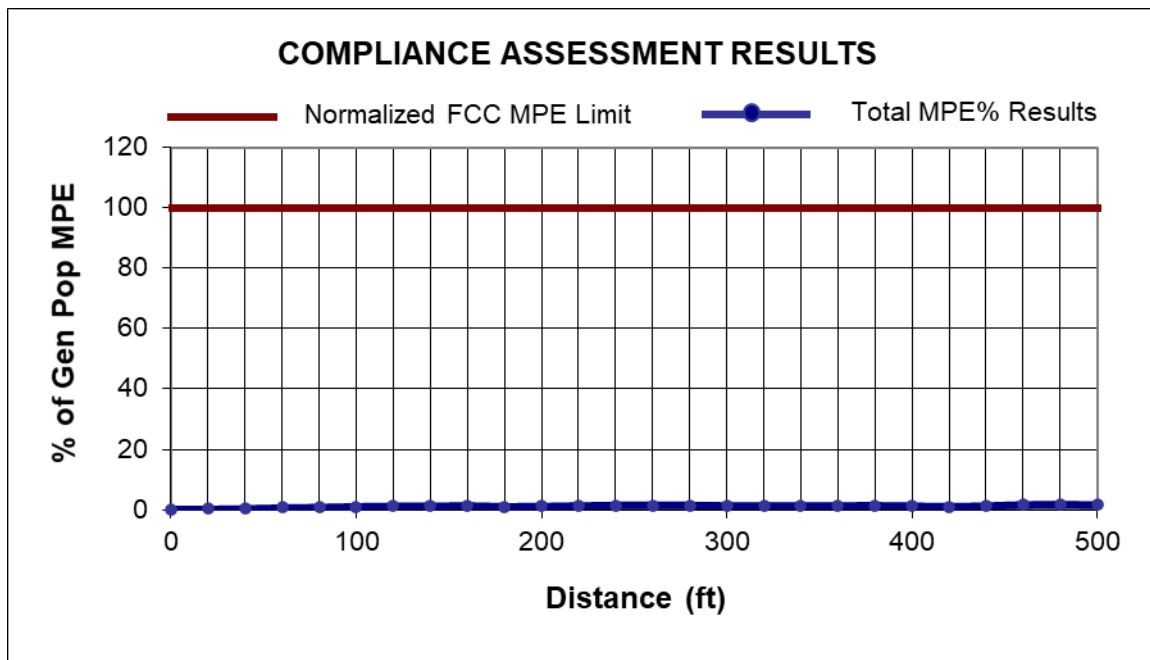
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very “safe-side” conclusions about compliance.

The table that follows provides the results of the MPE% calculations for each antenna operation, with the overall worst-case calculated result highlighted in bold in the last column. Note that the transmission parameters for each Dish antenna sector are identical, and the calculations reflect the worst-case result for any/all sectors.

