



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

February 6, 2023

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

RE: Tower Share Application  
383 Torrington Road, Litchfield CT 06759  
Latitude: 41.766283  
Longitude: 73.178528  
Site #: CT46123-A\_BOHVN00202A\_SBA\_DISH

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 383 Torrington Road, Litchfield, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 94-foot level of the existing 140-foot tower, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within a 7' x 5' lease area within the existing fenced compound. Included are plans by B+T, dated January 26, 2023, Exhibit C. Also included is a structural analysis prepared by TES, stamped January 25, 2023, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Connecticut Siting Council, Docket No. 299 received on August 24, 2005. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Denise Raap, First Selectwoman and Dennis Tobin, Land Use Administrator for the Town of Litchfield, as well as the property owner and the tower owner.

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the existing tower is 140-feet and the Dish Wireless LLC antennas will be located at a center line height of 94-feet.
2. The proposed modifications will not result in an increase of the site boundary as depicted on the attached site plan.



3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The combined site operations will result in a total power density of 15.52% as evidenced by Exhibit F.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully submits that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit D.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this tower in Litchfield. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit G, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 94-foot level of the existing 140-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading. Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Litchfield.

Sincerely,

*Denise Sabo*

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



**NSS** **NORTHEAST**  
SITE SOLUTIONS  
*Turnkey Wireless Development*

Attachments

Cc: Denise Raap, First Selectwoman  
Town of Litchfield  
74 West Street PO Box 488, Litchfield, CT 06759

Dennis Tobin, Land Use Administrator  
Town of Litchfield  
74 West Street, PO Box 488, Litchfield, CT 06759

Old Toll Gate Hill, LLC - Property Owner  
387 Torrington Road Litchfield, CT 06759

SBA - Tower Owner

# Exhibit A

## **Original Facility Approval**

**DOCKET NO. 299** – Sprint Spectrum, L.P. application for a } Connecticut  
Certificate of Environmental Compatibility and Public Need for }  
the construction, maintenance and operation of a } Siting  
telecommunications facility at 383 Torrington Road in Litchfield, }  
Connecticut. } Council

August 24, 2005

### **Decision and Order**

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Sprint Spectrum, L.P. for the construction, maintenance and operation of a wireless telecommunications facility to be located at 383 Torrington Road, in Litchfield, Connecticut.

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

1. The tower shall be designed as a monopole and shall be constructed no taller than 140 feet above ground level to provide telecommunications services to both public and private entities.
2. The Certificate Holder, in developing the facility, shall incorporate wetlands mitigation measures that shall include, but not be limited to, the installation of a small culvert underneath the proposed access road to hydraulically connect the wetlands separated by the access road and the inclusion of wildlife planting consisting of native shrubs and a wildlife conservation seed mix that would be planted in areas disturbed around the proposed facility and access road.
3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Litchfield and all parties and intervenors, as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas mountings, equipment building, access road, utility line, and landscaping; and

- b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
4. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council in the event other carriers locate at this facility or if circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
5. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
6. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
7. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.
8. If the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.
9. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
10. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.
11. Any request for extension of the time periods referred to in Conditions 8 and 9 shall be filed with the Council not later than sixty days prior to the expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Litchfield, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

12. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction and the commencement of site operation.

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

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

The parties and intervenors to this proceeding are:

<b>Status Granted</b>	<b>Status Holder (name, address &amp; phone number)</b>	<b>Representative (name, address &amp; phone number)</b>
<b>Applicant</b>	Sprint Spectrum, L.P. d/b/a Sprint PCS	Thomas J. Regan, Esq. Brown Rudnick Berlack Israels LLP CityPlace I, 38 <sup>th</sup> Floor 185 Asylum Street Hartford, CT 06103-3402 (860) 509-6522 (860) 509-6501 – f <a href="mailto:tregan@brbilaw.com">tregan@brbilaw.com</a>
<b>Intervenor (Approved 12/1/04)</b>	Southwestern Bell Mobile Systems, LLC d/b/a Cingular Wireless	Wendell G. Davis, Esq. Blackwell, Davis & Spadaccini, LLC 158 East Center Street Manchester, CT 06040 860-432-0676 860-432-2926 – f <a href="mailto:wdavis@bds-law.com">wdavis@bds-law.com</a>

<b>Party (Approved on 1/24/05)</b>	Town of Litchfield	Michael D. Rybak Guion, Stevens & Rybak, LLP P.O. Box 338 Litchfield, CT 06759-0338 860-567-0821 860-567-0825 – f <a href="mailto:mdr@litchlaw.com">mdr@litchlaw.com</a>  Leo Paul, Jr., First Selectman Town of Litchfield P.O. Box 488 Litchfield, CT 06759-0488 860-567-7550 860-567-7552 <a href="mailto:lfselectman@optonline.net">lfselectman@optonline.net</a>
<b>Intervenor (Approved 2/2/05)</b>	Jay Abbott 130 Norfolk Road Litchfield, CT 06759 860-567-8848 <a href="mailto:jlaskaatmarshfds@aol.com">jlaskaatmarshfds@aol.com</a>	
<b>Intervenor (Approved 2/2/05)</b>	Frank Rosa Georgiana Bianchi	Peter J. Tyrrell Levy & Droney, PC 74 Batterson Park Road Farmington, CT 06034 860-676-3069 860-676-3200 – f <a href="mailto:ptyrrell@ldlaw.com">ptyrrell@ldlaw.com</a>
<b>Intervenor (Approved 2/2/05)</b>	John Bolus 112 East Chestnut Hill Road Litchfield, CT 06759 860-567-4129 860-457-8720 – f <a href="mailto:Jsbolus@excite.com">Jsbolus@excite.com</a>	
<b>Intervenor (Approved 4/21/05)</b>	Cellco Partnership d/b/a Verizon Wireless	Kenneth C. Baldwin, Esq. Robinson & Cole 280 Trumbull Street Hartford, CT 06103-3597 (860) 275-8200 <a href="mailto:kbaldwin@rc.com">kbaldwin@rc.com</a>



# Exhibit B

## Property Card



Property Information

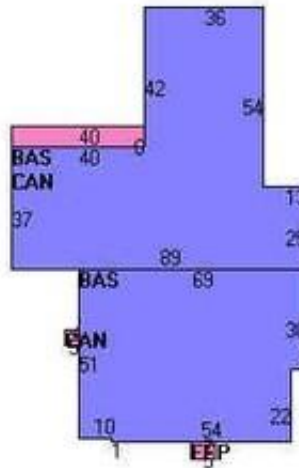
Property Location	383 TORRINGTON RD
Owner	OLD TOLL GATE HILL LLC
Co-Owner	C/O WM PERSSONATTI
Mailing Address	387 TORRINGTON RD LITCHFIELD CT 06759-2704
Land Use	201 Commercial
Land Class	C
Zoning Code	5
Census Tract	3

Street Index	225
Acreage	6.7
Utilities	UNKNOWN
Lot Setting/Desc	UNKNOWN UNKNOWN
Additional Info	

Photo



Sketch



Primary Construction Details

Year Built	1919
Stories	1
Building Style	Multipurpose
Building Use	Comm/Ind
Building Condition	A
Interior Floors 1	Carpet
Interior Floors 2	Minimum
Total Rooms	0
Basement Garages	
Occupancy	6.00
Building Grade	

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Bath Style	NA
Kitchen Style	NA
Roof Style	Flat
Roof Cover	Tar & Gravel
AC Type	None
Fireplaces	0

Exterior Walls	Concr/Cinder
Exterior Walls 2	Brick Veneer
Interior Walls	Typical
Interior Walls 2	NA
Heating Type	Forced Hot Air
Heating Fuel	Oil
Sq. Ft. Basement	
Fin BSMT Quality	
Extra Kitchens	



# Town of Litchfield, CT

## Property Listing Report

Map Block Lot **126-036-091**

Building # **1**

Section # **1**

Account **002199**

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

Item	Appraised	Assessed
Buildings	387620	271340
Extras	0	0
Improvements		
Outbuildings	828600	580020
Land	323050	226140
<b>Total</b>	<b>1539270</b>	<b>1077500</b>

### Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	8117	8117
Canopy	260	0
Finished Enclosed Porch	35	0
<b>Total Area</b>	<b>8412</b>	<b>8117</b>

### Outbuilding and Extra Features

Type	Description
Paving	16000 S.F.
Cell Tower	4 UNITS
Fence	200 L.F.

### Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
BOLUS ANGELA M	0164/0267	1979-01-18	0
BOLUS,ANGELA M	0225/1159	1995-02-09	0
OLD TOLL GATE HILL LLC	0234/0333	1996-11-13	0



# Town of Litchfield, CT

## Property Listing Report

Map Block Lot

126-036-091

Building #

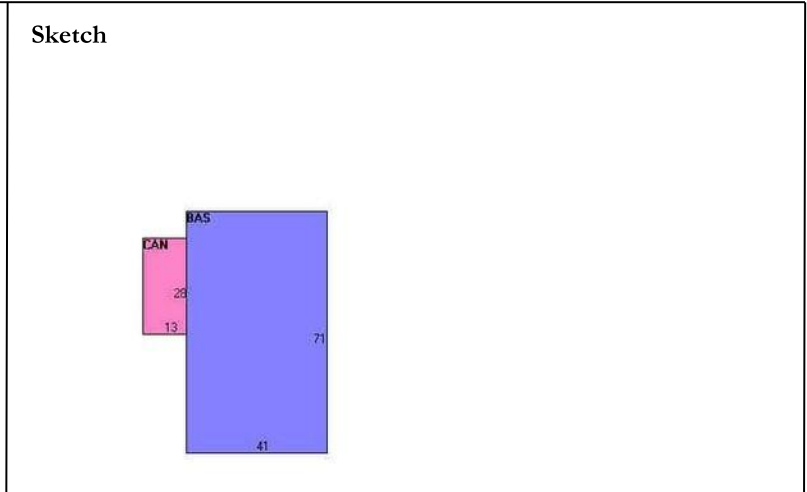
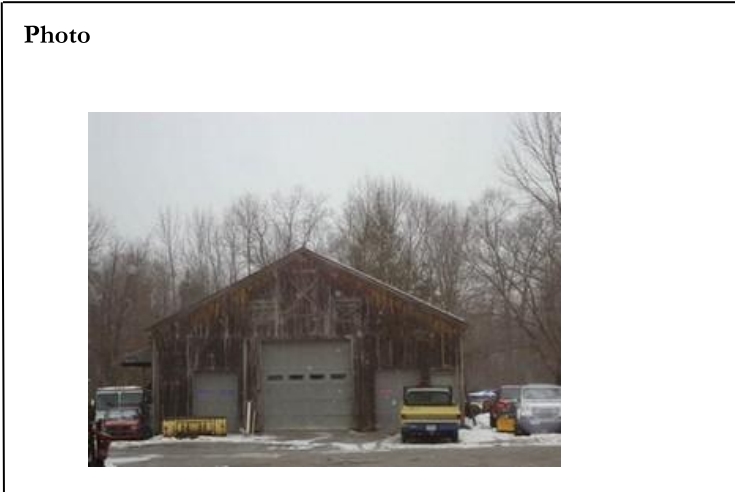
2

Section #

1

Account

002199



### Primary Construction Details

Year Built	1985
Stories	1
Building Style	Storage Building
Building Use	Comm/Ind
Building Condition	F
Interior Floors 1	Concrete
Interior Floors 2	NA
Total Rooms	0
Basement Garages	0
Occupancy	1.00
Building Grade	

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Bath Style	NA
Kitchen Style	NA
Roof Style	Gable
Roof Cover	Asphalt
AC Type	None
Fireplaces	0

Exterior Walls	Board & Batten
Exterior Walls 2	Wood On Sheath
Interior Walls	Minimum
Interior Walls 2	NA
Heating Type	None
Heating Fuel	None
Sq. Ft. Basement	
Fin BSMT Quality	
Extra Kitchens	

### Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	2911	2911
Canopy	364	0

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
<b>Total Area</b>	<b>3275</b>	<b>2911</b>


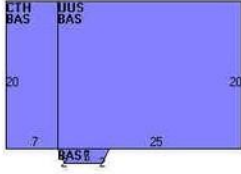


Town of Litchfield, CT

Property Listing Report

Map Block Lot 126-036-091

Building # 3 Section # 1 Account 002199

<p>Photo</p> 	<p>Sketch</p> 
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Primary Construction Details

Year Built	1950
Stories	2
Building Style	Store
Building Use	Comm/Ind
Building Condition	A
Interior Floors 1	Linoleum
Interior Floors 2	NA
Total Rooms	0
Basement Garages	0
Occupancy	1.00
Building Grade	

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Bath Style	NA
Kitchen Style	NA
Roof Style	Gable
Roof Cover	Tar & Gravel
AC Type	None
Fireplaces	0

Exterior Walls	Clapboard
Exterior Walls 2	NA
Interior Walls	Drywall
Interior Walls 2	NA
Heating Type	Forced Hot Air
Heating Fuel	Propane
Sq. Ft. Basement	
Fin BSMT Quality	
Extra Kitchens	

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	652	652
Cathedral Ceiling	140	0
Unfinished Upper Story	500	0

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	1292	652


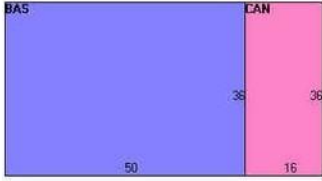


# Town of Litchfield, CT

## Property Listing Report

Map Block Lot **126-036-091**

Building # **4** Section # **1** Account **002199**

<p><b>Photo</b></p> 	<p><b>Sketch</b></p> 
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### Primary Construction Details

Year Built	<b>1950</b>
Stories	<b>1</b>
Building Style	<b>Storage Building</b>
Building Use	<b>Comm/Ind</b>
Building Condition	<b>A</b>
Interior Floors 1	<b>Concrete</b>
Interior Floors 2	<b>NA</b>
Total Rooms	<b>0</b>
Basement Garages	<b>0</b>
Occupancy	<b>1.00</b>
Building Grade	

Bedrooms	<b>0</b>
Full Bathrooms	<b>0</b>
Half Bathrooms	<b>0</b>
Extra Fixtures	<b>0</b>
Bath Style	<b>NA</b>
Kitchen Style	<b>NA</b>
Roof Style	<b>Gable</b>
Roof Cover	<b>Rolled</b>
AC Type	<b>None</b>
Fireplaces	<b>0</b>

Exterior Walls	<b>Minimum</b>
Exterior Walls 2	<b>Wood On Sheath</b>
Interior Walls	<b>Wall Board</b>
Interior Walls 2	<b>NA</b>
Heating Type	<b>Forced Hot Air</b>
Heating Fuel	<b>Oil</b>
Sq. Ft. Basement	
Fin BSMT Quality	
Extra Kitchens	

### Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
<b>First Floor</b>	<b>1800</b>	<b>1800</b>
<b>Canopy</b>	<b>576</b>	<b>0</b>

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
<b>Total Area</b>	<b>2376</b>	<b>1800</b>



# Town of Litchfield, CT

## Property Listing Report

Map Block Lot

126-036-091

Building #

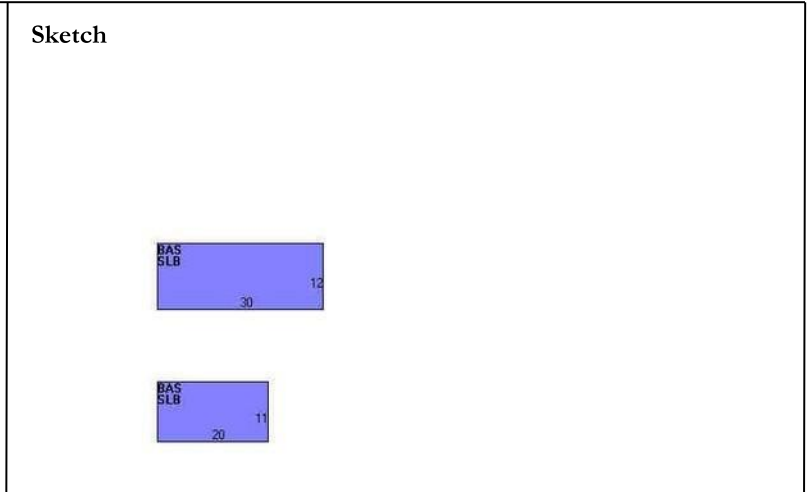
5

Section #

1

Account

002199



### Primary Construction Details

Year Built	2008
Stories	1
Building Style	Commercial
Building Use	Comm/Ind
Building Condition	A
Interior Floors 1	Concrete
Interior Floors 2	NA
Total Rooms	0
Basement Garages	0
Occupancy	0.00
Building Grade	

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Bath Style	NA
Kitchen Style	NA
Roof Style	Flat
Roof Cover	Tar & Gravel
AC Type	None
Fireplaces	0

Exterior Walls	Concr/Cinder
Exterior Walls 2	NA
Interior Walls	Minimum
Interior Walls 2	NA
Heating Type	None
Heating Fuel	None
Sq. Ft. Basement	
Fin BSMT Quality	
Extra Kitchens	

### Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	580	580
Slab	580	0

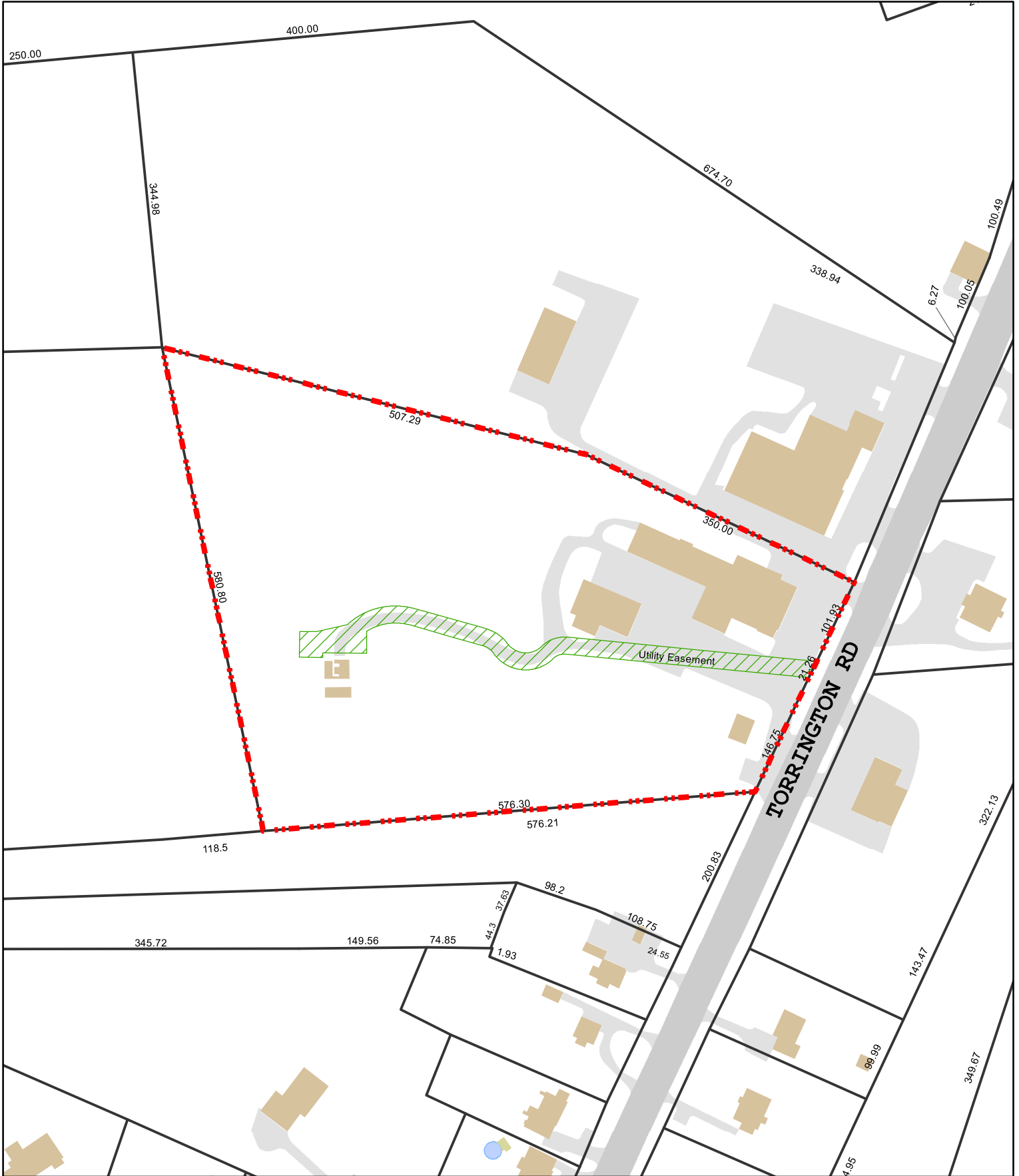
Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	1160	580



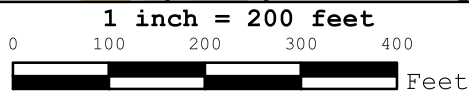
Town of Litchfield, CT: Parcel Map

MBL: 126-036-091

LOCATION: 383 TORRINGTON RD



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



Map Produced  
 May 2021



# Exhibit C

## **Construction Drawings**



DISH Wireless L.L.C. SITE ID:  
**BOHVN00202A**

DISH Wireless L.L.C. SITE ADDRESS:  
**383 TORRINGTON RD  
LITCHFIELD, CT 06759**



**By sroth at 5:07:51 PM, 1/26/2023**

**SCOPE OF WORK**

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

- TOWER SCOPE OF WORK:**
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
  - INSTALL (1) PROPOSED ANTENNA PLATFORM MOUNT
  - 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 INFORMATION**

PROPERTY OWNER: OLD TOLL GATE HILL LLC  
ADDRESS: 387 TORRINGTON RD  
LITCHFIELD, CT 06759

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: CT46123-A

TOWER APP NUMBER: 169201

COUNTY: LITCHFIELD

LATITUDE (NAD 83): 41° 45' 58.62" N  
41.766283 N

LONGITUDE (NAD 83): 73° 10' 42.70" W  
73.178528 W

ZONING JURISDICTION: LITCHFIELD COUNTY

ZONING DISTRICT: RR

PARCEL NUMBER: 126-036-091

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: EVERSOURCE

TELEPHONE COMPANY: AT&T

**PROJECT DIRECTORY**

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

TOWER OWNER: SBA COMMUNICATAIONS CORP.  
8051 CONGRESS AVENUE  
BOCA RATON, FL 33487  
(800) 487-7483

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

SITE ACQUISITION: JEAN COTTRELL  
jean.cottrell@dish.com

CONST. MANAGER: JAVIER SOTO  
javier.soto@dish.com

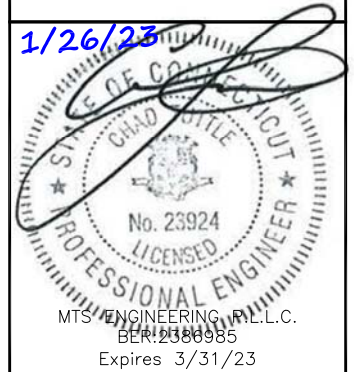
RF ENGINEER: SYED ZAIDI  
syed.zaidi@dish.com



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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

DRAWN BY: YN CHECKED BY: RMC APPROVED BY: RMC

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
0	11/3/21	ISSUED FOR CONSTRUCTION
1	1/26/23	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOHVN00202A  
383 TORRINGTON RD  
LITCHFIELD, CT 06759**

SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T-1**

**CONNECTICUT CODE OF 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	2022 CT STATE BUILDING CODE/2021 IBC W/ CT AMENDMENTS
MECHANICAL	2022 CT STATE BUILDING CODE/2021 IMC W/ CT AMENDMENTS
ELECTRICAL	2022 CT STATE BUILDING CODE/2020 NEC W/ CT AMENDMENTS

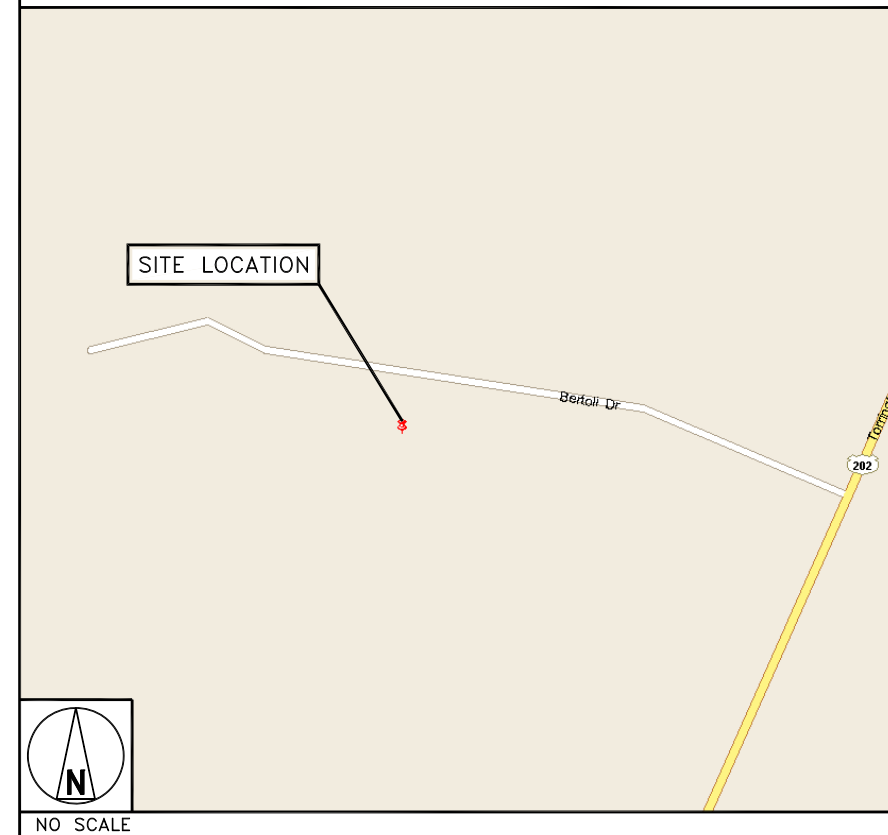
**SITE PHOTO**



**DIRECTIONS**

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:  
CONTINUE TO BRADLEY INTERNATIONAL AIRPORT CON, HEAD NORTH TOWARD BRADLEY INTERNATIONAL AIRPORT, SLIGHT LEFT ONTO BRADLEY INTERNATIONAL AIRPORT, CONTINUE STRAIGHT, TAKE CT-20 W, CT-219 S, CT-318 W, US-44 W/NEW HARTFORD RD, ... AND US-202 W TO BERTOLI DR IN LITCHFIELD, CONTINUE ONTO BRADLEY INTERNATIONAL AIRPORT CON, TAKE THE CT-20 W EXIT TOWARD E GRANBY/GRANBY, CONTINUE ONTO CT-20 W, SLIGHT LEFT ONTO CT-20 W/W GRANBY RD, CONTINUE TO FOLLOW CT-20 W, TURN LEFT ONTO CT-219 S, TURN LEFT ONTO CT-179 S/CT-219 S, CONTINUE TO FOLLOW CT-219 S SLIGHT RIGHT ONTO CT-318 W, TURN LEFT ONTO CT-181 S/CT-318 W, CONTINUE TO FOLLOW CT-318 W, TURN RIGHT ONTO US-44 W/NEW HARTFORD RD, TURN LEFT ONTO CT-8 S, TAKE EXIT 43 FOR HARWINTON AVE, TURN RIGHT ONTO LAUREL HILL RD, TURN LEFT ONTO HARWINTON AVE, TURN RIGHT ONTO E ALBERT ST, TURN LEFT ONTO US-202 W/NEW LITCHFIELD ST, CONTINUE TO FOLLOW US-202 W, SHARP RIGHT ONTO BERTOLI DR - ARRIVE AT BOHVN00202A.

