



IN CITY COUNCIL

Marlborough, Mass., ~~_____~~ JULY 24, 2023 ~~_____~~

ORDERED:

**IN CITY COUNCIL
NOTICE OF DECISION
GRANT OF SPECIAL PERMIT**

Special Permit Application of:
Dish Wireless, LLC
9601 S. Meridian Boulevard
Englewood, CO 80112
Order No. 23-1008913B

Locus:
2 Mount Royal Avenue
Marlborough, MA 01752
Assessors Map 79, Parcel 33B

DECISION

The City Council of the City of Marlborough hereby **GRANTS** the Application for a Special Permit to Dish Wireless LLC, with a principal office located at 9601 S. Meridian Boulevard, Englewood, CO 80112 c/o Network Building & Consulting, LLC, 100 Apollo Drive, Chelmsford, MA 01824, as provided in the DECISION and subject to the Findings of Fact and Conditions therein.

Decision date: **July 24, 2023.**

The Decision of the City Council was filed in the Office of the City Clerk of Marlborough on the **28th** day of **July 2023.**

This is to certify that twenty (20) days have passed since the filing of the within decision and no appeal has been filed with this office.

Given at Marlborough this **18th** day of **August 2023.**

Given under Chapter 40A Section 17 of the General Laws.

A TRUE COPY
ATTEST:


City Clerk



IN CITY COUNCIL

Marlborough, Mass., JULY 24, 2023

ORDERED:

PAGE 1

IN CITY COUNCIL

DECISION ON A SPECIAL PERMIT DISH WIRELESS, LLC

ORDER NO. 23-1008913B

The City Council of the City of Marlborough hereby **GRANTS** the Application for a Special Permit to Dish Wireless LLC (the "Applicant") to allow for the co-location of a new Wireless Communications Facility (3 antennas and associated equipment) on an existing building, pursuant to the submitted plans, as provided in the DECISION and subject to the Findings of Fact and Conditions therein.

FINDINGS OF FACT

1. The Applicant is a duly organized and existing corporation and FCC Licensee having a principal office located at 9601 S. Meridian Boulevard, Englewood, CO 80112 c/o Network Building & Consulting, LLC, 100 Apollo Drive, Chelmsford, MA 01824.
2. The Applicant is a sublessee of a portion of the property located at 2 Mount Royal Avenue (Assessor's Map 79, Parcel(s) 33) and 0 Lakeside Avenue-A (Assessor's Map 79, Parcel(s) 33B), Marlborough, Massachusetts (the "Site").
3. On May 24, 2023, the Applicant filed with the City Clerk of the City of Marlborough an application (hereinafter referred to as the "Application") for a Special Permit under Chapter 650 (Zoning) of the Code of the City of Marlborough (hereinafter referred to as the "Zoning Ordinance"), Section 650-25 entitled Wireless Communications Facilities.
4. In accordance with Article V, Section 650-18(A)(20) and Section 650-25 of the Zoning Ordinance, the Applicant proposes the co-location of a new Wireless Communications Facility (3 antennas and associated equipment) on an existing building) (the "Use") at the Site, as shown in the plans submitted with the Application and referenced in paragraph 5 below.
5. In connection with the Application, the Applicant submitted a certified list of abutters, filing fees, and plans by NB&C Engineering Services, LLC, with the last revision date of November 18, 2022, (collectively the "Plans"), attached hereto as **"Attachment A."**
6. Pursuant to the Application, the Applicant is licensed by the FCC to provide personal wireless services in the City of Marlborough and surrounding areas and currently has a problem with significant gaps in coverage and capacity issues with coverage that could be alleviated by installing the Use on the subject location as shown on the Plans.



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ORDERED:

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7. The Site is located in the Business (B) Zoning District which allows a Special Permit to be issued for a Wireless Communication Facility (“WCF”).
8. Pursuant to the Rules and Regulations of the City Council of the City of Marlborough and applicable statutes of the Commonwealth of Massachusetts, the City Council established a date for a public hearing on the Application, and the City Clerk for the City of Marlborough caused notice of the same to be advertised and determined that notice of the same was provided to abutters and the planning boards of all surrounding towns entitled thereto in accordance with applicable regulations and law.
9. The Marlborough City Council, pursuant to Massachusetts General Laws Chapter 40A, opened a public hearing on the Application on June 26, 2023. The public hearing was held in the City Council Chamber, at the Marlborough City Hall, 140 Main Street. The public hearing was closed on June 26, 2023.
10. The Applicant presented oral testimony and demonstrative evidence at the public hearing, demonstrating that the Use meets all the applicable Special Permit criteria of Article VI, Section 650-25 and Article VIII, Section 650-59.
11. At the Public Hearing, there were no members of the public speaking in opposition to the Use.
12. The Council, in reviewing the Application, considered the Review Standard and Development Requirements, as enumerated in Article VI, Section 650-25 and Article VII, Section 650-59 of the City of Marlborough Zoning Ordinance, applicable to the Use.

**BASED ON THE ABOVE, THE CITY COUNCIL MAKES THE FOLLOWING
FINDINGS AND TAKES THE FOLLOWING ACTIONS:**

- A. The Applicant has complied with the Rules and Regulations promulgated by the Marlborough City Council as they pertain to special permit applications.
- B. The City Council finds the proposed Use of the Site is in harmony with the intent and general purpose of the Zoning Ordinance of the City of Marlborough when subject to appropriate terms and conditions as provided in this Decision. The City Council makes these findings subject to the completion and adherence by the Applicant, its successors and/or assigns to the conditions more fully set forth herein.
- C. The City Council finds that the proposed Use is consistent with the purposes of Section 650-25 governing WCFs in the City.
- D. The proposed WCF and location are consistent with both the applicable review standards in Section 650-25(D) and the development requirements in Section 650-25(E).



IN CITY COUNCIL

Marlborough, Mass., JULY 24, 2023

ORDERED:

PAGE 3

- E. The City Council recognizes the Applicant is a federal licensee afforded certain protection under federal telecommunications law, to the extent provided by law.
- F. The City Council confirms the Applicant has demonstrated the need to construct the proposed facility to solve certain wireless coverage and capacity issues that currently exist in its network in the vicinity.
- G. The City Council finds that there are adequate, ample parking spaces on the host parcel.
- H. The City Council finds the proposed Use, which consists of an unmanned and unoccupied facility, will have no impact on traffic and pedestrian safety in the area.
- I. The City Council finds the proposed Use will not be contrary to the public health, safety, convenience and welfare and will not be offensive or detrimental.
- J. The City Council, pursuant to its authority under MGL Chapter 40A and the City of Marlborough Zoning Ordinance **GRANTS** to the Applicant a Special Permit for construction of the Use, a wireless communications facility on the existing monopole, **SUBJECT TO THE FOLLOWING CONDITIONS**, which conditions shall be binding on the Applicant, its successors and/or assigns:
 1. Construction in Accordance with Applicable Laws. Construction of all structures on the Site is to be in accordance with all applicable Building Codes and Zoning Regulations in effect in the City of Marlborough and the Commonwealth of Massachusetts and shall be built according to the Plans as may be amended during Site Plan Review.
 2. Site Plan Review. The issuance of the Special Permit is further subject to detailed Site Plan Review by the Site Plan Review Committee, in accordance with the City of Marlborough Site Plan Review Ordinance prior to the issuance of the building permit. Any additional changes, alterations, modifications or amendments, as required during the process of Site Plan Review, shall be further conditions attached to the building permit, and no occupancy permit shall be issued until the Applicant has complied with all conditions. Subsequent Site Plan Review shall be consistent with the conditions of this Special Permit and the Plans submitted, reviewed and approved by the City Council as the Special Permit Granting Authority.
 3. Incorporation of Submissions. All plans, photo renderings, site evaluations, briefs and other documentation provided by the Applicant as part of the Application, and as amended or revised during the application/hearing process before the City Council and/or the City Council's Public Services Committee, are herein incorporated into and become a part of this Special Permit and become conditions and requirements of the same, unless otherwise altered by the City Council.



