DEVELOPMENT

October 10, 2023

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

RE: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower
1111 East Putnam Avenue, Riverside, CT 06878
Latitude: 41.04119° N / Longitude: 73.584163° W

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing building at 1111 East Putnam Avenue in Riverside (the "Property"). The existing 37'-0" building is owned by Fountainhead Properties, LLC. DISH requests that the Council find that the proposed shared use of the Fountainhead Properties building satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. This modification/proposal includes hardware that is 5G capable through remote software configuration and either or both services may be turned on or off at various times. A copy of this filing is being sent to Patrick LaRow, Planning & Zoning Director – City of Greenwich, John Vallerie, Chief Building Official – City of Greenwich, and Thomas Torelli, Managing Partner – Allied Property Group, Fred Camillo, First Selectman – City of Greenwich.

Background

The existing Fountainhead Properties facility consists of a 37'-0" building. DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and Fountainhead Properties have agreed to the proposed shared use of the 1111 East Putnam Avenue building pursuant to mutually acceptable terms and conditions. Likewise, DISH and Fountainhead Properties have agreed to the proposed installation of equipment cabinets within the existing building. Fountainhead Properties has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.

DISH proposes to install 3 antennas, 6 RRH, 3 OVP and associated cables on the roof level. In addition, DISH will install an equipment cabinet within the existing building. Included in the Construction Drawings are DISH's project specifications for locations of all proposed site improvements. The Construction Drawings also contain specifications for DISH's proposed antennas and groundwork. The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

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 building is 37'-0"; Dish Wireless LLC proposed antennas will be located at a center line height of 43'-6".

2. The proposed modifications will not result in the 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. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 85.1328% as evidenced by Exhibit E.

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

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

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

C. Environmental Feasibility. The proposed shared use of the Fountainhead Properties building would have a minimal environmental effect for the following reasons:

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this building therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.

2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.

3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the Fountainhead Properties facility other than periodic maintenance. The proposed shared use of the Fountainhead Properties building would, therefore, have a minimal environmental effect, and is environmentally feasible.

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

E. Public Safety Concerns. As discussed above, the building is structurally capable of supporting DISH's full array of 3 antennas, 6 RRU radios, 3 OVP and associated cables and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing Fountainhead Properties building.

Conclusion

For the reasons discussed above, the proposed shared use of the existing Fountainhead Properties at 1111 East Putnam Avenue satisfies the criteria stated in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of buildings in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Sincerely,

Michael Jones
President, M+K Development
140 Beach 137th St
Rockaway Beach, NY 11694
732-677-8881

CC:
Patrick LaRow, Planning & Zoning Director – City of Greenwich
John Vallerie, Chief Building Official – City of Greenwich
Thomas Torelli, Managing Partner – Allied Property Group
Fred Camillo, First Selectman – City of Greenwich

MK DEVELOPMENT

EXHIBIT A

Letter of Authorization

Allied Property Management, LLC
116 Mason Street
Greenwich, CT. 06830

Letter of Authorization

October 10, 2023

Dish Wireless, LLC
5701 South Santa Fe Drive
Littleton, CO 80120

Re: Development Application Letter of Authorization – 1111 E. Putnam Avenue, Riverside, CT 06878 - NJJER02023B

Dear Sir/Madam

Fountainhead Properties, LLC owns the facility at 1111E. Putnam Avenue, Riverside, CT 06878 and identified as Parcel # 12-1010/S (the "Property"). Fountainhead Properties, LLC hereby authorizes DISH Wireless LLC ("DISH") and its agent, O4 Innovations and M&K Development LLC, to file applications for the sole purpose of gaining any zoning approval and building permit(s) to install new telecommunications equipment ("Equipment") on an existing rooftop of the Property. DISH and its aforementioned agents shall not have authority to agree to any stipulations associated with their business before the Building Department that results in a duty on the part of Fountainhead Properties, LLC that Fountainhead Properties, LLC has not expressly permitted in writing.

DISH shall not be permitted to install the Equipment on the property until DISH provides a copy of its building permit from the Town and until DISH complies with any and all requirements set forth in DISH's lease with Fountainhead Properties, LLC.

Please contact me at 203-253-4714 or tom@alliedpropertygp.com should you have any questions or concerns.

Sincerely,

Thomas Torelli
Managing Partner
Allied Property Group

MK DEVELOPMENT

EXHIBIT B

Property Card

Tax ID 407/054 Printed 05/29/2018 Card No. 1 of 1

ADMINISTRATIVE INFORMATION

PARCEL NUMBER
12-1010/S

Parent Parcel Number

Property Address
EAST PUTNAM AVENUE 1111

Neighborhood
2300 EAST PUTNAM

Property Class
212 General Office

TAXING DISTRICT INFORMATION

Jurisdiction	57	Greenwich, CT
Area	001	
Corporation	057	
District	12	
Section & Plat	352	
Routing Number	2365N0104	

Site Description

Topography:

Public Utilities:
Sewer, Electric

Street or Road:

Neighborhood:

Zoning:
LB Local Business

Legal Acres:
0.4993

OWNERSHIP

FOUNTAINHEAD PROPERTIES LLC
% ALLIED PROP MGMT-ATT T TORELLI
116 MASON ST
GREENWICH, CT 06830

LOT NO 10 11 12 & 39B-1 E PUTNAM AVE N 104

TRANSFER OF OWNERSHIP

Date		
12/22/1999	FOUNTAINHEAD PROPERTIES L	Bk/Pg: 3369, 199 $3000000
01/11/1967	NA	Bk/Pg: 750, 310 $0

COMMERCIAL

VALUATION RECORD

Assessment Year		10/31/2005	10/01/2010	10/01/2015	10/01/2015	10/01/2015	10/01/2016	10/01/2017
Reason for Change		2005 Revised	2010 Reval	2015 Prelim	2015 Final	2015 BAA	2016 List	2017 List
VALUATION	L	2967500	2323700	2383600	2383600	2383600	2383600	2383600
Market	B	3192300	2894700	4115900	4115900	3615900	3615900	3216400
	T	6159800	5218400	6499500	6499500	5999500	5999500	5600000
VALUATION	L	2077250	1626590	1668520	1668520	1668520	1668520	1668520
70% Assessed	B	2234610	2026290	2881130	2881130	2531130	2531130	2251480
	T	4311860	3652880	4549650	4549650	4199650	4199650	3920000

LAND DATA AND CALCULATIONS

Land Type	Rating Soil ID -or- Actual Frontage	Measured Acreage -or- Effective Frontage	Table Effective Depth	Prod. Factor -or- Depth Factor -or- Square Feet	Base Rate	Adjusted Rate	Extended Value	Influence Factor	Value
1 Primary Commercial				21749.50	109.59	109.59	2383600		2383600

BA15: Decrease Total value by $500,000
BP14: 14-2192: Lessee - Version Wireless, Antennas $21,000, nvc
DBA: Wind Office Bldg
GEN: Ext wall material: Brk, Stl, Gls
Antenaes Income $192,548 2015 income
ST1P: 2015 GL & 2016 GL

Permit Number / Type	FilingDate	Est. Cost / Est. SqFt	Field Visit

Supplemental Cards

TRUE TAX VALUE 2383600

Supplemental Cards

TOTAL LAND VALUE 2383600

IMPROVEMENT DATA

PHYSICAL CHARACTERISTICS

ROOFING

Built-up

WALLS

	B	1	2	U
Frame		Yes	Yes	Yes
Brick				
Metal				
Guard				

FRAMING

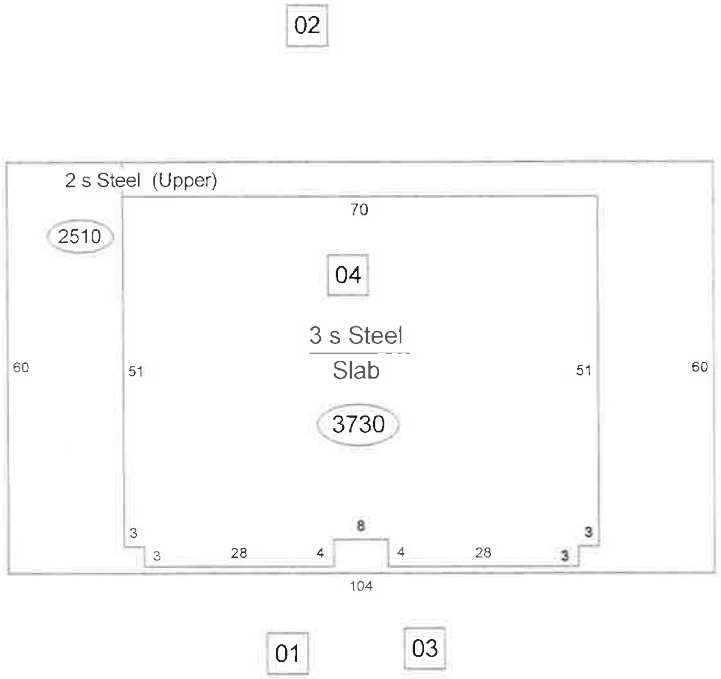
	B	1	2	U
F Prf	0	3730	6240	6240

FINISH

	UF	SF	FO	FD
1	0	0	0	3730
2	0	0	0	6240
U	0	0	0	6240
Total	0	0	0	16210

HEATING AND AIR CONDITIONING

	B	1	2	U
Heat	0	3730	6240	6240
Sprink	0	3730	6240	6240



(LCM: 150.00)

SPECIAL FEATURES

Description	Value

SUMMARY OF IMPROVEMENTS

ID	Use	Stry Hgt	Const Type	Grade	Year Const	Eff Year	Cond	Base Rate	Feat-ures	Adj Rate	Size or Area	Computed Value	Phys Depr	Obsol Depr	Market Adj	% Comp	Value
C	GENOFF	0.00		Avg-	1969	1985	AV	0.00	N	0.00	6240	0	0	0	150	100	3699600
01	PAVING	0.00	85	Good	1969	1985	AV	4.60	N	10.35	16000	165600	13	0	100	100	144100
02	RTWCONC	10.00	6D	Good	1969	1985	AV	26.00	N	58.50	10x 56	3280	13	0	100	100	2900
03	RTWCONC	5.00	6D	Good	1969	1985	AV	26.00	N	58.50	5x 90	5270	13	0	100	100	4600
04	ELEVCOM	3.00	2H	Avg+	1969	1985	AV	169000	N	304200	1@ 0	304200	13	0	100	100	264700

Data Collector/Date	Appraiser/Date	Neighborhood	Supplemental Cards TOTAL IMPROVEMENT VALUE	4115900
JLT 12/08/1999	TOG 10/01/2015	Neigh 2300 AV		

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EXHIBIT C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

NJJER02023B

DISH Wireless L.L.C. SITE ADDRESS:

1111 E PUTNAM AVE
RIVERSIDE, CT 06878

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 PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRHs (2 PER SECTOR)
- INSTALL (3) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) (1 PER SECTOR)
- INSTALL (6) PROPOSED PIPE MOUNTS
- INSTALL (6) PROPOSED DISCRETE CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED EQUIPMENT PLINTH
- INSTALL (1) PROPOSED CABLE TRAY
- 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 CEILING CABLE RUNWAY

SITE INFORMATION

PROPERTY OWNER:	FOUNTAINHEAD PROPERTIES, LLC
ADDRESS:	1111 E PUTNAM AVE RIVERSIDE, CT 06878
TOWER TYPE:	ROOFTOP
TOWER CO SITE ID:	N/A
TOWER APP NUMBER:	N/A
COUNTY:	FAIRFIELD COUNTY
LATITUDE (NAD 83):	41° 02' 28.3" N 41.04119 N
LONGITUDE (NAD 83):	73° 35' 03.0" W 73.584163 W
ZONING JURISDICTION:	CITY OF GREENWICH
ZONING DISTRICT:	LB
PARCEL NUMBER:	12-1010/S
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	LIGHTSOURCE, AT&T

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	FOUNTAINHEAD PROPERTIES, LLC 15 W 72ND STREET, UNIT #32B NEW YORK, NY 10023
SITE DESIGNER:	M+K DEVELOPMENT 140 BEACH 137TH STREET ROCKAWAY, NY 11694
SITE ACQUISITION:	AUSTIN PAPPAS AUSTIN.PAPPAS@DISH.COM
CONSTRUCTION MANAGER:	OMAR ZEERBAN OMAR.ZEERBAN@DISH.COM
RF ENGINEER:	RAFAEL VELAZQUEZ RAFAEL.VELAZQUEZ@DISH.COM

CONNECTICUT CODE OF COMPLIANCE

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

CODE TYPE	CODE
BUILDING	2022 CT STATE BUILDING CODE/2021 IBC W/ CT AMENDMENTS
MECHANICAL	2022 CT STATE BUILDING CODE/2021 IMC W/ CT AMENDMENTS
ELECTRICAL	2022 CT STATE BUILDING CODE/2020 NEC W/ CT AMENDMENTS

SITE PHOTO

SHEET INDEX

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

811

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

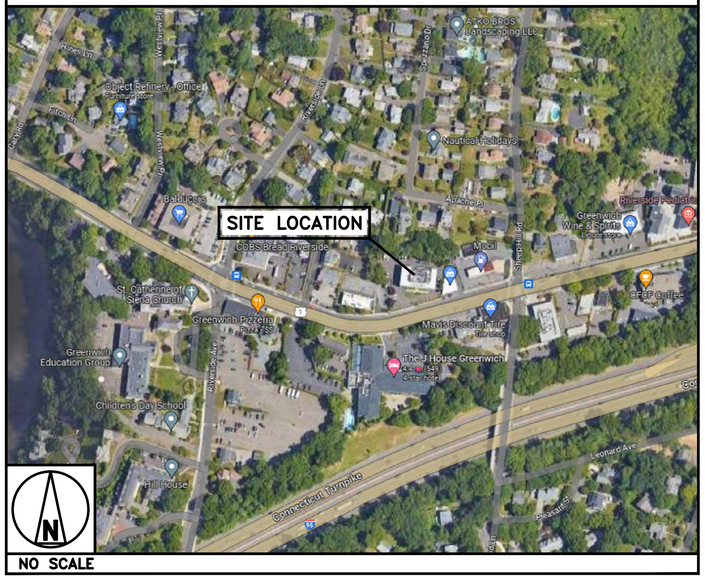
CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

DIRECTIONS

DIRECTIONS FROM 3 ADP BLVD, NJ 07068, USA:

HEAD NORTHEAST TOWARD ADP BLVD, TURN LEFT, TURN LEFT TOWARD ADP BLVD, TURN LEFT TOWARD ADP BLVD, TURN LEFT ONTO ADP BLVD, TURN RIGHT TOWARD CHOCTAW WAY, SLIGHT RIGHT ONTO CHOCTAW WAY, USE THE LEFT LANE TO TURN RIGHT ONTO LIVINGSTON AVE, USE THE RIGHT LANE TO TAKE THE RAMP ONTO I-280 E, MERGE ONTO I-280 E, TAKE EXIT 12 FOR GARDEN STATE PKWY N, KEEP LEFT, FOLLOW SIGNS FOR GARDEN STATE PARKWAY AND MERGE ONTO GARDEN STATE PKWY, CONTINUE ONTO NJ-444 N/GARDEN STATE PKWY, CONTINUE ONTO GARDEN STATE PARKWAY CONNECTOR, TAKE EXIT 14-1 TO MERGE ONTO I-287 E/I-87 S, KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E, FOLLOW SIGNS FOR WHITE PLAINS/RYE, MERGE ONTO I-95 N, TAKE EXIT 5 FOR US-1 TOWARD RIVERSIDE/OLD GREENWICH, TURN LEFT ONTO US-1 S/E PUTNAM AVE.

VICINITY MAP



NO SCALE

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

M+K DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGNUSON
33678
PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	09/06/2023	ISSUED FOR REVIEW
0	10/12/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

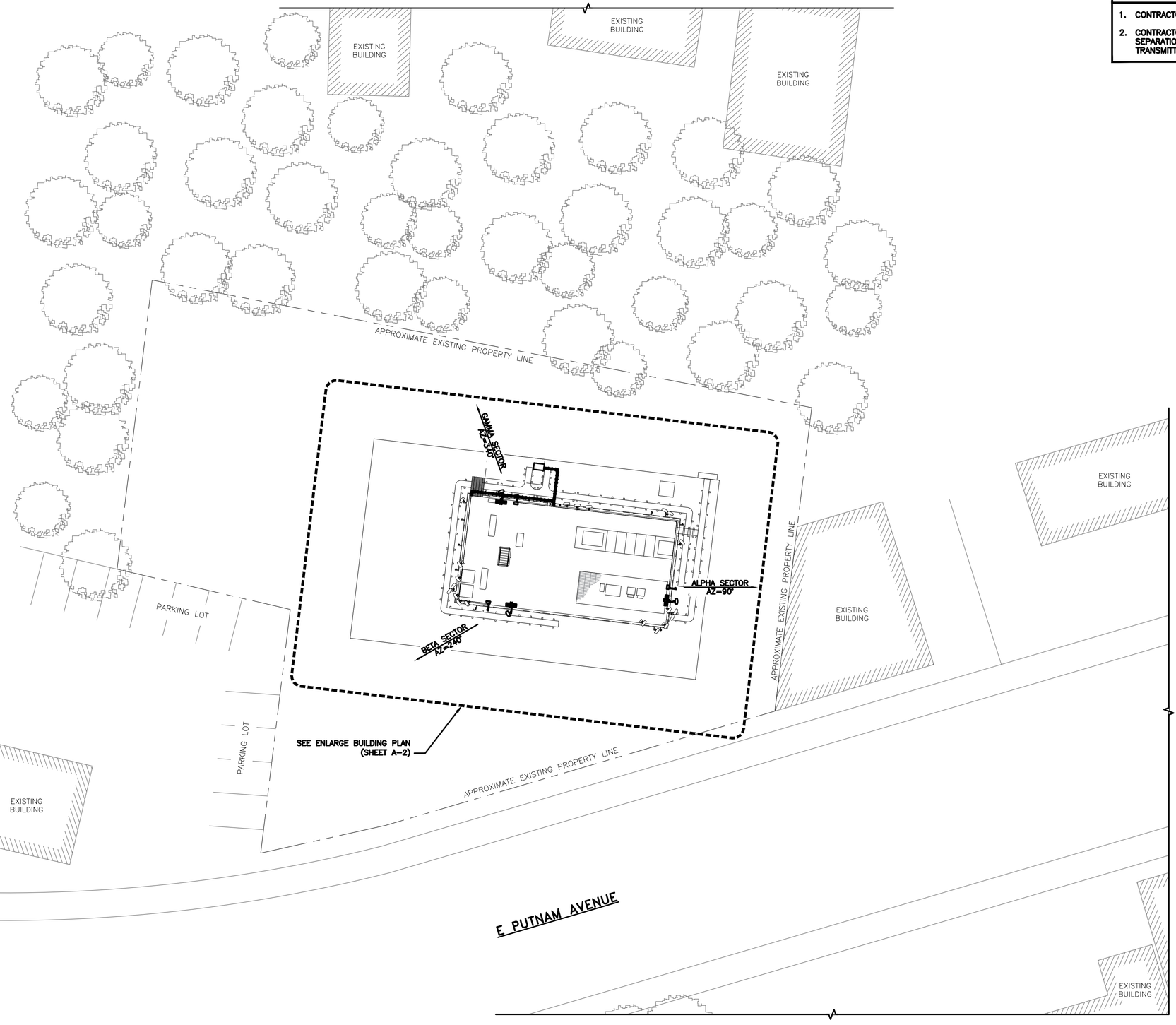
TITLE SHEET

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 ANTENNAS AND EXISTING GPS UNITS.



OVERALL SITE PLAN

16' 12' 8' 4' 0 16' 32'

1/16"=1'-0"

1

DISH Wireless L.L.C. TEMPLATE VERSION 45 – 10/08/2021

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT

140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGNUSON
33678
REGISTERED PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
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RIVERSIDE, CT 06878

SHEET TITLE

OVERALL SITE PLAN

SHEET NUMBER

A-1

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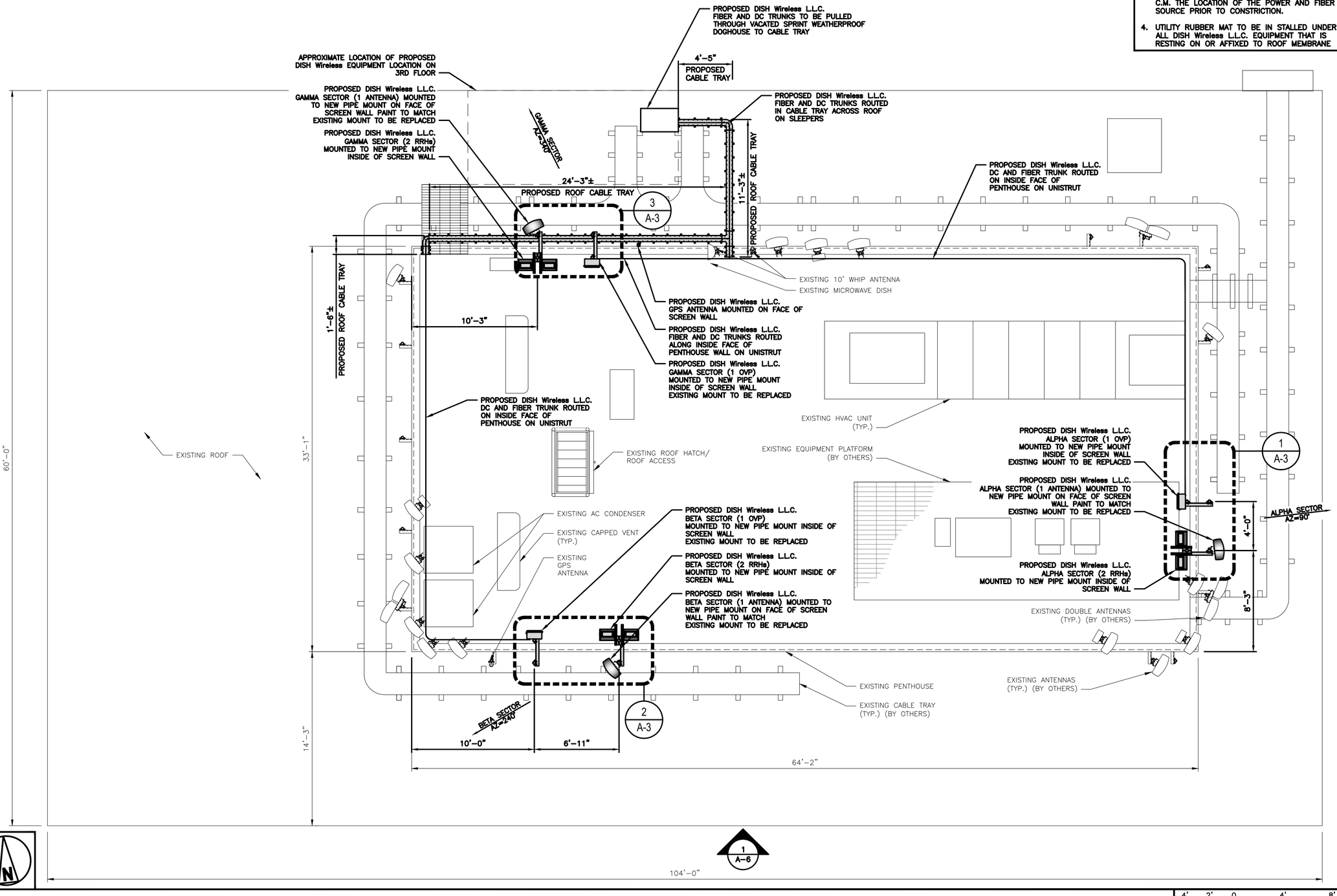
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. CONTRACTOR TO VERIFY WITH DISH Wireless L.L.C. C.M. THE LOCATION OF THE POWER AND FIBER SOURCE PRIOR TO CONSTRICTION.
4. UTILITY RUBBER MAT TO BE IN STALLED UNDER ALL DISH Wireless L.L.C. EQUIPMENT THAT IS RESTING ON OR AFFIXED TO ROOF MEMBRANE



ENLARGED BUILDING PLAN

4' 2' 0 4' 8'
1/4"=1'-0"

1

DISH Wireless L.L.C. TEMPLATE VERSION 45 – 10/08/2021

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGNUSON
33678
REGISTERED PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

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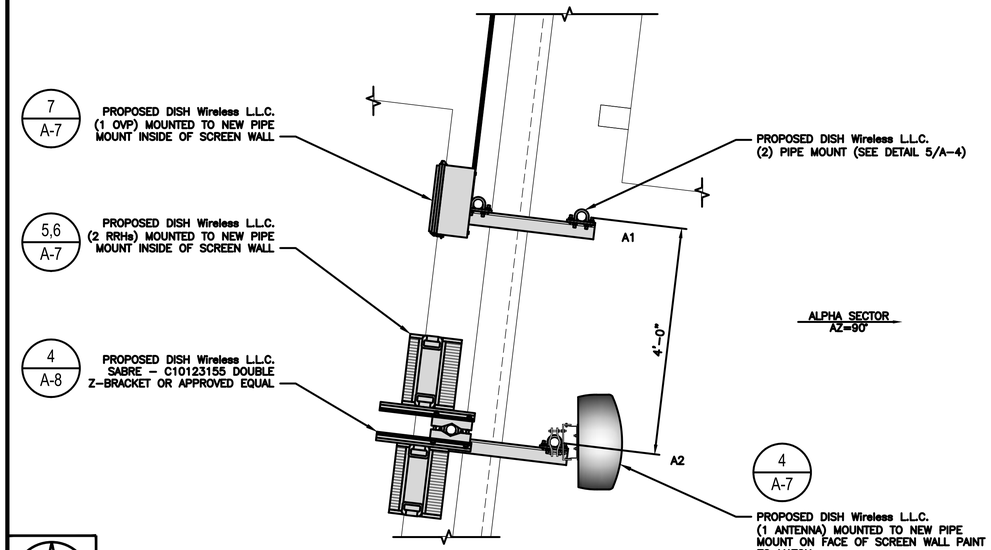
NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02023B
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE
ENLARGED BUILDING PLAN

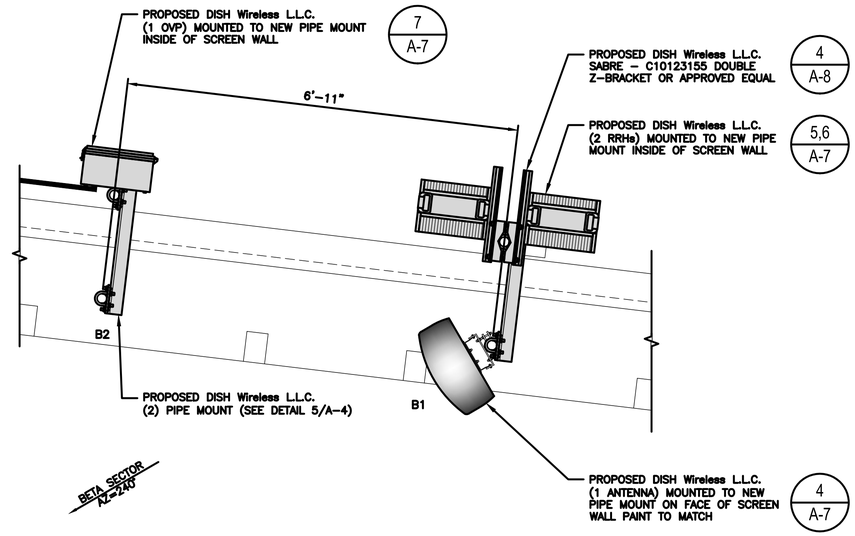
SHEET NUMBER
A-2



ANTENNA PLAN (ALPHA SECTOR)

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

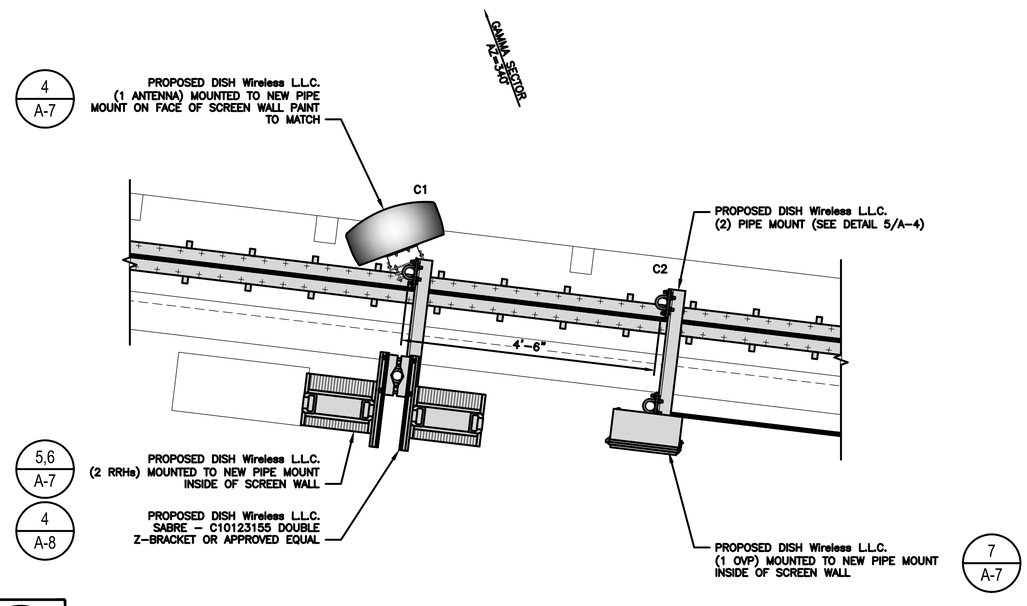
1



ANTENNA PLAN (BETA SECTOR)

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

2



ANTENNA PLAN (GAMMA SECTOR)

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

3

ANTENNA SCHEDULE

SEC	STATUS	ANTENNA MANUF/MODEL	TECH	LxWxD (INCHES)	AREA (SF)	AZIMUTH	ELECTRIC DOWNTILT	MECHANICAL DOWNTILT	ANTENNA CENTERLINE	RRH/ OVP	RRH MODEL	OVP MODEL	CABLE	CABLE LENGTH
A1	–	–	–	–	–	–	–	–	–	1	–	RDIDC-3045-PF-48	8 AWG DC/ FIBER TRUNK	90'-0"
A2	PROPOSED	COMMSCOPE-FFVV-65B-R2	5G	72x19.6 x7.8	1.06	90°	2°	0°	43'-6"	2	SAMSUNG – MID BAND SFG-ARR3KM01DI_RF4451D-70A SAMSUNG – LOW BAND SFG-ARR3J601DI_RF4450T-71A	–	–	–
B1	PROPOSED	COMMSCOPE-FFVV-65B-R2	5G	72x19.6 x7.8	1.06	240°	2°	0°	43'-6"	2	SAMSUNG – MID BAND SFG-ARR3KM01DI_RF4451D-70A SAMSUNG – LOW BAND SFG-ARR3J601DI_RF4450T-71A	–	–	–
B2	–	–	–	–	–	–	–	–	–	1	–	RDIDC-3045-PF-48	8 AWG DC/ FIBER TRUNK	100'-0"
C1	–	–	–	–	–	–	–	–	–	1	–	RDIDC-3045-PF-48	8 AWG DC/ FIBER TRUNK	45'-0"
C2	PROPOSED	COMMSCOPE-FFVV-65B-R2	5G	72x19.6 x7.8	1.06	340°	2°	0°	43'-6"	2	SAMSUNG – MID BAND SFG-ARR3KM01DI_RF4451D-70A SAMSUNG – LOW BAND SFG-ARR3J601DI_RF4450T-71A	–	–	–
–	PROPOSED	PCTEL GPSGL-TMG-SPI-40NCB	–	3.2X7.25	–	–	–	–	–	–	–	–	1/2" COAX	30'-0"

NOTES:
1. INFORMATION BASED ON RFDS DATED TBD. CONTRACTOR TO VERIFY LATEST RFDS WITH RF ENGINEER.
2. ANTENNA CENTERLINE HEIGHT VERIFIED IN FIELD.

