



Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
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
48 Westchester Road, Colchester CT 06415
Latitude: 41.57132711
Longitude: -72.30232222
Site #: CT02218-S_BOBOS00889A_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 48 Westchester Road, Colchester, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 147-foot level of the existing 180-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 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 26, 2023, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Town of Colchester, Approval No. SDP#99-235, received on November 4, 1999. 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 The Honorable Andreas Bisbikos, First Selectman and Ariel Lago, ZEO for the Town of Colchester, as well as the tower owner and property 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 180-feet and the Dish Wireless LLC antennas will be located at a center line height of 147-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 7.09% 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 Colchester. 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 147-foot level of the existing 180-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 Colchester.

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



NSS

NORTHEAST
SITE SOLUTIONS

Turnkey Wireless Development

Attachments

Cc: The Honorable Andreas Bisbikos
Town of Colchester
127 Norwich Ave, Colchester Ct 06415

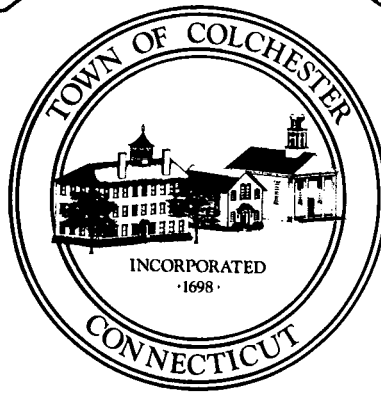
Ariel Lago, ZEO
Town of Colchester
127 Norwich Ave, Colchester Ct 06415

Margus Properties LLC– Property Owner
48 Westchester, Colchester Ct 06415

SBA - Tower Owner

Exhibit A

Original Facility Approval



Planning and Zoning

Planning Director
Town Engineer
Code Administration
Health Director
Building Official
Fire Marshal
Registered Sanitarian
Zoning Enforcement
Wetlands Enforcement

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

November 4, 1999

Ms. Esther McNany
SBA Inc.
125 Shaw Street
New London, CT 06320

RE: SDP#99-235, SBA/Omnipoint Communications, 48 Westchester Road,
Communications Tower, Site Development Plan prepared by Goodkind & O'Dea
Inc (Job#CT10125-018) dated 8/25/99 revised through 9/28/99

Dear Ms. McNany:

The above referenced site development plan was approved by the Zoning & Planning Commission at their regular meeting held November 3, 1999.

Per Section 12.10.1 of the Zoning Regulations, a bond in the amount of 25% of the total cost of site improvements must be posted prior to the endorsement of this plan and/or commencement of work. A bond estimate must be submitted to the Town Engineer for his review and approval.

If you have any questions, please call me at 537-7283.

Very truly yours,

Alicia Lathrop
Zoning Enforcement Officer

Exhibit B

Property Card



Town of Colchester, CT

Property Report

Map Block Lot

06-12/038-000

PID 3133

Building # 1

Section # 1

Account

M0428100

Property Information

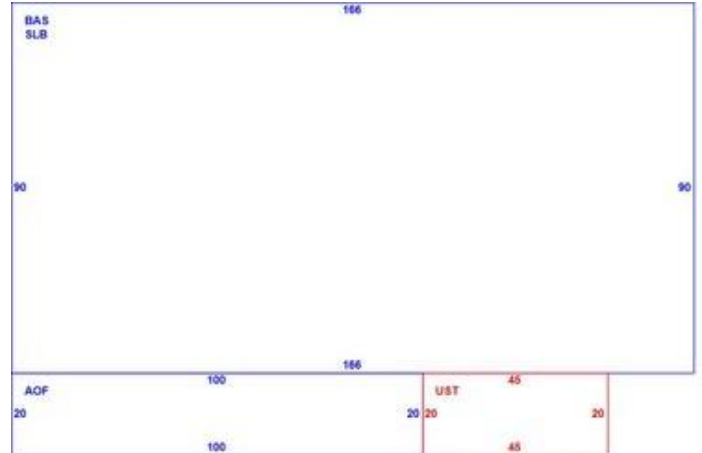
Property Location	48 WESTCHESTER RD
Owner	MARGUS PROPERTIES LLC
Co-Owner	na
Mailing Address	48 WESTCHESTER RD COLCHESTER CT 06415
Land Use	4000 Factory MDL-96
Land Class	I
Zoning Code	I
Census Tract	

Neighborhood	
Acres	22.69
Utilities	UNKNOWN
Lot Setting/Desc	UNKNOWN UNKNOWN
Additional Info	

Photo



Sketch



Primary Construction Details

Year Built	1989
Stories	1
Building Style	Pre-Eng Mfg
Building Use	Commercial
Building Condition	
Interior Floors 1	Concrete Slab
Interior Floors 2	Carpet
Total Rooms	
Basement Garages	
Occupancy	1.00
Building Grade	

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Bath Style	
Kitchen Style	
Roof Style	Gable
Roof Cover	Enam Mtl Shing
AC Type	Partial
Fireplaces	0

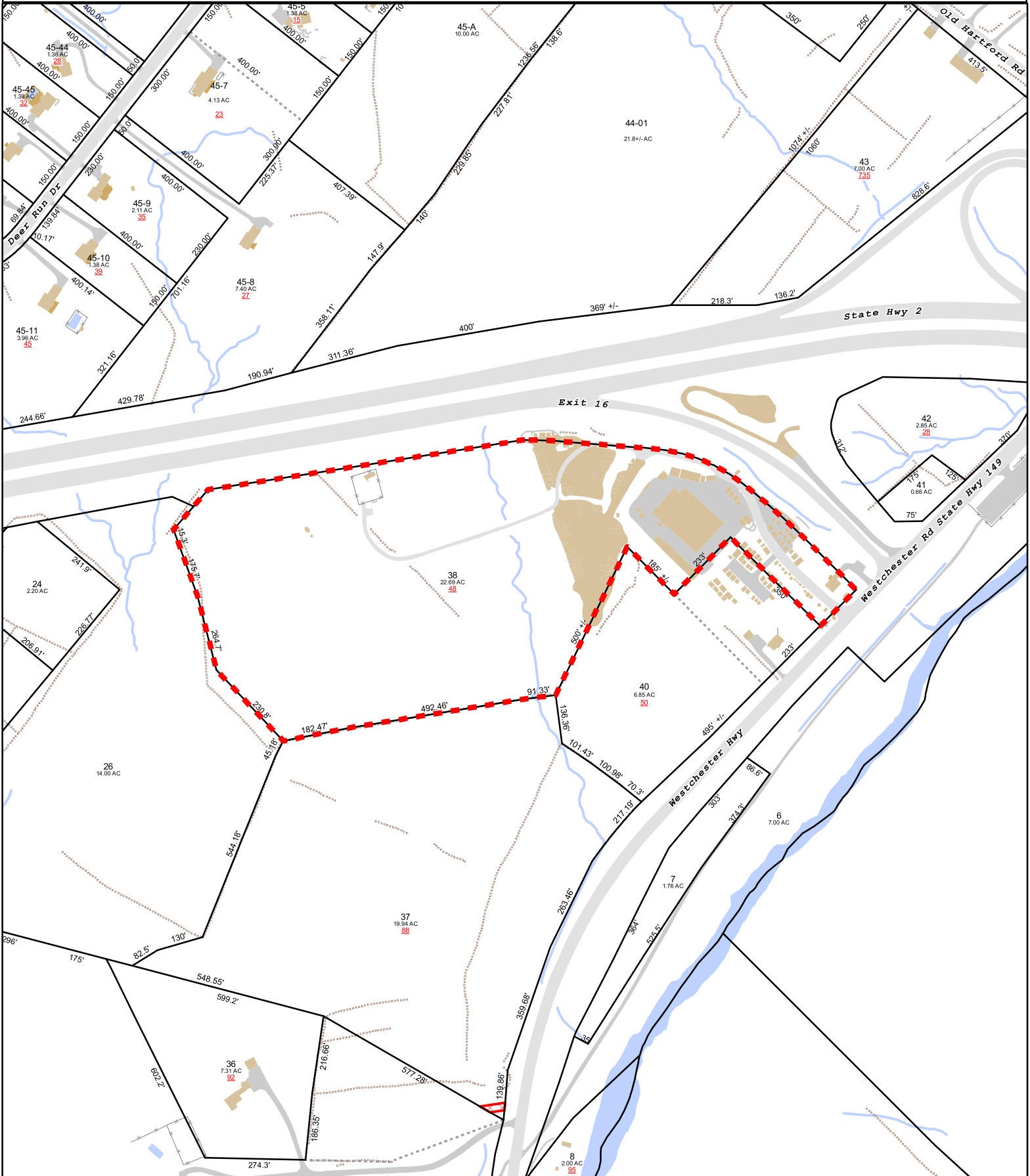
Exterior Walls	Vinyl Siding
Exterior Walls 2	NA
Interior Walls	Drywall
Interior Walls 2	NA
Heating Type	Forced Air-Duc
Heating Fuel	Gas
Sq. Ft. Basement	
Fin BSMT Quality	
Extra Kitchens	



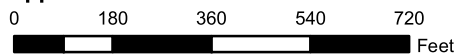
Town of Colchester, Connecticut - Assessment Parcel Map

Parcel: 06-12-038-000

Address: 48 WESTCHESTER RD



Approximate Scale: 1 inch = 350 feet



Map Produced: April 2022 / Grand List: 2021

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

Exhibit C

Construction Drawings



DISH Wireless L.L.C. SITE ID:

BOBOS00889A

DISH Wireless L.L.C. SITE ADDRESS:

**48 WESTCHESTER ROAD
COLCHESTER, CT 06415**

SBA APPROVED



THE PROJECT DEPICTED INVOLVES THE COLLECTION REMOVAL AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE TO THE EXISTING STRUCTURE. **By sroth at 5:23:25 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 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)
 - INSTALL (1) PROPOSED METER CANISTER IN EXISTING METER SOCKET
 - INSTALL (1) PROPOSED FIBER HAND HOLE

SITE INFORMATION

PROPERTY OWNER: SBA TOWERS INC
ADDRESS: 8051 CONGRESS AVENUE BOCA RATON, FL 33487

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: 251936

TOWER APP NUMBER: 168272

COUNTY: NEW LONDON

LATITUDE (NAD 83): 41° 35' 24.58" N
41.59016078

LONGITUDE (NAD 83): 72° 24' 5.28" W
-72.40146667

ZONING JURISDICTION: NEW LONDON COUNTY

ZONING DISTRICT: COMMERCIAL

PARCEL NUMBER: 06-12/038-000/TWR

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: T.B.D

TELEPHONE COMPANY: VERIZON

PROJECT DIRECTORY

APPLICANT: DISH Wireless L.L.C.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120
(303) 706-5008

TOWER OWNER: SBA COMMUNICATIIONS 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: RYAN LYNCH
RYAN.LYNCH@DISH.COM

CONST. MANAGER: JAVIER SOTO
JAVIER.SOTO@DISH.COM

RF ENGINEER: ARVIN SEBASTIAN
ARVIN.SEBASTIAN@DISH.COM



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



8051 CONGRESS AVENUE
BOCA RATON, FL 33487



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



1/26/23
MTS ENGINEERING P.L.L.C.
BER:2386985
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: SS
CHECKED BY: DAS
APPROVED BY: DAS

RFDS REV #: 0.0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	11/22/21	ISSUED FOR REVIEW
0	3/8/22	ISSUED FOR CONSTRUCTION
1	5/2/22	ISSUED FOR CONSTRUCTION
2	1/26/23	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
159105.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00889A
**48 WESTCHESTER ROAD
COLCHESTER, CT 06415**

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

SHEET INDEX

SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
LS1	SITE SURVEY
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

SITE PHOTO



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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

GENERAL NOTES

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

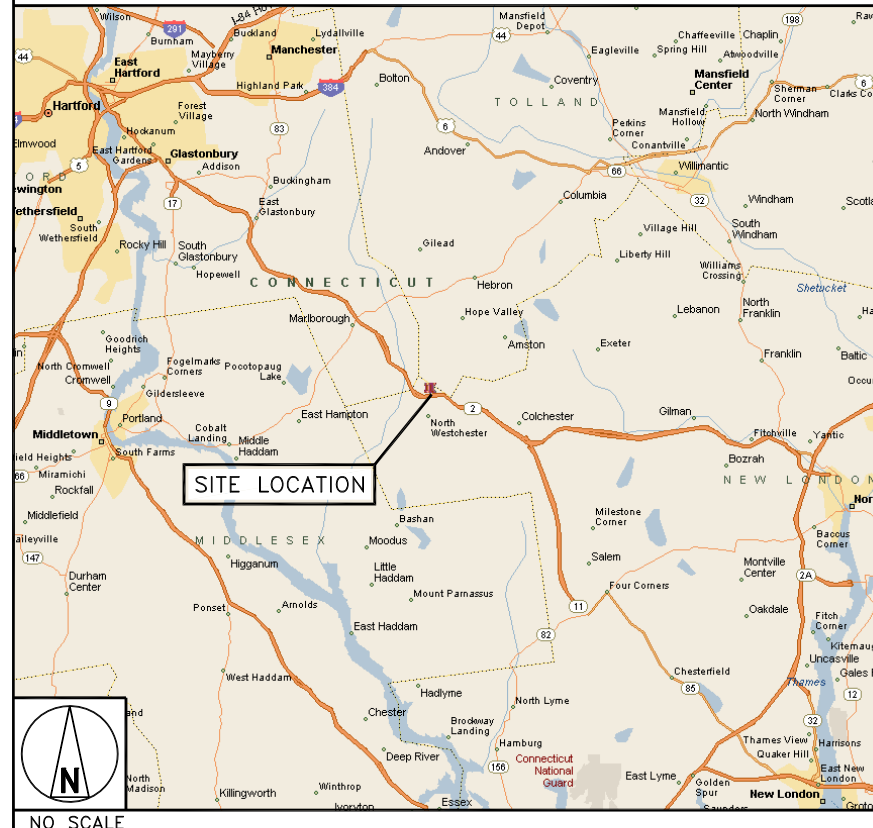
11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