IN CITY COUNCIL

Marlborough, Mass., JULY 24, 2023

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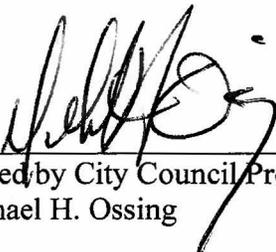
PAGE 4

4. Compliance with Applicable Laws. The Applicant, its successors and/or assigns agrees to comply with all municipal, state, and federal rules, regulations, and ordinances as they may apply to the construction, maintenance, and operation of the Use.
5. All work performed on the Site shall comply with this Decision. No other building or construction or activity (including but not limited to any other communications device, WCF, tower, etc.) shall occur without further modification of this Special Permit. This condition shall be interpreted consistent with federal law governing WCF's.
6. No signage or advertising of any sort shall be permitted as part of the Use.
7. The Applicant shall comply with all applicable conditions for WCFs as set forth in Section 650-25(F), each of which shall constitute conditions of this special permit.
8. In accordance with the provisions of Massachusetts General Laws Chapter 40A, Section 11, the Applicant, its successors and/or assigns, at its expense shall record this Special Permit in the Middlesex South Registry of Deeds after the City Clerk has certified that the twenty-day period for appealing this Special Permit has elapsed with no appeal having been filed, and before the Applicant has applied to the Building Commissioner for a building permit. Upon recording, the Applicant shall forthwith provide a copy of the recorded Special Permit to the City Council Office, the Building Department and the City Solicitor's Office.

Yea: 10 – Nay: 0 – Absent: 1

Yea: Doucette, Dumais, Brown, Irish, Navin, Landers, Oram, Ossing, Perlman, & Robey.

Absent: Wagner.


Signed by City Council President
Michael H. Ossing

ADOPTED
In City Council
23-1008913B

ORDER NO. 23-1008913B

ATTACHMENT

A



DISH Wireless L.L.C. SITE ID:
BOBOS01051C

DISH Wireless L.L.C. SITE ADDRESS:
**2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752**

SCOPE OF WORK	
THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIPMENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:	
SECTOR SCOPE OF WORK:	
<ul style="list-style-type: none"> INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) INSTALL (3) PROPOSED ANTENNA MOUNTS (1 PER SECTOR) INSTALL PROPOSED JUMPERS INSTALL (6) PROPOSED RIRN (2 PER SECTOR) INSTALL (3) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) (1 PER SECTOR) INSTALL (3) PROPOSED DC POWER CABLES (1 PER SECTOR) INSTALL (3) PROPOSED FIBER TRUNKS (1 PER SECTOR) INSTALL PROPOSED CABLE TRAY 	
ROOFTOP SCOPE OF WORK:	
<ul style="list-style-type: none"> INSTALL (1) PROPOSED METAL PLATFORM WITH H-FRAME INSTALL (1) PROPOSED CABLE TRAY INSTALL (1) PROPOSED RIRN IN CABINET INSTALL (1) PROPOSED EQUIPMENT CABINET INSTALL (1) PROPOSED NEMA 3 TELECO-FIBER BOX INSTALL (1) PROPOSED UPS UNIT INSTALL (1) PROPOSED GROUNDING CONDUIT INSTALL (1) PROPOSED POWER CONDUIT INSTALL (1) PROPOSED FIBER CONDUIT 	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: CB EQUITIES MT ROYAL LLC ADDRESS: 200 SUMMIT DRIVE #210 BURLINGTON, MA 01803	APPLICANT: DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER TYPE: ROOFTOP	TOWER MANAGER: CB EQUITIES MT ROYAL LLC 200 SUMMIT DRIVE #210 BURLINGTON, MA 01803
TOWER CO SITE ID: N/A	
TOWER APP NUMBER: N/A	
COUNTY: MIDDLESEX	SITE DESIGNER: NB+C ENGINEERING SERVICES, LLC 100 APOLLO DRIVE, SUITE 303 CHELSEA, MA 01824 (978) 858-8308
LATITUDE (NAD 83): 42° 20' 25.4574" N 42.340406 N	SITE ACQUISITION: KATIE ADAMS KADAMS@NBCLLC.COM
LONGITUDE (NAD 83): 71° 34' 42.8780" W 71.578410 W	CONSTRUCTION MANAGER: AARON CHANDLER AARON@CHANDLERBODISH.COM
ZONING JURISDICTION: CITY OF MARLBOROUGH	RF ENGINEER: RIMA SEBASTIAN RIMA.SEBASTIAN@DISH.COM
ZONING DISTRICT: N/A	
PARCEL NUMBER: MARL-078-033	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: N-B	
POWER COMPANY: NATIONAL GRID	
TELEPHONE COMPANY: COMCAST	

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, L.L.C.
100 APOLLO DRIVE
SUITE 303
CHELSEA, MA 01824
(978) 858-8308



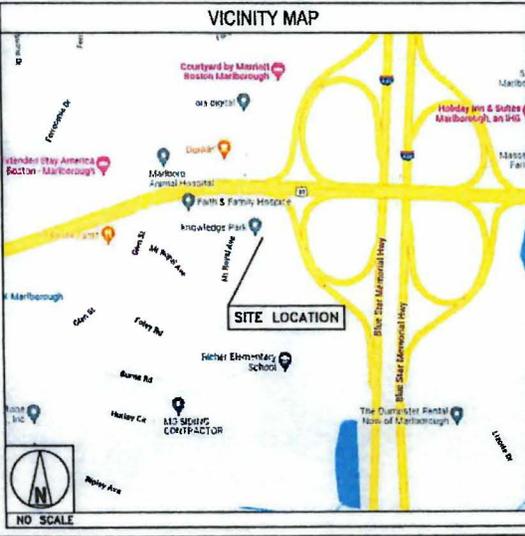
MASSACHUSETTS CODE COMPLIANCE	
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:	
CODE TYPE	CODE
BUILDING	MA STATE BUILDING CODE, 9TH EDITION (780 CMR)/2015 IBC W/ AMENDMENTS
MECHANICAL	MECHANICAL CODE 2015 OF MASSACHUSETTS/2015 IMC W/ AMENDMENTS
ELECTRICAL	MA ELECTRICAL CODE/2020 NEC W/ AMENDMENTS



DIRECTIONS

DIRECTIONS FROM DISH WIRELESS, LOGAN AIRPORT:
GET ON I-90 W FROM TRANSPORTATION WAY. HEAD SOUTH/EAST. SLIGHT RIGHT. USE ANY LANE TO TURN SLIGHTLY LEFT ONTO TRANSPORTATION WAY. TURN LEFT ONTO THE WILLIAMS TUNNEL RAMP TO I-93 W/7-83. MERGE ONTO I-93 W. USE THE RIGHT 2 LANES TO TAKE EXIT 108 TO MERGE ONTO I-495 N. TAKE EXIT 838 TO MERGE ONTO US-30 W/LAKESIDE AVE TOWARD NORTHBOROUGH. MERGE ONTO US-30 W/LAKESIDE AVE. TURN LEFT ONTO GLEN ST. TURN LEFT ONTO MT ROYAL AVE. TURN LEFT TO STAY ON MT ROYAL AVE. TURN RIGHT. DESTINATION WILL BE ON THE RIGHT.

SHEET INDEX	
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	BUILDING PLAN
A-2	ANTENNA PLAN, ELEVATION AND SCHEDULE
A-3	BUILDING ELEVATION
A-4	EQUIPMENT PLATFORM AND H-FRAME 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 & 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	RF SIGNAGE
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES
GN-5	GENERAL NOTES



UNDERGROUND SERVICE ALERT - 811 DIG SAFE
UTILITY NOTIFICATION CENTER OF MASSACHUSETTS
(888) 544-7285
WWW.DIGSAFE.COM

CALL 8 WORKING DAYS AHEAD 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.