AWG	MAX DISTANCE
4 AWG	240 ft
6 AWG	180 ft
8 AWG	120 ft

ANTENNA SCHEDULE

NO SCALE

4

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGNUSON
33678
PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

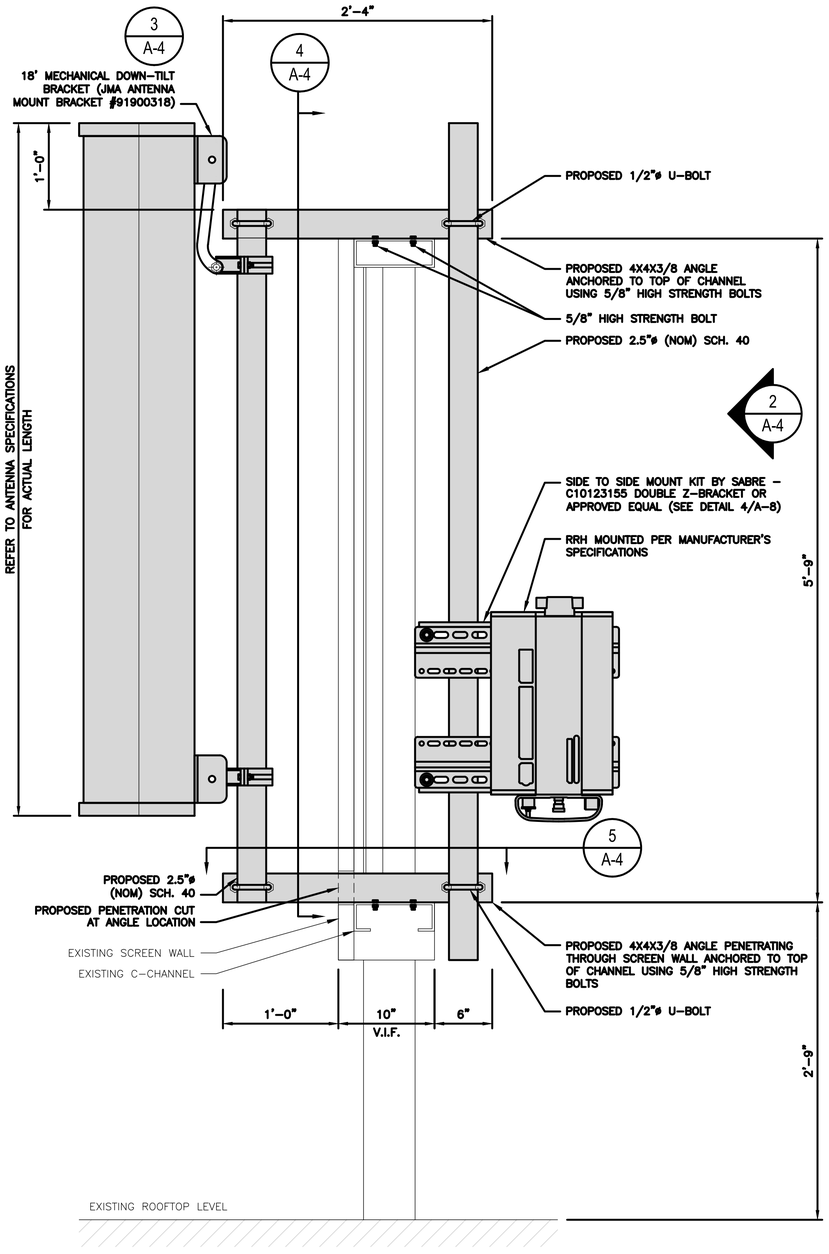
REV	DATE	DESCRIPTION
A	09/06/2023	ISSUED FOR REVIEW
0	10/12/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02023B
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

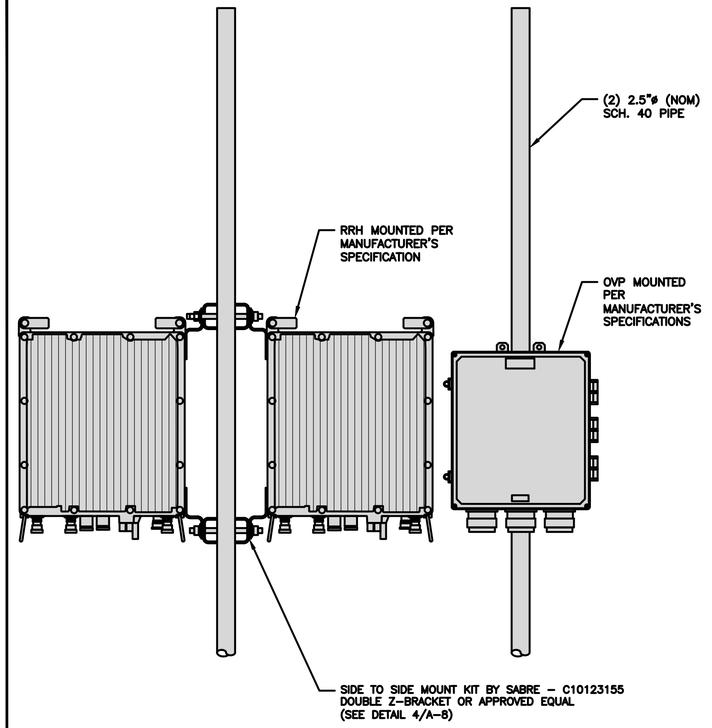
SHEET TITLE
ANTENNA PLANS AND ANTENNA SCHEDULE

SHEET NUMBER
A-3

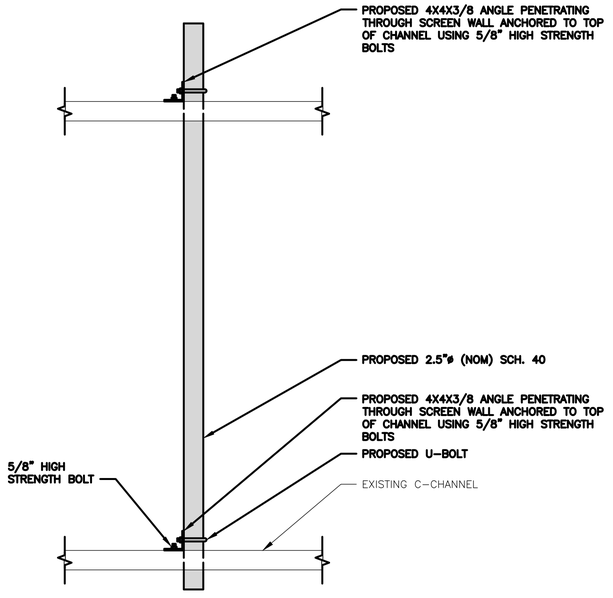


NOTES:
1. CONTRACTOR SHALL REFER TO GENERAL NOTES DIVISION 4 MASONRY, GIVING SPECIAL ATTENTION TO NOTES 16 AND 25 FOR INCLUSION IN THEIR BID.
2. CONTRACTOR TO INSTALL L-ANGLE DIAGONAL BRACE AT A 45 DEGREE ANGLE FROM HE HORIZONTAL PLANE. TO EXTENT POSSIBLE, HOWEVER, SHALL NOT EXCEED 60 DEGREES OR BE LESS THAN 40 DEGREES. ATTACHMENT POINT ON VERTICAL POST TO BE ADJUSTED TO MEET THIS CRITERIA.
3. STRUCTURAL ELEMENTS WERE CONCEALED DURING SITE VISIT. EXISTING CONDITION OF THE PARAPET WALLS COULD NOT BE DETERMINED AS THEY WERE COVERED. CONTRACTOR TO OBTAIN PHOTOGRAPHS OF CONNECTION TO STRUCTURE PRIOR TO SEALING AND PROVIDE TO ENGINEER OF RECORD.
4. EXISTING MOUNT BRACKETS IN ALPHA, BETA AND GAMMA SECTOR TO BE REMOVED AND REPLACED WITH THIS PROPOSED DESIGN.

PROPOSED MOUNTS (ALL SECTORS) | NO SCALE | 1



ANTENNA FRAME REAR ELEVATION (ALL SECTORS) | NO SCALE | 2

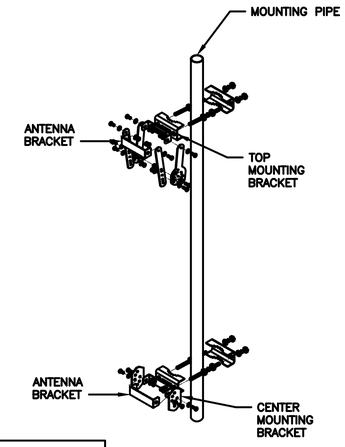


ANTENNA MOUNT ELEVATION (ALL SECTORS) | NO SCALE | 4

JMA ANTENNA MOUNT BRACKET #91900318	
TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

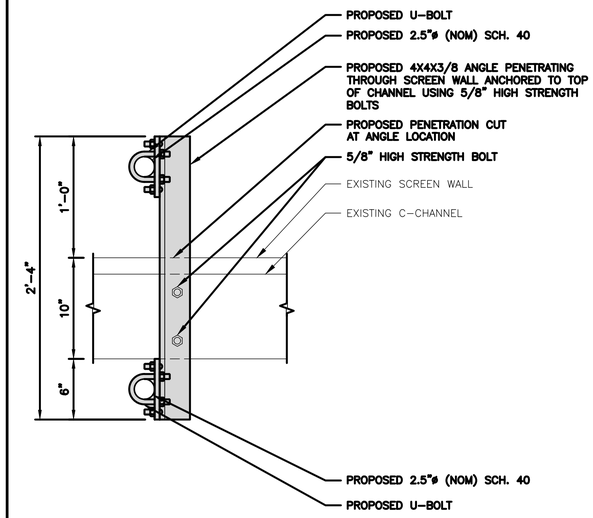
NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-,6-, AND 8-FOOT ANTENNAS

ANTENNA BRACKET NOT PART OF KIT



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

ANTENNA MOUNTING BRACKET | NO SCALE | 3



ANTENNA MOUNT PLAN (ALL SECTORS) | NO SCALE | 5

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STATE OF CONNECTICUT
BRET J MAGNAN
33678
10/12/2023
PROFESSIONAL ENGINEER

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RFDS REV #: ---

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PROJECT INFORMATION
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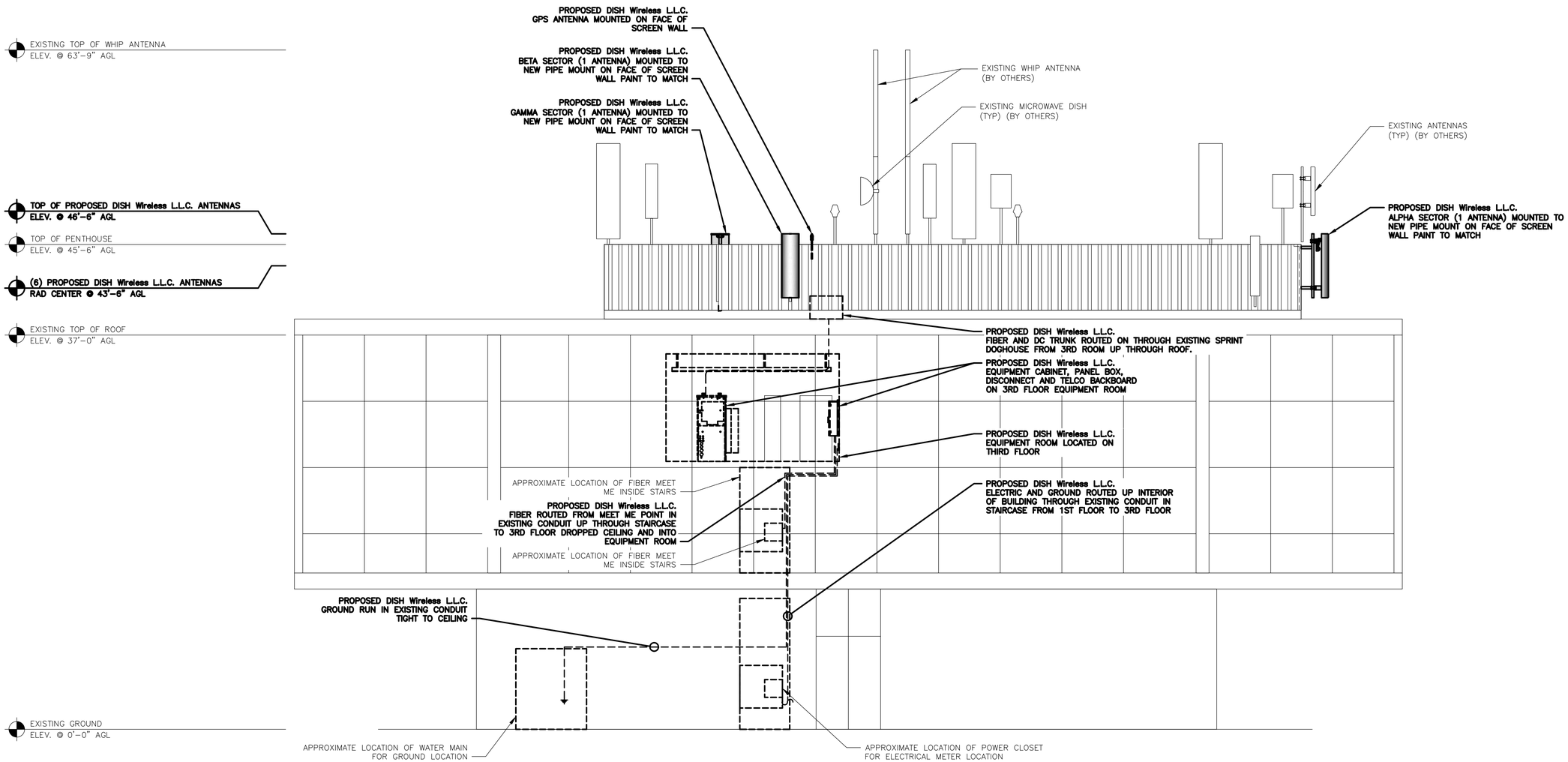
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE
ANTENNA MOUNT DETAILS (ALL SECTORS)

SHEET NUMBER
A-4



SOUTH ELEVATION

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1

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RFDS REV #: ---

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PROJECT INFORMATION

NJJER02023B

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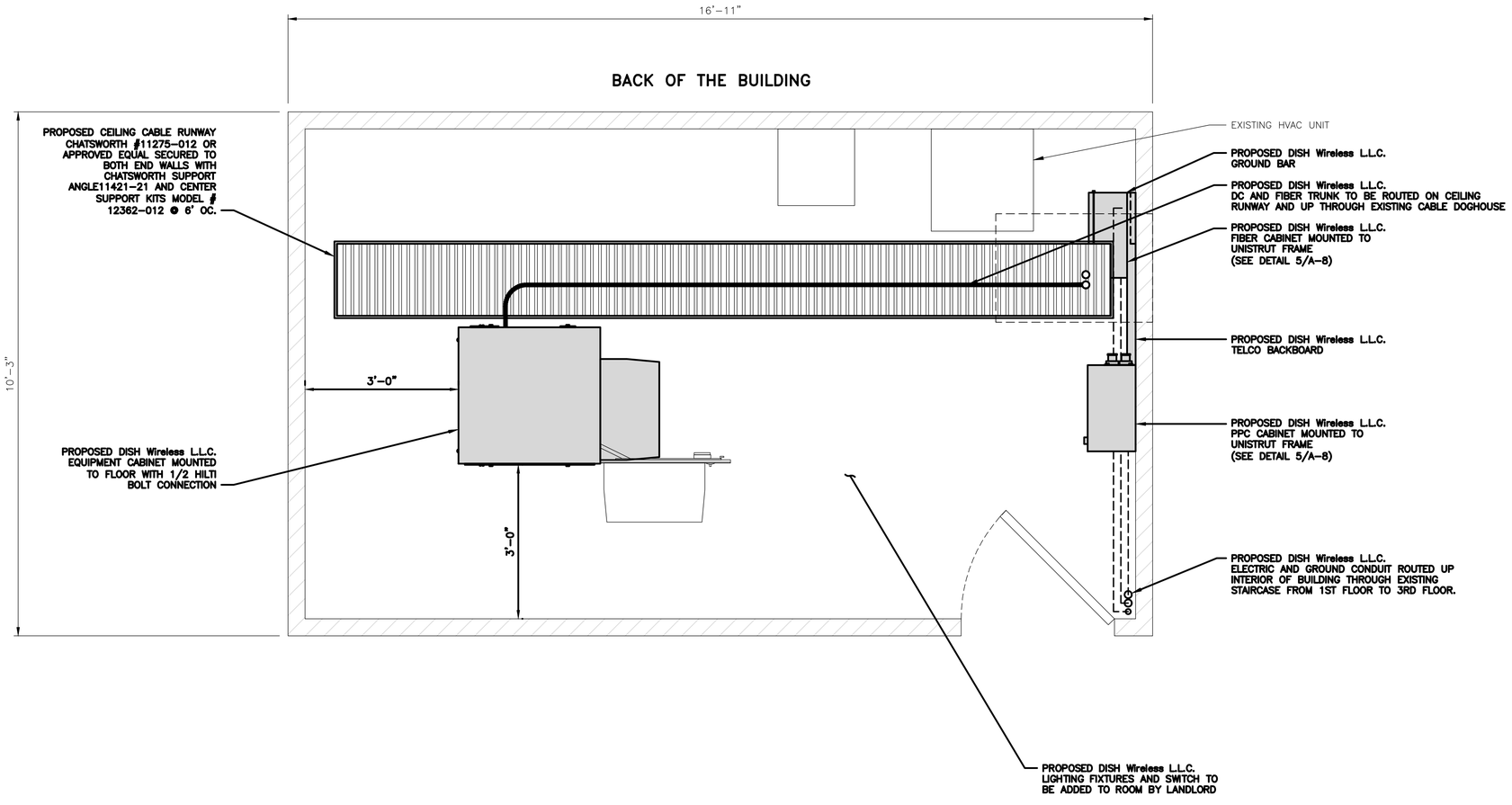
RIVERSIDE, CT 06878

SHEET TITLE

SOUTH ELEVATION

SHEET NUMBER

A-5



EQUIPMENT ROOM PLAN (3RD FLOOR LEVEL)

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

1

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RIVERSIDE, CT 06878

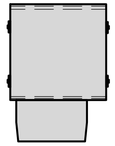
SHEET TITLE

EQUIPMENT ROOM PLAN

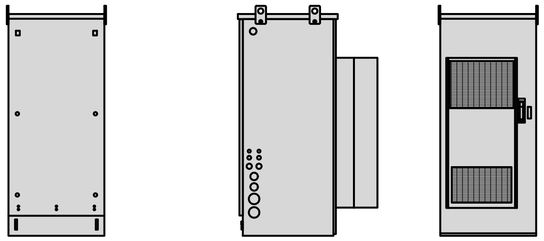
SHEET NUMBER

A-6

CHARLES INDUSTRY HEX CUBE–PM639155N4	
DIMENSIONS (HxWxD)	74"x32"x32"
POWER PLANT	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 lbs



PLAN

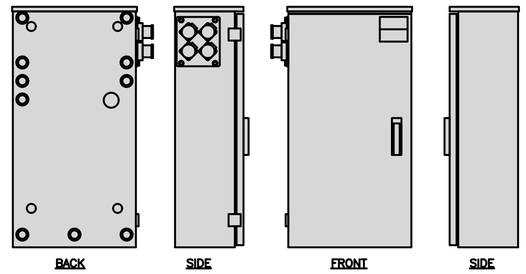


BACK SIDE FRONT

CABINET DETAIL — NO SCALE — 1

RAYCAP PPC RDIAC–2465–P–240–MTS	
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

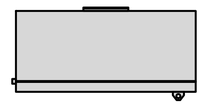
TOP



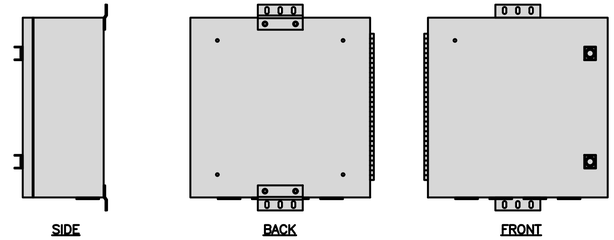
BACK SIDE FRONT SIDE

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

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



FRONT

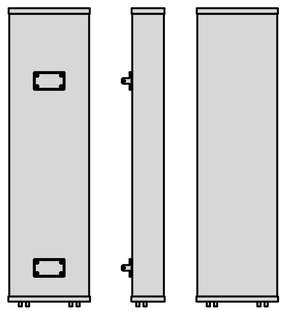


SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL — NO SCALE — 3

COMMSCOPE FFVV–65B–R2	
DIMENSIONS (HxWxD)(MM/IN)	1828x498x197 72"x19.6"x7.8"
RF CONNECTOR INTERFACE	4.3–10 FEMALE
WEIGHT	70.8 lbs
WEIGHT WITH BRACKETS	98.1 lbs

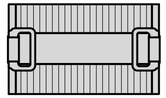
PLAN



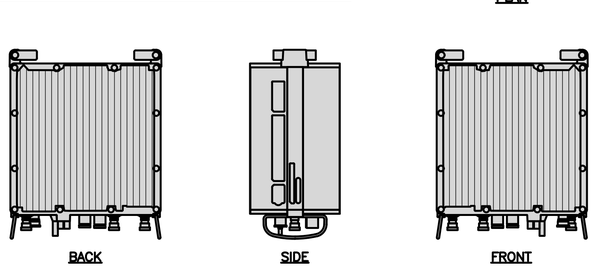
BACK SIDE FRONT

ANTENNA DETAIL — NO SCALE — 4

SAMSUNG – MID BAND SFG–ARR3KM01DI_RF4451D–70A	
DIMENSIONS (HxWxD)	15"x15"x8.9"
WEIGHT	61.3 lbs
CONNECTOR TYPE	4.3–10 RF CONNECTOR
INPUT VOLTAGE	–48VDC (–36 to 58 VDC)



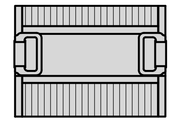
PLAN



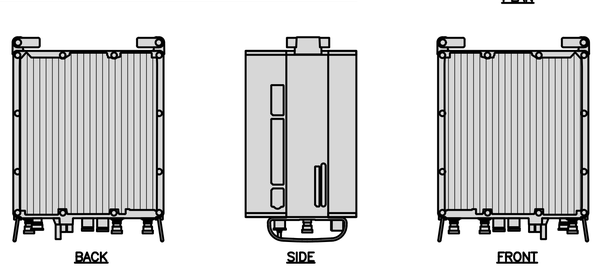
BACK SIDE FRONT

RRH DETAIL — NO SCALE — 5

SAMSUNG – LOW BAND SFG–ARR3J601DI_RF4450T–71A	
DIMENSIONS (HxWxD)	15"x16.5"x11"
WEIGHT	94.6 lbs
CONNECTOR TYPE	4.3–10 RF CONNECTOR
INPUT VOLTAGE	–48VDC (–36 to 58 VDC)



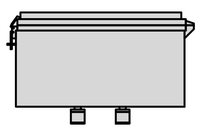
PLAN



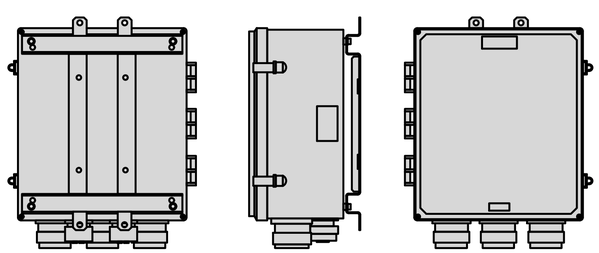
BACK SIDE FRONT

RRH DETAIL — NO SCALE — 6

RAYCAP RDIDC–3045–PF–48 SURGE PROTECTION DEVICE (OVP)	
DIMENSIONS (HxWxD)	19"x16.21"x9.64"
WEIGHT	21 lbs



PLAN

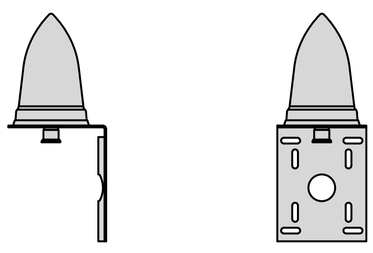


BACK SIDE FRONT

SURGE PROTECTION DEVICE (OVP) DETAIL — NO SCALE — 7

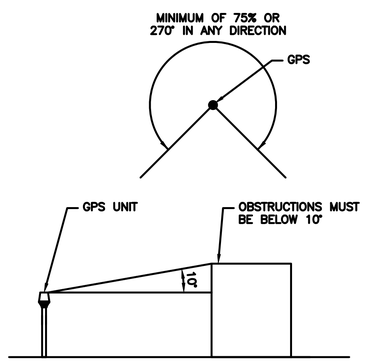
PCTEL GPSGL–TMG–SPI–40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N–FEMALE
FREQUENCY RANGE	1590 ± 30MHz

