DEVELOPMENT

August 23, 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
208 Valley Road, New Canaan, CT 06840
Latitude: 41. 166242° N / Longitude: 73.470481° 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 telecommunication tower at 208 Valley Road in New Canaan (the "Property"). The existing 120'-0" Monopole tower is owned by Tarpon Towers II. The underlying property is owned by Silver Hill Hospital Inc. DISH requests that the Council find that the proposed shared use of the Tarpon Towers II tower 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 Kevin Moynihan, First Selectman– City of New Canaan, Daniel Radman, Planning & Zoning Chairman – City of New Canaan, Brian Platz, Chief Building Official – City of New Canaan, Richard Canning, Chairman of Board of Directors – Silver Hill Hospital Inc., and Todd Bowman, Vice President – Tarpon Towers.

Background

The existing Tarpon Towers II facility consists of a 120'-0" monopole tower. DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and Tarpon Towers II have agreed to the proposed shared use of the 208 Valley Road tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and Tarpon Towers II have agreed to the proposed installation of equipment cabinets on the ground on the North side of the tower within the existing compound. Tarpon Towers II 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 and 1 cable at the 75'-0"-foot level. In addition, DISH will install a ground equipment cabinet on a 5'x7' equipment platform. 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.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the tower is 120'-0"; Dish Wireless LLC proposed antennas will be located at a center line height of 75'-0".

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 7.8166% 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 Tarpon Towers II tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support DISH's proposed loading. A copy of the Structural Report has been included in this application.

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

C. **Environmental Feasibility.** The proposed shared use of the Tarpon Towers II tower would have a minimal environmental effect for the following reasons:

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

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

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

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

E. **Public Safety Concerns.** As discussed above, the tower is structurally capable of supporting DISH's full array of 3 antennas, 6 RRU radios, 1 OVP and 1 cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing Tarpon Towers II tower.

Conclusion

For the reasons discussed above, the proposed shared use of the existing Tarpon Towers II tower at 208 Valley Road 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 towers 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:
Kevin Moynihan, First Selectman– City of New Canaan
Daniel Radman, Planning & Zoning Chairman – City of New Canaan
Brian Platz, Chief Building Official – City of New Canaan
Richard Canning, Chairman of Board of Directors – Silver Hill Hospital Inc
Todd Bowman, Vice President – Tarpon Towers.

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EXHIBIT A

Letter of Authorization

July 25, 2023

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

Re: Development Application Letter of Authorization - 208 Valley Road, New Canaan, CT 06840 - NJJER01146D

Letter of Authorization

Dear Sir or Madam:

Tarpon Towers II, LLC ("Tarpon"), owns the tower facility at 208 Valley Road, New Canaan, CT 06840 and identified as Block # 44, Lot # 120 (the "Property"). Tarpon 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 a proposed canister tower on 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 Tarpon that has not been 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 Tarpon.

Please contact Todd Bowman, Vice President of Tarpon at (941) 757-5010 ext 108 or tbowman@tarpontowers.com should you have any questions or concerns.

Sincerely,

Brett Buggeln
COO
Tarpon Towers II, LLC

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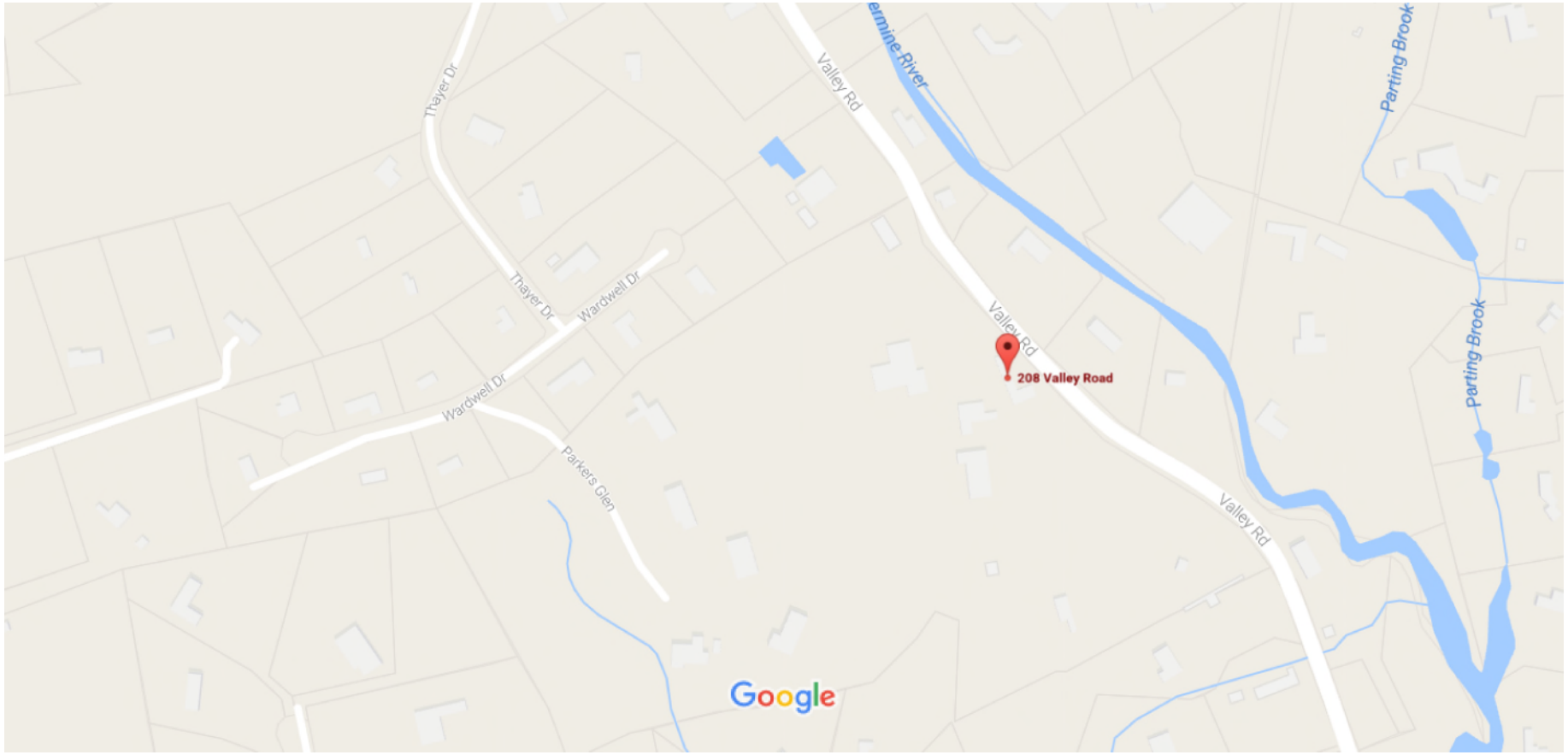
EXHIBIT B

Property Card

Google Maps 208 Valley Rd



Map data ©2016 Google 200 ft

Location	Owner	Account	MBLU
208 VALLEY RD	SILVER HILL HOSPITAL INC	30126	0044/ 0108/ 0120/

Parcel Value

Item	Appraised Value	Assessed Value
Buildings	9,890,300	6,923,210
Extra Building Features	0	0
Outbuildings	67,700	47,390
Land	5,092,000	3,564,400
Total	**15,050,000**	**10,535,000**

Owner of Record

SILVER HILL HOSPITAL INC
208 VALLEY RD
NEW CANAAN, CT 06840

Owner History

Name	Book/Page	Sale Date	Sale Price
SILVER HILL HOSPITAL INC	702/ 281	11/09/2004	0
SILVER HILL FOUNDATION INC	67/ 13	05/18/1940	136,567

Assessment History

Year	Total Assessment
2015	10,535,000
2014	10,535,000
2013	10,535,000
2012	9,209,060
2011	9,209,060
2010	9,209,060
2009	9,209,100
2008	10,969,100
2007	4,710,900
2006	4,710,900
2005	4,710,900
2004	4,710,900
2003	4,710,900
2002	6,112,960

Building Permits

Permit ID	Issue Date	Ammount	Description
16-00064	01/28/2016	10,000	"REPAIR WATER DAMAGE AT MAIN HOUSE."
15-01238	12/09/2015	80,000	MARTIN CENTER - REPLACE EXISTING ENTRANCE STAIRS AND ROOF.
15-01184	11/30/2015	75,000	RENOVATE 18 EXISTING RESTROOMS (WITH NEW FINISHES AND NEW TOILETS AND SHOWER CONTROLS FOR PATIENT SAFETY.) NO INCREASE IN FIXTURE COUNT.
15-00466	06/01/2015	300,000	MAIN HOUSE - INTERIOR RENOVATIONS TO THE 2ND FLOOR
15-00280	04/07/2015	90,000	'ENLARGE MED ROOM AND SWAP LOUNGE & TREATMENT ROOMS TO FACILITATE PATIENT CARE, ADD AC UNITS TO MED, TREATMENT AND & NURSE STATION."
14-1307	12/16/2014	72,000	CONSTRUCT A 12 X 24 SHELTER- FOR PROPANE GENERATOR, 6 ANTENNAS, UG PROPANE TANKS

14-0244	03/24/2014	400,000	"MARTIN CENTER BUILDING OFFICE: - RENOVATE EXISTING OFFICE SPACE INCLUDING ADA ACCESS TO UPPER LEVEL, INCLUDES ADDING HVAC & EXTERIOR WINDOWS [**REVISION- $25,000: CREATE NEW RESTROOM TO REPLACE ONE MOVED TO CREAT DATA CLOSET. NEW RESTROOM TO BE ADA COMPL
14-0297	03/19/2014	175,000	WIRELESS CELL TOWER ONLY.
14-0296	03/19/2014	30,000	INSTALLATION OF EQUIPMENT ON 12x20 CONCRETE PAD, CONCRETE PAD & 3 PANEL ANTENNAS AT 86'
14-0169	02/26/2014	1,600,000	"RESIDENTIAL BUILDING" -- RENOVATION TOTHE EXISTING 7800 SQ FT RESIDENTIAL BUILDING - INCLUDING ADA UPGRADES, NEW WINDOWS SIDING, ROOF, MECHANICALS AND FINISHES FOR THE K HOUSE
14-0168	02/12/2014	20,000	REMOVE POLE MOUNTED FLOOD LIGHTS & REPLACE WITH CAMPUS STD LOW LIGHT POST LIGHTS.
12-0452	09/21/2012	1,500,000	COM ADDS & ALTS
12-0359	04/02/2012	30,000	COM ADDS & ALTS
11-0059	03/15/2011	1,234,000	COM ADDS & ALTS
11-0037	01/19/2011	65,000	ASBESTOS ABATEMENT, EXPLORATION DEMO
10-0086	03/24/2010	735,000	COM ADDS & ALTS
09-0649	01/29/2010	0	SIDEWALKS & ACCESSIBLE ROUTE
09-0109	04/14/2009	100,000	COM ADDS & ALTS
08-0846	11/18/2008	25,000	INT ALTS AND DECK
07-1210	02/28/2008	250,000	CHANGE OF USE INT. ALTS & RAMP R-4
07-0675	08/20/2007	6,199,000	COM ADDITIONS AND ALTERATIONS
07-0402	05/11/2007	50,000	COM ADDS & ALTS
07-0309	04/25/2007	25,000	COM ADDS & ALTS
01-0773A	11/06/2001	0	COM CO
01-0773	09/17/2001	20,000	NEW OUTSIDE STAIRS
01-0096	03/12/2001	73,000	PATIENT ROOM REMO
20343	01/03/2001	42,000	
1914-0120	09/23/1998	150,000	SILVERHILL FOUNDATION, INC.
1796-0120	07/29/1996	1,000	SILVERHILL FOUNDATION, INC.

Land Line Valuation

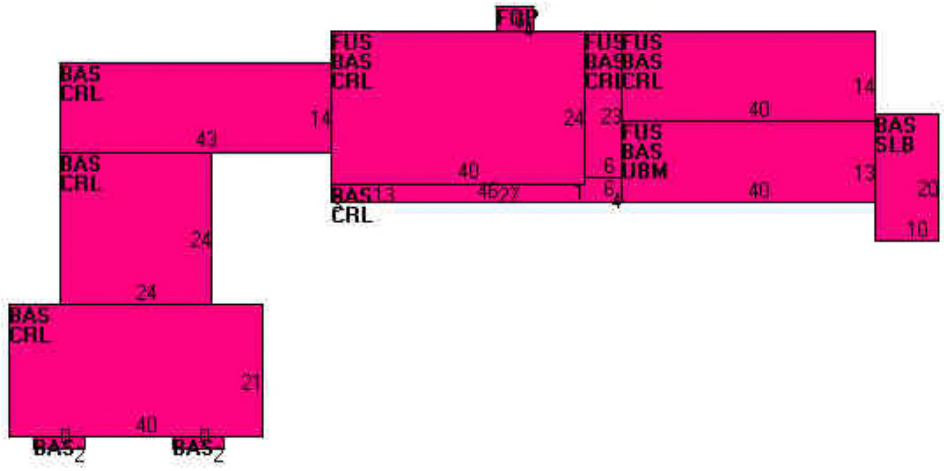
Size	Zone	Dev Map #	Appraised Value	Assessed Value
21.57 AC	2 AC	7319, 7350	5,092,000	3,564,400

Building Details - Click Buildings Below

Building 1 | Building 2 | Building 3 | Building 4 | Building 5 | Building 6 | Building 7 | Building 8

Building 1

Building Sketch



Subarea Summary

Code	Description	Gross Area	Living Area
BAS	First Floor	4,572	4,572
CRL	Crawl Space	3,820	0
FOP	Open Porch	24	0
FUS	Upper Story, Finished	2,178	2,178
SLB	Slab	200	0
UBM	Basement, Unfinished	520	0
	Total Living Area:		**6,750**

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EXHIBIT C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

NJJER01146D

DISH Wireless L.L.C. SITE ADDRESS:

208 VALLEY ROAD
NEW CANAAN, CT 06840

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/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2022 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2022 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

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 (12) PROPOSED 7/8" COAX CABLES
- INSTALL (3) PROPOSED DIPLEXERS
- INSTALL (1) PROPOSED CABLE CLAMP

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (6) PROPOSED RRHs (2 PER SECTOR)
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- INSTALL (1) PROPOSED METER SOCKET
- INSTALL (3) PROPOSED DIPLEXERS
- INSTALL (1) WORK LIGHT
- INSTALL 6'-0" WIDE FENCE

SITE PHOTO

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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

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.

SITE INFORMATION

PROPERTY OWNER:	SILVER HILL HOSPITAL INC.
ADDRESS:	208 VALLEY RD NEW CANAAN, CT 06840
TOWER TYPE:	CANISTER
TOWER CO SITE ID:	N/A
TOWER APP NUMBER:	N/A
COUNTY:	FAIRFIELD COUNTY
LATITUDE (NAD 83):	41° 09' 58.5" N 41.166242 N
LONGITUDE (NAD 83):	73° 28' 13.7" W 73.470481° W
ZONING JURISDICTION:	CT SITING COUNCIL
ZONING DISTRICT:	2AC
PARCEL NUMBER:	44/108/120
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	TBD

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	TARPON TOWERS II 8916 77TH TERRANCE EAST SUITE 103 LAKEWOOD RANCH, FL 34202
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:	SRI RAM GOTTUMUKKALA SRIRAM.GOTTUMUKKALA@DISH.COM

DIRECTIONS

DIRECTIONS FROM 3 ADP BOULEVARD, ROSELAND, NJ:

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, KEEP RIGHT TO STAY ON I-280 E, FOLLOW SIGNS FOR NJ-21/NEWARK/HARRISON, TAKE EXIT 15X AND 16E TOWARD LINCOLN TUNL, MERGE ONTO I-95 N, KEEP LEFT TO STAY ON I-95 N, USE THE LEFT 2 LANES TO TAKE THE I-95 EXIT TOWARD GEORGE WASHINGTON BR, CONTINUE ONTO INTERSTATE 95 UPPER LEVEL N/NJ TPKE N, CONTINUE ONTO US-9 N/INTERSTATE 95 UPPER LEVEL N, CONTINUE ONTO INTERSTATE 95 UPPER LEVEL N/US-1 UPPER LEVEL N, CONTINUE ONTO I-95 N, TAKE EXIT 1C-D TO MERGE ONTO I-87 N TOWARD ALBANY, TAKE EXIT 4 TOWARD CROSS CNTY PKWY, MERGE ONTO CENTRAL PARK AVE, TAKE THE CROSS COUNTY PKWY RAMP, KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR HUTCHINSON PKWY AND MERGE ONTO CROSS COUNTY PKWY, MERGE ONTO HUTCHINSON RIVER PKWY N, KEEP RIGHT AT THE FORK TO STAY ON HUTCHINSON RIVER PKWY N, CONTINUE ONTO CT-15 N, TAKE EXIT 38 TOWARD NEW CANAAN AVE, TURN RIGHT ONTO NEW CANAAN AVE, TURN RIGHT ONTO CARTER ST, TURN RIGHT ONTO CT-106 N, TURN LEFT ONTO VALLEY RD, CONTINUE STRAIGHT TO STAY ON VALLEY RD.

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
BRIAN J MAGNAN
33678
PROFESSIONAL ENGINEER
8/23/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
TER	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/23/2023	ISSUED FOR REVIEW
0	08/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER01146D

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

SHEET TITLE

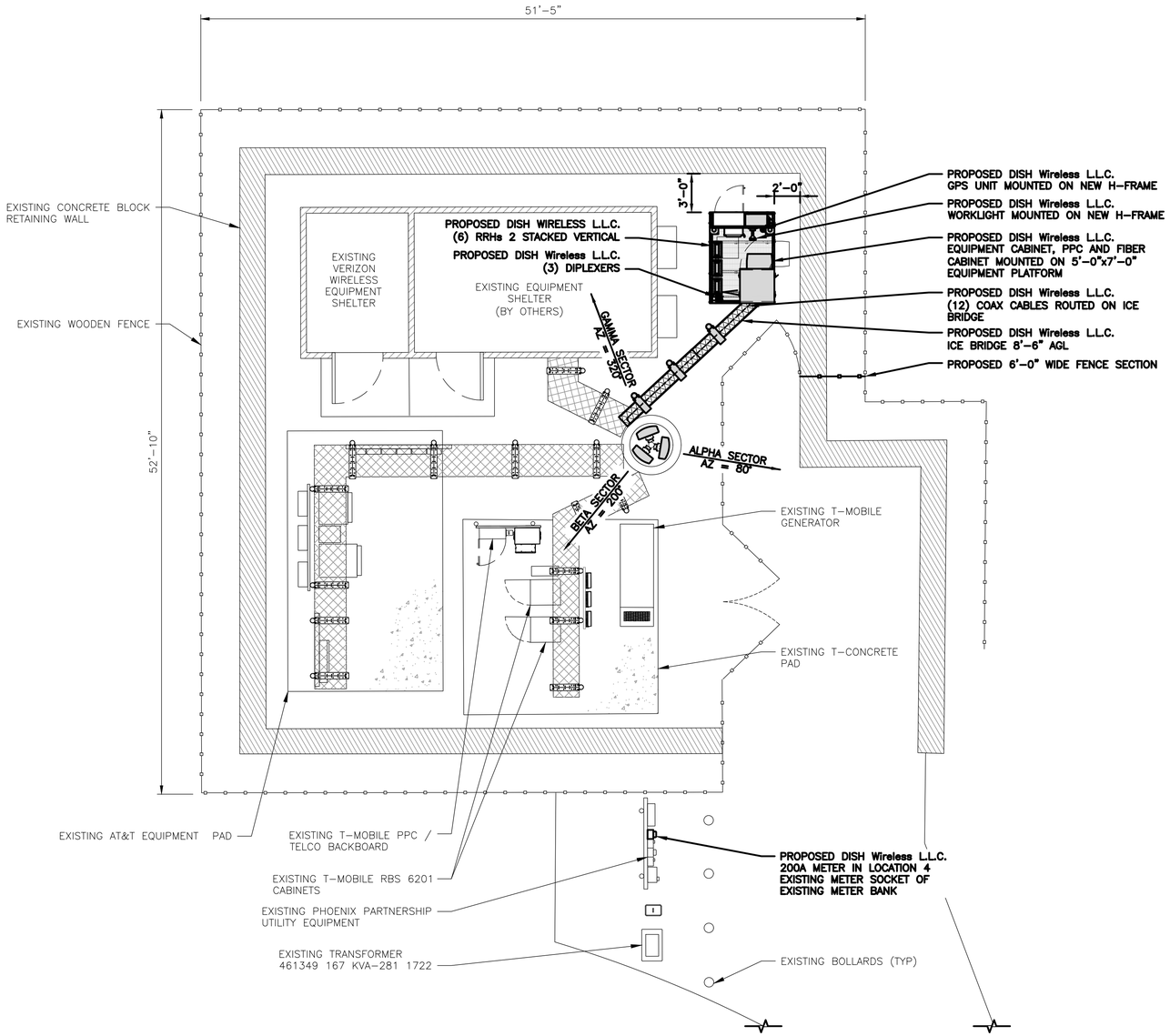
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



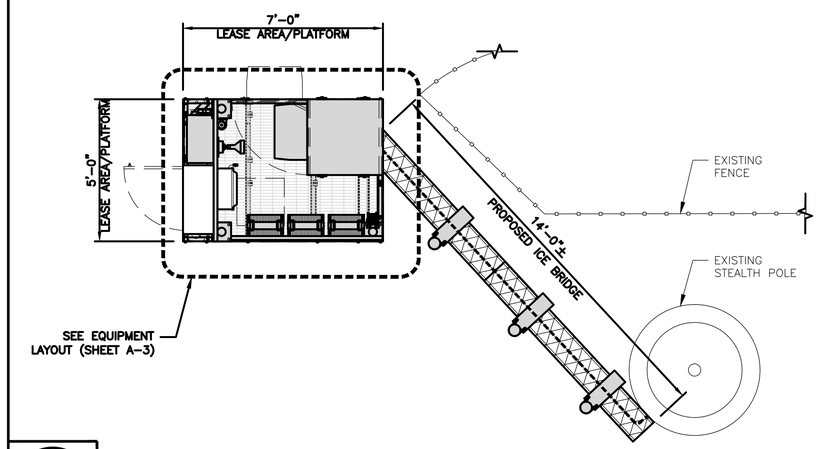
OVERALL SITE PLAN

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

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.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