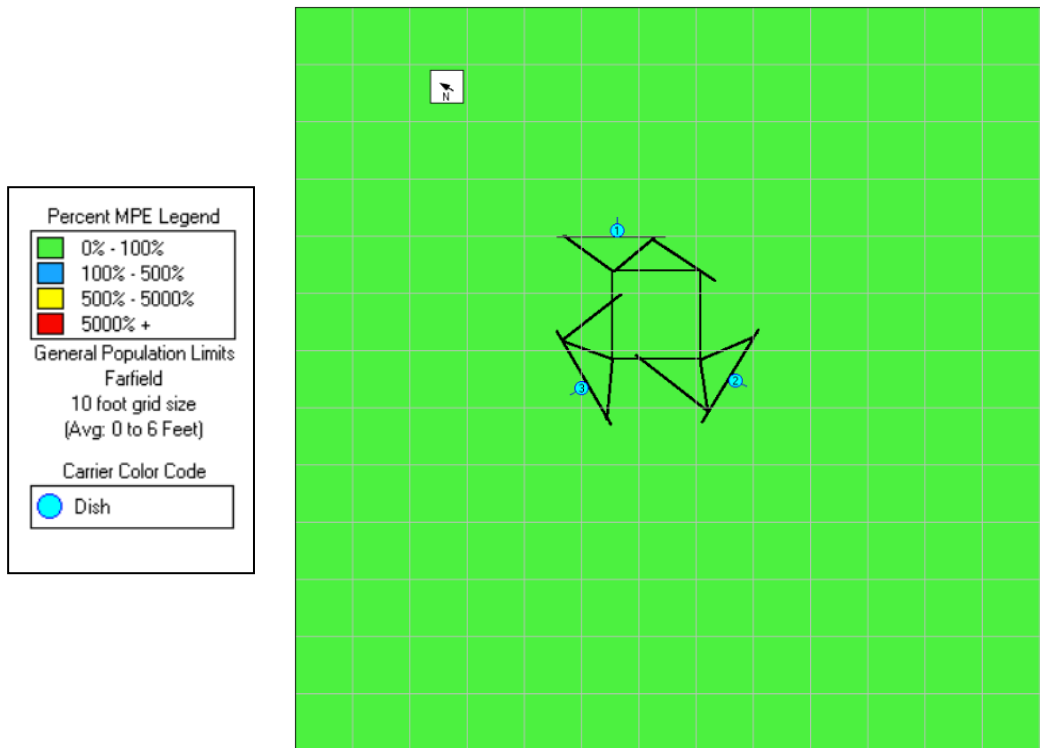
Ground Distance (ft)	Dish 600 MHz MPE%	Dish 2000 MHz MPE%	Dish 2100 MHz MPE%	AT&T MPE%	Sprint MPE%	T-Mobile MPE%	Verizon Wireless MPE%	Total MPE%
0	0.0299	0.0014	0.0002	0.0542	0.0159	0.1196	0.0179	0.2391
20	0.0503	0.0014	0.0016	0.0475	0.0098	0.1668	0.0224	0.2998
40	0.1095	0.0076	0.0248	0.1066	0.0072	0.1703	0.0495	0.4755
60	0.0967	0.0482	0.0112	0.1565	0.0066	0.2932	0.1012	0.7136
80	0.0273	0.0011	0.0694	0.2111	0.0207	0.4168	0.1266	0.8730
100	0.0419	0.1673	0.0774	0.2874	0.0186	0.3716	0.1251	1.0893
120	0.1402	0.1214	0.2537	0.2724	0.0379	0.3155	0.0971	1.2382
140	0.1949	0.1532	0.1973	0.2771	0.0379	0.2083	0.1782	1.2469
160	0.1562	0.1256	0.2061	0.4398	0.0369	0.1586	0.2450	1.3682
180	0.0874	0.0111	0.0638	0.5197	0.0374	0.1760	0.2033	1.0987
200	0.0386	0.0230	0.0166	0.5282	0.0696	0.2217	0.2585	1.1562
220	0.0239	0.0027	0.0420	0.5582	0.1007	0.2526	0.3811	1.3612
240	0.0192	0.0544	0.0221	0.5855	0.0779	0.3469	0.3942	1.5002
260	0.0164	0.0636	0.0532	0.5985	0.0473	0.4256	0.3388	1.5434
280	0.0109	0.0211	0.0818	0.5447	0.0253	0.5451	0.2845	1.5134
300	0.0074	0.0090	0.0466	0.3945	0.0207	0.7144	0.1890	1.3816
320	0.0066	0.0563	0.0156	0.2911	0.0265	0.7766	0.1305	1.3032
340	0.0116	0.0746	0.0449	0.2102	0.0393	0.9522	0.0804	1.4132
360	0.0224	0.0644	0.0731	0.1585	0.0421	0.9916	0.0229	1.3750
380	0.0400	0.0362	0.0741	0.1332	0.0454	1.0719	0.0236	1.4244
400	0.0657	0.0117	0.0500	0.1249	0.0494	0.9467	0.0435	1.2919
420	0.0992	0.0032	0.0224	0.1251	0.0507	0.7708	0.0398	1.1112
440	0.0911	0.0029	0.0206	0.1328	0.0441	0.9628	0.0785	1.3328
460	0.1299	0.0028	0.0065	0.1579	0.0296	1.1979	0.1352	1.6598
<b>480</b>	<b>0.1755</b>	<b>0.0023</b>	<b>0.0022</b>	<b>0.2178</b>	<b>0.0274</b>	<b>1.1365</b>	<b>0.2119</b>	<b>1.7736</b>
500	0.1626	0.0021	0.0020	0.2020	0.0133	1.0456	0.1964	1.6240