**VICINITY MAP**



**SHEET INDEX**

SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
LS-1	SITE SURVEY
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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

**UNDERGROUND SERVICE ALERT CBYD 811**  
**UTILITY NOTIFICATION CENTER OF CONNECTICUT**  
(800) 922-4455  
[WWW.CBYD.COM](http://WWW.CBYD.COM)

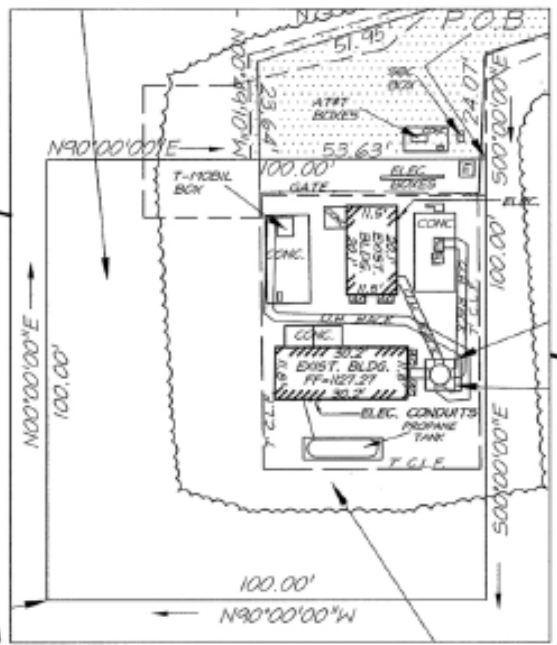
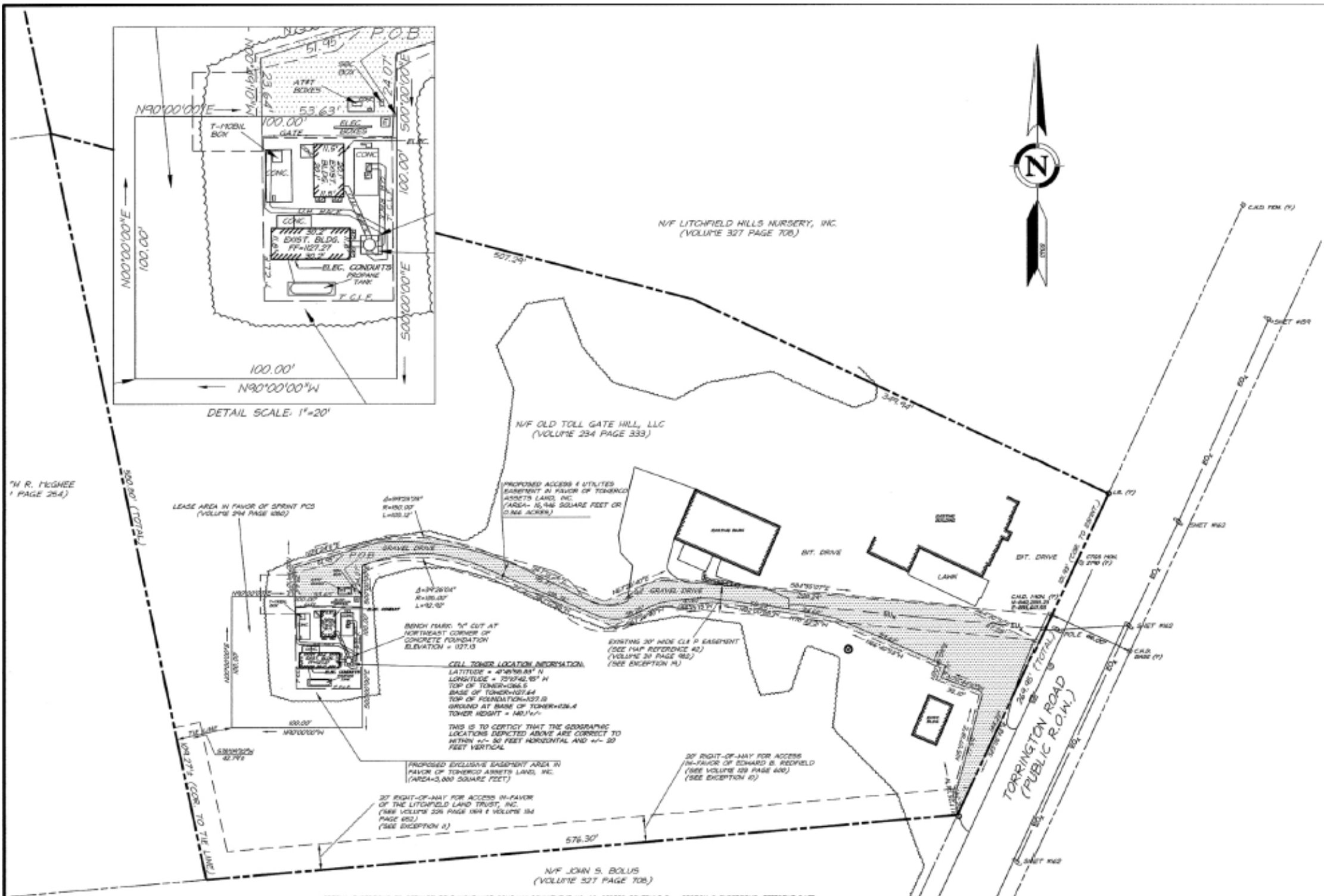
CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

**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.



- MAP REFERENCES:**
- MAP OF PROPERTY TO BE CONVEYED BY TOLL GATE DAIRY FARMS, INC. TO THE AVERY GREEN DAIRY COMPANY TERRINGTON ROAD-LITCHFIELD, CONN. SCALE, 1 INCH=50 FEET. - SEPTEMBER 1968, GEORGE E. BRENNAN REGISTERED LAND SURVEYOR.
  - CORRELATION PLAN MAP SHOWING EASEMENT AREA TO BE GRANTED TO THE CONNECTICUT LIGHT AND POWER COMPANY ACROSS THE PROPERTY OF OLD TOLL GATE HILL, LLC 389 TERRINGTON ROAD CONNECTICUT ROUTE 202 LITCHFIELD, CONNECTICUT SCALE: 1"=40' DATE: SEPTEMBER 20, 2007 DON-BERRY-GOODING, INC.
  - CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF LITCHFIELD LITCHFIELD-TERRINGTON ROAD FROM THE CONGRESSIONAL CHURCH NORTHEASTERLY ABOUT 4,700 FEET. ROUTE 08 DATE MARCH 31, 1952 SCALE 1"=80'
- NOTES:**
- PROPERTY IS IN THE R-20 ZONE.
  - HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1983-1996. VERTICAL DATUM IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
  - 1/4"=1" PARCEL CONTAINS 4.875 ACRES BASED ON MAP REFERENCE #1.
  - PROPERTY DOES NOT FALL WITHIN THE LIMITS OF A FLOOD HAZARD ZONE AS DEPICTED ON "FIRM FLOOD INSURANCE RATE MAP TOWN OF LITCHFIELD, CONNECTICUT LITCHFIELD COUNTY PANEL # OF 18 CORRELATION PANEL NUMBER DRENT 008C MAP REVISED JANUARY 2, 1992 FEDERAL EMERGENCY MANAGEMENT AGENCY.
  - THE MAIN PARCEL IS SUBJECT TO A POSSIBLE EASEMENT IN FAVOR OF THE CONNECTICUT LIGHT & POWER COMPANY. (SEE MAP REFERENCE #2).
  - UNDERGROUND UTILITY, STRUCTURE AND FACILITY LOCATIONS DEPICTED AND NOTED HEREON HAVE BEEN CORRELATED, IN PART, FROM RECORD PLANNING SUPPLIED BY THE RESPECTIVE UTILITY COMPANIES OR GOVERNMENTAL AGENCIES FROM PARCEL TESTIMONY AND FROM OTHER SOURCES. THESE LOCATIONS MUST BE CORRELATED AS APPROPRIATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE OF WHICH ARE UNKNOWN TO DESIGN PROFESSIONALS. THE SIZE, LOCATION AND EXISTENCE OF ALL SUCH FEATURES MUST BE FIELD DETERMINED AND VERIFIED BY THE APPROPRIATE AUTHORITY PRIOR TO CONSTRUCTION.
  - CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" FOR UNDERGROUND UTILITY MARKINGS AT LEAST TWO FULL WORKING DAYS PRIOR TO START OF CONSTRUCTION. 1-800-455-4665 OR WWW.CBYD.COM

**DETS & BOUNDS DESCRIPTION:**  
(MAIN PARCEL) - DESCRIPTION BASED ON VOLUME 234 PAGE 388.

THE FOLLOWING DESCRIBED LAND WITH ALL BUILDINGS AND IMPROVEMENTS THEREON, SITUATED IN THE TOWN AND COUNTY OF LITCHFIELD AND STATE OF CONNECTICUT, BOUNDED:

NORTHERLY: BY LAND OF LITCHFIELD HILLS NURSERY IN PART, AND IN PART BY LAND NOW OR FORMERLY OF GOTTHARD B. ANDERSON;

EASTERLY: BY STATE HIGHWAY ROUTE 202;

SOUTHERLY: BY LAND FORMERLY OF JANE B. BRENNAN;

WESTERLY: BY LAND NOW OR FORMERLY OF EDWARD B. REDFIELD.

SAID PREMISES ARE MORE PARTICULARLY SHOWN ON A CERTAIN SURVEY ENTITLED: "MAP OF PROPERTY TO BE CONVEYED BY TOLL GATE DAIRY FARMS, INC. TO THE AVERY GREEN DAIRY COMPANY TERRINGTON ROAD-LITCHFIELD, CONN. SCALE, 1 INCH=50 FEET. - SEPTEMBER 1968, GEORGE E. BRENNAN REGISTERED LAND SURVEYOR", WHICH SURVEY IS ON FILE IN THE LITCHFIELD TOWN CLERK'S OFFICE.

**DETS AND BOUNDS DESCRIPTION: (ACCESS AND UTILITIES EASEMENT)**

BEGINNING AT A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF TERRINGTON ROAD AND AT THE NORTHEASTERLY CORNER OF LAND NOW OR FORMERLY JOHN S. BOLUS:

THENCE N 1°25'16" E, 66.74 FEET TO A POINT;

THENCE S 85°17'18" E, 77.64 FEET TO A POINT;

THENCE N 70°44'20" E, 35.10 FEET TO A POINT;

THENCE N 20°46'04" E, 9.31 FEET TO A POINT;

THENCE N 64°40'53" E, 89.62 FEET TO A POINT;

THENCE N 70°43'21" E, 34.68 FEET TO A POINT;

THENCE N 82°00'55" E, 58.23 FEET TO A POINT;

THENCE S 85°15'15" E, 41.62 FEET TO A POINT;

THENCE S 67°26'40" E, 38.25 FEET TO A POINT;

THENCE N 67°12'25" E, 126.76 FEET TO A POINT;

THENCE ALONG A CURVE TO THE LEFT HAVING A DELTA ANGLE OF 37°21'04", RADIUS OF 150.00 FEET AND AN ARC LENGTH OF 162.92 FEET TO A POINT;

THENCE S 02°02'00" E, 24.07 FEET TO A POINT;

THENCE S 90°00'00" E, 53.63 FEET TO A POINT;

THENCE N 02°02'00" E, 23.64 FEET TO A POINT;

THENCE N 75°24'15" E, 51.96 FEET TO A POINT;

THENCE ALONG A CURVE TO THE RIGHT HAVING A DELTA ANGLE OF 37°23'23", RADIUS OF 150.00 FEET AND AN ARC LENGTH OF 169.02 FEET TO A POINT;

THENCE S 67°12'25" E, 16.47 FEET TO A POINT;

THENCE N 67°26'40" E, 46.94 FEET TO A POINT;

THENCE S 64°38'51" E, 228.29 FEET TO A POINT;

THENCE S 64°38'21" E, 67.28 FEET TO A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF TERRINGTON ROAD;

THENCE S 25°02'48" N ALONG THE WESTERLY RIGHT-OF-WAY LINE OF TERRINGTON ROAD, 144.22 FEET TO THE POINT AND PLACE OF BEGINNING.

SPECIAL EXCEPTION TO STANDARD TITLE INSURANCE COMPANY COMMITMENT NO. 11-130720 SCHEDULE B - SECTION 2 EXCEPTING EFFECTIVE DATE: MAY 31, 2012.

- TERMS AND CONDITIONS OF A RIGHT OF WAY AND EASEMENT RECORDED DECEMBER 18, 1964 IN BOOK 123 PAGE 603.
- TERMS AND CONDITIONS OF EASEMENT RECORDED SEPTEMBER 16, 1968 IN BOOK 134 PAGE 652, AS SAME MAY BE AFFECTED BY GRANT OF EASEMENT RECORDED FEB. 8, 1968 IN BOOK 124 PAGE 1718.
- MATTERS AS NOTED ON MAP OF PROPERTY TO BE CONVEYED BY TOLL GATE DAIRY FARMS, INC. TO THE AVERY GREEN DAIRY COMPANY TERRINGTON ROAD-LITCHFIELD CONN AS RECORDED SEPTEMBER 30, 1968 IN PLAN BOOK 7, DEANCE G. MAP 6.
- RIGHTS OF EDWARD REDFIELD, HIS SUCCESSORS AND/OR ASSIGNS, IN WATER, BELLS AND APPURTENANCES, INCLUDING UTILITY AND MAINTENANCE OF SAME AS REFERRED IN DEED RECORDED JANUARY 18, 1939 IN BOOK 164 PAGE 267.
- SPACE, IF ANY, OF LEASE AS NOTED IN NOTICE OF LEASE RECORDED MARCH 13, 1996 IN BOOK 234 PAGE 330.
- TERMS AND CONDITIONS OF MEMORANDUM OF AGREEMENT BY & BETWEEN OLD TOLL GATE HILL, LLC AND SPRINT PCS RECORDED JULY 11, 2005 IN BOOK 284 PAGE 1088, AS SAME IS AFFECTED BY ASSIGNMENT OF SITE AGREEMENT BY & BETWEEN SPRINT SPECTRUM L.R. AND TOLL GATE HILL, LLC RECORDED DECEMBER 22, 2006 IN BOOK 325 PAGE 636. (AFFECTS BOTH EASEMENT AREAS)
- TERMS AND CONDITIONS OF A CERTIFICATE OF APPLICATION APPROVAL OF THE PLANNING AND ZONING COMMISSION OF THE TOWN OF LITCHFIELD, CONNECTICUT, RECORDED JUNE 5, 2006 IN BOOK 301 PAGE 1157.
- TERMS AND CONDITIONS OF ELECTRIC DISTRIBUTION EASEMENT RECORDED NOVEMBER 19, 2007 IN BOOK 311 PAGE 882. (AFFECTS ACCESS & UTILITIES EASEMENT AREA)
- TERMS AND CONDITIONS OF TELEPHONE DISTRIBUTION EASEMENT RECORDED NOVEMBER 18, 2007 IN BOOK 311 PAGE 985. (AFFECTS ACCESS & UTILITIES EASEMENT AREA)

**DETS AND BOUNDS DESCRIPTION: (EXCLUSIVE EASEMENT AREA)**

BEGINNING AT THE NORTHEASTERLY CORNER OF THE HEREIN DESCRIBED EASEMENT, SAID POINT HAS A CONNECTICUT STATE PLANE COORDINATE OF N=646,248.33 & E=668,085.46

THENCE S 02°02'00" E, 100.00 FEET, TO A POINT;

THENCE N 40°00'00" N, 100.00 FEET, TO A POINT;

THENCE N 02°02'00" E, 100.00 FEET, TO A POINT;

THENCE N 40°00'00" E, 100.00 FEET, TO THE POINT AND PLACE OF BEGINNING.

**CERTIFICATION**

I HEREBY CERTIFY TO CORE HYDRATION SERVICES, TCO LAND II LLC, A DELAWARE LIMITED LIABILITY COMPANY AND STENART TITLE INSURANCE COMPANY THAT THIS PLAN AND FIELD SURVEY HAS BEEN PREPARED BASED ON STENART TITLE GUARANTY COMPANY COMMITMENT FOR TITLE INSURANCE FILE NUMBER: KNOWN EFFECTIVE DATE: JULY 28, 2007 AT 8:00 A.M. AND TO THE "STANDARDS AND ACCURACIES" DESCRIBED BELOW.

- SURVEY NOTES:**
- THIS SURVEY AND MAP HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-308b-1 THRU 20-308b-10 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
  - TYPE OF SURVEY IS AN EASEMENT SURVEY AND IS INTENDED TO DEPICT THE LOCATION OF EXISTING IMPROVEMENTS RELATIVE TO PROPERTY LINES AND PROPOSED EASEMENTS/LEASE AREAS.
  - THIS IS A DEPENDENT RESURVEY BASED ON MAP REFERENCE #1.
  - HORIZONTAL ACCURACY MEETS CLASS A-2 STANDARDS, TOPOGRAPHIC ACCURACY MEETS CLASS T-2 STANDARDS AND VERTICAL ACCURACY MEETS CLASS V-8.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

*Lawrence R. Gessler, Jr.*  
LAWRENCE R. GESSLER, JR., L.S.  
L.S. NO. 0377

**LEGEND**

DISTING	DESCRIPTION
POWER	
EQ	ELECTRICAL LINES, OVERHEAD
EU	ELECTRICAL LINES, UNDERGROUND
U	UTILITY POLE
PROPERTY	
O	PROPERTY LINE
IP	IRON PIN
M	MONUMENT
SITE FEATURES	
CL	CHAIN LINK FENCE
T	TREE
TL	TREE LINE
STORM SEWER	
CS	CURB INLET

DESIGN PROFESSIONALS  
CIVIL & TRAFFIC ENGINEERS / PLANNERS / SURVEYORS  
WE ANALYZE / LABORARE ARCHITECTS

PREPARED FOR:  
CLS GROUP, INC.  
609 SOUTH BELLY AVENUE  
SUITE D  
EDMUNDS, OK 73003

TCO LAND II LLC  
SITE ID: CT0006  
383 TERRINGTON ROAD  
LITCHFIELD, CONNECTICUT

REVISIONS

NO.	DATE	BY	DESCRIPTION
1	7/28/07	L.R.C.	ISSUED

EASEMENT PLAN

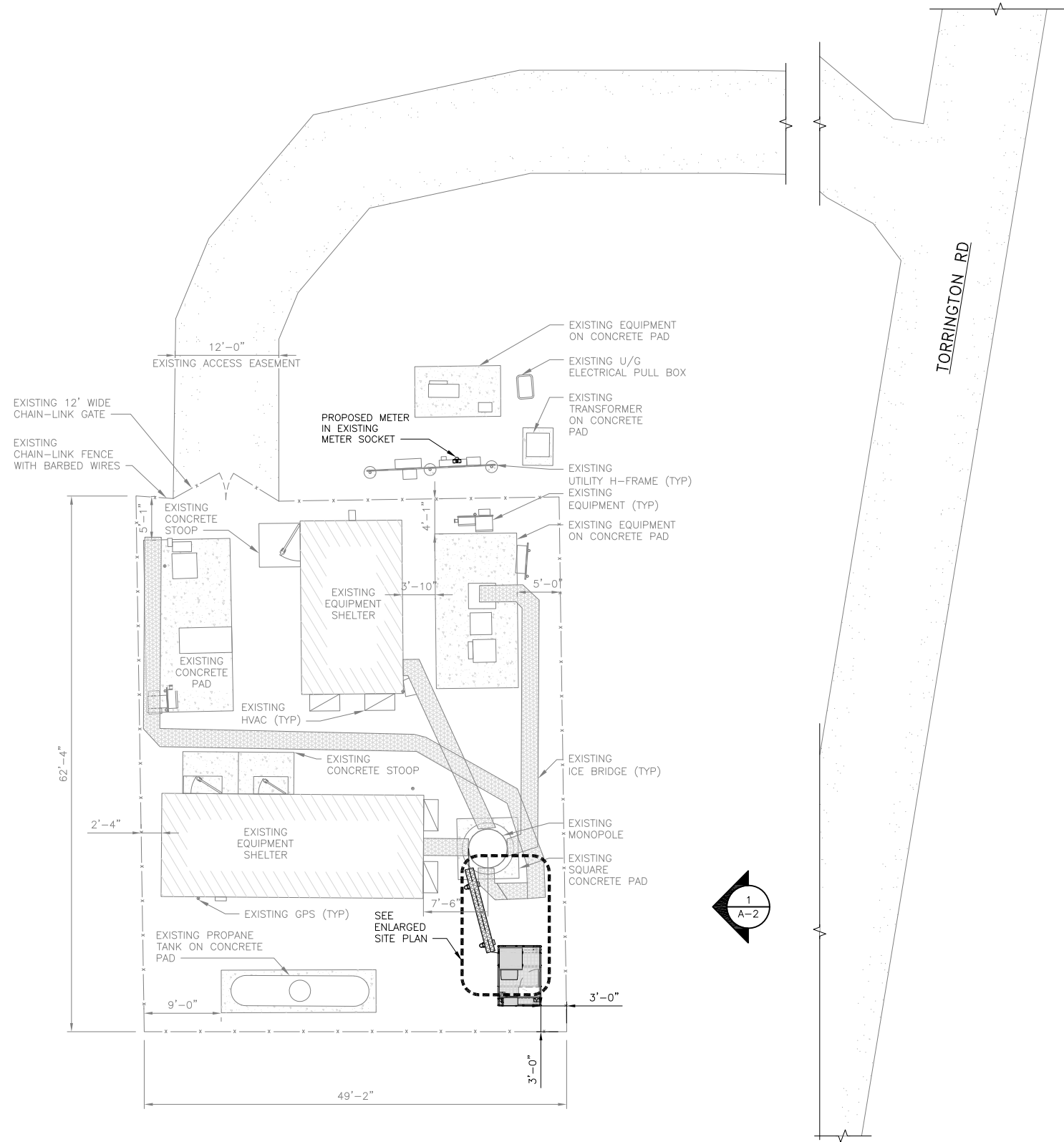
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VB-01