2

AERIAL VIEW

NO SCALE

3

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGNUSSEN
33678
PROFESSIONAL ENGINEER
8/23/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
TER	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/23/2023	ISSUED FOR REVIEW
0	08/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER01146D

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

SHEET TITLE

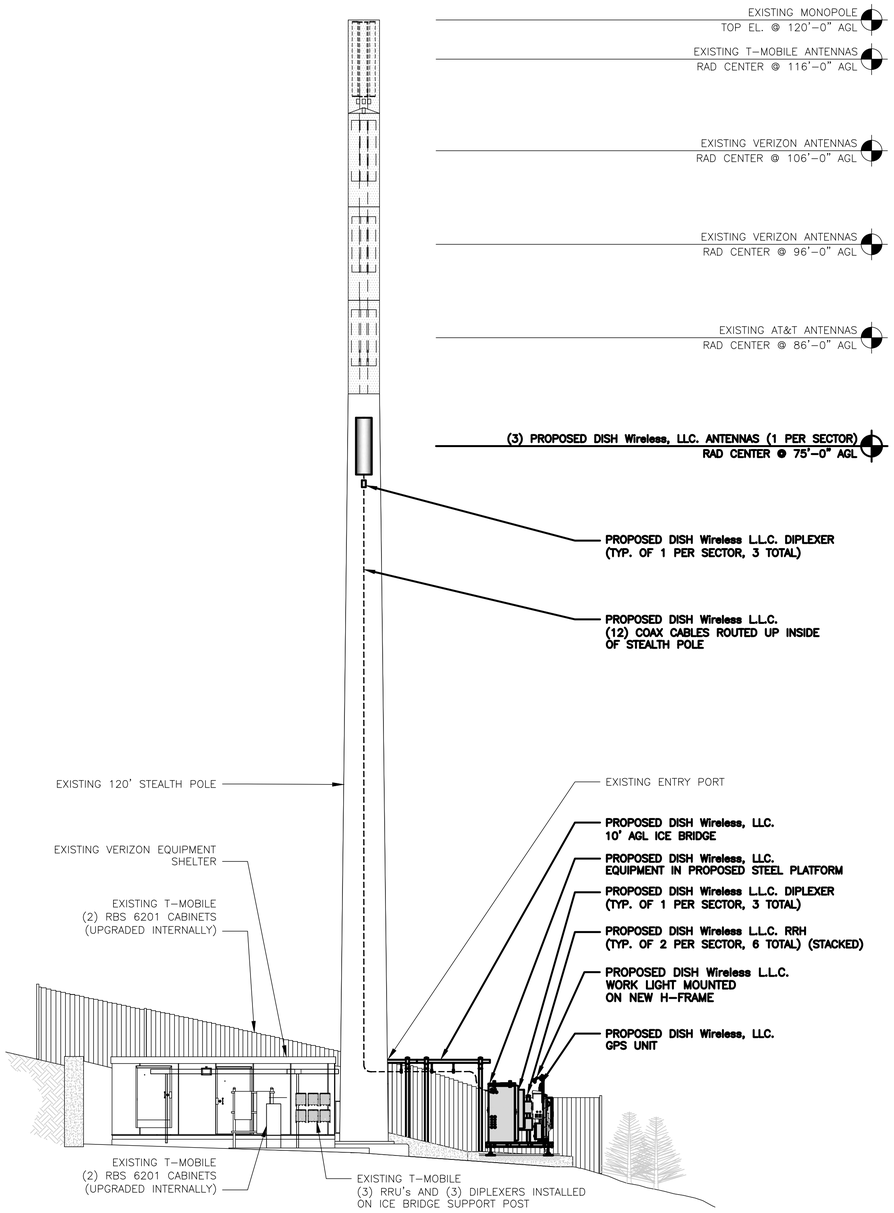
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

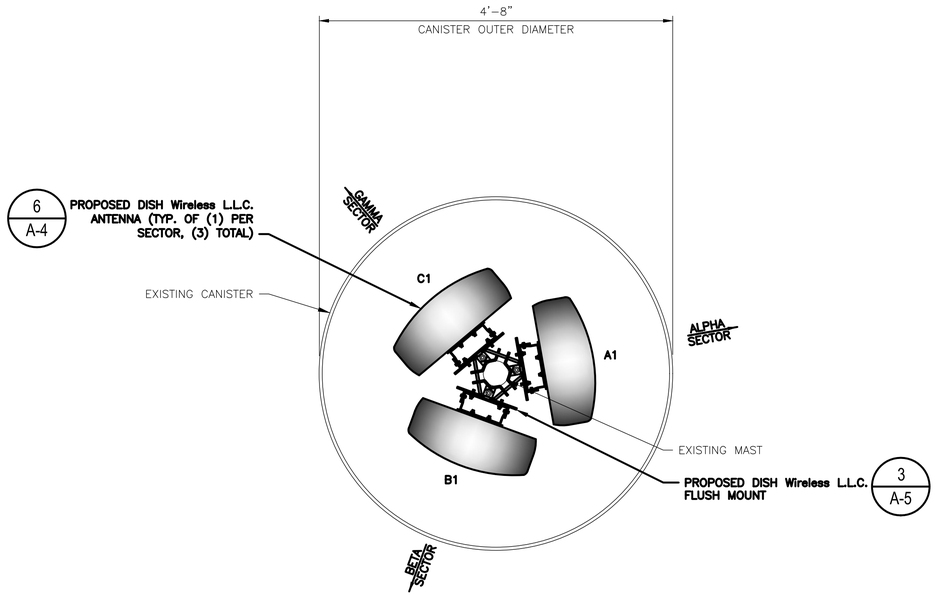
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED NORTHEAST ELEVATION

8' 4' 0 8' 16'
1/8"=1'–0"

1



RAD CENTER @ 75'–0" A.G.L.

ANTENNA LAYOUT

12" 9" 6" 3" 0 1' 2'
1"=1'–0"

2

ANTENNA SCHEDULE

SEC	STATUS	MANUF/MODEL	TECH	LxWxD (INCHES)	AREA (SF)	AZIMUTH	ELECTRIC DOWNTILT	MECHANICAL DOWNTILT	ANTENNA CENTERLINE	RRH/ OVP	RRH MODEL	DIPLEXER MODEL	CABLE	CABLE LENGTH
A1	PROPOSED	COMMSCOPE – FVV–65B–R3	5G	71.97" x 11.81"	5.9	80°	2°	0°	75'–0"	2	SAMSUNG – MID BAND SFG–ARR3KM01DI_RF4451D–70A SAMSUNG – LOW BAND SFG–ARR3J601DI_RF4450T–71A	(2) COMMSCOPE – CDX623–DS–T	(4) 7/8" COAX CABLE	109'–0"
B1	PROPOSED	COMMSCOPE – FVV–65B–R3	5G	71.97" x 11.81"	5.9	200°	2°	0°	75'–0"	2	SAMSUNG – MID BAND SFG–ARR3KM01DI_RF4451D–70A SAMSUNG – LOW BAND SFG–ARR3J601DI_RF4450T–71A	(2) COMMSCOPE – CDX623–DS–T	(4) 7/8" COAX CABLE	109'–0"
C1	PROPOSED	COMMSCOPE – FVV–65B–R3	5G	71.97" x 11.81"	5.9	320°	2°	0°	75'–0"	2	SAMSUNG – MID BAND SFG–ARR3KM01DI_RF4451D–70A SAMSUNG – LOW BAND SFG–ARR3J601DI_RF4450T–71A	(2) COMMSCOPE – CDX623–DS–T	(4) 7/8" COAX CABLE	109'–0"
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	PROPOSED	PCTEL GPSGL–TMG–SPI–40NCB	–	3.2x7.25	–	–	–	–	–	–	–	–	–	–

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

3

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGRAM
33678
PROFESSIONAL ENGINEER
8/23/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
TER	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

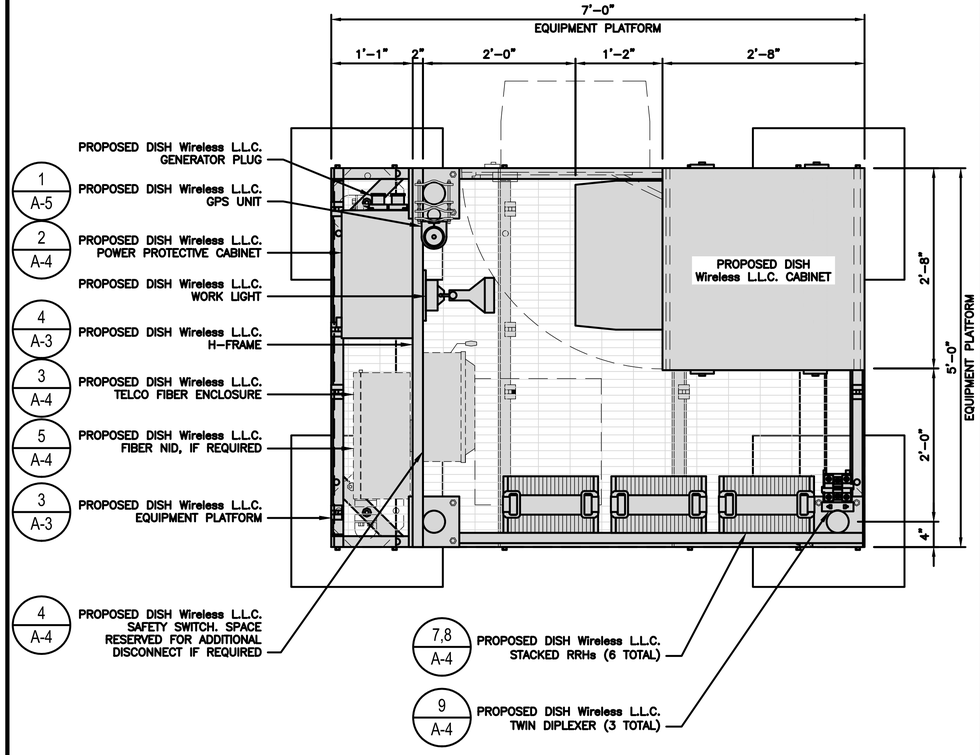
REV	DATE	DESCRIPTION
A	06/23/2023	ISSUED FOR REVIEW
0	08/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
NJJER01146D

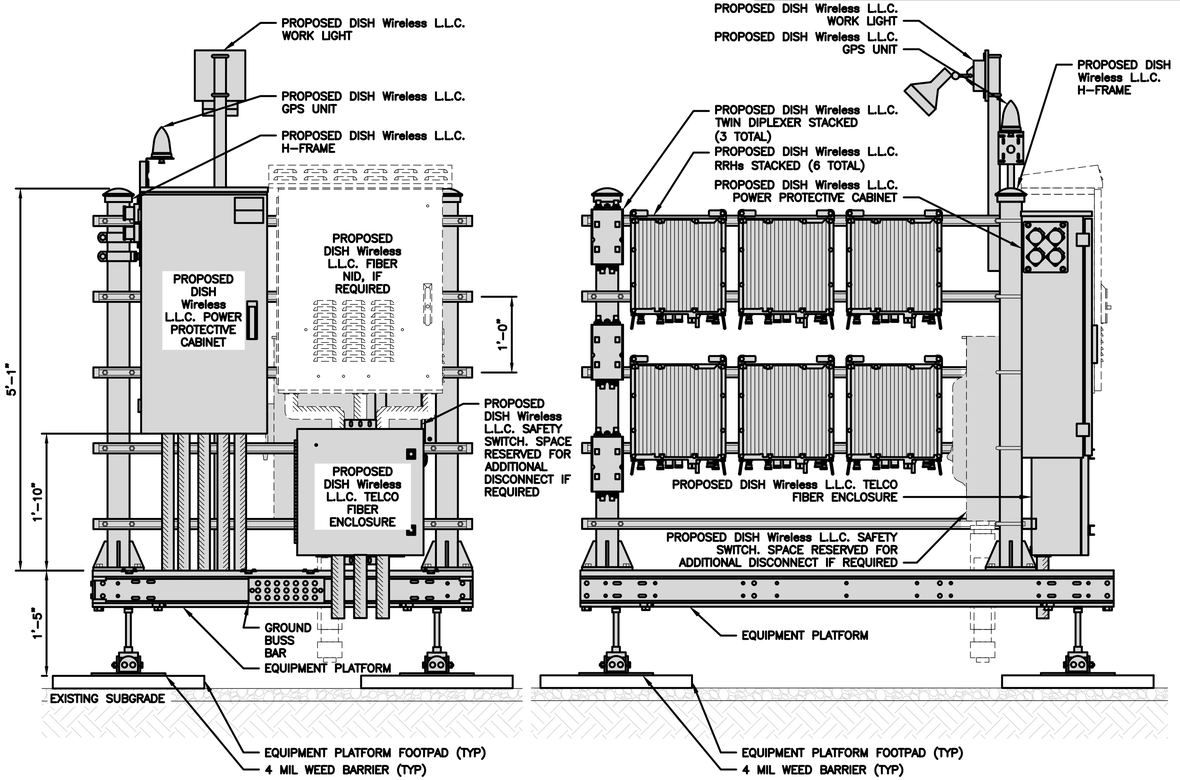
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



PLATFORM EQUIPMENT PLAN | NO SCALE | 1



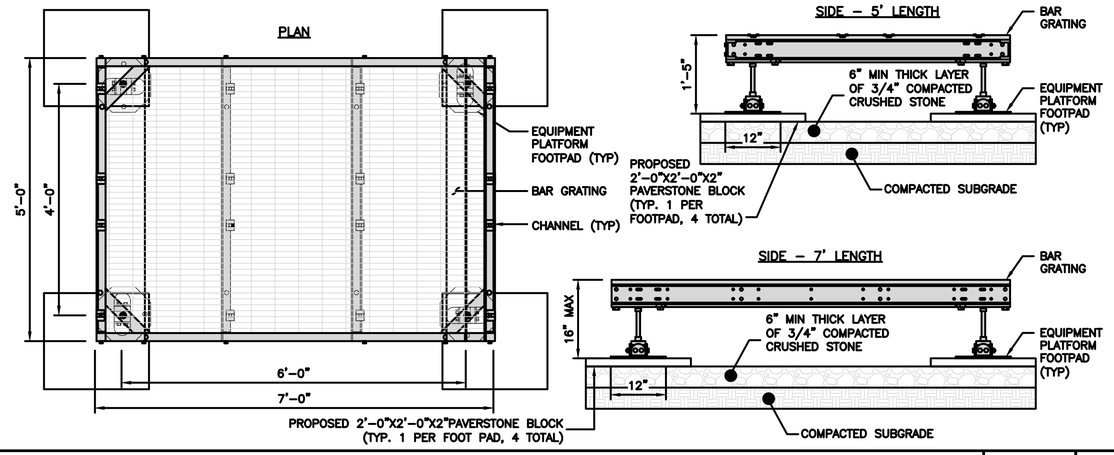
H-FRAME EQUIPMENT ELEVATION | NO SCALE | 2

NOTES

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

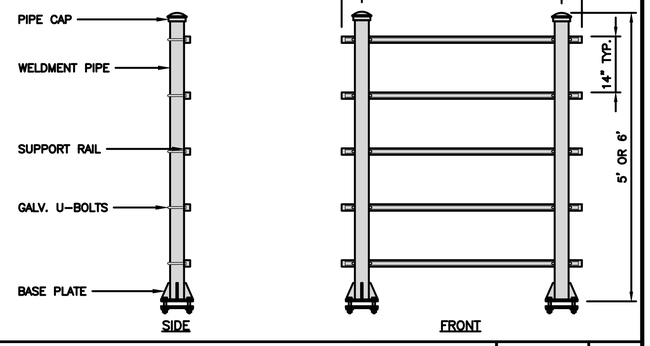
COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

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



PLATFORM DETAIL | NO SCALE | 3

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



H-FRAME DETAIL | NO SCALE | 4

dish wireless.
5701 SOUTH SANTA FE DRIVE
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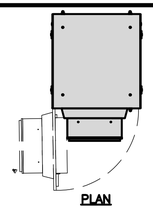
NEW CANAAN, CT 06840

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

DELTA ELECTRONICS, INC. ESOA600-HCB04 (HEX)

DIMENSIONS (HxWxD)	32"x32"x75"
WEIGHT (EMPTY)	594 lbs (approx.)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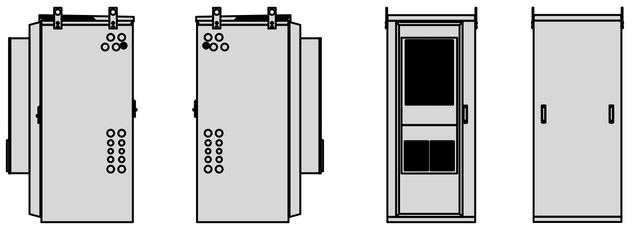
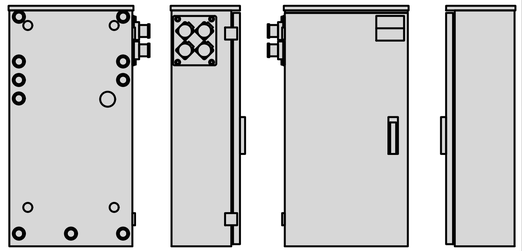

LEFT SIDE | RIGHT SIDE | FRONT | BACK

CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC-2465-P-240-MTS

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


TOP

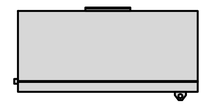

BACK | SIDE | FRONT | SIDE

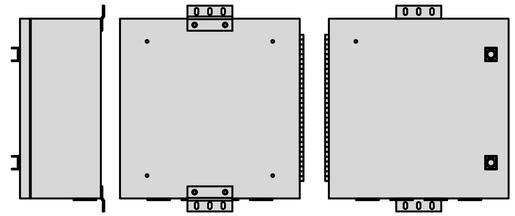
THIS DETAIL HAS NOT BEEN REVIEWED BY THE STAMPING PARTY. THEREFORE, THE STAMPING PARTY MAKES NO REPRESENTATION(S) WITH RESPECT TO ITS CONTENTS, AND SHALL NOT BE LIABLE FOR SUCH. THIS DETAIL IS FOR REFERENCE ONLY. ANY RELIANCE ON THIS DETAIL SHALL BE AT THE RELYING PARTY(IES)'S OWN RISK AND HEREBY WAIVES ANY AND ALL CLAIM(S) RELATED TO THE EXISTENCE OF THE STAMP OR OTHERWISE.

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

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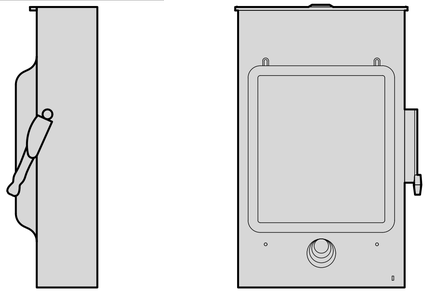
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 3

SQUARE D SAFETY SWITCHES D224NRB

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

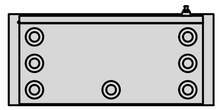

TOP

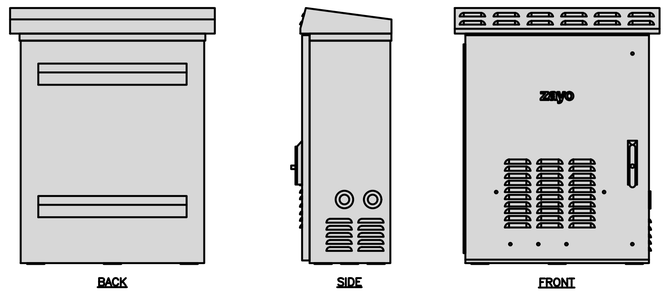

SIDE | FRONT

SAFETY SWITCH DETAIL | NO SCALE | 4

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE

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

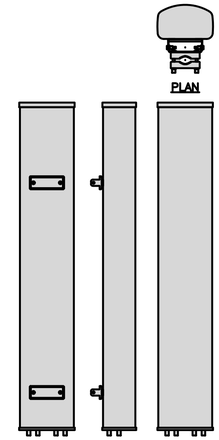

BOTTOM


BACK | SIDE | FRONT

FIBER NID ENCLOSURE DETAIL | NO SCALE | 5

COMMSCOPE FVV-65B-R3

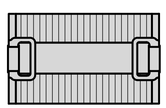
DIMENSIONS (HxWxD)(MM/IN)	1828x300x181 71.9"x11.8"x7.1"
RF CONNECTOR INTERFACE	4.3-10 FEMALE
WEIGHT	43.8 lbs
WEIGHT WITH BRACKETS	70.9 lbs

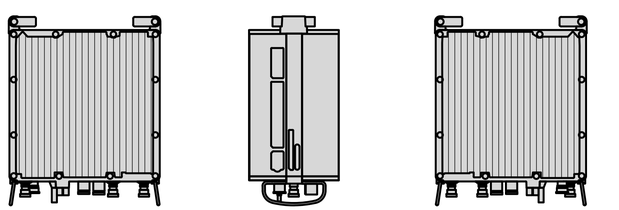

PLAN | BACK | SIDE | FRONT

ANTENNA DETAIL | NO SCALE | 6

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)

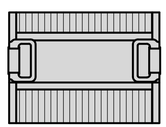

PLAN


BACK | SIDE | FRONT

RRH DETAIL | NO SCALE | 7

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)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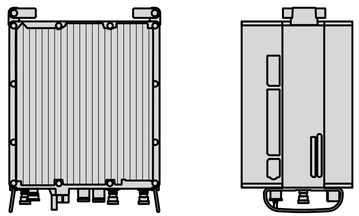
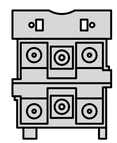
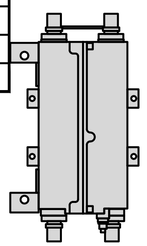

BACK | SIDE | FRONT

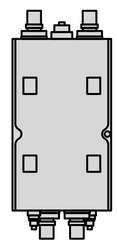
RRH DETAIL | NO SCALE | 8

COMMSCOPE TWIN DIPLEXER CDX623T-DS-T-43

DIMENSIONS W/O BRACKETS (HxWxD)	8.7"x5"x4.5"
WEIGHT (W/MOUNTING HARDWARE)	10 lbs (10.5 lbs)
IMPEDANCE	50 OHM
AISG CARRIER	2176 KHz ±110 PPM
AISG CONNECTOR	8-PIN DIN FEMALE
VOLTAGE	10-30 VDC
OPERATING CURRENT AT VOLTAGE	35mA @ 12V 37mA @ 24V