As indicated, the maximum calculated overall RF level is 1.7736 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

A graph of the overall calculation results, shown below, perhaps provides a clearer *visual* illustration of the relative compliance of the calculated RF levels. The line representing the overall calculation results shows an obviously clear, consistent margin to the FCC MPE limit.



The graphic output for the areas at street level surrounding the site is reproduced on the next page.

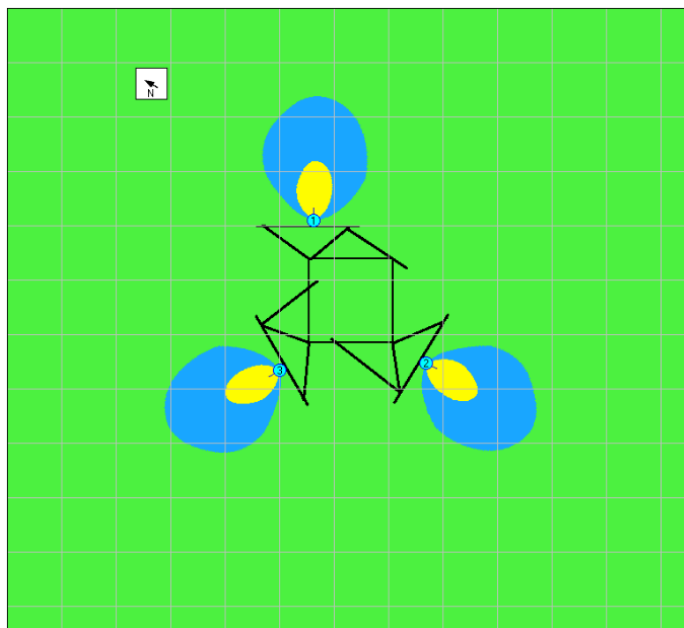
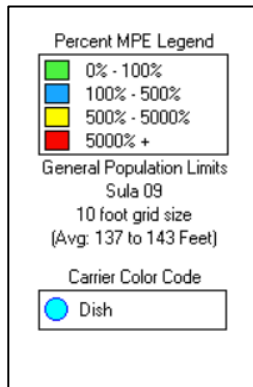


### ***Near-field Analysis***

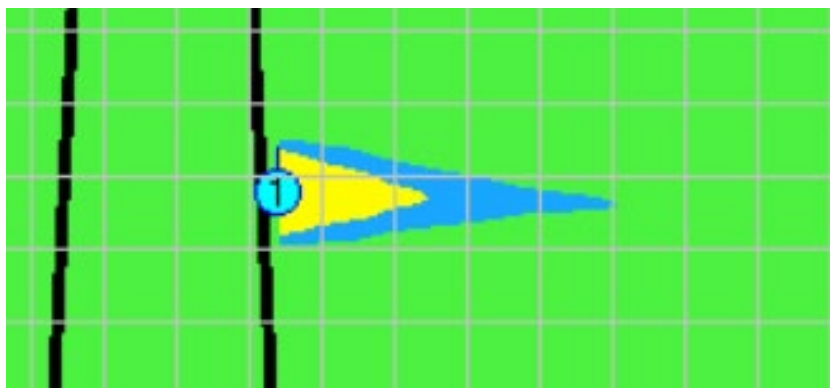
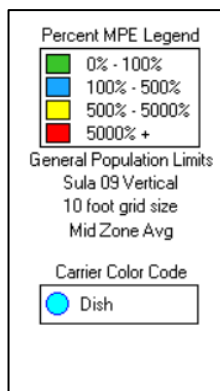
The compliance analysis for the same height as the antennas is performed using the RoofMaster program by Waterford Consultants.

RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above nearby roof, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than they are to the sides or rear, and in any given horizontal direction are inversely proportional to the straight-line distance to the antenna.

The RoofMaster graphic outputs for the same height as the Dish antennas are reproduced on the next page.



***RoofMaster – Same Height as the Antennas –  
Alpha / Beta / Gamma sectors***



***RoofMaster – Same Height as the Antennas –  
Alpha / Beta / Gamma sectors***

## Compliance Conclusion

According to the FCC, the MPE limit has been constructed in such a manner that continuous human exposure to RF fields up to and including 100 percent of the MPE limit is acceptable and safe.

The conservative analysis in this case shows that the maximum calculated RF level from the combination of proposed and existing antenna operations at street level around the site is 1.7736 percent of the FCC general population MPE limit. At the same height as the antennas, the analysis shows that the calculated RF levels potentially exceed the FCC MPE limit. Per Dish guidelines, and consistent with FCC guidance on compliance, it is recommended that four Caution signs be installed six feet below the antennas. In addition, NOC Information signs be installed at the base of the tower.

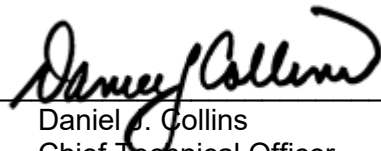
The results of the calculations, along with the described RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines on compliance.

Moreover, because of the extremely conservative calculation methodology and operational assumptions we applied in the analysis, RF levels actually caused by the antennas will be significantly lower than the calculation results here indicate.

## CERTIFICATION

It is the policy of Pinnacle Telecom Group that all FCC RF compliance assessments are reviewed, approved, and signed by the firm's Chief Technical Officer who certifies as follows:

1. I have read and fully understand the FCC regulations concerning RF safety and the control of human exposure to RF fields (47 CFR 1.1301 *et seq*).
2. To the best of my knowledge, the statements and information disclosed in this report are true, complete and accurate.
3. The analysis of site RF compliance provided herein is consistent with the applicable FCC regulations, additional guidelines issued by the FCC, and industry practice.
4. The results of the analysis indicate that the subject antenna operations will be in compliance with the FCC regulations concerning the control of potential human exposure to the RF emissions from antennas.



Daniel J. Collins  
Chief Technical Officer  
Pinnacle Telecom Group, LLC

3/17/22

Date

## **Appendix A. DOCUMENTS USED TO PREPARE THE ANALYSIS**

**RFDS:** RFDS-NJJER01162A-Final-20210916-v.0\_20210916104509

**CD:** NJJER01162A\_FinalStampedCDs\_20210830133704

## Appendix B. Background on the FCC MPE Limit

As directed by the Telecommunications Act of 1996, the FCC has established limits for maximum continuous human exposure to RF fields.

The FCC maximum permissible exposure (MPE) limits represent the consensus of federal agencies and independent experts responsible for RF safety matters. Those agencies include the National Council on Radiation Protection and Measurements (NCRP), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American National Standards Institute (ANSI), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). In formulating its guidelines, the FCC also considered input from the public and technical community – notably the Institute of Electrical and Electronics Engineers (IEEE).

The FCC's RF exposure guidelines are incorporated in Section 1.301 *et seq* of its Rules and Regulations (47 CFR 1.1301-1.1310). Those guidelines specify MPE limits for both occupational and general population exposure.