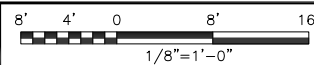
SHEET 1 OF 1

**NOTES**

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



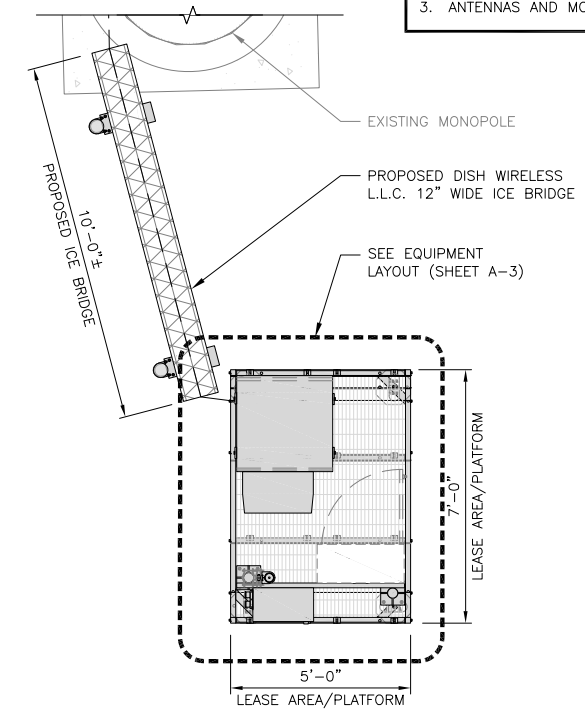
**OVERALL SITE PLAN**



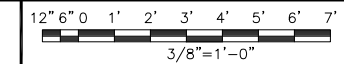
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**NOTES**

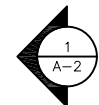
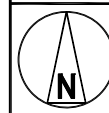
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



**ENLARGED SITE PLAN**



2



**dish wireless.**

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**B+T GRP**

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



MTS ENGINEERING, P.C. L.L.C.  
BER: 2388985  
Expires 3/31/23

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
YN	RMC	RMC

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
0	11/3/21	ISSUED FOR CONSTRUCTION
1	1/26/23	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION

**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**OVERALL AND ENLARGED SITE PLAN**

SHEET NUMBER

**A-1**

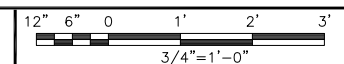
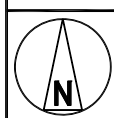
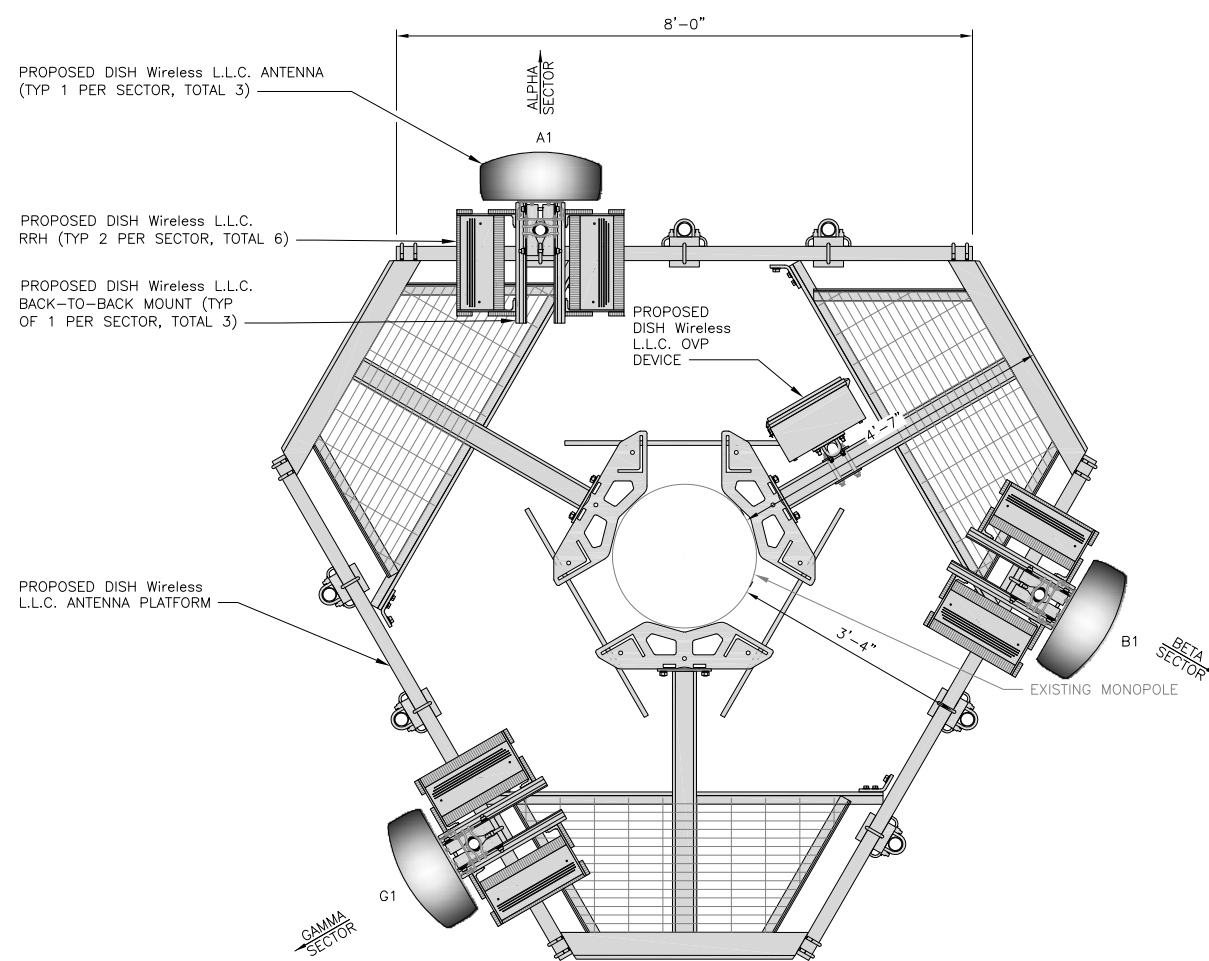
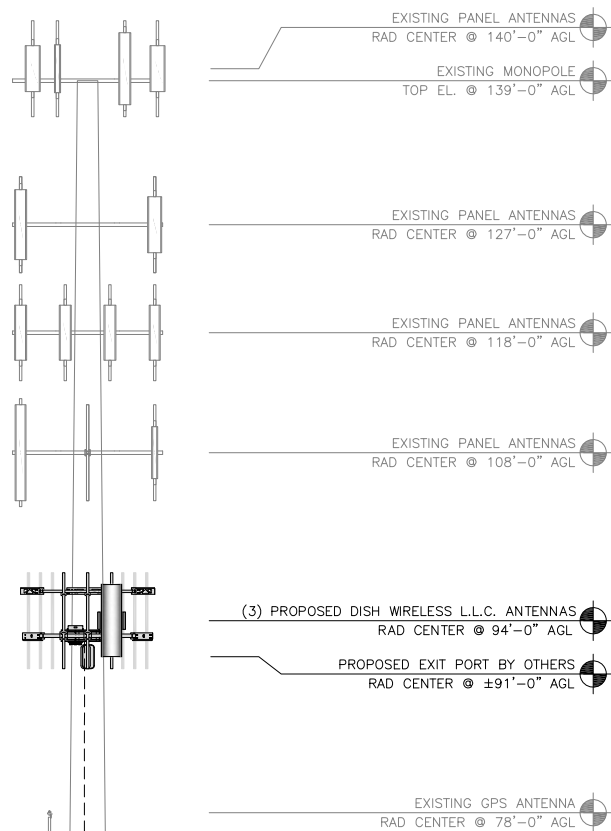
NOT USED

NO SCALE

3

**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**

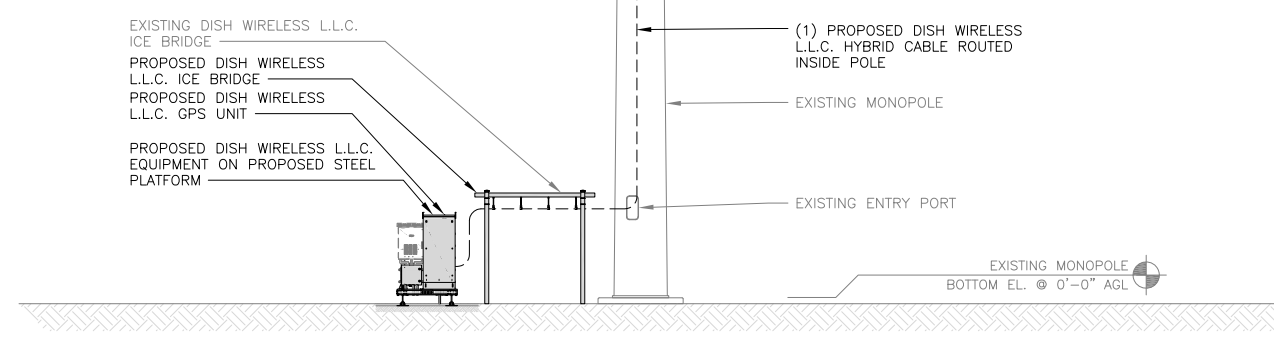
2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA - MX08FR0665-21	5G	72.0" x 20.0"	0°	94'-0"	(1) HIGH-CAPACITY HYBRID CABLE (130' LONG)
BETA	B1	PROPOSED	JMA - MX08FR0665-21	5G	72.0" x 20.0"	120°	94'-0"	
GAMMA	G1	PROPOSED	JMA - MX08FR0665-21	5G	72.0" x 20.0"	240°	94'-0"	

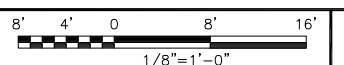
SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU - TA08025-B605	5G	1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.
	A1	FUJITSU - TA08025-B604	5G	
BETA	B1	FUJITSU - TA08025-B605	5G	
	B1	FUJITSU - TA08025-B604	5G	
GAMMA	G1	FUJITSU - TA08025-B605	5G	
	G1	FUJITSU - TA08025-B604	5G	

**NOTES**

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.



**PROPOSED EAST ELEVATION**



1

**ANTENNA SCHEDULE**

NO SCALE

3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

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

1/26/23

MTS ENGINEERING, P.C.  
BER: 2388985  
Expires 3/31/23

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
YN	RMC	RMC

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
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1	1/26/23	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C. PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**ELEVATION, ANTENNA LAYOUT AND SCHEDULE**

SHEET NUMBER  
**A-2**

## CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
0	11/3/21	ISSUED FOR CONSTRUCTION
1	1/26/23	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION

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LITCHFIELD, CT 06759

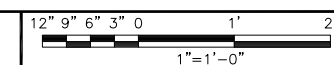
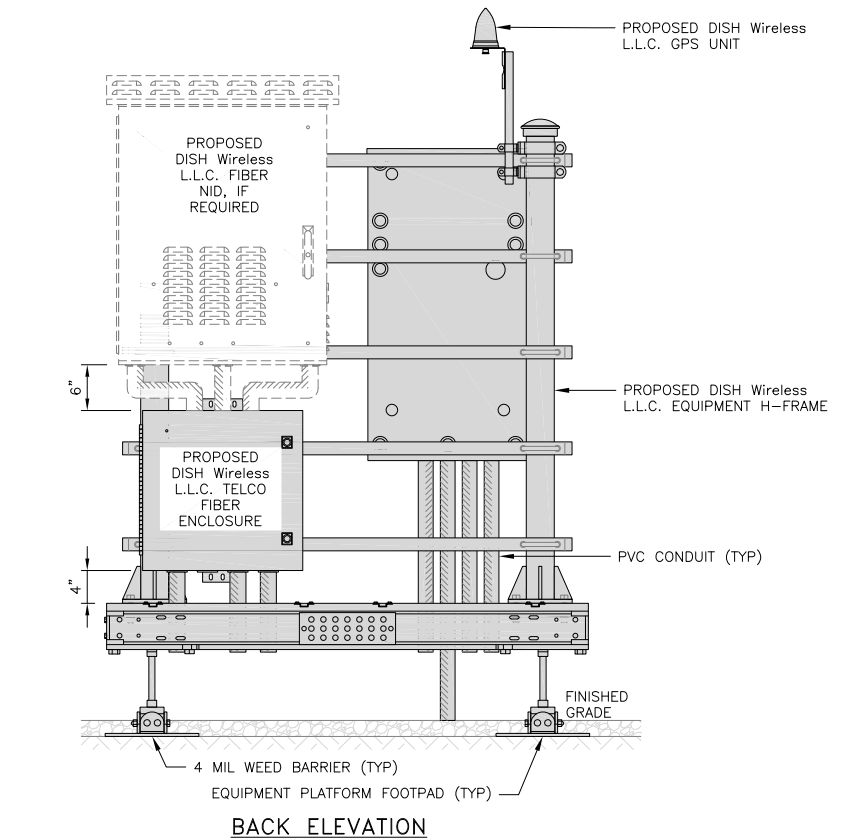
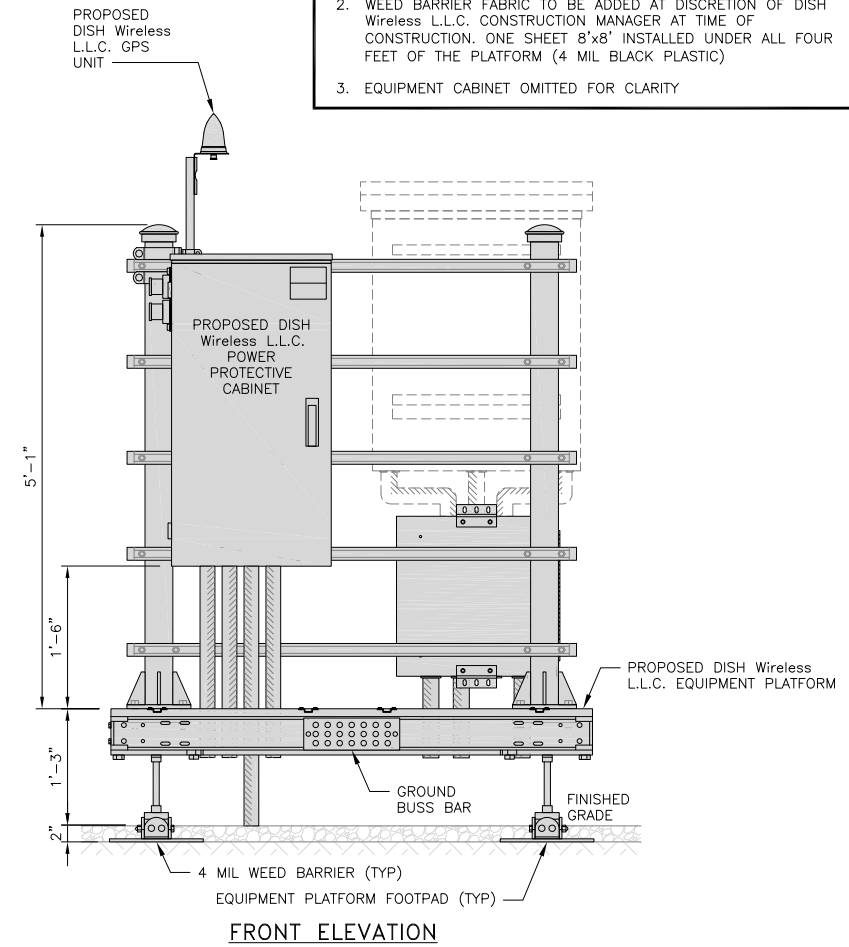
SHEET TITLE  
**EQUIPMENT PLATFORM AND H-FRAME DETAILS**

SHEET NUMBER

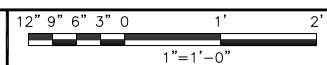
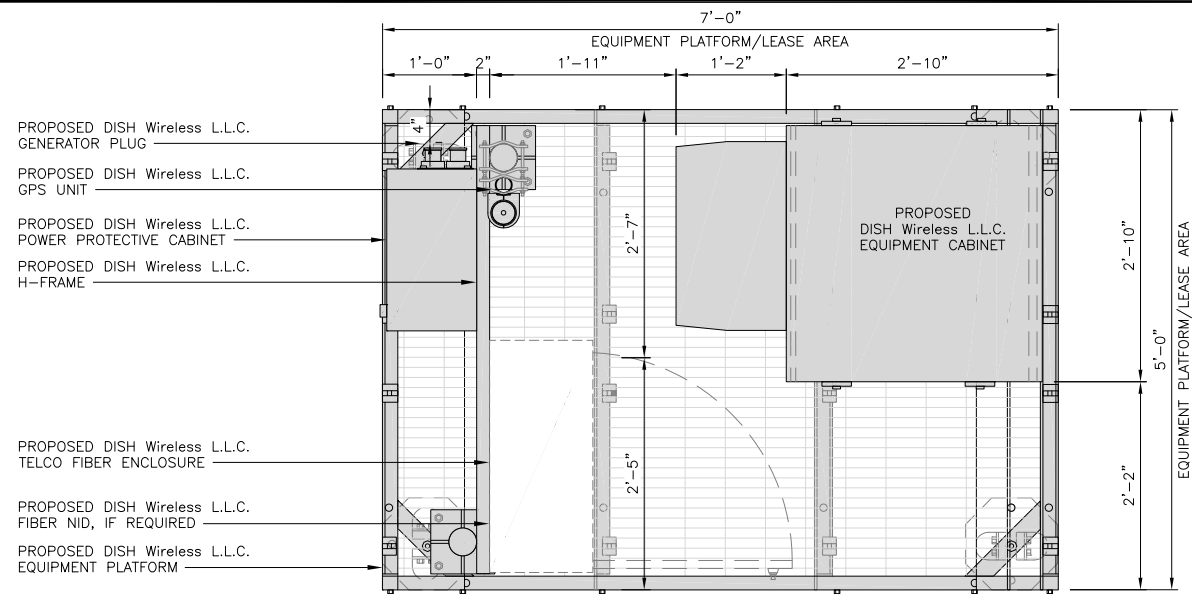
**A-3**

### NOTES

- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
- 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)
- EQUIPMENT CABINET OMITTED FOR CLARITY



5

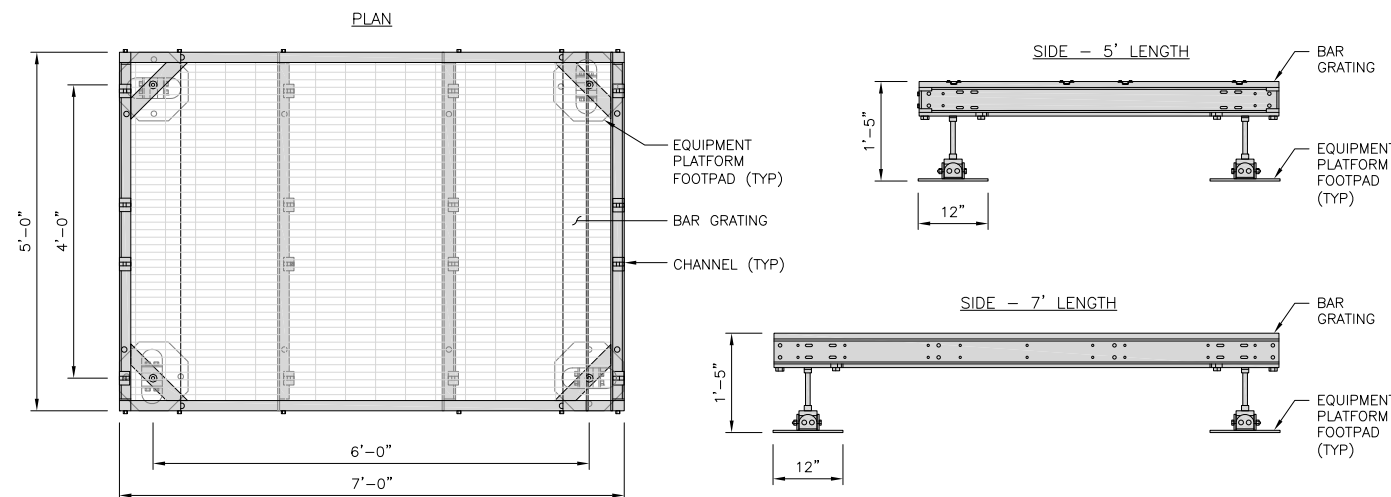


1

### 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"



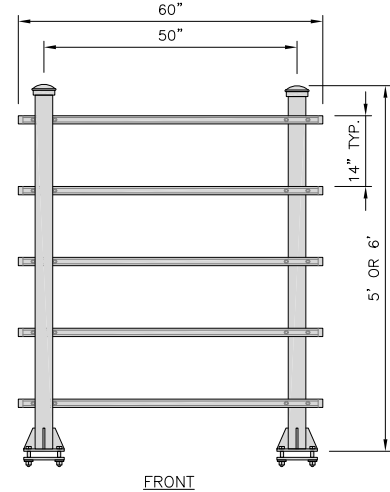
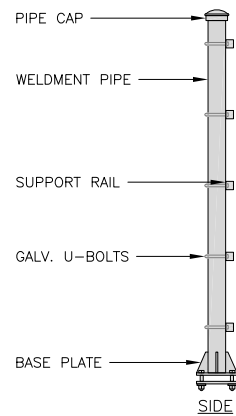
NO SCALE

2

### COMMSCOPE MTC4045HFLD H-FRAME

UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs

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



**H-FRAME DETAIL**

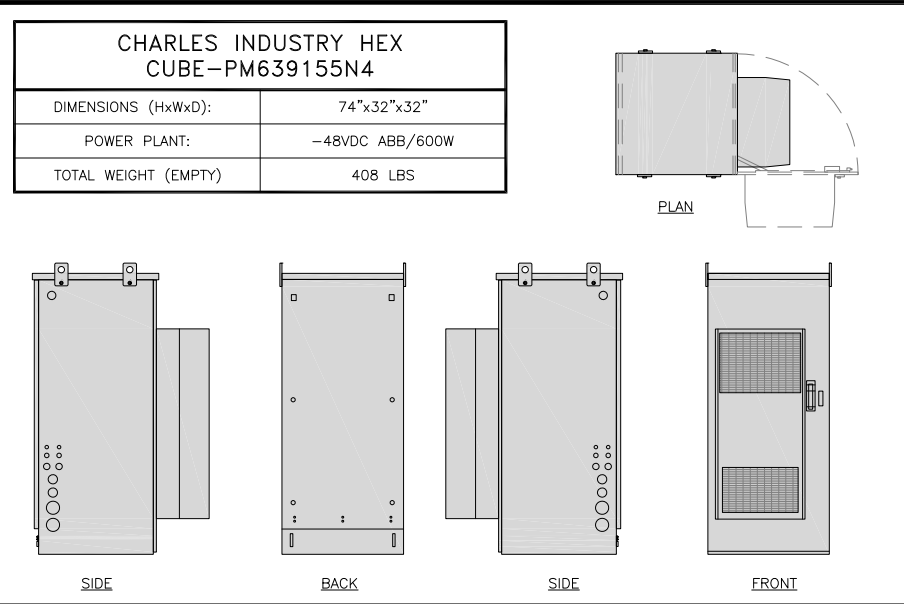
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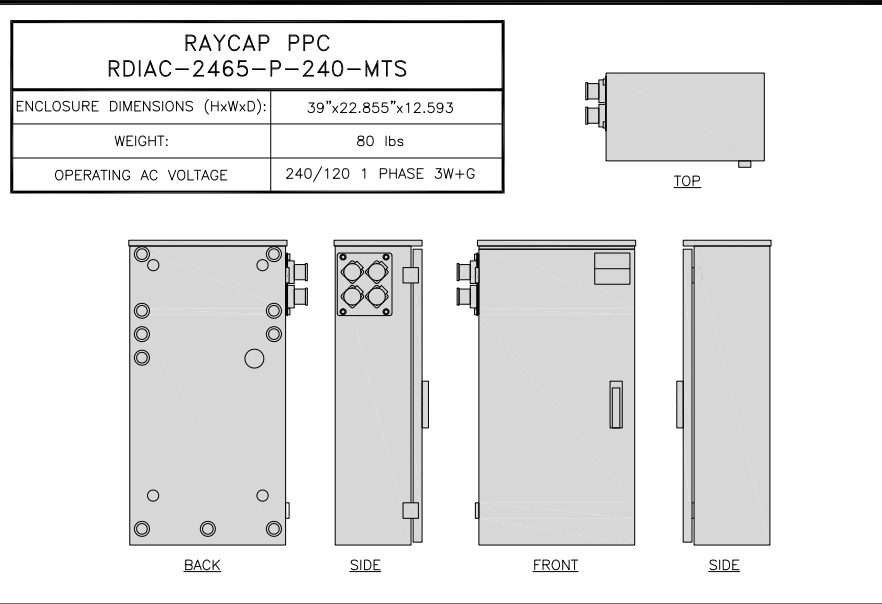
NOT USED