IF 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:
AN	NSB	DRG
RFDS REV #:	0	

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/18/2023	ISSUED FOR CONSTRUCTION

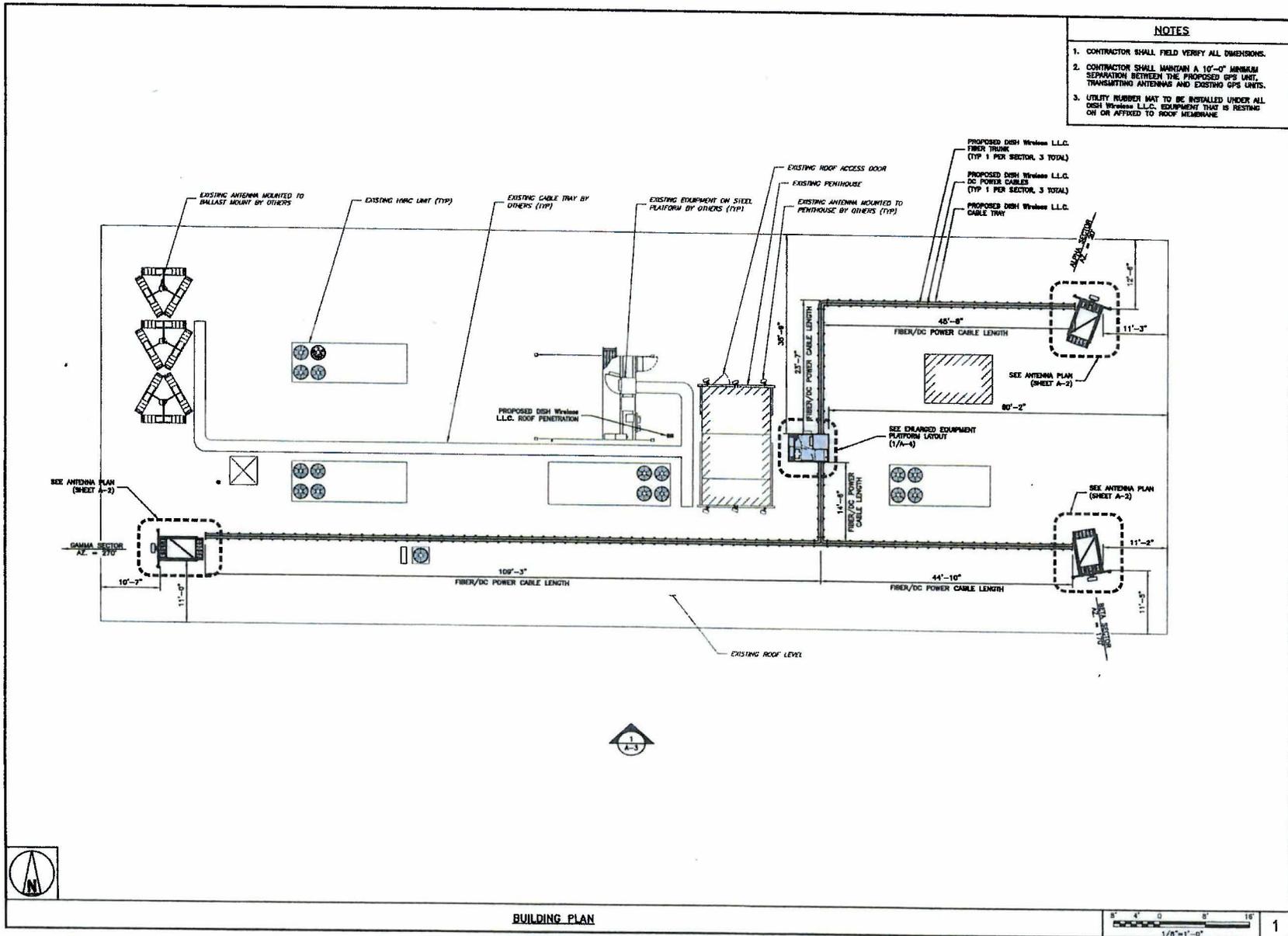
AK# PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



- NOTES**
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
 2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAE AND EXISTING GPS UNITS.
 3. UTILITY RUBBER MAT TO BE INSTALLED UNDER ALL DISH Wireless L.L.C. EQUIPMENT THAT IS RESTING ON OR AFFIXED TO ROOF MEMBRANE.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.
160 APOLLO DRIVE
SUITE 303
CHELSEA, MA 01824
(978) 886-8288



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: _____
AN NSB DRG

RFDS REV #: _____ 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2009	ISSUED FOR CONSTRUCTION

AGE PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
BUILDING PLAN

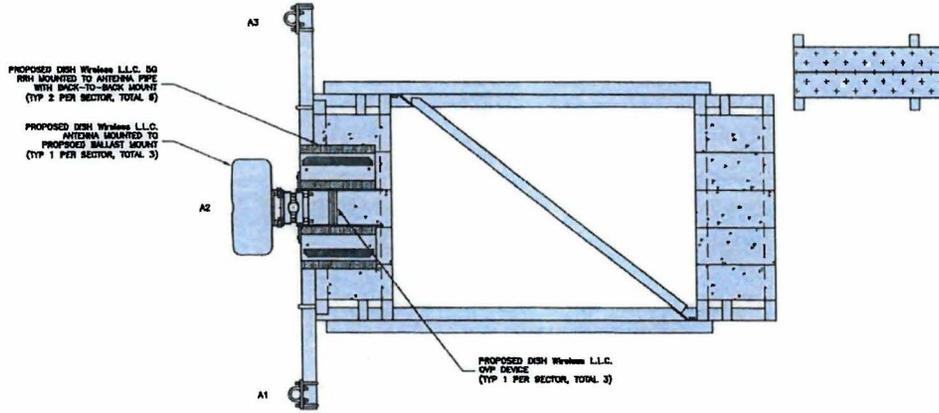
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A-1

BUILDING PLAN



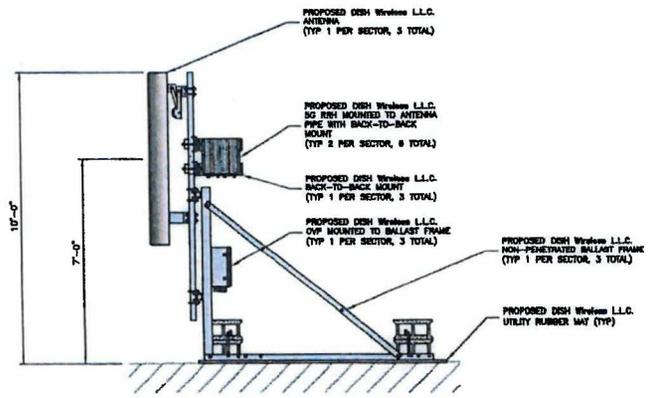
NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
3. EXISTING EQUIPMENT OMITTED FOR CLARITY.
4. ALPHA SECTOR SHOWN TYPICAL FOR BETA AND GAMMA SECTORS.



ANTENNA PLAN (TYPICAL PER SECTOR)

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



ANTENNA ELEVATION

12' 6" 3' 0' 1' 2' 3' 4' 5'
1/2"=1'-0"

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECH	AZIMUTH	RAD CENTER		MANUFACTURER - MODEL NUMBER	TECH	POS.	
A1	---	---	---	---	---	(1) 5000 DC POWER CABLE (1) FIBER TRUNK (70' & LONG)	FLRITSU - TA08025-8805	5G	A2	RAYCAP
A2	PROPOSED	COMSCOPE - FPVW-858-R2	5G	20'	87°-0'		FLRITSU - TA08025-8804	5G	A2	RODEC-3045-PF-88
A3	---	---	---	---	---		---	---	---	---
B1	---	---	---	---	---	(1) 5000 DC POWER CABLE (1) FIBER TRUNK (88' & LONG)	FLRITSU - TA08025-8805	5G	B2	RAYCAP
B2	PROPOSED	COMSCOPE - FPVW-858-R2	5G	170'	87°-0'		FLRITSU - TA08025-8804	5G	B2	RODEC-3045-PF-88
B3	---	---	---	---	---		---	---	---	---
C1	---	---	---	---	---	(1) 5000 DC POWER CABLE (1) FIBER TRUNK (132' & LONG)	FLRITSU - TA08025-8805	5G	C2	RAYCAP
C2	PROPOSED	COMSCOPE - FPVW-858-R2	5G	270'	87°-0'		FLRITSU - TA08025-8804	5G	C2	RODEC-3045-PF-88
C3	---	---	---	---	---		---	---	---	---

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

ANTENNA SCHEDULE

NO SCALE 3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



NB+C ENGINEERING SERVICES, L.L.C.
180 APOLLO DRIVE
SUITE 303
CHARLESTON, MA 01924
(978) 665-8366



IF 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:
AN NSB DRC
RFD5 REV # : 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/18/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01051A
2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