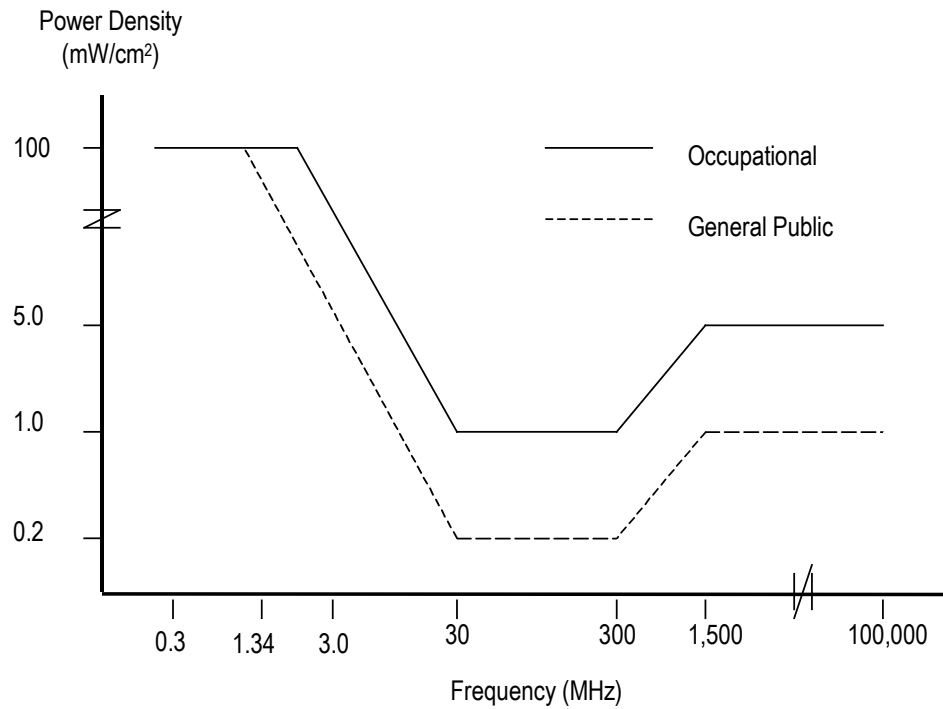
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in the form of heat). The occupational MPE guidelines incorporate a safety factor of 10 or greater with respect to RF levels known to represent a health hazard, and an additional safety factor of five is applied to the MPE limits for general population exposure. Thus, the general population MPE limit has a built-in safety factor of more than 50. The limits were constructed to appropriately protect humans of both sexes and all ages and sizes and under all conditions – and continuous exposure at levels equal to or below the applicable MPE limits is considered to result in no adverse health effects or even health risk.

The reason for *two* tiers of MPE limits is based on an understanding and assumption that members of the general public are unlikely to have had appropriate RF safety training and may not be aware of the exposures they receive; occupational exposure in controlled environments, on the other hand, is assumed to involve individuals who have had such training, are aware of the exposures, and know how to maintain a safe personal work environment.

The FCC's RF exposure limits are expressed in two equivalent forms, using alternative units of field strength (expressed in volts per meter, or V/m), and power density (expressed in milliwatts per square centimeter, or mW/cm<sup>2</sup>). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm<sup>2</sup> reference, for the different radio frequency ranges.

Frequency Range (F) (MHz)	Occupational Exposure (mW/cm <sup>2</sup> )	General Public Exposure (mW/cm <sup>2</sup> )
0.3 - 1.34	100	100
1.34 - 3.0	100	$180 / F^2$
3.0 - 30	$900 / F^2$	$180 / F^2$
30 - 300	1.0	0.2
300 - 1,500	$F / 300$	$F / 1500$
1,500 - 100,000	5.0	1.0

The diagram below provides a graphical illustration of both the FCC's occupational and general population MPE limits.



Because the FCC's RF exposure limits are frequency-shaped, the exact MPE limits applicable to the instant situation depend on the frequency range used by the systems of interest.

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

For potential exposure from multiple systems, the respective percentages of the MPE limits are added, and the total percentage compared to 100 (percent of the limit). If the result is less than 100, the total exposure is in compliance; if it is more than 100, exposure mitigation measures are necessary to achieve compliance.