NO SCALE

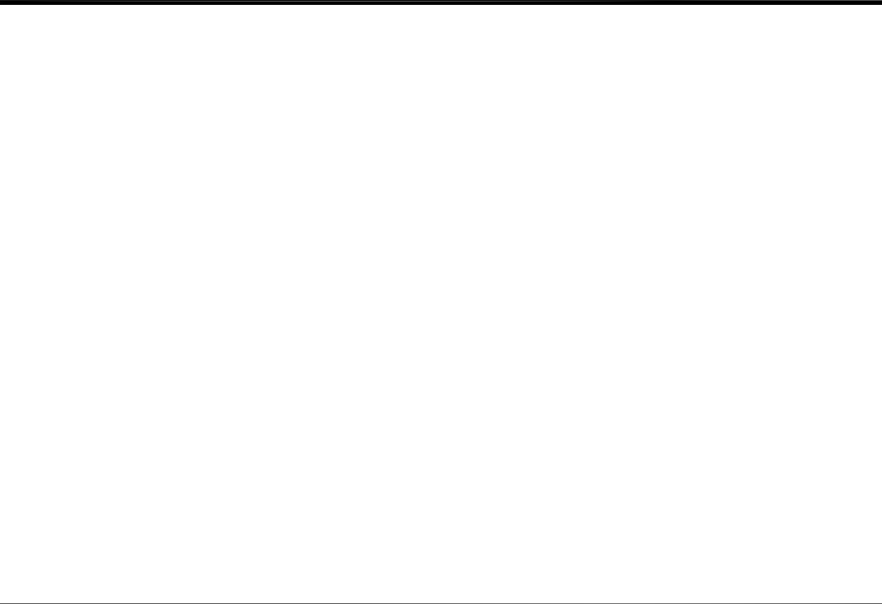
4



CABINET DETAIL      NO SCALE      **1**



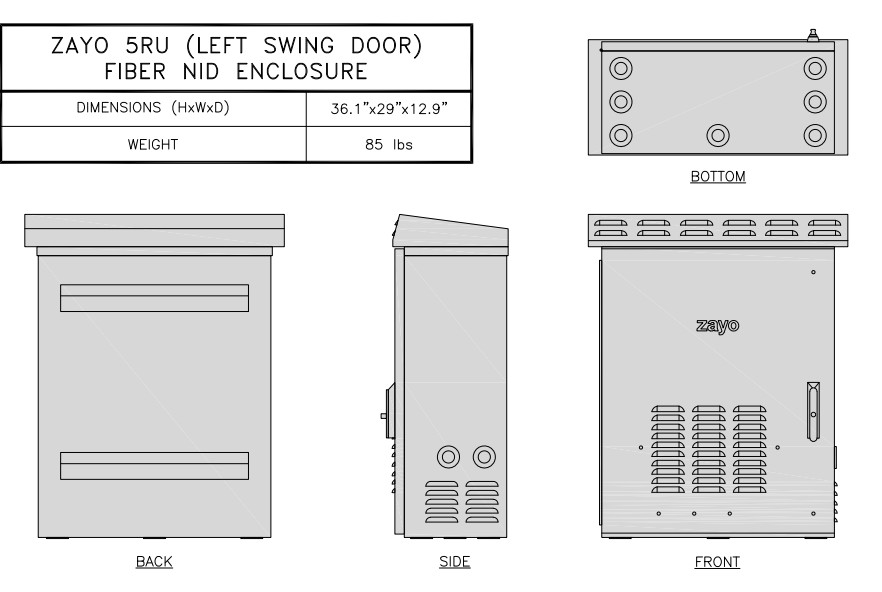
POWER PROTECTION CABINET (PPC) DETAIL      NO SCALE      **2**



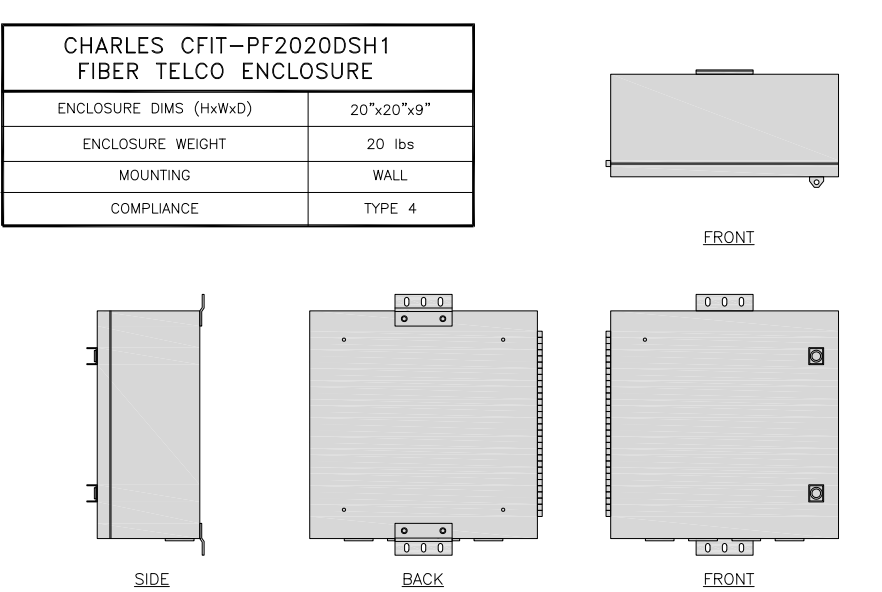
NOT USED      NO SCALE      **3**



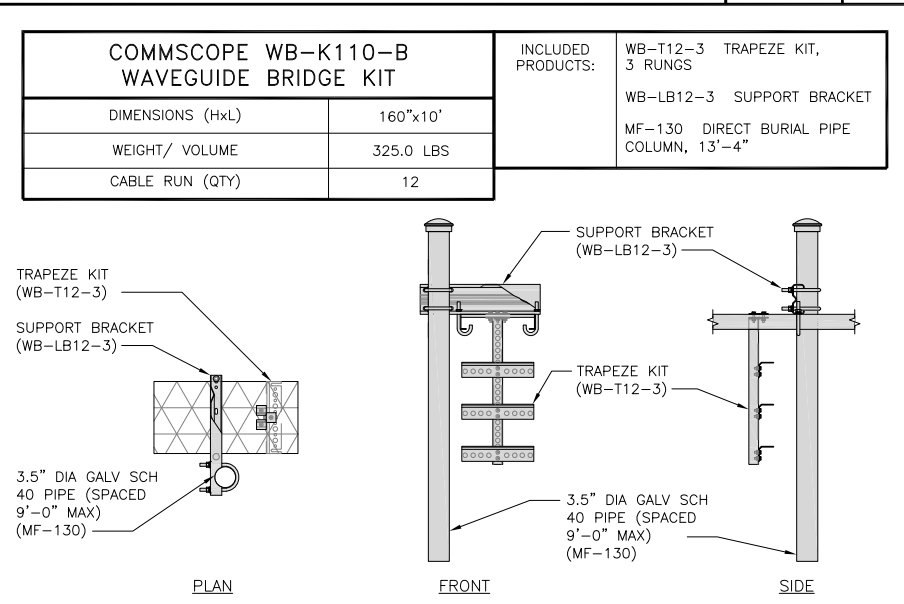
NOT USED      NO SCALE      **4**



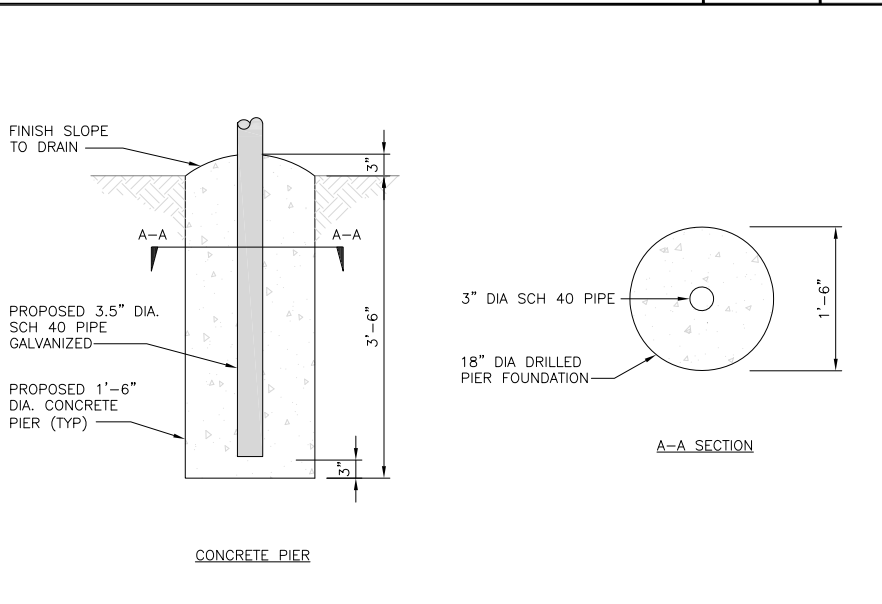
FIBER NID ENCLOSURE DETAIL      NO SCALE      **5**



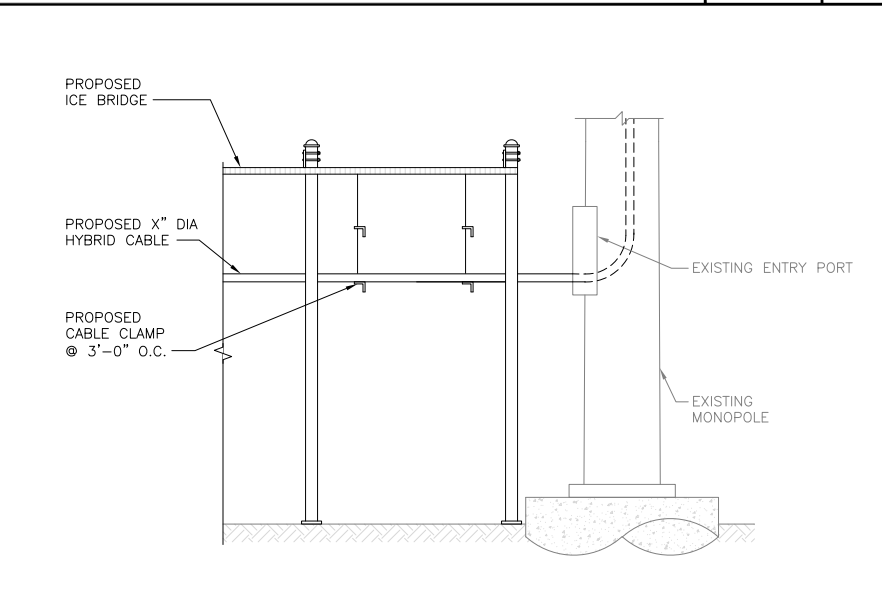
FIBER TELCO ENCLOSURE DETAIL      NO SCALE      **6**



ICE BRIDGE DETAIL      NO SCALE      **7**



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



HYBRID CABLE RUN      NO SCALE      **9**

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SUITE 300  
TULSA, OK 74119  
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www.btgrp.com

1/26/23

MTS ENGINEERING, P.C.  
BER: 238985  
Expires 3/31/23

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DRAWN BY:	CHECKED BY:	APPROVED BY:
YN	RMC	RMC

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
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1	1/26/23	ISSUED FOR CONSTRUCTION

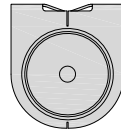
A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

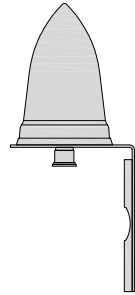
SHEET TITLE  
**EQUIPMENT DETAILS**

SHEET NUMBER  
**A-4**

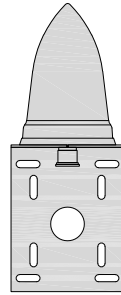
<b>PCTEL</b> <b>GPSGL-TMG-SPI-40NCB</b>	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



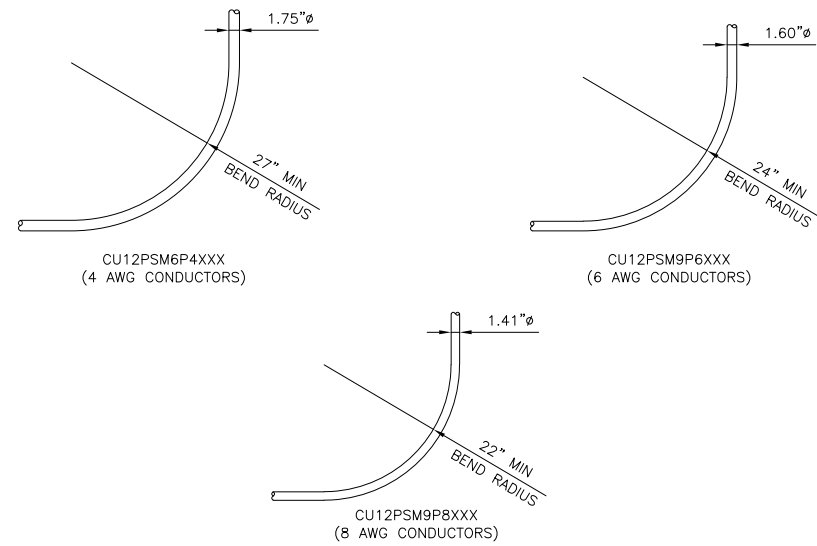
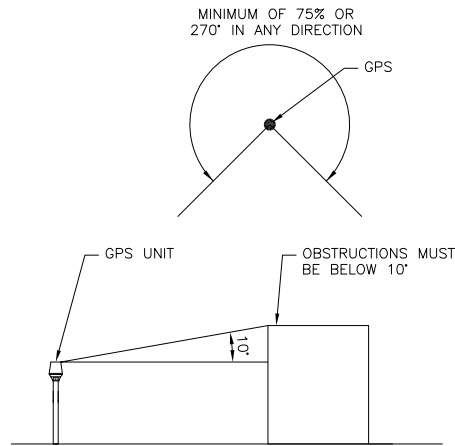
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE  
MINIMUM BEND RADIUS

NO SCALE

3

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

**dish**  
wireless.

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1/26/23

CHAD LITTLE  
No. 23924  
LICENSED  
PROFESSIONAL ENGINEER  
MTS ENGINEERING, P.C. L.L.C.  
BER: 2388985  
Expires 3/31/23

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DRAWN BY:	CHECKED BY:	APPROVED BY:
YN	RMC	RMC

RFDS REV #: 1

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A&E PROJECT NUMBER  
**149545.001.01**

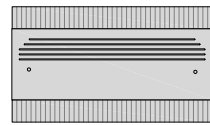
DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**EQUIPMENT DETAILS**

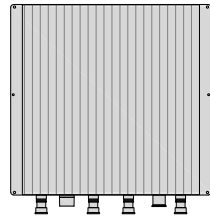
SHEET NUMBER  
**A-5**



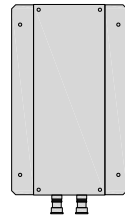
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



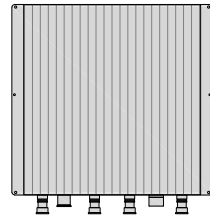
PLAN



BACK

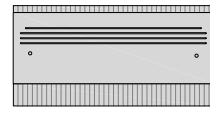


SIDE

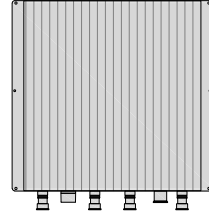


FRONT

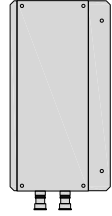
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



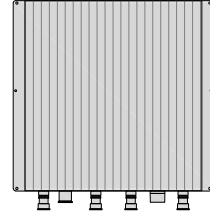
PLAN



BACK



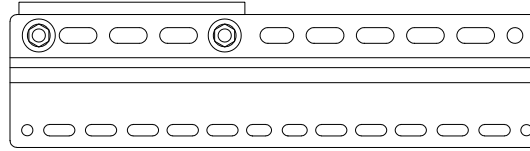
SIDE



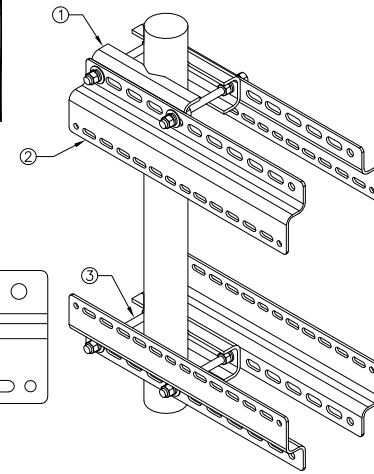
FRONT

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

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



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



RRH DETAIL

NO SCALE

1

RRH DETAIL

NO SCALE

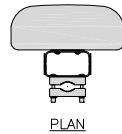
2

RRH MOUNT DETAIL

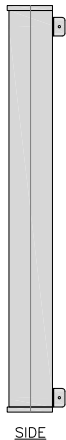
NO SCALE

3

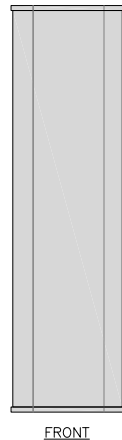
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



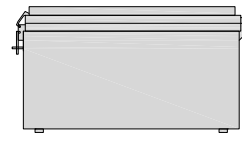
FRONT

ANTENNA DETAIL

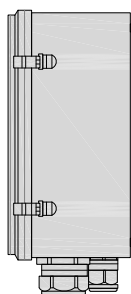
NO SCALE

4

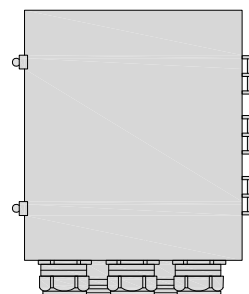
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



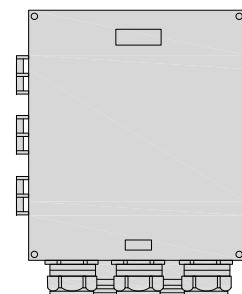
PLAN



SIDE



BACK



FRONT

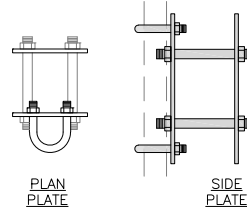
SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

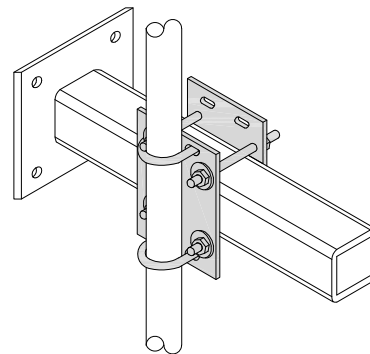
COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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



PLAN  
U-BOLT

SIDE  
U-BOLT



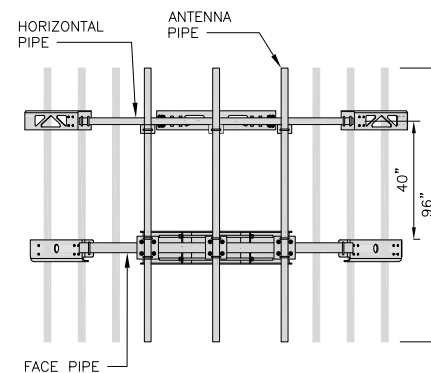
RRH/OVP MOUNT DETAIL

NO SCALE

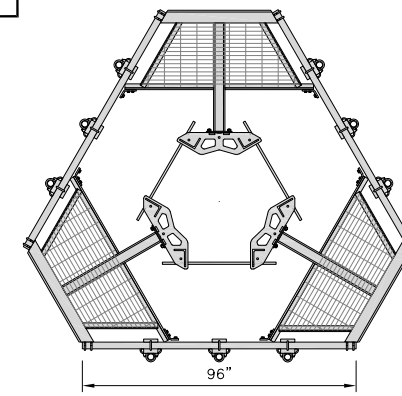
8

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

NOTE:  
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APPROVED EQUIVALENT



FACE PIPE



ANTENNA PLATFORM DETAIL

NO SCALE

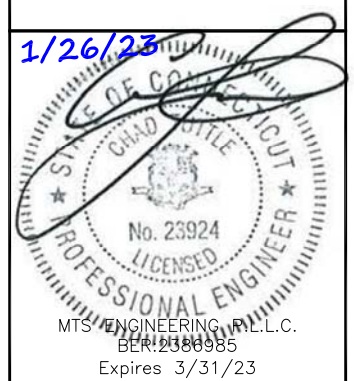
9

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**B+T GRP**

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**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**EQUIPMENT DETAILS**

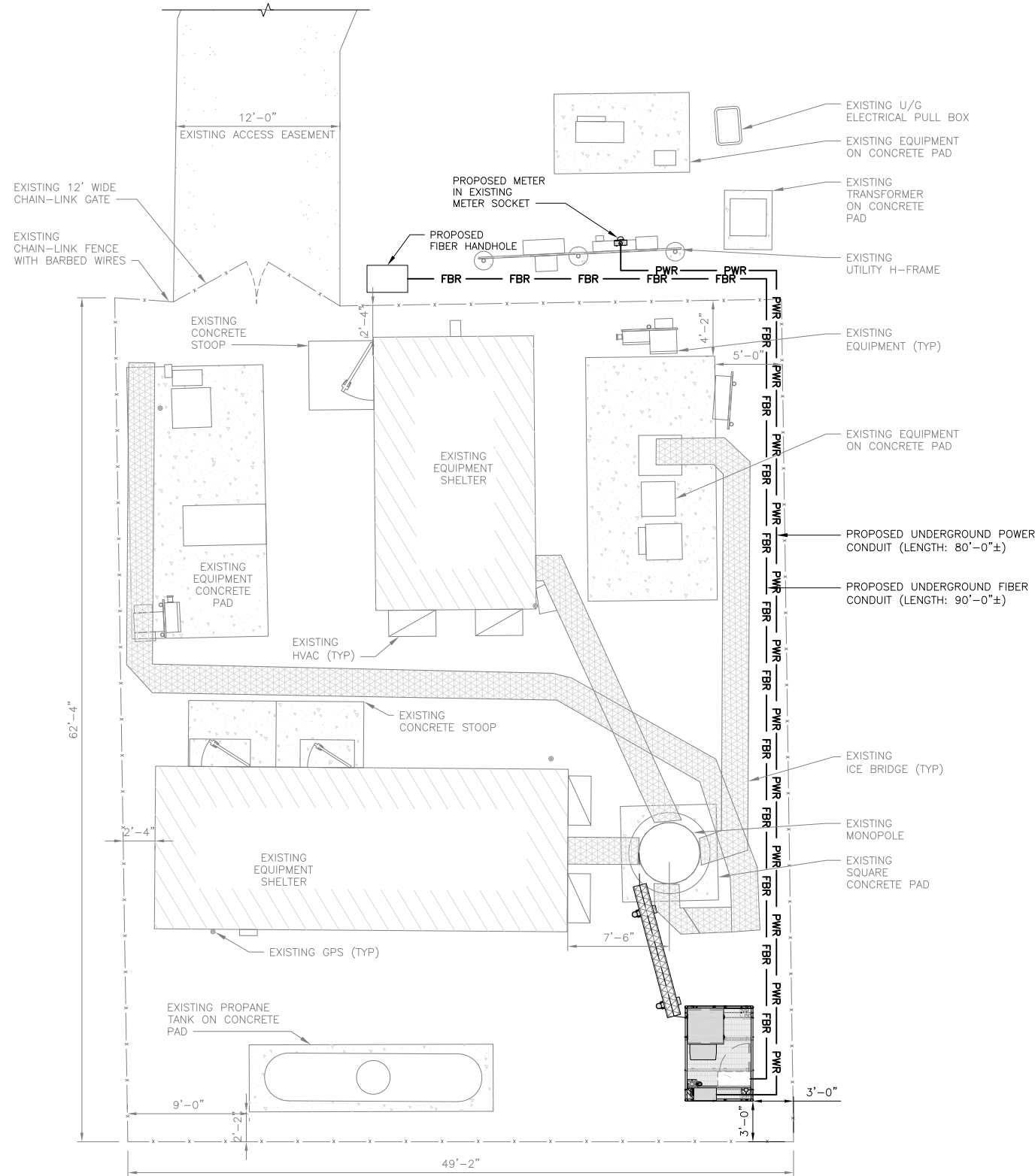
SHEET NUMBER  
**A-6**

**NOTES**

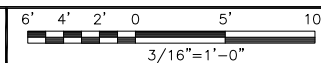
1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

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

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



UTILITY ROUTE PLAN



1

**ELECTRICAL NOTES**

NO SCALE

2



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DRAWN BY:	CHECKED BY:	APPROVED BY:
YN	RMC	RMC

RFDS REV #: 1

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149545.001.01

DISH Wireless L.L.C.  
PROJECT INFORMATION

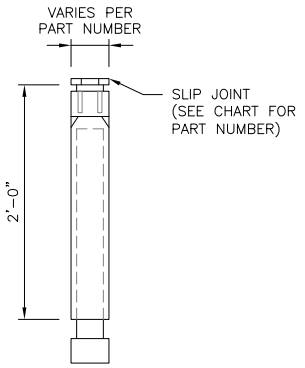
BOHVN00202A  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