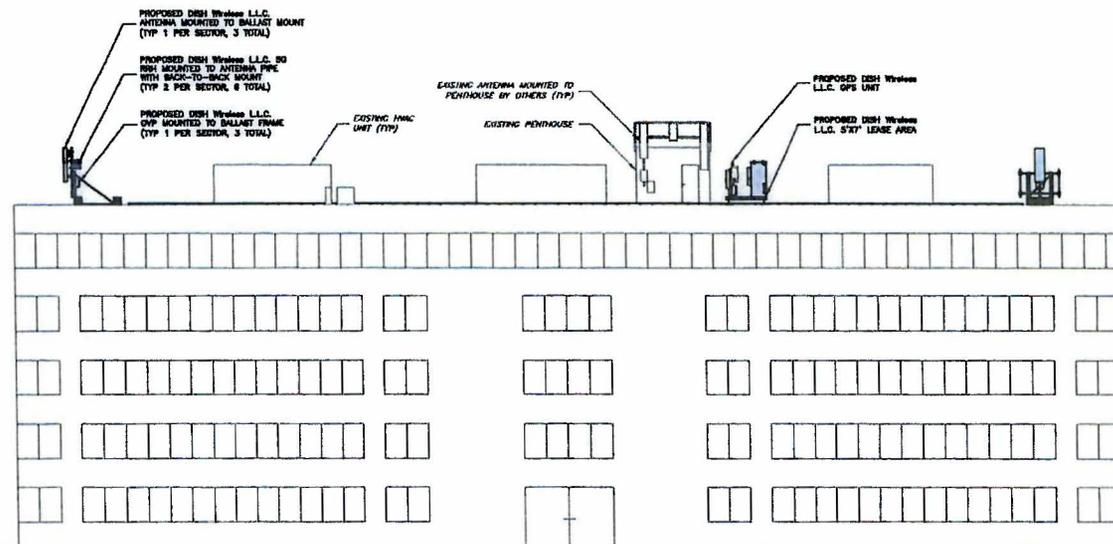
SHEET TITLE
ANTENNA PLAN,
ELEVATION AND SCHEDULE
SHEET NUMBER

A-2

NOTES

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

- TOP OF HIGHEST APPURTENANCE
74'-0" AGL
- EXISTING PENTHOUSE
70'-0" AGL
- TOP OF PROPOSED DISH Wireless L.L.C. ANTENNA (TYP. 1 PER SECTOR, 3 TOTAL)
70'-0" AGL
- PROPOSED DISH Wireless L.L.C. ANTENNA (TYP. 1 PER SECTOR, 3 TOTAL)
RAD CENTER @ 67'-0" AGL
- EXISTING BUILDING ROOF
66'-0" AGL



GROUND LEVEL
0'-0" AGL

BUILDING ELEVATION



IF IS A HOLDER OF LIP FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
AN	NSB	ORC
RFDS REV #:		0

CONSTRUCTION DOCUMENTS		
SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/14/2022	ISSUED FOR CONSTRUCTION

AKS PROJECT NUMBER
100753

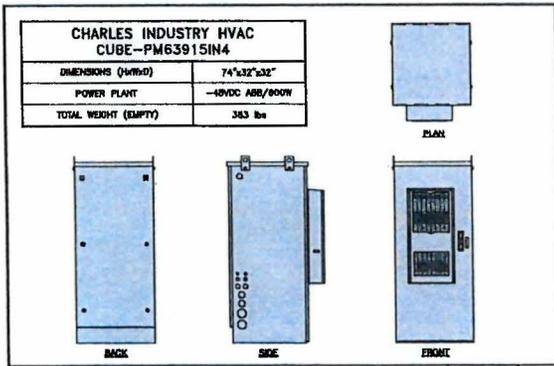
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01051A

**2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752**

SHEET TITLE
**BUILDING
ELEVATION**

SHEET NUMBER

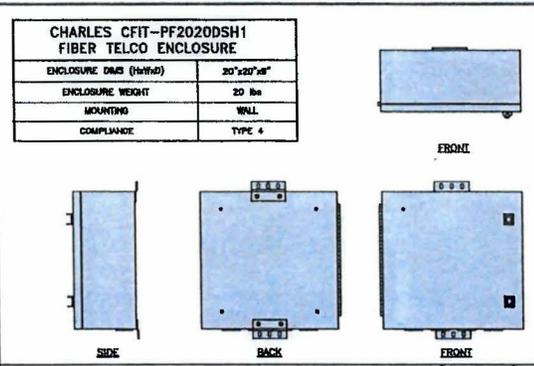
A-3



CABINET DETAIL

NO SCALE

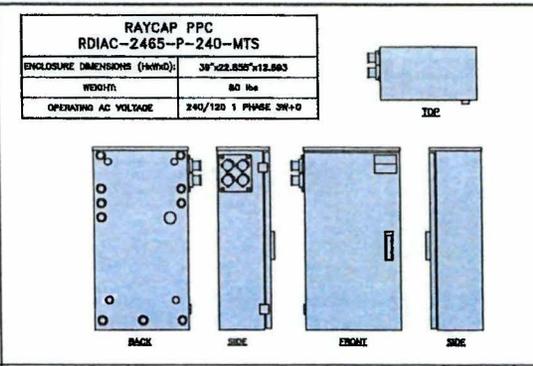
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FIBER TELCO ENCLOSURE DETAIL

NO SCALE

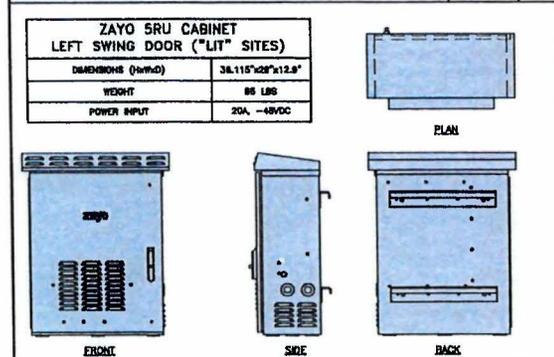
2



POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

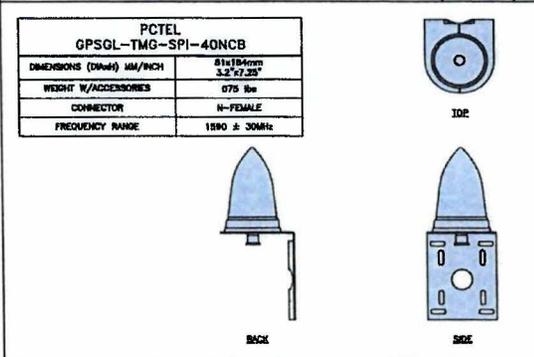
3



NETWORK INTERFACE UNIT DETAIL

NO SCALE

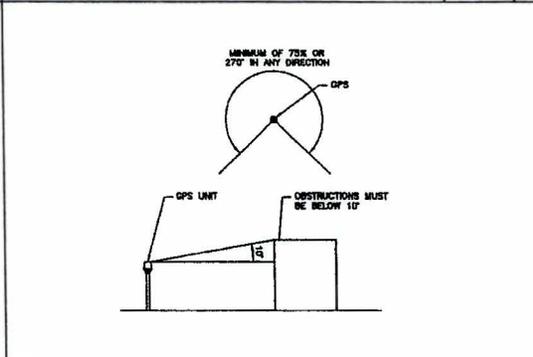
4



GPS DETAIL

NO SCALE

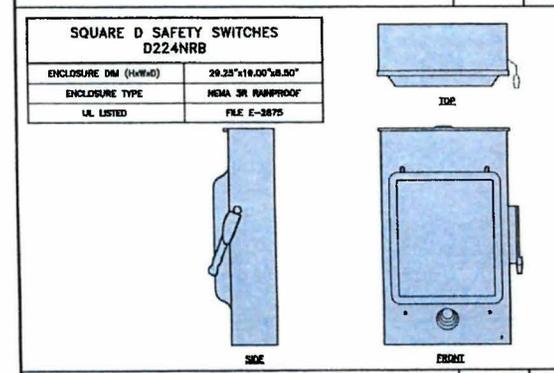
5



GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

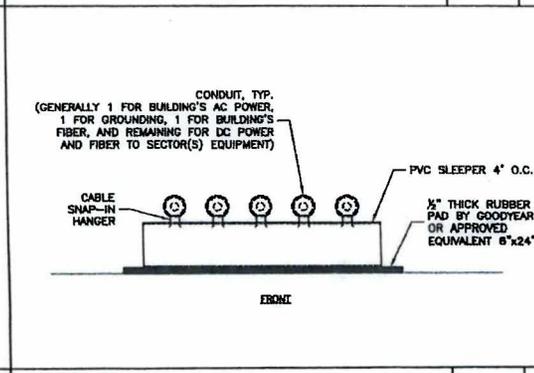
6



SAFETY SWITCH DETAIL

NO SCALE

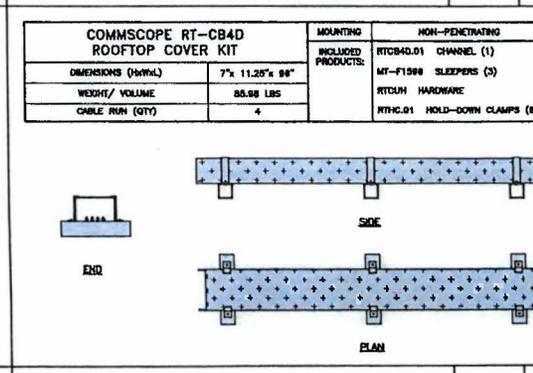
7



ROOFTOP SLEEPER DETAIL

NO SCALE

8



ROOFTOP CABLE TRAY DETAIL

NO SCALE

9

3701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, L.L.C.