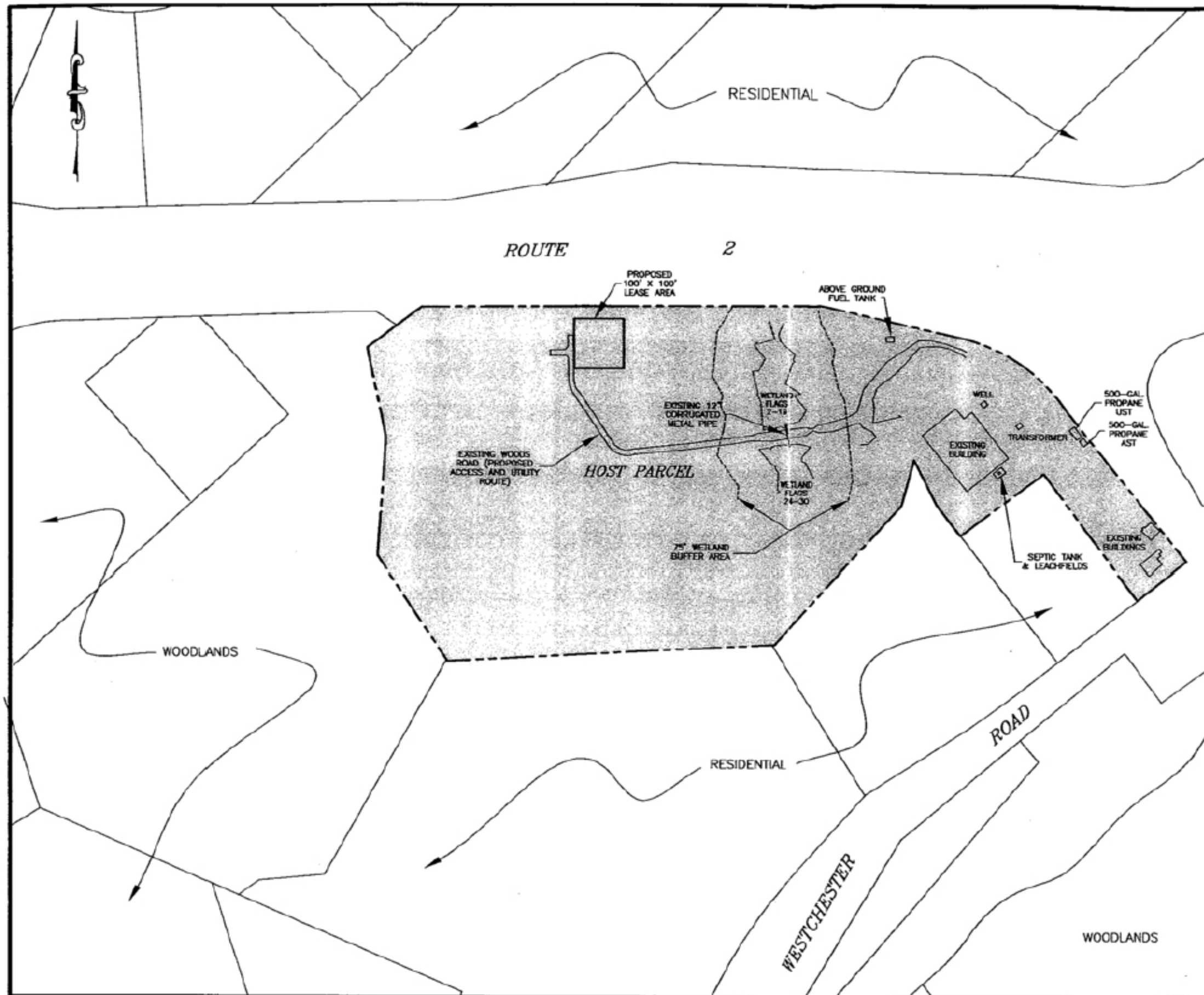
CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:
BRADLEY INTERNATIONAL AIRPORT, SCHOEPHOESTER RD, WINDSOR LOCKS, CT 06096, UNITED STATES, CONTINUE TO EAST GRANBY, HEAD NORTH TOWARD BRADLEY INTERNATIONAL AIRPORT, SLIGHT LEFT ONTO BRADLEY INTERNATIONAL AIRPORT, CONTINUE STRAIGHT, TAKE I-91 S TO CT-2 E, CONTINUE ONTO BRADLEY INTERNATIONAL AIRPORT, CONTINUE ONTO CT-20E/BRADLEY INTERNATIONAL AIRPORT, TAKE THE EXIT ONTO I-91 S TOWARD HARTFORD, USE THE LEFT LANE TO TAKE EXIT 30 TO MERGE WITH I-84 E, TAKE EXIT 55 FOR CT-2 E TOWARD NORWICH/NEW LONDON, I-84 E, CONTINUE ONTO CT-2 E DESTINATION WILL BE ON RIGHT ARIVE AT BOBOS00889A.

VICINITY MAP





NOTES:

1. THIS FIGURE WAS PREPARED FROM A COPY OF TAX MAP NUMBER 6-12 AVAILABLE AT THE TOWN OF COLCHESTER, CONNECTICUT TAX ASSESSOR'S OFFICE.
2. THIS FIGURE IS TO BE VIEWED IN CONJUNCTION WITH THE ACCOMPANYING REPORT.
3. THIS FIGURE IS INTENDED TO SHOW THE INTER-RELATIONSHIP BETWEEN THE PROPOSED LEASE SITE AND THE HOST PARCEL, TOGETHER WITH PROVIDING AN OVERVIEW OF THE FIELD NOTES TAKEN DURING THE SITE RECONNAISSANCE. IT IS IMPORTANT TO NOTE, THIS DRAWING IS NOT TO SCALE AND WAS PREPARED WITHOUT THE BENEFIT OF SURVEY DATA. AS SUCH, THIS FIGURE DOES NOT REPRESENT AN INCLUSIVE OVERVIEW OF THE HOST PARCEL AND FEATURES.

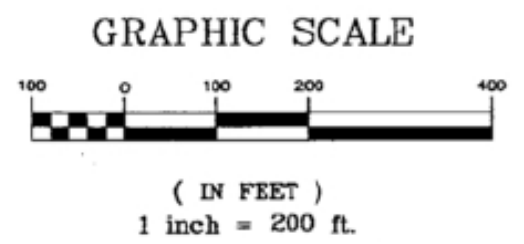



FIGURE 2
TAX MAP
WITH SITE FEATURES

SBA TOWER SITE #10125-018
COLCHESTER, CONNECTICUT

PREPARED FOR: SBA, INC. 125 SHAW STREET, SUITE 118 NEW LONDON, CONNECTICUT 06320	DATE: SEPTEMBER, 1999 SCALE: 1" = 200' PROJECT NO: 99539
---	--


JAWORSKI
GEOTECH, INC.
 150 Zachary Road
 Manchester, New Hampshire 03109 (603)647-9700

Geotechnical
 Environmental
 Construction
 Underground Tank
 & Materials Testing

99539



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



8051 CONGRESS AVENUE
BOCA RATON, FL 33487



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1/26/23
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BER:2386985
Expires 3/31/23

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DRAWN BY: SS CHECKED BY: DAS APPROVED BY: DAS

RFDS REV #: 0.0

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DISH Wireless L.L.C.
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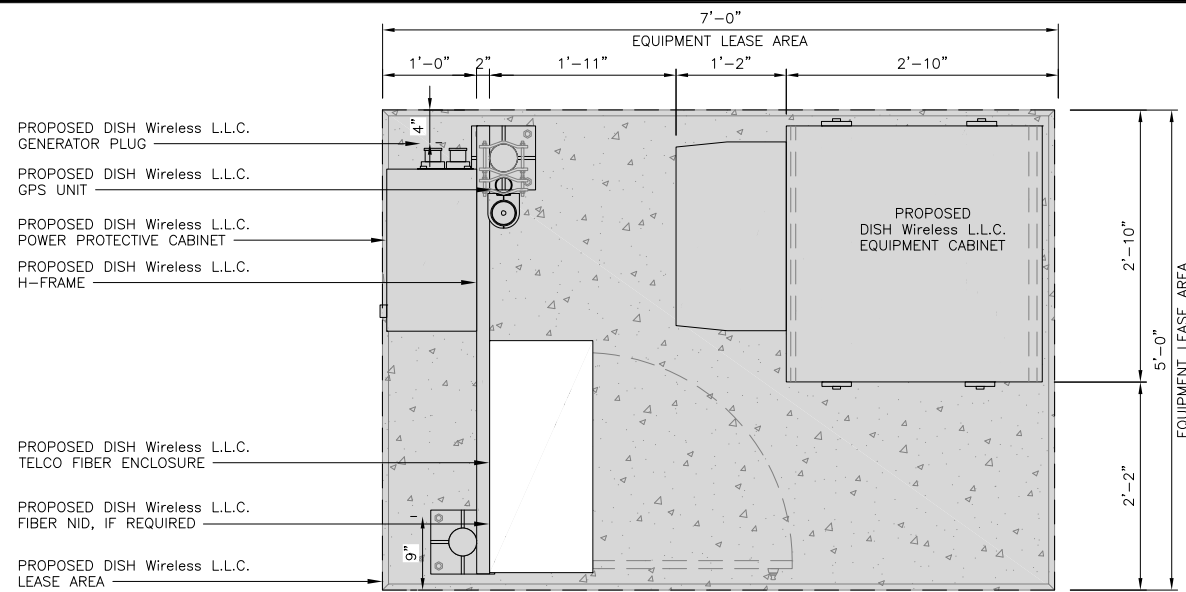
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

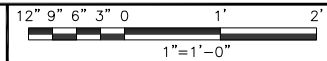
A-3

NOTES

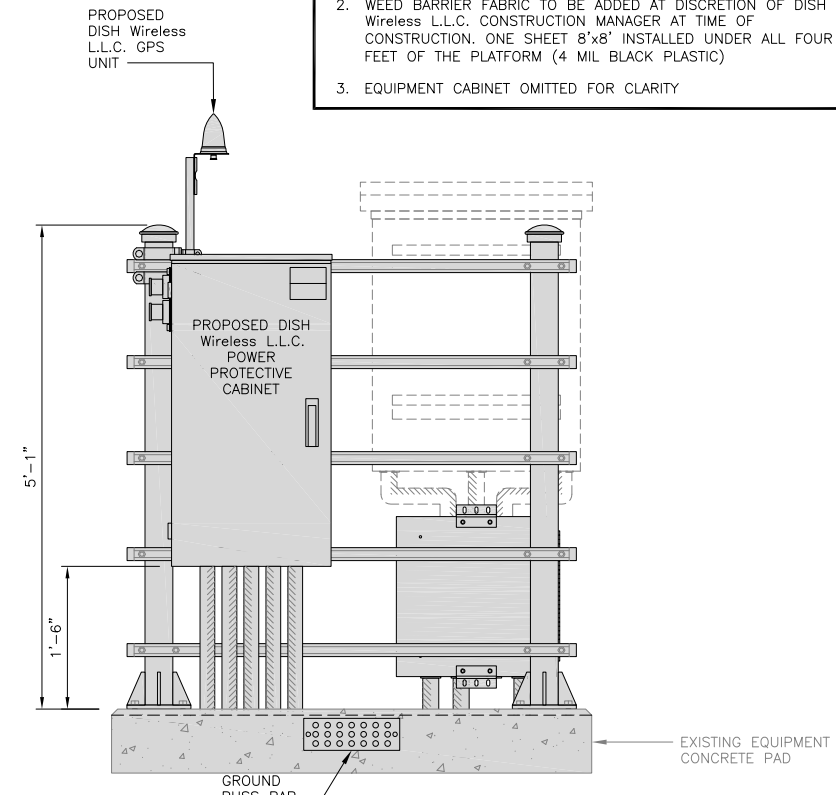
1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT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