TOP



BACK SIDE

GPS DETAIL — NO SCALE — 8



GPS MINIMUM SKY VIEW REQUIREMENTS — NO SCALE — 9

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LITTLETON, CO 80120

MK DEVELOPMENT

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PROJECT INFORMATION

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1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

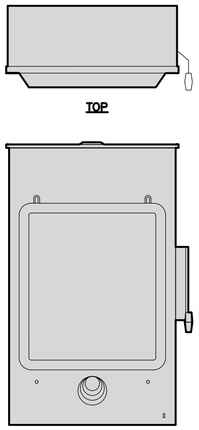
EQUIPMENT DETAILS

SHEET NUMBER

A-7

SQUARE D SAFETY SWITCHES D224NRB

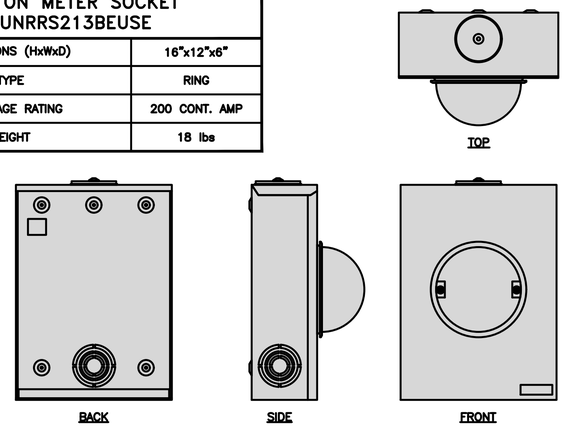
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875



SAFETY SWITCH DETAIL | NO SCALE | 1

EATON METER SOCKET UNRRS213BEUSE

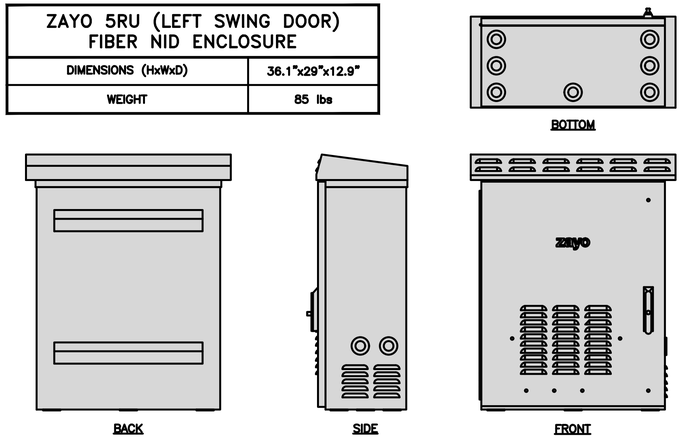
DIMENSIONS (HxWxD)	16"x12"x6"
TYPE	RING
AMPERAGE RATING	200 CONT. AMP
WEIGHT	18 lbs



METER SOCKET DETAIL | NO SCALE | 2

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE

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

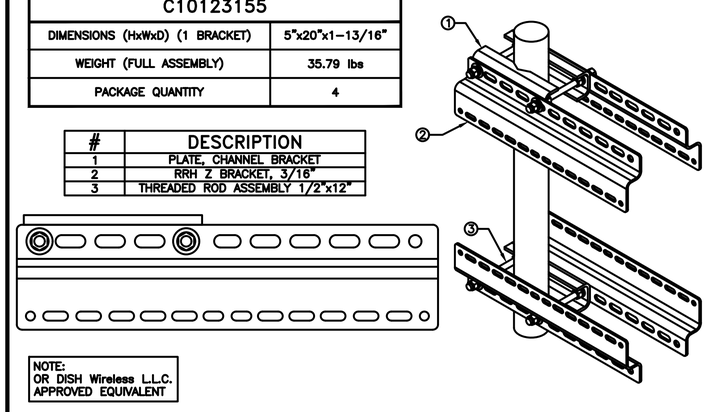


FIBER NID ENCLOSURE DETAIL | NO SCALE | 3

SABRE DOUBLE Z-BRACKET C10123155

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

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



NOTE:
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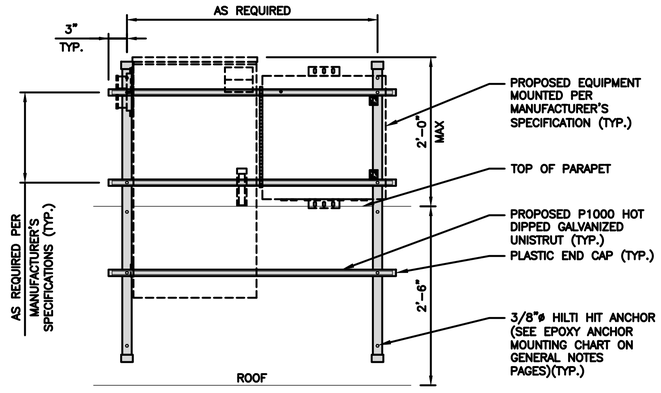
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 4



UNISTRUT FRAME DETAIL | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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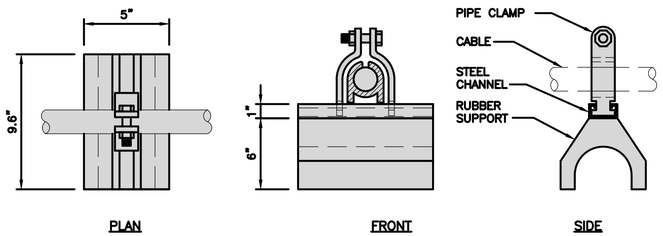
SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

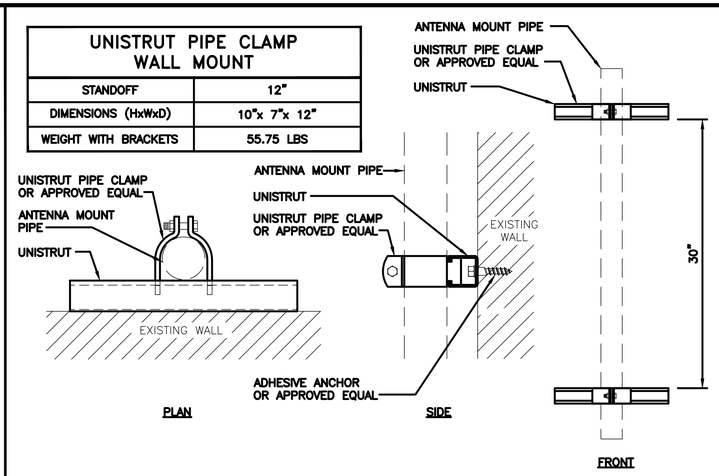
A-8

DURA-BLOK DB10 ROOFTOP CABLE SUPPORT	
DIMENSIONS (HxWxL)	5"x6"x9.6"
WEIGHT/ VOLUME	5.28 LBS
ULTIMATE LOAD CAPACITY	500 LBS
NOTE: NON-PENETRATING	



ROOF CABLE SUPPORT DETAIL | NO SCALE | 1

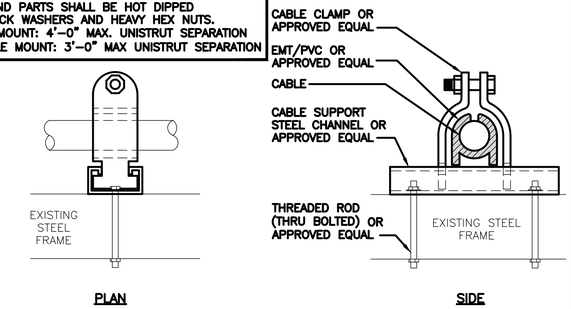
UNISTRUT PIPE CLAMP WALL MOUNT	
STANDOFF	12"
DIMENSIONS (HxWxD)	10"x 7"x 12"
WEIGHT WITH BRACKETS	55.75 LBS



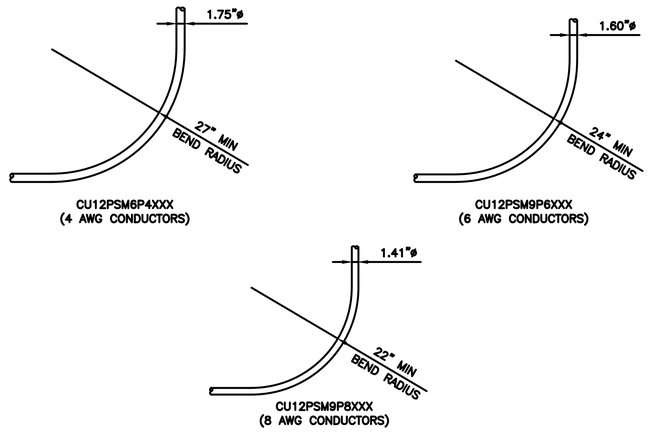
UNISTRUT WALL MOUNT DETAIL | NO SCALE | 2

CABLE WALL MOUNT SUPPORT	
UNISTRUT TYPE	GRAINGER P1000T
UNISTRUT DIMENSIONS (HxWxL)	1 5/8"x 1 5/8"x 12"
WEIGHT/ VOLUME	1.85 LB PER FOOT
ULTIMATE LOAD CAPACITY	718.5 LB

NOTES:
1. ALL HARDWARE AND PARTS SHALL BE HOT DIPPED GALVANIZED WITH LOCK WASHERS AND HEAVY HEX NUTS.
2. VERTICAL CABLE MOUNT: 4'-0" MAX. UNISTRUT SEPARATION
3. HORIZONTAL CABLE MOUNT: 3'-0" MAX UNISTRUT SEPARATION

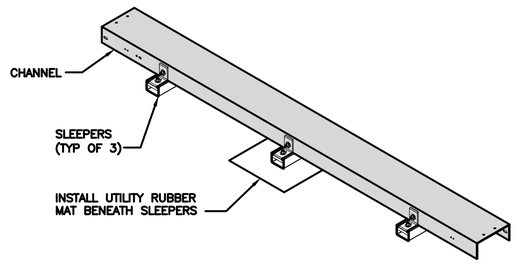


CABLE WALL MOUNT SUPPORT DETAIL | NO SCALE | 3



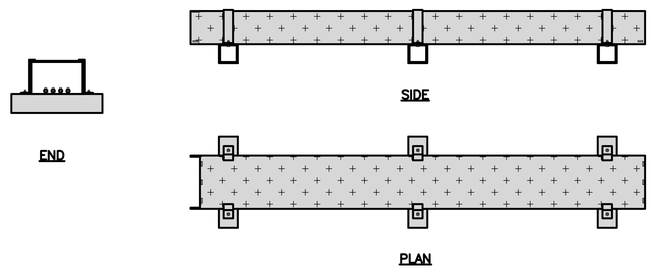
DISCRETE CABLE MINIMUM BEND RADIUSES | NO SCALE | 4

COMMSCOPE MT-F1543 ROOFTOP CABLE BRIDGE KIT	
DIMENSIONS (HxWxL)	7"x6"x96"
WEIGHT	112.3 lbs
CABLE RUN, QUANTITY	8
NOTE: NON-PENETRATING, 12-GAUGE COVER, OR APPROVED EQUAL. INCLUDES: CHANNEL, HARDWARE AND (3) SLEEPERS	

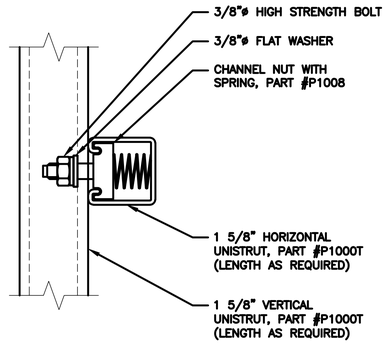


ROOF MOUNTED CABLE TRAY DETAIL | NO SCALE | 5

COMMSCOPE RT-CB4D ROOFTOP COVER KIT		MOUNTING	NON-PENETRATING
DIMENSIONS (HxWxL)	7"x 6"x 96"	INCLUDED PRODUCTS:	RTCB4D.01 CHANNEL (1)
WEIGHT/ VOLUME	85.98 LBS		MT-F1598 SLEEPERS (3)
CABLE RUN (QTY)	4		RTCUH HARDWARE
			RTHC.01 HOLD-DOWN CLAMPS (6)



ROOFTOP CABLE TRAY DETAIL | NO SCALE | 6



UNISTRUT CONNECTION DETAIL | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGNUSON
33678
PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	09/06/2023	ISSUED FOR REVIEW
0	10/12/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
NJJER02023B

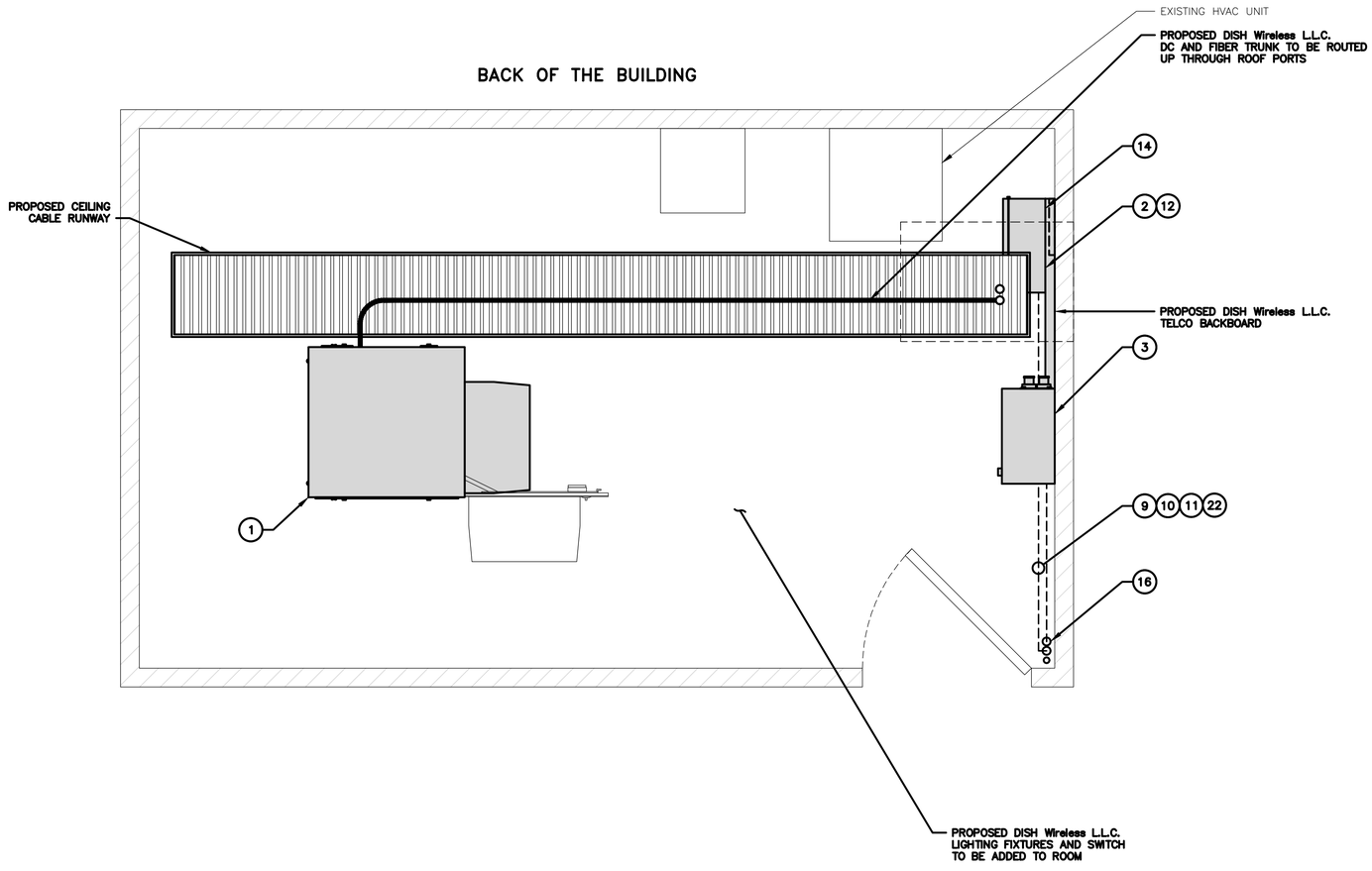
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02023B
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE
CONDUIT ROUTING DETAILS

SHEET NUMBER
A-9

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. THE GROUND LEASE DOES NOT SPECIFY OUR UTILITY RIGHTS. "PWR" AND "FBR" PATH DEPICTED ON A–1 AND E–1 ARE BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLAEASE LOCATE AND FOLLOW EXSITING PATH. IF EXISTING PATH IS NOT AN OPTION PLEASE NOTIFY TOWER OWNER AS FURTHER COORINATION MAY BE NEEDED.



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

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

SERVICE PLAN KEY NOTES:

1. EQUIPMENT CABINET.
2. FIBER CABINET: CHARLES INDUSTRIES FIBER CABINET MODEL # MP1818WB-A.
3. PPC CABINET: RAYCAP PPC. MODEL #RDIAC-6512-240-MTS. PROVIDED BY DISH Wireless L.L.C.. PROVIDE CIRCUIT BREAKERS PER PANEL SCHEDULE.
4. PROPOSED FIBER "MEET ME" POINT. CONTRACTOR TO INSTALL A NEW 48"X48"X3/4" PLYWOOD BACKBOARD. BACKBOARD SHALL BE PRIMED WITH FIRE RESISTANT, INTUMESCENT PRIMER AND PAINTED FLAT BLACK.
5. DISH Wireless L.L.C. TO TAP TO THE EXISTING CUSTOMER SIDE OF THE EXISTING SERVICE END BOX. DESIGN TO BE APPROVED BY UTILITY COMPANY.
6. PROVIDE AND INSTALL EXISTING 200A, 1Ø, UTILITY APPROVED BY-PASS METER SOCKET.
7. PROVIDE AND INSTALL A NEW 200A, 1Ø, 250V, NEMA 1, FUSED DISCONNECT WITH (2) 200A, 250V FUSES. PROVIDE GROUNDING PER NEC.
8. EXISTING 2" CONDUIT WITH (3) # 4/0 AWG & (1) #4 AWG EQUIP-GRD BETWEEN THE SERVICE END BOX, METER SOCKET AND DISCONNECT.
9. EXISTING 2" CONDUIT WITH (3) #4/0 AWG & (1) #4 AWG EQUIP-GRD. INSTALL CONDUIT BETWEEN THE DISCONNECT AND RAYCAP PPC.
10. EXISTING 1" CONDUIT WITH (1) #2/0 AWG STRANDED, INSULATED, COPPER CONDUCTOR. INSTALL CONDUIT BETWEEN THE GROUNDING ELECTRODE AND THE MASTER GROUND BAR.
11. EXISTING 2" CONDUIT WITH PULL LINE BETWEEN THE TELCO BACKBOARD AND CHARLES FIBER CABINET.
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13. BOND GROUNDING CONDUCTOR TO WATER MAIN.
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FIBER CONDUIT DISTANCE IS APPROX. : 65' TOTAL
(20' ROOF, 35' VERTICAL, 10' CELLAR)

GROUND CONDUIT DISTANCE IS APPROX. : 100' TOTAL
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ELECTRICAL CONDUIT DISTANCE IS APPROX. : 95' TOTAL
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NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

SERVICE PLAN (3RD FLOOR LEVEL) AND NOTES

SHEET NUMBER

E-1

N

SERVICE PLAN (3RD FLOOR LEVEL)

12" 6" 0 1' 2' 3'
3/4"=1'–0"

1

ELECTRICAL NOTES

NO SCALE

2

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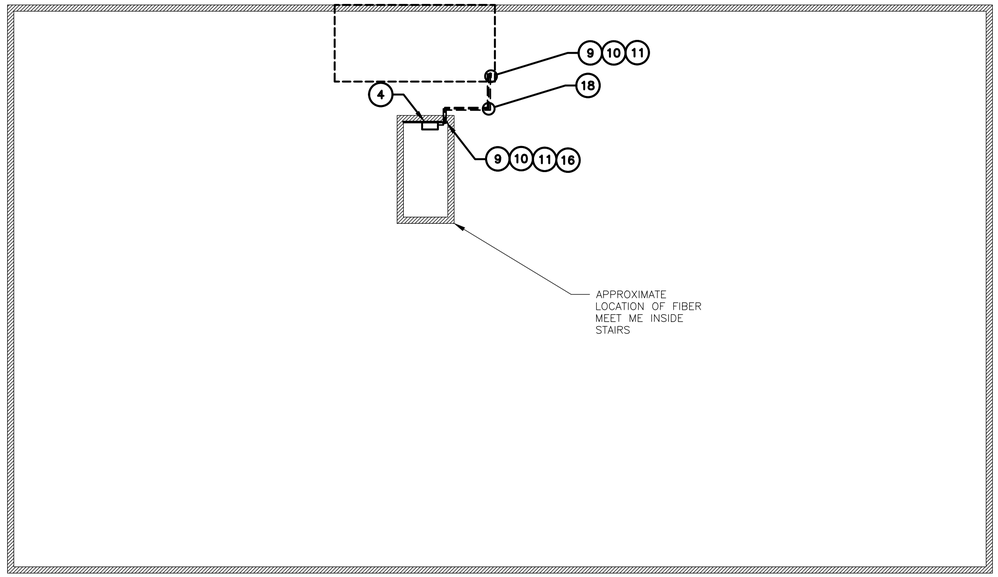
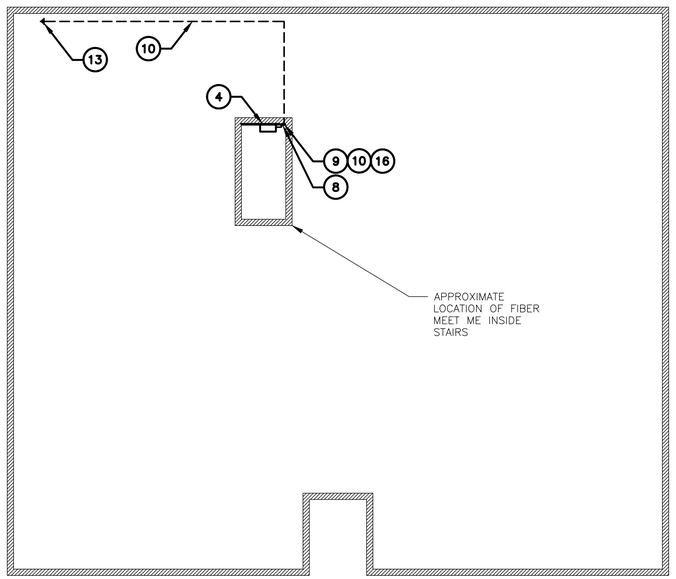


N

SERVICE PLAN (2ND FLOOR LEVEL)

8' 4' 0 8' 16'
1/8"=1'–0"

1



N

SERVICE PLAN (1ST FLOOR LEVEL)

8' 4' 0 8' 16'
1/8"=1'–0"

1

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ELECTRICAL NOTES

NO SCALE

2

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGUIRE
33678
10/12/2023
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

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A&E PROJECT NUMBER

NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

SERVICE PLAN (1ST AND 2ND FLOOR) AND NOTES

SHEET NUMBER

E-2

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.

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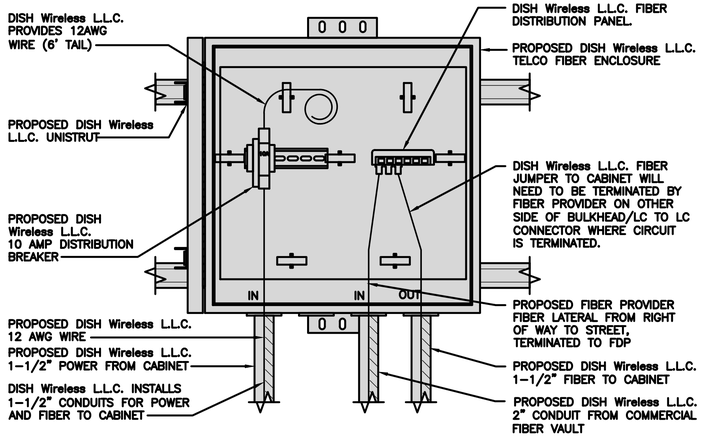
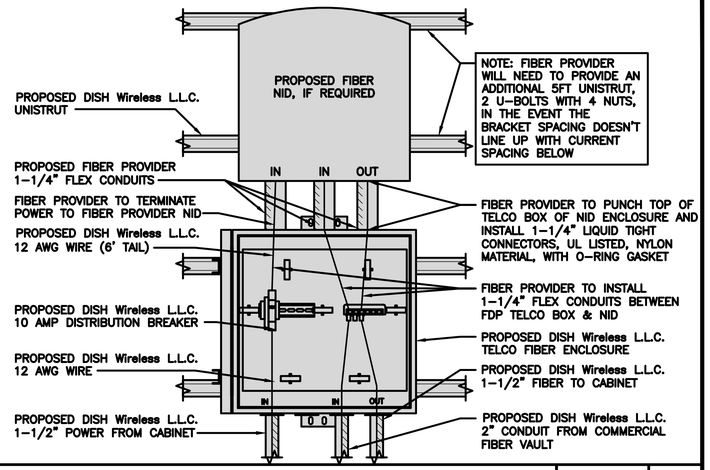
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.

ELECTRICAL NOTES | NO SCALE | 1



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 2



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) | 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

DISH Wireless L.L.C. TEMPLATE VERSION 45 – 10/08/2021

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

MK DEVELOPMENT
140 BEACH 137TH STREET
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STATE OF CONNECTICUT
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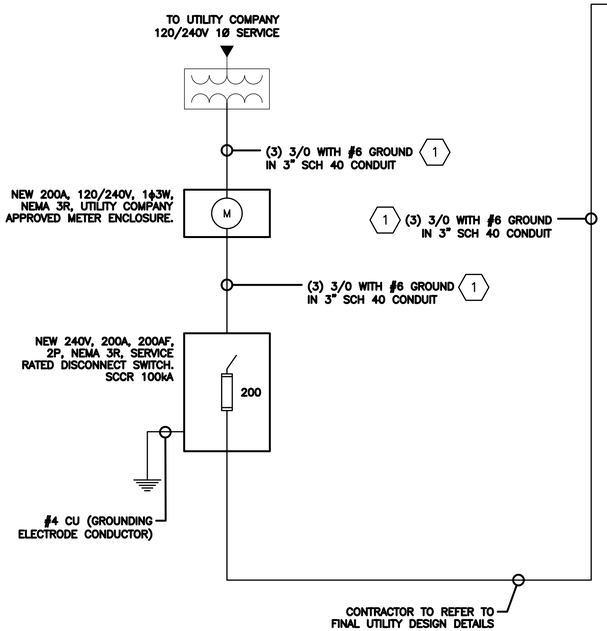
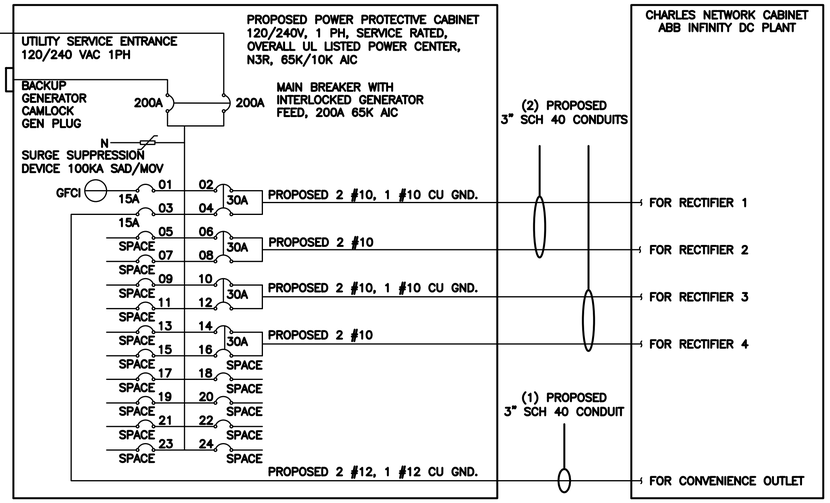
SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-3





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:
(4) 30A, 2P BREAKER – SQUARE D P/N:QO230
(2) 15A, 1P BREAKER – SQUARE D P/N:QO115

SERVICE/FEEDER CONDUCTOR LENGTH TABLE
(BASED ON INDUSTRY STANDARD 3% VOLTAGE DROP AND 5% NEC ALLOWABLE LIMIT)

	CONDUCTOR SIZES					
DESIGN LOADS	250 kcmil AL	300 kcmil AL	3/0 CU	4/0 CU	250 kcmil CU	300 kcmil CU
DISH Wireless L.L.C. MAXIMUM CONTINUOUS LOAD (160A) (NEC ARTICLE 220 & 230 3% VOLTAGE DROP)	130'	155'	145'	180'	215'	255'
DISH Wireless L.L.C. MAXIMUM CONTINUOUS LOAD (160A) (NEC ARTICLE 220 & 230 5% VOLTAGE DROP)	220'	260'	240'	300'	360'	425'

NOTES:
1. 250 MCM/KCMIL AL + #2 AL GRD MAY BE USED AS A REPLACEMENT FOR 3/0 CU + #6 CU GRD SERVICE CONDUCTOR FROM THE DISH Wireless L.L.C. FIRST MEANS OF DISCONNECT/UTILITY COMPANY MEET-ME POINT. REFER TO VALUES ABOVE TO LIMIT VOLTAGE DROP TO 3%.
2. ALUMINUM/COPPER CONDUCTORS MUST BE RATED 75°C.
3. ALUMINUM TO COPPER BUSS CONNECTIONS MUST MEET AND CONFORM TO ANSI AND BE UL LISTED. USE ANTI CORROSION CONDUCTIVE LUBRICANT ON CONNECTIONS
4. PPC MAIN DISCONNECT CIRCUIT BREAKERS ACCEPT #4 – 300KCMIL AL OR CU CONDUCTORS.
5. VOLTAGE DROP FOR SINGLE METER ENCLOSURE FED FROM TRANSFORMER WITH MULTIPLE CUSTOMERS IS CALCULATED FROM THE TRANSFORMER TO PPC. (SERVICE AND FEEDER CONDUCTOR LENGTH)
6. VOLTAGE DROP FOR MULTI-METER ENCLOSURE IS CALCULATED FROM THE METER TO PPC. (FEEDER CONDUCTOR LENGTH)
7. VOLTAGE DROP CALCULATIONS ARE BASED ON A POWER FACTOR OF 1, A LINE TO GROUND VOLTAGE PER CONDUCTOR OF 120V, NO CORRECTION FACTOR FOR AMBIENT TEMPERATURE OR ADJUSTMENT FACTOR FOR MORE THAN THREE CURRENT-CARRYING CONDUCTORS IN A SINGLE CONDUCT OR RACEWAY. A POWER FACTOR LESS THAN 1 OR VOLTAGE LESS THAN 120 WILL RESULT IN SHORTER DISTANCES THAN SHOWN IN TABLE.