Note that the FCC “categorically excludes” all “non-building-mounted” wireless antenna operations whose mounting heights are more than 10 meters (32.8 feet) from the routine requirement to demonstrate compliance with the MPE limit, because such operations “are deemed, individually and cumulatively, to have no significant effect on the human environment”. The categorical exclusion also applies to *all* point-to-point antenna operations, regardless of the type of structure they’re mounted on. Note that the FCC considers any facility qualifying for the categorical exclusion to be automatically in compliance.

In addition, FCC Rules and Regulations Section 1.1307(b)(3) describes a provision known in the industry as “the 5% rule”. It describes that when a specific location – like a spot on a rooftop – is subject to an overall exposure level exceeding the applicable MPE limit, operators with antennas whose MPE% contributions at the point of interest are less than 5% are exempted from the obligation otherwise shared by all operators to bring the site into compliance, and those antennas are automatically deemed by the FCC to satisfy the rooftop compliance requirement.

### ***FCC References on RF Compliance***

47 CFR, FCC Rules and Regulations, Part 1 (Practice and Procedure), Section 1.1310 (Radiofrequency radiation exposure limits).

FCC Second Memorandum Opinion and Order and Notice of Proposed Rulemaking (FCC 97-303), *In the Matter of Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934 (WT Docket 97-192)*, *Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62)*, and *Petition for Rulemaking of the Cellular Telecommunications Industry Association Concerning Amendment of the Commission's Rules to Preempt State and Local Regulation of Commercial Mobile Radio Service Transmitting Facilities*, released August 25, 1997.

FCC First Memorandum Opinion and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released December 24, 1996.






FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies*, released December 4, 2019.

FCC Office of Engineering and Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 97-01, August 1997.

FCC Office of Engineering and Technology (OET) Bulletin 56, "Questions and Answers About Biological Effects and Potential Hazards of RF Radiation", edition 4, August 1999.



<p>NOC Information Sign</p>		<p>Caution Sign</p>	
<p>Guidelines Sign</p>		<p>Warning Sign</p>	
<p>Notice Sign</p>			

## Appendix D. SUMMARY of EXPERT QUALIFICATIONS

***Daniel J. Collins, Chief Technical Officer, Pinnacle Telecom Group, LLC***

<b><i>Synopsis:</i></b>	<ul style="list-style-type: none"> <li>• 40+ years of experience in all aspects of wireless system engineering, related regulation, and RF exposure</li> <li>• Has performed or led RF exposure compliance assessments on more than 20,000 antenna sites since the latest FCC regulations went into effect in 1997</li> <li>• Has provided testimony as an RF compliance expert more than 1,500 times since 1997</li> <li>• Have been accepted as an FCC compliance expert in New York, New Jersey, Connecticut, Pennsylvania and more than 40 other states, as well as by the FCC</li> </ul>
<b><i>Education:</i></b>	<ul style="list-style-type: none"> <li>• B.E.E., City College of New York (Sch. Of Eng.), 1971</li> <li>• M.B.A., 1982, Fairleigh Dickinson University, 1982</li> <li>• Bronx High School of Science, 1966</li> </ul>
<b><i>Current Responsibilities:</i></b>	<ul style="list-style-type: none"> <li>• Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation</li> </ul>
<b><i>Prior Experience:</i></b>	<ul style="list-style-type: none"> <li>• Edwards &amp; Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99</li> <li>• Bellcore (a Bell Labs offshoot after AT&amp;T's 1984 divestiture), Executive Director – Regulation and Public Policy, 1983-96</li> <li>• AT&amp;T (Corp. HQ), Division Manager – RF Engineering, and Director – Radio Spectrum Management, 1977-83</li> <li>• AT&amp;T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77</li> </ul>
<b><i>Specific RF Safety / Compliance Experience:</i></b>	<ul style="list-style-type: none"> <li>• Involved in RF exposure matters since 1972</li> <li>• Have had lead corporate responsibility for RF safety and compliance at AT&amp;T, Bellcore, Edwards &amp; Kelcey, and PTG</li> <li>• While at AT&amp;T, helped develop the mathematical models for calculating RF exposure levels</li> <li>• Have been relied on for compliance by all major wireless carriers, as well as by the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting / engineering firms</li> </ul>
<b><i>Other Background:</i></b>	<ul style="list-style-type: none"> <li>• Author, <i>Microwave System Engineering</i> (AT&amp;T, 1974)</li> <li>• Co-author and executive editor, <i>A Guide to New Technologies and Services</i> (Bellcore, 1993)</li> <li>• National Spectrum Management Association (NSMA) – former three-term President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, long-time member of the Board, and was named an NSMA Fellow in 1991</li> <li>• Have published more than 35 articles in industry magazines</li> </ul>