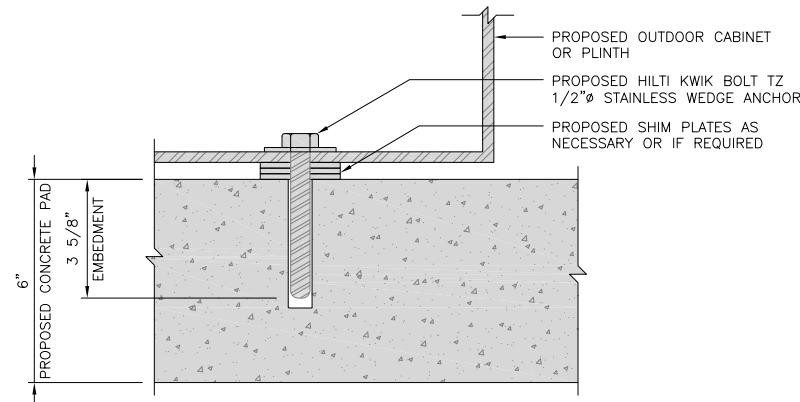
PLATFORM EQUIPMENT PLAN



1



FRONT ELEVATION

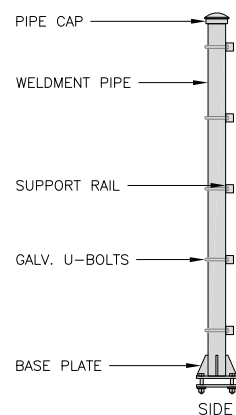


TYPICAL OUTDOOR EQUIPMENT TO CONCRETE SLAB ANCHORAGE

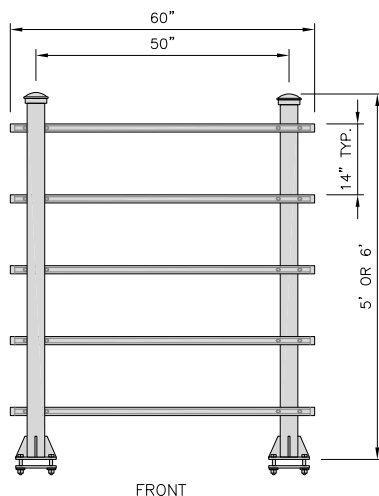
2

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

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



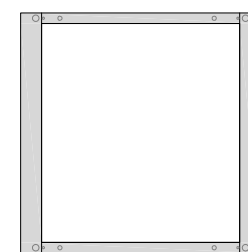
H-FRAME DETAIL



NO SCALE

3

CHARLES INDUSTRY LT-97-002422 PLINTH KIT	
DIMENSIONS (HxWxD):	6"x 32"x 32"
NOTE: GASKET AND MOUNTING HARDWARE INCLUDED	



PLAN



FRONT/BACK

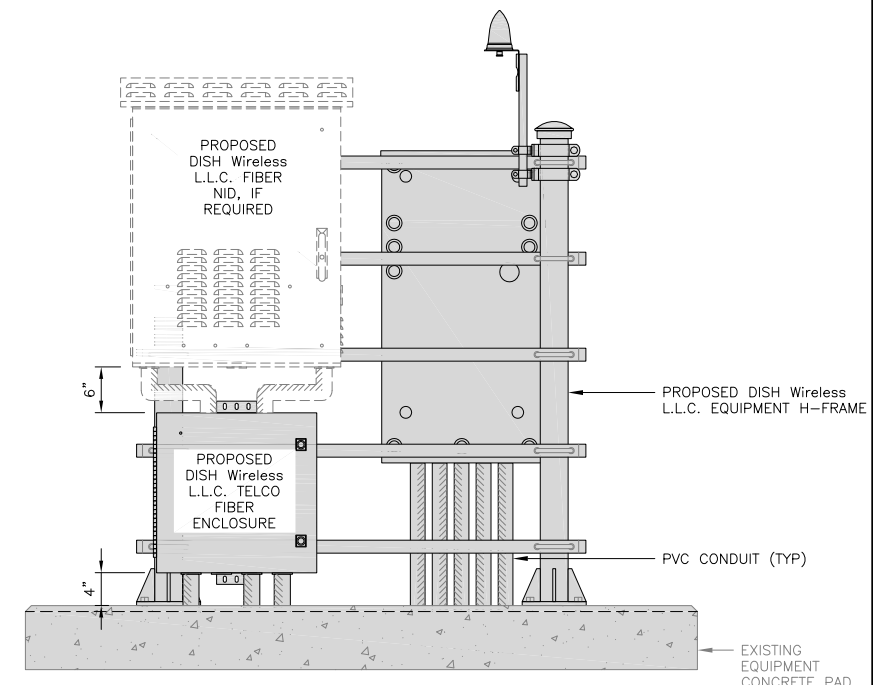


SIDE

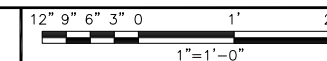
PLINTH DETAIL

NO SCALE

4

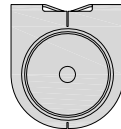


BACK ELEVATION

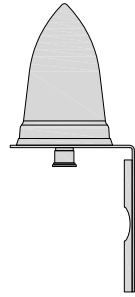


5

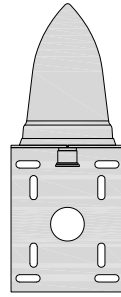
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



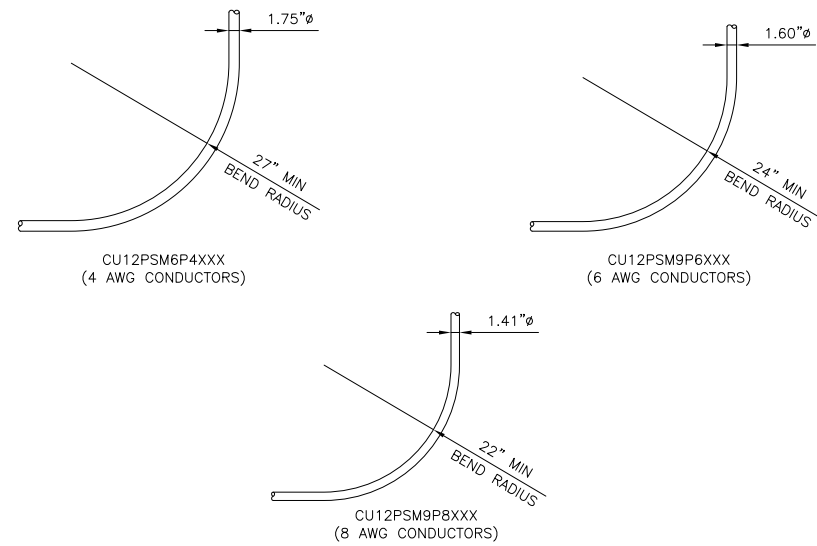
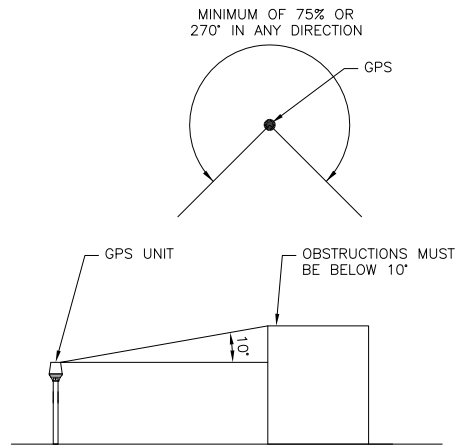
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND 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.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



8051 CONGRESS AVENUE
BOCA RATON, FL 33487



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2	1/26/23	ISSUED FOR CONSTRUCTION

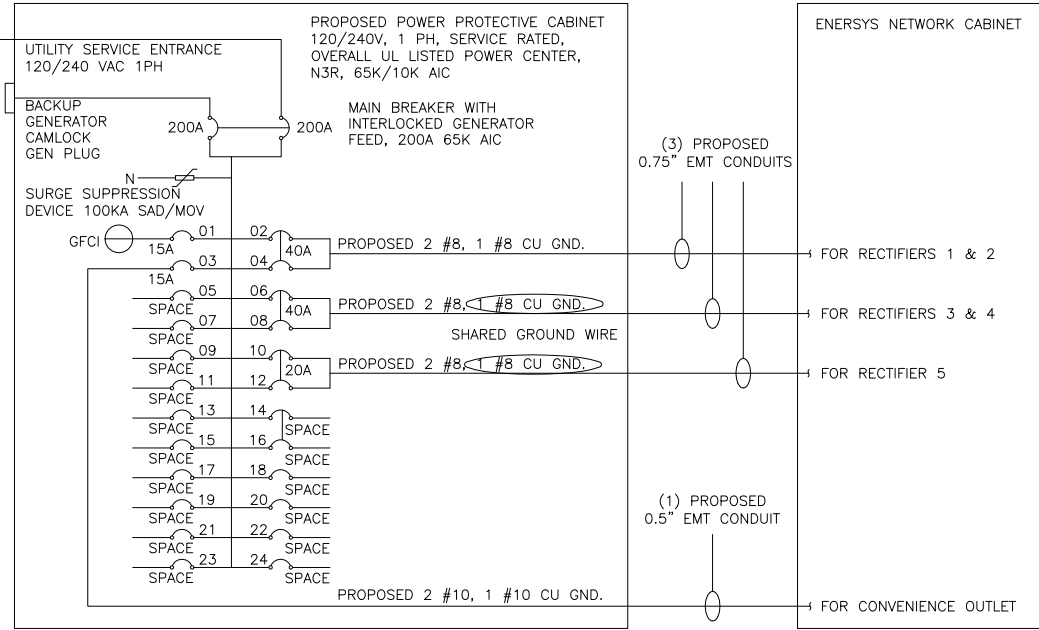
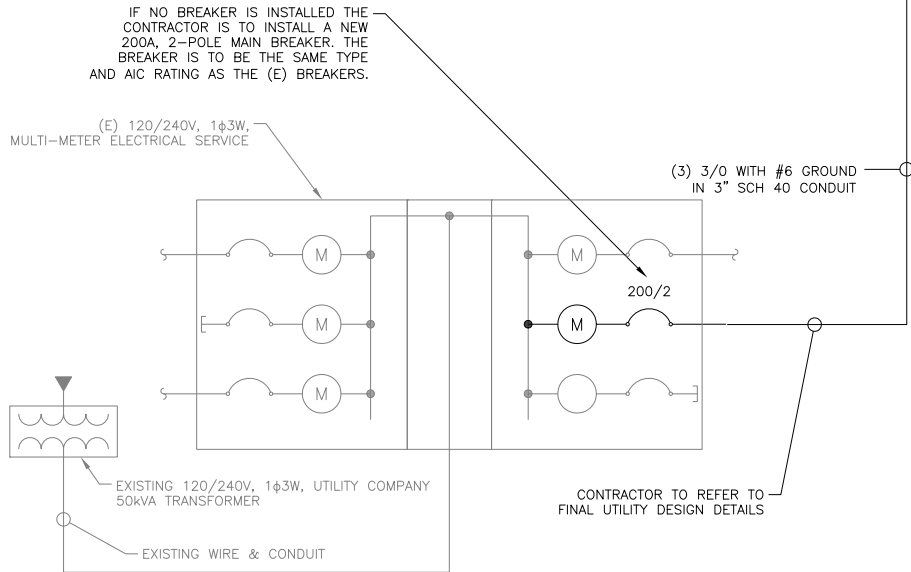
A&E PROJECT NUMBER
159105.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00889A
48 WESTCHESTER ROAD
COLCHESTER, CT 06415

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5



NOTE:
BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL1015, 105°C, 600V, AND PVC INSULATED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THWN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

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

NOTES

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

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

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 (3 CONDUITS): USING UL1015, CU.

#8 - 0.0552 SQ. IN X 2 = 0.1103 SQ. IN
#8 - 0.0131 SQ. IN X 1 = 0.0131 SQ. IN <BARE GROUND
TOTAL = 0.1234 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) 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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LITTLETON, CO 80120



8051 CONGRESS AVENUE
BOCA RATON, FL 33487



1/26/23
MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

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RFDS REV #: 0.0

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PROJECT INFORMATION
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48 WESTCHESTER ROAD
COLCHESTER, CT 06415

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

SHEET NUMBER
E-3

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED ENERSYS 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	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 1 & 2	
ENERSYS GFCI OUTLET			15A	3	B	4	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4	
-SPACE-				5	A	6	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4	
-SPACE-				7	B	8	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIER 5	
-SPACE-				9	A	10					
-SPACE-				11	B	12					
-SPACE-				13	A	14					
-SPACE-				15	B	16					
-SPACE-				17	A	18					
-SPACE-				19	B	20					
-SPACE-				21	A	22					
-SPACE-				23	B	24					
VOLTAGE AMPS			180	180			9500	9500			
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1	L2			VOLTAGE AMPS				
MB RATING: 65,000 AIC			9680	9680			AMPS				
			81	81			MAX AMPS				
			81	102			MAX 125%				

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



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SS	DAS	DAS

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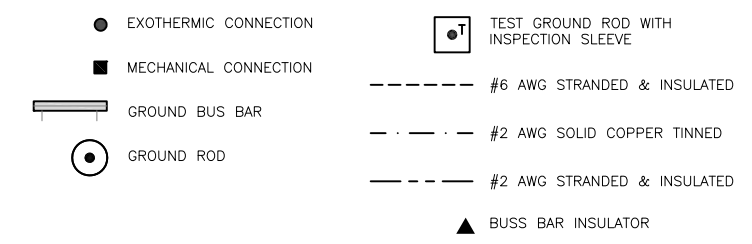
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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00889A
48 WESTCHESTER ROAD
COLCHESTER, CT 06415