PLAN


SIDE


FRONT

TWIN DIPLEXER DETAIL | NO SCALE | 9

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5701 SOUTH SANTA FE DRIVE
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PROJECT INFORMATION
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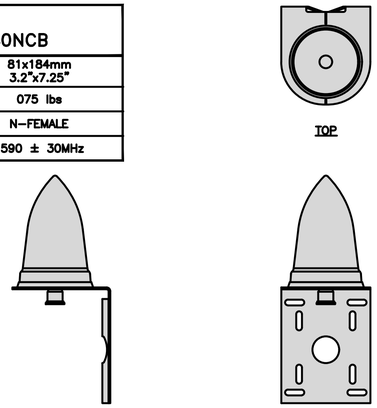
208 VALLEY ROAD
NEW CANAAN, CT 06840

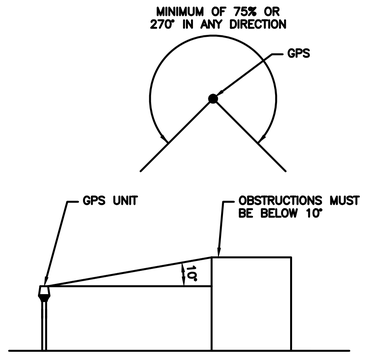
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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



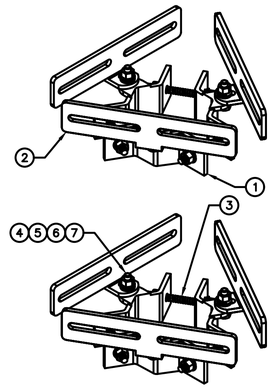
GPS DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2

EEI FPS-AB TRIAD FLUH MOUNT	
DESCRIPTION	PART # – QTY
TRIAD-FPS – 1/4" BRACKET ASSEMBLY	PART 1 – QTY: 6
TRIAD-AB – 1/4" HRPO GUSSET ASSEMBLY	PART 2 – QTY: 6
3/8"x5-1/2" A36 THREADED ROD	PART 3 – QTY: 6
3/8"x1-1/4" A307 BOLT	PART 4 – QTY: 6
3/8" HEX NUT	PART 5 – QTY: 6
3/8" FLAT WASHER	PART 6 – QTY: 6
3/8" LOCK WASHER	PART 7 – QTY: 6
TOTAL WEIGHT	±8 lbs

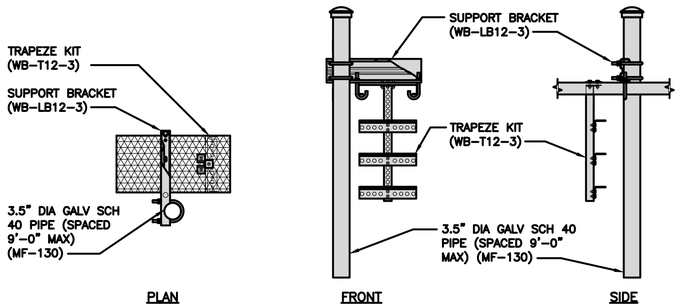
NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



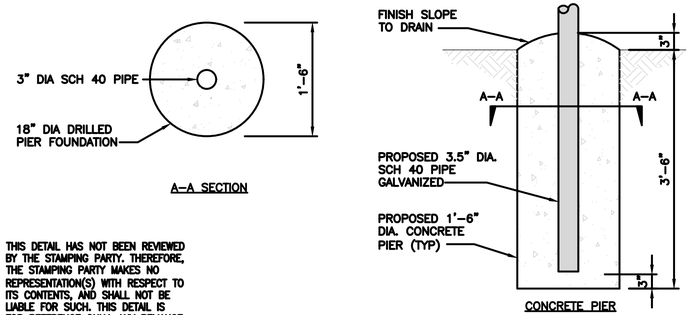
MAST MOUNT DETAIL | NO SCALE | 3

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

INCLUDED PRODUCTS:
- WB-T12-3 TRAPEZE KIT, 3 RUNGS
- WB-LB12-3 SUPPORT BRACKET
- MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"



ICE BRIDGE DETAIL | NO SCALE | 4



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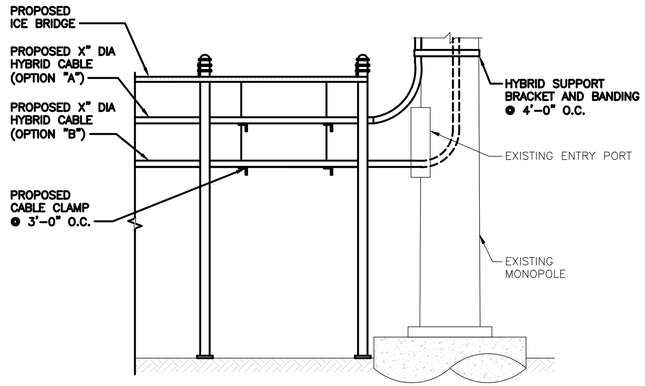
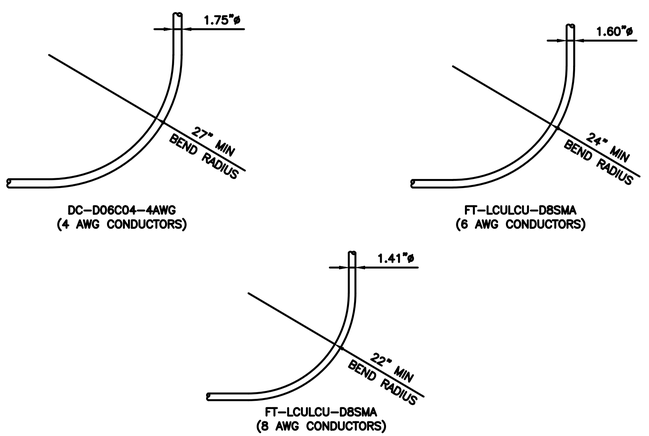
TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 5

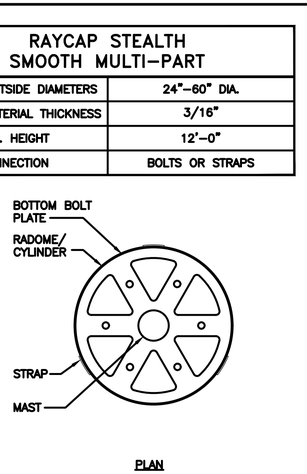


HYBRID CABLE RUN | NO SCALE | 6

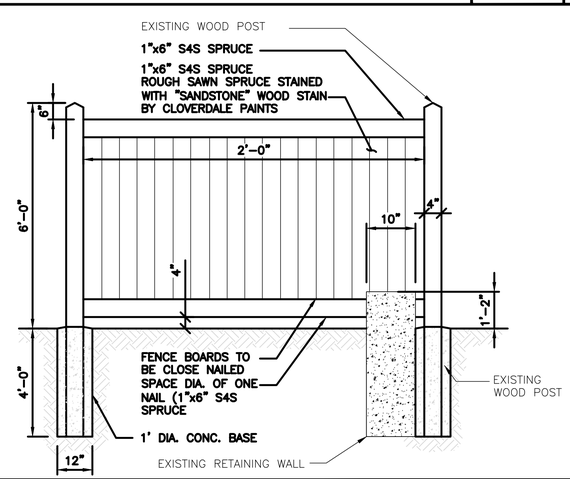


CABLES UNLIMITED DC AND FIBER MINIMUM BEND RADIUSES | NO SCALE | 7

RAYCAP STEALTH SMOOTH MULTI-PART	
RADOME OUTSIDE DIAMETERS	24"–60" DIA.
APPROX. MATERIAL THICKNESS	3/16"
MAX. HEIGHT	12'–0"
CONNECTION	BOLTS OR STRAPS



RADOME CANISTER DETAIL | NO SCALE | 8



FENCE DETAIL | NO SCALE | 9

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SHEET TITLE

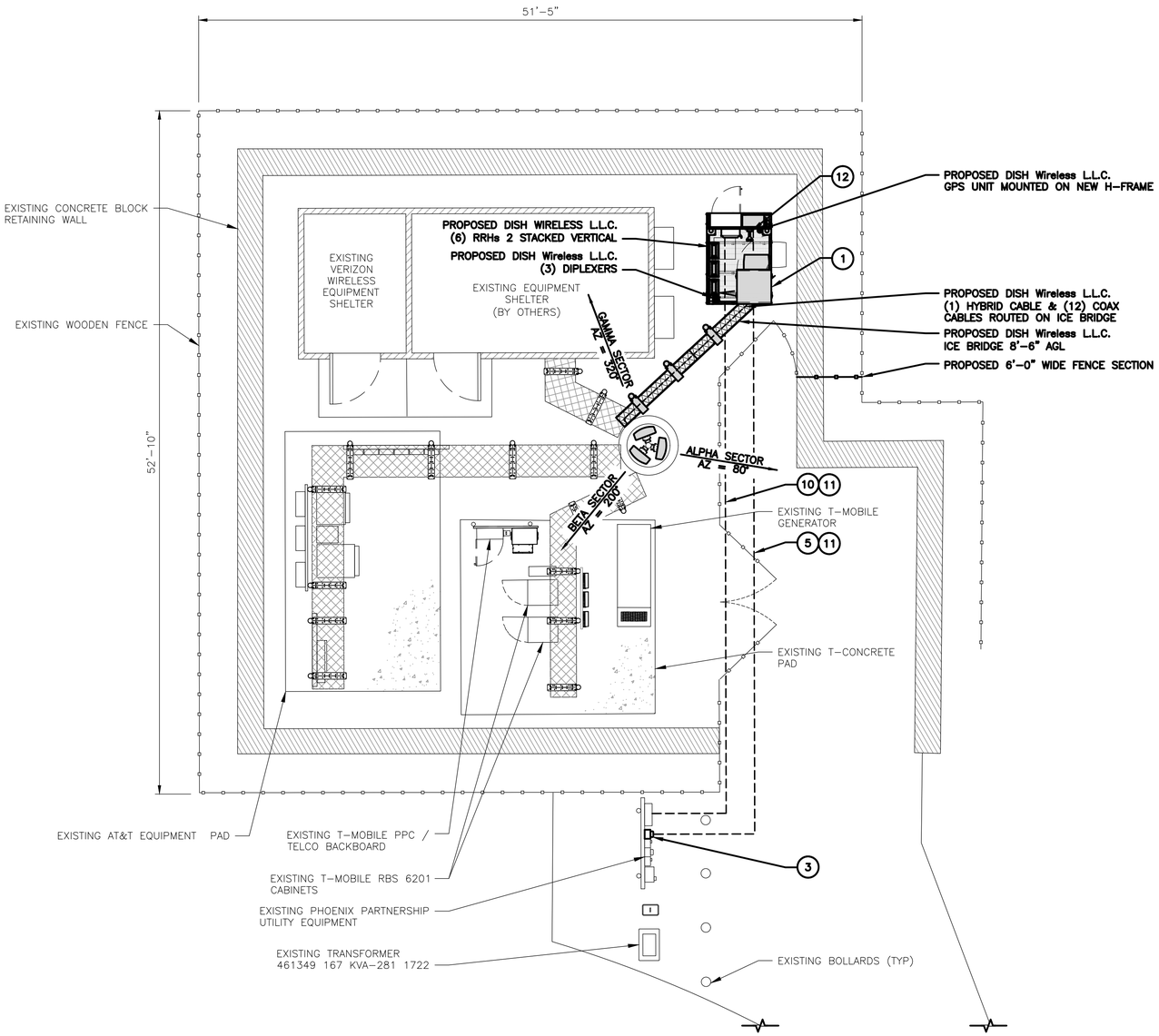
EQUIPMENT DETAILS

SHEET NUMBER

A-5

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. THE GROUND LEASE PROVIDES BROAD/BLANKET 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 PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS NOT AN OPTION, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN

8' 4' 0 8' 16'
1/8"=1'-0"

1

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
14. INSTALL MOUNTED MOTION ACTIVE WORK LIGHT.

SERVICE PLAN KEY NOTES:

1. EQUIPMENT CABINET.
2. DISH Wireless L.L.C. TO TAP THE CUSTOMER SIDE OF THE EXISTING SERVICE END BOX. DESIGN TO BE APPROVED BY CON EDISON.
3. PROVIDE AND INSTALL NEW 200A, 1Ø, UTILITY APPROVED BY-PASS METER IN EXISTING SOCKET.
4. PROVIDE AND INSTALL A NEW 200A, 1Ø, 250V, NEMA 1, FUSED DISCONNECT WITH (2) 200A, 250V FUSES. PROVIDE GROUNDING PER NEC.
5. PROVIDE NEW 2" CONDUIT WITH (3) #4/0 AWG & (1) #4 AWG EQUIP-GRD. INSTALL CONDUIT BETWEEN THE DISCONNECT AND RAYCAP PPC. CONDUIT DISTANCE IS APPROX.: 75' TOTAL
6. RAYCAP PPC. MODEL #RDIAC-6512-240-MTS. PROVIDED BY DISH Wireless L.L.C.. PROVIDE CIRCUIT BREAKERS PER PANEL SCHEDULE.
7. CONTRACTOR TO INSTALL A NEW 48"X48"X3/4" PLYWOOD BACKBOARD. BACKBOARD SHALL BE PRIMED WITH FIRE RESISTANT, INTUMESCENT PRIMER AND PAINTED FLAT BLACK.
8. CONTRACTOR TO INSTALL CHARLES INDUSTRIES FIBER CABINET MODEL # MP1818WB-A.
9. PROVIDE AND INSTALL 120V, 20A GFI RECEPTACLE INSIDE THE TELCO SECTION OF THE PPC.
10. PROVIDE NEW 2" CONDUIT WITH PULL LINE BETWEEN THE TELCO BACKBOARD AND CHARLES FIBER CABINET. CONDUIT DISTANCE IS APPROX. : 75' TOTAL
11. INSTALL CONDUIT UP AND OVER UNDERGROUND IN TRENCH. SEE DETAIL 7/EN-030
12. INSTALL MOUNTED MOTION ACTIVATED WORK LIGHT.SEE DETAIL 1/EN-030

ELECTRICAL NOTES

NO SCALE

2

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140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGRAM
33678
PROFESSIONAL ENGINEER
8/23/2023

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CONSTRUCTION DOCUMENTS

SUBMITTALS

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A&E PROJECT NUMBER

NJJER01146D

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

SHEET TITLE

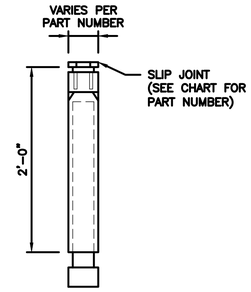
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

CARLON EXPANSION FITTINGS

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

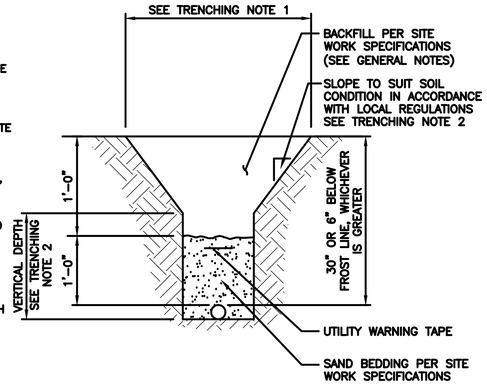


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

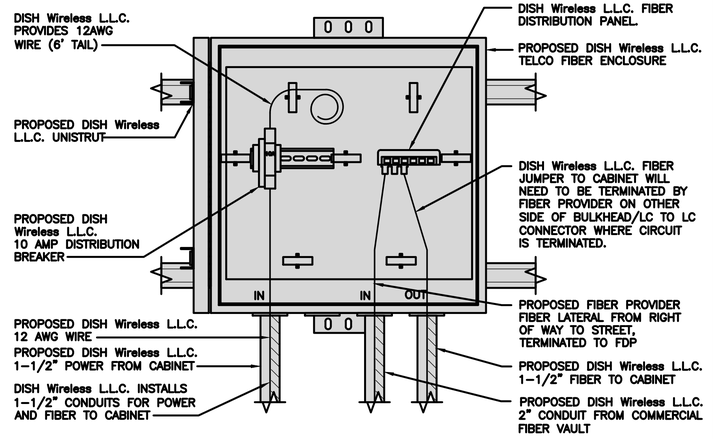
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

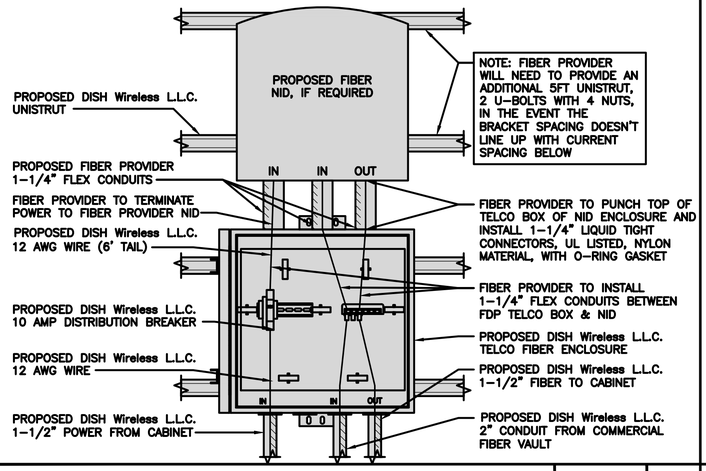
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



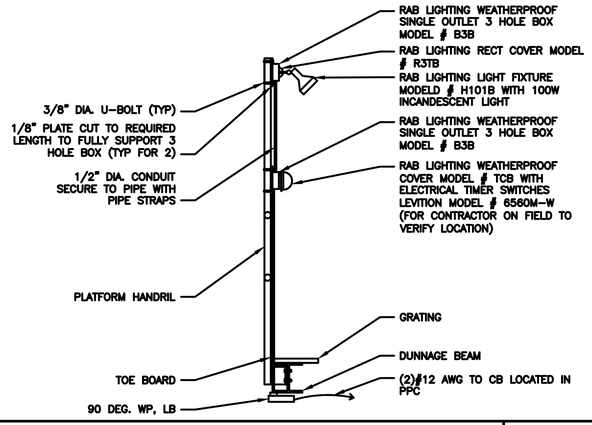
TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 3



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



WORK LIGHT 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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140 BEACH 137TH STREET
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STATE OF CONNECTICUT
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33678
PROFESSIONAL ENGINEER
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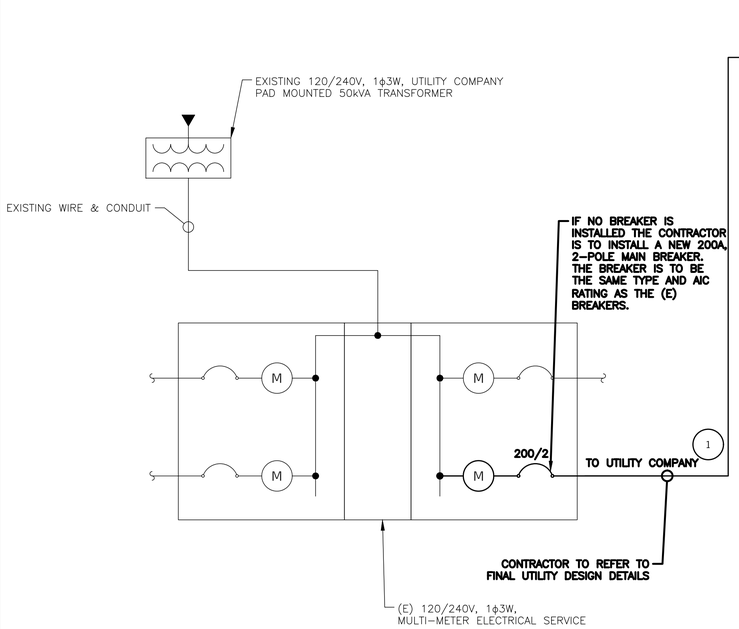
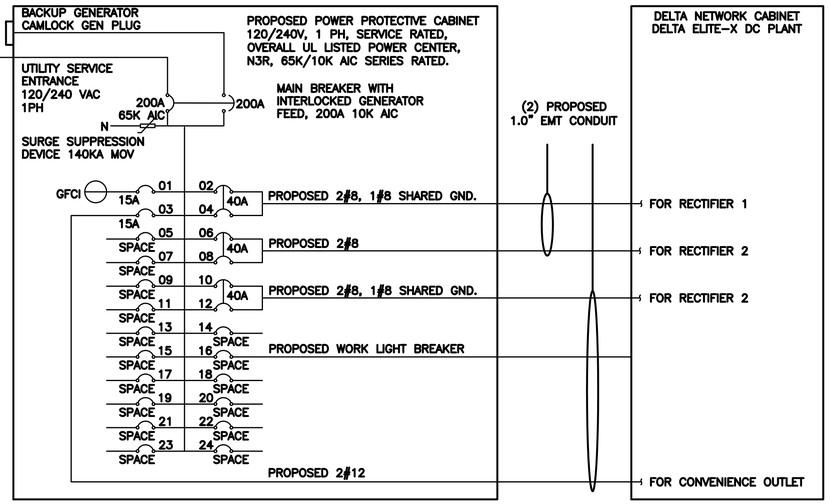
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2





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: (OR EQUIVALENT MANUFACTURER)
(3) 40A, 2P BREAKER – SQUARE D P/N:QO240
(2) 15A, 1P BREAKER – SQUARE D P/N:QO115

NOTES

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE. (ALL WIRE AND TERMINATION HARDWARE TO BE RATED 75°C)

#12 FOR 20A OCPD WIRE DERATING: 0.8 x 25A = 20.0A
#8 FOR 40A OCPD WIRE DERATING: 0.8 x 50A = 40.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.