100 APOLLO DRIVE
SUITE 203
CHELSEA/CORV. MA 01924
(978) 666-8308

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DRAWN BY: CHECKED BY: APPROVED BY:

AN NSB DRG

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2002	ISSUED FOR CONSTRUCTION

AKA PROJECT NUMBER
100753

DISH Wireless L.L.C. PROJECT INFORMATION
BOBOS01051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.8"x19.7"x7.5"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -55--35V



PLAN



BACK



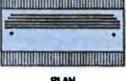
SIDE



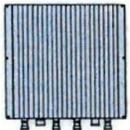
FRONT

RRH DETAIL NO SCALE 1

FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.8"x19.7"x8"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -55--35V



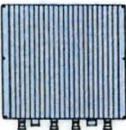
PLAN



BACK



SIDE

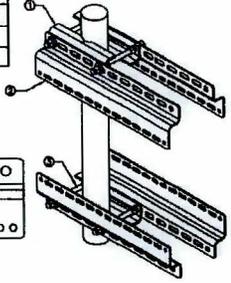


FRONT

RRH DETAIL NO SCALE 2

SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x11-13/16"
WEIGHT (FULL ASSEMBLY)	38.79 lbs
PACKAGE QUANTITY	4

ITEM #	DESCRIPTION
1	FLAT CHANNEL BRACKET
2	RRU 2 BRACKET 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



11MM ± 30MM SLOTS
±0.04 ON CENTER

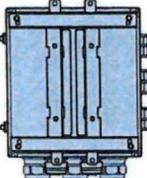
11MM ± 24MM SLOTS

REMOTE RADIO MOUNT DETAIL NO SCALE 3

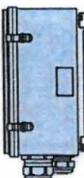
RAYCAP RDIDC-3045-PF-4B SURGE PROTECTION DEVICE (OVP)	
DIMENSIONS (HxWxD)	18.00"x18.21"x9.84"
WEIGHT	21 lbs



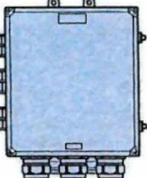
PLAN



BACK



SIDE



FRONT

SURGE PROTECTION DEVICE DETAIL (OVP) NO SCALE 4

COMMSCOPE FFVY-65B-R2	
DIMENSIONS (HxWxD)(MxWxD)	102x498x107 / 72x18.8x7.8"
RF CONNECTOR INTERFACE	4.3-10 FEMALE
WEIGHT	70.8 lbs
WEIGHT WITH BRACKETS	98.1 lbs



PLAN



BACK



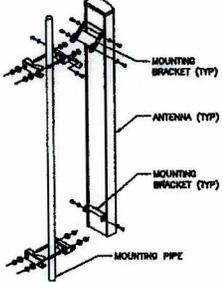
SIDE



FRONT

ANTENNA DETAIL NO SCALE 5

M04 MOUNTING BRACKET HPA-33R-BUU-H4-K	
WIDTH	5" (128mm)
DEPTH	2" (51mm)
HEIGHT	8" (213mm)
TOTAL WEIGHT (WITH BRACKETS)	1.5 LBS (15.50 Kg)
HOUSING MATERIAL	ASA/ABS/ALUMINUM
PANACHE COLOR	LIGHT GRAY
CONNECTOR	1X8-PIN DASHY CHAIN



MOUNTING BRACKET (TYP)

ANTENNA (TYP)

MOUNTING BRACKET (TYP)

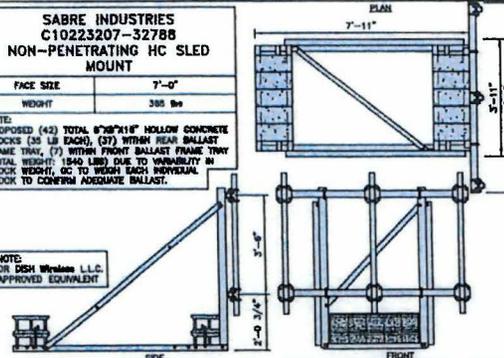
MOUNTING PIPE

ANTENNA MOUNTING DETAIL NO SCALE 6

SABRE INDUSTRIES C10223207-32788 NON-PENETRATING HC SLED MOUNT	
FACE SIZE	7'-0"
WEIGHT	385 lbs

NOTE: PROPOSED (42) TOTAL 8"x8"x18" HOLLOW CONCRETE BLOCKS (35 LB EACH), (37) WITH REAR BALLAST FRAME TRAY, (7) WITH FRONT BALLAST FRAME TRAY (TOTAL WEIGHT: 1840 LBS) DUE TO VARIABILITY IN BLOCK WEIGHT, GC TO WEIGH EACH INDIVIDUAL BLOCK TO CONFIRM ADEQUATE BALLAST.

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



PLAN 7'-11"

5'-11"

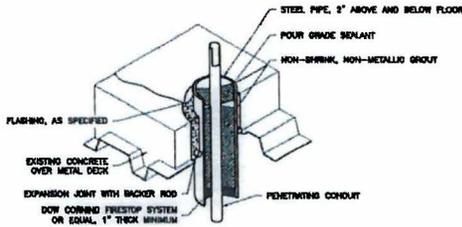
7'-0"

FRONT

FRONT

FRONT

SLED DETAIL NO SCALE 7



STEEL PIPE, 2" ABOVE AND BELOW FLOOR

POUR GRADE SEALANT

NON-SHRINK, NON-METALLIC GROUT

FLASING, AS SPECIFIED

EXISTING CONCRETE OVER METAL DECK

EXPANSION JOINT WITH BACKER ROD

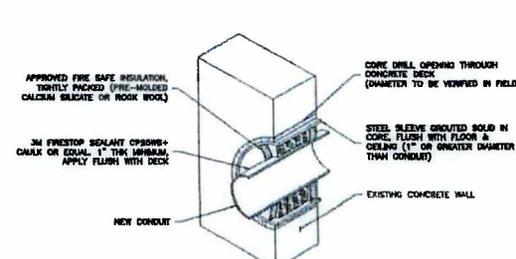
DOW CORNING FIRESTOP SYSTEM OR EQUAL, 1" THICK MINIMUM

PENETRATING CONDUIT

NEW CONDUIT

- VERIFY REINFORCING LOCATION PRIOR TO CORING FLOOR.
- 3" MINIMUM DISTANCE BETWEEN FLOOR PENETRATIONS.
- PROVIDE A MINIMUM 1/4" PILET HOLE PRIOR TO CORING DRILLING IN ORDER TO LOCATE COLUMNS, COMPONENTS, ETC.
- PROVIDE SEALANT TO PREVENT TEMPERATURE MIGRATION FROM WARM TO COLD LOCATIONS AS PER MFG 2506.
- ALL AREAS TO BE PROTECTED WHERE CORE DRILLING ACTIVITIES ARE TO OCCUR.
- ALL AREAS TO BE THOROUGHLY CLEANED UPON COMPLETION OF ALL CORE DRILLING ACTIVITIES.
- CONTRACTOR SHALL REPLACE ALL DAMAGED CEILING TILES BELOW WORK AREA (CORE DRILLING AREA) AS A PART OF THIS WORK.