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1



GROUNDING LEGEND

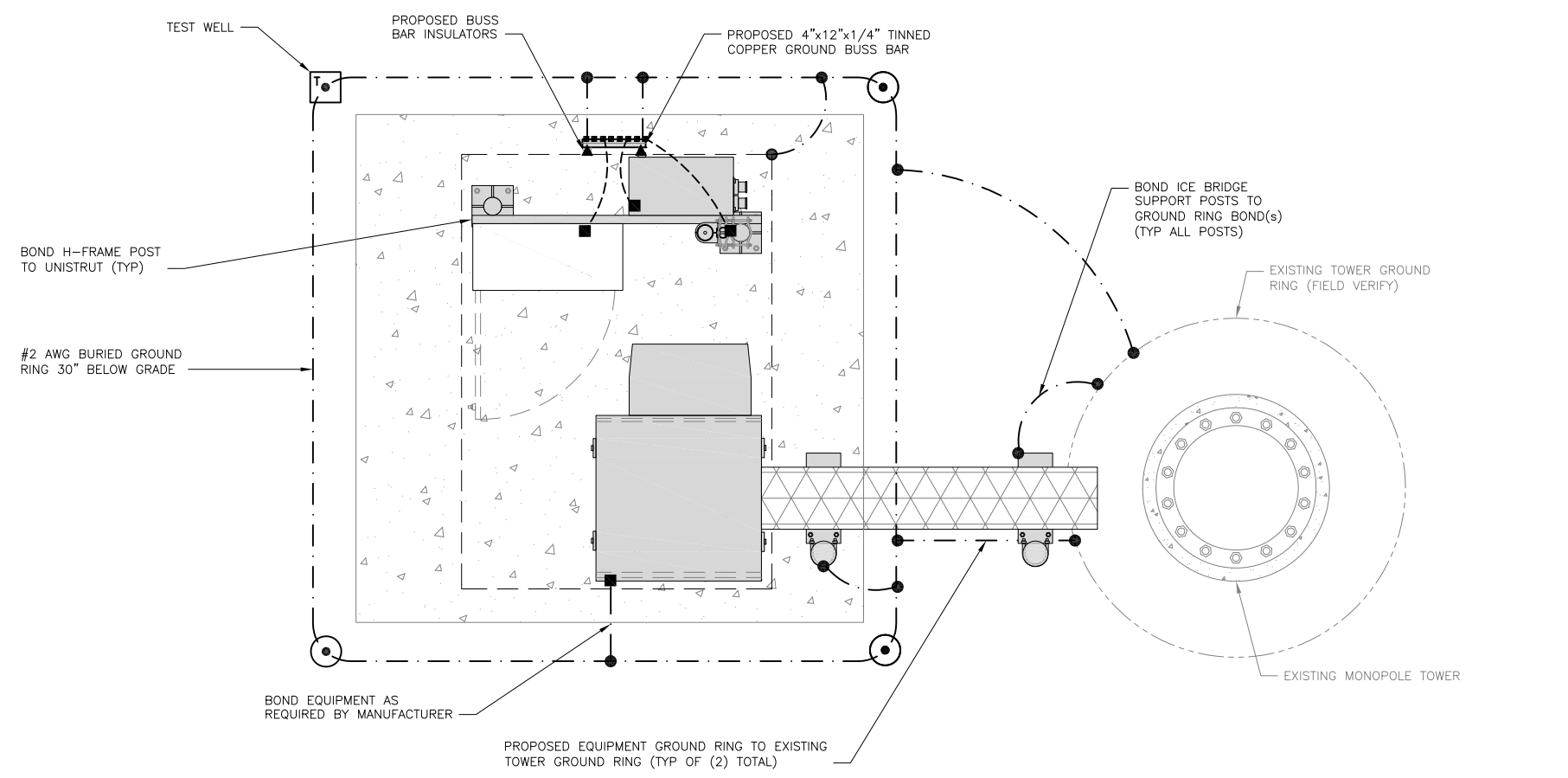
- GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
- CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
- ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM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

GROUNDING KEY NOTES

NO SCALE 3

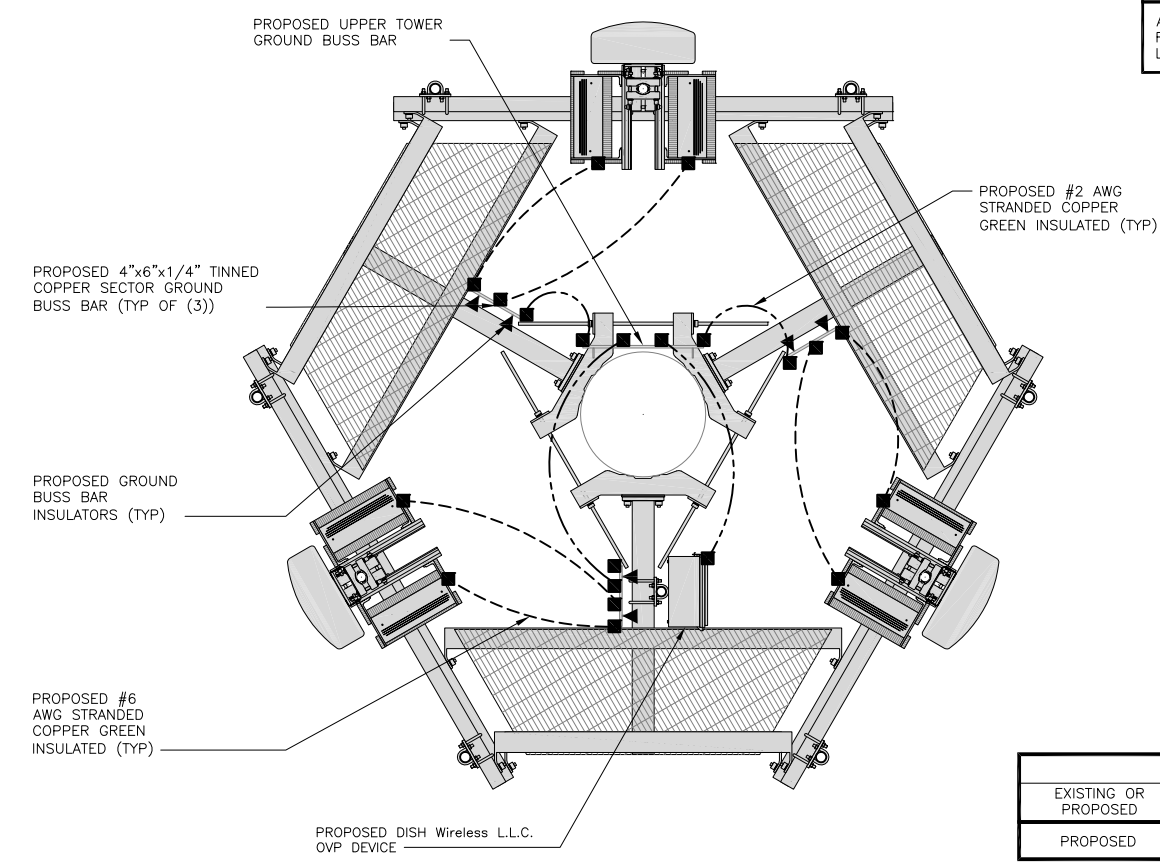


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

NOTES

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



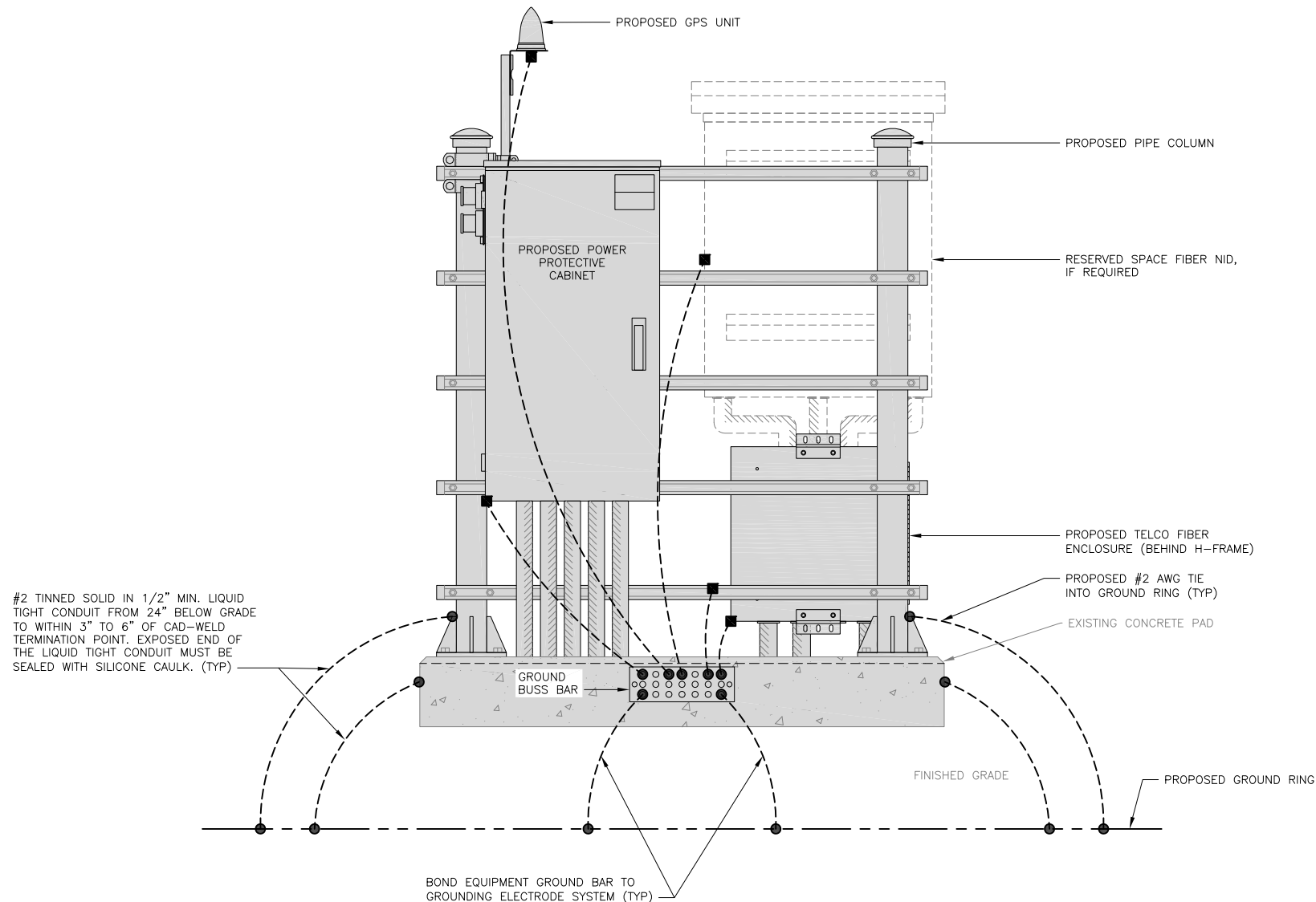
TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

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

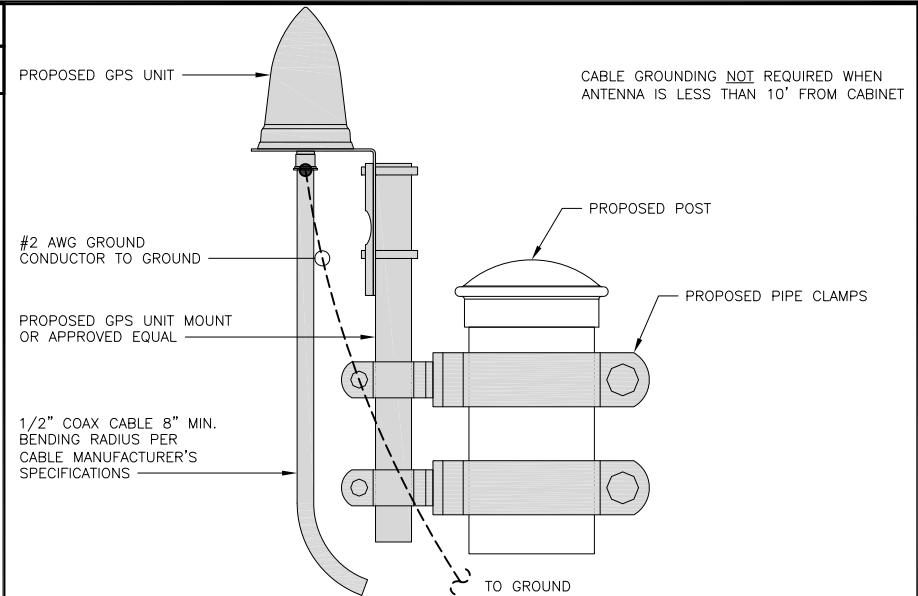
NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY



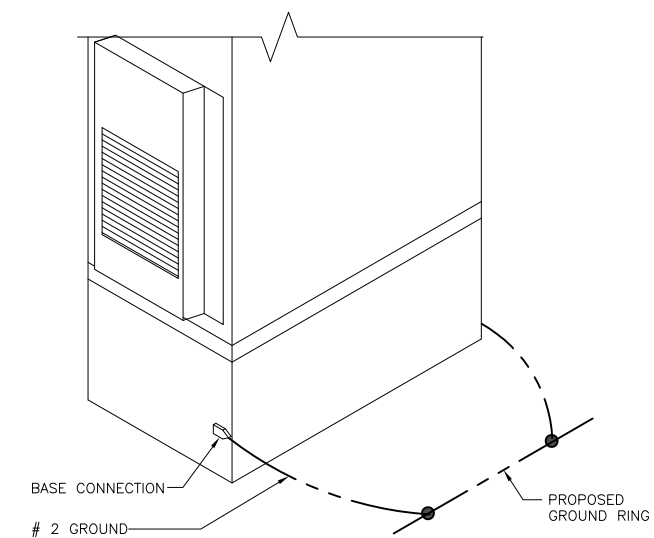
H-FRAME GROUNDING DETAIL

NO SCALE 1



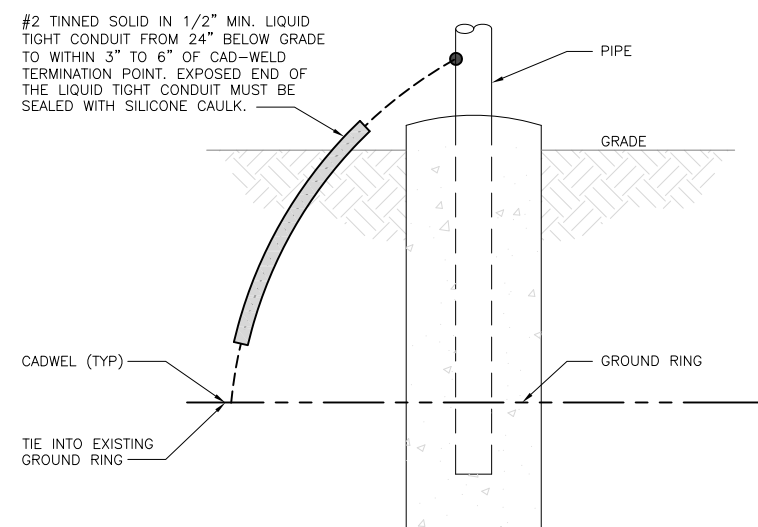
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