1.0" CONDUIT – .3460 SQ. IN AREA
3.0" CONDUIT – 3.538 SQ. IN AREA

(2 CONDUIT): USING THWN-2, CU.
RECTIFIER CONDUCTORS

#8 – 0.0366 SQ. IN X 4 = 0.1464 SQ. IN
#8 – 0.0366 SQ. IN X 1 = 0.0366 SQ. IN <GROUND
TOTAL = 0.1830 SQ. IN

RECTIFIER & GFCI CONDUCTORS

#12 – 0.0133 SQ. IN X 2 = 0.0266 SQ. IN
#8 – 0.0366 SQ. IN X 2 = 0.0732 SQ. IN
#8 – 0.0366 SQ. IN X 1 = 0.0366 SQ. IN <GROUND
TOTAL = 0.1364 SQ. IN

1.0" 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) OPTIONAL ALUMINUM SERVICE CONDUCTOR:
- 4/0 AL + #2 GRD MAY BE USED INSTEAD OF 3/0 CU + #6 GRD IF THE TOTAL LENGTH OF THE CONDUCTOR IS LESS THAN 300 FT FROM THE TRANSFORMER.
- ALUMINUM CONDUCTORS MUST BE 90°C TO CARRY THE FULL 200A LOAD REQUIRED
- ALUMINUM TO COPPER BUSS CONNECTIONS MUST MEET AND CONFORM TO ANSI AND BE UL LISTED. USE ANTI CORROSION CONDUCTIVE LUBRICANT ON CONNECTIONS

PPC ONE-LINE DIAGRAM

NO SCALE | 1

PANEL NAME	LOCATION	VOLTAGE: 240/120 1Ø MAIN C/B: 200 AMPS BUS RATING: 200 AMPS	MOUNTING/ENCLOSURE: SURFACE/NEMA 3R AVAIL. FAULT CURRENT: SHORT CIRCUIT RATING: 65,000 / 10,000 SERIES RATED
DELTA	EQUIPMENT PLATFORM		

AMPS POLES	WIRE & CONDUIT	TYPE	DESCRIPTION	KVA	CKT	A	B	CKT	KVA	DESCRIPTION	TYPE	WIRE & CONDUIT	AMPS POLES
15/1	2 #12, 1 #12G	R	INTERNAL GFCI	0.18	1	1.68		2	1.50	RECTIFIER	EQ	SEE ONE LINE	40/2
15/1	SEE ONE LINE	R	CONVENIENCE OUTLET	0.18	3		1.68	4	1.50		EQ		
	SEE ONE LINE	R	LIGHTING		5	1.50		6	1.50	RECTIFIER	EQ	SEE ONE LINE	40/2
			SPACE		7		1.50	8	1.50		EQ		
			SPACE		9	1.50		10	1.50	RECTIFIER	EQ	SEE ONE LINE	40/2
			SPACE		11		1.50	12	1.50		EQ		
			SPACE		13			14		SPACE			
			SPACE		15			16		SPACE			
			SPACE		17			18		SPACE			
			SPACE		19			20		SPACE			
			SPACE		21			22		SPACE			
			SPACE		23			24		SPACE			
			PHASED LOAD			4.7	4.7	KVA					

TOTAL CONNECTED LOAD	9.4 kVA	39 A
TOTAL DEMAND LOAD	9.4 kVA	39 A

LOAD TYPE	DESCRIPTION	CONN. LOAD KVA	CONN. LOAD AMPS	DEMAND FACTOR	DESIGN LOAD KVA	DESIGN LOAD AMPS
L	LIGHTING	0.0	0.0	1.25	0.0	0.0
R	RECEPTACLE	0.4	1.5	NEC	0.4	1.5
M	MOTOR	0.0	0.0	NEC	0.0	0.0
H	HEATING	0.0	0.0	1.00	0.0	0.0
AC	HVAC	0.0	0.0	1.00	0.0	0.0
EQ	EQUIPMENT	9.0	37.5	1.00	9.0	37.5
E	EXISTING	0.0	0.0	1.25	0.0	0.0

*ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

PANEL SCHEDULE

NO SCALE | 2

NOT USED

NO SCALE | 3

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LITTLETON, CO 80120

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGNUSSEN
33678
PROFESSIONAL ENGINEER
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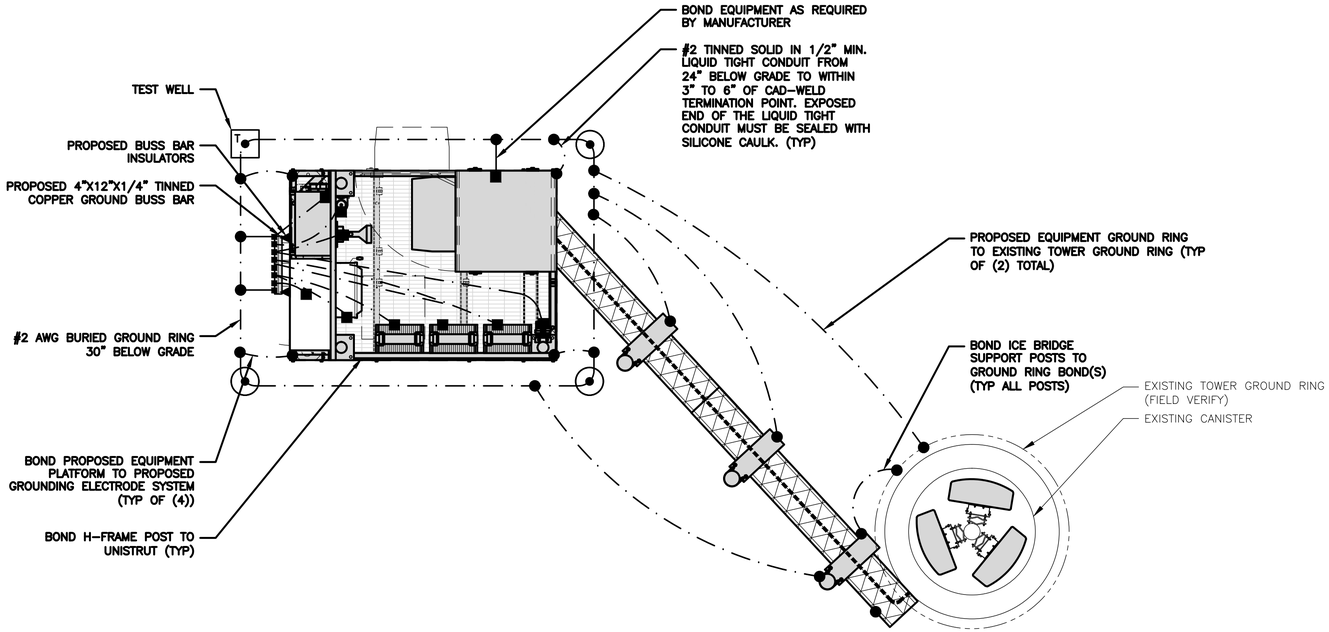
NJJER01146D

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

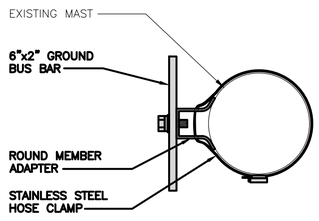
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

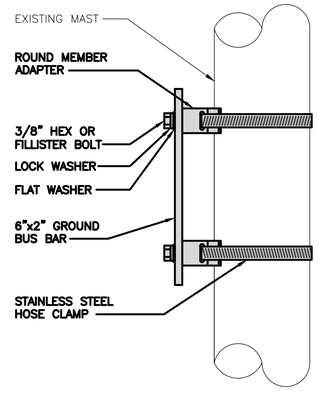


EQUIPMENT GROUNDING PLAN

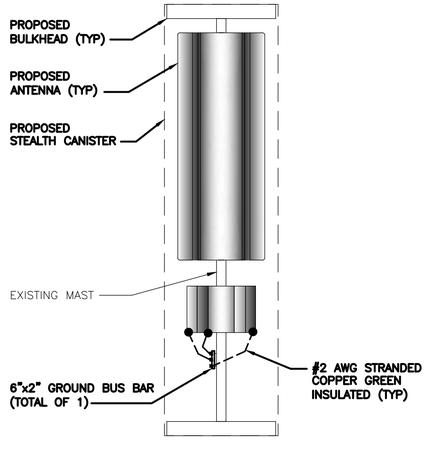
NO SCALE | 1



BUSS BAR PLAN



BUSS BAR ELEVATION



ANTENNA GROUNDING ELEVATION

TYPICAL ANTENNA GROUNDING DETAIL | NO SCALE | 2

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.

GROUNDING KEY NOTES

(A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.

(B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

(D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

(F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

(H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.

(I) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR AND EXTERIOR GROUND RING.

(J) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.

(K) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.

(L) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.

(M) EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE

(N) ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.

(O) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT.

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

GROUNDING KEY NOTES | NO SCALE | 3

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LITTLETON, CO 80120

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DISH Wireless L.L.C.
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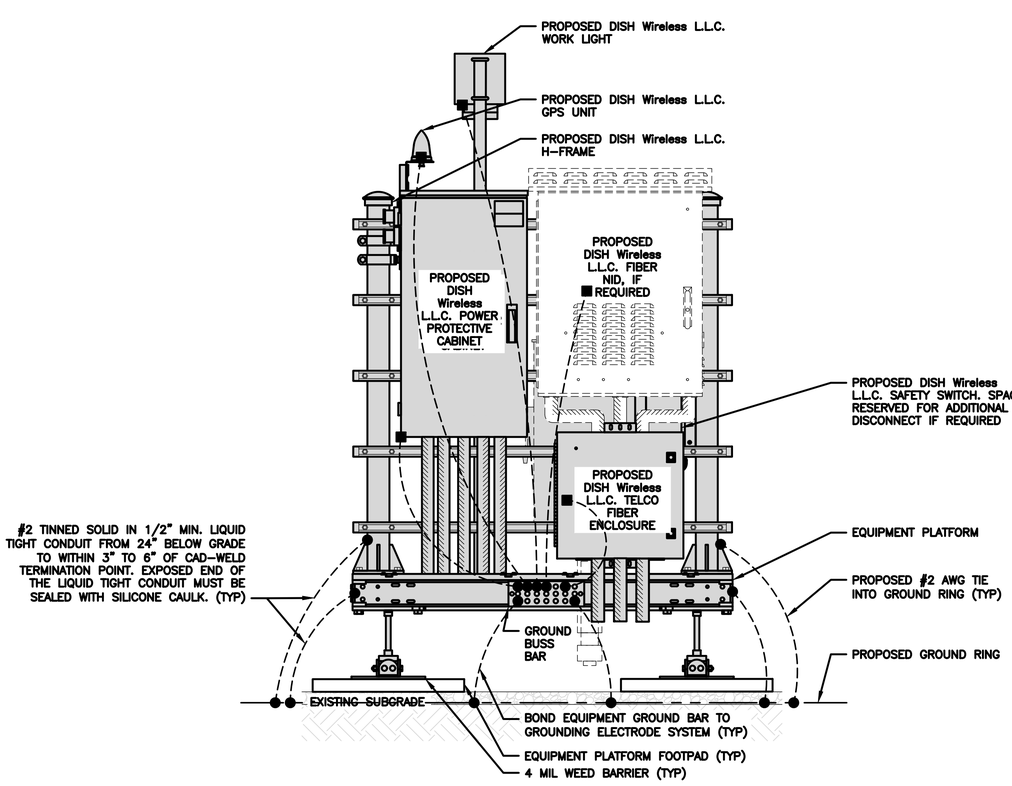
208 VALLEY ROAD
NEW CANAAN, CT 06840

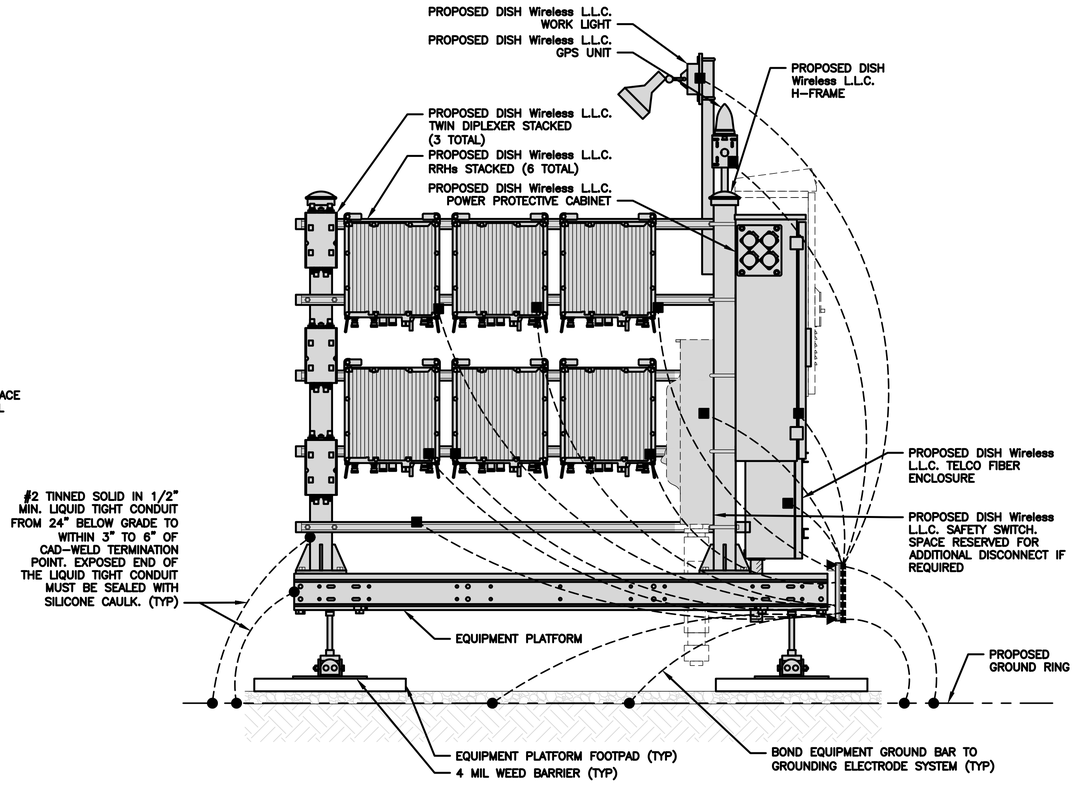
SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

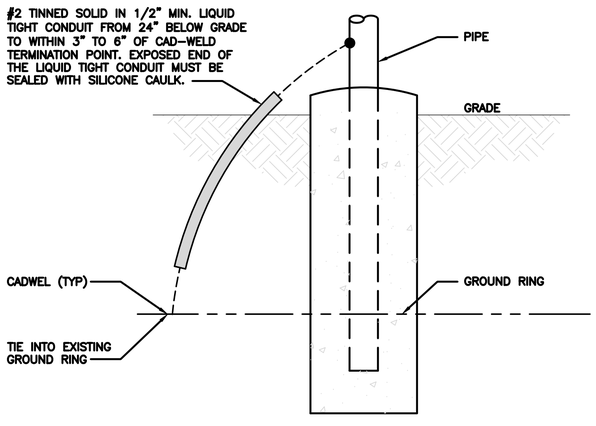
NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY

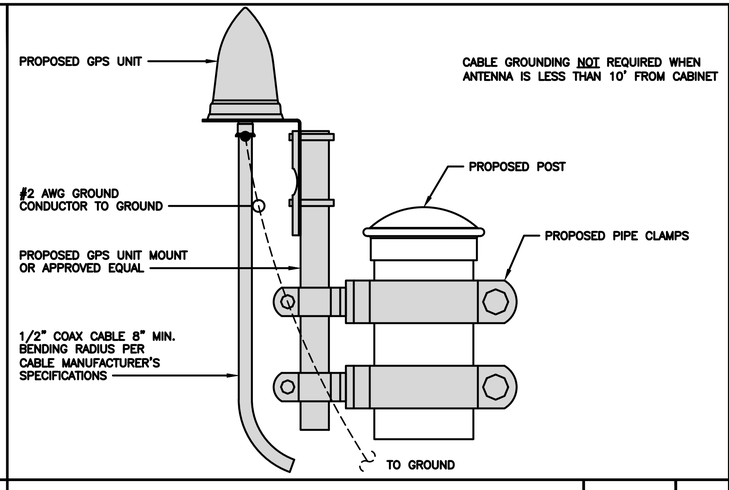




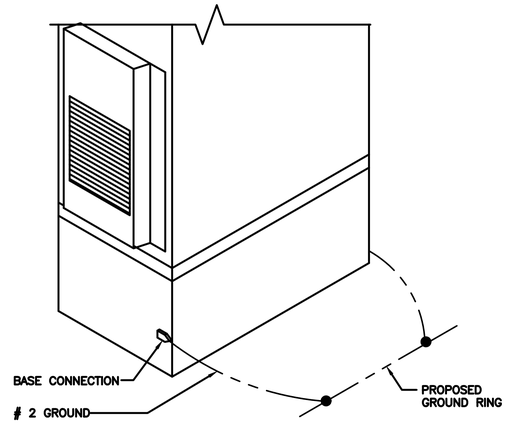
H-FRAME GROUNDING DETAIL | NO SCALE | 1



TRANSITIONING GROUND DETAIL | NO SCALE | 2



TYPICAL GPS UNIT GROUNDING | NO SCALE | 3



OUTDOOR CABINET GROUNDING | NO SCALE | 4

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140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGRAM
33678
8/23/2023
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
TER	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	06/23/2023	ISSUED FOR REVIEW
0	08/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER01146D

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

SHEET TITLE

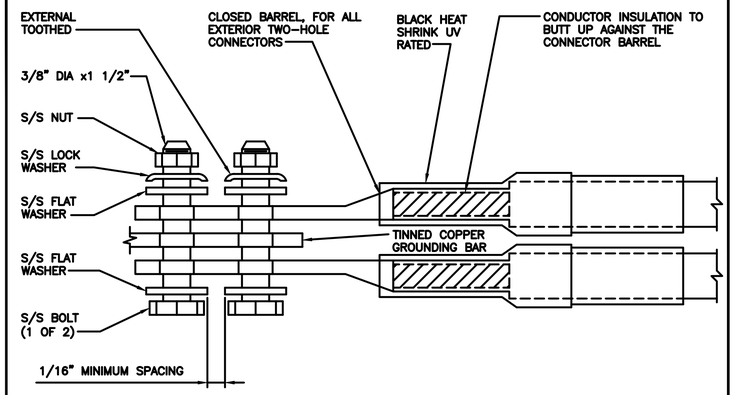
GROUNDING DETAILS

SHEET NUMBER

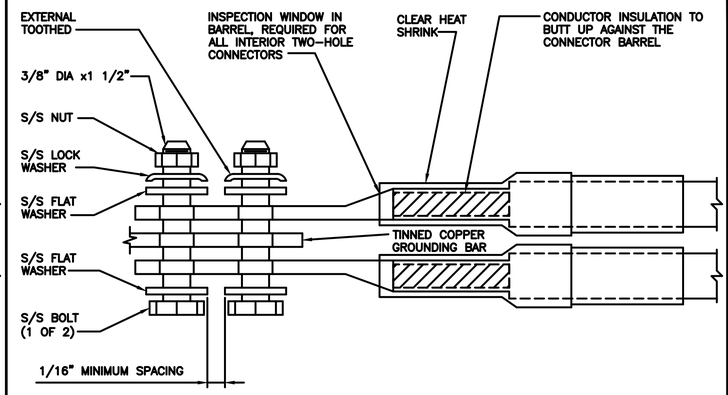
G-2

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

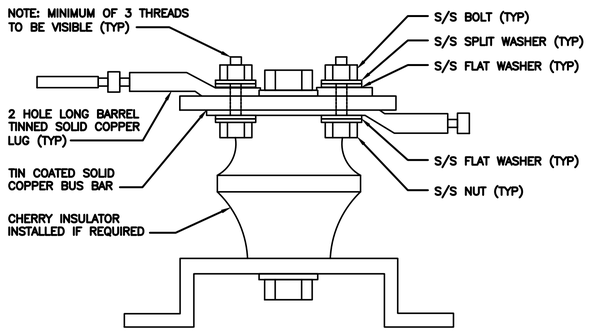
TYPICAL GROUNDING NOTES | NO SCALE | 1



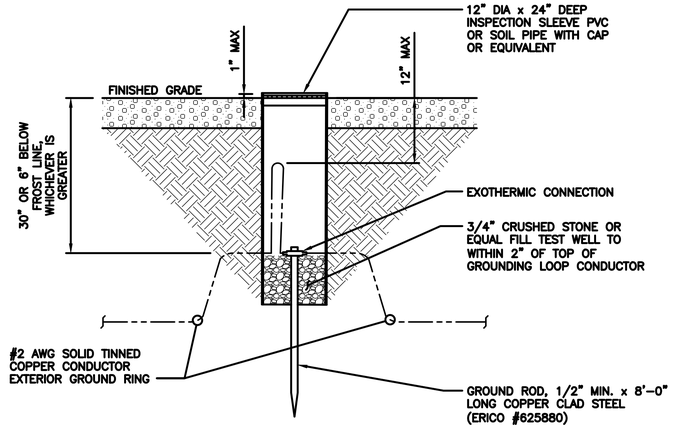
TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4



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

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

dish wireless.
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GROUNDING DETAILS

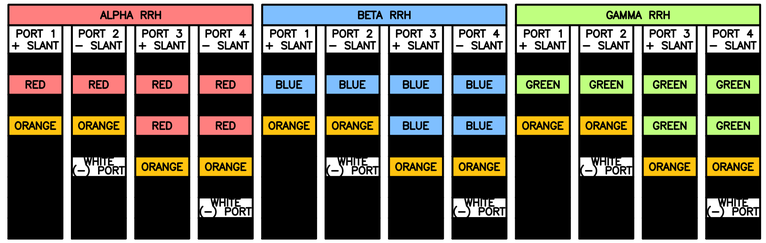
SHEET NUMBER

G-3

HYBRID/DISCREET CABLES — 3/4" TAPE WIDTHS WITH 3/4" SPACING

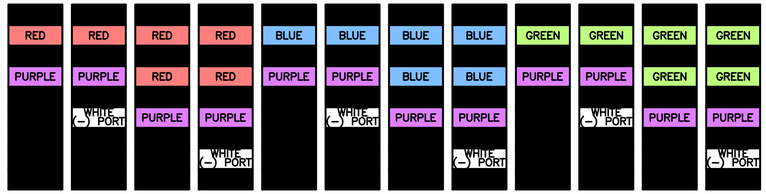
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

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)



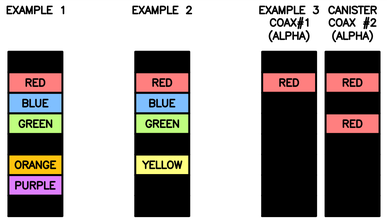
HYBRID/DISCREET CABLES

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.