## UNDERLYING PROPERTY INFORMATION

CURRENT OWNER		TOPO		UTILITIES		STRT / ROAD		LOCATION		CURRENT ASSESSMENT								<div>6091</div> <div>NEW FAIRFIELD, CT</div> <div>VISION</div>			
AMERICAN TOWERS INC C/O AMERICAN TOWER CORPORATI PO BOX 723597  ATLANTA GA 31139										Description	Code	Appraised	Assessed								
										PUB UTIL.	400	113,200	79,200								
										PUB UTIL.	400	257,200	180,000								
SUPPLEMENTAL DATA										PUB UTIL.	400	1,083,000	758,100								
Alt Prcl ID 27 2 7.3 State Clas 200 St Cls Cod 504 Census Tr 2201000000 Devl Lot # Survey Ma SM 1247 GIS ID 00580500						BAA Section 3  Asking callback X  Assoc Pid#				Total		1,453,400	1,017,300								
RECORD OF OWNERSHIP			BK-VOL/PAGE		SALE DATE		Q/U V/I		SALE PRICE		VC		PREVIOUS ASSESSMENTS (HISTORY)								
AMERICAN TOWERS INC			0301 0274		02-17-2000		U V		359,641				Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
													2019	400	79,200	2018	400	88,600	2017	400	88,600
														400	180,000		400	180,000		400	180,000
														400	758,100		400	496,000		400	496,000
Total												1017300	Total	764600	Total	764600					
EXEMPTIONS				OTHER ASSESSMENTS				This signature acknowledges a visit by a Data Collector or Assessor													
Year	Code	Description	Amount	Code	Description	Number	Amount													Comm Int	
Total			0.00																		
ASSESSING NEIGHBORHOOD										<div>APPRaised VALUE SUMMARY</div> <div>Appraised Bldg. Value (Card) 113,200</div> <div>Appraised Xf (B) Value (Bldg) 0</div> <div>Appraised Ob (B) Value (Bldg) 1,083,000</div> <div>Appraised Land Value (Bldg) 257,200</div> <div>Special Land Value 0</div> <div>Total Appraised Parcel Value 1,453,400</div> <div>Valuation Method C</div> <div>Total Appraised Parcel Value 1,453,400</div>											
Nbhd		Nbhd Name		B		Tracing		Batch													
CI																					
NOTES																					
AMERICAN TOWER SITE#CT-088014 FCC TOWER REG # 1056420 197 FOOT TOWER PHOTO 2 = BLD 2 (TOWER) IA 4/09 NO HEATING SYSTEM- REMOVED 30000 - 10% VAC/EXP = 27000 / .10 =										270,000 CELL TENANT VALUE 2014 GL BAA DENIED--NO SHOW 2019- EST NO TRESPASSING GATED FUNC=OVERBUILT ADDED 12 PANEL ANTENNAS											
BUILDING PERMIT RECORD										VISIT / CHANGE HISTORY											
Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments		Date	Id	Type	Is	Cd	Purpost/Result						
11-000139	10-19-2011	CM	ANTENAS			100		06-23-2009 CO# 09-40		07-11-2019	ES			01	Meas. - Int. Est.						
10-06	01-27-2010	CM	ANTENNAS, O			100				03-12-2015	RS	03		52	BAA NO CHANGE						
B-09-011	03-11-2009	RS	Residential			100				09-30-2009	SR			12	Field Review						
5249	10-13-2005		VERIZON WIR			100				09-09-2009	JL			12	Field Review						
97129	06-12-1997	RE	Remodel			100				04-14-2009	MI	01		00	Meas. & Listed						
										08-26-2004	AJ		12	Field Review							
LAND LINE VALUATION SECTION																					
B	Use Code	Description	Zone	Land Type	Land Units	Unit Price	I. Factor	Site Index	Cond.	Nbhd.	Nbhd Adj	Notes		Location Adjustment		Adj Unit Pric	Land Value				
1	400	Pub. Utility	2		1.000 AC	159,300.00	1.00000	A	1.00	D	1.100	TOPO				0	175,200				
1	400	Pub. Utility	2		4.100 AC	20,000.00	1.00000	0	1.00	1.000	0					82,000					
Total Card Land Units					5.100 AC	Parcel Total Land Area: 5.1000					Total Land Value					257,200					