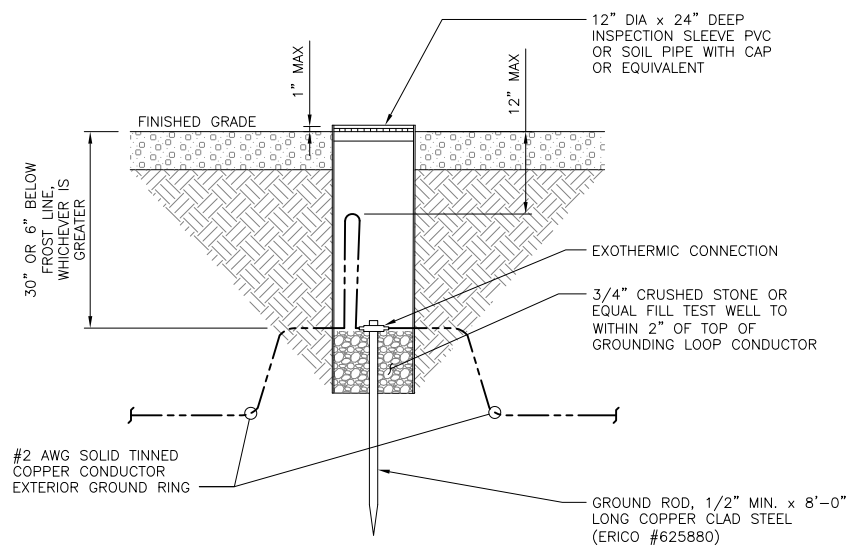
OUTDOOR CABINET GROUNDING

NO SCALE 3



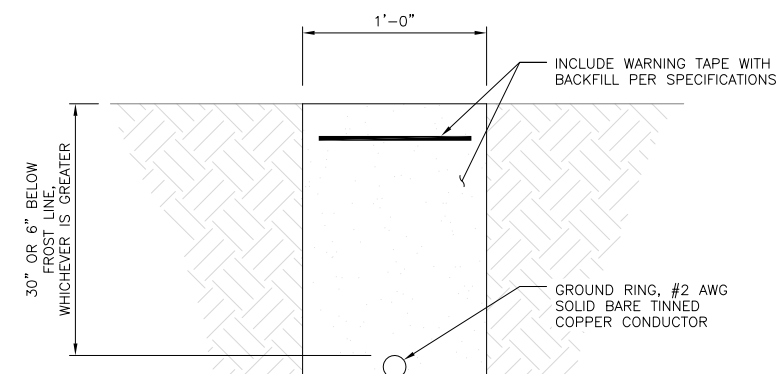
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6



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MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

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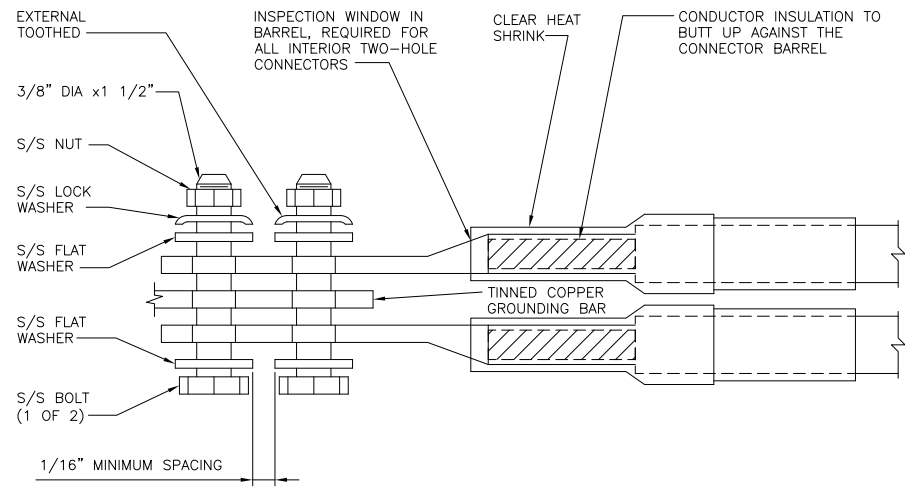
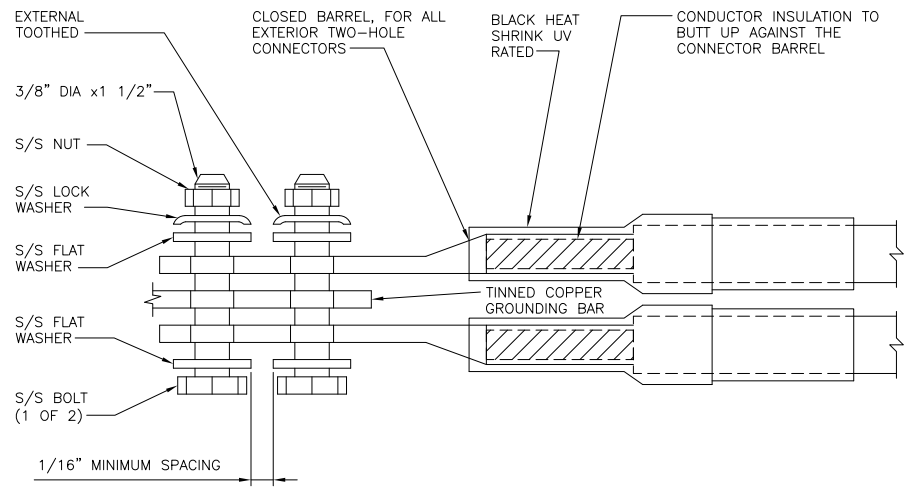
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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00889A
48 WESTCHESTER ROAD
COLCHESTER, CT 06415

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).



TYPICAL GROUNDING NOTES

NO SCALE

1

TYPICAL EXTERIOR TWO HOLE LUG

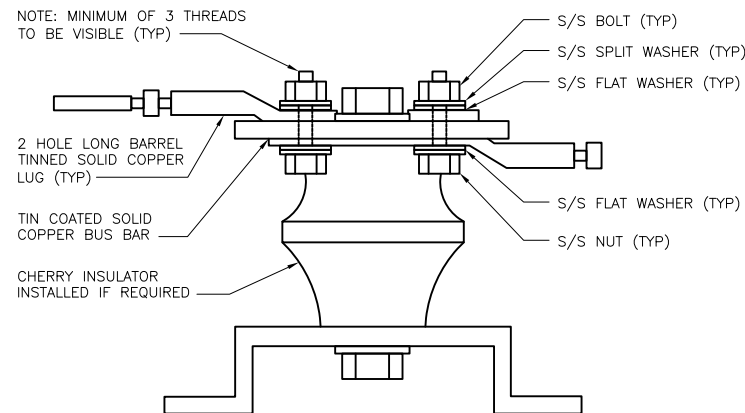
NO SCALE

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

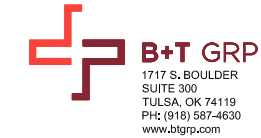
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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

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.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



8051 CONGRESS AVENUE
BOCA RATON, FL 33487



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



1/26/23
MTS ENGINEERING P.L.L.C.
BER:2386985
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:
SS	DAS	DAS

RFDS REV #: 0.0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	11/22/21	ISSUED FOR REVIEW
0	3/8/22	ISSUED FOR CONSTRUCTION
1	5/2/22	ISSUED FOR CONSTRUCTION
2	1/26/23	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
159105.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00889A
48 WESTCHESTER ROAD
COLCHESTER, CT 06415

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

Exhibit D

Structural Analysis Report



Tower Engineering Solutions

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

Structural Analysis Report

Existing 180 ft Valmont Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT02218-S

Customer Site Name: Colchester2

Carrier Name: Dish Wireless (App#: 168272, V1)

Carrier Site ID / Name: BOBOS00889A / 0

Site Location: 48 Westchester Road

Colchester, Connecticut

New London County

Latitude: 41.590161

Longitude: -72.401467



Analysis Result:

Max Structural Usage: 87.8% [Pass]

Max Foundation Usage: 75.0% [Pass]

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

Report Prepared By: Younus Alkarawi



Tower Engineering Solutions

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

Structural Analysis Report

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Analysis Result:

Max Structural Usage: 87.8% [Pass]

Max Foundation Usage: 75.0% [Pass]

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

Report Prepared By: Younus Alkarawi

Introduction

The purpose of this report is to summarize the analysis results on the 180 ft Valmont 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

Tower Drawings	Tower Drawings prepared by Valmont Microflect, Order # 19487-99 Dated 11/03/1999
Foundation Drawing	Foundation Drawing prepared by Towerkraftt, Project# 2985 Dated 11/04/1999
Geotechnical Report	JGI #99539G.dated 11/12/1999
Modification Drawings	N/A
Mount Analysis	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.

Wind Speed Used in the Analysis:	125.0 mph (3-Sec. Gust) (Ultimate wind speed)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Service Load Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
Exposure Category:	C
Risk Category:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	$S_5 = 0.205$, $S_1 = 0.055$

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	177.0	3	RFS APXVAALL24 43-U-NA20 - Panel	Platform w/ Hand Rails [(1) RMQP-4096-HK Plat. + HR/Kicker]	(5) 1.9" Fiber (5) 1 5/8	T-Mobile
2		3	Ericsson AIR6419 B41 - Panel			
3		3	Commscope VV-65B-R1 - Panel			
4		3	Ericsson 4460 B25 + B66			
5		3	Ericsson KRY 112 489/2 TMA			
6		3	Ericsson 4449 B71 + B85 RRU			
7		3	Kathrein 782 11056-Bias Ts			
8	167.0	6	Commscope SBNHH-1D65B - Panel	Platform w/ Hand Rails	(12) 1 5/8" (1) 1 5/8" Hybrid (1) 1-1/4" Hybrid (1) 1/2"	Verizon
9		2	Raycap RC2DC-3315-PF-48			
10		6	Antel LPA-80080-4CF-EDIN-0 - Panel			
11		3	Samsung VZS01 - Panel			
12		3	Samsung B5/B13 RRH-BR04C			
13	3	Samsung B2/B66A RRH-BR049				
14	157.0	3	Powerwave - 7770 - Panel	(1) Low Profile Platform	(12) 1 5/8" (2) 3/4 DC (1) 1/2 Fiber	AT&T
15		2	CCI - DMP65R-BU4DA - Panel			
16		1	CCI - DMP65R-BU8DA - Panel			
17		2	CCI - HPA65R-BU4A - Panel			
18		1	CCI - HPA65R-BU8A - Panel			
19		3	4449 B5/B12			
20		3	8843 B2/B66A			
21	1	Raycap DC6-48-60-18-8F				

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
22	147.0	3	JMA Wireless MX08FRO665-21 - Panel	(1) Commscope MC-PK8-DSH Platform w/HRK	(1) 1.6" Hybrid	Dish Wireless
23		3	Fujitsu TA08025-B605 RRU			
24		3	Fujitsu TA08025-B604 RRU			
25		1	Raycap RDIDC-9181-PF-48-OVP			

See the attached coax layout for the line placement considered in the analysis.