CONCRETE DECK CONDUIT PENETRATION DETAIL NO SCALE 8



APPROVED FIRE SAFE INSULATION, TIGHTLY PACKED (FIRE-INCLUDED CALCEM BRICKS OR ROCK WOOL)

3M FIRESTOP SEALANT CPSSW+ CARAK OR EQUAL, 1" THICK MINIMUM, APPLY FLUSH WITH DECK

NEW CONDUIT

STEEL SLEEVE GROUTED SOLID IN CORE, FLUSH WITH FLOOR & CEILING (1" OR GREATER DIAMETER THAN CONDUIT)

EXISTING CONCRETE WALL

CONCRETE WALL PENETRATION DETAIL NO SCALE 9

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C
TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, L.L.C.
199 APOLLO DRIVE
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CHILMARK, MA 01924
(978) 936-4306



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DRAWN BY: CHECKED BY: APPROVED BY:

AH NSB DRG

RFDS REV #:

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2022	ISSUED FOR CONSTRUCTION

A/E PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION

BOB0S01051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

1. UTILIZE EXISTING ABANDONED METROPOLIS CONDUITS WHERE AVAILABLE. REPLACE/INSTALL NEW CONDUIT SECTIONS AS FEASIBLE.
2. CONTRACTOR TO VERIFY WITH DISH Wireless L.L.C. C.M. THE LOCATION OF THE POWER AND FIBER SOURCE PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



TOTALLY COMMITTED.
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(978) 286-4300



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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
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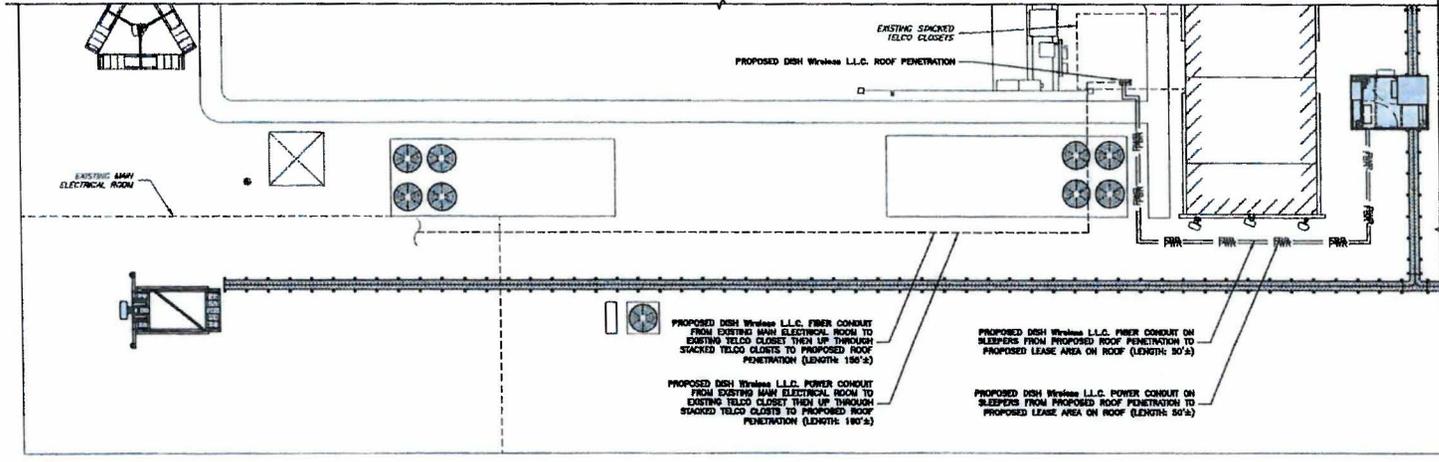
A&E PROJECT NUMBER
100753

DISH Wireless L.L.C. PROJECT INFORMATION
BOB0S1051A

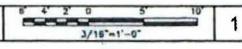
**2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752**

SHEET TITLE
**ELECTRICAL/FIBER ROUTE
PLAN AND NOTES**

SHEET NUMBER
E-1

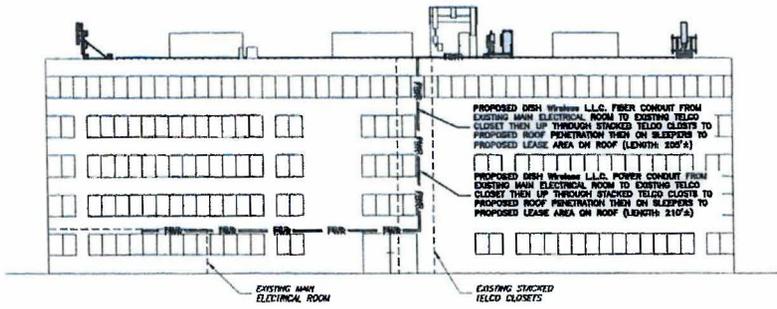


UTILITY ROUTE PLAN

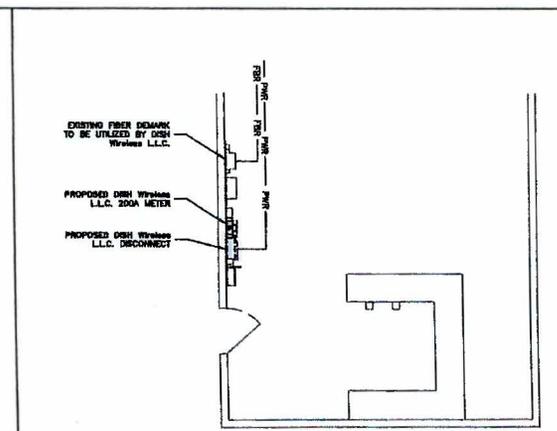


NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. EXISTING METER AND DISCONNECT LOCATED IN THE ELECTRICAL ROOM IN THE BASEMENT. WILL NEED BUILDING MAINTENANCE FOR ROOM ACCESS



UTILITY ROUTE ELEVATION

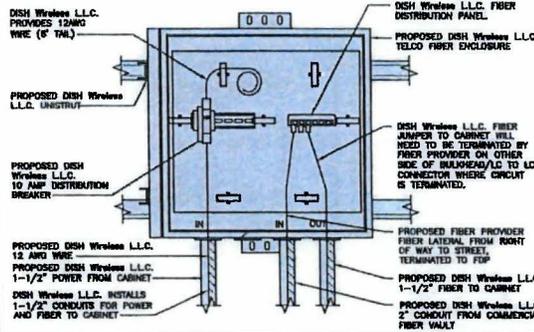


ELECTRICAL ROOM PLAN

NO SCALE

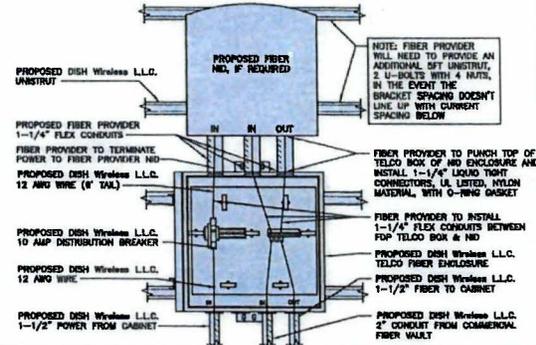
DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

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



DARK TELCO BOX - INTERIOR WIRING LAYOUT

NO SCALE 2



LIT TELCO BOX - INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 3

ELECTRICAL NOTES

NO SCALE 1

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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, L.L.C.

100 APOLLO DRIVE
SUITE 303
CHILMARK, MA 01914
(978) 698-6508



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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/16/2022	ISSUED FOR CONSTRUCTION

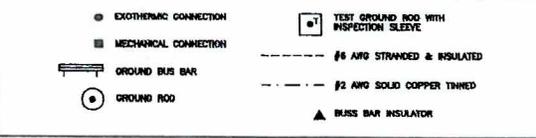
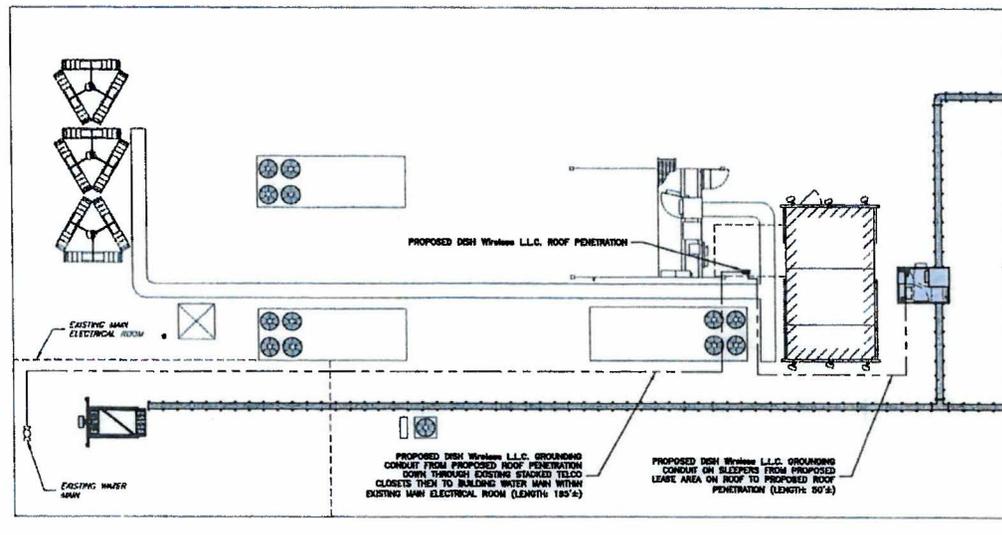
A&E PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01051A
2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
**ELECTRICAL
DETAILS**