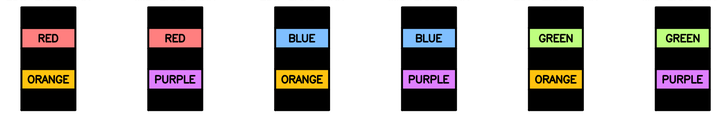


FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

POWER CABLES TO RRHs

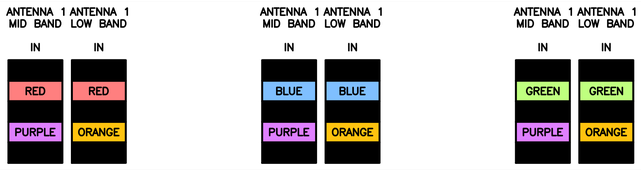
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

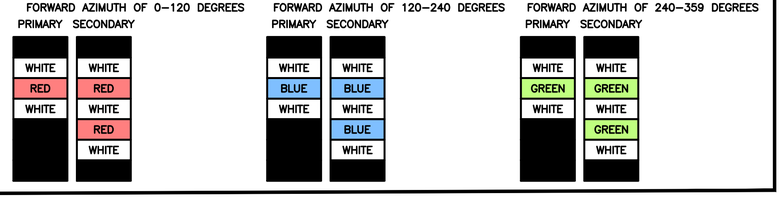
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



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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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
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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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RF SIGNAGE

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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.

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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BRETT J MAGNUSON
33678
8/23/2023
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
TER	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/23/2023	ISSUED FOR REVIEW
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A&E PROJECT NUMBER

NJJER01146D

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

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.

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGNUSSEN
33678
PROFESSIONAL ENGINEER
8/23/2023

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A	06/23/2023	ISSUED FOR REVIEW
0	08/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER01146D

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01146D
208 VALLEY ROAD
NEW CANAAN, CT 06840

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

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BRETT J MAGNUSSEN
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DISH Wireless L.L.C.
PROJECT INFORMATION

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208 VALLEY ROAD
NEW CANAAN, CT 06840

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-5

MK DEVELOPMENT

EXHIBIT D

Structural Analysis

Date: May 2, 2023

Todd Bowman
Vice President
Tarpon Towers II, LLC
(941) 757-5010
tbowman@tarpontowers.com

Engineered Tower Solutions, PLLC
3227 Wellington Court
Raleigh, NC 27615
(919) 782-2710

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Dish Wireless* Co-Locate** **Carrier Site Number:**	 NJJER01146D
Tower Owner Designation:	***Tarpon Towers* Site Number:** ***Tarpon Towers* Site Name:**	CT1192 New Canaan
Engineering Firm Designation:	**ETS, PLLC Job Number:**	22112671.STR.6806
Site Data:	**208 Valley Road, New Canaan, Fairfield County, CT 06840** **Latitude *N 41° 09' 58.5"*, Longitude *W 73° 28' 13.7"*** **120.0 Foot – Monopole Tower**	

Dear Todd Bowman,

Engineered Tower Solutions, PLLC is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

Existing + Proposed Equipment Configuration	**Tower:**	**79.3%**	**Sufficient Capacity**
	Foundation:	**45.8%**	**Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 117 mph as required by the 2022 Connecticut State Building Code (2021 IBC). Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by:

Hicham Anssar
Structural Engineer I

Respectfully submitted by:

Frederic G. Bost, PE
Chief Technical Officer

5/2/23

STATE OF CONNECTICUT
FREDERIC BOST
PEN.0029529
LICENSED
PROFESSIONAL ENGINEER

TABLE OF CONTENTS

1) INTRODUCTION

The tower is a 120.0 ft Monopole tower designed by TransAmerican Power Products in April of 2014. The tower was originally designed for an ultimate wind speed of 110 mph per ANSI/TIA-222-G-2.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	117 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.0 in
Wind Speed With Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
75.0 (Dish)	75.0	3	Commscope	FFVV-65B-R3	12	7/8
		1	Kaelus	SBT0003F1V2		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
117.0 (T-Mobile)	117.0	3	Commscope	FVV-65C-R3	18	7/8 FH
106.0 (Verizon)	106.0	3	Commscope	NNH4-65B-R6H4	12 1	1-1/4 6x12 Hybrid
102.0 (Verizon)	102.0	6	Commscope	CBC61923T-DS-43		
98.0 (Verizon)	98.0	3	JMA	MX08FIT265-01		
95.0 (Verizon)	95.0	1	Samsung	RF4439d-25A		
		1	Samsung	RF4440d-13A		
		1	Samsung	RT-8808-77A		
93.0 (Verizon)	93.0	1	Raycap	RHSDC-3315-PF-48		
86.0 (AT&T)	86.0	3	Quintel	QS66512-2	12	1-1/4 FH
		6	Kaelus	TMA2117F00V1-1		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower and Foundation Design Drawings	TransAmerican Power Products, Inc (Job No. 23514-0110)	04/09/2014	Tarpon Towers
Final Erection Drawings	TransAmerican Power Products, Inc (Drawing No. 12359-PA)	05/02/2014	Tarpon Towers
Extension Erection Drawings	TransAmerican Power Products, Inc (Drawing No. 12359-RA)	04/26/2014	Tarpon Towers
Geotechnical Investigation Report	Design Earth Technology (Job No. 2012.06/2011.08)	06/01/2012	Tarpon Towers
Previous Structural Analysis	ETS, PLLC (Job No. 22112671.STR.6444)	10/27/2022	On File
Carrier Construction Drawings	Centek Engineering (21007.21007.79)	01/19/2022	Tarpon Towers
Canister Design Drawings	Larson (Job No. A550147)	08/10/2022	Tarpon Towers

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built and have been maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Engineered Tower Solutions, PLLC should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 110	Pole	TP14x14x0.2188	1	-1.55	559.88	3.6	Pass
L2	110 - 100	Pole	TP14x14x0.2188	2	-3.27	559.88	13.7	Pass
L3	100 - 90	Pole	TP14x14x0.2188	3	-4.96	559.88	29.9	Pass
L4	90 - 80	Pole	TP14x14x0.2188	4	-7.14	559.88	52.1	Pass
L5	80 - 70	Pole	TP14x14x0.2188	5	-9.13	559.88	79.3	Pass
L6	70 - 32	Pole	TP45.16x40x0.25	6	-14.42	2045.32	20.8	Pass
L7	32 - 0	Pole	TP49x43.8113x0.25	7	-22.28	2153.74	35.5	Pass
							Summary	
						Pole (L5)	79.3	Pass
						Rating =	79.3	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	70.0	63.4	Pass
1	Flange Plates		24.9	Pass
1	Anchor Rods	0	43.8	Pass
1	Baseplate	0	34.4	Pass
1	Base Foundation Structural	0	28.0	Pass
1	Base Foundation Soil Interaction	0	45.8	Pass

Structure Rating (max from all components) =	**79.3%**

Notes:
1) See additional documentation in “Appendix C - Additional Calculations” for calculations supporting the % capacity consumed.

4.1) Recommendations

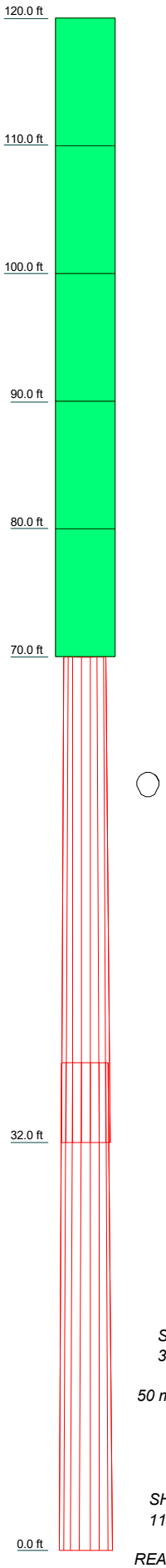
The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

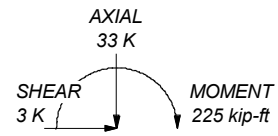
TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7
Length (ft)	10.00	10.00	10.00	10.00	10.00	38.00	38.25
Number of Sides	18	18	18	18	18	18	18
Thickness (in)	0.2188	0.2188	0.2188	0.2188	0.2188	0.2500	0.2500
Socket Length (ft)						6.25	
Top Dia (in)	14.0000	14.0000	14.0000	14.0000	14.0000	40.0000	43.8113
Bot Dia (in)	14.0000	14.0000	14.0000	14.0000	14.0000	45.1600	49.0000
Grade						A572-65	
Weight (K)	0.3	0.3	0.3	0.3	0.3	4.3	4.8

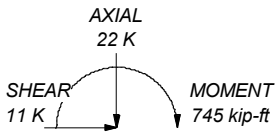
Total Weight (K) 10.7



ALL REACTIONS ARE FACTORED



50 mph WIND - 1.0000 in ICE



REACTIONS - 117 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) FVV-65C-R3_TIA w/ Mount Pipe	117	RT-8808-77A	95
56" dia. x 10' Canister	115	RHSDC-3315-PF-48	93
(3) NNH4-65B-R6H4_TIA w/ Mount Pipe	106	(6) TMA2117F00V1-1	86
		(3) QS66512-2_TIA w/ Mount Pipe	86
56" dia. x 10' Canister	105	56" dia. x 10' Canister	85
(6) CBC61923T-DS-43	102	56" dia. x 10' Canister	75
(3) MX08FIT265-01 w/ Mount Pipe	98	FFVV-65B-R3 w/Mount pipe	75
56" dia. x 10' Canister	95	FFVV-65B-R3 w/Mount pipe	75
RF4440d-13A	95	FFVV-65B-R3 w/Mount pipe	75
RF4439d-25A	95	SBT0003F1V2	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 117 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 79.3%

Engineered Tower Solutions, PLLC
3227 Wellington Court
Raleigh, NC 27615
Phone: (919) 782-2710
FAX:

Job: ***CT1192 New Canaan***		
Project: ***ETS, PLLC Job No. 22112671.STR.6806***		
Client: Tarpon Towers	Drawn by: Hicham Anssar	App'd:
Code: TIA-222-H	Date: 05/01/23	Scale: NTS
Path: C:\Users\user\Desktop\ETS-TOWER DIVISION\Tarpon Towers\04-28-2023\6608_Tower Reanalysis\Analysis\Tower\New Canaan_SA_050123.eri		Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 259.24 ft.
Basic wind speed of 117 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	120.00-110.00	10.00	0.00	18	14.0000	14.0000	0.2188	0.8750	A572-65 (65 ksi)
L2	110.00-100.00	10.00	0.00	18	14.0000	14.0000	0.2188	0.8750	A572-65 (65 ksi)
L3	100.00-90.00	10.00	0.00	18	14.0000	14.0000	0.2188	0.8750	A572-65 (65 ksi)
L4	90.00-80.00	10.00	0.00	18	14.0000	14.0000	0.2188	0.8750	A572-65 (65 ksi)
L5	80.00-70.00	10.00	0.00	18	14.0000	14.0000	0.2188	0.8750	A572-65 (65 ksi)
L6	70.00-32.00	38.00	6.25	18	40.0000	45.1600	0.2500	1.0000	A572-65 (65 ksi)
L7	32.00-0.00	38.25		18	43.8113	49.0000	0.2500	1.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
L2	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
L3	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
L4	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
L5	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
	14.1822	9.5706	229.6428	4.8923	7.1120	32.2895	459.5877	4.7862	2.0790	9.502
L6	40.5785	31.5416	6296.4503	14.1113	20.3200	309.8647	12601.1856	15.7738	6.6000	26.4
	45.8181	35.6361	9080.5791	15.9430	22.9413	395.8183	18173.1067	17.8214	7.5082	30.033
L7	45.3095	34.5659	8286.8004	15.4643	22.2561	372.3377	16584.5047	17.2862	7.2708	29.083
	49.7173	38.6831	11614.7065	17.3062	24.8920	466.6040	23244.6960	19.3452	8.1840	32.736

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 120.00-110.00				1	1	1			
L2 110.00-100.00				1	1	1			
L3 100.00-90.00				1	1	1			
L4 90.00-80.00				1	1	1			
L5 80.00-70.00				1	1	1			
L6 70.00-32.00				1	1	1			
L7 32.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
***											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***									
LDF5-50A(7/8)	C	No	No	Inside Pole	117.00 - 0.00	18	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
LDF6-50A(1-1/4)	C	No	No	Inside Pole	86.00 - 0.00	12	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
***									
1.55" Hybrid	C	No	No	Inside Pole	106.00 - 0.00	1	No Ice	0.00	1.00
							1/2" Ice	0.00	1.00
							1" Ice	0.00	1.00
LDF6-50A(1-1/4)	C	No	No	Inside Pole	106.00 - 0.00	6	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
LDF6-50A(1-1/4)	C	No	No	Inside Pole	96.00 - 0.00	6	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
***									
LDF5-50A(7/8")	C	No	No	Inside Pole	75.00 - 0.00	12	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L2	110.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.09
L3	100.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.13
L4	90.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.18
L5	80.00-70.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.23

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L6	70.00-32.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.96
L7	32.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.81

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-110.00	A	1.133	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.04
L2	110.00-100.00	A	1.123	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.09
L3	100.00-90.00	A	1.112	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.13
L4	90.00-80.00	A	1.099	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.18
L5	80.00-70.00	A	1.086	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.23
L6	70.00-32.00	A	1.045	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.96
L7	32.00-0.00	A	0.929	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.81

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.00-110.00	0.0000	0.0000	0.0000	0.0000
L2	110.00-100.00	0.0000	0.0000	0.0000	0.0000
L3	100.00-90.00	0.0000	0.0000	0.0000	0.0000
L4	90.00-80.00	0.0000	0.0000	0.0000	0.0000
L5	80.00-70.00	0.0000	0.0000	0.0000	0.0000
L6	70.00-32.00	0.0000	0.0000	0.0000	0.0000
L7	32.00-0.00	0.0000	0.0000	0.0000	0.0000

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
56" dia. x 10' Canister	C	None		0.0000	75.00	No Ice	23.33	23.33	0.70
						1/2" Ice	33.53	33.53	1.13
						1" Ice	34.40	34.40	1.57
56" dia. x 10' Canister	C	None		0.0000	85.00	No Ice	23.33	23.33	0.70
						1/2" Ice	33.53	33.53	1.13
						1" Ice	34.40	34.40	1.57
56" dia. x 10' Canister	C	None		0.0000	95.00	No Ice	23.33	23.33	0.70
						1/2" Ice	33.53	33.53	1.13
						1" Ice	34.40	34.40	1.57
56" dia. x 10' Canister	C	None		0.0000	105.00	No Ice	23.33	23.33	0.70
						1/2" Ice	33.53	33.53	1.13
						1" Ice	34.40	34.40	1.57
56" dia. x 10' Canister	C	None		0.0000	115.00	No Ice	23.33	23.33	0.70
						1/2" Ice	33.53	33.53	1.13
						1" Ice	34.40	34.40	1.57
***									
(3) FVV-65C-R3_TIA w/ Mount Pipe	C	None		0.0000	117.00	No Ice	0.00	0.00	0.10
						1/2" Ice	0.00	0.00	0.10
						1" Ice	0.00	0.00	0.10
***									
(3) QS66512-2_TIA w/ Mount Pipe	C	None		0.0000	86.00	No Ice	0.00	0.00	0.14
						1/2" Ice	0.00	0.00	0.14
						1" Ice	0.00	0.00	0.14
(6) TMA2117F00V1-1	C	None		0.0000	86.00	No Ice	0.00	0.00	0.03
						1/2" Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.03
***									
(3) NNH4-65B-R6H4_TIA w/ Mount Pipe	C	None		0.0000	106.00	No Ice	0.00	0.00	0.11
						1/2" Ice	0.00	0.00	0.11
						1" Ice	0.00	0.00	0.11
(6) CBC61923T-DS-43	C	None		0.0000	102.00	No Ice	0.00	0.00	0.01
						1/2" Ice	0.00	0.00	0.01
						1" Ice	0.00	0.00	0.01
(3) MX08FIT265-01 w/ Mount Pipe	C	None		0.0000	98.00	No Ice	0.00	0.00	0.03
						1/2" Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.03
RF4440d-13A	C	None		0.0000	95.00	No Ice	0.00	0.00	0.07
						1/2" Ice	0.00	0.00	0.07
						1" Ice	0.00	0.00	0.07
RF4439d-25A	C	None		0.0000	95.00	No Ice	0.00	0.00	0.07
						1/2" Ice	0.00	0.00	0.07
						1" Ice	0.00	0.00	0.07
RT-8808-77A	C	None		0.0000	95.00	No Ice	0.00	0.00	0.03
						1/2" Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.03
RHSDC-3315-PF-48	C	None		0.0000	93.00	No Ice	0.00	0.00	0.03
						1/2" Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.03
***									
FFVV-65B-R3 w/Mount pipe	C	None		0.0000	75.00	No Ice	0.00	0.00	0.10
						1/2" Ice	0.00	0.00	0.18
						1" Ice	0.00	0.00	0.27
FFVV-65B-R3 w/Mount pipe	C	None		0.0000	75.00	No Ice	0.00	0.00	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	0.00	0.00	0.18
						1" Ice	0.00	0.00	0.27
FFVV-65B-R3 w/Mount pipe	C	None		0.0000	75.00	No Ice	0.00	0.00	0.10
						1/2" Ice	0.00	0.00	0.18
						1" Ice	0.00	0.00	0.27
SBT0003F1V2	C	None		0.0000	75.00	No Ice	0.00	0.00	0.00
						1/2" Ice	0.00	0.00	0.00
						1" Ice	0.00	0.00	0.00
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft^2	Weight K
***										

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice

Comb. No.	Description
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 110	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	26	-2.84	0.00	0.00
			Max. Mx	8	-1.55	-6.59	0.00
			Max. My	2	-1.55	0.00	6.59
			Max. Vy	8	1.31	-6.59	0.00
			Max. Vx	2	-1.31	0.00	6.59
			Max. Torque	4			-0.00
L2	110 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-5.83	0.00	0.00
			Max. Mx	8	-3.27	-26.08	0.00
			Max. My	2	-3.27	0.00	26.08
			Max. Vy	8	2.59	-26.08	0.00
			Max. Vx	2	-2.59	0.00	26.08
			Max. Torque	4			-0.00
L3	100 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.75	0.00	0.00
			Max. Mx	8	-4.96	-57.99	0.00
			Max. My	2	-4.96	0.00	57.99
			Max. Vy	8	3.79	-57.99	0.00
			Max. Vx	2	-3.79	0.00	57.99
			Max. Torque	4			-0.00
L4	90 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.08	0.00	0.00
			Max. Mx	8	-7.14	-101.49	0.00
			Max. My	2	-7.14	0.00	101.49
			Max. Vy	8	4.90	-101.49	0.00
			Max. Vx	2	-4.90	0.00	101.49
			Max. Torque	4			-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	80 - 70	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.68	0.00	0.00
			Max. Mx	8	-9.13	-154.95	0.00
			Max. My	2	-9.13	0.00	154.95
			Max. Vy	8	5.79	-154.95	0.00
			Max. Vx	2	-5.79	0.00	154.95
			Max. Torque	4			-0.00
L6	70 - 32	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.74	0.00	0.00
			Max. Mx	8	-14.42	-377.79	0.00
			Max. My	2	-14.42	0.00	377.79
			Max. Vy	8	8.24	-377.79	0.00
			Max. Vx	2	-8.24	0.00	377.79
			Max. Torque	4			-0.00
L7	32 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.97	0.00	0.00
			Max. Mx	8	-22.28	-744.78	0.00
			Max. My	2	-22.28	0.00	744.78
			Max. Vy	8	10.92	-744.78	0.00
			Max. Vx	2	-10.92	0.00	744.78
			Max. Torque	4			-0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	32.97	0.00	0.00
	Max. H_x	20	22.28	10.92	0.00
	Max. H_z	2	22.28	0.00	10.92
	Max. M_x	2	744.78	0.00	10.92
	Max. M_z	8	744.78	-10.92	0.00
	Max. Torsion	12	0.00	-5.46	-9.46
	Min. Vert	5	16.71	-5.46	9.46
	Min. H_x	8	22.28	-10.92	0.00
	Min. H_z	14	22.28	0.00	-10.92
	Min. M_x	14	-744.78	0.00	-10.92
	Min. M_z	20	-744.78	10.92	0.00
	Min. Torsion	4	-0.00	-5.46	9.46