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:	87.8%	80.3%	61.9%
Pass/Fail	Pass	Pass	Pass

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	5681.2	43.8	61.0

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 1.6884 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 87.77% at 53.0ft

Structure: CT02218-S-SBA
Site Name: Colchester2
Height: 180.00 (ft)
Base Elev: 0.000 (ft)

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

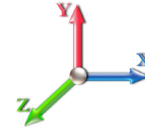
1/26/2023



Page: 1

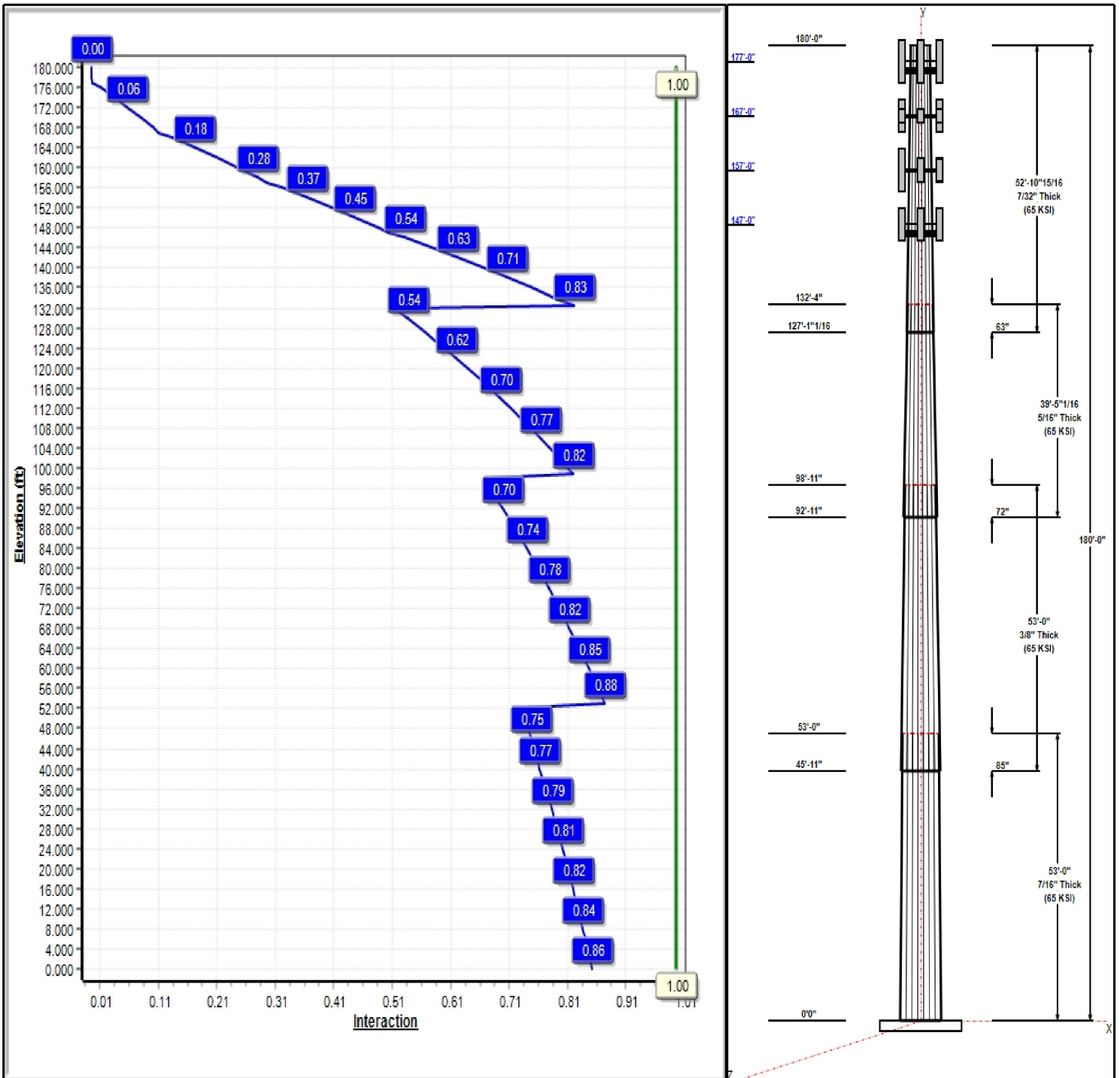
Dead Load Factor: 1.20
Wind Load Factor: 1.00

Load Case : 1.2D + 1.0W 125 mph Wind



Iterations: 30

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Structure: CT02218-S-SBA

Type: Tapered
Site Name: Colchester2
Height: 180.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 16 Sided
Taper: 0.20502

1/26/2023

Page: 2



Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.00	49.13	60.00	0.438		0.20502	65
2	53.00	40.47	51.34	0.375	Slip	0.20502	65
3	39.42	34.24	42.33	0.313	Slip	0.20502	65
4	52.91	24.91	35.76	0.219	Slip	0.20502	65

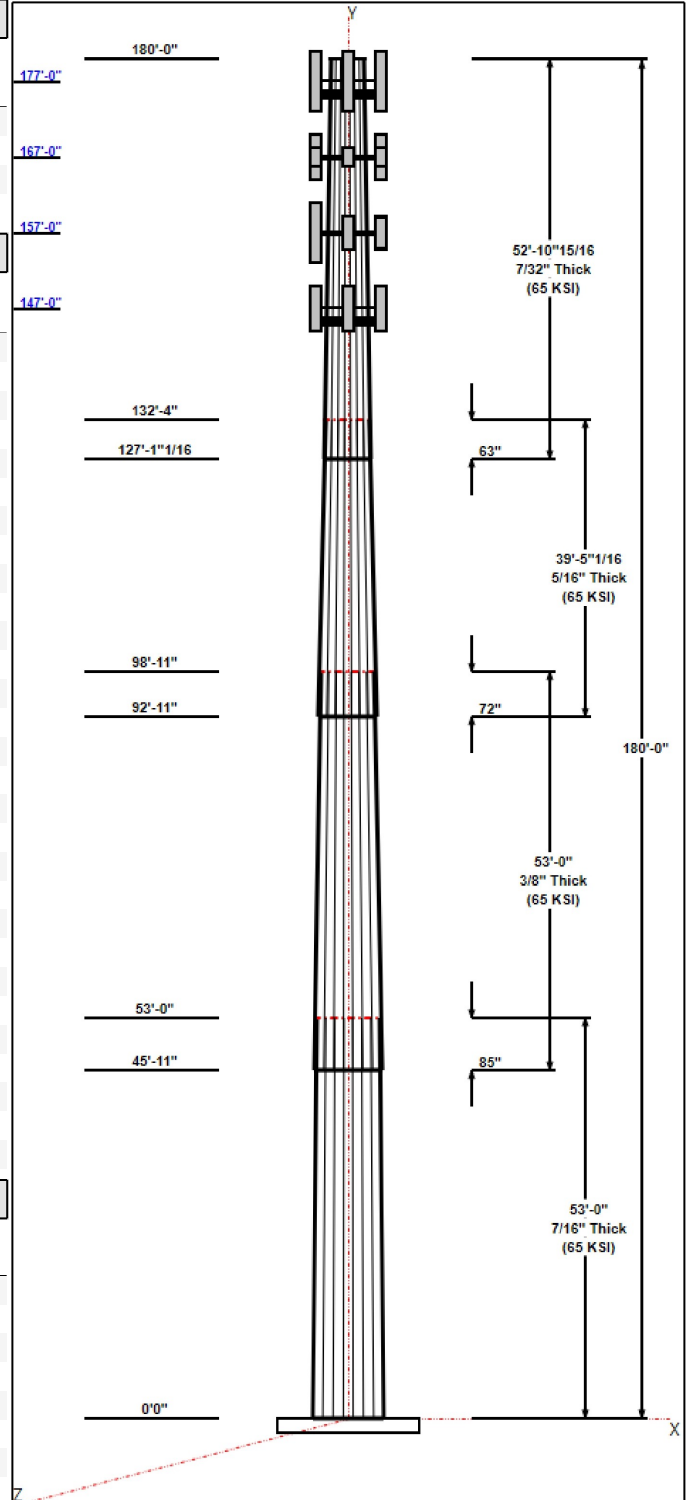
Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
177.00	177.00	3	782 11056	T-Mobile
177.00	177.00	3	RFS	T-Mobile
177.00	177.00	3	Ericsson KRY 112 489/2	T-Mobile
177.00	177.00	3	Ericsson 4449 B71 + B85	T-Mobile
177.00	177.00	3	Ericsson AIR6419 B41	T-Mobile
177.00	177.00	3	Commscope VV-65B-R1	T-Mobile
177.00	177.00	3	Ericsson 4460 B25 + B66	T-Mobile
177.00	177.00	1	RMQP-4096-HK Plat. +	T-Mobile
167.00	167.00	3	Samsung B5/B13	Verizon
167.00	167.00	3	Samsung B2/B66A	Verizon
167.00	167.00	3	Samsung VZS01	Verizon
167.00	167.00	6	Commscope	Verizon
167.00	167.00	2	Raycap	Verizon
167.00	167.00	6	Antel	Verizon
167.00	167.00	1	Platform w/ Hand Rails	Verizon
157.00	157.00	1	Low Profile	AT&T
157.00	157.00	3	7770	AT&T
157.00	157.00	2	DMP65R-BU4DA	AT&T
157.00	157.00	1	DMP65R-BU8DA	AT&T
157.00	157.00	2	HPA65R-BU4A	AT&T
157.00	157.00	1	HPA65R-BU8A	AT&T
157.00	157.00	3	4449 B5/B12	AT&T
157.00	157.00	3	8843 B2/B66A	AT&T
157.00	157.00	1	Raycap DC6-48-60-18-8F	AT&T
147.00	147.00	3	JMA Wireless	Dish Wireless
147.00	147.00	1	MC-PK8-DSH	Dish Wireless
147.00	147.00	3	Fujitsu TA08025-B605	Dish Wireless
147.00	147.00	3	Fujitsu TA08025-B604	Dish Wireless
147.00	147.00	1	Raycap	Dish Wireless

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	177.00	Inside	1 5/8" Coax	T-Mobile
0.00	177.00	Inside	1.9" Fiber	T-Mobile
0.00	167.00	Inside	1 5/8" Coax	Verizon
0.00	167.00	Inside	1 5/8" Hybrid	Verizon
0.00	167.00	Inside	1-1/4" Hybrid	Verizon
0.00	167.00	Inside	1/2" Coax	Verizon
0.00	157.00	Inside	1 5/8" Coax	AT&T
0.00	157.00	Inside	DC	AT&T
0.00	157.00	Inside	Fiber	AT&T
0.00	147.00	Inside	1.6" Hybrid	Dish Wireless

Anchor Bolts



Structure: CT02218-S-SBA

Type: Tapered
Site Name: Colchester2
Height: 180.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 16 Sided
Taper: 0.20502

1/26/2023

Page: 3



Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	74.6	60.0	Polygon

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.0W 125 mph Wind	5681.2	43.8	61.0
0.9D + 1.0W 125 mph Wind	5600.4	43.8	45.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1352.9	10.6	79.2
1.2D + 1.0Ev + 1.0Eh	129.8	0.7	63.3
0.9D + 1.0Ev + 1.0Eh	128.1	0.7	47.9
1.0D + 1.0W 60 mph Wind	1163.0	9.0	50.8

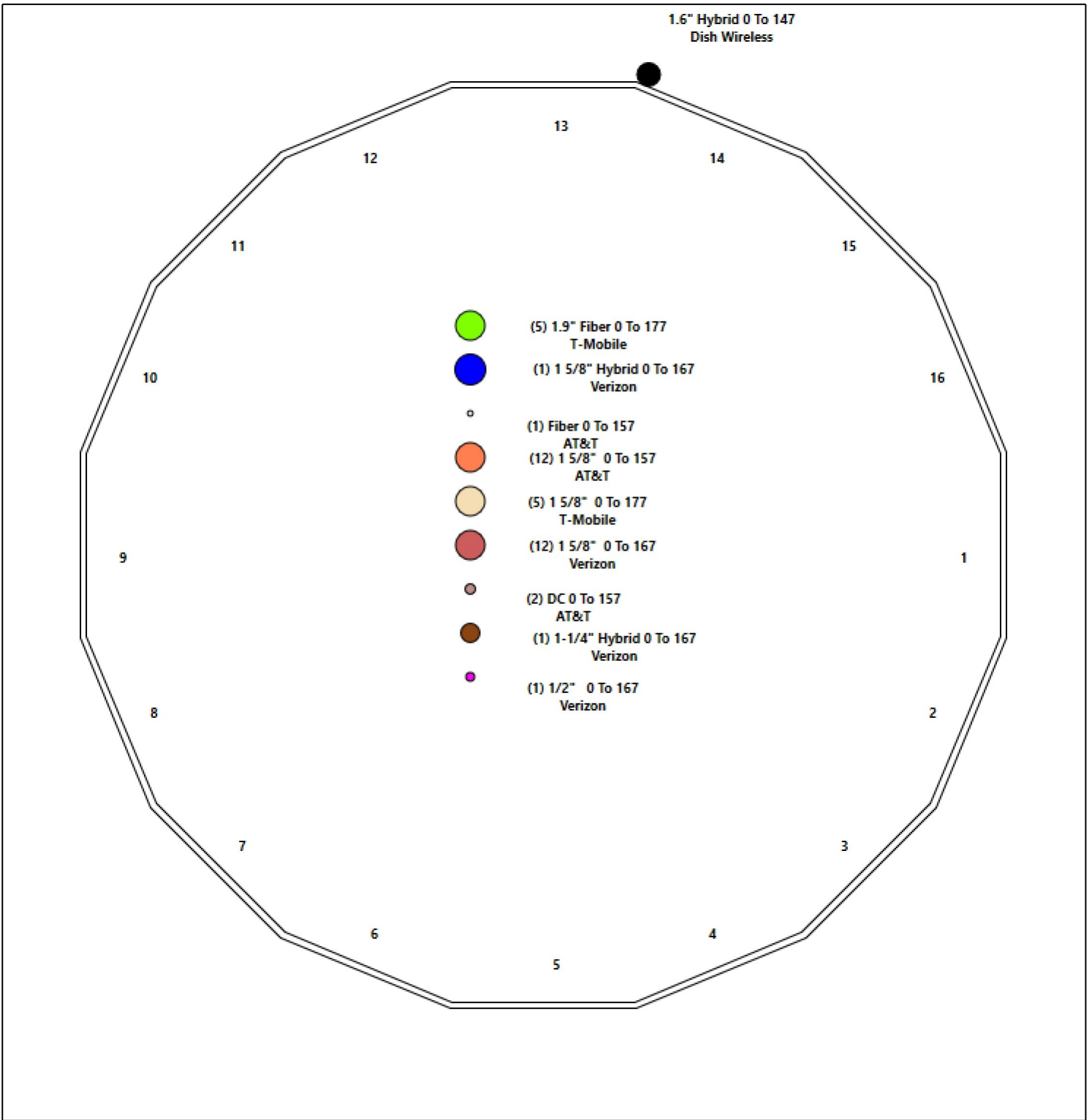
Structure: CT02218-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Colchester2
Height: 180.00 (ft)

1/26/2023



Page: 4



Final Analysis Summary

Structure: CT02218-S-SBA	Code: TIA-222-H	1/26/2023
Site Name: Colchester2	Exposure: C	
Height: 180.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 47