SHEET NUMBER

E-2



GROUNDING LEGEND

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

GROUNDING ROOFTOP KEY NOTES

- EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 8 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL ON FOOTING.
- ROOFTOP GROUND SYSTEM: THE GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- 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 GROUND TO THE INTERIOR GROUND RING WITH #8 AWG STRANDED GREEN INSULATED CONDUCTOR.
- ROAD TO INTERIOR GROUND RING: #2 AWG SOLID THINW COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING OR ROOM.
- 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.
- CELL REFERENCE GROUND BAR (CRGB): 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 COMMON BUILDING GROUND SYSTEM WITH (2) #2 SOLID THINW COPPER CONDUCTORS.
- HATCH PLATE GROUND BAR: BOND TO THE COMMON BUILDING GROUND SYSTEM 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.
- EXTERIOR CABLE ENTRY POINT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE ROOM, BOND TO GROUND RING WITH A #2 AWG SOLID THINW COPPER CONDUCTORS WITH MECHANICAL CONNECTIONS.
- TELEC. GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENT'S METAL FRAMEWORK.
- INTERIOR LINE 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.
- FENCE AND GATE GROUNDING: METAL FENCES SHALL BE BONDED TO THE COMMON BUILDING GROUND SYSTEM WITH A #2 AWG SOLID THINW COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
- EXTERIOR LINE BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE COMMON BUILDING GROUND SYSTEM USING #2 THINW SOLID COPPER WIRE.
- ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LED SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE THINW COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LED AND BURIED GROUND RING.
- 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.
- ROOFTOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO COMMON BUILDING GROUND SYSTEM. REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C
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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

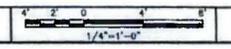
REV	DATE	DESCRIPTION
0	11/14/2008	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
100753
DISH Wireless L.L.C.
PROJECT INFORMATION
BOB0S01051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752
SHEET TITLE
GROUNDING PLANS AND NOTES
SHEET NUMBER

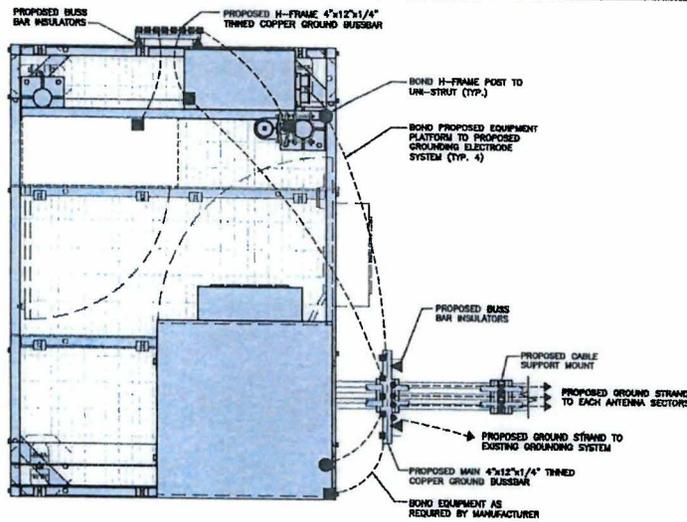
G-1

GROUNDING PLAN



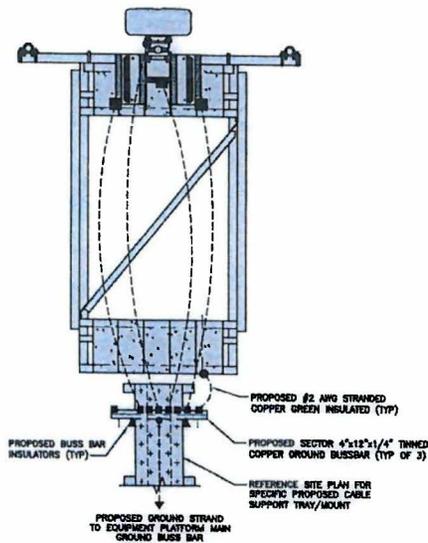
GROUNDING KEY NOTES

NO SCALE 2



TYPICAL ROOFTOP EQUIPMENT GROUNDING PLAN

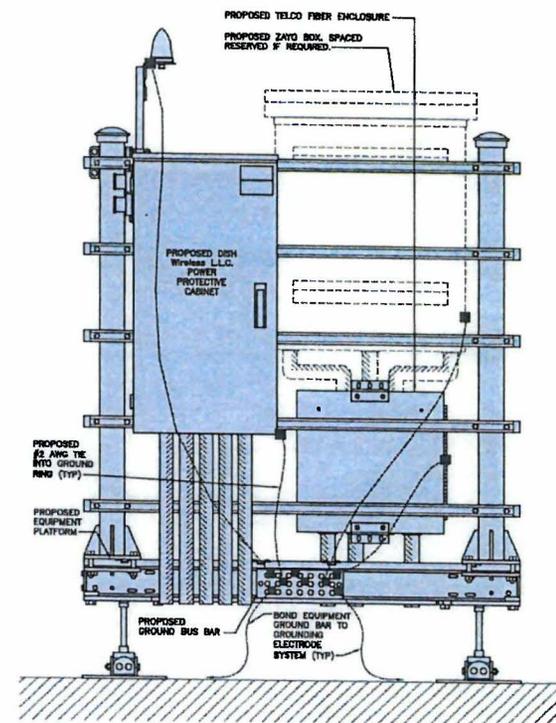
NO SCALE 1



TYPICAL ROOFTOP ANTENNA GROUNDING PLAN

NO SCALE 2

NOTE
EQUIPMENT CABINET OMITTED FOR CLARITY



H-FRAME GROUNDING DETAIL

NO SCALE 3

dish wireless.

5701 SOUTH SANTA FE DRIVE
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AN NSB DRG

R/FDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2010	ISSUED FOR CONSTRUCTION