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	18.57	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	22.28	0.00	-10.92	-744.78	0.00	0.00
0.9 Dead+1.0 Wind 0 deg - No Ice	16.71	0.00	-10.92	-739.76	0.00	0.00
1.2 Dead+1.0 Wind 30 deg - No Ice	22.28	5.46	-9.46	-645.00	-372.39	0.00
0.9 Dead+1.0 Wind 30 deg - No	16.71	5.46	-9.46	-640.65	-369.88	0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice						
1.2 Dead+1.0 Wind 60 deg - No Ice	22.28	9.46	-5.46	-372.39	-645.00	-0.00
0.9 Dead+1.0 Wind 60 deg - No Ice	16.71	9.46	-5.46	-369.88	-640.65	-0.00
1.2 Dead+1.0 Wind 90 deg - No Ice	22.28	10.92	0.00	0.00	-744.78	0.00
0.9 Dead+1.0 Wind 90 deg - No Ice	16.71	10.92	0.00	0.00	-739.76	0.00
1.2 Dead+1.0 Wind 120 deg - No Ice	22.28	9.46	5.46	372.39	-645.00	0.00
0.9 Dead+1.0 Wind 120 deg - No Ice	16.71	9.46	5.46	369.88	-640.65	0.00
1.2 Dead+1.0 Wind 150 deg - No Ice	22.28	5.46	9.46	645.00	-372.39	-0.00
0.9 Dead+1.0 Wind 150 deg - No Ice	16.71	5.46	9.46	640.65	-369.88	-0.00
1.2 Dead+1.0 Wind 180 deg - No Ice	22.28	0.00	10.92	744.78	0.00	0.00
0.9 Dead+1.0 Wind 180 deg - No Ice	16.71	0.00	10.92	739.76	0.00	0.00
1.2 Dead+1.0 Wind 210 deg - No Ice	22.28	-5.46	9.46	645.00	372.39	0.00
0.9 Dead+1.0 Wind 210 deg - No Ice	16.71	-5.46	9.46	640.65	369.88	0.00
1.2 Dead+1.0 Wind 240 deg - No Ice	22.28	-9.46	5.46	372.39	645.00	-0.00
0.9 Dead+1.0 Wind 240 deg - No Ice	16.71	-9.46	5.46	369.88	640.65	-0.00
1.2 Dead+1.0 Wind 270 deg - No Ice	22.28	-10.92	0.00	0.00	744.78	0.00
0.9 Dead+1.0 Wind 270 deg - No Ice	16.71	-10.92	0.00	0.00	739.76	0.00
1.2 Dead+1.0 Wind 300 deg - No Ice	22.28	-9.46	-5.46	-372.39	645.00	0.00
0.9 Dead+1.0 Wind 300 deg - No Ice	16.71	-9.46	-5.46	-369.88	640.65	0.00
1.2 Dead+1.0 Wind 330 deg - No Ice	22.28	-5.46	-9.46	-645.00	372.39	-0.00
0.9 Dead+1.0 Wind 330 deg - No Ice	16.71	-5.46	-9.46	-640.65	369.88	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	32.97	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	32.97	0.00	-3.30	-225.41	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	32.97	1.65	-2.86	-195.21	-112.71	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	32.97	2.86	-1.65	-112.71	-195.21	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	32.97	3.30	0.00	0.00	-225.41	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	32.97	2.86	1.65	112.71	-195.21	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	32.97	1.65	2.86	195.21	-112.71	-0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	32.97	0.00	3.30	225.41	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	32.97	-1.65	2.86	195.21	112.71	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	32.97	-2.86	1.65	112.71	195.21	-0.00
1.2 Dead+1.0 Wind 270	32.97	-3.30	0.00	0.00	225.41	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	32.97	-2.86	-1.65	-112.71	195.21	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	32.97	-1.65	-2.86	-195.21	112.71	-0.00
Dead+Wind 0 deg - Service	18.57	0.00	-2.60	-177.42	0.00	0.00
Dead+Wind 30 deg - Service	18.57	1.30	-2.25	-153.65	-88.71	0.00
Dead+Wind 60 deg - Service	18.57	2.25	-1.30	-88.71	-153.65	-0.00
Dead+Wind 90 deg - Service	18.57	2.60	0.00	0.00	-177.42	0.00
Dead+Wind 120 deg - Service	18.57	2.25	1.30	88.71	-153.65	0.00
Dead+Wind 150 deg - Service	18.57	1.30	2.25	153.65	-88.71	-0.00
Dead+Wind 180 deg - Service	18.57	0.00	2.60	177.42	0.00	0.00
Dead+Wind 210 deg - Service	18.57	-1.30	2.25	153.65	88.71	0.00
Dead+Wind 240 deg - Service	18.57	-2.25	1.30	88.71	153.65	-0.00
Dead+Wind 270 deg - Service	18.57	-2.60	0.00	0.00	177.42	0.00
Dead+Wind 300 deg - Service	18.57	-2.25	-1.30	-88.71	153.65	0.00
Dead+Wind 330 deg - Service	18.57	-1.30	-2.25	-153.65	88.71	-0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-18.57	0.00	0.00	18.57	0.00	0.000%
2	0.00	-22.28	-10.92	0.00	22.28	10.92	0.000%
3	0.00	-16.71	-10.92	0.00	16.71	10.92	0.000%
4	5.46	-22.28	-9.46	-5.46	22.28	9.46	0.000%
5	5.46	-16.71	-9.46	-5.46	16.71	9.46	0.000%
6	9.46	-22.28	-5.46	-9.46	22.28	5.46	0.000%
7	9.46	-16.71	-5.46	-9.46	16.71	5.46	0.000%
8	10.92	-22.28	0.00	-10.92	22.28	0.00	0.000%
9	10.92	-16.71	0.00	-10.92	16.71	0.00	0.000%
10	9.46	-22.28	5.46	-9.46	22.28	-5.46	0.000%
11	9.46	-16.71	5.46	-9.46	16.71	-5.46	0.000%
12	5.46	-22.28	9.46	-5.46	22.28	-9.46	0.000%
13	5.46	-16.71	9.46	-5.46	16.71	-9.46	0.000%
14	0.00	-22.28	10.92	0.00	22.28	-10.92	0.000%
15	0.00	-16.71	10.92	0.00	16.71	-10.92	0.000%
16	-5.46	-22.28	9.46	5.46	22.28	-9.46	0.000%
17	-5.46	-16.71	9.46	5.46	16.71	-9.46	0.000%
18	-9.46	-22.28	5.46	9.46	22.28	-5.46	0.000%
19	-9.46	-16.71	5.46	9.46	16.71	-5.46	0.000%
20	-10.92	-22.28	0.00	10.92	22.28	0.00	0.000%
21	-10.92	-16.71	0.00	10.92	16.71	0.00	0.000%
22	-9.46	-22.28	-5.46	9.46	22.28	5.46	0.000%
23	-9.46	-16.71	-5.46	9.46	16.71	5.46	0.000%
24	-5.46	-22.28	-9.46	5.46	22.28	9.46	0.000%
25	-5.46	-16.71	-9.46	5.46	16.71	9.46	0.000%
26	0.00	-32.97	0.00	0.00	32.97	0.00	0.000%
27	0.00	-32.97	-3.30	0.00	32.97	3.30	0.000%
28	1.65	-32.97	-2.86	-1.65	32.97	2.86	0.000%
29	2.86	-32.97	-1.65	-2.86	32.97	1.65	0.000%
30	3.30	-32.97	0.00	-3.30	32.97	0.00	0.000%
31	2.86	-32.97	1.65	-2.86	32.97	-1.65	0.000%
32	1.65	-32.97	2.86	-1.65	32.97	-2.86	0.000%
33	0.00	-32.97	3.30	0.00	32.97	-3.30	0.000%
34	-1.65	-32.97	2.86	1.65	32.97	-2.86	0.000%
35	-2.86	-32.97	1.65	2.86	32.97	-1.65	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
36	-3.30	-32.97	0.00	3.30	32.97	0.00	0.000%
37	-2.86	-32.97	-1.65	2.86	32.97	1.65	0.000%
38	-1.65	-32.97	-2.86	1.65	32.97	2.86	0.000%
39	0.00	-18.57	-2.60	0.00	18.57	2.60	0.000%
40	1.30	-18.57	-2.25	-1.30	18.57	2.25	0.000%
41	2.25	-18.57	-1.30	-2.25	18.57	1.30	0.000%
42	2.60	-18.57	0.00	-2.60	18.57	0.00	0.000%
43	2.25	-18.57	1.30	-2.25	18.57	-1.30	0.000%
44	1.30	-18.57	2.25	-1.30	18.57	-2.25	0.000%
45	0.00	-18.57	2.60	0.00	18.57	-2.60	0.000%
46	-1.30	-18.57	2.25	1.30	18.57	-2.25	0.000%
47	-2.25	-18.57	1.30	2.25	18.57	-1.30	0.000%
48	-2.60	-18.57	0.00	2.60	18.57	0.00	0.000%
49	-2.25	-18.57	-1.30	2.25	18.57	1.30	0.000%
50	-1.30	-18.57	-2.25	1.30	18.57	2.25	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00061862
3	Yes	4	0.00000001	0.00022788
4	Yes	5	0.00000001	0.00099458
5	Yes	5	0.00000001	0.00048367
6	Yes	5	0.00000001	0.00099458
7	Yes	5	0.00000001	0.00048367
8	Yes	4	0.00000001	0.00061862
9	Yes	4	0.00000001	0.00022788
10	Yes	5	0.00000001	0.00099458
11	Yes	5	0.00000001	0.00048367
12	Yes	5	0.00000001	0.00099458
13	Yes	5	0.00000001	0.00048367
14	Yes	4	0.00000001	0.00061862
15	Yes	4	0.00000001	0.00022788
16	Yes	5	0.00000001	0.00099458
17	Yes	5	0.00000001	0.00048367
18	Yes	5	0.00000001	0.00099458
19	Yes	5	0.00000001	0.00048367
20	Yes	4	0.00000001	0.00061862
21	Yes	4	0.00000001	0.00022788
22	Yes	5	0.00000001	0.00099458
23	Yes	5	0.00000001	0.00048367
24	Yes	5	0.00000001	0.00099458
25	Yes	5	0.00000001	0.00048367
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00021423
28	Yes	5	0.00000001	0.00029580
29	Yes	5	0.00000001	0.00029580
30	Yes	5	0.00000001	0.00021423
31	Yes	5	0.00000001	0.00029580
32	Yes	5	0.00000001	0.00029580
33	Yes	5	0.00000001	0.00021423
34	Yes	5	0.00000001	0.00029580
35	Yes	5	0.00000001	0.00029580
36	Yes	5	0.00000001	0.00021423

37	Yes	5	0.00000001	0.00029580
38	Yes	5	0.00000001	0.00029580
39	Yes	4	0.00000001	0.00002896
40	Yes	4	0.00000001	0.00021851
41	Yes	4	0.00000001	0.00021851
42	Yes	4	0.00000001	0.00002896
43	Yes	4	0.00000001	0.00021851
44	Yes	4	0.00000001	0.00021851
45	Yes	4	0.00000001	0.00002896
46	Yes	4	0.00000001	0.00021851
47	Yes	4	0.00000001	0.00021851
48	Yes	4	0.00000001	0.00002896
49	Yes	4	0.00000001	0.00021851
50	Yes	4	0.00000001	0.00021851

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 110	9.988	39	0.9793	0.0000
L2	110 - 100	7.939	39	0.9740	0.0000
L3	100 - 90	5.934	39	0.9305	0.0000
L4	90 - 80	4.094	39	0.8115	0.0000
L5	80 - 70	2.613	39	0.5815	0.0000
L6	70 - 32	1.759	39	0.2079	0.0000
L7	38.25 - 0	0.601	39	0.1334	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
117.00	(3) FVV-65C-R3_TIA w/ Mount Pipe	39	9.372	0.9794	0.0000	94080
115.00	56" dia. x 10' Canister	39	8.962	0.9789	0.0000	94080
106.00	(3) NNH4-65B-R6H4_TIA w/ Mount Pipe	39	7.126	0.9637	0.0000	14732
105.00	56" dia. x 10' Canister	39	6.925	0.9598	0.0000	12586
102.00	(6) CBC61923T-DS-43	39	6.327	0.9444	0.0000	8753
98.00	(3) MX08FIT265-01 w/ Mount Pipe	39	5.549	0.9132	0.0000	6273
95.00	56" dia. x 10' Canister	39	4.985	0.8811	0.0000	5199
93.00	RHSDC-3315-PF-48	39	4.621	0.8556	0.0000	4631
86.00	(3) QS66512-2_TIA w/ Mount Pipe	39	3.438	0.7397	0.0000	2399
85.00	56" dia. x 10' Canister	39	3.285	0.7184	0.0000	2178
75.00	56" dia. x 10' Canister	39	2.121	0.3923	0.0000	2291

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 110	42.045	2	4.1306	0.0000
L2	110 - 100	33.411	2	4.1081	0.0000
L3	100 - 90	24.965	2	3.9238	0.0000
L4	90 - 80	17.211	2	3.4200	0.0000
L5	80 - 70	10.975	2	2.4480	0.0000
L6	70 - 32	7.382	2	0.8728	0.0000
L7	38.25 - 0	2.521	2	0.5600	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
117.00	(3) FVV-65C-R3_TIA w/ Mount Pipe	2	39.450	4.1308	0.0000	22417
115.00	56" dia. x 10' Canister	2	37.721	4.1289	0.0000	22417
106.00	(3) NNH4-65B-R6H4_TIA w/ Mount Pipe	2	29.986	4.0643	0.0000	3512
105.00	56" dia. x 10' Canister	2	29.137	4.0480	0.0000	3000
102.00	(6) CBC61923T-DS-43	2	26.617	3.9828	0.0000	2086
98.00	(3) MX08FIT265-01 w/ Mount Pipe	2	23.340	3.8507	0.0000	1494
95.00	56" dia. x 10' Canister	2	20.966	3.7146	0.0000	1238
93.00	RHSDC-3315-PF-48	2	19.431	3.6068	0.0000	1103
86.00	(3) QS66512-2_TIA w/ Mount Pipe	2	14.446	3.1166	0.0000	571
85.00	56" dia. x 10' Canister	2	13.802	3.0264	0.0000	518
75.00	56" dia. x 10' Canister	2	8.902	1.6500	0.0000	544

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	120 - 110 (1)	TP14x14x0.2188	10.00	0.00	0.0	9.5707	-1.55	559.88	0.003
L2	110 - 100 (2)	TP14x14x0.2188	10.00	0.00	0.0	9.5707	-3.27	559.88	0.006
L3	100 - 90 (3)	TP14x14x0.2188	10.00	0.00	0.0	9.5707	-4.96	559.88	0.009
L4	90 - 80 (4)	TP14x14x0.2188	10.00	0.00	0.0	9.5707	-7.14	559.88	0.013
L5	80 - 70 (5)	TP14x14x0.2188	10.00	0.00	0.0	9.5707	-9.13	559.88	0.016
L6	70 - 32 (6)	TP45.16x40x0.25	38.00	0.00	0.0	34.9627	-14.42	2045.32	0.007
L7	32 - 0 (7)	TP49x43.8113x0.25	38.25	0.00	0.0	38.6831	-22.28	2153.74	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	120 - 110 (1)	TP14x14x0.2188	6.59	199.91	0.033	0.00	199.91	0.000
L2	110 - 100 (2)	TP14x14x0.2188	26.08	199.91	0.130	0.00	199.91	0.000
L3	100 - 90 (3)	TP14x14x0.2188	57.99	199.91	0.290	0.00	199.91	0.000
L4	90 - 80 (4)	TP14x14x0.2188	101.50	199.91	0.508	0.00	199.91	0.000
L5	80 - 70 (5)	TP14x14x0.2188	154.95	199.91	0.775	0.00	199.91	0.000
L6	70 - 32 (6)	TP45.16x40x0.25	377.79	1878.46	0.201	0.00	1878.46	0.000
L7	32 - 0 (7)	TP49x43.8113x0.25	744.78	2164.90	0.344	0.00	2164.90	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 110 (1)	TP14x14x0.2188	1.31	167.97	0.008	0.00	202.72	0.000
L2	110 - 100 (2)	TP14x14x0.2188	2.59	167.97	0.015	0.00	202.72	0.000
L3	100 - 90 (3)	TP14x14x0.2188	3.79	167.97	0.023	0.00	202.72	0.000
L4	90 - 80 (4)	TP14x14x0.2188	4.90	167.97	0.029	0.00	202.72	0.000
L5	80 - 70 (5)	TP14x14x0.2188	5.79	167.97	0.034	0.00	202.72	0.000
L6	70 - 32 (6)	TP45.16x40x0.25	8.24	613.60	0.013	0.00	2367.66	0.000
L7	32 - 0 (7)	TP49x43.8113x0.25	10.92	678.89	0.016	0.00	2898.37	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 110 (1)	0.003	0.033	0.000	0.008	0.000	0.036	1.000	4.8.2
L2	110 - 100 (2)	0.006	0.130	0.000	0.015	0.000	0.137	1.000	4.8.2
L3	100 - 90 (3)	0.009	0.290	0.000	0.023	0.000	0.299	1.000	4.8.2
L4	90 - 80 (4)	0.013	0.508	0.000	0.029	0.000	0.521	1.000	4.8.2
L5	80 - 70 (5)	0.016	0.775	0.000	0.034	0.000	0.793	1.000	4.8.2
L6	70 - 32 (6)	0.007	0.201	0.000	0.013	0.000	0.208	1.000	4.8.2
L7	32 - 0 (7)	0.010	0.344	0.000	0.016	0.000	0.355	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	120 - 110	Pole	TP14x14x0.2188	1	-1.55	559.88	3.6	Pass
L2	110 - 100	Pole	TP14x14x0.2188	2	-3.27	559.88	13.7	Pass
L3	100 - 90	Pole	TP14x14x0.2188	3	-4.96	559.88	29.9	Pass
L4	90 - 80	Pole	TP14x14x0.2188	4	-7.14	559.88	52.1	Pass
L5	80 - 70	Pole	TP14x14x0.2188	5	-9.13	559.88	79.3	Pass
L6	70 - 32	Pole	TP45.16x40x0.25	6	-14.42	2045.32	20.8	Pass

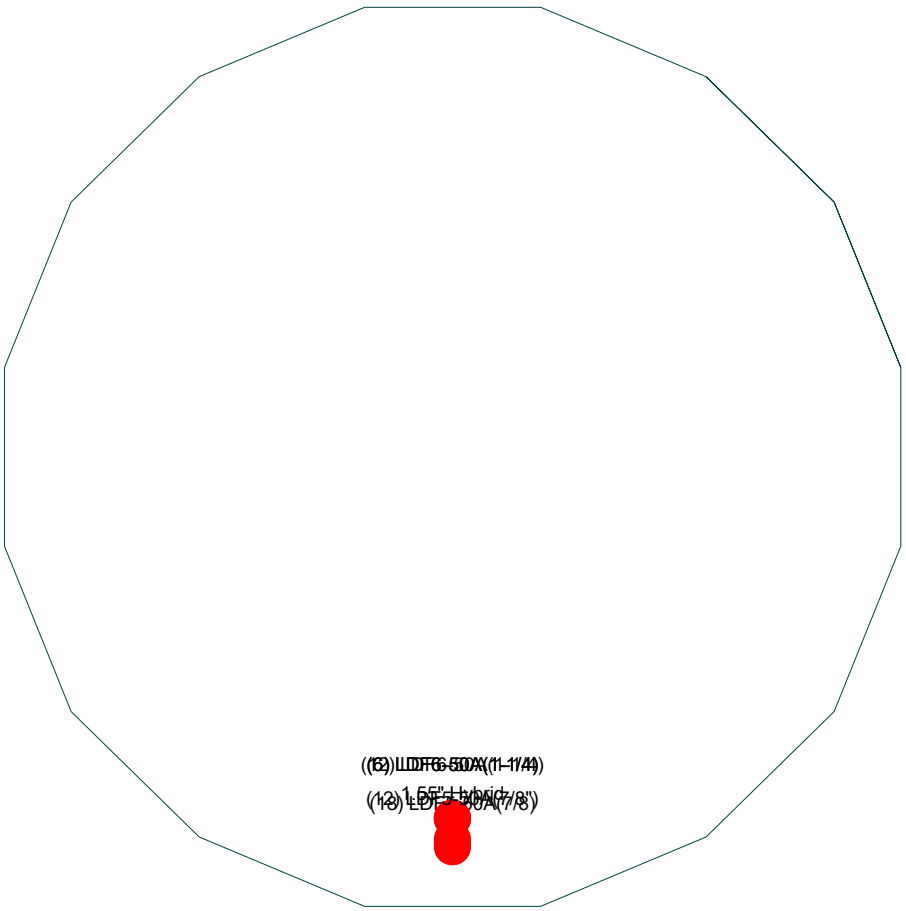
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L7	32 - 0	Pole	TP49x43.8113x0.25	7	-22.28	2153.74	35.5	Pass
							Summary	
						Pole (L5)	79.3	Pass
						RATING =	**79.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face



Engineered Tower Solutions, PLLC
3227 Wellington Court
Raleigh, NC 27615
Phone: (919) 782-2710
FAX:

Job: ***CT1192 New Canaan***		
Project: ***ETS, PLLC Job No. 22112671.STR.6806***		
Client: Tarpon Towers	Drawn by: Hicham Anssar	App'd:
Code: TIA-222-H	Date: 05/01/23	Scale: NTS
Path: C:\Users\user\Desktop\ETS-TOWER DIVISION\Tarpon Towers\04-28-2023\6608_Tower Reanalysis\Analysis\Tower\New Canaan_SA_050123.eri		Dwg No. E-7

APPENDIX C

ADDITIONAL CALCULATIONS

Monopole Flange Plate Connection

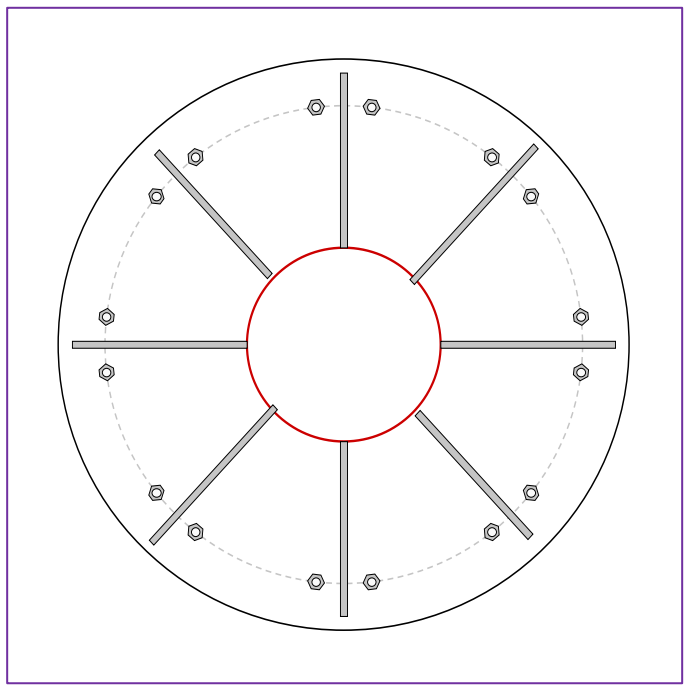
Elevation = 70 ft.