BAS

57

57

57

57

A photograph of a small, tan-colored utility building with a large lattice tower behind it. A metal gate with a sign reading "103-8430" is in the foreground. The ground is covered in dry leaves and some snow.

## NOTIFICATIONS

Track Another Package +

Tracking Number: 9505512322632102520386

Remove X

Your item has been delivered and is available at a PO Box at 2:11 pm on April 14, 2022 in ATLANTA, GA 31139.

USPS Tracking Plus® Available ∨

✓ Delivered, PO Box

April 14, 2022 at 2:11 pm  
ATLANTA, GA 31139

Feedback

Get Updates ∨

Text & Email Updates	∨
Tracking History	∨
USPS Tracking Plus®	∨
Product Information	∨

See Less ^

## Can't find what you're looking for?

Go to our FAQs section to find answers to your tracking questions.

**FAQs**

Feedback



April 18, 2022

Dear Customer,

The following is the proof-of-delivery for tracking number: 776556068441

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**Delivery Information:**

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<b>Status:</b>	Delivered	<b>Delivered To:</b>	Shipping/Receiving
<b>Signed for by:</b>	B.BANDETO	<b>Delivery Location:</b>	4 Brush Hill Road
<b>Service type:</b>	FedEx 2Day		
<b>Special Handling:</b>	Deliver Weekday		NEW FAIRFIELD, CT, 06812
		<b>Delivery date:</b>	Apr 18, 2022 10:29

---

**Shipping Information:**

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<b>Tracking number:</b>	776556068441	<b>Ship Date:</b>	Apr 12, 2022
		<b>Weight:</b>	2.0 LB/0.91 KG

**Recipient:**  
Pat Del Monaco - First Selectman,  
4 Brush Hill Road  
NEW FAIRFIELD, CT, US, 06812

**Shipper:**  
Corey Milan, NB+C  
100 Apollo Dr.  
Suite 303  
CHELMSFORD, MA, US, 01824

**Reference** 100814

Thank you for choosing FedEx



April 18, 2022

Dear Customer,

The following is the proof-of-delivery for tracking number: 776556097529

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**Delivery Information:**

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<b>Status:</b>	Delivered	<b>Delivered To:</b>	Shipping/Receiving
<b>Signed for by:</b>	B.BANDETO	<b>Delivery Location:</b>	4 Brush Hill Road
<b>Service type:</b>	FedEx 2Day		
<b>Special Handling:</b>	Deliver Weekday		NEW FAIRFIELD, CT, 06812
		<b>Delivery date:</b>	Apr 18, 2022 10:29

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**Shipping Information:**

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<b>Tracking number:</b>	776556097529	<b>Ship Date:</b>	Apr 12, 2022
		<b>Weight:</b>	1.0 LB/0.45 KG

**Recipient:**  
Eric J. Kist - Building Official,  
4 Brush Hill Road  
NEW FAIRFIELD, CT, US, 06812

**Shipper:**  
Corey Milan, NB+C  
100 Apollo Dr.  
Suite 303  
CHELMSFORD, MA, US, 01824

**Reference** 100814

Thank you for choosing FedEx