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.

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

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

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

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.

#12 – 0.0050 SQ. IN X 2 = 0.0100 SQ. IN
#12 – 0.0050 SQ. IN X 1 = 0.0050 SQ. IN <GROUND
TOTAL = 0.0150 SQ. IN

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.

#10 – 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
#10 – 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
TOTAL = 0.1146 SQ. IN

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

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 – 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
#6 – 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
TOTAL = 0.8544 SQ. IN

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

1 PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, AL.

250kcmil AL – 0.3970 SQ. IN X 3 = 1.191 SQ. IN
#4 AL – 0.0824 SQ. IN X 1 = 0.0824 SQ.IN <GROUND
TOTAL = 1.2734 SQ. IN

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

PPC ONE-LINE DIAGRAM — NO SCALE — 1

PROPOSED CHARLES PANEL SCHEDULE

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

PANEL SCHEDULE — NO SCALE — 2

NOT USED — NO SCALE — 3

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PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER
NJJER02023B

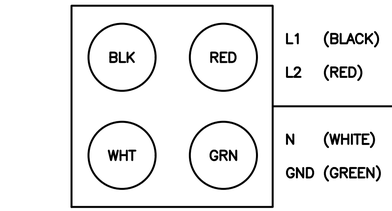
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02023B
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

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

SHEET NUMBER
E-4

NOTES:

1. HAZARD OF ELECTRICAL SHOCK OR BURN. TURN OFF POWER SUPPLYING THIS EQUIPMENT BEFORE WORKING INSIDE.
2. 100 OR 200 AMP, 240 VOLTS, SINGLE PHASE ALTERNATING CURRENT CIRCUIT ONLY
3. GENERATOR SHORT CIRCUIT RATING: 10,000 / 20,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS
4. UTILITY SHORT CIRCUIT RATING: 65,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS
5. SUITABLE FOR USE AS SERVICE EQUIPMENT
6. SUITABLE FOR USE IN ACCORDANCE WITH ARTICLE 702 OF THE NATIONAL ELECTRIC CODE ANSI/NFPA 70
7. BONDED NEUTRAL WHEN INSTALLED AS SHOWN IN WIRING DIAGRAM
8. RAIN PROOF TYPE 3R
9. USE CU–AL WIRE 60–75 °C
10. EQUIPPED WITH SLIDE BAR MECHANICAL INTERLOCK
11. INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY
12. EQUIPPED WITH SQUARE D BREAKERS OR ALTERNATIVE MANUFACTURER EQUIVALENT
13. WHEN REPLACE LOAD CENTER BREAKERS, USE ONLY SQUARE D (QO TYPE) OF THE SAME RATING OR EQUIVALENT
14. WHEN RESETTING BREAKERS TURN TO OFF POSITION, THEN TO ON POSITION
15. WARNING: MAKE CONTINUITY CHECK WITH OHM METER TO VERIFY CORRECT PHASING AND GROUNDING CONNECTIONS BEFORE POWER UP
16. VERIFY PIN OUT CONFIGURATION OF GENERATOR PRIOR TO USE.
17. RISK OF ELECTRIC SHOCK, BOTH ENDS OF DISCONNECTING MEANS MAY BE ENERGIZED. TEST BEFORE SERVICING
18. THIS SWITCH BOARD MAY CONTAIN A TAP ON THE SERVICE SIDE OF THE MAIN POWER DISCONNECT FOR REMOTE MONITORING OF UTILITY/STANDBY POWER
19. THE NORMAL AC POWER MONITORING CIRCUIT MUST UTILIZE A DISCONNECTING MEANS WITH A SHORT CIRCUIT RATING GREATER THAN THE AVAILABLE INTERRUPTING CURRENT
20. A RED PUSH–TO–TRIP BUTTON PROVIDES A MEANS TO MECHANICALLY TRIP THE CIRCUIT BREAKER. THIS ACTION EXERCISES THE TRIPPING PORTION OF THE MECHANISM AND ALLOWS MAINTENANCE CHECK ON THE BREAKER



CAM–LOCK GENERATOR RECEPTACLE

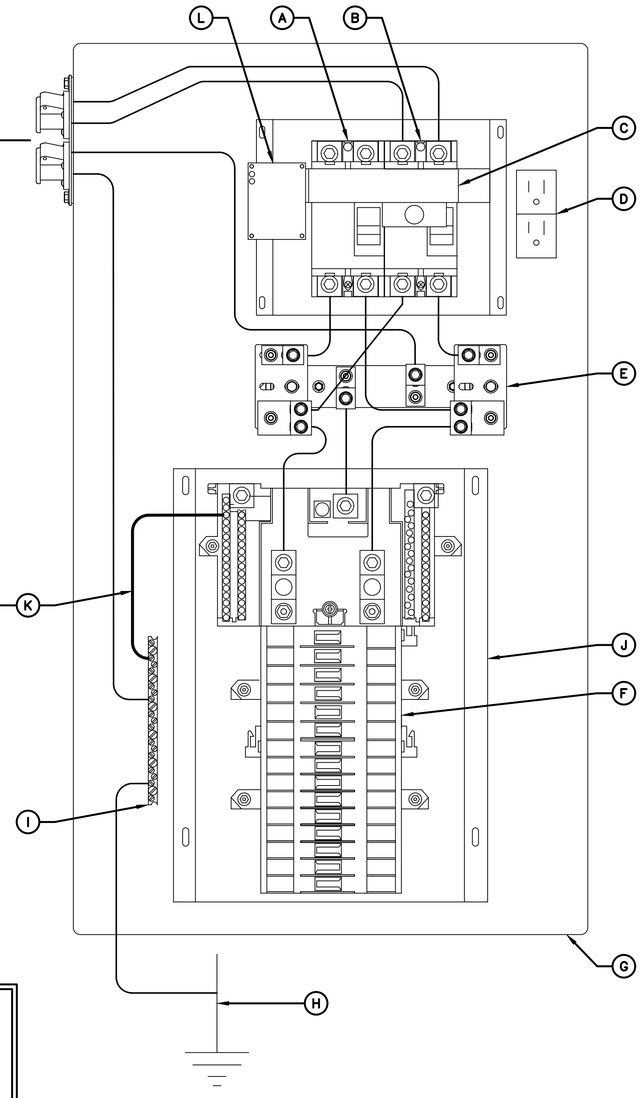
(AS VIEWED FROM OUTSIDE OF ENCLOSURE)
USE LINE UP PIN AS REFERENCE

REFER TO RECEPTACLE FOR MODEL NUMBER

DANGER:

HAZARD OF ELECTRICAL SHOCK OR BURN. TURN OFF POWER SUPPLYING THIS EQUIPMENT BEFORE WORKING INSIDE.

RAYCAP CUSTOMER SERVICE
(800) 890–2569



SUITABLE FOR USE AS SERVICE EQUIPMENT

ELECTRICAL RATING 120/240 VOLTS SINGLE PHASE 60 Hz	
NORMAL AC POWER 100A☐ 200A☐	GENERATOR POWER 100A☐ 200A☐

CAUTION:

- THE OPERATING HANDLE ASSUMES A CENTER POSITION WHEN THE CIRCUIT BREAKER IS TRIPPED
- THE BREAKER CAN BE RESET BY OPERATING THE HANDLE TO THE EXTREME OFF POSITION AND THEN TO ON
- SLIDE BAR MECHANICAL INTERLOCK TRANSFERS NORMAL AC POWER TO GENERATOR POWER. THE SLIDE BAR MECHANICAL INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY
- TO TRANSFER FROM ON POWER SOURCE TO THE OTHER POWER SOURCE, SWITCH ON BREAKER TO THE OFF POSITION, MOVE THE SLIDE BAR TO THE OTHER SIDE AND THE SWITCH THE OTHER BREAKER TO THE ON POSITION

THIS SWITCHBOARD UTILITY MAN BREAKER IS SUITABLE FOR USE ON CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 65,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.

200A UTILITY FEED

LOAD SIZE CIRCUIT BREAKERS				LINE SIDE MAIN CIRCUIT BREAKER					
MFR.	TYPE	POLES	AMP RATING	MFR.	TYPE	AMP RATING	SYMMET. AMP RMS	VOLTS AC	PHASES
SQ–D	QO	1 2	15–100A	SQ–D	QGL	200A	65,000A	240V	2

THIS SWITCHBOARD GENERATOR POWER CIRCUIT IS SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 10,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.

200A GENERATOR FEED

LOAD SIZE CIRCUIT BREAKERS				LINE SIDE MAIN CIRCUIT BREAKER					
MFR.	TYPE	POLES	AMP RATING	MFR.	TYPE	AMP RATING	SYMMET. AMP RMS	VOLTS AC	PHASES
SQ–D	QO	1 2	15–100A	SQ–D	QGL	200A	65,000A	240V	2

MAXIMUM CONTINUOUS LOADS NOT TO EXCEED 80% OF THE OVER–CURRENT PROTECTIVE DEVICE (CIRCUIT BREAKER AND FUSES) RATINGS EMPLOYED IN OTHER THAN MOTOR CIRCUITS, EXCEPT FOR THOSE CIRCUITS EMPLOYING CIRCUIT BREAKERS MARKED AS SUITABLE FOR CONTINUOUS OPERATION AT 100% OF THEIR RATINGS. CONDUCTORS ARE NOT TO ENTER OR LEAVE THE ENCLOSURE DIRECTLY OPPOSITE THE WIRING TERMINAL

NEUTRAL–TO–GROUND NOTES:

- WHEN THE PPC IS USED AS THE SERVICE ENTRANCE DEVICE, THE NEUTRAL TO GROUND BOND NEEDS TO BE ESTABLISHED IN THE PPC.
- WHEN THE SERVICE ENTRY DEVICE IS A MULTI–METER CENTER OR A PRE–PPC DISCONNECT IS USED AND HAS "NEUTRAL TO GROUND" ACCOMMODATIONS, THE NEUTRAL TO GROUND WIRE IN THE PPC IS NOT REQUIRED.
- THE GREEN #6 WIRE IS PROVIDED WITH THE PPC CABINET AS A SEPARATE UNINSTALLED PART TO BE INSTALLED BY CONTRACTOR IF NEEDED.

NEUTRAL–TO–GROUND CONDING JUMPER

INSTALLTION INSTRUCTIONS:

- IF REQUIRED, THE N–G BONDING KIT SHOULD BE INSTALLED BY QUALIFIED PERSONNEL
- ENSURE THE MAIN BREAKERS ARE OFF
- USE THE GREEN #6 WIRE PROVIDED WITH THE PPC
- INSTALL THE JUMPER AS SHOWN IN THE WIRING DIAGRAM
- TIGHTEN TERMINALS TO TORQUE VALUE SHOWN IN TORQUE TABLE
- PLACE THE PROVIDED "SERVICE" LABEL IN THE SPACE BELOW THE WORDS "AC POWER" LOCATED ABODE THE MAIN CIRCUIT BREAKER IN THE UPPER PORTION OF THE DEAD FRONT

LEGEND:

A. UTILITY DISCONNECT (SERVICE RATED)
B. GENERATOR DISCONNECT
C. MAIN DISCONNECT CIRCUIT BREAKERS W/ MECHANICAL INTERLOCK
D. GFCI RECEPTACLE 15A
E. SPD STRIKESORB KELVIN CONNECTION (TYP OF 2)
F. BREAKER PANEL – 24 POSITION (CONTRACTOR TO ADD APPROPRIATE BREAKER PER ONE–LINE DIAGRAM PANEL SCHEDULE)
G. POWER PROTECTION CABINET (PPC) (FULLY ASSEMBLED FROM MANUFACTURER)
H. CONTRACTOR TO ATTACH TO UNDERGROUND GROUNDING HALO OR INSTALL GROUND ROD WHEN REQUIRED BY CODE
I. GROUND BAR
J. SQUARE D Q SERIES LOAD CENTER
K. NETURAL–TO–GROUND (N–G) BONDING JUMPER (CONTRACTOR INSTALLED IF REQUIRED)
L. OPTIONAL SPD STATUS INDICATORS

RAYCAP POWER PROTECTION CABINET – RDIAC–2465–P–240–MTS (NEUTRAL–TO–GROUND)

NO SCALE

1

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BRET J MAGNUSON
33678
10/12/2023
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

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NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

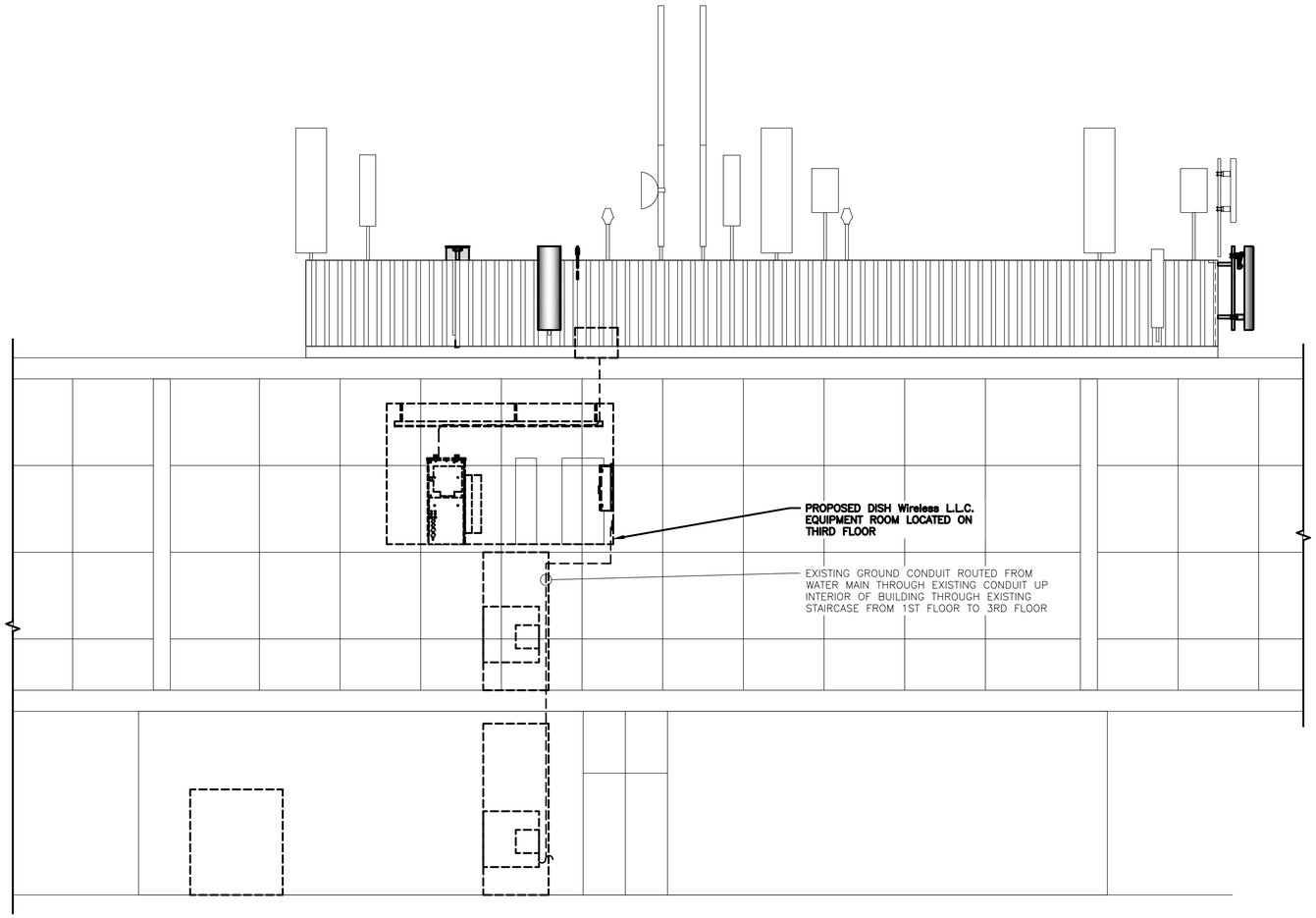
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

PPC NEUTRAL–TO–GROUND SCHEMATIC

SHEET NUMBER

E-5



GROUNDING ELEVATION

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

GROUND BUS BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

#6 AWG STRANDED & INSULATED

#2 AWG SOLID COPPER TINNED

BUSS BAR INSULATOR

GROUNDING LEGEND

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

GROUNDING ROOFTOP 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) ROOFTOP GROUND SYSTEM: THE 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 OR ROOM.

(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 (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 TINNED COPPER CONDUCTORS.

(G) 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.

(H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE ROOM. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH MECHANICAL CONNECTIONS.

(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 SHALL BE BONDED TO THE COMMON BUILDING GROUND SYSTEM 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 COMMON BUILDING GROUND SYSTEM. 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) ROOFTOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO COMMON BUILDING GROUND SYSTEM.

REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE

2

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10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	09/08/2023	ISSUED FOR REVIEW
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A&E PROJECT NUMBER

NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

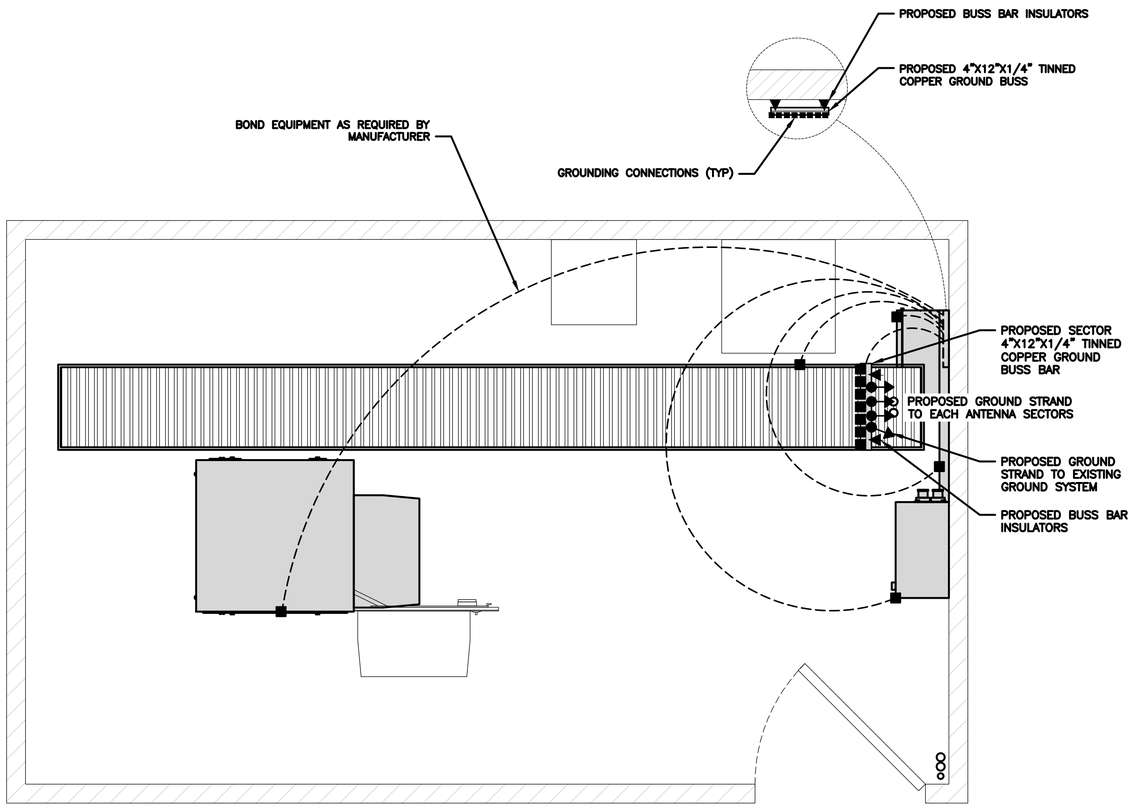
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

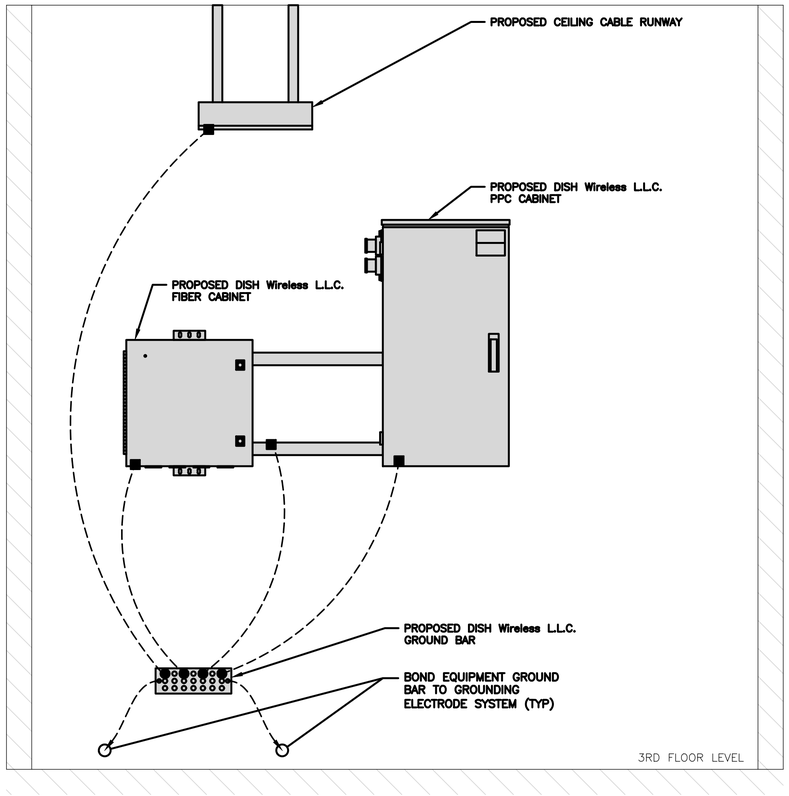
GROUNDING ELEVATION AND NOTES

SHEET NUMBER

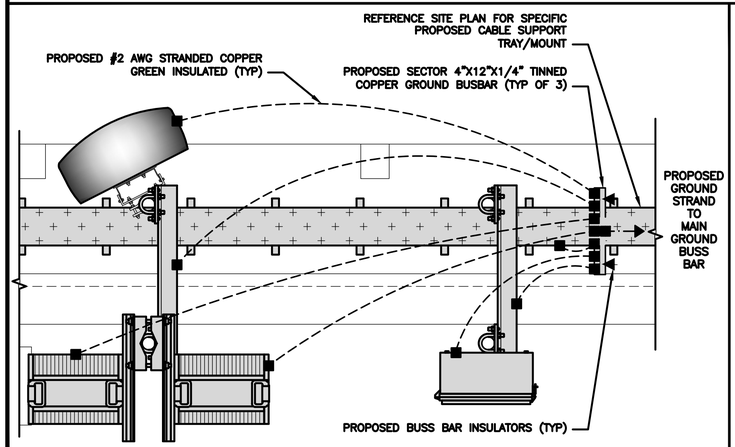
G-1



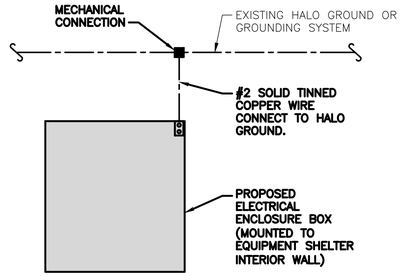
EQUIPMENT GROUNDING PLAN | NO SCALE | 1



WALL GROUNDING DETAIL | NO SCALE | 2



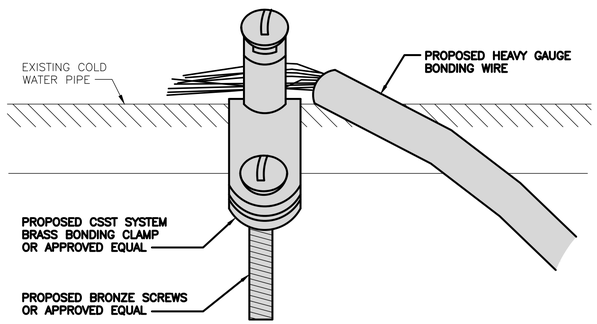
TYPICAL ROOFTOP ANTENNA GROUNDING PLAN | NO SCALE | 3



TYPICAL INDOOR ELECTRICAL ENCLOSURE BOX GROUNDING DETAIL | NO SCALE | 4

NOTE

REMOVE ANY PAINT ON PIPE OR FITTING SURFACE UNDER BONDING CLAMP.



TYPICAL COLD WATER CONDUIT GROUNDING DETAIL | NO SCALE | 5

NOTE

EQUIPMENT CABINET OMITTED FOR CLARITY

dish wireless.
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BRET J MAGNUSON
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PROFESSIONAL ENGINEER
10/12/2023

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CHR	---	---

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DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02023B
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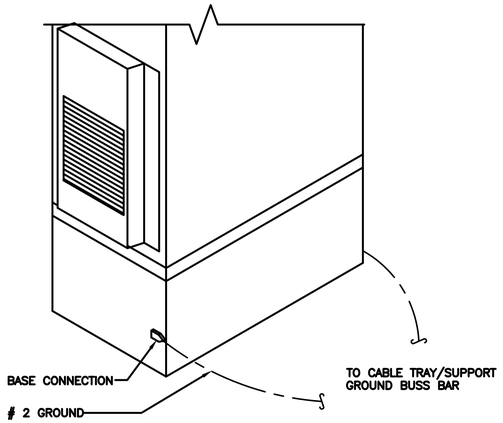
RIVERSIDE, CT 06878

SHEET TITLE
GROUNDING DETAILS

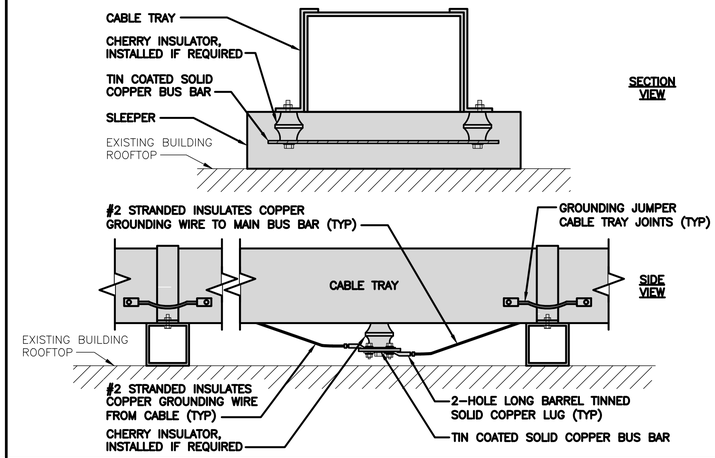
SHEET NUMBER
G-2

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).