SHEET NUMBER  
**E-1**

**CARLON EXPANSION FITTINGS**

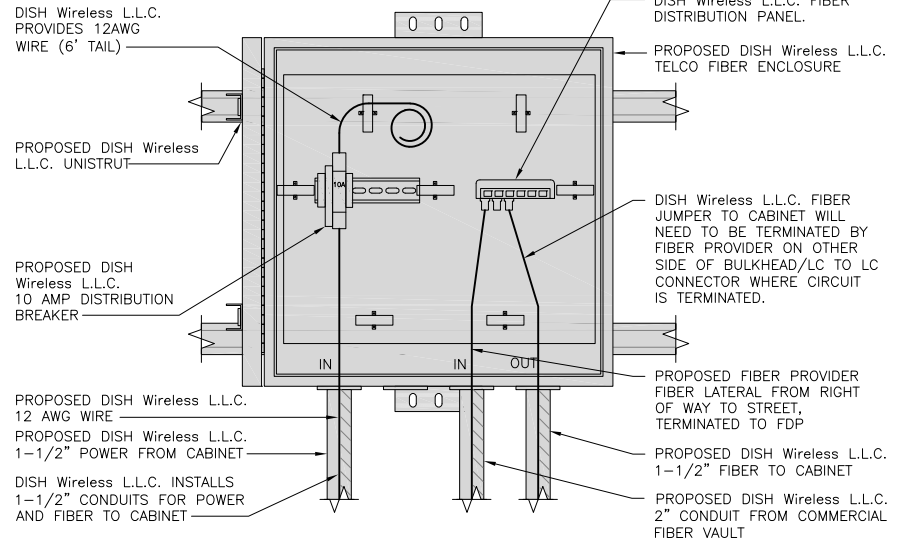
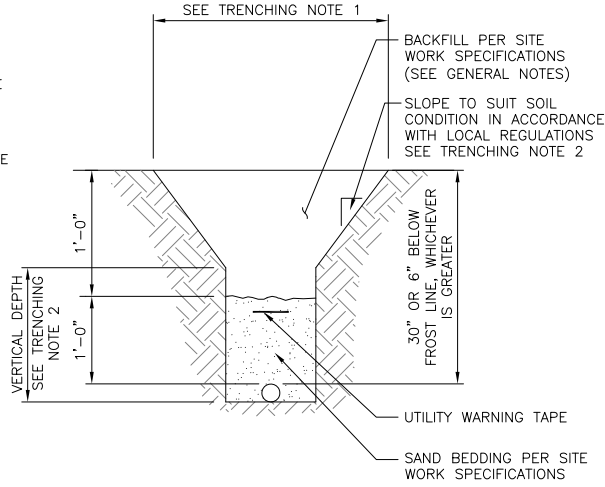
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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



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

**TRENCHING NOTES**

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



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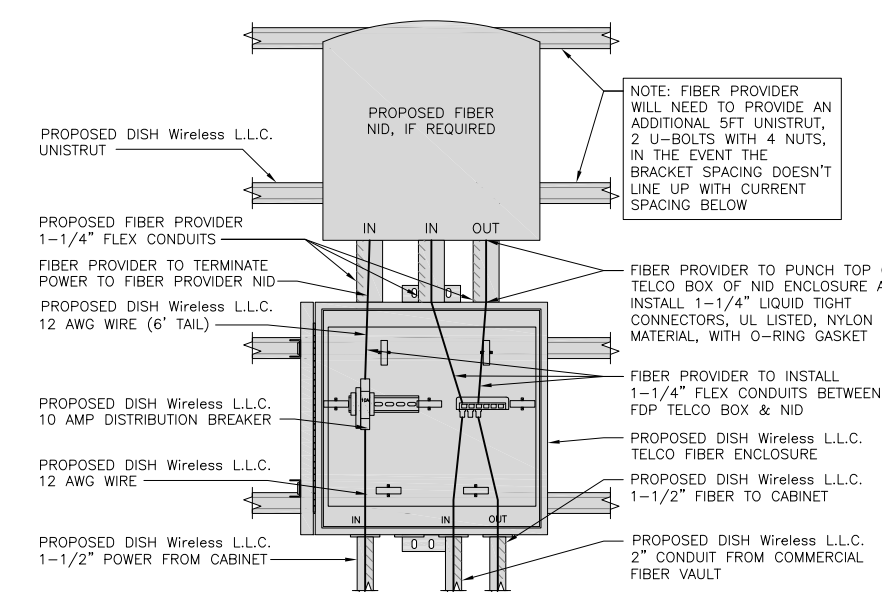


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www.btgrp.com

EXPANSION JOINT DETAIL NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT NO SCALE 3



NOT USED

NOT USED

LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) NO SCALE 4

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED

NOT USED

NOT USED

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9

1/26/23

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DRAWN BY:	CHECKED BY:	APPROVED BY:
YN	RMC	RMC

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

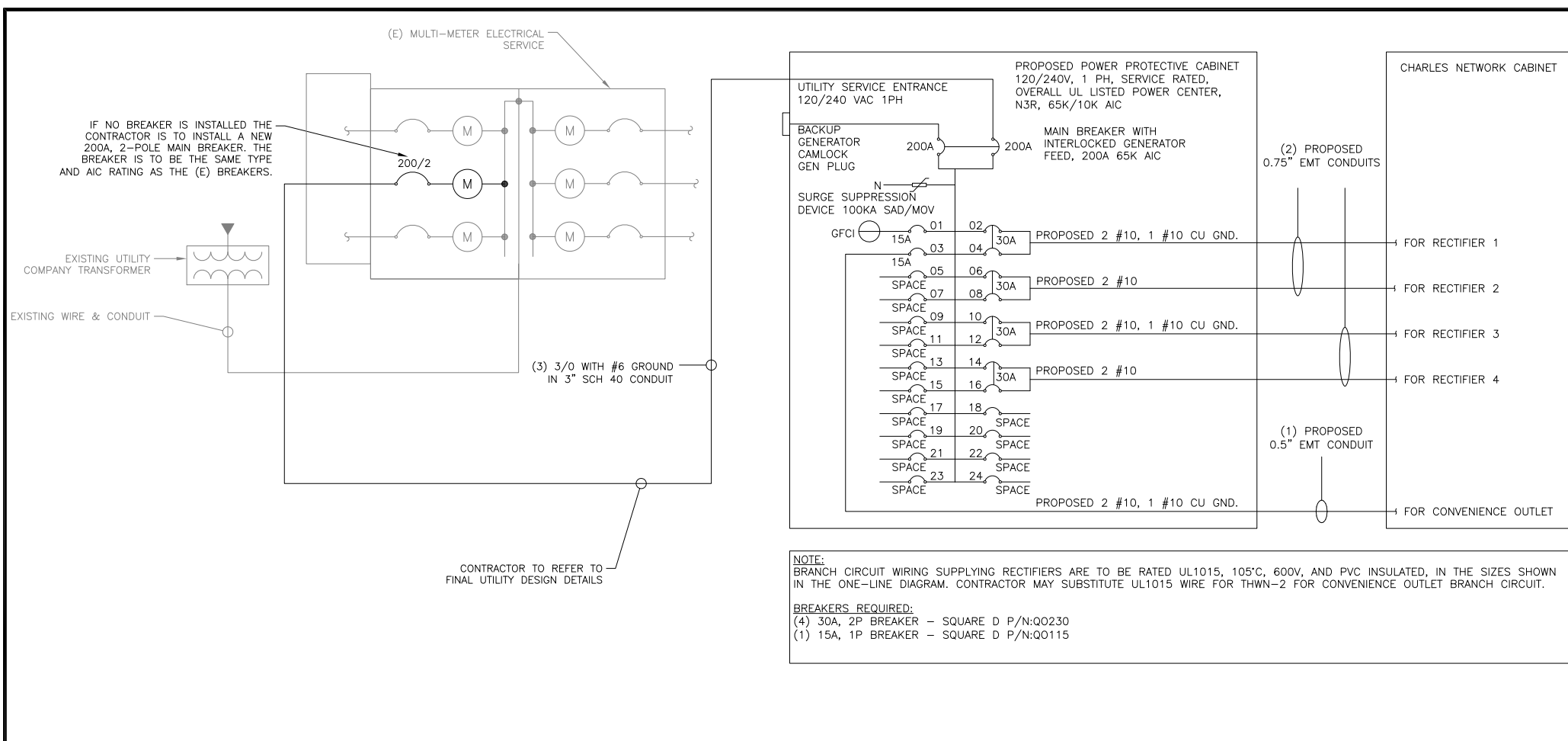
SUBMITTALS		
REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
0	11/3/21	ISSUED FOR CONSTRUCTION
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A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**ELECTRICAL DETAILS**

SHEET NUMBER  
**E-2**



**NOTES**

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

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

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

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

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

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

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

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

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

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1/26/23

STATE OF CONNECTICUT  
CHAD LITTLE  
No. 23924  
LICENSED PROFESSIONAL ENGINEER  
MTS ENGINEERING, P.C.  
BER: 2388985  
Expires 3/31/23

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PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

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

SHEET NUMBER  
**E-3**

**PROPOSED CHARLES PANEL SCHEDULE**

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

<b>PPC ONE-LINE DIAGRAM</b>		NO SCALE	1
<b>PANEL SCHEDULE</b>		NO SCALE	2
<b>NOT USED</b>		NO SCALE	3

**CONSTRUCTION DOCUMENTS**

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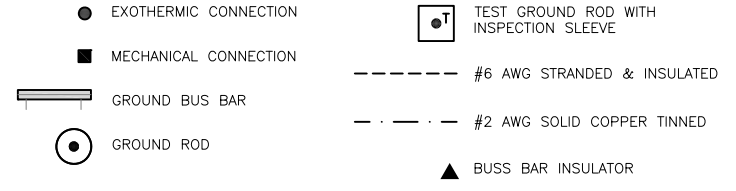
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PROJECT INFORMATION

**BOHVN00202A**  
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SHEET TITLE  
**GROUNDING PLANS AND NOTES**

SHEET NUMBER  
**G-1**

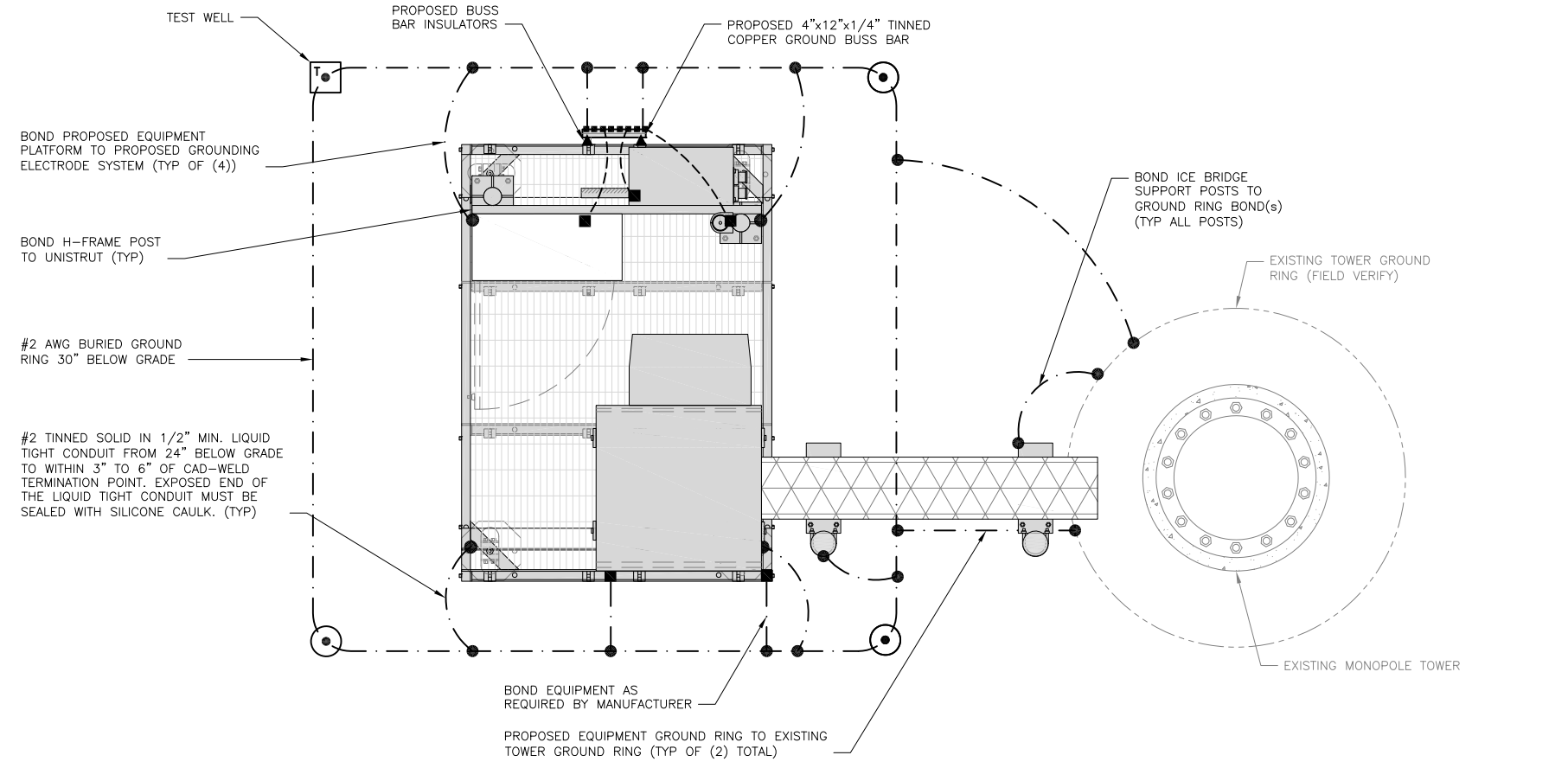


**GROUNDING LEGEND**

- 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 PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

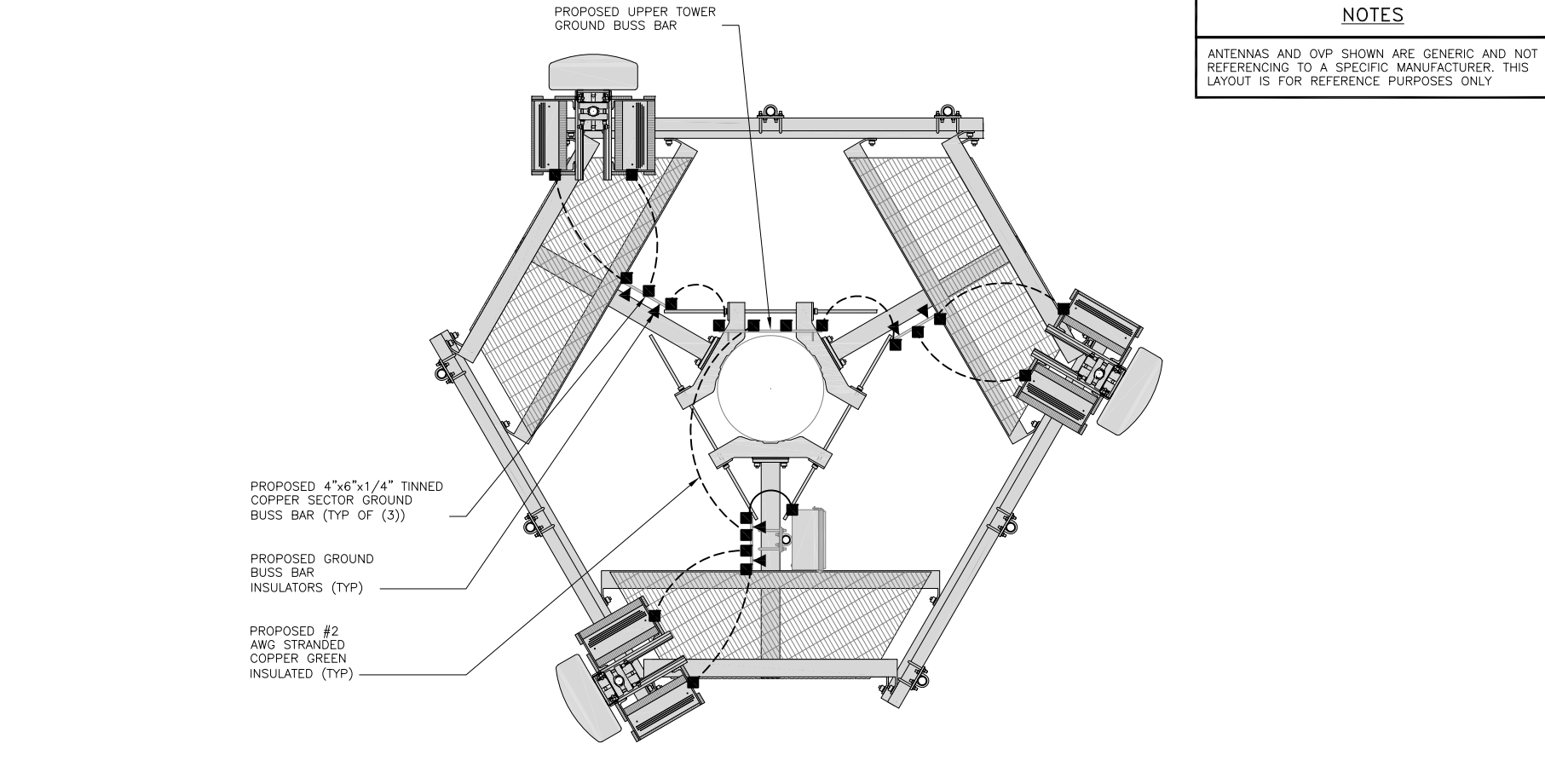


**TYPICAL EQUIPMENT GROUNDING PLAN**

NO SCALE 1

**NOTES**

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



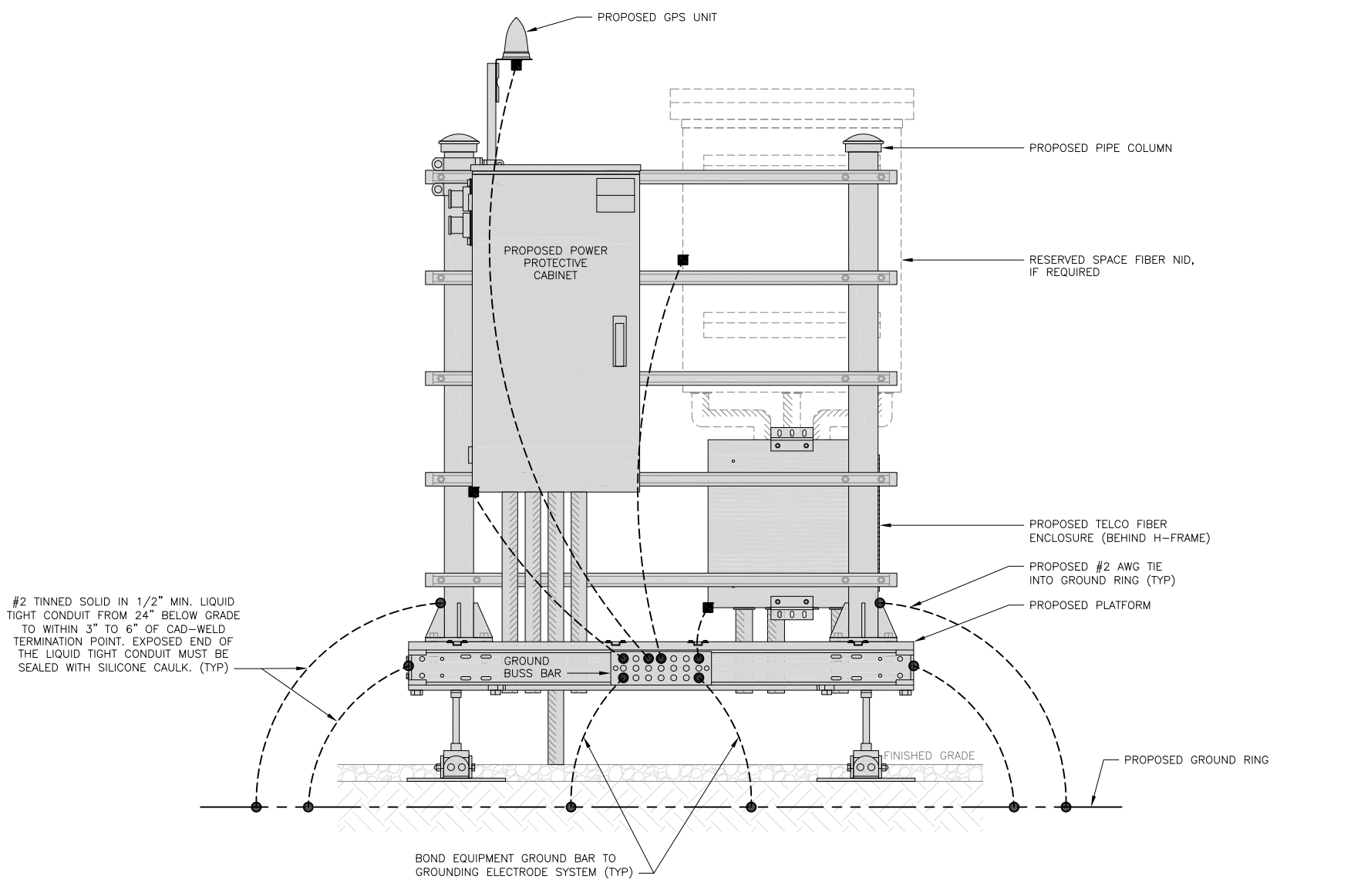
**TYPICAL ANTENNA GROUNDING PLAN**

NO SCALE 2

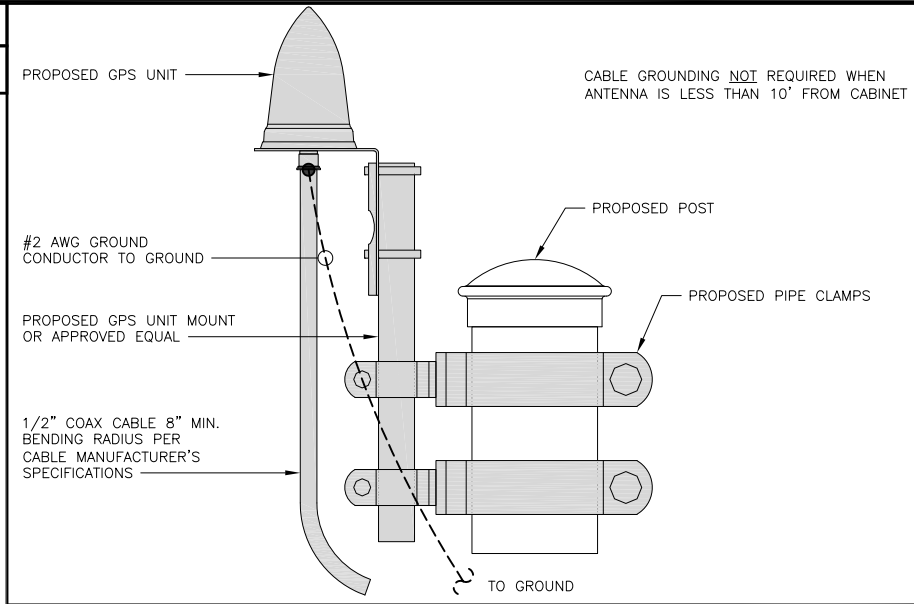
**GROUNDING KEY NOTES**

NO SCALE 3

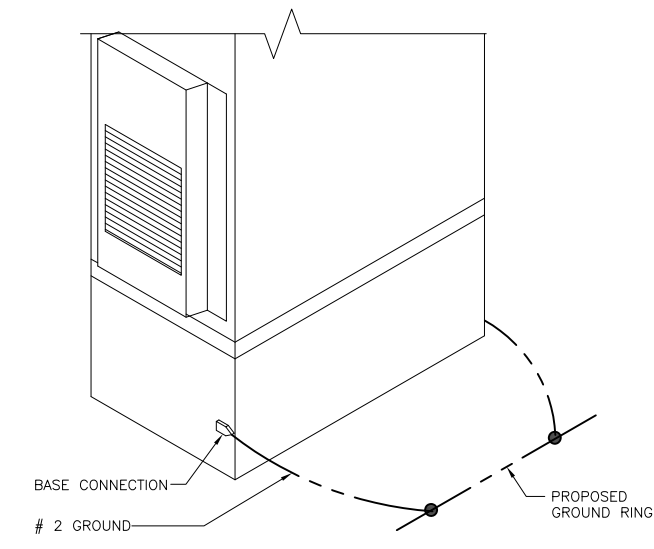
**NOTES**  
EQUIPMENT CABINET OMITTED FOR CLARITY



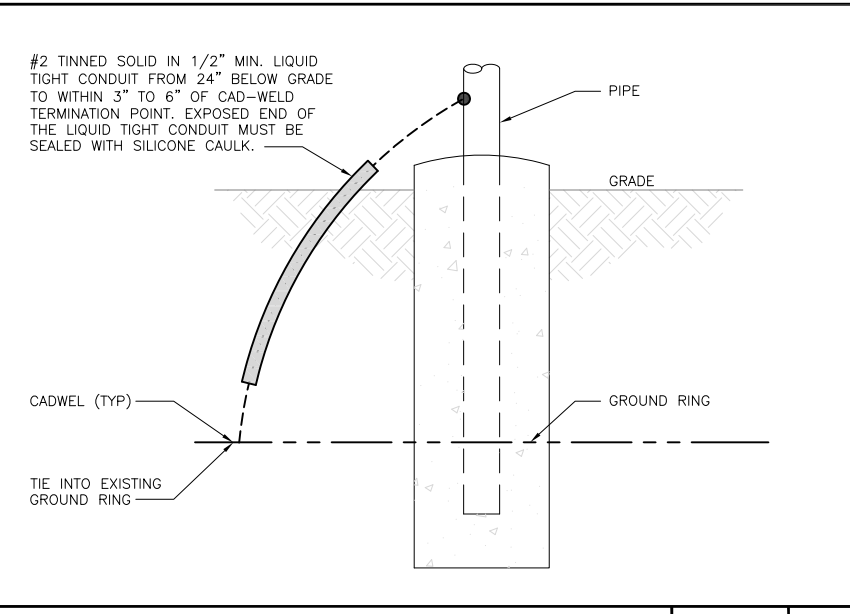
**H-FRAME GROUNDING DETAIL** NO SCALE **1**