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 125 mph Wind	43.8	0.00	60.97	0.00	0.00	5681.20
0.9D + 1.0W 125 mph Wind	43.8	0.00	45.72	0.00	0.00	5600.43
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.6	0.00	79.16	0.00	0.00	1352.89
1.2D + 1.0Ev + 1.0Eh	0.7	0.00	63.28	0.00	0.00	129.79
0.9D + 1.0Ev + 1.0Eh	0.7	0.00	47.95	0.00	0.00	128.11
1.0D + 1.0W 60 mph Wind	9.0	0.00	50.83	0.00	0.00	1163.02

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 125 mph Wind	-38.74	-38.21	0.00	-3488.7	0.00	-3488.7	3967.43	1039.4	4274.84	4025.79	53.00	0.878
0.9D + 1.0W 125 mph Wind	-28.69	-37.75	0.00	-3421.8	0.00	-3421.8	3967.43	1039.4	4274.84	4025.79	53.00	0.859
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-54.86	-9.18	0.00	-824.84	0.00	-824.84	3967.43	1039.4	4274.84	4025.79	53.00	0.219
1.2D + 1.0Ev + 1.0Eh	-20.56	-0.76	0.00	-26.80	0.00	-26.80	1489.26	422.54	1209.69	1053.20	132.34	0.039
0.9D + 1.0Ev + 1.0Eh	-15.59	-0.75	0.00	-26.46	0.00	-26.46	1489.26	422.54	1209.69	1053.20	132.34	0.036
1.0D + 1.0W 60 mph Wind	-33.55	-7.82	0.00	-712.93	0.00	-712.93	3967.43	1039.4	4274.84	4025.79	53.00	0.186

Base Plate Summary

Structure: CT02218-S-SB	Code: TIA-222-H	1/26/2023
Site Name: Colchester2	Exposure: C	
Height: 180.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 48



Reactions	Base Plate	Anchor Bolts
Original Design	Yield (ksi): 60.00	Bolt Circle: 68.62
Moment (kip-ft): 5045.00	Width (in): 74.62	Number Bolts: 20.00
Axial (kip): 56.10	Style: Polygon	Bolt Type: 2.25" 18J
Shear (kip): 39.50	Polygon Sides: 16.00	Bolt Diameter (in): 2.25
Analysis (1.2D + 1.0W)	Clip Length (in): 0.00	Yield (ksi): 75.00
Moment (kip-ft): 5681.20	Effective Len (in): 13.76	Ultimate (ksi): 100.00
Axial (kip): 60.97	Moment (kip-in): 869.54	Arrangement: Radial
Shear (kip): 43.85	Allow Stress (ksi): 81.00	Cluster Dist (in): 0.00
	Applied Stress (ksi): 50.22	Start Angle (deg): 0.00
	Stress Ratio: 0.62	Compression
		Force (kip): 201.75
		Allowable (kip): 268.39
		Ratio: 0.75
		Tension
		Force (kip): 195.65
		Allowable (kip): 243.75
		Ratio: 0.80



Monopole Mat Foundation Design

Date
1/26/2023

Customer Name:	Dish Wireless	TIA Standard:	TIA-222-H
Site Name:		Structure Height (Ft.):	180
Site Number:	CT02218-S-SBA	Engineer Name:	H. You
Engr. Number:	138177	Engineer Login ID:	

Foundation Info Obtained from:

Drawings/Calculations
Monopole
Analysis

Structure Type:

Analysis or Design?

Base Reactions (Factored):

Axial Load (Kips):	61.0	Shear Force (Kips):	43.8
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5681.2

Allowable overstress %: 5.0%

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	8.0	Depth of Base BG (ft.):	5.5
Pier Height A. G. (ft.):		Thickness of Pad (ft.):	6.00
Length of Pad (ft.):	26	Width of Pad (ft.):	26
Final Length of pad (ft)	26.0	Final width of pad (ft):	26.0

Material Properties and Rebar Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	24	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	10	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:

Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30
---------------------------	----	---------------------------	----

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	15	Qty. of Rebar in Pad (W):	15
---------------------------	----	---------------------------	----

Apply 1.35 factor for e/w Per G: 1.35

Soil Design Parameters:

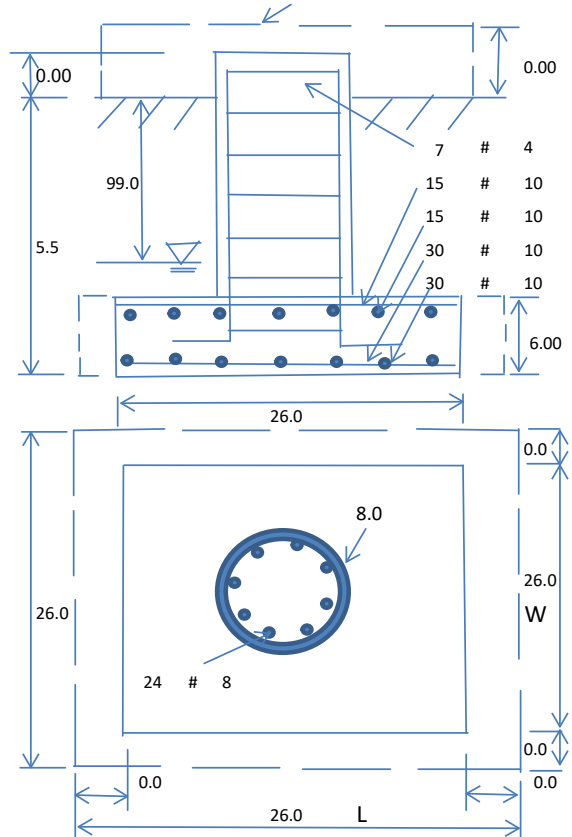
Soil Unit Weight (pcf):	110.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	12000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	1.25	Total Dry Soil Weight (Kips):	0.14
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.14	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	4056.35	Total Dry Concrete Weight (Kips):	608.45
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	608.45	Total Vertical Load on Base (Kips):	669.59

Check Soil Capacities:

Calculated Maxium Net Soil Pressure under the base (psf):	4007	<	Allowable Factored Soil Bearing (psf):	9000	0.45	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	7913.5	>	Design Factored Momont (kips-ft):	5944	0.75	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.33					OK!



Check the capacities of Reinforcing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1752.7	>	One-Way Factored Shear (L-D. Kips):	214.5	0.12	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1752.7	>	One-Way Factored Shear (W-D., Kips)	214.5	0.12	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1171.2	>	One-Way Factored Shear (C-C, Kips):	219.2	0.19	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0018	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0018		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	11476.6	>	Moment at Bottom (L-Dir. K-Ft):	1890.0	0.16	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	11476.6	>	Moment at Bottom (W-Dir. K-Ft):	1890.0	0.16	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	16133.5	>	Moment at Bottom (C-C Dir. K-Ft):	2672.9	0.17	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0009	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0009		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	5799.9	>	Moment at the top (L-Dir K-Ft):	854.5	0.15	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	5799.9	>	Moment at the top (W-Dir K-Ft):	854.5	0.15	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	8178.0	>	Moment at the top (C-C Dir. K-Ft):	805.1	0.10	OK!

(3).Check Punching Shear Capacity due to Moment in the Pier:

Moment transferred by punching shear:	2272.5	k-ft.	Max. factored shear stress $v_{u,CD}$:	2.7	Psi
Max. factored shear stress $v_{u,AB}$:	5.1	Psi	Factored shear Strength ϕv_n :	164.3	Psi
Max. factored shear stress v_u :	5.1	Psi	Check Usage of Punching Shear Capacity:	0.03	OK!

(4).Check Bending Capacity of the Pad Within the Effective Slab Width:

Overturning moment to be transferred by flexure:	1704.4	k-ft.	Effective Width for resisting OT moment:	26.0	ft.
Calculated number of Rebar in Effective width:	15		Actual number of Rebar in Effective width:	13	
Steel Pad Moment Capacity (L-Direc. Kips-ft):	5033.7	k-ft.	Check Usage of the Flexure Capacity:	0.34	OK!

Exhibit E

Mount Analysis



January 23, 2023

Dave Evans
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
btwo@btgrp.com

Subject: **Appurtenance Mount Analysis Report**

Carrier Designation: **Dish Co-Locate**
Site Number: BOBOS00889A
Site Name: N/A

SBA Network Services Designation: **Site Number:** CT02218-S
Site Name: Colchester
Application Number: 168272, v1

Engineering Firm Designation: **Project Number:** 159105.004.01

Site Data: **48 Westchester Road, Colchester, CT, 06415, New London County**
Latitude 41.59016°, Longitude -72.4014°
Monopole
8 ft. Platform Mount

Dear Mr. Evans

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:

<p>Proposed Equipment Note: See Table 1 for the final loading configuration</p>	<p>Sufficient Capacity (Passing at 55.9%)</p>
--	--

This analysis utilizes an ultimate 3-second gust wind speed of 121 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria..

All the equipment proposed in this report shall be installed in accordance with the drawings for the determined available structural capacity to be effective.

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: Erik Perez

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

Chad E. Tuttle, P.E.



TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 – Proposed Equipment Information

Table 2 – Documents Provided

3) ANALYSIS PROCEDURE

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 3 – Mount Component Stresses vs. Capacity

5) RECOMMENDATIONS

6) APPENDIX A

RISA-3D Output

7) APPENDIX B

Additional Calculations

1) INTRODUCTION

The appurtenance mount consists of platform mount designed by Commscope (Part #MC-PK8-DSH) at 147 ft., attached to monopole at 48 Westchester Road, Colchester, CT, 06415, New London County. The proposed antenna loading information was obtained from SBA Network Services, LLC. All information provided to B+T Group 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 121 mph with no ice and 50 mph with 1 inch escalated ice thickness. Exposure Category C & Topographic Category 1 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 and Existing Equipment Information

Loading	RAD Center Elev. (ft.)	Position	Qty.	Description	Note
Proposed	147	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 Proposed 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
RFDS	Proposed Loading	Date: 07/23/2021	SBA Network Services, LLC.
Collo App		Date: 08/04/2021	

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 area 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. B+T Group 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	147	8.7	Pass
-	Support Rails	147	15.5	Pass
-	Support Tubes	147	55.9	Pass
-	Support Channels	147	38.0	Pass
-	Support Angles	147	41.0	Pass
-	Mount Pipes	147	17.4	Pass
-	Connection Plates	147	19.8	Pass
-	Connection Angles	147	26.8	Pass
-	Bolt Connection	147	29.1	Pass

5) RECOMMENDATIONS

The Commscope platform mount, 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	159105.003.01 - Colchester, C	KSC
SUBJECT	Platform Mount Analysis	
DATE	11/12/21	PAGE OF



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

Tower Type	:	Monopole	
Ground Elevation	z_s :	374	ft [ASCE7 Hazard Tool]
Tower Height	:	180.00	ft
Mount Elevation	:	147.00	ft
Antenna Elevation	:	147.00	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 :	121	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 :	0.21	
	S_1 :	0.06	
	S_{DS} :	0.22	
	S_{D1} :	0.09	
Gust Factor	G_h :	1.00	[Sec. 16.6]
Pressure Coefficient	K_z :	1.37	[Sec. 2.6.5.2]
Topography Factor	K_{zt} :	1.00	[Sec. 2.6.6]
Elevation Factor	K_e :	0.99	[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} :	1.16	in [Sec. 2.6.10]
Importance Factor	I_e :	1	[Table 2-3]
Response Coefficient	C_s :	0.111	[Sec. 2.7.7.1]
Amplification	A_s :	2.266667	[Sec. 16.7]
	q_z :	48.21	psf

PROJECT	159105.003.01 - Colchester, C	KSC
SUBJECT	Platform Mount Analysis	
DATE	11/12/21	PAGE OF



Manufacturer	Model	Qty	Aspect Ratio	C_a	EPA_N (ft ²)	EPA_T (ft ²)	EPA_{N-Ice} (ft ²)	EPA_{T-Ice} (ft ²)	$F_{A \text{ No Ice (N)}}$	$F_{A \text{ No Ice (T)}}$	$F_{A \text{ Ice (N)}}$	$F_{A \text{ Ice (T)}}$
				flat/round								
JMA Wireless	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.19	0.08	0.04	0.02
JMA Wireless	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.19	0.08	0.04	0.02
FUJITSU	TA08025-B605	1	1.05	1.20	1.64	0.99	2.17	1.43	0.09	0.05	0.01	0.01
FUJITSU	TA08025-B604	1	1.05	1.20	1.64	0.86	2.17	1.28	0.09	0.04	0.01	0.01
JMA Wireless	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.19	0.08	0.04	0.02
JMA Wireless	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.19	0.08	0.04	0.02
FUJITSU	TA08025-B605	1	1.05	1.20	1.64	0.99	2.17	1.43	0.09	0.05	0.01	0.01
FUJITSU	TA08025-B604	1	1.05	1.20	1.64	0.86	2.17	1.28	0.09	0.04	0.01	0.01
JMA Wireless	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.19	0.08	0.04	0.02
JMA Wireless	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.19	0.08	0.04	0.02
FUJITSU	TA08025-B605	1	1.05	1.20	1.64	0.99	2.17	1.43	0.09	0.05	0.01	0.01
FUJITSU	TA08025-B604	1	1.05	1.20	1.64	0.86	2.17	1.28	0.09	0.04	0.01	0.01
RAYCAP	RDIDC-9181-PF-48	1	1.14	1.20	1.68	0.94	2.22	1.37	0.09	0.05	0.01	0.01