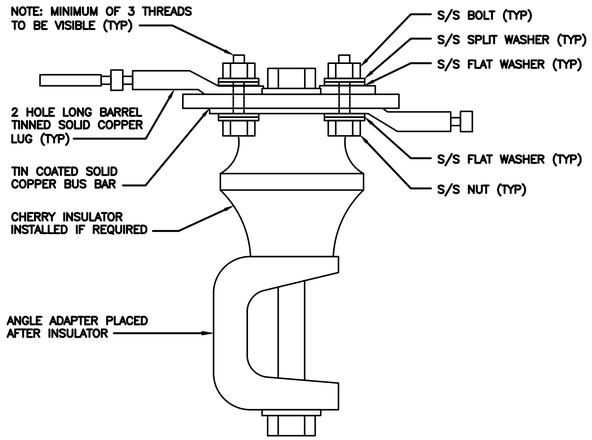
TYPICAL GROUNDING NOTES | NO SCALE | 1



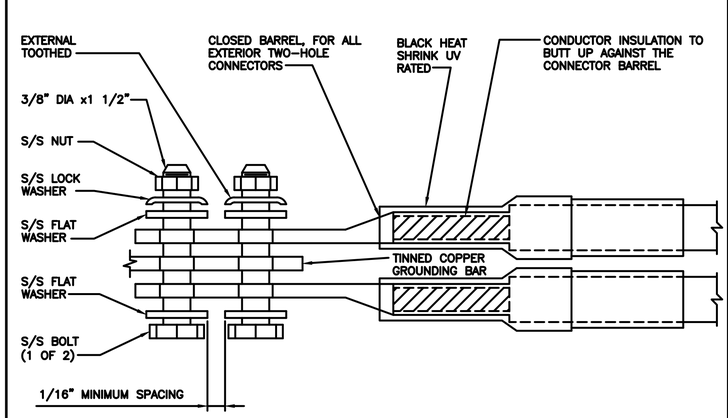
OUTDOOR CABINET GROUNDING | NO SCALE | 2



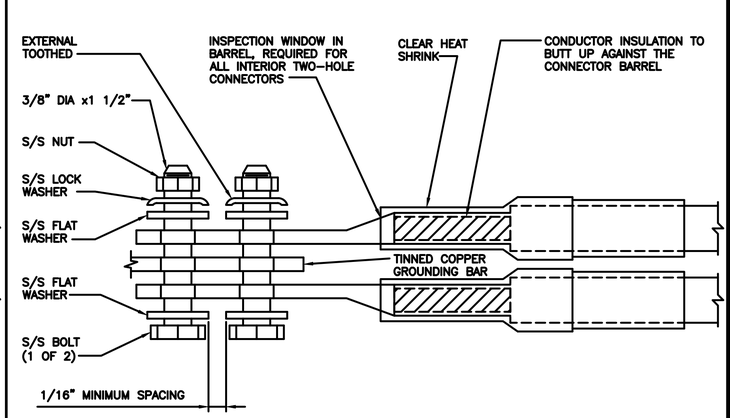
TYPICAL CABLE TRAY GROUND BUSS BAR | NO SCALE | 3



LUG DETAIL | NO SCALE | 4



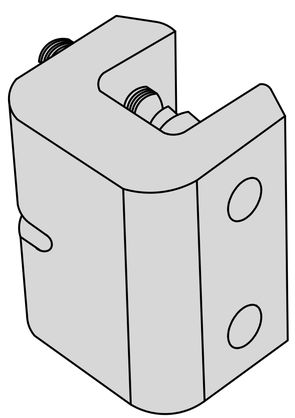
TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 5



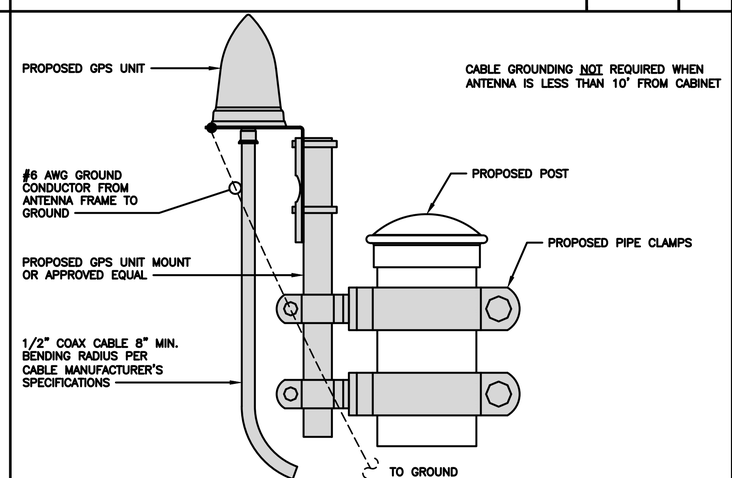
TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 6

PANDUIT GUBC500–6 UNIVERSAL BEAM GROUNDING, CLAMP	
COPPER CONDUCTOR SIZE RANGE AWG	#6–500
FLANGE THICKNESS INCHES	0.250–0.675
STUD SIZE INCHES	1/2"
THREAD SIZE	1/2"–13
DIMENSIONS (LxWxH)	3.15"x 2.13"x 2.50"

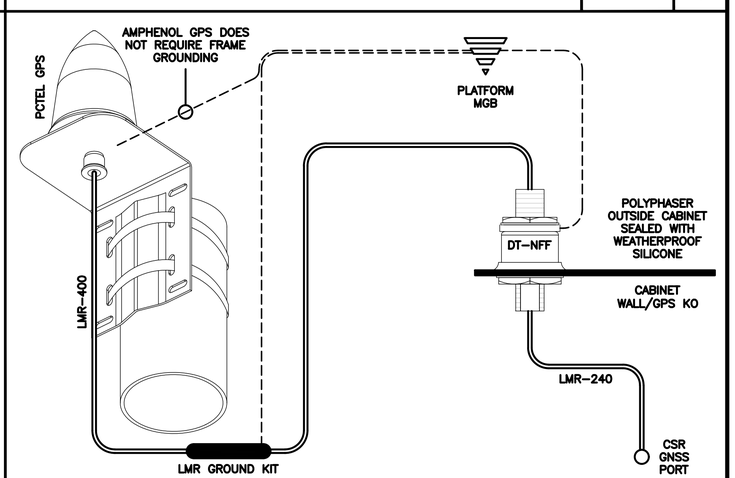
NOTE:
1. UNIVERSAL, FITS ON A WIDE RANGE OF STANDARD (ANGLED) AND WIDE FLANGE (PARALLEL) STRUCTURAL STEEL BEAMS.
2. UL 467 LISTED FOR GROUNDING AND BONDING ONLY



BUILDING STEEL GROUNDING DETAIL | NO SCALE | 7



TYPICAL PCTEL GPS UNIT GROUNDING | NO SCALE | 8



TYPICAL PCTEL GPS UNIT GROUNDING DIAGRAM | NO SCALE | 9

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGUIRE
33678
10/12/2023
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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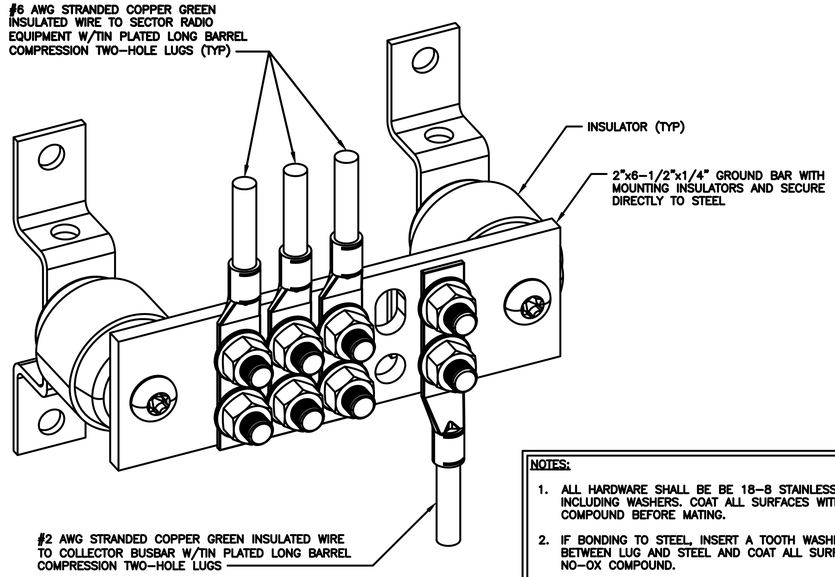
A&E PROJECT NUMBER
NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02023B
1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

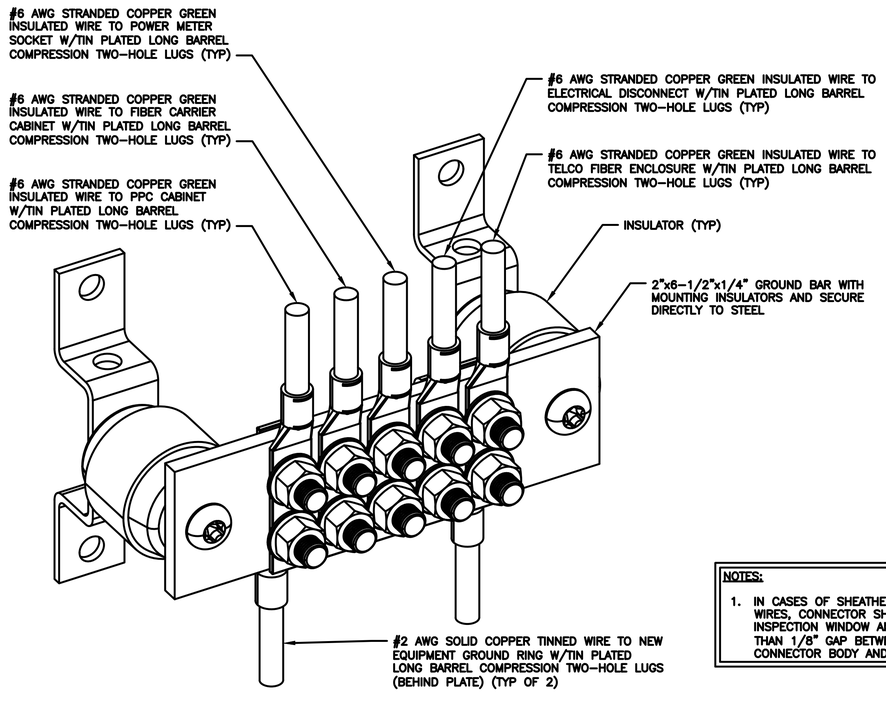


NOTES:

1. ALL HARDWARE SHALL BE BE 18-8 STAINLESS STEEL INCLUDING WASHERS. COAT ALL SURFACES WITH NO-OX COMPOUND BEFORE MATING.
2. IF BONDING TO STEEL, INSERT A TOOTH WASHER BETWEEN LUG AND STEEL AND COAT ALL SURFACE WITH NO-OX COMPOUND.
3. USE A THIN COAT OF NO-OX OR UL LISTED ANTIOXIDANT COMPOUND BETWEEN GROUNDING CONNECTIONS.

SECTOR GROUND BUSBAR DETAIL | NO SCALE | 1

NOT USED | NO SCALE | 2



NOTES:

1. IN CASES OF SHEATHED STRANDED WIRES, CONNECTOR SHALL HAVE INSPECTION WINDOW AND NO MORE THAN 1/8" GAP BETWEEN CONNECTOR BODY AND SHEATH.

EQUIPMENT GROUND BUSBAR DETAIL | NO SCALE | 3

NOT USED | NO SCALE | 4

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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

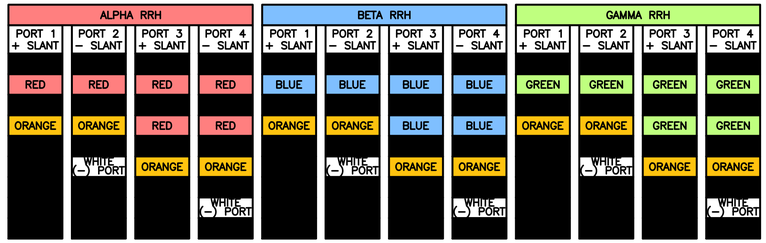
G-4

HYBRID/DISCREET CABLES

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

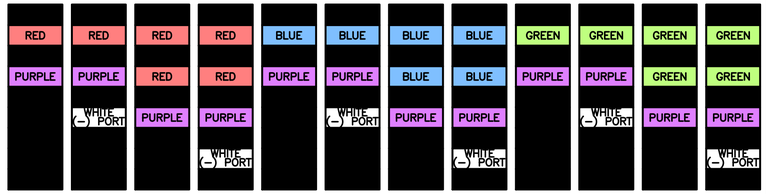
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

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



MID–BAND RRH
(AWS BANDS N66+N70)

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



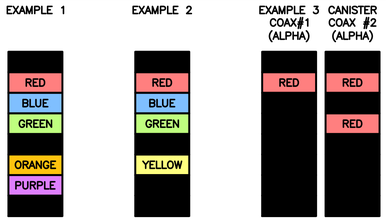
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

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

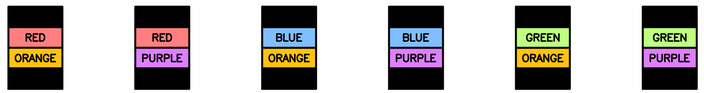
EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 – MAIN COAX WITH GROUND MOUNTED RRHs.



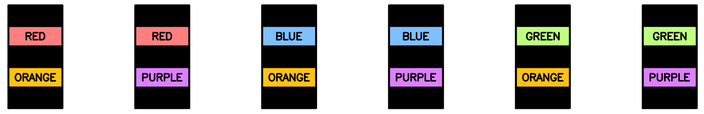
FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.



POWER CABLES TO RRHs

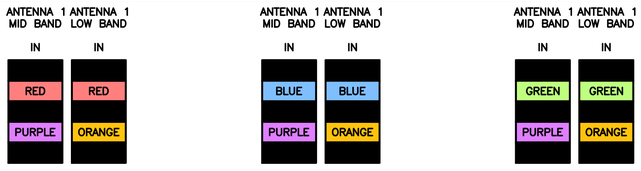
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

RET CONTROL IS HANDLED BY THE MID–BAND RRH WHEN ONE SET OF RET PORTS EXIST ON ANTENNA.

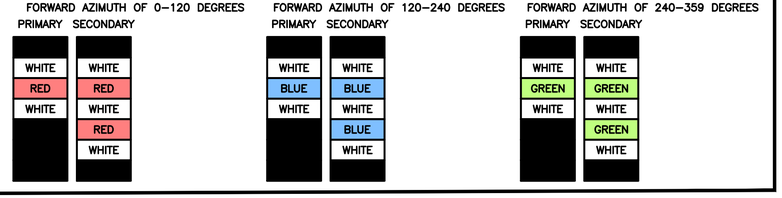
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5–2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE.
ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.

MICROWAVE CABLES WILL REQUIRE P–TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID's.



RF CABLE COLOR CODES | NO SCALE | 1

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

AWS (N66+N70+H–BLOCK): PURPLE

CBRS TECH (3 GHz): YELLOW

NEGATIVE SLANT PORT ON ANT/RRH: WHITE

ALPHA SECTOR: RED

BETA SECTOR: BLUE

GAMMA SECTOR: GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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1111 E PUTNAM AVE
RIVERSIDE, CT 06878

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–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED–1–25A400/51K–SR4–120–PE–DDBTXD

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

LEGEND

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

ABBREVIATIONS

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT

140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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RIVERSIDE, CT 06878

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(b)
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(b)
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(b)

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 (GREEN) 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 SIGH 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 SCREWS
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: _____

dish

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dish

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Site ID: _____

dish

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RF SIGNAGE

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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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 ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.

4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).

5. ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."

6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.

10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.

11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.

12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.

14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.

15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.

16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.

18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1.FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.

4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.

5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.

6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.

12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER

13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

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PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	09/06/2023	ISSUED FOR REVIEW
0	10/12/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

1111 E PUTNAM AVE
RIVERSIDE, CT 06878

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 (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
- CONCRETE EXPOSED TO EARTH OR WEATHER:
- #6 BARS AND LARGER 2"
- #5 BARS AND SMALLER 1-1/2"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
- SLAB AND WALLS 3/4"
- BEAMS AND COLUMNS 1-1/2"

7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.

4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.

5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.

6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).

7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.

8. TIE WRAPS ARE NOT ALLOWED.

9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.

12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).

14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.

18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.

20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.

21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).

22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).

23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.

25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.

29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".

30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

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PROFESSIONAL ENGINEER
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A&E PROJECT NUMBER

NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.

4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.

7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.

8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.

11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.

13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.

14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.

17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.

19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT

140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGUIRE
33678
REGISTERED
PROFESSIONAL ENGINEER
10/12/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHR	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	09/06/2023	ISSUED FOR REVIEW
0	10/12/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02023B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02023B

1111 E PUTNAM AVE
RIVERSIDE, CT 06878

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-5

MK DEVELOPMENT

EXHIBIT D

Structural Analysis

October 18, 2023

PASS

RE: **Structural Analysis for Antenna Mounts and Equipment Cabinet**

Location: **1111 E. Putnam Ave Riverside, CT 06878**

Site ID: **NJJER02023B**

Dish Wireless LLC,

Per your request, we have performed a structural analysis of the proposed antenna mounts for this existing building and the proposed equipment cabinet. This site consists of six (6) proposed wall mounts that will be installed on the existing screen walls of the building and a cabinet that will be installed inside an equipment room on the 3rd floor of the building. This review determines if the antenna mounts and equipment room can support the proposed loads.

1.0 Assumptions:

CATEGORY	DATA	CODE
Structure Type	Building	
RAD Center	43'-6"	
Structure Class	II	ASCE 7-16
Exposure Class	C	ASCE 7-16
Kzt Factor	1.0	ASCE 7-16
Basic Wind Speed	120	ASCE 7-16
Ice Thickness	1"	ASCE 7-16
Ice Windspeed	50 MPH	ASCE 7-16
Seismic Design Category	B	ASCE 7-16
S_{DS}	.283	ASCE 7-16

2.0 Existing Documents:

DOCUMENT	COMPANY	DATE
Proposed Drawings	M&K Development	9/6/2023
Site Visit Photos	M&K Development	11/4/2022

The proposed cabinet will be installed inside an equipment room located on the 3rd floor of the building. We have been informed that the floor is a 6-inch concrete slab.

All three sectors will have proposed pipe wall mounts installed on the outside of the existing screen walls of the building. These pipes will be 2.5" STD pipes that are 8'-0" long. The attachment points back through the walls will be 4x4x3/8 angles that will be connected to the top and bottom channels that support the screen walls.

3.0 Proposed Equipment:

MANUFACTURER	EQUIPMENT	WEIGHTS
Charles Industry	**(1) CUBE-PM639155N4**	**408 lbs**
Varies	**In Cabinet Equipment**	**256 lbs**
CommScope	**(6) FFVV-65B-R2**	**70.5 lbs**
Samsung	**(6) SFG-ARR3KM01DI_RF4451D-70A**	**61.3 lbs**
Samsung	**(6) SFG-ARR3J601DI_RF4450T-71A**	**94.6 lbs**
RayCap	**(3) OVP RDIDC-3045-PF-48**	**32 lbs**

Bold represents equipment to be added

After performing an analysis on the mounts and screen walls, it has been determined that they are **ADEQUATE** for the proposed loads. A 6" concrete slab by inspection will be **ADEQUATE** to support the proposed equipment cabinet on the 3rd floor.

This report does not address the structural stability of any other mounts, or portion of the structure, nor does it provide any warranty either express or implied, for any portion of the proposed mounts or structure.

Please note that we have not had a professional engineer perform an independent visit to confirm existing structural conditions and the outcome of this analysis is based solely on the information provided in the previous photos and drawing details. If the existing conditions are modified, in disrepair or not properly represented, contact our office immediately for an amended report since this analysis may be inaccurate.

If you have any questions, feel free to contact us at any time.

Sincerely,

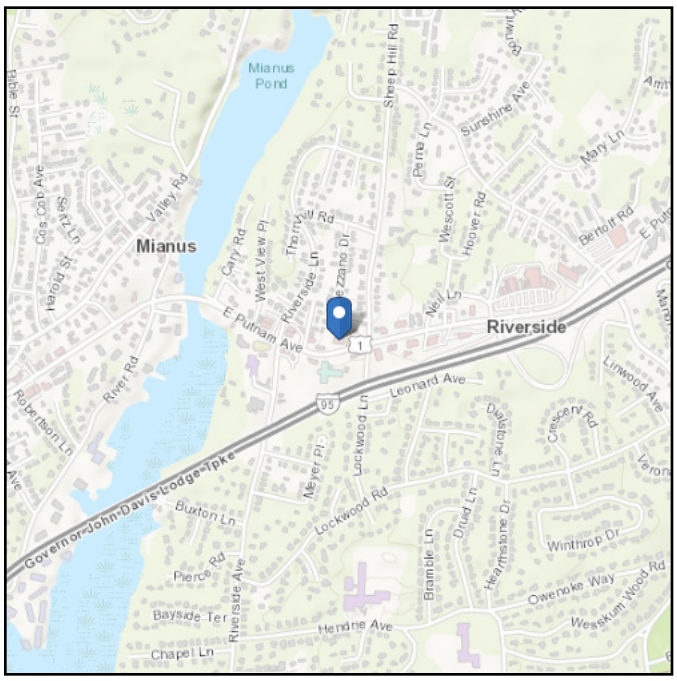
Magaram Engineering

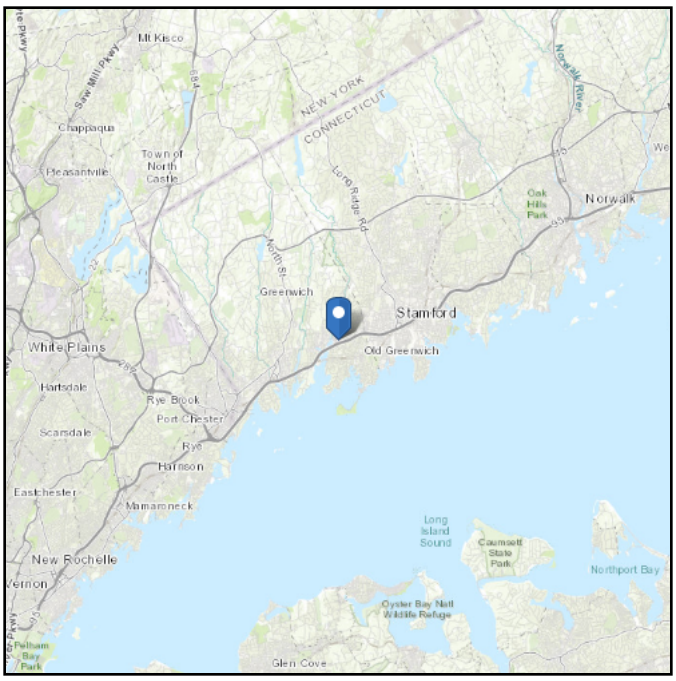
Brett Magaram
Connecticut License # 33678
Brett@MagaramEngineering.com
Phone: 914-450-8416

ASCE 7 Hazards Report

Address:
1111 E Putnam Ave
Riverside, Connecticut
06878

Standard:	ASCE/SEI 7-16	**Latitude:**	41.041092
Risk Category:	II	**Longitude:**	-73.584221
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	81.61 ft (NAVD 88)





Seismic

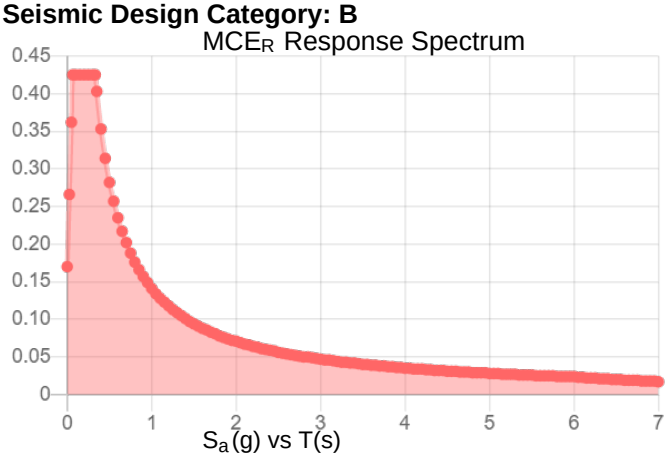
D - Default (see Section 11.4.3)

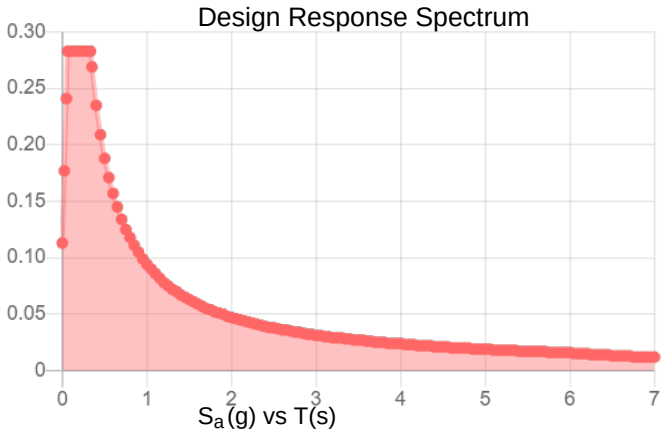
Site Soil Class:

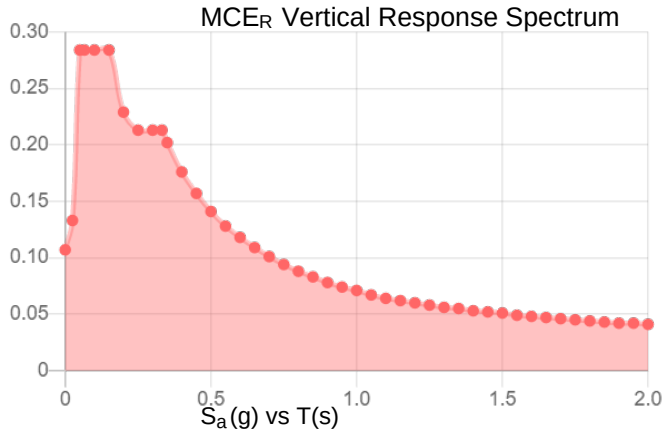
Results:

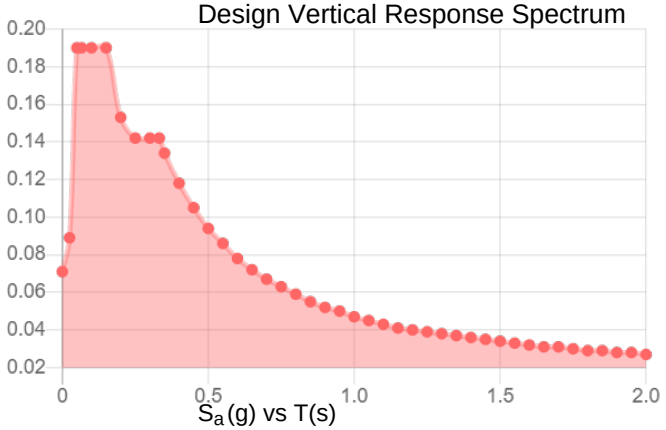
S_S :	0.268	S_{D1} :	0.094
S_1 :	0.059	T_L :	6
F_a :	1.585	PGA :	0.162
F_v :	2.4	PGA_M :	0.239
S_{MS} :	0.425	F_{PGA} :	1.475
S_{M1} :	0.141	I_e :	1
S_{DS} :	0.283	C_v :	0.836