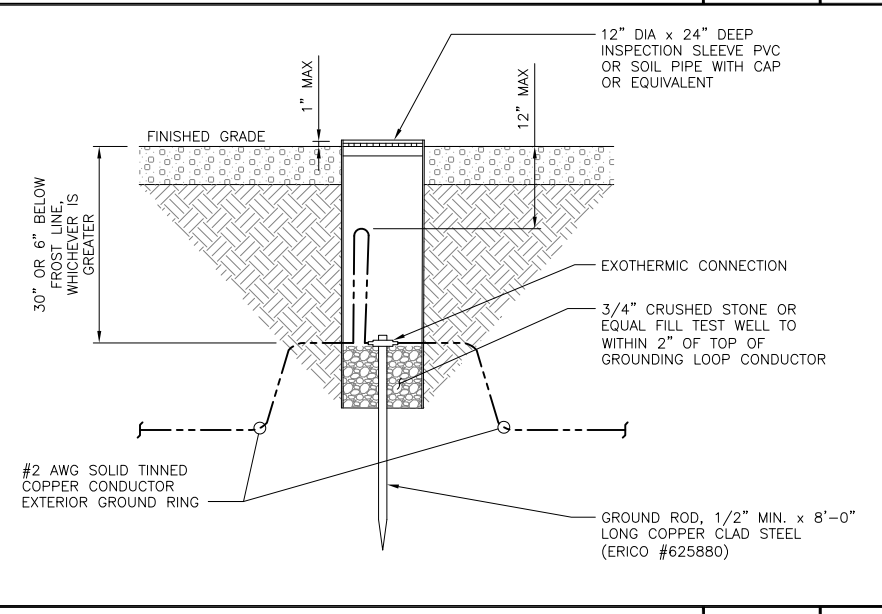
**TYPICAL GPS UNIT GROUNDING** NO SCALE **2**



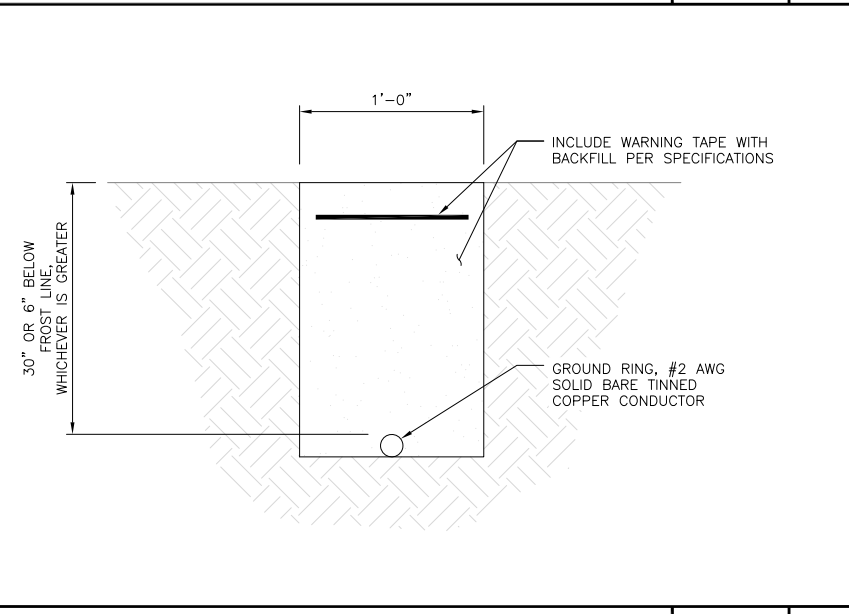
**OUTDOOR CABINET GROUNDING** NO SCALE **3**



**TRANSITIONING GROUND DETAIL** NO SCALE **4**



**TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE** NO SCALE **5**



**TYPICAL GROUND RING TRENCH** NO SCALE **6**

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1/26/23  
STATE OF CONNECTICUT  
CHAD LITTLE  
No. 23924  
LICENSED PROFESSIONAL ENGINEER  
MTS ENGINEERING, P.C.  
BER: 2388985  
Expires 3/31/23

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RFDS REV #: 1

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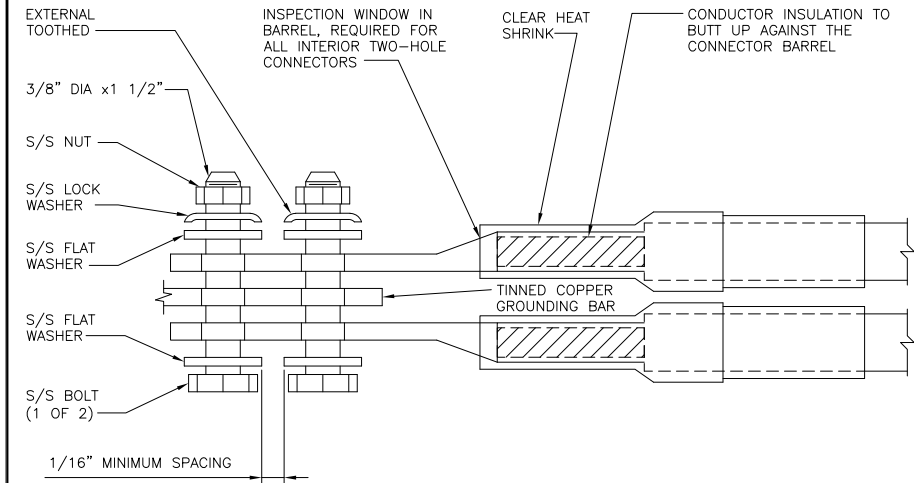
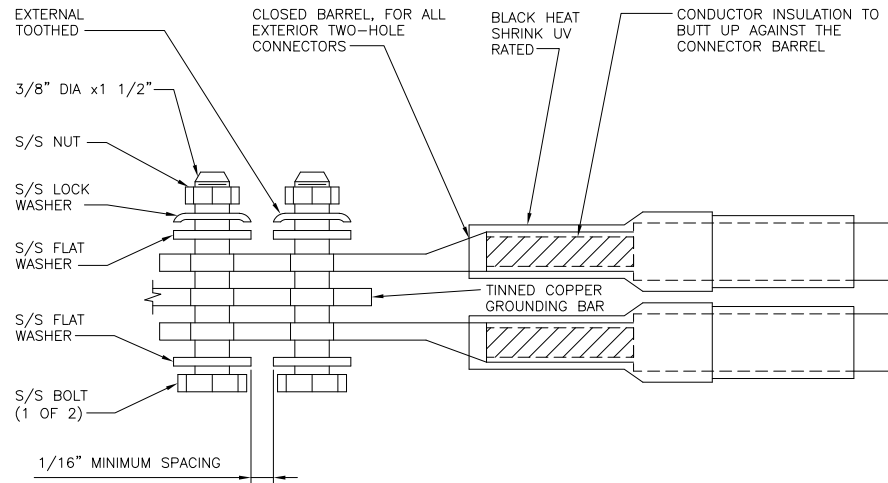
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383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**GROUNDING DETAILS**

SHEET NUMBER  
**G-2**

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



**dish**  
wireless.

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SHEET TITLE  
**GROUNDING DETAILS**

SHEET NUMBER  
**G-3**

TYPICAL GROUNDING NOTES

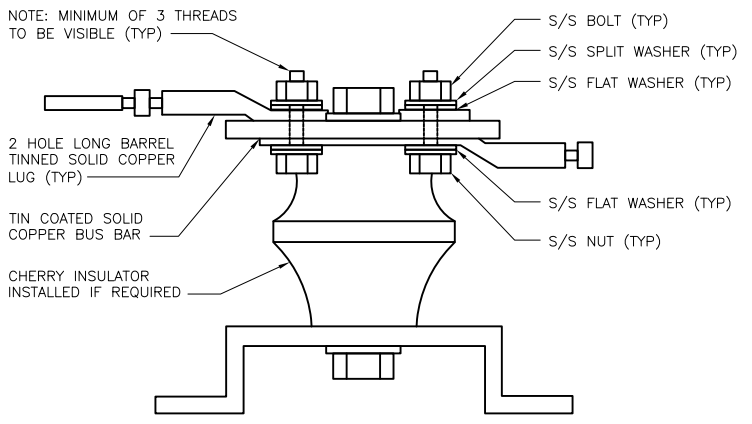
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9

**RF JUMPER COLOR CODING**

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

LOW-BAND RRH - (600MHz N71 BASEBAND) + (850MHz N26 BAND) + (700MHz N29 BAND) - OPTIONAL PER MARKET

ALPHA RRH				BETA RRH				GAMMA RRH			
PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
	WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BANDS)

MID-BAND RRH - (AWS BANDS N66+N70)

PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BANDS)

**HYBRID/DISCREET CABLES**

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS

EXAMPLE 1 - HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS

EXAMPLE 1	EXAMPLE 2	EXAMPLE 3
RED	RED	RED
BLUE	BLUE	BLUE
GREEN	GREEN	ORANGE
ORANGE	YELLOW	PURPLE
PURPLE		

CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RD DETAILS. FINAL RFDS IS IN NEXSYSONE.

**FIBER JUMPERS TO RRHs**

LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**POWER CABLES TO RRHs**

LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**RET MOTORS AT ANTENNAS**

ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**MICROWAVE RADIO LINKS**

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.

MICROWAVE CABLES WILL REQUIRE P-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID'S

FORWARD AZIMUTH OF 0-120 DEGREES		FORWARD AZIMUTH OF 120-240 DEGREES		FORWARD AZIMUTH OF 240-360 DEGREES	
PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	RED		BLUE		GREEN
	WHITE		WHITE		WHITE

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

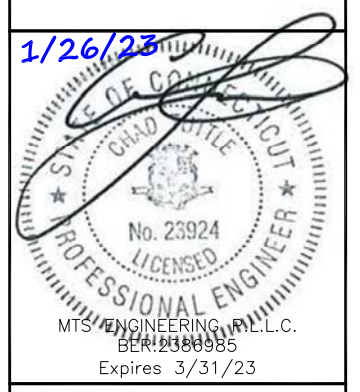
COLOR IDENTIFIER NO SCALE 2

NOT USED NO SCALE 3

RF CABLE COLOR CODES NO SCALE 1 NOT USED NO SCALE 4



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LITTLETON, CO 80120



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DRAWN BY: YN CHECKED BY: RMC APPROVED BY: RMC

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS

REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
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A&E PROJECT NUMBER  
149545.001.01

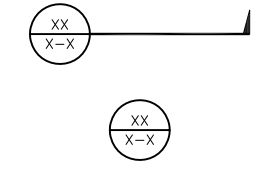
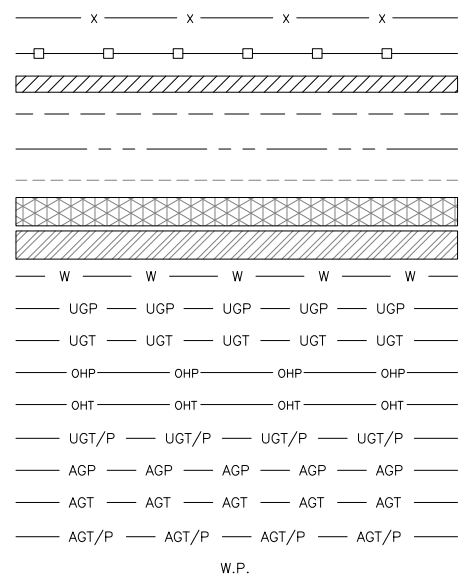
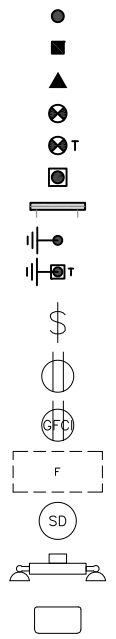
DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00202A  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
RF  
CABLE COLOR CODES

SHEET NUMBER  
RF-1



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



**LEGEND**

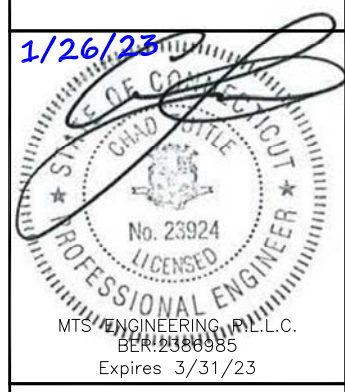
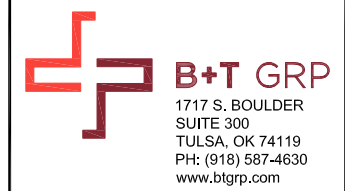
AB ANCHOR BOLT  
 ABV ABOVE  
 AC ALTERNATING CURRENT  
 ADDL ADDITIONAL  
 AFF ABOVE FINISHED FLOOR  
 AFG ABOVE FINISHED GRADE  
 AGL ABOVE GROUND LEVEL  
 AIC AMPERAGE INTERRUPTION CAPACITY  
 ALUM ALUMINUM  
 ALT ALTERNATE  
 ANT ANTENNA  
 APPROX APPROXIMATE  
 ARCH ARCHITECTURAL  
 ATS AUTOMATIC TRANSFER SWITCH  
 AWG AMERICAN WIRE GAUGE  
 BATT BATTERY  
 BLDG BUILDING  
 BLK BLOCK  
 BLKG BLOCKING  
 BM BEAM  
 BTC BARE TINNED COPPER CONDUCTOR  
 BOF BOTTOM OF FOOTING  
 CAB CABINET  
 CANT CANTILEVERED  
 CHG CHARGING  
 CLG CEILING  
 CLR CLEAR  
 COL COLUMN  
 COMM COMMON  
 CONC CONCRETE  
 CONSTR CONSTRUCTION  
 DBL DOUBLE  
 DC DIRECT CURRENT  
 DEPT DEPARTMENT  
 DF DOUGLAS FIR  
 DIA DIAMETER  
 DIAG DIAGONAL  
 DIM DIMENSION  
 DWG DRAWING  
 DWL DOWEL  
 EA EACH  
 EC ELECTRICAL CONDUCTOR  
 EL ELEVATION  
 ELEC ELECTRICAL  
 EMT ELECTRICAL METALLIC TUBING  
 ENG ENGINEER  
 EQ EQUAL  
 EXP EXPANSION  
 EXT EXTERIOR  
 EW EACH WAY  
 FAB FABRICATION  
 FF FINISH FLOOR  
 FG FINISH GRADE  
 FIF FACILITY INTERFACE FRAME  
 FIN FINISH(ED)  
 FLR FLOOR  
 FDN FOUNDATION  
 FOC FACE OF CONCRETE  
 FOM FACE OF MASONRY  
 FOS FACE OF STUD  
 FOW FACE OF WALL  
 FS FINISH SURFACE  
 FT FOOT  
 FTG FOOTING  
 GA GAUGE  
 GEN GENERATOR  
 GFCI GROUND FAULT CIRCUIT INTERRUPTER  
 GLB GLUE LAMINATED BEAM  
 GLV GALVANIZED  
 GPS GLOBAL POSITIONING SYSTEM  
 GND GROUND  
 GSM GLOBAL SYSTEM FOR MOBILE  
 HDG HOT DIPPED GALVANIZED  
 HDR HEADER  
 HGR HANGER  
 HVAC HEAT/VENTILATION/AIR CONDITIONING  
 HT HEIGHT  
 IGR INTERIOR GROUND RING

IN INCH  
 INT INTERIOR  
 LB(S) POUND(S)  
 LF LINEAR FEET  
 LTE LONG TERM EVOLUTION  
 MAS MASONRY  
 MAX MAXIMUM  
 MB MACHINE BOLT  
 MECH MECHANICAL  
 MFR MANUFACTURER  
 MGB MASTER GROUND BAR  
 MIN MINIMUM  
 MISC MISCELLANEOUS  
 MTL METAL  
 MTS MANUAL TRANSFER SWITCH  
 MW MICROWAVE  
 NEC NATIONAL ELECTRIC CODE  
 NM NEWTON METERS  
 NO. NUMBER  
 # NUMBER  
 NTS NOT TO SCALE  
 OC ON-CENTER  
 OSHA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION  
 OPNG OPENING  
 P/C PRECAST CONCRETE  
 PCS PERSONAL COMMUNICATION SERVICES  
 PCU PRIMARY CONTROL UNIT  
 PRC PRIMARY RADIO CABINET  
 PP POLARIZING PRESERVING  
 PSF POUNDS PER SQUARE FOOT  
 PSI POUNDS PER SQUARE INCH  
 PT PRESSURE TREATED  
 PWR POWER CABINET  
 QTY QUANTITY  
 RAD RADIUS  
 RECT RECTIFIER  
 REF REFERENCE  
 REINF REINFORCEMENT  
 REQ'D REQUIRED  
 RET REMOTE ELECTRIC TILT  
 RF RADIO FREQUENCY  
 RMC RIGID METALLIC CONDUIT  
 RRH REMOTE RADIO HEAD  
 RRU REMOTE RADIO UNIT  
 RWY RACEWAY  
 SCH SCHEDULE  
 SHT SHEET  
 SIAD SMART INTEGRATED ACCESS DEVICE  
 SIM SIMILAR  
 SPEC SPECIFICATION  
 SQ SQUARE  
 SS STAINLESS STEEL  
 STD STANDARD  
 STL STEEL  
 TEMP TEMPORARY  
 THK THICKNESS  
 TMA TOWER MOUNTED AMPLIFIER  
 TN TOE NAIL  
 TOA TOP OF ANTENNA  
 TOC TOP OF CURB  
 TOF TOP OF FOUNDATION  
 TOP TOP OF PLATE (PARAPET)  
 TOS TOP OF STEEL  
 TOW TOP OF WALL  
 TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION  
 TYP TYPICAL  
 UG UNDERGROUND  
 UL UNDERWRITERS LABORATORY  
 UNO UNLESS NOTED OTHERWISE  
 UMTS UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM  
 UPS UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)  
 VIF VERIFIED IN FIELD  
 W WIDE  
 W/ WITH  
 WD WOOD  
 WP WEATHERPROOF  
 WT WEIGHT

**ABBREVIATIONS**



5701 SOUTH SANTA FE DRIVE  
 LITTLETON, CO 80120



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DISH Wireless L.L.C.  
 PROJECT INFORMATION  
**BOHVN00202A**  
 383 TORRINGTON RD  
 LITCHFIELD, CT 06759

SHEET TITLE  
**LEGEND AND ABBREVIATIONS**

SHEET NUMBER  
**GN-1**

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



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SHEET TITLE  
**GENERAL NOTES**

SHEET NUMBER  
**GN-2**

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

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

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



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DRAWN BY:	CHECKED BY:	APPROVED BY:
YN	RMC	RMC

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	9/28/21	ISSUED FOR REVIEW
0	11/3/21	ISSUED FOR CONSTRUCTION
1	1/26/23	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**GENERAL NOTES**

SHEET NUMBER  
**GN-3**

**GROUNDING NOTES:**

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



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A&E PROJECT NUMBER  
**149545.001.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOHVN00202A**  
383 TORRINGTON RD  
LITCHFIELD, CT 06759

SHEET TITLE  
**GENERAL NOTES**

SHEET NUMBER  
**GN-4**

# Exhibit D

## **Structural Analysis Report**



**Tower Engineering Solutions**

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

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**Structural Analysis Report**

**Existing 139 ft Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT46123-A**

**Customer Site Name: Litchfield**

**Carrier Name: Dish Wireless (App#: 169201, V1)**

**Carrier Site ID / Name: BOHVN00202A / 0**

**Site Location: 383 Torrington Rd**

**Litchfield, Connecticut**

**Litchfield County**

**Latitude: 41.766278**

**Longitude: -73.178527**

**Analysis Result:**

**Max Structural Usage: 69.4% [Pass]**

**Max Foundation Usage: 68.1% [Pass]**

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



**Report Prepared By: Praveen Shrestha**



**Tower Engineering Solutions**

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**Report Prepared By: Praveen Shrestha**

## Introduction

The purpose of this report is to summarize the analysis results on the 139 ft Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

<b>Tower Drawings</b>	FDH Project # 15BGLG1400 (SA Report), dated 03/19/2015
<b>Foundation Drawing</b>	EEl Project # 14854, dated 04/08/2008
<b>Geotechnical Report</b>	Clarence Welti Associates, Inc. Geotechnical Report, dated 08/19/2005
<b>Modification Drawings</b>	N/A
<b>Mount Analysis</b>	N/A

## Analysis Criteria

The comprehensive analysis was performed in accordance with the requirements and stipulations of the TIA-222-H. In accordance with this standard, the structure was analyzed using **TESPoles**, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

<b>Wind Speed Used in the Analysis:</b>	115.0 mph (3-Sec. Gust) (Ultimate wind speed)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 1" radial ice concurrent
<b>Service Load Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
<b>Exposure Category:</b>	C
<b>Risk Category:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Seismic Parameters:</b>	$S_S = 0.178$ , $S_1 = 0.054$

This structural analysis is based upon the tower being classified as a Risk Category II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.



## Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	138.0	3	E14F05P59 Diplexer	(3) T-Arms w/ ring mount	(12) 1 5/8"	Verizon
2	137.0	6	Antel LPA-80063/4CF ___ Panel			
3	136.0	3	Commscope NHH-85B-R2B Panel			
4		3	Antel BXA-171063-8BF-EDIN-2 Panel			
5	127.0	3	RFS APXVSP18-C-A20 - Panel	(3) T-Arms	(4) 1 1/4"	Sprint
6		3	Alcatel Lucent 1900 MHz			
7		3	Alcatel Lucent 800 MHz			
8		3	Alcatel Lucent 800 MHz Filters			
9		4	RFS ACU-A20-N RETs			
10		3	RFS APXV14-C-I20 - Panel			
11		3	Alcatel Lucent TD-RRH8x20-25			
12	118.0	3	Powerwave 7770 – Panel	(3) T-Arms w/ (6) 2" pipe steel brace	(12) 1 5/8" (6) 3/4" DC Power* (3) 7/16" Fiber* (1) 3" Conduit <sup>2</sup>	AT&T
13		1	AM-X-CD-14-65-00T- Panel			
14		18	LGP21401 TMA			
15		6	7020.00 RET			
16		3	Ericsson RRUS 11 - RRU			
17		3	Ericsson RRUS 12 - RRU			
18		18	Powerwave LGP13519 Diplexer			
19		3	Raycap DC6-48-60-18-8F ("Squid")			
20		1	AM-X-CD-16-65-00T-RET- Panel			
21		1	Cci OPA65R-BU6B - Panel			
22		2	Cci OPA65R-BU4B - Panel			
23		1	Cci HPA65R-BU6A - Panel			
24		2	SBNHH-1D65A - Panel			
25		1	800 10764 K- Panel			
26		3	B14 4478 - RRU			
27		3	4478 B5 - RRU			
28		3	RRUS 32 B30 - RRU			
29	3	4426 B66 - RRU				
30	108.0	3	Commscope VV-65A-R1 - Panel	Low Profile Platform + Support Rail w/ end connections	(14) 1 5/8" (3) 1.9" Fiber	T-Mobile
31		3	Ericsson AIR6419 B41 - Panel			
32		3	RFS APXVAALL24_43-U-NA20 - Panel			
33		3	Ericsson 4460 B25 + B66 RRU			
34		3	Ericsson 4480 B71 + B85 RRU			
38		12	TMA			
39		3	Kathrein 782 11056 TMA			

1. (1) 7/16" fiber and (2) 3/4" DC Power lines inside (2) 2" flex conduit

2. (1) 7/16" fiber and (2) 3/4" DC Power lines inside 3" Conduit

## **Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines**

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
40	94.0	3	JMA Wireless - MX08FRO665-21 - Panel	(1) Commscope- MC- PK8-DSH- Platform w/Handrail	(1) 1.6" Hybrid	Dish Wireless
41		3	Fujitsu- TA08025-B605- RRU			
42		3	Fujitsu- TA08025-B604- RRU			
43		1	Raycap- RDIDC-9181-PF-48- OVP			

All transmission lines are considered running inside of the pole shafts.

## **Analysis Results**

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	<b>69.4%</b>	<b>60.2%</b>	<b>45.7%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3094.5	30.5	48.1

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

## **Service Load Condition (Rigidity):**

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.0521 degrees under the operational wind speed as specified in the Analysis Criteria.