Site Name	New Canaan

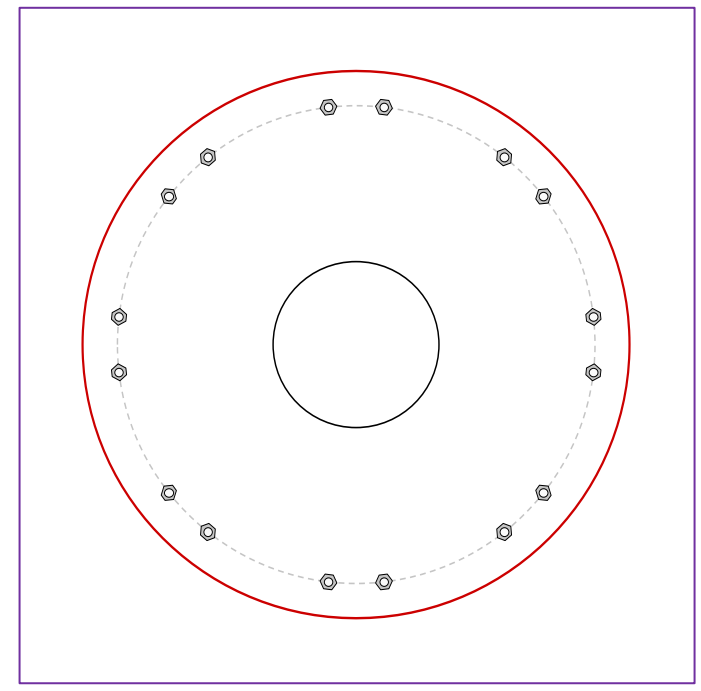
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	154.95
Axial Force (kips)	9.13
Shear Force (kips)	5.79

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 5/8" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 34.5" BC

Top Plate Data

41.25" OD x 1.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Bottom Plate Data

12" ID x 1.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Top Stiffener Data

(8) 18"H x 12.625"W x 0.5"T, Notch: 1"
plate: Fy= 65 ksi ; weld: Fy= 80 ksi
horiz. weld: 0.5625" fillet
vert. weld: 0.3125" fillet

Bottom Stiffener Data

N/A

Top Pole Data

14" x 0.2188" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Pole Data

40" x 0.25" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	12.90	
Allowable (kips)	20.33	
Stress Rating:	**63.4%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	6.45	(Roark's Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	**12.0%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Bottom Plate Capacity

Max Stress (ksi):	13.45	(Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	**24.9%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Top Stiffener Capacity

Horizontal Weld:	**10.8%**	**Pass**
Vertical Weld:	**16.9%**	**Pass**
Plate Flexure+Shear:	**7.6%**	**Pass**
Plate Tension+Shear:	**9.8%**	**Pass**
Plate Compression:	**21.9%**	**Pass**

Bottom Stiffener Capacity

Horizontal Weld:	**N/A**
Vertical Weld:	**N/A**
Plate Flexure+Shear:	**N/A**
Plate Tension+Shear:	**N/A**
Plate Compression:	**N/A**

Top Pole Capacity

Punching Shear:	**11.5%**	**Pass**

Bottom Pole Capacity

Punching Shear:	**N/A**

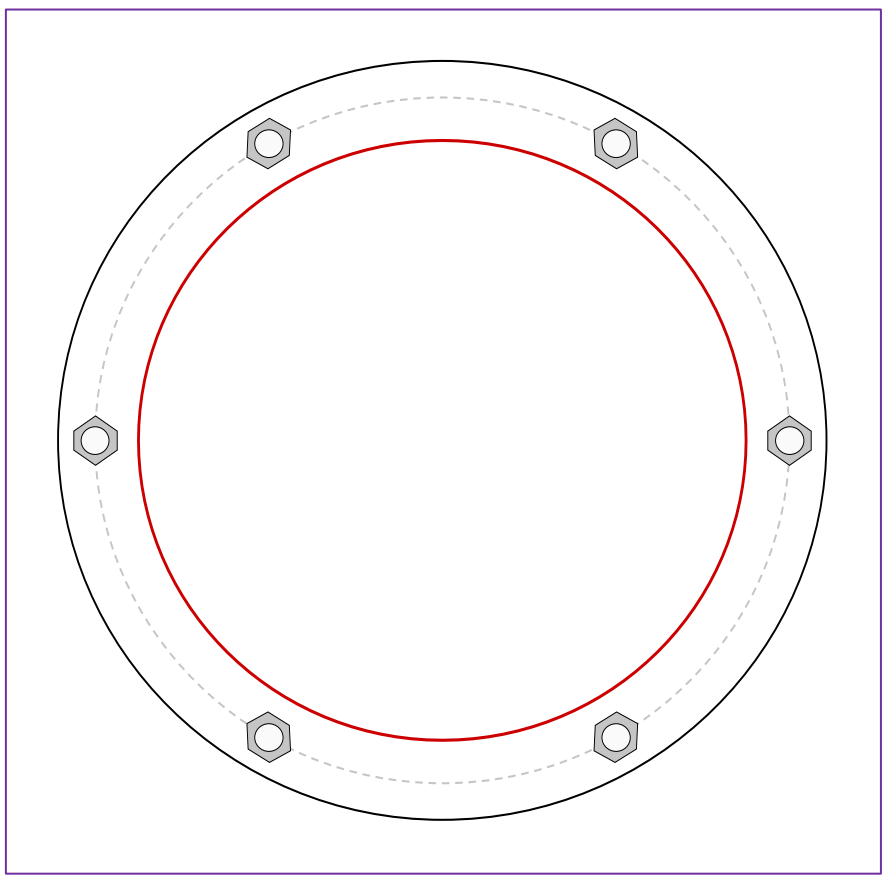
Analysis Date: 5/1/2023

Monopole Base Plate Connection

Site Info	
Site Name	New Canaan

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	3

Applied Loads	
Moment (kip-ft)	744.78
Axial Force (kips)	22.28
Shear Force (kips)	10.92



Connection Properties

Anchor Rod Data

(6) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 56" BC

Base Plate Data

62" OD x 1.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

49" x 0.25" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 110.04	ϕPn_c = 268.39	**Stress Rating**
Vu = 1.82	ϕVn = 120.77	**43.8%**
Mu = 3.55	ϕMn = 128.14	**Pass**

Base Plate Summary

Max Stress (ksi):	18.55	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**34.4%**	**Pass**

Analysis Date: 5/1/2023

Pier and Pad Foundation

Site Name:	New Canaan
TIA-222 Revision:	H
Tower Type:	Monopole

Superstructure Analysis Reactions		
Compression, $\mathbf{P_{comp}}$:	22.28	kips
Base Shear, Vu_comp:	10.92	kips
Moment, $\mathbf{M_u}$:	744.78	ft-kips
Tower Height, **H**:	120	ft
BP Dist. Above Fdn, $\mathbf{bp_{dist}}$:	3	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	7	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	48	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	14	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $\mathbf{cc_{pier}}$:	3	in

Pad Properties		
Depth, **D**:	6	ft
Pad Width, $\mathbf{W_1}$:	16	ft
Pad Thickness, **T**:	2	ft
Pad Rebar Size (Bottom dir. 2), $\mathbf{Sp_2}$:	8	
Pad Rebar Quantity (Bottom dir. 2), $\mathbf{mp_2}$:	16	
Pad Clear Cover, $\mathbf{cc_{pad}}$:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties			
Total Soil Unit Weight, γ:	125	pcf	
Ultimate Gross Bearing, Qult:	31.920	ksf	<--Toggle between Gross and Net
Cohesion, **Cu**:	0.000	ksf	
Friction Angle, φ:	30	degrees	
SPT Blow Count, $\mathbf{N_{blows}}$:	104		
Base Friction, μ:	0.35		
Neglected Depth, **N**:	1.00	ft	
Foundation Bearing on Rock?	Yes		
Groundwater Depth, **gw**:	N/A	ft	

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	114.13	10.92	**9.6%**	**Pass**
Bearing Pressure (ksf)	23.94	2.46	**10.3%**	**Pass**
*Overturning (kip*ft)*	1786.83	818.49	**45.8%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	6058.99	793.92	**13.1%**	**Pass**
Pier Compression (kip)	24494.62	53.45	**0.2%**	**Pass**
*Pad Flexure (kip*ft)*	1076.12	186.05	**17.3%**	**Pass**
Pad Shear - 1-way (kips)	355.19	53.33	**15.0%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.021	**11.2%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	1702.84	476.35	**28.0%**	**Pass**

Structural Rating:	**28.0%**
Soil Rating:	**45.8%**

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Latitude: 41.16625
Longitude: -73.47047
Elevation: 259.32758390215696 ft (NAVD 88)

Wind

Results:

Wind Speed	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Fri Apr 28 2023

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

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

Seismic

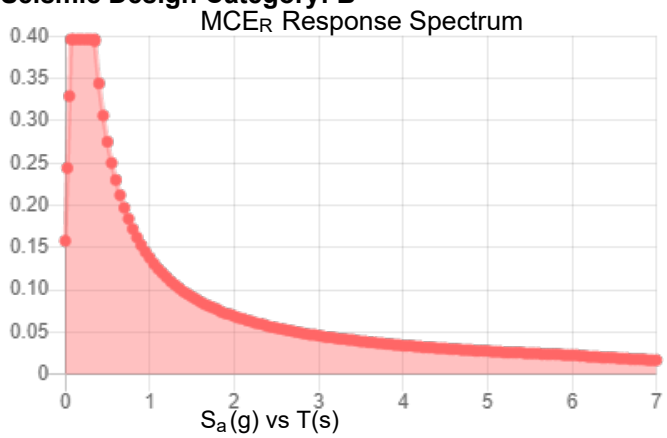
D - Stiff Soil

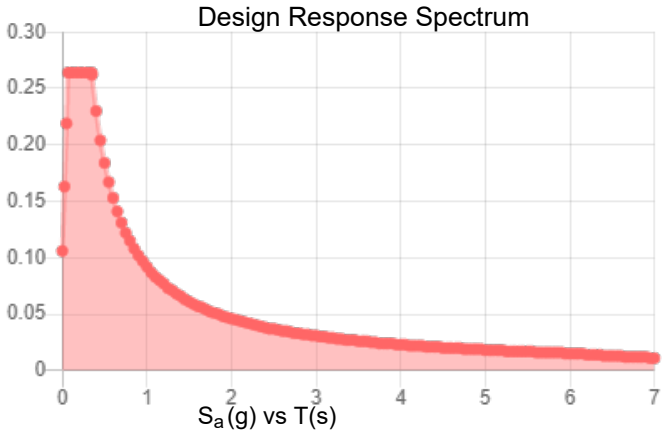
Site Soil Class:

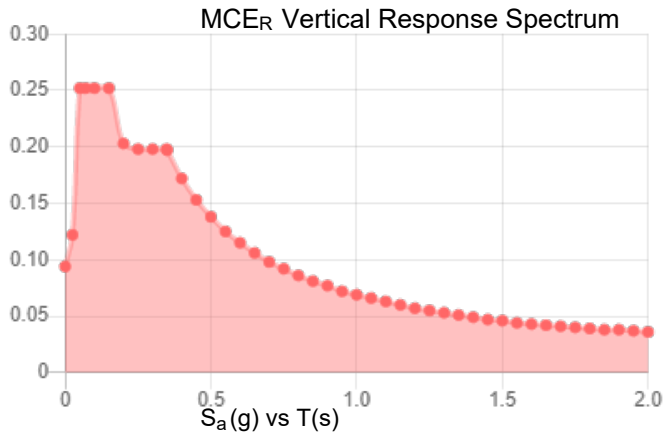
Results:

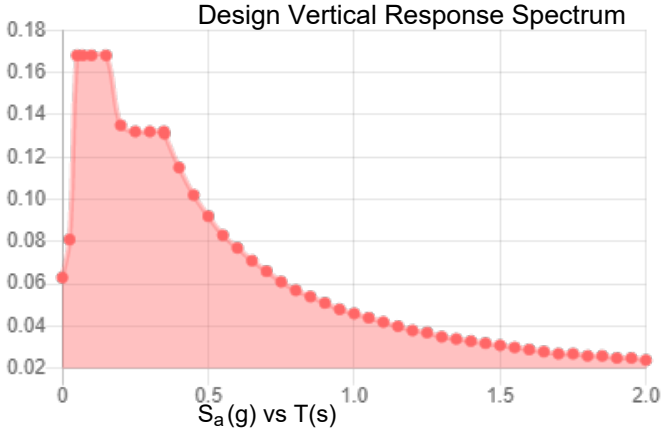
S_S :	0.248	S_{D1} :	0.092
S_1 :	0.057	T_L :	6
F_a :	1.6	PGA :	0.147
F_v :	2.4	PGA_M :	0.221
S_{MS} :	0.396	F_{PGA} :	1.506
S_{M1} :	0.138	I_e :	1
S_{DS} :	0.264	C_v :	0.795

Seismic Design Category: B









Data Accessed: **Fri Apr 28 2023**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Fri Apr 28 2023

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

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

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:	NJJER01146D
Site Address:	208 Valley Road New Canaan, CT
Latitude:	N 41.166242
Longitude:	W 73.470481
Structure type:	Unipole
Report date:	August 23, 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 expert assessment of radiofrequency (RF) levels and related FCC compliance for existing wireless base station antenna operations in a unipole located at 208 Valley Road in New Canaan, CT. DISH refers to the antenna site by the code "NJJER01146D", and its existing antenna operation involves directional panel antennas and transmission in the 600 MHz, 2000 MHz and 2100 MHz frequency bands licensed to it by the FCC.

The FCC requires all wireless antenna operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC's regulations. In this case, the compliance assessment needs to take into account the RF effects of other existing antenna operations at the site by AT&T, T-Mobile, and Verizon Wireless. Note FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

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

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

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

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

- At street level, the conservatively calculated maximum RF level from the existing antenna operations at the site is 7.8166 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance. In other words, the worst-case calculated RF level – intentionally and significantly overstated by the calculations – is still more than 12 times below the FCC limit for safe, continuous exposure of the general public. Per DISH guidelines, and consistent with FCC guidance on compliance, it is recommended that three Caution signs and NOC Information signs be installed at the base of the unipole.
- 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. 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 existing DISH antenna operations at the site, as well as on the other existing antenna operations;
- a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- analysis of the results of the calculations against the FCC MPE limit, and the compliance conclusion for the site.

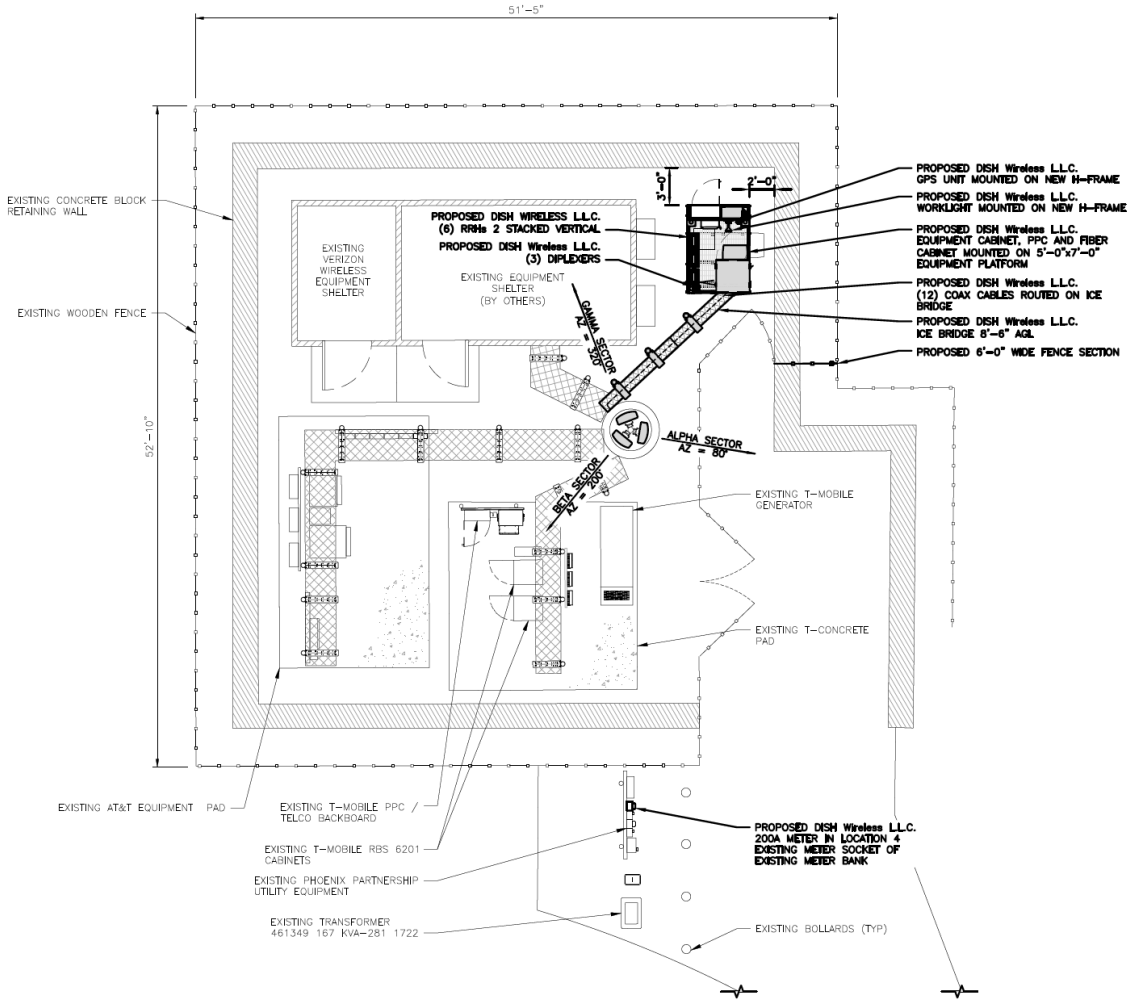
In addition, four Appendices are included. Appendix A provides information on the documents used to prepare the analysis. Appendix B provides background on the FCC MPE limit. Appendix C details the proposed mitigation to satisfy the FCC requirements and associated guidelines on RF compliance. Appendix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

a summary of the qualifications of the expert certifying FCC compliance for this site.

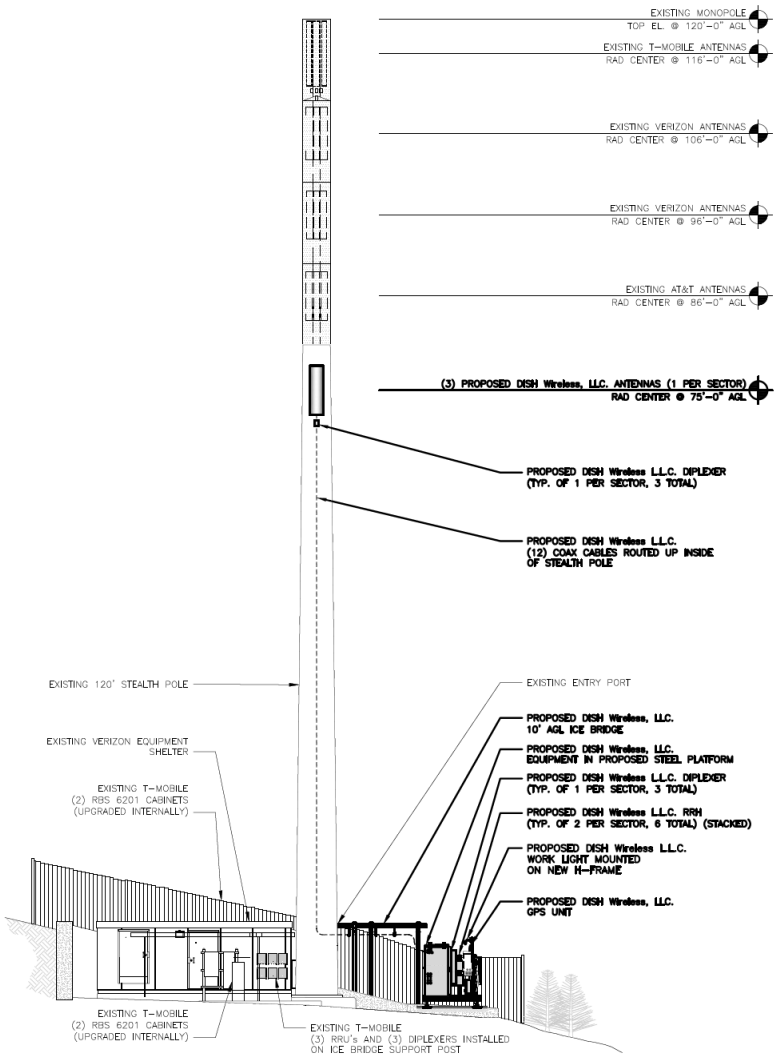
Antenna and Transmission Data

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

Plan View:



Elevation View:



The table that follows summarizes the relevant data for the existing 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 AGL (ft)	Ant. Gain (dBd)	B/W	Azimuth	EDT	MDT
❶	DISH	Commscope	FVV-65B-R3	Panel	600	6	120	1687	75.0	12.16	71	80	2	0
❶	DISH	Commscope	FVV-65B-R3	Panel	2000	6	160	5260	75.0	15.96	64	80	2	0
❶	DISH	Commscope	FVV-65B-R3	Panel	2100	6	160	6546	75.0	16.26	64	80	2	0
❷	DISH	Commscope	FVV-65B-R3	Panel	600	6	120	1687	75.0	12.16	71	200	2	0
❷	DISH	Commscope	FVV-65B-R3	Panel	2000	6	160	5260	75.0	15.96	64	200	2	0
❷	DISH	Commscope	FVV-65B-R3	Panel	2100	6	160	6546	75.0	16.26	64	200	2	0
❸	DISH	Commscope	FVV-65B-R3	Panel	600	6	120	1687	75.0	12.16	71	320	2	0
❸	DISH	Commscope	FVV-65B-R3	Panel	2000	6	160	5260	75.0	15.96	64	320	2	0
❸	DISH	Commscope	FVV-65B-R3	Panel	2100	6	160	6546	75.0	16.26	64	320	2	0