Seismic Design Category: B









Data Accessed: **Fri Nov 18 2022**

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

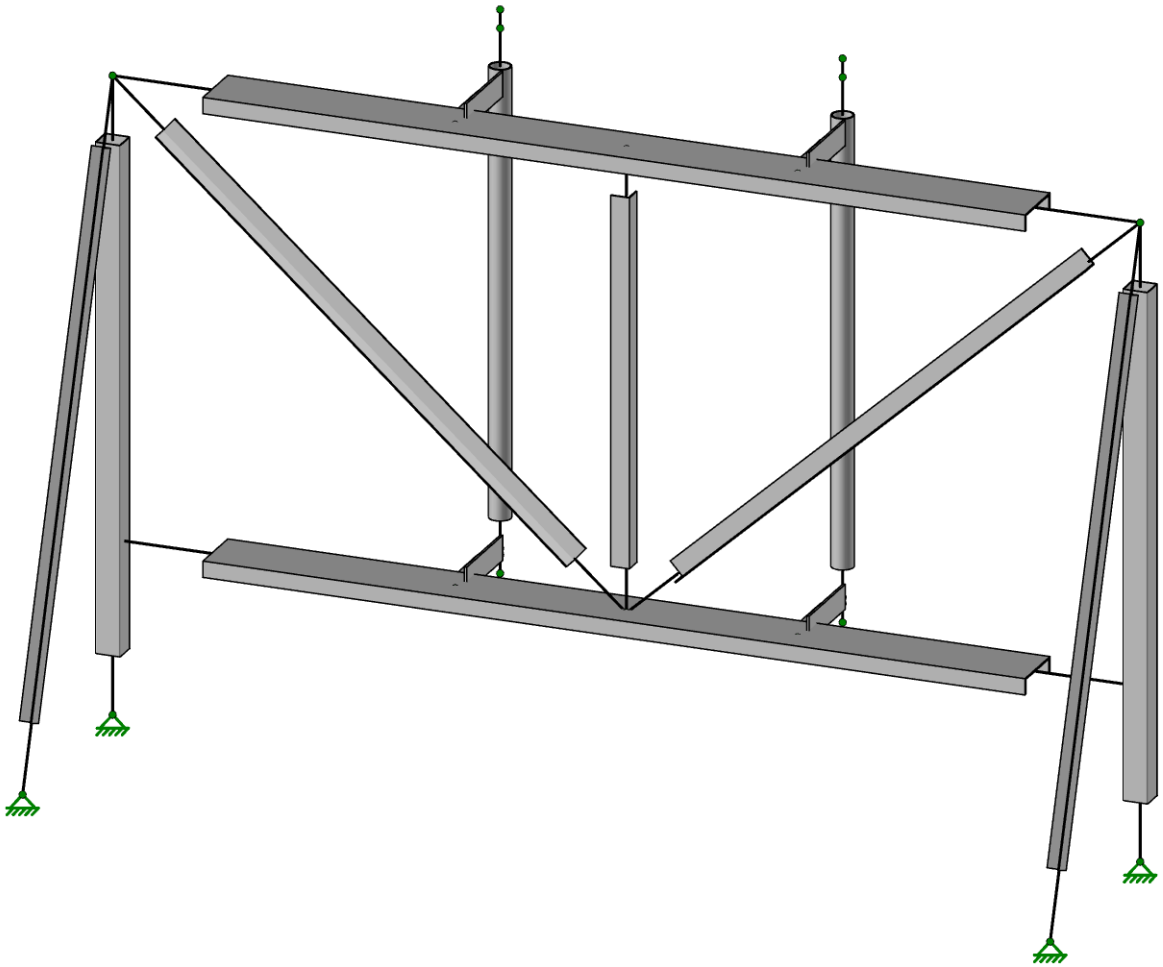
Results:

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 18 2022

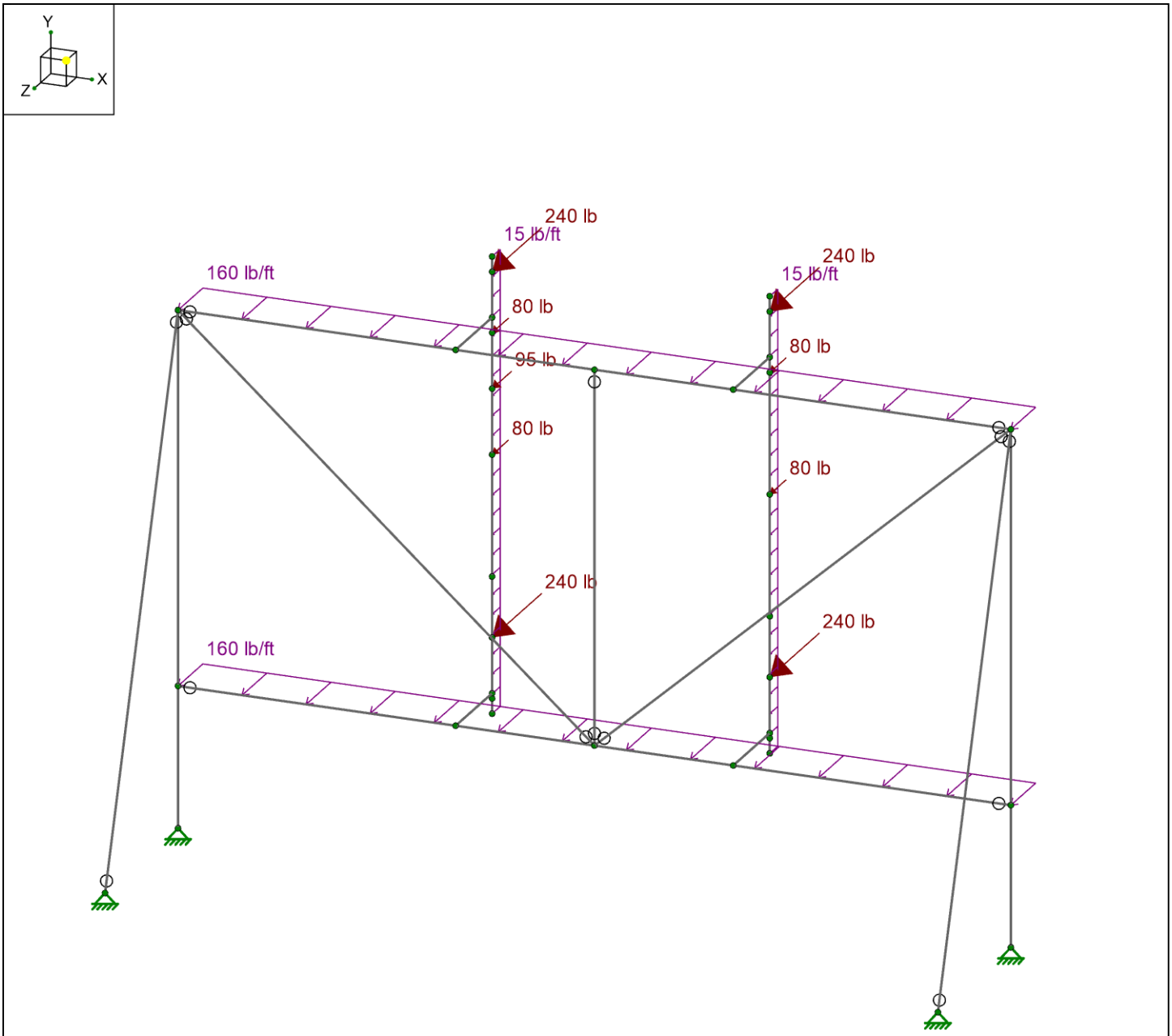
Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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.

Municipality	Ultimate Design Wind Speed, V_{ult} (mph)	Nominal Design Wind Speed, V_{asd} (mph)	Ground Snow Load pg (psf)	Hurricane-Prone Region
East Windsor	120	93	30	Yes
Eastford	120	93	40	Yes
Easton	120	93	30	Yes
Ellington	120	93	35	Yes
Enfield	120	93	35	Yes
Essex	125	97	30	Yes
Fairfield	120	93	30	Yes
Farmington	120	93	35	Yes
Franklin	125	97	30	Yes
Glastonbury	120	93	30	Yes
Goshen	115	89	40	-
Granby	120	93	35	Yes
Greenwich	120	93	30	Yes
Griswold	125	97	30	Yes
Groton	128	99	30	Yes
Guilford	125	97	30	Yes
Haddam	125	97	30	Yes
Hamden	120	93	30	Yes
Hampton	125	97	35	Yes
Hartford	120	93	30	Yes
Hartland	115	89	35	-
Harwinton	120	93	35	Yes
Hebron	125	97	30	Yes
Kent	115	89	40	-
Killingly	125	97	35	Yes
Killingworth	125	97	30	Yes
Lebanon	125	97	30	Yes
Ledyard	126	101	30	Yes
Lisbon	125	97	30	Yes
Litchfield	115	89	35	-
Lyme	125	97	30	Yes
Madison	125	97	30	Yes
Manchester	120	93	30	Yes
Mansfield	120	93	35	Yes
Marlborough	125	97	30	Yes
Meriden	120	93	30	Yes
Middlebury	120	93	35	Yes
Middlefield	120	93	30	Yes
Middletown	120	93	30	Yes
Milford	120	93	30	Yes
Monroe	120	93	30	Yes
Montville	125	97	30	Yes
Morris	115	89	35	-
Naugatuck	120	93	30	Yes
New Britain	120	93	30	Yes
New Canaan	120	93	30	Yes
New Fairfield	115	89	30	-
New Hartford	115	89	35	-

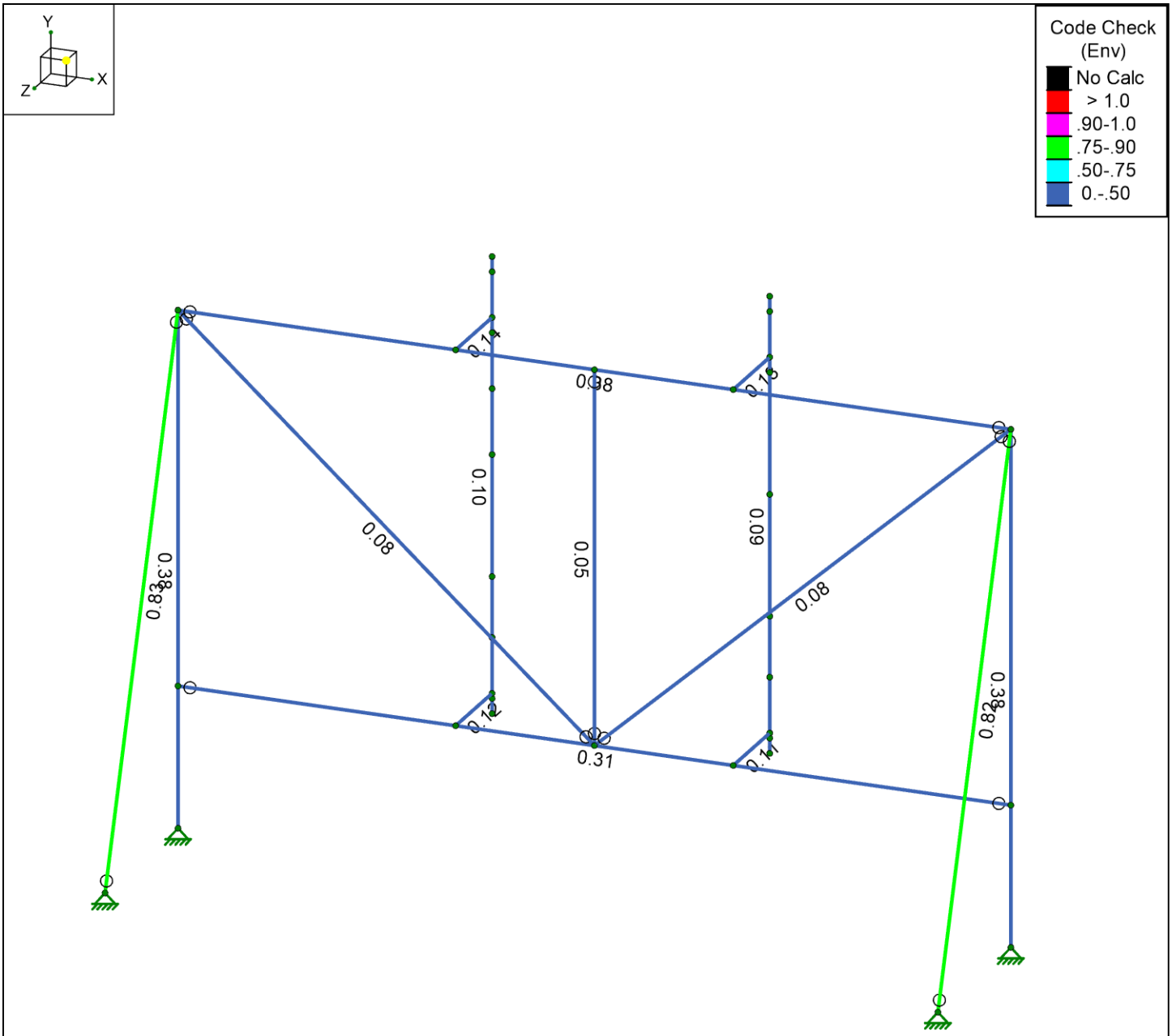


Magaram Engineering	NJJER02023B	SK-1
BJM		Oct 18, 2023
		NJJER02023B 10.18.2023.r3d



Loads: BLC 2, WLz

Magaram Engineering	NJJER02023B	SK-2
BJM		Oct 18, 2023
		NJJER02023B 10.18.2023.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Magaram Engineering	NJJER02023B	SK-3
BJM		Oct 18, 2023
		NJJER02023B 10.18.2023.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
8	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1
9	A500 GR.C	29000	11154	0.3	0.65	0.49	46	1.6	60	1.2
10	A529 Gr. 50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
11	A1011-33Ksi	29000	11154	0.3	0.65	0.49	33	1.5	58	1.2
12	A1011 36 Ksi	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
13	A1018 50 Ksi	29000	11154	0.3	0.65	0.49	50	1.5	65	1.2
14	FRP	2600	977	0.33	0.6	0.121	10	1.44	30	1.3

General Materials Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Plate Methodology
1	gen_Conc3NW	3155	1372	0.15	0.6	0.145	Isotropic
2	gen_Conc4NW	3644	1584	0.15	0.6	0.145	Isotropic
3	gen_Conc3LW	2085	906	0.15	0.6	0.11	Isotropic
4	gen_Conc4LW	2408	1047	0.15	0.6	0.11	Isotropic
5	gen_Alum	10100	4077	0.3	1.29	0.173	Isotropic
6	gen_Steel	29000	11154	0.3	0.65	0.49	Isotropic
7	gen_Plywood	1800	38	0	0.3	0.035	Isotropic
8	RIGID	1e+6		0.3	0	0	Isotropic

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	6.5"x0.37" Plate	PL6.5x0.375	Beam	None	A1011 36 Ksi	Typical	2.438	0.029	8.582	0.11
2	6"x0.37" Plate	Plate 6x.37	Beam	None	A1011 36 Ksi	Typical	2.22	0.025	6.66	0.097
3	L 2"x2"x3/16"	L2x2x3	Beam	None	A529 Gr. 50	Typical	0.722	0.271	0.271	0.009
4	Face Pipes(3.5x.16)	W1100x499	Beam	None	A500 GR.C	Typical	98.27	1201.245	30992.126	74.477
5	Antenna Pipes(2.375x.12	Antenna Pipes(2.375x.12)	Beam	None	A500 GR.C	Typical	0.85	0.542	0.542	1.084
6	Channel(3.38x2.06)	C3.38x2.06x0.25	Beam	None	A1011 36 Ksi	Typical	1.75	0.715	3.026	0.034
7	Square Tubing	HSS4X4X4	Beam	None	A500 GR.C	Typical	3.37	7.8	7.8	12.8
8	Handrail Connector	L6.6x4.46x0.25	Beam	None	A1011 36 Ksi	Typical	2.703	4.759	12.473	0.055
9	Handrail	PIPE_2.0	Beam	None	A500 GR.C	Typical	1.02	0.627	0.627	1.25

General Section Sets

	Label	Shape	Type	Material	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	GEN1	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+06	1e+06	1e+06	1e+06

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N2	N1		PIPE_3.0	Beam	HSS Pipe	A53 Gr.B	Typical
2	M2	N4	N3		PIPE_3.0	Beam	HSS Pipe	A53 Gr.B	Typical
3	M11	N37	N34		HSS4X4X2	Beam	Tube	A500 Gr.B Rect	Typical
4	M12	N36	N35		HSS4X4X2	Beam	Tube	A500 Gr.B Rect	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
5	M13	N39	N38	90	C10X15.3	Beam	Channel	A572 Gr.50	Typical
6	M14	N37	N36	90	C10X15.3	Beam	Channel	A572 Gr.50	Typical
7	M15	N37	N40		L3X3X3	Beam	Single Angle	A36 Gr.36	Typical
8	M16	N40	N36		L3X3X3	Beam	Single Angle	A36 Gr.36	Typical
9	M17	N41	N40		L3X3X3	Beam	Single Angle	A36 Gr.36	Typical
10	M18	N48	N42		L4X4X6	Beam	Single Angle	A36 Gr.36	Typical
11	M19	N47	N44		L4X4X6	Beam	Single Angle	A36 Gr.36	Typical
12	M20	N49	N45		L4X4X6	Beam	Single Angle	A36 Gr.36	Typical
13	M21	N46	N43		L4X4X6	Beam	Single Angle	A36 Gr.36	Typical
14	M22	N36	N50		L3X3X3	Beam	Single Angle	A36 Gr.36	Typical
15	M23	N37	N51		L3X3X3	Beam	Single Angle	A36 Gr.36	Typical

Member Advanced Data

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
1	M1			Yes	Default	None
2	M2			Yes	Default	None
3	M11			Yes	Default	None
4	M12			Yes	Default	None
5	M13	BenPIN	BenPIN	Yes	Default	None
6	M14	BenPIN	BenPIN	Yes	Default	None
7	M15	BenPIN	BenPIN	Yes	Default	None
8	M16	BenPIN	BenPIN	Yes	Default	None
9	M17	BenPIN	BenPIN	Yes	Default	None
10	M18			Yes	Default	None
11	M19			Yes	Default	None
12	M20			Yes	Default	None
13	M21			Yes	Default	None
14	M22	BenPIN	BenPIN	Yes	Default	None
15	M23	BenPIN	BenPIN	Yes	Default	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lcomp top [in]	Function
1	M1	PIPE_3.0	90	Lbyy	Lateral
2	M2	PIPE_3.0	90	Lbyy	Lateral
3	M11	HSS4X4X2	102	Lbyy	Lateral
4	M12	HSS4X4X2	102	Lbyy	Lateral
5	M13	C10X15.3	165	Lbyy	Lateral
6	M14	C10X15.3	165	Lbyy	Lateral
7	M15	L3X3X3	110.825	Lbyy	Lateral
8	M16	L3X3X3	110.825	Lbyy	Lateral
9	M17	L3X3X3	74	Lbyy	Lateral
10	M18	L4X4X6	18	Lbyy	Lateral
11	M19	L4X4X6	18	Lbyy	Lateral
12	M20	L4X4X6	18	Lbyy	Lateral
13	M21	L4X4X6	18	Lbyy	Lateral
14	M22	L3X3X3	108.167	Lbyy	Lateral
15	M23	L3X3X3	108.167	Lbyy	Lateral

Member RISAConnection Properties

	Label	Shape	Start Conn	End Conn	Start Release	End Release
1	M1	PIPE_3.0	None	None	Fixed	Fixed
2	M2	PIPE_3.0	None	None	Fixed	Fixed

Member RISAConnection Properties (Continued)

	Label	Shape	Start Conn	End Conn	Start Release	End Release
3	M11	HSS4X4X2	None	None	Fixed	Fixed
4	M12	HSS4X4X2	None	None	Fixed	Fixed
5	M13	C10X15.3	None	None	Pinned	Pinned
6	M14	C10X15.3	None	None	Pinned	Pinned
7	M15	L3X3X3	None	None	Pinned	Pinned
8	M16	L3X3X3	None	None	Pinned	Pinned
9	M17	L3X3X3	None	None	Pinned	Pinned
10	M18	L4X4X6	None	None	Fixed	Fixed
11	M19	L4X4X6	None	None	Fixed	Fixed
12	M20	L4X4X6	None	None	Fixed	Fixed
13	M21	L4X4X6	None	None	Fixed	Fixed
14	M22	L3X3X3	None	None	Pinned	Pinned
15	M23	L3X3X3	None	None	Pinned	Pinned

Design Size and Code Check Parameters

	Label	Max Axial/Bending Chk	Max Shear Chk
1	Typical	1	1

Concrete Rebar Parameters

	Label	Optimize Rebar ?	Min Flex Bar	Max Flex Bar	Shear Bar	Legs per Stirrup	Top (Column) Cover [in]	Bottom Cover [in]	Side Cover [in]	Top/Bottom Bars	Add'l Side Bars	Shear Bar Spacing [in]
1	Typical	Optimize	#6	#10	#4	2	1.5	1.5	1.5	2	1	12

Deflection Design

	Label	LC	Ratio	LC	Ratio	LC	Ratio
1	Typical	None	N/A	None	N/A	None	N/A

Wall Panel U.C. Parameters

	Label	Max Bending Chk	Max Shear Chk
1	Typical	1	1

Frame / HR Column Seismic Design Rule

	Label	Frame Ductility	Overstrength Reqd
1	OCBF	Minimal	Yes
2	SCBF	High	Yes
3	OMF	Minimal	Yes
4	IMF	Moderate	Yes
5	SMF-RBS	High	Yes
6	SMF-Kaiser	High	Yes

HR Beam Seismic Design Rule

	Label	Connection	Overstrength Reqd	Z Factor	Hinge Location [in]
1	OCBF	Other/None			
2	SCBF	Other/None	Yes		
3	OMF	BUEEP			12
4	IMF	BFP			12
5	SMF-RBS	RBS		0.685	14.625
6	SMF-Kaiser	KBB-B			12

HR Brace Seismic Design Rule

	Label	Overstrength Reqd	KL/r
1	OCBF		
2	SCBF		Yes
3	OMF		
4	IMF		
5	SMF-RBS		
6	SMF-Kaiser		

Connection Design Rules

	Label	Conn Type	Type	Beam Conn	Col/Girder Conn	Eccentricity
1	Col/Bm Single Angle Shear	Shear	Column/Beam Clip Single Angle Shear	Bolted	Bolted	1.5
2	Col/Bm Double Angle Shear	Shear	Column/Beam Clip Double Angle Shear	Bolted	Bolted	0
3	Col/Bm Two Side Clip Angle Shear	Shear	Column/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
4	Col/Bm End Plate Shear	Shear	Column/Beam End-Plate Shear	N/A	Bolted	N/A
5	Col/Bm Shear Tab Shear	Shear	Column/Beam Shear Tab Shear	Bolted	N/A	0
6	Girder/Bm Single Angle Shear	Shear	Girder/Beam Clip Single Angle Shear	Bolted	Bolted	N/A
7	Girder/Bm Double Angle Shear	Shear	Girder/Beam Clip Double Angle Shear	Bolted	Bolted	N/A
8	Grd/Bm Two Side Clip Angle Shear	Shear	Girder/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
9	Girder/Bm End Plate Shear	Shear	Girder/Beam End-Plate Shear	N/A	Bolted	N/A
10	Girder/Bm Shear Tab Shear	Shear	Girder/Beam Shear Tab Shear	Bolted	N/A	N/A
11	Beam Shear Splice	Shear	Beam Shear Tab Splice	N/A	N/A	N/A
12	Column Shear Splice	Shear	Column Shear Tab Splice	N/A	N/A	N/A
13	Col/Bm Ext. End Plate Moment	Moment	Column/Beam Extended End-Plate Moment	N/A	N/A	N/A
14	Col/Bm PartExt. End Plate Moment	Moment	Column/Beam Partially Extended End-Plate Moment (Tension side)	N/A	N/A	N/A
15	Col/Bm Flush End Plate Moment	Moment	Column/Beam Flush End-Plate Moment	N/A	N/A	N/A
16	Col/Bm Flange Plate Moment	Moment	Column/Beam Flange Plate Moment	Bolted	N/A	N/A
17	Col/Bm Direct Weld Moment	Moment	Column/Beam Direct Weld Moment	Bolted	N/A	N/A
18	Col/Bm Seismic Moment	Moment	Column/Beam Seismic Moment	N/A	N/A	N/A
19	Beam Moment Plate Splice	Moment	Beam Moment Plate Splice	N/A	N/A	N/A
20	Column Moment Plate Splice	Moment	Column Moment Plate Splice	N/A	N/A	N/A
21	Beam Direct Weld Moment Splice	Moment	Beam Direct Weld Splice	N/A	N/A	N/A
22	Col Direct Weld Moment Splice	Moment	Column Direct Weld Splice	N/A	N/A	N/A
23	Bm Ext. End Plate Moment Splice	Moment	Beam Extended End Plate Splice	Bolted	N/A	N/A
24	Col Ext. End Plate Moment Splice	Moment	Column Extended End Plate Splice	N/A	Bolted	N/A
25	Diagonal Vertical Brace	Brace	Diagonal Vertical Brace	N/A	N/A	N/A
26	Chevron Vertical Brace	Brace	Chevron Vertical Brace	N/A	N/A	N/A
27	Seismic Diagonal Brace	Brace	Diagonal Brace Seismic	N/A	N/A	N/A
28	Seismic Chevron Brace	Brace	Chevron Brace Seismic	N/A	N/A	N/A
29	Knee Brace	Brace	Knee Brace	N/A	N/A	N/A
30	Single Column Base Plate	Baseplate	Single Column Baseplate	N/A	N/A	N/A
31	Base Plate with Vertical Brace	Baseplate	Brace to Column Base Plate	N/A	N/A	N/A
32	HSS Truss Connection	Truss	HSS T-Connection	N/A	N/A	N/A

Node Loads and Enforced Displacements (BLC 1 : DL)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N25	L	Y	-35
2	N24	L	Y	-35
3	N31	L	Y	-61.3
4	N30	L	Y	-61.3
5	N29	L	Y	-94.6
6	N28	L	Y	-94.6
7	N12	L	Y	-21
8	N52	L	Y	-35

Node Loads and Enforced Displacements (BLC 1 : DL) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
9	N53	L	Y	-35

Node Loads and Enforced Displacements (BLC 2 : WLz)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N25	L	Z	240
2	N24	L	Z	240
3	N31	L	Z	80
4	N30	L	Z	80
5	N29	L	Z	80
6	N28	L	Z	80
7	N12	L	Z	95
8	N52	L	Z	240
9	N53	L	Z	240

Node Loads and Enforced Displacements (BLC 3 : IL)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N25	L	Y	-60
2	N24	L	Y	-60
3	N31	L	Y	-28
4	N30	L	Y	-28
5	N29	L	Y	-28
6	N28	L	Y	-28
7	N12	L	Y	-33
8	N52	L	Y	-60
9	N53	L	Y	-60

Node Loads and Enforced Displacements (BLC 4 : WLiz)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N25	L	Z	35
2	N24	L	Z	35
3	N31	L	Z	19
4	N30	L	Z	19
5	N29	L	Z	19
6	N28	L	Z	19
7	N12	L	Z	22
8	N52	L	Z	35
9	N53	L	Z	35

Node Loads and Enforced Displacements (BLC 5 : WLx)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N25	L	X	170
2	N24	L	X	170
3	N31	L	X	45
4	N30	L	X	45
5	N29	L	X	50
6	N28	L	X	50
7	N12	L	X	70
8	N52	L	X	170
9	N53	L	X	170

Node Loads and Enforced Displacements (BLC 6 : WLix)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N25	L	X	20
2	N24	L	X	20
3	N31	L	X	11
4	N30	L	X	11
5	N29	L	X	12
6	N28	L	X	12
7	N12	L	X	16
8	N52	L	X	20
9	N53	L	X	20

Member Point Loads

No Data to Print...