## **Conclusions**

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

## Standard Conditions

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

# Usage Diagram - Max Ratio 69.40% at 0.0ft

**Structure:** CT46123-A-SBA  
**Site Name:** Litchfield  
**Height:** 139.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-H  
**Exposure:** C  
**Gh:** 1.1

1/25/2023



Page: 1

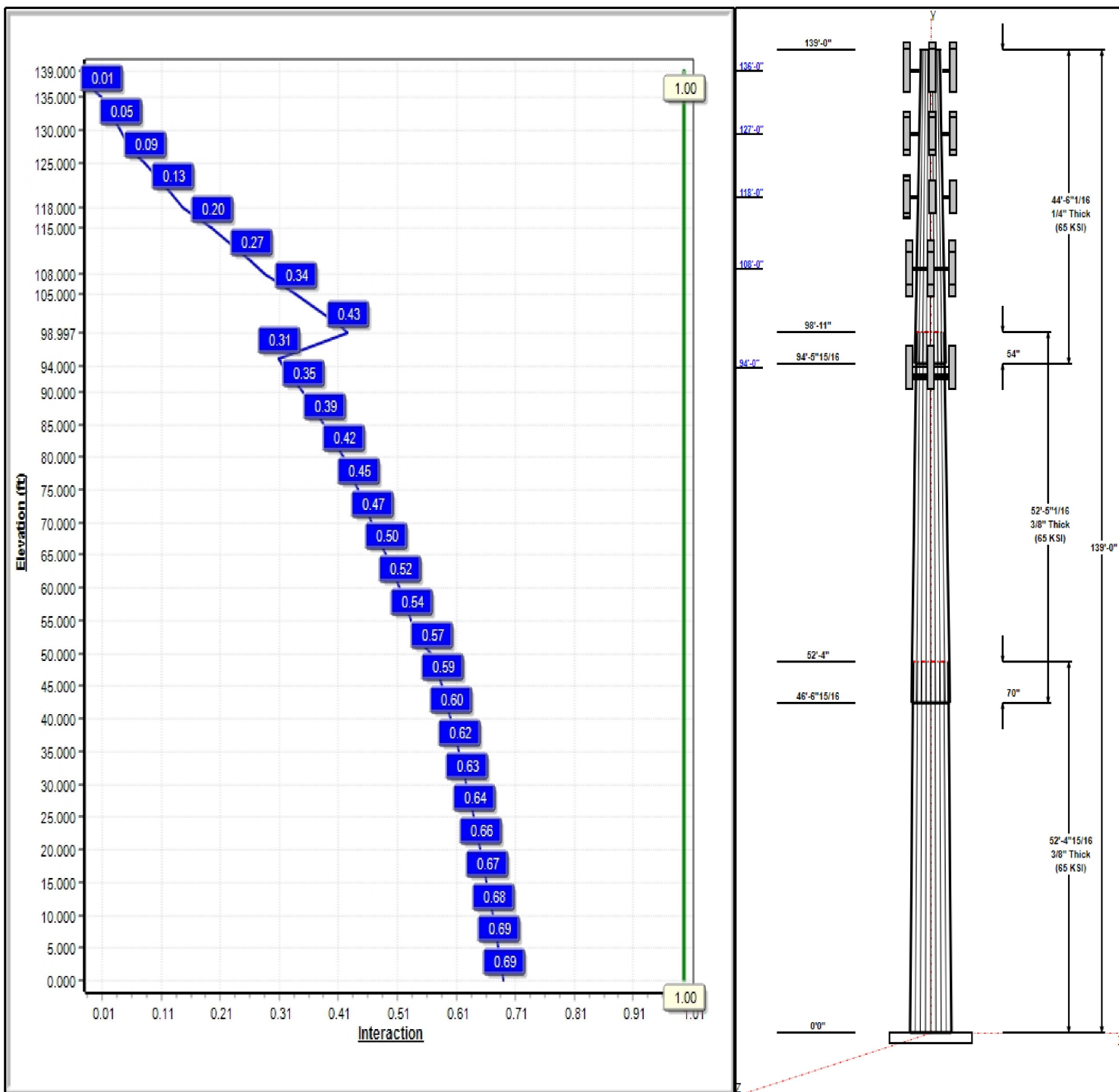
Dead Load Factor: 1.20  
Wind Load Factor: 1.00

Load Case : 1.2D + 1.0W 115 mph Wind



Iterations: 23

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# Structure: CT46123-A-SBA

**Type:** Tapered  
**Site Name:** Litchfield  
**Height:** 139.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.24460

1/25/2023

Page: 2

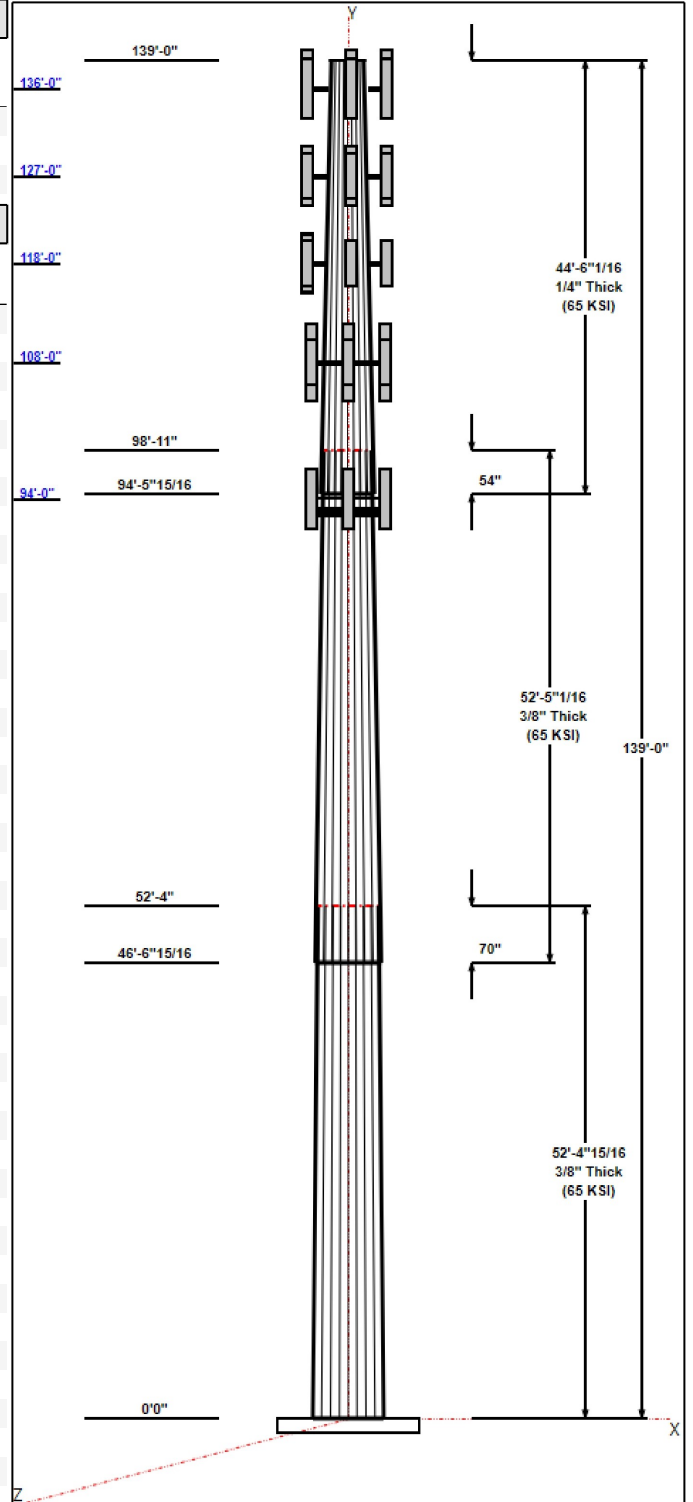


### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	52.41	40.43	53.25	0.375		0.24460	65
2	52.42	29.78	42.61	0.375	Slip	0.24460	65
3	44.50	20.50	31.39	0.250	Slip	0.24460	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
136.00	136.00	3	T-Arms w/ Ring Mount	Verizon
136.00	137.00	3	Antel	Verizon
136.00	137.00	6	LPA-80063/4CF ____	Verizon
136.00	138.00	3	E14F05P59 Diplexer	Verizon
136.00	136.00	3	NHH-85B-R2B	Verizon
127.00	127.00	3	T-Arms	Sprint Nextel
127.00	127.00	3	Collar Mounts	Sprint Nextel
127.00	127.00	3	RFS APXVSP18-C-A20	Sprint Nextel
127.00	127.00	3	Alcatel Lucent 1900 MHz	Sprint Nextel
127.00	127.00	3	Alcatel Lucent 800 MHz	Sprint Nextel
127.00	127.00	3	Alcatel Lucent 800 MHz	Sprint Nextel
127.00	127.00	4	RFS ACU-A20-N RETs	Sprint Nextel
127.00	127.00	3	RFS APXVTM14-C-I20	Sprint Nextel
127.00	127.00	3	Alcatel Lucent	Sprint Nextel
118.00	118.00	3	T-Arms	AT&T
118.00	118.00	3	Powerwave 7770	AT&T
118.00	118.00	1	KMW	AT&T
118.00	118.00	18	LGP21401 TMA	AT&T
118.00	118.00	6	Powerwave 7020.00 RET	AT&T
118.00	118.00	3	Ericsson RRU-11-RRU	AT&T
118.00	118.00	3	Ericsson RRU-12-RRU	AT&T
118.00	118.00	18	Powerwave LGP13519	AT&T
118.00	118.00	3	Raycap DC6-48-60-18-8F	AT&T
118.00	118.00	1	OPA65R-BU6B	AT&T
118.00	118.00	2	OPA65R-BU4B	AT&T
118.00	118.00	1	HPA65R-BU6A	AT&T
118.00	118.00	2	SBNHH-1D65A	AT&T
118.00	118.00	1	800 10764 K	AT&T
118.00	118.00	3	RRUS 4478 B14	AT&T
118.00	118.00	3	RRUS 4478 B5	AT&T
118.00	118.00	3	RRUS 32 B30	AT&T
118.00	118.00	3	4426 B66	AT&T
118.00	118.00	2	Steel Brace	AT&T
118.00	118.00	1	KMW	AT&T
108.00	108.00	3	VV-65A-R1	T-Mobile
108.00	108.00	3	AIR 6419 B77G	T-Mobile
108.00	108.00	3	APXVAALL24_43-U-NA20	T-Mobile
108.00	108.00	3	4460 Radio	T-Mobile
108.00	108.00	3	4480 Radio	T-Mobile
108.00	108.00	1	support rail	T-Mobile
108.00	108.00	1	Low Profile Platform	T-Mobile
108.00	108.00	12	TMA	T-Mobile
108.00	108.00	3	Kathrein 782 11056-Bias-T	T-Mobile
94.00	94.00	3	MX08FRO665-21	Dish Wireless
94.00	94.00	1	MC-PK8-DSH	Dish Wireless
94.00	94.00	3	TA08025-B605	Dish Wireless



**Structure: CT46123-A-SBA**

**Type:** Tapered  
**Site Name:** Litchfield  
**Height:** 139.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.24460

1/25/2023

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94.00	94.00	3	TA08025-B604	Dish Wireless
94.00	94.00	1	RDIDC-9181-PF-48	Dish Wireless

**Linear Appurtenances**

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	136.00	Inside	1 5/8" Coax	Verizon
0.00	127.00	Inside	1 1/4" Coax	Sprint Nextel
0.00	118.00	Inside	1 5/8" Coax	AT&T
0.00	118.00	Inside	2" Conduit	AT&T
0.00	118.00	Inside	3" Conduit	AT&T
0.00	118.00	Inside	3/4" DC	AT&T
0.00	118.00	Inside	7/16" Fiber	AT&T
0.00	108.00	Inside	1 5/8" Coax	T-Mobile
0.00	108.00	Inside	1.9" Fiber	T-Mobile
0.00	94.00	Inside	1.6" Hybrid	Dish Wireless

**Anchor Bolts**

Qty	Specifications	Grade (ksi)	Arrangement
16	2.25" 18J	75.0	Radial

**Base Plate**

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	72.0	60.0	Round

**Reactions**

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.0W 115 mph Wind	3094.5	30.5	48.1
0.9D + 1.0W 115 mph Wind	3060.6	30.5	36.1
1.2D + 1.0Di + 1.0Wi 50 mph Wind	853.6	8.6	63.5
1.2D + 1.0Ev + 1.0Eh	77.1	0.7	49.8
0.9D + 1.0Ev + 1.0Eh	76.6	0.7	37.6
1.0D + 1.0W 60 mph Wind	748.9	7.4	40.2

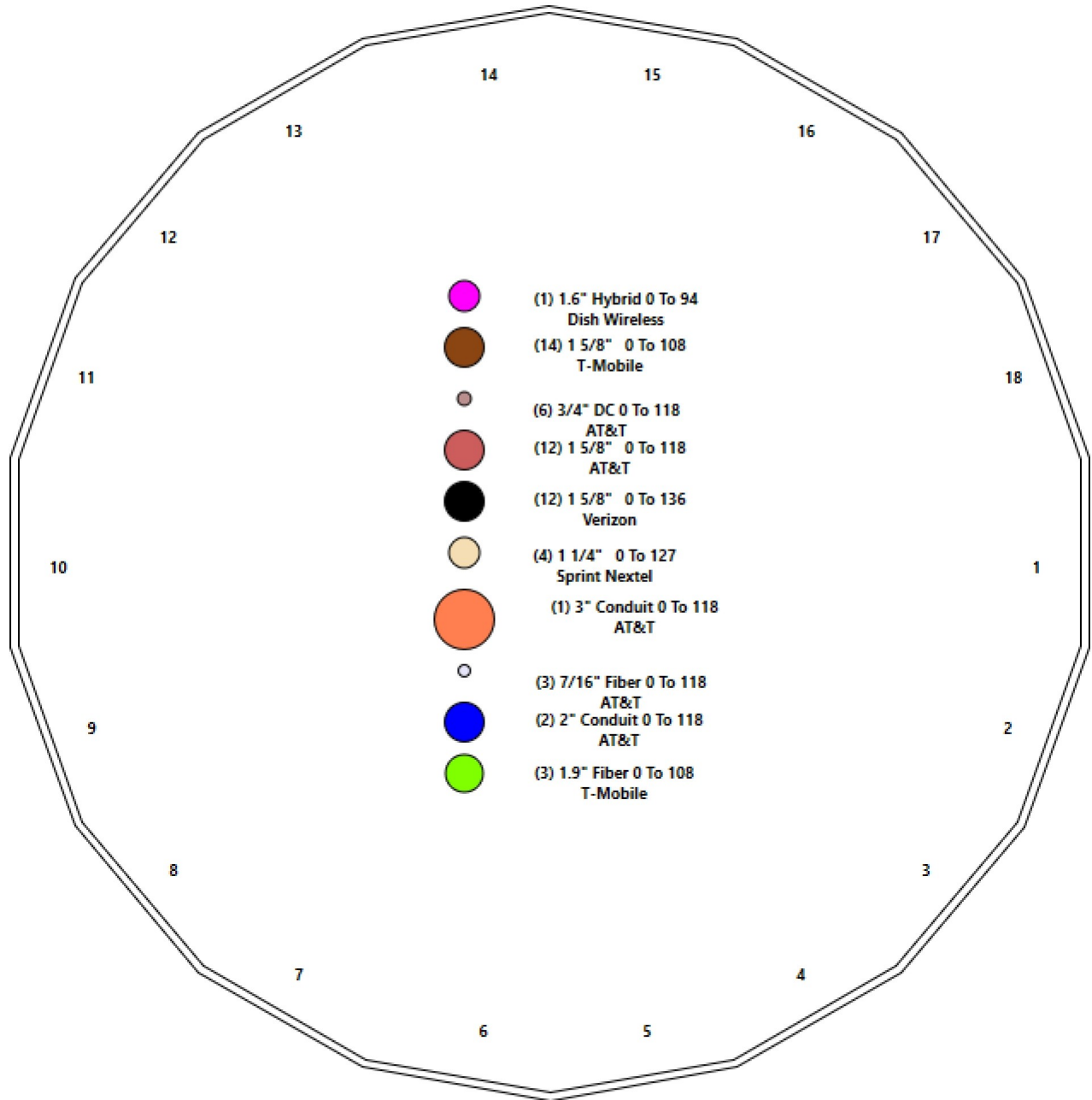
# Structure: CT46123-A-SBA - Coax Line Placement

Type: Monopole  
Site Name: Litchfield  
Height: 139.00 (ft)

1/25/2023



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## Final Analysis Summary

<b>Structure:</b> CT46123-A-SBA	<b>Code:</b> TIA-222-H	1/25/2023
<b>Site Name:</b> Litchfield	<b>Exposure:</b> C	
<b>Height:</b> 139.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.0W 115 mph Wind	30.5	0.00	48.14	0.00	0.00	3094.53
0.9D + 1.0W 115 mph Wind	30.5	0.00	36.09	0.00	0.00	3060.57
1.2D + 1.0Di + 1.0Wi 50 mph Wind	8.6	0.00	63.50	0.00	0.00	853.64
1.2D + 1.0Ev + 1.0Eh	0.7	0.00	49.77	0.00	0.00	77.06
0.9D + 1.0Ev + 1.0Eh	0.7	0.00	37.65	0.00	0.00	76.56
1.0D + 1.0W 60 mph Wind	7.4	0.00	40.16	0.00	0.00	748.85

### Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.0W 115 mph Wind	-48.14	-30.51	0.00	-3094.5	0.00	-3094.5	4169.21	1104.4	4845.24	4539.29	0.00	0.694
0.9D + 1.0W 115 mph Wind	-36.09	-30.49	0.00	-3060.5	0.00	-3060.5	4169.21	1104.4	4845.24	4539.29	0.00	0.684
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-63.50	-8.56	0.00	-853.64	0.00	-853.64	4169.21	1104.4	4845.24	4539.29	0.00	0.203
1.2D + 1.0Ev + 1.0Eh	-49.77	-0.67	0.00	-77.06	0.00	-77.06	4169.21	1104.4	4845.24	4539.29	0.00	0.029
0.9D + 1.0Ev + 1.0Eh	-37.65	-0.67	0.00	-76.56	0.00	-76.56	4169.21	1104.4	4845.24	4539.29	0.00	0.026
1.0D + 1.0W 60 mph Wind	-40.16	-7.43	0.00	-748.85	0.00	-748.85	4169.21	1104.4	4845.24	4539.29	0.00	0.175

## Base Plate Summary

<b>Structure:</b> CT46123-A-SB	<b>Code:</b> TIA-222-H	1/25/2023
<b>Site Name:</b> Litchfield	<b>Exposure:</b> C	
<b>Height:</b> 139.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II
		Page: 34



Reactions	Base Plate	Anchor Bolts
Original Design	<b>Yield (ksi):</b> 60.00	<b>Bolt Circle:</b> 62.00
<b>Moment (kip-ft):</b> 3021.60	<b>Width (in):</b> 72.00	<b>Number Bolts:</b> 16.00
<b>Axial (kip):</b> 26.90	<b>Style:</b> Round	<b>Bolt Type:</b> 2.25" 18J
<b>Shear (kip):</b> 29.20	<b>Polygon Sides:</b> 0.00	<b>Bolt Diameter (in):</b> 2.25
Analysis (1.2D + 1.0W)	<b>Clip Length (in):</b> 0.00	<b>Yield (ksi):</b> 75.00
<b>Moment (kip-ft):</b> 3094.53	<b>Effective Len (in):</b> 14.31	<b>Ultimate (ksi):</b> 100.00
<b>Axial (kip):</b> 48.14	<b>Moment (kip-in):</b> 668.26	<b>Arrangement:</b> Radial
<b>Shear (kip):</b> 30.51	<b>Allow Stress (ksi):</b> 81.00	<b>Cluster Dist (in):</b> 0.00
	<b>Applied Stress (ksi):</b> 37.26	<b>Start Angle (deg):</b> 0.00
	<b>Stress Ratio:</b> 0.46	<b>Compression</b>
		<b>Force (kip):</b> 152.74
		<b>Allowable (kip):</b> 268.39
		<b>Ratio:</b> 0.57
		<b>Tension</b>
		<b>Force (kip):</b> 146.73
		<b>Allowable (kip):</b> 243.75
		<b>Ratio:</b> 0.60

# Exhibit E

## **Mount Analysis**



January 23, 2023

Sherri Knapik  
SBA Network Services, LLC.  
134 Flanders Road, Suite 125  
Westborough, MA 01581  
(508) 251-0720 x 3805

MTS Engineering, P.L.L.C.  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630  
towersupport@btgrp.com

**Subject:** **Appurtenance Mount Analysis Report**

**Carrier Designation:** **Dish Wireless Co-Locate**  
**Site Number:** BOHVN00202A  
**Site Name:** N/A

**SBA Network Services Designation:** **Site Number:** CT46123-A  
**Site Name:** Litchfield  
**Application Number:** 169201, v1

**Engineering Firm Designation:** **Project Number:** 149545.004.01

**Site Data:** **383 Torrington Rd, Litchfield, CT, 06759, Litchfield County**  
**Latitude 41.76627°, Longitude -73.17852°**  
**Monopole**  
**8 ft. Platform Mount**

Dear Ms. Knapik,

We are pleased to submit this “**Appurtenance Mount Analysis Report**” to determine the structural integrity of the antenna mount on the above-mentioned structure.

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

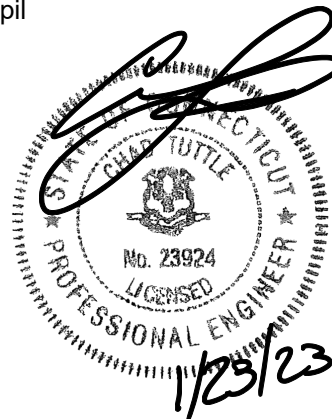
Proposed Equipment	<b>Sufficient Capacity</b>
Note: See Table 1 for the final loading configuration	<b>(Passing at 43.8%)</b>

This analysis utilizes an ultimate 3-second gust wind speed of 115 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

We appreciate the opportunity of providing our continuing professional services to you and *SBA Network Services, LLC.* If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by: Joseph Variamparmpil

Respectfully submitted by: MTS Engineering, P.L.L.C.  
COA: BER:2386985 Expires: 3/31/2023



Chad E. Tuttle, P.E.

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RISA-3D Output

### 7) APPENDIX B

Additional Calculations

## 1) INTRODUCTION

The mount consists of Commscope Platform mounts (Part #MC-PK8-DSH) at 94ft., attached to monopole at 383 Torrington Rd, Litchfield, CT, 06759, Litchfield County. The proposed antenna loading information was obtained from SBA Network Services, LLC. All information provided to MTS Engineering, P.L.L.C. was assumed accurate and complete.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this mount in accordance with the ANSI/TIA-222-H-2017 Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures using a 3-second gust wind speed of 115 mph with no ice and 50 mph with 1 inch escalated ice thickness. Exposure Category C and Risk Category II were used in this analysis. In addition, the platform mount has been analyzed for various live loading conditions consisting of a 250-lb man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust of 30 mph. The mount was analyzed under 30° increments in the wind direction. The analyzed loading is detailed in Table 1.

**Table 1 – Proposed Equipment Information**

Loading	RAD Center Elev. (ft.)	Position	Qty.	Description	Note
Proposed	94	1	3	JMA Wireless MX08FRO665-21	1
			3	Fujitsu TA08025-B605	2
			3	Fujitsu TA08025-B604	
		--	1	Raycap RDIDC-9181-PF-48	3

Note:

- (1) Proposed Antenna to be installed on the Mount Pipe.
- (2) Proposed Equipment to be installed directly behind the Antenna.
- (3) Proposed Equipment to be installed on the Mount.

**Table 2 - Documents Provided**

Documents	Remarks	Reference	Source
SBA Application	Proposed Loading	Date: 08/11/2021	SBA Network Services, LLC.
RFDS		Date: 07/23/2021	

## 3) ANALYSIS PROCEDURE

### 3.1) Analysis Method

RISA-3D (Version 19.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses and deflections for various loading cases. Selected output from the analysis is included in Appendix A.

Manufacturers drawing were used to create the model.

### 3.2) Assumptions

1. The mount was built in accordance with the manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. The configuration of antennas and other appurtenances are as specified in Table 1.
4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.

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

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

#### 4) ANALYSIS RESULTS

**Table 3 – Mount Component Stresses vs. Capacity**

Notes	Component	Elevation (ft.)	% Capacity	Pass / Fail
-	Main Horizontals	94	6.8	Pass
-	Support Rails	94	9.8	Pass
-	Support Tubes	94	43.8	Pass
-	Support Channels	94	32.7	Pass
-	Support Angles	94	28.7	Pass
-	Mount Pipes	94	11.3	Pass
-	Connection Plates	94	19.5	Pass
-	Connection Angles	94	15.8	Pass

#### 5) RECOMMENDATIONS

The Commscope Platform mounts Part #MC-PK8-DSH has sufficient capacity to carry the proposed loads and is in compliance with the ANSI/TIA-222-H standard for the proposed loading. (Refer to the RISA output for the specific members).