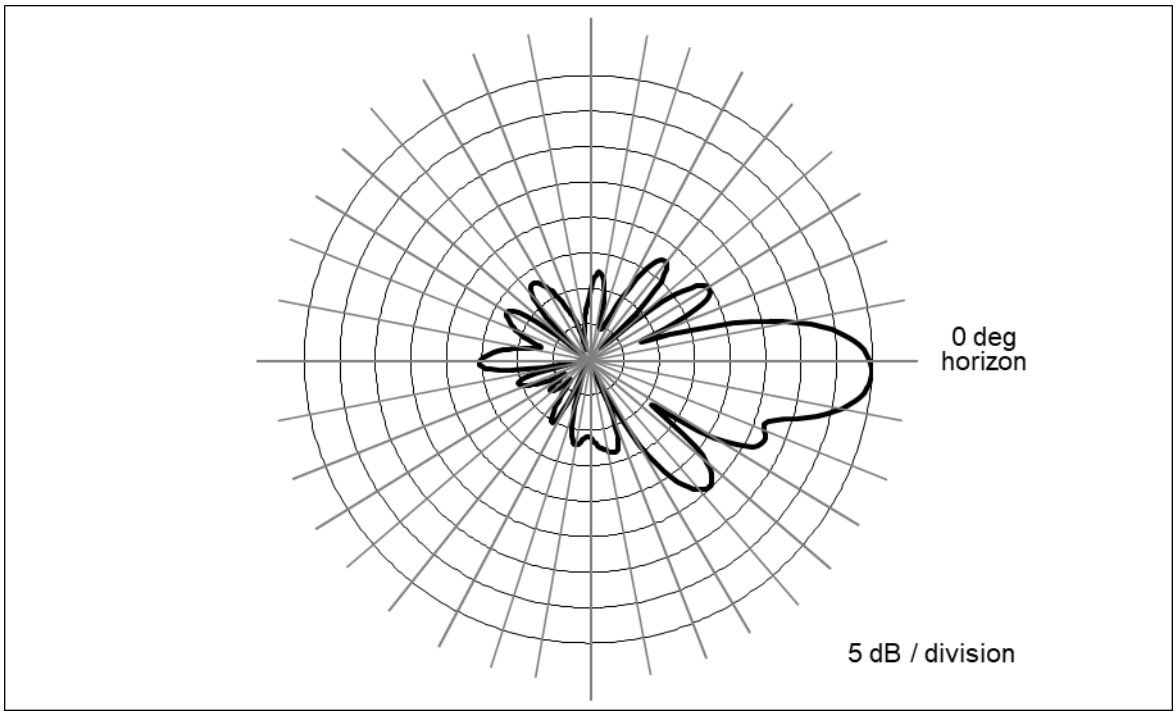
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

By way of illustration, Figure 1 that follows shows the vertical-plane radiation pattern of the 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 FVV-65B-R3 – 600 MHz Vertical-plane Pattern



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

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

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

Compliance Analysis

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

Street Level Analysis

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

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

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

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

where

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

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

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

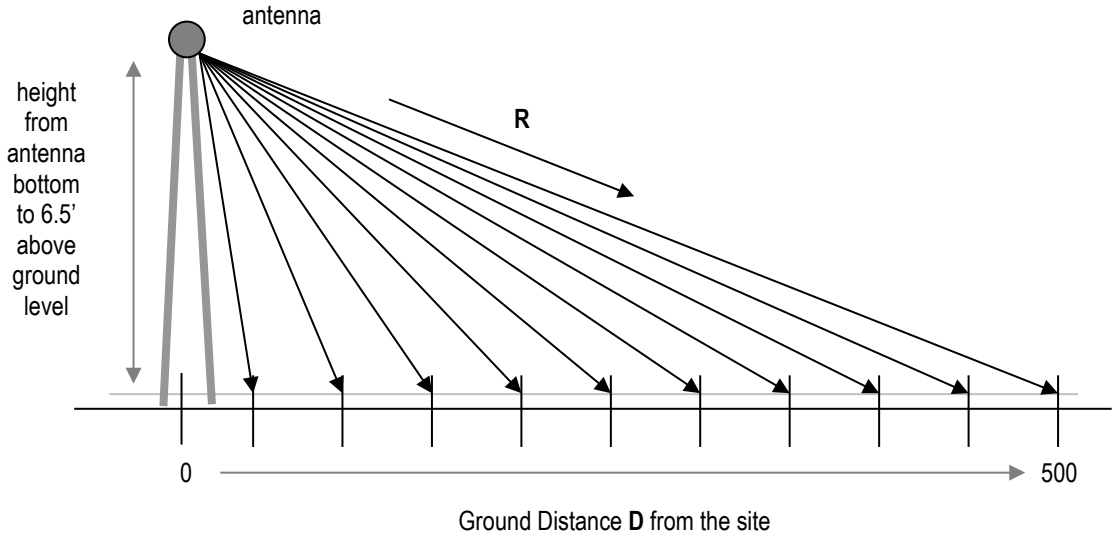


Figure 2. Street-level MPE% Calculation Geometry

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

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

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

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

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

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

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

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

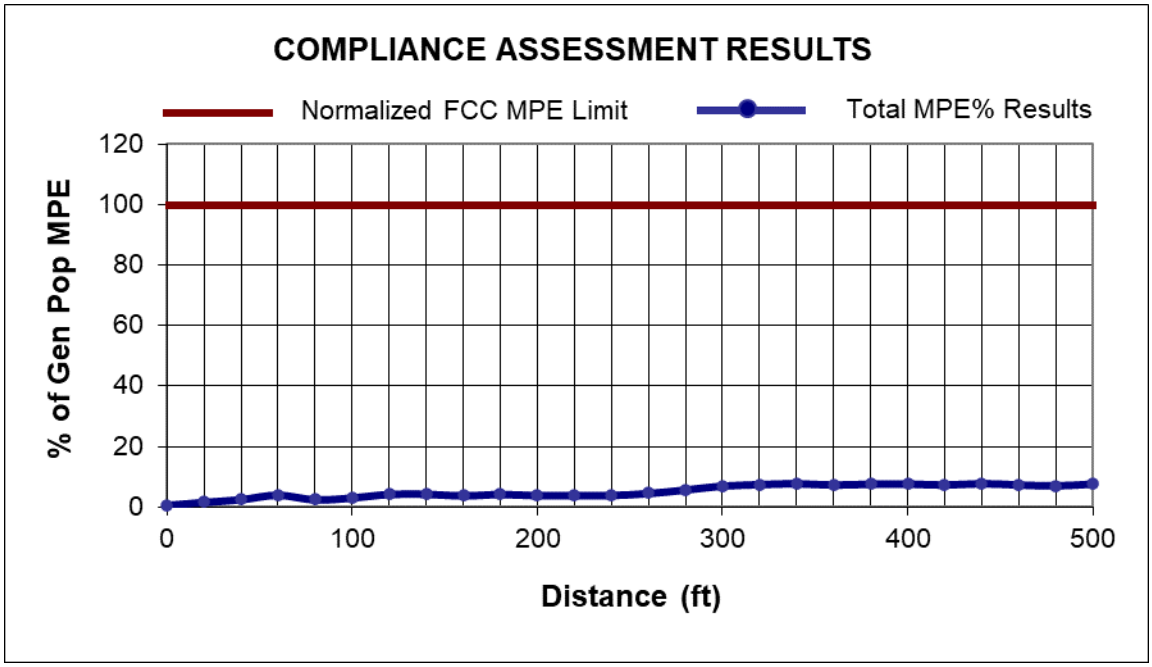
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very "safe-side" conclusions about compliance.

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

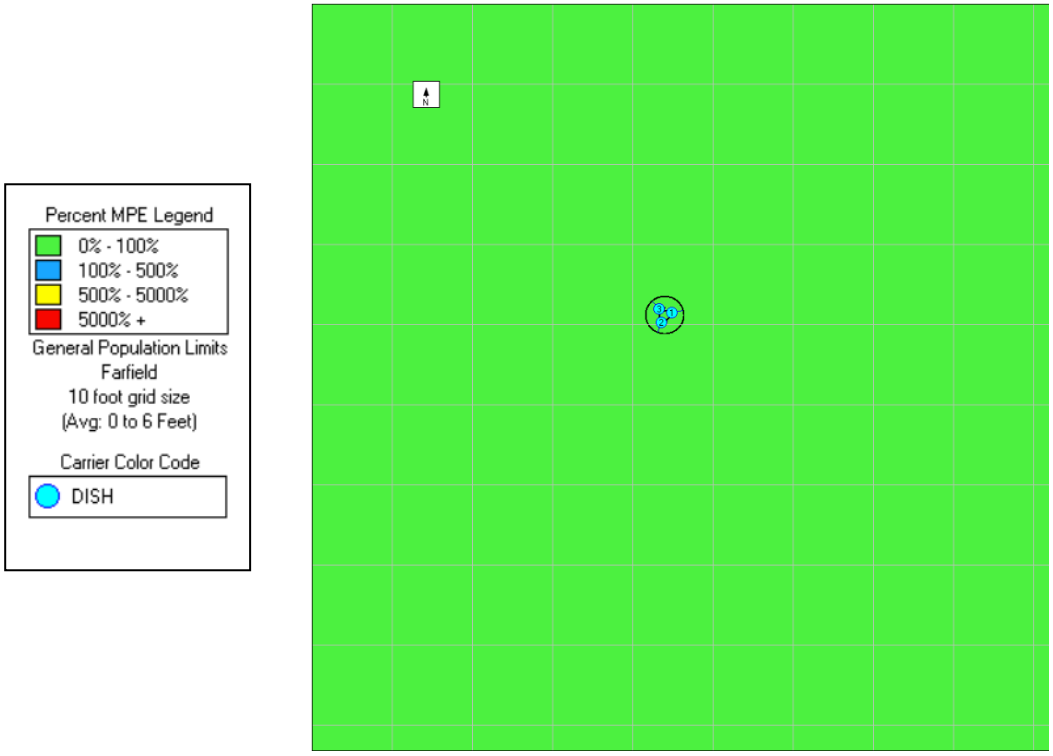
Ground Distance (ft)	DISH 600 MHz MPE%	DISH 2000 MHz MPE%	DISH 2100 MHz MPE%	AT&T MPE%	T-Mobile MPE%	Verizon Wireless MPE%	Total MPE%
0	0.0734	0.0537	0.0757	0.1869	0.3512	0.0404	0.7813
20	0.1260	0.0899	0.5802	0.3650	0.5124	0.0790	1.7525
40	0.1763	0.1595	0.1034	0.7652	1.1146	0.3036	2.6226
60	0.9667	0.1957	0.5454	1.0371	1.0535	0.3010	4.0994
80	0.2048	0.2269	0.7777	0.4523	0.6887	0.2412	2.5916
100	0.1234	0.3960	0.1193	1.1952	0.7081	0.6452	3.1872
120	0.5725	0.1775	0.1192	2.0037	0.9271	0.5296	4.3296
140	0.5810	0.1083	0.1281	1.7395	1.0895	0.7554	4.4018
160	0.4101	0.0621	0.0491	1.3530	1.3101	0.6794	3.8638
180	0.3364	0.0649	0.1043	0.9918	2.3984	0.4290	4.3248
200	0.3428	0.0130	0.0331	0.5259	2.7686	0.2374	3.9208
220	0.5391	0.0138	0.0054	0.2500	3.0258	0.1105	3.9446
240	0.6409	0.0115	0.0103	0.6234	2.6437	0.0840	4.0138
260	0.7529	0.0027	0.0016	0.9375	2.7729	0.1474	4.6150
280	0.8689	0.0254	0.0137	1.2557	3.3991	0.2142	5.7770
300	0.9816	0.0949	0.0802	1.5296	4.0532	0.2999	7.0394
320	1.0821	0.1689	0.1709	1.7744	3.8841	0.4116	7.4920
340	1.1658	0.1766	0.2009	2.0487	3.6696	0.5384	7.8000
360	1.0439	0.1581	0.1799	1.8371	3.4555	0.6864	7.3609
380	1.1069	0.0884	0.1136	2.1978	3.2903	0.8371	7.6341
400	1.0018	0.0800	0.1028	2.7256	3.0243	0.7592	7.6937
420	1.0434	0.0072	0.0151	2.4805	2.9105	0.9079	7.3646
440	**0.9527**	**0.0066**	**0.0138**	**3.1342**	**2.8790**	**0.8303**	**7.8166**
460	0.8733	0.0060	0.0126	2.8749	2.6782	0.9636	7.4086
480	0.8972	0.0303	0.0247	2.6462	2.6240	0.8875	7.1099
500	0.8281	0.0280	0.0228	3.2994	2.4827	1.0081	7.6691

As indicated, the maximum calculated overall RF level is 7.8166 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

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



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


Percent MPE Legend
0% - 100%
100% - 500%
500% - 5000%
5000% +
General Population Limits
Farfield
10 foot grid size
(Avg: 0 to 6 Feet)
Carrier Color Code
DISH

Compliance Conclusion

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

The conservative analysis in this case shows that the maximum calculated RF level from the existing antenna operations at street level around the site is 7.8166 percent of the FCC general population MPE limit. Per DISH guidelines, and consistent with FCC guidance on compliance, it is recommended that three Caution signs and NOC Information signs be installed at the base of the unipole.

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

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

Certification

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

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

8/23/23

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

Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER01146D-Preliminary-20230330-v.2_20230330123748

CD: NJJER01146D_FinalStampedCDs_20230725101113 (1)

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.

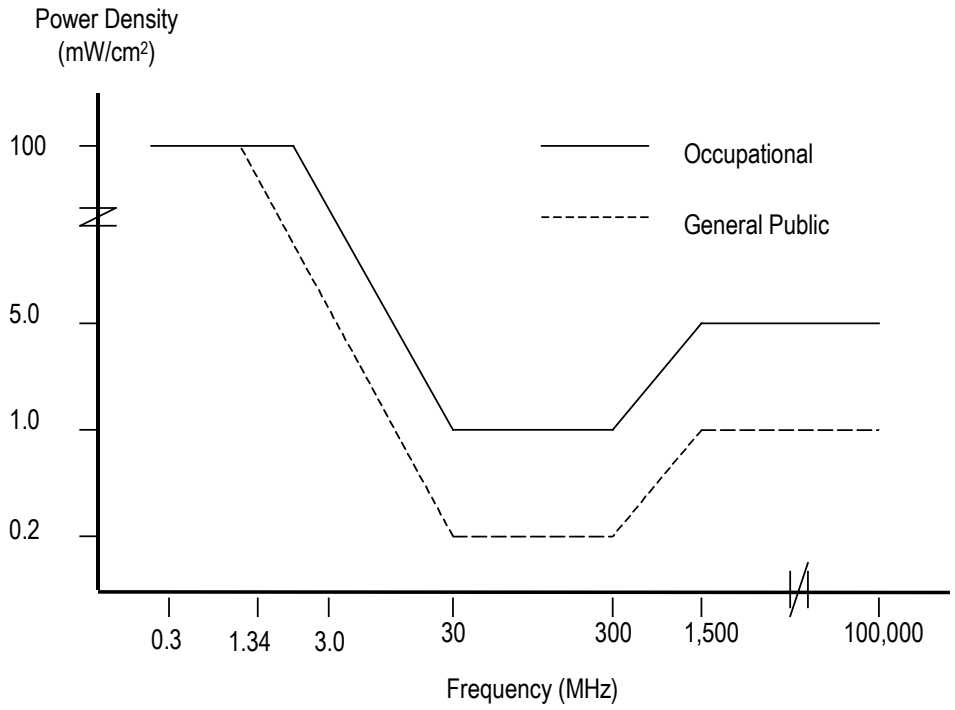
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in 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.

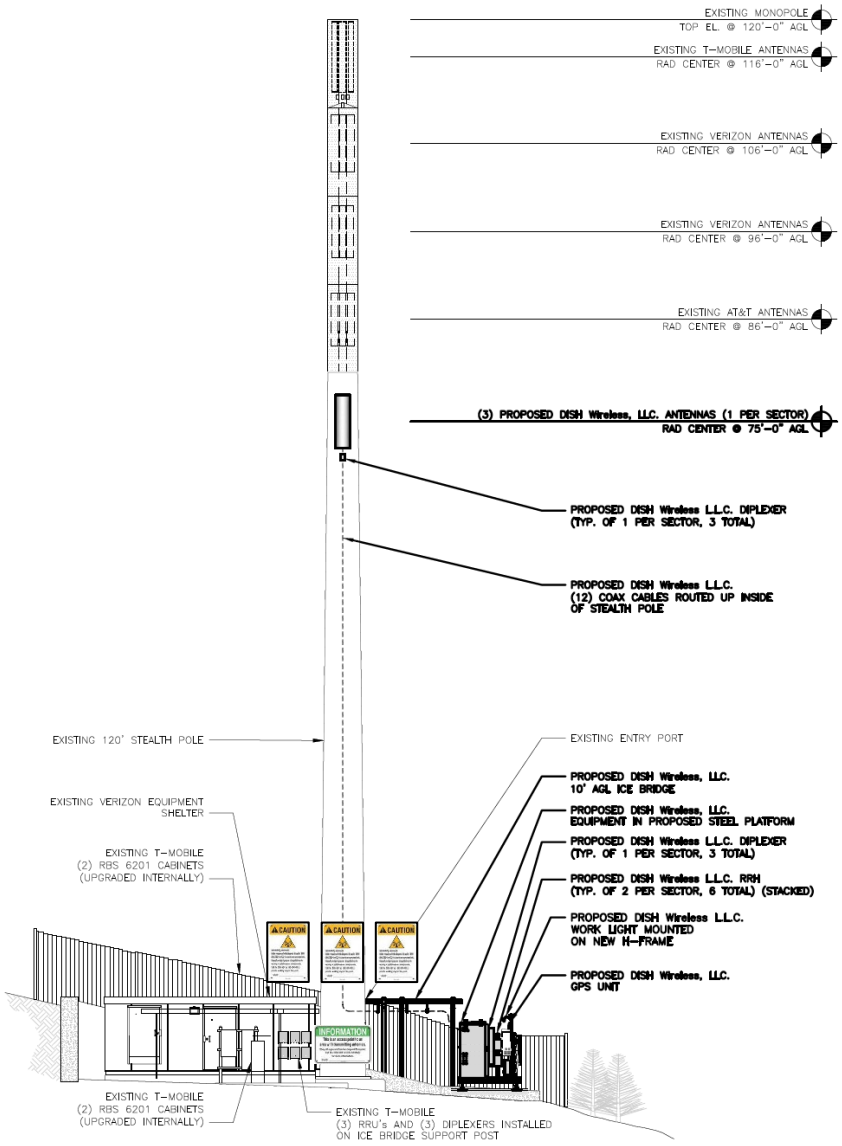
FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies,* 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)	0	0	0	0	1	0	
Alpha	0	0	1	0	0	0	
Beta	0	0	1	0	0	0	
Gamma	0	0	1	0	0	0	



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

FedEx

September 08, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 773291106110

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	C.KROLIKOWSKI	**Delivery Location:**	77 MAIN ST
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		NEW CANAAN, CT, 06840
		Delivery date:	Sep 6, 2023 11:28

Shipping Information:

Tracking number:	773291106110	**Ship Date:**	Sep 5, 2023
		Weight:	1.8 LB/0.82 KG

Recipient:
Brian Platz, City of New Canaan
77 Main Street
Lower Level- Building Department
NEW CANAAN, CT, US, 06840

Shipper:
Michael Jones,
140 Beach 137th Street
ROCKAWAY PARK, NY, US, 11694

Reference NJJER01146D

DELIVERED

Wednesday

9/6/23 at 11:28 AM

Signed for by: C.KROLIKOWSKI

Obtain proof of delivery

DELIVERY STATUS

Delivered

TRACKING ID

773291099570

Want updates on this shipment? Enter your email and we will do the rest!

YOUR EMAIL SUBMIT

MORE OPTIONS

Manage Delivery

FROM
Michael Jones
140 Beach 137th Street
ROCKAWAY PARK, NY US 11694
7326778881

Label Created
9/2/23 3:56 PM

WE HAVE YOUR PACKAGE
JAMAICA, NY
9/5/23 7:04 PM

IN TRANSIT
STAMFORD, CT
9/6/23 9:16 AM

OUT FOR DELIVERY
STAMFORD, CT
9/6/23 9:35 AM

DELIVERED
Daniel Radman
City of New Canaan
77 Main Street Lower Level-
Planning & Zoning
NEW CANAAN, CT US 06840
2035943012

Delivered
9/6/23 at 11:28 AM

View travel history

Shipment facts

Shipment overview

TRACKING NUMBER	773291099570
DELIVERED TO	Receptionist/Front Desk
SHIPPER REFERENCE	NJJER01146D
SHIP DATE	9/5/23
STANDARD TRANSIT	9/7/23 before 5:00 PM
ACTUAL DELIVERY	9/6/23 at 11:28 AM

Services

SERVICE	FedEx 2Day

FedEx

September 08, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 773291143240

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	K.FLYNN	**Delivery Location:**	77 MAIN ST
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		NEW CANAAN, CT, 06840
		Delivery date:	Sep 6, 2023 11:35

Shipping Information:

Tracking number:	773291143240	**Ship Date:**	Sep 5, 2023
		Weight:	

Recipient:
Kevin Moynihan, City of New Canaan
77 Main Street
2nd Floor- First Selectman
NEW CANAAN, CT, US, 06840

Shipper:
Michael Jones,
140 Beach 137th Street
ROCKAWAY PARK, NY, US, 11694

Reference NJJER01146D

FedEx

September 08, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 773291149064

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	T.MORALES	**Delivery Location:**	208 VALLEY RD
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		NEW CANAAN, CT, 06840
		Delivery date:	Sep 6, 2023 15:20

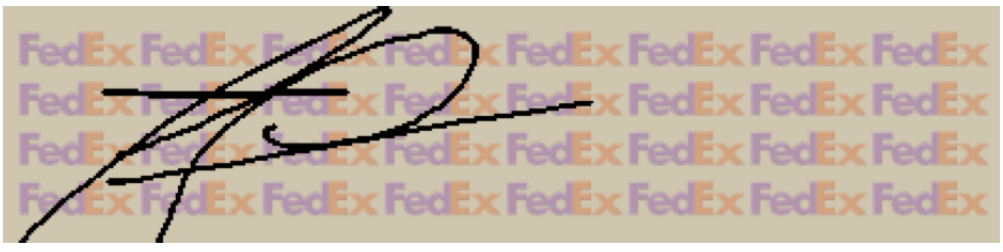
Shipping Information:

Tracking number:	773291149064	**Ship Date:**	Sep 5, 2023
		Weight:	

Recipient:
Richard Canning, Silver Hill Hospital, Inc
208 Valley Road
NEW CANAAN, CT, US, 06840

Shipper:
Michael Jones,
140 Beach 137th Street
ROCKAWAY PARK, NY, US, 11694

Reference NJJER01146D



FedEx

September 08, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 773291140457

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	T.BOWMAN	**Delivery Location:**	8916 77TH TER E 103
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		LAKEWOOD RANCH, FL, 34202
		Delivery date:	Sep 7, 2023 16:00

Shipping Information:

Tracking number:	773291140457	**Ship Date:**	Sep 5, 2023
		Weight:	2.0 LB/0.91 KG

Recipient:
Todd Bowman, Tarpon Tower II
8916 77th Terrace East
Suite 103
LAKEWOOD RANCH, FL, US, 34202

Shipper:
Michael Jones,
140 Beach 137th Street
ROCKAWAY PARK, NY, US, 11694

Reference NJJER01146D