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Distributed
1	DL	DL	-1	9	
2	WLz	WL		9	4
3	IL	SL		9	2
4	WLiz	WL		9	2
5	WLx	WL		9	6
6	WLix	WL		9	2
7	W30z	WL			
8	W30x	WL			
9	EQx	ELX			
10	EQz	ELZ			
11	Extreme Ice Vertical (Mount)	None			

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	DL+WL	Yes	Y	1	0.9	5	1				
2	DL+WL	Yes	Y	1	1.2	5	1				
3	DL+WLi+IL	Yes	Y	1	1.2	6	1	3	1		
4	30 deg DL+WL	Yes	Y	1	0.9	2	0.5	5	0.87		
5	30 deg DL+WL	Yes	Y	1	1.2	2	0.5	5	0.87		
6	30 deg DL+WLi+IL	Yes	Y	1	1.2	4	0.5	6	0.87	3	1
7	60 deg DL+WL	Yes	Y	1	0.9	2	0.87	5	0.5		
8	60 deg DL+WL	Yes	Y	1	1.2	2	0.87	5	0.5		
9	60 deg DL+WLi+IL	Yes	Y	1	1.2	4	0.87	6	0.5	3	1
10	90 deg DL+WL	Yes	Y	1	0.9	2	1				
11	90 deg DL+WL	Yes	Y	1	1.2	2	1				
12	90 deg DL+WLi+IL	Yes	Y	1	1.2	4	1			3	1
13	120 deg DL+WL	Yes	Y	1	0.9	2	0.87	5	-0.5		
14	120 deg DL+WL	Yes	Y	1	1.2	2	0.87	5	-0.5		
15	120 deg DL+WLi+IL	Yes	Y	1	1.2	4	0.87	6	-0.5	3	1
16	150 deg DL+WL	Yes	Y	1	0.9	2	0.5	5	-0.87		
17	150 deg DL+WL	Yes	Y	1	1.2	2	0.5	5	-0.87		
18	150 deg DL+WLi+IL	Yes	Y	1	1.2	4	0.5	6	-0.87	3	1
19	180 DL+WL	Yes	Y	1	0.9	5	-1				
20	180 DL+WL	Yes	Y	1	1.2	5	-1				
21	180 DL+WLi+IL	Yes	Y	1	1.2	6	-1	3	1		
22	210 deg DL+WL	Yes	Y	1	0.9	2	-0.5	5	-0.87		
23	210 deg DL+WL	Yes	Y	1	1.2	2	-0.5	5	-0.87		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
24	210 deg DL+WLi+IL	Yes	Y	1	1.2	4	-0.5	6	-0.87	3	1
25	240 deg DL+WL	Yes	Y	1	0.9	2	-0.87	5	-0.5		
26	240 deg DL+WL	Yes	Y	1	1.2	2	-0.87	5	-0.5		
27	240 deg DL+WLi+IL	Yes	Y	1	1.2	4	-0.87	6	-0.5	3	1
28	270 deg DL+WL	Yes	Y	1	0.9	2	-1				
29	270 deg DL+WL	Yes	Y	1	1.2	2	-1				
30	270 deg DL+WLi+IL	Yes	Y	1	1.2	4	-1			3	1
31	300 deg DL+WL	Yes	Y	1	0.9	2	-0.87	5	0.5		
32	300 deg DL+WL	Yes	Y	1	1.2	2	-0.87	5	0.5		
33	300 deg DL+WLi+IL	Yes	Y	1	1.2	4	-0.87	6	0.5	3	1
34	330 deg DL+WL	Yes	Y	1	0.9	2	-0.5	5	0.87		
35	330 deg DL+WL	Yes	Y	1	1.2	2	-0.5	5	0.87		

Load Combination Design

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	30 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	30 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	30 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	60 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	60 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	60 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	90 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	90 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	90 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	120 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	120 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	120 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	150 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	150 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	150 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	180 DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	180 DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	180 DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	210 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	210 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	210 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	240 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	240 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	240 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	270 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	270 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	270 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	300 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	300 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	300 deg DL+WLi+IL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	330 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	330 deg DL+WL		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

No Data to Print...

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N35	max	634.683	19	6605.026	29	933.879	28	0	35	0	35	0	35
2		min	-631.982	2	-4940.865	10	-1057.955	11	0	1	0	1	0	1
3	N34	max	631.903	20	6698.662	29	935.654	28	0	35	0	35	0	35
4		min	-634.623	1	-5012.783	10	-1062.54	11	0	1	0	1	0	1
5	N50	max	5.048	23	5533.713	10	2066.784	29	LOCKED		LOCKED		0	35
6		min	-4.456	32	-5814.563	29	-1941.554	10	LOCKED		LOCKED		0	1
7	N51	max	4.536	26	5611.929	10	2097.087	29	LOCKED		LOCKED		0	35
8		min	-5.113	35	-5899.798	29	-1968.98	10	LOCKED		LOCKED		0	1
9	Totals:	max	1267	19	2067.326	30	6000	29						
10		min	-1267	2	1191.994	31	-6000	10						

Envelope Node Displacements

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	0.175	1	-0.032	31	0.337	11	-2.043e-4	28	1.629e-3	14	8.686e-4	19
2		min	-0.181	20	-0.071	30	-0.313	28	-1.883e-3	30	-1.063e-3	31	-9.393e-4	2
3	N2	max	0.189	2	-0.032	31	0.208	10	2.28e-4	28	1.708e-3	14	9.148e-5	4
4		min	-0.189	20	-0.071	30	-0.256	29	-1.819e-3	11	-1.354e-3	31	-1.61e-4	23
5	N3	max	0.178	2	-0.033	31	0.337	11	-3.225e-4	28	1.473e-3	26	1.123e-3	20
6		min	-0.178	20	-0.079	27	-0.313	28	-1.994e-3	30	-1.085e-3	7	-1.052e-3	1
7	N4	max	0.185	1	-0.033	31	0.206	10	3.863e-4	28	1.977e-3	26	3.885e-4	2
8		min	-0.191	20	-0.079	27	-0.256	29	-2.069e-3	11	-1.397e-3	7	-3.188e-4	19
9	N5	max	0.178	1	-0.032	31	0.332	11	-2.044e-4	28	1.629e-3	14	8.687e-4	19
10		min	-0.183	20	-0.071	30	-0.314	28	-1.883e-3	30	-1.063e-3	31	-9.394e-4	2
11	N6	max	0.181	2	-0.033	31	0.333	11	-3.226e-4	28	1.473e-3	26	1.123e-3	20
12		min	-0.181	20	-0.079	27	-0.314	28	-1.994e-3	30	-1.085e-3	7	-1.052e-3	1
13	N12	max	0.198	1	-0.033	31	0.256	10	1.306e-3	28	1.882e-3	26	5.599e-4	2
14		min	-0.202	20	-0.079	27	-0.269	29	-1.997e-3	11	-1.338e-3	7	-5.025e-4	19
15	N24	max	0.189	2	-0.032	31	0.213	10	2.281e-4	28	1.708e-3	14	9.156e-5	4
16		min	-0.189	20	-0.071	30	-0.256	29	-1.82e-3	11	-1.354e-3	31	-1.611e-4	23
17	N25	max	0.186	1	-0.033	31	0.212	10	3.864e-4	28	1.977e-3	26	3.886e-4	2
18		min	-0.192	20	-0.079	27	-0.256	29	-2.069e-3	11	-1.397e-3	7	-3.189e-4	19
19	N28	max	0.198	2	-0.032	31	0.273	10	1.35e-3	28	1.68e-3	14	1.987e-4	1
20		min	-0.201	20	-0.071	30	-0.282	29	-1.56e-3	11	-1.248e-3	31	-2.515e-4	20
21	N29	max	0.204	1	-0.033	31	0.278	10	1.368e-3	28	1.793e-3	26	2.765e-4	2
22		min	-0.207	20	-0.079	27	-0.286	29	-1.559e-3	11	-1.283e-3	7	-2.252e-4	19
23	N30	max	0.191	2	-0.032	31	0.232	10	6.081e-4	28	1.705e-3	14	2.513e-4	1
24		min	-0.192	20	-0.071	30	-0.257	29	-1.966e-3	11	-1.343e-3	31	-3.181e-4	20
25	N31	max	0.192	1	-0.033	31	0.234	10	7.819e-4	28	1.957e-3	26	5.564e-4	2
26		min	-0.197	20	-0.079	27	-0.259	29	-2.212e-3	11	-1.384e-3	7	-4.899e-4	19
27	N32	max	0.196	1	-0.032	31	0.304	11	7.812e-4	28	1.654e-3	14	3.689e-4	19
28		min	-0.2	20	-0.071	30	-0.308	28	-1.133e-3	11	-1.154e-3	31	-4.235e-4	2
29	N33	max	0.201	2	-0.033	31	0.307	11	6.743e-4	28	1.629e-3	26	5.586e-4	20
30		min	-0.204	20	-0.079	27	-0.312	28	-1.004e-3	11	-1.182e-3	7	-5.057e-4	1
31	N34	max	0	1	0	10	0	11	9.254e-3	11	5.944e-3	29	6.892e-3	20
32		min	0	20	0	29	0	28	-9.115e-3	28	-3.538e-3	10	-6.891e-3	2
33	N35	max	0	2	0	10	0	11	9.207e-3	11	3.549e-3	10	6.891e-3	20
34		min	0	19	0	29	0	28	-9.074e-3	28	-5.96e-3	29	-6.892e-3	2
35	N36	max	0.178	2	0.012	10	0.11	10	4.548e-3	28	3.549e-3	10	2.056e-3	2
36		min	-0.179	20	-0.016	29	-0.125	29	-4.913e-3	11	-5.96e-3	29	-2.039e-3	20
37	N37	max	0.179	2	0.013	10	0.112	10	4.55e-3	28	5.944e-3	29	2.039e-3	2

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
38		min	-0.178	20	-0.016	29	-0.127	29	-4.923e-3	11	-3.538e-3	10	-2.056e-3	20
39	N38	max	0.172	2	0.003	10	0.224	11	5.289e-3	11	3.549e-3	10	4.439e-3	20
40		min	-0.172	20	-0.004	29	-0.222	28	-5.295e-3	28	-5.96e-3	29	-4.436e-3	2
41	N39	max	0.172	2	0.003	10	0.226	11	5.321e-3	11	5.944e-3	29	4.436e-3	20
42		min	-0.172	20	-0.005	29	-0.223	28	-5.326e-3	28	-3.538e-3	10	-4.439e-3	2
43	N40	max	0.173	2	0.008	10	0.347	11	-4.267e-4	31	1.055e-4	20	1.248e-4	12
44		min	-0.173	20	-0.022	29	-0.328	28	-2.666e-3	27	-1.016e-4	1	-2.155e-5	28
45	N41	max	0.179	2	0.008	10	0.245	10	1.11e-4	31	4.742e-5	16	1.348e-4	30
46		min	-0.179	20	-0.024	29	-0.276	29	-2.579e-3	14	-4.891e-5	35	-1.978e-5	10
47	N42	max	0.179	2	0.001	10	0.228	10	2.132e-4	31	1.352e-3	29	7.566e-4	30
48		min	-0.179	20	-0.044	29	-0.257	29	-2.726e-3	14	-1.208e-3	10	2.334e-4	10
49	N43	max	0.179	2	0	10	0.227	10	8.873e-6	31	1.237e-3	10	-2.505e-4	10
50		min	-0.179	20	-0.039	29	-0.256	29	-2.484e-3	24	-1.384e-3	29	-6.492e-4	30
51	N44	max	0.173	2	-0.01	10	0.331	11	-4.923e-4	31	9.595e-4	28	7.719e-4	12
52		min	-0.173	20	-0.034	12	-0.315	28	-2.78e-3	27	-1.104e-3	11	1.373e-4	28
53	N45	max	0.173	2	-0.006	10	0.331	11	-3.612e-4	31	1.12e-3	11	-1.538e-4	28
54		min	-0.173	20	-0.031	29	-0.314	28	-2.552e-3	27	-9.73e-4	28	-6.792e-4	11
55	N46	max	0.19	2	-0.032	31	0.227	10	3.804e-4	28	1.708e-3	14	1.87e-4	1
56		min	-0.191	20	-0.071	30	-0.256	29	-1.972e-3	11	-1.354e-3	31	-2.566e-4	20
57	N47	max	0.182	2	-0.033	31	0.331	11	-3.227e-4	28	1.473e-3	26	1.123e-3	20
58		min	-0.183	20	-0.079	27	-0.315	28	-1.994e-3	30	-1.085e-3	7	-1.052e-3	1
59	N48	max	0.19	1	-0.033	31	0.228	10	5.388e-4	28	1.977e-3	26	4.98e-4	2
60		min	-0.195	20	-0.079	27	-0.257	29	-2.221e-3	11	-1.397e-3	7	-4.284e-4	19
61	N49	max	0.179	1	-0.032	31	0.331	11	-2.045e-4	28	1.629e-3	14	8.688e-4	19
62		min	-0.184	20	-0.071	30	-0.314	28	-1.883e-3	30	-1.063e-3	31	-9.395e-4	2
63	N50	max	0	32	0	29	0	10	0	35	0	35	1.689e-2	29
64		min	0	23	0	10	0	29	0	1	0	1	-1.005e-2	10
65	N51	max	0	35	0	29	0	10	0	35	0	35	1.002e-2	10
66		min	0	26	0	10	0	29	0	1	0	1	-1.685e-2	29
67	N52	max	0.189	1	-0.032	31	0.317	11	2.18e-4	28	1.641e-3	14	7.176e-4	19
68		min	-0.193	20	-0.071	30	-0.315	28	-1.151e-3	30	-1.106e-3	31	-7.788e-4	2
69	N53	max	0.193	2	-0.033	31	0.319	11	9.193e-5	28	1.548e-3	26	9.522e-4	20
70		min	-0.194	20	-0.079	27	-0.317	28	-1.2e-3	30	-1.131e-3	7	-8.92e-4	1

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M1	PIPE_3.0	0.091	12.188	29	0.02	12.188		32	48251.352	65205	5.749	5.749	1.908	H1-1b
2	M2	PIPE_3.0	0.098	12.188	29	0.027	12.188		26	48251.352	65205	5.749	5.749	1.907	H1-1b
3	M11	HSS4X4X2	0.384	74.375	31	0.049	102	z	11	55297.506	73278	8.24	8.24	1.376	H1-1b
4	M12	HSS4X4X2	0.383	74.375	25	0.048	102	z	11	55297.506	73278	8.24	8.24	1.376	H1-1b
5	M13	C10X15.3	0.309	82.5	11	0.046	0	y	11	18836.396	201600	6.928	22.083	1.137	H1-1b
6	M14	C10X15.3	0.376	82.5	29	0.042	165	y	29	18836.396	201600	6.928	22.052	1.135	H1-1b
7	M15	L3X3X3	0.078	55.413	20	0.001	110.825	y	26	6884.678	35316	1.32	1.902	1.136	H2-1
8	M16	L3X3X3	0.078	55.413	2	0.001	110.825	y	17	6884.678	35316	1.32	1.902	1.136	H2-1
9	M17	L3X3X3	0.048	74	30	0	74	y	20	15253.915	35316	1.32	2.136	1	H2-1
10	M18	L4X4X6	0.145	18	2	0.024	18	z	20	90095.708	92664	4.398	9.886	1.298	H2-1
11	M19	L4X4X6	0.118	0	12	0.023	18	y	5	90095.708	92664	4.398	9.886	1.5	H2-1
12	M20	L4X4X6	0.105	0	12	0.021	18	y	17	90095.708	92664	4.398	9.886	1.5	H2-1
13	M21	L4X4X6	0.126	18	20	0.019	18	z	2	90095.708	92664	4.398	9.886	1.5	H2-1
14	M22	L3X3X3	0.82	59.717	10	0.001	108.167	y	29	7227.294	35316	1.32	1.924	1.136	H2-1
15	M23	L3X3X3	0.831	59.717	10	0.001	108.167	y	32	7227.294	35316	1.32	1.924	1.136	H2-1

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A36 Gr.36	L4X4X6	4	72	0.058
3	A36 Gr.36	L3X3X3	5	512	0.158
4	A500 Gr.B Rect	HSS4X4X2	2	204	0.11
5	A53 Gr.B	PIPE_3.0	2	180	0.106
6	A572 Gr.50	C10X15.3	2	330	0.419
7	Total HR Steel		15	1298	0.852

Warning Log

	Message
1	There are members defined as member type: "Beam" that are vertical (or nearly vertical). For proper deflection optimization, change member type to "Column".

MK DEVELOPMENT

EXHIBIT E

NIERS Study

Pinnacle Telecom Group

Professional and Technical Services

Antenna Site FCC RF Compliance Assessment and Report for Municipal Submission

Prepared for:	DISH Wireless, LLC
Site ID:	NJJER02023B
Site Address:	1111 East Putnam Avenue Riverside, CT
Latitude:	N 41.04119
Longitude:	W 73.584163
Structure type:	Rooftop
Report date:	September 22, 2023
Compliance Conclusion:	DISH Wireless, LLC will be in compliance with the rules and regulations as described in OET Bulletin 65, following the implementation of the proposed mitigation as detailed in the report.

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

Contents

Introduction and Summary

At the request of DISH Wireless LLC ("DISH"), Pinnacle Telecom Group has performed an independent assessment of radiofrequency (RF) levels and related FCC compliance for proposed wireless base station antenna operations on the roof of a building located at 1111 East Putnam Avenue in Riverside, CT. DISH refers to the site by the code "NJJER02023B", and its proposed operation involves directional panel antennas and transmission in the 600 MHz, 2000 MHz and 2100 MHz bands licensed to DISH by the FCC.

The FCC requires wireless system operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC regulations. In this case, the compliance assessment needs to take into account the RF effects of other existing antenna operations at the site by T-Mobile, Verizon Wireless, the Town of Greenwich and the Town of Greenwich Police Department. Note that FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

This report describes mathematical analyses of potential RF exposure levels associated with the antennas. The analyses both at street level and on the subject roof employ standard FCC mathematical models for calculating the effects of the antennas in a very conservative manner, in order to overstate the RF levels and to ensure "safe-side" conclusions regarding compliance with the FCC limit for safe continuous exposure of the general public.

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

compliance with the MPE limit. We can (and will) also describe the overall worst-case result via the “plain-English” equivalent “times-below-the-limit” factor.

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

- At street level around the site, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations is 85.1328 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance.
- A supplemental analysis of the RF levels on the subject rooftop in the vicinity of the DISH antennas yields a worst-case result of 449.69 percent of the FCC general population MPE limit. Per DISH guidelines and consistent with FCC guidance on rooftop compliance, barriers are to be installed at each of the DISH antenna sectors. Notice signs are to be installed on the barriers and at each of the DISH antennas. In addition, NOC Information and Guidelines signs are to be installed at the roof access point(s).
- The results of the calculations, along with the proposed mitigation, combine to satisfy the FCC requirements and associated guidelines on RF compliance at street level around the site and on the subject roof. Moreover, because of the significant conservatism incorporated in the analysis, RF levels actually caused by the antennas will be lower than these calculations indicate.

The remainder of this report provides the following:

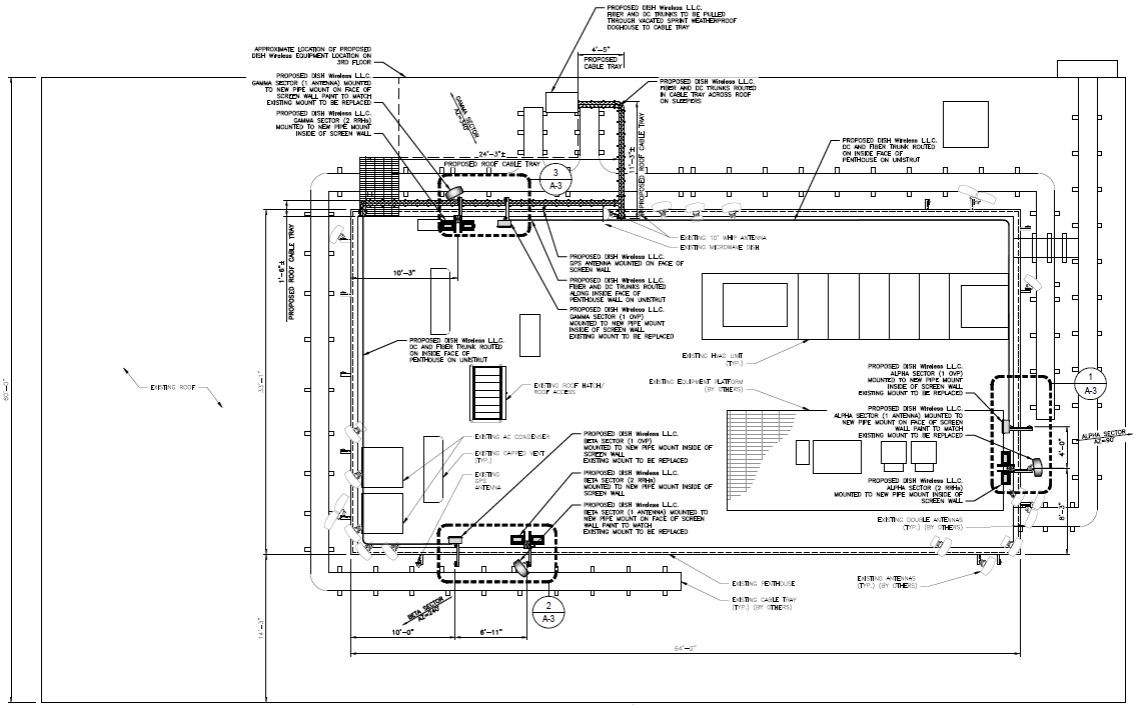
- relevant technical data on the proposed DISH antenna operations at the site, as well as on the existing antenna operations;
- a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- analysis of the results of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

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

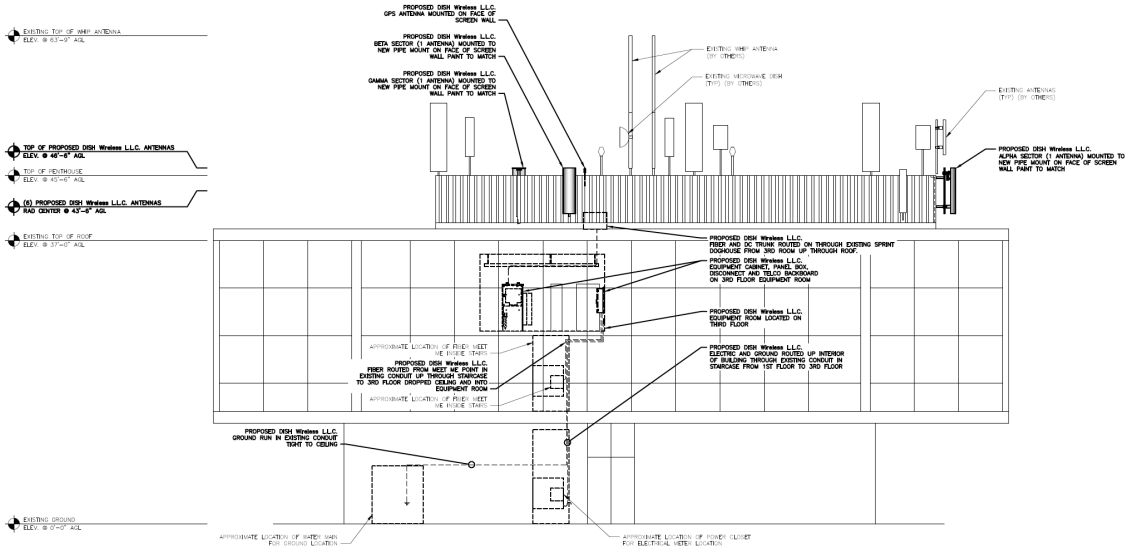
Antenna and Transmission Data

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

Plan View:



Elevation View:



The table that follows summarizes the relevant data for the proposed DISH antenna operations. Note that the "Z" height references the centerline of the antenna.

Ant. ID	Carrier	Antenna Manufacturer	Antenna Model	Type	Freq (MHz)	Ant. Dim. (ft.)	Total Input Power (watts)	Total ERP (watts)	Z ARL (ft)	Z AGL (ft)	Ant. Gain (dBd)	B/W	Azimuth	EDT	MDT
❶	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	6.5	43.5	12.46	64	90	5	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	6.5	43.5	16.66	67	90	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	6.5	43.5	16.66	67	90	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	6.5	43.5	12.46	64	240	4	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	6.5	43.5	16.66	67	240	7	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	6.5	43.5	16.66	67	240	7	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	6.5	43.5	12.46	64	340	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	6.5	43.5	16.66	67	340	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	6.5	43.5	16.66	67	340	2	0

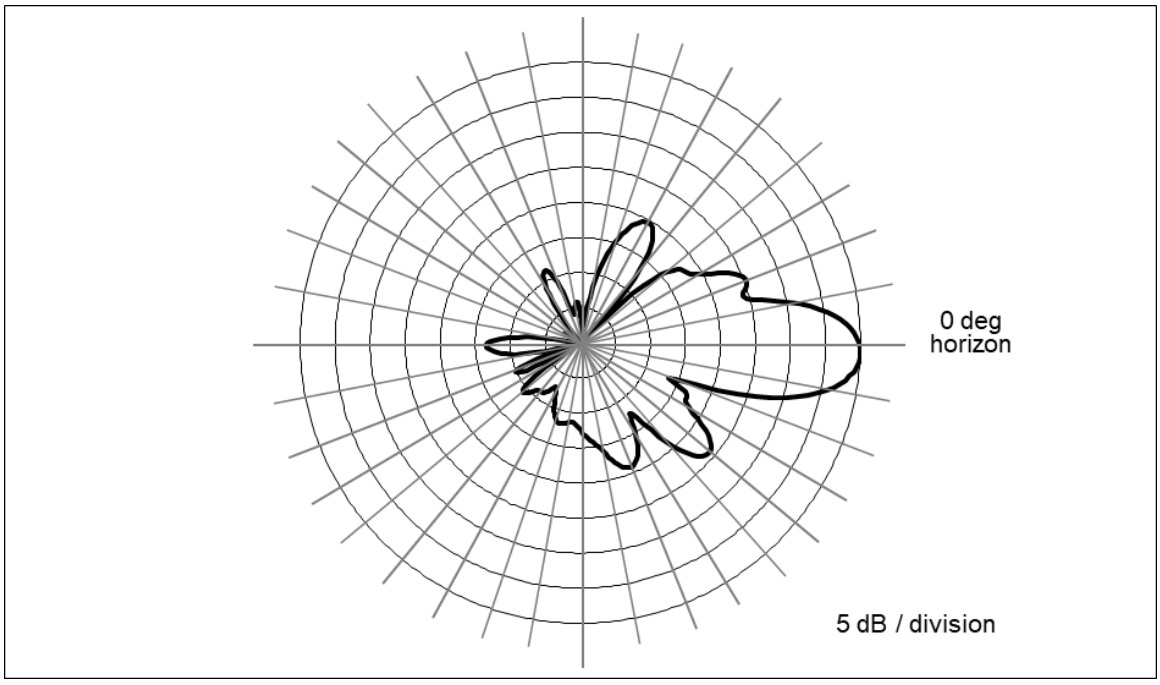
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

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

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

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

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



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

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

Carrier	*Antenna Manufacturer*	*Antenna Model*	*Type*	*Freq (MHz)*	*Total ERP (watts)*	*Ant. Gain (dBd)*	*Azimuth*
T-Mobile	Generic	Generic	Panel	600	3163	12.96	N/A
T-Mobile	Generic	Generic	Panel	700	867	13.36	N/A
T-Mobile	Generic	Generic	Panel	1900	4123	15.36	N/A
T-Mobile	Generic	Generic	Panel	1900	1452	15.60	N/A
T-Mobile	Generic	Generic	Panel	2100	4626	15.86	N/A
T-Mobile	Generic	Generic	Panel	1900	1419	15.50	N/A
T-Mobile	Generic	Generic	Panel	2500	12804	22.35	N/A
Verizon Wireless	Generic	Generic	Panel	746	2400	11.76	N/A
Verizon Wireless	Generic	Generic	Panel	869	5166	12.36	N/A
Verizon Wireless	Generic	Generic	Panel	1900	5372	15.26	N/A
Verizon Wireless	Generic	Generic	Panel	2100	5625	15.46	N/A
Town of Greenwich	Generic	Generic	Dish	11 GHz	2666	38.26	N/A
Town of Greenwich	Generic	Generic	Dish	11 GHz	1138	36.16	N/A
Town of Greenwich PD	Generic	Generic	Omnidirectional	851	138	9.00	N/A

*Generic antenna patterns have been used from a library of panel, omnidirectional, microwave and broadcast patterns that are representative of the actual antenna.