PROJECT	159105.003.01 - Colchester, CT	KSC
SUBJECT	Platform Mount Analysis	
DATE	11/12/21	PAGE 1 OF 1



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

B+T GRP

[REF: AISC 360-05]

Reactions at Bolted Connection

Tension	:	1.498	k
Vertical Shear	:	1.812	k
Horizontal Shear	:	1.248	k
Torsion	:	0.343	k.ft
Moment from Horizontal Forces	:	1.265	k.ft
Moment from Vertical Forces	:	4.15	k.ft

Bolt Parameters

Bolt Grade	:	A325	
Bolt Diameter	:	0.625	in
Nominal Bolt Area	:	0.307	in ²
Bolt spacing, Horizontal	:	6	in
Bolt spacing, Vertical	:	6	in
Bolt edge distance, plate height	:	1.5	in
Bolt edge distance, plate width	:	1.5	in
Total Number of Bolts	:	4	bolts

Summary of Forces

Shear Resultant Force	:	2.20	k
Force from Horz. Moment	:	2.29	k
Force from Vert. Moment	:	7.52	k
Shear Load / Bolt	:	0.55	k
Tension Load / Bolt	:	0.37	k
Resultant from Moments / Bolt	:	3.93	k

Bolt Checks

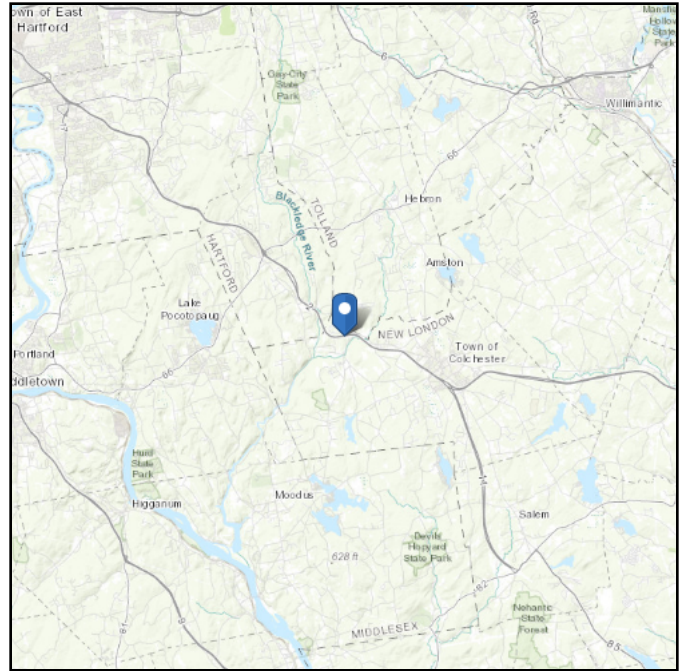
Nominal Tensile Stress, F_{nt}	:	90.00	ksi	[AISC Table J3.2]
Available Tensile Stress, ΦR_{nt}	:	20.72	k/bolt	[Eq. J3-1]
Unity Check, Bolt Tension	:	20.77%		OKAY
Nominal Shear Stress, F_{nv}	:	48.00	ksi	[AISC Table J3.2]
Available Shear Stress, ΦR_{nv}	:	11.05	k/bolt	[Eq. J3-1]
Unity Check, Bolt Shear	:	8.37%		OKAY
Unity Check, Combined	:	29.13%		OKAY
Available Bearing Strength, ΦR_n	:	34.66	k/bolt	
Unity Check, Bolt Bearing	:	1.59%		OKAY

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 374.3 ft (NAVD 88)
Latitude: 41.59016
Longitude: -72.4014



Wind

Results:

Wind Speed:	121 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	93 Vmph
100-year MRI	99 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: Fri Nov 12 2021

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

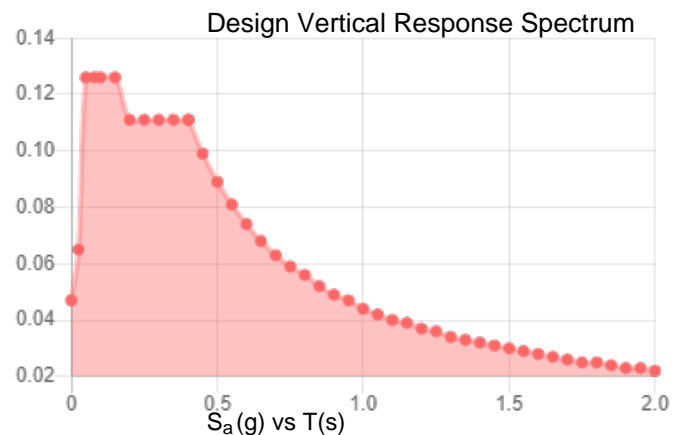
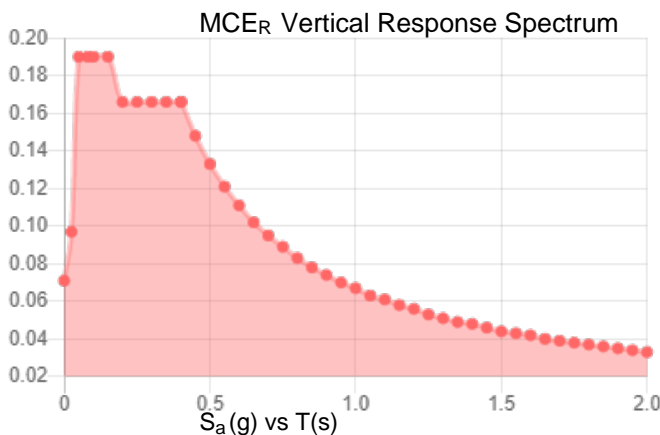
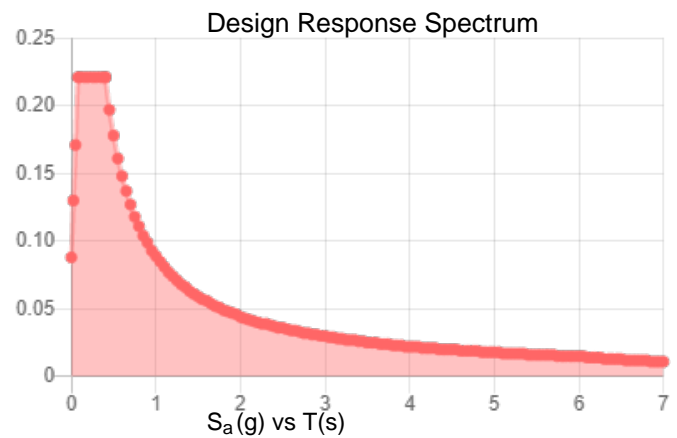
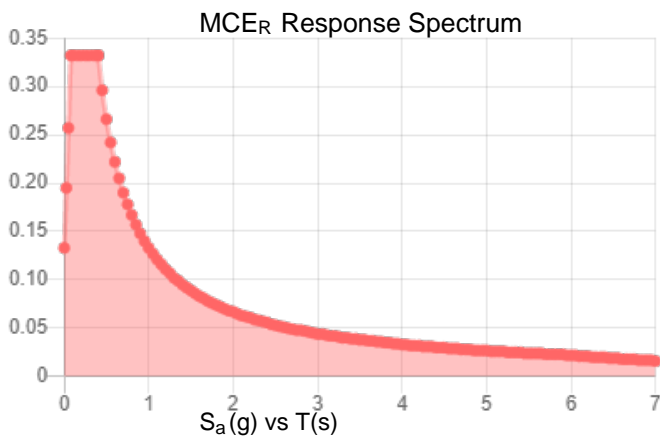
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

Results:

S_s :	0.207	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.115
F_v :	2.4	PGA _M :	0.181
S_{MS} :	0.332	F_{PGA} :	1.57
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.221	C_v :	0.715

Seismic Design Category B



Data Accessed:

Fri Nov 12 2021

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: 15 F
Gust Speed: 50 mph

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

Date Accessed: Fri Nov 12 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 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.

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

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Exhibit F

Power Density/RF Emissions Report



Radio Frequency Emissions Analysis Report



Site ID: BOBOS00889A

SBA - Westchester Road
48 Westchester Road
Colchester, CT 06415

January 7, 2023

Fox Hill Telecom Project Number: 222139

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.09 %

January 7, 2023

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOBOS00889A – SBA - Westchester Road**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **48 Westchester Road, Colchester, 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 **48 Westchester Road, Colchester, 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	147
B	1	JMA MX08FRO665-21	147
C	1	JMA MX08FRO665-21	147

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)	12.15 / 15.95 / 16.25	12	566	17,079.80	1.71
Sector A Composite MPE%							1.71
Antenna B1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	12.15 / 15.95 / 16.25	12	566	17,079.80	1.71
Sector B Composite MPE%							1.71
Antenna C1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	12.15 / 15.95 / 16.25	12	566	17,079.80	1.71
Sector C Composite MPE%							1.71

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.

Site Composite MPE%	
Carrier	MPE%
Dish – Max Per Sector Value	1.71 %
T-Mobile	0.96 %
Verizon Wireless	1.59 %
AT&T	2.83 %
Site Total MPE %:	7.09 %

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	1.71 %
Dish Sector B Total:	1.71 %
Dish Sector C Total:	1.71 %
Site Total:	
	7.09 %

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	1,008.96	147	4.52	n71 (600 MHz)	400	1.13%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,574.20	147	2.90	n70 (AWS-4 / 1995-2020)	1000	0.29%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,686.79	147	2.90	n66 (AWS-4 / 2180-2200)	1000	0.29%
						Total:	1.71 %

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:	1.71 %
Sector B:	1.71 %
Sector C:	1.71 %
Dish Maximum Total (per sector):	1.71 %
Site Total:	7.09 %
Site Compliance Status:	COMPLIANT

The anticipated composite emissions value for this site, assuming all carriers present, is **7.09 %** 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



ANDREAS BISBIKOS
FIRST SELECTMAN
127 NORWICH AVE
COLCHESTER CT 06415-1230


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


Expected Delivery Date: 02/09/23
Ref#: SBDS-00889
0000

USPS TRACKING #

9405 5036 9930 0474 1195 11

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\$9.65
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02/06/2023

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Ship Date:	02/06/2023		
Expected			
Delivery Date:	02/09/2023		

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


To: ANDREAS BISBIKOS
FIRST SELECTMAN
127 NORWICH AVE
COLCHESTER CT 06415-1230

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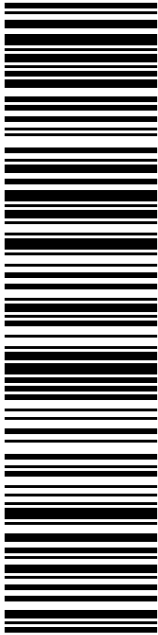


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ZONING ENFORCEMENT OFFICER
127 NORWICH AVE
COLCHESTER CT 06415-1230

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420 MAIN ST
STURBRIDGE MA 01566-1359

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Ship Date: 02/06/2023	
Expected Delivery Date: 02/09/2023	
From: DEBORAH CHASE Ref#: SBDS-00889	
NORTHEAST SITE SOLUTIONS	
STE 1	
420 MAIN ST	
STURBRIDGE MA 01566-1359	
To: ARIEL LAGO	
ZONING ENFORCEMENT OFFICER	
127 NORWICH AVE	
COLCHESTER CT 06415-1230	
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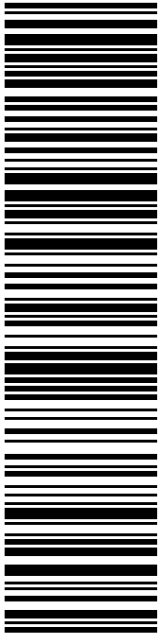
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SBA COMMUNICATIONS CORPORATION
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WESTBOROUGH MA 01581

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

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Ship Date: 02/06/2023	
Expected Delivery Date: 02/08/2023	
From: DEBORAH CHASE Ref#: SBDS-00889	
NORTHEAST SITE SOLUTIONS	
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420 MAIN ST	
STURBRIDGE MA 01566-1359	
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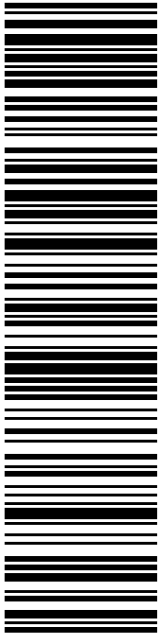


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Trans. #: 582098813	Priority Mail® Postage: \$9.65
Print Date: 02/06/2023	Total: \$9.65
Ship Date: 02/06/2023	
Expected Delivery Date: 02/09/2023	

From: DEBORAH CHASE Ref#: SBDS-00889
 NORTHEAST SITE SOLUTIONS
 STE 1
 420 MAIN ST
 STURBRIDGE MA 01566-1359

To: MARGUS PROPERTIES LLC
 48 WESTCHESTER RD
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WORCESTER, MA 01605-1925
(800)275-8777

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Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
Colchester, CT 06415			
Weight: 0 lb 13.90 oz			
Acceptance Date:			
Tue 02/07/2023			
Tracking #:			
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Prepaid Mail	1		\$0.00
Colchester, CT 06415			
Weight: 0 lb 13.80 oz			
Acceptance Date:			
Tue 02/07/2023			
Tracking #:			
9405 5036 9930 0474 1195 28			

Prepaid Mail	1		\$0.00
Westborough, MA 01581			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Tue 02/07/2023			
Tracking #:			
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Weight: 0 lb 13.80 oz			
Acceptance Date:			
Tue 02/07/2023			
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Grand Total:			\$0.00
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