AME PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

HYBRID/DISCREET CABLES												
3/4" TAPE WIDTHS WITH 3/4" SPACING												
<p>LOW-BAND RRH (500 MHz N71 BASEBAND) + (500 MHz N25 BAND) + (700 MHz N20 BAND) - OPTIONAL FOR MARKET ADD FREQUENCY COLOR TO SECTOR BAND (CORS WILL USE YELLOW BAND)</p>												
ALPHA RRH				BETA RRH				GAMMA RRH				
PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 5 + SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN	ORANGE
		ORANGE	ORANGE			ORANGE	ORANGE			ORANGE	ORANGE	ORANGE
<p>MID-BAND RRH (AWS BANDS H8B+N7D) ADD FREQUENCY COLOR TO SECTOR BAND (CORS WILL USE YELLOW BANDS)</p>												
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN	PURPLE
		PURPLE	PURPLE			PURPLE	PURPLE			PURPLE	PURPLE	PURPLE
<p>HYBRID/DISCREET CABLES</p> <p>INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.</p> <p>EXAMPLE 1 - HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS.</p> <p>EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS CORS ONLY, ALL SECTORS.</p> <p>EXAMPLE 3 - MAIN COAX WITH GROUND MOUNTED RRH.</p>												
EXAMPLE 1		EXAMPLE 2		EXAMPLE 3		CONVERTER CORNER #2 (ALPHA)						
RED	RED	RED	RED	RED	RED	RED	RED					
BLUE	BLUE	BLUE	BLUE									
GREEN	GREEN	GREEN	GREEN									
ORANGE	ORANGE	ORANGE	ORANGE									
PURPLE	PURPLE	PURPLE	PURPLE									
<p>FIBER JUMPERS TO RRHs</p> <p>LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY.</p>												
LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH							
RED	RED	BLUE	BLUE	GREEN	GREEN							
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE							
<p>POWER CABLES TO RRHs</p> <p>LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY.</p>												
LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH							
RED	RED	BLUE	BLUE	GREEN	GREEN							
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE							
<p>RET MOTORS AT ANTENNAS</p> <p>RET CONTROL IS HANDLED BY THE MID-BAND RRH WHEN ONE SET OF RET PORTS EXIST ON ANTENNAS.</p> <p>SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.</p>												
ANTENNA 1 MID BAND LOW BAND		ANTENNA 1 MID BAND LOW BAND		ANTENNA 1 MID BAND LOW BAND		ANTENNA 1 MID BAND LOW BAND						
IN	IN	IN	IN	IN	IN	IN	IN					
RED	RED	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN					
PURPLE	ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE	ORANGE					
<p>MICROWAVE RADIO LINKS</p> <p>LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE. ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.</p> <p>MICROWAVE CABLES WILL REQUIRE P-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE IDs.</p>												
FORWARD AZIMUTH OF 0-120 DEGREES			FORWARD AZIMUTH OF 120-240 DEGREES			FORWARD AZIMUTH OF 240-360 DEGREES						
PRIMARY		SECONDARY	PRIMARY		SECONDARY	PRIMARY		SECONDARY				
WHITE	WHITE	RED	WHITE	WHITE	RED	WHITE	WHITE	GREEN	WHITE			
RED	RED	ORANGE	WHITE	WHITE	ORANGE	WHITE	WHITE	GREEN	WHITE			
WHITE	WHITE	RED	WHITE	WHITE	RED	WHITE	WHITE	GREEN	WHITE			
WHITE	WHITE	ORANGE	WHITE	WHITE	ORANGE	WHITE	WHITE	GREEN	WHITE			

RF CABLE COLOR CODES

NO SCALE

1

NOT USED

NO SCALE

4

LOW BANDS (N71+N20)
OPTIONAL - (N25)

ORANGE

AWS
(N6B+N7D+H-BLOCK)

PURPLE

CORS TECH
(3 OH)

YELLOW

NEGATIVE SLANT PORT
ON ANT/RRH

WHITE

ALPHA SECTOR

RED

BETA SECTOR

BLUE

GAMMA SECTOR

GREEN

COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

dish
wireless.

3701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C
TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.

100 POLLO DRIVE
SUITE 303
CHELSEA, MA 01824
978-284-3388



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DRAWN BY: CHECKED BY: APPROVED BY:

AN NSB DRC

RFDS REV #:

0

CONSTRUCTION
DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2023	ISSUED FOR CONSTRUCTION

AWE PROJECT NUMBER

100753

DISH Wireless L.L.C.
PROJECT INFORMATION

BOB0501051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE

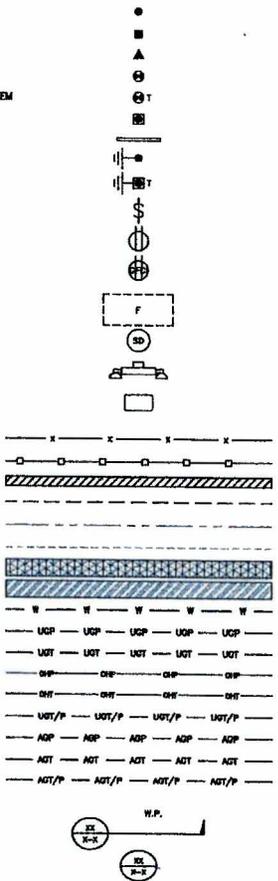
RF

CABLE COLOR CODE

SHEET NUMBER

RF-1

EXOThERMIC CONNECTION
 MECHANICAL CONNECTION
 BUSS BAR INSULATOR
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 EXOThERMIC WITH INSPECTION SLEEVE
 GROUNDING BAR
 GROUND ROD
 TEST GROUND ROD WITH INSPECTION SLEEVE
 SINGLE POLE SWITCH
 DUPLEX RECEPTACLE
 DUPLEX GFCI RECEPTACLE
 FLUORESCENT LIGHTING FIXTURE
 (2) TWO LAMPS 48"-TS
 SMOKE DETECTION (DC)
 EMERGENCY LIGHTING (DC)
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
 DEBWH-48884800/35K-SR4-120-PE-DB8TXD
 WOOD/WROUGHT IRON FENCE
 WALL STRUCTURE
 LEASE AREA
 PROPERTY LINE (PL)
 SETBACKS
 ICE BRIDGE
 CABLE TRAY
 WATER LINE
 UNDERGROUND POWER
 UNDERGROUND TELCO
 OVERHEAD POWER
 OVERHEAD TELCO
 UNDERGROUND TELCO/POWER
 ABOVE GROUND POWER
 ABOVE GROUND TELCO
 ABOVE GROUND TELCO/POWER
 WORKPOINT
 SECTION REFERENCE
 DETAIL REFERENCE



LEGEND

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

ABBREVIATIONS



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



TOTALLY COMMITTED.

NB-C ENGINEERING SERVICES, LLC.

186 APOLO DRIVE
SUITE 300
CHELSEAFORD, MA 01824
(978) 368-6266



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DRAWN BY: CHECKED BY: APPROVED BY:

AN	NSB	DRG
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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS	
REV	DATE DESCRIPTION
0	11/16/2022 ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOB0501051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SIGN TYPES		
TYPE	COLOR	COLOR CODE PURPOSE
INFORMATION	GREEN	"INFORMATIONAL SIGN" TO NOTIFY OTHERS OF SITE OWNERSHIP & CONTACT NUMBER AND POTENTIAL RF EXPOSURE.
NOTICE	BLUE	"NOTICE BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(f).
CAUTION	YELLOW	"CAUTION BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(f).
WARNING	ORANGE/RED	"WARNING BEYOND THIS POINT" RF FIELDS AT THIS SITE EXCEED FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(f).

SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING EME REPORT, CREATED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH Wireless L.L.C.
- INFORMATION SIGN (SIGNED) SHALL BE LOCATED ON EXISTING DISH Wireless L.L.C. EQUIPMENT.
A) IF THE INFORMATION SIGN IS A STICKER, IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C. EQUIPMENT CABINET.
B) IF THE INFORMATION SIGN IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C. H-FRAME WITH A SECURE ATTACH METHOD.
- IF EME REPORT IS NOT AVAILABLE AT THE TIME OF CREATION OF CONSTRUCTION DOCUMENTS, PLEASE CONTACT DISH Wireless L.L.C. CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION ON HOW TO PROCEED.

NOTES:

1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH Wireless L.L.C. CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE.
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH BOWS
6. ALL SIGNS TO BE 8.5"x11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL.

INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: _____

THIS SIGN IS FOR REFERENCE PURPOSES ONLY



NOTICE



Transmitting Antenna(s)

Radio frequency fields beyond this point MAY EXCEED the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____



THIS SIGN IS FOR REFERENCE PURPOSES ONLY

CAUTION



Transmitting Antenna(s)

Radio frequency fields beyond this point MAY EXCEED the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

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Site ID: _____



THIS SIGN IS FOR REFERENCE PURPOSES ONLY

WARNING



Transmitting Antenna(s)

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Site ID: _____



THIS SIGN IS FOR REFERENCE PURPOSES ONLY



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



NB+C ENGINEERING SERVICES, L.L.C.

100 APOLLO DRIVE
SUITE 300
CHELSEA, MA 01824
(978) 898-8306



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DRAWN BY: CHECKED BY: APPROVED BY:

AN NSB DRG

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2012	ISSUED FOR CONSTRUCTION

A/E PROJECT NUMBER
100753

DISH Wireless L.L.C. PROJECT INFORMATION

BOBOSO1051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
RF SIGNAGE

SHEET NUMBER

GN-2

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



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TOTALLY COMMITTED.

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STATE OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER

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DRAWN BY: CHECKED BY: APPROVED BY:

AN	NSB	DRG
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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOB0501051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

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

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

dish
wireless.

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DRAWN BY: CHECKED BY: APPROVED BY:

AN	NSB	DRG
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RFDS REV #:

0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/16/2010	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOB0501051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

GROUNDING NOTES:

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



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DRAWN BY: CHECKED BY: APPROVED BY:

AN NSB DRG

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/14/2003	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
100753

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01051A

2 MOUNT ROYAL AVENUE
MARLBOROUGH, MA 01752

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-5