Compliance Analysis

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

Street Level Analysis

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

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

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

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

where

MPE%	=	RF level, expressed as a percentage of the FCC general population MPE limit
100	=	factor to convert the raw result to percentage form
TxPower	=	maximum net power into antenna sector, in milliwatts, a function of the number of channels per sector, the transmitter power per channel, and line loss

$10^{(Gmax-Vdisc)/10}$	=	numeric equivalent of the relative antenna gain in the downward direction of interest, referenced to any applied antenna mechanical downtilt
4	=	factor to account for a 100-percent-efficient energy reflection from the ground, and the squared relationship between RF field strength and power density ($2^2 = 4$)
MPE	=	FCC general population MPE limit
R	=	straight-line distance from the RF source to the point of interest, centimeters

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

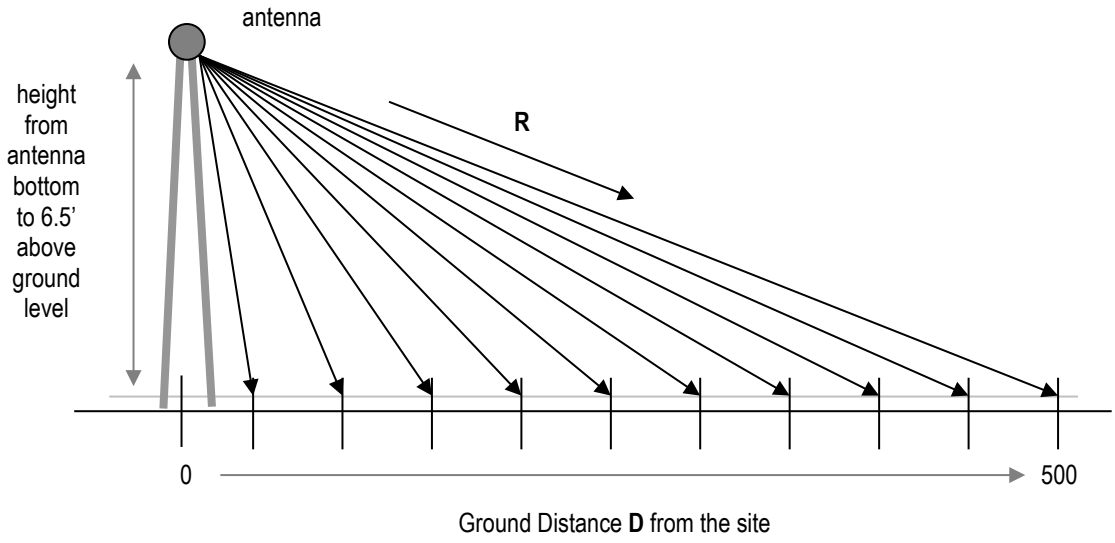


Figure 2. Street-level MPE% Calculation Geometry

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

Therefore, RF levels may actually increase slightly with increasing distance within the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF

levels become primarily distance-controlled and, as a result, the RF levels generally decrease with increasing distance. In any case, the RF levels more than 500 feet from a wireless antenna site are well understood to be sufficiently low to be comfortably in compliance.

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

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

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

1. The antennas are assumed to be operating continuously at maximum power and maximum channel capacity.
2. The power-attenuation effects of shadowing or other obstructions to the line-of-sight path from the antenna to the point of interest are ignored.
3. The calculations intentionally minimize the distance factor (R) by assuming a 6’6” human and performing the calculations from the bottom (rather than the centerline) of each operator’s lowest-mounted antenna, as applicable.
4. The calculations also conservatively take into account, when applicable, the different technical characteristics and related RF effects of the use of

multiple antennas for transmission in the same frequency band.

5. The RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a “perfect” field reflection from the intervening ground.

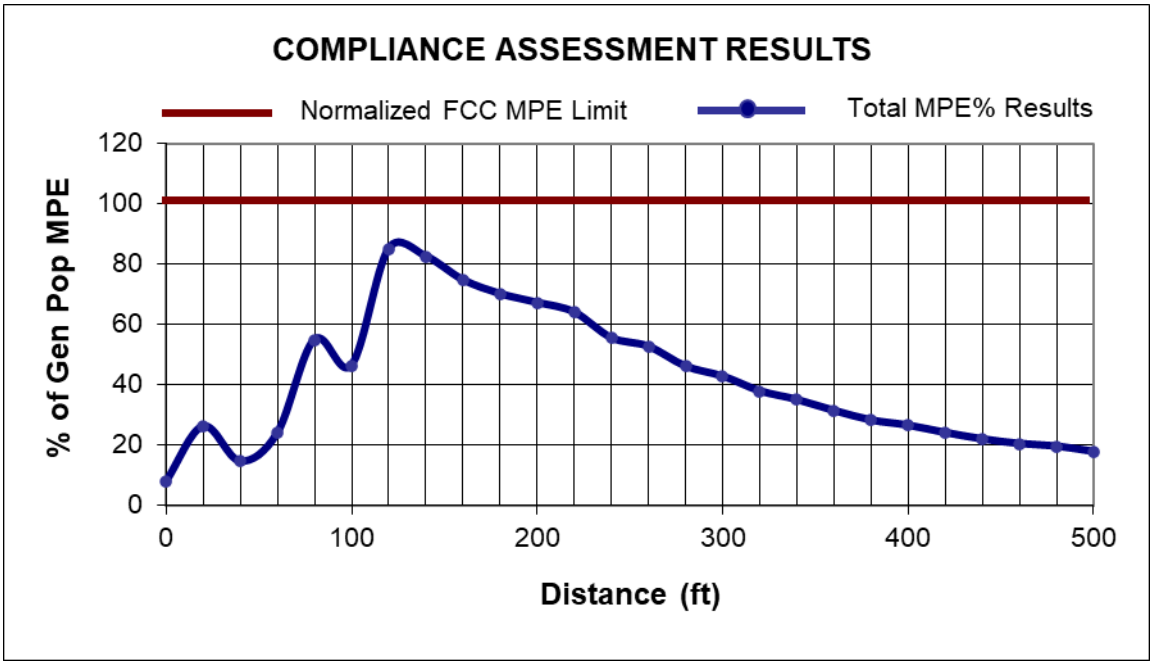
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very “safe-side” conclusions about compliance.

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

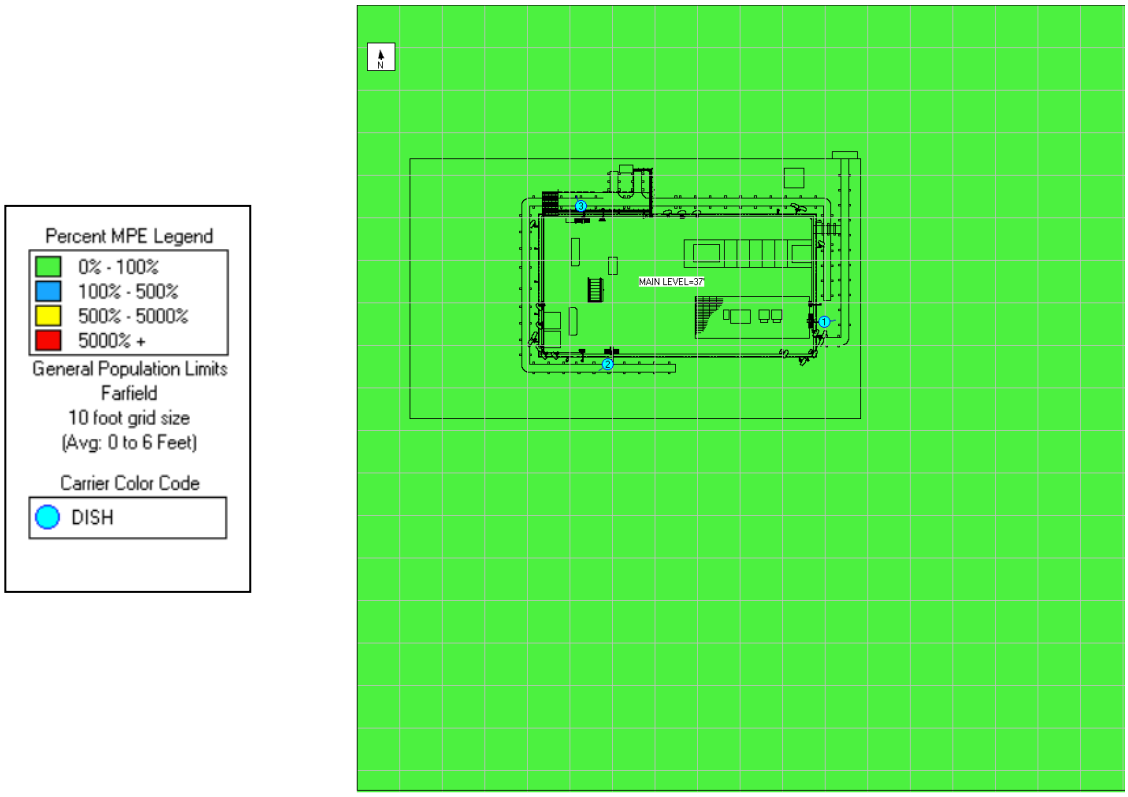
Ground Distance (ft)	**DISH 600 MHz MPE%**	**DISH 2000 MHz MPE%**	**DISH 2100 MHz MPE%**	**T-Mobile MPE%**	**Verizon Wireless MPE%**	**Town of Greenwich MPE%**	**Town of Greenwich PD MPE%**	**Total MPE%**
0	0.4097	0.0359	0.0024	6.9646	0.2534	0.0064	0.0373	7.7097
20	0.5475	0.6453	0.2804	22.4776	2.0306	0.0054	0.0803	26.0671
40	3.0417	0.7934	1.5977	4.9358	4.0384	0.0036	0.0627	14.4733
60	0.1225	0.0078	0.1512	18.9293	4.5727	0.0024	0.0582	23.8441
80	0.5876	0.2325	0.3806	52.2410	1.4848	0.0063	0.0054	54.9382
100	3.3334	0.0276	0.0697	42.2784	0.6352	0.0044	0.0045	46.3532
120	**5.6041**	**1.6065**	**0.9636**	**75.0753**	**1.8747**	**0.0042**	**0.0044**	**85.1328**
140	6.4307	0.6897	0.8029	70.1185	4.5247	0.0049	0.0229	82.5943
160	6.8862	0.9233	0.5589	61.5871	4.7456	0.0039	0.0302	74.7352
180	6.2177	2.9108	2.2081	52.4620	6.2844	0.0092	0.0209	70.1131
200	5.6230	5.2766	4.5851	45.3828	6.3015	0.0075	0.0110	67.1875
220	5.0618	6.9133	6.5116	40.2890	5.2347	0.0063	0.0033	64.0200
240	4.2692	5.8309	5.4920	34.3567	5.5376	0.0065	0.0016	55.4945
260	3.8556	6.0600	6.0183	30.7375	5.9746	0.0056	0.0014	52.6530
280	3.4493	5.0946	5.2373	27.1005	5.1642	0.0084	0.0060	46.0603
300	3.0103	4.4463	4.5709	24.9338	5.7654	0.0073	0.0052	42.7392
320	2.6499	3.9139	4.0235	22.1883	5.0755	0.0065	0.0148	37.8724
340	2.3775	2.7071	2.8282	21.2985	5.7285	0.0057	0.0131	34.9586
360	2.1230	2.4173	2.5254	19.1405	5.1155	0.0051	0.0117	31.3385
380	1.9071	2.1715	2.2686	17.2028	4.5956	0.0046	0.0225	28.1727
400	1.7028	1.1982	1.2461	17.0745	5.1960	0.0042	0.0204	26.4422
420	1.5455	1.0875	1.1310	15.5110	4.7162	0.0038	0.0185	24.0135
440	1.4090	0.9915	1.0311	14.1455	4.2998	0.0035	0.0168	21.8972
460	1.2898	0.9076	0.9438	13.2750	3.9362	0.0032	0.0154	20.3710
480	1.1851	0.8339	0.8672	12.9824	3.6167	0.0029	0.0246	19.5128
500	1.0555	0.3442	0.3458	11.9429	4.0333	0.0027	0.0227	17.7471

As indicated, the maximum calculated overall RF level is 85.1328 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

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



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



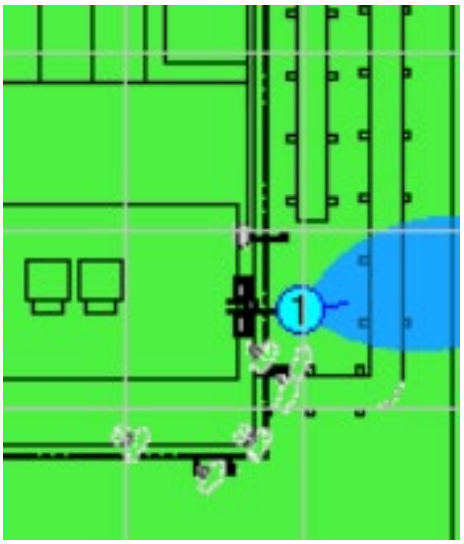
RoofMaster – Alpha / Beta / Gamma sectors

Rooftop Analysis

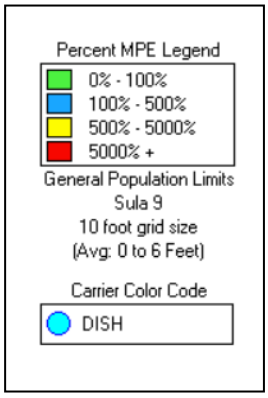
The compliance analysis for the rooftop is performed using the RoofMaster program by Waterford Consultants.

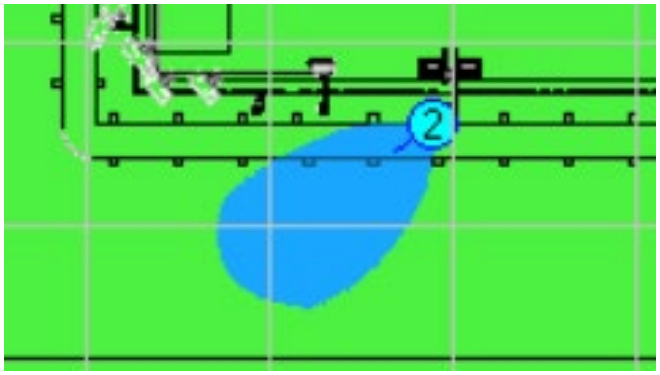
RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above nearby roof, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than they are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

The RoofMaster graphic outputs for the areas surrounding the DISH antennas are reproduced on the pages that follow.

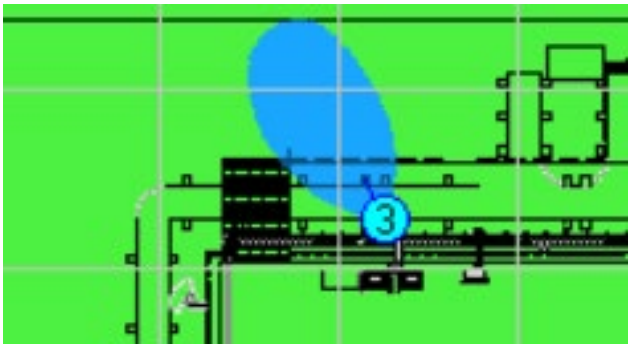


RoofMaster – Main Roof – Alpha sector





RoofMaster – Main Roof – Beta sector



RoofMaster – Main Roof – Gamma sector

As indicated by the color coding of the main roof, the calculated RF levels potentially exceed the FCC general population MPE limit. The maximum RF level in any accessible area near the DISH antennas is 449.69 percent of the FCC general population MPE limit. Emissions from the proposed DISH antenna operations do not contribute more than 5% to any other antenna operations at the site where the FCC MPE limit may be exceeded.

Per DISH guidelines and consistent with FCC guidance on rooftop compliance, barriers are to be installed at each of the DISH antenna sectors. Notice signs are to be installed on the barriers and at each of the DISH antennas. In addition, NOC Information and Guidelines signs are to be installed at the roof access point(s).

Compliance Conclusion

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

The street-level analysis in this case shows a maximum RF level of 85.1328 percent of the applicable FCC general population MPE limit. The analyses indicate that the calculated RF levels at each of the DISH antennas potentially exceeds the FCC MPE limit. Per DISH guidelines and consistent with FCC guidance on rooftop compliance, barriers are to be installed at each of the DISH antenna sectors. Notice signs are to be installed on the barriers and at each of the DISH antennas. In addition, NOC Information and Guidelines signs are to be installed at the roof access point(s).

The results of the calculations, along with the proposed RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines at street level around the site and on the subject roof.

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

Certification

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

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

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

9/22/23
Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER02023B-Final-20230321-v.2_20230321133923

CD: NJJER02023B_FinalStampedCDs_20230919123552

Appendix B. Background on the FCC MPE Limit

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

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

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

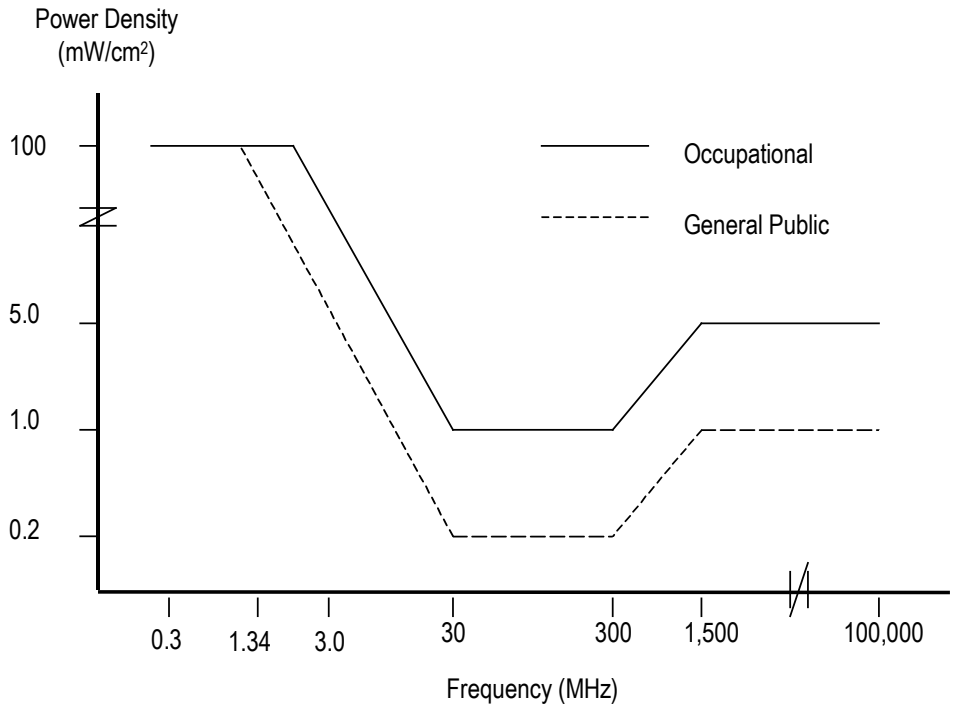
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in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

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

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

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

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



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

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit

applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

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

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

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

FCC References on RF Compliance

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

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

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

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

FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields;*

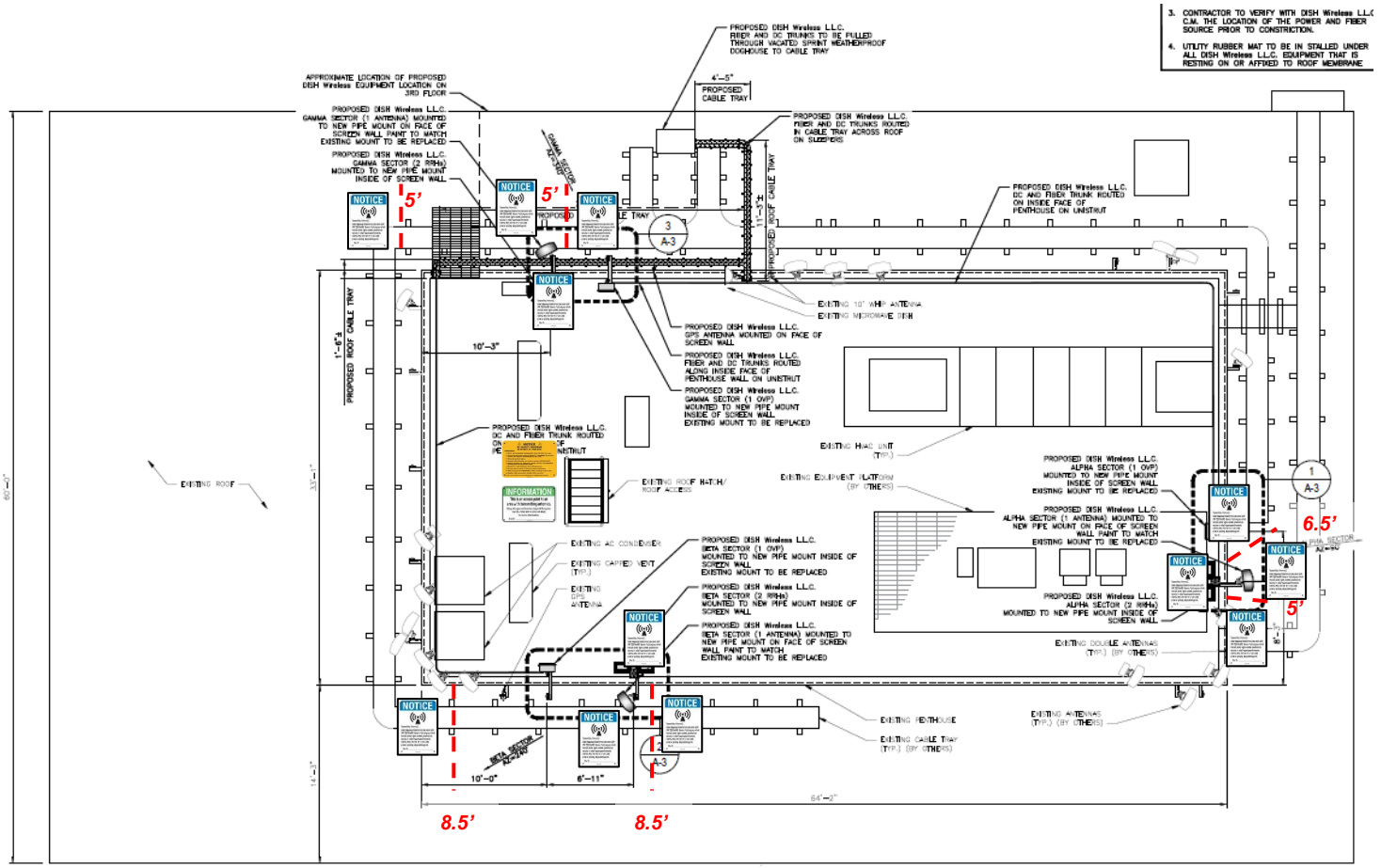
Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies, released December 4, 2019.

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

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

Appendix C. Proposed Signage

Final Compliance Configuration							
	GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	BARRIER/MARKER	
Access Point(s)	1	0	0	0	1	0	
Alpha	0	4	0	0	0	0	6.5', 5'
Beta	0	4	0	0	0	0	8.5', 8.5'
Gamma	0	4	0	0	0	0	5', 5'



Appendix D. Summary of Expert Qualifications

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

Synopsis:	• 40+ years of experience in all aspects of wireless system engineering, related regulation, and RF exposure • Has performed or led RF exposure compliance assessments on more than 20,000 antenna sites since the latest FCC regulations went into effect in 1997 • Has provided testimony as an RF compliance expert more than 1,500 times since 1997 • Have been accepted as an FCC compliance expert in New York, New Jersey, Connecticut, Pennsylvania and more than 40 other states, as well as by the FCC
Education:	• B.E.E., City College of New York (Sch. Of Eng.), 1971 • M.B.A., 1982, Fairleigh Dickinson University, 1982 • Bronx High School of Science, 1966
Current Responsibilities:	• Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
Prior Experience:	• Edwards & Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99 • Bellcore (a Bell Labs offshoot after AT&T's 1984 divestiture), Executive Director – Regulation and Public Policy, 1983-96 • AT&T (Corp. HQ), Division Manager – RF Engineering, and Director – Radio Spectrum Management, 1977-83 • AT&T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77
Specific RF Safety / Compliance Experience:	• Involved in RF exposure matters since 1972 • Have had lead corporate responsibility for RF safety and compliance at AT&T, Bellcore, Edwards & Kelcey, and PTG • While at AT&T, helped develop the mathematical models for calculating RF exposure levels • Have been relied on for compliance by all major wireless carriers, as well as by the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting / engineering firms
Other Background:	• Author, *Microwave System Engineering* (AT&T, 1974) • Co-author and executive editor, *A Guide to New Technologies and Services* (Bellcore, 1993) • National Spectrum Management Association (NSMA) – former three-term President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, long-time member of the Board, and was named an NSMA Fellow in 1991 • Have published more than 35 articles in industry magazines

MK DEVELOPMENT

EXHIBIT F

Proof of Notification

Subject: FedEx Shipment 773924974069: Your package has been delivered
Date: Thursday, November 2, 2023 at 3:56:16 PM Eastern Daylight Time
From: TrackingUpdates@fedex.com
To: Michael Jones

Hi. Your package was delivered Thu, 11/02/2023 at 3:49pm.

Delivered to 101 FIELD POINT RD, GREENWICH, CT 06830

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	773924974069
FROM	Michael Jones 140 Beach 137th Street ROCKAWAY PARK, NY, US, 11694
TO	Town of Greenwich Fred Camillo 101 Field Point Road First Floor GREENWICH, CT, US, 06830
REFERENCE	NJJER02023B
SHIPPER REFERENCE	NJJER02023B
SHIP DATE	Tue 10/31/2023 05:00 PM
PACKAGING TYPE	FedEx Small Box
ORIGIN	ROCKAWAY PARK, NY, US, 11694
DESTINATION	GREENWICH, CT, US, 06830
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	2.00 LB
SERVICE TYPE	FedEx 2Day

Make your deliveries fit your life

Don't want packages sitting on the porch? Enroll in FedEx Delivery Manager® to request to redirect a package to a FedEx location for free. You can also get a QR code to show to a team member for an even easier pickup.

Subject: FedEx Shipment 773925131737: Your package has been delivered
Date: Thursday, November 2, 2023 at 3:56:10 PM Eastern Daylight Time
From: TrackingUpdates@fedex.com
To: Michael Jones

Hi. Your package was delivered Thu, 11/02/2023 at 3:49pm.

Delivered to 101 FIELD POINT RD, GREENWICH, CT 06830

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	773925131737
FROM	Michael Jones 140 Beach 137th Street ROCKAWAY PARK, NY, US, 11694
TO	Town of Greenwich John Vallerie 101 Field Point Road 2nf Floor- Building Dept GREENWICH, CT, US, 06830
REFERENCE	NJJER02023B
SHIPPER REFERENCE	NJJER02023B
SHIP DATE	Tue 10/31/2023 05:00 PM
PACKAGING TYPE	FedEx Small Box
ORIGIN	ROCKAWAY PARK, NY, US, 11694
DESTINATION	GREENWICH, CT, US, 06830
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	2.00 LB
SERVICE TYPE	FedEx 2Day

Make your deliveries fit your life

Don't want packages sitting on the porch? Enroll in FedEx Delivery Manager® to request to redirect a package to a FedEx location for free. You can also get a QR code to show to a team member for an even easier pickup.

Subject: FedEx Shipment 773925321000: Your package has been delivered
Date: Thursday, November 2, 2023 at 3:56:14 PM Eastern Daylight Time
From: TrackingUpdates@fedex.com
To: Michael Jones

Hi. Your package was delivered Thu, 11/02/2023 at 3:49pm.

Delivered to 101 FIELD POINT RD, GREENWICH, CT 06830

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	773925321000
FROM	Michael Jones 140 Beach 137th Street ROCKAWAY PARK, NY, US, 11694
TO	Town of Greenwich Patrick LaRow 101 Field Point Road 2nf Floor- Planning & Zoning Dept GREENWICH, CT, US, 06830
REFERENCE	NJJER02023B
SHIPPER REFERENCE	NJJER02023B
SHIP DATE	Tue 10/31/2023 05:00 PM
PACKAGING TYPE	FedEx Small Box
ORIGIN	ROCKAWAY PARK, NY, US, 11694
DESTINATION	GREENWICH, CT, US, 06830
NUMBER OF PIECES	1
SERVICE TYPE	FedEx 2Day

Make your deliveries fit your life

Don't want packages sitting on the porch? Enroll in FedEx Delivery Manager® to request to redirect a package to a FedEx location for free. You can also get a QR code to show to a team member for an even easier pickup.

Subject: FedEx Shipment 773925453898: Your package has been delivered
Date: Thursday, November 2, 2023 at 2:41:34 PM Eastern Daylight Time
From: TrackingUpdates@fedex.com
To: Michael Jones

Hi. Your package was delivered Thu, 11/02/2023 at 2:32pm.

Delivered to 116 MASON ST, GREENWICH, CT 06830
Received by T.TORRELLI

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	773925453898
FROM	Michael Jones 140 Beach 137th Street ROCKAWAY PARK, NY, US, 11694
TO	Fountainhead Properties LLC Tom Torrelli 116 Mason Street GREENWICH, CT, US, 06830
REFERENCE	NJJER02023B
SHIPPER REFERENCE	NJJER02023B
SHIP DATE	Tue 10/31/2023 05:00 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Small Box
ORIGIN	ROCKAWAY PARK, NY, US, 11694
DESTINATION	GREENWICH, CT, US, 06830
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	2.00 LB
SERVICE TYPE	FedEx 2Day

Make your deliveries fit your life

Don't want packages sitting on the porch? Enroll in FedEx Delivery Manager® to request to redirect a package to a FedEx location for free. You can also get a QR code to show