## APPENDIX B

(Additional Calculations)



PROJECT	<b>149545.003.01 - Litchfield, CT</b>	<b>KSC</b>
SUBJECT	<b>Platform Mount Analysis</b>	
DATE	<b>01/23/23</b>	



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

Tower Type	:	Monopole	
Ground Elevation	$z_s$	: 1122 ft	[ASCE7 Hazard Tool]
Tower Height	:	139.00 ft	
Mount Elevation	:	94.00 ft	
Antenna Elevation	:	94.00 ft	
Crest Height	:	0 ft	
Risk Category	:	II	[Table 2-1 ]
Exposure Category	:	C	[Sec. 2.6.5.1.2]
Topography Category	:	1.00	[Sec. 2.6.6.2]
Wind Velocity	V	: 115 mph	[ASCE7 Hazard Tool]
Ice wind Velocity	$V_i$	: 50 mph	[ASCE7 Hazard Tool]
Service Velocity	$V_s$	: 30 mph	[ASCE7 Hazard Tool]
Base Ice thickness	$t_i$	: 1.00 in	[ASCE7 Hazard Tool]
Seismic Design Cat.	:	B	[ASCE7 Hazard Tool]
	$S_S$	: 0.18	
	$S_1$	: 0.05	
	$S_{DS}$	: 0.19	
	$S_{D1}$	: 0.09	
Gust Factor	$G_h$	: 1.00	[Sec. 16.6]
Pressure Coefficient	$K_z$	: 1.25	[Sec. 2.6.5.2]
Topography Facto	$K_{zt}$	: 1.00	[Sec. 2.6.6]
Elevation Factor	$K_e$	: 0.96	[Sec. 2.6.8]
Directionality Factor	$K_d$	: 0.95	[Sec. 16.6]
Shielding Factor	$K_a$	: 0.90	[Sec. 16.6]
Design Ice Thickness	$t_{iz}$	: 1.11 in	[Sec. 2.6.10]
Importance Factor	$I_e$	: 1	[Table 2-3 ]
Response Coefficient	$C_s$	: 0.094	[Sec. 2.7.7.1]
Amplification	$A_s$	: 1.705036	[Sec. 16.7]
	$q_z$	: 38.58 psf	

PROJECT	<b>149545.003.01 - Litchfield, CT</b>	<b>KSC</b>
SUBJECT	<b>Platform Mount Analysis</b>	
DATE	<b>01/23/23</b>	



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

**B+T GRP**

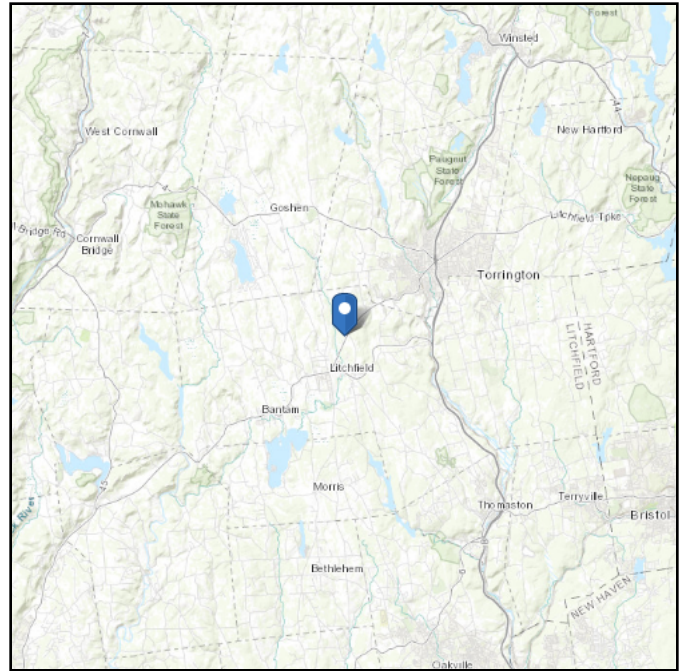
Manufacturer	Model	Qty	Height (in <sup>2</sup> )	Width (in <sup>2</sup> )	Depth (in <sup>2</sup> )	Weight (lbs)	C <sub>a</sub> A <sub>a</sub> (N) (ft <sup>2</sup> )	C <sub>a</sub> A <sub>a</sub> (T) (ft <sup>2</sup> )	C <sub>a</sub> A <sub>a</sub> (N) Ice (ft <sup>2</sup> )	C <sub>a</sub> A <sub>a</sub> (T) Ice (ft <sup>2</sup> )	F <sub>A</sub> (N) (k)	F <sub>A</sub> (T) (k)	F <sub>A</sub> (N) Ice (k)	F <sub>A</sub> (T) Ice (k)	
JMA Wireless	MX08FRO665-21	0.5	72.0	20.0	8.0	82.5	4.01	1.61	4.53	2.06	0.15	0.06	0.03	0.02	
JMA Wireless	MX08FRO665-21	0.5					4.01	1.61	4.53	2.06	0.15	0.06	0.03	0.02	
Fujitsu	TA08025-B605	1	15.8	15.0	9.1	75.0	1.96	1.19	2.57	1.69	0.07	0.04	0.01	0.01	
Fujitsu	TA08025-B604	1	15.8	15.0	7.9	63.9	1.96	1.03	2.57	1.51	0.07	0.04	0.01	0.01	
RAYCAP	RDIDC-9181-PF-48	1	16.6	14.6	8.2	21.9	2.01	1.13	2.63	1.62	0.07	0.04	0.01	0.01	
JMA Wireless	MX08FRO665-21	0.5	72.0	20.0	8.0	82.5	4.01	1.61	4.53	2.06	0.15	0.06	0.03	0.02	
JMA Wireless	MX08FRO665-21	0.5					4.01	1.61	4.53	2.06	0.15	0.06	0.03	0.02	
Fujitsu	TA08025-B605	1	15.8	15.0	9.1	75.0	1.96	1.19	2.57	1.69	0.07	0.04	0.01	0.01	
Fujitsu	TA08025-B604	1	15.8	15.0	7.9	63.9	1.96	1.03	2.57	1.51	0.07	0.04	0.01	0.01	
JMA Wireless	MX08FRO665-21	0.5	72.0	20.0	8.0	82.5	4.01	1.61	4.53	2.06	0.15	0.06	0.03	0.02	
JMA Wireless	MX08FRO665-21	0.5					4.01	1.61	4.53	2.06	0.15	0.06	0.03	0.02	
Fujitsu	TA08025-B605	1	15.8	15.0	9.1	75.0	1.96	1.19	2.57	1.69	0.07	0.04	0.01	0.01	
Fujitsu	TA08025-B604	1	15.8	15.0	7.9	63.9	1.96	1.03	2.57	1.51	0.07	0.04	0.01	0.01	

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Latitude:** 41.76627  
**Longitude:** -73.17852  
**Elevation:** 1122.85 ft (NAVD 88)



## Wind

### Results:

Wind Speed	115 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph

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

Date Accessed: Mon Jan 23 2023

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

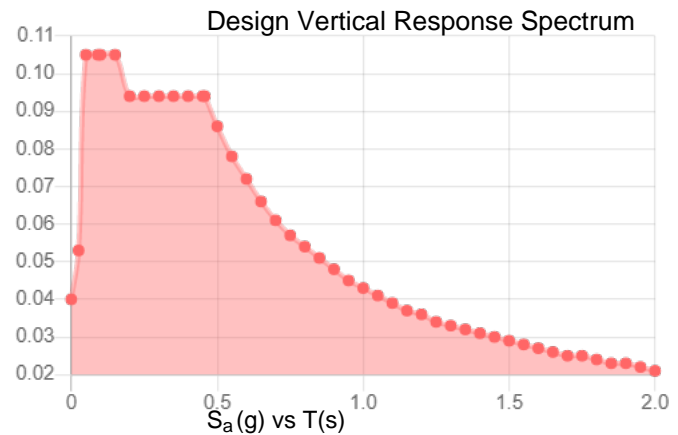
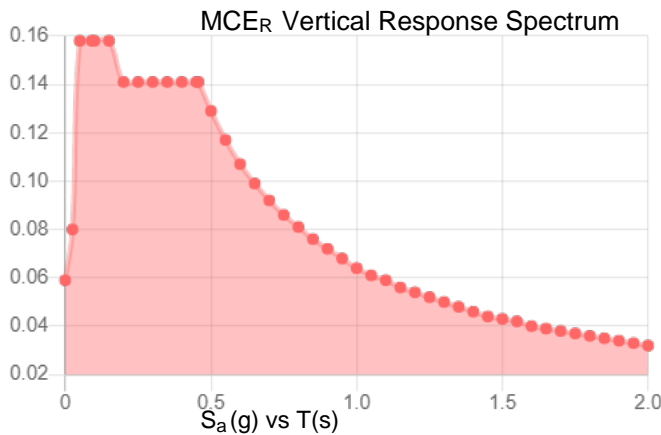
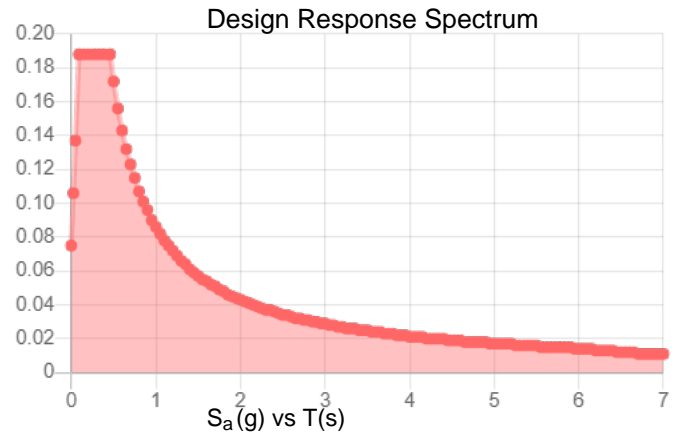
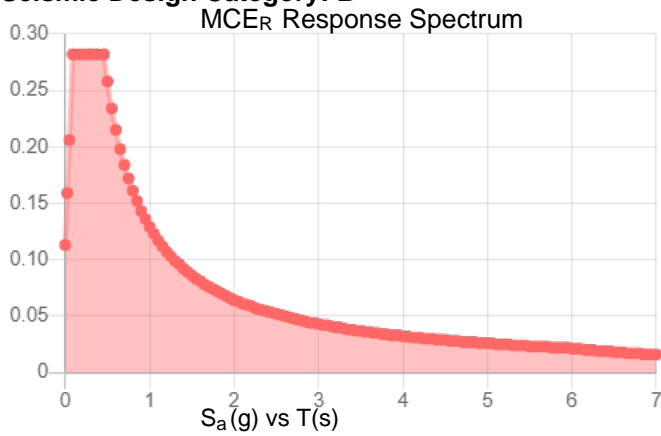
Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

**Site Soil Class:**

**Results:**

$S_s$ :	0.176	$S_{D1}$ :	0.086
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.094
$F_v$ :	2.4	PGA <sub>M</sub> :	0.151
$S_{MS}$ :	0.282	$F_{PGA}$ :	1.6
$S_{M1}$ :	0.129	$I_e$ :	1
$S_{DS}$ :	0.188	$C_v$ :	0.7

**Seismic Design Category: B**



**Data Accessed:** Mon Jan 23 2023

**Date Source:**

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

## Ice

---

**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 5 F  
Gust Speed 50 mph

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

**Date Accessed:** Mon Jan 23 2023

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

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

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# Exhibit F

## **Power Density/RF Emissions Report**



# Radio Frequency Emissions Analysis Report



**Site ID: BOHVN00202A**

SBA Litchfield  
383 Torrington Rd  
Litchfield, CT 06759

**January 5, 2023**

**Fox Hill Telecom Project Number: 222130**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>15.52 %</b>

January 5, 2023

Dish Wireless  
5701 South Santa Fe Drive  
Littleton, CO 80120

### Emissions Analysis for Site: **BOHVN00202A – SBA Litchfield**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **383 Torrington Rd, Litchfield, CT**, for the purpose of determining whether the emissions from the Proposed Dish radio and antenna installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the 600 MHz band is approximately  $400 \mu\text{W}/\text{cm}^2$ . The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS / AWS-4) bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.





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

Additional details can be found in FCC OET 65.



## CALCULATIONS

Calculations were performed for the proposed upgrades to the Dish Wireless antenna facility located at **383 Torrington Rd, Litchfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

In OET-65, plane wave power densities in the Far Field of an antenna are calculated by considering antenna gain and reflective waves that would contribute to exposure.

Since the radiation pattern of an antenna has developed in the **Far Field** region the power gain in specific directions needs to be considered in exposure predictions to yield an Effective Radiated Power (ERP) in each specific direction from the antenna. Also, since the vertical radiation pattern of the antenna is considered, the exposure calculations would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels. To determine a worst-case scenario at each point along the calculation radials, each point was calculated using the antenna gain value at each angle of incident and compared against the result using an isotropic radiator at the antenna height with the greater of the two used to yield the more pessimistic far field value for each point along the calculation radial.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential 1.6 times increase in power density in calculating far field power density values.

With these factors Considered, the worst case **Far Field prediction model** utilized in this analysis is determined by the following equation:

Equation 9 per FCC OET65 for Far Field Modeling

$$S = \frac{33.4 \text{ ERP}}{R^2}$$

S = Power Density (in  $\mu\text{w}/\text{cm}^2$ )

ERP = Effective Radiated Power from antenna (watts)

R = Distance from the antenna (meters)

Predicted far field power density values for all carriers identified in this report were calculated 6 feet above the ground level and are displayed as a percentage of the applicable FCC standards. All emissions values for other carriers were calculated using the same Far Field model outlined above, using industry standard radio configurations and frequency band selection based upon available licenses in this geographic area for emissions contribution estimates.



For each Dish sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
5G	n71 (600 MHz)	4	61.5
5G	n70 (AWS-4 / 1995-2020)	4	40
5G	n66 (AWS-4 / 2180-2200)	4	40

*Table 1: Channel Data Table*



The following **Dish** antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz (n71) frequency band and the 2100 MHz (AWS 4) frequency bands at 1995-2020 MHz (n70) and 2180-2200 MHz (n66). This is based on feedback from Dish regarding anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-21	94
B	1	JMA MX08FRO665-21	94
C	1	JMA MX08FRO665-21	94

*Table 2: Antenna Data*

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

## RESULTS

Per the calculations completed for the proposed **Dish** configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	4.38
Sector A Composite MPE%							<b>4.38</b>
Antenna B1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	4.38
Sector B Composite MPE%							<b>4.38</b>
Antenna C1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	4.38
Sector C Composite MPE%							<b>4.38</b>

*Table 3: Dish Emissions Levels*

The Following table (*Table 4*) shows all additional carriers on site and their emissions contribution estimates, along with the newly calculated **Dish** far field emissions contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site emissions values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each **Dish** Sector as well as the composite emissions value for the site.

<b>Site Composite MPE%</b>	
<b>Carrier</b>	<b>MPE%</b>
Dish – Max Per Sector Value	<b>4.38 %</b>
Verizon Wireless	2.40 %
Sprint	1.58 %
AT&T	4.46 %
T-Mobile	2.70 %
<b>Site Total MPE %:</b>	<b>15.52 %</b>

*Table 4: All Carrier MPE Contributions*

Dish Sector A Total:	4.38 %
Dish Sector B Total:	4.38 %
Dish Sector C Total:	4.38 %
Site Total:	15.52 %

*Table 5: Site MPE Summary*



Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated **Dish** sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

Dish _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Dish n71 (600 MHz) 5G	4	858.77	94	11.60	n71 (600 MHz)	400	2.90%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,648.39	94	7.40	n70 (AWS-4 / 1995-2020)	1000	0.74%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,849.52	94	7.40	n66 (AWS-4 / 2180-2200)	1000	0.74%
						<b>Total:</b>	<b>4.38 %</b>

Table 6: Dish Maximum Sector MPE Power Values

## Summary

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

The anticipated maximum composite contributions from the Dish facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Dish Sector	Power Density Value (%)
Sector A:	4.38 %
Sector B:	4.38 %
Sector C:	4.38 %
Dish Maximum Total (per sector):	4.38 %
Site Total:	15.52 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite emissions value for this site, assuming all carriers present, is **15.52 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

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



Scott Heffernan  
Principal RF Engineer  
**Fox Hill Telecom, Inc**  
Worcester, MA 01609  
(978)660-3998



# Exhibit G

## **Letter of Authorization**

## SBA Letter of Authorization

CT - CONNECTICUT SITING COUNCIL

Melanie A. Bachman

Executive Director

Connecticut Siting Council

10 Franklin Square

New Britain, CT 06051

Re: Tower Share Application

SBA COMMUNICATIONS CORPORATION hereby authorizes DISH Wireless LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CONNECTICUT SITING COUNCIL for existing wireless communications towers.

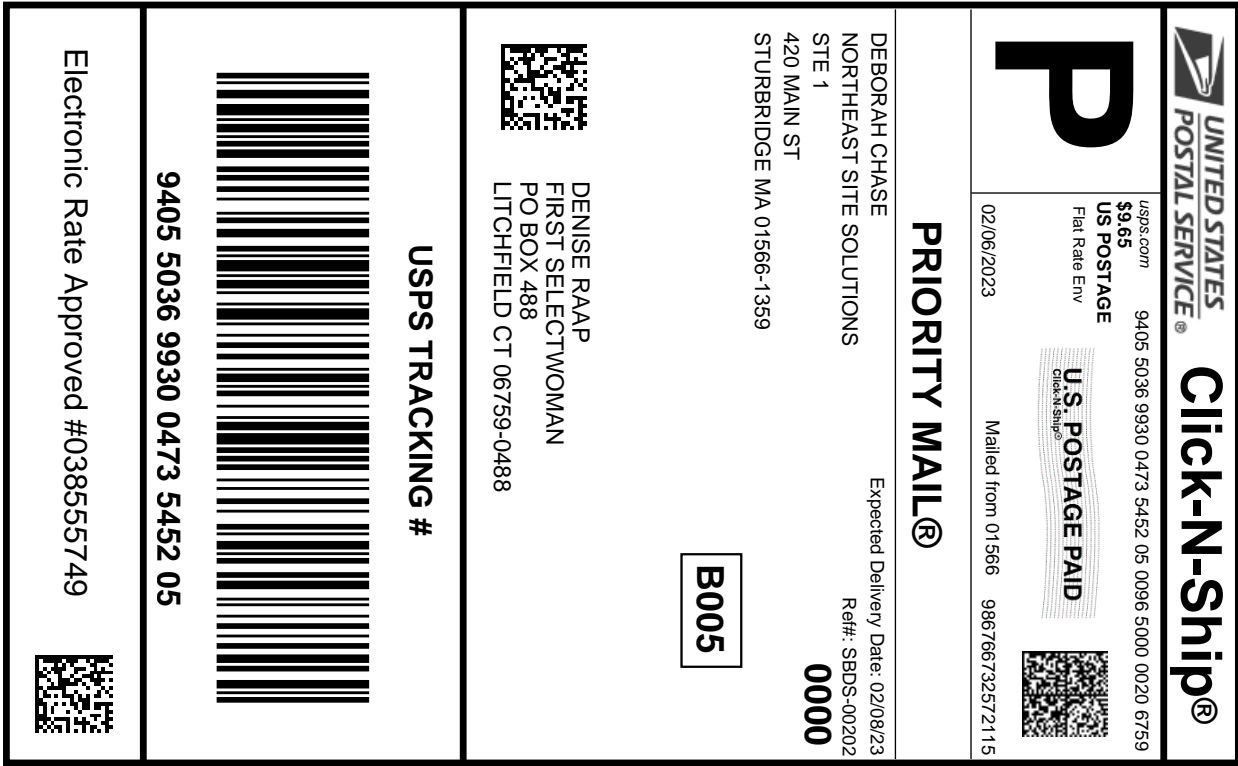
SBA COMMUNICATIONS CORPORATION

134 Flanders Road, Suite 125

Westboro, MA 01581

# Exhibit H

## Recipient Mailings



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### Instructions

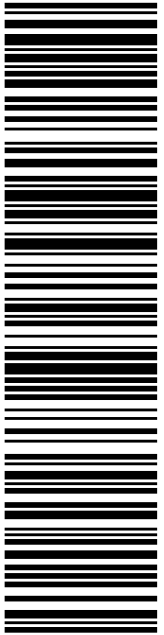
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Ship Date:	02/06/2023
Expected Delivery Date:	02/08/2023
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Total:	<b>\$9.65</b>
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Ref#:	SBDS-00202
<b>To:</b>	DENISE RAAP FIRST SELECTWOMAN PO BOX 488 LITCHFIELD CT 06759-0488
<small>* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.</small>	



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**US POSTAGE**  
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Mailed from 01566 986766732570893

**Click-N-Ship®**

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Expected Delivery Date: 02/08/23  
Ref#: SBDC-00202  
**0000**

**B005**

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

DENNIS TOBIN  
LAND USE ADMINISTRATOR  
PO BOX 488  
LITCHFIELD CT 06759-0488

Electronic Rate Approved #038555749



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



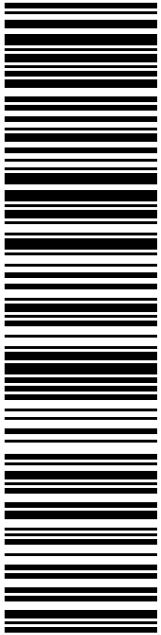

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 <b>Click-N-Ship®</b>	<div style="text-align: right; font-size: 2em; font-weight: bold;">P</div> <div style="font-size: 0.8em;">         usps.com 9405 5036 9930 0473 5452 36 0096 5000 0010 1581  <b>US POSTAGE</b>          Flat Rate Env          02/06/2023       </div> <div style="text-align: center; font-weight: bold; border: 1px solid black; padding: 2px;">         U.S. POSTAGE PAID  <small>Click-N-Ship®</small> </div> <div style="font-size: 0.8em;">         Mailed from 01566 986766732568633       </div>	<div style="text-align: center; font-weight: bold; font-size: 1.5em;">PRIORITY MAIL®</div> Expected Delivery Date: 02/07/23 Ref#: SBDS-00202 <div style="text-align: center; border: 1px solid black; padding: 5px; font-weight: bold; font-size: 1.2em;">R005</div>	<div style="text-align: center;">  </div> <p style="text-align: center;">         SBA COMMUNICATIONS CORPORATION          STE 125          13 FLANDERS RD          WESTBOROUGH MA 01581       </p>	<div style="text-align: center;">  </div> <p style="text-align: center; font-weight: bold; font-size: 1.2em;">         USPS TRACKING #  <b>9405 5036 9930 0473 5452 36</b> </p>	<p style="text-align: center; font-size: 0.9em;">Electronic Rate Approved #038555749</p> <div style="text-align: center;">  </div>
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Priority Mail® Postage:	<b>\$9.65</b>												
Total:	<b>\$9.65</b>												

<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359	Ref#: SBDS-00202
<b>To:</b> SBA COMMUNICATIONS CORPORATION STE 125 13 FLANDERS RD WESTBOROUGH MA 01581	

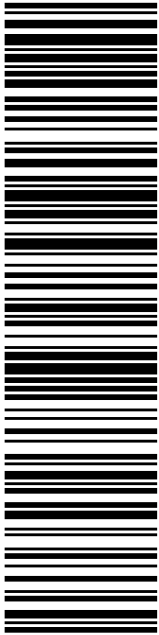
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OLD TOLL GATE HILL LLC  
387 TORRINGTON RD  
LITCHFIELD CT 06759-2704

**USPS TRACKING #**



**9405 5036 9930 0473 5452 67**

**P**

USPS.com 9405 5036 9930 0473 5452 67 0096 5000 0020 6759  
**US POSTAGE \$9.65**  
 Flat Rate Env  
 U.S. POSTAGE PAID  
 Click-N-Ship®  
 Mailed from 01566 986766732565049  
 02/06/2023


**PRIORITY MAIL®**

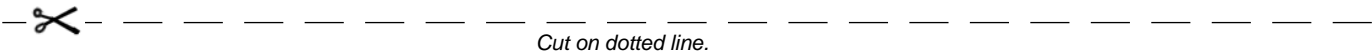
DEBORAH CHASE  
NORTHEAST SITE SOLUTIONS  
STE 1  
420 MAIN ST  
STURBRIDGE MA 01566-1359

Expected Delivery Date: 02/08/23  
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Ship Date: 02/06/2023	
Expected Delivery Date: 02/08/2023	

**From:** DEBORAH CHASE      Ref#: SBDS-00202  
 NORTHEAST SITE SOLUTIONS  
 STE 1  
 420 MAIN ST  
 STURBRIDGE MA 01566-1359

**To:** OLD TOLL GATE HILL LLC  
 387 TORRINGTON RD  
 LITCHFIELD CT 06759-2704

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BOHUN 02024 SBA DISH



LINCOLN MALL  
560 LINCOLN ST STE 8  
WORCESTER, MA 01605-1925  
(800)275-8777

02/06/2023

03:42 PM

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Product Qty Unit Price  
Price  
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Prepaid Mail 1 \$0.00

Litchfield, CT 06759

Weight: 0 lb 14.20 oz

Acceptance Date:

Mon 02/06/2023

Tracking #:

9405 5036 9930 0473 5452 12

Prepaid Mail 1 \$0.00

Litchfield, CT 06759

Weight: 0 lb 14.10 oz

Acceptance Date:

Mon 02/06/2023

Tracking #:

9405 5036 9930 0473 5452 05

Prepaid Mail 1 \$0.00

Litchfield, CT 06759

Weight: 0 lb 14.20 oz

Acceptance Date:

Mon 02/06/2023

Tracking #:

9405 5036 9930 0473 5452 67

Prepaid Mail 1 \$0.00

Westborough, MA 01581

Weight: 0 lb 2.00 oz

Acceptance Date:

Mon 02/06/2023

Tracking #:

9405 5036 9930 0473 5452 36

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Grand Total: \$0.00  
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